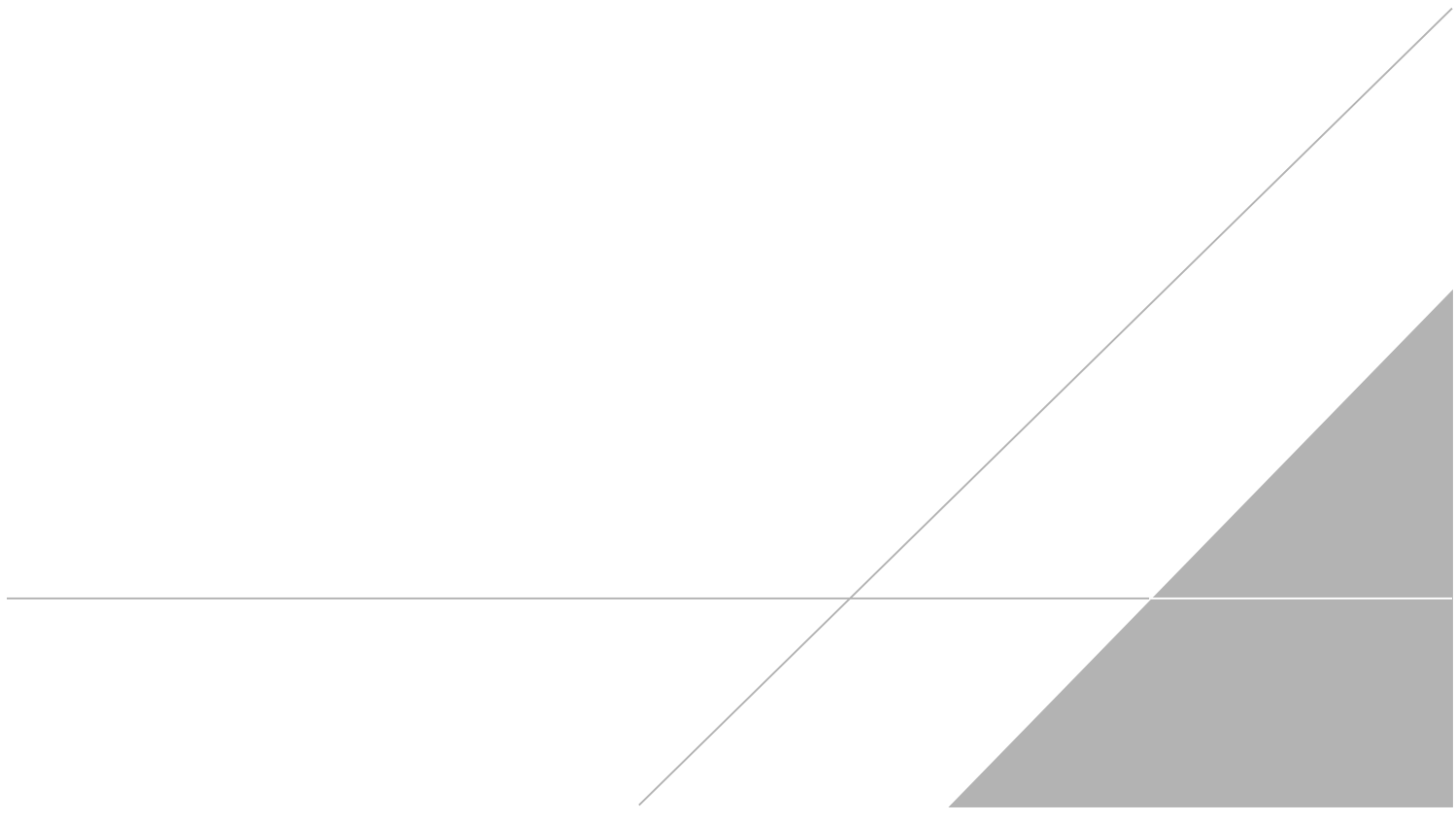
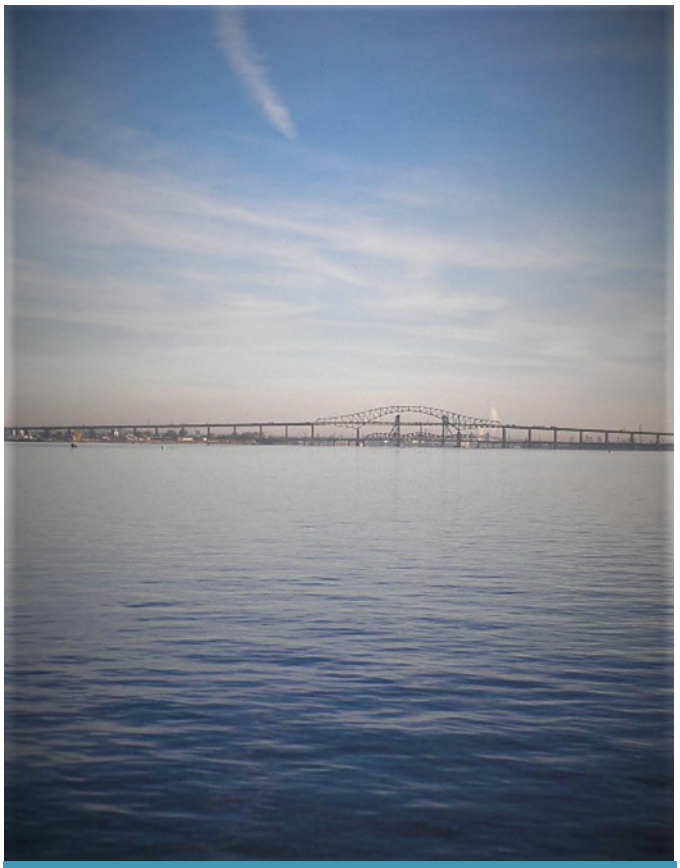
APPENDIX J

Model Documentation



Appendix J-1

Newark Bay Study Area (NBSA) Remedial Investigation and Feasibility Study (RI/FS) Model Documentation (Prepared by HDR Engineering, Inc.)



Newark Bay Study Area (NBSA) Remedial Investigation and Feasibility Study (RI/FS) Model Documentation

November 2021

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1 Introduction

The Newark Bay Study Area (NBSA) Remedial Investigation and Feasibility Study (RI/FS) includes the application of a modeling framework consisting of hydrodynamic, wind-wave, sediment transport, organic carbon, and contaminant fate and transport model components. The current model framework (NBSA RI/FS model) includes enhancements introduced as part of the application and calibration performed by the Cooperating Parties Group, as part of the Lower Passaic River (LPR) Remedial Investigation (Anchor QEA 2019). This report provides an abbreviated description of elements of the model components and identifies sections of existing reports with more-detailed descriptions of the evolution of the model framework, and development of model inputs and calibration approaches and performance of the current framework.

This report also documents the progression of the application of the NBSA RI model from the end of the calibration in September 2013 through September 2019, and development of FS model inputs and simulation of future remedial alternatives. This report provides specific focus on elements of the modeling framework for which additional detail was requested by the Glenn Springs Holding RI/FS team.

1.1 Model Development History

The modeling framework applied for the NBSA RI/FS has its origins in the model application developed as part of the Contamination Assessment and Reduction Project (CARP) in the early-2000s. The CARP model framework included a hydrodynamic model, sediment transport model, organic carbon and eutrophication model, and a contaminant fate and transport model. The model domain included the Hudson River, New York-New Jersey Harbor, Long Island Sound, and New York Bight from Cape May, New Jersey to Nantucket Shoals, Rhode Island. Although primarily focused on the New York and New Jersey Harbor Estuary, the CARP model domain also included NBSA, the LPR, and Hackensack River (including the Meadowlands). However, model grid resolution within NBSA was relatively coarse and model calibration performance in NBSA was not assessed.

The CARP modeling framework was subsequently proposed in 2006 as the starting point for the model application for the RI/FS of the LPR and NBSA. Accordingly, model grid resolution in the LPR and NBSA was refined to support the objectives of the RI/FS. Hydrodynamic model performance within LPR and NBSA was assessed, and the model calibration developed in 2008. Since its domain extends over the same physical domain as the CARP model, the model grid used for the hydrodynamic model calibration is referred to as the “full grid”. Subsequently, in the interest of computational efficiency, the model domain was truncated to the extent of the LPR, NBSA, Hackensack River (including the Meadowlands) and the eastern and southern ends of the Kill van Kull and Arthur Kill, respectively. This model grid version is referred to as the “truncated grid”.

The calibrated hydrodynamic model (using the truncated grid) was used to support the development and calibration of sediment transport, organic carbon, and contaminant fate

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and transport models by EPA for the Focused Feasibility Study of the lower 8.3 miles of the Lower Passaic River (OU2) in 2014; this is referred to as the FFS model. The calibrated hydrodynamic model (using the truncated grid) was also used to support the development and calibration of sediment transport, organic carbon, and contaminant fate and transport models by the Cooperating Parties Group for the RI/FS of the 17-mile LPR and NBSA; this is referred to as the LPR and NBSA RI/FS model. Model development was initiated by verification of hydrodynamic model performance in the LPR using data collected as part of the RI of the 17-mile LPR. This was followed by the development of the sediment transport, organic carbon, and contaminant fate and transport models of the LPR. Subsequently, the NBSA portion of the model domain was refined and calibrated by the CPG using RI data in NBSA.

It is worth noting that the FFS model and the LPR and NBSA RI/FS models use largely the same model formulations, although some specific inputs and processes differ. The following section lists citations for the various modeling studies and reports discussed above.

1.2 Additional Documentation

Additional Reports related to the development of models used for the RI/FS for the Lower Passaic River and Newark Bay include:

- Hydrodynamic and Sediment Transport Model of Newark Bay – (Moffatt & Nichol and Deltares 2020a) prepared for the Lower Passaic River Cooperating Parties Group (including Appendices A-F), which is included as Attachment 1 to this report.
- Organic Carbon Model Report of Newark Bay – (Moffatt & Nichol and Deltares 2020b) prepared for the Lower Passaic River Cooperating Parties Group, which is included as Attachment 2 to this report.
- Contaminant Fate and Transport Model Report for the Newark Bay Study Area - (Anchor QEA 2020) prepared for the Lower Passaic River Cooperating Parties Group, which is included as Attachment 3 to this report.
- Lower Passaic River Study Area Remedial Investigation/Feasibility Study Remedial Investigation Report – Available at: http://www.ourpassaic.org/RemedialInvestigation.aspx
- Lower Passaic River Final Focused Feasibility Study (April 2014) – Available at: https://sharepoint.ourpassaic.org/Public%20Documents/2014-03-10%20LPR%20Focused%20Feasibility%20Study%20Report.pdf
- Lower Passaic River Final Remedial Investigation Report (April 2014) - Available at: https://sharepoint.ourpassaic.org/Public%20Documents/2014-02-05%20LPR%20Remedial%20Investigation%20Report.pdf
- Lower Passaic River Final Hydrodynamic Modeling Report (January 2008) - Available at

https://sharepoint.ourpassaic.org/Public%20Documents/2008-1-25-LPR-NB_Hydrodynamic%20Report.pdf

- Newark Bay Study Modeling Work Plan Addendum – Available at: https://sharepoint.ourpassaic.org/Public%20Documents/2006-10-04%20NBSA%20Modeling%20WP%20Addendum%20HQI.pdf
- Lower Passaic River Final Modeling Workplan – Available at: https://sharepoint.ourpassaic.org/Public%20Documents/2006-09-13%20Final%20Modeling%20Workplan%20HQI.pdf
- CARP Modeling Report – Available at: https://www.hudsonriver.org/article/contaminants

1.3 Modeling Framework

The NBSA modeling framework is comprised of three main elements: (1) a coupled hydrodynamic and sediment-transport model, (2) an organic carbon model, and (3) a contaminant fate and transport model.

1.3.1 Coupled Hydrodynamic and Sediment Transport (HST) Model

In the interest of computational efficiency, model hydrodynamics and sediment transport were run separately with different timesteps. The hydrodynamics and sediment-transport solutions were then coupled periodically to reflect small bathymetric changes due to net erosion or deposition. The modeled interval between bathymetric coupling was typically 15 days but ranged from 30 days during quiescent conditions to as little as 1 day during high-flow conditions (Section 5.3 of Moffatt & Nichol and Deltares 2020a). Within the sediment-transport component, bed scour due to ship traffic within the navigational channels and ship terminal areas was implemented as a constant scour rate and vertically uniform resuspension into the water column (Section 5.2.8 of Moffatt & Nichol and Deltares 2020a). The scour rate was adjusted during model calibration until rates of deposition within the navigational areas were generally consistent with estimates of net deposition based on analyses of historical bathymetry data and maintenance dredging records.

1.3.2 Alternative Organic Carbon (AOC) Model

The organic carbon model for the NBSA employed the same simplified kinetics developed for the Lower Passaic River Study Area (LPRSA) model (Moffatt & Nichol and Deltares 2019c), and included external loadings of algal and detrital OC, advection and dispersion, settling of the algal and detrital fractions at different rates, deposition to the sediment bed, and potential erosion of the detrital fraction. The term “Alternate” in the title differentiates this version from the one that includes a coupled sediment diagenesis and nutrient flux submodel (Appendix BIII, Section 2 of Louis Berger Group et al 2014). A fraction of the algal OC depositing to the bed was converted to detrital OC as an approximation to microbially mediated sediment diagenesis. Detrital OC was treated as a conservative substance to simulate the refractory carbon remaining after all trophic interactions have occurred.

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1.3.3 Contaminant Fate and Transport (CFT) Model

The Modeling Work Plan developed by Region 2 for the RI/FS of the LPRSA (HydroQual 2006a) and NBSA (HydroQual 2006b) included the development and application of a contaminant fate and transport model to simulate contaminant dynamics within the LPRSA and NBSA. The model applications to the LPRSA and NBSA share the model codes, formulations, inputs, and calibration metrics/parameters. The application to LPRSA was developed initially and is documented in Anchor QEA 2019 followed by the application to NBSA documented in Anchor QEA 2020.

1.4 Model Domain

The NBSA model domain encompasses waterways leading to Newark Bay proper such as Kill van Kull (KVK) in the east and entire Arthur Kill (AK) on the west and south, as well as upstream waterways, such as the Lower Passaic River (LPR) and Hackensack River (HR). A more detailed description of model domain and a history of morphological changes in Newark Bay can be found in Section 2 of Moffatt & Nichol and Deltares 2020a and HydroQual 2008.

The NBSA horizontal grid is a truncated version of the spatially variable, orthogonal curvilinear grid developed for the LPRSA model, with ten vertical layers each representing ten percent of the water column (Section 3 of Moffatt & Nichol and Deltares 2020a). Grid resolution within NBSA ranges from an average of 113 m wide and 147 m long (along the longitudinal axis of the Bay) within the navigation channel (excluding the Port Newark and Port Elizabeth channels) to 149 m wide and 130 m long on the subtidal channels. Grid resolution was varied spatially primarily to resolve the navigation channel with a minimum of 2-3 cells, with a somewhat coarser resolution on the subtidal shallows. This allows the representation of physical processes such as salinity intrusion, spatial variations in tidal currents and shear stresses relevant for sediment transport, etc. that depend on the appropriate representation of lateral variations in bathymetry. For computational consistency, the same grid is employed by each of the NBSA component models (i.e., HST, AOC, and CFT). Computational efficiency is achieved by using a coarser grid in areas of the model domain outside the primary region of interest (ROI) and a finer grid within the region of interest and for regions where bathymetry and physical transport processes vary at smaller spatial scales (Figure 1-1). Thus, a larger grid size is sufficient to characterize channelized flow in the AK and KVK whereas a much smaller grid size is used within Newark Bay to better represent the influence of deep navigational channels and the bathymetric transition to adjacent shallow subtidal areas. Grid resolution within the Arthur Kill averages 157 m wide and 815 m long (along the north-south direction), and within Kill van Kull averages 130 m wide and 320 m long (along the east-west direction).

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2 Modeling Framework

2.1 Hydrodynamic and Sediment Transport

2.1.1 Bathymetry

Model bathymetry within the NBSA portion of the model domain was based on several data sources. For the calibration simulations between 1996 and 2019, model bathymetry in the navigation channels of Newark Bay, KVK, and the AK was varied to reflect depth changes associated with the USACE NY District Harbor Deepening Projects (HDP). The HDP started from 1999 in the NBSA area and most of the deepening activities within NBSA model domain were completed by 2010. However, on the sub-tidal shallows within NBSA, given the lack of historical high-resolution multi-beam bathymetry data, bathymetry inputs were defined using the NBSA RI bathymetry collected in 2012-2013. In computational terms, the hydrodynamic and sediment transport models were initialized in water year 1995 using the authorized channel depths (in the navigation channel and port areas) and using the 2012 NBSA RI bathymetry on the sub-tidal shallows. Subsequently, bathymetry evolves in response to morphological change due to erosion and deposition. Periodic changes within the navigation channel and port areas due to the HDP deepening projects were incorporated as an instantaneous change in the model bathymetry.

In addition to bathymetry in NBSA, as part of the calibration of the NBSA RI/FS model by the CPG, bathymetry (and geometry) inputs in the Meadowlands were refined. Briefly, the modifications were limited to the inter-tidal areas within the Meadowlands and was defined primarily based on model performance assessment for tidal currents in the Hackensack River and the model's ability to reproduce features such as ebb-dominance in tidal currents in the Hackensack River and the phase difference in the timing of tidal currents in the Hackensack River and the LPR. A discussion of the bathymetry modifications is included in Section 3.4 of Moffatt & Nichol and Deltares 2020a.

2.1.2 Thin Dams

In several instances, solid structures (e.g., piers, breakwaters, dikes) notably smaller than the model grid size protrude into the model domain and block flow. These protrusions are handled numerically by a "thin dam" feature in the hydrodynamic model. A thin dam acts like an infinitely narrow vertical wall extending through the water column and preventing flow and diffusive exchange between two adjacent grid cells. Figure 2-1 shows the locations of thin dams in the KVK and lower Newark Bay, which are included to represent narrow land masses protruding into the waterways. Thin dams in the Meadowlands near Saw Mill Creek (Figure 2-2) represent long dikes separating water bodies between the HR and the adjacent marsh/wetland/flood-control areas.

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2.2 Hydrodynamic Model

Additional details of the hydrodynamic model are included in previous reports (HydroQual 2008, Moffatt & Nichol and Deltares 2019a, and 2020a).

2.2.1 NBSA Model Boundary Conditions

The NBSA model domain is a subset of the NY-NJ Harbor Regional Model (Figure 2-3), which encompasses the entire NY-NJ Harbor as well as adjoining water bodies, including the Hudson River north to Poughkeepsie, NY, the East River and Long Island Sound, and the coastal Atlantic Bight from Cape May, NJ, to the island of Nantucket, MA (HydroQual 2008). The Regional Model simulates the comprehensive hydrodynamic behavior of the region, providing all the necessary forcing information for the NBSA model, such as tidal water-surface elevations, seasonal and short-term water-elevation perturbations due to meteorological events (i.e., storm surges), time- and depth-variable water temperature and salinity variations due to high-flow and low-flow events in Hudson River, etc. Boundary forcing data for the NBSA model were extracted from output of the Regional Model at the entrance to the KVK near Constable Hook and the southern entrance of the AK near South Amboy.

Physical forcing for the Regional Model included the following components:

- Astronomical tides computed by the Global Tidal Prediction Model TPXO.2 developed by Oregon State University
- Sub-tidal elevation observed at the NOAA tide station at Sandy Hook, NJ (ID: 8531680), which provides seasonal variations of water levels as well as storm-related water level changes in the NY-NJ Harbor
- Constant cross-shelf gradients in water-surface elevation to represent the long-term geostrophic balance across the New York Bight Apex
- Water temperature and salinity (T/S) boundary conditions at offshore boundaries extracted from monthly climatological data compiled in NOAA's World Ocean Atlas (2013) (Levitus et al, 2015), which were applied for all model years
- USGS flow gage data for the LPR at Dundee Dam, Clifton, NJ (#01389090), and the Hackensack River at New Milford, NJ (#01378500).
- Additional inflows within the model domain included a total of 203 combined sewer outfalls, storm sewer outfalls and stormwater direct drainage, and sewage treatment plant outfalls (Louis Berger Group et al 2014).

Additional information may be found in Section 2.1.3 of Moffatt & Nichol and Deltares 2019a.

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2.2.2 Coriolis Force

The Coriolis force is included in the ECOM's Reynolds momentum equations (HydroQual, 2010):

$$\frac{\partial U}{\partial t}+\vec{V}\cdot\nabla U+W\frac{\partial U}{\partial z}-fV=-\frac{1}{\rho_o}\frac{\partial P}{\partial x}+\frac{\partial}{\partial z}\left(K_M\frac{\partial U}{\partial z}\right)+F_X$$

$$\frac{\partial V}{\partial t}+\vec{V}\cdot\nabla V+W\frac{\partial V}{\partial z}+fU=-\frac{1}{\rho_o}\frac{\partial P}{\partial y}+\frac{\partial}{\partial z}\left(K_M\frac{\partial V}{\partial z}\right)+F_Y$$

Latitudinal variation of the Coriolis parameter, f, is computed using the linear β-plane approximation

$$f = 2\omega\sin\phi_{ref} + \beta y$$

where ω is the angular rotation rate of the Earth, ϕ_{ref} is the reference latitude for the model domain, β is the meridional gradient of the Coriolis parameter at ϕ_{ref}, and y is the meridional distance from ϕ_{ref}.

2.2.3 Bottom Friction

In ECOM, the bed shear stress ($\vec{\tau}_b$) is determined by matching the near-bed velocity ($\vec{V}_b$) with the logarithmic law of the wall via a quadratic drag formulation. Specifically,

$$\vec{\tau}_b=\rho_o C_D|\vec{V}_b|\vec{V}_b$$

The drag coefficient (C_D) in the formula above is calculated as

$$C_D=\left[\frac{1}{\kappa}\ln\left(H+z_b\right)/z_o\right]^{-2}$$

where ρ_o is a reference water density, H is mean water depth, z_b is distance from the bed to the middle of the model's deepest computational layer, z_0 is a bottom roughness parameter, and κ is von Karman's constant (= 0.4). A constant, spatially uniform value for z_0 of 0.1 cm was specified for the entire model domain, which represents the relative roughness of a mud/silt bed.

2.2.4 Eddy Viscosity and Eddy Diffusivity

ECOM incorporates the Mellor and Yamada (1982) level 2-½ turbulence closure scheme to provide a realistic parameterization of vertical turbulent mixing of momentum (*eddy viscosity*) and scalar properties (*eddy diffusivity*), such as temperature and salinity. A Smagorinsky (1963) formulation is used for calculation of horizontal turbulent mixing. A more detailed description can be found in Mellor and Blumberg (1985). The eddy viscosity

calculation applies a minimum value of 1.0 E-6 m^2/s^2, representing the approximate kinematic molecular viscosity of water. The Smargorinsky horizontal diffusion scaling coefficient was set to 0.01 for the entire model domain. The same values were used for both the larger-domain Regional Model and the smaller-domain NBSA model.

2.2.5 Wind and Atmospheric Pressure Forcing

For the NBSA model, meteorological data observed at Newark International Airport (EWR), located near the center of the model domain, were used, and spatially constant values were applied to the entire model domain. These meteorological input parameters include wind speed and direction, air temperature, atmospheric pressure, relative humidity, and cloud cover. Within the ECOM hydrodynamic model, air temperature, atmospheric pressure, relative humidity, and shortwave radiation regulate heat flux across the air-water interface. Since shortwave radiation data were not available at EWR, shortwave radiation was computed in the model from cloud cover data (HydroQual 2006a).

For surface wind stress, the nondimensional wind drag coefficient (C_D) is computed in three tiers in ECOM:

- If wind speed is less than 11 m/s, C_D is set to a constant value of 1.2 E-3.
- If wind speed is greater than 11 m/s and less than 25 m/s,

  $C_D = (0.49 + 0.065\ W_s) \times 1.0$ E-3

  where W_s is the wind speed (m/s).
- If wind speed is greater than 25 m/s,

  $C_D = (0.49 + 0.065 \times 25.0) \times 1.0$ E-3

  or is capped at a maximum value of 2.115 E-3.

The surface wind stress is calculated as:

$$T_{surf} = 1.2 C_D W_s^2$$

Atmospheric pressure is also added to the barotropic pressure terms in the computation of sea surface elevations. However, because the NBSA domain is relatively small, a spatially constant reference pressure is sufficient and does not contribute to the computation of sea surface elevations.

2.3 Sediment Transport Model

2.3.1 Computational Timing

In the interest of incorporating the effect of bathymetric changes calculated by the sediment transport (ST) model (in response to erosion, deposition, navigation scour, consolidation, and swelling processes) in a given period into the circulation and flow patterns computed by the HD model in subsequent periods, the HD model is updated with

bathymetric changes calculated by the ST model. This is achieved by executing the HD and ST models for discrete time periods which range from as much as 30 days (more typically 15 days) during low to average flow conditions to as little as 1 day during high-flow conditions. For computational efficiency and recognizing that bathymetric changes within each time period are marginal compared to total water depths, bathymetric changes computed by the ST model are incorporated into the subsequent hydrodynamic simulations with a lag of one time period. The sequence of computations in the decoupled HD and ST models is as follows. For an example with simulations proceeding in 15-day periods, the HD model is run first, the HD transport solution saved and used to run the ST model. However, the bathymetric changes computed during a simulation from day 0-15 are incorporated not in the following period (day 15-30), but rather in the simulation from day 30-45. This enables the HD model to be run for the time-period from day 15-30 in parallel with the ST model run for day 0-15. This is a reasonable approximation since the bathymetric changes within a given time period are typically on the order of a few millimeters to centimeters which is small compared to the water depth in individual grid cells (typically on the order of meters). This is the same protocol that was used for the LPRSA model (Moffatt & Nichol and Deltares 2019a,b).

2.3.2 Transport Formulation

The ST model framework applied to the NBSA follows the approach outlined in the LPR and NB MWP documents (HydroQual 2006a,b). The model framework is identical to the one applied for the 17-mile LPRSA RI/FS (Moffatt & Nichol and Deltares 2019a,b), except as described in the following text. It involves an implementation of the SEDZLJ bed model developed by Jones and Lick (2001) and the bed consolidation model developed by Sanford (2008) within the computational framework of the ECOM hydrodynamic model. The combined hydrodynamic and ST modeling framework is referred to as the ECOM-SEDZLJS model. Because the overall ST model framework and formulations (relating to general ST processes of advection, erosion, deposition, consolidation, etc.) are the same as used for the LPRSA RI/FS, these are not described here in detail. The report documenting the model application for the LPRSA RI/FS (Moffatt & Nichol and Deltares 2019a,b) provides documentation of the general ST model processes, formulations, as well as modifications and formulations implemented during the course of model application to the LPRSA.

2.3.3 Critical Shear Stress for Erosion

Flow moving across the sediment bed imparts a frictional shearing force per unit area tangential to the bed, which is termed the bed shear stress ($\vec{\tau}_b$). Bed shear stress is considered to represent the effect of form friction due to the presence of large-scale features such as bed forms (dunes, ripples, etc.), vegetation, and debris, and skin friction which is the shear stress component acting on the individual sediment particles at the bed-water interface and is the force responsible for erosion. Skin friction is calculated using the median grain diameter, D_{50}, of the surficial sediments at model initialization, and the instantaneous currents in the bottom-most water column layer. In other words, the D_{50} used to calculate the Nikuradse grain roughness height (which is an input to the skin friction

formulation) is a spatially-variable (due to spatial variations in initial conditions for sediment grain size mass fractions) but a temporally constant property. When skin friction exceeds the critical shear stress for erosion (τ_{Cr}), the shearing force exerted on the bed exceeds the various forces maintaining bed stability and the bed begins to erode. For sediments containing approximately 15% or more of fine-grained solids with nominal diameters less than 63 μm (i.e., silt and clay), electrostatic and adhesive interaction between the small sediment solids often result in critical shear stresses for erosion that are elevated relative to non-cohesive beds comprised of quartz sand. The capacity of these cohesive sediments to withstand erosion is notably site dependent and cannot be predicted through parametric or empirical relationships based on the sediment's physical and chemical properties alone. For cohesive beds, the critical shear stress for erosion is typically estimated experimentally under controlled flow conditions by eroding sediment cores collected at the site of interest within a field-deployable recirculating flume called the Sedflume. Details of the 2012 Sedflume studies within the NBSA are presented in Appendix B of Moffatt & Nichol and Deltares 2020a.

Like the sediment transport model developed for the LPRSA, the erosion properties of the NBSA sediment transport model distinguish between three categories of bed sediment layers: (1) an easily erodible surficial Fluff Layer that is subject to erosion and redeposition every tidal cycle, (2) a stack of consolidated sediment layers referred to as Parent Layers, and (3) Deposited Layers that develop by deposition during the course of model simulation. Erosional properties for the NBSA Fluff Layer are the same as those developed for the LPRSA model. Erosional properties for the Parent Layers were derived from the Sedflume experiments mentioned previously. Erosional properties for the Deposited Layers vary with time following the bed consolidation model of Sanford (2008), which was parameterized such that the erosional properties of the Deposited Layers approach those of the Parent Layers during the process of consolidation. A detailed description of bed erosional properties for the NBSA sediment transport model is presented in Section 5.2.5 of Moffatt & Nichol and Deltares 2020a.

2.3.4 Sediment Specification

2.3.4.1 Particle Size Classes

For simulation continuity with the LPRSA ST model, the NBSA ST model employed the same five sediment size classes: clay, silt, fine sand, coarse sand, and gravel. Effective particle diameters for the modeled sediment size classes are listed in Table 2 of Moffatt & Nichol and Deltares 2020a.

2.3.4.2 Bed Composition

Initial sediment mass fractions within each of the modeled size classes were based on evaluations of NBSA measurements by Sommerfield and Chant (2010) and the 2005 and 2007 NBSA RI Phase I and II datasets. Spatial patterns in the available data were evaluated first to segregate the model domain into ten zones (Figure 5-1 of Moffatt & Nichol and Deltares 2020a) that showed similar sediment characteristics and were expected to experience similar hydrodynamic and sediment transport regimes. Other locally important

processes, such as potential wave erosion in the shallows and navigation scour in the ship channels (Section 5.2.2 of Moffatt & Nichol and Deltares 2020a) were also considered. For each zone, an averaged grain-size distribution was computed from the sampling stations located within that zone. Average zonal grain-size distributions were based solely on the NBSA RI datasets because Sommerfield and Chant (2010) did not characterize sand content over the entire range of the sand size class (i.e., 63–2000 μm). Data from Sommerfield and Chant (2010) and the 2005 and 2007 NBSA RI Phase I and II datasets indicate that the area at the intersection of the NB main shipping channel and the channels leading to the Arthur Kill and Kill van Kull (Figure 5-1 of Moffatt & Nichol and Deltares 2020a), is a region of exposed bedrock. Therefore, the initial condition for this area was defined as "non-erodible," meaning that erosion of the model Parent Layers could not occur, but sediment can deposit on top of the non-erodible bed over the course of the model simulation, and deposited sediment can erode if time-variable skin friction exceeds the critical threshold value. Due to a paucity of sediment grain-size data below the surficial layer, the average grain-size mass fractions developed for the top 15 cm of the bed were also used as initial conditions for deeper model layers in all zones.

2.3.4.3 Bed Layer Structure with Depth

The initial layer structure of the model sediment bed (Section 5.2.7 of Moffatt & Nichol and Deltares 2020a) derives from the seven depth intervals (0-2.5, 2.5-5, 5-10, 10-15, 15-20, 20-25, > 25 cm) defined for the Sedflume erosional study (Table 3 and Appendix B of Moffatt & Nichol and Deltares 2020a). Data-based erosional properties, sediment dry density, and initial conditions for bed grain-size distributions are assigned to each of these seven initial Parent Layers. The surficial Fluff Layer was initialized with a thickness of 1 mm. Depositional Layers that develop over the course of the model simulation are also defined with 1-mm discretization to achieve a smooth transition in consolidation and erosional properties with depth in the bed.

2.3.4.4 Hard Bottom

Data were not available to characterize the erosion characteristics of the sediment bed in the Hackensack River, the Meadowlands, or portions of the Kill van Kull and Arthur Kill south of the Goethals Bridge. Therefore, the Parent Layers in these areas are represented in the model as hard-bottom, or non-erodible. However, sediments deposited in these areas during the course of the simulation are tracked in the Deposited Layers and can be subject to erosion depending on the formulations described in Section 2.3.3. Although the hard-bottom definition in these areas represents an approximation of sediment dynamics within these model sub-domains, it should be noted that these areas are outside NBSA. In addition, the navigation channel in the Kill van Kull and Arthur Kill are known to contain exposed bed rock and/or Pleistocene-era deposits, and therefore, the hard-bottom assumption in these areas is not unreasonable. Furthermore, as part of the calibration process, the model-calculated exchange of suspended sediments between these sub-domains and NBSA was assessed by comparison to RI data and to the literature (as available). Overall, the artifacts introduced by the hard-bottom assumptions in these sub-domains represent more so an uncertainty for model performance within those sub-domains than for the exchange between NBSA and these sub-domains. This implies that

model performance within NBSA is not expected to be impacted by the hard-bottom assumptions within the Hackensack River, the Meadowlands, or portions of the Kill van Kull and Arthur Kill.

2.3.5 Inflow Loading for Suspended Sediment

Inflows to the NBSA ST model (Section 5.2.4 of Moffatt & Nichol and Deltares 2020a) are the same as for the LPRSA ST model (Moffatt & Nichol and Deltares 2019b) and include inflows from the Kill van Kull, Arthur Kill, Dundee Dam, freshwater tributaries entering the LPR downstream of Dundee Dam, the Hackensack River, and CSOs/SWOs. Suspended sediment concentrations (SSC) for the LPR freshwater tributaries, the Hackensack River, and the CSOs/SWOs were set the same as the Region 2 FFS model (Louis Berger 2014). For the remaining inflows, rating curves developed for the LPRSA ST model were applied to the NBSA ST model, relating total SSC to other measured or modeled physical parameters, such as velocity, volumetric discharge, tidal range, etc. In addition to SSC, mass-fractions of modeled sediment size classes assigned to inflows followed the grain-size fractions developed previously for the LPRSA ST model (Moffatt & Nichol and Deltares 2019b).

2.3.6 Scaling Factors

The partitioning or scaling of resuspension into suspension and bedload is described in Jones and Lick 2001.

2.3.6.1 Turbulent Schmidt Number for Suspended Sediment

The turbulence closure scheme employed in ECOM-SEDZLJS distinguishes between a turbulent vertical mixing coefficient (K_M) for fluid momentum (*vertical eddy viscosity*) and a turbulent vertical mixing coefficient (K_H) for scalar properties (*vertical eddy diffusivity*) such as temperature, salinity, and the concentration of suspended sediment. Within the context of the Mellor and Yamada 1982, level 2-½ turbulent closure scheme, $K_M = \ell q S_M$ and $K_H = \ell q S_H$, where ℓ is the turbulence macroscale, $q^2/2$ is turbulent kinetic energy, and S_M and S_H are the Galperin et al. 1988 stability functions

$$S_M = \frac{B_1^{-1/3} - 3A_1A_2G_H\left[\left(B_2 - 3A_2\right)\left(1 - \frac{6A_1}{B_1}\right) - 3C_1\left(B_2 - 6A_1\right)\right]}{\left[1 - 3A_2G_H\left(6A_1 + B_2\right)\right]\left(1 - 9A_1A_2G_H\right)}$$

$$S_H = \frac{A_2\left(1 - \frac{6A_1}{B_1}\right)}{1 - 3A_2G_H\left(6A_1 + B_2\right)}$$

and

$$G_H = -\left(\frac{\ell}{q}\right)^2 \frac{g}{\rho_0}\frac{\partial \rho}{\partial z}$$

is the parameter that accounts for the influence on turbulent mixing of density (ρ) stratification of the water column. The various empirical constants of the turbulence closure are given by the vector ($A_1, A_2, B_1, B_2, C_1, E_1, E_2$) = (0.92, 0.74, 16.6, 10.1, 0.08, 1.8, 1.33). The relationship between the turbulent mixing coefficients K_M and K_H is often presented as $K_H = K_M/\sigma_H$, where σ_H is the turbulent Schmidt number for mixing of scalar properties. From the above equations, it can be seen that in the context of the ECOM-SEDZLJS turbulence closure, $\sigma_H = S_M/S_H$. If vertical density gradients are present, then the turbulent Schmidt number applied in the sediment transport model will vary with G_H, both in space and in time. However, if vertical density gradients are absent or negligible, then both S_M and S_H reduce to discrete values (0.39 and 0.49, respectively), making the ECOM-SEDZLJS turbulent Schmidt number $\sigma_H \approx 0.80$ for an unstratified water column. This value falls midway within the literature range (i.e., 0.7–0.9) for turbulent mixing of passive scalar properties (e.g., Businger et al. 1971; Yamada 1975; Luyten et al. 1996).

2.3.7 Navigation Scour

The NBSA ST model includes the impact of navigation scour on sediment transport. Newark Bay is characterized by intense ship traffic, with ships in motion independently or supported by tugboats. The wake of the ships and their propellers can induce considerable erosion/scour of the bed, particularly while maneuvering for mooring, redistributing the sediments within the Bay (Sections 2.3, 5.2.8, and 6.3 of Moffatt & Nichol and Deltares 2020a). Preliminary application of the NBSA ST model without navigation scour suggested SSC deficits at locations beyond the main shipping areas and excessive sedimentation within shipping channels and terminal areas. Model results were improved by resuspending sediment at a calibrated rate in areas considered to be impacted by navigation scour and allowing those solids to be redistributed within the model domain (Sections 4.1, 5.2.8, and 6.3 of Moffatt & Nichol and Deltares 2020a). Accordingly, the areas subject to navigation scour include the navigation channels in the Kill van Kull, Arthur Kill, and Newark Bay, and the port and terminal areas in Newark Bay. However, as discussed in Section 3.5.1, based on further review of the navigation traffic data in Arthur Kill, the spatial extent of navigation scour in Arthur Kill was refined from the initial definition developed as part of model calibration by the CPG.

2.4 Organic Carbon Model

The Modeling Work Plan developed by Region 2 for the RI/FS of the LPRSA (HydroQual 2006a) and NBSA (HydroQual 2006b) included the development and application of a eutrophication model (ST-SWEM) to simulate organic carbon (OC) dynamics within the LPRSA and NBSA. Subsequent discussions between Region 2 and the CPG led to the development and implementation of a relatively simpler approach (referred to as the Alternative Organic Carbon [AOC] model) for modeling OC dynamics within the LPRSA and NBSA. The formulations, setup, and performance of the AOC model summarized here are documented in further detail in Moffatt & Nichol and Deltares 2019c and 2020b.

2.4.1 Model Formulations

Briefly, the AOC model involved the elimination of the eutrophication and sediment diagenesis components of OC kinetics in ST-SWEM which allowed for a simplification of model formulations, inputs, and calibration. The AOC model has three main aspects. The first aspect involves the reduction of the number of OC fractions from the ST-SWEM representation of algal, labile, inert, and refractory (the latter three representing various forms of detrital carbon) to only algal and detrital carbon. The second aspect deals with the simplification of model kinetics to only represent external loadings (from freshwater and marine sources) of algal and detrital forms of OC, advection and dispersion of OC, settling of algae, and erosion/deposition of detrital carbon. Detrital carbon is considered a conservative substance in both water column and bed whereas only a fraction of the depositing algal carbon is assumed to be transformed to detrital carbon as an approximation of sediment diagenesis. In other words, the kinetics of eutrophication and sediment diagenesis are not simulated in the AOC model. The final aspect involves the modeling procedure since the AOC model requires only a limited set of inputs and limited model calibration as compared to a eutrophication model. The rationale and formulations of the AOC approach summarized above are described in further detail in Section 2 of Moffatt & Nichol and Deltares 2019c and 2020b. In addition, Section 3 of Moffatt & Nichol and Deltares 2019c also includes a comparison of results for various metrics using the AOC and ST-SWEM models.

2.4.2 Model Setup

The AOC model was applied over the same model domain and using the same model grid as the LPRSA and NBSA HST and CFT models. Initial conditions were specified for detrital carbon in the sediment bed using RI data, and for algal carbon and detrital carbon in the water column. Boundary conditions to the AOC model consist of inflowing concentrations of algal and detrital OC entering the model domain from (1) various freshwater inflows such as Dundee Dam, Hackensack River, Saddle River, Second River, Third River, and MacDonald Brook, (2) combined sewer overflows and stormwater outfalls, and (3) the Arthur Kill and Kill van Kull tidal boundaries. The boundary conditions were defined using a combination of empirical data and the results from regional-scale eutrophication models. Additional parameters required for the AOC model include water depths, advective and dispersive transport rates, and sediment erosion/deposition rates (relevant for detrital carbon). These were saved as 15-minute averaged quantities from the HST models and used directly by the AOC model. The only adjustable, i.e., calibrated, parameter in the AOC model is the settling velocity for algae – this was set to a value of 0.2 m/d. This is a typical representative value for algae and is over an order of magnitude lower than that of the slowest-settling sediment class in the ST model. The model setup summarized above is described in further detail in Sections 4 and 3 of Moffatt & Nichol and Deltares 2019c and 2020b, respectively.

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2.5 CFT Model

The Modeling Work Plan developed by Region 2 for the RI/FS of the LPRSA (HydroQual 2006a) and NBSA (HydroQual 2006b) included the development and application of a contaminant fate and transport model to simulate contaminant dynamics within the LPRSA and NBSA. The model applications to the LPRSA and NBSA share the model codes, formulations, inputs, and calibration metrics/parameters. The application to LPRSA was developed initially and is documented in Anchor QEA 2019 followed by the application to NBSA documented in Anchor QEA 2020.

2.5.1 Model Formulations

The formulations used in the LPRSA and NBSA CFT models derive from a previous regional-scale model application, the Contaminant Assessment and Reduction Project (CARP) for the New York/New Jersey Harbor Estuary (HydroQual 2007). The model includes the major fate and transport processes including advection, dispersion, settling, and volatilization in the water column, bed-water exchange processes of resuspension, deposition, and porewater diffusion, mixing by bioturbation and diffusive exchange in the bed, and three-phase partitioning. The model calculates the instantaneous dissolved and particulate-phase concentrations of these contaminants in the sediment bed and in the water column as a function of the time-variable fate and transport processes. The CFT model framework was further modified as part of its application to LPRSA and NBSA. Specific refinements include the inclusion of the fluff layer, approximation of sorption kinetics, representation of erosion rates, depth-variable bioturbation mixing rates, and inclusion of navigation scour. The formulations of the CFT model summarized above are described in further detail in Anchor QEA 2019 (Section 2) and 2020.

State variables in the CFT model consist of nine chemicals, including:

- 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD);
- tetrachlorobiphenyl (tetra-CB);
- 1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF);
- 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD);
- 2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF);
- polychlorinated biphenyl (PCB)-126;
- PCB-167;
- total 4,4’-DDx (i.e., sum of 4,4’ isomers only); and
- mercury.

The modeled contaminants were selected based on contaminants of concern in LPRSA as the 17-mile LPR RI model was being developed.

The model framework also allows for representation of typical remedial actions assessed as part of feasibility studies at Superfund sites. Specifically, it allows for representation of remedial actions such as dredging with/without backfill or capping, capping without dredging, thin layer capping, contaminant (and solids and OC) releases during dredging, and the far-field transport and recontamination potential associated with releases caused by dredging activities. Remedial actions can be represented following time-variable sequence and construction rates, as desired/appropriate for a given remedial scenario, and at the spatial scale of individual grid cells in the model. Contaminant (and OC and solids) mass released during dredging can be defined as a fraction of the dredged mass. Similarly, cap properties such as composition and thickness, and depth of dredging can also be defined. Remedial alternatives can also include combinations of different remedial actions in different areas of the study area. The model capability for representing remedial alternatives is generally similar to that applied and documented in the Focused Feasibility Study (FFS) of the lower 8 miles of the LPRSA (Louis Berger Group et al. 2014; USEPA 2016).

2.5.2 Model Setup

The CFT model was applied over the same model domain and using the same model grid as the LPRSA and NBSA HST and AOC models. In the vertical, the water column is represented by 10 layers of thickness (equal thickness layers at any given time but variable over time as a function of changing water depth). The sediment bed is comprised of a variable thickness fluff layer (1 mm or less), overlying a variable thickness surface layer (0.5 to 2.0 cm thick), followed by 106 1-cm bed layers, with an underlying deep bed layer (≥ 0 cm thick; initially 61 cm). The variables prescribing transport processes (advection, dispersion, water depths, suspended sediment concentrations and fluxes (erosion/settling/deposition rates), sediment mass bed, algal and detrital carbon concentrations and fluxes are based on 15-minute average values saved by the HST and AOC models over the scale of the individual model grid cells. Additional inputs for the CFT model include sediment initial conditions, boundary conditions, atmospheric loadings, point and non-point source loadings, and parameterizations of the sediment fluff layer, partitioning, and sediment bed mixing. These are briefly described next and described in further detail in Anchor QEA 2019 (Section 3) and 2020.

Sediment initial conditions in the CFT model application to NBSA include the definition of concentrations for the various state variables listed in the preceding section. The initial conditions were defined over the top 6 inches, 0.5 to 1.5 feet, 1.5 to 2.5 feet, 2.5 to 3.5 feet, and 3.5 to 5.5 feet depth-intervals in the bed. These depth-intervals correspond to the core intervals of the major LPRSA and NBSA datasets. The initial conditions were developed for two time-horizons, reflecting the model calibration strategy, partly based on the paucity of historical sediment data. The short-term calibration scenario consisted of a 2-year simulation from water year[1] 2012 (WY2012) through WY2013 covering the period of the chemical water column monitoring (CWCM) program in NBSA, and the long-term

[1] Water year is defined as the 12-month period from October 1, for any given year through September 30, of the following year. The water year is designated by the calendar year in which it ends. Water year 2012 starts October 1, 2011 and ends September 30, 2012.

calibration scenario consisted of a simulation from WY1995 through WY2013. The primary datasets used to develop initial conditions for the short-term calibration are the Phase I and Phase II data in NBSA (data collected from 2005 through 2007). Because of the paucity of historical data in NBSA, the Phase I and Phase II data were also used to develop initial conditions for the long-term calibration scenario, with available data from 1995 through 1999 used in the vicinity of the navigation channels near the Port Newark-Elizabeth Marine Terminal. The mapping approach used Thiessen polygons to map the data within each of seven geomorphic units in NBSA. Attachment 1 of Anchor QEA 2020 includes maps of initial conditions for each of the nine modeled contaminants over the top two depth-intervals.

Boundary conditions to the CFT model consist of inflowing whole-water concentrations for each of the nine contaminants entering the model domain from (1) various freshwater inflows such as Dundee Dam, Hackensack River, Saddle River, Second River, Third River, and MacDonald Brook, (2) combined sewer overflows and stormwater outfalls, and (3) the Arthur Kill and Kill van Kull tidal boundaries. The boundary conditions were defined using a combination of empirical data and the results from the regional-scale CARP model and are described in further detail in HydroQual 2007, Louis Berger Group et al. 2014, and USEPA 2016. During calibration, the boundary conditions at Arthur Kill, Kill van Kull, and Dundee Dam for some contaminants were adjusted by applying a uniform scale-factor if the model-predicted water column concentrations were consistently higher or lower than the data at the stations closest to these boundaries (i.e., the Arthur Kill, Kill van Kull, and RM 10.2 stations) and if model-data agreement could be materially improved by scaling those boundary conditions within their uncertainty bounds. These adjustments are described in further detail in Appendix O (Section 3.2) of Anchor QEA 2019a. Contaminant loadings from stormwater outfalls and combined sewer overflows were adopted directly from the FFS model (USEPA 2016). Similarly, atmospheric loadings were defined using USEPA FFS model inputs (USEPA 2016) which were derived from data gathered by New Jersey Atmospheric Deposition Network. The CARP (HydroQual 2007) and FFS (Louis Berger Group et al. 2014) model reports include further details of how the measured values were converted into model inputs.

Additional inputs required for the model include parameterization of partitioning, sorption kinetics, the sediment fluff layer, and sediment bed mixing. These inputs, summarized here, are further described in Section 3.5 of Appendix O of the LPR RI report (Anchor QEA 2019). Partition coefficients were generally based on the octanol-water partition coefficient values from the USEPA FFS model (Louis Berger Group et al. 2014; USEPA 2016) except in the case of mercury which was based on phytoplankton partitioning studies. The scaling factor for partitioning to dissolved OC was based on literature values. Parameterization of contaminant sorption kinetics (fractionation between equilibrium and resistantly-sorbed forms, and mass transfer rate from resistant to equilibrium form) were based on a combination of high-volume CWCM data and literature values. Parameterization of fluff layer dynamics was partly derived from the sediment transport model representation (primarily the maximum thickness of 1 mm), and partly derived on the basis of model calibration (primarily the diffusion coefficient describing contaminant mass exchange with the underlying bed layer and the rate of fluff layer thickness transfer to the parent bed). Parameterization of mixing (depth of mixing and mixing rate) in the sediment bed due to

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bioturbation was based on a combination of literature values, site-specific considerations, and model calibration. The mixing parameter values applied in NBSA are based on the LPRSA model application and is qualitatively consistent with the structure and abundance of the benthic macroinvertebrate community, the expected vertical variation in benthic biomass density, and the depth of the oxic zone. Sediment mixing intensity was set to be highest in the top 2 cm and declining linearly to 0 at 10-cm depth. The depth-mean mixing rate was adjusted during model calibration and treated as a spatially constant parameter. The calibrated depth-mean value of the mixing rate was based on the long-term sediment calibration in the LPRSA. Section 3.3 in Anchor QEA 2020 notes that a study of the biologically active zone in the NBSA (R.J. Diaz and Daughters and ARCADIS, 2008), conducted as part of the NBSA RI, indicates mixing depths up to 15 cm which is somewhat greater than the mixing depth in the CFT model. However, because of the lack of data to establish a calibration target to constrain concentration trends in NBSA surface sediments, mixing depths in NBSA were not adjusted from values established for LPRSA. Furthermore, a sensitivity analysis using the CFT model indicated only a moderate sensitivity of surface sediment concentration trajectories to the mixing depth.

3 Model Calibration

3.1 Hydrodynamic Model Calibration and Performance

The calibration of the hydrodynamic model for NBSA was originally developed by HydroQual (2008). Sections 4.4 and 4.5 of HydroQual 2008 include a comprehensive assessment of model performance for water level, currents, temperature, and salinity at locations within NBSA and at the marine boundaries (Arthur Kill and Kill van Kull). HydroQual 2008 also includes quantitative metrics comparing model performance relative to data. This model was further refined by Moffatt & Nichol and Deltares (2020a) as part of the development of the RI/FS models of LPRSA and NBSA. Specific refinements include the model setup in portions of the model domain outside LPRSA and NBSA (in portions of the Arthur Kill south of the Goethals Bridge, and in the Hackensack River and the Meadowlands) in order to reproduce gross transport patterns in the northern and southern portions of NBSA. This was achieved by assessing slack water timing in these portions of NBSA (see Sections 3.5.1 and 3.5. 2 of Moffatt & Nichol and Deltares 2020a). In addition, model performance for velocity and salinity was also assessed using time-series measurements from in situ moorings during the 2010 physical water column monitoring (PWCM) program at several locations within NBSA and at the boundaries of NBSA (see Section 3.5.3 and Appendix A of Moffatt & Nichol and Deltares 2020a). Finally, model performance was also assessed using salinity measurements from the 2011-2013 CWCM program at several locations within NBSA and at the boundaries of NBSA (see Section 3.5.4 of Moffatt & Nichol and Deltares 2020a). Overall, the assessment of model performance using the PWCM and CWCM data serve to validate the model calibration in NBSA (albeit, with refinements in the Arthur Kill, Hackensack River, and the Meadowlands) originally developed by HydroQual (2008).

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3.2 Sediment Transport Model Calibration and Performance

Model performance was assessed by comparing model results to several metrics within the NBSA, as well as at the NBSA boundaries (i.e., LPR, Hackensack River, Arthur Kill and Kill van Kull). Because of the tidal nature of the NBSA, net solids exchange at the boundaries is a function of the sediment dynamics within the NBSA, as well as the applied SS boundary conditions. Assessing model performance at these various locations allows for an examination of the processes and sediment dynamics within the NBSA and the system-wide behavior and mass balance for the NBSA. Calibration metrics included salinity, SSC, and SS fluxes determined as part of the 2009–2010 PWCM and 2011–2013 CWCM programs, as well as a comparison of model sedimentation rates versus NBSA maintenance dredging rates (Section 6.2 of Moffatt & Nichol and Deltares 2020a). Overall, the NBSA ST model reasonably reproduces the various processes and sediment dynamics identified within the NBSA, including spatial and temporal patterns in SSC and SS fluxes at the model boundaries and within Newark Bay and longer-term rates and patterns of sedimentation relative to measured maintenance dredging rates within the navigation channels and terminal areas within NBSA. Model performance is described in further detail in Sections 6.4 and 6.5 of Moffatt & Nichol and Deltares 2020a, and additional model-data comparisons are presented in Appendix F of Moffatt & Nichol and Deltares 2020a.

3.3 AOC Model Calibration and Performance

The AOC model was applied over the same time periods as the HST and CFT models. Model performance was assessed against several metrics over various spatial and temporal scales. Calibration metrics included chlorophyll-a data collected by the Passaic Valley Sewerage Commission and New Jersey Harbor Dischargers Group at several locations in the LPRSA and NBSA over 2003-2013, particulate organic carbon data collected as part of the physical and chemical water column monitoring programs in LPRSA and NBSA over 2009-2013, and data for OC in the sediment bed collected as part of the RI of LPRSA and NBSA. Model performance was assessed by comparison of model and data in the form of spatial and temporal trends, probability distributions, and cross-plots of model results against measured values. In addition, model performance was also assessed by comparing calculated and measured trends of particulate organic carbon versus suspended sediment concentrations. In general, the AOC model performed reasonably in reproducing various trends, features, and processes apparent in the data. The model performance summarized above is described in further detail in Sections 5 and 4 of Moffatt & Nichol and Deltares 2019c and 2020b, respectively.

3.4 Contaminant Fate and Transport Model Calibration and Performance

The CFT model was applied over the same time periods as the HST and AOC models, albeit following the short-term and long-term calibration scenarios mentioned previously. The short-term calibration scenario, covering WY2012 through WY2013, was chosen for calibrating model performance to water column data, specifically the CWCM dataset in

NBSA. The long-term calibration scenario, covering WY1996 through WY2013, was used for assessing model performance over the long term, primarily to temporal trends in surface sediments (0 to 6 inches).

Model parameters adjusted as part of calibration include the sediment mixing rate, the rate of chemical mass exchange between the fluff layer and the underlying bed, and the rate of thickness transfer from the fluff layer to the underlying bed. As mentioned previously, boundary conditions (at Dundee Dam, Kill van Kull, and Arthur Kill) for a limited number of contaminants were adjusted if supported by model-data agreement at stations closest to these boundaries and judged to be within the uncertainty of the boundary conditions (see Table 3-3 of Appendix O of Anchor QEA 2019).

Model calibration metrics in the water column included whole-water and particulate-phase concentrations using small-volume CWCM data, and whole-water and dissolved-phase concentrations using high-volume CWCM data. The CWCM data were collected at 5 stations within NBSA, distributed between the relatively deep channel and relatively shallow sub-tidal flats, and one station each at the four boundaries of NBSA (LPR, Hackensack River, Arthur Kill, and Kill van Kull). Model performance was evaluated against data qualitatively using cumulative probability distributions and cross-plots, separately based on location, based on depth in the water column where the data was collected, and based on flow regime in the LPR. In addition, model performance for each monitoring event was also evaluated against data using spatial plots for an assessment of spatial trends during each survey, using time-averaged concentrations over large spatial zones for an inter-annual assessment of temporal trends during the period spanning the CWCM surveys, and using instantaneous concentrations for a detailed assessment of intra-tidal dynamics in contaminant concentrations. Model performance in the water column was also assessed quantitatively for a statistical assessment of the quality of model calibration.

Model calibration metrics in the sediment bed included qualitative assessments of long-term temporal trends and large-scale spatial trends using the Phase I and Phase II RI data. Temporal trends were assessed over spatial zones distinguished by depositional and erosional characteristics over the course of the long-term simulation, over the scale of individual grid cells by comparing maps of initial and final concentrations, and over various spatially distributed zones in NBSA. Spatial trends were assessed separately in the channel and the subtidal areas on either side of the channel in NBSA.

Overall, the model performance assessment indicates that the CFT model generates physically reasonable results in the bed and water column for the NBSA and achieves a reasonable agreement with the data considered in the calibration process. The model shows a general degree of consistency with water column data when assessed longitudinally, vertically, and by flow regime, providing confidence in its ability to represent the net flux of COPCs between the bed and the water column. The qualitative lines-of-evidence assessing the long-term performance of the model also indicate consistency with the sediment data, suggesting that the integrated long-term model dynamics are also reasonable. The model calibration strategy and calibration performance summarized above is described in further detail in Section 4 of Anchor QEA 2020.

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3.5 Model Setup Refinement

The NBSA sediment transport model and CFT model calibration setups developed by Moffatt & Nichol and Deltares (2020a) and Anchor QEA (2020), respectively, were reviewed and further refined by the EPA modeling team with input from Arcadis. The performance of the refined models was evaluated against several calibration metrics used for the respective models. However, the overall calibration performance was not significantly impacted because the refinements are primarily local in scale. The refinements are further discussed in the following sections.

3.5.1 Arthur Kill Navigation Scour

The original sediment transport model setup developed by Moffatt & Nichol and Deltares (2020a) included the implementation of navigation along the entire length of the Arthur Kill, from its confluence with Newark Bay to Raritan Bay, as well as across the entire width of the Arthur Kill (i.e., beyond the lateral limits of the navigation channel). However, review of the ship traffic data used by Moffatt & Nichol and Deltares (2020a) to develop the navigation scour inputs in NBSA showed relatively little navigation in the southern half of the Arthur Kill. In addition, ship traffic was noted to be generally restricted to the navigation channel and the terminal areas rather than uniformly distributed across the width of the Arthur Kill. These lines of evidence were therefore used to refine the spatial extent of navigation scour in the Arthur Kill. The refined model setup includes navigation scour in the Arthur Kill only between the confluence with Newark Bay and the confluence with Rahway River (approximately 3.1 miles south of the Goethals Bridge) based on a ship traffic threshold of 25 or more per 5-day period. Furthermore, navigation scour in the refined model setup is limited to the lateral extent of the navigation channel in Arthur Kill.

The refined model setup was used to simulate the CPG's 1995-2013 calibration period and model performance compared against the CPG's original calibration performance. Model performance within NBSA was compared for various metrics including TSS at selected locations, annual mass balance flux summaries, and bathymetric change maps. Overall model performance was concluded to not be significantly impacted by the model refinement. For instance, net solids exchange between the Arthur Kill and NBSA, which represents the metric and location most liable to be impacted by the model refinement, showed a relatively small impact, with the refined model setup calculating 2% more solids export as compared to the CPG's original calibration performance. Therefore, the refinement of navigation scour in the Arthur Kill, was concluded to offer a more realistic representation of the distribution of navigation scour while not negatively impacting the calibration performance.

3.5.2 Arthur Kill Contaminant Sediment Initial Conditions

The original CFT model setup developed by Anchor QEA (2020) used relatively sparse Phase I and Phase II sediment data to develop contaminant initial conditions in the Arthur Kill. These were updated to include additional data available from NOAA's Data Integration Visualization Exploration and Reporting (DIVER) application. Additionally, the 2013

REMAP data for 2,3,7,8-TCDD as well as the CARP dataset for Tetra-CB were appended to the data obtained from NOAA DIVER. Data interpolation was performed in order to revise the 1996 initial conditions in the top 15 cm in the Arthur Kill area of the contaminant fate and transport model.

Since the Tetra-CB data in the Arthur Kill was very limited, the Total PCB data was obtained to estimate some of the Tetra-CB values used in the interpolation. The estimates were computed based on the Tetra-CB to total Aroclor and Tetra-CB to the sum of PCB congeners #44, #52, and #66 regressions derived from the Phase III data. Therefore, in addition to the reported Tetra-CB and sum of Tetra-CB congener data, the Tetra-CB estimates were appended to the dataset. The regressions below were used for the Tetra-CB estimates:

$$Tetra - CB\ (\frac{\mu g}{kg}) = 0.4627 * (Aroclor\ total\ (\frac{\mu g}{kg}))^{1.00766}$$

$$Tetra - CB\ (\frac{\mu g}{kg}) = 2.3827(BZ\#44 + BZ\#52 + BZ\#66\ (\frac{\mu g}{kg}))^{1.0316}$$

A raster surface was then interpolated for each contaminant using the Inverse Distance Weighting (IDW) interpolation tool in ArcMap. The output cell size for the raster surfaces was explicitly specified as 10 ft. Additionally, the input exponent of distance, which controls the significance of surrounding points on the interpolated value, for each contaminant was set to the optimized power value obtained from the Geostatistical Wizard tool for Inverse Distance Weighting (IDW) in ArcMap. One exception was the interpolation for 44-DDx because the optimized power value of 27.8 was determined to be unreasonably high and the result of a single high measurement of 44-DDx, so the power of 3, which falls in the highest range of reasonable power values, was used instead. Table 3-1 shows the optimized power values for each contaminant.

Table 3-1. Input Power Values Used for Each Contaminant in the IDW Analysis

Contaminant	Power value
44-DDx	3
TCDD	1
HG	1.7673
Tetra-CB	1.1297
HpCDF	1
PeCDD	1
PeCDF	1
PCB-126	1
PCB-167	1.0608

After a raster surface was interpolated for 2,3,7,8-TCDD, Tetra-PCBs, Total 4,4' DDx, Mercury, 1,2,3,7,8-PeCDD, 2,3,4,7,8-PeCDF,1,2,3,4,6,7,8-HpCDF, PCB 126, and PCB 167 the Zonal Statistics tool in ArcMap was used to compute the average 15 cm concentrations for each model grid cell. For the Arthur Kill (J < 28) WY 1996 contaminant initial condition reset in the top 15 cm, the average 15 cm interpolated dry weight contaminant concentrations for each model grid cell were converted to volumetric concentrations by multiplying by the solids from the WY 1996 model initial conditions. This yielded one volumetric concentration applicable to the top 15 cm of each cell. Then, the vertical gradient in the top 15 cm was computed based on the same vertical gradient in the CPG WY 1996 model initial conditions and applied to the interpolated values. For example, the concentration for layer one was calculated by multiplying the newly calculated average 15 cm concentration by the ratio of the original CPG concentration in layer one to the total original CPG concentration for the top 15 layers. The deeper sediment layers beyond 15 cm were not changed since the bed in the Arthur Kill does not erode. A comparison of the original CPG 1996 and revised initial conditions for 2,3,7,8-TCDD, Tetra-PCBs, Total 4,4' DDx, and Mercury is presented in Appendix A. No other changes in the WY 1996 initial conditions were made in NBSA cells outside of the Arthur Kill.

The refined model setup was used to simulate the CPG's 1995-2013 calibration period and model performance compared against the CPG's original calibration performance. Model performance within NBSA was compared for various metrics including annual mass balance flux summaries, and water column contaminant concentrations. Overall model performance was concluded to not be significantly impacted by the model refinement. For instance, although net DDx exchange between the Arthur Kill and NBSA showed a 32% increase in the flux from Arthur Kill to NBSA, as compared to the CPG's original calibration performance, the majority of the additional flux is exported through the Kill van Kull. Therefore, the refinement of sediment initial conditions in the Arthur Kill was concluded to not meaningfully impact the calibration performance.

3.6 Model Mass Transport Summaries

Model results were summarized to characterize solids and contaminant mass transport into and out of the bay at connections to the Passaic and Hackensack Rivers and to the Arthur Kill and Kill Van Kull. Annual (water years) Mass Transport summaries for solids are presented in Table 3-2, and summaries for 2,3,7,8-TCDD, Tetra-PCBs, Total 4,4' DDx, Mercury, 1,2,3,7,8-PeCDD, 2,3,4,7,8-PeCDF,1,2,3,4,6,7,8-HpCDF, PCB 126, and PCB 167 are shown on Tables 3-3 through 3-11, respectively. Annual mass transport based on water years, is influenced substantially by flow conditions, with large input to the bay in high-flow years (e.g. Hurricane Irene in 2011). During low flow years, such as 2002, net transport of solids and some contaminant are from the bay to the LPR. In low flow years, like 2002, for those contaminants for which the net transport continues to be from the LPR to the bay, the magnitude of the net transport is reduced substantially compared to years with more-typical flows.

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Mass balance summaries for sub-regions of the bay, which highlight the relative magnitude of various source and sink terms for solids and contaminants in different areas, are presented in Appendix E.

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Table 3-2. Solids Annual Mass Transport into and out of Newark Bay (MT/yr)

Year	Annual Solids Fluxes (MT/yr)											
	Newark Bay & Mouth of Passaic (MT/yr)			Newark Bay & Hackensack (MT/yr)			Newark Bay & Kill Van Kull (MT/yr)			Newark Bay & Arthur Kill (MT/yr)		
	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay
1996	109,298	84,671	24,627	252,037	263,902	(11,865)	341,643	245,789	95,854	87,032	109,633	(22,601)
1997	93,760	80,886	12,875	247,603	259,493	(11,890)	337,192	241,343	95,850	87,518	112,055	(24,537)
1998	86,077	76,877	9,200	214,434	224,580	(10,146)	326,570	235,746	90,823	92,304	108,756	(16,452)
1999	81,089	64,892	16,197	173,577	181,020	(7,443)	325,635	240,905	84,730	93,056	107,219	(14,163)
2000	69,690	75,005	(5,314)	182,873	191,441	(8,568)	317,484	222,216	95,268	84,997	102,394	(17,397)
2001	67,977	68,227	(250)	175,898	183,786	(7,888)	313,662	221,433	92,230	87,193	103,486	(16,293)
2002	45,985	53,476	(7,490)	140,576	147,136	(6,560)	307,608	231,949	75,660	89,373	103,621	(14,248)
2003	95,889	81,111	14,778	247,051	257,870	(10,819)	664,865	396,852	268,013	123,491	155,410	(31,919)
2004	99,049	87,252	11,797	261,900	274,423	(12,523)	683,302	395,190	288,112	124,229	168,445	(44,216)
2005	85,284	69,748	15,536	210,807	220,404	(9,597)	367,171	237,074	130,097	92,535	115,367	(22,832)
2006	104,038	81,115	22,924	246,272	257,073	(10,801)	533,242	322,539	210,703	104,446	143,017	(38,571)
2007	142,143	81,768	60,375	286,435	292,662	(6,227)	567,717	349,376	218,341	117,529	159,309	(41,780)
2008	87,168	76,609	10,559	239,893	249,886	(9,993)	507,430	320,741	186,689	109,190	138,857	(29,667)
2009	86,566	86,463	103	245,163	256,576	(11,413)	557,321	341,249	216,072	115,614	146,946	(31,332)
2010	131,771	87,399	44,372	295,802	309,123	(13,321)	581,620	353,283	228,337	115,167	154,378	(39,211)
2011	332,230	97,905	234,325	426,744	443,230	(16,486)	740,393	455,107	285,286	124,612	200,998	(76,386)
2012	94,798	97,309	(2,511)	316,688	331,781	(15,093)	681,481	405,475	276,006	118,671	170,713	(52,042)
2013	97,339	96,228	1,111	292,449	304,955	(12,506)	685,352	408,496	276,856	118,518	169,020	(50,502)
2014	108,591	97,209	11,382	290,839	303,642	(12,803)	609,740	405,139	204,601	136,955	163,700	(26,745)
2015	92,097	98,362	(6,265)	279,897	292,691	(12,794)	603,756	405,075	198,681	147,609	172,070	(24,461)
2016	95,174	97,094	(1,920)	259,729	269,733	(10,004)	597,197	406,245	190,952	132,630	148,250	(15,620)
Grand Total	**2,206,013**	**1,739,605**	**466,407**	**5,286,667**	**5,515,407**	**(228,740)**	**10,650,382**	**6,841,221**	**3,809,160**	**2,302,669**	**2,953,644**	**(650,975)**

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Table 3-3. 2,3,7,8-TCDD Annual Mass Transport into and out of Newark Bay (g/yr)

Year	Annual TCDD Fluxes (g/yr)											
	Newark Bay & Passaic			Newark Bay & Hackensack			Newark Bay & Kill Van Kull			Newark Bay & Arthur Kill		
	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay
1996	45.60	18.62	26.99	61.42	64.63	(3.21)	8.76	22.91	(4.15)	9.21	12.68	(3.47)
1997	24.04	14.00	10.04	40.57	42.65	(2.08)	13.77	16.47	(2.70)	7.78	9.81	(2.04)
1998	21.62	12.53	9.10	34.67	36.57	(1.90)	11.92	14.63	(2.71)	7.21	8.32	(1.11)
1999	29.28	11.33	17.95	27.06	28.64	(1.58)	11.73	13.86	(2.13)	7.69	9.67	(1.98)
2000	13.35	11.49	1.86	23.63	24.84	(1.21)	10.21	11.19	(0.98)	6.37	7.28	(0.90)
2001	14.49	10.71	3.78	22.91	23.95	(1.04)	9.54	0.79	(1.24)	5.96	6.94	(0.98)
2002	8.94	8.16	0.77	17.72	18.51	(0.79)	8.04	9.11	(1.07)	5.24	5.86	(0.61)
2003	18.74	9.46	9.28	26.02	27.07	(1.05)	9.83	10.93	(1.10)	5.05	6.19	(1.14)
2004	15.88	8.73	7.15	23.52	24.61	(1.08)	8.57	9.08	(0.50)	4.19	5.85	(1.67)
2005	16.57	7.48	9.10	24.20	25.14	(0.93)	9.46	10.61	(1.15)	5.23	6.89	(1.66)
2006	15.61	7.60	8.02	22.67	23.55	(0.88)	8.44	9.37	(0.93)	4.18	5.85	(1.67)
2007	28.11	7.97	20.14	31.35	32.49	(1.14)	12.31	15.73	(3.42)	6.52	9.16	(2.64)
2008	16.34	8.64	7.69	25.64	26.57	(0.92)	9.01	10.07	(1.06)	4.73	6.12	(1.39)
2009	13.13	8.26	4.88	20.54	21.48	(0.93)	7.60	8.01	(0.40)	4.32	5.26	(0.94)
2010	33.42	8.80	24.63	41.92	43.29	(1.38)	1.14	13.49	(2.35)	6.22	9.21	(2.99)
2011	197.29	13.47	183.82	168.18	175.01	(6.83)	46.83	73.89	(27.05)	24.09	45.19	(21.10)
2012	38.33	26.75	11.58	73.70	78.57	(4.87)	15.19	18.65	(3.46)	8.58	13.07	(4.49)
2013	23.47	14.98	8.49	37.75	39.62	(1.88)	11.14	13.24	(2.10)	6.21	8.69	(2.48)
2014	34.50	17.24	17.27	45.10	47.35	(2.25)	11.94	15.14	(3.20)	7.95	9.73	(1.78)
2015	18.19	13.30	4.89	29.32	30.97	(1.65)	8.16	9.97	(1.81)	5.96	6.73	(0.77)
2016	21.38	13.01	8.37	31.19	32.64	(1.45)	8.90	10.99	(2.08)	6.30	7.11	(0.82)
Grand Total	**648.29**	**252.51**	**395.79**	**829.08**	**868.13**	**(39.06)**	**262.51**	**328.12**	**(65.61)**	**148.99**	**205.62**	**(56.64)**

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Table 3-4. Tetra-PCB Annual Mass Transport into and out of Newark Bay (Kg/yr)

Annual TetraPCB Fluxes (kg/yr)												
Year	Newark Bay & Passaic			Newark Bay & Hackensack			Newark Bay & Kill Van Kull			Newark Bay & Arthur Kill		
	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay
1996	38.37	22.57	15.80	81.32	84.47	(3.15)	113.51	101.17	12.34	40.95	51.39	(10.44)
1997	28.69	20.89	7.80	73.55	76.27	(2.72)	97.98	89.35	8.62	38.61	47.44	(8.83)
1998	26.22	19.07	7.15	64.65	66.83	(2.18)	85.48	81.25	4.22	37.86	42.46	(4.59)
1999	27.77	16.80	10.97	52.46	54.19	(1.73)	79.08	74.93	4.16	36.50	40.83	(4.33)
2000	20.81	18.71	2.10	54.53	56.33	(1.81)	85.15	76.43	8.72	35.16	40.90	(5.74)
2001	19.69	16.76	2.93	50.62	52.01	(1.40)	75.26	68.87	6.38	32.87	37.93	(5.06)
2002	13.87	13.85	0.02	42.54	43.75	(1.21)	66.68	62.73	3.95	30.83	34.28	(3.45)
2003	20.87	13.26	7.60	45.43	46.51	(1.08)	65.54	57.78	7.76	26.42	31.11	(4.69)
2004	20.37	13.53	6.84	44.65	45.79	(1.14)	61.36	52.03	9.33	22.16	28.90	(6.74)
2005	19.93	12.73	7.20	45.44	46.72	(1.29)	65.92	58.28	7.64	25.82	31.72	(5.90)
2006	18.85	11.88	6.96	41.45	42.43	(0.97)	59.39	50.69	8.70	20.98	27.77	(6.79)
2007	27.15	12.63	14.53	48.14	49.26	(1.12)	64.03	56.74	7.29	23.56	31.25	(7.69)
2008	17.96	11.93	6.03	41.42	42.31	(0.89)	55.45	48.79	6.66	21.85	26.70	(4.85)
2009	16.23	12.34	3.89	38.70	39.77	(1.06)	56.60	47.74	8.86	22.27	27.06	(4.79)
2010	21.07	11.12	9.96	41.15	42.13	(0.97)	54.67	47.47	7.20	21.78	27.21	(5.43)
2011	88.20	12.58	75.62	94.86	98.20	(3.34)	70.14	70.74	(0.60)	24.45	41.40	(16.95)
2012	24.66	18.08	6.58	56.96	59.53	(2.57)	53.77	45.94	7.83	18.63	26.58	(7.95)
2013	19.22	13.57	5.65	41.59	42.78	(1.19)	49.18	41.68	7.49	18.13	24.72	(6.59)
2014	22.00	13.77	8.22	43.06	44.37	(1.31)	47.25	44.20	3.05	23.84	26.92	(3.08)
2015	14.69	11.92	2.77	34.14	35.20	(1.06)	39.04	36.44	2.59	21.08	22.85	(1.77)
2016	16.29	11.97	4.33	35.98	36.97	(0.99)	41.92	39.80	2.12	22.20	23.43	(1.23)
Grand Total	522.88	309.93	212.95	1,072.64	1,105.80	**(33.16)**	1,387.37	1,253.06	134.31	565.96	692.86	**(126.90)**

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Table 3-5. Total 4,4'-DDx Annual Mass Transport into and out of Newark Bay (Kg/yr)

Year	Annual DDx Fluxes (kg/yr)											
	Newark Bay & Passaic			Newark Bay & Hackensack			Newark Bay & Kill Van Kull			Newark Bay & Arthur Kill		
	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay
1996	12.59	8.06	4.54	30.09	30.78	(0.69)	35.27	44.35	(9.09)	116.74	106.76	9.98
1997	9.71	7.65	2.06	28.06	28.65	(0.59)	32.85	42.23	(9.39)	107.13	98.29	8.84
1998	10.25	8.31	1.94	29.84	30.48	(0.64)	35.14	50.19	(15.05)	125.46	109.09	16.37
1999	10.71	7.75	2.96	26.20	26.69	(0.49)	34.15	48.10	(13.95)	136.30	120.71	15.58
2000	7.69	6.97	0.72	22.17	22.54	(0.37)	27.56	36.87	(9.31)	106.09	96.29	9.80
2001	7.73	6.85	0.88	22.38	22.72	(0.33)	28.21	38.36	(10.15)	115.78	104.92	10.86
2002	7.32	7.42	(0.09)	24.62	25.06	(0.44)	33.87	47.12	(13.25)	159.47	144.18	15.29
2003	8.32	5.86	2.46	22.13	22.25	(0.12)	28.84	36.81	(7.97)	97.95	87.24	10.71
2004	7.29	5.24	2.05	19.00	19.13	(0.13)	23.08	27.34	(4.27)	87.07	81.19	5.89
2005	7.18	5.41	1.77	20.32	20.57	(0.25)	26.77	32.36	(5.59)	102.57	95.73	6.84
2006	7.03	4.82	2.21	18.56	18.59	(0.04)	22.89	27.25	(4.35)	78.56	73.47	5.08
2007	9.15	4.84	4.30	19.32	19.34	(0.01)	21.77	25.40	(3.62)	73.50	70.13	3.37
2008	7.63	5.97	1.66	21.89	22.11	(0.23)	28.46	36.22	(7.77)	141.16	129.91	11.25
2009	6.91	5.58	1.34	18.74	18.92	(0.18)	22.67	26.12	(3.45)	79.80	74.91	4.89
2010	8.27	5.05	3.22	19.66	19.81	(0.15)	23.87	28.50	(4.63)	78.22	71.73	6.49
2011	27.02	4.49	22.53	32.61	33.35	(0.74)	20.88	24.01	(3.12)	52.96	54.87	(1.91)
2012	8.16	6.27	1.89	20.67	21.35	(0.68)	18.15	19.41	(1.26)	60.02	60.57	(0.55)
2013	7.25	5.62	1.63	19.23	19.43	(0.21)	23.09	27.72	(4.63)	135.95	128.54	7.41
2014	10.40	7.65	2.75	26.05	26.60	(0.56)	31.54	41.70	(10.16)	119.58	106.51	13.07
2015	7.54	6.55	0.99	20.81	21.27	(0.46)	25.01	32.61	(7.60)	100.81	90.81	10.00
2016	8.00	6.67	1.34	21.90	22.33	(0.42)	26.62	35.85	(9.23)	108.05	95.68	12.37
Grand Total	**196.18**	**133.03**	**63.15**	**484.25**	**491.98**	**(7.73)**	**570.69**	**728.52**	**(157.83)**	**2,183.16**	**2,001.53**	**181.63**

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3-6. Mercury Annual Mass Transport into and out of Newark Bay (Kg/yr)

Year	Annual Hg Fluxes (kg/yr)											
	Newark Bay & Passaic			Newark Bay & Hackensack			Newark Bay & Kill Van Kull			Newark Bay & Arthur Kill		
	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay
1996	306.19	205.22	100.97	749.94	772.69	(22.75)	868.18	821.26	46.92	436.63	512.18	(75.54)
1997	244.21	194.66	49.56	695.26	722.12	(26.86)	815.04	779.98	35.06	435.56	504.02	(68.46)
1998	229.22	182.14	47.08	620.98	642.13	(21.15)	760.53	761.24	(0.72)	463.42	487.97	(24.55)
1999	213.82	156.49	57.33	496.24	512.16	(15.91)	704.93	694.18	10.75	459.56	476.85	(17.29)
2000	181.32	164.94	16.38	486.82	504.10	(17.29)	655.04	623.16	31.88	378.84	417.61	(38.77)
2001	174.47	152.71	21.76	471.13	485.10	(13.97)	624.16	600.85	23.32	374.37	408.79	(34.42)
2002	126.77	131.04	(4.27)	411.29	424.72	(13.43)	587.99	579.06	8.92	391.24	411.79	(20.55)
2003	190.99	128.37	62.63	446.85	456.60	(9.75)	575.88	527.08	48.80	334.02	362.30	(28.28)
2004	190.02	132.87	57.15	427.83	439.46	(11.63)	521.68	448.73	72.95	255.39	309.58	(54.20)
2005	170.45	121.30	49.15	419.84	432.36	(12.51)	529.96	478.29	51.67	288.68	329.64	(40.97)
2006	173.81	117.25	56.57	407.50	416.35	(8.85)	505.01	444.33	60.67	250.01	301.64	(51.63)
2007	252.64	124.99	127.64	473.30	482.51	(9.21)	542.38	500.58	41.80	261.31	328.62	(67.31)
2008	152.83	109.66	43.17	377.69	385.28	(7.60)	449.55	403.55	46.00	249.58	283.83	(34.25)
2009	144.98	114.74	30.24	355.89	365.96	(10.07)	451.58	389.18	62.40	240.77	276.83	(36.06)
2010	193.55	109.03	84.52	398.41	407.10	(8.69)	456.07	407.38	48.69	243.37	284.68	(41.32)
2011	614.28	115.13	499.14	718.07	742.19	(24.12)	543.23	528.15	15.09	211.89	338.20	(126.31)
2012	199.10	151.08	48.01	462.31	485.58	(23.27)	434.27	363.11	71.15	175.02	235.79	(60.77)
2013	171.05	123.42	47.63	376.44	386.82	(10.39)	418.02	356.87	61.16	198.34	254.36	(56.02)
2014	187.20	123.97	63.23	385.12	397.13	(12.01)	414.01	397.95	16.06	283.54	302.18	(18.64)
2015	137.61	114.58	23.03	332.05	342.71	(10.67)	374.64	359.80	14.84	276.16	283.69	(7.53)
2016	145.22	112.87	32.35	336.02	345.88	(9.87)	384.33	376.54	7.79	286.44	284.56	1.88
Grand Total	**4,399.74**	**2,886.46**	**1,513.28**	**9,848.97**	**10,148.96**	**(299.99)**	**11,616.48**	**10,841.28**	**775.20**	**6,494.14**	**7,395.11**	**(900.97)**

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3-7. 1,2,3,7,8-PeCDD Annual Mass Transport into and out of Newark Bay (g/yr)

Year	Annual PeCDD Fluxes (g/yr)											
	Newark Bay & Passaic			Newark Bay & Hackensack			Newark Bay & Kill Van Kull			Newark Bay & Arthur Kill		
	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay
1996	1.86	1.26	0.59	5.55	5.31	0.24	3.87	3.99	(0.12)	1.92	2.31	(0.39)
1997	1.48	1.10	0.38	4.89	4.66	0.23	3.35	3.50	(0.14)	1.72	2.05	(0.33)
1998	1.52	1.14	0.38	4.98	4.72	0.27	3.15	3.51	(0.36)	1.83	2.03	(0.19)
1999	1.43	1.04	0.39	4.15	3.93	0.21	2.90	3.11	(0.22)	1.65	1.82	(0.17)
2000	1.36	1.14	0.22	4.55	4.31	0.24	3.09	3.29	(0.20)	1.72	1.95	(0.24)
2001	1.20	1.00	0.21	4.03	3.82	0.21	2.70	2.86	(0.16)	1.50	1.71	(0.21)
2002	1.04	0.97	0.06	3.77	3.59	0.18	2.46	2.63	(0.17)	1.41	1.55	(0.13)
2003	1.48	1.00	0.49	4.84	4.47	0.37	2.91	3.14	(0.23)	1.61	1.88	(0.27)
2004	1.41	0.97	0.44	4.39	4.08	0.31	2.64	2.72	(0.08)	1.37	1.69	(0.31)
2005	1.18	0.84	0.34	3.74	3.52	0.22	2.55	2.62	(0.07)	1.30	1.57	(0.27)
2006	1.38	0.92	0.46	4.44	4.10	0.33	2.64	2.78	(0.14)	1.42	1.78	(0.36)
2007	1.83	1.02	0.80	5.03	4.66	0.37	2.96	3.23	(0.27)	1.57	2.02	(0.45)
2008	1.30	0.96	0.34	4.24	3.98	0.27	2.61	2.71	(0.09)	1.39	1.65	(0.26)
2009	1.31	1.00	0.31	4.32	4.03	0.29	2.64	2.68	(0.04)	1.44	1.74	(0.30)
2010	1.50	0.84	0.66	4.06	3.81	0.26	2.57	2.62	(0.05)	1.34	1.68	(0.35)
2011	2.96	0.80	2.16	4.83	4.66	0.17	2.81	2.88	(0.07)	1.15	1.85	(0.70)
2012	1.12	0.82	0.29	3.02	2.96	0.05	2.20	1.95	0.24	0.84	1.20	(0.36)
2013	1.27	0.93	0.34	4.06	3.79	0.28	2.47	2.40	0.07	1.16	1.61	(0.45)
2014	1.58	1.09	0.48	4.34	4.14	0.20	2.59	2.79	(0.20)	1.67	1.88	(0.22)
2015	1.29	1.05	0.24	3.88	3.72	0.17	2.32	2.49	(0.17)	1.52	1.64	(0.13)
2016	1.22	0.96	0.27	3.47	3.35	0.12	2.34	2.49	(0.15)	1.49	1.54	(0.05)
Grand Total	**30.72**	**20.85**	**9.87**	**90.58**	**85.59**	**4.99**	**57.75**	**60.36**	**(2.61)**	**31.02**	**37.16**	**(6.14)**

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3-8. 2,3,4,7,8-PeCDF Annual Mass Transport into and out of Newark Bay (g/yr)

Year	Annual PeCDF Fluxes (g/yr)											
	Newark Bay & Passaic			Newark Bay & Hackensack			Newark Bay & Kill Van Kull			Newark Bay & Arthur Kill		
	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay
1996	4.07	2.61	1.46	10.59	10.55	0.04	8.93	8.83	0.10	4.09	4.97	(0.89)
1997	3.07	2.33	0.74	9.21	9.18	0.03	7.58	7.59	(0.01)	3.72	4.43	(0.71)
1998	2.90	2.19	0.71	8.52	8.41	0.11	6.67	7.12	(0.44)	3.76	4.12	(0.37)
1999	2.85	1.95	0.90	6.83	6.74	0.09	6.14	6.36	(0.22)	3.46	3.78	(0.32)
2000	2.37	2.09	0.28	7.24	7.13	0.11	6.58	6.57	0.01	3.44	3.89	(0.46)
2001	2.25	1.89	0.35	6.60	6.50	0.10	5.81	5.86	(0.05)	3.07	3.49	(0.41)
2002	1.73	1.69	0.04	5.87	5.79	0.07	5.08	5.22	(0.15)	2.88	3.13	(0.25)
2003	2.56	1.69	0.87	7.14	6.85	0.29	5.47	5.53	(0.05)	2.95	3.36	(0.41)
2004	2.46	1.68	0.78	6.63	6.40	0.23	4.93	4.72	0.20	2.44	3.01	(0.56)
2005	2.19	1.51	0.69	5.99	5.86	0.12	5.13	4.96	0.16	2.50	3.00	(0.51)
2006	2.26	1.50	0.77	6.38	6.13	0.26	4.92	4.82	0.09	2.54	3.10	(0.56)
2007	3.30	1.65	1.64	7.52	7.22	0.30	5.62	5.76	(0.15)	2.85	3.65	(0.80)
2008	2.14	1.53	0.61	6.18	5.98	0.20	4.78	4.64	0.14	2.43	2.87	(0.44)
2009	2.02	1.57	0.45	6.04	5.83	0.20	4.82	4.53	0.29	2.45	2.92	(0.47)
2010	2.52	1.40	1.13	6.02	5.83	0.19	4.78	4.59	0.19	2.40	2.95	(0.55)
2011	9.31	1.50	7.81	11.20	11.28	(0.08)	6.18	6.72	(0.53)	2.54	4.22	(1.68)
2012	2.77	2.03	0.74	6.55	6.72	(0.17)	4.49	4.00	0.49	1.74	2.47	(0.73)
2013	2.36	1.71	0.66	6.24	6.07	0.17	4.53	4.21	0.32	2.04	2.78	(0.74)
2014	2.67	1.76	0.91	6.35	6.25	0.10	4.57	4.71	(0.14)	2.93	3.25	(0.32)
2015	1.96	1.61	0.35	5.38	5.30	0.08	3.90	4.01	(0.11)	2.61	2.77	(0.17)
2016	2.04	1.56	0.48	5.15	5.11	0.04	4.09	4.21	(0.12)	2.65	2.71	(0.06)
Grand Total	**59.82**	**37.45**	**22.37**	**147.64**	**145.13**	**2.51**	**114.99**	**114.96**	**0.03**	**59.48**	**70.89**	**(11.41)**

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3-9. 1,2,3,4,6,7,8-HpCDF Annual Mass Transport into and out of Newark Bay (g/yr)

Year	Annual HpCDF Fluxes (g/yr)											
	Newark Bay & Passaic			Newark Bay & Hackensack			Newark Bay & Kill Van Kull			Newark Bay & Arthur Kill		
	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay
1996	68.36	46.28	22.08	180.53	177.02	3.51	96.57	94.20	2.38	51.49	59.54	(8.06)
1997	52.29	41.46	10.84	163.14	159.80	3.33	81.30	81.39	(0.09)	47.01	53.93	(6.92)
1998	51.57	40.74	10.83	152.98	148.57	4.41	71.53	77.09	(5.56)	49.75	52.23	(2.48)
1999	49.91	34.93	14.98	121.54	117.50	4.04	68.27	69.97	(1.69)	47.54	50.41	(2.88)
2000	42.72	39.66	3.06	130.88	126.45	4.44	79.02	76.14	2.88	49.59	53.40	(3.81)
2001	39.14	34.57	4.57	116.83	112.97	3.87	67.13	65.34	1.80	43.41	47.07	(3.65)
2002	31.39	31.44	(0.05)	108.04	104.84	3.19	58.04	59.28	(1.24)	40.23	42.53	(2.30)
2003	46.71	32.49	14.22	137.85	129.15	8.70	68.67	70.63	(1.96)	42.00	46.31	(4.31)
2004	43.84	31.54	12.30	124.90	117.96	6.94	61.79	60.50	1.29	34.29	41.22	(6.93)
2005	37.27	26.66	10.61	107.63	103.31	4.32	63.00	58.92	4.07	34.24	40.06	(5.81)
2006	41.31	28.63	12.68	123.20	115.46	7.74	63.03	62.68	0.35	36.48	43.37	(6.89)
2007	57.16	31.56	25.60	142.68	133.73	8.95	72.76	73.15	(0.38)	39.27	48.42	(9.15)
2008	40.13	29.89	10.24	126.80	119.50	7.30	66.78	64.74	2.04	37.13	42.68	(5.55)
2009	38.82	31.10	7.72	122.90	116.12	6.77	68.27	63.84	4.44	39.23	45.14	(5.91)
2010	43.40	25.10	18.30	113.85	107.41	6.44	64.29	60.26	4.03	36.11	42.29	(6.19)
2011	144.38	27.28	117.10	186.91	185.33	1.58	83.23	86.21	(2.99)	33.69	54.04	(20.35)
2012	42.33	32.24	10.09	102.11	104.11	(1.99)	56.02	45.38	10.64	21.39	29.64	(8.25)
2013	40.77	30.78	9.99	113.99	108.56	5.43	61.69	55.46	6.23	28.96	38.27	(9.30)
2014	51.50	35.42	16.08	129.65	124.69	4.96	64.14	64.85	(0.71)	47.93	51.60	(3.66)
2015	39.47	33.21	6.27	115.37	110.74	4.63	53.51	55.88	(2.37)	43.49	45.11	(1.62)
2016	39.66	31.17	8.49	104.78	101.66	3.11	56.36	57.13	(0.77)	43.69	43.13	0.56
Grand Total	**1,042.13**	**696.15**	**345.99**	**2,726.54**	**2,624.89**	**101.65**	**1,425.41**	**1,403.02**	**22.39**	**846.92**	**970.38**	**(123.46)**

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3-10. PCB-126 Annual Mass Transport into and out of Newark Bay (g/yr)

Year	Annual PCB-126 Fluxes (g/yr)											
	Newark Bay & Passaic			Newark Bay & Hackensack			Newark Bay & Kill Van Kull			Newark Bay & Arthur Kill		
	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay
1996	33.93	22.96	10.97	97.06	93.45	3.61	44.03	61.11	(17.09)	62.01	71.67	(9.66)
1997	24.41	17.67	6.73	76.50	73.63	2.86	39.39	53.01	(13.62)	56.40	65.07	(8.66)
1998	24.96	18.60	6.37	79.58	76.08	3.50	43.29	60.59	(17.29)	64.96	69.76	(4.80)
1999	24.28	17.15	7.13	67.87	64.69	3.18	39.40	54.08	(14.68)	67.95	72.30	(4.36)
2000	21.24	17.62	3.62	67.71	64.60	3.10	38.04	50.44	(12.40)	57.57	64.76	(7.19)
2001	19.76	16.48	3.28	66.24	62.96	3.29	38.13	49.83	(11.69)	59.77	66.35	(6.58)
2002	16.82	16.12	0.70	62.88	60.15	2.73	37.75	48.97	(11.22)	64.31	69.32	(5.01)
2003	24.71	16.83	7.89	77.66	73.18	4.48	58.65	66.10	(7.45)	59.80	68.25	(8.45)
2004	23.08	16.06	7.02	69.31	65.39	3.92	45.59	50.53	(4.94)	49.10	59.79	(10.69)
2005	19.65	14.03	5.62	61.89	58.66	3.23	40.51	48.32	(7.82)	55.92	64.60	(8.69)
2006	22.29	14.81	7.48	68.15	64.03	4.13	43.39	49.36	(5.97)	47.73	59.27	(11.54)
2007	28.15	15.67	12.48	74.61	69.58	5.03	44.46	52.95	(8.49)	48.51	61.23	(12.72)
2008	20.56	15.02	5.54	63.46	60.20	3.26	39.43	46.23	(6.80)	53.59	62.33	(8.74)
2009	20.42	15.58	4.84	62.83	59.61	3.22	39.60	44.69	(5.09)	50.55	60.16	(9.61)
2010	22.55	13.48	9.07	61.86	58.41	3.45	39.10	45.18	(6.08)	48.55	58.40	(9.85)
2011	52.44	12.90	39.54	81.28	78.60	2.68	39.96	46.99	(7.03)	34.45	53.42	(18.96)
2012	20.32	15.26	5.06	58.46	56.84	1.62	31.30	33.17	(1.87)	35.33	47.97	(12.65)
2013	21.44	15.57	5.87	64.42	60.55	3.87	34.51	38.28	(3.77)	41.02	54.24	(13.23)
2014	25.22	17.01	8.21	62.70	61.01	1.69	39.96	49.26	(9.31)	60.74	67.35	(6.60)
2015	20.36	16.30	4.06	54.98	53.87	1.11	36.82	45.25	(8.43)	60.29	64.96	(4.67)
2016	19.34	14.88	4.46	50.63	49.69	0.94	35.71	44.67	(8.96)	59.88	62.90	(3.02)
Grand Total	**505.90**	**339.98**	**165.92**	**1,430.08**	**1,365.19**	**64.89**	**849.02**	**1,039.02**	**(190.00)**	**1,138.42**	**1,324.09**	**(185.67)**

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3-11. PCB-167 Annual Mass Transport into and out of Newark Bay (g/yr)

Year	Annual PCB-167 Fluxes (g/yr)											
	Newark Bay & Passaic			Newark Bay & Hackensack			Newark Bay & Kill Van Kull			Newark Bay & Arthur Kill		
	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay	Into the Bay	Out of Bay	Net into the Bay
1996	281.13	141.93	139.20	426.19	442.62	(16.42)	231.39	244.87	(13.49)	141.12	168.79	(27.68)
1997	189.55	118.25	71.30	333.30	346.15	(12.85)	190.41	203.46	(13.05)	127.09	147.10	(20.01)
1998	171.92	107.77	64.16	297.09	307.84	(10.75)	162.67	185.31	(22.64)	128.29	136.25	(7.96)
1999	199.31	98.57	100.74	237.53	246.29	(8.77)	150.48	168.28	(17.80)	130.58	141.50	(10.92)
2000	137.40	109.83	27.57	234.79	242.62	(7.83)	156.38	161.77	(5.39)	115.61	126.05	(10.45)
2001	130.11	96.82	33.29	219.36	225.60	(6.24)	142.42	149.64	(7.23)	109.76	120.02	(10.26)
2002	83.34	73.42	9.92	168.78	172.72	(3.94)	120.85	129.99	(9.14)	108.46	113.94	(5.48)
2003	148.95	82.51	66.43	232.02	236.85	(4.83)	140.22	145.84	(5.62)	98.29	108.47	(10.18)
2004	135.30	79.70	55.59	215.27	220.96	(5.69)	123.63	122.10	1.53	80.42	97.86	(17.45)
2005	118.79	65.34	53.45	204.27	208.99	(4.72)	131.81	131.92	(0.11)	90.13	105.71	(15.59)
2006	121.54	67.16	54.38	200.84	204.44	(3.60)	122.76	124.10	(1.34)	80.95	96.82	(15.86)
2007	190.91	72.92	117.99	257.56	262.45	(4.88)	149.86	161.63	(11.77)	92.23	117.07	(24.84)
2008	118.36	68.67	49.70	208.94	213.14	(4.20)	124.08	124.53	(0.45)	83.96	97.70	(13.73)
2009	107.33	71.03	36.30	187.13	191.76	(4.63)	122.51	115.60	6.91	81.17	93.50	(12.33)
2010	133.73	59.53	74.21	200.71	204.72	(4.02)	124.72	123.72	0.99	82.23	97.86	(15.63)
2011	871.38	79.80	791.59	831.31	864.39	(33.09)	269.56	360.52	(90.96)	132.17	230.46	(98.29)
2012	241.08	164.42	76.66	448.76	473.58	(24.82)	151.28	156.89	(5.61)	81.55	115.17	(33.62)
2013	155.38	103.46	51.92	262.22	270.11	(7.90)	130.09	130.50	(0.41)	78.73	102.16	(23.43)
2014	174.84	100.60	74.24	261.22	270.41	(9.18)	126.61	137.87	(11.26)	106.74	116.95	(10.21)
2015	119.34	88.14	31.20	202.57	210.48	(7.92)	100.75	109.64	(8.89)	95.48	99.85	(4.38)
2016	126.36	86.22	40.14	206.39	213.19	(6.80)	109.73	119.87	(10.14)	98.29	99.91	(1.62)
Grand Total	**3,956.05**	**1,936.09**	**2,019.97**	**5,836.24**	**6,029.31**	**(193.07)**	**3,082.19**	**3,308.07**	**(225.88)**	**2,143.23**	**2,533.15**	**(389.92)**

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4 Simulation of Post 1995-2013 Calibration Period

4.1 Extension to Time of Phase III Data

The calibrated NBSA RI model simulated the period from October 1995 through September 2013 (Anchor QEA 2020). The selection of 1995 as the starting point of the calibration simulation was based on the availability of the 1995 RI sediment sampling data in the Lower Passaic River. It is noted that the approach for the FS simulations was to extend the CPG's 1995-2013 calibration to WY2016 (when the Phase III data were collected), and update the bed composition (grain size distribution) and chemistry with the concentrations based on the Phase III data, and then run forward through WY 2022 to provide initial conditions for FS simulations starting in WY2023. In order to use the model for FS forecasts, the model was extended in time using available forcing data (e.g. meteorological, tidal, and river flow data).

The extension of the model through the period of the NBSA Phase III sampling program in 2016 allowed comparison of the model results to the Phase III data. The comparisons were developed with the a priori recognition that the limited sediment contaminant data for Newark Bay available to assign initial conditions (as described in Section 3.1 and Attachment 1 of Anchor QEA 2020) introduces uncertainty in the starting point for the contaminant concentration simulations and minimizes the likelihood of the model results developing the sharper spatial gradients in concentrations observed in the Phase III dataset, which has much higher spatial resolution compared to earlier Newark Bay datasets. Drawing firm conclusions from comparisons between model and data, however, is complicated by uncertainty in the initial conditions, which precipitated the question of whether the model would respond differently if the more-spatially dense Phase III data were used to assign initial conditions.

The following subsections describe the Phase III bed composition and chemistry reset in water years 2016 and 2017. Also described is a sensitivity to setting Phase III initial conditions starting at different points in time to help understand how significant events might have affected contaminant trajectories, and whether differences in bed composition between Phase I/II and Phase III datasets might be due to temporal changes or the increased spatial density of the Phase III data.

4.1.1 Phase III Grainsize Data Interpolation

The Phase III sediment grain size data were analyzed to determine the percentage in each of the five size classes included in the sediment transport model bed characterization. A spatial interpolation of each size class was performed using inverse distance weighting (with an exponent of 3.0 on distance) in ArcMap. The interpolation was done within separate geomorphic regions, to avoid applying data from subtidal flats to channel regions and vice versa. The raster surfaces generated by the interpolation were converted to points and then averaged within the model grid using the spatial join feature, resulting in a grain size distribution for each model grid cell.

The interpolated Phase III grain size distributions were evaluated based on similarity and assigned to one of 90 different groups. The grain size distributions within each of the 90 groups were averaged to create the distribution for the group, referred to as a core. The sediment transport model initial conditions are described using this set of 90 representative cores, each of which has specific grain size distribution and erosion properties. Each model grid cell is assigned one of the 90 representative cores. The median grain diameters, D_{50}, assigned from the 90 representative cores derived from the interpolated Phase III data, are shown on Figure 4-1. Figure 4-2 shows the change in D_{50} between the 1995 inputs and the Phase III-based values. A general pattern of coarser sediment is noted. The corresponding reduction in the fraction of cohesive solids is shown on Figure 4-3.

The model calibration developed by the CPG used sediment grain size distribution initial conditions based on the Phase I and II data to define the spatially variable and temporally constant D_{50} used to calculate the Nikuradse roughness height that is an input to the skin friction formulation. As part of the refinement of sediment grain size distribution initial conditions using the Phase III data, the D_{50} (and the Nikuradse roughness height) were revised. However, because skin friction is positively correlated to the D_{50}, the relatively coarser sediments measured in the Phase III data resulted in higher skin friction (on average) as compared to the CPG's original calibration in several areas on the subtidal shallows of NBSA. The resulting model performance, because of the higher skin friction, showed significant localized areas of erosion on the subtidal shallows which represented a deviation from the original calibration performance developed by the CPG. While it is possible that the relatively coarser sediments seen in the Phase III data may be a consequence of erosion/coarsening during Hurricane Irene, Sandy, etc., no definitive conclusions can be drawn in this regard because of the relatively sparse Phase I and II data. Therefore, in order to maintain the original calibration performance, and accounting for the possibility that the Phase III data may reflect a transient event-driven coarsening, the D_{50} used to calculate Nikuradse roughness height (and skin friction) were retained at the values originally developed as part of model calibration by the CPG. Only the sediment grain size distribution was refined using the Phase III data.

The erosion properties for the cores were based on categorizing the cores as cohesive or non-cohesive, based on the D_{50} of the core and the cumulative percent of the first two size classes. For cohesive cores, erosion properties were assigned based on the region of the model grid defined from analyses of the 2012 Sedflume erosion field study (Section 5.2.5 of Moffatt & Nichol and Deltares 2020a). That analysis separated Newark Bay into four regions based on spatial erodibility patterns, and average erosion properties were calculated for each region. The model grid cells were sorted by region, and then each core within the region was assigned the erosion properties for that region. For non-cohesive cores, erosion properties were computed based on the D_{50} of the core.

4.1.2 Phase III Surface Contaminant Data Interpolation

The Phase III contaminant data (except for the Clam/Crab sampling stations) interpolation was performed in order to reset the initial conditions in the top 15 cm of the Newark Bay Study Area in the contaminant fate and transport model. The surface concentration reset

in the model was done at the beginning of water year 2017 (i.e., October 1, 2016) to reflect the data. Note that Phase III surface grain size and TOC was reset in water year 2016 (i.e., October 1, 2015) to allow one year of spinup before resetting the surface contaminant concentrations.

A raster surface was interpolated for each contaminant and total organic carbon (TOC) using the Inverse Distance Weighting (IDW) interpolation tool in ArcMap. For input data each contaminant was organic carbon normalized and log-transformed first. The TOC values were log-transformed. The output cell size for the raster surfaces was explicitly specified as 100 ft. Additionally, the input exponent of distance, which controls the significance of surrounding points on the interpolated value, was set to 3, and a variable search radius was specified in order to find 3 nearest sample points to be used to perform the interpolation. Finally, the barrier polyline feature input was used to create breaks between the subtidal flats and channel in the Newark Bay Study Area in searching for the input data points. The parameters were chosen by performing a few sensitivity interpolations and comparing the interpolated values to the data to check that the interpolation did not overly smooth out concentration gradients.

After a raster surface was interpolated for each contaminant and TOC, the Raster To Point conversion tool in ArcMap was used to convert the raster values to points. Each point was positioned at the center of the cell that it represents. The antilogs of the interpolated point values were taken, and each contaminant point was assigned the closest TOC value by using the Spatial Join tool in ArcMap in order to convert the organic carbon normalized concentrations back to dry weight basis. Finally, the Spatial Join tool in ArcMap was used with the interpolated contaminant values and model grid to compute the average dry weight concentrations for each model grid cell.

The average 2,3,7,8-TCDD, Tetra-PCBs, Total 4,4' DDx, Mercury, 1,2,3,7,8-PeCDD, 2,3,4,7,8-PeCDF,1,2,3,4,6,7,8-HpCDF, PCB 126, and PCB 167 concentrations in each model grid cell were then used to set the model initial conditions for water year 2017. This was done by converting the dry weight contaminant concentrations to volumetric concentrations using the solids concentrations in the top 15 cm from the model right after the grain size reset based on the interpolated Phase III grain size data. Additionally, the model computed contaminant concentrations at the time of the initial concentration reset were used to compute the vertical concentration gradients in the top 15 cm and were then applied to the interpolated Phase III data in order to preserve the model computed concentration gradients while setting the average concentration in the top 15 cm to the interpolated Phase III data. The interpolation results for 2,3,7,8-TCDD, Tetra-PCBs, Total 4,4' DDx, Mercury, 1,2,3,7,8-PeCDD, 2,3,4,7,8-PeCDF,1,2,3,4,6,7,8-HpCDF, PCB 126, and PCB 167 are shown on Figures 4-4 through 4-12, respectively.

4.1.3 Sensitivity Simulation Results with Phase III-based Initial Conditions

Sensitivity simulations to the Phase III reset were run by inserting the Phase III-based initial condition at various times. In one simulation, the initial conditions were inserted in 2005, contrasting the sparser Phase I/II data with the more spatially dense Phase III data.

To assess potential event-based changes, two additional simulations were run starting in October 2010 (after the March 2010 high flow event, but before Hurricane Irene in 2011) and in October 2011 (after Hurricane Irene). Hydrodynamic-sediment transport, carbon, and contaminant fate and transport simulations beginning at these three points in time were executed to assess effects of changes in bed composition and effects on the trajectories of bed contaminant concentrations.

In order to initialize these simulations, Phase III sediment grain size and contaminant concentration data were spatially interpolated, and interpolation results were averaged within model grid cells to develop model initial condition inputs. It should be noted that these tests were performed using the CPG's original sediment transport and CFT model calibration setups rather than the refined setup discussed in Section 3.5 and did not include subsurface interpolation resets discussed in Sections 4.1.4. Model average concentrations in six zones of the bay (Figure 4-13), for simulations with Phase III-based initial conditions assigned at different points in time are presented in Figures 4-14 (2,3,7,8-TCDD) and 4-15 (Tetra-PCBs). The black and blue lines represent the original calibration and extension to 2019, and can be thought of as one continuous simulation. The results of simulations starting with Phase III-based initial conditions in 2005, 2010, and 2011 are shown with the green, magenta and dark yellow lines, respectively. The results for both contaminants show similar patterns of concentration changes over time among the four simulations. The most noticeable difference is between the simulation starting in 2011 (after Hurricane Irene) and the other three simulations, reflecting the effect that Hurricane Irene had on sediment concentrations. While the absolute magnitude of the concentrations before and after Hurricane Irene differ, the trend in concentrations among the simulations are very similar. This is an encouraging observation for the FS simulations, which will start with initial conditions based on the more-spatially dense Phase III data.

4.1.4 Phase I and II Subsurface Contaminant Data Interpolation

The Phase I and II contaminant data sampled at 0.5-1.5 ft, 1.5-2.5 ft, 2.5-3.5 ft and 3.5-5.5 ft depths were organic carbon normalized and interpolated in order to reset the initial conditions in the subsurface layers of the Newark Bay Study Area in the contaminant fate and transport model along with the Phase III surface reset discussed in Section 4.1.2. The concentration reset in the model was done at the beginning of water year 2017 to reflect the data.

Thiessen polygons were created for each organic carbon normalized contaminant data in each sediment layer using the Thiessen Polygon tool in ArcMap. Then the Spatial Join tool in ArcMap was used with the generated Thiessen polygons and model grid to compute the average organic carbon normalized concentrations for each model grid cell.

The average organic carbon normalized 2,3,7,8-TCDD, Tetra-PCBs, Total 4,4' DDx, Mercury, 1,2,3,7,8-PeCDD, 2,3,4,7,8-PeCDF,1,2,3,4,6,7,8-HpCDF, PCB 126, and PCB 167 concentrations in each model grid cell for each depth interval were then used to set the model initial conditions for water year 2017. This was done by converting the average organic carbon normalized contaminant concentrations to volumetric concentrations by using the organic carbon concentrations from the model right after the organic carbon

concentration reset at the beginning of water year 2017. Additionally, the contaminant concentrations at the beginning of water year 1996 were used to compute the vertical concentration gradients for each cell at each depth interval (except at 3.5-5.5 ft since in the model it is represented as one layer) and were then applied to the interpolated Phase I and II data. Using this methodology, the average contaminant concentrations in each subsurface depth layer were set to the interpolated Phase I and II data while creating vertical gradients based on the water year 1996 initial conditions. The only exceptions were the cells where any of the subsurface layers had zero concentrations at the beginning of water year 1996. In those cases, the vertical gradients were computed by first replacing zero concentrations with the concentrations in the layer above to avoid unusual vertical profiles with 0 concentrations in some layers.

4.1.5 Simulation Results with Correction to an Intermittent Issue with Navigation Scour

A minor issue was identified in the CFT code related to intermittent limitation of deposition of solids and sorbed contaminants when navigation scour in the Passaic River reached high values. The intent of the code was to avoid the need for a very small timestep when navigation scour resulted in high deposition rates. Occasionally, the limitation imposed on the deposition rate resulted in differences between the bed erosion/deposition in the sediment transport and CFT models. After modifying the CFT code to eliminate the inconsistency, the simulation from 1995 to 2016 was repeated. Various metrics were assessed to compare the performance of the revised calibration simulation to the original calibration performance developed by Anchor QEA (2020). Model performance was virtually identical to the original calibration performance, thus resulting in the conclusion that the code issue did not meaningfully impact model calibration and performance.

4.2 Model Post 1995-2013 Calibration Period

Model-data comparisons are presented for average concentrations in six zones of the bay (Figure 4-13). Plots of the time series of average concentrations for the nine chemicals modeled are presented on Figures 4-16 to 4-24. Data are presented as means plus and minus two standard errors, with the number of data points included in the average noted next to each mean. The most noticeable changes in concentrations during the simulation period are in model results for 2,3,7,8-TCDD (Figure 4-16) around the time of Hurricane Irene in late August 2011. Abrupt increases in concentrations at that time are seen in the time series of each of the six regions, but most markedly in the Southern Channel and CAD Cell area, where pre-Irene concentrations were lowest. The response to Hurricane Irene is noticeable but more subtle in the time series of concentrations for the remaining eight contaminants. Comparisons among the other eight contaminants show a high degree of correspondence, with concentrations in the northern channel, northern subtidal flats, and southeastern subtidal flats showing slower declines in concentrations compared to the southern channel and southwestern subtidal flat areas.

Overall, the temporal changes in contaminant concentrations are consistent with the expectation that concentrations on the subtidal flats would change more slowly than in the

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channel. This is particularly the case for the southern channel, where the highest rates of sediment accumulation occur since the water depths were increased to 50 feet with the completion of the Harbor Deepening Project. It is noted that the approach for the FS simulations was to extend the CPG's 1995-2013 calibration to 2016 (when the Phase III data were collected), and update the bed composition (grain size distribution) and chemistry with the concentrations based on the Phase III data, and then run forward through 2022 to provide initial conditions for FS simulations starting in 2023. Figures 4-16 to 4-24 show chemical trajectories through 2022 and include the Phase III chemical reset in WY2017.

4.3 Model Setup for Feasibility Study Baseline Simulations

The application of the HST, AOC, and CFT model framework to simulate remedial alternatives as part of the FS requires specification of appropriate model inputs. These include the timeline of the FS projection simulations, remediation of LPRSA OU2, potential remediation of LPRSA OU4, contaminant initial conditions in the sediment bed, the hydrograph for the projections, boundary conditions for salinity, temperature, suspended sediments, organic carbon, and contaminants, bathymetry inputs, and anticipated maintenance and capital dredging in the navigation channels in NBSA. Each of these inputs is discussed briefly.

4.3.1 Projection Timeline

The NBSA FS projection simulations are anticipated to last approximately 45 years into the future. This timeline is consistent with the projection simulations used for the FFS of LPRSA OU2 (USEPA 2016). The FS simulations will be initiated in WY2017 using NBSA Phase III data to define sediment initial conditions. All FS alternatives (including the baseline simulation) will represent the LPRSA OU2 remedy using the dredging schedule, dredging releases, dredge depths, cap properties, etc. developed by GSH. However, remediation in LPRSA OU3 will not be simulated because no remedy decision has been made at this time. Similarly, no remediation in the Hackensack River or Berry's Creek will be simulated; no decision has been made regarding remediation in the Hackensack River, and the model domain does not include Berry's Creek.

4.3.2 Hydrograph

The hydrograph for the projection simulations relies on the measured historical hydrograph. Comparison of the cumulative probability distribution of the long-term (1900-2018) hydrograph in the LPR at Little Falls shows a good correspondence with the 15-year hydrograph from WY1996 through WY2010, indicating the suitability of this 15-year hydrograph for representing the long-term hydrograph in the LPR. Therefore, the projection simulations will consist of the actual hydrograph through WY2019, followed by WY1996 through WY1998 to simulate the period prior to the OU2 remedy, followed by three repeated cycles of the WY1996-WY2010 hydrograph. Repeating the cycles of the WY1996-WY2010 hydrograph avoids repeating the approximately 90-year flows

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associated with Hurricane Irene in WY2011 and is also consistent with the approach used for the FFS of LPRSA OU2 (USEPA 2016).

4.3.3 Wind-Wave Inputs

The wind-wave model uses the same meteorological forcings that were applied to the hydrodynamic model. Therefore, the sequence of wind-wave model results computed for WY1996-WY2010 using the post-50' deepening bathymetry will be repeated for the projection simulations.

4.3.4 Boundary Conditions

Boundary conditions for salinity and temperature at the marine boundaries (Arthur Kill and Kill van Kull) will be based on results of a simulation using the regional model (HydroQual 2008) with the post-50' deepening bathymetry in NY harbor and in NBSA. Similarly, marine boundary conditions for suspended sediments will be specified using the application of solids rating curves to velocities and water levels computed using the regional model for the WY1996-WY2010 hydrograph with post-50 ft deepening bathymetry. Marine boundary conditions for algal and detrital OC will be based on inputs defined for the calibration simulations for WY1996-WY2010. Marine boundary conditions for contaminants will be based on CARP model projections which projected a long-term declining trend. Freshwater boundaries, point-source, and non-point source loadings of suspended sediments, algal and detrital OC, and contaminants, which although variable in time as a function of the flow rates, do not include a temporal decline and will be used as defined for the calibration setup.

4.3.5 Bathymetry

The FS projection simulations will be initiated using the post-50 ft deepening bathymetry in the NBSA navigation channels. Bathymetry elsewhere in NBSA and LPRSA will be based on that calculated at the end of WY2016 (i.e., following the extension of the CPG's calibration simulation to the period of the Phase III data). Subsequent bathymetric updates will be internally calculated by the model in response to erosion/deposition over the course of the simulation as described in Section 2 of this report, or in response to periodic maintenance dredging as described in the following section.

4.3.6 Maintenance Dredging

The decadal-scale simulations anticipated for the FS projections are expected to cause significant sedimentation within the NBSA navigation channels and terminal areas. Currently, maintenance dredging is implemented by the US Army Corps of Engineers and the terminal operators on an as-needed basis in order to maintain safe navigable depths. While the frequency of maintenance dredging in the future cannot be reasonably anticipated, within the context of the FS projection simulations, maintenance dredging will be implemented every 5 years. Based on recent dredging in the 40 ft navigation channel, the maintenance dredging will be included in both the 40 ft and 50 ft channels within NBSA.

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Maintenance dredging will be represented as a removal of accumulated sediment, organic carbon, and contaminants in the strata above the designated channel depths, thus effecting a change in bathymetry and sediment composition.

5 Model Uncertainties Relevant for FS

5.1 NBSA Model Framework Uncertainties

The NBSA model framework described in the preceding sections was developed using an extensive dataset to develop model inputs and parameters, and to calibrate the model. As is typical of such environmental models, the model framework includes certain limitations and approximations that may need to be considered when applying the model for assessing remedial scenarios in NBSA. Although not a comprehensive list, some of these sources of uncertainty are described next.

5.1.1 Hackensack River and the Meadowlands

As discussed in Sections 3.4 and 5.2.2 of Moffatt & Nichol and Deltares 2020a, the model setup in the Hackensack River and the Meadowlands was the result of a number of assumptions and approximations. These approximations were a consequence of the paucity of suitable data to define various inputs and parameters as well as the acknowledgement that for the NBSA RI/FS, the exchange between NBSA and the Hackensack River and Meadowlands is the more relevant metric rather than the accurate representation of fate and transport processes within the Hackensack River and Meadowlands. The exchange between NBSA and the Hackensack River and Meadowlands was quantified empirically for various metrics, and was reproduced by the model to varying degrees depending on the metric. Nonetheless, there is a degree of uncertainty of unknown impact associated with this exchange.

5.1.2 Fluff Layer Parameterization on the Subtidal Shallows

The fluff layer parameterization in both the sediment transport model (Section 5.2.5 of Moffatt & Nichol and Deltares 2020a) and the CFT model (Section 3.5.2 of Appendix O of Anchor QEA 2019) and relied on globally (over the model domain) constant parameterization. To the degree that these parameters vary spatially in reality (e.g., between deeper areas such as in the navigation channel versus shallower sub-tidal areas), there may be an unknown uncertainty associated with the assumption of a spatially constant parameterization.

5.1.3 Model Performance for Low Net Deposition Areas on the Subtidal Shallows

As discussed in Section 6.4.8 of Moffatt & Nichol and Deltares 2020a, model performance for sedimentation was calibrated to the maintenance dredging rate in the NBSA navigation channel and terminal areas. Due to the paucity of suitable data (bathymetric change) on

the subtidal shallows, model performance for sedimentation on the subtidal shallows is somewhat untested. However, as part of the model application during the FS, model performance can be further assessed by comparison to empirical data such as cesium and contaminant core profiles for a qualitative assessment of model uncertainty.

5.1.4 Future Loadings of Contaminants

As mentioned in a previous section, boundary conditions for contaminants at the marine boundaries will be based on CARP model projections which include a long-term declining trend. However, contaminant loadings from the freshwater boundaries, point-sources, and non-point sources do not include such a long-term temporal decline. To the degree that the prescribed boundary conditions control projected trajectories of relevant metrics for any given contaminant, this uncertainty may need to be further assessed as part of the FS.

5.1.5 Response to Large Storm Events

As discussed in Section 5.4.6 of Moffatt & Nichol and Deltares 2019b, during Hurricane Irene, representing an event with a return period of 90-years, the sediment transport model tends to overpredict erosion within LPRSA, and correspondingly, deposition within NBSA. However, during other high-flow events included within the 18-year calibration simulation (WY1996 through WY2013), the model does not calculate a similar magnitude of erosion. Moreover, Hurricane Irene will not be simulated as part of the proposed hydrograph for the FS projection simulations. Therefore, the uncertainty introduced by the model performance during Hurricane Irene is not expected to influence the FS projection simulations.

5.1.6 Sediment Mixing Depth in the CFT Model

As mentioned previously, Section 3.3 of Anchor QEA 2020 describes a bias in the prescribed depth of bioturbation in NBSA compared to empirical estimates. A sensitivity analysis with greater mixing depths presented in Section 6.2.1 of Appendix O of Anchor QEA 2019 shows only moderate impact of this parameter on reach average sediment concentrations, with no impact on the overall trajectory trends or water column results. Therefore, even though there is an uncertainty associated with the mixing depth used in NBSA, it is not anticipated to be a significant factor influencing the relative comparison of sediment concentrations amongst different FS scenarios.

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5.1.7 Grid Resolution

As mentioned previously, the average model grid cell widths and lengths within NBSA is in excess of 100 m. The grid resolution was aimed at resolving large-scale spatial gradients in physical and bathymetric features while minimizing the total number of grid cells in the model domain in order to ensure reasonable computation times, especially for the decadal-scale simulations used for the calibration and FS simulations. Therefore, even though model performance may be considered reliable over large spatial scales, the relatively large grid sizes imply that there may be small-scale spatial patterns in bathymetry and transport that are not well resolved by the grid. Therefore, the potential for artifacts due to limitations of grid resolution should be considered when reviewing model performance in individual grid cells. Model performance should also be assessed relative to other lines of evidence in decision-making.

5.2 EPA Guidance on Model Uncertainty

EPA guidance on the use of numerical models for Superfund decision-making (USEPA 2002; 2005; 2009; 2017) recognizes model uncertainties, limitations, and constraints deriving from computational limitations, model assumptions, knowledge gaps, etc. inherent in complex environmental models. EPA guidance recognizes that models are simplifications of the complex environmental processes and are best viewed as tools to help inform decisions rather than a means to produce exact outcomes (USEPA 2017). In order to account for such limitations, models are typically used as one line-of-evidence in decision-making at Superfund sites. Furthermore, models are generally used to support relative comparisons of management alternatives, an approach that reduces the impact of model uncertainties that may be more significant in an absolute sense in any given alternative but somewhat mitigated when comparing results between alternatives.

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Figures

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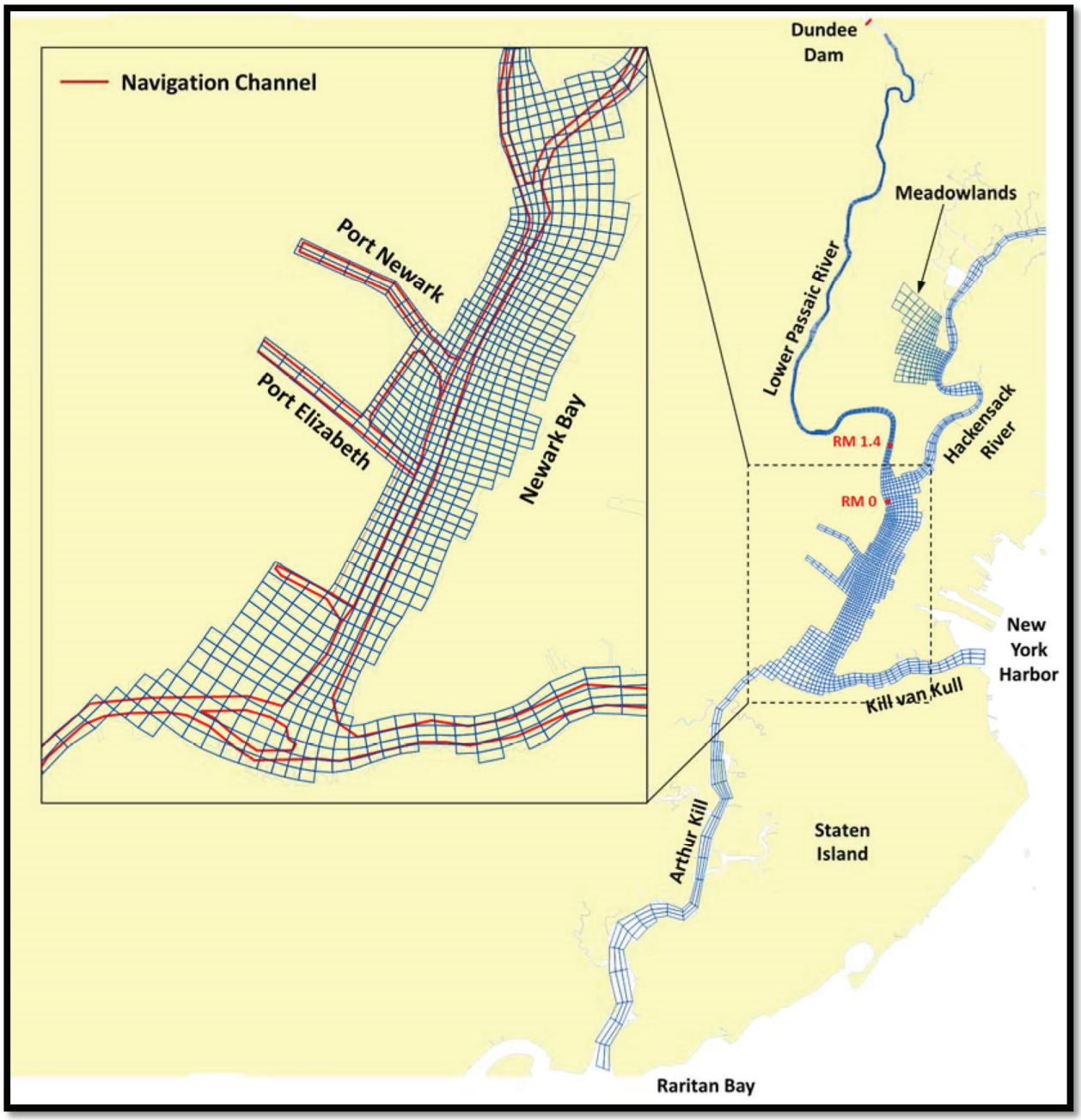


Figure 1-1. Model Grid and Computational Domain

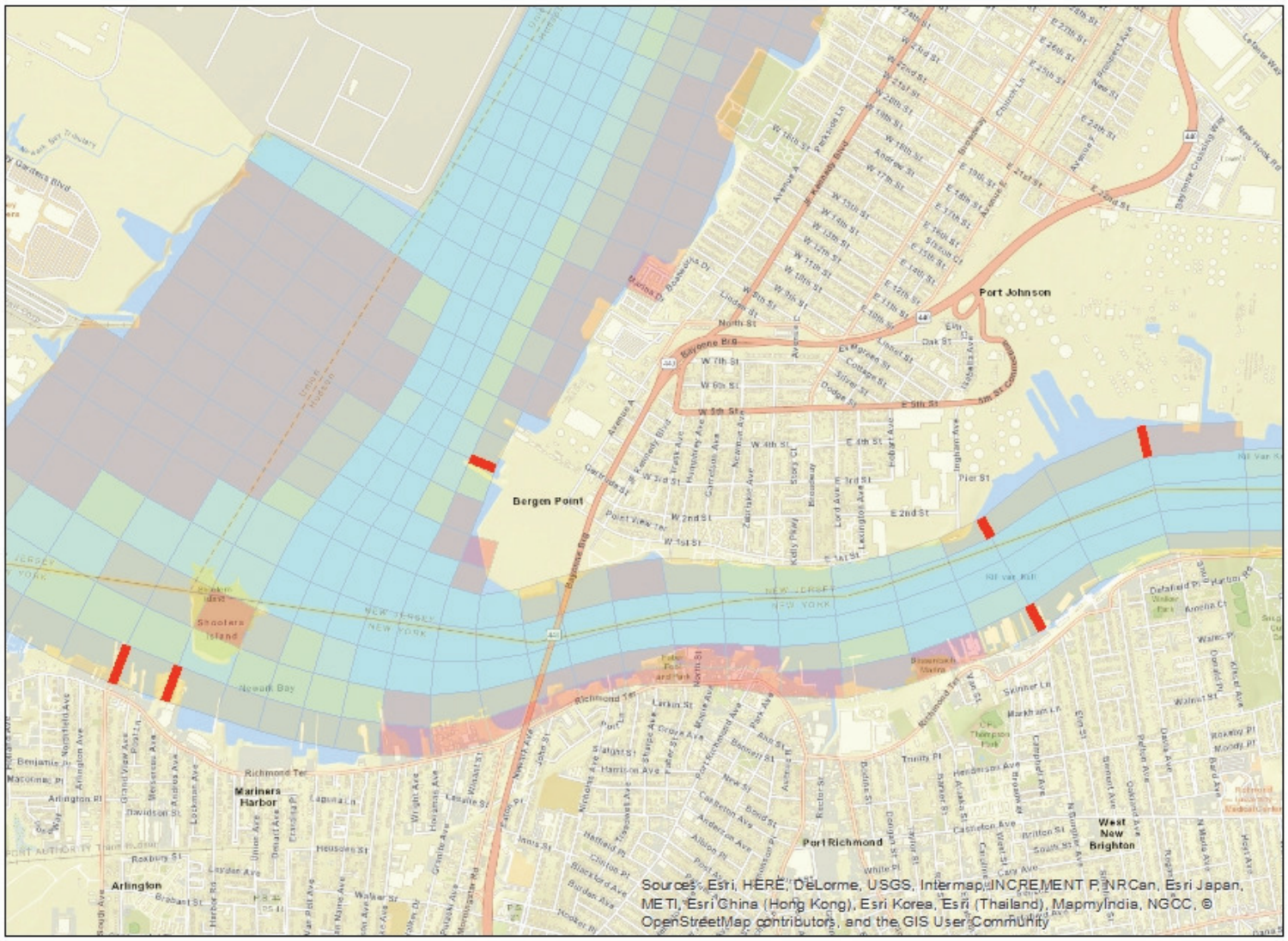


Figure 2-1. Locations of Thin Dams in the Kill Van Kull and Southern Newark Bay

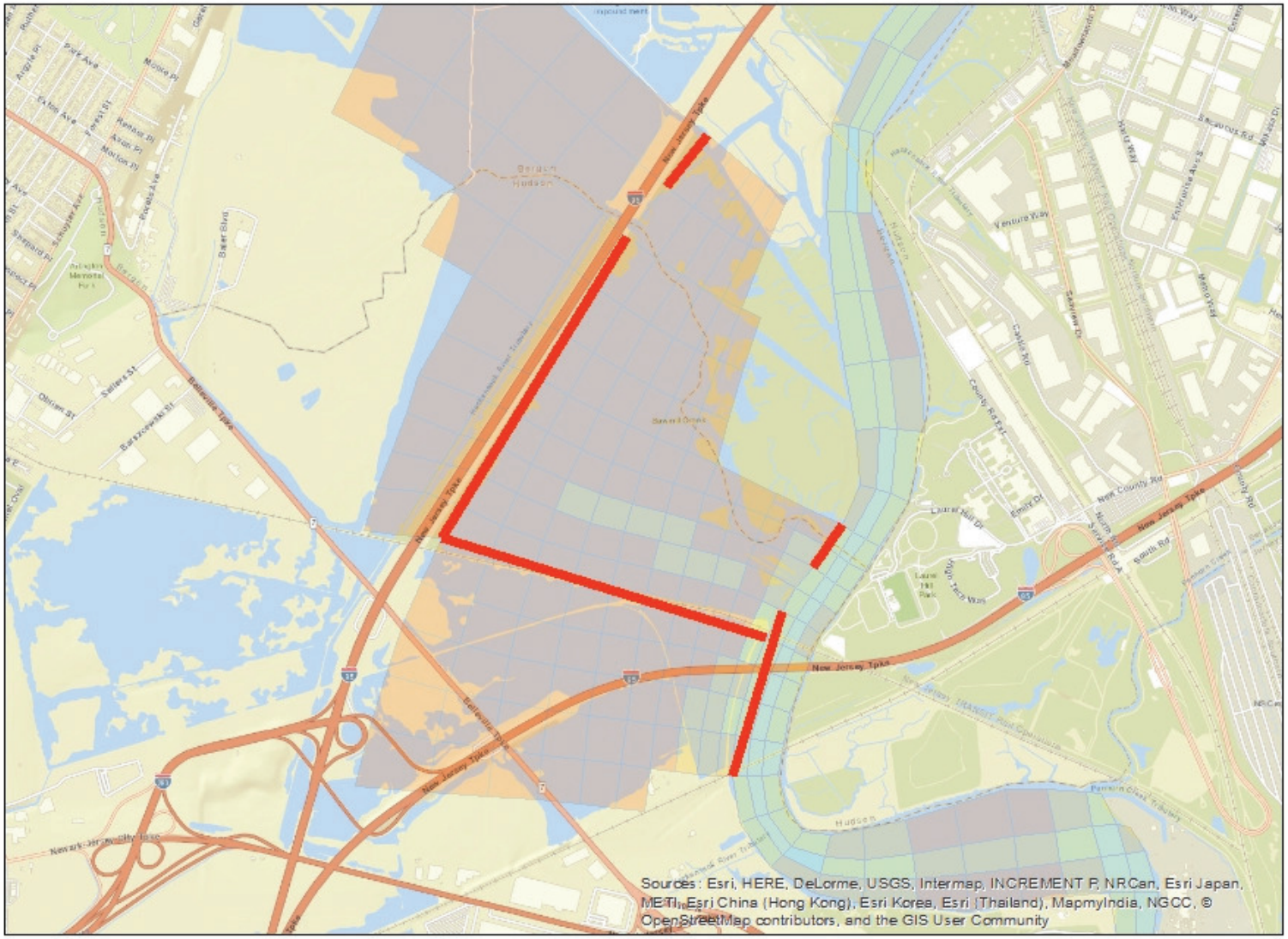


Figure 2-2. Locations of Thin Dams in the Hackensack River/Meadowlands

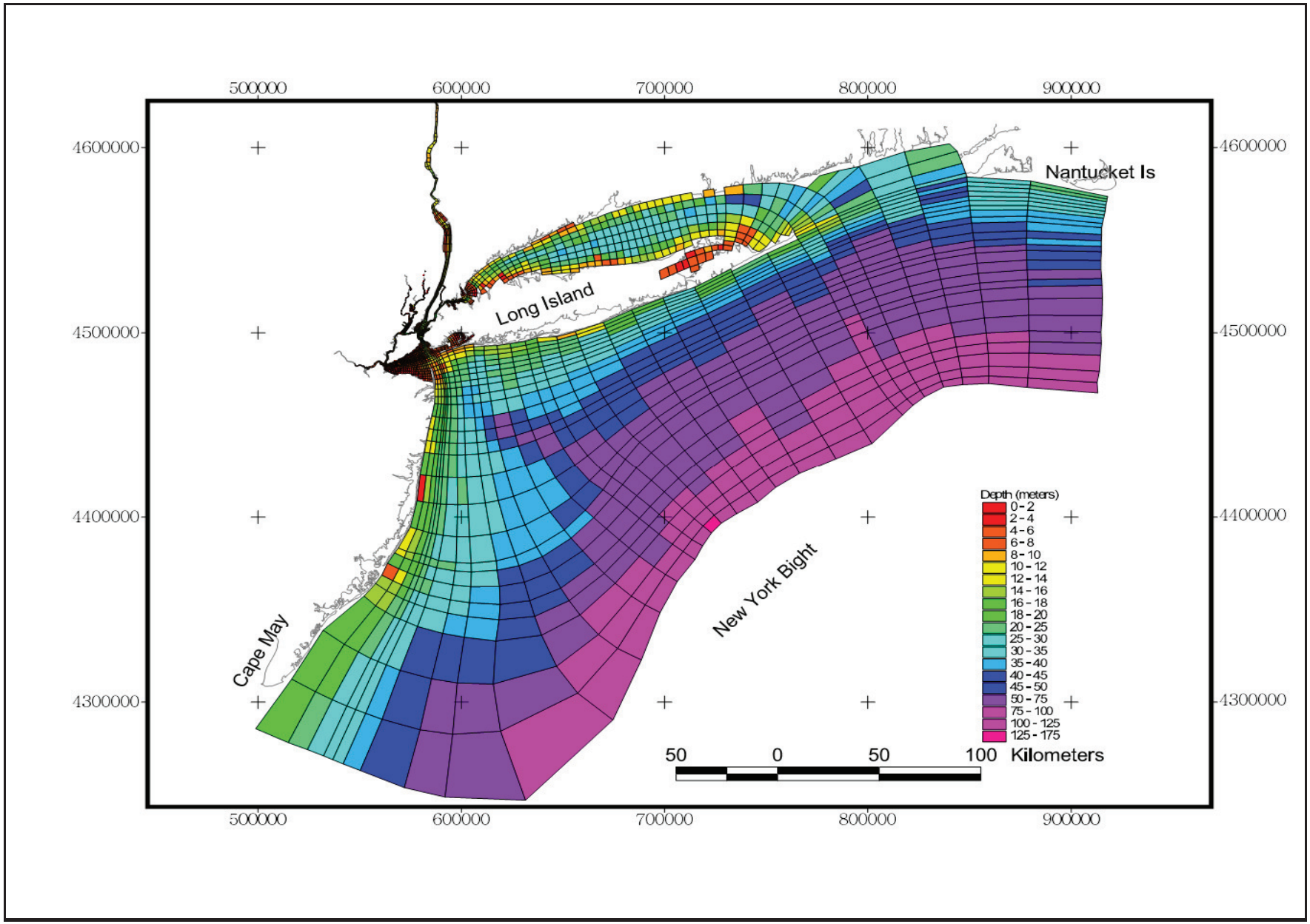


Figure 2-3. NY-NJ Harbor Regional Model

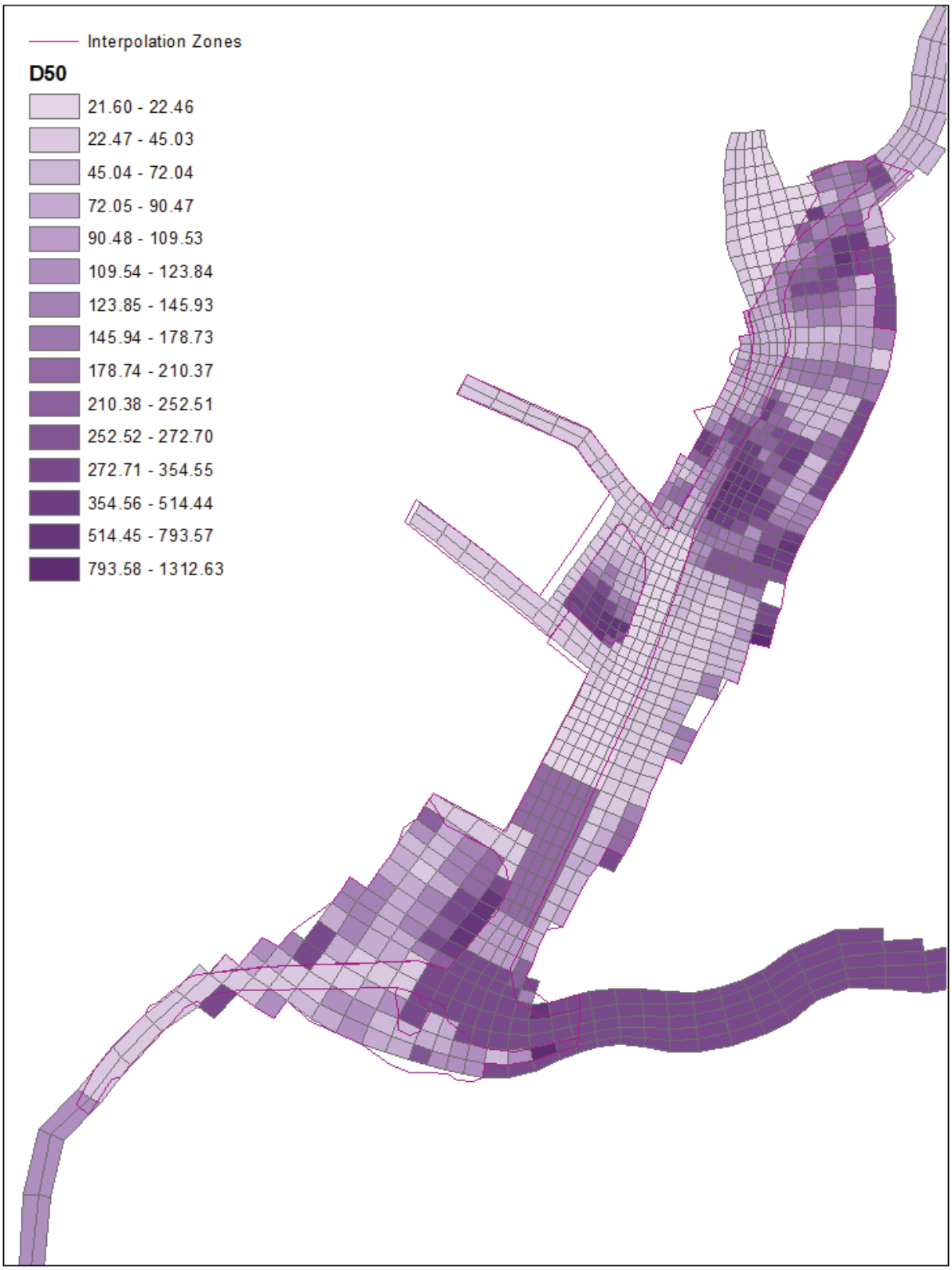


Figure 4-1. D50 based on Interpolated Phase III data

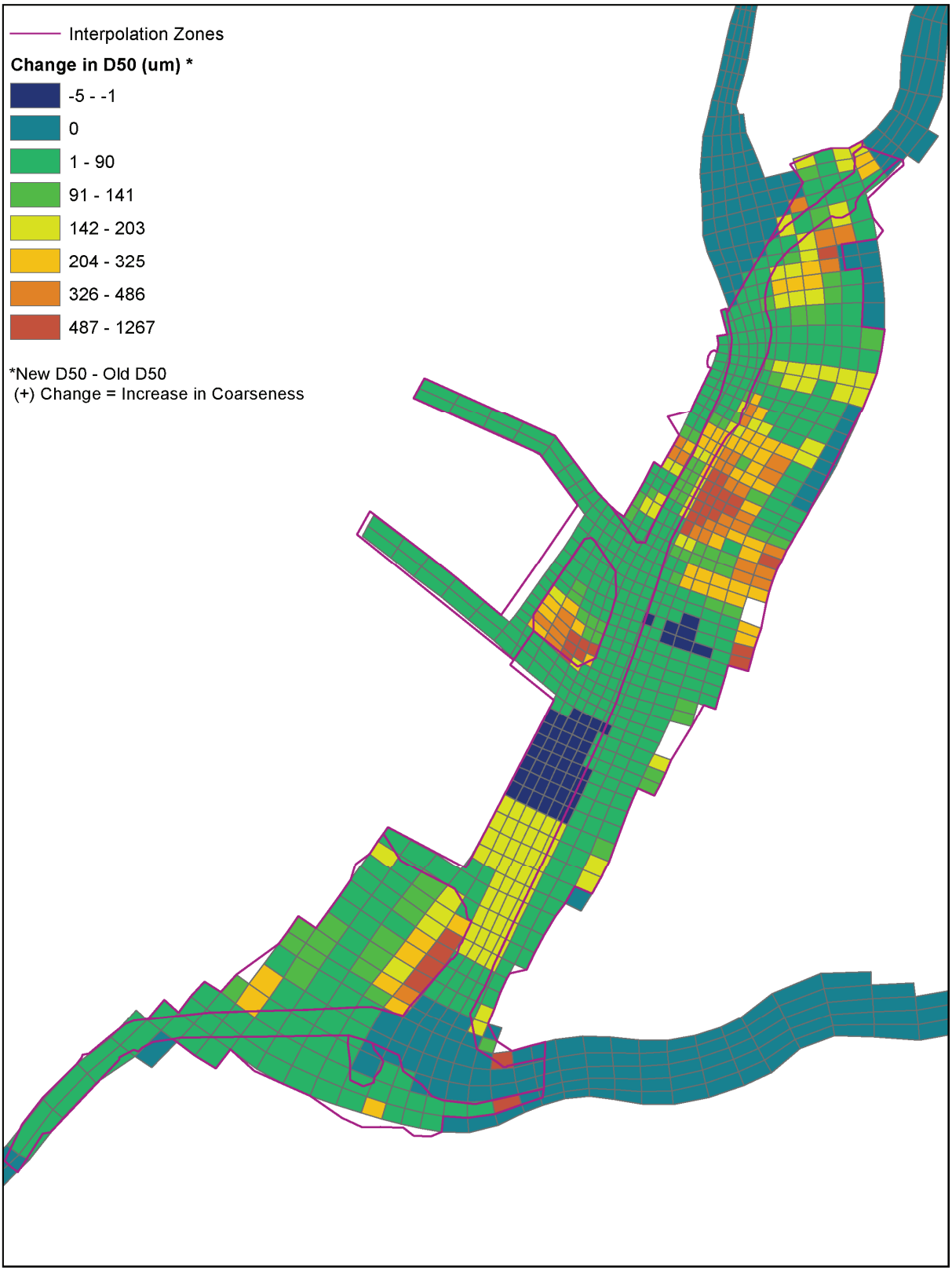


Figure 4-2. Difference between Original and Phase III-based D50

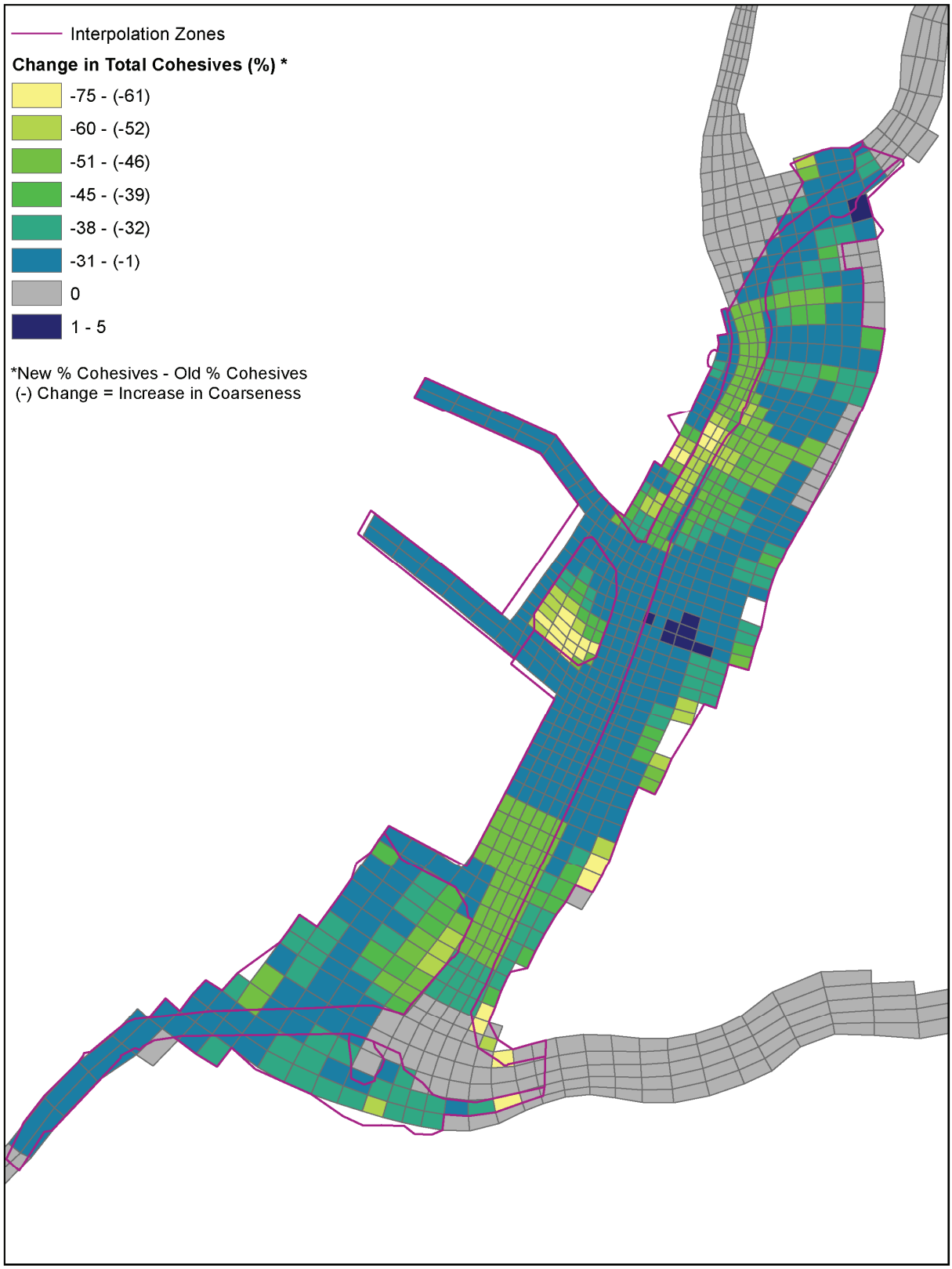


Figure 4-3. Difference between Original and Phase III-based Cohesive Solids Fractions

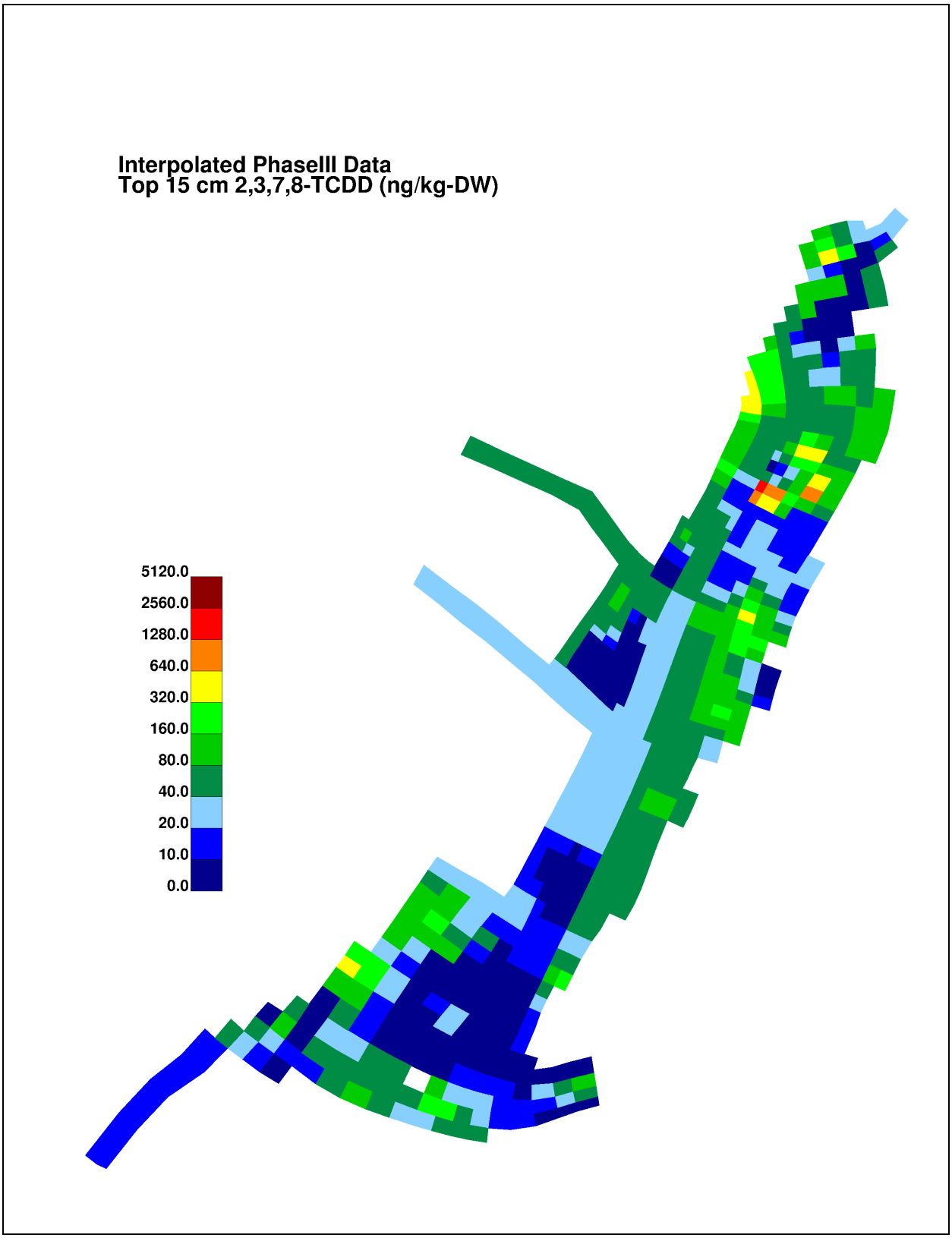


Figure 4-4. Phase III Data Interpolation for 2,3,7,8-TCDD

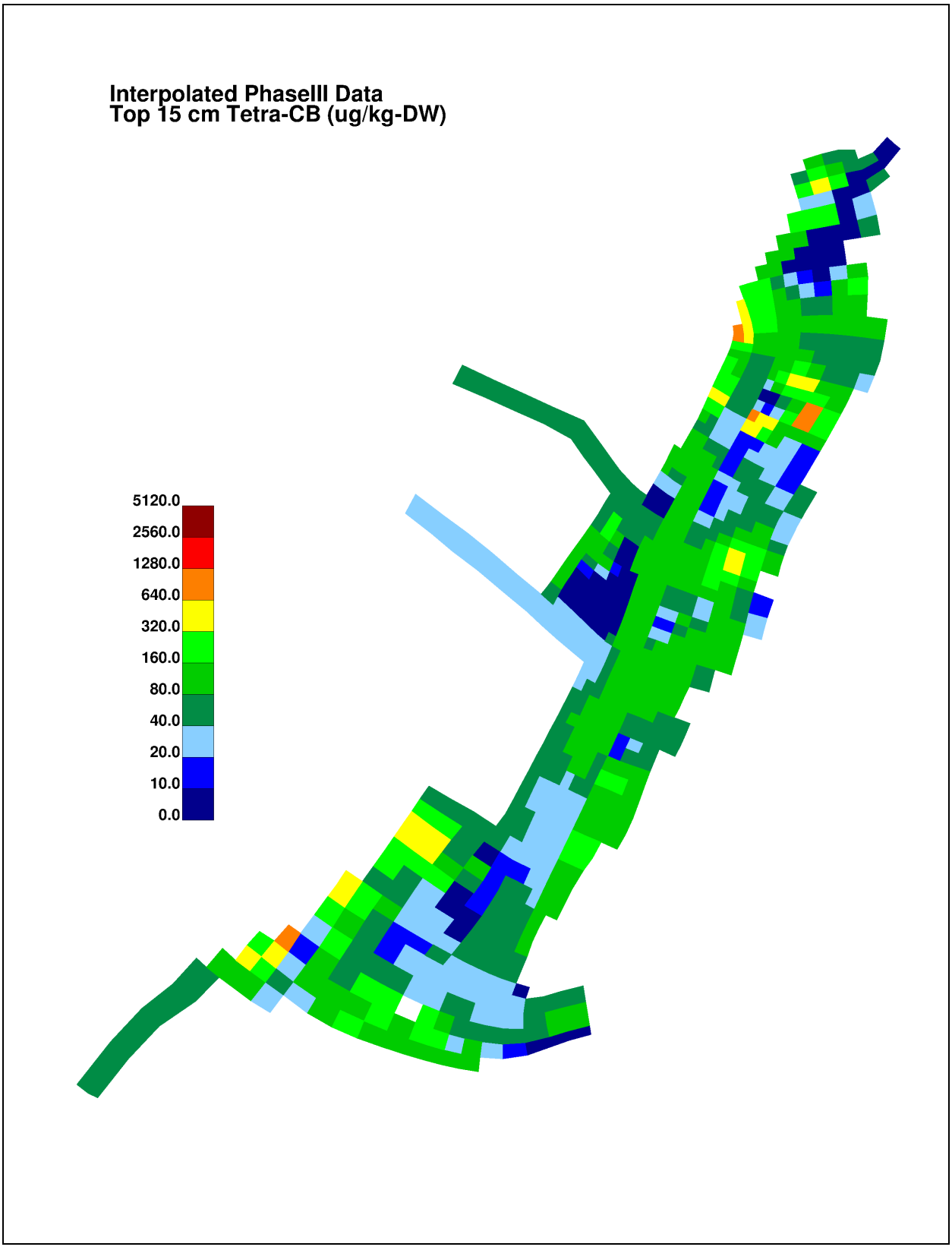


Figure 4-5. Phase III Data Interpolation for Tetra-PCB

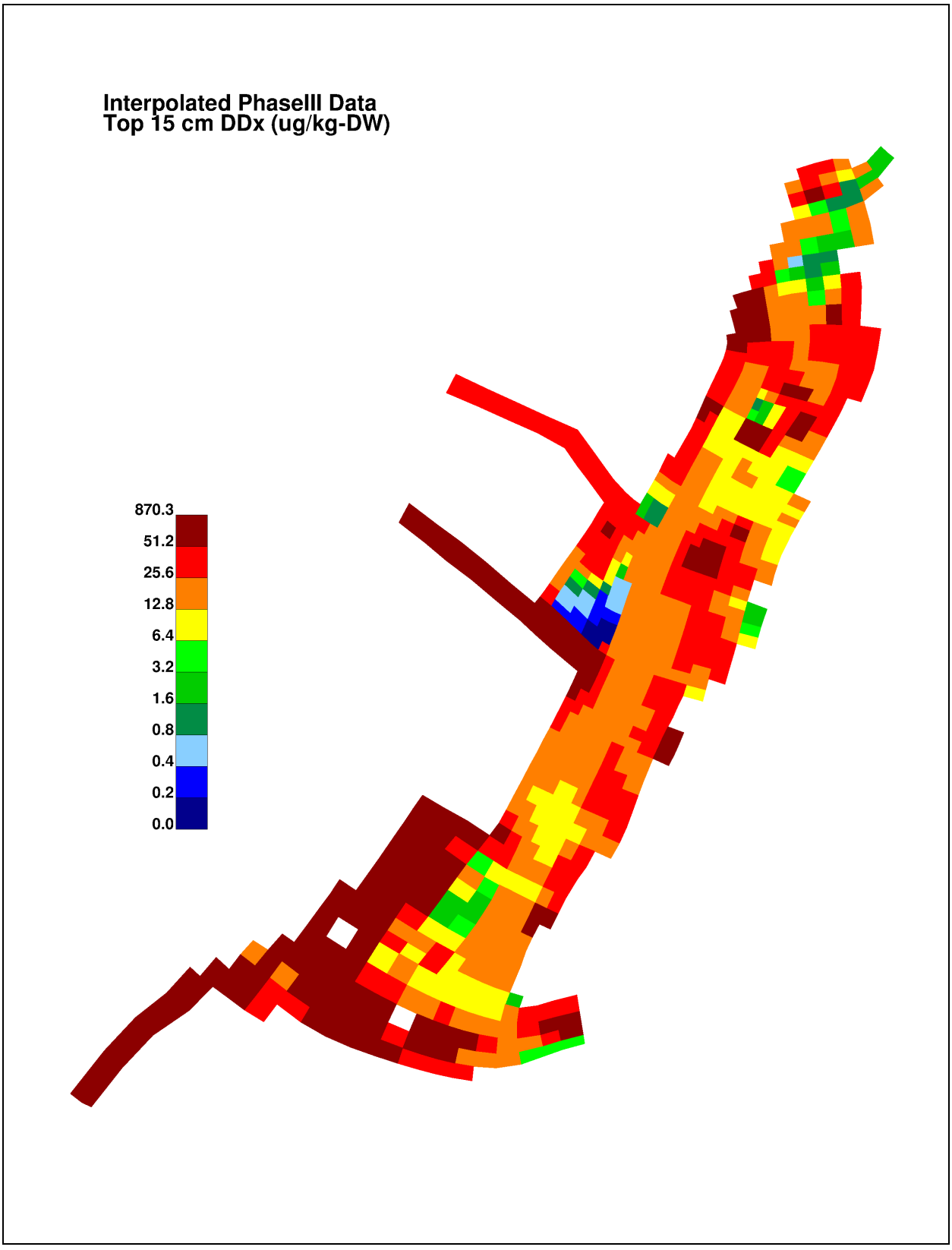


Figure 4-6. Phase III Data Interpolation for Total 4,4'-DDx

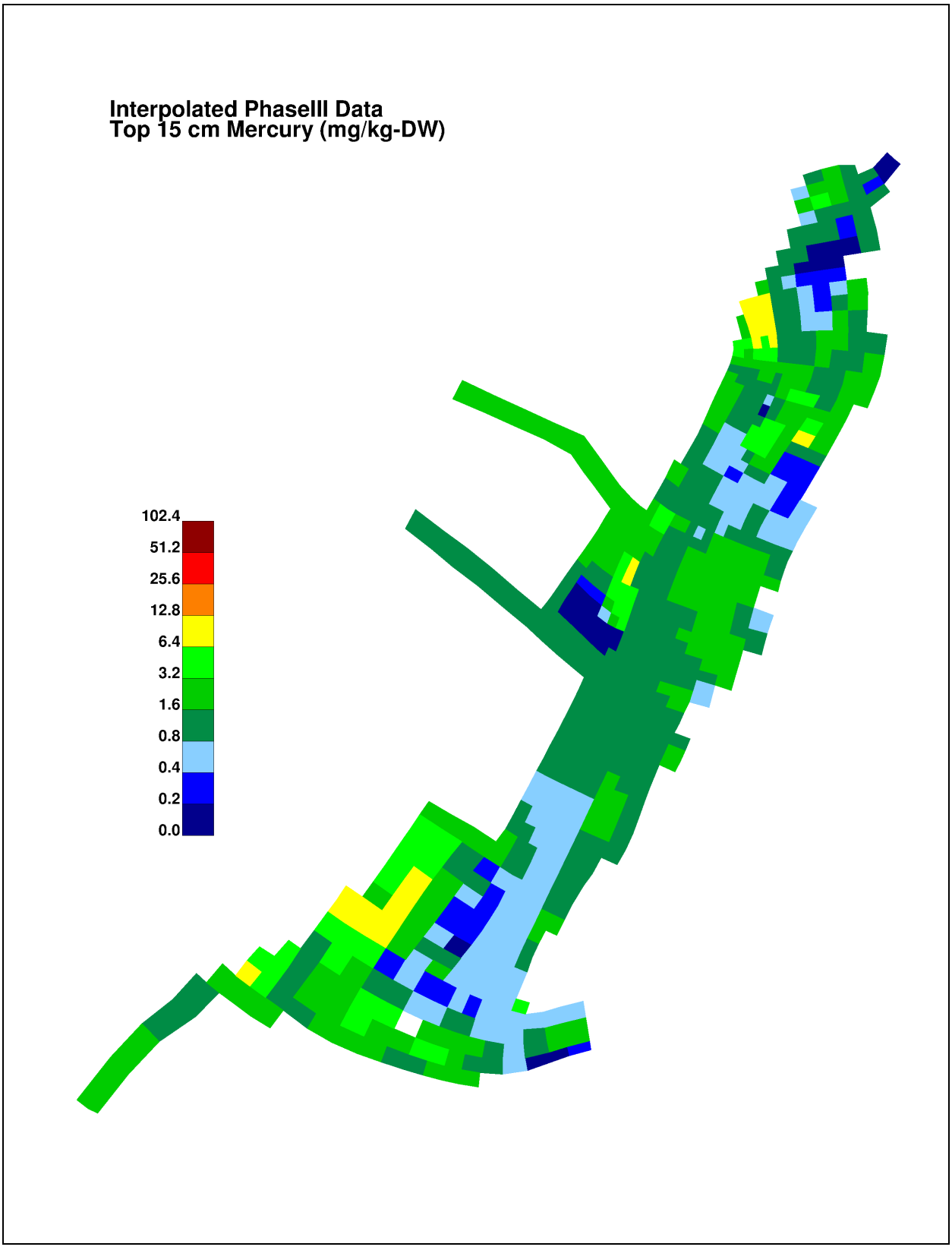


Figure 4-7. Phase III Data Interpolation for Mercury

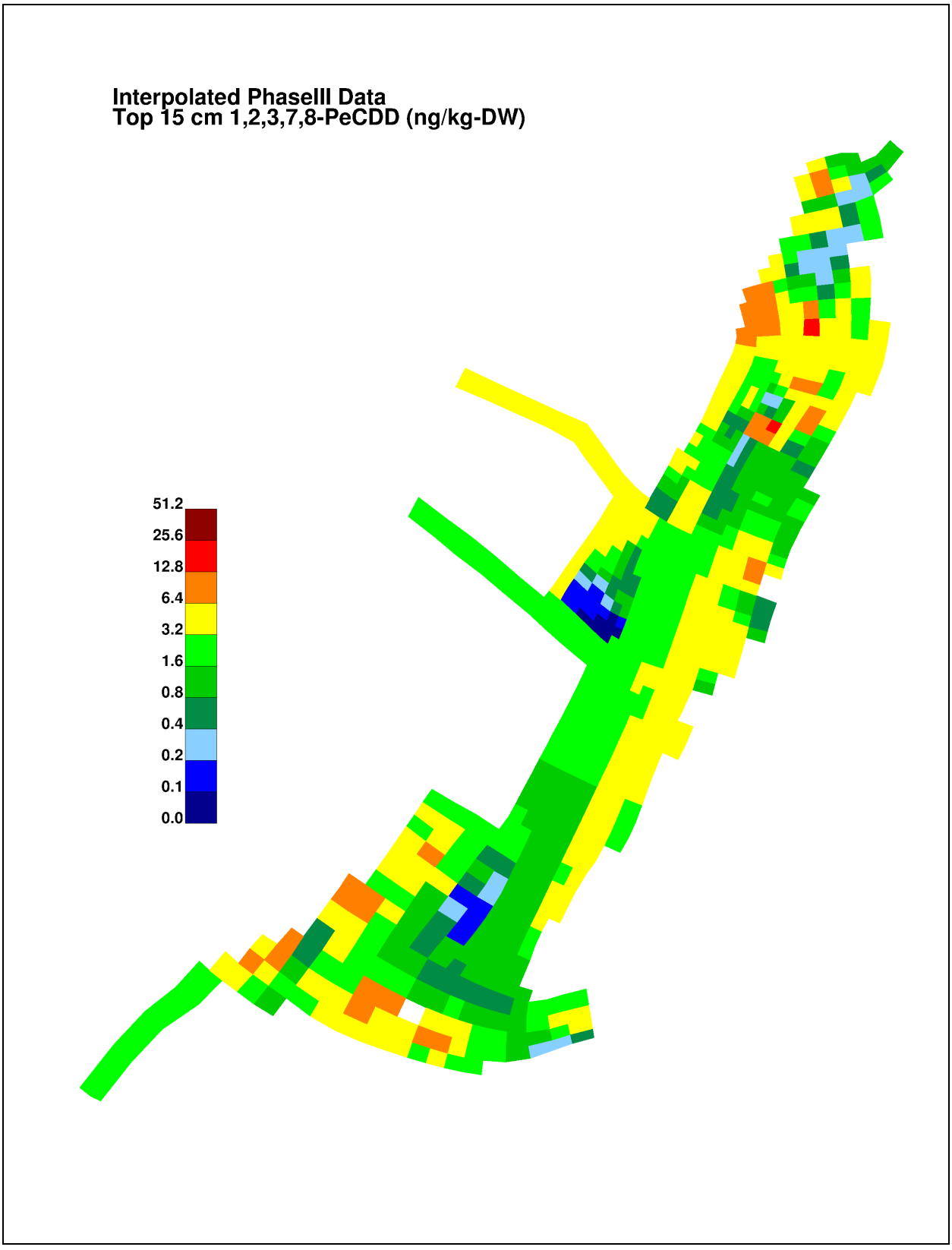


Figure 4-8. Phase III Data Interpolation for 1,2,3,7,8-PeCDD

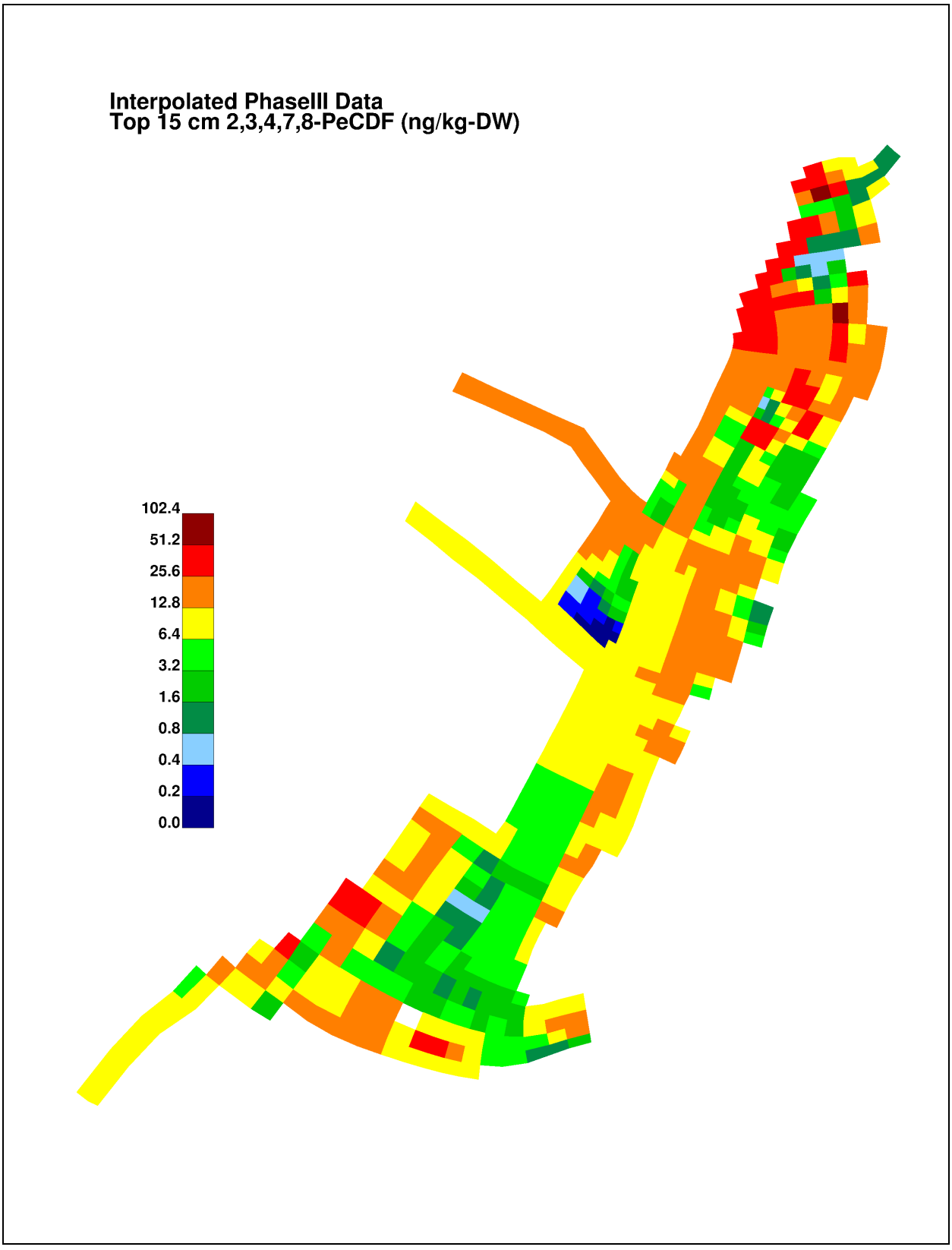


Figure 4-9. Phase III Data Interpolation for 2,3,4,7,8-PeCDF

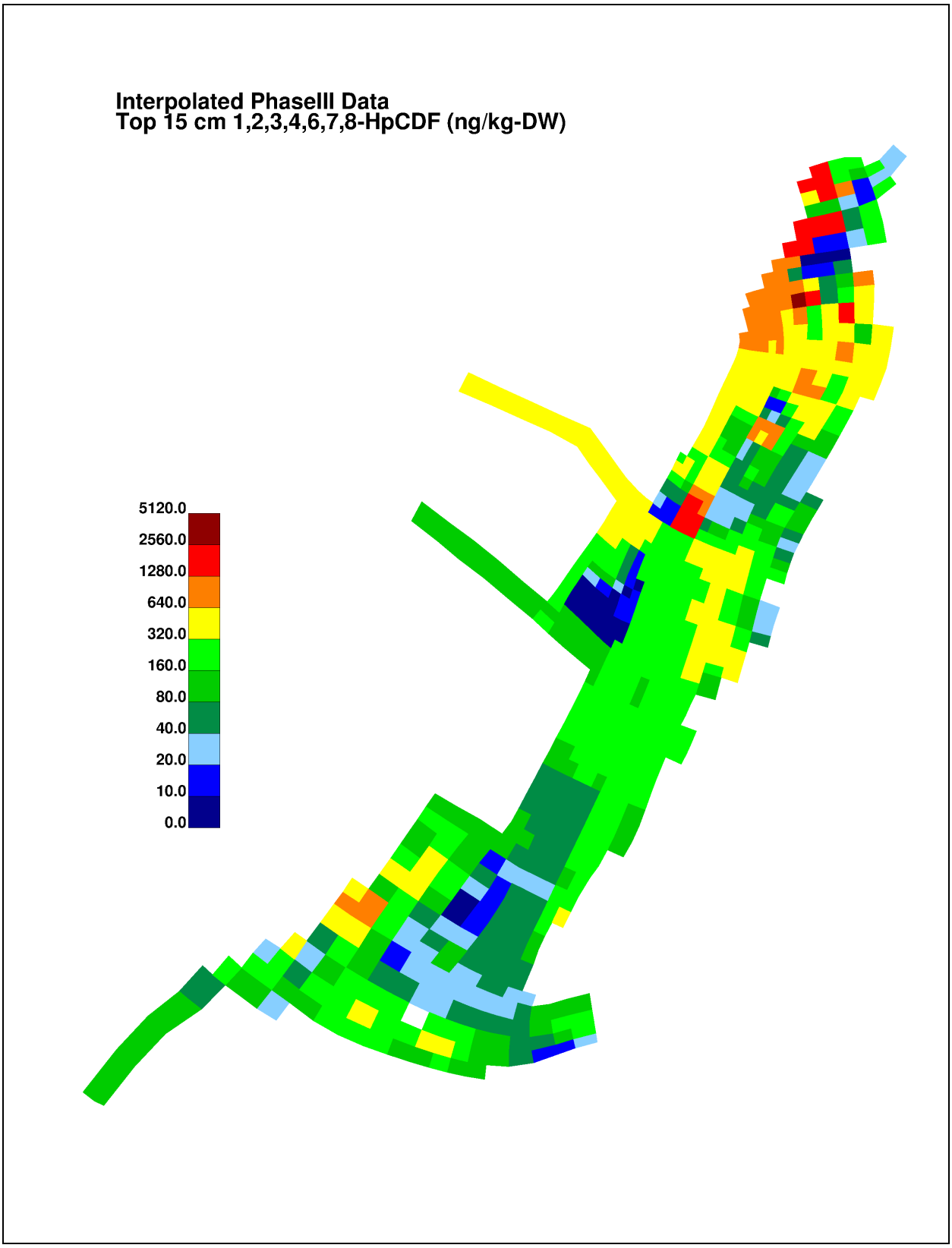


Figure 4-10. Phase III Data Interpolation for 1,2,3,4,6,7,8-HpCDF

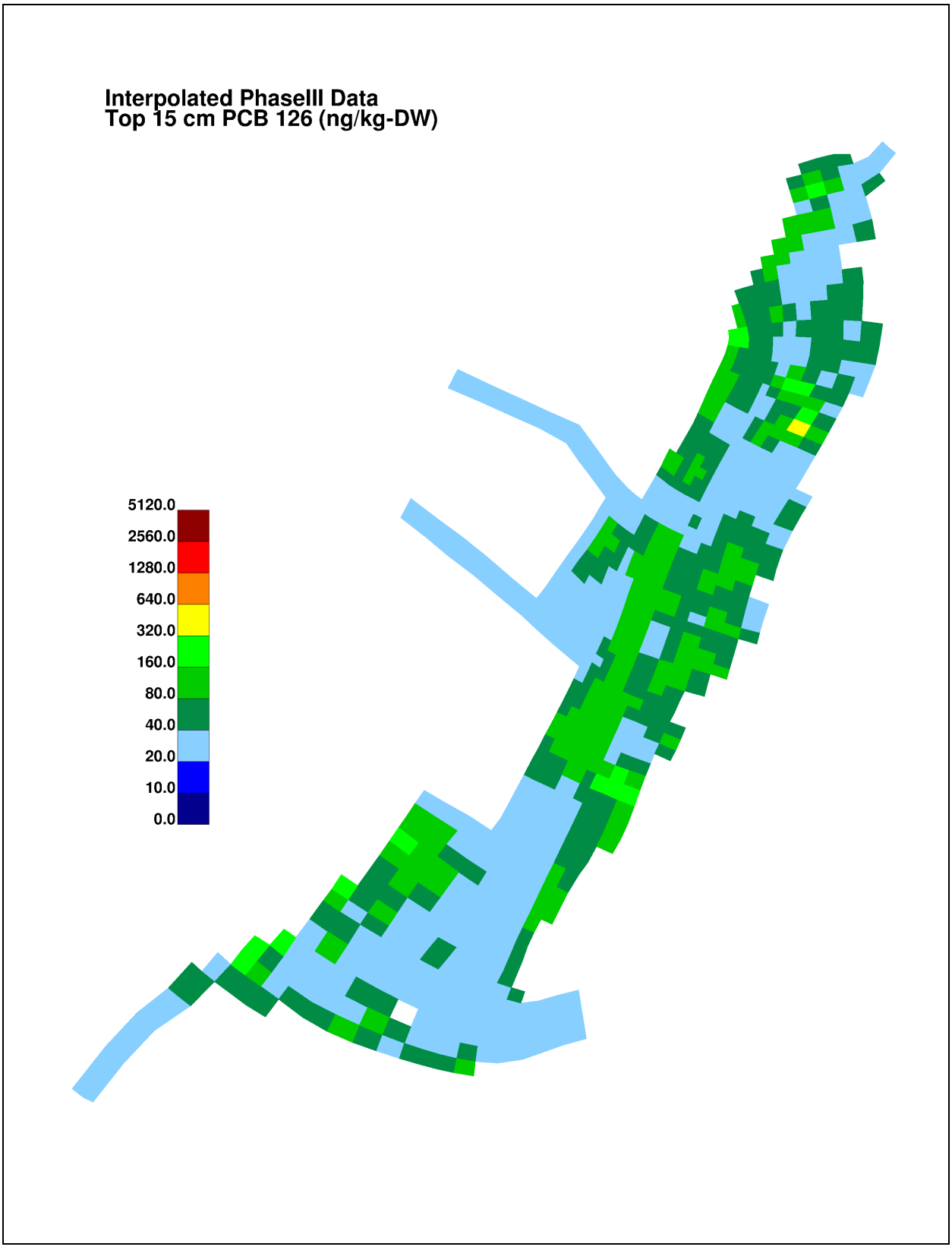


Figure 4-11. Phase III Data Interpolation for PCB-126

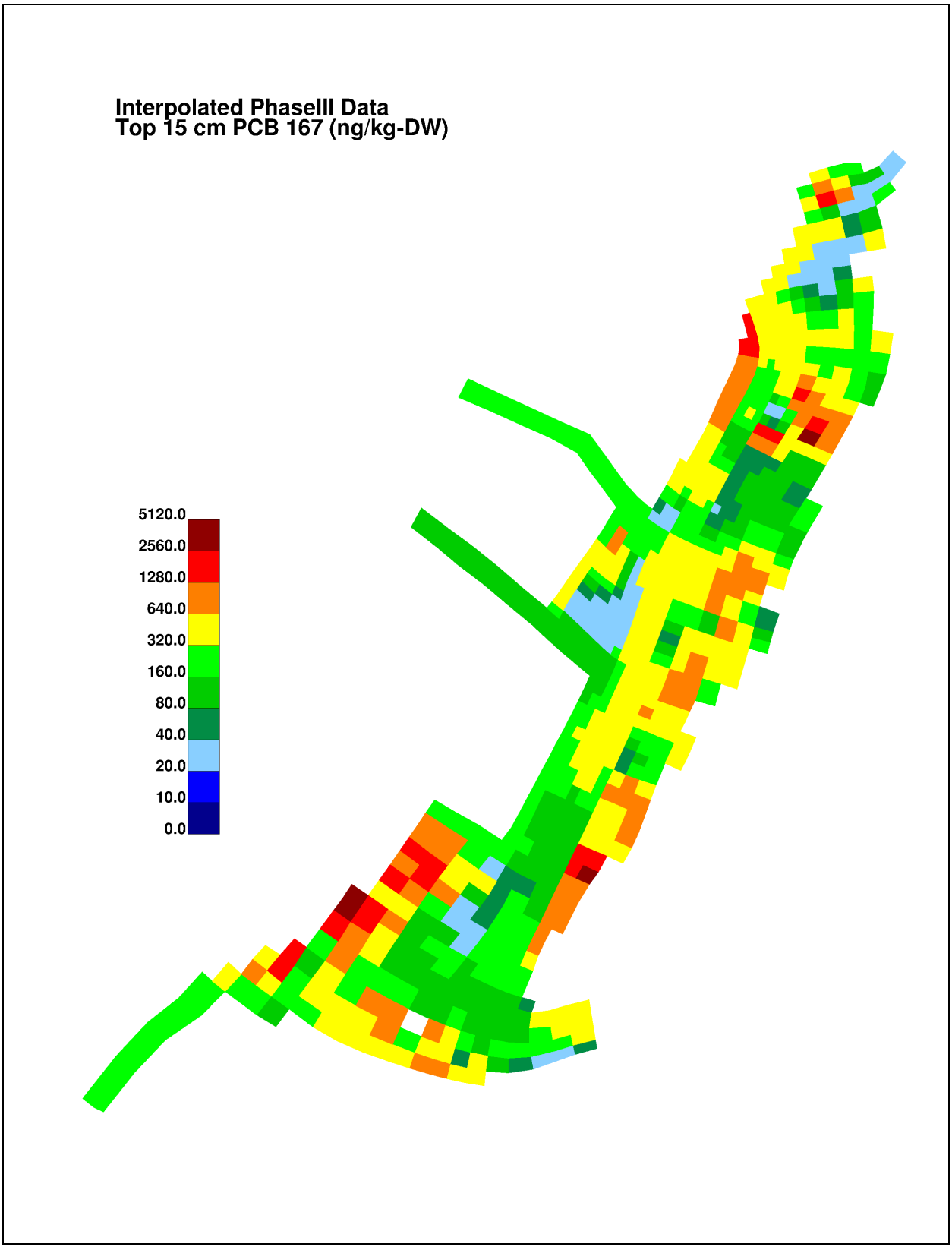


Figure 4-12. Phase III Data Interpolation for PCB-167

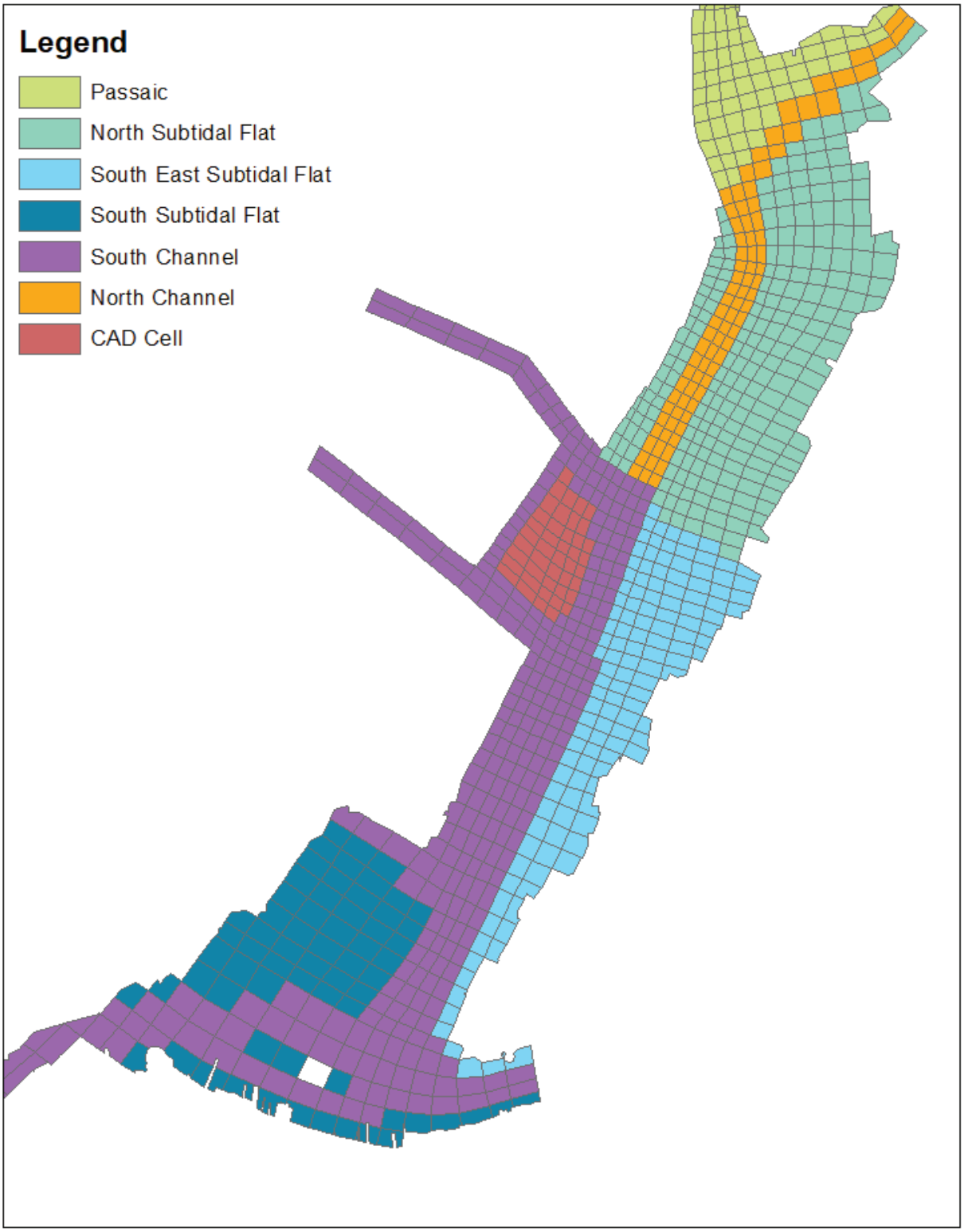


Figure 4-13. Newark Bay Zones for Comparison of Model-Data Comparisons

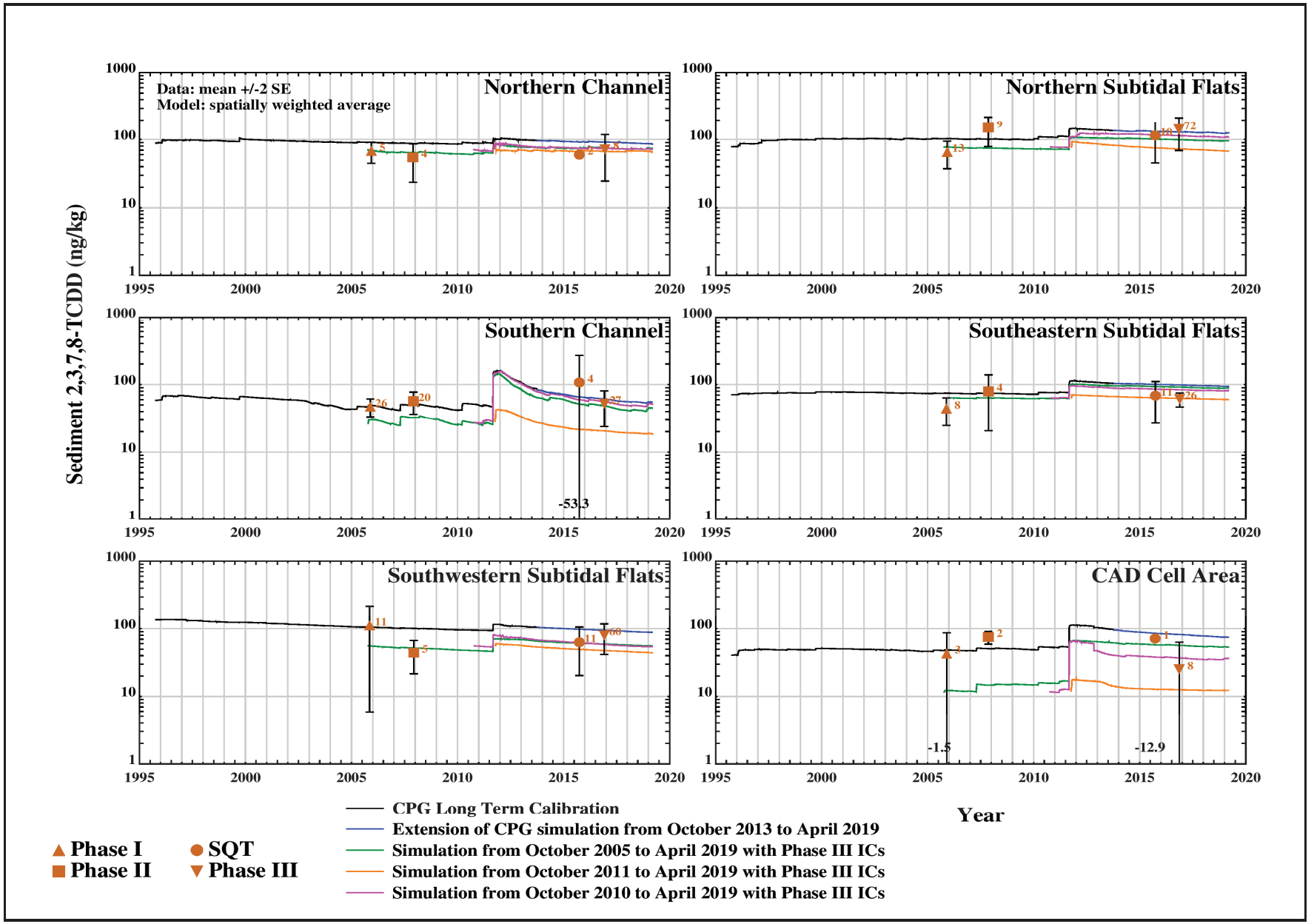


Figure 4-14. Sensitivity Simulations for 2,3,7,8-TCDD

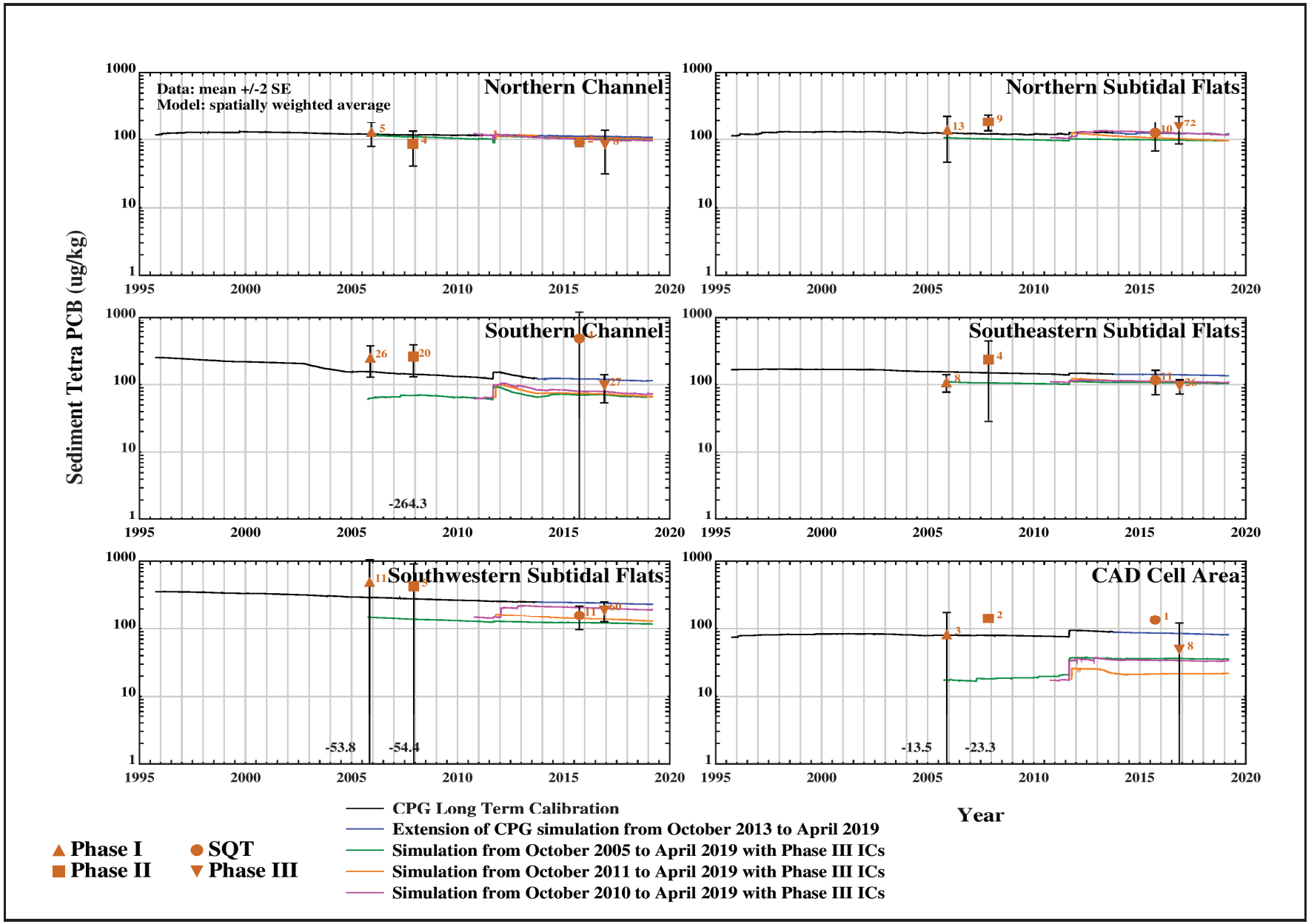


Figure 4-15. Sensitivity Simulations for Tetra-PCB

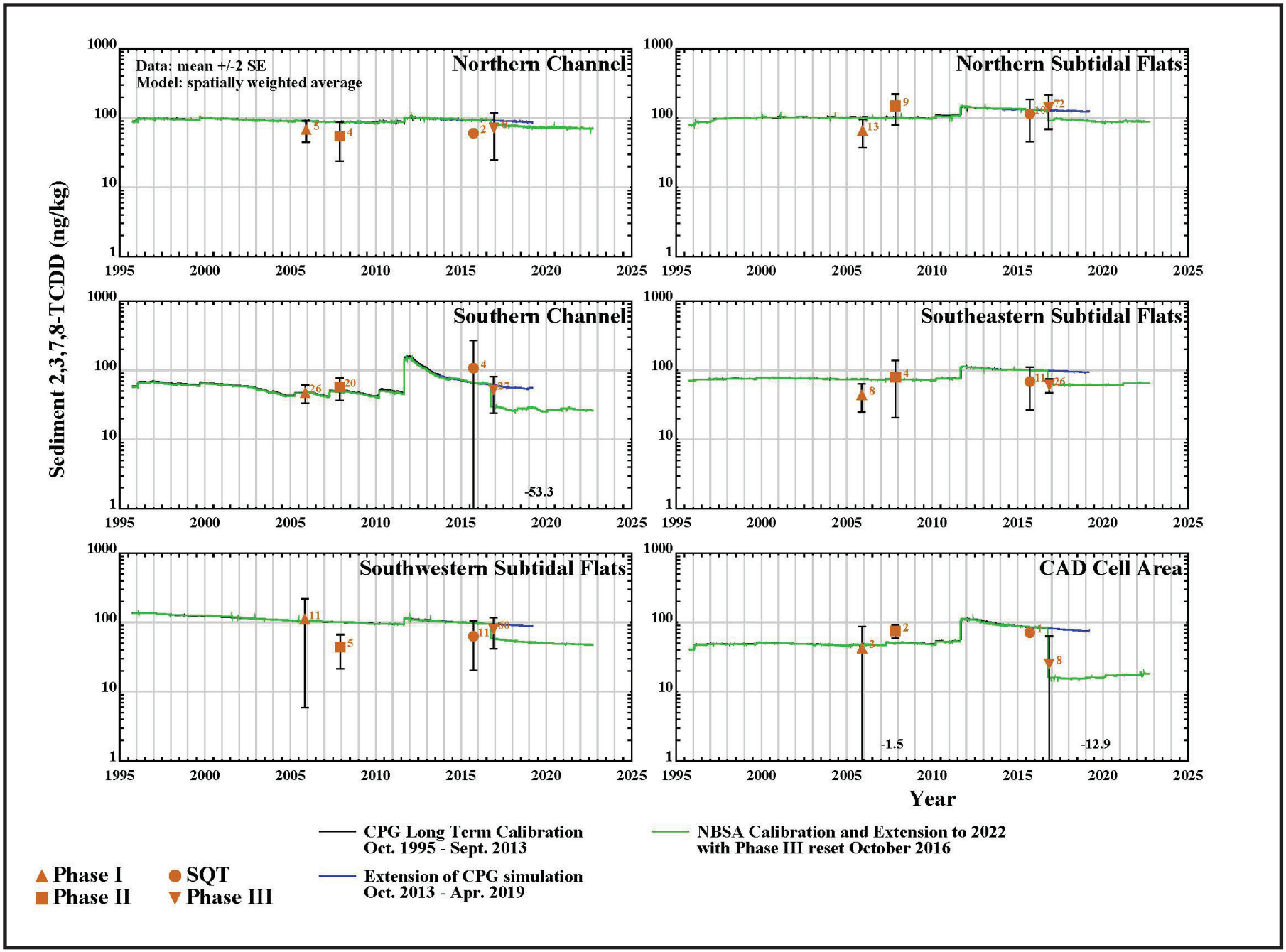


Figure 4-16. Time Series of Calibration, Extension to 2022 and Phase III Reset for TCDD

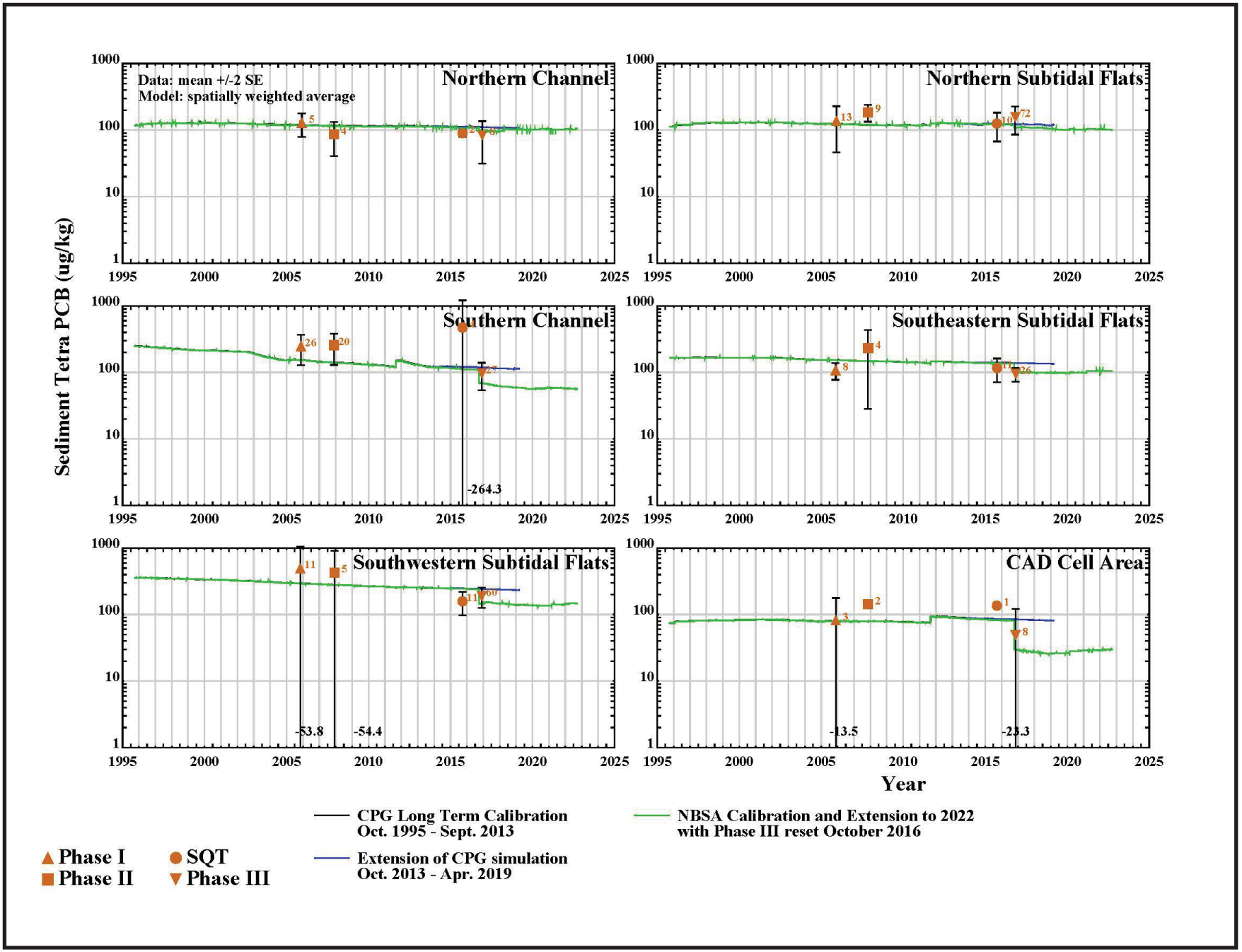


Figure 4-17. Time Series of Calibration, Extension to 2022 and Phase III Reset for TETRA

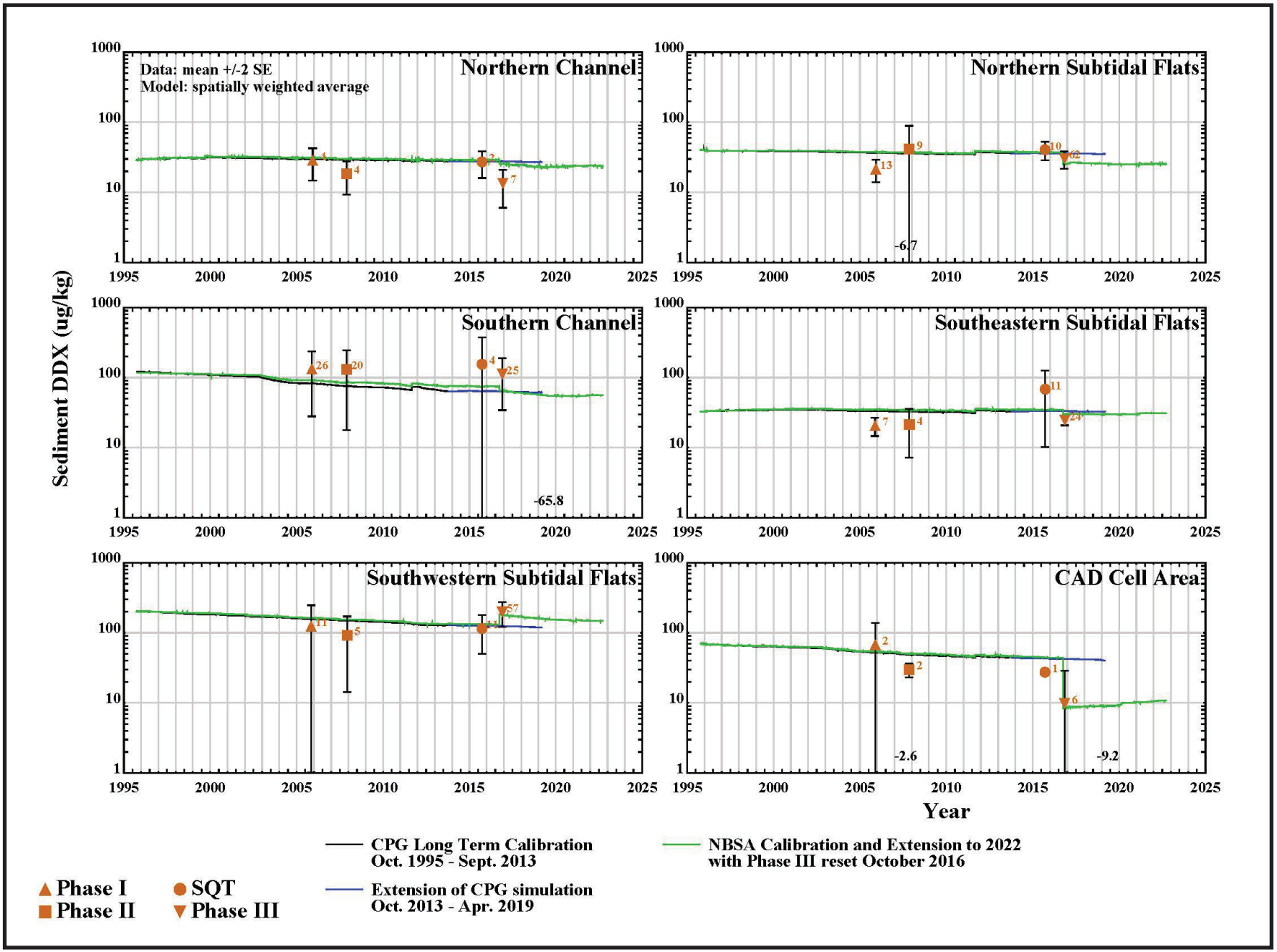


Figure 4-18. Time Series of Calibration, Extension to 2022 and Phase III Reset for DDX

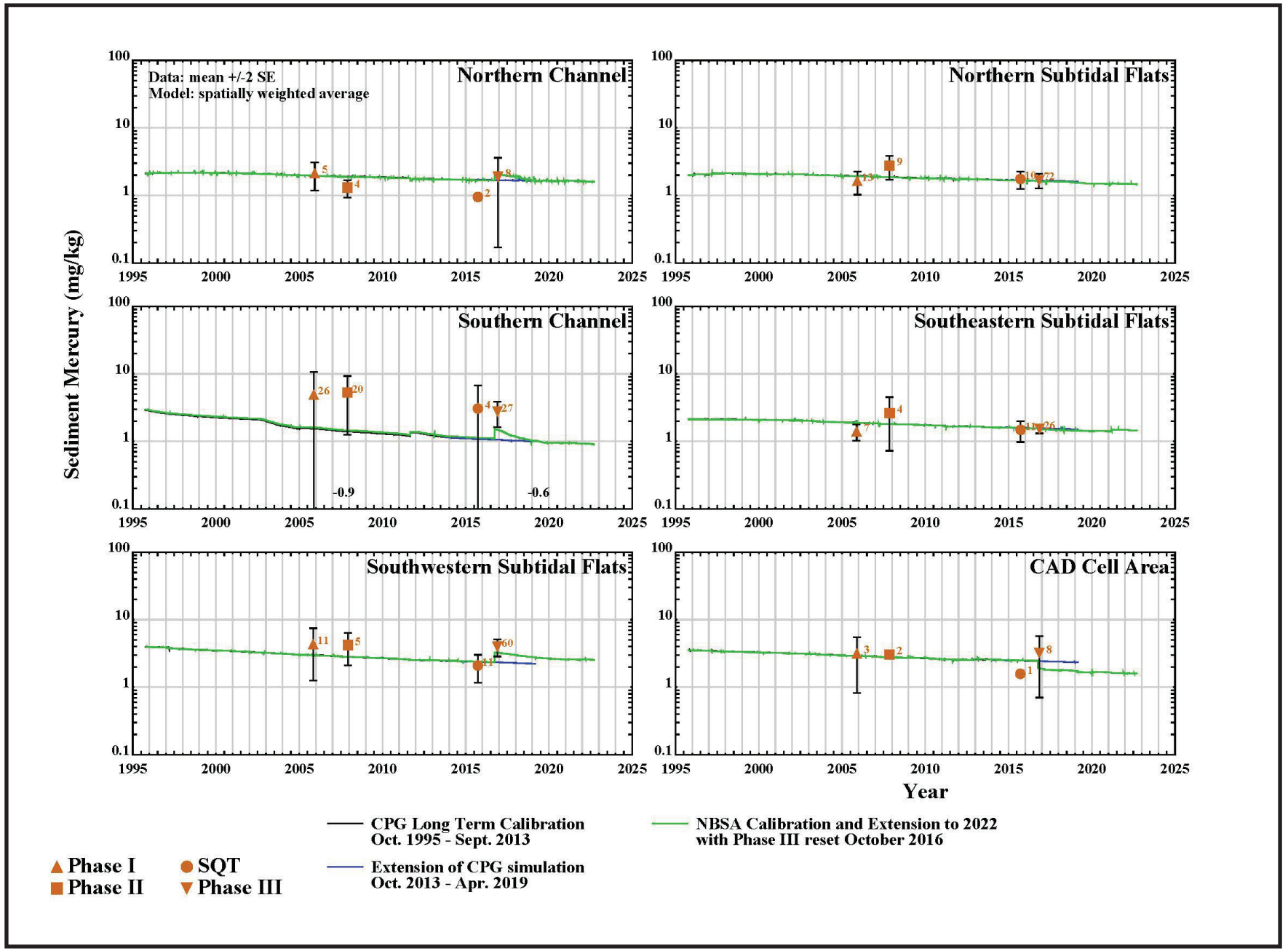


Figure 4-19. Time Series of Calibration, Extension to 2022 and Phase III Reset for HG

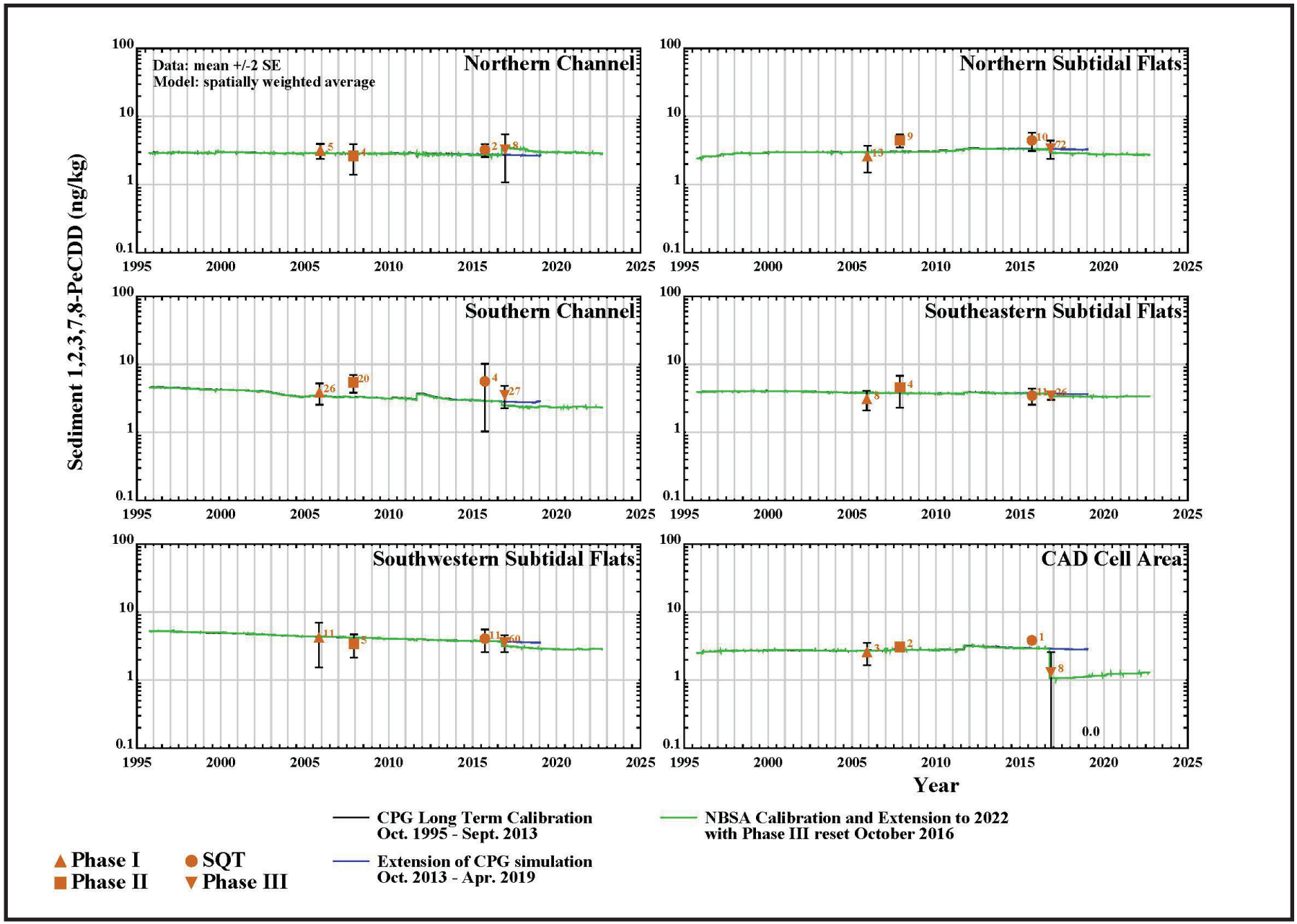


Figure 4-20. Time Series of Calibration, Extension to 2022 and Phase III Reset for PECDD

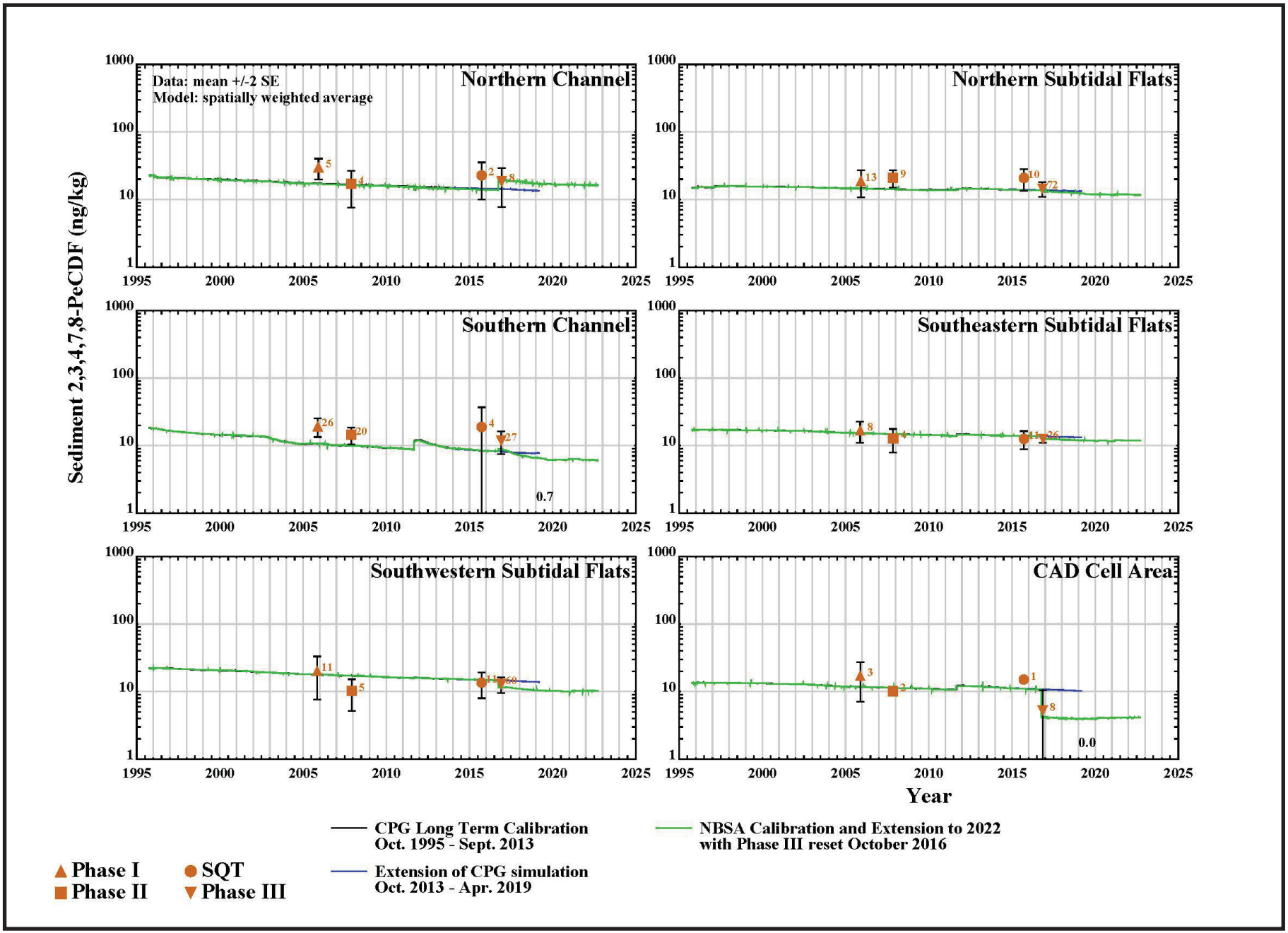


Figure 4-21. Time Series of Calibration, Extension to 2022 and Phase III Reset for PECDF

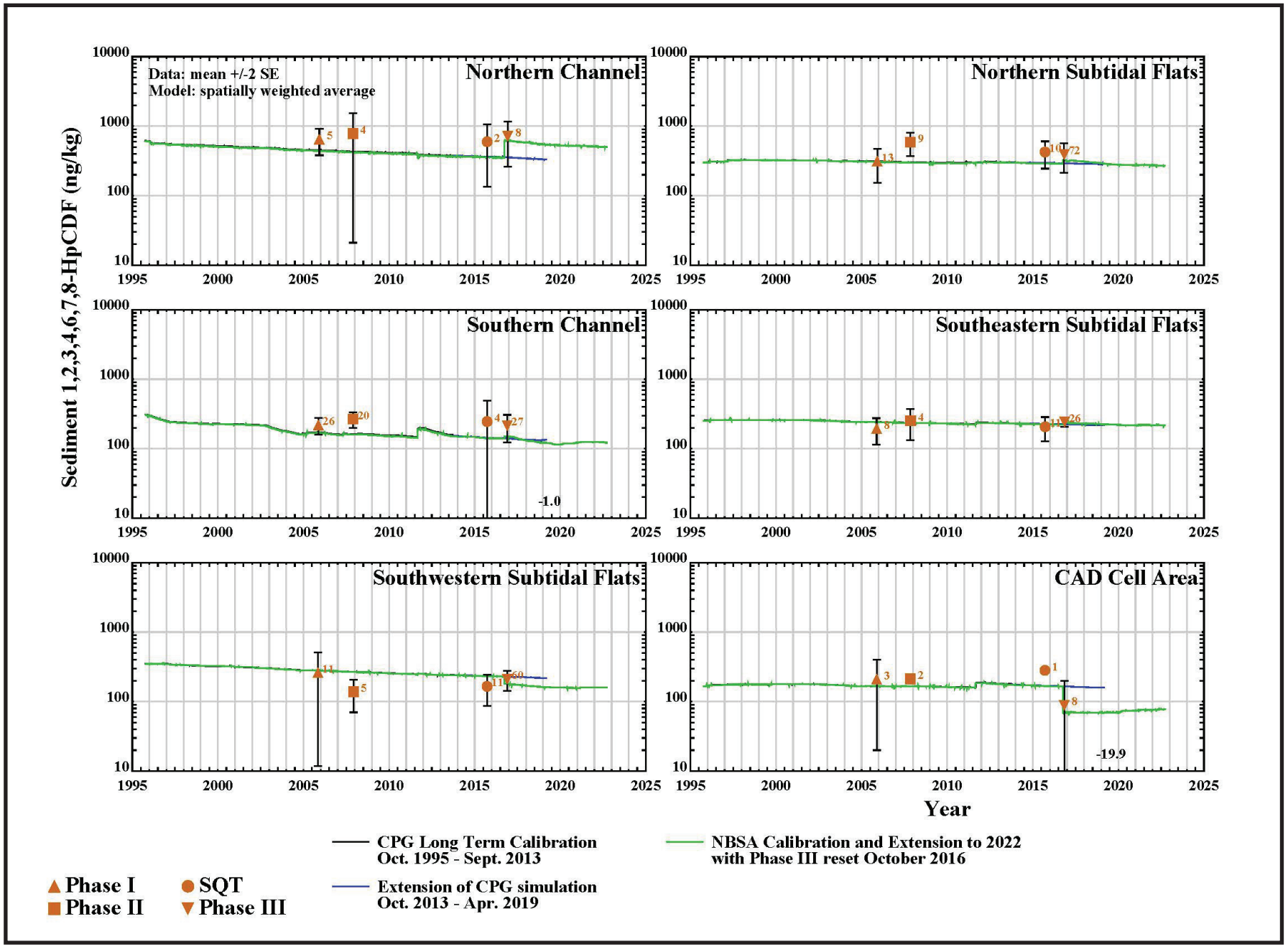


Figure 4-22. Time Series of Calibration, Extension to 2022 and Phase III Reset for HPCDF

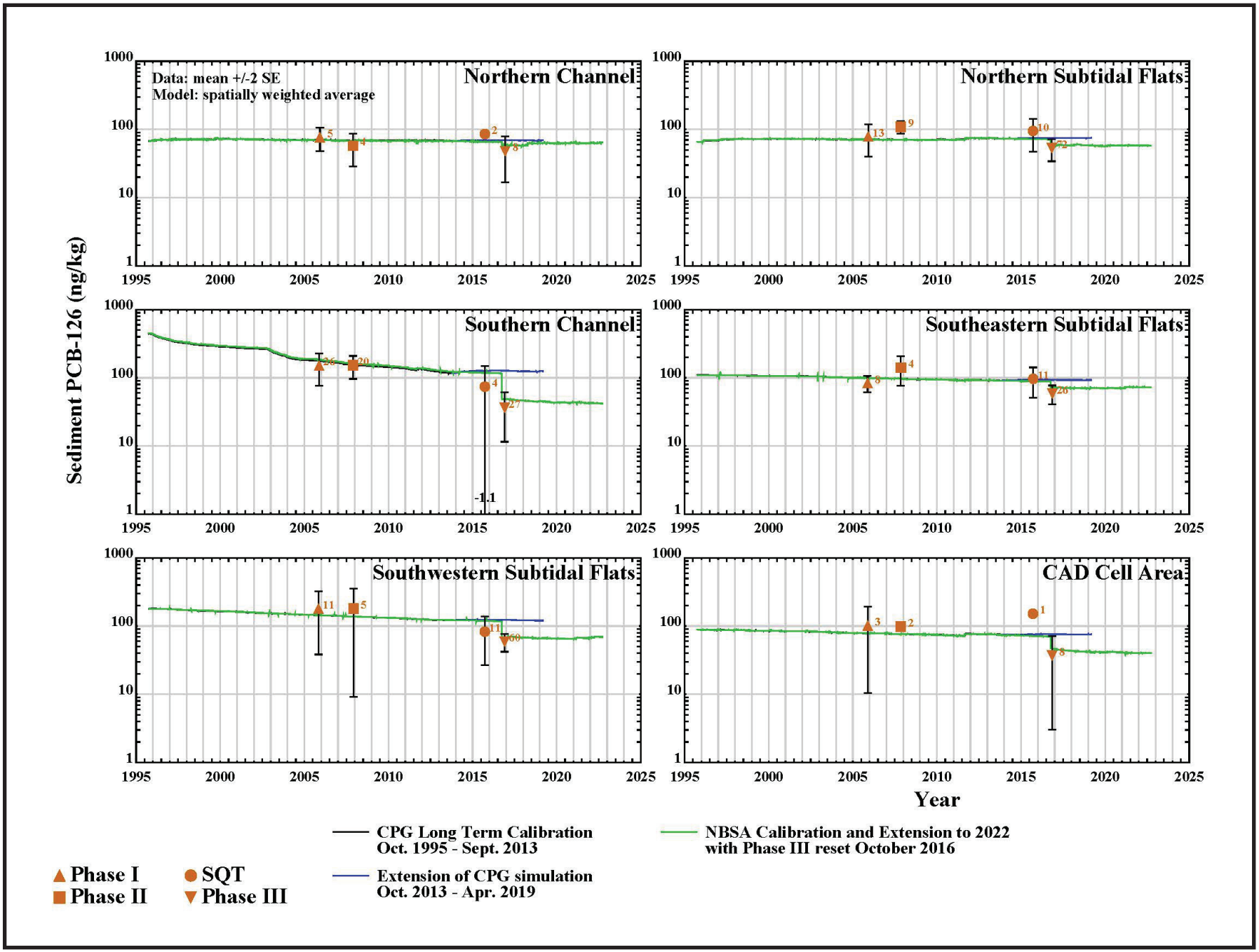


Figure 4-23. Time Series of Calibration, Extension to 2022 and Phase III Reset for PCB126

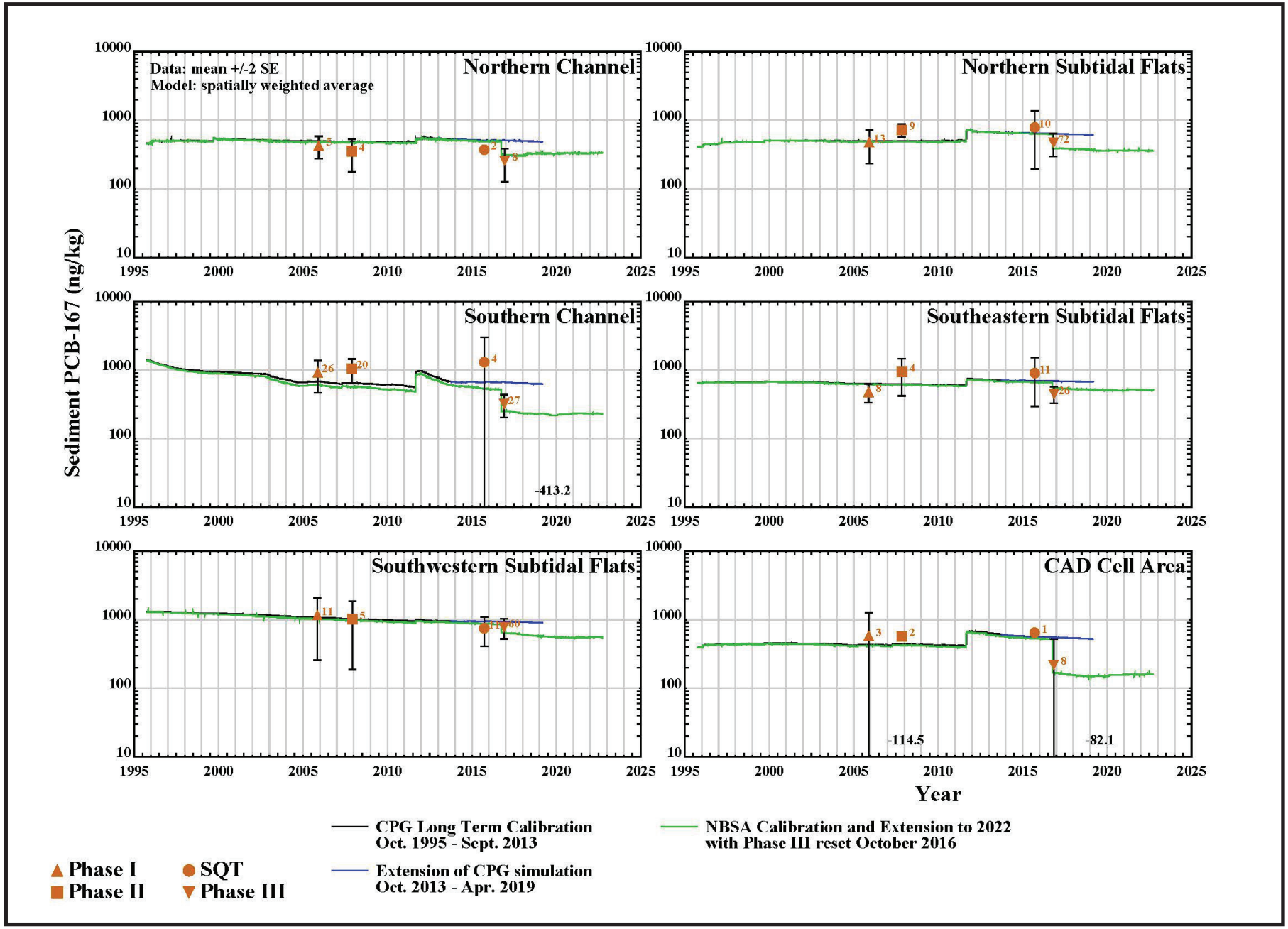


Figure 4-24. Time Series of Calibration, Extension to 2022 and Phase III Reset for PCB167

Appendix A

Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

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Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7003	1	2.61E+01	2.67E+03	1.91E+02	1.36E+03	2.16E+01	1.11E+02	8.42E+01	1.00E+03
7003	2	2.79E+01	2.89E+03	2.05E+02	1.46E+03	2.31E+01	1.20E+02	9.03E+01	1.08E+03
7003	3	2.92E+01	3.05E+03	2.16E+02	1.55E+03	2.42E+01	1.27E+02	9.51E+01	1.14E+03
7003	4	3.07E+01	3.22E+03	2.28E+02	1.63E+03	2.54E+01	1.34E+02	1.00E+02	1.20E+03
7003	5	3.23E+01	3.41E+03	2.40E+02	1.73E+03	2.68E+01	1.42E+02	1.06E+02	1.27E+03
7003	6	3.39E+01	3.60E+03	2.52E+02	1.82E+03	2.81E+01	1.50E+02	1.11E+02	1.34E+03
7003	7	3.56E+01	3.79E+03	2.65E+02	1.92E+03	2.94E+01	1.58E+02	1.17E+02	1.41E+03
7003	8	3.72E+01	3.99E+03	2.78E+02	2.02E+03	3.08E+01	1.66E+02	1.22E+02	1.48E+03
7003	9	3.90E+01	4.20E+03	2.92E+02	2.12E+03	3.23E+01	1.75E+02	1.28E+02	1.56E+03
7003	10	4.08E+01	4.42E+03	3.05E+02	2.22E+03	3.37E+01	1.84E+02	1.34E+02	1.64E+03
7003	11	4.33E+01	4.73E+03	3.25E+02	2.37E+03	3.58E+01	1.97E+02	1.43E+02	1.75E+03
7003	12	4.98E+01	5.57E+03	3.76E+02	2.79E+03	4.12E+01	2.31E+02	1.65E+02	2.05E+03
7003	13	5.45E+01	6.27E+03	4.15E+02	3.14E+03	4.51E+01	2.61E+02	1.82E+02	2.32E+03
7003	14	5.72E+01	6.78E+03	4.38E+02	3.40E+03	4.74E+01	2.82E+02	1.93E+02	2.50E+03
7003	15	5.79E+01	6.91E+03	4.44E+02	3.47E+03	4.79E+01	2.87E+02	1.95E+02	2.56E+03
8003	1	3.42E+01	2.02E+03	2.76E+02	3.20E+03	2.94E+01	1.47E+02	1.30E+02	1.21E+03
8003	2	3.56E+01	2.15E+03	2.91E+02	3.48E+03	3.06E+01	1.57E+02	1.37E+02	1.32E+03
8003	3	3.62E+01	2.25E+03	2.99E+02	3.71E+03	3.10E+01	1.64E+02	1.41E+02	1.41E+03
8003	4	3.67E+01	2.34E+03	3.08E+02	3.91E+03	3.16E+01	1.70E+02	1.45E+02	1.49E+03
8003	5	3.73E+01	2.42E+03	3.16E+02	4.10E+03	3.21E+01	1.76E+02	1.48E+02	1.56E+03
8003	6	3.79E+01	2.50E+03	3.23E+02	4.28E+03	3.25E+01	1.82E+02	1.52E+02	1.62E+03
8003	7	3.84E+01	2.57E+03	3.30E+02	4.44E+03	3.29E+01	1.87E+02	1.55E+02	1.69E+03
8003	8	3.88E+01	2.63E+03	3.35E+02	4.59E+03	3.33E+01	1.92E+02	1.58E+02	1.74E+03
8003	9	3.91E+01	2.69E+03	3.40E+02	4.71E+03	3.36E+01	1.96E+02	1.60E+02	1.79E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8003	10	3.94E+01	2.74E+03	3.44E+02	4.81E+03	3.38E+01	1.99E+02	1.62E+02	1.83E+03
8003	11	3.95E+01	2.93E+03	3.53E+02	5.24E+03	3.39E+01	2.13E+02	1.66E+02	1.99E+03
8003	12	3.95E+01	2.93E+03	3.53E+02	5.24E+03	3.39E+01	2.13E+02	1.66E+02	1.99E+03
8003	13	3.95E+01	2.93E+03	3.53E+02	5.24E+03	3.39E+01	2.13E+02	1.66E+02	1.99E+03
8003	14	3.95E+01	2.93E+03	3.53E+02	5.24E+03	3.39E+01	2.13E+02	1.66E+02	1.99E+03
8003	15	3.95E+01	2.93E+03	3.53E+02	5.24E+03	3.39E+01	2.13E+02	1.66E+02	1.99E+03
6004	1	2.16E+01	9.90E+02	1.18E+02	2.64E+03	1.79E+01	7.59E+01	3.15E+01	1.34E+03
6004	2	2.19E+01	1.04E+03	1.21E+02	2.84E+03	1.81E+01	7.95E+01	3.22E+01	1.45E+03
6004	3	2.22E+01	1.09E+03	1.23E+02	3.06E+03	1.83E+01	8.34E+01	3.29E+01	1.55E+03
6004	4	2.24E+01	1.14E+03	1.26E+02	3.27E+03	1.85E+01	8.72E+01	3.35E+01	1.66E+03
6004	5	2.27E+01	1.19E+03	1.28E+02	3.48E+03	1.87E+01	9.08E+01	3.41E+01	1.77E+03
6004	6	2.29E+01	1.23E+03	1.30E+02	3.68E+03	1.89E+01	9.43E+01	3.46E+01	1.87E+03
6004	7	2.31E+01	1.27E+03	1.32E+02	3.86E+03	1.91E+01	9.76E+01	3.51E+01	1.96E+03
6004	8	2.33E+01	1.32E+03	1.33E+02	4.04E+03	1.93E+01	1.01E+02	3.55E+01	2.05E+03
6004	9	2.35E+01	1.36E+03	1.34E+02	4.21E+03	1.94E+01	1.04E+02	3.59E+01	2.14E+03
6004	10	2.37E+01	1.39E+03	1.36E+02	4.36E+03	1.96E+01	1.07E+02	3.62E+01	2.22E+03
6004	11	2.36E+01	1.62E+03	1.36E+02	5.39E+03	1.95E+01	1.24E+02	3.62E+01	2.74E+03
6004	12	2.36E+01	1.62E+03	1.36E+02	5.39E+03	1.95E+01	1.24E+02	3.62E+01	2.74E+03
6004	13	2.36E+01	1.62E+03	1.36E+02	5.39E+03	1.95E+01	1.24E+02	3.62E+01	2.74E+03
6004	14	2.36E+01	1.62E+03	1.36E+02	5.39E+03	1.95E+01	1.24E+02	3.62E+01	2.74E+03
6004	15	2.36E+01	1.62E+03	1.36E+02	5.39E+03	1.95E+01	1.24E+02	3.62E+01	2.74E+03
7004	1	1.71E+01	1.65E+03	4.99E+01	2.01E+03	8.81E+00	8.79E+01	3.80E+01	1.61E+03
7004	2	1.82E+01	1.77E+03	5.30E+01	2.17E+03	9.39E+00	9.46E+01	4.03E+01	1.73E+03
7004	3	1.89E+01	1.85E+03	5.48E+01	2.27E+03	9.75E+00	9.88E+01	4.17E+01	1.81E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7004	4	1.95E+01	1.93E+03	5.64E+01	2.36E+03	1.01E+01	1.03E+02	4.29E+01	1.88E+03
7004	5	2.01E+01	2.00E+03	5.77E+01	2.45E+03	1.03E+01	1.07E+02	4.39E+01	1.95E+03
7004	6	2.05E+01	2.06E+03	5.88E+01	2.53E+03	1.06E+01	1.10E+02	4.47E+01	2.02E+03
7004	7	2.09E+01	2.13E+03	5.95E+01	2.61E+03	1.08E+01	1.13E+02	4.53E+01	2.08E+03
7004	8	2.13E+01	2.18E+03	6.00E+01	2.68E+03	1.10E+01	1.17E+02	4.57E+01	2.14E+03
7004	9	2.15E+01	2.24E+03	6.02E+01	2.75E+03	1.11E+01	1.20E+02	4.58E+01	2.20E+03
7004	10	2.18E+01	2.30E+03	6.01E+01	2.82E+03	1.12E+01	1.23E+02	4.58E+01	2.25E+03
7004	11	2.06E+01	2.63E+03	4.74E+01	3.26E+03	1.06E+01	1.40E+02	3.60E+01	2.61E+03
7004	12	2.06E+01	2.63E+03	4.74E+01	3.26E+03	1.06E+01	1.40E+02	3.60E+01	2.61E+03
7004	13	2.06E+01	2.63E+03	4.74E+01	3.26E+03	1.06E+01	1.40E+02	3.60E+01	2.61E+03
7004	14	2.06E+01	2.63E+03	4.74E+01	3.26E+03	1.06E+01	1.40E+02	3.60E+01	2.61E+03
7004	15	2.06E+01	2.63E+03	4.74E+01	3.26E+03	1.06E+01	1.40E+02	3.60E+01	2.61E+03
8004	1	2.01E+01	1.55E+03	6.58E+01	1.60E+03	9.42E+00	9.30E+01	5.25E+01	1.36E+03
8004	2	2.02E+01	1.72E+03	6.46E+01	1.89E+03	9.48E+00	1.03E+02	5.15E+01	1.61E+03
8004	3	2.04E+01	1.83E+03	6.40E+01	2.08E+03	9.54E+00	1.10E+02	5.10E+01	1.78E+03
8004	4	2.05E+01	1.92E+03	6.36E+01	2.23E+03	9.60E+00	1.15E+02	5.08E+01	1.90E+03
8004	5	2.06E+01	2.01E+03	6.33E+01	2.36E+03	9.65E+00	1.20E+02	5.05E+01	2.02E+03
8004	6	2.07E+01	2.09E+03	6.28E+01	2.49E+03	9.70E+00	1.25E+02	5.01E+01	2.13E+03
8004	7	2.08E+01	2.16E+03	6.23E+01	2.62E+03	9.75E+00	1.30E+02	4.97E+01	2.23E+03
8004	8	2.09E+01	2.23E+03	6.17E+01	2.73E+03	9.78E+00	1.34E+02	4.92E+01	2.33E+03
8004	9	2.09E+01	2.30E+03	6.09E+01	2.84E+03	9.81E+00	1.38E+02	4.86E+01	2.43E+03
8004	10	2.10E+01	2.37E+03	6.01E+01	2.94E+03	9.84E+00	1.42E+02	4.79E+01	2.51E+03
8004	11	1.99E+01	2.69E+03	4.82E+01	3.48E+03	9.33E+00	1.61E+02	3.85E+01	2.97E+03
8004	12	1.99E+01	2.69E+03	4.82E+01	3.48E+03	9.33E+00	1.61E+02	3.85E+01	2.97E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8004	13	1.99E+01	2.69E+03	4.82E+01	3.48E+03	9.33E+00	1.61E+02	3.85E+01	2.97E+03
8004	14	1.99E+01	2.69E+03	4.82E+01	3.48E+03	9.33E+00	1.61E+02	3.85E+01	2.97E+03
8004	15	1.99E+01	2.69E+03	4.82E+01	3.48E+03	9.33E+00	1.61E+02	3.85E+01	2.97E+03
6005	1	2.25E+01	8.95E+02	1.23E+02	2.10E+03	1.01E+01	1.09E+02	3.73E+01	1.07E+03
6005	2	2.28E+01	9.47E+02	1.25E+02	2.34E+03	1.02E+01	1.16E+02	3.80E+01	1.20E+03
6005	3	2.30E+01	1.00E+03	1.27E+02	2.59E+03	1.03E+01	1.22E+02	3.87E+01	1.32E+03
6005	4	2.31E+01	1.05E+03	1.29E+02	2.82E+03	1.04E+01	1.29E+02	3.92E+01	1.44E+03
6005	5	2.33E+01	1.11E+03	1.31E+02	3.07E+03	1.05E+01	1.35E+02	3.98E+01	1.57E+03
6005	6	2.34E+01	1.16E+03	1.33E+02	3.32E+03	1.05E+01	1.42E+02	4.03E+01	1.70E+03
6005	7	2.35E+01	1.22E+03	1.34E+02	3.58E+03	1.06E+01	1.49E+02	4.07E+01	1.83E+03
6005	8	2.36E+01	1.28E+03	1.35E+02	3.84E+03	1.06E+01	1.56E+02	4.11E+01	1.96E+03
6005	9	2.37E+01	1.33E+03	1.36E+02	4.09E+03	1.07E+01	1.63E+02	4.14E+01	2.09E+03
6005	10	2.38E+01	1.39E+03	1.37E+02	4.32E+03	1.07E+01	1.70E+02	4.17E+01	2.21E+03
6005	11	2.25E+01	1.75E+03	1.30E+02	6.06E+03	1.01E+01	2.14E+02	3.94E+01	3.10E+03
6005	12	2.25E+01	1.75E+03	1.30E+02	6.06E+03	1.01E+01	2.14E+02	3.94E+01	3.10E+03
6005	13	2.25E+01	1.75E+03	1.30E+02	6.06E+03	1.01E+01	2.14E+02	3.94E+01	3.10E+03
6005	14	2.25E+01	1.75E+03	1.30E+02	6.06E+03	1.01E+01	2.14E+02	3.94E+01	3.10E+03
6005	15	2.25E+01	1.75E+03	1.30E+02	6.06E+03	1.01E+01	2.14E+02	3.94E+01	3.10E+03
7005	1	2.19E+01	1.56E+03	6.64E+01	1.65E+03	1.26E+01	1.29E+02	7.47E+01	1.45E+03
7005	2	2.20E+01	1.67E+03	6.62E+01	1.84E+03	1.26E+01	1.38E+02	7.45E+01	1.61E+03
7005	3	2.20E+01	1.75E+03	6.60E+01	1.97E+03	1.26E+01	1.44E+02	7.43E+01	1.73E+03
7005	4	2.19E+01	1.82E+03	6.55E+01	2.09E+03	1.26E+01	1.50E+02	7.38E+01	1.84E+03
7005	5	2.18E+01	1.90E+03	6.48E+01	2.21E+03	1.26E+01	1.57E+02	7.29E+01	1.94E+03
7005	6	2.17E+01	1.97E+03	6.38E+01	2.34E+03	1.25E+01	1.63E+02	7.18E+01	2.05E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7005	7	2.15E+01	2.05E+03	6.25E+01	2.46E+03	1.24E+01	1.70E+02	7.03E+01	2.17E+03
7005	8	2.13E+01	2.14E+03	6.09E+01	2.59E+03	1.23E+01	1.77E+02	6.86E+01	2.28E+03
7005	9	2.11E+01	2.22E+03	5.92E+01	2.72E+03	1.21E+01	1.83E+02	6.66E+01	2.39E+03
7005	10	2.08E+01	2.30E+03	5.72E+01	2.84E+03	1.20E+01	1.90E+02	6.44E+01	2.49E+03
7005	11	1.73E+01	2.78E+03	3.50E+01	3.65E+03	9.96E+00	2.30E+02	3.93E+01	3.21E+03
7005	12	1.73E+01	2.78E+03	3.50E+01	3.65E+03	9.96E+00	2.30E+02	3.93E+01	3.21E+03
7005	13	1.73E+01	2.78E+03	3.50E+01	3.65E+03	9.96E+00	2.30E+02	3.93E+01	3.21E+03
7005	14	1.73E+01	2.78E+03	3.50E+01	3.65E+03	9.96E+00	2.30E+02	3.93E+01	3.21E+03
7005	15	1.73E+01	2.78E+03	3.50E+01	3.65E+03	9.96E+00	2.30E+02	3.93E+01	3.21E+03
8005	1	2.16E+01	1.52E+03	6.97E+01	1.60E+03	1.12E+01	1.09E+02	7.99E+01	1.46E+03
8005	2	2.17E+01	1.63E+03	6.94E+01	1.78E+03	1.13E+01	1.17E+02	7.96E+01	1.63E+03
8005	3	2.17E+01	1.72E+03	6.91E+01	1.94E+03	1.13E+01	1.24E+02	7.93E+01	1.77E+03
8005	4	2.17E+01	1.80E+03	6.88E+01	2.07E+03	1.12E+01	1.30E+02	7.90E+01	1.89E+03
8005	5	2.16E+01	1.88E+03	6.83E+01	2.19E+03	1.12E+01	1.35E+02	7.84E+01	2.00E+03
8005	6	2.15E+01	1.96E+03	6.75E+01	2.31E+03	1.12E+01	1.41E+02	7.75E+01	2.11E+03
8005	7	2.15E+01	2.04E+03	6.65E+01	2.43E+03	1.11E+01	1.47E+02	7.64E+01	2.22E+03
8005	8	2.14E+01	2.12E+03	6.53E+01	2.55E+03	1.11E+01	1.53E+02	7.49E+01	2.33E+03
8005	9	2.12E+01	2.21E+03	6.38E+01	2.68E+03	1.10E+01	1.59E+02	7.32E+01	2.45E+03
8005	10	2.11E+01	2.29E+03	6.21E+01	2.79E+03	1.09E+01	1.65E+02	7.13E+01	2.56E+03
8005	11	1.81E+01	2.88E+03	3.99E+01	3.77E+03	9.40E+00	2.07E+02	4.58E+01	3.45E+03
8005	12	1.81E+01	2.88E+03	3.99E+01	3.77E+03	9.40E+00	2.07E+02	4.58E+01	3.45E+03
8005	13	1.81E+01	2.88E+03	3.99E+01	3.77E+03	9.40E+00	2.07E+02	4.58E+01	3.45E+03
8005	14	1.81E+01	2.88E+03	3.99E+01	3.77E+03	9.40E+00	2.07E+02	4.58E+01	3.45E+03
8005	15	1.81E+01	2.88E+03	3.99E+01	3.77E+03	9.40E+00	2.07E+02	4.58E+01	3.45E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6006	1	1.54E+01	1.30E+03	3.43E+02	1.48E+03	6.22E+00	2.55E+02	1.62E+02	1.02E+03
6006	2	1.66E+01	1.46E+03	3.83E+02	1.67E+03	6.70E+00	2.88E+02	1.81E+02	1.16E+03
6006	3	1.76E+01	1.60E+03	4.18E+02	1.84E+03	7.09E+00	3.15E+02	1.97E+02	1.27E+03
6006	4	1.85E+01	1.73E+03	4.51E+02	1.99E+03	7.45E+00	3.42E+02	2.13E+02	1.38E+03
6006	5	1.94E+01	1.87E+03	4.84E+02	2.15E+03	7.81E+00	3.69E+02	2.29E+02	1.48E+03
6006	6	2.03E+01	2.01E+03	5.18E+02	2.31E+03	8.17E+00	3.96E+02	2.45E+02	1.59E+03
6006	7	2.12E+01	2.15E+03	5.52E+02	2.47E+03	8.53E+00	4.24E+02	2.61E+02	1.70E+03
6006	8	2.21E+01	2.29E+03	5.86E+02	2.63E+03	8.88E+00	4.52E+02	2.77E+02	1.82E+03
6006	9	2.29E+01	2.43E+03	6.20E+02	2.79E+03	9.23E+00	4.80E+02	2.93E+02	1.92E+03
6006	10	2.37E+01	2.57E+03	6.54E+02	2.94E+03	9.56E+00	5.07E+02	3.09E+02	2.03E+03
6006	11	2.58E+01	3.03E+03	7.60E+02	3.48E+03	1.04E+01	5.98E+02	3.59E+02	2.40E+03
6006	12	2.50E+01	3.27E+03	8.04E+02	3.76E+03	1.01E+01	6.45E+02	3.79E+02	2.59E+03
6006	13	2.50E+01	3.27E+03	8.04E+02	3.76E+03	1.01E+01	6.45E+02	3.79E+02	2.59E+03
6006	14	2.50E+01	3.27E+03	8.04E+02	3.76E+03	1.01E+01	6.45E+02	3.79E+02	2.59E+03
6006	15	2.50E+01	3.27E+03	8.04E+02	3.76E+03	1.01E+01	6.45E+02	3.79E+02	2.59E+03
7006	1	2.21E+01	1.94E+03	5.28E+02	2.09E+03	1.06E+01	3.54E+02	1.79E+02	1.86E+03
7006	2	2.23E+01	2.00E+03	5.43E+02	2.17E+03	1.07E+01	3.65E+02	1.84E+02	1.94E+03
7006	3	2.24E+01	2.05E+03	5.57E+02	2.25E+03	1.07E+01	3.76E+02	1.89E+02	2.01E+03
7006	4	2.25E+01	2.11E+03	5.70E+02	2.33E+03	1.08E+01	3.86E+02	1.93E+02	2.08E+03
7006	5	2.25E+01	2.17E+03	5.83E+02	2.41E+03	1.08E+01	3.97E+02	1.98E+02	2.15E+03
7006	6	2.26E+01	2.23E+03	5.96E+02	2.49E+03	1.08E+01	4.07E+02	2.02E+02	2.22E+03
7006	7	2.26E+01	2.28E+03	6.09E+02	2.56E+03	1.08E+01	4.18E+02	2.07E+02	2.29E+03
7006	8	2.26E+01	2.34E+03	6.22E+02	2.64E+03	1.08E+01	4.29E+02	2.11E+02	2.36E+03
7006	9	2.25E+01	2.40E+03	6.35E+02	2.72E+03	1.08E+01	4.40E+02	2.15E+02	2.43E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7006	10	2.25E+01	2.46E+03	6.47E+02	2.79E+03	1.08E+01	4.50E+02	2.20E+02	2.49E+03
7006	11	2.02E+01	2.77E+03	7.01E+02	3.22E+03	9.68E+00	5.07E+02	2.38E+02	2.87E+03
7006	12	2.02E+01	2.77E+03	7.01E+02	3.22E+03	9.68E+00	5.07E+02	2.38E+02	2.87E+03
7006	13	2.02E+01	2.77E+03	7.01E+02	3.22E+03	9.68E+00	5.07E+02	2.38E+02	2.87E+03
7006	14	2.02E+01	2.77E+03	7.01E+02	3.22E+03	9.68E+00	5.07E+02	2.38E+02	2.87E+03
7006	15	2.02E+01	2.77E+03	7.01E+02	3.22E+03	9.68E+00	5.07E+02	2.38E+02	2.87E+03
8006	1	2.78E+01	1.01E+03	3.99E+02	3.71E+03	1.17E+01	3.21E+02	1.46E+02	2.08E+03
8006	2	2.82E+01	1.05E+03	4.13E+02	3.90E+03	1.19E+01	3.34E+02	1.51E+02	2.18E+03
8006	3	2.85E+01	1.09E+03	4.27E+02	4.08E+03	1.20E+01	3.47E+02	1.56E+02	2.28E+03
8006	4	2.89E+01	1.13E+03	4.40E+02	4.26E+03	1.21E+01	3.59E+02	1.61E+02	2.39E+03
8006	5	2.92E+01	1.17E+03	4.53E+02	4.44E+03	1.23E+01	3.72E+02	1.65E+02	2.49E+03
8006	6	2.95E+01	1.21E+03	4.66E+02	4.62E+03	1.24E+01	3.84E+02	1.70E+02	2.59E+03
8006	7	2.98E+01	1.25E+03	4.78E+02	4.80E+03	1.25E+01	3.96E+02	1.75E+02	2.69E+03
8006	8	3.00E+01	1.29E+03	4.90E+02	4.97E+03	1.26E+01	4.09E+02	1.79E+02	2.78E+03
8006	9	3.03E+01	1.33E+03	5.02E+02	5.15E+03	1.27E+01	4.21E+02	1.83E+02	2.88E+03
8006	10	3.04E+01	1.36E+03	5.14E+02	5.32E+03	1.28E+01	4.33E+02	1.88E+02	2.98E+03
8006	11	2.86E+01	1.56E+03	5.62E+02	6.33E+03	1.20E+01	4.94E+02	2.05E+02	3.55E+03
8006	12	2.86E+01	1.56E+03	5.62E+02	6.33E+03	1.20E+01	4.94E+02	2.05E+02	3.55E+03
8006	13	2.86E+01	1.56E+03	5.62E+02	6.33E+03	1.20E+01	4.94E+02	2.05E+02	3.55E+03
8006	14	2.86E+01	1.56E+03	5.62E+02	6.33E+03	1.20E+01	4.94E+02	2.05E+02	3.55E+03
8006	15	2.86E+01	1.56E+03	5.62E+02	6.33E+03	1.20E+01	4.94E+02	2.05E+02	3.55E+03
6007	1	2.19E+01	1.66E+03	4.57E+02	1.70E+03	2.38E+01	2.21E+02	2.16E+02	3.02E+03
6007	2	2.21E+01	1.76E+03	4.77E+02	1.84E+03	2.39E+01	2.33E+02	2.25E+02	3.28E+03
6007	3	2.21E+01	1.85E+03	4.96E+02	1.97E+03	2.40E+01	2.45E+02	2.34E+02	3.51E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6007	4	2.21E+01	1.93E+03	5.14E+02	2.09E+03	2.40E+01	2.56E+02	2.43E+02	3.72E+03
6007	5	2.22E+01	2.01E+03	5.31E+02	2.21E+03	2.41E+01	2.67E+02	2.51E+02	3.93E+03
6007	6	2.22E+01	2.09E+03	5.49E+02	2.33E+03	2.41E+01	2.78E+02	2.59E+02	4.14E+03
6007	7	2.23E+01	2.18E+03	5.66E+02	2.45E+03	2.42E+01	2.89E+02	2.68E+02	4.36E+03
6007	8	2.23E+01	2.27E+03	5.84E+02	2.57E+03	2.42E+01	3.01E+02	2.76E+02	4.57E+03
6007	9	2.22E+01	2.35E+03	6.02E+02	2.69E+03	2.41E+01	3.13E+02	2.84E+02	4.78E+03
6007	10	2.22E+01	2.44E+03	6.19E+02	2.80E+03	2.41E+01	3.24E+02	2.93E+02	4.99E+03
6007	11	2.04E+01	3.00E+03	7.18E+02	3.63E+03	2.21E+01	3.98E+02	3.39E+02	6.45E+03
6007	12	2.04E+01	3.00E+03	7.18E+02	3.63E+03	2.21E+01	3.98E+02	3.39E+02	6.45E+03
6007	13	2.04E+01	3.00E+03	7.18E+02	3.63E+03	2.21E+01	3.98E+02	3.39E+02	6.45E+03
6007	14	2.04E+01	3.00E+03	7.18E+02	3.63E+03	2.21E+01	3.98E+02	3.39E+02	6.45E+03
6007	15	2.04E+01	3.00E+03	7.18E+02	3.63E+03	2.21E+01	3.98E+02	3.39E+02	6.45E+03
7007	1	2.18E+01	1.89E+03	5.18E+02	2.12E+03	2.30E+01	2.54E+02	2.28E+02	3.92E+03
7007	2	2.21E+01	1.96E+03	5.35E+02	2.21E+03	2.33E+01	2.64E+02	2.35E+02	4.07E+03
7007	3	2.22E+01	2.02E+03	5.49E+02	2.28E+03	2.35E+01	2.72E+02	2.42E+02	4.20E+03
7007	4	2.24E+01	2.08E+03	5.63E+02	2.35E+03	2.37E+01	2.80E+02	2.48E+02	4.33E+03
7007	5	2.26E+01	2.14E+03	5.78E+02	2.42E+03	2.39E+01	2.88E+02	2.54E+02	4.46E+03
7007	6	2.27E+01	2.20E+03	5.92E+02	2.49E+03	2.40E+01	2.96E+02	2.61E+02	4.60E+03
7007	7	2.28E+01	2.26E+03	6.06E+02	2.56E+03	2.41E+01	3.05E+02	2.67E+02	4.73E+03
7007	8	2.29E+01	2.33E+03	6.21E+02	2.64E+03	2.42E+01	3.14E+02	2.73E+02	4.87E+03
7007	9	2.30E+01	2.39E+03	6.35E+02	2.71E+03	2.43E+01	3.22E+02	2.80E+02	5.01E+03
7007	10	2.31E+01	2.46E+03	6.50E+02	2.78E+03	2.44E+01	3.31E+02	2.86E+02	5.14E+03
7007	11	1.99E+01	2.82E+03	7.10E+02	3.20E+03	2.11E+01	3.80E+02	3.12E+02	5.91E+03
7007	12	1.99E+01	2.82E+03	7.10E+02	3.20E+03	2.11E+01	3.80E+02	3.12E+02	5.91E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7007	13	1.99E+01	2.82E+03	7.10E+02	3.20E+03	2.11E+01	3.80E+02	3.12E+02	5.91E+03
7007	14	1.99E+01	2.82E+03	7.10E+02	3.20E+03	2.11E+01	3.80E+02	3.12E+02	5.91E+03
7007	15	1.99E+01	2.82E+03	7.10E+02	3.20E+03	2.11E+01	3.80E+02	3.12E+02	5.91E+03
8007	1	2.87E+01	9.87E+02	3.98E+02	3.38E+03	2.19E+01	2.61E+02	2.09E+02	3.43E+03
8007	2	2.91E+01	1.03E+03	4.12E+02	3.59E+03	2.22E+01	2.72E+02	2.17E+02	3.64E+03
8007	3	2.94E+01	1.07E+03	4.26E+02	3.80E+03	2.24E+01	2.83E+02	2.24E+02	3.86E+03
8007	4	2.95E+01	1.11E+03	4.38E+02	4.02E+03	2.25E+01	2.94E+02	2.30E+02	4.08E+03
8007	5	2.97E+01	1.15E+03	4.51E+02	4.23E+03	2.26E+01	3.05E+02	2.37E+02	4.30E+03
8007	6	2.98E+01	1.19E+03	4.64E+02	4.45E+03	2.27E+01	3.16E+02	2.43E+02	4.52E+03
8007	7	3.00E+01	1.23E+03	4.76E+02	4.68E+03	2.28E+01	3.27E+02	2.50E+02	4.75E+03
8007	8	3.01E+01	1.28E+03	4.88E+02	4.90E+03	2.29E+01	3.38E+02	2.56E+02	4.97E+03
8007	9	3.01E+01	1.32E+03	5.00E+02	5.12E+03	2.30E+01	3.49E+02	2.63E+02	5.20E+03
8007	10	3.01E+01	1.36E+03	5.11E+02	5.33E+03	2.30E+01	3.60E+02	2.69E+02	5.41E+03
8007	11	2.78E+01	1.59E+03	5.65E+02	6.68E+03	2.11E+01	4.20E+02	2.97E+02	6.79E+03
8007	12	2.78E+01	1.59E+03	5.65E+02	6.68E+03	2.11E+01	4.20E+02	2.97E+02	6.79E+03
8007	13	2.78E+01	1.59E+03	5.65E+02	6.68E+03	2.11E+01	4.20E+02	2.97E+02	6.79E+03
8007	14	2.78E+01	1.59E+03	5.65E+02	6.68E+03	2.11E+01	4.20E+02	2.97E+02	6.79E+03
8007	15	2.78E+01	1.59E+03	5.65E+02	6.68E+03	2.11E+01	4.20E+02	2.97E+02	6.79E+03
6008	1	2.23E+01	1.72E+03	4.71E+02	1.83E+03	3.62E+01	1.24E+02	2.45E+02	2.74E+03
6008	2	2.24E+01	1.81E+03	4.90E+02	1.96E+03	3.63E+01	1.30E+02	2.55E+02	2.93E+03
6008	3	2.24E+01	1.89E+03	5.07E+02	2.07E+03	3.62E+01	1.36E+02	2.64E+02	3.11E+03
6008	4	2.23E+01	1.97E+03	5.23E+02	2.18E+03	3.61E+01	1.42E+02	2.73E+02	3.26E+03
6008	5	2.23E+01	2.05E+03	5.39E+02	2.28E+03	3.61E+01	1.47E+02	2.81E+02	3.42E+03
6008	6	2.22E+01	2.13E+03	5.55E+02	2.39E+03	3.60E+01	1.53E+02	2.89E+02	3.58E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6008	7	2.22E+01	2.21E+03	5.71E+02	2.50E+03	3.59E+01	1.59E+02	2.98E+02	3.74E+03
6008	8	2.21E+01	2.29E+03	5.87E+02	2.60E+03	3.58E+01	1.65E+02	3.06E+02	3.90E+03
6008	9	2.20E+01	2.37E+03	6.03E+02	2.71E+03	3.57E+01	1.70E+02	3.14E+02	4.05E+03
6008	10	2.19E+01	2.45E+03	6.18E+02	2.80E+03	3.55E+01	1.76E+02	3.22E+02	4.20E+03
6008	11	2.03E+01	2.93E+03	7.04E+02	3.49E+03	3.28E+01	2.11E+02	3.67E+02	5.23E+03
6008	12	2.03E+01	2.93E+03	7.04E+02	3.49E+03	3.28E+01	2.11E+02	3.67E+02	5.23E+03
6008	13	2.03E+01	2.93E+03	7.04E+02	3.49E+03	3.28E+01	2.11E+02	3.67E+02	5.23E+03
6008	14	2.03E+01	2.93E+03	7.04E+02	3.49E+03	3.28E+01	2.11E+02	3.67E+02	5.23E+03
6008	15	2.03E+01	2.93E+03	7.04E+02	3.49E+03	3.28E+01	2.11E+02	3.67E+02	5.23E+03
7008	1	2.16E+01	1.91E+03	5.21E+02	2.15E+03	3.60E+01	1.39E+02	2.38E+02	3.16E+03
7008	2	2.18E+01	1.97E+03	5.35E+02	2.21E+03	3.63E+01	1.43E+02	2.44E+02	3.25E+03
7008	3	2.18E+01	2.03E+03	5.48E+02	2.28E+03	3.63E+01	1.47E+02	2.50E+02	3.35E+03
7008	4	2.19E+01	2.08E+03	5.61E+02	2.34E+03	3.65E+01	1.52E+02	2.56E+02	3.45E+03
7008	5	2.20E+01	2.14E+03	5.75E+02	2.41E+03	3.66E+01	1.56E+02	2.62E+02	3.55E+03
7008	6	2.21E+01	2.20E+03	5.88E+02	2.48E+03	3.68E+01	1.60E+02	2.69E+02	3.65E+03
7008	7	2.22E+01	2.26E+03	6.02E+02	2.55E+03	3.69E+01	1.65E+02	2.75E+02	3.75E+03
7008	8	2.23E+01	2.33E+03	6.16E+02	2.63E+03	3.70E+01	1.69E+02	2.81E+02	3.86E+03
7008	9	2.23E+01	2.39E+03	6.30E+02	2.70E+03	3.72E+01	1.74E+02	2.88E+02	3.96E+03
7008	10	2.24E+01	2.45E+03	6.44E+02	2.77E+03	3.72E+01	1.78E+02	2.94E+02	4.07E+03
7008	11	2.10E+01	2.81E+03	7.14E+02	3.20E+03	3.49E+01	2.04E+02	3.26E+02	4.71E+03
7008	12	2.10E+01	2.81E+03	7.14E+02	3.20E+03	3.49E+01	2.04E+02	3.26E+02	4.71E+03
7008	13	2.10E+01	2.81E+03	7.14E+02	3.20E+03	3.49E+01	2.04E+02	3.26E+02	4.71E+03
7008	14	2.10E+01	2.81E+03	7.14E+02	3.20E+03	3.49E+01	2.04E+02	3.26E+02	4.71E+03
7008	15	2.10E+01	2.81E+03	7.14E+02	3.20E+03	3.49E+01	2.04E+02	3.26E+02	4.71E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8008	1	3.52E+01	1.14E+03	4.78E+02	4.12E+03	4.26E+01	1.81E+02	3.70E+02	3.17E+03
8008	2	3.46E+01	1.15E+03	4.78E+02	4.17E+03	4.19E+01	1.82E+02	3.70E+02	3.21E+03
8008	3	3.37E+01	1.16E+03	4.78E+02	4.24E+03	4.08E+01	1.84E+02	3.70E+02	3.26E+03
8008	4	3.29E+01	1.17E+03	4.78E+02	4.30E+03	3.98E+01	1.85E+02	3.70E+02	3.31E+03
8008	5	3.21E+01	1.19E+03	4.79E+02	4.38E+03	3.88E+01	1.88E+02	3.70E+02	3.37E+03
8008	6	3.13E+01	1.20E+03	4.79E+02	4.46E+03	3.80E+01	1.90E+02	3.71E+02	3.43E+03
8008	7	3.06E+01	1.22E+03	4.80E+02	4.55E+03	3.71E+01	1.92E+02	3.72E+02	3.50E+03
8008	8	2.99E+01	1.24E+03	4.81E+02	4.65E+03	3.62E+01	1.95E+02	3.73E+02	3.58E+03
8008	9	2.92E+01	1.25E+03	4.83E+02	4.76E+03	3.53E+01	1.98E+02	3.74E+02	3.66E+03
8008	10	2.84E+01	1.28E+03	4.84E+02	4.87E+03	3.44E+01	2.01E+02	3.75E+02	3.75E+03
8008	11	2.35E+01	1.53E+03	5.19E+02	6.48E+03	2.84E+01	2.42E+02	4.02E+02	4.99E+03
8008	12	2.35E+01	1.53E+03	5.19E+02	6.48E+03	2.84E+01	2.42E+02	4.02E+02	4.99E+03
8008	13	2.35E+01	1.53E+03	5.19E+02	6.48E+03	2.84E+01	2.42E+02	4.02E+02	4.99E+03
8008	14	2.35E+01	1.53E+03	5.19E+02	6.48E+03	2.84E+01	2.42E+02	4.02E+02	4.99E+03
8008	15	2.35E+01	1.53E+03	5.19E+02	6.48E+03	2.84E+01	2.42E+02	4.02E+02	4.99E+03
9008	1	3.98E+01	3.57E+02	3.52E+02	5.58E+03	3.85E+01	2.19E+02	5.31E+02	2.93E+03
9008	2	3.98E+01	3.60E+02	3.57E+02	5.85E+03	3.85E+01	2.21E+02	5.38E+02	3.07E+03
9008	3	3.95E+01	3.62E+02	3.61E+02	6.09E+03	3.82E+01	2.22E+02	5.44E+02	3.20E+03
9008	4	3.91E+01	3.64E+02	3.64E+02	6.31E+03	3.78E+01	2.23E+02	5.48E+02	3.32E+03
9008	5	3.87E+01	3.65E+02	3.67E+02	6.53E+03	3.74E+01	2.24E+02	5.53E+02	3.43E+03
9008	6	3.83E+01	3.66E+02	3.69E+02	6.74E+03	3.70E+01	2.25E+02	5.56E+02	3.54E+03
9008	7	3.79E+01	3.67E+02	3.71E+02	6.93E+03	3.66E+01	2.25E+02	5.58E+02	3.64E+03
9008	8	3.75E+01	3.67E+02	3.72E+02	7.12E+03	3.62E+01	2.25E+02	5.60E+02	3.74E+03
9008	9	3.71E+01	3.67E+02	3.73E+02	7.30E+03	3.58E+01	2.25E+02	5.62E+02	3.84E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
9008	10	3.66E+01	3.67E+02	3.73E+02	7.48E+03	3.53E+01	2.25E+02	5.63E+02	3.93E+03
9008	11	3.12E+01	3.60E+02	3.69E+02	9.01E+03	3.01E+01	2.21E+02	5.56E+02	4.73E+03
9008	12	3.12E+01	3.60E+02	3.69E+02	9.01E+03	3.01E+01	2.21E+02	5.56E+02	4.73E+03
9008	13	3.12E+01	3.60E+02	3.69E+02	9.01E+03	3.01E+01	2.21E+02	5.56E+02	4.73E+03
9008	14	3.12E+01	3.60E+02	3.69E+02	9.01E+03	3.01E+01	2.21E+02	5.56E+02	4.73E+03
9008	15	3.12E+01	3.60E+02	3.69E+02	9.01E+03	3.01E+01	2.21E+02	5.56E+02	4.73E+03
6009	1	2.38E+01	1.69E+03	4.86E+02	1.85E+03	1.99E+01	9.93E+01	3.79E+02	1.78E+03
6009	2	2.38E+01	1.79E+03	5.03E+02	1.99E+03	1.99E+01	1.05E+02	3.93E+02	1.91E+03
6009	3	2.37E+01	1.87E+03	5.19E+02	2.10E+03	1.98E+01	1.10E+02	4.05E+02	2.01E+03
6009	4	2.36E+01	1.94E+03	5.33E+02	2.19E+03	1.97E+01	1.14E+02	4.16E+02	2.10E+03
6009	5	2.35E+01	2.02E+03	5.47E+02	2.28E+03	1.96E+01	1.18E+02	4.27E+02	2.19E+03
6009	6	2.34E+01	2.09E+03	5.61E+02	2.38E+03	1.96E+01	1.23E+02	4.38E+02	2.28E+03
6009	7	2.33E+01	2.17E+03	5.75E+02	2.48E+03	1.94E+01	1.27E+02	4.49E+02	2.37E+03
6009	8	2.31E+01	2.25E+03	5.89E+02	2.57E+03	1.93E+01	1.32E+02	4.60E+02	2.47E+03
6009	9	2.29E+01	2.33E+03	6.03E+02	2.67E+03	1.91E+01	1.37E+02	4.71E+02	2.56E+03
6009	10	2.26E+01	2.41E+03	6.17E+02	2.76E+03	1.89E+01	1.41E+02	4.81E+02	2.65E+03
6009	11	1.79E+01	2.99E+03	6.90E+02	3.50E+03	1.50E+01	1.76E+02	5.39E+02	3.36E+03
6009	12	1.79E+01	2.99E+03	6.90E+02	3.50E+03	1.50E+01	1.76E+02	5.39E+02	3.36E+03
6009	13	1.79E+01	2.99E+03	6.90E+02	3.50E+03	1.50E+01	1.76E+02	5.39E+02	3.36E+03
6009	14	1.79E+01	2.99E+03	6.90E+02	3.50E+03	1.50E+01	1.76E+02	5.39E+02	3.36E+03
6009	15	1.79E+01	2.99E+03	6.90E+02	3.50E+03	1.50E+01	1.76E+02	5.39E+02	3.36E+03
7009	1	1.84E+01	1.48E+03	4.15E+02	1.71E+03	1.65E+01	1.02E+02	5.16E+02	1.64E+03
7009	2	1.96E+01	1.63E+03	4.53E+02	1.88E+03	1.75E+01	1.12E+02	5.63E+02	1.80E+03
7009	3	2.05E+01	1.77E+03	4.87E+02	2.03E+03	1.83E+01	1.21E+02	6.06E+02	1.95E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7009	4	2.12E+01	1.89E+03	5.18E+02	2.17E+03	1.89E+01	1.30E+02	6.44E+02	2.08E+03
7009	5	2.19E+01	2.01E+03	5.48E+02	2.31E+03	1.96E+01	1.38E+02	6.81E+02	2.21E+03
7009	6	2.26E+01	2.13E+03	5.77E+02	2.44E+03	2.01E+01	1.46E+02	7.17E+02	2.34E+03
7009	7	2.32E+01	2.25E+03	6.05E+02	2.57E+03	2.07E+01	1.55E+02	7.53E+02	2.46E+03
7009	8	2.37E+01	2.36E+03	6.33E+02	2.70E+03	2.11E+01	1.62E+02	7.87E+02	2.58E+03
7009	9	2.42E+01	2.48E+03	6.59E+02	2.82E+03	2.16E+01	1.70E+02	8.20E+02	2.70E+03
7009	10	2.45E+01	2.58E+03	6.84E+02	2.93E+03	2.19E+01	1.78E+02	8.51E+02	2.81E+03
7009	11	2.46E+01	2.81E+03	7.32E+02	3.17E+03	2.20E+01	1.93E+02	9.11E+02	3.04E+03
7009	12	2.03E+01	3.10E+03	7.71E+02	3.46E+03	1.81E+01	2.13E+02	9.60E+02	3.31E+03
7009	13	2.03E+01	3.10E+03	7.71E+02	3.46E+03	1.81E+01	2.13E+02	9.60E+02	3.31E+03
7009	14	2.03E+01	3.10E+03	7.71E+02	3.46E+03	1.81E+01	2.13E+02	9.60E+02	3.31E+03
7009	15	2.03E+01	3.10E+03	7.71E+02	3.46E+03	1.81E+01	2.13E+02	9.60E+02	3.31E+03
8009	1	2.33E+01	6.84E+02	2.89E+02	2.51E+03	1.69E+01	1.01E+02	5.97E+02	1.28E+03
8009	2	2.43E+01	7.73E+02	3.19E+02	2.89E+03	1.76E+01	1.14E+02	6.61E+02	1.47E+03
8009	3	2.49E+01	8.40E+02	3.42E+02	3.17E+03	1.81E+01	1.24E+02	7.08E+02	1.62E+03
8009	4	2.56E+01	9.08E+02	3.65E+02	3.45E+03	1.86E+01	1.34E+02	7.56E+02	1.76E+03
8009	5	2.64E+01	9.81E+02	3.90E+02	3.75E+03	1.92E+01	1.45E+02	8.07E+02	1.92E+03
8009	6	2.73E+01	1.06E+03	4.16E+02	4.07E+03	1.98E+01	1.56E+02	8.61E+02	2.08E+03
8009	7	2.83E+01	1.14E+03	4.43E+02	4.40E+03	2.06E+01	1.68E+02	9.17E+02	2.25E+03
8009	8	2.94E+01	1.23E+03	4.72E+02	4.75E+03	2.13E+01	1.81E+02	9.76E+02	2.42E+03
8009	9	3.04E+01	1.31E+03	5.01E+02	5.10E+03	2.21E+01	1.94E+02	1.04E+03	2.60E+03
8009	10	3.15E+01	1.40E+03	5.30E+02	5.44E+03	2.28E+01	2.07E+02	1.10E+03	2.78E+03
8009	11	3.43E+01	1.78E+03	6.48E+02	7.08E+03	2.49E+01	2.63E+02	1.34E+03	3.61E+03
8009	12	3.24E+01	1.89E+03	6.69E+02	7.57E+03	2.35E+01	2.79E+02	1.38E+03	3.86E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8009	13	3.24E+01	1.89E+03	6.69E+02	7.57E+03	2.35E+01	2.79E+02	1.38E+03	3.86E+03
8009	14	3.24E+01	1.89E+03	6.69E+02	7.57E+03	2.35E+01	2.79E+02	1.38E+03	3.86E+03
8009	15	3.24E+01	1.89E+03	6.69E+02	7.57E+03	2.35E+01	2.79E+02	1.38E+03	3.86E+03
9009	1	4.22E+01	3.86E+02	3.85E+02	6.53E+03	2.49E+01	1.95E+02	1.06E+03	2.34E+03
9009	2	4.17E+01	3.84E+02	3.84E+02	6.65E+03	2.46E+01	1.94E+02	1.05E+03	2.38E+03
9009	3	4.10E+01	3.81E+02	3.83E+02	6.76E+03	2.42E+01	1.93E+02	1.05E+03	2.42E+03
9009	4	4.02E+01	3.79E+02	3.81E+02	6.87E+03	2.37E+01	1.92E+02	1.05E+03	2.46E+03
9009	5	3.94E+01	3.77E+02	3.80E+02	6.98E+03	2.33E+01	1.91E+02	1.04E+03	2.50E+03
9009	6	3.87E+01	3.75E+02	3.79E+02	7.09E+03	2.29E+01	1.90E+02	1.04E+03	2.54E+03
9009	7	3.80E+01	3.72E+02	3.77E+02	7.20E+03	2.25E+01	1.88E+02	1.03E+03	2.58E+03
9009	8	3.74E+01	3.70E+02	3.75E+02	7.31E+03	2.20E+01	1.87E+02	1.03E+03	2.62E+03
9009	9	3.66E+01	3.67E+02	3.73E+02	7.42E+03	2.16E+01	1.86E+02	1.02E+03	2.66E+03
9009	10	3.59E+01	3.64E+02	3.70E+02	7.53E+03	2.12E+01	1.84E+02	1.02E+03	2.70E+03
9009	11	2.98E+01	3.38E+02	3.43E+02	8.13E+03	1.76E+01	1.71E+02	9.42E+02	2.91E+03
9009	12	2.98E+01	3.38E+02	3.43E+02	8.13E+03	1.76E+01	1.71E+02	9.42E+02	2.91E+03
9009	13	2.98E+01	3.38E+02	3.43E+02	8.13E+03	1.76E+01	1.71E+02	9.42E+02	2.91E+03
9009	14	2.98E+01	3.38E+02	3.43E+02	8.13E+03	1.76E+01	1.71E+02	9.42E+02	2.91E+03
9009	15	2.98E+01	3.38E+02	3.43E+02	8.13E+03	1.76E+01	1.71E+02	9.42E+02	2.91E+03
6010	1	3.35E+01	1.51E+03	6.19E+02	2.86E+03	7.74E+00	5.48E+01	9.52E+01	1.71E+03
6010	2	3.38E+01	1.66E+03	6.60E+02	3.30E+03	7.83E+00	6.01E+01	1.02E+02	1.97E+03
6010	3	3.39E+01	1.78E+03	6.97E+02	3.67E+03	7.85E+00	6.46E+01	1.07E+02	2.19E+03
6010	4	3.39E+01	1.89E+03	7.30E+02	3.99E+03	7.86E+00	6.86E+01	1.12E+02	2.38E+03
6010	5	3.40E+01	2.01E+03	7.64E+02	4.32E+03	7.88E+00	7.27E+01	1.17E+02	2.58E+03
6010	6	3.42E+01	2.13E+03	7.98E+02	4.67E+03	7.92E+00	7.71E+01	1.23E+02	2.78E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6010	7	3.44E+01	2.25E+03	8.34E+02	5.02E+03	7.97E+00	8.15E+01	1.28E+02	2.99E+03
6010	8	3.47E+01	2.37E+03	8.69E+02	5.37E+03	8.02E+00	8.60E+01	1.34E+02	3.20E+03
6010	9	3.49E+01	2.49E+03	9.04E+02	5.71E+03	8.07E+00	9.04E+01	1.39E+02	3.41E+03
6010	10	3.51E+01	2.61E+03	9.38E+02	6.04E+03	8.11E+00	9.47E+01	1.44E+02	3.60E+03
6010	11	3.45E+01	3.30E+03	1.12E+03	8.19E+03	7.98E+00	1.20E+02	1.72E+02	4.88E+03
6010	12	3.45E+01	3.30E+03	1.12E+03	8.19E+03	7.98E+00	1.20E+02	1.72E+02	4.88E+03
6010	13	3.45E+01	3.30E+03	1.12E+03	8.19E+03	7.98E+00	1.20E+02	1.72E+02	4.88E+03
6010	14	3.45E+01	3.30E+03	1.12E+03	8.19E+03	7.98E+00	1.20E+02	1.72E+02	4.88E+03
6010	15	3.45E+01	3.30E+03	1.12E+03	8.19E+03	7.98E+00	1.20E+02	1.72E+02	4.88E+03
7010	1	2.45E+01	1.38E+03	5.00E+02	3.49E+03	5.80E+00	5.47E+01	8.48E+01	1.99E+03
7010	2	2.72E+01	1.56E+03	5.64E+02	3.97E+03	6.43E+00	6.20E+01	9.57E+01	2.26E+03
7010	3	2.94E+01	1.72E+03	6.19E+02	4.38E+03	6.94E+00	6.83E+01	1.05E+02	2.49E+03
7010	4	3.13E+01	1.86E+03	6.69E+02	4.75E+03	7.39E+00	7.40E+01	1.14E+02	2.70E+03
7010	5	3.31E+01	2.00E+03	7.16E+02	5.10E+03	7.81E+00	7.94E+01	1.22E+02	2.90E+03
7010	6	3.48E+01	2.13E+03	7.62E+02	5.45E+03	8.22E+00	8.48E+01	1.29E+02	3.10E+03
7010	7	3.65E+01	2.27E+03	8.08E+02	5.80E+03	8.61E+00	9.02E+01	1.37E+02	3.30E+03
7010	8	3.80E+01	2.40E+03	8.53E+02	6.15E+03	8.99E+00	9.55E+01	1.45E+02	3.50E+03
7010	9	3.95E+01	2.53E+03	8.96E+02	6.48E+03	9.33E+00	1.01E+02	1.52E+02	3.68E+03
7010	10	4.08E+01	2.65E+03	9.36E+02	6.79E+03	9.64E+00	1.06E+02	1.59E+02	3.86E+03
7010	11	4.25E+01	2.97E+03	1.03E+03	7.64E+03	1.00E+01	1.18E+02	1.75E+02	4.35E+03
7010	12	3.99E+01	3.24E+03	1.09E+03	8.39E+03	9.42E+00	1.29E+02	1.86E+02	4.77E+03
7010	13	3.99E+01	3.24E+03	1.09E+03	8.39E+03	9.42E+00	1.29E+02	1.86E+02	4.77E+03
7010	14	3.99E+01	3.24E+03	1.09E+03	8.39E+03	9.42E+00	1.29E+02	1.86E+02	4.77E+03
7010	15	3.99E+01	3.24E+03	1.09E+03	8.39E+03	9.42E+00	1.29E+02	1.86E+02	4.77E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8010	1	3.21E+01	1.52E+03	6.51E+02	4.06E+03	9.13E+00	8.61E+01	1.66E+02	2.37E+03
8010	2	3.26E+01	1.56E+03	6.68E+02	4.21E+03	9.27E+00	8.88E+01	1.71E+02	2.46E+03
8010	3	3.30E+01	1.61E+03	6.86E+02	4.37E+03	9.38E+00	9.15E+01	1.75E+02	2.55E+03
8010	4	3.33E+01	1.66E+03	7.03E+02	4.53E+03	9.47E+00	9.42E+01	1.80E+02	2.65E+03
8010	5	3.37E+01	1.71E+03	7.21E+02	4.70E+03	9.57E+00	9.71E+01	1.84E+02	2.75E+03
8010	6	3.40E+01	1.76E+03	7.40E+02	4.88E+03	9.66E+00	1.00E+02	1.89E+02	2.86E+03
8010	7	3.43E+01	1.82E+03	7.59E+02	5.07E+03	9.74E+00	1.03E+02	1.94E+02	2.97E+03
8010	8	3.45E+01	1.87E+03	7.78E+02	5.27E+03	9.81E+00	1.06E+02	1.99E+02	3.08E+03
8010	9	3.47E+01	1.93E+03	7.97E+02	5.47E+03	9.87E+00	1.10E+02	2.04E+02	3.20E+03
8010	10	3.49E+01	1.99E+03	8.17E+02	5.68E+03	9.91E+00	1.13E+02	2.09E+02	3.32E+03
8010	11	3.25E+01	2.43E+03	9.41E+02	7.40E+03	9.24E+00	1.38E+02	2.40E+02	4.33E+03
8010	12	3.25E+01	2.43E+03	9.41E+02	7.40E+03	9.24E+00	1.38E+02	2.40E+02	4.33E+03
8010	13	3.25E+01	2.43E+03	9.41E+02	7.40E+03	9.24E+00	1.38E+02	2.40E+02	4.33E+03
8010	14	3.25E+01	2.43E+03	9.41E+02	7.40E+03	9.24E+00	1.38E+02	2.40E+02	4.33E+03
8010	15	3.25E+01	2.43E+03	9.41E+02	7.40E+03	9.24E+00	1.38E+02	2.40E+02	4.33E+03
6011	1	2.57E+01	2.41E+02	1.57E+03	4.05E+03	1.17E+01	7.37E+01	1.62E+02	2.06E+03
6011	2	2.54E+01	2.40E+02	1.68E+03	4.49E+03	1.16E+01	7.34E+01	1.74E+02	2.28E+03
6011	3	2.50E+01	2.40E+02	1.77E+03	4.86E+03	1.14E+01	7.35E+01	1.84E+02	2.47E+03
6011	4	2.47E+01	2.41E+02	1.86E+03	5.16E+03	1.13E+01	7.38E+01	1.92E+02	2.63E+03
6011	5	2.45E+01	2.43E+02	1.93E+03	5.45E+03	1.12E+01	7.42E+01	2.00E+02	2.77E+03
6011	6	2.43E+01	2.44E+02	2.00E+03	5.73E+03	1.11E+01	7.45E+01	2.08E+02	2.91E+03
6011	7	2.42E+01	2.45E+02	2.08E+03	6.01E+03	1.10E+01	7.48E+01	2.15E+02	3.05E+03
6011	8	2.40E+01	2.45E+02	2.15E+03	6.28E+03	1.09E+01	7.51E+01	2.22E+02	3.19E+03
6011	9	2.37E+01	2.46E+02	2.22E+03	6.54E+03	1.08E+01	7.53E+01	2.29E+02	3.32E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6011	10	2.35E+01	2.47E+02	2.28E+03	6.78E+03	1.07E+01	7.54E+01	2.36E+02	3.45E+03
6011	11	2.03E+01	2.40E+02	2.69E+03	8.43E+03	9.26E+00	7.33E+01	2.79E+02	4.29E+03
6011	12	2.03E+01	2.40E+02	2.69E+03	8.43E+03	9.26E+00	7.33E+01	2.79E+02	4.29E+03
6011	13	2.03E+01	2.40E+02	2.69E+03	8.43E+03	9.26E+00	7.33E+01	2.79E+02	4.29E+03
6011	14	2.03E+01	2.40E+02	2.69E+03	8.43E+03	9.26E+00	7.33E+01	2.79E+02	4.29E+03
6011	15	2.03E+01	2.40E+02	2.69E+03	8.43E+03	9.26E+00	7.33E+01	2.79E+02	4.29E+03
7011	1	2.30E+01	2.22E+02	1.79E+03	5.16E+03	1.04E+01	6.77E+01	1.68E+02	2.68E+03
7011	2	2.35E+01	2.28E+02	1.85E+03	5.36E+03	1.07E+01	6.96E+01	1.74E+02	2.78E+03
7011	3	2.39E+01	2.32E+02	1.91E+03	5.53E+03	1.08E+01	7.10E+01	1.79E+02	2.86E+03
7011	4	2.43E+01	2.37E+02	1.96E+03	5.69E+03	1.10E+01	7.24E+01	1.84E+02	2.95E+03
7011	5	2.46E+01	2.41E+02	2.01E+03	5.86E+03	1.11E+01	7.37E+01	1.89E+02	3.04E+03
7011	6	2.49E+01	2.45E+02	2.06E+03	6.03E+03	1.13E+01	7.49E+01	1.94E+02	3.13E+03
7011	7	2.51E+01	2.49E+02	2.11E+03	6.20E+03	1.14E+01	7.60E+01	1.98E+02	3.21E+03
7011	8	2.52E+01	2.52E+02	2.16E+03	6.36E+03	1.14E+01	7.69E+01	2.03E+02	3.30E+03
7011	9	2.53E+01	2.54E+02	2.21E+03	6.52E+03	1.14E+01	7.76E+01	2.08E+02	3.38E+03
7011	10	2.53E+01	2.56E+02	2.26E+03	6.67E+03	1.14E+01	7.82E+01	2.12E+02	3.46E+03
7011	11	2.03E+01	2.43E+02	2.53E+03	7.62E+03	9.19E+00	7.41E+01	2.38E+02	3.95E+03
7011	12	2.03E+01	2.43E+02	2.53E+03	7.62E+03	9.19E+00	7.41E+01	2.38E+02	3.95E+03
7011	13	2.03E+01	2.43E+02	2.53E+03	7.62E+03	9.19E+00	7.41E+01	2.38E+02	3.95E+03
7011	14	2.03E+01	2.43E+02	2.53E+03	7.62E+03	9.19E+00	7.41E+01	2.38E+02	3.95E+03
7011	15	2.03E+01	2.43E+02	2.53E+03	7.62E+03	9.19E+00	7.41E+01	2.38E+02	3.95E+03
8011	1	2.53E+01	2.40E+02	1.54E+03	3.88E+03	1.10E+01	7.85E+01	1.35E+02	2.05E+03
8011	2	2.54E+01	2.42E+02	1.62E+03	4.21E+03	1.11E+01	7.90E+01	1.42E+02	2.22E+03
8011	3	2.54E+01	2.44E+02	1.70E+03	4.53E+03	1.11E+01	7.95E+01	1.49E+02	2.39E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8011	4	2.53E+01	2.46E+02	1.78E+03	4.84E+03	1.10E+01	8.01E+01	1.56E+02	2.55E+03
8011	5	2.52E+01	2.47E+02	1.86E+03	5.15E+03	1.10E+01	8.07E+01	1.63E+02	2.72E+03
8011	6	2.50E+01	2.48E+02	1.94E+03	5.46E+03	1.09E+01	8.10E+01	1.71E+02	2.88E+03
8011	7	2.47E+01	2.49E+02	2.02E+03	5.79E+03	1.08E+01	8.12E+01	1.78E+02	3.05E+03
8011	8	2.44E+01	2.49E+02	2.11E+03	6.12E+03	1.06E+01	8.13E+01	1.86E+02	3.23E+03
8011	9	2.40E+01	2.49E+02	2.20E+03	6.44E+03	1.05E+01	8.12E+01	1.93E+02	3.40E+03
8011	10	2.36E+01	2.48E+02	2.29E+03	6.76E+03	1.03E+01	8.10E+01	2.01E+02	3.57E+03
8011	11	1.96E+01	2.33E+02	2.79E+03	8.86E+03	8.53E+00	7.62E+01	2.46E+02	4.68E+03
8011	12	1.96E+01	2.33E+02	2.79E+03	8.86E+03	8.53E+00	7.62E+01	2.46E+02	4.68E+03
8011	13	1.96E+01	2.33E+02	2.79E+03	8.86E+03	8.53E+00	7.62E+01	2.46E+02	4.68E+03
8011	14	1.96E+01	2.33E+02	2.79E+03	8.86E+03	8.53E+00	7.62E+01	2.46E+02	4.68E+03
8011	15	1.96E+01	2.33E+02	2.79E+03	8.86E+03	8.53E+00	7.62E+01	2.46E+02	4.68E+03
6012	1	1.91E+01	1.79E+02	1.36E+03	4.03E+03	7.96E+00	5.77E+01	3.07E+01	2.46E+03
6012	2	1.98E+01	1.87E+02	1.46E+03	4.32E+03	8.26E+00	6.05E+01	3.29E+01	2.64E+03
6012	3	2.03E+01	1.95E+02	1.55E+03	4.56E+03	8.48E+00	6.28E+01	3.48E+01	2.78E+03
6012	4	2.08E+01	2.02E+02	1.63E+03	4.81E+03	8.69E+00	6.52E+01	3.67E+01	2.93E+03
6012	5	2.14E+01	2.10E+02	1.72E+03	5.07E+03	8.92E+00	6.77E+01	3.86E+01	3.09E+03
6012	6	2.19E+01	2.18E+02	1.81E+03	5.33E+03	9.17E+00	7.02E+01	4.06E+01	3.25E+03
6012	7	2.26E+01	2.25E+02	1.90E+03	5.60E+03	9.42E+00	7.27E+01	4.27E+01	3.41E+03
6012	8	2.32E+01	2.33E+02	1.99E+03	5.87E+03	9.68E+00	7.53E+01	4.48E+01	3.58E+03
6012	9	2.38E+01	2.41E+02	2.09E+03	6.16E+03	9.94E+00	7.79E+01	4.71E+01	3.76E+03
6012	10	2.44E+01	2.50E+02	2.20E+03	6.46E+03	1.02E+01	8.06E+01	4.94E+01	3.94E+03
6012	11	2.52E+01	2.60E+02	2.33E+03	6.84E+03	1.05E+01	8.39E+01	5.24E+01	4.18E+03
6012	12	2.68E+01	2.88E+02	2.76E+03	8.13E+03	1.12E+01	9.30E+01	6.20E+01	4.96E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6012	13	2.68E+01	3.09E+02	3.23E+03	9.58E+03	1.12E+01	9.99E+01	7.28E+01	5.85E+03
6012	14	2.54E+01	3.16E+02	3.48E+03	1.03E+04	1.06E+01	1.02E+02	7.83E+01	6.31E+03
6012	15	2.51E+01	3.16E+02	3.50E+03	1.04E+04	1.05E+01	1.02E+02	7.87E+01	6.34E+03
7012	1	2.34E+01	2.25E+02	1.80E+03	4.98E+03	1.15E+01	7.61E+01	4.89E+01	2.88E+03
7012	2	2.38E+01	2.29E+02	1.85E+03	5.16E+03	1.17E+01	7.77E+01	5.04E+01	2.98E+03
7012	3	2.40E+01	2.33E+02	1.91E+03	5.33E+03	1.18E+01	7.89E+01	5.18E+01	3.08E+03
7012	4	2.41E+01	2.37E+02	1.96E+03	5.52E+03	1.18E+01	8.01E+01	5.32E+01	3.19E+03
7012	5	2.42E+01	2.40E+02	2.01E+03	5.72E+03	1.19E+01	8.12E+01	5.47E+01	3.30E+03
7012	6	2.42E+01	2.42E+02	2.07E+03	5.94E+03	1.19E+01	8.21E+01	5.62E+01	3.43E+03
7012	7	2.42E+01	2.45E+02	2.13E+03	6.16E+03	1.19E+01	8.29E+01	5.77E+01	3.55E+03
7012	8	2.42E+01	2.47E+02	2.18E+03	6.39E+03	1.19E+01	8.35E+01	5.92E+01	3.68E+03
7012	9	2.40E+01	2.48E+02	2.24E+03	6.62E+03	1.18E+01	8.41E+01	6.07E+01	3.82E+03
7012	10	2.39E+01	2.50E+02	2.29E+03	6.84E+03	1.17E+01	8.45E+01	6.22E+01	3.95E+03
7012	11	2.13E+01	2.47E+02	2.51E+03	7.77E+03	1.05E+01	8.37E+01	6.83E+01	4.48E+03
7012	12	2.13E+01	2.47E+02	2.51E+03	7.77E+03	1.05E+01	8.37E+01	6.83E+01	4.48E+03
7012	13	2.13E+01	2.47E+02	2.51E+03	7.77E+03	1.05E+01	8.37E+01	6.83E+01	4.48E+03
7012	14	2.13E+01	2.47E+02	2.51E+03	7.77E+03	1.05E+01	8.37E+01	6.83E+01	4.48E+03
7012	15	2.13E+01	2.47E+02	2.51E+03	7.77E+03	1.05E+01	8.37E+01	6.83E+01	4.48E+03
8012	1	2.48E+01	2.24E+02	1.41E+03	3.69E+03	1.39E+01	9.89E+01	5.58E+01	2.27E+03
8012	2	2.51E+01	2.29E+02	1.47E+03	3.88E+03	1.41E+01	1.01E+02	5.82E+01	2.38E+03
8012	3	2.52E+01	2.33E+02	1.54E+03	4.09E+03	1.41E+01	1.02E+02	6.08E+01	2.51E+03
8012	4	2.52E+01	2.36E+02	1.61E+03	4.34E+03	1.41E+01	1.04E+02	6.36E+01	2.67E+03
8012	5	2.52E+01	2.39E+02	1.69E+03	4.61E+03	1.41E+01	1.05E+02	6.68E+01	2.84E+03
8012	6	2.52E+01	2.42E+02	1.78E+03	4.92E+03	1.41E+01	1.06E+02	7.03E+01	3.02E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8012	7	2.51E+01	2.44E+02	1.88E+03	5.25E+03	1.40E+01	1.08E+02	7.42E+01	3.23E+03
8012	8	2.49E+01	2.47E+02	1.98E+03	5.61E+03	1.40E+01	1.09E+02	7.83E+01	3.45E+03
8012	9	2.47E+01	2.49E+02	2.09E+03	5.99E+03	1.39E+01	1.10E+02	8.27E+01	3.68E+03
8012	10	2.45E+01	2.51E+02	2.21E+03	6.37E+03	1.37E+01	1.11E+02	8.74E+01	3.92E+03
8012	11	1.93E+01	2.47E+02	3.07E+03	9.75E+03	1.08E+01	1.09E+02	1.21E+02	5.99E+03
8012	12	1.93E+01	2.47E+02	3.07E+03	9.75E+03	1.08E+01	1.09E+02	1.21E+02	5.99E+03
8012	13	1.93E+01	2.47E+02	3.07E+03	9.75E+03	1.08E+01	1.09E+02	1.21E+02	5.99E+03
8012	14	1.93E+01	2.47E+02	3.07E+03	9.75E+03	1.08E+01	1.09E+02	1.21E+02	5.99E+03
8012	15	1.93E+01	2.47E+02	3.07E+03	9.75E+03	1.08E+01	1.09E+02	1.21E+02	5.99E+03
6013	1	1.96E+01	1.88E+02	1.54E+03	4.49E+03	1.71E+01	2.39E+02	2.81E+02	4.50E+03
6013	2	2.04E+01	1.98E+02	1.63E+03	4.76E+03	1.79E+01	2.51E+02	2.98E+02	4.77E+03
6013	3	2.10E+01	2.05E+02	1.70E+03	4.97E+03	1.84E+01	2.60E+02	3.10E+02	4.98E+03
6013	4	2.17E+01	2.12E+02	1.77E+03	5.19E+03	1.90E+01	2.70E+02	3.24E+02	5.20E+03
6013	5	2.24E+01	2.20E+02	1.85E+03	5.43E+03	1.96E+01	2.79E+02	3.38E+02	5.44E+03
6013	6	2.31E+01	2.28E+02	1.93E+03	5.67E+03	2.02E+01	2.89E+02	3.53E+02	5.69E+03
6013	7	2.37E+01	2.36E+02	2.02E+03	5.93E+03	2.08E+01	2.99E+02	3.69E+02	5.94E+03
6013	8	2.43E+01	2.44E+02	2.11E+03	6.19E+03	2.13E+01	3.09E+02	3.85E+02	6.21E+03
6013	9	2.50E+01	2.51E+02	2.20E+03	6.47E+03	2.19E+01	3.19E+02	4.02E+02	6.48E+03
6013	10	2.56E+01	2.59E+02	2.29E+03	6.75E+03	2.24E+01	3.29E+02	4.19E+02	6.76E+03
6013	11	2.63E+01	2.82E+02	2.68E+03	7.95E+03	2.31E+01	3.58E+02	4.89E+02	7.97E+03
6013	12	2.34E+01	2.77E+02	2.82E+03	8.43E+03	2.05E+01	3.51E+02	5.16E+02	8.45E+03
6013	13	2.34E+01	2.77E+02	2.82E+03	8.43E+03	2.05E+01	3.51E+02	5.16E+02	8.45E+03
6013	14	2.34E+01	2.77E+02	2.82E+03	8.43E+03	2.05E+01	3.51E+02	5.16E+02	8.45E+03
6013	15	2.34E+01	2.77E+02	2.82E+03	8.43E+03	2.05E+01	3.51E+02	5.16E+02	8.45E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7013	1	2.29E+01	2.23E+02	1.85E+03	5.26E+03	2.17E+01	2.83E+02	3.46E+02	5.38E+03
7013	2	2.33E+01	2.27E+02	1.89E+03	5.41E+03	2.21E+01	2.89E+02	3.54E+02	5.53E+03
7013	3	2.37E+01	2.31E+02	1.94E+03	5.56E+03	2.24E+01	2.94E+02	3.62E+02	5.69E+03
7013	4	2.39E+01	2.35E+02	1.98E+03	5.71E+03	2.27E+01	2.99E+02	3.71E+02	5.84E+03
7013	5	2.41E+01	2.38E+02	2.03E+03	5.85E+03	2.29E+01	3.03E+02	3.79E+02	5.99E+03
7013	6	2.43E+01	2.41E+02	2.07E+03	6.00E+03	2.30E+01	3.07E+02	3.87E+02	6.14E+03
7013	7	2.44E+01	2.44E+02	2.11E+03	6.15E+03	2.31E+01	3.10E+02	3.95E+02	6.29E+03
7013	8	2.44E+01	2.47E+02	2.16E+03	6.30E+03	2.32E+01	3.14E+02	4.04E+02	6.45E+03
7013	9	2.44E+01	2.49E+02	2.20E+03	6.45E+03	2.31E+01	3.16E+02	4.12E+02	6.60E+03
7013	10	2.43E+01	2.50E+02	2.24E+03	6.59E+03	2.30E+01	3.18E+02	4.20E+02	6.74E+03
7013	11	2.13E+01	2.49E+02	2.51E+03	7.64E+03	2.02E+01	3.16E+02	4.69E+02	7.82E+03
7013	12	2.13E+01	2.49E+02	2.51E+03	7.64E+03	2.02E+01	3.16E+02	4.69E+02	7.82E+03
7013	13	2.13E+01	2.49E+02	2.51E+03	7.64E+03	2.02E+01	3.16E+02	4.69E+02	7.82E+03
7013	14	2.13E+01	2.49E+02	2.51E+03	7.64E+03	2.02E+01	3.16E+02	4.69E+02	7.82E+03
7013	15	2.13E+01	2.49E+02	2.51E+03	7.64E+03	2.02E+01	3.16E+02	4.69E+02	7.82E+03
8013	1	2.55E+01	2.37E+02	1.71E+03	4.44E+03	2.57E+01	3.07E+02	3.51E+02	4.85E+03
8013	2	2.57E+01	2.40E+02	1.78E+03	4.70E+03	2.59E+01	3.10E+02	3.65E+02	5.14E+03
8013	3	2.58E+01	2.42E+02	1.84E+03	4.91E+03	2.60E+01	3.13E+02	3.77E+02	5.36E+03
8013	4	2.57E+01	2.43E+02	1.89E+03	5.10E+03	2.60E+01	3.15E+02	3.87E+02	5.56E+03
8013	5	2.56E+01	2.45E+02	1.94E+03	5.29E+03	2.59E+01	3.17E+02	3.97E+02	5.78E+03
8013	6	2.55E+01	2.46E+02	1.99E+03	5.50E+03	2.57E+01	3.18E+02	4.08E+02	6.01E+03
8013	7	2.54E+01	2.47E+02	2.05E+03	5.73E+03	2.56E+01	3.20E+02	4.19E+02	6.26E+03
8013	8	2.52E+01	2.48E+02	2.10E+03	5.98E+03	2.54E+01	3.21E+02	4.31E+02	6.53E+03
8013	9	2.50E+01	2.49E+02	2.16E+03	6.22E+03	2.52E+01	3.22E+02	4.43E+02	6.80E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8013	10	2.47E+01	2.49E+02	2.22E+03	6.47E+03	2.49E+01	3.22E+02	4.55E+02	7.07E+03
8013	11	1.85E+01	2.37E+02	2.66E+03	8.63E+03	1.86E+01	3.06E+02	5.46E+02	9.43E+03
8013	12	1.85E+01	2.37E+02	2.66E+03	8.63E+03	1.86E+01	3.06E+02	5.46E+02	9.43E+03
8013	13	1.85E+01	2.37E+02	2.66E+03	8.63E+03	1.86E+01	3.06E+02	5.46E+02	9.43E+03
8013	14	1.85E+01	2.37E+02	2.66E+03	8.63E+03	1.86E+01	3.06E+02	5.46E+02	9.43E+03
8013	15	1.85E+01	2.37E+02	2.66E+03	8.63E+03	1.86E+01	3.06E+02	5.46E+02	9.43E+03
6014	1	2.28E+01	2.23E+02	1.86E+03	5.08E+03	7.55E+00	2.05E+02	8.15E+02	3.08E+03
6014	2	2.29E+01	2.26E+02	1.92E+03	5.37E+03	7.58E+00	2.07E+02	8.42E+02	3.25E+03
6014	3	2.30E+01	2.29E+02	1.97E+03	5.60E+03	7.62E+00	2.10E+02	8.65E+02	3.39E+03
6014	4	2.31E+01	2.32E+02	2.01E+03	5.78E+03	7.66E+00	2.13E+02	8.85E+02	3.50E+03
6014	5	2.32E+01	2.35E+02	2.06E+03	5.95E+03	7.70E+00	2.16E+02	9.03E+02	3.60E+03
6014	6	2.34E+01	2.38E+02	2.10E+03	6.11E+03	7.75E+00	2.18E+02	9.21E+02	3.70E+03
6014	7	2.35E+01	2.41E+02	2.14E+03	6.28E+03	7.81E+00	2.21E+02	9.39E+02	3.80E+03
6014	8	2.37E+01	2.44E+02	2.18E+03	6.44E+03	7.87E+00	2.24E+02	9.57E+02	3.90E+03
6014	9	2.39E+01	2.47E+02	2.22E+03	6.59E+03	7.92E+00	2.27E+02	9.75E+02	3.99E+03
6014	10	2.40E+01	2.50E+02	2.26E+03	6.74E+03	7.96E+00	2.29E+02	9.93E+02	4.08E+03
6014	11	2.26E+01	2.54E+02	2.46E+03	7.51E+03	7.50E+00	2.33E+02	1.08E+03	4.55E+03
6014	12	2.26E+01	2.54E+02	2.46E+03	7.51E+03	7.50E+00	2.33E+02	1.08E+03	4.55E+03
6014	13	2.26E+01	2.54E+02	2.46E+03	7.51E+03	7.50E+00	2.33E+02	1.08E+03	4.55E+03
6014	14	2.26E+01	2.54E+02	2.46E+03	7.51E+03	7.50E+00	2.33E+02	1.08E+03	4.55E+03
6014	15	2.26E+01	2.54E+02	2.46E+03	7.51E+03	7.50E+00	2.33E+02	1.08E+03	4.55E+03
7014	1	2.30E+01	2.26E+02	1.90E+03	5.37E+03	7.24E+00	2.09E+02	9.04E+02	3.30E+03
7014	2	2.35E+01	2.31E+02	1.95E+03	5.58E+03	7.37E+00	2.14E+02	9.32E+02	3.43E+03
7014	3	2.35E+01	2.32E+02	1.98E+03	5.68E+03	7.37E+00	2.15E+02	9.43E+02	3.49E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7014	4	2.34E+01	2.33E+02	2.00E+03	5.77E+03	7.36E+00	2.16E+02	9.53E+02	3.55E+03
7014	5	2.34E+01	2.35E+02	2.02E+03	5.87E+03	7.36E+00	2.17E+02	9.65E+02	3.60E+03
7014	6	2.35E+01	2.36E+02	2.05E+03	5.97E+03	7.37E+00	2.19E+02	9.79E+02	3.67E+03
7014	7	2.35E+01	2.38E+02	2.08E+03	6.09E+03	7.38E+00	2.21E+02	9.94E+02	3.74E+03
7014	8	2.35E+01	2.40E+02	2.12E+03	6.21E+03	7.38E+00	2.22E+02	1.01E+03	3.81E+03
7014	9	2.34E+01	2.42E+02	2.16E+03	6.34E+03	7.37E+00	2.24E+02	1.03E+03	3.89E+03
7014	10	2.34E+01	2.44E+02	2.20E+03	6.47E+03	7.35E+00	2.26E+02	1.05E+03	3.98E+03
7014	11	2.25E+01	2.55E+02	2.51E+03	7.63E+03	7.07E+00	2.36E+02	1.20E+03	4.69E+03
7014	12	2.25E+01	2.55E+02	2.51E+03	7.63E+03	7.07E+00	2.36E+02	1.20E+03	4.69E+03
7014	13	2.25E+01	2.55E+02	2.51E+03	7.63E+03	7.07E+00	2.36E+02	1.20E+03	4.69E+03
7014	14	2.25E+01	2.55E+02	2.51E+03	7.63E+03	7.07E+00	2.36E+02	1.20E+03	4.69E+03
7014	15	2.25E+01	2.55E+02	2.51E+03	7.63E+03	7.07E+00	2.36E+02	1.20E+03	4.69E+03
8014	1	2.31E+01	2.24E+02	1.75E+03	4.72E+03	6.94E+00	2.02E+02	8.57E+02	2.86E+03
8014	2	2.32E+01	2.26E+02	1.80E+03	4.93E+03	6.96E+00	2.04E+02	8.85E+02	2.98E+03
8014	3	2.32E+01	2.28E+02	1.86E+03	5.13E+03	6.98E+00	2.06E+02	9.13E+02	3.10E+03
8014	4	2.33E+01	2.31E+02	1.91E+03	5.34E+03	7.00E+00	2.09E+02	9.40E+02	3.23E+03
8014	5	2.33E+01	2.33E+02	1.97E+03	5.56E+03	7.01E+00	2.11E+02	9.67E+02	3.36E+03
8014	6	2.33E+01	2.36E+02	2.03E+03	5.79E+03	7.02E+00	2.13E+02	9.96E+02	3.50E+03
8014	7	2.34E+01	2.39E+02	2.09E+03	6.02E+03	7.03E+00	2.16E+02	1.03E+03	3.64E+03
8014	8	2.34E+01	2.41E+02	2.15E+03	6.25E+03	7.05E+00	2.18E+02	1.05E+03	3.78E+03
8014	9	2.35E+01	2.44E+02	2.21E+03	6.48E+03	7.06E+00	2.20E+02	1.08E+03	3.92E+03
8014	10	2.35E+01	2.46E+02	2.26E+03	6.71E+03	7.07E+00	2.23E+02	1.11E+03	4.06E+03
8014	11	2.26E+01	2.56E+02	2.60E+03	8.11E+03	6.81E+00	2.31E+02	1.27E+03	4.91E+03
8014	12	2.26E+01	2.56E+02	2.60E+03	8.11E+03	6.81E+00	2.31E+02	1.27E+03	4.91E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8014	13	2.26E+01	2.56E+02	2.60E+03	8.11E+03	6.81E+00	2.31E+02	1.27E+03	4.91E+03
8014	14	2.26E+01	2.56E+02	2.60E+03	8.11E+03	6.81E+00	2.31E+02	1.27E+03	4.91E+03
8014	15	2.26E+01	2.56E+02	2.60E+03	8.11E+03	6.81E+00	2.31E+02	1.27E+03	4.91E+03
6015	1	2.28E+01	2.19E+02	1.76E+03	4.82E+03	1.27E+01	7.80E+01	5.59E+02	1.75E+03
6015	2	2.29E+01	2.22E+02	1.82E+03	5.04E+03	1.27E+01	7.88E+01	5.77E+02	1.83E+03
6015	3	2.30E+01	2.25E+02	1.88E+03	5.26E+03	1.28E+01	8.00E+01	5.97E+02	1.91E+03
6015	4	2.31E+01	2.29E+02	1.94E+03	5.50E+03	1.29E+01	8.13E+01	6.17E+02	2.00E+03
6015	5	2.32E+01	2.33E+02	2.01E+03	5.74E+03	1.29E+01	8.27E+01	6.37E+02	2.09E+03
6015	6	2.33E+01	2.36E+02	2.07E+03	5.98E+03	1.30E+01	8.39E+01	6.56E+02	2.18E+03
6015	7	2.34E+01	2.39E+02	2.13E+03	6.22E+03	1.31E+01	8.51E+01	6.75E+02	2.26E+03
6015	8	2.35E+01	2.43E+02	2.19E+03	6.44E+03	1.31E+01	8.63E+01	6.94E+02	2.34E+03
6015	9	2.36E+01	2.46E+02	2.24E+03	6.66E+03	1.32E+01	8.74E+01	7.11E+02	2.42E+03
6015	10	2.37E+01	2.49E+02	2.30E+03	6.86E+03	1.32E+01	8.85E+01	7.29E+02	2.49E+03
6015	11	2.28E+01	2.58E+02	2.53E+03	7.80E+03	1.27E+01	9.17E+01	8.03E+02	2.83E+03
6015	12	2.28E+01	2.58E+02	2.53E+03	7.80E+03	1.27E+01	9.17E+01	8.03E+02	2.83E+03
6015	13	2.28E+01	2.58E+02	2.53E+03	7.80E+03	1.27E+01	9.17E+01	8.03E+02	2.83E+03
6015	14	2.28E+01	2.58E+02	2.53E+03	7.80E+03	1.27E+01	9.17E+01	8.03E+02	2.83E+03
6015	15	2.28E+01	2.58E+02	2.53E+03	7.80E+03	1.27E+01	9.17E+01	8.03E+02	2.83E+03
7015	1	2.45E+01	2.34E+02	1.90E+03	5.33E+03	1.37E+01	7.54E+01	6.97E+02	2.00E+03
7015	2	2.45E+01	2.37E+02	1.95E+03	5.60E+03	1.38E+01	7.62E+01	7.18E+02	2.10E+03
7015	3	2.45E+01	2.38E+02	2.00E+03	5.78E+03	1.37E+01	7.68E+01	7.33E+02	2.17E+03
7015	4	2.45E+01	2.40E+02	2.03E+03	5.93E+03	1.37E+01	7.75E+01	7.48E+02	2.22E+03
7015	5	2.44E+01	2.42E+02	2.07E+03	6.04E+03	1.37E+01	7.80E+01	7.61E+02	2.27E+03
7015	6	2.43E+01	2.43E+02	2.10E+03	6.15E+03	1.37E+01	7.84E+01	7.73E+02	2.31E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7015	7	2.42E+01	2.45E+02	2.14E+03	6.27E+03	1.36E+01	7.88E+01	7.85E+02	2.35E+03
7015	8	2.41E+01	2.46E+02	2.17E+03	6.38E+03	1.35E+01	7.92E+01	7.97E+02	2.39E+03
7015	9	2.40E+01	2.47E+02	2.20E+03	6.49E+03	1.35E+01	7.95E+01	8.09E+02	2.43E+03
7015	10	2.39E+01	2.48E+02	2.24E+03	6.60E+03	1.34E+01	7.98E+01	8.22E+02	2.47E+03
7015	11	2.07E+01	2.42E+02	2.44E+03	7.39E+03	1.16E+01	7.81E+01	8.97E+02	2.77E+03
7015	12	2.07E+01	2.42E+02	2.44E+03	7.39E+03	1.16E+01	7.81E+01	8.97E+02	2.77E+03
7015	13	2.07E+01	2.42E+02	2.44E+03	7.39E+03	1.16E+01	7.81E+01	8.97E+02	2.77E+03
7015	14	2.07E+01	2.42E+02	2.44E+03	7.39E+03	1.16E+01	7.81E+01	8.97E+02	2.77E+03
7015	15	2.07E+01	2.42E+02	2.44E+03	7.39E+03	1.16E+01	7.81E+01	8.97E+02	2.77E+03
8015	1	2.19E+01	2.13E+02	1.71E+03	4.48E+03	1.21E+01	5.45E+01	6.99E+02	1.57E+03
8015	2	2.22E+01	2.17E+02	1.79E+03	4.79E+03	1.23E+01	5.56E+01	7.29E+02	1.68E+03
8015	3	2.24E+01	2.21E+02	1.85E+03	5.04E+03	1.24E+01	5.66E+01	7.54E+02	1.77E+03
8015	4	2.26E+01	2.25E+02	1.91E+03	5.28E+03	1.25E+01	5.76E+01	7.78E+02	1.85E+03
8015	5	2.28E+01	2.29E+02	1.97E+03	5.51E+03	1.26E+01	5.85E+01	8.02E+02	1.94E+03
8015	6	2.30E+01	2.33E+02	2.02E+03	5.74E+03	1.27E+01	5.95E+01	8.25E+02	2.02E+03
8015	7	2.32E+01	2.36E+02	2.08E+03	5.97E+03	1.28E+01	6.05E+01	8.48E+02	2.10E+03
8015	8	2.34E+01	2.40E+02	2.14E+03	6.20E+03	1.30E+01	6.14E+01	8.71E+02	2.18E+03
8015	9	2.36E+01	2.44E+02	2.19E+03	6.44E+03	1.31E+01	6.24E+01	8.95E+02	2.26E+03
8015	10	2.38E+01	2.48E+02	2.25E+03	6.67E+03	1.31E+01	6.34E+01	9.19E+02	2.34E+03
8015	11	2.35E+01	2.65E+02	2.62E+03	8.28E+03	1.30E+01	6.77E+01	1.07E+03	2.91E+03
8015	12	2.35E+01	2.65E+02	2.62E+03	8.28E+03	1.30E+01	6.77E+01	1.07E+03	2.91E+03
8015	13	2.35E+01	2.65E+02	2.62E+03	8.28E+03	1.30E+01	6.77E+01	1.07E+03	2.91E+03
8015	14	2.35E+01	2.65E+02	2.62E+03	8.28E+03	1.30E+01	6.77E+01	1.07E+03	2.91E+03
8015	15	2.35E+01	2.65E+02	2.62E+03	8.28E+03	1.30E+01	6.77E+01	1.07E+03	2.91E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6016	1	2.24E+01	2.12E+02	1.66E+03	4.08E+03	1.01E+01	8.71E+01	1.85E+02	1.32E+03
6016	2	2.26E+01	2.19E+02	1.80E+03	4.73E+03	1.02E+01	9.01E+01	2.01E+02	1.52E+03
6016	3	2.28E+01	2.24E+02	1.89E+03	5.14E+03	1.03E+01	9.22E+01	2.11E+02	1.66E+03
6016	4	2.31E+01	2.29E+02	1.95E+03	5.43E+03	1.05E+01	9.39E+01	2.18E+02	1.75E+03
6016	5	2.33E+01	2.33E+02	2.01E+03	5.69E+03	1.06E+01	9.56E+01	2.25E+02	1.84E+03
6016	6	2.35E+01	2.37E+02	2.07E+03	5.95E+03	1.07E+01	9.72E+01	2.31E+02	1.92E+03
6016	7	2.37E+01	2.40E+02	2.13E+03	6.21E+03	1.07E+01	9.87E+01	2.38E+02	2.00E+03
6016	8	2.39E+01	2.44E+02	2.19E+03	6.46E+03	1.08E+01	1.00E+02	2.44E+02	2.08E+03
6016	9	2.41E+01	2.48E+02	2.24E+03	6.71E+03	1.09E+01	1.02E+02	2.50E+02	2.16E+03
6016	10	2.42E+01	2.51E+02	2.30E+03	6.94E+03	1.10E+01	1.03E+02	2.57E+02	2.24E+03
6016	11	2.26E+01	2.58E+02	2.55E+03	8.03E+03	1.02E+01	1.06E+02	2.85E+02	2.59E+03
6016	12	2.26E+01	2.58E+02	2.55E+03	8.03E+03	1.02E+01	1.06E+02	2.85E+02	2.59E+03
6016	13	2.26E+01	2.58E+02	2.55E+03	8.03E+03	1.02E+01	1.06E+02	2.85E+02	2.59E+03
6016	14	2.26E+01	2.58E+02	2.55E+03	8.03E+03	1.02E+01	1.06E+02	2.85E+02	2.59E+03
6016	15	2.26E+01	2.58E+02	2.55E+03	8.03E+03	1.02E+01	1.06E+02	2.85E+02	2.59E+03
7016	1	2.23E+01	2.20E+02	1.87E+03	5.43E+03	8.80E+00	6.45E+01	1.71E+02	1.23E+03
7016	2	2.27E+01	2.25E+02	1.94E+03	5.63E+03	8.97E+00	6.62E+01	1.77E+02	1.27E+03
7016	3	2.29E+01	2.28E+02	1.98E+03	5.75E+03	9.03E+00	6.71E+01	1.80E+02	1.30E+03
7016	4	2.30E+01	2.31E+02	2.02E+03	5.87E+03	9.07E+00	6.78E+01	1.84E+02	1.33E+03
7016	5	2.31E+01	2.33E+02	2.05E+03	5.98E+03	9.11E+00	6.86E+01	1.87E+02	1.35E+03
7016	6	2.32E+01	2.36E+02	2.09E+03	6.09E+03	9.15E+00	6.93E+01	1.90E+02	1.38E+03
7016	7	2.33E+01	2.38E+02	2.12E+03	6.20E+03	9.19E+00	7.00E+01	1.93E+02	1.40E+03
7016	8	2.34E+01	2.41E+02	2.16E+03	6.31E+03	9.23E+00	7.07E+01	1.97E+02	1.43E+03
7016	9	2.35E+01	2.43E+02	2.19E+03	6.43E+03	9.26E+00	7.14E+01	2.00E+02	1.45E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7016	10	2.35E+01	2.45E+02	2.23E+03	6.54E+03	9.29E+00	7.21E+01	2.03E+02	1.48E+03
7016	11	2.31E+01	2.58E+02	2.47E+03	7.46E+03	9.13E+00	7.57E+01	2.25E+02	1.68E+03
7016	12	2.31E+01	2.58E+02	2.47E+03	7.46E+03	9.13E+00	7.57E+01	2.25E+02	1.68E+03
7016	13	2.31E+01	2.58E+02	2.47E+03	7.46E+03	9.13E+00	7.57E+01	2.25E+02	1.68E+03
7016	14	2.31E+01	2.58E+02	2.47E+03	7.46E+03	9.13E+00	7.57E+01	2.25E+02	1.68E+03
7016	15	2.31E+01	2.58E+02	2.47E+03	7.46E+03	9.13E+00	7.57E+01	2.25E+02	1.68E+03
8016	1	1.93E+01	1.86E+02	1.54E+03	4.43E+03	6.73E+00	4.03E+01	1.21E+02	7.55E+02
8016	2	2.01E+01	1.96E+02	1.65E+03	4.78E+03	7.01E+00	4.25E+01	1.30E+02	8.14E+02
8016	3	2.07E+01	2.04E+02	1.73E+03	5.05E+03	7.22E+00	4.42E+01	1.37E+02	8.60E+02
8016	4	2.13E+01	2.11E+02	1.82E+03	5.31E+03	7.43E+00	4.59E+01	1.43E+02	9.04E+02
8016	5	2.18E+01	2.19E+02	1.90E+03	5.57E+03	7.63E+00	4.75E+01	1.50E+02	9.49E+02
8016	6	2.24E+01	2.26E+02	1.99E+03	5.83E+03	7.82E+00	4.91E+01	1.57E+02	9.92E+02
8016	7	2.29E+01	2.33E+02	2.07E+03	6.08E+03	8.00E+00	5.06E+01	1.63E+02	1.04E+03
8016	8	2.34E+01	2.40E+02	2.15E+03	6.33E+03	8.17E+00	5.21E+01	1.69E+02	1.08E+03
8016	9	2.38E+01	2.47E+02	2.23E+03	6.56E+03	8.33E+00	5.35E+01	1.76E+02	1.12E+03
8016	10	2.43E+01	2.53E+02	2.31E+03	6.79E+03	8.47E+00	5.49E+01	1.82E+02	1.16E+03
8016	11	2.53E+01	2.83E+02	2.72E+03	8.16E+03	8.85E+00	6.13E+01	2.15E+02	1.39E+03
8016	12	2.53E+01	2.83E+02	2.72E+03	8.16E+03	8.85E+00	6.13E+01	2.15E+02	1.39E+03
8016	13	2.53E+01	2.83E+02	2.72E+03	8.16E+03	8.85E+00	6.13E+01	2.15E+02	1.39E+03
8016	14	2.53E+01	2.83E+02	2.72E+03	8.16E+03	8.85E+00	6.13E+01	2.15E+02	1.39E+03
8016	15	2.53E+01	2.83E+02	2.72E+03	8.16E+03	8.85E+00	6.13E+01	2.15E+02	1.39E+03
6017	1	1.12E+01	9.92E+01	6.34E+02	2.03E+03	5.73E+00	5.49E+01	9.75E+01	7.95E+02
6017	2	1.25E+01	1.14E+02	7.88E+02	2.50E+03	6.36E+00	6.33E+01	1.21E+02	9.77E+02
6017	3	1.34E+01	1.26E+02	9.06E+02	2.85E+03	6.83E+00	6.95E+01	1.39E+02	1.11E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6017	4	1.44E+01	1.38E+02	1.04E+03	3.24E+03	7.37E+00	7.66E+01	1.60E+02	1.27E+03
6017	5	1.56E+01	1.53E+02	1.19E+03	3.69E+03	7.99E+00	8.44E+01	1.84E+02	1.44E+03
6017	6	1.70E+01	1.68E+02	1.36E+03	4.18E+03	8.67E+00	9.30E+01	2.10E+02	1.63E+03
6017	7	1.84E+01	1.85E+02	1.55E+03	4.71E+03	9.41E+00	1.02E+02	2.38E+02	1.84E+03
6017	8	2.00E+01	2.04E+02	1.75E+03	5.28E+03	1.02E+01	1.13E+02	2.70E+02	2.07E+03
6017	9	2.17E+01	2.24E+02	1.98E+03	5.87E+03	1.11E+01	1.24E+02	3.04E+02	2.29E+03
6017	10	2.35E+01	2.45E+02	2.22E+03	6.38E+03	1.20E+01	1.36E+02	3.41E+02	2.50E+03
6017	11	2.68E+01	2.85E+02	2.67E+03	7.69E+03	1.37E+01	1.58E+02	4.11E+02	3.01E+03
6017	12	3.06E+01	3.32E+02	3.19E+03	9.16E+03	1.56E+01	1.84E+02	4.91E+02	3.58E+03
6017	13	3.51E+01	3.87E+02	3.82E+03	1.10E+04	1.79E+01	2.14E+02	5.88E+02	4.32E+03
6017	14	4.02E+01	4.49E+02	4.53E+03	1.32E+04	2.05E+01	2.49E+02	6.97E+02	5.17E+03
6017	15	4.60E+01	5.20E+02	5.36E+03	1.56E+04	2.35E+01	2.88E+02	8.25E+02	6.11E+03
7017	1	2.21E+01	2.16E+02	1.85E+03	5.32E+03	1.10E+01	1.04E+02	3.28E+02	1.84E+03
7017	2	2.24E+01	2.21E+02	1.90E+03	5.48E+03	1.11E+01	1.06E+02	3.37E+02	1.89E+03
7017	3	2.27E+01	2.25E+02	1.95E+03	5.63E+03	1.13E+01	1.08E+02	3.45E+02	1.94E+03
7017	4	2.29E+01	2.29E+02	1.99E+03	5.77E+03	1.14E+01	1.10E+02	3.53E+02	1.99E+03
7017	5	2.31E+01	2.32E+02	2.03E+03	5.90E+03	1.14E+01	1.11E+02	3.61E+02	2.04E+03
7017	6	2.32E+01	2.35E+02	2.08E+03	6.04E+03	1.15E+01	1.13E+02	3.68E+02	2.08E+03
7017	7	2.33E+01	2.38E+02	2.12E+03	6.18E+03	1.16E+01	1.14E+02	3.75E+02	2.13E+03
7017	8	2.35E+01	2.41E+02	2.16E+03	6.32E+03	1.17E+01	1.16E+02	3.83E+02	2.18E+03
7017	9	2.36E+01	2.44E+02	2.20E+03	6.46E+03	1.17E+01	1.17E+02	3.90E+02	2.23E+03
7017	10	2.37E+01	2.47E+02	2.24E+03	6.60E+03	1.18E+01	1.19E+02	3.97E+02	2.27E+03
7017	11	2.32E+01	2.60E+02	2.50E+03	7.56E+03	1.15E+01	1.25E+02	4.42E+02	2.61E+03
7017	12	2.32E+01	2.60E+02	2.50E+03	7.56E+03	1.15E+01	1.25E+02	4.42E+02	2.61E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7017	13	2.32E+01	2.60E+02	2.50E+03	7.56E+03	1.15E+01	1.25E+02	4.42E+02	2.61E+03
7017	14	2.32E+01	2.60E+02	2.50E+03	7.56E+03	1.15E+01	1.25E+02	4.42E+02	2.61E+03
7017	15	2.32E+01	2.60E+02	2.50E+03	7.56E+03	1.15E+01	1.25E+02	4.42E+02	2.61E+03
8017	1	2.20E+01	1.98E+02	1.42E+03	3.78E+03	1.05E+01	8.50E+01	2.52E+02	1.25E+03
8017	2	2.22E+01	2.03E+02	1.52E+03	4.14E+03	1.06E+01	8.73E+01	2.70E+02	1.37E+03
8017	3	2.25E+01	2.09E+02	1.62E+03	4.48E+03	1.08E+01	8.98E+01	2.87E+02	1.48E+03
8017	4	2.28E+01	2.15E+02	1.71E+03	4.80E+03	1.09E+01	9.23E+01	3.03E+02	1.58E+03
8017	5	2.31E+01	2.21E+02	1.80E+03	5.12E+03	1.10E+01	9.49E+01	3.19E+02	1.69E+03
8017	6	2.34E+01	2.27E+02	1.90E+03	5.44E+03	1.12E+01	9.73E+01	3.36E+02	1.79E+03
8017	7	2.36E+01	2.32E+02	1.99E+03	5.75E+03	1.13E+01	9.97E+01	3.52E+02	1.90E+03
8017	8	2.39E+01	2.38E+02	2.08E+03	6.07E+03	1.14E+01	1.02E+02	3.69E+02	2.00E+03
8017	9	2.41E+01	2.44E+02	2.17E+03	6.38E+03	1.15E+01	1.05E+02	3.85E+02	2.11E+03
8017	10	2.43E+01	2.49E+02	2.27E+03	6.68E+03	1.16E+01	1.07E+02	4.02E+02	2.21E+03
8017	11	2.29E+01	2.79E+02	2.90E+03	8.97E+03	1.10E+01	1.20E+02	5.14E+02	2.96E+03
8017	12	2.29E+01	2.79E+02	2.90E+03	8.97E+03	1.10E+01	1.20E+02	5.14E+02	2.96E+03
8017	13	2.29E+01	2.79E+02	2.90E+03	8.97E+03	1.10E+01	1.20E+02	5.14E+02	2.96E+03
8017	14	2.29E+01	2.79E+02	2.90E+03	8.97E+03	1.10E+01	1.20E+02	5.14E+02	2.96E+03
8017	15	2.29E+01	2.79E+02	2.90E+03	8.97E+03	1.10E+01	1.20E+02	5.14E+02	2.96E+03
6018	1	1.41E+01	1.38E+02	1.17E+03	3.42E+03	1.15E+01	2.40E+01	3.10E+02	2.08E+03
6018	2	1.59E+01	1.57E+02	1.35E+03	3.94E+03	1.30E+01	2.73E+01	3.56E+02	2.40E+03
6018	3	1.73E+01	1.71E+02	1.47E+03	4.33E+03	1.41E+01	2.98E+01	3.90E+02	2.63E+03
6018	4	1.86E+01	1.85E+02	1.60E+03	4.70E+03	1.52E+01	3.22E+01	4.23E+02	2.86E+03
6018	5	2.00E+01	1.99E+02	1.73E+03	5.09E+03	1.63E+01	3.47E+01	4.57E+02	3.09E+03
6018	6	2.14E+01	2.13E+02	1.86E+03	5.48E+03	1.75E+01	3.72E+01	4.92E+02	3.33E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6018	7	2.27E+01	2.27E+02	1.99E+03	5.88E+03	1.86E+01	3.97E+01	5.27E+02	3.57E+03
6018	8	2.41E+01	2.42E+02	2.13E+03	6.27E+03	1.97E+01	4.22E+01	5.63E+02	3.81E+03
6018	9	2.53E+01	2.55E+02	2.26E+03	6.66E+03	2.07E+01	4.46E+01	5.97E+02	4.05E+03
6018	10	2.65E+01	2.68E+02	2.39E+03	7.02E+03	2.16E+01	4.69E+01	6.31E+02	4.27E+03
6018	11	2.87E+01	3.13E+02	2.95E+03	8.76E+03	2.34E+01	5.47E+01	7.81E+02	5.32E+03
6018	12	2.80E+01	3.16E+02	3.02E+03	8.99E+03	2.29E+01	5.51E+01	8.00E+02	5.46E+03
6018	13	2.80E+01	3.16E+02	3.02E+03	8.99E+03	2.29E+01	5.51E+01	8.00E+02	5.46E+03
6018	14	2.80E+01	3.16E+02	3.02E+03	8.99E+03	2.29E+01	5.51E+01	8.00E+02	5.46E+03
6018	15	2.80E+01	3.16E+02	3.02E+03	8.99E+03	2.29E+01	5.51E+01	8.00E+02	5.46E+03
7018	1	2.21E+01	2.12E+02	1.77E+03	4.96E+03	1.73E+01	3.74E+01	9.65E+02	3.10E+03
7018	2	2.25E+01	2.17E+02	1.82E+03	5.14E+03	1.76E+01	3.82E+01	9.94E+02	3.22E+03
7018	3	2.28E+01	2.22E+02	1.88E+03	5.34E+03	1.78E+01	3.90E+01	1.03E+03	3.34E+03
7018	4	2.31E+01	2.27E+02	1.94E+03	5.56E+03	1.81E+01	3.99E+01	1.06E+03	3.47E+03
7018	5	2.34E+01	2.32E+02	2.00E+03	5.78E+03	1.83E+01	4.08E+01	1.09E+03	3.61E+03
7018	6	2.37E+01	2.37E+02	2.06E+03	6.00E+03	1.85E+01	4.16E+01	1.12E+03	3.76E+03
7018	7	2.40E+01	2.41E+02	2.12E+03	6.23E+03	1.87E+01	4.25E+01	1.16E+03	3.90E+03
7018	8	2.42E+01	2.46E+02	2.18E+03	6.45E+03	1.89E+01	4.33E+01	1.19E+03	4.03E+03
7018	9	2.44E+01	2.50E+02	2.24E+03	6.66E+03	1.91E+01	4.40E+01	1.22E+03	4.17E+03
7018	10	2.45E+01	2.54E+02	2.29E+03	6.85E+03	1.92E+01	4.46E+01	1.25E+03	4.29E+03
7018	11	2.23E+01	2.59E+02	2.54E+03	7.70E+03	1.74E+01	4.55E+01	1.39E+03	4.82E+03
7018	12	2.23E+01	2.59E+02	2.54E+03	7.70E+03	1.74E+01	4.55E+01	1.39E+03	4.82E+03
7018	13	2.23E+01	2.59E+02	2.54E+03	7.70E+03	1.74E+01	4.55E+01	1.39E+03	4.82E+03
7018	14	2.23E+01	2.59E+02	2.54E+03	7.70E+03	1.74E+01	4.55E+01	1.39E+03	4.82E+03
7018	15	2.23E+01	2.59E+02	2.54E+03	7.70E+03	1.74E+01	4.55E+01	1.39E+03	4.82E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8018	1	2.19E+01	2.00E+02	1.57E+03	4.18E+03	1.68E+01	3.47E+01	9.68E+02	2.51E+03
8018	2	2.20E+01	2.04E+02	1.63E+03	4.40E+03	1.69E+01	3.54E+01	1.01E+03	2.64E+03
8018	3	2.22E+01	2.09E+02	1.70E+03	4.67E+03	1.71E+01	3.63E+01	1.05E+03	2.81E+03
8018	4	2.25E+01	2.15E+02	1.79E+03	4.97E+03	1.73E+01	3.73E+01	1.10E+03	2.98E+03
8018	5	2.28E+01	2.21E+02	1.87E+03	5.28E+03	1.75E+01	3.84E+01	1.16E+03	3.17E+03
8018	6	2.30E+01	2.27E+02	1.96E+03	5.60E+03	1.77E+01	3.95E+01	1.21E+03	3.36E+03
8018	7	2.33E+01	2.33E+02	2.05E+03	5.92E+03	1.79E+01	4.05E+01	1.27E+03	3.56E+03
8018	8	2.35E+01	2.39E+02	2.14E+03	6.24E+03	1.80E+01	4.15E+01	1.32E+03	3.75E+03
8018	9	2.37E+01	2.45E+02	2.23E+03	6.56E+03	1.82E+01	4.26E+01	1.38E+03	3.94E+03
8018	10	2.38E+01	2.51E+02	2.31E+03	6.86E+03	1.83E+01	4.36E+01	1.43E+03	4.12E+03
8018	11	2.36E+01	2.77E+02	2.75E+03	8.57E+03	1.81E+01	4.80E+01	1.70E+03	5.15E+03
8018	12	2.36E+01	2.77E+02	2.75E+03	8.57E+03	1.81E+01	4.80E+01	1.70E+03	5.15E+03
8018	13	2.36E+01	2.77E+02	2.75E+03	8.57E+03	1.81E+01	4.80E+01	1.70E+03	5.15E+03
8018	14	2.36E+01	2.77E+02	2.75E+03	8.57E+03	1.81E+01	4.80E+01	1.70E+03	5.15E+03
8018	15	2.36E+01	2.77E+02	2.75E+03	8.57E+03	1.81E+01	4.80E+01	1.70E+03	5.15E+03
9018	1	2.26E+01	1.77E+02	1.11E+03	2.78E+03	1.75E+01	3.27E+01	6.71E+02	1.56E+03
9018	2	2.30E+01	1.86E+02	1.23E+03	3.20E+03	1.79E+01	3.44E+01	7.48E+02	1.80E+03
9018	3	2.33E+01	1.96E+02	1.39E+03	3.71E+03	1.81E+01	3.63E+01	8.40E+02	2.08E+03
9018	4	2.35E+01	2.06E+02	1.53E+03	4.21E+03	1.82E+01	3.81E+01	9.29E+02	2.36E+03
9018	5	2.37E+01	2.15E+02	1.68E+03	4.68E+03	1.83E+01	3.99E+01	1.02E+03	2.63E+03
9018	6	2.39E+01	2.24E+02	1.81E+03	5.14E+03	1.85E+01	4.16E+01	1.10E+03	2.89E+03
9018	7	2.41E+01	2.33E+02	1.95E+03	5.59E+03	1.87E+01	4.32E+01	1.18E+03	3.14E+03
9018	8	2.43E+01	2.41E+02	2.08E+03	6.04E+03	1.88E+01	4.47E+01	1.26E+03	3.39E+03
9018	9	2.44E+01	2.49E+02	2.22E+03	6.49E+03	1.89E+01	4.62E+01	1.34E+03	3.64E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
9018	10	2.45E+01	2.57E+02	2.35E+03	6.92E+03	1.90E+01	4.76E+01	1.42E+03	3.88E+03
9018	11	2.18E+01	2.89E+02	3.13E+03	9.75E+03	1.69E+01	5.36E+01	1.89E+03	5.47E+03
9018	12	2.18E+01	2.89E+02	3.13E+03	9.75E+03	1.69E+01	5.36E+01	1.89E+03	5.47E+03
9018	13	2.18E+01	2.89E+02	3.13E+03	9.75E+03	1.69E+01	5.36E+01	1.89E+03	5.47E+03
9018	14	2.18E+01	2.89E+02	3.13E+03	9.75E+03	1.69E+01	5.36E+01	1.89E+03	5.47E+03
9018	15	2.18E+01	2.89E+02	3.13E+03	9.75E+03	1.69E+01	5.36E+01	1.89E+03	5.47E+03
10018	1	2.31E+01	1.86E+02	1.01E+03	2.63E+03	2.09E+01	8.01E+01	5.40E+02	1.40E+03
10018	2	2.29E+01	1.86E+02	1.04E+03	2.75E+03	2.07E+01	8.01E+01	5.61E+02	1.47E+03
10018	3	2.29E+01	1.88E+02	1.12E+03	2.98E+03	2.07E+01	8.13E+01	5.99E+02	1.59E+03
10018	4	2.30E+01	1.94E+02	1.22E+03	3.30E+03	2.08E+01	8.37E+01	6.55E+02	1.76E+03
10018	5	2.34E+01	2.02E+02	1.35E+03	3.71E+03	2.11E+01	8.70E+01	7.26E+02	1.98E+03
10018	6	2.38E+01	2.11E+02	1.51E+03	4.20E+03	2.15E+01	9.10E+01	8.09E+02	2.23E+03
10018	7	2.42E+01	2.21E+02	1.68E+03	4.73E+03	2.19E+01	9.55E+01	9.01E+02	2.52E+03
10018	8	2.47E+01	2.32E+02	1.86E+03	5.30E+03	2.23E+01	1.00E+02	9.99E+02	2.82E+03
10018	9	2.51E+01	2.43E+02	2.05E+03	5.88E+03	2.26E+01	1.05E+02	1.10E+03	3.13E+03
10018	10	2.54E+01	2.55E+02	2.25E+03	6.46E+03	2.29E+01	1.10E+02	1.21E+03	3.44E+03
10018	11	2.16E+01	3.02E+02	3.58E+03	1.11E+04	1.95E+01	1.30E+02	1.92E+03	5.91E+03
10018	12	2.16E+01	3.02E+02	3.58E+03	1.11E+04	1.95E+01	1.30E+02	1.92E+03	5.91E+03
10018	13	2.16E+01	3.02E+02	3.58E+03	1.11E+04	1.95E+01	1.30E+02	1.92E+03	5.91E+03
10018	14	2.16E+01	3.02E+02	3.58E+03	1.11E+04	1.95E+01	1.30E+02	1.92E+03	5.91E+03
10018	15	2.16E+01	3.02E+02	3.58E+03	1.11E+04	1.95E+01	1.30E+02	1.92E+03	5.91E+03
6019	1	2.37E+01	2.06E+02	1.68E+03	4.76E+03	2.41E+01	1.90E+02	8.12E+02	5.99E+03
6019	2	2.41E+01	2.10E+02	1.73E+03	4.95E+03	2.45E+01	1.94E+02	8.36E+02	6.23E+03
6019	3	2.45E+01	2.15E+02	1.78E+03	5.15E+03	2.49E+01	1.98E+02	8.60E+02	6.48E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6019	4	2.49E+01	2.19E+02	1.83E+03	5.34E+03	2.53E+01	2.02E+02	8.84E+02	6.72E+03
6019	5	2.53E+01	2.24E+02	1.88E+03	5.53E+03	2.57E+01	2.07E+02	9.08E+02	6.96E+03
6019	6	2.57E+01	2.28E+02	1.92E+03	5.72E+03	2.61E+01	2.11E+02	9.31E+02	7.19E+03
6019	7	2.60E+01	2.32E+02	1.97E+03	5.90E+03	2.64E+01	2.15E+02	9.55E+02	7.43E+03
6019	8	2.63E+01	2.37E+02	2.02E+03	6.08E+03	2.68E+01	2.18E+02	9.78E+02	7.65E+03
6019	9	2.66E+01	2.41E+02	2.07E+03	6.25E+03	2.71E+01	2.22E+02	1.00E+03	7.87E+03
6019	10	2.69E+01	2.44E+02	2.11E+03	6.42E+03	2.74E+01	2.26E+02	1.02E+03	8.08E+03
6019	11	2.64E+01	2.55E+02	2.31E+03	7.15E+03	2.69E+01	2.35E+02	1.12E+03	9.00E+03
6019	12	2.64E+01	2.55E+02	2.31E+03	7.15E+03	2.69E+01	2.35E+02	1.12E+03	9.00E+03
6019	13	2.64E+01	2.55E+02	2.31E+03	7.15E+03	2.69E+01	2.35E+02	1.12E+03	9.00E+03
6019	14	2.64E+01	2.55E+02	2.31E+03	7.15E+03	2.69E+01	2.35E+02	1.12E+03	9.00E+03
6019	15	2.64E+01	2.55E+02	2.31E+03	7.15E+03	2.69E+01	2.35E+02	1.12E+03	9.00E+03
7019	1	2.68E+01	1.94E+02	1.53E+03	4.38E+03	2.35E+01	2.01E+02	1.24E+03	6.13E+03
7019	2	2.74E+01	1.99E+02	1.59E+03	4.61E+03	2.39E+01	2.06E+02	1.29E+03	6.45E+03
7019	3	2.80E+01	2.04E+02	1.65E+03	4.82E+03	2.45E+01	2.11E+02	1.33E+03	6.74E+03
7019	4	2.86E+01	2.09E+02	1.70E+03	5.01E+03	2.50E+01	2.16E+02	1.37E+03	7.01E+03
7019	5	2.91E+01	2.14E+02	1.75E+03	5.19E+03	2.54E+01	2.21E+02	1.41E+03	7.27E+03
7019	6	2.97E+01	2.18E+02	1.80E+03	5.38E+03	2.59E+01	2.26E+02	1.45E+03	7.53E+03
7019	7	3.02E+01	2.23E+02	1.85E+03	5.56E+03	2.64E+01	2.31E+02	1.49E+03	7.78E+03
7019	8	3.07E+01	2.28E+02	1.90E+03	5.74E+03	2.68E+01	2.36E+02	1.54E+03	8.03E+03
7019	9	3.12E+01	2.32E+02	1.95E+03	5.91E+03	2.72E+01	2.40E+02	1.58E+03	8.28E+03
7019	10	3.16E+01	2.36E+02	2.00E+03	6.09E+03	2.76E+01	2.45E+02	1.62E+03	8.52E+03
7019	11	3.22E+01	2.52E+02	2.26E+03	7.11E+03	2.81E+01	2.61E+02	1.83E+03	9.95E+03
7019	12	3.22E+01	2.52E+02	2.26E+03	7.11E+03	2.81E+01	2.61E+02	1.83E+03	9.95E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7019	13	3.22E+01	2.52E+02	2.26E+03	7.11E+03	2.81E+01	2.61E+02	1.83E+03	9.95E+03
7019	14	3.22E+01	2.52E+02	2.26E+03	7.11E+03	2.81E+01	2.61E+02	1.83E+03	9.95E+03
7019	15	3.22E+01	2.52E+02	2.26E+03	7.11E+03	2.81E+01	2.61E+02	1.83E+03	9.95E+03
9019	1	2.38E+01	2.22E+02	1.80E+03	4.99E+03	3.53E+01	1.62E+02	4.86E+02	2.93E+03
9019	2	2.37E+01	2.23E+02	1.84E+03	5.12E+03	3.53E+01	1.64E+02	4.96E+02	3.00E+03
9019	3	2.36E+01	2.25E+02	1.87E+03	5.24E+03	3.51E+01	1.64E+02	5.04E+02	3.07E+03
9019	4	2.36E+01	2.26E+02	1.90E+03	5.36E+03	3.50E+01	1.66E+02	5.12E+02	3.14E+03
9019	5	2.35E+01	2.28E+02	1.93E+03	5.49E+03	3.49E+01	1.67E+02	5.21E+02	3.22E+03
9019	6	2.34E+01	2.30E+02	1.97E+03	5.63E+03	3.48E+01	1.68E+02	5.31E+02	3.30E+03
9019	7	2.34E+01	2.32E+02	2.01E+03	5.78E+03	3.47E+01	1.70E+02	5.42E+02	3.39E+03
9019	8	2.33E+01	2.34E+02	2.05E+03	5.95E+03	3.46E+01	1.71E+02	5.54E+02	3.48E+03
9019	9	2.32E+01	2.36E+02	2.10E+03	6.12E+03	3.45E+01	1.73E+02	5.66E+02	3.59E+03
9019	10	2.32E+01	2.39E+02	2.15E+03	6.31E+03	3.44E+01	1.75E+02	5.80E+02	3.69E+03
9019	11	2.24E+01	2.67E+02	2.68E+03	8.30E+03	3.32E+01	1.95E+02	7.21E+02	4.86E+03
9019	12	2.24E+01	2.67E+02	2.68E+03	8.30E+03	3.32E+01	1.95E+02	7.21E+02	4.86E+03
9019	13	2.24E+01	2.67E+02	2.68E+03	8.30E+03	3.32E+01	1.95E+02	7.21E+02	4.86E+03
9019	14	2.24E+01	2.67E+02	2.68E+03	8.30E+03	3.32E+01	1.95E+02	7.21E+02	4.86E+03
9019	15	2.24E+01	2.67E+02	2.68E+03	8.30E+03	3.32E+01	1.95E+02	7.21E+02	4.86E+03
10019	1	2.11E+01	1.50E+02	5.81E+02	1.27E+03	3.28E+01	1.34E+02	1.38E+02	7.93E+02
10019	2	2.20E+01	1.61E+02	7.56E+02	1.85E+03	3.43E+01	1.44E+02	1.80E+02	1.15E+03
10019	3	2.25E+01	1.72E+02	9.25E+02	2.39E+03	3.50E+01	1.53E+02	2.21E+02	1.49E+03
10019	4	2.28E+01	1.83E+02	1.10E+03	2.92E+03	3.54E+01	1.63E+02	2.61E+02	1.82E+03
10019	5	2.31E+01	1.96E+02	1.27E+03	3.46E+03	3.59E+01	1.74E+02	3.03E+02	2.16E+03
10019	6	2.35E+01	2.08E+02	1.45E+03	4.02E+03	3.65E+01	1.85E+02	3.47E+02	2.51E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
10019	7	2.40E+01	2.20E+02	1.64E+03	4.61E+03	3.73E+01	1.96E+02	3.92E+02	2.88E+03
10019	8	2.45E+01	2.32E+02	1.84E+03	5.22E+03	3.81E+01	2.07E+02	4.40E+02	3.26E+03
10019	9	2.50E+01	2.45E+02	2.05E+03	5.84E+03	3.89E+01	2.18E+02	4.89E+02	3.65E+03
10019	10	2.54E+01	2.58E+02	2.26E+03	6.46E+03	3.96E+01	2.30E+02	5.40E+02	4.04E+03
10019	11	2.25E+01	3.21E+02	3.82E+03	1.19E+04	3.50E+01	2.86E+02	9.12E+02	7.43E+03
10019	12	2.25E+01	3.21E+02	3.82E+03	1.19E+04	3.50E+01	2.86E+02	9.12E+02	7.43E+03
10019	13	2.25E+01	3.21E+02	3.82E+03	1.19E+04	3.50E+01	2.86E+02	9.12E+02	7.43E+03
10019	14	2.25E+01	3.21E+02	3.82E+03	1.19E+04	3.50E+01	2.86E+02	9.12E+02	7.43E+03
10019	15	2.25E+01	3.21E+02	3.82E+03	1.19E+04	3.50E+01	2.86E+02	9.12E+02	7.43E+03
6020	1	3.82E+01	1.77E+02	5.34E+02	2.49E+03	2.39E+01	4.73E+02	9.84E+04	8.55E+03
6020	2	3.90E+01	1.80E+02	5.48E+02	2.57E+03	2.44E+01	4.83E+02	1.01E+05	8.80E+03
6020	3	3.94E+01	1.82E+02	5.56E+02	2.61E+03	2.46E+01	4.87E+02	1.03E+05	8.93E+03
6020	4	3.98E+01	1.83E+02	5.64E+02	2.64E+03	2.48E+01	4.91E+02	1.04E+05	9.06E+03
6020	5	4.01E+01	1.85E+02	5.71E+02	2.68E+03	2.51E+01	4.95E+02	1.05E+05	9.19E+03
6020	6	4.04E+01	1.86E+02	5.78E+02	2.72E+03	2.52E+01	4.99E+02	1.07E+05	9.31E+03
6020	7	4.07E+01	1.88E+02	5.85E+02	2.75E+03	2.54E+01	5.02E+02	1.08E+05	9.44E+03
6020	8	4.10E+01	1.89E+02	5.92E+02	2.79E+03	2.56E+01	5.06E+02	1.09E+05	9.56E+03
6020	9	4.13E+01	1.90E+02	5.99E+02	2.82E+03	2.58E+01	5.10E+02	1.10E+05	9.69E+03
6020	10	4.16E+01	1.92E+02	6.05E+02	2.86E+03	2.60E+01	5.13E+02	1.12E+05	9.80E+03
6020	11	4.26E+01	1.96E+02	6.39E+02	3.04E+03	2.66E+01	5.25E+02	1.18E+05	1.04E+04
6020	12	4.26E+01	1.96E+02	6.39E+02	3.04E+03	2.66E+01	5.25E+02	1.18E+05	1.04E+04
6020	13	4.26E+01	1.96E+02	6.39E+02	3.04E+03	2.66E+01	5.25E+02	1.18E+05	1.04E+04
6020	14	4.26E+01	1.96E+02	6.39E+02	3.04E+03	2.66E+01	5.25E+02	1.18E+05	1.04E+04
6020	15	4.26E+01	1.96E+02	6.39E+02	3.04E+03	2.66E+01	5.25E+02	1.18E+05	1.04E+04

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7020	1	6.40E+01	1.42E+02	3.94E+02	2.11E+03	2.28E+01	4.08E+02	1.23E+05	7.48E+03
7020	2	6.60E+01	1.45E+02	4.07E+02	2.19E+03	2.35E+01	4.17E+02	1.27E+05	7.75E+03
7020	3	6.69E+01	1.46E+02	4.13E+02	2.23E+03	2.38E+01	4.20E+02	1.28E+05	7.88E+03
7020	4	6.77E+01	1.47E+02	4.18E+02	2.26E+03	2.41E+01	4.22E+02	1.30E+05	7.99E+03
7020	5	6.84E+01	1.47E+02	4.22E+02	2.29E+03	2.43E+01	4.24E+02	1.31E+05	8.10E+03
7020	6	6.91E+01	1.47E+02	4.27E+02	2.32E+03	2.46E+01	4.25E+02	1.33E+05	8.20E+03
7020	7	6.98E+01	1.48E+02	4.31E+02	2.34E+03	2.48E+01	4.25E+02	1.34E+05	8.30E+03
7020	8	7.04E+01	1.48E+02	4.35E+02	2.37E+03	2.50E+01	4.26E+02	1.35E+05	8.40E+03
7020	9	7.11E+01	1.48E+02	4.39E+02	2.40E+03	2.53E+01	4.27E+02	1.37E+05	8.50E+03
7020	10	7.17E+01	1.49E+02	4.43E+02	2.43E+03	2.55E+01	4.28E+02	1.38E+05	8.59E+03
7020	11	7.51E+01	1.48E+02	4.65E+02	2.61E+03	2.67E+01	4.25E+02	1.45E+05	9.25E+03
7020	12	7.51E+01	1.48E+02	4.65E+02	2.61E+03	2.67E+01	4.25E+02	1.45E+05	9.25E+03
7020	13	7.51E+01	1.48E+02	4.65E+02	2.61E+03	2.67E+01	4.25E+02	1.45E+05	9.25E+03
7020	14	7.51E+01	1.48E+02	4.65E+02	2.61E+03	2.67E+01	4.25E+02	1.45E+05	9.25E+03
7020	15	7.51E+01	1.48E+02	4.65E+02	2.61E+03	2.67E+01	4.25E+02	1.45E+05	9.25E+03
8020	1	2.55E+01	1.51E+02	8.17E+02	2.47E+03	1.84E+01	1.84E+02	5.31E+04	2.53E+03
8020	2	2.61E+01	1.55E+02	8.97E+02	2.75E+03	1.88E+01	1.89E+02	5.83E+04	2.82E+03
8020	3	2.71E+01	1.63E+02	1.00E+03	3.10E+03	1.95E+01	1.98E+02	6.53E+04	3.17E+03
8020	4	2.81E+01	1.71E+02	1.11E+03	3.45E+03	2.02E+01	2.08E+02	7.25E+04	3.53E+03
8020	5	2.90E+01	1.79E+02	1.22E+03	3.79E+03	2.09E+01	2.18E+02	7.96E+04	3.88E+03
8020	6	3.01E+01	1.87E+02	1.34E+03	4.14E+03	2.17E+01	2.28E+02	8.70E+04	4.24E+03
8020	7	3.12E+01	1.96E+02	1.46E+03	4.51E+03	2.25E+01	2.38E+02	9.47E+04	4.62E+03
8020	8	3.24E+01	2.05E+02	1.58E+03	4.90E+03	2.33E+01	2.49E+02	1.03E+05	5.01E+03
8020	9	3.36E+01	2.15E+02	1.71E+03	5.30E+03	2.42E+01	2.61E+02	1.11E+05	5.42E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
8020	10	3.48E+01	2.25E+02	1.85E+03	5.70E+03	2.51E+01	2.73E+02	1.20E+05	5.84E+03
8020	11	3.62E+01	2.36E+02	2.00E+03	6.14E+03	2.61E+01	2.87E+02	1.30E+05	6.28E+03
8020	12	4.30E+01	2.96E+02	2.85E+03	8.83E+03	3.10E+01	3.60E+02	1.85E+05	9.04E+03
8020	13	4.40E+01	3.09E+02	3.04E+03	9.47E+03	3.17E+01	3.76E+02	1.98E+05	9.69E+03
8020	14	4.40E+01	3.09E+02	3.04E+03	9.47E+03	3.17E+01	3.76E+02	1.98E+05	9.69E+03
8020	15	4.40E+01	3.09E+02	3.04E+03	9.47E+03	3.17E+01	3.76E+02	1.98E+05	9.69E+03
9020	1	2.50E+01	2.27E+02	1.75E+03	4.55E+03	2.68E+01	2.12E+02	3.74E+04	3.41E+03
9020	2	2.50E+01	2.29E+02	1.79E+03	4.72E+03	2.68E+01	2.14E+02	3.81E+04	3.54E+03
9020	3	2.49E+01	2.30E+02	1.82E+03	4.88E+03	2.67E+01	2.15E+02	3.87E+04	3.65E+03
9020	4	2.48E+01	2.31E+02	1.84E+03	5.03E+03	2.66E+01	2.15E+02	3.93E+04	3.77E+03
9020	5	2.47E+01	2.32E+02	1.88E+03	5.20E+03	2.64E+01	2.16E+02	4.00E+04	3.90E+03
9020	6	2.45E+01	2.33E+02	1.92E+03	5.38E+03	2.63E+01	2.18E+02	4.08E+04	4.03E+03
9020	7	2.44E+01	2.34E+02	1.96E+03	5.57E+03	2.61E+01	2.19E+02	4.17E+04	4.17E+03
9020	8	2.42E+01	2.36E+02	2.01E+03	5.78E+03	2.59E+01	2.20E+02	4.28E+04	4.33E+03
9020	9	2.40E+01	2.38E+02	2.06E+03	6.01E+03	2.57E+01	2.22E+02	4.40E+04	4.50E+03
9020	10	2.38E+01	2.40E+02	2.13E+03	6.25E+03	2.54E+01	2.24E+02	4.53E+04	4.68E+03
9020	11	2.03E+01	2.60E+02	2.77E+03	8.82E+03	2.17E+01	2.43E+02	5.90E+04	6.61E+03
9020	12	2.03E+01	2.60E+02	2.77E+03	8.82E+03	2.17E+01	2.43E+02	5.90E+04	6.61E+03
9020	13	2.03E+01	2.60E+02	2.77E+03	8.82E+03	2.17E+01	2.43E+02	5.90E+04	6.61E+03
9020	14	2.03E+01	2.60E+02	2.77E+03	8.82E+03	2.17E+01	2.43E+02	5.90E+04	6.61E+03
9020	15	2.03E+01	2.60E+02	2.77E+03	8.82E+03	2.17E+01	2.43E+02	5.90E+04	6.61E+03
6021	1	4.52E+01	1.57E+02	4.67E+02	2.20E+03	3.07E+01	2.34E+02	2.87E+03	4.36E+03
6021	2	4.62E+01	1.60E+02	4.78E+02	2.28E+03	3.13E+01	2.38E+02	2.94E+03	4.50E+03
6021	3	4.71E+01	1.63E+02	4.89E+02	2.34E+03	3.20E+01	2.43E+02	3.01E+03	4.63E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6021	4	4.80E+01	1.65E+02	4.99E+02	2.41E+03	3.26E+01	2.47E+02	3.07E+03	4.76E+03
6021	5	4.89E+01	1.68E+02	5.10E+02	2.47E+03	3.31E+01	2.50E+02	3.13E+03	4.88E+03
6021	6	4.97E+01	1.70E+02	5.19E+02	2.53E+03	3.37E+01	2.54E+02	3.19E+03	5.00E+03
6021	7	5.05E+01	1.73E+02	5.29E+02	2.59E+03	3.42E+01	2.57E+02	3.25E+03	5.12E+03
6021	8	5.12E+01	1.75E+02	5.39E+02	2.65E+03	3.48E+01	2.61E+02	3.31E+03	5.24E+03
6021	9	5.20E+01	1.77E+02	5.48E+02	2.71E+03	3.53E+01	2.64E+02	3.37E+03	5.35E+03
6021	10	5.27E+01	1.79E+02	5.56E+02	2.76E+03	3.57E+01	2.67E+02	3.42E+03	5.46E+03
6021	11	5.52E+01	1.86E+02	5.96E+02	3.02E+03	3.75E+01	2.77E+02	3.66E+03	5.97E+03
6021	12	5.52E+01	1.86E+02	5.96E+02	3.02E+03	3.75E+01	2.77E+02	3.66E+03	5.97E+03
6021	13	5.52E+01	1.86E+02	5.96E+02	3.02E+03	3.75E+01	2.77E+02	3.66E+03	5.97E+03
6021	14	5.52E+01	1.86E+02	5.96E+02	3.02E+03	3.75E+01	2.77E+02	3.66E+03	5.97E+03
6021	15	5.52E+01	1.86E+02	5.96E+02	3.02E+03	3.75E+01	2.77E+02	3.66E+03	5.97E+03
7021	1	6.17E+01	1.38E+02	4.15E+02	2.11E+03	2.98E+01	1.74E+02	2.93E+03	3.04E+03
7021	2	6.32E+01	1.41E+02	4.25E+02	2.18E+03	3.05E+01	1.77E+02	3.00E+03	3.13E+03
7021	3	6.45E+01	1.43E+02	4.34E+02	2.23E+03	3.11E+01	1.79E+02	3.07E+03	3.21E+03
7021	4	6.55E+01	1.44E+02	4.42E+02	2.28E+03	3.16E+01	1.81E+02	3.12E+03	3.27E+03
7021	5	6.65E+01	1.45E+02	4.49E+02	2.32E+03	3.20E+01	1.83E+02	3.17E+03	3.33E+03
7021	6	6.73E+01	1.46E+02	4.55E+02	2.36E+03	3.24E+01	1.84E+02	3.21E+03	3.38E+03
7021	7	6.81E+01	1.47E+02	4.61E+02	2.39E+03	3.28E+01	1.85E+02	3.26E+03	3.44E+03
7021	8	6.89E+01	1.48E+02	4.67E+02	2.43E+03	3.32E+01	1.86E+02	3.30E+03	3.49E+03
7021	9	6.98E+01	1.49E+02	4.73E+02	2.47E+03	3.36E+01	1.87E+02	3.34E+03	3.54E+03
7021	10	7.05E+01	1.49E+02	4.78E+02	2.50E+03	3.40E+01	1.88E+02	3.38E+03	3.59E+03
7021	11	7.37E+01	1.50E+02	5.03E+02	2.67E+03	3.55E+01	1.88E+02	3.56E+03	3.84E+03
7021	12	7.37E+01	1.50E+02	5.03E+02	2.67E+03	3.55E+01	1.88E+02	3.56E+03	3.84E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7021	13	7.37E+01	1.50E+02	5.03E+02	2.67E+03	3.55E+01	1.88E+02	3.56E+03	3.84E+03
7021	14	7.37E+01	1.50E+02	5.03E+02	2.67E+03	3.55E+01	1.88E+02	3.56E+03	3.84E+03
7021	15	7.37E+01	1.50E+02	5.03E+02	2.67E+03	3.55E+01	1.88E+02	3.56E+03	3.84E+03
6022	1	4.37E+01	1.46E+02	3.87E+02	1.72E+03	3.33E+01	2.01E+02	1.14E+03	3.08E+03
6022	2	4.56E+01	1.47E+02	4.08E+02	1.89E+03	3.47E+01	2.03E+02	1.21E+03	3.38E+03
6022	3	4.76E+01	1.50E+02	4.29E+02	2.04E+03	3.62E+01	2.07E+02	1.27E+03	3.65E+03
6022	4	4.93E+01	1.54E+02	4.48E+02	2.16E+03	3.75E+01	2.12E+02	1.32E+03	3.86E+03
6022	5	5.09E+01	1.58E+02	4.65E+02	2.27E+03	3.88E+01	2.17E+02	1.37E+03	4.06E+03
6022	6	5.25E+01	1.61E+02	4.81E+02	2.37E+03	4.00E+01	2.22E+02	1.42E+03	4.25E+03
6022	7	5.41E+01	1.65E+02	4.98E+02	2.48E+03	4.12E+01	2.27E+02	1.47E+03	4.45E+03
6022	8	5.57E+01	1.69E+02	5.15E+02	2.59E+03	4.24E+01	2.32E+02	1.52E+03	4.64E+03
6022	9	5.72E+01	1.72E+02	5.32E+02	2.70E+03	4.36E+01	2.37E+02	1.57E+03	4.83E+03
6022	10	5.87E+01	1.76E+02	5.48E+02	2.80E+03	4.47E+01	2.42E+02	1.62E+03	5.01E+03
6022	11	6.32E+01	1.86E+02	6.12E+02	3.23E+03	4.81E+01	2.55E+02	1.81E+03	5.78E+03
6022	12	6.32E+01	1.86E+02	6.12E+02	3.23E+03	4.81E+01	2.55E+02	1.81E+03	5.78E+03
6022	13	6.32E+01	1.86E+02	6.12E+02	3.23E+03	4.81E+01	2.55E+02	1.81E+03	5.78E+03
6022	14	6.32E+01	1.86E+02	6.12E+02	3.23E+03	4.81E+01	2.55E+02	1.81E+03	5.78E+03
6022	15	6.32E+01	1.86E+02	6.12E+02	3.23E+03	4.81E+01	2.55E+02	1.81E+03	5.78E+03
7022	1	5.06E+01	1.30E+02	4.21E+02	1.80E+03	3.34E+01	2.18E+02	1.20E+03	3.21E+03
7022	2	5.28E+01	1.32E+02	4.41E+02	1.93E+03	3.48E+01	2.21E+02	1.26E+03	3.43E+03
7022	3	5.49E+01	1.34E+02	4.62E+02	2.05E+03	3.62E+01	2.25E+02	1.31E+03	3.64E+03
7022	4	5.69E+01	1.37E+02	4.81E+02	2.16E+03	3.75E+01	2.29E+02	1.37E+03	3.83E+03
7022	5	5.89E+01	1.39E+02	5.00E+02	2.26E+03	3.88E+01	2.33E+02	1.42E+03	4.02E+03
7022	6	6.08E+01	1.41E+02	5.17E+02	2.36E+03	4.01E+01	2.37E+02	1.47E+03	4.19E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7022	7	6.25E+01	1.43E+02	5.34E+02	2.45E+03	4.12E+01	2.41E+02	1.52E+03	4.36E+03
7022	8	6.42E+01	1.46E+02	5.50E+02	2.54E+03	4.23E+01	2.44E+02	1.57E+03	4.52E+03
7022	9	6.58E+01	1.48E+02	5.66E+02	2.63E+03	4.34E+01	2.47E+02	1.61E+03	4.67E+03
7022	10	6.74E+01	1.49E+02	5.81E+02	2.71E+03	4.44E+01	2.51E+02	1.65E+03	4.82E+03
7022	11	7.35E+01	1.57E+02	6.47E+02	3.10E+03	4.84E+01	2.63E+02	1.84E+03	5.51E+03
7022	12	7.35E+01	1.57E+02	6.47E+02	3.10E+03	4.84E+01	2.63E+02	1.84E+03	5.51E+03
7022	13	7.35E+01	1.57E+02	6.47E+02	3.10E+03	4.84E+01	2.63E+02	1.84E+03	5.51E+03
7022	14	7.35E+01	1.57E+02	6.47E+02	3.10E+03	4.84E+01	2.63E+02	1.84E+03	5.51E+03
7022	15	7.35E+01	1.57E+02	6.47E+02	3.10E+03	4.84E+01	2.63E+02	1.84E+03	5.51E+03
6023	1	4.83E+01	1.53E+02	4.50E+02	2.16E+03	3.67E+01	2.85E+02	7.59E+02	3.98E+03
6023	2	4.87E+01	1.54E+02	4.56E+02	2.20E+03	3.70E+01	2.87E+02	7.69E+02	4.05E+03
6023	3	4.92E+01	1.55E+02	4.62E+02	2.24E+03	3.73E+01	2.89E+02	7.79E+02	4.13E+03
6023	4	5.00E+01	1.58E+02	4.72E+02	2.30E+03	3.80E+01	2.94E+02	7.96E+02	4.24E+03
6023	5	5.10E+01	1.60E+02	4.83E+02	2.37E+03	3.87E+01	2.98E+02	8.14E+02	4.36E+03
6023	6	5.20E+01	1.63E+02	4.93E+02	2.43E+03	3.94E+01	3.03E+02	8.32E+02	4.48E+03
6023	7	5.30E+01	1.66E+02	5.04E+02	2.50E+03	4.02E+01	3.08E+02	8.50E+02	4.61E+03
6023	8	5.40E+01	1.68E+02	5.15E+02	2.57E+03	4.10E+01	3.13E+02	8.69E+02	4.73E+03
6023	9	5.50E+01	1.71E+02	5.26E+02	2.64E+03	4.17E+01	3.18E+02	8.87E+02	4.85E+03
6023	10	5.60E+01	1.74E+02	5.37E+02	2.70E+03	4.25E+01	3.23E+02	9.06E+02	4.97E+03
6023	11	6.02E+01	1.85E+02	5.89E+02	3.04E+03	4.57E+01	3.45E+02	9.93E+02	5.60E+03
6023	12	6.02E+01	1.85E+02	5.89E+02	3.04E+03	4.57E+01	3.45E+02	9.93E+02	5.60E+03
6023	13	6.02E+01	1.85E+02	5.89E+02	3.04E+03	4.57E+01	3.45E+02	9.93E+02	5.60E+03
6023	14	6.02E+01	1.85E+02	5.89E+02	3.04E+03	4.57E+01	3.45E+02	9.93E+02	5.60E+03
6023	15	6.02E+01	1.85E+02	5.89E+02	3.04E+03	4.57E+01	3.45E+02	9.93E+02	5.60E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7023	1	5.39E+01	1.27E+02	4.28E+02	1.96E+03	3.45E+01	2.78E+02	7.37E+02	3.78E+03
7023	2	5.57E+01	1.30E+02	4.43E+02	2.03E+03	3.57E+01	2.85E+02	7.63E+02	3.92E+03
7023	3	5.75E+01	1.34E+02	4.59E+02	2.12E+03	3.68E+01	2.93E+02	7.89E+02	4.08E+03
7023	4	5.91E+01	1.37E+02	4.73E+02	2.19E+03	3.78E+01	2.99E+02	8.13E+02	4.23E+03
7023	5	6.06E+01	1.39E+02	4.86E+02	2.27E+03	3.88E+01	3.04E+02	8.36E+02	4.38E+03
7023	6	6.21E+01	1.41E+02	5.00E+02	2.35E+03	3.98E+01	3.10E+02	8.60E+02	4.53E+03
7023	7	6.36E+01	1.44E+02	5.13E+02	2.43E+03	4.07E+01	3.15E+02	8.83E+02	4.68E+03
7023	8	6.51E+01	1.46E+02	5.27E+02	2.50E+03	4.17E+01	3.20E+02	9.06E+02	4.83E+03
7023	9	6.66E+01	1.49E+02	5.40E+02	2.58E+03	4.26E+01	3.25E+02	9.29E+02	4.97E+03
7023	10	6.80E+01	1.51E+02	5.53E+02	2.65E+03	4.35E+01	3.30E+02	9.51E+02	5.11E+03
7023	11	7.35E+01	1.58E+02	6.10E+02	2.98E+03	4.71E+01	3.45E+02	1.05E+03	5.74E+03
7023	12	7.35E+01	1.58E+02	6.10E+02	2.98E+03	4.71E+01	3.45E+02	1.05E+03	5.74E+03
7023	13	7.35E+01	1.58E+02	6.10E+02	2.98E+03	4.71E+01	3.45E+02	1.05E+03	5.74E+03
7023	14	7.35E+01	1.58E+02	6.10E+02	2.98E+03	4.71E+01	3.45E+02	1.05E+03	5.74E+03
7023	15	7.35E+01	1.58E+02	6.10E+02	2.98E+03	4.71E+01	3.45E+02	1.05E+03	5.74E+03
6024	1	4.00E+01	1.21E+02	2.55E+02	1.44E+03	2.84E+01	1.86E+02	3.00E+02	2.10E+03
6024	2	4.27E+01	1.26E+02	2.76E+02	1.58E+03	3.03E+01	1.93E+02	3.26E+02	2.31E+03
6024	3	4.49E+01	1.30E+02	2.97E+02	1.70E+03	3.19E+01	2.00E+02	3.49E+02	2.47E+03
6024	4	4.71E+01	1.34E+02	3.18E+02	1.81E+03	3.34E+01	2.07E+02	3.75E+02	2.64E+03
6024	5	4.93E+01	1.38E+02	3.40E+02	1.92E+03	3.50E+01	2.12E+02	4.01E+02	2.81E+03
6024	6	5.16E+01	1.41E+02	3.63E+02	2.04E+03	3.66E+01	2.17E+02	4.28E+02	2.98E+03
6024	7	5.41E+01	1.44E+02	3.87E+02	2.17E+03	3.84E+01	2.22E+02	4.56E+02	3.16E+03
6024	8	5.68E+01	1.47E+02	4.12E+02	2.30E+03	4.03E+01	2.26E+02	4.86E+02	3.36E+03
6024	9	5.97E+01	1.50E+02	4.40E+02	2.45E+03	4.24E+01	2.31E+02	5.19E+02	3.57E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6024	10	6.28E+01	1.54E+02	4.70E+02	2.59E+03	4.46E+01	2.36E+02	5.54E+02	3.78E+03
6024	11	6.71E+01	1.58E+02	5.11E+02	2.79E+03	4.77E+01	2.44E+02	6.02E+02	4.07E+03
6024	12	7.59E+01	1.69E+02	5.92E+02	3.22E+03	5.39E+01	2.60E+02	6.97E+02	4.70E+03
6024	13	8.33E+01	1.78E+02	6.58E+02	3.56E+03	5.92E+01	2.74E+02	7.76E+02	5.19E+03
6024	14	9.07E+01	1.88E+02	7.24E+02	3.87E+03	6.44E+01	2.90E+02	8.53E+02	5.65E+03
6024	15	1.01E+02	2.04E+02	8.21E+02	4.38E+03	7.20E+01	3.14E+02	9.68E+02	6.39E+03
7024	1	3.33E+01	1.01E+02	2.92E+02	1.32E+03	2.37E+01	1.68E+02	2.61E+02	2.10E+03
7024	2	3.62E+01	1.06E+02	3.37E+02	1.50E+03	2.57E+01	1.77E+02	3.01E+02	2.39E+03
7024	3	3.84E+01	1.11E+02	3.75E+02	1.64E+03	2.73E+01	1.85E+02	3.35E+02	2.61E+03
7024	4	4.06E+01	1.16E+02	4.14E+02	1.78E+03	2.89E+01	1.93E+02	3.69E+02	2.84E+03
7024	5	4.30E+01	1.20E+02	4.55E+02	1.93E+03	3.06E+01	2.00E+02	4.06E+02	3.07E+03
7024	6	4.55E+01	1.25E+02	4.98E+02	2.08E+03	3.24E+01	2.08E+02	4.45E+02	3.31E+03
7024	7	4.83E+01	1.30E+02	5.45E+02	2.25E+03	3.43E+01	2.16E+02	4.86E+02	3.57E+03
7024	8	5.11E+01	1.35E+02	5.94E+02	2.41E+03	3.64E+01	2.25E+02	5.30E+02	3.84E+03
7024	9	5.41E+01	1.40E+02	6.46E+02	2.58E+03	3.85E+01	2.34E+02	5.77E+02	4.11E+03
7024	10	5.73E+01	1.46E+02	7.00E+02	2.74E+03	4.08E+01	2.43E+02	6.25E+02	4.36E+03
7024	11	6.70E+01	1.63E+02	8.60E+02	3.32E+03	4.77E+01	2.71E+02	7.68E+02	5.27E+03
7024	12	7.62E+01	1.80E+02	1.01E+03	3.86E+03	5.42E+01	2.99E+02	9.01E+02	6.14E+03
7024	13	8.32E+01	1.92E+02	1.14E+03	4.36E+03	5.92E+01	3.19E+02	1.02E+03	6.93E+03
7024	14	8.64E+01	1.97E+02	1.22E+03	4.70E+03	6.15E+01	3.27E+02	1.09E+03	7.47E+03
7024	15	8.64E+01	1.97E+02	1.22E+03	4.70E+03	6.15E+01	3.27E+02	1.09E+03	7.47E+03
6025	1	3.37E+01	1.64E+02	4.93E+02	1.68E+03	2.74E+01	1.15E+02	3.00E+02	1.88E+03
6025	2	3.47E+01	1.68E+02	5.27E+02	1.77E+03	2.82E+01	1.18E+02	3.20E+02	1.98E+03
6025	3	3.64E+01	1.77E+02	5.80E+02	1.92E+03	2.96E+01	1.24E+02	3.52E+02	2.14E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
6025	4	3.81E+01	1.86E+02	6.36E+02	2.06E+03	3.10E+01	1.31E+02	3.86E+02	2.30E+03
6025	5	3.97E+01	1.95E+02	6.91E+02	2.20E+03	3.23E+01	1.37E+02	4.20E+02	2.46E+03
6025	6	4.12E+01	2.03E+02	7.49E+02	2.34E+03	3.35E+01	1.43E+02	4.55E+02	2.62E+03
6025	7	4.28E+01	2.12E+02	8.11E+02	2.49E+03	3.48E+01	1.49E+02	4.93E+02	2.79E+03
6025	8	4.45E+01	2.22E+02	8.79E+02	2.66E+03	3.62E+01	1.56E+02	5.34E+02	2.97E+03
6025	9	4.63E+01	2.33E+02	9.50E+02	2.83E+03	3.76E+01	1.64E+02	5.77E+02	3.16E+03
6025	10	4.82E+01	2.45E+02	1.03E+03	3.00E+03	3.92E+01	1.72E+02	6.24E+02	3.35E+03
6025	11	5.04E+01	2.58E+02	1.11E+03	3.17E+03	4.09E+01	1.81E+02	6.75E+02	3.55E+03
6025	12	5.66E+01	2.94E+02	1.33E+03	3.71E+03	4.60E+01	2.06E+02	8.08E+02	4.15E+03
6025	13	6.19E+01	3.23E+02	1.51E+03	4.14E+03	5.03E+01	2.27E+02	9.20E+02	4.63E+03
6025	14	6.87E+01	3.66E+02	1.79E+03	4.80E+03	5.58E+01	2.57E+02	1.09E+03	5.37E+03
6025	15	7.22E+01	3.91E+02	1.96E+03	5.20E+03	5.87E+01	2.75E+02	1.19E+03	5.82E+03
7025	1	3.57E+01	2.12E+02	6.08E+02	2.64E+03	2.95E+01	1.35E+02	4.53E+02	2.65E+03
7025	2	3.74E+01	2.24E+02	6.54E+02	2.85E+03	3.09E+01	1.43E+02	4.88E+02	2.85E+03
7025	3	3.86E+01	2.33E+02	6.87E+02	3.00E+03	3.18E+01	1.49E+02	5.12E+02	3.00E+03
7025	4	3.97E+01	2.42E+02	7.21E+02	3.15E+03	3.28E+01	1.54E+02	5.38E+02	3.15E+03
7025	5	4.10E+01	2.52E+02	7.58E+02	3.30E+03	3.38E+01	1.61E+02	5.65E+02	3.31E+03
7025	6	4.22E+01	2.62E+02	7.96E+02	3.46E+03	3.49E+01	1.67E+02	5.93E+02	3.47E+03
7025	7	4.35E+01	2.72E+02	8.35E+02	3.63E+03	3.59E+01	1.73E+02	6.23E+02	3.63E+03
7025	8	4.48E+01	2.82E+02	8.74E+02	3.79E+03	3.70E+01	1.80E+02	6.52E+02	3.80E+03
7025	9	4.61E+01	2.92E+02	9.14E+02	3.96E+03	3.80E+01	1.86E+02	6.82E+02	3.96E+03
7025	10	4.73E+01	3.02E+02	9.53E+02	4.10E+03	3.91E+01	1.93E+02	7.11E+02	4.10E+03
7025	11	5.15E+01	3.50E+02	1.16E+03	5.10E+03	4.26E+01	2.23E+02	8.63E+02	5.10E+03
7025	12	5.15E+01	3.50E+02	1.16E+03	5.10E+03	4.26E+01	2.23E+02	8.63E+02	5.10E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7025	13	5.15E+01	3.50E+02	1.16E+03	5.10E+03	4.26E+01	2.23E+02	8.63E+02	5.10E+03
7025	14	5.15E+01	3.50E+02	1.16E+03	5.10E+03	4.26E+01	2.23E+02	8.63E+02	5.10E+03
7025	15	5.15E+01	3.50E+02	1.16E+03	5.10E+03	4.26E+01	2.23E+02	8.63E+02	5.10E+03
6026	1	4.10E+01	2.07E+02	5.07E+02	2.83E+03	1.69E+01	3.63E+01	1.02E+02	2.64E+03
6026	2	4.20E+01	2.16E+02	5.29E+02	2.98E+03	1.73E+01	3.78E+01	1.06E+02	2.78E+03
6026	3	4.17E+01	2.27E+02	5.69E+02	3.09E+03	1.71E+01	3.98E+01	1.14E+02	2.88E+03
6026	4	4.00E+01	2.37E+02	6.11E+02	3.15E+03	1.64E+01	4.16E+01	1.23E+02	2.94E+03
6026	5	3.76E+01	2.44E+02	6.39E+02	3.17E+03	1.55E+01	4.27E+01	1.28E+02	2.96E+03
6026	6	3.56E+01	2.45E+02	6.50E+02	3.14E+03	1.47E+01	4.30E+01	1.31E+02	2.93E+03
6026	7	3.46E+01	2.44E+02	6.45E+02	3.10E+03	1.42E+01	4.27E+01	1.30E+02	2.89E+03
6026	8	3.46E+01	2.40E+02	6.32E+02	3.07E+03	1.42E+01	4.20E+01	1.27E+02	2.86E+03
6026	9	3.51E+01	2.35E+02	6.14E+02	3.06E+03	1.44E+01	4.12E+01	1.23E+02	2.86E+03
6026	10	3.59E+01	2.30E+02	5.95E+02	3.06E+03	1.48E+01	4.03E+01	1.20E+02	2.86E+03
6026	11	3.65E+01	2.22E+02	5.68E+02	3.06E+03	1.50E+01	3.88E+01	1.14E+02	2.86E+03
6026	12	3.68E+01	2.14E+02	5.41E+02	3.05E+03	1.51E+01	3.74E+01	1.09E+02	2.85E+03
6026	13	3.68E+01	2.07E+02	5.20E+02	3.05E+03	1.51E+01	3.63E+01	1.04E+02	2.85E+03
6026	14	3.65E+01	2.04E+02	5.13E+02	3.06E+03	1.50E+01	3.58E+01	1.03E+02	2.85E+03
6026	15	3.60E+01	2.05E+02	5.20E+02	3.07E+03	1.48E+01	3.59E+01	1.04E+02	2.86E+03
7026	1	3.73E+01	2.32E+02	4.58E+02	2.69E+03	1.89E+01	4.66E+01	1.77E+02	1.84E+03
7026	2	3.82E+01	2.42E+02	4.83E+02	2.85E+03	1.93E+01	4.86E+01	1.87E+02	1.95E+03
7026	3	3.89E+01	2.53E+02	5.13E+02	3.02E+03	1.97E+01	5.08E+01	1.98E+02	2.06E+03
7026	4	3.95E+01	2.65E+02	5.46E+02	3.20E+03	2.00E+01	5.33E+01	2.11E+02	2.19E+03
7026	5	4.02E+01	2.78E+02	5.82E+02	3.39E+03	2.04E+01	5.60E+01	2.25E+02	2.32E+03
7026	6	4.08E+01	2.92E+02	6.19E+02	3.59E+03	2.07E+01	5.87E+01	2.39E+02	2.46E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7026	7	4.15E+01	3.06E+02	6.56E+02	3.80E+03	2.10E+01	6.15E+01	2.54E+02	2.60E+03
7026	8	4.22E+01	3.20E+02	6.94E+02	4.00E+03	2.14E+01	6.43E+01	2.68E+02	2.74E+03
7026	9	4.29E+01	3.35E+02	7.32E+02	4.21E+03	2.18E+01	6.73E+01	2.83E+02	2.88E+03
7026	10	4.37E+01	3.49E+02	7.72E+02	4.41E+03	2.22E+01	7.02E+01	2.99E+02	3.02E+03
7026	11	4.50E+01	3.69E+02	8.23E+02	4.68E+03	2.28E+01	7.41E+01	3.18E+02	3.20E+03
7026	12	4.88E+01	4.13E+02	9.40E+02	5.38E+03	2.47E+01	8.30E+01	3.64E+02	3.68E+03
7026	13	5.16E+01	4.49E+02	1.04E+03	5.99E+03	2.61E+01	9.02E+01	4.01E+02	4.10E+03
7026	14	5.26E+01	4.70E+02	1.10E+03	6.40E+03	2.66E+01	9.45E+01	4.25E+02	4.38E+03
7026	15	5.26E+01	4.70E+02	1.10E+03	6.40E+03	2.66E+01	9.45E+01	4.25E+02	4.38E+03
6027	1	3.30E+01	1.74E+02	2.70E+02	2.01E+03	3.62E+01	1.86E+02	3.00E+02	2.32E+03
6027	2	3.38E+01	1.80E+02	2.87E+02	2.16E+03	3.71E+01	1.93E+02	3.19E+02	2.49E+03
6027	3	3.38E+01	1.85E+02	3.04E+02	2.25E+03	3.71E+01	1.98E+02	3.38E+02	2.60E+03
6027	4	3.36E+01	1.89E+02	3.22E+02	2.33E+03	3.68E+01	2.02E+02	3.58E+02	2.68E+03
6027	5	3.33E+01	1.91E+02	3.38E+02	2.40E+03	3.66E+01	2.05E+02	3.76E+02	2.77E+03
6027	6	3.32E+01	1.93E+02	3.53E+02	2.48E+03	3.64E+01	2.06E+02	3.93E+02	2.86E+03
6027	7	3.32E+01	1.94E+02	3.68E+02	2.56E+03	3.64E+01	2.08E+02	4.09E+02	2.96E+03
6027	8	3.33E+01	1.96E+02	3.85E+02	2.66E+03	3.65E+01	2.10E+02	4.28E+02	3.07E+03
6027	9	3.34E+01	1.99E+02	4.05E+02	2.77E+03	3.67E+01	2.13E+02	4.50E+02	3.20E+03
6027	10	3.35E+01	2.04E+02	4.29E+02	2.89E+03	3.68E+01	2.18E+02	4.77E+02	3.33E+03
6027	11	3.38E+01	2.12E+02	4.74E+02	3.10E+03	3.71E+01	2.27E+02	5.26E+02	3.57E+03
6027	12	3.45E+01	2.24E+02	5.26E+02	3.33E+03	3.79E+01	2.39E+02	5.84E+02	3.84E+03
6027	13	3.58E+01	2.39E+02	5.96E+02	3.66E+03	3.93E+01	2.55E+02	6.63E+02	4.23E+03
6027	14	3.75E+01	2.55E+02	6.73E+02	4.03E+03	4.12E+01	2.73E+02	7.48E+02	4.65E+03
6027	15	3.97E+01	2.74E+02	7.67E+02	4.48E+03	4.36E+01	2.94E+02	8.52E+02	5.17E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Comparison of CPG and Revised Arthur Kill Water Year 1996 Sediment Initial Conditions

Cell	Layer	CPG WY1996 Initial Conditions				Arthur Kill Revised WY1996 Initial Conditions			
		TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)	TCDD (ng/kg-dw)	TETRA (ug/kg-dw)	DDX (ug/kg-dw)	HG (ug/kg-dw)
7027	1	3.55E+01	2.24E+02	4.41E+02	2.69E+03	3.76E+01	1.66E+02	5.01E+02	3.14E+03
7027	2	3.65E+01	2.33E+02	4.62E+02	2.84E+03	3.86E+01	1.72E+02	5.26E+02	3.32E+03
7027	3	3.72E+01	2.39E+02	4.79E+02	2.95E+03	3.94E+01	1.77E+02	5.45E+02	3.45E+03
7027	4	3.79E+01	2.46E+02	4.96E+02	3.07E+03	4.01E+01	1.82E+02	5.64E+02	3.58E+03
7027	5	3.86E+01	2.53E+02	5.12E+02	3.18E+03	4.08E+01	1.87E+02	5.83E+02	3.72E+03
7027	6	3.92E+01	2.59E+02	5.29E+02	3.29E+03	4.15E+01	1.92E+02	6.02E+02	3.85E+03
7027	7	3.99E+01	2.65E+02	5.45E+02	3.41E+03	4.22E+01	1.96E+02	6.20E+02	3.98E+03
7027	8	4.05E+01	2.71E+02	5.61E+02	3.51E+03	4.29E+01	2.01E+02	6.38E+02	4.10E+03
7027	9	4.11E+01	2.77E+02	5.77E+02	3.62E+03	4.35E+01	2.05E+02	6.56E+02	4.22E+03
7027	10	4.16E+01	2.82E+02	5.92E+02	3.71E+03	4.41E+01	2.09E+02	6.74E+02	4.33E+03
7027	11	4.23E+01	3.04E+02	6.62E+02	4.23E+03	4.48E+01	2.25E+02	7.54E+02	4.94E+03
7027	12	4.23E+01	3.04E+02	6.62E+02	4.23E+03	4.48E+01	2.25E+02	7.54E+02	4.94E+03
7027	13	4.23E+01	3.04E+02	6.62E+02	4.23E+03	4.48E+01	2.25E+02	7.54E+02	4.94E+03
7027	14	4.29E+01	3.02E+02	6.62E+02	4.18E+03	4.54E+01	2.23E+02	7.53E+02	4.88E+03
7027	15	4.39E+01	2.98E+02	6.61E+02	4.07E+03	4.65E+01	2.20E+02	7.52E+02	4.75E+03

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Appendix B

Model Code Compilation Information

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Appendix B – Model Code Compilation Information

The FORTRAN code used in the NBSA RI/FS modeling is compiled in advance of starting Linux run scripts (i.e. none of the codes are compiled during the simulations). For the reader interested in the details of the model compilation details, compilation instructions are presented below. PGI FORTRAN compiler releases 10.3, 11.8, and 19.4 have been used for the Hydrodynamic/sediment transport and carbon models, and release 19.4 was used for the Wind-wave model, SWAN. The Intel FORTRAN compiler release 12.1.5.339 was used for the contaminant fate and transport model.

Hydrodynamic and Sediment Transport

The hydrodynamic and sediment transport model was compiled by invoking the following Makefile.

```
.SUFFIXES: .a .o .f
FC=pgf95
FFLAGS = -Mextend -Msave -byteswapio -fastsse -Mconcur=nonuma
LFLAGS = -Mextend -byteswapio -fastsse -Msave -Mconcur=nonuma -Bstatic -o
FILES= bcdata.f bcond.f first.f disply.f maxmin.f  print.f prints.f prtxy.f  \
      setdom.f sinter.f slicexz.f sliceyz.f tands.f zeroes.f reordr.f \
      sedflx.f sedic.f suslod.f fhcalc.f wavesmb.f wavedon.f \
      randb.f oclamp.f \
      advave.f advq.f advt.f advu.f advv.f \
      antidif.f antidif_sed.f \
      archive.f baropg.f pclamp.f  ptide.f\
      alphabc.f dens.f ecom3d.f extrnl.f\
      profu.f profv.f proft.f profq.f profe.f \
      smag.f transport.f vertvl.f advsed.f profsed.f bulk.f fzol.f jday.f \
      longwave.f ncld.f n_cloud.f qsat.f vapor.f wreal.f traninp.f \
      partrak.f onepart.f advcon.f stress.f bottau.f \
      datehr.f getdate.f hitflx.f \
      north.f solar.f zenith.f mixed.f wandd_kky.f \
      sj_bedload.f sj_sedflx.f sj_sedic.f sj_tecout.f sj_shuffle.f sj_consol.f \
      makercaf10.f sj_bedload2.f transport_sed.f stswemout.f rw_restart.f \
      sj_tecout_mass_ts.f neg_trap.f gr_fric.f sj_archive.f
OBJECTS= bcdata.o bcond.o first.o disply.o maxmin.o print.o prints.o prtxy.o \
       setdom.o sinter.o slicexz.o sliceyz.o tands.o zeroes.o reordr.o \
       sedflx.o sedic.o suslod.o fhcalc.o wavesmb.o wavedon.o \
       randb.o oclamp.o \
       advave.o advq.o advt.o advu.o advv.o \
       antidif.o antidif_sed.o \
       archive.o baropg.o pclamp.o ptide.o\
       alphabc.o dens.o ecom3d.o extrnl.o\
       profu.o profv.o proft.o profq.o profe.o \
       smag.o transport.o vertvl.o advsed.o profsed.o bulk.o fzol.o jday.o \
       longwave.o ncld.o n_cloud.o qsat.o vapor.o wreal.o traninp.o \
       partrak.o onepart.o advcon.o stress.o bottau.o \
```

```
        datehr.o getdate.o hitflx.o \
        north.o solar.o zenith.o mixed.o wandd_kky.o \
        sj_bedload.o sj_sedflx.o sj_sedic.o sj_tecout.o sj_shuffle.o sj_consol.o \
        makercaf10.o sj_bedload2.o transport_sed.o stswemout.o rw_restart.o \
        sj_tecout_mass_ts.o neg_trap.o gr_fric.o sj_archive.o
ECOMSEDZLJS.EXE: ${OBJECTS} comdeck
        $(FC) $(LFLAGS) ECOMSEDZLJS.EXE  $(OBJECTS)
        @echo "ECOMSEDZLJS.EXE is now up to date."
$(OBJECTS): comdeck
```

Wind-Wave Model

The Wind-wave model was compiled by invoking the following Makefile with the omp option.

```
# ------------------------------------------------------------------------------
#                    Makefile for building SWAN program and documentation
# ------------------------------------------------------------------------------
#
# Before compilation, type "make config" first!
#
# To compile the serial executable type "make ser"
# To compile the OpenMP executable type "make omp"
# To compile the MPI executable type "make mpi"
#
# To remove compiled objects and modules: type "make clean"
#
# To remove compiled objects, modules and executable: type "make clobber"
#
# To compile the SWAN documentation type "make doc"
#
# To remove the PDF and HTML documents type "make cleandoc"
#
# Please do not change anything below, unless you're very sure what you're doing
# ------------------------------------------------------------------------------

include macros.inc

SWAN_EXE = swan.exe

SWAN_OBJS = \
swmod1.$(EXTO) \
swmod2.$(EXTO) \
m_constants.$(EXTO) \
m_fileio.$(EXTO) \
serv_xnl4v5.$(EXTO) \
mod_xnl4v5.$(EXTO) \
SwanGriddata.$(EXTO) \
SwanGridobjects.$(EXTO) \
```

```
SwanCompdata.$(EXTO) \
swanmain.$(EXTO) \
swanpre1.$(EXTO) \
swanpre2.$(EXTO) \
swancom1.$(EXTO) \
swancom2.$(EXTO) \
swancom3.$(EXTO) \
swancom4.$(EXTO) \
swancom5.$(EXTO) \
swanout1.$(EXTO) \
swanout2.$(EXTO) \
swanser.$(EXTO) \
swanparll.$(EXTO) \
SwanReadGrid.$(EXTO) \
SwanReadADCGrid.$(EXTO) \
SwanReadTriangleGrid.$(EXTO) \
SwanReadEasymeshGrid.$(EXTO) \
SwanInitCompGrid.$(EXTO) \
SwanCheckGrid.$(EXTO) \
SwanCreateEdges.$(EXTO) \
SwanGridTopology.$(EXTO) \
SwanGridVert.$(EXTO) \
SwanGridCell.$(EXTO) \
SwanGridFace.$(EXTO) \
SwanPrintGridInfo.$(EXTO) \
SwanFindPoint.$(EXTO) \
SwanPointinMesh.$(EXTO) \
SwanBpntlist.$(EXTO) \
SwanPrepComp.$(EXTO) \
SwanVertlist.$(EXTO) \
SwanCompUnstruc.$(EXTO) \
SwanDispParm.$(EXTO) \
SwanPropvelX.$(EXTO) \
SwanSweepSel.$(EXTO) \
SwanPropvelS.$(EXTO) \
SwanTranspAc.$(EXTO) \
SwanTranspX.$(EXTO) \
SwanDiffPar.$(EXTO) \
SwanGSECorr.$(EXTO) \
SwanInterpolatePoint.$(EXTO) \
SwanInterpolateAc.$(EXTO) \
SwanInterpolateOutput.$(EXTO) \
SwanConvAccur.$(EXTO) \
SwanConvStopc.$(EXTO) \
SwanThreadBounds.$(EXTO) \
SwanFindObstacles.$(EXTO) \
SwanCrossObstacle.$(EXTO) \
SwanComputeForce.$(EXTO) \
SwanIntgratSpc.$(EXTO) \
ocpids.$(EXTO) \
ocpcre.$(EXTO) \
ocpmix.$(EXTO)
```

```
HCAT_EXE = hcat.exe
HCAT_OBJS = swanhcat.$(EXTO)

.SUFFIXES: .o .f .for .f90

.PHONEY: help clean clobber

help:
	@echo "This Makefile supports the following:"
	@echo "make config    -- makes machine-dependent macros include file"
	@echo "make ser       -- makes the serial $(SWAN_EXE) executable"
	@echo "make omp       -- makes the OpenMP $(SWAN_EXE) executable"
	@echo "make mpi       -- makes the    MPI $(SWAN_EXE) executable"
	@echo "make doc       -- makes the SWAN documentation (PDF)"
	@echo "make clean     -- removes compiled objects and modules"
	@echo "make clobber   -- removes compiled objects, modules and $(SWAN_EXE)"
	@echo "make cleandoc  -- removes all SWAN documents"

config:
	@perl platform.pl

install:
	@perl platform.pl

ser:
	@perl switch.pl $(swch) *.ftn *.ftn90
	$(MAKE) FOR=$(F90_SER) FFLAGS="$(FLAGS_OPT) $(FLAGS_MSC)
$(FLAGS_SER)" \
	    FFLAGS90="$(FLAGS_OPT) $(FLAGS90_MSC) $(FLAGS_SER)" \
	  INCS="$(INCS_SER)" LIBS="$(LIBS_SER)" $(SWAN_EXE)
	$(MAKE) hcat

omp:
	@perl switch.pl $(swch) *.ftn *.ftn90
	$(MAKE) FOR=$(F90_OMP) FFLAGS="$(FLAGS_OPT) $(FLAGS_MSC)
$(FLAGS_OMP)" \
	    FFLAGS90="$(FLAGS_OPT) $(FLAGS90_MSC) $(FLAGS_OMP)" \
	  INCS="$(INCS_OMP)" LIBS="$(LIBS_OMP)" $(SWAN_EXE)
	$(MAKE) hcat

mpi:
	@perl switch.pl $(swch) -mpi *.ftn *.ftn90
	$(MAKE) FOR=$(F90_MPI) FFLAGS="$(FLAGS_OPT) $(FLAGS_MSC)
$(FLAGS_MPI)" \
	    FFLAGS90="$(FLAGS_OPT) $(FLAGS90_MSC) $(FLAGS_MPI)" \
	  INCS="$(INCS_MPI)" LIBS="$(LIBS_MPI)" $(SWAN_EXE)
	$(MAKE) hcat

hcat:
	@perl switch.pl $(swch) swanhcat.ftn
	$(MAKE) FOR=$(F90_SER) FFLAGS="$(FLAGS_OPT) $(FLAGS_MSC)
$(FLAGS_SER)" \
```

```
                FFLAGS90="$(FLAGS_OPT) $(FLAGS90_MSC) $(FLAGS_SER)"
$(HCAT_EXE)

doc:
        $(MAKE) -f Makefile.latex TARGET=swanuse doc
        $(MAKE) -f Makefile.latex TARGET=swantech doc
        $(MAKE) -f Makefile.latex TARGET=swanimp doc
        $(MAKE) -f Makefile.latex TARGET=swanpgr doc
        $(MAKE) -f Makefile.latex TARGET=latexfordummies doc

$(HCAT_EXE): $(HCAT_OBJS)
        $(FOR) $(HCAT_OBJS) $(FFLAGS) $(OUT)$(HCAT_EXE)

$(SWAN_EXE): $(SWAN_OBJS)
        $(FOR) $(SWAN_OBJS) $(FFLAGS) $(OUT)$(SWAN_EXE) $(INCS) $(LIBS)

.f.o:
        $(FOR) $< -c $(FFLAGS) $(INCS)

.f90.o:
        $(FOR) $< -c $(FFLAGS90) $(INCS)

.for.o:
        $(FOR) $< -c $(FFLAGS) $(INCS)

.for.obj:
        $(FOR) $< -c $(FFLAGS) $(INCS)

.f90.obj:
        $(FOR) $< -c $(FFLAGS90) $(INCS)

clean:
        $(RM) *.$(EXTO) *.mod

clobber:
        $(RM) *.$(EXTO) *.mod *.f *.for *.f90 $(SWAN_EXE) $(HCAT_EXE)

allclean:
        $(RM) *.$(EXTO) *.mod *.f *.for *.f90 $(SWAN_EXE) $(HCAT_EXE)

cleandoc:
        $(MAKE) -f Makefile.latex TARGET=swanuse cleandoc
        $(MAKE) -f Makefile.latex TARGET=swantech cleandoc
        $(MAKE) -f Makefile.latex TARGET=swanimp cleandoc
        $(MAKE) -f Makefile.latex TARGET=swanpgr cleandoc
        $(MAKE) -f Makefile.latex TARGET=latexfordummies cleandoc
```

Carbon Model

The carbon model was compiled by executing the following Linux command.

```
pgf95 -Bstatic -O2 -Kieee -Mextend -Msave -byteswapio -o rca_aoc *.f
```

Contaminant Fate and Transport

The contaminant fate and transport model was compiled by invoking the following Makefile.

```
SUFFIXES: .o .f .h
FC = ifort -extend_source 132 -O2 -convert big_endian -align -save -static
#####  COMPILING FLAGS  #####
FFLAGS  = -c
#####  LINKING FLAGS  #####
LFLAGS= -i-static -o rca.exe
#####  CODES  #####
OBJECTS = checkstop.o f77_cdadr_func.o f77_hgadr_func.o f77_mehgadr_func.o fmter.o
iunitcheck.o rca01.o rca02.o rca03.o rca04.o rca05.o rca06.o rca07.o rca08.o rca09.o
rca10.o rca11.o rca12.o rca13.o rca14.o rcabyss.o rcadwrit.o rcaexp1.o rcaexp.o rcaexpfl.o
rcaexps.o rca.o rcalf1.o rcalfs.o rcamess.o rcamprof.o rcaprnt.o rcasplt1.o rcasplt2.o
rcasplt.o rcaspltfl.o rcasplts.o rcasplts_nomb.o sedtox_as_dbg.o sinter.o toxics_as_dbg.o
############################
########  TARGETS  ########
############################
rca.exe: $(OBJECTS) RCACM SEDTOXCM3 CHEMPARM.H SEGPARM.H
      $(FC) $(LFLAGS) $(OBJECTS)
      @echo rca.exe is now up to date
############################
#####  DEPENDENCIES  ######
############################
MODULES: RCACM SEDTOXCM3 CHEMPARM.H SEGPARM.H
OBJECTS: RCACM SEDTOXCM3 CHEMPARM.H SEGPARM.H $(MODULES)
OBJECTSD: RCACM SEDTOXCM3 CHEMPARM.H SEGPARM.H
############################
########  RULES  ##########
############################
.f.mod:
      $(FC) $(FFLAGS) $<
.f.o:

      $(FC) $(FFLAGS) $<
```

Appendix C

Model Operation Information

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Appendix C – Model Operations Information

Additional details on model operations are included in this Appendix.

Grid Development and Definition

A brief discussion of the model grid is presented in Section 1.4 of this document and additional details are available in Section 3 of Moffatt & Nichol and Deltares (2020a). A discussion of the evolution of the model grid is presented in Section 2 of HydroQual (2008), and Section 5 of the same document discusses sensitivity analyses and a grid convergence test performed as part of the model development. The hydrodynamic model grid that extends through Long Island Sound and New York/New Jersey Harbor, and out to the continental shelf break off of the Long Island and New Jersey coasts, is referred to as the full grid model. This model was used to provide hydrodynamic model boundary conditions to the truncated grid, at the eastern end of the Kill Van Kull and southern end of the Arthur Kill. The truncated model grid is common to the linked hydrodynamic, sediment transport, carbon, and contaminant fate and transport models. The truncated model grid is identical to the portion of the full grid covering the Kill Van Kull, Arthur Kill, Newark Bay, Hackensack River and Lower Passaic Rivers (LPR). The full grid includes 268 rows by 74 columns, and the truncated grid includes 243 rows by 44 columns.

In general, there are roughly:

- 68 grid cells along the bay, with 9-12 grid cells in Newark Bay perpendicular to channels axis
- 47 grid cells along the river, with 4 grid cells across in LPR downstream of roughly RM 5
- 102 grid cells along the river, with 3 grid cells across in LPR upstream of roughly RM 5

During model development, rigorous grid convergence tests were performed to guide the selected grid resolution in the study area. The tradeoff between the number of grid cells in cross-sectional and longitudinal directions versus model performance and run times was evaluated. Grid convergence tests indicated that nominal improvements could be achieved with grid resolution higher than the current configuration. A description of the grid convergence test can be found in Section 5.2 of HydroQual 2008.

The horizontal dimensions of the grid are not varied based on changing conditions (e.g. high versus normal flow), but the vertical dimension (depth) varies with changes in water depth due to deposition, erosion, dredging and capping. During periods of high current speeds, the computational time step is lowered to maintain stable solutions. ECOM is capable of time-variable time steps.

Coordinate System

For computational consistency, all of the NBSA component models (i.e., HST, AOC, and CFT) use the same three-dimensional, orthogonal, curvilinear grid. The model's coordinate directions are geographical, with the x-coordinate corresponding to true East, the y-coordinate corresponding to true North, and the z-coordinate oriented positive upward with the origin at mean sea level. To simplify computations for model domains with spatially variable bathymetry and temporal changes in water-surface elevations (e.g. due to tides, storm surge, and river flood waves), the vertical direction is

redefined and the model equations are transformed to a vertical σ-coordinate system by the relationship, $\sigma = (z - \eta)/D$, where η is water-surface elevation above mean sea level, and D is local water depth. In a σ-coordinate system, the water surface and bed become fixed coordinate surfaces, but the depth of the water column can expand and contract both in space and in time, with each of the model's vertical computational layers representing a fixed proportion of the local water depth. Details on the σ-coordinate system and transformation can be found in Blumberg and Mellor (1987).

Model Components and Linkages

The NBSA modeling framework is comprised of three main components: (1) hydrodynamics and sediment-transport, (2) organic carbon, and (3) contaminant fate and transport. For computational efficiency, modeled hydrodynamics and sediment transport were computed separately at different time steps, but both of these model elements were based on the same code, ECOM-SEDZLJ. The hydrodynamic and sediment-transport solutions were then coupled periodically to reflect the hydrodynamic influence of small bathymetric changes from net erosion or deposition. The modeled interval between bathymetric coupling was typically 15 days but ranged from 30 days during quiescent conditions to as little as 1 day during high-flow conditions (Section 5.3 of Moffatt & Nichol and Deltares 2020a). During dredging the bathymetric coupling is done on a 1 day interval to reflect the relatively rapid changes in bathymetry due to dredging. Time-variable hydrodynamic boundary conditions for the NBSA model were extracted from the larger domain NY-NJ Regional Hydrodynamic Model, which employs the same computational grid within the region of the smaller domain NBSA model. Output from a SWAN wave model (Moffatt & Nichol and Deltares 2020a) coupled with the NBSA model hydrodynamic calculations generated enhanced wave-current skin friction on the sediment bed, which influenced spatiotemporal patterns of sediment transport primarily in the shallow, subtidal region toward the eastern side of Newark Bay. Hydrodynamic and sediment transport results provided inputs to the Organic Carbon (OC) model, which was based on a simplified version of the LPR Carbon Model (Louis Berger Group et al. 2014). Hydrodynamic and organic carbon model results provided inputs to the Contaminant Fate and Transport (CFT) Model.

Limitations

It is difficult to identify a comprehensive list of limitations of a suite of models. Models are mathematical approximations of complex physical, biological and chemical phenomena. Mathematical representations of these processes are discretized in space and time. Efforts to introduce more detailed representation of the processes, and more highly refined discretization in space and time increases the computational requirements, both in the types of computer systems and in the time to perform simulations. Application of models to address practical problems requires trade-offs between the detail included in the model (processes, as well as spatial and temporal resolution) and the time required to generate answers to the questions being addressed. For example, the sediment transport model uses only five finite particle sizes to represent the continuum of particle sizes in the system. More size classes would provide an improved representation of the gradation in sizes in the bay, but could substantially increase the time required for each model simulation, both in calibration and in evaluating conditions forty years or more into the future as part of the feasibility study. The objective of developing a modeling suite for addressing contaminated sediment sites is to achieve a balance between representing reality and achieving practicable solutions. In addition to the computational limitations on the model itself, the model is also limited by spatial and temporal coverage of the data that are used to define inputs to and test model performance.

Questions have been raised regarding situations that may violate assumptions internal to the model. A specific example cited was assumptions of the shallow water equations. Often times the term "shallow water equations" is used to describe the vertically integrated set of equations with "constant density". The hydrodynamic model was run in a three-dimensional mode, so that does not apply in this application. The external (barotropic) model is two-dimensional but the internal (baroclinic) model makes the model three dimensional.

The model solves for water temperature and salinity in three dimensions. However, the equations assume that the horizontal length scale is much greater than the vertical length scale so that near field dynamics like outfall plumes or turbulent flows around bridge piers, etc., cannot be represented in detail, and are not attempted in this application.

Operating System, Compiler, and Computational Processer

All of the NBSA component models (i.e., HST, AOC, and CFT) run under a 64-bit Linux operating system, which is currently Mageia 7. However, most, if not all, modern Linux variants will execute the ECOM-SEDZLJ and RCA modeling components and will provide binary-compatible, although not identical results if compiled using a different Fortran compiler and/or computer system. NBSA modeling was performed primarily with the PGI FORTRAN compiler (releases 10.3, 11.8 and 19.4). Intel FORTRAN release 12.1.5.339 was used for the CFT simulations due to run speed considerations. Any Intel or AMD X86, 64-bit processor can run the model, provided the system has enough RAM to execute the model and disk storage to hold the outputs. A minimum of 4 processor cores, 3.5 GHz or faster with 8 Gbytes of RAM, is recommended. Computational performance improvements have been noted up to 8 cores with state-of-the-art hardware. NBSA modeling primarily employed 8-Core Intel i9-9900K processors (generally running at 4.6 GHz under load), with 8 cores running with 32 Gbytes of RAM. On occasion, modeling was also performed with 10-core Intel i9-7900X and 32-core AMD Threadripper 3970X processors. As with most models of this type (e.g., MIKE, Delft), hyperthreads are ineffective in further reducing runtime speed beyond physical core limits of the CPU. A minimum of 2 Terabytes of hard disk space is recommended to store results of a multi-decadal simulation. Static compilation with the same compiler release ensures the same results will be achieved on any x86-64, Linux-based platform. Results under Windows or MacOSX operating systems, or generated with different compiler flags or options, will not be binary compatible, although the models will execute if compiled under these operating systems.

Runtime Error Checking

The model components include internal checks that halt execution if problems with model inputs are identified or the results indicate that the model has likely gone unstable.

Hydrodynamic and sediment transport model execution stops if:

- Temperature is less than -20 or greater than 40 degrees Celsius
- Salinity is less than -20 or greater than 40 ppt
- Current velocity is greater than 10 m/s
- Heat flux calculation fails to converge

- Suspended solids concentration is greater than 100,000 mg/l
- Settling velocity is negative
- Cohesive solids resuspension flux is negative

In cases where negative concentrations are calculated, but not of a magnitude that stopped the simulation based on the tests above, the concentrations are reset to zero and the model keeps track of the mass added by increasing the concentration to zero. This does not apply to temperature.

Carbon model execution stops if:

- Water column concentration is greater than maximum specified in input file[2]
- Cohesive or non-cohesive solids in the active or archive layer are negative

Carbon model generates a warning and continues simulation if:

- Water column concentration is less than 1.0E-9, in which case, the concentration is reset to 1.0E-9 and the model keeps track of the mass added to increase the concentration.
- Sediment concentration is negative, in which case, the concentration is reset to zero and the model keeps track of the mass added to increase the concentration.

Contaminant fate and transport model execution stops if:

- Water column concentration is greater than maximum specified in input file[3]
- Bed thickness is negative
- Thickness of the active or archive layer is negative after splitting/combining layers
- Sediment temperature is less than or equal to zero, or greater than 45 Celsius
- Sum of sorbed fractions is greater than one
- Deposition flux is negative
- Resuspension flux is negative
- Navigation scour is greater than 60 cm
- Cohesive solids concentration in sediment bed is negative
- Thickness of the active layer is negative

[2] Code allows state variable-specific maximum concentration. Input is specified as 5000 mg/l for each state variable, to trap only unstable conditions
[3] Code allows state variable-specific maximum concentration. Input is specified as 10E+10 mg/l for each state variable, to trap only unstable conditions

Contaminant fate and transport model generates a warning and continues simulation if:

- Water column concentration is negative, in which case, the concentration is reset to zero and the model keeps track of the mass added to increase the concentration.
- Rate of change in bed thickness exceeds stability criteria, in which case, the rate is capped at HSED/DT[4].
- Resuspension velocity exceeds stability criteria, in which case, the velocity is capped at HSED/DT*0.7.
- Archive stack emptied after erosion, in which case, one layer is added with previous concentration.
- Sediment concentration is less than zero, in which case, the concentration is reset to zero and the model keeps track of the mass added to increase the concentration.
- Sediment mixing exceeds stability criteria, in which case the mixing rate is capped at the stability criteria.
- Non-cohesive solids concentration in sediment bed is negative, in which case, the concentration is reset to zero and the model keeps track of the mass added to increase the concentration.

[4] HSED/DT is the change in thickness of the active layer with respect to time

Appendix D

Exposure Concentration Linkage between Contaminant Fate and Transport and Bioaccumulation Models

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Appendix D - Exposure Concentration Linkage between Contaminant Fate and Transport and Bioaccumulation Models

Concentrations computed by the contaminant fate and transport model are averaged in space and time to generate inputs for the bioaccumulation model. Linkage zones are shown on Figure D-1. Values for the linkage zones are area-weighted averages of CFT model grid cell averages calculated according to the following methods:

- Water column depth averaging is a straight average because all water column layers have the same thickness (each is 10% of the total water column depth).
- Sediment depth averaging is a depth-weighted average because the top layer of the active bed has a varying thickness.
- The archive bed does not have separate output for dissolved and particulate chemical concentrations, so the partitioning in the bottom layer of the active layer is used to estimate the partitioning in the archive bed.

The variables that are averaged are:

- Water temperature (degrees C)
- Depth-average bioavailable concentration in water column (ng/g)
- Depth-average concentration in sediment porewater (ng/g)
- Depth-average concentration on sediment solids (ng/g)
- Depth-average concentration on water column particulates (ng/g)
- Depth-average concentration of suspended solids (kg/L)
- Depth-average organic carbon content of sediment (fraction of total)
- Depth-average organic carbon content of water column particulates (fraction of total)
- Concentration in particulates in the bottom layer of the water column (for detritivores) (ng/g)

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Figure D- 1. Newark Bay Bioaccumulation Model Linkage Zones

Appendix E

Mass Balances by Region 1996 - 2016

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Table 1. Solids Mass Balance

Years	Region	Erosion (MT)	Navigation Scour (MT)	Deposition (MT)	Net Erosion (MT)	Flux in (MT)	Flux Out (MT)	Net Flux (MT)	CSO Diffuser Load (MT)	Mass Added with reset of Negative Concentrations (MT)	Change in WC Mass (MT)	Flux Out (MT) External Calc	%Error
1995	1	33,727	1,420	39,467	-4,319	250,939	-246,599	4,340	0	0	19	246,600	-0.0006%
1995	19	1,843	0	1,854	-11	207,977	-208,043	-66	81	0	4	208,044	-0.0003%
1995	20	64,914	0	65,391	-477	296,732	-296,238	494	0	0	12	296,242	-0.0014%
1995	21	68,768	0	68,958	-190	192,470	-192,257	213	0	0	10	192,270	-0.0069%
1995	22	134,837	0	132,675	2,163	345,066	-347,431	-2,365	257	0	49	347,437	-0.0018%
1995	23	32,915	0	33,713	-798	535,190	-534,382	808	0	0	5	534,387	-0.0010%
1995	25	29,644	367	34,628	-4,616	264,318	-259,779	4,538	103	0	20	259,784	-0.0019%
1995	26	5,952	0	9,028	-3,077	110,367	-107,287	3,080	0	0	3	107,287	-0.0001%
1995	27	285,317	218	290,502	-4,967	690,157	-685,192	4,965	19	0	77	685,133	0.0086%
1995	32	411,546	179,746	606,307	-15,014	1,919,315	-1,905,092	14,223	1,475	0	618	1,905,158	-0.0035%
1995	33	32,773	28,937	88,749	-27,039	223,867	-197,240	26,627	482	0	68	197,242	-0.0010%
1995	34	17,397	27,388	72,419	-27,634	198,745	-171,054	27,691	0	0	55	171,056	-0.0011%
1995	35	501,817	18,402	491,936	28,283	2,555,238	-2,583,340	-28,102	0	0	194	2,583,327	0.0005%
1995	38	204,761	8,504	204,604	8,661	582,741	-591,238	-8,497	0	0	12	591,390	-0.0257%
1995	39	616,514	0	607,445	9,069	744,967	-754,163	-9,196	195	0	37	754,193	-0.0040%
1996	1	36,250	2,532	45,841	-7,059	287,988	-280,948	7,040	0	0	-5	280,934	0.0050%
1996	19	2,106	0	2,194	-88	218,378	-218,424	-47	125	0	0	218,414	0.0047%
1996	20	62,320	0	63,221	-901	264,502	-263,597	906	0	0	-2	263,603	-0.0025%
1996	21	94,686	0	94,800	-115	175,111	-174,981	130	0	0	1	174,995	-0.0082%
1996	22	146,356	0	143,297	3,059	328,543	-332,018	-3,475	386	0	-10	331,998	0.0061%
1996	23	22,529	0	23,404	-875	547,538	-546,652	886	0	0	3	546,660	-0.0014%
1996	25	33,439	357	37,419	-3,623	256,111	-252,624	3,487	117	0	-1	252,606	0.0071%
1996	26	6,363	0	8,791	-2,428	113,032	-110,603	2,429	0	0	1	110,603	0.0000%
1996	27	430,464	405	442,273	-11,404	649,279	-637,931	11,348	22	0	-15	637,912	0.0031%
1996	32	373,653	182,272	577,462	-21,537	1,833,722	-1,814,564	19,157	2,222	0	-30	1,814,436	0.0071%
1996	33	46,270	29,641	101,342	-25,432	209,305	-184,613	24,693	708	0	17	184,564	0.0262%
1996	34	17,043	28,044	77,305	-32,218	184,232	-152,001	32,231	0	0	10	152,004	-0.0020%
1996	35	383,587	18,515	402,856	-754	2,591,616	-2,590,875	741	0	0	-8	2,590,870	0.0002%
1996	38	140,601	5,084	144,836	849	613,060	-613,874	-814	0	0	-2	613,911	-0.0061%
1996	39	843,384	0	831,002	12,382	769,693	-782,390	-12,697	298	0	-13	782,386	0.0005%
1997	1	36,183	1,812	42,993	-4,997	258,756	-253,731	5,025	0	0	27	253,733	-0.0006%
1997	19	2,150	0	2,221	-71	212,938	-212,989	-50	122	0	0	212,989	-0.0004%
1997	20	60,779	0	61,662	-883	259,188	-258,307	882	0	0	-3	258,309	-0.0009%
1997	21	169,852	0	169,936	-84	172,048	-171,960	88	0	0	-6	171,970	-0.0060%
1997	22	310,377	0	301,022	9,355	332,231	-341,957	-9,727	355	0	-20	341,961	-0.0012%
1997	23	20,953	0	21,198	-245	533,655	-533,407	248	0	0	-1	533,411	-0.0008%
1997	25	34,678	432	38,140	-3,030	263,006	-260,132	2,874	149	0	-8	260,133	-0.0003%
1997	26	6,241	0	9,020	-2,779	114,123	-111,346	2,777	0	0	-1	111,346	-0.0002%
1997	27	285,790	450	289,736	-3,496	621,950	-618,521	3,428	23	0	-11	618,488	0.0054%
1997	32	377,927	182,585	584,102	-23,590	1,830,950	-1,809,511	21,439	2,047	0	-104	1,809,512	-0.0001%
1997	33	45,396	29,515	101,112	-26,200	205,853	-180,360	25,494	677	0	-30	180,360	-0.0002%
1997	34	18,245	27,928	78,640	-32,467	182,903	-150,446	32,456	0	0	-13	150,448	-0.0015%

Table 1. Solids Mass Balance

Years	Region	Erosion (MT)	Navigation Scour (MT)	Deposition (MT)	Net Erosion (MT)	Flux in (MT)	Flux Out (MT)	Net Flux (MT)	CSO Diffuser Load (MT)	Mass Added with reset of Negative Concentrations (MT)	Change in WC Mass (MT)	Flux Out (MT) External Calc	%Error
1997	35	260,053	18,489	281,256	-2,714	2,514,469	-2,511,757	2,713	0	0	8	2,511,747	0.0004%
1997	38	77,060	2,717	79,894	-117	571,963	-571,805	157	0	0	3	571,843	-0.0065%
1997	39	771,626	0	756,397	15,230	738,255	-753,762	-15,507	291	0	6	753,769	-0.0009%
1998	1	36,826	2,138	42,052	-3,088	237,619	-234,552	3,067	0	0	-22	234,554	-0.0006%
1998	19	1,828	0	1,864	-36	185,860	-185,950	-90	121	0	-2	185,947	0.0014%
1998	20	48,459	0	49,409	-950	234,080	-233,125	955	0	0	4	233,126	-0.0006%
1998	21	56,995	0	57,227	-231	155,905	-155,660	245	0	0	0	155,674	-0.0090%
1998	22	245,179	0	240,222	4,957	313,104	-318,444	-5,340	386	0	1	318,447	-0.0008%
1998	23	16,581	0	16,670	-89	462,813	-462,721	92	0	0	-4	462,728	-0.0016%
1998	25	34,293	416	37,560	-2,851	248,278	-245,613	2,665	186	0	-1	245,614	-0.0004%
1998	26	6,508	0	9,016	-2,508	108,211	-105,704	2,507	0	0	-1	105,704	-0.0002%
1998	27	262,505	358	268,286	-5,423	583,841	-578,427	5,414	22	0	12	578,428	-0.0001%
1998	32	352,740	182,993	555,433	-19,701	1,731,087	-1,713,792	17,294	2,222	0	-185	1,713,792	0.0000%
1998	33	40,319	29,496	92,905	-23,090	186,403	-164,055	22,348	723	0	-21	164,057	-0.0016%
1998	34	17,352	27,895	73,845	-28,598	165,257	-136,685	28,573	0	0	-26	136,685	-0.0005%
1998	35	264,087	18,490	284,013	-1,435	2,210,003	-2,208,661	1,342	0	0	-97	2,208,664	-0.0001%
1998	38	76,987	3,167	80,295	-142	511,137	-510,924	212	0	0	-7	511,002	-0.0152%
1998	39	376,637	0	371,074	5,564	643,831	-649,691	-5,860	290	0	-13	649,698	-0.0010%
1999	1	32,203	1,902	37,358	-3,253	212,282	-209,021	3,262	0	0	8	209,021	-0.0003%
1999	19	1,571	0	1,691	-120	151,766	-151,737	29	94	0	3	151,736	0.0004%
1999	20	41,255	0	42,131	-876	219,592	-218,707	885	0	0	7	218,709	-0.0010%
1999	21	47,604	0	48,416	-812	145,381	-144,558	823	0	0	4	144,565	-0.0051%
1999	22	118,413	0	119,710	-1,296	305,044	-304,011	1,033	302	0	34	304,016	-0.0016%
1999	23	15,420	0	16,037	-617	377,584	-376,953	631	0	0	11	376,957	-0.0009%
1999	25	31,833	420	36,005	-3,753	240,040	-236,432	3,608	165	0	21	236,431	0.0004%
1999	26	6,161	0	8,940	-2,780	101,247	-98,463	2,784	0	0	4	98,463	-0.0005%
1999	27	217,575	398	222,979	-5,007	570,720	-565,726	4,994	19	0	19	565,713	0.0022%
1999	32	305,810	182,941	504,124	-15,372	1,678,018	-1,663,992	14,026	1,740	0	391	1,663,995	-0.0002%
1999	33	32,681	29,461	82,706	-20,563	170,528	-150,470	20,057	585	0	77	150,472	-0.0014%
1999	34	17,725	27,866	68,006	-22,415	152,427	-129,952	22,475	0	0	59	129,953	-0.0005%
1999	35	214,830	18,422	236,446	-3,194	1,887,693	-1,884,335	3,358	0	0	155	1,884,344	-0.0005%
1999	38	52,160	1,872	55,376	-1,344	440,231	-438,837	1,393	0	0	9	438,878	-0.0092%
1999	39	165,624	0	165,773	-148	538,233	-538,272	-39	225	0	35	538,275	-0.0005%
2000	1	33,940	2,616	38,643	-2,087	203,632	-201,566	2,066	0	0	-24	201,569	-0.0018%
2000	19	1,772	0	1,786	-13	159,115	-159,216	-101	113	0	-4	159,219	-0.0018%
2000	20	34,618	0	35,566	-948	203,445	-202,512	933	0	0	-16	202,513	-0.0006%
2000	21	37,246	0	37,384	-138	127,599	-127,466	133	0	0	-8	127,469	-0.0025%
2000	22	102,943	0	102,285	659	279,193	-280,228	-1,035	332	0	-47	280,230	-0.0008%
2000	23	16,723	0	16,707	16	391,336	-391,358	-22	0	0	-11	391,363	-0.0014%
2000	25	34,754	424	38,867	-3,690	235,366	-231,830	3,537	130	0	-24	231,830	0.0000%
2000	26	6,248	0	8,722	-2,475	100,373	-97,902	2,470	0	0	-4	97,902	0.0001%
2000	27	232,161	466	236,069	-3,442	508,685	-505,333	3,352	19	0	-75	505,337	-0.0008%

Table 1. Solids Mass Balance

Years	Region	Erosion (MT)	Navigation Scour (MT)	Deposition (MT)	Net Erosion (MT)	Flux in (MT)	Flux Out (MT)	Net Flux (MT)	CSO Diffuser Load (MT)	Mass Added with reset of Negative Concentrations (MT)	Change in WC Mass (MT)	Flux Out (MT) External Calc	%Error
2000	32	301,288	182,725	498,660	-14,647	1,581,105	-1,568,764	12,340	1,910	0	-410	1,568,777	-0.0008%
2000	33	41,030	29,587	89,451	-18,834	178,287	-160,139	18,148	607	0	-75	160,134	0.0026%
2000	34	16,031	27,964	68,230	-24,234	141,925	-117,741	24,183	0	0	-50	117,741	0.0003%
2000	35	153,728	18,450	173,402	-1,224	1,857,699	-1,856,701	997	0	0	-208	1,856,683	0.0010%
2000	38	54,218	2,021	56,498	-258	425,671	-425,439	232	0	0	-13	425,426	0.0031%
2000	39	221,360	0	218,437	2,923	541,681	-544,927	-3,246	271	0	-48	544,924	0.0006%
2001	1	32,597	1,579	36,906	-2,731	196,461	-193,706	2,755	0	0	27	193,703	0.0016%
2001	19	1,795	0	1,822	-27	153,170	-153,232	-62	89	0	1	153,231	0.0009%
2001	20	40,679	0	41,347	-667	204,385	-203,709	676	0	0	6	203,711	-0.0015%
2001	21	33,565	0	33,937	-373	130,394	-130,013	381	0	0	4	130,017	-0.0036%
2001	22	132,147	0	130,238	1,910	274,908	-277,057	-2,149	258	0	12	277,064	-0.0024%
2001	23	25,040	0	24,940	101	379,511	-379,609	-98	0	0	2	379,609	0.0000%
2001	25	30,940	417	35,394	-4,037	228,812	-224,858	3,954	77	0	3	224,849	0.0039%
2001	26	5,629	0	8,201	-2,571	97,435	-94,864	2,571	0	0	0	94,863	0.0005%
2001	27	244,458	439	245,570	-672	509,694	-508,985	710	15	0	57	508,981	0.0008%
2001	32	305,108	183,449	505,672	-17,115	1,570,052	-1,554,339	15,713	1,483	0	76	1,554,344	-0.0003%
2001	33	39,171	29,499	88,652	-19,982	179,664	-160,127	19,537	451	0	4	160,129	-0.0013%
2001	34	15,781	27,901	67,691	-24,010	143,207	-119,189	24,018	0	0	7	119,190	-0.0013%
2001	35	180,024	18,424	199,598	-1,149	1,830,378	-1,829,137	1,241	0	0	92	1,829,137	0.0000%
2001	38	53,169	1,571	55,064	-324	417,109	-416,777	332	0	0	9	416,776	0.0002%
2001	39	190,933	0	189,339	1,594	529,690	-531,471	-1,780	212	0	17	531,479	-0.0016%
2002	1	28,122	667	29,472	-682	145,177	-144,505	672	0	0	-13	144,507	-0.0016%
2002	19	1,558	0	1,586	-29	123,834	-123,886	-52	80	0	0	123,885	0.0006%
2002	20	36,719	0	37,059	-340	190,444	-190,104	339	0	0	0	190,104	0.0002%
2002	21	37,722	0	37,807	-85	119,038	-118,946	91	0	0	-1	118,954	-0.0063%
2002	22	170,108	0	168,312	1,796	267,003	-269,034	-2,031	235	0	-4	269,038	-0.0016%
2002	23	15,671	0	15,607	63	298,972	-299,032	-60	0	0	0	299,035	-0.0011%
2002	25	29,063	398	33,298	-3,837	225,589	-221,853	3,736	98	0	-4	221,853	-0.0004%
2002	26	6,084	0	8,317	-2,233	91,314	-89,083	2,232	0	0	-1	89,082	0.0001%
2002	27	198,802	495	200,489	-1,192	486,903	-485,764	1,139	14	0	-12	485,737	0.0054%
2002	32	283,104	184,688	479,577	-11,786	1,519,546	-1,509,187	10,359	1,353	0	-77	1,509,189	-0.0001%
2002	33	28,099	29,370	75,206	-17,737	162,301	-145,002	17,299	436	0	-5	145,005	-0.0023%
2002	34	15,948	27,751	60,710	-17,010	131,520	-114,524	16,996	0	0	-16	114,525	-0.0012%
2002	35	129,157	18,249	147,896	-489	1,494,137	-1,493,692	445	0	0	-37	1,493,685	0.0005%
2002	38	36,286	1,048	37,420	-86	322,784	-322,674	110	0	0	-5	322,702	-0.0089%
2002	39	266,661	0	262,928	3,733	415,467	-419,382	-3,914	190	0	4	419,386	-0.0011%
2003	1	38,209	2,555	46,753	-5,988	260,591	-254,591	6,000	0	0	11	254,592	-0.0002%
2003	19	2,422	0	2,448	-26	209,534	-209,647	-113	145	0	4	209,649	-0.0009%
2003	20	45,107	0	47,521	-2,414	288,410	-285,981	2,429	0	0	16	285,981	0.0000%
2003	21	38,481	0	39,363	-882	175,645	-174,746	899	0	0	11	174,752	-0.0034%
2003	22	147,432	0	150,450	-3,019	451,646	-449,006	2,640	436	0	54	449,009	-0.0005%
2003	23	17,640	0	17,758	-118	541,490	-541,357	134	0	0	13	541,360	-0.0006%

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2003	25	39,928	545	49,341	-8,868	338,734	-330,108	8,625	274	0	29	330,110	-0.0004%
2003	26	7,668	0	11,547	-3,879	154,042	-150,156	3,886	0	0	5	150,157	-0.0010%
2003	27	307,978	1,278	319,774	-10,518	792,473	-781,933	10,540	24	0	64	781,915	0.0023%
2003	32	585,520	187,800	889,869	-116,549	2,599,296	-2,484,315	114,981	2,510	0	996	2,484,260	0.0022%
2003	33	54,419	29,590	121,875	-37,866	266,466	-229,219	37,248	823	0	210	229,214	0.0022%
2003	34	16,752	27,963	81,361	-36,646	199,655	-162,916	36,739	0	0	91	162,918	-0.0012%
2003	35	254,063	18,477	280,172	-7,632	2,602,030	-2,594,155	7,875	0	0	293	2,594,106	0.0019%
2003	38	73,523	2,839	80,581	-4,219	610,575	-606,302	4,274	0	0	17	606,339	-0.0061%
2003	39	166,423	0	170,625	-4,201	732,319	-728,422	3,897	346	0	38	728,426	-0.0005%
2004	1	38,780	5,246	49,225	-5,199	272,558	-267,358	5,201	0	0	-1	267,360	-0.0008%
2004	19	2,648	0	2,721	-72	221,444	-221,516	-72	144	0	3	221,512	0.0016%
2004	20	45,805	0	48,292	-2,488	297,479	-294,986	2,493	0	0	5	294,987	-0.0002%
2004	21	38,585	0	39,435	-849	181,654	-180,784	870	0	0	13	180,792	-0.0041%
2004	22	294,743	0	291,474	3,269	469,020	-472,670	-3,651	392	0	1	472,680	-0.0020%
2004	23	19,623	0	20,164	-541	576,828	-576,272	555	0	0	11	576,276	-0.0006%
2004	25	42,441	577	52,159	-9,141	349,724	-340,835	8,890	237	0	-13	340,833	0.0005%
2004	26	7,836	0	11,812	-3,976	160,655	-156,681	3,974	0	0	-2	156,682	-0.0004%
2004	27	343,108	1,302	352,811	-8,401	800,965	-792,476	8,489	30	0	125	792,469	0.0008%
2004	32	617,481	187,733	933,168	-127,954	2,677,962	-2,552,302	125,660	2,258	0	-41	2,552,307	-0.0002%
2004	33	60,504	29,692	130,789	-40,592	279,451	-239,664	39,787	754	0	-54	239,667	-0.0012%
2004	34	16,690	28,080	84,218	-39,448	207,781	-168,285	39,496	0	0	44	168,288	-0.0023%
2004	35	234,898	18,585	264,171	-10,688	2,736,797	-2,726,047	10,750	0	0	78	2,726,030	0.0006%
2004	38	76,726	3,300	82,116	-2,090	640,233	-638,105	2,128	0	0	16	638,127	-0.0035%
2004	39	284,936	0	283,769	1,168	769,505	-770,905	-1,400	344	0	103	770,914	-0.0011%
2005	1	34,875	5,265	42,613	-2,472	224,406	-221,942	2,464	0	0	-9	221,942	-0.0001%
2005	19	2,274	0	2,308	-34	177,663	-177,726	-63	92	0	-7	177,727	-0.0008%
2005	20	38,168	0	39,678	-1,511	224,925	-223,437	1,488	0	0	-22	223,436	0.0002%
2005	21	34,778	0	35,044	-266	146,000	-145,747	253	0	0	-25	145,759	-0.0078%
2005	22	129,419	0	129,915	-496	293,650	-293,438	212	224	0	-63	293,442	-0.0012%
2005	23	26,978	0	27,192	-214	461,057	-460,861	196	0	0	-23	460,866	-0.0011%
2005	25	29,463	514	34,773	-4,796	221,292	-216,618	4,674	106	0	-19	216,621	-0.0010%
2005	26	5,498	0	8,009	-2,511	97,284	-94,774	2,510	0	0	-3	94,775	-0.0011%
2005	27	264,664	1,189	271,251	-5,398	543,051	-537,887	5,163	18	0	-211	537,882	0.0010%
2005	32	378,845	186,414	607,771	-42,512	1,682,070	-1,641,666	40,404	1,282	0	-828	1,641,668	-0.0001%
2005	33	43,989	29,537	98,223	-24,697	196,472	-172,287	24,186	368	0	-145	172,289	-0.0015%
2005	34	15,564	27,917	69,991	-26,510	157,185	-130,798	26,387	0	0	-123	130,798	0.0002%
2005	35	185,994	18,462	210,949	-6,493	2,142,648	-2,136,463	6,185	0	0	-314	2,136,469	-0.0003%
2005	38	70,404	2,700	73,064	39	511,721	-511,791	-69	0	0	-34	511,795	-0.0008%
2005	39	218,436	0	218,015	422	608,895	-609,682	-786	220	0	-150	609,687	-0.0008%
2006	1	38,867	6,155	49,963	-4,941	263,804	-258,861	4,943	0	0	-1	258,865	-0.0015%
2006	19	2,695	0	2,728	-33	205,798	-205,949	-151	180	0	0	205,945	0.0018%
2006	20	41,597	0	43,739	-2,142	259,667	-257,526	2,141	0	0	-1	257,527	-0.0002%

Table 1. Solids Mass Balance

Years	Region	Erosion (MT)	Navigation Scour (MT)	Deposition (MT)	Net Erosion (MT)	Flux in (MT)	Flux Out (MT)	Net Flux (MT)	CSO Diffuser Load (MT)	Mass Added with reset of Negative Concentrations (MT)	Change in WC Mass (MT)	Flux Out (MT) External Calc	%Error
2006	21	35,403	0	35,997	-595	166,230	-165,625	605	0	0	0	165,635	-0.0060%
2006	22	117,824	0	119,519	-1,695	384,664	-383,366	1,299	415	0	16	383,369	-0.0008%
2006	23	19,280	0	19,661	-381	542,153	-541,765	389	0	0	4	541,768	-0.0007%
2006	25	36,613	529	44,104	-6,962	292,243	-285,543	6,700	264	0	5	285,541	0.0009%
2006	26	7,102	0	9,985	-2,883	134,244	-131,361	2,883	0	0	0	131,361	-0.0003%
2006	27	299,332	1,304	308,081	-7,445	673,887	-666,420	7,467	33	0	47	666,428	-0.0012%
2006	32	519,083	187,330	786,323	-79,910	2,195,648	-2,117,996	77,652	2,394	0	131	2,118,001	-0.0003%
2006	33	55,618	29,590	119,441	-34,233	238,103	-204,656	33,447	805	0	18	204,658	-0.0006%
2006	34	17,390	27,956	79,139	-33,793	180,894	-147,100	33,795	0	0	-2	147,104	-0.0028%
2006	35	219,086	18,513	246,742	-9,144	2,513,006	-2,503,881	9,124	0	0	-12	2,503,873	0.0003%
2006	38	77,206	3,217	82,725	-2,302	600,942	-598,617	2,325	0	0	3	598,637	-0.0034%
2006	39	185,056	0	187,091	-2,035	715,074	-713,439	1,635	429	0	16	713,452	-0.0019%
2007	1	92,173	15,370	116,629	-9,086	319,390	-310,293	9,097	0	0	9	310,294	-0.0005%
2007	19	2,757	0	2,788	-32	235,072	-235,202	-130	172	0	5	235,207	-0.0023%
2007	20	43,934	0	47,156	-3,222	306,525	-303,293	3,232	0	0	9	303,294	-0.0004%
2007	21	33,974	0	35,417	-1,443	199,802	-198,330	1,472	0	0	14	198,344	-0.0074%
2007	22	121,546	0	124,372	-2,826	434,238	-431,844	2,394	470	0	31	431,851	-0.0016%
2007	23	19,754	0	20,099	-346	620,518	-620,164	354	0	0	3	620,170	-0.0009%
2007	25	39,554	603	48,079	-7,922	323,852	-316,306	7,546	390	0	15	316,304	0.0006%
2007	26	7,136	0	10,959	-3,823	149,063	-145,233	3,830	0	0	4	145,235	-0.0015%
2007	27	316,205	1,289	329,172	-11,679	765,989	-754,338	11,651	41	0	51	754,300	0.0050%
2007	32	546,537	187,593	831,655	-97,526	2,450,536	-2,355,130	95,406	2,723	0	608	2,355,126	0.0002%
2007	33	55,872	29,592	123,599	-38,135	266,037	-228,830	37,207	1,011	0	81	228,833	-0.0012%
2007	34	17,850	27,973	83,819	-37,995	208,751	-170,698	38,053	0	0	56	170,700	-0.0010%
2007	35	246,481	18,799	275,499	-10,219	2,899,510	-2,889,098	10,413	0	0	204	2,889,087	0.0004%
2007	38	87,622	8,644	102,124	-5,858	688,302	-682,264	6,038	0	0	11	682,433	-0.0248%
2007	39	175,713	0	180,226	-4,514	817,684	-813,538	4,147	409	0	34	813,545	-0.0010%
2008	1	35,118	19,599	57,901	-3,183	239,658	-236,476	3,181	0	0	-4	236,478	-0.0008%
2008	19	2,558	0	2,598	-39	202,049	-202,152	-103	134	0	-3	202,146	0.0030%
2008	20	42,703	0	44,401	-1,697	259,887	-258,180	1,707	0	0	7	258,183	-0.0009%
2008	21	34,112	0	34,656	-545	169,756	-169,215	541	0	0	-8	169,220	-0.0028%
2008	22	148,384	0	149,936	-1,552	358,547	-357,377	1,170	368	0	-19	357,382	-0.0013%
2008	23	19,589	0	19,929	-341	526,019	-525,675	344	0	0	-1	525,679	-0.0009%
2008	25	34,930	585	41,923	-6,408	274,779	-268,618	6,161	232	0	-13	268,617	0.0006%
2008	26	6,829	0	9,620	-2,791	120,529	-117,743	2,785	0	0	-4	117,741	0.0019%
2008	27	308,811	1,225	314,877	-4,842	667,476	-662,638	4,838	25	0	14	662,645	-0.0011%
2008	32	497,085	188,026	756,401	-71,289	2,118,435	-2,049,569	68,866	2,119	0	-309	2,049,573	-0.0002%
2008	33	51,079	29,666	112,810	-32,065	229,841	-198,509	31,333	697	0	-38	198,510	-0.0009%
2008	34	17,695	28,027	77,322	-31,600	180,517	-148,927	31,590	0	0	-11	148,927	0.0000%
2008	35	252,367	19,188	277,881	-6,326	2,470,246	-2,464,004	6,243	0	0	-101	2,464,021	-0.0007%
2008	38	77,974	11,459	88,606	827	570,233	-571,026	-792	0	0	3	571,058	-0.0056%
2008	39	190,108	0	190,150	-42	702,133	-702,407	-274	319	0	6	702,404	0.0004%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 1. Solids Mass Balance

Years	Region	Erosion (MT)	Navigation Scour (MT)	Deposition (MT)	Net Erosion (MT)	Flux in (MT)	Flux Out (MT)	Net Flux (MT)	CSO Diffuser Load (MT)	Mass Added with reset of Negative Concentrations (MT)	Change in WC Mass (MT)	Flux Out (MT) External Calc	%Error
2009	1	36,917	15,763	54,182	-1,503	247,346	-245,848	1,498	0	0	-10	245,854	-0.0024%
2009	19	2,575	0	2,613	-38	207,848	-207,952	-104	131	0	-3	207,944	0.0037%
2009	20	49,376	0	50,970	-1,593	278,684	-277,105	1,579	0	0	-16	277,107	-0.0007%
2009	21	38,263	0	38,579	-316	168,447	-168,127	320	0	0	-7	168,137	-0.0065%
2009	22	161,401	0	161,801	-400	389,296	-389,270	26	354	0	-26	389,277	-0.0017%
2009	23	18,312	0	18,533	-220	530,690	-530,475	215	0	0	-6	530,476	-0.0001%
2009	25	37,784	585	45,452	-7,084	297,872	-290,991	6,881	196	0	-6	290,990	0.0004%
2009	26	7,593	0	10,806	-3,212	138,317	-135,104	3,213	0	0	-1	135,106	-0.0016%
2009	27	308,486	1,288	316,608	-6,834	688,729	-682,026	6,703	22	0	-113	682,030	-0.0007%
2009	32	517,824	187,721	783,305	-77,760	2,270,294	-2,195,004	75,290	2,037	0	-436	2,195,007	-0.0002%
2009	33	50,232	29,589	117,009	-37,189	245,961	-209,458	36,503	638	0	-44	209,454	0.0017%
2009	34	18,146	27,955	77,339	-31,238	185,413	-154,216	31,197	0	0	-42	154,216	-0.0006%
2009	35	221,431	18,886	247,383	-7,066	2,500,653	-2,493,683	6,970	0	0	-89	2,493,675	0.0003%
2009	38	72,651	3,742	78,525	-2,132	568,318	-566,264	2,054	0	0	-18	566,204	0.0107%
2009	39	193,944	0	195,388	-1,444	710,557	-709,473	1,084	314	0	-59	709,486	-0.0018%
2010	1	46,029	22,959	72,985	-3,998	314,061	-310,055	4,006	0	0	7	310,056	-0.0002%
2010	19	2,908	0	2,976	-68	246,761	-246,798	-37	106	0	0	246,799	-0.0005%
2010	20	56,657	0	59,559	-2,902	321,170	-318,259	2,911	0	0	4	318,264	-0.0015%
2010	21	42,238	0	43,632	-1,394	203,496	-202,085	1,411	0	0	5	202,097	-0.0060%
2010	22	160,330	0	162,675	-2,345	430,138	-428,090	2,048	306	0	10	428,088	0.0003%
2010	23	21,729	0	22,194	-465	652,769	-652,294	475	0	0	3	652,301	-0.0010%
2010	25	40,004	586	47,644	-7,054	321,024	-314,191	6,832	226	0	4	314,192	-0.0003%
2010	26	8,258	0	11,454	-3,196	152,985	-149,789	3,197	0	0	1	149,788	0.0005%
2010	27	367,857	1,269	382,607	-13,481	794,286	-780,787	13,499	18	0	35	780,788	-0.0002%
2010	32	541,199	187,849	822,844	-93,796	2,471,754	-2,379,651	92,103	1,765	0	60	2,379,663	-0.0005%
2010	33	52,630	29,583	124,827	-42,615	274,176	-232,124	42,051	563	0	-1	232,125	-0.0003%
2010	34	19,314	27,974	85,253	-37,966	211,712	-173,741	37,971	0	0	3	173,744	-0.0017%
2010	35	268,997	19,399	299,921	-11,525	3,043,245	-3,031,684	11,561	0	0	21	3,031,699	-0.0005%
2010	38	91,555	7,087	101,042	-2,400	718,587	-716,125	2,461	0	0	9	716,178	-0.0074%
2010	39	380,425	0	380,360	65	874,043	-874,356	-313	253	0	8	874,353	0.0003%
2011	1	1,068,574	29,655	1,103,922	-5,693	587,381	-581,674	5,707	0	0	10	581,678	-0.0006%
2011	19	3,505	0	3,550	-45	348,808	-348,934	-126	184	0	6	348,941	-0.0021%
2011	20	68,321	0	75,436	-7,115	478,305	-471,156	7,149	0	0	11	471,179	-0.0049%
2011	21	46,234	0	50,292	-4,058	312,005	-307,869	4,136	0	0	17	307,930	-0.0196%
2011	22	155,309	0	162,956	-7,647	591,226	-584,019	7,207	511	0	47	584,044	-0.0042%
2011	23	25,470	0	26,745	-1,275	958,455	-957,150	1,305	0	0	15	957,165	-0.0015%
2011	25	48,470	659	60,335	-11,206	440,436	-429,636	10,800	433	0	31	429,632	0.0008%
2011	26	11,107	0	14,914	-3,806	221,983	-218,167	3,816	0	0	7	218,170	-0.0015%
2011	27	433,281	1,328	466,935	-32,326	1,105,837	-1,073,651	32,185	232	0	60	1,073,682	-0.0029%
2011	32	666,632	188,020	1,007,758	-153,106	3,368,738	-3,217,685	151,053	2,956	0	866	3,217,721	-0.0011%
2011	33	60,257	29,623	153,287	-63,408	388,484	-326,316	62,168	1,435	0	183	326,328	-0.0036%
2011	34	23,825	28,033	110,994	-59,136	318,073	-258,787	59,286	0	0	146	258,791	-0.0015%

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Years	Region	Erosion (MT)	Navigation Scour (MT)	Deposition (MT)	Net Erosion (MT)	Flux in (MT)	Flux Out (MT)	Net Flux (MT)	CSO Diffuser Load (MT)	Mass Added with reset of Negative Concentrations (MT)	Change in WC Mass (MT)	Flux Out (MT) External Calc	%Error
2011	35	499,630	20,738	566,930	-46,563	4,523,649	-4,476,920	46,729	0	0	209	4,476,876	0.0010%
2011	38	353,652	21,986	399,484	-23,846	1,123,513	-1,099,580	23,933	0	0	14	1,099,653	-0.0066%
2011	39	314,953	0	326,688	-11,735	1,291,601	-1,280,209	11,392	438	0	48	1,280,257	-0.0037%
2012	1	38,135	27,851	73,417	-7,431	282,724	-275,273	7,451	0	0	11	275,282	-0.0033%
2012	19	3,341	0	3,495	-155	269,336	-269,310	26	115	0	-5	269,301	0.0034%
2012	20	61,529	0	63,830	-2,301	359,814	-357,514	2,300	0	0	-3	357,516	-0.0005%
2012	21	84,738	0	84,281	457	221,413	-221,870	-457	0	0	-13	221,883	-0.0056%
2012	22	238,563	0	231,195	7,367	472,688	-480,394	-7,706	312	0	-33	480,401	-0.0014%
2012	23	22,404	0	23,012	-608	686,531	-685,932	599	0	0	-16	685,938	-0.0009%
2012	25	43,879	649	52,954	-8,427	344,350	-336,175	8,175	223	0	-29	336,175	0.0000%
2012	26	8,498	0	12,746	-4,249	160,716	-156,475	4,241	0	0	-6	156,473	0.0010%
2012	27	384,170	1,250	391,399	-5,979	865,696	-859,850	5,846	124	0	-15	859,856	-0.0007%
2012	32	629,230	189,566	921,549	-102,752	2,771,089	-2,670,766	100,322	1,796	0	-605	2,670,737	0.0011%
2012	33	60,030	29,691	139,905	-50,184	307,961	-258,717	49,244	809	0	-138	258,724	-0.0026%
2012	34	22,923	28,101	92,352	-41,328	232,261	-191,040	41,221	0	0	-110	191,044	-0.0020%
2012	35	418,739	28,210	453,094	-6,146	3,253,663	-3,247,600	6,063	0	0	-122	3,247,639	-0.0012%
2012	38	180,700	42,238	217,286	5,653	711,796	-717,471	-5,675	0	0	-7	717,456	0.0021%
2012	39	262,250	0	257,257	4,993	926,832	-932,122	-5,291	274	0	-16	932,114	0.0008%
2013	1	36,152	29,670	69,943	-4,121	281,789	-277,699	4,090	0	0	-31	277,700	-0.0001%
2013	19	2,715	0	2,748	-34	248,246	-248,340	-94	130	0	-2	248,344	-0.0017%
2013	20	71,482	0	71,448	34	357,846	-357,890	-45	0	0	-12	357,891	-0.0002%
2013	21	84,377	0	82,912	1,465	218,829	-220,287	-1,458	0	0	-11	220,304	-0.0080%
2013	22	199,481	0	198,656	825	473,338	-474,529	-1,191	349	0	-25	474,537	-0.0016%
2013	23	26,818	0	26,768	49	640,060	-640,096	-36	0	0	-4	640,113	-0.0027%
2013	25	43,701	618	52,712	-8,393	346,256	-338,108	8,149	238	0	-6	338,107	0.0001%
2013	26	8,904	0	12,763	-3,859	162,040	-158,180	3,860	0	0	-2	158,183	-0.0018%
2013	27	381,522	1,227	391,773	-9,024	860,354	-851,547	8,807	144	0	-90	851,564	-0.0021%
2013	32	627,997	188,530	915,501	-98,974	2,768,968	-2,672,315	96,653	2,009	0	-319	2,672,322	-0.0003%
2013	33	62,328	29,616	141,465	-49,521	308,356	-259,798	48,558	891	0	-67	259,793	0.0019%
2013	34	23,476	28,040	93,173	-41,657	231,706	-190,096	41,611	0	0	-50	190,099	-0.0017%
2013	35	333,358	23,969	366,639	-9,312	3,088,061	-3,078,956	9,104	0	0	-146	3,078,895	0.0020%
2013	38	115,464	25,145	135,604	5,005	687,282	-692,494	-5,212	0	0	-16	692,303	0.0276%
2013	39	215,019	0	217,527	-2,508	871,341	-869,177	2,164	310	0	-46	869,189	-0.0014%
2014	1	37,684	29,460	69,207	-2,062	289,501	-287,438	2,063	0	0	12	287,426	0.0039%
2014	19	2,404	0	2,453	-49	247,725	-247,791	-66	114	0	2	247,788	0.0014%
2014	20	55,289	0	57,796	-2,508	348,738	-346,235	2,503	0	0	5	346,225	0.0027%
2014	21	53,902	0	54,643	-741	219,443	-218,689	754	0	0	6	218,696	-0.0032%
2014	22	151,371	0	152,217	-846	456,333	-455,800	533	344	0	39	455,792	0.0018%
2014	23	18,103	0	18,186	-83	627,940	-627,848	92	0	0	5	627,852	-0.0006%
2014	25	41,298	563	48,641	-6,780	341,979	-335,389	6,590	183	0	8	335,375	0.0042%
2014	26	8,483	0	11,600	-3,118	151,389	-148,268	3,121	0	0	2	148,270	-0.0014%
2014	27	344,034	1,137	351,837	-6,666	829,965	-823,404	6,561	131	0	49	823,381	0.0028%

Table 1. Solids Mass Balance

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2014	32	568,225	188,711	820,117	-63,181	2,641,288	-2,579,852	61,436	1,982	0	231	2,579,858	-0.0002%
2014	33	58,744	29,587	135,370	-47,039	291,604	-245,458	46,146	907	0	44	245,428	0.0120%
2014	34	23,747	27,984	90,589	-38,858	221,948	-183,078	38,870	0	0	25	183,065	0.0071%
2014	35	266,672	21,951	293,768	-5,144	3,034,347	-3,030,227	4,120	0	0	81	3,029,121	0.0365%
2014	38	83,515	19,925	104,598	-1,158	683,526	-682,531	996	0	0	11	682,357	0.0254%
2014	39	197,081	0	200,015	-2,933	857,485	-854,770	2,714	271	0	33	854,790	-0.0023%
2015	1	38,351	27,428	66,594	-815	266,596	-265,761	835	0	0	20	265,760	0.0001%
2015	19	2,335	0	2,352	-17	240,033	-240,111	-78	99	0	6	240,109	0.0006%
2015	20	55,795	0	57,607	-1,812	346,235	-344,396	1,838	0	0	33	344,389	0.0020%
2015	21	48,312	0	48,658	-345	216,623	-216,247	376	0	0	22	216,255	-0.0039%
2015	22	129,533	0	130,622	-1,089	442,947	-442,129	819	312	0	36	442,135	-0.0013%
2015	23	17,784	0	17,819	-36	601,815	-601,784	30	0	0	13	601,765	0.0032%
2015	25	41,699	590	48,584	-6,295	334,804	-328,692	6,112	182	0	9	328,682	0.0029%
2015	26	8,125	0	11,622	-3,497	143,483	-139,984	3,499	0	0	2	139,983	0.0004%
2015	27	333,870	1,090	340,348	-5,388	820,994	-815,560	5,434	100	0	173	815,534	0.0032%
2015	32	561,615	188,621	806,199	-55,964	2,606,597	-2,551,937	54,660	1,793	0	492	2,551,935	0.0001%
2015	33	54,044	29,597	128,597	-44,956	281,793	-237,480	44,312	764	0	104	237,496	-0.0068%
2015	34	23,700	27,979	88,032	-36,353	218,195	-181,767	36,428	0	0	70	181,773	-0.0030%
2015	35	253,888	20,262	276,554	-2,404	2,943,380	-2,940,797	2,583	0	0	152	2,940,824	-0.0009%
2015	38	78,366	14,322	91,331	1,358	648,302	-649,719	-1,417	0	0	43	649,617	0.0158%
2015	39	191,865	0	191,768	97	823,510	-823,780	-270	237	0	81	823,763	0.0021%
2016	1	37,028	26,761	65,492	-1,702	281,467	-279,702	1,764	0	0	-8	279,772	-0.0250%
2016	19	2,332	0	2,283	49	233,389	-233,519	-130	75	0	-6	233,520	-0.0003%
2016	20	278,936	0	280,527	-1,591	361,051	-359,484	1,567	0	0	-27	359,487	-0.0010%
2016	21	383,492	0	384,185	-693	225,519	-224,811	709	0	0	-19	224,846	-0.0156%
2016	22	402,610	0	399,960	2,650	458,128	-461,054	-2,926	236	0	-48	461,061	-0.0016%
2016	23	36,050	0	36,044	6	523,049	-523,055	-6	0	0	-16	523,071	-0.0030%
2016	25	51,353	581	57,328	-5,394	313,843	-308,611	5,232	159	0	-12	308,621	-0.0032%
2016	26	21,952	0	23,448	-1,495	131,528	-130,035	1,493	0	0	-3	130,036	-0.0006%
2016	27	418,399	1,022	431,119	-11,698	862,609	-851,126	11,483	78	0	-136	851,125	0.0001%
2016	32	554,782	189,730	831,045	-86,533	2,611,992	-2,527,456	84,536	1,357	0	-564	2,527,381	0.0030%
2016	33	55,916	29,658	126,590	-41,015	301,153	-260,878	40,276	598	0	-125	260,860	0.0065%
2016	34	20,334	28,073	86,702	-38,296	235,233	-197,019	38,215	0	0	-70	197,008	0.0056%
2016	35	760,086	20,723	770,450	10,359	2,803,421	-2,814,090	-10,668	0	0	-181	2,813,962	0.0045%
2016	38	93,111	12,950	106,720	-659	601,852	-601,339	514	0	0	-36	601,229	0.0182%
2016	39	1,219,260	0	1,210,852	8,408	830,958	-839,608	-8,650	180	0	-85	839,631	-0.0028%

Table 2. Mass Balance for 2, 3, 7, 8-TCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1996	1	-9.12E+01	9.36E+01	2.35E+00	0.00E+00	6.59E-05	5.42E-04	0.00E+00	6.71E-01	1.56E-04	-4.12E-04	1.01E+01	7.04E+00	2.16E-03	0.00E+00	9.39E-05	2.02E-03	**-9.12E+01**	**-9.12E+01**	0.000%
1996	38	-1.65E+02	1.65E+02	-1.45E-01	0.00E+00	2.06E-04	1.73E-03	0.00E+00	1.12E+00	5.27E-02	7.86E-05	1.58E+01	1.49E+01	2.59E-03	0.00E+00	9.80E-05	1.81E-03	**-1.65E+02**	**-1.65E+02**	0.058%
1996	23	-1.33E+02	1.33E+02	1.63E-01	0.00E+00	5.51E-05	5.15E-04	0.00E+00	0.00E+00	1.38E-03	-2.48E-05	3.23E+00	3.07E+00	1.91E-03	0.00E+00	4.64E-05	9.59E-04	**-1.33E+02**	**-1.33E+02**	0.001%
1996	35	-6.14E+02	6.16E+02	1.99E+00	0.00E+00	4.92E-04	3.98E-03	0.00E+00	1.52E+00	0.00E+00	-8.72E-05	3.33E+01	2.98E+01	1.95E-02	0.00E+00	1.03E-03	1.68E-02	**-6.14E+02**	**-6.14E+02**	0.000%
1996	39	-2.42E+02	2.41E+02	-9.58E-01	7.32E-04	4.50E-04	4.13E-03	0.00E+00	0.00E+00	2.38E-04	1.25E-04	3.40E+01	3.49E+01	3.21E-02	0.00E+00	3.01E-04	4.27E-03	**-2.42E+02**	**-2.42E+02**	0.002%
1996	21	-4.11E+01	4.14E+01	3.45E-01	0.00E+00	1.10E-04	9.61E-04	0.00E+00	0.00E+00	6.39E-04	7.02E-05	6.00E+00	5.66E+00	6.87E-03	0.00E+00	6.30E-05	1.31E-03	**-4.11E+01**	**-4.11E+01**	0.015%
1996	27	-1.09E+02	1.11E+02	2.36E+00	2.69E-03	1.10E-03	8.93E-03	0.00E+00	8.94E-03	3.78E-05	-7.85E-05	4.89E+01	4.64E+01	6.44E-02	0.00E+00	7.88E-04	7.29E-03	**-1.09E+02**	**-1.09E+02**	0.002%
1996	34	-3.20E+01	3.64E+01	4.32E+00	0.00E+00	1.78E-04	9.70E-04	0.00E+00	3.46E+00	0.00E+00	-2.04E-04	9.68E+00	1.89E+00	8.70E-03	0.00E+00	4.52E-04	7.67E-03	**-3.20E+01**	**-3.20E+01**	0.000%
1996	20	-5.55E+01	5.60E+01	5.39E-01	0.00E+00	1.59E-04	1.33E-03	0.00E+00	0.00E+00	1.07E-05	-7.59E-06	6.80E+00	6.26E+00	6.81E-03	0.00E+00	1.04E-04	1.14E-03	**-5.55E+01**	**-5.55E+01**	0.001%
1996	33	-3.46E+01	3.76E+01	3.07E+00	7.47E-03	1.80E-04	8.66E-04	0.00E+00	3.11E+00	0.00E+00	-1.50E-04	1.13E+01	5.12E+00	8.92E-03	0.00E+00	4.82E-04	8.60E-03	**-3.46E+01**	**-3.46E+01**	0.000%
1996	32	-2.42E+02	2.44E+02	2.02E+00	1.43E-02	1.37E-03	7.29E-03	4.07E-02	9.02E+00	0.00E+00	-1.17E-04	3.82E+01	2.71E+01	3.34E-02	0.00E+00	3.44E-03	3.42E-02	**-2.42E+02**	**-2.42E+02**	0.000%
1996	22	-4.66E+01	4.61E+01	-5.04E-01	1.47E-02	5.12E-04	3.01E-03	0.00E+00	0.00E+00	1.90E-04	-1.29E-06	7.95E+00	8.43E+00	1.39E-02	0.00E+00	3.43E-04	2.53E-03	**-4.66E+01**	**-4.66E+01**	0.000%
1996	26	-1.62E+01	1.63E+01	1.45E-01	0.00E+00	3.80E-05	2.01E-04	0.00E+00	0.00E+00	0.00E+00	-2.96E-06	6.95E-01	5.50E-01	1.10E-03	0.00E+00	4.29E-05	2.97E-04	**-1.62E+01**	**-1.62E+01**	0.000%
1996	25	-3.42E+01	3.45E+01	3.49E-01	9.88E-04	1.56E-04	7.41E-04	0.00E+00	5.73E-03	0.00E+00	-2.71E-06	2.48E+00	2.12E+00	5.10E-03	0.00E+00	1.69E-04	1.32E-03	**-3.42E+01**	**-3.42E+01**	0.000%
1997	1	-5.35E+01	5.42E+01	7.88E-01	0.00E+00	6.16E-05	4.62E-04	0.00E+00	3.30E-01	1.85E-05	-3.54E-05	6.59E+00	5.49E+00	1.37E-03	0.00E+00	2.02E-03	1.26E-02	**-5.35E+01**	**-5.35E+01**	-0.001%
1997	38	-1.02E+02	1.01E+02	-6.22E-01	0.00E+00	1.93E-04	1.44E-03	0.00E+00	4.90E-01	1.51E-02	-1.27E-05	1.01E+01	1.02E+01	1.61E-03	0.00E+00	1.81E-03	4.28E-03	**-1.02E+02**	**-1.02E+02**	0.021%
1997	23	-8.70E+01	8.69E+01	-7.48E-02	0.00E+00	5.14E-05	3.97E-04	0.00E+00	0.00E+00	1.58E-04	-6.75E-07	2.11E+00	2.18E+00	1.68E-03	0.00E+00	9.59E-04	1.48E-03	**-8.70E+01**	**-8.70E+01**	-0.001%
1997	35	-4.00E+02	4.00E+02	1.78E-01	0.00E+00	4.60E-04	3.01E-03	0.00E+00	1.19E+00	0.00E+00	-9.74E-06	2.15E+01	2.01E+01	1.38E-02	0.00E+00	1.68E-02	4.12E-02	**-4.00E+02**	**-4.00E+02**	0.000%
1997	39	-1.57E+02	1.54E+02	-2.44E+00	7.62E-04	4.20E-04	3.14E-03	0.00E+00	0.00E+00	1.61E-04	1.63E-05	2.10E+01	2.35E+01	2.07E-02	0.00E+00	4.27E-03	7.58E-03	**-1.57E+02**	**-1.57E+02**	0.003%
1997	21	-2.77E+01	2.77E+01	-4.83E-02	0.00E+00	1.03E-04	7.24E-04	0.00E+00	0.00E+00	1.43E-03	1.05E-06	3.95E+00	4.00E+00	3.91E-03	0.00E+00	1.31E-03	1.11E-03	**-2.77E+01**	**-2.77E+01**	0.010%
1997	27	-7.33E+01	7.36E+01	2.75E-01	2.42E-03	1.03E-03	6.58E-03	0.00E+00	4.16E-03	0.00E+00	-6.04E-06	3.11E+01	3.08E+01	4.55E-02	0.00E+00	7.29E-03	9.65E-03	**-7.33E+01**	**-7.33E+01**	0.002%
1997	34	-2.23E+01	2.54E+01	3.12E+00	0.00E+00	1.66E-04	6.81E-04	0.00E+00	2.66E+00	0.00E+00	-6.23E-05	7.55E+00	1.77E+00	4.34E-03	0.00E+00	7.67E-03	6.25E-03	**-2.23E+01**	**-2.23E+01**	0.000%
1997	20	-3.77E+01	3.79E+01	1.57E-01	0.00E+00	1.49E-04	9.55E-04	0.00E+00	0.00E+00	1.13E-04	-1.55E-06	4.66E+00	4.50E+00	3.58E-03	0.00E+00	1.14E-03	1.19E-03	**-3.77E+01**	**-3.77E+01**	0.002%
1997	33	-2.37E+01	2.59E+01	2.21E+00	6.53E-03	1.68E-04	6.18E-04	0.00E+00	2.39E+00	0.00E+00	-4.51E-05	8.49E+00	3.88E+00	4.36E-03	0.00E+00	8.60E-03	5.96E-03	**-2.37E+01**	**-2.37E+01**	0.000%
1997	32	-1.75E+02	1.75E+02	8.34E-01	1.24E-02	1.28E-03	5.31E-03	4.06E-02	6.91E+00	0.00E+00	-3.14E-05	2.85E+01	2.07E+01	2.20E-02	0.00E+00	3.42E-02	3.93E-02	**-1.75E+02**	**-1.75E+02**	0.000%
1997	22	-3.54E+01	3.39E+01	-1.55E+00	1.27E-02	4.79E-04	2.20E-03	0.00E+00	0.00E+00	1.58E-04	4.56E-06	6.24E+00	7.76E+00	1.07E-02	0.00E+00	2.53E-03	1.78E-03	**-3.54E+01**	**-3.54E+01**	0.001%
1997	26	-1.18E+01	1.20E+01	1.44E-01	0.00E+00	3.55E-05	1.46E-04	0.00E+00	0.00E+00	0.00E+00	-1.29E-06	5.56E-01	4.11E-01	4.72E-04	0.00E+00	2.96E-04	2.35E-04	**-1.18E+01**	**-1.18E+01**	0.000%
1997	25	-2.59E+01	2.61E+01	2.47E-01	9.56E-04	1.46E-04	5.48E-04	0.00E+00	3.74E-03	0.00E+00	-1.65E-06	2.02E+00	1.77E+00	3.01E-03	0.00E+00	1.32E-03	9.78E-04	**-2.59E+01**	**-2.59E+01**	0.000%
1998	1	-4.78E+01	4.82E+01	3.96E-01	0.00E+00	6.40E-05	4.46E-04	0.00E+00	3.74E-01	3.89E-05	-2.44E-05	5.90E+00	5.12E+00	1.06E-03	0.00E+00	1.26E-02	2.03E-03	**-4.78E+01**	**-4.78E+01**	0.000%
1998	38	-8.80E+01	8.76E+01	-4.04E-01	0.00E+00	2.00E-04	1.30E-03	0.00E+00	5.35E-01	1.05E-02	-3.66E-04	8.94E+00	8.82E+00	6.71E-04	0.00E+00	3.95E-03	1.03E-03	**-8.80E+01**	**-8.80E+01**	0.021%
1998	23	-7.39E+01	7.38E+01	-6.34E-02	0.00E+00	5.35E-05	3.56E-04	0.00E+00	0.00E+00	9.89E-05	-1.21E-05	1.75E+00	1.82E+00	1.00E-03	0.00E+00	1.47E-03	4.04E-04	**-7.39E+01**	**-7.39E+01**	-0.001%
1998	35	-3.39E+02	3.39E+02	-1.03E-01	0.00E+00	4.77E-04	2.66E-03	0.00E+00	1.08E+00	0.00E+00	-8.49E-06	1.81E+01	1.71E+01	1.05E-02	0.00E+00	4.12E-02	1.12E-02	**-3.39E+02**	**-3.39E+02**	0.000%
1998	39	-1.32E+02	1.31E+02	-9.37E-01	6.52E-04	4.36E-04	2.75E-03	0.00E+00	0.00E+00	3.27E-04	-6.70E-05	1.80E+01	1.89E+01	1.94E-02	0.00E+00	7.50E-03	2.69E-03	**-1.32E+02**	**-1.32E+02**	0.001%
1998	21	-2.35E+01	2.35E+01	-6.46E-03	0.00E+00	1.07E-04	6.31E-04	0.00E+00	0.00E+00	5.53E-04	-5.51E-05	3.40E+00	3.40E+00	3.43E-03	0.00E+00	1.06E-03	5.65E-04	**-2.35E+01**	**-2.35E+01**	0.007%
1998	27	-6.37E+01	6.41E+01	4.11E-01	2.39E-03	1.07E-03	5.58E-03	0.00E+00	4.47E-03	1.69E-04	-8.80E-05	2.80E+01	2.75E+01	3.03E-02	0.00E+00	9.58E-03	6.09E-03	**-6.37E+01**	**-6.37E+01**	0.002%

Table 2. Mass Balance for 2, 3, 7, 8-TCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1998	34	-1.85E+01	2.09E+01	2.41E+00	0.00E+00	1.72E-04	5.85E-04	0.00E+00	2.51E+00	0.00E+00	-6.68E-05	6.36E+00	1.43E+00	3.56E-03	0.00E+00	6.25E-03	3.26E-03	**-1.85E+01**	**-1.85E+01**	0.000%
1998	20	-3.15E+01	3.16E+01	1.30E-01	0.00E+00	1.54E-04	8.22E-04	0.00E+00	0.00E+00	0.00E+00	-2.60E-05	3.93E+00	3.79E+00	2.75E-03	0.00E+00	1.17E-03	9.66E-04	**-3.15E+01**	**-3.15E+01**	0.001%
1998	33	-2.00E+01	2.16E+01	1.67E+00	7.07E-03	1.74E-04	5.36E-04	0.00E+00	2.27E+00	0.00E+00	-5.00E-05	7.07E+00	3.12E+00	3.79E-03	0.00E+00	5.95E-03	3.55E-03	**-2.00E+01**	**-2.00E+01**	0.000%
1998	32	-1.50E+02	1.50E+02	6.91E-01	1.35E-02	1.33E-03	4.50E-03	4.06E-02	6.34E+00	0.00E+00	-4.26E-05	2.50E+01	1.79E+01	2.00E-02	0.00E+00	3.93E-02	2.23E-02	**-1.50E+02**	**-1.50E+02**	0.000%
1998	22	-3.06E+01	2.95E+01	-1.15E+00	1.39E-02	4.97E-04	1.88E-03	0.00E+00	0.00E+00	2.10E-06	-8.11E-06	5.85E+00	6.97E+00	1.18E-02	0.00E+00	1.77E-03	1.82E-03	**-3.06E+01**	**-3.06E+01**	0.001%
1998	26	-1.02E+01	1.03E+01	1.02E-01	0.00E+00	3.69E-05	1.24E-04	0.00E+00	0.00E+00	0.00E+00	-2.76E-06	4.88E-01	3.86E-01	3.28E-04	0.00E+00	2.35E-04	1.76E-04	**-1.02E+01**	**-1.02E+01**	0.000%
1998	25	-2.19E+01	2.21E+01	1.95E-01	1.11E-03	1.52E-04	4.66E-04	0.00E+00	3.81E-03	0.00E+00	-1.25E-06	1.73E+00	1.52E+00	2.48E-03	0.00E+00	9.78E-04	7.87E-04	**-2.19E+01**	**-2.19E+01**	0.000%
1999	1	-5.46E+01	5.55E+01	9.13E-01	0.00E+00	5.80E-05	5.61E-04	0.00E+00	4.13E-01	2.04E-05	-1.37E-04	5.63E+00	4.30E+00	1.68E-03	0.00E+00	2.03E-03	6.66E-03	**-5.46E+01**	**-5.46E+01**	0.000%
1999	38	-8.66E+01	8.71E+01	5.28E-01	0.00E+00	1.82E-04	1.50E-03	0.00E+00	4.72E-01	9.57E-03	-2.41E-04	7.84E+00	6.86E+00	1.12E-03	0.00E+00	8.55E-04	4.77E-03	**-8.66E+01**	**-8.66E+01**	0.024%
1999	23	-6.06E+01	6.09E+01	2.97E-01	0.00E+00	4.84E-05	3.72E-04	0.00E+00	0.00E+00	5.77E-05	-2.51E-05	1.92E+00	1.62E+00	1.62E-03	0.00E+00	4.00E-04	3.60E-03	**-6.06E+01**	**-6.06E+01**	0.000%
1999	35	-2.98E+02	3.00E+02	2.38E+00	0.00E+00	4.32E-04	2.82E-03	0.00E+00	1.01E+00	0.00E+00	-1.89E-04	1.80E+01	1.47E+01	1.31E-02	0.00E+00	1.12E-02	5.76E-02	**-2.98E+02**	**-2.98E+02**	-0.001%
1999	39	-1.14E+02	1.14E+02	3.29E-01	5.47E-04	3.95E-04	2.89E-03	0.00E+00	0.00E+00	1.71E-04	-3.24E-05	1.47E+01	1.44E+01	2.22E-02	0.00E+00	2.69E-03	1.82E-02	**-1.14E+02**	**-1.14E+02**	0.001%
1999	21	-2.14E+01	2.16E+01	2.10E-01	0.00E+00	9.69E-05	6.84E-04	0.00E+00	0.00E+00	7.01E-04	-1.54E-05	3.19E+00	2.98E+00	4.52E-03	0.00E+00	5.56E-04	2.68E-03	**-2.14E+01**	**-2.14E+01**	0.008%
1999	27	-6.25E+01	6.41E+01	1.58E+00	1.93E-03	9.69E-04	5.80E-03	0.00E+00	3.96E-03	4.03E-05	-6.51E-05	2.31E+01	2.15E+01	3.50E-02	0.00E+00	6.09E-03	2.42E-02	**-6.25E+01**	**-6.25E+01**	0.002%
1999	34	-1.73E+01	1.93E+01	2.01E+00	0.00E+00	1.56E-04	6.33E-04	0.00E+00	2.33E+00	0.00E+00	-5.06E-05	5.61E+00	1.29E+00	4.52E-03	0.00E+00	3.26E-03	2.44E-02	**-1.73E+01**	**-1.73E+01**	0.000%
1999	20	-2.83E+01	2.85E+01	2.21E-01	0.00E+00	1.40E-04	8.68E-04	0.00E+00	0.00E+00	0.00E+00	-5.29E-06	3.48E+00	3.26E+00	3.95E-03	0.00E+00	9.66E-04	4.33E-03	**-2.83E+01**	**-2.83E+01**	0.001%
1999	33	-1.76E+01	1.91E+01	1.52E+00	5.62E-03	1.58E-04	5.70E-04	0.00E+00	2.11E+00	0.00E+00	-4.09E-05	6.03E+00	2.41E+00	4.19E-03	0.00E+00	3.55E-03	2.67E-02	**-1.76E+01**	**-1.76E+01**	0.000%
1999	32	-1.44E+02	1.46E+02	2.23E+00	1.05E-02	1.21E-03	4.67E-03	4.05E-02	6.68E+00	0.00E+00	-1.10E-04	2.44E+01	1.55E+01	2.70E-02	0.00E+00	2.23E-02	8.61E-02	**-1.44E+02**	**-1.44E+02**	0.000%
1999	22	-2.90E+01	2.87E+01	-3.76E-01	1.08E-02	4.50E-04	1.93E-03	0.00E+00	0.00E+00	4.37E-07	-8.40E-06	5.63E+00	5.99E+00	1.26E-02	0.00E+00	1.82E-03	8.69E-03	**-2.90E+01**	**-2.90E+01**	0.001%
1999	26	-1.02E+01	1.03E+01	1.30E-01	0.00E+00	3.34E-05	1.28E-04	0.00E+00	0.00E+00	0.00E+00	-1.71E-06	4.87E-01	3.57E-01	4.17E-04	0.00E+00	1.76E-04	1.03E-03	**-1.02E+01**	**-1.02E+01**	0.000%
1999	25	-2.21E+01	2.24E+01	2.72E-01	8.96E-04	1.37E-04	4.83E-04	0.00E+00	4.02E-03	0.00E+00	-2.66E-06	1.73E+00	1.45E+00	3.17E-03	0.00E+00	7.87E-04	4.90E-03	**-2.21E+01**	**-2.21E+01**	0.000%
2000	1	-3.34E+01	3.34E+01	5.84E-02	0.00E+00	6.04E-05	3.78E-04	0.00E+00	3.86E-01	2.76E-05	-4.74E-06	4.73E+00	4.27E+00	1.11E-03	0.00E+00	6.66E-03	7.08E-04	**-3.34E+01**	**-3.34E+01**	-0.001%
2000	38	-5.86E+01	5.76E+01	-1.02E+00	0.00E+00	1.89E-04	1.12E-03	0.00E+00	4.35E-01	1.28E-02	-3.62E-05	6.64E+00	7.21E+00	2.44E-03	0.00E+00	4.73E-03	6.92E-04	**-5.86E+01**	**-5.86E+01**	0.017%
2000	23	-5.02E+01	5.01E+01	-1.01E-01	0.00E+00	5.04E-05	3.13E-04	0.00E+00	0.00E+00	5.73E-04	4.17E-07	1.44E+00	1.53E+00	2.14E-03	0.00E+00	3.60E-03	2.39E-04	**-5.02E+01**	**-5.02E+01**	-0.004%
2000	35	-2.26E+02	2.25E+02	-6.83E-01	0.00E+00	4.50E-04	2.28E-03	0.00E+00	1.11E+00	0.00E+00	-1.35E-04	1.28E+01	1.23E+01	1.62E-02	0.00E+00	5.75E-02	5.27E-03	**-2.26E+02**	**-2.26E+02**	0.000%
2000	39	-8.85E+01	8.75E+01	-1.00E+00	6.42E-04	4.12E-04	2.41E-03	0.00E+00	0.00E+00	5.05E-04	5.53E-06	1.30E+01	1.40E+01	2.06E-02	0.00E+00	1.82E-02	1.44E-03	**-8.85E+01**	**-8.85E+01**	0.001%
2000	21	-1.54E+01	1.53E+01	-8.87E-02	0.00E+00	1.01E-04	5.43E-04	0.00E+00	0.00E+00	7.58E-04	-3.21E-07	2.46E+00	2.54E+00	3.86E-03	0.00E+00	2.68E-03	3.14E-04	**-1.54E+01**	**-1.54E+01**	0.005%
2000	27	-4.28E+01	4.27E+01	-9.91E-02	2.27E-03	1.01E-03	4.79E-03	0.00E+00	2.71E-03	1.91E-06	-3.00E-06	1.88E+01	1.88E+01	3.11E-02	0.00E+00	2.42E-02	3.17E-03	**-4.28E+01**	**-4.28E+01**	0.002%
2000	34	-1.30E+01	1.44E+01	1.40E+00	0.00E+00	1.63E-04	4.86E-04	0.00E+00	2.20E+00	0.00E+00	4.48E-04	4.76E+00	1.13E+00	2.59E-03	0.00E+00	2.49E-02	3.18E-03	**-1.30E+01**	**-1.30E+01**	0.004%
2000	20	-2.16E+01	2.16E+01	2.22E-02	0.00E+00	1.46E-04	6.93E-04	0.00E+00	0.00E+00	3.22E-05	-1.58E-06	2.76E+00	2.73E+00	3.07E-03	0.00E+00	4.33E-03	4.30E-04	**-2.16E+01**	**-2.16E+01**	0.001%
2000	33	-1.49E+01	1.58E+01	9.31E-01	6.13E-03	1.65E-04	4.38E-04	0.00E+00	1.93E+00	0.00E+00	9.45E-04	5.25E+00	2.35E+00	2.98E-03	0.00E+00	2.77E-02	2.93E-03	**-1.49E+01**	**-1.49E+01**	0.007%
2000	32	-1.09E+02	1.09E+02	-1.65E-01	1.17E-02	1.26E-03	3.76E-03	4.05E-02	6.37E+00	0.00E+00	-3.24E-04	1.91E+01	1.27E+01	2.35E-02	0.00E+00	8.58E-02	1.12E-02	**-1.09E+02**	**-1.09E+02**	0.000%
2000	22	-2.14E+01	2.07E+01	-7.15E-01	1.20E-02	4.69E-04	1.54E-03	0.00E+00	0.00E+00	7.54E-06	-2.00E-06	4.57E+00	5.25E+00	1.11E-02	0.00E+00	8.69E-03	1.02E-03	**-2.14E+01**	**-2.14E+01**	0.000%
2000	26	-7.33E+00	7.42E+00	8.27E-02	0.00E+00	3.48E-05	1.02E-04	0.00E+00	0.00E+00	0.00E+00	-1.31E-06	3.76E-01	2.93E-01	2.53E-04	0.00E+00	1.03E-03	1.12E-04	**-7.33E+00**	**-7.33E+00**	0.000%
2000	25	-1.68E+01	1.70E+01	1.53E-01	9.83E-04	1.43E-04	3.85E-04	0.00E+00	3.35E-03	0.00E+00	-2.41E-06	1.41E+00	1.25E+00	2.21E-03	0.00E+00	4.89E-03	3.28E-04	**-1.68E+01**	**-1.68E+01**	0.000%

Table 2. Mass Balance for 2, 3, 7, 8-TCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2001	1	-3.41E+01	3.45E+01	3.27E-01	0.00E+00	5.49E-05	5.02E-04	0.00E+00	2.81E-01	2.17E-06	-6.94E-06	4.73E+00	4.13E+00	1.59E-03	0.00E+00	7.08E-04	4.33E-03	**-3.41E+01**	**-3.41E+01**	-0.001%
2001	38	-5.84E+01	5.80E+01	-3.95E-01	0.00E+00	1.72E-04	1.36E-03	0.00E+00	3.20E-01	4.73E-03	-4.25E-06	6.24E+00	6.32E+00	1.64E-03	0.00E+00	6.92E-04	1.82E-03	**-5.84E+01**	**-5.84E+01**	0.011%
2001	23	-4.88E+01	4.86E+01	-1.05E-01	0.00E+00	4.58E-05	3.39E-04	0.00E+00	0.00E+00	1.29E-04	8.14E-08	1.35E+00	1.46E+00	1.81E-03	0.00E+00	2.39E-04	5.65E-04	**-4.88E+01**	**-4.88E+01**	-0.002%
2001	35	-2.23E+02	2.23E+02	-3.15E-01	0.00E+00	4.10E-04	2.57E-03	0.00E+00	9.78E-01	0.00E+00	1.34E-07	1.32E+01	1.25E+01	1.44E-02	0.00E+00	5.27E-03	1.67E-02	**-2.23E+02**	**-2.23E+02**	0.000%
2001	39	-8.65E+01	8.60E+01	-5.35E-01	4.96E-04	3.74E-04	2.65E-03	0.00E+00	0.00E+00	4.72E-04	7.24E-06	1.23E+01	1.28E+01	1.92E-02	0.00E+00	1.44E-03	3.10E-03	**-8.65E+01**	**-8.65E+01**	0.001%
2001	21	-1.57E+01	1.56E+01	-3.13E-02	0.00E+00	9.19E-05	6.20E-04	0.00E+00	0.00E+00	6.11E-04	-4.67E-07	2.51E+00	2.54E+00	3.64E-03	0.00E+00	3.14E-04	6.54E-04	**-1.57E+01**	**-1.57E+01**	0.005%
2001	27	-4.27E+01	4.25E+01	-2.68E-01	1.79E-03	9.18E-04	5.25E-03	0.00E+00	2.83E-03	7.16E-05	-1.59E-06	1.77E+01	1.80E+01	2.49E-02	0.00E+00	3.17E-03	7.49E-03	**-4.27E+01**	**-4.27E+01**	0.001%
2001	34	-1.30E+01	1.44E+01	1.44E+00	0.00E+00	1.48E-04	5.37E-04	0.00E+00	2.02E+00	0.00E+00	-3.97E-05	4.49E+00	1.03E+00	2.85E-03	0.00E+00	3.18E-03	4.46E-03	**-1.30E+01**	**-1.30E+01**	0.000%
2001	20	-2.13E+01	2.14E+01	3.65E-02	0.00E+00	1.32E-04	7.68E-04	0.00E+00	0.00E+00	1.50E-05	-7.18E-07	2.78E+00	2.75E+00	3.09E-03	0.00E+00	4.30E-04	8.46E-04	**-2.13E+01**	**-2.13E+01**	0.002%
2001	33	-1.47E+01	1.57E+01	1.05E+00	4.69E-03	1.50E-04	4.85E-04	0.00E+00	1.80E+00	0.00E+00	-3.20E-05	4.98E+00	2.13E+00	3.09E-03	0.00E+00	2.93E-03	4.45E-03	**-1.47E+01**	**-1.47E+01**	0.000%
2001	32	-1.06E+02	1.07E+02	2.54E-01	9.11E-03	1.14E-03	4.02E-03	4.03E-02	5.85E+00	0.00E+00	-1.71E-05	1.87E+01	1.26E+01	2.25E-02	0.00E+00	1.12E-02	3.44E-02	**-1.06E+02**	**-1.06E+02**	0.000%
2001	22	-2.14E+01	2.02E+01	-1.18E+00	9.36E-03	4.27E-04	1.66E-03	0.00E+00	0.00E+00	3.54E-05	9.29E-07	4.25E+00	5.41E+00	1.17E-02	0.00E+00	1.02E-03	2.04E-03	**-2.14E+01**	**-2.14E+01**	0.001%
2001	26	-7.13E+00	7.22E+00	8.79E-02	0.00E+00	3.17E-05	1.08E-04	0.00E+00	0.00E+00	0.00E+00	-1.26E-06	3.49E-01	2.61E-01	3.05E-04	0.00E+00	1.12E-04	2.60E-04	**-7.13E+00**	**-7.13E+00**	0.000%
2001	25	-1.62E+01	1.63E+01	1.63E-01	6.52E-04	1.30E-04	4.05E-04	0.00E+00	3.31E-03	0.00E+00	-1.81E-06	1.29E+00	1.12E+00	2.04E-03	0.00E+00	3.28E-04	1.10E-03	**-1.62E+01**	**-1.62E+01**	0.000%
2002	1	-2.30E+01	2.31E+01	1.53E-02	0.00E+00	5.31E-05	6.14E-04	0.00E+00	1.03E-01	8.13E-06	-3.26E-06	3.13E+00	3.01E+00	1.97E-03	0.00E+00	4.34E-03	1.70E-03	**-2.30E+01**	**-2.30E+01**	-0.001%
2002	38	-4.16E+01	4.11E+01	-4.93E-01	0.00E+00	1.66E-04	1.53E-03	0.00E+00	1.65E-01	8.85E-03	-2.85E-04	3.82E+00	4.14E+00	1.13E-03	0.00E+00	1.53E-03	9.75E-04	**-4.16E+01**	**-4.16E+01**	0.013%
2002	23	-3.70E+01	3.69E+01	-8.64E-02	0.00E+00	4.43E-05	3.67E-04	0.00E+00	0.00E+00	1.09E-04	-1.22E-05	9.29E-01	1.01E+00	1.56E-03	0.00E+00	5.53E-04	5.67E-04	**-3.70E+01**	**-3.70E+01**	0.000%
2002	35	-1.69E+02	1.69E+02	-3.07E-01	0.00E+00	3.96E-04	2.66E-03	0.00E+00	8.57E-01	0.00E+00	6.45E-08	8.78E+00	8.21E+00	1.28E-02	0.00E+00	1.67E-02	1.13E-02	**-1.69E+02**	**-1.69E+02**	0.000%
2002	39	-6.47E+01	6.37E+01	-1.07E+00	4.39E-04	3.62E-04	2.74E-03	0.00E+00	0.00E+00	2.89E-03	-1.16E-05	8.33E+00	9.39E+00	1.90E-02	0.00E+00	3.08E-03	3.64E-03	**-6.47E+01**	**-6.47E+01**	0.001%
2002	21	-1.26E+01	1.25E+01	-8.64E-02	0.00E+00	8.88E-05	6.36E-04	0.00E+00	0.00E+00	1.15E-03	-3.23E-05	1.88E+00	1.97E+00	2.98E-03	0.00E+00	6.22E-04	5.13E-04	**-1.26E+01**	**-1.26E+01**	0.005%
2002	27	-3.33E+01	3.30E+01	-2.90E-01	1.63E-03	8.87E-04	4.91E-03	0.00E+00	1.88E-03	8.26E-05	-2.75E-05	1.16E+01	1.19E+01	1.98E-02	0.00E+00	7.46E-03	6.34E-03	**-3.33E+01**	**-3.33E+01**	0.001%
2002	34	-1.10E+01	1.19E+01	8.24E-01	0.00E+00	1.43E-04	5.31E-04	0.00E+00	1.74E+00	0.00E+00	-2.26E-05	3.47E+00	9.01E-01	2.28E-03	0.00E+00	4.46E-03	3.75E-03	**-1.10E+01**	**-1.10E+01**	0.000%
2002	20	-1.76E+01	1.76E+01	-1.34E-02	0.00E+00	1.28E-04	7.48E-04	0.00E+00	0.00E+00	6.09E-05	-2.72E-07	2.18E+00	2.20E+00	2.48E-03	0.00E+00	8.46E-04	7.85E-04	**-1.76E+01**	**-1.76E+01**	0.000%
2002	33	-1.22E+01	1.30E+01	7.80E-01	4.32E-03	1.45E-04	4.73E-04	0.00E+00	1.60E+00	0.00E+00	-2.28E-05	3.71E+00	1.32E+00	2.58E-03	0.00E+00	4.45E-03	4.09E-03	**-1.22E+01**	**-1.22E+01**	0.000%
2002	32	-8.65E+01	8.63E+01	-1.77E-01	8.30E-03	1.10E-03	3.48E-03	4.02E-02	4.94E+00	0.00E+00	-9.91E-06	1.47E+01	9.88E+00	2.02E-02	0.00E+00	3.44E-02	2.14E-02	**-8.65E+01**	**-8.65E+01**	0.000%
2002	22	-1.72E+01	1.62E+01	-9.84E-01	8.53E-03	4.12E-04	1.39E-03	0.00E+00	0.00E+00	3.09E-05	1.33E-06	3.37E+00	4.33E+00	1.10E-02	0.00E+00	2.04E-03	1.80E-03	**-1.72E+01**	**-1.72E+01**	0.001%
2002	26	-5.40E+00	5.46E+00	6.18E-02	0.00E+00	3.06E-05	9.00E-05	0.00E+00	0.00E+00	0.00E+00	-1.07E-06	2.97E-01	2.35E-01	2.83E-04	0.00E+00	2.59E-04	1.80E-04	**-5.40E+00**	**-5.40E+00**	0.000%
2002	25	-1.31E+01	1.32E+01	1.29E-01	6.70E-04	1.26E-04	3.37E-04	0.00E+00	3.28E-03	0.00E+00	-1.58E-06	1.05E+00	9.11E-01	1.85E-03	0.00E+00	1.10E-03	7.32E-04	**-1.31E+01**	**-1.31E+01**	0.000%
2003	1	-3.86E+01	3.92E+01	6.03E-01	0.00E+00	6.78E-05	3.38E-04	0.00E+00	3.37E-01	4.81E-05	-3.18E-05	4.79E+00	3.86E+00	1.18E-03	0.00E+00	1.70E-03	5.71E-03	**-3.86E+01**	**-3.86E+01**	0.000%
2003	38	-7.05E+01	7.07E+01	2.57E-01	0.00E+00	2.12E-04	1.07E-03	0.00E+00	4.69E-01	4.85E-03	7.12E-05	9.26E+00	8.54E+00	1.51E-03	0.00E+00	1.08E-03	5.35E-03	**-7.05E+01**	**-7.05E+01**	0.011%
2003	23	-5.60E+01	5.59E+01	-1.07E-01	0.00E+00	5.66E-05	2.94E-04	0.00E+00	0.00E+00	7.10E-05	-1.33E-06	1.50E+00	1.61E+00	1.68E-03	0.00E+00	5.67E-04	3.21E-03	**-5.60E+01**	**-5.60E+01**	0.001%
2003	35	-2.55E+02	2.56E+02	1.56E-01	0.00E+00	5.06E-04	2.19E-03	0.00E+00	7.07E-01	0.00E+00	1.41E-04	1.46E+01	1.38E+01	1.26E-02	0.00E+00	1.14E-02	5.17E-02	**-2.55E+02**	**-2.55E+02**	0.000%
2003	39	-9.75E+01	9.74E+01	-9.08E-02	9.30E-04	4.62E-04	2.29E-03	0.00E+00	0.00E+00	1.91E-03	-1.38E-05	1.48E+01	1.49E+01	2.06E-02	0.00E+00	3.63E-03	1.47E-02	**-9.75E+01**	**-9.75E+01**	0.001%
2003	21	-1.74E+01	1.75E+01	8.30E-03	0.00E+00	1.13E-04	5.29E-04	0.00E+00	0.00E+00	1.47E-04	-2.77E-06	2.61E+00	2.60E+00	3.59E-03	0.00E+00	5.11E-04	2.63E-03	**-1.74E+01**	**-1.74E+01**	0.004%
2003	27	-4.82E+01	4.83E+01	1.30E-01	2.90E-03	1.13E-03	4.80E-03	0.00E+00	4.86E-03	0.00E+00	1.16E-05	2.15E+01	2.14E+01	2.72E-02	0.00E+00	6.37E-03	1.98E-02	**-4.82E+01**	**-4.82E+01**	0.000%

Table 2. Mass Balance for 2, 3, 7, 8-TCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2003	34	-1.40E+01	1.58E+01	1.76E+00	0.00E+00	1.83E-04	4.86E-04	0.00E+00	1.50E+00	0.00E+00	5.80E-05	4.11E+00	8.69E-01	4.31E-03	0.00E+00	3.87E-03	2.14E-02	**-1.40E+01**	**-1.40E+01**	0.001%
2003	20	-2.35E+01	2.36E+01	1.35E-01	0.00E+00	1.63E-04	6.89E-04	0.00E+00	0.00E+00	6.36E-06	-4.95E-06	2.90E+00	2.76E+00	3.69E-03	0.00E+00	7.83E-04	3.65E-03	**-2.35E+01**	**-2.35E+01**	0.000%
2003	33	-1.53E+01	1.67E+01	1.39E+00	8.17E-03	1.85E-04	4.29E-04	0.00E+00	1.19E+00	0.00E+00	7.11E-04	4.56E+00	1.99E+00	3.68E-03	0.00E+00	4.85E-03	3.13E-02	**-1.53E+01**	**-1.53E+01**	0.005%
2003	32	-1.09E+02	1.11E+02	2.11E+00	1.53E-02	1.41E-03	3.74E-03	4.07E-02	3.81E+00	0.00E+00	4.03E-03	1.93E+01	1.33E+01	2.39E-02	0.00E+00	2.56E-02	6.84E-02	**-1.09E+02**	**-1.09E+02**	0.004%
2003	22	-2.20E+01	2.13E+01	-6.46E-01	1.58E-02	5.27E-04	1.62E-03	0.00E+00	0.00E+00	7.81E-06	-6.46E-06	4.46E+00	5.08E+00	1.28E-02	0.00E+00	1.79E-03	4.50E-03	**-2.20E+01**	**-2.20E+01**	0.000%
2003	26	-7.30E+00	7.36E+00	6.47E-02	0.00E+00	3.91E-05	1.05E-04	0.00E+00	0.00E+00	0.00E+00	-2.42E-06	2.93E-01	2.28E-01	6.44E-04	0.00E+00	1.79E-04	4.41E-04	**-7.30E+00**	**-7.30E+00**	0.000%
2003	25	-1.51E+01	1.53E+01	2.11E-01	1.42E-03	1.61E-04	3.86E-04	0.00E+00	2.94E-03	0.00E+00	-6.53E-06	1.20E+00	9.84E-01	3.06E-03	0.00E+00	7.31E-04	2.59E-03	**-1.51E+01**	**-1.51E+01**	0.000%
2004	1	-3.36E+01	3.40E+01	4.00E-01	0.00E+00	6.46E-05	3.06E-04	0.00E+00	5.56E-01	7.50E-05	-4.68E-05	4.43E+00	3.47E+00	1.09E-03	0.00E+00	5.70E-03	7.46E-03	**-3.36E+01**	**-3.36E+01**	0.000%
2004	38	-6.26E+01	6.24E+01	-2.18E-01	0.00E+00	2.02E-04	1.03E-03	0.00E+00	4.51E-01	6.94E-03	2.62E-06	8.16E+00	7.93E+00	2.47E-03	0.00E+00	5.35E-03	1.04E-02	**-6.26E+01**	**-6.26E+01**	0.012%
2004	23	-5.08E+01	5.09E+01	2.57E-02	0.00E+00	5.40E-05	2.92E-04	0.00E+00	0.00E+00	3.73E-04	-1.46E-06	1.58E+00	1.56E+00	2.69E-03	0.00E+00	3.21E-03	7.02E-03	**-5.08E+01**	**-5.08E+01**	0.000%
2004	35	-2.29E+02	2.29E+02	4.70E-01	0.00E+00	4.82E-04	2.16E-03	0.00E+00	6.41E-01	0.00E+00	-1.61E-05	1.39E+01	1.28E+01	1.54E-02	0.00E+00	5.17E-02	1.10E-01	**-2.29E+02**	**-2.29E+02**	0.000%
2004	39	-8.79E+01	8.70E+01	-9.27E-01	7.79E-04	4.40E-04	2.28E-03	0.00E+00	0.00E+00	5.59E-04	5.19E-06	1.33E+01	1.42E+01	2.17E-02	0.00E+00	1.47E-02	4.68E-02	**-8.79E+01**	**-8.79E+01**	0.001%
2004	21	-1.54E+01	1.54E+01	8.08E-03	0.00E+00	1.08E-04	5.20E-04	0.00E+00	0.00E+00	1.30E-04	-1.26E-06	2.35E+00	2.34E+00	4.03E-03	0.00E+00	2.63E-03	7.22E-03	**-1.54E+01**	**-1.54E+01**	0.007%
2004	27	-4.34E+01	4.33E+01	-7.76E-02	2.83E-03	1.08E-03	4.85E-03	0.00E+00	4.17E-03	0.00E+00	-5.52E-06	1.93E+01	1.94E+01	2.70E-02	0.00E+00	1.98E-02	6.48E-02	**-4.34E+01**	**-4.34E+01**	0.002%
2004	34	-1.25E+01	1.41E+01	1.58E+00	0.00E+00	1.74E-04	4.83E-04	0.00E+00	1.34E+00	0.00E+00	-5.28E-05	3.69E+00	7.89E-01	3.44E-03	0.00E+00	2.14E-02	3.49E-02	**-1.25E+01**	**-1.25E+01**	0.000%
2004	20	-2.06E+01	2.07E+01	1.12E-01	0.00E+00	1.56E-04	6.84E-04	0.00E+00	0.00E+00	7.07E-06	-2.21E-06	2.52E+00	2.40E+00	3.67E-03	0.00E+00	3.65E-03	7.93E-03	**-2.06E+01**	**-2.06E+01**	0.001%
2004	33	-1.33E+01	1.46E+01	1.30E+00	7.17E-03	1.76E-04	4.23E-04	0.00E+00	1.04E+00	0.00E+00	-5.07E-05	4.18E+00	1.84E+00	2.97E-03	0.00E+00	3.13E-02	3.93E-02	**-1.33E+01**	**-1.33E+01**	0.001%
2004	32	-9.61E+01	9.84E+01	2.28E+00	1.37E-02	1.34E-03	3.70E-03	4.07E-02	3.23E+00	0.00E+00	-1.20E-04	1.71E+01	1.16E+01	2.01E-02	0.00E+00	6.84E-02	1.35E-01	**-9.61E+01**	**-9.61E+01**	0.000%
2004	22	-2.03E+01	1.90E+01	-1.31E+00	1.41E-02	5.02E-04	1.58E-03	0.00E+00	0.00E+00	7.32E-05	1.07E-06	3.88E+00	5.18E+00	1.18E-02	0.00E+00	4.50E-03	1.15E-02	**-2.03E+01**	**-2.03E+01**	0.000%
2004	26	-6.57E+00	6.63E+00	5.91E-02	0.00E+00	3.72E-05	1.03E-04	0.00E+00	0.00E+00	0.00E+00	-1.56E-06	2.63E-01	2.04E-01	5.88E-04	0.00E+00	4.41E-04	8.61E-04	**-6.57E+00**	**-6.57E+00**	0.000%
2004	25	-1.35E+01	1.36E+01	1.78E-01	1.19E-03	1.53E-04	3.77E-04	0.00E+00	2.44E-03	0.00E+00	-3.50E-06	1.07E+00	8.89E-01	2.72E-03	0.00E+00	2.59E-03	3.35E-03	**-1.35E+01**	**-1.35E+01**	0.000%
2005	1	-3.32E+01	3.35E+01	3.25E-01	0.00E+00	5.26E-05	3.22E-04	0.00E+00	6.65E-01	5.03E-06	-1.30E-05	4.41E+00	3.41E+00	1.07E-03	0.00E+00	7.46E-03	2.51E-03	**-3.32E+01**	**-3.32E+01**	0.000%
2005	38	-6.44E+01	6.43E+01	-8.77E-02	0.00E+00	1.64E-04	1.05E-03	0.00E+00	4.33E-01	3.13E-03	-2.29E-05	8.20E+00	7.85E+00	2.23E-03	0.00E+00	1.04E-02	9.82E-04	**-6.44E+01**	**-6.44E+01**	0.009%
2005	23	-5.30E+01	5.30E+01	-1.68E-05	0.00E+00	4.39E-05	2.84E-04	0.00E+00	0.00E+00	1.13E-04	-2.03E-06	1.70E+00	1.69E+00	2.88E-03	0.00E+00	7.02E-03	7.11E-04	**-5.30E+01**	**-5.30E+01**	0.001%
2005	35	-2.39E+02	2.40E+02	6.87E-01	0.00E+00	3.92E-04	2.11E-03	0.00E+00	9.07E-01	0.00E+00	-4.69E-05	1.57E+01	1.40E+01	1.67E-02	0.00E+00	1.10E-01	1.77E-02	**-2.39E+02**	**-2.39E+02**	0.000%
2005	39	-9.01E+01	8.96E+01	-4.54E-01	5.00E-04	3.58E-04	2.19E-03	0.00E+00	0.00E+00	3.20E-04	-9.26E-06	1.49E+01	1.52E+01	2.35E-02	0.00E+00	4.68E-02	2.83E-03	**-9.01E+01**	**-9.01E+01**	0.001%
2005	21	-1.70E+01	1.70E+01	-9.38E-03	0.00E+00	8.79E-05	5.14E-04	0.00E+00	0.00E+00	1.82E-04	-3.57E-05	2.66E+00	2.66E+00	3.81E-03	0.00E+00	7.19E-03	4.20E-04	**-1.70E+01**	**-1.70E+01**	0.006%
2005	27	-4.61E+01	4.63E+01	1.92E-01	1.90E-03	8.79E-04	4.73E-03	0.00E+00	3.93E-03	3.45E-05	-1.63E-05	2.20E+01	2.17E+01	2.84E-02	0.00E+00	6.48E-02	4.31E-03	**-4.61E+01**	**-4.61E+01**	0.002%
2005	34	-1.39E+01	1.57E+01	1.85E+00	0.00E+00	1.42E-04	4.83E-04	0.00E+00	1.79E+00	0.00E+00	-4.86E-05	4.68E+00	1.01E+00	3.29E-03	0.00E+00	3.49E-02	3.22E-03	**-1.39E+01**	**-1.39E+01**	0.001%
2005	20	-2.32E+01	2.34E+01	1.74E-01	0.00E+00	1.27E-04	6.81E-04	0.00E+00	0.00E+00	0.00E+00	-3.71E-06	3.03E+00	2.85E+00	3.80E-03	0.00E+00	7.93E-03	6.74E-04	**-2.32E+01**	**-2.32E+01**	0.001%
2005	33	-1.54E+01	1.69E+01	1.43E+00	4.10E-03	1.43E-04	4.29E-04	0.00E+00	1.51E+00	0.00E+00	-3.90E-05	5.38E+00	2.39E+00	2.95E-03	0.00E+00	3.93E-02	3.85E-03	**-1.54E+01**	**-1.54E+01**	0.000%
2005	32	-1.10E+02	1.12E+02	1.58E+00	8.02E-03	1.09E-03	3.84E-03	4.02E-02	5.09E+00	0.00E+00	-8.57E-05	2.05E+01	1.37E+01	2.07E-02	0.00E+00	1.35E-01	2.60E-02	**-1.10E+02**	**-1.10E+02**	0.000%
2005	22	-2.22E+01	2.16E+01	-5.86E-01	8.24E-03	4.08E-04	1.65E-03	0.00E+00	0.00E+00	6.44E-07	-1.28E-07	4.66E+00	5.22E+00	1.03E-02	0.00E+00	1.15E-02	9.63E-04	**-2.22E+01**	**-2.22E+01**	0.001%
2005	26	-7.45E+00	7.52E+00	6.75E-02	0.00E+00	3.03E-05	1.09E-04	0.00E+00	0.00E+00	0.00E+00	-7.98E-07	3.15E-01	2.47E-01	5.54E-04	0.00E+00	8.61E-04	1.48E-04	**-7.45E+00**	**-7.45E+00**	0.000%
2005	25	-1.55E+01	1.57E+01	1.83E-01	6.95E-04	1.25E-04	4.05E-04	0.00E+00	3.00E-03	0.00E+00	-2.16E-06	1.27E+00	1.08E+00	2.59E-03	0.00E+00	3.35E-03	4.76E-04	**-1.55E+01**	**-1.55E+01**	0.000%

Table 2. Mass Balance for 2, 3, 7, 8-TCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2006	1	-3.15E+01	3.19E+01	3.23E-01	0.00E+00	6.60E-05	2.76E-04	0.00E+00	5.97E-01	1.83E-05	-2.27E-05	4.19E+00	3.27E+00	8.92E-04	0.00E+00	2.51E-03	9.12E-04	**-3.15E+01**	**-3.15E+01**	0.000%
2006	38	-6.07E+01	6.04E+01	-2.60E-01	0.00E+00	2.07E-04	9.26E-04	0.00E+00	4.78E-01	3.41E-03	-1.31E-04	7.81E+00	7.60E+00	2.01E-03	0.00E+00	8.72E-04	6.42E-04	**-6.07E+01**	**-6.07E+01**	0.013%
2006	23	-4.96E+01	4.95E+01	-3.64E-02	0.00E+00	5.51E-05	2.59E-04	0.00E+00	0.00E+00	1.56E-04	-7.53E-06	1.54E+00	1.57E+00	2.46E-03	0.00E+00	7.04E-04	4.56E-04	**-4.96E+01**	**-4.96E+01**	0.001%
2006	35	-2.21E+02	2.21E+02	3.68E-01	0.00E+00	4.92E-04	1.90E-03	0.00E+00	6.81E-01	0.00E+00	-3.78E-05	1.35E+01	1.24E+01	1.57E-02	0.00E+00	1.77E-02	7.31E-03	**-2.21E+02**	**-2.21E+02**	0.000%
2006	39	-8.40E+01	8.36E+01	-3.55E-01	9.70E-04	4.50E-04	1.99E-03	0.00E+00	0.00E+00	3.78E-05	-4.16E-05	1.25E+01	1.29E+01	2.17E-02	0.00E+00	2.80E-03	2.69E-03	**-8.40E+01**	**-8.40E+01**	0.002%
2006	21	-1.50E+01	1.49E+01	-1.70E-02	0.00E+00	1.10E-04	4.62E-04	0.00E+00	0.00E+00	1.50E-04	-2.44E-05	2.26E+00	2.27E+00	3.82E-03	0.00E+00	3.98E-04	2.63E-04	**-1.50E+01**	**-1.50E+01**	0.009%
2006	27	-4.25E+01	4.26E+01	1.02E-01	3.44E-03	1.10E-03	4.26E-03	0.00E+00	4.04E-03	0.00E+00	-4.70E-05	1.92E+01	1.91E+01	3.04E-02	0.00E+00	4.28E-03	4.58E-03	**-4.25E+01**	**-4.25E+01**	0.002%
2006	34	-1.16E+01	1.31E+01	1.52E+00	0.00E+00	1.78E-04	4.29E-04	0.00E+00	1.31E+00	0.00E+00	-4.99E-05	3.65E+00	8.20E-01	2.97E-03	0.00E+00	3.22E-03	2.25E-03	**-1.16E+01**	**-1.16E+01**	0.000%
2006	20	-2.00E+01	2.01E+01	1.07E-01	0.00E+00	1.59E-04	6.06E-04	0.00E+00	0.00E+00	0.00E+00	-1.09E-05	2.48E+00	2.37E+00	3.69E-03	0.00E+00	6.67E-04	3.67E-04	**-2.00E+01**	**-2.00E+01**	0.001%
2006	33	-1.30E+01	1.43E+01	1.26E+00	7.66E-03	1.80E-04	3.77E-04	0.00E+00	1.06E+00	0.00E+00	-4.74E-05	4.29E+00	1.96E+00	2.78E-03	0.00E+00	3.85E-03	2.86E-03	**-1.30E+01**	**-1.30E+01**	0.000%
2006	32	-9.69E+01	9.86E+01	1.77E+00	1.44E-02	1.37E-03	3.38E-03	4.07E-02	3.62E+00	0.00E+00	-1.17E-04	1.74E+01	1.20E+01	1.87E-02	0.00E+00	2.60E-02	1.50E-02	**-9.69E+01**	**-9.69E+01**	0.000%
2006	22	-1.98E+01	1.93E+01	-4.79E-01	1.48E-02	5.12E-04	1.45E-03	0.00E+00	0.00E+00	1.89E-06	-6.31E-06	4.12E+00	4.58E+00	1.13E-02	0.00E+00	9.59E-04	1.29E-03	**-1.98E+01**	**-1.98E+01**	0.001%
2006	26	-6.75E+00	6.81E+00	5.72E-02	0.00E+00	3.80E-05	9.51E-05	0.00E+00	0.00E+00	0.00E+00	-1.15E-06	2.71E-01	2.13E-01	4.89E-04	0.00E+00	1.48E-04	1.02E-04	**-6.75E+00**	**-6.75E+00**	0.000%
2006	25	-1.37E+01	1.39E+01	1.69E-01	1.26E-03	1.56E-04	3.52E-04	0.00E+00	2.41E-03	0.00E+00	-3.13E-06	1.10E+00	9.30E-01	2.41E-03	0.00E+00	4.76E-04	4.14E-04	**-1.37E+01**	**-1.37E+01**	0.000%
2007	1	-4.91E+01	4.95E+01	3.85E-01	0.00E+00	6.96E-05	2.84E-04	0.00E+00	8.33E-01	4.23E-06	-1.54E-04	4.46E+00	3.24E+00	5.46E-04	0.00E+00	9.12E-04	1.49E-03	**-4.91E+01**	**-4.91E+01**	0.002%
2007	38	-8.59E+01	8.63E+01	4.36E-01	0.00E+00	2.18E-04	9.09E-04	0.00E+00	5.28E-01	6.06E-03	-7.20E-05	8.52E+00	7.59E+00	1.71E-03	0.00E+00	6.42E-04	1.25E-03	**-8.59E+01**	**-8.59E+01**	0.041%
2007	23	-6.91E+01	6.91E+01	-3.71E-02	0.00E+00	5.82E-05	2.52E-04	0.00E+00	0.00E+00	6.30E-05	-2.69E-06	1.50E+00	1.54E+00	2.34E-03	0.00E+00	4.56E-04	6.01E-04	**-6.91E+01**	**-6.91E+01**	0.001%
2007	35	-3.19E+02	3.20E+02	9.43E-01	0.00E+00	5.19E-04	1.84E-03	0.00E+00	7.30E-01	0.00E+00	-6.32E-05	1.51E+01	1.34E+01	1.45E-02	0.00E+00	7.31E-03	1.23E-02	**-3.19E+02**	**-3.19E+02**	0.000%
2007	39	-1.17E+02	1.17E+02	3.52E-01	9.29E-04	4.74E-04	1.95E-03	0.00E+00	0.00E+00	3.20E-05	-5.38E-05	1.44E+01	1.41E+01	2.19E-02	0.00E+00	2.69E-03	3.44E-03	**-1.17E+02**	**-1.17E+02**	0.000%
2007	21	-2.39E+01	2.41E+01	2.09E-01	0.00E+00	1.16E-04	4.41E-04	0.00E+00	0.00E+00	2.82E-04	-2.05E-05	2.82E+00	2.61E+00	4.32E-03	0.00E+00	2.63E-04	8.40E-04	**-2.39E+01**	**-2.39E+01**	0.009%
2007	27	-6.48E+01	6.57E+01	9.21E-01	3.25E-03	1.16E-03	4.04E-03	0.00E+00	4.35E-03	0.00E+00	-6.44E-05	2.32E+01	2.22E+01	3.26E-02	0.00E+00	4.58E-03	5.11E-03	**-6.48E+01**	**-6.48E+01**	0.001%
2007	34	-1.81E+01	2.07E+01	2.64E+00	0.00E+00	1.87E-04	4.06E-04	0.00E+00	1.39E+00	0.00E+00	-1.83E-04	5.02E+00	9.88E-01	3.07E-03	0.00E+00	2.25E-03	4.81E-03	**-1.81E+01**	**-1.81E+01**	0.000%
2007	20	-3.27E+01	3.31E+01	3.94E-01	0.00E+00	1.68E-04	5.74E-04	0.00E+00	0.00E+00	0.00E+00	-2.28E-05	3.21E+00	2.82E+00	4.02E-03	0.00E+00	3.67E-04	7.98E-04	**-3.27E+01**	**-3.27E+01**	0.000%
2007	33	-2.03E+01	2.25E+01	2.22E+00	8.69E-03	1.89E-04	3.58E-04	0.00E+00	1.14E+00	0.00E+00	-1.50E-04	5.71E+00	2.34E+00	2.87E-03	0.00E+00	2.86E-03	5.95E-03	**-2.03E+01**	**-2.03E+01**	0.000%
2007	32	-1.59E+02	1.63E+02	4.26E+00	1.62E-02	1.45E-03	3.25E-03	4.10E-02	4.00E+00	0.00E+00	-3.30E-04	2.37E+01	1.54E+01	1.92E-02	0.00E+00	1.50E-02	2.24E-02	**-1.59E+02**	**-1.59E+02**	0.000%
2007	22	-3.30E+01	3.27E+01	-2.72E-01	1.66E-02	5.40E-04	1.39E-03	0.00E+00	0.00E+00	1.65E-05	-2.18E-05	5.94E+00	6.19E+00	1.24E-02	0.00E+00	1.29E-03	1.77E-03	**-3.30E+01**	**-3.30E+01**	0.000%
2007	26	-1.19E+01	1.20E+01	1.31E-01	0.00E+00	4.01E-05	9.20E-05	0.00E+00	0.00E+00	0.00E+00	-4.11E-06	4.26E-01	2.94E-01	5.57E-04	0.00E+00	1.02E-04	1.74E-04	**-1.19E+01**	**-1.19E+01**	0.000%
2007	25	-2.39E+01	2.42E+01	3.24E-01	1.53E-03	1.65E-04	3.44E-04	0.00E+00	2.39E-03	0.00E+00	-1.08E-05	1.65E+00	1.32E+00	2.43E-03	0.00E+00	4.14E-04	7.39E-04	**-2.39E+01**	**-2.39E+01**	0.000%
2008	1	-3.44E+01	3.46E+01	2.25E-01	0.00E+00	6.30E-05	3.89E-04	0.00E+00	1.10E+00	8.78E-05	-1.22E-05	4.61E+00	3.28E+00	5.12E-04	0.00E+00	1.49E-03	1.71E-03	**-3.44E+01**	**-3.44E+01**	-0.002%
2008	38	-6.63E+01	6.58E+01	-4.88E-01	0.00E+00	1.97E-04	1.24E-03	0.00E+00	5.98E-01	4.06E-03	1.81E-05	7.87E+00	7.77E+00	1.11E-03	0.00E+00	1.25E-03	1.43E-03	**-6.63E+01**	**-6.63E+01**	0.012%
2008	23	-5.54E+01	5.54E+01	-1.23E-02	0.00E+00	5.26E-05	3.30E-04	0.00E+00	0.00E+00	6.42E-04	-1.15E-06	1.62E+00	1.63E+00	2.42E-03	0.00E+00	6.01E-04	5.25E-04	**-5.54E+01**	**-5.54E+01**	0.001%
2008	35	-2.49E+02	2.49E+02	3.36E-01	0.00E+00	4.69E-04	2.44E-03	0.00E+00	7.99E-01	0.00E+00	-1.47E-05	1.51E+01	1.39E+01	1.52E-02	0.00E+00	1.23E-02	1.08E-02	**-2.49E+02**	**-2.49E+02**	0.000%
2008	39	-9.47E+01	9.42E+01	-5.00E-01	7.30E-04	4.29E-04	2.56E-03	0.00E+00	0.00E+00	5.76E-05	8.49E-07	1.42E+01	1.47E+01	2.69E-02	0.00E+00	3.44E-03	3.39E-03	**-9.47E+01**	**-9.47E+01**	0.000%
2008	21	-1.72E+01	1.72E+01	-4.38E-03	0.00E+00	1.05E-04	5.95E-04	0.00E+00	0.00E+00	4.34E-04	-4.60E-07	2.74E+00	2.74E+00	5.90E-03	0.00E+00	8.40E-04	4.68E-04	**-1.72E+01**	**-1.72E+01**	0.004%
2008	27	-4.48E+01	4.47E+01	-2.33E-02	2.64E-03	1.05E-03	5.25E-03	0.00E+00	4.15E-03	0.00E+00	-2.88E-06	2.05E+01	2.05E+01	4.16E-02	0.00E+00	5.11E-03	5.81E-03	**-4.48E+01**	**-4.48E+01**	0.001%

Table 2. Mass Balance for 2, 3, 7, 8-TCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2008	34	-1.36E+01	1.54E+01	1.75E+00	0.00E+00	1.69E-04	5.43E-04	0.00E+00	1.54E+00	0.00E+00	-4.15E-05	4.29E+00	9.89E-01	3.51E-03	0.00E+00	4.80E-03	3.57E-03	**-1.36E+01**	**-1.36E+01**	0.000%
2008	20	-2.25E+01	2.26E+01	1.00E-01	0.00E+00	1.52E-04	7.65E-04	0.00E+00	0.00E+00	0.00E+00	-1.40E-06	2.84E+00	2.74E+00	5.37E-03	0.00E+00	7.98E-04	7.91E-04	**-2.25E+01**	**-2.25E+01**	0.000%
2008	33	-1.44E+01	1.58E+01	1.40E+00	6.73E-03	1.71E-04	4.73E-04	0.00E+00	1.24E+00	0.00E+00	-3.82E-05	4.75E+00	2.10E+00	3.12E-03	0.00E+00	5.95E-03	4.26E-03	**-1.44E+01**	**-1.44E+01**	0.000%
2008	32	-1.03E+02	1.05E+02	1.77E+00	1.29E-02	1.31E-03	4.00E-03	4.06E-02	3.95E+00	0.00E+00	-7.38E-05	1.86E+01	1.28E+01	2.07E-02	0.00E+00	2.24E-02	2.25E-02	**-1.03E+02**	**-1.03E+02**	0.000%
2008	22	-2.02E+01	1.97E+01	-4.67E-01	1.32E-02	4.89E-04	1.70E-03	0.00E+00	0.00E+00	7.65E-05	-7.07E-07	3.96E+00	4.40E+00	1.14E-02	0.00E+00	1.77E-03	1.37E-03	**-2.02E+01**	**-2.02E+01**	0.000%
2008	26	-6.75E+00	6.81E+00	5.59E-02	0.00E+00	3.63E-05	1.10E-04	0.00E+00	0.00E+00	0.00E+00	-9.55E-07	2.82E-01	2.25E-01	5.34E-04	0.00E+00	1.74E-04	1.43E-04	**-6.75E+00**	**-6.75E+00**	0.000%
2008	25	-1.42E+01	1.44E+01	1.71E-01	1.14E-03	1.49E-04	4.06E-04	0.00E+00	2.56E-03	0.00E+00	-2.24E-06	1.16E+00	9.82E-01	2.65E-03	0.00E+00	7.39E-04	5.46E-04	**-1.42E+01**	**-1.42E+01**	0.000%
2009	1	-2.86E+01	2.87E+01	9.92E-02	0.00E+00	6.15E-05	3.32E-04	0.00E+00	8.90E-01	4.60E-05	-1.09E-05	3.77E+00	2.78E+00	6.63E-04	0.00E+00	1.71E-03	1.09E-03	**-2.87E+01**	**-2.86E+01**	0.010%
2009	38	-5.13E+01	5.11E+01	-1.35E-01	0.00E+00	1.93E-04	1.05E-03	0.00E+00	3.19E-01	3.59E-03	-2.62E-05	6.39E+00	6.21E+00	1.68E-03	0.00E+00	1.41E-03	5.54E-04	**-5.13E+01**	**-5.13E+01**	0.014%
2009	23	-4.35E+01	4.34E+01	-3.46E-02	0.00E+00	5.14E-05	2.79E-04	0.00E+00	0.00E+00	8.63E-05	-4.70E-08	1.21E+00	1.25E+00	2.23E-03	0.00E+00	5.26E-04	3.18E-04	**-4.35E+01**	**-4.35E+01**	0.008%
2009	35	-1.94E+02	1.94E+02	1.83E-01	0.00E+00	4.59E-04	2.01E-03	0.00E+00	5.90E-01	0.00E+00	1.02E-05	1.10E+01	1.03E+01	1.32E-02	0.00E+00	1.08E-02	9.51E-03	**-1.94E+02**	**-1.94E+02**	0.031%
2009	39	-7.52E+01	7.48E+01	-3.56E-01	9.06E-04	4.19E-04	2.15E-03	0.00E+00	0.00E+00	2.51E-04	-1.13E-06	1.13E+01	1.17E+01	2.08E-02	0.00E+00	3.40E-03	1.49E-03	**-7.52E+01**	**-7.52E+01**	0.011%
2009	21	-1.28E+01	1.28E+01	-5.25E-02	0.00E+00	1.03E-04	4.83E-04	0.00E+00	0.00E+00	4.09E-04	3.34E-07	2.06E+00	2.11E+00	4.45E-03	0.00E+00	4.68E-04	2.50E-04	**-1.28E+01**	**-1.28E+01**	0.018%
2009	27	-3.46E+01	3.45E+01	-6.90E-02	2.61E-03	1.03E-03	4.29E-03	0.00E+00	3.05E-03	0.00E+00	-4.88E-06	1.59E+01	1.59E+01	3.19E-02	0.00E+00	5.81E-03	3.12E-03	**-3.46E+01**	**-3.46E+01**	0.029%
2009	34	-1.03E+01	1.15E+01	1.22E+00	0.00E+00	1.66E-04	4.29E-04	0.00E+00	1.17E+00	0.00E+00	8.00E-05	3.11E+00	7.28E-01	2.76E-03	0.00E+00	3.67E-03	2.32E-03	**-1.03E+01**	**-1.03E+01**	0.082%
2009	20	-1.77E+01	1.77E+01	3.99E-02	0.00E+00	1.48E-04	6.13E-04	0.00E+00	0.00E+00	0.00E+00	-1.22E-06	2.15E+00	2.11E+00	3.49E-03	0.00E+00	7.91E-04	3.83E-04	**-1.77E+01**	**-1.77E+01**	0.016%
2009	33	-1.11E+01	1.22E+01	1.09E+00	6.73E-03	1.68E-04	3.71E-04	0.00E+00	9.37E-01	0.00E+00	1.26E-04	3.51E+00	1.47E+00	2.56E-03	0.00E+00	4.42E-03	3.15E-03	**-1.11E+01**	**-1.11E+01**	0.045%
2009	32	-8.21E+01	8.32E+01	1.13E+00	1.27E-02	1.28E-03	3.26E-03	4.05E-02	3.16E+00	0.00E+00	-2.62E-04	1.42E+01	9.88E+00	1.74E-02	0.00E+00	2.23E-02	1.82E-02	**-8.21E+01**	**-8.21E+01**	0.065%
2009	22	-1.66E+01	1.59E+01	-7.08E-01	1.31E-02	4.78E-04	1.40E-03	0.00E+00	0.00E+00	0.00E+00	-6.22E-07	3.25E+00	3.94E+00	9.26E-03	0.00E+00	1.37E-03	8.68E-04	**-1.66E+01**	**-1.66E+01**	0.015%
2009	26	-5.54E+00	5.59E+00	4.58E-02	0.00E+00	3.54E-05	9.12E-05	0.00E+00	0.00E+00	0.00E+00	-8.44E-07	2.28E-01	1.81E-01	4.55E-04	0.00E+00	1.43E-04	1.21E-04	**-5.54E+00**	**-5.54E+00**	0.001%
2009	25	-1.17E+01	1.19E+01	1.37E-01	1.04E-03	1.46E-04	3.37E-04	0.00E+00	2.25E-03	0.00E+00	-1.93E-06	9.42E-01	8.01E-01	2.14E-03	0.00E+00	5.46E-04	4.62E-04	**-1.17E+01**	**-1.17E+01**	0.009%
2010	1	-5.67E+01	5.72E+01	4.18E-01	0.00E+00	6.27E-05	3.18E-04	0.00E+00	1.51E+00	4.44E-06	-3.63E-05	5.50E+00	3.71E+00	6.11E-04	0.00E+00	1.09E-03	1.46E-03	**-5.69E+01**	**-5.67E+01**	0.242%
2010	38	-1.08E+02	1.09E+02	1.30E+00	0.00E+00	1.96E-04	1.06E-03	0.00E+00	9.94E-01	4.35E-03	-1.59E-04	1.27E+01	1.05E+01	2.33E-03	0.00E+00	4.74E-04	1.28E-03	**-1.08E+02**	**-1.08E+02**	0.088%
2010	23	-9.16E+01	9.16E+01	1.83E-02	0.00E+00	5.24E-05	2.95E-04	0.00E+00	0.00E+00	5.77E-04	-3.01E-06	2.46E+00	2.44E+00	3.04E-03	0.00E+00	3.16E-04	5.92E-04	**-9.16E+01**	**-9.16E+01**	0.004%
2010	35	-3.87E+02	3.90E+02	2.29E+00	0.00E+00	4.67E-04	2.12E-03	0.00E+00	9.24E-01	0.00E+00	-6.41E-05	2.04E+01	1.76E+01	1.68E-02	0.00E+00	9.51E-03	1.08E-02	**-3.88E+02**	**-3.87E+02**	0.099%
2010	39	-1.52E+02	1.53E+02	1.05E+00	6.06E-04	4.27E-04	2.32E-03	0.00E+00	0.00E+00	1.17E-03	-3.83E-05	2.15E+01	2.05E+01	2.98E-02	0.00E+00	1.47E-03	2.48E-03	**-1.52E+02**	**-1.52E+02**	0.040%
2010	21	-2.34E+01	2.36E+01	2.46E-01	0.00E+00	1.05E-04	5.05E-04	0.00E+00	0.00E+00	2.15E-04	-2.66E-05	3.41E+00	3.16E+00	5.49E-03	0.00E+00	2.31E-04	5.77E-04	**-2.34E+01**	**-2.34E+01**	0.041%
2010	27	-6.41E+01	6.63E+01	2.18E+00	2.08E-03	1.05E-03	4.87E-03	0.00E+00	4.72E-03	9.87E-06	-6.19E-05	3.07E+01	2.87E+01	4.24E-02	0.00E+00	3.09E-03	4.90E-03	**-6.44E+01**	**-6.41E+01**	0.467%
2010	34	-1.75E+01	2.02E+01	2.72E+00	0.00E+00	1.69E-04	4.74E-04	0.00E+00	1.50E+00	0.00E+00	-5.19E-05	5.38E+00	1.17E+00	3.99E-03	0.00E+00	2.32E-03	3.30E-03	**-1.75E+01**	**-1.75E+01**	0.074%
2010	20	-3.15E+01	3.19E+01	4.25E-01	0.00E+00	1.51E-04	6.76E-04	0.00E+00	0.00E+00	0.00E+00	-1.42E-05	3.80E+00	3.38E+00	4.39E-03	0.00E+00	3.75E-04	6.53E-04	**-3.15E+01**	**-3.15E+01**	0.030%
2010	33	-1.96E+01	2.19E+01	2.28E+00	5.61E-03	1.71E-04	4.25E-04	0.00E+00	1.28E+00	0.00E+00	-4.91E-05	5.97E+00	2.41E+00	3.50E-03	0.00E+00	3.15E-03	4.10E-03	**-1.97E+01**	**-1.96E+01**	0.076%
2010	32	-1.48E+02	1.52E+02	4.72E+00	1.07E-02	1.30E-03	4.03E-03	4.05E-02	4.42E+00	0.00E+00	-1.34E-04	2.52E+01	1.62E+01	2.18E-02	0.00E+00	1.82E-02	1.85E-02	**-1.48E+02**	**-1.48E+02**	0.188%
2010	22	-3.00E+01	2.99E+01	-1.23E-01	1.10E-02	4.87E-04	1.72E-03	0.00E+00	0.00E+00	4.95E-06	-1.04E-05	6.49E+00	6.61E+00	1.20E-02	0.00E+00	8.60E-04	1.28E-03	**-3.00E+01**	**-3.00E+01**	0.046%
2010	26	-1.12E+01	1.12E+01	7.73E-02	0.00E+00	3.61E-05	1.16E-04	0.00E+00	0.00E+00	0.00E+00	-1.37E-06	4.33E-01	3.57E-01	5.94E-04	0.00E+00	1.21E-04	1.44E-04	**-1.12E+01**	**-1.12E+01**	0.019%
2010	25	-2.15E+01	2.18E+01	3.05E-01	1.14E-03	1.48E-04	4.34E-04	0.00E+00	2.82E-03	0.00E+00	-3.25E-06	1.69E+00	1.39E+00	2.69E-03	0.00E+00	4.62E-04	5.57E-04	**-2.15E+01**	**-2.15E+01**	0.017%

Table 2. Mass Balance for 2, 3, 7, 8-TCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2011	1	-2.78E+02	2.79E+02	8.48E-01	0.00E+00	7.31E-05	5.16E-04	0.00E+00	2.22E+00	1.70E-05	2.94E-04	1.04E+01	7.37E+00	3.35E-04	0.00E+00	1.46E-03	1.45E-02	**-2.78E+02**	**-2.78E+02**	0.001%
2011	38	-4.59E+02	4.68E+02	8.81E+00	0.00E+00	2.29E-04	1.75E-03	0.00E+00	2.68E+00	7.22E-03	-3.41E-03	2.78E+01	1.64E+01	1.85E-03	0.00E+00	1.28E-03	1.43E-02	**-4.60E+02**	**-4.59E+02**	0.008%
2011	23	-3.86E+02	3.86E+02	6.07E-01	0.00E+00	6.10E-05	5.18E-04	0.00E+00	0.00E+00	3.95E-04	-1.84E-04	5.10E+00	4.50E+00	5.14E-03	0.00E+00	5.92E-04	6.33E-03	**-3.86E+02**	**-3.86E+02**	0.001%
2011	35	-1.72E+03	1.73E+03	1.23E+01	0.00E+00	5.44E-04	4.06E-03	0.00E+00	1.73E+00	0.00E+00	-8.14E-03	5.38E+01	3.99E+01	2.69E-02	0.00E+00	1.08E-02	9.28E-02	**-1.72E+03**	**-1.72E+03**	0.003%
2011	39	-6.23E+02	6.34E+02	1.06E+01	5.45E-04	4.98E-04	4.35E-03	0.00E+00	0.00E+00	4.13E-04	-4.24E-03	5.58E+01	4.52E+01	5.96E-02	0.00E+00	2.48E-03	2.52E-02	**-6.23E+02**	**-6.23E+02**	0.002%
2011	21	-1.22E+02	1.25E+02	3.19E+00	0.00E+00	1.22E-04	9.60E-04	0.00E+00	0.00E+00	1.15E-03	-8.31E-04	1.15E+01	8.29E+00	1.06E-02	0.00E+00	5.77E-04	7.52E-03	**-1.22E+02**	**-1.22E+02**	0.022%
2011	27	-3.08E+02	3.25E+02	1.68E+01	2.12E-03	1.22E-03	9.76E-03	0.00E+00	1.11E-02	5.24E-06	-5.20E-03	9.32E+01	7.64E+01	9.79E-02	0.00E+00	4.90E-03	3.71E-02	**-3.08E+02**	**-3.08E+02**	0.003%
2011	34	-9.83E+01	1.15E+02	1.63E+01	0.00E+00	1.97E-04	9.88E-04	0.00E+00	2.74E+00	0.00E+00	-5.51E-03	2.27E+01	3.75E+00	1.16E-02	0.00E+00	3.30E-03	4.60E-02	**-9.83E+01**	**-9.83E+01**	0.009%
2011	20	-1.78E+02	1.82E+02	4.12E+00	0.00E+00	1.76E-04	1.33E-03	0.00E+00	0.00E+00	5.79E-07	-1.43E-03	1.35E+01	9.43E+00	1.09E-02	0.00E+00	6.53E-04	5.95E-03	**-1.78E+02**	**-1.78E+02**	0.007%
2011	33	-1.05E+02	1.19E+02	1.49E+01	5.80E-03	1.99E-04	8.98E-04	0.00E+00	2.42E+00	0.00E+00	-4.50E-03	2.40E+01	6.77E+00	9.77E-03	0.00E+00	4.10E-03	5.28E-02	**-1.05E+02**	**-1.05E+02**	0.004%
2011	32	-8.24E+02	8.57E+02	3.30E+01	9.95E-03	1.52E-03	8.39E-03	4.04E-02	9.19E+00	1.56E-07	-1.20E-02	9.50E+01	5.30E+01	4.81E-02	0.00E+00	1.85E-02	1.56E-01	**-8.24E+02**	**-8.24E+02**	0.016%
2011	22	-1.75E+02	1.79E+02	4.08E+00	1.02E-02	5.67E-04	3.54E-03	0.00E+00	0.00E+00	7.40E-06	-1.13E-03	2.79E+01	2.38E+01	3.06E-02	0.00E+00	1.28E-03	6.02E-03	**-1.75E+02**	**-1.75E+02**	0.009%
2011	26	-7.34E+01	7.40E+01	6.26E-01	0.00E+00	4.21E-05	2.44E-04	0.00E+00	0.00E+00	0.00E+00	-1.20E-04	1.98E+00	1.36E+00	1.59E-03	0.00E+00	1.44E-04	8.88E-04	**-7.34E+01**	**-7.34E+01**	0.000%
2011	25	-1.33E+02	1.35E+02	2.72E+00	1.69E-03	1.73E-04	9.16E-04	0.00E+00	6.08E-03	0.00E+00	-4.08E-04	7.70E+00	4.97E+00	7.62E-03	0.00E+00	5.57E-04	3.16E-03	**-1.33E+02**	**-1.33E+02**	0.002%
2012	1	-8.84E+01	8.88E+01	4.25E-01	0.00E+00	5.85E-05	7.80E-04	0.00E+00	3.74E+00	9.39E-05	-1.53E-04	1.19E+01	7.77E+00	2.14E-03	0.00E+00	1.45E-02	4.81E-03	**-8.84E+01**	**-8.84E+01**	0.000%
2012	38	-1.77E+02	1.72E+02	-4.96E+00	0.00E+00	1.83E-04	2.49E-03	0.00E+00	2.83E+00	1.44E-03	9.53E-05	2.06E+01	2.28E+01	1.40E-03	0.00E+00	1.43E-02	2.58E-03	**-1.77E+02**	**-1.77E+02**	0.012%
2012	23	-1.58E+02	1.58E+02	8.54E-02	0.00E+00	4.88E-05	6.66E-04	0.00E+00	0.00E+00	0.00E+00	-4.94E-06	4.40E+00	4.31E+00	3.62E-03	0.00E+00	6.33E-03	7.76E-04	**-1.58E+02**	**-1.58E+02**	0.000%
2012	35	-6.93E+02	6.93E+02	5.30E-01	0.00E+00	4.36E-04	5.05E-03	0.00E+00	1.99E+00	0.00E+00	-4.88E-05	3.91E+01	3.64E+01	2.66E-02	0.00E+00	9.28E-02	2.46E-02	**-6.93E+02**	**-6.93E+02**	0.000%
2012	39	-2.74E+02	2.69E+02	-5.15E+00	4.56E-04	3.99E-04	5.34E-03	0.00E+00	0.00E+00	0.00E+00	5.28E-05	4.13E+01	4.63E+01	5.90E-02	0.00E+00	2.52E-02	5.21E-03	**-2.74E+02**	**-2.74E+02**	0.000%
2012	21	-4.57E+01	4.50E+01	-6.56E-01	0.00E+00	9.79E-05	1.23E-03	0.00E+00	0.00E+00	1.03E-04	1.16E-06	7.28E+00	7.92E+00	1.02E-02	0.00E+00	7.52E-03	1.12E-03	**-4.57E+01**	**-4.57E+01**	0.006%
2012	27	-1.12E+02	1.11E+02	-1.16E+00	8.77E-04	9.78E-04	1.12E-02	0.00E+00	5.52E-03	0.00E+00	2.57E-06	5.91E+01	6.02E+01	9.97E-02	0.00E+00	3.71E-02	9.68E-03	**-1.12E+02**	**-1.12E+02**	0.000%
2012	34	-3.38E+01	3.83E+01	4.49E+00	0.00E+00	1.58E-04	1.14E-03	0.00E+00	3.32E+00	0.00E+00	-1.74E-04	1.04E+01	2.56E+00	6.67E-03	0.00E+00	4.60E-02	7.37E-03	**-3.38E+01**	**-3.38E+01**	0.000%
2012	20	-5.95E+01	5.95E+01	-3.13E-02	0.00E+00	1.41E-04	1.59E-03	0.00E+00	0.00E+00	0.00E+00	-3.86E-06	7.76E+00	7.78E+00	1.23E-02	0.00E+00	5.95E-03	1.29E-03	**-5.95E+01**	**-5.95E+01**	0.001%
2012	33	-3.58E+01	4.00E+01	4.18E+00	2.86E-03	1.59E-04	9.73E-04	0.00E+00	2.51E+00	0.00E+00	-1.88E-04	1.14E+01	4.65E+00	6.25E-03	0.00E+00	5.28E-02	8.80E-03	**-3.58E+01**	**-3.58E+01**	0.000%
2012	32	-2.37E+02	2.40E+02	2.98E+00	4.10E-03	1.22E-03	8.38E-03	4.01E-02	6.93E+00	0.00E+00	-2.68E-04	3.85E+01	2.84E+01	3.78E-02	0.00E+00	1.56E-01	3.93E-02	**-2.37E+02**	**-2.37E+02**	0.000%
2012	22	-4.81E+01	4.56E+01	-2.44E+00	4.30E-03	4.55E-04	3.51E-03	0.00E+00	0.00E+00	0.00E+00	1.19E-05	9.20E+00	1.16E+01	1.94E-02	0.00E+00	6.02E-03	2.03E-03	**-4.81E+01**	**-4.81E+01**	0.000%
2012	26	-1.54E+01	1.55E+01	1.30E-01	0.00E+00	3.37E-05	2.34E-04	0.00E+00	0.00E+00	0.00E+00	-3.36E-06	6.16E-01	4.84E-01	1.17E-03	0.00E+00	8.88E-04	2.10E-04	**-1.54E+01**	**-1.54E+01**	0.000%
2012	25	-3.16E+01	3.19E+01	3.33E-01	1.01E-03	1.39E-04	8.55E-04	0.00E+00	4.02E-03	0.00E+00	-7.90E-06	2.50E+00	2.16E+00	6.47E-03	0.00E+00	3.16E-03	8.88E-04	**-3.16E+01**	**-3.16E+01**	0.000%
2013	1	-5.23E+01	5.24E+01	1.06E-01	0.00E+00	6.14E-05	4.84E-04	0.00E+00	2.21E+00	1.39E-04	-4.09E-05	7.09E+00	4.77E+00	9.49E-04	0.00E+00	4.81E-03	1.37E-03	**-5.23E+01**	**-5.23E+01**	0.000%
2013	38	-9.99E+01	9.74E+01	-2.52E+00	0.00E+00	1.92E-04	1.49E-03	0.00E+00	1.24E+00	5.12E-03	-3.80E-04	1.13E+01	1.26E+01	2.51E-04	0.00E+00	2.14E-03	7.65E-04	**-9.99E+01**	**-9.99E+01**	0.014%
2013	23	-8.23E+01	8.22E+01	-1.28E-01	0.00E+00	5.12E-05	3.92E-04	0.00E+00	0.00E+00	9.81E-05	-1.80E-05	2.17E+00	2.30E+00	1.56E-03	0.00E+00	7.57E-04	3.14E-04	**-8.23E+01**	**-8.23E+01**	0.002%
2013	35	-3.76E+02	3.76E+02	1.24E-02	0.00E+00	4.57E-04	2.99E-03	0.00E+00	1.11E+00	0.00E+00	-3.62E-05	2.09E+01	1.98E+01	1.61E-02	0.00E+00	2.46E-02	1.15E-02	**-3.76E+02**	**-3.76E+02**	0.000%
2013	39	-1.43E+02	1.42E+02	-7.27E-01	7.94E-04	4.18E-04	3.11E-03	0.00E+00	0.00E+00	7.38E-05	-4.75E-05	2.14E+01	2.21E+01	3.08E-02	0.00E+00	5.17E-03	1.67E-03	**-1.43E+02**	**-1.43E+02**	0.001%
2013	21	-2.74E+01	2.68E+01	-6.79E-01	0.00E+00	1.03E-04	7.24E-04	0.00E+00	0.00E+00	4.66E-04	-7.44E-05	4.06E+00	4.74E+00	5.07E-03	0.00E+00	1.04E-03	3.18E-04	**-2.74E+01**	**-2.74E+01**	0.007%
2013	27	-6.73E+01	6.69E+01	-3.91E-01	2.81E-03	1.02E-03	6.59E-03	0.00E+00	4.06E-03	0.00E+00	-3.70E-05	3.41E+01	3.44E+01	5.65E-02	0.00E+00	9.66E-03	3.57E-03	**-6.73E+01**	**-6.73E+01**	0.001%

Table 2. Mass Balance for 2, 3, 7, 8-TCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2013	34	-2.10E+01	2.36E+01	2.63E+00	0.00E+00	1.65E-04	6.70E-04	0.00E+00	2.04E+00	0.00E+00	-9.49E-05	6.23E+00	1.56E+00	4.50E-03	0.00E+00	7.36E-03	2.95E-03	**-2.10E+01**	**-2.10E+01**	0.000%
2013	20	-3.75E+01	3.68E+01	-6.23E-01	0.00E+00	1.48E-04	9.36E-04	0.00E+00	0.00E+00	0.00E+00	7.64E-06	4.36E+00	4.98E+00	5.33E-03	0.00E+00	1.29E-03	5.58E-04	**-3.75E+01**	**-3.75E+01**	0.001%
2013	33	-2.30E+01	2.56E+01	2.60E+00	6.81E-03	1.67E-04	5.80E-04	0.00E+00	1.60E+00	0.00E+00	-1.14E-04	7.16E+00	2.95E+00	4.64E-03	0.00E+00	8.80E-03	3.73E-03	**-2.30E+01**	**-2.30E+01**	0.000%
2013	32	-1.51E+02	1.53E+02	2.20E+00	1.22E-02	1.28E-03	5.08E-03	4.05E-02	4.64E+00	0.00E+00	-1.70E-04	2.47E+01	1.78E+01	2.63E-02	0.00E+00	3.93E-02	2.23E-02	**-1.51E+02**	**-1.51E+02**	0.000%
2013	22	-2.96E+01	2.88E+01	-7.95E-01	1.26E-02	4.76E-04	2.14E-03	0.00E+00	0.00E+00	2.03E-06	4.96E-07	5.57E+00	6.34E+00	1.32E-02	0.00E+00	2.03E-03	9.79E-04	**-2.96E+01**	**-2.96E+01**	0.001%
2013	26	-9.56E+00	9.66E+00	1.01E-01	0.00E+00	3.54E-05	1.43E-04	0.00E+00	0.00E+00	0.00E+00	-2.38E-06	4.13E-01	3.10E-01	8.73E-04	0.00E+00	2.10E-04	1.32E-04	**-9.56E+00**	**-9.56E+00**	0.000%
2013	25	-2.03E+01	2.06E+01	2.35E-01	1.11E-03	1.45E-04	5.29E-04	0.00E+00	3.16E-03	0.00E+00	-5.23E-06	1.70E+00	1.46E+00	4.43E-03	0.00E+00	8.88E-04	4.66E-04	**-2.03E+01**	**-2.03E+01**	0.000%
2014	1	-6.78E+01	6.81E+01	2.31E-01	0.00E+00	6.09E-05	5.28E-04	0.00E+00	2.60E+00	1.46E-05	-2.89E-05	8.55E+00	5.72E+00	1.42E-03	0.00E+00	1.37E-03	1.56E-03	**-6.78E+01**	**-6.78E+01**	0.000%
2014	38	-1.19E+02	1.20E+02	1.04E+00	0.00E+00	1.91E-04	1.62E-03	0.00E+00	1.62E+00	5.09E-03	-1.88E-04	1.50E+01	1.24E+01	1.13E-03	0.00E+00	6.26E-04	1.39E-03	**-1.19E+02**	**-1.19E+02**	0.005%
2014	23	-9.70E+01	9.69E+01	-4.80E-02	0.00E+00	5.08E-05	4.15E-04	0.00E+00	0.00E+00	2.26E-04	-5.51E-06	2.35E+00	2.40E+00	2.38E-03	0.00E+00	3.09E-04	6.70E-04	**-9.70E+01**	**-9.70E+01**	0.001%
2014	35	-4.43E+02	4.44E+02	5.72E-01	0.00E+00	4.54E-04	3.21E-03	0.00E+00	1.31E+00	0.00E+00	-2.95E-05	2.36E+01	2.17E+01	1.86E-02	0.00E+00	1.15E-02	1.16E-02	**-4.43E+02**	**-4.43E+02**	0.000%
2014	39	-1.68E+02	1.69E+02	8.94E-02	6.10E-04	4.15E-04	3.27E-03	0.00E+00	0.00E+00	1.52E-04	-3.46E-05	2.42E+01	2.41E+01	3.44E-02	0.00E+00	1.64E-03	3.92E-03	**-1.68E+02**	**-1.68E+02**	0.000%
2014	21	-3.14E+01	3.14E+01	-3.30E-02	0.00E+00	1.02E-04	7.90E-04	0.00E+00	0.00E+00	5.06E-04	-2.23E-05	4.90E+00	4.93E+00	5.96E-03	0.00E+00	2.98E-04	7.08E-04	**-3.14E+01**	**-3.14E+01**	0.003%
2014	27	-7.55E+01	7.57E+01	2.10E-01	2.41E-03	1.02E-03	6.93E-03	0.00E+00	4.75E-03	6.11E-06	-4.19E-05	3.59E+01	3.56E+01	5.54E-02	0.00E+00	3.54E-03	5.53E-03	**-7.55E+01**	**-7.55E+01**	0.001%
2014	34	-2.33E+01	2.63E+01	3.08E+00	0.00E+00	1.64E-04	7.41E-04	0.00E+00	2.35E+00	0.00E+00	-7.75E-05	7.34E+00	1.91E+00	5.00E-03	0.00E+00	2.95E-03	4.57E-03	**-2.33E+01**	**-2.33E+01**	0.000%
2014	20	-4.18E+01	4.20E+01	2.00E-01	0.00E+00	1.47E-04	1.02E-03	0.00E+00	0.00E+00	0.00E+00	-4.82E-06	5.33E+00	5.12E+00	5.82E-03	0.00E+00	5.59E-04	7.79E-04	**-4.18E+01**	**-4.18E+01**	0.000%
2014	33	-2.56E+01	2.83E+01	2.71E+00	6.64E-03	1.66E-04	6.48E-04	0.00E+00	1.89E+00	0.00E+00	-8.66E-05	8.27E+00	3.66E+00	4.46E-03	0.00E+00	3.72E-03	5.80E-03	**-2.56E+01**	**-2.56E+01**	0.000%
2014	32	-1.71E+02	1.73E+02	2.10E+00	1.83E-02	1.27E-03	5.43E-03	4.05E-02	5.73E+00	0.00E+00	-1.06E-04	2.79E+01	2.00E+01	2.60E-02	0.00E+00	2.23E-02	2.22E-02	**-1.71E+02**	**-1.71E+02**	0.000%
2014	22	-3.32E+01	3.28E+01	-4.46E-01	1.23E-02	4.73E-04	2.31E-03	0.00E+00	0.00E+00	0.00E+00	-1.12E-07	6.73E+00	7.15E+00	1.31E-02	0.00E+00	9.80E-04	2.38E-03	**-3.32E+01**	**-3.32E+01**	0.000%
2014	26	-1.10E+01	1.11E+01	7.23E-02	0.00E+00	3.51E-05	1.51E-04	0.00E+00	0.00E+00	0.00E+00	-1.82E-06	4.45E-01	3.72E-01	6.71E-04	0.00E+00	1.32E-04	1.95E-04	**-1.10E+01**	**-1.10E+01**	0.000%
2014	25	-2.30E+01	2.32E+01	2.50E-01	4.80E-04	1.44E-04	5.56E-04	0.00E+00	3.20E-03	0.00E+00	-3.77E-06	1.79E+00	1.53E+00	3.89E-03	0.00E+00	4.66E-04	8.62E-04	**-2.30E+01**	**-2.30E+01**	0.000%
2015	1	-4.05E+01	4.05E+01	1.95E-02	0.00E+00	5.88E-05	4.79E-04	0.00E+00	1.41E+00	3.60E-05	-2.28E-06	5.33E+00	3.91E+00	7.66E-04	0.00E+00	1.56E-03	7.68E-03	**-4.05E+01**	**-4.05E+01**	0.000%
2015	38	-7.33E+01	7.22E+01	-1.02E+00	0.00E+00	1.84E-04	1.37E-03	0.00E+00	6.93E-01	1.10E-02	1.00E-05	8.09E+00	8.42E+00	4.19E-04	0.00E+00	1.39E-03	8.41E-03	**-7.33E+01**	**-7.33E+01**	0.008%
2015	23	-6.18E+01	6.18E+01	-6.69E-02	0.00E+00	4.91E-05	3.39E-04	0.00E+00	0.00E+00	6.53E-05	-7.40E-08	1.41E+00	1.48E+00	1.86E-03	0.00E+00	6.70E-04	2.17E-03	**-6.18E+01**	**-6.18E+01**	0.001%
2015	35	-2.82E+02	2.82E+02	-5.03E-01	0.00E+00	4.38E-04	2.56E-03	0.00E+00	7.74E-01	0.00E+00	-2.66E-06	1.36E+01	1.34E+01	1.40E-02	0.00E+00	1.16E-02	2.99E-02	**-2.82E+02**	**-2.82E+02**	0.000%
2015	39	-1.08E+02	1.07E+02	-8.73E-01	6.05E-04	4.01E-04	2.67E-03	0.00E+00	0.00E+00	5.92E-04	1.26E-06	1.56E+01	1.64E+01	2.72E-02	0.00E+00	3.92E-03	1.19E-02	**-1.08E+02**	**-1.08E+02**	0.001%
2015	21	-1.99E+01	1.97E+01	-1.96E-01	0.00E+00	9.83E-05	6.11E-04	0.00E+00	0.00E+00	1.63E-03	-7.23E-07	3.23E+00	3.42E+00	5.19E-03	0.00E+00	7.08E-04	2.68E-03	**-1.99E+01**	**-1.99E+01**	0.003%
2015	27	-4.79E+01	4.75E+01	-3.76E-01	2.13E-03	9.82E-04	5.27E-03	0.00E+00	2.35E-03	3.82E-06	-2.62E-06	2.15E+01	2.18E+01	4.38E-02	0.00E+00	5.53E-03	1.95E-02	**-4.79E+01**	**-4.79E+01**	0.001%
2015	34	-1.48E+01	1.66E+01	1.72E+00	0.00E+00	1.58E-04	5.48E-04	0.00E+00	1.55E+00	0.00E+00	-5.46E-05	4.49E+00	1.22E+00	3.08E-03	0.00E+00	4.57E-03	1.03E-02	**-1.48E+01**	**-1.48E+01**	0.000%
2015	20	-2.66E+01	2.65E+01	-3.98E-02	0.00E+00	1.42E-04	7.65E-04	0.00E+00	0.00E+00	0.00E+00	-1.82E-06	3.32E+00	3.36E+00	4.35E-03	0.00E+00	7.79E-04	2.79E-03	**-2.66E+01**	**-2.66E+01**	0.000%
2015	33	-1.60E+01	1.77E+01	1.67E+00	6.11E-03	1.60E-04	4.66E-04	0.00E+00	1.25E+00	0.00E+00	-6.27E-05	4.96E+00	2.04E+00	3.03E-03	0.00E+00	5.80E-03	1.28E-02	**-1.60E+01**	**-1.60E+01**	0.000%
2015	32	-1.10E+02	1.11E+02	5.62E-01	1.09E-02	1.22E-03	3.87E-03	3.75E-02	3.76E+00	0.00E+00	-5.29E-05	1.70E+01	1.26E+01	2.10E-02	0.00E+00	2.22E-02	4.04E-02	**-1.10E+02**	**-1.10E+02**	0.000%
2015	22	-2.10E+01	2.06E+01	-4.33E-01	1.12E-02	4.57E-04	1.62E-03	0.00E+00	0.00E+00	7.73E-06	-7.46E-07	4.16E+00	4.57E+00	1.20E-02	0.00E+00	2.38E-03	4.14E-03	**-2.10E+01**	**-2.10E+01**	0.000%
2015	26	-6.56E+00	6.63E+00	6.78E-02	0.00E+00	3.39E-05	1.06E-04	0.00E+00	0.00E+00	0.00E+00	-1.68E-06	2.88E-01	2.20E-01	5.83E-04	0.00E+00	1.94E-04	2.71E-04	**-6.56E+00**	**-6.56E+00**	0.000%
2015	25	-1.48E+01	1.49E+01	1.27E-01	1.01E-03	1.39E-04	3.95E-04	0.00E+00	2.40E-03	0.00E+00	-2.69E-06	1.17E+00	1.04E+00	3.01E-03	0.00E+00	8.61E-04	1.10E-03	**-1.48E+01**	**-1.48E+01**	0.000%

Table 2. Mass Balance for 2, 3, 7, 8-TCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2016	1	-4.49E+01	4.49E+01	6.36E-02	0.00E+00	5.60E-05	4.82E-04	0.00E+00	1.84E+00	7.67E-06	1.21E-04	6.22E+00	4.32E+00	1.17E-03	0.00E+00	7.65E-03	3.89E-03	**-4.49E+01**	**-4.49E+01**	0.000%
2016	38	-8.00E+01	7.96E+01	-3.78E-01	0.00E+00	1.75E-04	1.45E-03	0.00E+00	7.46E-01	1.34E-02	3.80E-04	8.90E+00	8.52E+00	5.70E-04	0.00E+00	8.41E-03	2.57E-03	**-8.00E+01**	**-8.00E+01**	0.014%
2016	23	-6.69E+01	6.69E+01	-3.14E-02	0.00E+00	4.67E-05	3.72E-04	0.00E+00	0.00E+00	4.11E-05	8.25E-05	1.81E+00	1.83E+00	2.14E-03	0.00E+00	2.17E-03	6.02E-04	**-6.69E+01**	**-6.69E+01**	0.001%
2016	35	-3.04E+02	3.04E+02	4.04E-01	0.00E+00	4.17E-04	2.83E-03	0.00E+00	8.82E-01	0.00E+00	6.46E-04	1.74E+01	1.61E+01	1.65E-02	0.00E+00	2.99E-02	1.74E-02	**-3.04E+02**	**-3.04E+02**	0.000%
2016	39	-1.14E+02	1.14E+02	-4.84E-01	4.05E-04	3.82E-04	2.91E-03	0.00E+00	0.00E+00	1.26E-04	5.06E-04	1.67E+01	1.71E+01	2.75E-02	0.00E+00	1.19E-02	3.91E-03	**-1.14E+02**	**-1.14E+02**	0.001%
2016	21	-2.24E+01	2.23E+01	-1.23E-01	0.00E+00	9.36E-05	6.94E-04	0.00E+00	0.00E+00	1.80E-03	1.43E-04	3.55E+00	3.66E+00	5.14E-03	0.00E+00	2.68E-03	1.00E-03	**-2.24E+01**	**-2.24E+01**	0.006%
2016	27	-5.20E+01	5.18E+01	-1.59E-01	1.62E-03	9.36E-04	5.87E-03	0.00E+00	3.03E-03	3.44E-06	1.10E-03	2.38E+01	2.39E+01	4.61E-02	0.00E+00	1.95E-02	9.02E-03	**-5.20E+01**	**-5.20E+01**	0.001%
2016	34	-1.67E+01	1.87E+01	2.00E+00	0.00E+00	1.51E-04	6.37E-04	0.00E+00	1.82E+00	0.00E+00	9.56E-05	5.30E+00	1.47E+00	4.12E-03	0.00E+00	1.03E-02	4.72E-03	**-1.67E+01**	**-1.67E+01**	0.000%
2016	20	-2.92E+01	2.93E+01	1.91E-02	0.00E+00	1.35E-04	8.79E-04	0.00E+00	0.00E+00	0.00E+00	1.92E-04	3.69E+00	3.67E+00	4.83E-03	0.00E+00	2.79E-03	1.14E-03	**-2.92E+01**	**-2.92E+01**	0.000%
2016	33	-1.76E+01	1.94E+01	1.82E+00	4.60E-03	1.52E-04	5.46E-04	0.00E+00	1.45E+00	0.00E+00	9.99E-05	5.65E+00	2.36E+00	3.44E-03	0.00E+00	1.28E-02	5.41E-03	**-1.76E+01**	**-1.76E+01**	0.000%
2016	32	-1.20E+02	1.21E+02	1.05E+00	8.29E-03	1.16E-03	4.34E-03	3.62E-02	4.27E+00	0.00E+00	7.96E-04	1.95E+01	1.41E+01	2.28E-02	0.00E+00	4.04E-02	3.34E-02	**-1.20E+02**	**-1.20E+02**	0.000%
2016	22	-2.26E+01	2.23E+01	-3.92E-01	8.52E-03	4.35E-04	1.81E-03	0.00E+00	0.00E+00	0.00E+00	3.48E-04	4.48E+00	4.86E+00	1.18E-02	0.00E+00	4.14E-03	2.27E-03	**-2.26E+01**	**-2.26E+01**	0.000%
2016	26	-7.32E+00	7.38E+00	6.02E-02	0.00E+00	3.23E-05	1.17E-04	0.00E+00	0.00E+00	0.00E+00	1.69E-05	3.15E-01	2.54E-01	6.28E-04	0.00E+00	2.71E-04	2.15E-04	**-7.32E+00**	**-7.32E+00**	0.000%
2016	25	-1.61E+01	1.62E+01	1.56E-01	7.99E-04	1.33E-04	4.29E-04	0.00E+00	2.64E-03	0.00E+00	6.57E-05	1.29E+00	1.13E+00	2.96E-03	0.00E+00	1.10E-03	7.57E-04	**-1.61E+01**	**-1.61E+01**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3. Mass Balance for Tetra-PCB

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1996	1	-9.21E+04	9.38E+04	1.61E+03	0.00E+00	7.20E-01	1.71E+01	0.00E+00	5.22E+02	1.93E-01	-2.24E-01	9.14E+03	7.03E+03	1.82E+00	0.00E+00	0.00E+00	5.93E+00	**-9.21E+04**	**-9.21E+04**	0.000%
1996	38	-2.05E+05	2.05E+05	-2.53E+01	0.00E+00	1.87E+00	8.27E+01	0.00E+00	8.22E+02	3.83E+01	5.61E-02	1.44E+04	1.38E+04	-1.09E+01	0.00E+00	0.00E+00	5.44E+00	**-2.05E+05**	**-2.05E+05**	0.027%
1996	23	-1.75E+05	1.75E+05	1.57E+02	0.00E+00	4.01E-01	2.16E+01	0.00E+00	0.00E+00	1.12E+00	-1.87E-02	3.12E+03	2.99E+03	2.64E-01	0.00E+00	0.00E+00	3.06E+00	**-1.75E+05**	**-1.75E+05**	0.001%
1996	35	-8.71E+05	8.72E+05	1.12E+03	0.00E+00	1.58E+01	1.32E+02	0.00E+00	2.47E+03	0.00E+00	-6.81E-02	3.70E+04	3.36E+04	3.02E+01	0.00E+00	0.00E+00	6.68E+01	**-8.71E+05**	**-8.71E+05**	0.000%
1996	39	-3.23E+05	3.22E+05	-1.88E+03	1.12E+01	1.41E+01	1.59E+02	0.00E+00	0.00E+00	3.70E-01	2.10E-01	3.38E+04	3.58E+04	6.94E+01	0.00E+00	0.00E+00	1.59E+01	**-3.23E+05**	**-3.23E+05**	0.002%
1996	21	-6.58E+04	6.59E+04	7.31E+01	0.00E+00	4.11E+00	4.37E+01	0.00E+00	0.00E+00	7.31E-01	3.04E-02	6.39E+03	6.35E+03	1.21E+01	0.00E+00	0.00E+00	4.25E+00	**-6.58E+04**	**-6.58E+04**	0.009%
1996	27	-2.59E+05	2.61E+05	2.47E+03	5.80E+00	4.11E+01	3.92E+02	0.00E+00	2.69E+01	6.91E-02	-9.74E-02	5.79E+04	5.56E+04	2.05E+02	0.00E+00	0.00E+00	3.81E+01	**-2.59E+05**	**-2.59E+05**	0.002%
1996	34	-6.23E+04	6.74E+04	5.10E+03	0.00E+00	6.62E+00	2.03E+01	0.00E+00	4.88E+03	0.00E+00	-2.93E-01	1.28E+04	2.89E+03	1.88E+01	0.00E+00	0.00E+00	2.87E+01	**-6.23E+04**	**-6.23E+04**	0.000%
1996	20	-1.04E+05	1.04E+05	4.96E+02	0.00E+00	5.93E+00	6.53E+01	0.00E+00	0.00E+00	2.05E-02	-6.51E-03	8.33E+03	7.89E+03	1.04E+01	0.00E+00	0.00E+00	5.32E+00	**-1.04E+05**	**-1.04E+05**	0.001%
1996	33	-7.01E+04	7.39E+04	3.83E+03	3.08E+01	6.70E+00	1.75E+01	0.00E+00	4.98E+03	0.00E+00	-2.24E-01	1.65E+04	7.71E+03	2.75E+01	0.00E+00	0.00E+00	3.22E+01	**-7.01E+04**	**-7.01E+04**	0.000%
1996	32	-7.74E+05	7.75E+05	1.48E+03	3.38E+01	5.12E+01	3.04E+02	2.83E+02	2.37E+04	0.00E+00	-2.00E-01	8.69E+04	6.17E+04	1.64E+02	0.00E+00	0.00E+00	2.24E+02	**-7.74E+05**	**-7.74E+05**	0.000%
1996	22	-1.55E+05	1.54E+05	-1.09E+03	3.77E+01	1.91E+01	1.96E+02	0.00E+00	0.00E+00	3.34E-01	5.95E-03	1.68E+04	1.80E+04	1.37E+01	0.00E+00	0.00E+00	1.83E+01	**-1.55E+05**	**-1.55E+05**	0.000%
1996	26	-5.79E+04	5.84E+04	4.12E+02	0.00E+00	1.42E+00	1.04E+01	0.00E+00	0.00E+00	0.00E+00	-1.12E-02	1.74E+03	1.33E+03	5.29E+00	0.00E+00	0.00E+00	2.23E+00	**-5.79E+04**	**-5.79E+04**	0.000%
1996	25	-1.30E+05	1.31E+05	7.73E+02	1.24E+01	5.82E+00	4.33E+01	0.00E+00	2.36E+01	0.00E+00	-1.40E-02	6.35E+03	5.56E+03	2.81E+01	0.00E+00	0.00E+00	9.34E+00	**-1.30E+05**	**-1.30E+05**	0.000%
1997	1	-7.52E+04	7.60E+04	8.00E+02	0.00E+00	7.18E-01	1.72E+01	0.00E+00	3.31E+02	1.51E-02	-5.75E-02	7.66E+03	6.55E+03	1.51E+00	0.00E+00	5.92E+00	1.18E+01	**-7.52E+04**	**-7.52E+04**	0.000%
1997	38	-1.76E+05	1.76E+05	-2.07E+02	0.00E+00	1.87E+00	8.26E+01	0.00E+00	4.47E+02	1.44E+01	-2.63E-03	1.13E+04	1.12E+04	-1.09E+01	0.00E+00	5.44E+00	4.54E+00	**-1.76E+05**	**-1.76E+05**	0.013%
1997	23	-1.57E+05	1.57E+05	1.33E+01	0.00E+00	4.00E-01	2.13E+01	0.00E+00	0.00E+00	1.57E-01	-1.51E-03	2.75E+03	2.76E+03	2.99E-01	0.00E+00	3.06E+00	2.15E+00	**-1.57E+05**	**-1.57E+05**	0.000%
1997	35	-7.76E+05	7.77E+05	4.65E+02	0.00E+00	1.58E+01	1.28E+02	0.00E+00	2.38E+03	0.00E+00	-1.72E-02	3.20E+04	2.92E+04	3.02E+01	0.00E+00	6.68E+01	6.62E+01	**-7.76E+05**	**-7.76E+05**	0.000%
1997	39	-2.88E+05	2.85E+05	-3.47E+03	1.01E+01	1.41E+01	1.56E+02	0.00E+00	0.00E+00	1.72E-01	5.87E-02	2.77E+04	3.13E+04	6.06E+01	0.00E+00	1.59E+01	1.23E+01	**-2.88E+05**	**-2.88E+05**	0.001%
1997	21	-5.95E+04	5.93E+04	-2.06E+02	0.00E+00	4.10E+00	4.25E+01	0.00E+00	0.00E+00	2.12E+00	1.07E-03	5.51E+03	5.75E+03	7.95E+00	0.00E+00	4.25E+00	2.06E+00	**-5.95E+04**	**-5.95E+04**	0.006%
1997	27	-2.29E+05	2.30E+05	5.16E+02	5.23E+00	4.10E+01	3.74E+02	0.00E+00	1.87E+01	0.00E+00	-1.21E-02	4.74E+04	4.70E+04	1.59E+02	0.00E+00	3.81E+01	2.56E+01	**-2.29E+05**	**-2.29E+05**	0.001%
1997	34	-5.68E+04	6.14E+04	4.61E+03	0.00E+00	6.61E+00	1.92E+01	0.00E+00	4.52E+03	0.00E+00	-1.91E-01	1.21E+04	2.93E+03	1.34E+01	0.00E+00	2.87E+01	2.18E+01	**-5.68E+04**	**-5.68E+04**	0.000%
1997	20	-9.35E+04	9.38E+04	2.95E+02	0.00E+00	5.91E+00	6.22E+01	0.00E+00	0.00E+00	1.94E-01	-3.83E-03	7.33E+03	7.09E+03	5.96E+00	0.00E+00	5.32E+00	3.22E+00	**-9.35E+04**	**-9.35E+04**	0.001%
1997	33	-6.32E+04	6.67E+04	3.56E+03	2.71E+01	6.68E+00	1.68E+01	0.00E+00	4.60E+03	0.00E+00	-1.50E-01	1.51E+04	6.95E+03	1.74E+01	0.00E+00	3.22E+01	2.35E+01	**-6.32E+04**	**-6.32E+04**	0.000%
1997	32	-6.98E+05	6.98E+05	6.07E+02	2.92E+01	5.10E+01	2.83E+02	2.82E+02	2.13E+04	0.00E+00	-1.36E-01	7.89E+04	5.67E+04	1.37E+02	0.00E+00	2.24E+02	1.75E+02	**-6.98E+05**	**-6.98E+05**	0.000%
1997	22	-1.43E+05	1.40E+05	-3.14E+03	3.26E+01	1.91E+01	1.84E+02	0.00E+00	0.00E+00	3.09E-01	2.47E-02	1.54E+04	1.87E+04	4.01E-01	0.00E+00	1.83E+01	9.95E+00	**-1.43E+05**	**-1.43E+05**	0.001%
1997	26	-5.21E+04	5.26E+04	4.33E+02	0.00E+00	1.41E+00	9.70E+00	0.00E+00	0.00E+00	0.00E+00	-9.21E-03	1.61E+03	1.19E+03	2.14E+00	0.00E+00	2.23E+00	1.55E+00	**-5.21E+04**	**-5.21E+04**	0.000%
1997	25	-1.20E+05	1.20E+05	6.06E+02	1.40E+01	5.81E+00	4.01E+01	0.00E+00	1.78E+01	0.00E+00	-9.25E-03	5.99E+03	5.37E+03	1.95E+01	0.00E+00	9.34E+00	6.10E+00	**-1.20E+05**	**-1.20E+05**	0.000%
1998	1	-6.84E+04	6.88E+04	4.22E+02	0.00E+00	7.18E-01	1.64E+01	0.00E+00	3.73E+02	4.76E-02	-3.05E-02	6.97E+03	6.18E+03	6.23E-01	0.00E+00	1.18E+01	4.92E+00	**-6.84E+04**	**-6.84E+04**	0.000%
1998	38	-1.57E+05	1.57E+05	-1.33E+02	0.00E+00	1.87E+00	7.77E+01	0.00E+00	5.14E+02	1.12E+01	-4.12E-01	1.05E+04	1.03E+04	-1.10E+01	0.00E+00	4.16E+00	2.75E+00	**-1.57E+05**	**-1.57E+05**	0.015%
1998	23	-1.38E+05	1.38E+05	-5.81E+00	0.00E+00	4.00E-01	2.02E+01	0.00E+00	0.00E+00	1.35E-01	-1.86E-02	2.30E+03	2.32E+03	-1.47E+00	0.00E+00	2.13E+00	1.35E+00	**-1.38E+05**	**-1.38E+05**	0.000%
1998	35	-6.83E+05	6.83E+05	8.57E+01	0.00E+00	1.58E+01	1.21E+02	0.00E+00	2.16E+03	0.00E+00	-8.98E-03	2.72E+04	2.50E+04	2.08E+01	0.00E+00	6.62E+01	4.07E+01	**-6.83E+05**	**-6.83E+05**	0.000%
1998	39	-2.52E+05	2.50E+05	-1.62E+03	1.00E+01	1.41E+01	1.46E+02	0.00E+00	0.00E+00	5.57E-01	-1.24E-01	2.39E+04	2.56E+04	6.50E+01	0.00E+00	1.22E+01	9.16E+00	**-2.52E+05**	**-2.52E+05**	0.001%
1998	21	-5.27E+04	5.27E+04	-8.37E+01	0.00E+00	4.10E+00	3.99E+01	0.00E+00	0.00E+00	8.93E-01	-1.46E-01	4.85E+03	4.97E+03	7.41E+00	0.00E+00	1.91E+00	1.95E+00	**-5.28E+04**	**-5.27E+04**	0.007%
1998	27	-2.05E+05	2.05E+05	7.16E+02	5.17E+00	4.10E+01	3.48E+02	0.00E+00	1.90E+01	2.56E-01	-2.63E-01	4.22E+04	4.17E+04	1.01E+02	0.00E+00	2.53E+01	2.71E+01	**-2.05E+05**	**-2.05E+05**	0.001%
1998	34	-5.01E+04	5.37E+04	3.69E+03	0.00E+00	6.61E+00	1.80E+01	0.00E+00	4.15E+03	0.00E+00	-1.83E-01	1.04E+04	2.53E+03	1.08E+01	0.00E+00	2.18E+01	1.58E+01	**-5.01E+04**	**-5.01E+04**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3. Mass Balance for Tetra-PCB

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1998	20	-8.26E+04	8.29E+04	2.30E+02	0.00E+00	5.91E+00	5.82E+01	0.00E+00	0.00E+00	0.00E+00	-6.95E-02	6.42E+03	6.24E+03	4.12E+00	0.00E+00	3.15E+00	3.72E+00	**-8.26E+04**	**-8.26E+04**	0.001%
1998	33	-5.58E+04	5.86E+04	2.81E+03	2.92E+01	6.68E+00	1.58E+01	0.00E+00	4.22E+03	0.00E+00	-1.48E-01	1.27E+04	5.65E+03	1.49E+01	0.00E+00	2.34E+01	1.80E+01	**-5.58E+04**	**-5.58E+04**	0.000%
1998	32	-6.24E+05	6.24E+05	2.15E+01	3.18E+01	5.10E+01	2.61E+02	2.81E+02	1.92E+04	0.00E+00	-1.29E-01	6.94E+04	4.99E+04	1.25E+02	0.00E+00	1.75E+02	1.40E+02	**-6.24E+05**	**-6.24E+05**	0.000%
1998	22	-1.28E+05	1.26E+05	-2.35E+03	3.55E+01	1.91E+01	1.71E+02	0.00E+00	0.00E+00	4.93E-03	-8.43E-02	1.43E+04	1.67E+04	6.38E+00	0.00E+00	9.85E+00	1.09E+01	**-1.28E+05**	**-1.28E+05**	0.001%
1998	26	-4.68E+04	4.72E+04	3.30E+02	0.00E+00	1.41E+00	8.96E+00	0.00E+00	0.00E+00	0.00E+00	-1.21E-02	1.46E+03	1.13E+03	1.17E+00	0.00E+00	1.55E+00	1.39E+00	**-4.68E+04**	**-4.68E+04**	0.000%
1998	25	-1.07E+05	1.07E+05	4.79E+02	1.72E+01	5.81E+00	3.71E+01	0.00E+00	1.83E+01	0.00E+00	-5.64E-03	5.24E+03	4.74E+03	1.62E+01	0.00E+00	6.10E+00	5.79E+00	**-1.07E+05**	**-1.07E+05**	0.000%
1999	1	-6.51E+04	6.58E+04	6.29E+02	0.00E+00	7.18E-01	1.67E+01	0.00E+00	3.31E+02	1.73E-02	-1.03E-01	6.07E+03	5.13E+03	8.63E-01	0.00E+00	4.92E+00	8.18E+00	**-6.51E+04**	**-6.51E+04**	0.000%
1999	38	-1.38E+05	1.39E+05	3.49E+02	0.00E+00	1.87E+00	7.71E+01	0.00E+00	3.75E+02	9.59E+00	-5.67E-01	8.59E+03	7.96E+03	-1.14E+01	0.00E+00	2.23E+00	6.82E+00	**-1.38E+05**	**-1.38E+05**	0.014%
1999	23	-1.14E+05	1.14E+05	1.89E+02	0.00E+00	4.00E-01	1.94E+01	0.00E+00	0.00E+00	5.83E-02	-3.07E-02	2.02E+03	1.86E+03	-1.11E+00	0.00E+00	1.34E+00	4.18E+00	**-1.14E+05**	**-1.14E+05**	0.000%
1999	35	-5.80E+05	5.82E+05	1.26E+03	0.00E+00	1.58E+01	1.15E+02	0.00E+00	1.87E+03	0.00E+00	-1.42E-01	2.30E+04	2.00E+04	1.34E+01	0.00E+00	4.07E+01	8.13E+01	**-5.80E+05**	**-5.80E+05**	0.000%
1999	39	-2.09E+05	2.09E+05	-1.65E+02	7.79E+00	1.41E+01	1.41E+02	0.00E+00	0.00E+00	1.29E-01	-2.01E-02	1.86E+04	1.89E+04	6.13E+01	0.00E+00	9.16E+00	2.33E+01	**-2.09E+05**	**-2.09E+05**	0.001%
1999	21	-4.64E+04	4.65E+04	7.70E+01	0.00E+00	4.10E+00	3.87E+01	0.00E+00	0.00E+00	6.32E-01	-4.24E-02	4.34E+03	4.29E+03	8.41E+00	0.00E+00	1.91E+00	4.20E+00	**-4.64E+04**	**-4.64E+04**	0.005%
1999	27	-1.86E+05	1.87E+05	1.17E+03	4.15E+00	4.10E+01	3.31E+02	0.00E+00	1.29E+01	7.04E-02	-5.99E-02	3.40E+04	3.31E+04	7.98E+01	0.00E+00	2.71E+01	4.55E+01	**-1.86E+05**	**-1.86E+05**	0.001%
1999	34	-4.48E+04	4.76E+04	2.76E+03	0.00E+00	6.61E+00	1.73E+01	0.00E+00	3.84E+03	0.00E+00	-1.23E-01	8.94E+03	2.36E+03	9.77E+00	0.00E+00	1.58E+01	3.47E+01	**-4.48E+04**	**-4.48E+04**	0.000%
1999	20	-7.28E+04	7.30E+04	2.32E+02	0.00E+00	5.91E+00	5.59E+01	0.00E+00	0.00E+00	0.00E+00	-6.56E-03	5.72E+03	5.54E+03	4.82E+00	0.00E+00	3.72E+00	7.03E+00	**-7.28E+04**	**-7.28E+04**	0.000%
1999	33	-4.86E+04	5.09E+04	2.37E+03	2.32E+01	6.68E+00	1.50E+01	0.00E+00	3.91E+03	0.00E+00	-1.08E-01	1.05E+04	4.26E+03	1.16E+01	0.00E+00	1.80E+01	3.80E+01	**-4.86E+04**	**-4.86E+04**	0.000%
1999	32	-5.63E+05	5.63E+05	1.81E+02	2.48E+01	5.10E+01	2.49E+02	2.75E+02	1.89E+04	0.00E+00	-1.43E-01	6.14E+04	4.22E+04	1.38E+02	0.00E+00	1.40E+02	2.03E+02	**-5.63E+05**	**-5.63E+05**	0.000%
1999	22	-1.14E+05	1.13E+05	-8.78E+02	2.77E+01	1.91E+01	1.62E+02	0.00E+00	0.00E+00	8.94E-04	-1.10E-02	1.30E+04	1.40E+04	1.06E+01	0.00E+00	1.09E+01	1.95E+01	**-1.14E+05**	**-1.14E+05**	0.001%
1999	26	-4.05E+04	4.08E+04	3.54E+02	0.00E+00	1.41E+00	8.45E+00	0.00E+00	0.00E+00	0.00E+00	-8.54E-03	1.34E+03	9.93E+02	1.24E+00	0.00E+00	1.39E+00	2.41E+00	**-4.05E+04**	**-4.05E+04**	0.000%
1999	25	-9.64E+04	9.70E+04	5.35E+02	1.51E+01	5.81E+00	3.53E+01	0.00E+00	1.81E+01	0.00E+00	-1.13E-02	4.80E+03	4.25E+03	1.63E+01	0.00E+00	5.79E+00	1.04E+01	**-9.64E+04**	**-9.64E+04**	0.000%
2000	1	-5.85E+04	5.87E+04	2.07E+02	0.00E+00	7.20E-01	1.57E+01	0.00E+00	3.87E+02	2.26E-02	-1.11E-02	6.20E+03	5.62E+03	7.29E-01	0.00E+00	8.18E+00	2.81E+00	**-5.85E+04**	**-5.85E+04**	0.000%
2000	38	-1.32E+05	1.32E+05	-3.87E+02	0.00E+00	1.87E+00	7.46E+01	0.00E+00	4.05E+02	1.38E+01	-5.48E-02	8.74E+03	8.79E+03	-5.78E+00	0.00E+00	6.77E+00	2.33E+00	**-1.32E+05**	**-1.32E+05**	0.010%
2000	23	-1.16E+05	1.16E+05	-1.98E+01	0.00E+00	4.01E-01	1.93E+01	0.00E+00	0.00E+00	5.12E-01	3.24E-04	2.08E+03	2.12E+03	2.13E+00	0.00E+00	4.18E+00	1.14E+00	**-1.16E+05**	**-1.16E+05**	-0.001%
2000	35	-5.77E+05	5.77E+05	-1.64E+02	0.00E+00	1.58E+01	1.15E+02	0.00E+00	2.45E+03	0.00E+00	-2.13E-01	2.33E+04	2.10E+04	4.88E+01	0.00E+00	8.11E+01	3.21E+01	**-5.77E+05**	**-5.77E+05**	0.000%
2000	39	-2.12E+05	2.11E+05	-1.11E+03	9.39E+00	1.41E+01	1.39E+02	0.00E+00	0.00E+00	6.91E-01	1.38E-02	2.05E+04	2.17E+04	7.85E+01	0.00E+00	2.33E+01	7.27E+00	**-2.12E+05**	**-2.12E+05**	0.001%
2000	21	-4.44E+04	4.43E+04	-9.12E+01	0.00E+00	4.11E+00	3.81E+01	0.00E+00	0.00E+00	1.49E+00	-5.83E-04	4.17E+03	4.28E+03	1.26E+01	0.00E+00	4.20E+00	1.58E+00	**-4.44E+04**	**-4.44E+04**	0.004%
2000	27	-1.82E+05	1.82E+05	5.19E+02	4.87E+00	4.11E+01	3.33E+02	0.00E+00	1.40E+01	2.50E-03	-1.33E-02	3.67E+04	3.63E+04	1.24E+02	0.00E+00	4.55E+01	2.01E+01	**-1.82E+05**	**-1.82E+05**	0.001%
2000	34	-4.38E+04	4.67E+04	2.90E+03	0.00E+00	6.62E+00	1.68E+01	0.00E+00	4.09E+03	0.00E+00	5.25E-01	9.30E+03	2.30E+03	9.30E+00	0.00E+00	3.53E+01	1.77E+01	**-4.38E+04**	**-4.38E+04**	0.002%
2000	20	-7.28E+04	7.30E+04	1.74E+02	0.00E+00	5.93E+00	5.58E+01	0.00E+00	0.00E+00	4.91E-02	-4.29E-03	5.51E+03	5.37E+03	8.51E+00	0.00E+00	7.03E+00	2.81E+00	**-7.28E+04**	**-7.28E+04**	0.000%
2000	33	-5.29E+04	5.50E+04	2.12E+03	2.48E+01	6.70E+00	1.47E+01	0.00E+00	4.13E+03	0.00E+00	1.29E+00	1.17E+04	5.44E+03	1.31E+01	0.00E+00	3.94E+01	1.84E+01	**-5.29E+04**	**-5.29E+04**	0.003%
2000	32	-5.73E+05	5.72E+05	-5.25E+02	2.75E+01	5.12E+01	2.55E+02	2.67E+02	2.17E+04	0.00E+00	-1.26E+00	6.50E+04	4.35E+04	1.72E+02	0.00E+00	2.01E+02	1.14E+02	**-5.73E+05**	**-5.73E+05**	0.000%
2000	22	-1.14E+05	1.12E+05	-1.20E+03	3.07E+01	1.91E+01	1.65E+02	0.00E+00	0.00E+00	1.77E-02	-2.96E-03	1.39E+04	1.52E+04	2.07E+01	0.00E+00	1.95E+01	9.40E+00	**-1.14E+05**	**-1.14E+05**	0.000%
2000	26	-4.31E+04	4.34E+04	3.08E+02	0.00E+00	1.42E+00	8.71E+00	0.00E+00	0.00E+00	0.00E+00	-7.57E-03	1.35E+03	1.05E+03	8.47E-01	0.00E+00	2.41E+00	1.29E+00	**-4.31E+04**	**-4.31E+04**	0.000%
2000	25	-1.00E+05	1.01E+05	5.36E+02	1.18E+01	5.82E+00	3.60E+01	0.00E+00	1.77E+01	0.00E+00	-1.15E-02	5.19E+03	4.63E+03	1.66E+01	0.00E+00	1.04E+01	4.57E+00	**-1.00E+05**	**-1.00E+05**	0.000%
2001	1	-5.42E+04	5.46E+04	3.44E+02	0.00E+00	7.18E-01	1.53E+01	0.00E+00	2.76E+02	3.07E-03	-1.39E-02	5.85E+03	5.25E+03	1.92E+00	0.00E+00	2.81E+00	6.76E+00	**-5.42E+04**	**-5.42E+04**	0.000%
2001	38	-1.23E+05	1.23E+05	-1.72E+02	0.00E+00	1.87E+00	6.98E+01	0.00E+00	3.03E+02	5.19E+00	-3.29E-03	8.14E+03	8.09E+03	-8.03E+00	0.00E+00	2.33E+00	3.16E+00	**-1.23E+05**	**-1.23E+05**	0.007%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3. Mass Balance for Tetra-PCB

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2001	23	-1.08E+05	1.08E+05	-3.66E+01	0.00E+00	4.00E-01	1.77E+01	0.00E+00	0.00E+00	1.43E-01	3.15E-05	1.97E+03	2.02E+03	5.50E-01	0.00E+00	1.14E+00	1.32E+00	**-1.08E+05**	**-1.08E+05**	-0.001%
2001	35	-5.37E+05	5.37E+05	-5.63E+01	0.00E+00	1.58E+01	1.06E+02	0.00E+00	2.14E+03	0.00E+00	-1.11E-03	2.26E+04	2.05E+04	3.76E+01	0.00E+00	3.21E+01	4.38E+01	**-5.37E+05**	**-5.37E+05**	0.000%
2001	39	-1.97E+05	1.96E+05	-8.08E+02	7.32E+00	1.41E+01	1.28E+02	0.00E+00	0.00E+00	9.83E-01	1.32E-02	1.90E+04	1.98E+04	6.23E+01	0.00E+00	7.27E+00	8.34E+00	**-1.97E+05**	**-1.97E+05**	0.001%
2001	21	-4.17E+04	4.16E+04	-4.34E+01	0.00E+00	4.10E+00	3.50E+01	0.00E+00	0.00E+00	9.68E-01	-1.13E-03	4.08E+03	4.14E+03	9.08E+00	0.00E+00	1.58E+00	1.74E+00	**-4.17E+04**	**-4.17E+04**	0.003%
2001	27	-1.67E+05	1.67E+05	-1.72E+01	3.84E+00	4.10E+01	3.03E+02	0.00E+00	1.35E+01	1.20E-01	-5.64E-03	3.32E+04	3.34E+04	6.79E+01	0.00E+00	2.01E+01	2.39E+01	**-1.67E+05**	**-1.67E+05**	0.001%
2001	34	-4.08E+04	4.35E+04	2.70E+03	0.00E+00	6.61E+00	1.55E+01	0.00E+00	3.76E+03	0.00E+00	-1.25E-01	8.53E+03	2.08E+03	8.94E+00	0.00E+00	1.77E+01	1.76E+01	**-4.08E+04**	**-4.08E+04**	0.000%
2001	20	-6.73E+04	6.74E+04	1.36E+02	0.00E+00	5.91E+00	5.07E+01	0.00E+00	0.00E+00	3.02E-02	-2.61E-03	5.34E+03	5.25E+03	7.28E+00	0.00E+00	2.81E+00	2.90E+00	**-6.73E+04**	**-6.73E+04**	0.001%
2001	33	-4.89E+04	5.10E+04	2.13E+03	1.88E+01	6.68E+00	1.35E+01	0.00E+00	3.80E+03	0.00E+00	-1.02E-01	1.07E+04	4.79E+03	1.21E+01	0.00E+00	1.84E+01	1.87E+01	**-4.89E+04**	**-4.89E+04**	0.000%
2001	32	-5.21E+05	5.21E+05	-2.35E+02	2.14E+01	5.10E+01	2.30E+02	2.52E+02	1.97E+04	0.00E+00	-7.54E-02	6.02E+04	4.06E+04	1.49E+02	0.00E+00	1.14E+02	1.53E+02	**-5.21E+05**	**-5.21E+05**	0.000%
2001	22	-1.04E+05	1.02E+05	-1.92E+03	2.39E+01	1.91E+01	1.49E+02	0.00E+00	0.00E+00	5.70E-02	4.10E-03	1.25E+04	1.46E+04	1.66E+01	0.00E+00	9.40E+00	9.99E+00	**-1.04E+05**	**-1.04E+05**	0.001%
2001	26	-3.88E+04	3.92E+04	3.10E+02	0.00E+00	1.41E+00	7.83E+00	0.00E+00	0.00E+00	0.00E+00	-6.79E-03	1.21E+03	9.09E+02	1.20E+00	0.00E+00	1.29E+00	1.48E+00	**-3.88E+04**	**-3.88E+04**	0.000%
2001	25	-9.07E+04	9.12E+04	5.21E+02	7.35E+00	5.81E+00	3.23E+01	0.00E+00	1.67E+01	0.00E+00	-1.01E-02	4.58E+03	4.06E+03	1.33E+01	0.00E+00	4.57E+00	6.16E+00	**-9.07E+04**	**-9.07E+04**	0.000%
2002	1	-4.17E+04	4.17E+04	5.65E+01	0.00E+00	7.18E-01	1.62E+01	0.00E+00	1.07E+02	7.91E-03	-4.78E-03	4.29E+03	4.13E+03	1.94E+00	0.00E+00	6.76E+00	3.98E+00	**-4.17E+04**	**-4.17E+04**	-0.001%
2002	38	-9.91E+04	9.89E+04	-2.26E+02	0.00E+00	1.87E+00	7.25E+01	0.00E+00	1.67E+02	9.83E+00	-5.14E-01	5.57E+03	5.71E+03	-9.77E+00	0.00E+00	2.63E+00	2.46E+00	**-9.91E+04**	**-9.91E+04**	0.008%
2002	23	-8.98E+04	8.98E+04	-2.78E+01	0.00E+00	4.00E-01	1.84E+01	0.00E+00	0.00E+00	1.14E-01	-2.61E-02	1.47E+03	1.52E+03	-4.40E-01	0.00E+00	1.29E+00	1.44E+00	**-8.98E+04**	**-8.98E+04**	0.000%
2002	35	-4.49E+05	4.49E+05	-1.23E+02	0.00E+00	1.58E+01	1.08E+02	0.00E+00	1.90E+03	0.00E+00	-1.51E-03	1.65E+04	1.48E+04	2.74E+01	0.00E+00	4.38E+01	3.67E+01	**-4.49E+05**	**-4.49E+05**	0.000%
2002	39	-1.61E+05	1.60E+05	-1.34E+03	6.59E+00	1.41E+01	1.33E+02	0.00E+00	0.00E+00	5.45E+00	-3.13E-02	1.42E+04	1.56E+04	6.12E+01	0.00E+00	8.29E+00	9.77E+00	**-1.61E+05**	**-1.61E+05**	0.001%
2002	21	-3.64E+04	3.63E+04	-1.10E+02	0.00E+00	4.10E+00	3.61E+01	0.00E+00	0.00E+00	2.21E+00	-9.37E-02	3.39E+03	3.52E+03	5.95E+00	0.00E+00	1.65E+00	1.72E+00	**-3.64E+04**	**-3.64E+04**	0.004%
2002	27	-1.46E+05	1.46E+05	-7.73E+01	3.50E+00	4.10E+01	3.03E+02	0.00E+00	1.00E+01	1.63E-01	-1.12E-01	2.48E+04	2.51E+04	4.19E+01	0.00E+00	2.38E+01	2.42E+01	**-1.46E+05**	**-1.46E+05**	0.001%
2002	34	-3.70E+04	3.86E+04	1.68E+03	0.00E+00	6.61E+00	1.55E+01	0.00E+00	3.33E+03	0.00E+00	-8.32E-02	6.90E+03	1.89E+03	4.54E+00	0.00E+00	1.76E+01	1.46E+01	**-3.70E+04**	**-3.70E+04**	0.000%
2002	20	-5.92E+04	5.93E+04	6.67E+01	0.00E+00	5.91E+00	5.14E+01	0.00E+00	0.00E+00	6.35E-02	-1.03E-03	4.60E+03	4.58E+03	4.57E+00	0.00E+00	2.90E+00	3.08E+00	**-5.92E+04**	**-5.92E+04**	0.000%
2002	33	-4.27E+04	4.44E+04	1.69E+03	1.77E+01	6.68E+00	1.35E+01	0.00E+00	3.41E+03	0.00E+00	-8.65E-02	8.22E+03	3.09E+03	8.52E+00	0.00E+00	1.87E+01	1.70E+01	**-4.27E+04**	**-4.27E+04**	0.000%
2002	32	-4.58E+05	4.57E+05	-1.15E+03	1.95E+01	5.10E+01	2.22E+02	2.49E+02	1.72E+04	0.00E+00	-5.19E-02	5.05E+04	3.42E+04	1.34E+02	0.00E+00	1.53E+02	1.23E+02	**-4.58E+05**	**-4.58E+05**	0.000%
2002	22	-9.04E+04	8.87E+04	-1.77E+03	2.18E+01	1.91E+01	1.43E+02	0.00E+00	0.00E+00	5.22E-02	5.32E-03	1.08E+04	1.26E+04	1.41E+01	0.00E+00	9.99E+00	9.86E+00	**-9.04E+04**	**-9.04E+04**	0.001%
2002	26	-3.21E+04	3.24E+04	2.29E+02	0.00E+00	1.41E+00	7.37E+00	0.00E+00	0.00E+00	0.00E+00	-6.87E-03	1.10E+03	8.73E+02	1.39E+00	0.00E+00	1.47E+00	1.19E+00	**-3.21E+04**	**-3.21E+04**	0.000%
2002	25	-7.95E+04	8.00E+04	4.34E+02	9.05E+00	5.81E+00	3.07E+01	0.00E+00	1.75E+01	0.00E+00	-1.08E-02	3.96E+03	3.51E+03	1.40E+01	0.00E+00	6.16E+00	4.91E+00	**-7.95E+04**	**-7.95E+04**	0.000%
2003	1	-5.03E+04	5.08E+04	5.26E+02	0.00E+00	7.18E-01	1.22E+01	0.00E+00	3.31E+02	4.26E-02	-4.26E-02	5.14E+03	4.29E+03	1.79E+00	0.00E+00	3.98E+00	6.72E+00	**-5.03E+04**	**-5.03E+04**	0.000%
2003	38	-1.15E+05	1.15E+05	2.67E+02	0.00E+00	1.87E+00	5.87E+01	0.00E+00	4.37E+02	4.15E+00	2.41E-01	9.68E+03	9.04E+03	-4.48E+00	0.00E+00	2.74E+00	6.86E+00	**-1.15E+05**	**-1.15E+05**	0.010%
2003	23	-9.72E+04	9.72E+04	-4.95E+01	0.00E+00	4.00E-01	1.52E+01	0.00E+00	0.00E+00	8.16E-02	-2.43E-03	1.80E+03	1.87E+03	7.66E-01	0.00E+00	1.44E+00	3.61E+00	**-9.72E+04**	**-9.72E+04**	0.001%
2003	35	-4.77E+05	4.78E+05	1.17E+02	0.00E+00	1.58E+01	8.70E+01	0.00E+00	1.31E+03	0.00E+00	5.60E-01	2.01E+04	1.87E+04	3.16E+01	0.00E+00	3.73E+01	7.00E+01	**-4.77E+05**	**-4.77E+05**	0.000%
2003	39	-1.73E+05	1.73E+05	-2.43E+02	1.21E+01	1.41E+01	1.08E+02	0.00E+00	0.00E+00	5.44E+00	-3.28E-02	1.76E+04	1.78E+04	6.95E+01	0.00E+00	9.75E+00	1.92E+01	**-1.73E+05**	**-1.73E+05**	0.001%
2003	21	-3.62E+04	3.62E+04	-4.15E+01	0.00E+00	4.10E+00	2.95E+01	0.00E+00	0.00E+00	2.29E-01	-7.49E-03	3.23E+03	3.29E+03	9.09E+00	0.00E+00	1.72E+00	3.79E+00	**-3.62E+04**	**-3.62E+04**	0.004%
2003	27	-1.43E+05	1.43E+05	2.74E+02	6.23E+00	4.10E+01	2.52E+02	0.00E+00	2.15E+01	0.00E+00	2.46E-01	3.05E+04	3.04E+04	8.32E+01	0.00E+00	2.45E+01	3.69E+01	**-1.43E+05**	**-1.43E+05**	0.001%
2003	34	-3.52E+04	3.77E+04	2.51E+03	0.00E+00	6.61E+00	1.28E+01	0.00E+00	2.25E+03	0.00E+00	2.96E-01	6.11E+03	1.35E+03	1.57E+01	0.00E+00	1.50E+01	2.97E+01	**-3.52E+04**	**-3.52E+04**	0.001%
2003	20	-5.76E+04	5.78E+04	1.95E+02	0.00E+00	5.91E+00	4.17E+01	0.00E+00	0.00E+00	6.71E-03	-1.52E-02	4.25E+03	4.09E+03	1.03E+01	0.00E+00	3.07E+00	5.68E+00	**-5.76E+04**	**-5.76E+04**	0.000%
2003	33	-4.16E+04	4.39E+04	2.35E+03	3.33E+01	6.68E+00	1.04E+01	0.00E+00	2.20E+03	0.00E+00	3.03E+00	8.34E+03	3.77E+03	1.49E+01	0.00E+00	2.01E+01	4.14E+01	**-4.16E+04**	**-4.16E+04**	0.008%

Table 3. Mass Balance for Tetra-PCB

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2003	32	-4.34E+05	4.38E+05	4.19E+03	3.61E+01	5.10E+01	1.64E+02	2.91E+02	1.20E+04	0.00E+00	2.35E+01	5.78E+04	4.12E+04	1.41E+02	0.00E+00	1.47E+02	1.81E+02	**-4.34E+05**	**-4.34E+05**	0.005%
2003	22	-8.86E+04	8.73E+04	-1.30E+03	4.03E+01	1.91E+01	1.16E+02	0.00E+00	0.00E+00	2.12E-02	-2.99E-02	1.10E+04	1.24E+04	3.48E+01	0.00E+00	9.84E+00	1.31E+01	**-8.86E+04**	**-8.86E+04**	0.000%
2003	26	-3.27E+04	3.29E+04	2.31E+02	0.00E+00	1.41E+00	6.25E+00	0.00E+00	0.00E+00	0.00E+00	-1.13E-02	9.42E+02	7.12E+02	3.61E+00	0.00E+00	1.19E+00	1.44E+00	**-3.27E+04**	**-3.27E+04**	0.000%
2003	25	-7.15E+04	7.20E+04	5.70E+02	2.49E+01	5.81E+00	2.47E+01	0.00E+00	1.38E+01	0.00E+00	-2.96E-02	3.94E+03	3.33E+03	1.90E+01	0.00E+00	4.90E+00	7.00E+00	**-7.15E+04**	**-7.15E+04**	0.000%
2004	1	-4.95E+04	4.99E+04	4.19E+02	0.00E+00	7.20E-01	1.24E+01	0.00E+00	6.13E+02	7.31E-02	-5.27E-02	5.29E+03	4.26E+03	1.75E+00	0.00E+00	6.71E+00	6.94E+00	**-4.95E+04**	**-4.95E+04**	0.000%
2004	38	-1.13E+05	1.13E+05	-1.47E+01	0.00E+00	1.87E+00	6.03E+01	0.00E+00	4.49E+02	6.97E+00	-2.83E-03	9.62E+03	9.26E+03	-1.18E+00	0.00E+00	6.86E+00	8.60E+00	**-1.13E+05**	**-1.13E+05**	0.010%
2004	23	-9.57E+04	9.57E+04	6.19E+01	0.00E+00	4.01E-01	1.54E+01	0.00E+00	0.00E+00	3.42E-01	-2.70E-03	2.03E+03	1.98E+03	7.09E+00	0.00E+00	3.61E+00	5.39E+00	**-9.57E+04**	**-9.57E+04**	0.001%
2004	35	-4.65E+05	4.66E+05	6.38E+02	0.00E+00	1.58E+01	8.79E+01	0.00E+00	1.26E+03	0.00E+00	-3.92E-02	2.08E+04	1.90E+04	4.66E+01	0.00E+00	7.00E+01	9.78E+01	**-4.65E+05**	**-4.65E+05**	0.000%
2004	39	-1.71E+05	1.69E+05	-1.19E+03	1.19E+01	1.41E+01	1.10E+02	0.00E+00	0.00E+00	8.90E-01	9.40E-03	1.78E+04	1.90E+04	7.69E+01	0.00E+00	1.92E+01	3.56E+01	**-1.71E+05**	**-1.71E+05**	0.001%
2004	21	-3.48E+04	3.48E+04	-3.76E+01	0.00E+00	4.11E+00	2.99E+01	0.00E+00	0.00E+00	1.88E-01	-2.48E-03	3.25E+03	3.31E+03	1.20E+01	0.00E+00	3.79E+00	5.94E+00	**-3.48E+04**	**-3.48E+04**	0.006%
2004	27	-1.36E+05	1.36E+05	-3.65E+01	6.16E+00	4.11E+01	2.54E+02	0.00E+00	1.96E+01	0.00E+00	-2.13E-02	3.02E+04	3.04E+04	8.59E+01	0.00E+00	3.69E+01	6.11E+01	**-1.36E+05**	**-1.36E+05**	0.001%
2004	34	-3.34E+04	3.60E+04	2.56E+03	0.00E+00	6.62E+00	1.29E+01	0.00E+00	2.15E+03	0.00E+00	-1.56E-01	6.03E+03	1.31E+03	1.13E+01	0.00E+00	2.97E+01	3.59E+01	**-3.34E+04**	**-3.34E+04**	0.000%
2004	20	-5.48E+04	5.50E+04	1.95E+02	0.00E+00	5.93E+00	4.23E+01	0.00E+00	0.00E+00	1.06E-02	-6.76E-03	4.12E+03	3.95E+03	1.07E+01	0.00E+00	5.68E+00	7.52E+00	**-5.48E+04**	**-5.48E+04**	0.000%
2004	33	-3.95E+04	4.20E+04	2.43E+03	3.01E+01	6.70E+00	1.05E+01	0.00E+00	2.07E+03	0.00E+00	-1.59E-01	8.46E+03	3.92E+03	1.15E+01	0.00E+00	4.14E+01	4.21E+01	**-3.95E+04**	**-3.95E+04**	0.000%
2004	32	-4.03E+05	4.09E+05	5.13E+03	3.22E+01	5.12E+01	1.63E+02	2.84E+02	1.09E+04	0.00E+00	-4.76E-01	5.53E+04	3.89E+04	1.18E+02	0.00E+00	1.81E+02	2.23E+02	**-4.03E+05**	**-4.03E+05**	0.000%
2004	22	-8.43E+04	8.17E+04	-2.60E+03	3.60E+01	1.91E+01	1.15E+02	0.00E+00	0.00E+00	1.23E-01	4.29E-03	1.05E+04	1.31E+04	4.01E+01	0.00E+00	1.31E+01	1.68E+01	**-8.43E+04**	**-8.43E+04**	0.001%
2004	26	-3.06E+04	3.08E+04	2.19E+02	0.00E+00	1.42E+00	6.20E+00	0.00E+00	0.00E+00	0.00E+00	-8.54E-03	8.90E+02	6.72E+02	3.18E+00	0.00E+00	1.44E+00	1.68E+00	**-3.06E+04**	**-3.06E+04**	0.000%
2004	25	-6.58E+04	6.63E+04	5.06E+02	2.18E+01	5.82E+00	2.43E+01	0.00E+00	1.23E+01	0.00E+00	-1.88E-02	3.74E+03	3.20E+03	1.62E+01	0.00E+00	7.00E+00	6.72E+00	**-6.58E+04**	**-6.58E+04**	0.000%
2005	1	-4.84E+04	4.87E+04	3.09E+02	0.00E+00	7.18E-01	1.30E+01	0.00E+00	6.44E+02	4.19E-03	-2.13E-02	5.31E+03	4.36E+03	1.24E+00	0.00E+00	6.94E+00	4.09E+00	**-4.84E+04**	**-4.84E+04**	0.000%
2005	38	-1.15E+05	1.15E+05	-5.24E+01	0.00E+00	1.87E+00	6.27E+01	0.00E+00	4.16E+02	3.56E+00	-2.01E-02	9.66E+03	9.36E+03	-2.55E+00	0.00E+00	8.60E+00	1.87E+00	**-1.15E+05**	**-1.15E+05**	0.008%
2005	23	-9.81E+04	9.81E+04	3.40E+01	0.00E+00	4.00E-01	1.61E+01	0.00E+00	0.00E+00	9.82E-02	-2.51E-03	2.11E+03	2.08E+03	7.68E+00	0.00E+00	5.39E+00	1.37E+00	**-9.81E+04**	**-9.81E+04**	0.001%
2005	35	-4.81E+05	4.82E+05	7.09E+02	0.00E+00	1.58E+01	9.37E+01	0.00E+00	1.80E+03	0.00E+00	-5.70E-02	2.23E+04	1.97E+04	5.47E+01	0.00E+00	9.78E+01	4.11E+01	**-4.81E+05**	**-4.81E+05**	0.000%
2005	39	-1.73E+05	1.73E+05	-6.56E+02	7.60E+00	1.41E+01	1.15E+02	0.00E+00	0.00E+00	4.79E-01	-3.63E-03	1.95E+04	2.01E+04	8.96E+01	0.00E+00	3.56E+01	6.91E+00	**-1.73E+05**	**-1.73E+05**	0.001%
2005	21	-3.74E+04	3.73E+04	-7.44E+01	0.00E+00	4.10E+00	3.20E+01	0.00E+00	0.00E+00	3.39E-01	-3.09E-02	3.66E+03	3.75E+03	1.11E+01	0.00E+00	5.91E+00	1.18E+00	**-3.74E+04**	**-3.74E+04**	0.005%
2005	27	-1.45E+05	1.46E+05	4.34E+02	4.10E+00	4.10E+01	2.74E+02	0.00E+00	1.82E+01	4.89E-02	-2.63E-02	3.24E+04	3.21E+04	9.75E+01	0.00E+00	6.11E+01	1.66E+01	**-1.45E+05**	**-1.45E+05**	0.001%
2005	34	-3.64E+04	3.89E+04	2.54E+03	0.00E+00	6.61E+00	1.42E+01	0.00E+00	2.93E+03	0.00E+00	-1.23E-01	7.15E+03	1.66E+03	7.41E+00	0.00E+00	3.59E+01	1.42E+01	**-3.64E+04**	**-3.64E+04**	0.000%
2005	20	-5.97E+04	5.99E+04	2.30E+02	0.00E+00	5.91E+00	4.62E+01	0.00E+00	0.00E+00	0.00E+00	-6.72E-03	4.70E+03	4.50E+03	1.08E+01	0.00E+00	7.52E+00	2.21E+00	**-5.97E+04**	**-5.97E+04**	0.000%
2005	33	-4.32E+04	4.54E+04	2.21E+03	1.58E+01	6.68E+00	1.16E+01	0.00E+00	2.97E+03	0.00E+00	-1.09E-01	9.62E+03	4.40E+03	9.94E+00	0.00E+00	4.21E+01	1.82E+01	**-4.32E+04**	**-4.32E+04**	0.000%
2005	32	-4.40E+05	4.42E+05	2.41E+03	1.88E+01	5.10E+01	1.87E+02	2.46E+02	1.61E+04	0.00E+00	-2.10E-01	5.71E+04	3.82E+04	1.28E+02	0.00E+00	2.23E+02	1.39E+02	**-4.40E+05**	**-4.40E+05**	0.000%
2005	22	-8.90E+04	8.79E+04	-1.13E+03	2.10E+01	1.91E+01	1.32E+02	0.00E+00	0.00E+00	1.44E-03	-1.70E-03	1.11E+04	1.23E+04	3.05E+01	0.00E+00	1.68E+01	6.52E+00	**-8.90E+04**	**-8.90E+04**	0.000%
2005	26	-3.22E+04	3.24E+04	2.38E+02	0.00E+00	1.41E+00	7.10E+00	0.00E+00	0.00E+00	0.00E+00	-5.36E-03	9.30E+02	6.93E+02	3.06E+00	0.00E+00	1.68E+00	1.04E+00	**-3.22E+04**	**-3.22E+04**	0.000%
2005	25	-7.16E+04	7.20E+04	4.60E+02	9.64E+00	5.81E+00	2.84E+01	0.00E+00	1.48E+01	0.00E+00	-1.04E-02	3.85E+03	3.37E+03	1.60E+01	0.00E+00	6.72E+00	3.82E+00	**-7.16E+04**	**-7.16E+04**	0.000%
2006	1	-4.48E+04	4.52E+04	3.51E+02	0.00E+00	7.18E-01	1.09E+01	0.00E+00	6.20E+02	1.32E-02	-3.16E-02	5.04E+03	4.07E+03	1.29E+00	0.00E+00	4.09E+00	3.02E+00	**-4.48E+04**	**-4.48E+04**	0.000%
2006	38	-1.04E+05	1.04E+05	-7.46E+01	0.00E+00	1.87E+00	5.36E+01	0.00E+00	4.44E+02	3.56E+00	-2.70E-01	9.04E+03	8.74E+03	-1.98E+00	0.00E+00	1.62E+00	2.46E+00	**-1.04E+05**	**-1.04E+05**	0.011%
2006	23	-8.93E+04	8.93E+04	8.07E+00	0.00E+00	4.00E-01	1.39E+01	0.00E+00	0.00E+00	1.49E-01	-1.50E-02	1.94E+03	1.94E+03	5.06E+00	0.00E+00	1.35E+00	1.50E+00	**-8.93E+04**	**-8.93E+04**	0.001%
2006	35	-4.33E+05	4.34E+05	4.95E+02	0.00E+00	1.58E+01	7.95E+01	0.00E+00	1.37E+03	0.00E+00	-4.98E-02	2.01E+04	1.82E+04	4.98E+01	0.00E+00	4.11E+01	3.19E+01	**-4.33E+05**	**-4.33E+05**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3. Mass Balance for Tetra-PCB

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2006	39	-1.57E+05	1.57E+05	-4.28E+02	1.48E+01	1.41E+01	9.81E+01	0.00E+00	0.00E+00	1.18E-01	-1.34E-01	1.66E+04	1.71E+04	7.61E+01	0.00E+00	6.79E+00	8.87E+00	**-1.57E+05**	**-1.57E+05**	0.001%
2006	21	-3.28E+04	3.27E+04	-6.19E+01	0.00E+00	4.10E+00	2.73E+01	0.00E+00	0.00E+00	2.11E-01	-9.00E-02	3.12E+03	3.19E+03	1.15E+01	0.00E+00	1.09E+00	1.35E+00	**-3.28E+04**	**-3.28E+04**	0.007%
2006	27	-1.28E+05	1.28E+05	2.07E+02	7.44E+00	4.10E+01	2.33E+02	0.00E+00	2.02E+01	0.00E+00	-1.85E-01	2.90E+04	2.88E+04	1.07E+02	0.00E+00	1.65E+01	2.14E+01	**-1.28E+05**	**-1.28E+05**	0.001%
2006	34	-3.12E+04	3.35E+04	2.32E+03	0.00E+00	6.61E+00	1.21E+01	0.00E+00	2.24E+03	0.00E+00	-1.33E-01	5.97E+03	1.40E+03	9.16E+00	0.00E+00	1.42E+01	1.20E+01	**-3.12E+04**	**-3.12E+04**	0.000%
2006	20	-5.14E+04	5.16E+04	1.81E+02	0.00E+00	5.91E+00	3.89E+01	0.00E+00	0.00E+00	0.00E+00	-3.03E-02	3.98E+03	3.82E+03	1.17E+01	0.00E+00	2.18E+00	2.26E+00	**-5.14E+04**	**-5.14E+04**	0.001%
2006	33	-3.72E+04	3.94E+04	2.16E+03	3.20E+01	6.68E+00	9.83E+00	0.00E+00	2.21E+03	0.00E+00	-1.33E-01	8.39E+03	3.98E+03	1.06E+01	0.00E+00	1.82E+01	1.61E+01	**-3.72E+04**	**-3.72E+04**	0.000%
2006	32	-3.87E+05	3.90E+05	3.15E+03	3.41E+01	5.10E+01	1.55E+02	2.93E+02	1.21E+04	0.00E+00	-3.16E-01	5.28E+04	3.72E+04	1.12E+02	0.00E+00	1.39E+02	1.15E+02	**-3.87E+05**	**-3.87E+05**	0.000%
2006	22	-7.90E+04	7.79E+04	-1.04E+03	3.80E+01	1.91E+01	1.09E+02	0.00E+00	0.00E+00	4.28E-03	-4.03E-02	1.02E+04	1.13E+04	3.78E+01	0.00E+00	6.49E+00	8.25E+00	**-7.90E+04**	**-7.90E+04**	0.001%
2006	26	-2.97E+04	2.99E+04	1.86E+02	0.00E+00	1.41E+00	5.98E+00	0.00E+00	0.00E+00	0.00E+00	-6.08E-03	8.46E+02	6.62E+02	2.55E+00	0.00E+00	1.04E+00	9.21E-01	**-2.97E+04**	**-2.97E+04**	0.000%
2006	25	-6.38E+04	6.43E+04	4.44E+02	2.44E+01	5.81E+00	2.34E+01	0.00E+00	1.22E+01	0.00E+00	-1.43E-02	3.59E+03	3.12E+03	1.49E+01	0.00E+00	3.82E+00	3.71E+00	**-6.38E+04**	**-6.38E+04**	0.000%
2007	1	-5.72E+04	5.76E+04	3.76E+02	0.00E+00	7.18E-01	1.13E+01	0.00E+00	8.86E+02	2.98E-03	-1.64E-01	5.26E+03	4.01E+03	-3.46E-02	0.00E+00	3.02E+00	3.67E+00	**-5.72E+04**	**-5.72E+04**	0.001%
2007	38	-1.23E+05	1.23E+05	2.79E+02	0.00E+00	1.87E+00	5.40E+01	0.00E+00	5.31E+02	5.10E+00	-1.05E-01	9.54E+03	8.82E+03	-2.59E+00	0.00E+00	2.46E+00	3.56E+00	**-1.23E+05**	**-1.23E+05**	0.027%
2007	23	-1.04E+05	1.04E+05	1.58E+00	0.00E+00	4.00E-01	1.37E+01	0.00E+00	0.00E+00	6.89E-02	-2.62E-03	1.93E+03	1.94E+03	4.39E+00	0.00E+00	1.50E+00	1.73E+00	**-1.04E+05**	**-1.04E+05**	0.001%
2007	35	-5.08E+05	5.09E+05	6.98E+02	0.00E+00	1.58E+01	7.82E+01	0.00E+00	1.38E+03	0.00E+00	-8.27E-02	2.10E+04	1.89E+04	4.51E+01	0.00E+00	3.19E+01	4.09E+01	**-5.08E+05**	**-5.08E+05**	0.000%
2007	39	-1.82E+05	1.82E+05	-3.25E+01	1.42E+01	1.41E+01	9.68E+01	0.00E+00	0.00E+00	5.28E-02	-5.41E-02	1.77E+04	1.77E+04	7.94E+01	0.00E+00	8.87E+00	1.08E+01	**-1.82E+05**	**-1.82E+05**	0.001%
2007	21	-3.97E+04	3.98E+04	8.20E+01	0.00E+00	4.10E+00	2.65E+01	0.00E+00	0.00E+00	4.21E-01	-1.85E-02	3.47E+03	3.40E+03	1.42E+01	0.00E+00	1.35E+00	2.44E+00	**-3.97E+04**	**-3.97E+04**	0.007%
2007	27	-1.47E+05	1.48E+05	7.97E+02	7.22E+00	4.10E+01	2.26E+02	0.00E+00	1.84E+01	0.00E+00	-8.12E-02	3.13E+04	3.06E+04	1.22E+02	0.00E+00	2.14E+01	2.24E+01	**-1.47E+05**	**-1.47E+05**	0.001%
2007	34	-3.66E+04	3.95E+04	2.90E+03	0.00E+00	6.61E+00	1.17E+01	0.00E+00	2.25E+03	0.00E+00	-2.48E-01	6.62E+03	1.47E+03	8.42E+00	0.00E+00	1.20E+01	1.57E+01	**-3.66E+04**	**-3.66E+04**	0.000%
2007	20	-6.15E+04	6.18E+04	3.35E+02	0.00E+00	5.91E+00	3.78E+01	0.00E+00	0.00E+00	0.00E+00	-2.67E-02	4.38E+03	4.06E+03	1.36E+01	0.00E+00	2.26E+00	2.96E+00	**-6.15E+04**	**-6.15E+04**	0.001%
2007	33	-4.30E+04	4.57E+04	2.65E+03	3.85E+01	6.68E+00	9.52E+00	0.00E+00	2.22E+03	0.00E+00	-2.21E-01	9.01E+03	4.10E+03	1.00E+01	0.00E+00	1.61E+01	2.05E+01	**-4.30E+04**	**-4.30E+04**	0.000%
2007	32	-4.41E+05	4.46E+05	4.97E+03	3.82E+01	5.10E+01	1.52E+02	3.20E+02	1.19E+04	0.00E+00	-5.40E-01	5.60E+04	3.87E+04	1.06E+02	0.00E+00	1.15E+02	1.38E+02	**-4.41E+05**	**-4.41E+05**	0.000%
2007	22	-9.07E+04	8.99E+04	-8.44E+02	4.27E+01	1.91E+01	1.06E+02	0.00E+00	0.00E+00	2.03E-02	-2.21E-02	1.11E+04	1.20E+04	4.11E+01	0.00E+00	8.25E+00	1.07E+01	**-9.07E+04**	**-9.07E+04**	0.001%
2007	26	-3.38E+04	3.41E+04	2.72E+02	0.00E+00	1.41E+00	5.84E+00	0.00E+00	0.00E+00	0.00E+00	-9.91E-03	9.31E+02	6.61E+02	2.85E+00	0.00E+00	9.21E-01	1.16E+00	**-3.38E+04**	**-3.38E+04**	0.000%
2007	25	-7.28E+04	7.33E+04	5.02E+02	3.58E+01	5.81E+00	2.31E+01	0.00E+00	1.14E+01	0.00E+00	-2.25E-02	3.85E+03	3.31E+03	1.34E+01	0.00E+00	3.71E+00	4.69E+00	**-7.28E+04**	**-7.28E+04**	0.000%
2008	1	-4.39E+04	4.41E+04	2.20E+02	0.00E+00	7.20E-01	1.18E+01	0.00E+00	1.14E+03	8.73E-02	-2.22E-02	5.04E+03	3.69E+03	-5.68E-01	0.00E+00	3.67E+00	3.64E+00	**-4.39E+04**	**-4.39E+04**	-0.001%
2008	38	-1.02E+05	1.02E+05	-2.59E+02	0.00E+00	1.87E+00	5.57E+01	0.00E+00	6.29E+02	3.94E+00	2.41E-02	8.60E+03	8.29E+03	-5.51E+00	0.00E+00	3.56E+00	3.40E+00	**-1.02E+05**	**-1.02E+05**	0.008%
2008	23	-8.87E+04	8.87E+04	2.01E+01	0.00E+00	4.01E-01	1.40E+01	0.00E+00	0.00E+00	4.75E-01	-1.60E-03	1.89E+03	1.88E+03	4.39E+00	0.00E+00	1.73E+00	1.58E+00	**-8.87E+04**	**-8.87E+04**	0.001%
2008	35	-4.30E+05	4.30E+05	3.77E+02	0.00E+00	1.58E+01	8.06E+01	0.00E+00	1.39E+03	0.00E+00	-2.52E-02	2.01E+04	1.83E+04	3.94E+01	0.00E+00	4.09E+01	3.70E+01	**-4.30E+05**	**-4.30E+05**	0.000%
2008	39	-1.57E+05	1.56E+05	-5.56E+02	1.10E+01	1.41E+01	1.00E+02	0.00E+00	0.00E+00	3.76E-02	1.18E-03	1.71E+04	1.77E+04	8.32E+01	0.00E+00	1.08E+01	1.05E+01	**-1.57E+05**	**-1.57E+05**	0.001%
2008	21	-3.26E+04	3.26E+04	-3.03E+01	0.00E+00	4.11E+00	2.72E+01	0.00E+00	0.00E+00	4.69E-01	-1.13E-03	3.43E+03	3.47E+03	1.74E+01	0.00E+00	2.44E+00	1.60E+00	**-3.26E+04**	**-3.26E+04**	0.004%
2008	27	-1.23E+05	1.23E+05	7.77E+01	5.71E+00	4.11E+01	2.30E+02	0.00E+00	1.75E+01	0.00E+00	-1.11E-02	2.90E+04	2.89E+04	1.37E+02	0.00E+00	2.24E+01	2.28E+01	**-1.23E+05**	**-1.23E+05**	0.001%
2008	34	-3.07E+04	3.30E+04	2.29E+03	0.00E+00	6.62E+00	1.22E+01	0.00E+00	2.24E+03	0.00E+00	-1.15E-01	5.97E+03	1.44E+03	7.40E+00	0.00E+00	1.57E+01	1.43E+01	**-3.07E+04**	**-3.07E+04**	0.000%
2008	20	-5.04E+04	5.06E+04	1.64E+02	0.00E+00	5.93E+00	3.86E+01	0.00E+00	0.00E+00	0.00E+00	-4.12E-03	4.12E+03	3.97E+03	1.65E+01	0.00E+00	2.96E+00	3.04E+00	**-5.04E+04**	**-5.04E+04**	0.000%
2008	33	-3.57E+04	3.78E+04	2.09E+03	2.80E+01	6.70E+00	9.76E+00	0.00E+00	2.20E+03	0.00E+00	-1.15E-01	7.99E+03	3.67E+03	9.16E+00	0.00E+00	2.05E+01	1.81E+01	**-3.57E+04**	**-3.57E+04**	0.000%
2008	32	-3.66E+05	3.69E+05	3.01E+03	3.04E+01	5.12E+01	1.52E+02	2.78E+02	1.18E+04	0.00E+00	-2.46E-01	4.98E+04	3.47E+04	1.06E+02	0.00E+00	1.38E+02	1.27E+02	**-3.66E+05**	**-3.66E+05**	0.000%
2008	22	-7.32E+04	7.22E+04	-1.02E+03	3.39E+01	1.91E+01	1.06E+02	0.00E+00	0.00E+00	4.14E-02	-3.34E-03	9.43E+03	1.05E+04	3.68E+01	0.00E+00	1.07E+01	7.76E+00	**-7.32E+04**	**-7.32E+04**	0.000%

Table 3. Mass Balance for Tetra-PCB

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2008	26	-2.64E+04	2.66E+04	1.76E+02	0.00E+00	1.42E+00	5.70E+00	0.00E+00	0.00E+00	0.00E+00	-5.39E-03	7.89E+02	6.15E+02	2.40E+00	0.00E+00	1.16E+00	9.48E-01	**-2.64E+04**	**-2.64E+04**	0.000%
2008	25	-5.91E+04	5.95E+04	3.89E+02	2.14E+01	5.82E+00	2.26E+01	0.00E+00	1.19E+01	0.00E+00	-1.17E-02	3.33E+03	2.91E+03	1.40E+01	0.00E+00	4.69E+00	3.68E+00	**-5.91E+04**	**-5.91E+04**	0.000%
2009	1	-4.12E+04	4.14E+04	1.14E+02	0.00E+00	7.18E-01	1.13E+01	0.00E+00	1.01E+03	5.21E-02	-1.37E-02	4.70E+03	3.59E+03	8.93E-02	0.00E+00	3.64E+00	2.44E+00	**-4.12E+04**	**-4.12E+04**	0.006%
2009	38	-9.31E+04	9.31E+04	5.62E+01	0.00E+00	1.87E+00	5.32E+01	0.00E+00	3.27E+02	3.52E+00	-6.11E-02	8.01E+03	7.69E+03	-3.10E+00	0.00E+00	3.35E+00	1.28E+00	**-9.31E+04**	**-9.31E+04**	0.010%
2009	23	-8.21E+04	8.21E+04	2.83E+00	0.00E+00	4.00E-01	1.33E+01	0.00E+00	0.00E+00	7.72E-02	2.17E-04	1.69E+03	1.70E+03	3.94E+00	0.00E+00	1.58E+00	8.22E-01	**-8.21E+04**	**-8.21E+04**	0.004%
2009	35	-3.98E+05	3.99E+05	3.60E+02	0.00E+00	1.58E+01	7.62E+01	0.00E+00	1.27E+03	0.00E+00	5.49E-02	1.81E+04	1.65E+04	3.88E+01	0.00E+00	3.70E+01	2.90E+01	**-3.98E+05**	**-3.98E+05**	0.013%
2009	39	-1.46E+05	1.45E+05	-3.90E+02	1.11E+01	1.41E+01	9.45E+01	0.00E+00	0.00E+00	1.62E-01	-3.59E-04	1.60E+04	1.64E+04	6.60E+01	0.00E+00	1.05E+01	4.47E+00	**-1.46E+05**	**-1.46E+05**	0.005%
2009	21	-2.98E+04	2.97E+04	-6.40E+01	0.00E+00	4.10E+00	2.57E+01	0.00E+00	0.00E+00	5.69E-01	5.33E-04	3.13E+03	3.20E+03	1.44E+01	0.00E+00	1.60E+00	8.12E-01	**-2.98E+04**	**-2.98E+04**	0.010%
2009	27	-1.16E+05	1.16E+05	1.75E+02	5.61E+00	4.10E+01	2.19E+02	0.00E+00	1.63E+01	0.00E+00	-1.68E-02	2.71E+04	2.70E+04	1.17E+02	0.00E+00	2.28E+01	1.17E+01	**-1.16E+05**	**-1.16E+05**	0.009%
2009	34	-2.88E+04	3.08E+04	2.00E+03	0.00E+00	6.61E+00	1.12E+01	0.00E+00	2.07E+03	0.00E+00	3.18E-01	5.40E+03	1.33E+03	7.09E+00	0.00E+00	1.47E+01	1.08E+01	**-2.88E+04**	**-2.88E+04**	0.028%
2009	20	-4.88E+04	4.89E+04	1.26E+02	0.00E+00	5.91E+00	3.66E+01	0.00E+00	0.00E+00	0.00E+00	-3.66E-03	3.86E+03	3.76E+03	1.04E+01	0.00E+00	3.04E+00	1.47E+00	**-4.88E+04**	**-4.88E+04**	0.006%
2009	33	-3.44E+04	3.66E+04	2.17E+03	2.67E+01	6.68E+00	8.98E+00	0.00E+00	2.06E+03	0.00E+00	5.61E-01	7.56E+03	3.30E+03	9.28E+00	0.00E+00	1.88E+01	1.51E+01	**-3.44E+04**	**-3.44E+04**	0.015%
2009	32	-3.60E+05	3.63E+05	3.04E+03	2.98E+01	5.10E+01	1.48E+02	2.71E+02	1.13E+04	0.00E+00	-1.32E+00	4.85E+04	3.39E+04	1.04E+02	0.00E+00	1.26E+02	1.03E+02	**-3.60E+05**	**-3.60E+05**	0.016%
2009	22	-7.27E+04	7.14E+04	-1.30E+03	3.32E+01	1.91E+01	1.03E+02	0.00E+00	0.00E+00	0.00E+00	-2.49E-03	9.37E+03	1.07E+04	3.03E+01	0.00E+00	7.76E+00	5.01E+00	**-7.27E+04**	**-7.27E+04**	0.004%
2009	26	-2.72E+04	2.74E+04	1.93E+02	0.00E+00	1.41E+00	5.64E+00	0.00E+00	0.00E+00	0.00E+00	-5.05E-03	8.19E+02	6.27E+02	2.60E+00	0.00E+00	9.47E-01	7.47E-01	**-2.72E+04**	**-2.72E+04**	0.000%
2009	25	-5.93E+04	5.97E+04	4.17E+02	1.82E+01	5.81E+00	2.21E+01	0.00E+00	1.22E+01	0.00E+00	-1.14E-02	3.38E+03	2.94E+03	1.26E+01	0.00E+00	3.68E+00	2.91E+00	**-5.93E+04**	**-5.93E+04**	0.002%
2010	1	-4.61E+04	4.63E+04	2.24E+02	0.00E+00	7.18E-01	1.07E+01	0.00E+00	1.13E+03	5.61E-03	-2.72E-02	4.60E+03	3.32E+03	-6.52E-01	0.00E+00	2.44E+00	3.18E+00	**-4.61E+04**	**-4.61E+04**	0.150%
2010	38	-1.03E+05	1.03E+05	6.83E+01	0.00E+00	1.87E+00	5.06E+01	0.00E+00	4.73E+02	3.68E+00	-2.46E-01	8.66E+03	8.22E+03	-3.81E+00	0.00E+00	1.10E+00	2.91E+00	**-1.03E+05**	**-1.03E+05**	0.050%
2010	23	-8.87E+04	8.87E+04	8.33E+00	0.00E+00	4.00E-01	1.26E+01	0.00E+00	0.00E+00	3.19E-01	-7.07E-03	1.83E+03	1.83E+03	4.84E+00	0.00E+00	8.17E-01	1.41E+00	**-8.87E+04**	**-8.87E+04**	0.005%
2010	35	-4.27E+05	4.28E+05	1.03E+03	0.00E+00	1.58E+01	7.18E+01	0.00E+00	1.25E+03	0.00E+00	-6.57E-02	1.91E+04	1.72E+04	3.73E+01	0.00E+00	2.90E+01	3.26E+01	**-4.27E+05**	**-4.27E+05**	0.084%
2010	39	-1.57E+05	1.56E+05	-8.42E+02	8.77E+00	1.41E+01	8.95E+01	0.00E+00	0.00E+00	2.08E+00	-8.86E-02	1.73E+04	1.82E+04	7.26E+01	0.00E+00	4.39E+00	7.38E+00	**-1.57E+05**	**-1.57E+05**	0.040%
2010	21	-3.17E+04	3.17E+04	4.24E+01	0.00E+00	4.10E+00	2.43E+01	0.00E+00	0.00E+00	2.68E-01	-7.56E-02	3.27E+03	3.24E+03	1.43E+01	0.00E+00	7.43E-01	1.70E+00	**-3.17E+04**	**-3.17E+04**	0.033%
2010	27	-1.21E+05	1.23E+05	1.17E+03	4.48E+00	4.10E+01	2.09E+02	0.00E+00	1.44E+01	6.81E-03	-1.73E-01	3.04E+04	2.96E+04	1.19E+02	0.00E+00	1.16E+01	1.95E+01	**-1.22E+05**	**-1.21E+05**	0.282%
2010	34	-2.92E+04	3.16E+04	2.34E+03	0.00E+00	6.61E+00	1.06E+01	0.00E+00	1.92E+03	0.00E+00	-1.28E-01	5.58E+03	1.33E+03	7.31E+00	0.00E+00	1.08E+01	1.19E+01	**-2.92E+04**	**-2.92E+04**	0.048%
2010	20	-5.07E+04	5.09E+04	2.31E+02	0.00E+00	5.91E+00	3.45E+01	0.00E+00	0.00E+00	0.00E+00	-3.83E-02	4.02E+03	3.82E+03	9.60E+00	0.00E+00	1.44E+00	2.51E+00	**-5.07E+04**	**-5.07E+04**	0.022%
2010	33	-3.50E+04	3.74E+04	2.39E+03	2.29E+01	6.68E+00	8.42E+00	0.00E+00	1.94E+03	0.00E+00	-1.40E-01	7.60E+03	3.27E+03	8.58E+00	0.00E+00	1.51E+01	1.55E+01	**-3.51E+04**	**-3.50E+04**	0.053%
2010	32	-3.65E+05	3.70E+05	4.32E+03	2.53E+01	5.10E+01	1.42E+02	2.70E+02	1.08E+04	0.00E+00	-3.34E-01	4.83E+04	3.34E+04	9.96E+01	0.00E+00	1.03E+02	1.08E+02	**-3.66E+05**	**-3.65E+05**	0.122%
2010	22	-7.39E+04	7.32E+04	-7.91E+02	2.82E+01	1.91E+01	9.85E+01	0.00E+00	0.00E+00	6.09E-03	-6.05E-02	9.79E+03	1.06E+04	3.35E+01	0.00E+00	4.95E+00	8.08E+00	**-7.40E+04**	**-7.39E+04**	0.041%
2010	26	-2.81E+04	2.82E+04	1.84E+02	0.00E+00	1.41E+00	5.43E+00	0.00E+00	0.00E+00	0.00E+00	-6.49E-03	8.34E+02	6.56E+02	2.33E+00	0.00E+00	7.47E-01	9.49E-01	**-2.81E+04**	**-2.81E+04**	0.015%
2010	25	-6.03E+04	6.07E+04	3.76E+02	2.02E+01	5.81E+00	2.14E+01	0.00E+00	1.09E+01	0.00E+00	-1.35E-02	3.32E+03	2.93E+03	1.13E+01	0.00E+00	2.91E+00	3.83E+00	**-6.03E+04**	**-6.03E+04**	0.010%
2011	1	-1.37E+05	1.37E+05	3.58E+02	0.00E+00	7.18E-01	1.46E+01	0.00E+00	1.52E+03	1.20E-02	1.30E-01	6.61E+03	4.75E+03	-1.31E+00	0.00E+00	3.17E+00	9.20E+00	**-1.37E+05**	**-1.37E+05**	0.003%
2011	38	-2.51E+05	2.54E+05	3.34E+03	0.00E+00	1.87E+00	6.47E+01	0.00E+00	1.29E+03	6.29E+00	-1.42E+00	1.50E+04	1.04E+04	-4.63E+00	0.00E+00	2.91E+00	9.71E+00	**-2.51E+05**	**-2.51E+05**	0.012%
2011	23	-2.13E+05	2.13E+05	2.72E+02	0.00E+00	4.00E-01	1.63E+01	0.00E+00	0.00E+00	3.63E-01	-6.20E-02	3.02E+03	2.76E+03	7.69E+00	0.00E+00	1.41E+00	4.24E+00	**-2.13E+05**	**-2.13E+05**	0.001%
2011	35	-9.86E+05	9.91E+05	5.07E+03	0.00E+00	1.58E+01	9.35E+01	0.00E+00	1.43E+03	0.00E+00	-3.08E+00	3.27E+04	2.63E+04	4.13E+01	0.00E+00	3.26E+01	7.19E+01	**-9.86E+05**	**-9.86E+05**	0.006%
2011	39	-3.60E+05	3.64E+05	3.57E+03	8.21E+00	1.41E+01	1.18E+02	0.00E+00	0.00E+00	6.81E-01	-1.50E+00	3.11E+04	2.76E+04	1.03E+02	0.00E+00	7.38E+00	2.01E+01	**-3.60E+05**	**-3.60E+05**	0.004%
2011	21	-7.12E+04	7.24E+04	1.17E+03	0.00E+00	4.10E+00	3.13E+01	0.00E+00	0.00E+00	1.09E+00	-3.10E-01	6.32E+03	5.18E+03	1.92E+01	0.00E+00	1.70E+00	5.23E+00	**-7.12E+04**	**-7.12E+04**	0.023%

Table 3. Mass Balance for Tetra-PCB

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2011	27	-2.20E+05	2.27E+05	6.77E+03	6.47E+00	4.10E+01	2.74E+02	0.00E+00	1.65E+01	1.03E-02	-2.01E+00	5.39E+04	4.72E+04	1.70E+02	0.00E+00	1.95E+01	3.75E+01	**-2.20E+05**	**-2.20E+05**	0.006%
2011	34	-6.22E+04	6.98E+04	7.64E+03	0.00E+00	6.61E+00	1.37E+01	0.00E+00	2.21E+03	0.00E+00	-2.20E+00	1.21E+04	2.30E+03	1.50E+01	0.00E+00	1.19E+01	3.41E+01	**-6.22E+04**	**-6.22E+04**	0.018%
2011	20	-1.09E+05	1.11E+05	1.72E+03	0.00E+00	5.91E+00	4.42E+01	0.00E+00	0.00E+00	4.30E-04	-5.32E-01	7.77E+03	6.08E+03	1.63E+01	0.00E+00	2.51E+00	5.48E+00	**-1.09E+05**	**-1.09E+05**	0.009%
2011	33	-6.86E+04	7.57E+04	7.08E+03	2.63E+01	6.68E+00	1.11E+01	0.00E+00	2.15E+03	0.00E+00	-1.80E+00	1.40E+04	4.75E+03	1.40E+01	0.00E+00	1.55E+01	4.05E+01	**-6.86E+04**	**-6.86E+04**	0.008%
2011	32	-6.30E+05	6.45E+05	1.53E+04	2.34E+01	5.10E+01	1.80E+02	2.62E+02	1.08E+04	3.68E-04	-4.85E+00	7.24E+04	4.63E+04	9.98E+01	0.00E+00	1.08E+02	1.84E+02	**-6.30E+05**	**-6.30E+05**	0.031%
2011	22	-1.30E+05	1.31E+05	8.04E+02	2.62E+01	1.91E+01	1.23E+02	0.00E+00	0.00E+00	8.20E-03	-4.36E-01	1.72E+04	1.64E+04	5.43E+01	0.00E+00	8.08E+00	9.95E+00	**-1.30E+05**	**-1.30E+05**	0.012%
2011	26	-5.31E+04	5.34E+04	3.62E+02	0.00E+00	1.41E+00	7.02E+00	0.00E+00	0.00E+00	0.00E+00	-5.21E-02	1.39E+03	1.04E+03	2.88E+00	0.00E+00	9.49E-01	1.38E+00	**-5.31E+04**	**-5.31E+04**	0.001%
2011	25	-1.04E+05	1.05E+05	1.26E+03	4.03E+01	5.81E+00	2.70E+01	0.00E+00	1.06E+01	0.00E+00	-1.74E-01	5.38E+03	4.09E+03	1.47E+01	0.00E+00	3.83E+00	5.09E+00	**-1.04E+05**	**-1.04E+05**	0.005%
2012	1	-6.04E+04	6.06E+04	2.76E+02	0.00E+00	7.20E-01	1.44E+01	0.00E+00	2.07E+03	2.87E-02	-1.02E-01	6.89E+03	4.55E+03	1.01E+00	0.00E+00	9.17E+00	4.90E+00	**-6.04E+04**	**-6.04E+04**	0.000%
2012	38	-1.35E+05	1.34E+05	-1.73E+03	0.00E+00	1.87E+00	6.53E+01	0.00E+00	1.49E+03	6.97E-01	6.62E-02	1.15E+04	1.18E+04	-7.33E+00	0.00E+00	9.72E+00	2.85E+00	**-1.35E+05**	**-1.35E+05**	0.009%
2012	23	-1.22E+05	1.22E+05	5.43E+01	0.00E+00	4.01E-01	1.60E+01	0.00E+00	0.00E+00	0.00E+00	-3.95E-03	2.49E+03	2.44E+03	3.65E+00	0.00E+00	4.24E+00	1.07E+00	**-1.22E+05**	**-1.22E+05**	0.000%
2012	35	-5.71E+05	5.71E+05	3.31E+02	0.00E+00	1.58E+01	8.99E+01	0.00E+00	1.48E+03	0.00E+00	-4.37E-02	2.53E+04	2.35E+04	2.79E+01	0.00E+00	7.19E+01	3.53E+01	**-5.71E+05**	**-5.71E+05**	0.000%
2012	39	-2.16E+05	2.13E+05	-2.50E+03	3.14E+00	1.41E+01	1.14E+02	0.00E+00	0.00E+00	0.00E+00	4.40E-02	2.41E+04	2.66E+04	8.49E+01	0.00E+00	2.01E+01	7.42E+00	**-2.16E+05**	**-2.16E+05**	0.001%
2012	21	-4.12E+04	4.08E+04	-3.46E+02	0.00E+00	4.11E+00	3.01E+01	0.00E+00	0.00E+00	1.37E-01	1.82E-03	4.57E+03	4.93E+03	1.18E+01	0.00E+00	5.23E+00	1.53E+00	**-4.12E+04**	**-4.12E+04**	0.005%
2012	27	-1.38E+05	1.37E+05	-3.74E+02	2.51E+00	4.11E+01	2.52E+02	0.00E+00	1.26E+01	0.00E+00	-3.55E-03	3.88E+04	3.92E+04	1.54E+02	0.00E+00	3.75E+01	1.67E+01	**-1.38E+05**	**-1.38E+05**	0.000%
2012	34	-3.59E+04	3.89E+04	3.01E+03	0.00E+00	6.62E+00	1.30E+01	0.00E+00	2.28E+03	0.00E+00	-1.82E-01	7.15E+03	1.84E+03	6.44E+00	0.00E+00	3.41E+01	1.30E+01	**-3.59E+04**	**-3.59E+04**	0.000%
2012	20	-6.24E+04	6.25E+04	9.87E+01	0.00E+00	5.93E+00	4.18E+01	0.00E+00	0.00E+00	0.00E+00	-4.99E-03	5.51E+03	5.43E+03	1.57E+01	0.00E+00	5.48E+00	2.21E+00	**-6.24E+04**	**-6.24E+04**	0.000%
2012	33	-4.13E+04	4.45E+04	3.22E+03	1.13E+01	6.70E+00	1.02E+01	0.00E+00	2.10E+03	0.00E+00	-2.11E-01	9.36E+03	4.00E+03	8.40E+00	0.00E+00	4.05E+01	1.64E+01	**-4.13E+04**	**-4.13E+04**	0.000%
2012	32	-3.86E+05	3.90E+05	4.08E+03	9.53E+00	5.12E+01	1.58E+02	2.29E+02	9.73E+03	0.00E+00	-3.72E-01	5.02E+04	3.61E+04	7.72E+01	0.00E+00	1.84E+02	1.01E+02	**-3.86E+05**	**-3.86E+05**	0.000%
2012	22	-7.96E+04	7.68E+04	-2.87E+03	1.07E+01	1.91E+01	1.07E+02	0.00E+00	0.00E+00	0.00E+00	1.73E-02	1.03E+04	1.32E+04	2.92E+01	0.00E+00	9.95E+00	5.72E+00	**-7.96E+04**	**-7.96E+04**	0.000%
2012	26	-2.81E+04	2.83E+04	2.21E+02	0.00E+00	1.42E+00	5.92E+00	0.00E+00	0.00E+00	0.00E+00	-7.00E-03	8.57E+02	6.37E+02	2.20E+00	0.00E+00	1.38E+00	7.03E-01	**-2.81E+04**	**-2.81E+04**	0.000%
2012	25	-6.04E+04	6.08E+04	4.20E+02	2.05E+01	5.82E+00	2.29E+01	0.00E+00	1.01E+01	0.00E+00	-1.50E-02	3.45E+03	3.01E+03	1.37E+01	0.00E+00	5.09E+00	2.87E+00	**-6.04E+04**	**-6.04E+04**	0.000%
2013	1	-4.65E+04	4.66E+04	9.83E+01	0.00E+00	7.18E-01	1.14E+01	0.00E+00	1.57E+03	9.15E-02	-3.63E-02	5.24E+03	3.58E+03	5.32E-01	0.00E+00	4.90E+00	2.09E+00	**-4.65E+04**	**-4.65E+04**	0.000%
2013	38	-1.04E+05	1.03E+05	-9.75E+02	0.00E+00	1.87E+00	5.13E+01	0.00E+00	8.90E+02	3.36E+00	-4.68E-01	8.56E+03	8.71E+03	-5.98E+00	0.00E+00	2.34E+00	1.20E+00	**-1.04E+05**	**-1.04E+05**	0.012%
2013	23	-8.95E+04	8.94E+04	-5.86E+01	0.00E+00	4.00E-01	1.26E+01	0.00E+00	0.00E+00	6.29E-02	-2.59E-02	1.69E+03	1.76E+03	8.77E-01	0.00E+00	1.05E+00	6.57E-01	**-8.95E+04**	**-8.95E+04**	0.001%
2013	35	-4.33E+05	4.34E+05	1.60E+02	0.00E+00	1.58E+01	7.16E+01	0.00E+00	1.15E+03	0.00E+00	-4.18E-02	1.87E+04	1.74E+04	2.44E+01	0.00E+00	3.53E+01	2.32E+01	**-4.33E+05**	**-4.33E+05**	0.000%
2013	39	-1.59E+05	1.59E+05	-4.80E+02	1.08E+01	1.41E+01	8.98E+01	0.00E+00	0.00E+00	3.06E-02	-7.50E-02	1.69E+04	1.74E+04	5.88E+01	0.00E+00	7.35E+00	3.91E+00	**-1.59E+05**	**-1.59E+05**	0.001%
2013	21	-3.34E+04	3.28E+04	-5.51E+02	0.00E+00	4.10E+00	2.39E+01	0.00E+00	0.00E+00	3.89E-01	-1.04E-01	3.39E+03	3.95E+03	7.04E+00	0.00E+00	1.42E+00	7.20E-01	**-3.34E+04**	**-3.34E+04**	0.007%
2013	27	-1.15E+05	1.15E+05	2.21E+01	8.53E+00	4.10E+01	2.03E+02	0.00E+00	1.25E+01	9.53E-04	-8.23E-02	3.03E+04	3.03E+04	1.15E+02	0.00E+00	1.67E+01	1.03E+01	**-1.15E+05**	**-1.15E+05**	0.002%
2013	34	-2.98E+04	3.22E+04	2.36E+03	0.00E+00	6.61E+00	1.05E+01	0.00E+00	1.86E+03	0.00E+00	-1.49E-01	5.74E+03	1.52E+03	7.15E+00	0.00E+00	1.30E+01	8.32E+00	**-2.98E+04**	**-2.98E+04**	0.000%
2013	20	-5.20E+04	5.18E+04	-2.81E+02	0.00E+00	5.91E+00	3.33E+01	0.00E+00	0.00E+00	0.00E+00	6.53E-03	4.16E+03	4.46E+03	7.53E+00	0.00E+00	2.20E+00	1.31E+00	**-5.20E+04**	**-5.20E+04**	0.001%
2013	33	-3.50E+04	3.76E+04	2.58E+03	3.22E+01	6.68E+00	8.28E+00	0.00E+00	1.78E+03	0.00E+00	-1.77E-01	7.84E+03	3.44E+03	9.24E+00	0.00E+00	1.64E+01	1.08E+01	**-3.50E+04**	**-3.50E+04**	0.000%
2013	32	-3.37E+05	3.40E+05	3.30E+03	2.88E+01	5.10E+01	1.31E+02	2.72E+02	8.70E+03	0.00E+00	-3.16E-01	4.37E+04	3.14E+04	7.65E+01	0.00E+00	1.01E+02	8.14E+01	**-3.37E+05**	**-3.37E+05**	0.000%
2013	22	-6.79E+04	6.65E+04	-1.39E+03	3.21E+01	1.91E+01	8.87E+01	0.00E+00	0.00E+00	1.71E-03	1.47E-03	8.65E+03	1.00E+04	2.95E+01	0.00E+00	5.72E+00	4.12E+00	**-6.79E+04**	**-6.79E+04**	0.001%
2013	26	-2.46E+04	2.48E+04	1.98E+02	0.00E+00	1.41E+00	4.96E+00	0.00E+00	0.00E+00	0.00E+00	-6.65E-03	7.64E+02	5.67E+02	2.30E+00	0.00E+00	7.02E-01	5.72E-01	**-2.46E+04**	**-2.46E+04**	0.000%
2013	25	-5.35E+04	5.39E+04	3.76E+02	2.18E+01	5.81E+00	1.92E+01	0.00E+00	9.74E+00	0.00E+00	-1.39E-02	3.09E+03	2.68E+03	1.33E+01	0.00E+00	2.87E+00	2.29E+00	**-5.35E+04**	**-5.35E+04**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3. Mass Balance for Tetra-PCB

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2014	1	-4.93E+04	4.94E+04	1.08E+02	0.00E+00	7.18E-01	1.12E+01	0.00E+00	1.58E+03	8.61E-03	-1.81E-02	5.44E+03	3.76E+03	5.25E-01	0.00E+00	2.09E+00	2.80E+00	**-4.93E+04**	**-4.93E+04**	0.000%
2014	38	-1.06E+05	1.07E+05	2.95E+02	0.00E+00	1.87E+00	5.05E+01	0.00E+00	9.01E+02	3.43E+00	-2.47E-01	9.22E+03	8.08E+03	-5.43E+00	0.00E+00	9.75E-01	2.83E+00	**-1.06E+05**	**-1.06E+05**	0.005%
2014	23	-9.19E+04	9.19E+04	-2.01E+01	0.00E+00	4.00E-01	1.24E+01	0.00E+00	0.00E+00	1.56E-01	-1.14E-02	1.60E+03	1.63E+03	2.22E+00	0.00E+00	6.46E-01	1.32E+00	**-9.19E+04**	**-9.19E+04**	0.001%
2014	35	-4.43E+05	4.43E+05	1.42E+02	0.00E+00	1.57E+01	7.21E+01	0.00E+00	1.16E+03	0.00E+00	-2.38E-02	1.78E+04	1.66E+04	2.66E+01	0.00E+00	2.32E+01	2.89E+01	**-4.43E+05**	**-4.43E+05**	0.000%
2014	39	-1.62E+05	1.62E+05	-1.41E+02	9.38E+00	1.42E+01	8.83E+01	0.00E+00	0.00E+00	2.16E-01	-8.97E-02	1.69E+04	1.70E+04	6.35E+01	0.00E+00	3.83E+00	8.23E+00	**-1.62E+05**	**-1.62E+05**	0.000%
2014	21	-3.36E+04	3.35E+04	-9.50E+01	0.00E+00	4.11E+00	2.40E+01	0.00E+00	0.00E+00	4.74E-01	-4.98E-02	3.59E+03	3.70E+03	8.39E+00	0.00E+00	6.72E-01	1.64E+00	**-3.36E+04**	**-3.36E+04**	0.004%
2014	27	-1.16E+05	1.16E+05	1.59E+02	7.51E+00	4.11E+01	2.00E+02	0.00E+00	1.11E+01	7.44E-03	-1.15E-01	2.80E+04	2.78E+04	1.07E+02	0.00E+00	1.02E+01	1.77E+01	**-1.16E+05**	**-1.16E+05**	0.001%
2014	34	-2.95E+04	3.18E+04	2.31E+03	0.00E+00	6.62E+00	1.07E+01	0.00E+00	1.89E+03	0.00E+00	-1.20E-01	5.78E+03	1.59E+03	6.90E+00	0.00E+00	8.31E+00	1.10E+01	**-2.95E+04**	**-2.95E+04**	0.000%
2014	20	-5.21E+04	5.23E+04	1.50E+02	0.00E+00	5.92E+00	3.35E+01	0.00E+00	0.00E+00	0.00E+00	-5.85E-03	4.35E+03	4.22E+03	7.90E+00	0.00E+00	1.31E+00	2.35E+00	**-5.21E+04**	**-5.21E+04**	0.001%
2014	33	-3.46E+04	3.70E+04	2.41E+03	3.23E+01	6.69E+00	8.43E+00	0.00E+00	1.82E+03	0.00E+00	-1.42E-01	7.69E+03	3.43E+03	7.76E+00	0.00E+00	1.08E+01	1.45E+01	**-3.46E+04**	**-3.46E+04**	0.000%
2014	32	-3.47E+05	3.48E+05	1.93E+03	4.17E+01	5.11E+01	1.33E+02	2.78E+02	9.22E+03	0.00E+00	-1.85E-01	4.17E+04	3.02E+04	7.39E+01	0.00E+00	8.14E+01	1.02E+02	**-3.47E+05**	**-3.47E+05**	0.000%
2014	22	-6.92E+04	6.83E+04	-8.69E+02	3.16E+01	1.91E+01	9.00E+01	0.00E+00	0.00E+00	0.00E+00	6.70E-04	8.86E+03	9.75E+03	2.72E+01	0.00E+00	4.12E+00	9.56E+00	**-6.92E+04**	**-6.92E+04**	0.001%
2014	26	-2.47E+04	2.49E+04	1.55E+02	0.00E+00	1.42E+00	4.95E+00	0.00E+00	0.00E+00	0.00E+00	-5.31E-03	7.22E+02	5.70E+02	1.68E+00	0.00E+00	5.72E-01	9.11E-01	**-2.47E+04**	**-2.47E+04**	0.000%
2014	25	-5.61E+04	5.64E+04	3.54E+02	4.86E+00	5.82E+00	1.93E+01	0.00E+00	9.34E+00	0.00E+00	-1.03E-02	2.95E+03	2.58E+03	1.16E+01	0.00E+00	2.29E+00	3.82E+00	**-5.61E+04**	**-5.61E+04**	0.000%
2015	1	-3.65E+04	3.65E+04	2.20E+01	0.00E+00	7.18E-01	9.72E+00	0.00E+00	1.05E+03	2.47E-02	-5.68E-03	4.04E+03	2.98E+03	-2.71E-01	0.00E+00	2.80E+00	5.94E+00	**-3.65E+04**	**-3.65E+04**	0.000%
2015	38	-8.19E+04	8.15E+04	-4.06E+02	0.00E+00	1.87E+00	4.21E+01	0.00E+00	5.10E+02	6.20E+00	1.03E-02	6.37E+03	6.31E+03	-5.94E+00	0.00E+00	2.83E+00	6.80E+00	**-8.19E+04**	**-8.19E+04**	0.006%
2015	23	-7.21E+04	7.20E+04	-2.78E+01	0.00E+00	4.00E-01	1.04E+01	0.00E+00	0.00E+00	3.83E-02	-4.67E-05	1.20E+03	1.24E+03	1.81E+00	0.00E+00	1.32E+00	2.23E+00	**-7.21E+04**	**-7.21E+04**	0.001%
2015	35	-3.49E+05	3.49E+05	-3.20E+02	0.00E+00	1.57E+01	6.00E+01	0.00E+00	8.83E+02	0.00E+00	-5.32E-03	1.33E+04	1.28E+04	1.96E+01	0.00E+00	2.89E+01	3.87E+01	**-3.49E+05**	**-3.49E+05**	0.000%
2015	39	-1.28E+05	1.27E+05	-6.21E+02	8.11E+00	1.42E+01	7.41E+01	0.00E+00	0.00E+00	5.28E-01	7.12E-04	1.32E+04	1.39E+04	5.21E+01	0.00E+00	8.23E+00	1.34E+01	**-1.28E+05**	**-1.28E+05**	0.001%
2015	21	-2.63E+04	2.62E+04	-1.52E+02	0.00E+00	4.11E+00	1.97E+01	0.00E+00	0.00E+00	1.62E+00	-8.26E-04	2.87E+03	3.03E+03	8.09E+00	0.00E+00	1.64E+00	2.87E+00	**-2.63E+04**	**-2.63E+04**	0.004%
2015	27	-9.29E+04	9.28E+04	-1.14E+02	6.22E+00	4.11E+01	1.65E+02	0.00E+00	8.05E+00	3.10E-03	-7.56E-03	2.15E+04	2.16E+04	8.99E+01	0.00E+00	1.77E+01	2.71E+01	**-9.29E+04**	**-9.29E+04**	0.001%
2015	34	-2.33E+04	2.49E+04	1.68E+03	0.00E+00	6.62E+00	8.77E+00	0.00E+00	1.51E+03	0.00E+00	-9.83E-02	4.46E+03	1.27E+03	4.60E+00	0.00E+00	1.10E+01	1.48E+01	**-2.33E+04**	**-2.33E+04**	0.000%
2015	20	-4.14E+04	4.14E+04	3.37E+01	0.00E+00	5.92E+00	2.76E+01	0.00E+00	0.00E+00	0.00E+00	-3.29E-03	3.43E+03	3.41E+03	6.68E+00	0.00E+00	2.35E+00	3.81E+00	**-4.14E+04**	**-4.14E+04**	0.000%
2015	33	-2.72E+04	2.91E+04	1.86E+03	2.77E+01	6.69E+00	6.81E+00	0.00E+00	1.48E+03	0.00E+00	-1.19E-01	5.90E+03	2.53E+03	6.20E+00	0.00E+00	1.45E+01	1.93E+01	**-2.72E+04**	**-2.72E+04**	0.000%
2015	32	-2.80E+05	2.81E+05	1.01E+03	2.55E+01	5.11E+01	1.10E+02	2.49E+02	7.69E+03	0.00E+00	-1.34E-01	3.38E+04	2.49E+04	6.62E+01	0.00E+00	1.02E+02	1.09E+02	**-2.80E+05**	**-2.80E+05**	0.000%
2015	22	-5.52E+04	5.44E+04	-8.21E+02	2.85E+01	1.91E+01	7.44E+01	0.00E+00	0.00E+00	1.20E-02	-1.88E-03	7.26E+03	8.08E+03	2.69E+01	0.00E+00	9.56E+00	9.24E+00	**-5.52E+04**	**-5.52E+04**	0.000%
2015	26	-1.91E+04	1.93E+04	1.47E+02	0.00E+00	1.42E+00	4.04E+00	0.00E+00	0.00E+00	0.00E+00	-5.48E-03	5.99E+02	4.53E+02	1.63E+00	0.00E+00	9.10E-01	9.51E-01	**-1.91E+04**	**-1.91E+04**	0.000%
2015	25	-4.52E+04	4.54E+04	2.43E+02	5.53E+00	5.82E+00	1.60E+01	0.00E+00	8.17E+00	0.00E+00	-8.88E-03	2.43E+03	2.18E+03	9.84E+00	0.00E+00	3.82E+00	3.77E+00	**-4.52E+04**	**-4.52E+04**	0.000%
2016	1	-3.92E+04	3.93E+04	5.12E+01	0.00E+00	7.22E-01	1.08E+01	0.00E+00	1.24E+03	5.11E-03	1.58E-01	4.50E+03	3.22E+03	2.24E-02	0.00E+00	5.92E+00	3.91E+00	**-3.92E+04**	**-3.92E+04**	0.000%
2016	38	-8.72E+04	8.70E+04	-1.49E+02	0.00E+00	1.88E+00	4.77E+01	0.00E+00	5.11E+02	9.13E+00	4.97E-01	6.89E+03	6.57E+03	-6.40E+00	0.00E+00	6.80E+00	2.87E+00	**-8.72E+04**	**-8.72E+04**	0.011%
2016	23	-7.64E+04	7.64E+04	-1.66E+01	0.00E+00	4.02E-01	1.18E+01	0.00E+00	0.00E+00	3.34E-02	1.13E-01	1.33E+03	1.36E+03	2.06E+00	0.00E+00	2.23E+00	9.13E-01	**-7.64E+04**	**-7.64E+04**	0.001%
2016	35	-3.70E+05	3.70E+05	1.28E+02	0.00E+00	1.58E+01	6.79E+01	0.00E+00	9.15E+02	0.00E+00	1.05E+00	1.50E+04	1.39E+04	2.17E+01	0.00E+00	3.87E+01	2.74E+01	**-3.70E+05**	**-3.70E+05**	0.000%
2016	39	-1.34E+05	1.34E+05	-4.17E+02	6.23E+00	1.43E+01	8.39E+01	0.00E+00	0.00E+00	5.32E-02	7.91E-01	1.39E+04	1.43E+04	5.20E+01	0.00E+00	1.34E+01	6.36E+00	**-1.34E+05**	**-1.34E+05**	0.001%
2016	21	-2.85E+04	2.83E+04	-1.12E+02	0.00E+00	4.13E+00	2.26E+01	0.00E+00	0.00E+00	1.99E+00	2.23E-01	3.05E+03	3.17E+03	7.40E+00	0.00E+00	2.87E+00	1.46E+00	**-2.85E+04**	**-2.85E+04**	0.005%
2016	27	-9.99E+04	9.99E+04	-3.40E+00	4.84E+00	4.13E+01	1.87E+02	0.00E+00	8.68E+00	4.68E-03	2.08E+00	2.33E+04	2.33E+04	9.29E+01	0.00E+00	2.71E+01	1.72E+01	**-9.99E+04**	**-9.99E+04**	0.001%
2016	34	-2.51E+04	2.69E+04	1.81E+03	0.00E+00	6.65E+00	1.00E+01	0.00E+00	1.65E+03	0.00E+00	2.20E-01	4.89E+03	1.42E+03	6.23E+00	0.00E+00	1.48E+01	1.00E+01	**-2.51E+04**	**-2.51E+04**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 3. Mass Balance for Tetra-PCB

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2016	20	-4.44E+04	4.44E+04	6.16E+01	0.00E+00	5.96E+00	3.15E+01	0.00E+00	0.00E+00	0.00E+00	3.38E-01	3.66E+03	3.62E+03	7.11E+00	0.00E+00	3.81E+00	2.17E+00	**-4.44E+04**	**-4.44E+04**	0.000%
2016	33	-2.90E+04	3.10E+04	1.94E+03	2.18E+01	6.73E+00	7.79E+00	0.00E+00	1.60E+03	0.00E+00	2.22E-01	6.31E+03	2.73E+03	6.75E+00	0.00E+00	1.93E+01	1.26E+01	**-2.90E+04**	**-2.90E+04**	0.000%
2016	32	-3.00E+05	3.02E+05	1.30E+03	1.95E+01	5.14E+01	1.23E+02	2.28E+02	8.27E+03	0.00E+00	2.36E+00	3.61E+04	2.63E+04	7.39E+01	0.00E+00	1.09E+02	1.04E+02	**-3.00E+05**	**-3.00E+05**	0.000%
2016	22	-5.90E+04	5.82E+04	-8.01E+02	2.18E+01	1.92E+01	8.33E+01	0.00E+00	0.00E+00	0.00E+00	9.42E-01	7.58E+03	8.39E+03	2.54E+01	0.00E+00	9.24E+00	7.32E+00	**-5.90E+04**	**-5.90E+04**	0.000%
2016	26	-2.06E+04	2.07E+04	1.45E+02	0.00E+00	1.42E+00	4.52E+00	0.00E+00	0.00E+00	0.00E+00	5.43E-02	6.31E+02	4.88E+02	1.81E+00	0.00E+00	9.51E-01	8.60E-01	**-2.06E+04**	**-2.06E+04**	0.000%
2016	25	-4.83E+04	4.86E+04	2.78E+02	4.85E+00	5.85E+00	1.78E+01	0.00E+00	8.63E+00	0.00E+00	2.37E-01	2.59E+03	2.30E+03	9.63E+00	0.00E+00	3.77E+00	3.43E+00	**-4.83E+04**	**-4.83E+04**	0.000%

Table 4. Mass Balance for Total 4,4'-DDX

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1996	1	-3.17E+04	3.21E+04	4.73E+02	0.00E+00	2.43E+00	1.36E+00	0.00E+00	1.59E+02	5.04E-02	-7.25E-02	3.01E+03	2.38E+03	1.06E+00	0.00E+00	1.53E-01	2.91E+00	**-3.17E+04**	**-3.17E+04**	0.000%
1996	38	-7.34E+04	7.34E+04	4.33E+01	0.00E+00	8.03E+00	5.07E+00	0.00E+00	2.37E+02	1.15E+01	1.05E-02	4.77E+03	4.50E+03	-3.31E+00	0.00E+00	1.52E-01	2.68E+00	**-7.34E+04**	**-7.34E+04**	0.023%
1996	23	-6.39E+04	6.39E+04	5.48E+01	0.00E+00	2.25E+00	1.53E+00	0.00E+00	0.00E+00	2.26E-01	-5.14E-03	1.04E+03	9.86E+02	1.24E-01	0.00E+00	6.68E-02	1.50E+00	**-6.39E+04**	**-6.39E+04**	0.001%
1996	35	-3.19E+05	3.19E+05	4.44E+02	0.00E+00	6.76E+00	1.24E+01	0.00E+00	8.39E+02	0.00E+00	-1.53E-02	1.22E+04	1.10E+04	1.46E+01	0.00E+00	1.25E+00	3.31E+01	**-3.19E+05**	**-3.19E+05**	0.000%
1996	39	-1.17E+05	1.17E+05	-5.27E+02	3.40E+01	6.54E+00	1.22E+01	0.00E+00	0.00E+00	7.63E-02	5.86E-02	1.10E+04	1.15E+04	2.85E+01	0.00E+00	4.05E-01	7.94E+00	**-1.17E+05**	**-1.17E+05**	0.001%
1996	21	-2.44E+04	2.45E+04	8.39E+01	0.00E+00	8.97E-01	3.13E+00	0.00E+00	0.00E+00	1.99E-01	8.90E-03	2.10E+03	2.02E+03	4.65E+00	0.00E+00	7.33E-02	2.09E+00	**-2.44E+04**	**-2.44E+04**	0.007%
1996	27	-9.58E+04	9.66E+04	7.55E+02	1.13E+01	8.97E+00	3.22E+01	0.00E+00	7.86E+00	2.69E-02	-2.81E-02	1.89E+04	1.81E+04	9.06E+01	0.00E+00	8.48E-01	1.88E+01	**-9.58E+04**	**-9.58E+04**	0.002%
1996	34	-2.39E+04	2.55E+04	1.62E+03	0.00E+00	1.45E+00	3.16E+00	0.00E+00	1.57E+03	0.00E+00	-1.07E-01	4.16E+03	9.75E+02	8.83E+00	0.00E+00	4.98E-01	1.44E+01	**-2.39E+04**	**-2.39E+04**	0.000%
1996	20	-3.96E+04	3.96E+04	9.17E+00	0.00E+00	1.29E+00	4.96E+00	0.00E+00	0.00E+00	2.92E-02	-1.68E-03	2.86E+03	2.86E+03	5.97E+00	0.00E+00	1.13E-01	2.69E+00	**-3.96E+04**	**-3.96E+04**	0.001%
1996	33	-2.68E+04	2.80E+04	1.16E+03	7.85E+01	1.46E+00	2.85E+00	0.00E+00	1.67E+03	0.00E+00	-8.46E-02	5.45E+03	2.54E+03	1.33E+01	0.00E+00	5.30E-01	1.62E+01	**-2.68E+04**	**-2.68E+04**	0.000%
1996	32	-4.84E+05	4.85E+05	7.43E+02	6.94E+01	1.12E+01	5.55E+01	3.13E+02	1.29E+04	0.00E+00	-1.03E-01	4.50E+04	3.13E+04	7.91E+01	0.00E+00	3.31E+00	3.12E+02	**-4.84E+05**	**-4.84E+05**	0.000%
1996	22	-8.83E+04	8.74E+04	-9.25E+02	8.09E+01	4.17E+00	2.11E+01	0.00E+00	0.00E+00	1.04E-01	3.84E-03	9.46E+03	1.03E+04	2.55E+01	0.00E+00	3.40E-01	2.24E+01	**-8.83E+04**	**-8.83E+04**	0.000%
1996	26	-3.62E+04	3.64E+04	2.58E+02	0.00E+00	3.09E-01	1.67E+00	0.00E+00	0.00E+00	0.00E+00	-1.11E-02	9.46E+02	6.89E+02	3.96E+00	0.00E+00	4.05E-02	3.58E+00	**-3.62E+04**	**-3.62E+04**	0.000%
1996	25	-1.06E+05	1.06E+05	5.40E+02	1.22E+01	1.27E+00	6.59E+00	0.00E+00	7.38E+00	0.00E+00	-5.82E-03	3.75E+03	3.19E+03	1.69E+01	0.00E+00	1.50E-01	1.38E+01	**-1.06E+05**	**-1.06E+05**	0.000%
1997	1	-2.69E+04	2.71E+04	2.52E+02	0.00E+00	2.42E+00	1.37E+00	0.00E+00	1.06E+02	3.84E-03	-1.92E-02	2.63E+03	2.27E+03	1.03E+00	0.00E+00	2.90E+00	5.09E+00	**-2.69E+04**	**-2.69E+04**	0.000%
1997	38	-6.57E+04	6.57E+04	-1.98E+01	0.00E+00	8.01E+00	5.12E+00	0.00E+00	1.34E+02	4.78E+00	6.27E-04	3.87E+03	3.76E+03	-3.53E+00	0.00E+00	2.68E+00	1.98E+00	**-6.57E+04**	**-6.57E+04**	0.010%
1997	23	-5.93E+04	5.93E+04	1.13E+01	0.00E+00	2.24E+00	1.54E+00	0.00E+00	0.00E+00	4.23E-02	-5.27E-04	9.42E+02	9.29E+02	2.34E-01	0.00E+00	1.50E+00	1.03E+00	**-5.93E+04**	**-5.93E+04**	0.000%
1997	35	-2.96E+05	2.96E+05	2.00E+02	0.00E+00	6.74E+00	1.24E+01	0.00E+00	8.55E+02	0.00E+00	-5.38E-03	1.10E+04	9.96E+03	1.60E+01	0.00E+00	3.31E+01	3.53E+01	**-2.96E+05**	**-2.96E+05**	0.000%
1997	39	-1.08E+05	1.07E+05	-8.67E+02	3.05E+01	6.52E+00	1.23E+01	0.00E+00	0.00E+00	2.65E-02	2.03E-02	9.38E+03	1.02E+04	2.77E+01	0.00E+00	7.94E+00	6.29E+00	**-1.08E+05**	**-1.08E+05**	0.001%
1997	21	-2.30E+04	2.30E+04	2.84E+01	0.00E+00	8.95E-01	3.13E+00	0.00E+00	0.00E+00	7.21E-01	8.77E-05	1.90E+03	1.87E+03	3.56E+00	0.00E+00	2.09E+00	1.17E+00	**-2.30E+04**	**-2.30E+04**	0.004%
1997	27	-9.04E+04	9.06E+04	1.53E+02	1.02E+01	8.94E+00	3.19E+01	0.00E+00	5.73E+00	0.00E+00	-4.71E-03	1.63E+04	1.61E+04	7.47E+01	0.00E+00	1.88E+01	1.66E+01	**-9.04E+04**	**-9.04E+04**	0.001%
1997	34	-2.28E+04	2.44E+04	1.53E+03	0.00E+00	1.44E+00	3.09E+00	0.00E+00	1.50E+03	0.00E+00	-7.46E-02	4.05E+03	1.01E+03	6.98E+00	0.00E+00	1.44E+01	1.52E+01	**-2.28E+04**	**-2.28E+04**	0.000%
1997	20	-3.76E+04	3.76E+04	-9.50E+00	0.00E+00	1.29E+00	4.90E+00	0.00E+00	0.00E+00	7.15E-02	-1.47E-03	2.63E+03	2.63E+03	4.31E+00	0.00E+00	2.69E+00	2.16E+00	**-3.76E+04**	**-3.76E+04**	0.001%
1997	33	-2.56E+04	2.68E+04	1.16E+03	6.93E+01	1.46E+00	2.85E+00	0.00E+00	1.60E+03	0.00E+00	-6.06E-02	5.22E+03	2.38E+03	9.40E+00	0.00E+00	1.62E+01	1.80E+01	**-2.56E+04**	**-2.56E+04**	0.000%
1997	32	-4.57E+05	4.57E+05	1.40E+02	5.99E+01	1.11E+01	5.34E+01	3.11E+02	1.23E+04	0.00E+00	-6.83E-02	4.23E+04	2.93E+04	6.99E+01	0.00E+00	3.12E+02	1.42E+02	**-4.57E+05**	**-4.57E+05**	0.000%
1997	22	-8.55E+04	8.32E+04	-2.31E+03	6.99E+01	4.16E+00	2.06E+01	0.00E+00	0.00E+00	2.53E-01	8.45E-03	8.93E+03	1.12E+04	1.45E+01	0.00E+00	2.24E+01	8.05E+00	**-8.55E+04**	**-8.55E+04**	0.001%
1997	26	-3.41E+04	3.43E+04	2.63E+02	0.00E+00	3.08E-01	1.60E+00	0.00E+00	0.00E+00	0.00E+00	-7.80E-03	8.81E+02	6.16E+02	1.70E+00	0.00E+00	3.58E+00	1.22E+00	**-3.41E+04**	**-3.41E+04**	0.000%
1997	25	-9.96E+04	1.00E+05	3.83E+02	1.33E+01	1.27E+00	6.29E+00	0.00E+00	5.84E+00	0.00E+00	-6.92E-03	3.53E+03	3.11E+03	1.09E+01	0.00E+00	1.38E+01	5.07E+00	**-9.96E+04**	**-9.96E+04**	0.000%
1998	1	-2.89E+04	2.90E+04	1.50E+02	0.00E+00	2.42E+00	1.57E+00	0.00E+00	1.34E+02	1.83E-02	-7.63E-03	2.83E+03	2.54E+03	6.61E-01	0.00E+00	5.09E+00	3.10E+00	**-2.89E+04**	**-2.89E+04**	0.000%
1998	38	-7.11E+04	7.11E+04	4.03E+01	0.00E+00	8.01E+00	5.83E+00	0.00E+00	1.66E+02	4.24E+00	-1.72E-01	4.21E+03	4.01E+03	-4.54E+00	0.00E+00	1.82E+00	1.79E+00	**-7.11E+04**	**-7.11E+04**	0.013%
1998	23	-6.32E+04	6.32E+04	4.45E+00	0.00E+00	2.24E+00	1.76E+00	0.00E+00	0.00E+00	5.52E-02	-8.99E-03	9.53E+02	9.48E+02	-5.31E-01	0.00E+00	1.02E+00	9.43E-01	**-6.32E+04**	**-6.32E+04**	0.001%
1998	35	-3.19E+05	3.20E+05	1.45E+02	0.00E+00	6.74E+00	1.43E+01	0.00E+00	9.83E+02	0.00E+00	2.19E-04	1.15E+04	1.04E+04	1.38E+01	0.00E+00	3.53E+01	2.84E+01	**-3.19E+05**	**-3.19E+05**	0.000%
1998	39	-1.15E+05	1.15E+05	-2.82E+02	3.05E+01	6.52E+00	1.40E+01	0.00E+00	0.00E+00	1.72E-01	-6.32E-02	9.75E+03	9.98E+03	3.33E+01	0.00E+00	6.19E+00	6.31E+00	**-1.15E+05**	**-1.15E+05**	0.001%
1998	21	-2.53E+04	2.53E+04	3.88E+01	0.00E+00	8.95E-01	3.61E+00	0.00E+00	0.00E+00	2.91E-01	-9.59E-02	2.05E+03	2.02E+03	3.73E+00	0.00E+00	1.08E+00	1.30E+00	**-2.53E+04**	**-2.53E+04**	0.005%
1998	27	-1.01E+05	1.02E+05	3.22E+02	1.01E+01	8.94E+00	3.65E+01	0.00E+00	7.72E+00	9.50E-02	-1.72E-01	1.77E+04	1.73E+04	6.02E+01	0.00E+00	1.65E+01	1.94E+01	**-1.01E+05**	**-1.01E+05**	0.001%
1998	34	-2.51E+04	2.66E+04	1.50E+03	0.00E+00	1.44E+00	3.62E+00	0.00E+00	1.72E+03	0.00E+00	-8.66E-02	4.35E+03	1.12E+03	7.08E+00	0.00E+00	1.52E+01	1.20E+01	**-2.51E+04**	**-2.51E+04**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 4. Mass Balance for Total 4,4'-DDX

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1998	20	-4.15E+04	4.15E+04	3.55E+01	0.00E+00	1.29E+00	5.69E+00	0.00E+00	0.00E+00	0.00E+00	-4.61E-02	2.86E+03	2.82E+03	4.11E+00	0.00E+00	2.12E+00	2.60E+00	**-4.15E+04**	**-4.15E+04**	0.000%
1998	33	-2.83E+04	2.95E+04	1.15E+03	7.46E+01	1.46E+00	3.34E+00	0.00E+00	1.86E+03	0.00E+00	-7.30E-02	5.52E+03	2.43E+03	1.02E+01	0.00E+00	1.80E+01	1.37E+01	**-2.83E+04**	**-2.83E+04**	0.000%
1998	32	-5.29E+05	5.29E+05	5.87E+02	6.54E+01	1.11E+01	6.27E+01	3.10E+02	1.49E+04	0.00E+00	-8.31E-02	5.13E+04	3.54E+04	8.15E+01	0.00E+00	1.42E+02	1.54E+02	**-5.29E+05**	**-5.29E+05**	0.000%
1998	22	-1.01E+05	9.91E+04	-1.82E+03	7.62E+01	4.16E+00	2.49E+01	0.00E+00	0.00E+00	1.28E-03	-6.62E-02	1.14E+04	1.31E+04	1.89E+01	0.00E+00	7.97E+00	1.13E+01	**-1.01E+05**	**-1.01E+05**	0.000%
1998	26	-4.10E+04	4.13E+04	2.88E+02	0.00E+00	3.08E-01	1.95E+00	0.00E+00	0.00E+00	0.00E+00	-9.13E-03	1.13E+03	8.41E+02	1.94E+00	0.00E+00	1.22E+00	1.41E+00	**-4.10E+04**	**-4.10E+04**	0.000%
1998	25	-1.18E+05	1.18E+05	4.78E+02	1.62E+01	1.27E+00	7.65E+00	0.00E+00	8.00E+00	0.00E+00	-2.16E-04	4.26E+03	3.75E+03	1.32E+01	0.00E+00	5.07E+00	5.04E+00	**-1.18E+05**	**-1.18E+05**	0.000%
1999	1	-2.81E+04	2.83E+04	1.90E+02	0.00E+00	2.42E+00	1.76E+00	0.00E+00	1.11E+02	7.84E-03	-2.80E-02	2.54E+03	2.24E+03	7.84E-01	0.00E+00	3.10E+00	2.80E+00	**-2.81E+04**	**-2.81E+04**	0.000%
1999	38	-6.54E+04	6.56E+04	1.33E+02	0.00E+00	8.01E+00	6.35E+00	0.00E+00	1.18E+02	3.46E+00	-3.63E-01	3.60E+03	3.36E+03	-5.54E+00	0.00E+00	1.45E+00	2.35E+00	**-6.54E+04**	**-6.54E+04**	0.009%
1999	23	-5.59E+04	5.59E+04	6.46E+01	0.00E+00	2.24E+00	1.85E+00	0.00E+00	0.00E+00	1.79E-02	-1.63E-02	8.28E+02	7.65E+02	-1.01E+00	0.00E+00	9.31E-01	1.42E+00	**-5.59E+04**	**-5.59E+04**	0.001%
1999	35	-2.88E+05	2.89E+05	4.74E+02	0.00E+00	6.74E+00	1.49E+01	0.00E+00	8.71E+02	0.00E+00	-4.08E-02	9.80E+03	8.46E+03	7.87E+00	0.00E+00	2.84E+01	2.90E+01	**-2.88E+05**	**-2.88E+05**	0.000%
1999	39	-1.02E+05	1.02E+05	5.11E+01	2.36E+01	6.52E+00	1.48E+01	0.00E+00	0.00E+00	4.15E-02	-6.57E-03	8.00E+03	7.90E+03	3.37E+01	0.00E+00	6.31E+00	7.98E+00	**-1.02E+05**	**-1.02E+05**	0.001%
1999	21	-2.35E+04	2.36E+04	7.30E+01	0.00E+00	8.95E-01	3.79E+00	0.00E+00	0.00E+00	2.20E-01	-2.77E-02	1.89E+03	1.82E+03	4.10E+00	0.00E+00	1.27E+00	1.48E+00	**-2.35E+04**	**-2.35E+04**	0.004%
1999	27	-9.58E+04	9.63E+04	4.44E+02	8.07E+00	8.94E+00	3.75E+01	0.00E+00	4.81E+00	2.83E-02	-1.95E-02	1.51E+04	1.46E+04	4.76E+01	0.00E+00	1.94E+01	1.62E+01	**-9.58E+04**	**-9.58E+04**	0.001%
1999	34	-2.38E+04	2.49E+04	1.11E+03	0.00E+00	1.44E+00	3.71E+00	0.00E+00	1.62E+03	0.00E+00	-6.58E-02	3.81E+03	1.07E+03	6.15E+00	0.00E+00	1.20E+01	1.21E+01	**-2.38E+04**	**-2.38E+04**	0.000%
1999	20	-3.85E+04	3.86E+04	3.02E+01	0.00E+00	1.29E+00	5.85E+00	0.00E+00	0.00E+00	0.00E+00	-2.33E-03	2.62E+03	2.59E+03	3.92E+00	0.00E+00	2.60E+00	2.55E+00	**-3.85E+04**	**-3.85E+04**	0.000%
1999	33	-2.60E+04	2.69E+04	9.46E+02	5.93E+01	1.46E+00	3.42E+00	0.00E+00	1.73E+03	0.00E+00	-6.00E-02	4.61E+03	1.87E+03	8.11E+00	0.00E+00	1.37E+01	1.36E+01	**-2.60E+04**	**-2.60E+04**	0.000%
1999	32	-5.31E+05	5.31E+05	4.07E+02	5.10E+01	1.11E+01	6.80E+01	3.04E+02	1.45E+04	0.00E+00	-8.62E-02	4.84E+04	3.30E+04	7.18E+01	0.00E+00	1.54E+02	1.35E+02	**-5.31E+05**	**-5.31E+05**	0.000%
1999	22	-9.86E+04	9.79E+04	-7.34E+02	5.94E+01	4.16E+00	2.64E+01	0.00E+00	0.00E+00	3.19E-04	-4.39E-03	1.10E+04	1.17E+04	1.96E+01	0.00E+00	1.13E+01	1.03E+01	**-9.86E+04**	**-9.86E+04**	0.001%
1999	26	-3.87E+04	3.90E+04	3.34E+02	0.00E+00	3.08E-01	2.09E+00	0.00E+00	0.00E+00	0.00E+00	-1.55E-02	1.05E+03	7.19E+02	1.91E+00	0.00E+00	1.41E+00	1.34E+00	**-3.87E+04**	**-3.87E+04**	0.000%
1999	25	-1.21E+05	1.22E+05	5.80E+02	1.40E+01	1.27E+00	8.33E+00	0.00E+00	7.52E+00	0.00E+00	-1.51E-02	4.29E+03	3.68E+03	1.42E+01	0.00E+00	5.04E+00	5.75E+00	**-1.21E+05**	**-1.21E+05**	0.000%
2000	1	-2.21E+04	2.22E+04	7.32E+01	0.00E+00	2.43E+00	1.29E+00	0.00E+00	1.34E+02	5.69E-03	-4.10E-03	2.21E+03	2.00E+03	7.87E-01	0.00E+00	2.80E+00	1.66E+00	**-2.21E+04**	**-2.21E+04**	0.000%
2000	38	-5.21E+04	5.20E+04	-7.16E+01	0.00E+00	8.03E+00	4.69E+00	0.00E+00	1.27E+02	4.38E+00	-1.99E-02	3.14E+03	3.08E+03	-1.39E+00	0.00E+00	2.34E+00	1.33E+00	**-5.21E+04**	**-5.21E+04**	0.009%
2000	23	-4.66E+04	4.66E+04	-2.57E+00	0.00E+00	2.25E+00	1.43E+00	0.00E+00	0.00E+00	1.53E-01	9.23E-05	7.47E+02	7.46E+02	9.68E-01	0.00E+00	1.42E+00	7.49E-01	**-4.66E+04**	**-4.66E+04**	0.000%
2000	35	-2.32E+05	2.32E+05	-2.72E+01	0.00E+00	6.76E+00	1.13E+01	0.00E+00	8.79E+02	0.00E+00	-7.91E-02	8.33E+03	7.45E+03	2.49E+01	0.00E+00	2.89E+01	1.94E+01	**-2.32E+05**	**-2.32E+05**	0.000%
2000	39	-8.47E+04	8.45E+04	-2.30E+02	2.85E+01	6.54E+00	1.13E+01	0.00E+00	0.00E+00	1.98E-01	3.72E-03	7.31E+03	7.48E+03	3.63E+01	0.00E+00	7.98E+00	4.61E+00	**-8.47E+04**	**-8.47E+04**	0.001%
2000	21	-1.79E+04	1.79E+04	4.62E+00	0.00E+00	8.97E-01	2.85E+00	0.00E+00	0.00E+00	2.72E-01	-2.59E-04	1.45E+03	1.45E+03	5.77E+00	0.00E+00	1.48E+00	9.45E-01	**-1.79E+04**	**-1.79E+04**	0.004%
2000	27	-7.29E+04	7.30E+04	1.46E+02	9.44E+00	8.97E+00	2.86E+01	0.00E+00	4.71E+00	6.13E-04	-6.00E-03	1.31E+04	1.29E+04	6.22E+01	0.00E+00	1.62E+01	1.17E+01	**-7.29E+04**	**-7.29E+04**	0.001%
2000	34	-1.81E+04	1.91E+04	9.78E+02	0.00E+00	1.45E+00	2.77E+00	0.00E+00	1.35E+03	0.00E+00	1.73E-01	3.12E+03	7.84E+02	5.91E+00	0.00E+00	1.23E+01	1.06E+01	**-1.81E+04**	**-1.81E+04**	0.001%
2000	20	-3.00E+04	3.01E+04	9.78E+00	0.00E+00	1.29E+00	4.42E+00	0.00E+00	0.00E+00	1.86E-02	-1.79E-03	1.98E+03	1.96E+03	5.63E+00	0.00E+00	2.54E+00	1.70E+00	**-3.00E+04**	**-3.00E+04**	0.000%
2000	33	-2.19E+04	2.25E+04	6.64E+02	6.31E+01	1.46E+00	2.55E+00	0.00E+00	1.43E+03	0.00E+00	4.57E-01	4.08E+03	1.92E+03	7.89E+00	0.00E+00	1.41E+01	1.08E+01	**-2.19E+04**	**-2.19E+04**	0.002%
2000	32	-4.08E+05	4.08E+05	-2.55E+02	5.65E+01	1.12E+01	4.94E+01	2.93E+02	1.28E+04	0.00E+00	-4.11E-01	3.86E+04	2.55E+04	9.64E+01	0.00E+00	1.34E+02	4.44E+01	**-4.08E+05**	**-4.08E+05**	0.000%
2000	22	-7.26E+04	7.15E+04	-1.07E+03	6.58E+01	4.17E+00	1.85E+01	0.00E+00	0.00E+00	4.81E-03	-2.81E-03	8.73E+03	9.72E+03	2.59E+01	0.00E+00	1.03E+01	5.62E+00	**-7.26E+04**	**-7.26E+04**	0.000%
2000	26	-3.11E+04	3.13E+04	2.15E+02	0.00E+00	3.09E-01	1.46E+00	0.00E+00	0.00E+00	0.00E+00	-5.26E-03	8.14E+02	5.98E+02	1.26E+00	0.00E+00	1.34E+00	4.30E-01	**-3.11E+04**	**-3.11E+04**	0.000%
2000	25	-9.19E+04	9.24E+04	4.12E+02	1.17E+01	1.27E+00	5.72E+00	0.00E+00	5.52E+00	0.00E+00	-8.18E-03	3.37E+03	2.93E+03	1.12E+01	0.00E+00	5.75E+00	1.47E+00	**-9.19E+04**	**-9.19E+04**	0.000%
2001	1	-2.22E+04	2.23E+04	1.21E+02	0.00E+00	2.42E+00	1.44E+00	0.00E+00	9.86E+01	1.43E-03	-5.31E-03	2.24E+03	2.02E+03	1.25E+00	0.00E+00	1.66E+00	3.77E+00	**-2.22E+04**	**-2.22E+04**	0.000%
2001	38	-5.31E+04	5.31E+04	-2.43E+01	0.00E+00	8.01E+00	5.15E+00	0.00E+00	9.82E+01	1.76E+00	-9.13E-04	3.13E+03	3.06E+03	-2.91E+00	0.00E+00	1.33E+00	1.86E+00	**-5.31E+04**	**-5.31E+04**	0.005%

Table 4. Mass Balance for Total 4,4'-DDX

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2001	23	-4.72E+04	4.72E+04	-5.73E+00	0.00E+00	2.24E+00	1.54E+00	0.00E+00	0.00E+00	4.74E-02	-1.35E-05	7.57E+02	7.62E+02	2.08E-01	0.00E+00	7.49E-01	9.46E-01	**-4.72E+04**	**-4.72E+04**	0.000%
2001	35	-2.38E+05	2.38E+05	4.25E+01	0.00E+00	6.74E+00	1.23E+01	0.00E+00	8.42E+02	0.00E+00	-1.57E-03	8.65E+03	7.76E+03	2.11E+01	0.00E+00	1.94E+01	2.99E+01	**-2.38E+05**	**-2.38E+05**	0.000%
2001	39	-8.57E+04	8.56E+04	-1.20E+02	2.22E+01	6.52E+00	1.22E+01	0.00E+00	0.00E+00	2.71E-01	4.06E-03	7.17E+03	7.25E+03	3.11E+01	0.00E+00	4.61E+00	5.77E+00	**-8.57E+04**	**-8.57E+04**	0.001%
2001	21	-1.87E+04	1.88E+04	1.73E+01	0.00E+00	8.95E-01	3.11E+00	0.00E+00	0.00E+00	3.27E-01	-4.63E-04	1.56E+03	1.55E+03	4.49E+00	0.00E+00	9.45E-01	1.18E+00	**-1.87E+04**	**-1.87E+04**	0.003%
2001	27	-7.59E+04	7.59E+04	2.14E+00	7.45E+00	8.94E+00	3.10E+01	0.00E+00	4.62E+00	3.63E-02	-2.25E-03	1.28E+04	1.28E+04	3.96E+01	0.00E+00	1.17E+01	1.84E+01	**-7.59E+04**	**-7.59E+04**	0.001%
2001	34	-1.90E+04	2.00E+04	9.76E+02	0.00E+00	1.44E+00	3.00E+00	0.00E+00	1.35E+03	0.00E+00	-5.45E-02	3.13E+03	8.01E+02	5.73E+00	0.00E+00	1.06E+01	1.40E+01	**-1.90E+04**	**-1.90E+04**	0.000%
2001	20	-3.12E+04	3.12E+04	-8.63E+00	0.00E+00	1.29E+00	4.80E+00	0.00E+00	0.00E+00	1.23E-02	-1.12E-03	2.11E+03	2.12E+03	5.17E+00	0.00E+00	1.70E+00	2.27E+00	**-3.12E+04**	**-3.12E+04**	0.001%
2001	33	-2.27E+04	2.34E+04	7.53E+02	4.75E+01	1.46E+00	2.76E+00	0.00E+00	1.43E+03	0.00E+00	-4.44E-02	4.04E+03	1.80E+03	7.63E+00	0.00E+00	1.08E+01	1.60E+01	**-2.27E+04**	**-2.27E+04**	0.000%
2001	32	-4.31E+05	4.32E+05	4.23E+02	4.40E+01	1.11E+01	5.55E+01	2.76E+02	1.29E+04	0.00E+00	-4.92E-02	4.00E+04	2.66E+04	8.25E+01	0.00E+00	4.44E+01	3.07E+02	**-4.31E+05**	**-4.31E+05**	0.000%
2001	22	-7.73E+04	7.56E+04	-1.65E+03	5.12E+01	4.16E+00	2.08E+01	0.00E+00	0.00E+00	3.48E-02	4.80E-03	8.68E+03	1.03E+04	2.29E+01	0.00E+00	5.62E+00	1.78E+01	**-7.73E+04**	**-7.73E+04**	0.001%
2001	26	-3.18E+04	3.21E+04	2.49E+02	0.00E+00	3.08E-01	1.66E+00	0.00E+00	0.00E+00	0.00E+00	-7.31E-03	8.16E+02	5.71E+02	1.54E+00	0.00E+00	4.30E-01	4.12E+00	**-3.18E+04**	**-3.18E+04**	0.000%
2001	25	-9.68E+04	9.73E+04	4.78E+02	7.37E+00	1.27E+00	6.56E+00	0.00E+00	5.99E+00	0.00E+00	-8.54E-03	3.35E+03	2.87E+03	9.72E+00	0.00E+00	1.47E+00	1.69E+01	**-9.68E+04**	**-9.68E+04**	0.000%
2002	1	-2.28E+04	2.29E+04	3.20E+01	0.00E+00	2.42E+00	2.09E+00	0.00E+00	4.58E+01	3.81E-03	-2.96E-03	2.18E+03	2.10E+03	1.54E+00	0.00E+00	3.77E+00	3.70E+00	**-2.28E+04**	**-2.28E+04**	0.000%
2002	38	-5.78E+04	5.78E+04	4.82E+00	0.00E+00	8.01E+00	7.38E+00	0.00E+00	6.18E+01	3.91E+00	-3.10E-01	2.85E+03	2.79E+03	-5.81E+00	0.00E+00	1.54E+00	2.35E+00	**-5.78E+04**	**-5.78E+04**	0.006%
2002	23	-5.20E+04	5.20E+04	-2.77E+00	0.00E+00	2.24E+00	2.12E+00	0.00E+00	0.00E+00	3.37E-02	-1.89E-02	7.19E+02	7.23E+02	-4.60E-01	0.00E+00	9.27E-01	1.40E+00	**-5.20E+04**	**-5.20E+04**	0.000%
2002	35	-2.67E+05	2.67E+05	5.17E+01	0.00E+00	6.74E+00	1.75E+01	0.00E+00	1.04E+03	0.00E+00	-9.80E-04	8.42E+03	7.33E+03	2.16E+01	0.00E+00	2.99E+01	4.03E+01	**-2.67E+05**	**-2.67E+05**	0.000%
2002	39	-9.32E+04	9.31E+04	-1.90E+02	2.00E+01	6.52E+00	1.72E+01	0.00E+00	0.00E+00	1.64E+00	-2.15E-02	6.90E+03	7.05E+03	3.55E+01	0.00E+00	5.74E+00	9.57E+00	**-9.32E+04**	**-9.32E+04**	0.001%
2002	21	-2.24E+04	2.24E+04	1.01E+01	0.00E+00	8.95E-01	4.48E+00	0.00E+00	0.00E+00	7.34E-01	-6.34E-02	1.77E+03	1.76E+03	3.95E+00	0.00E+00	1.12E+00	1.90E+00	**-2.24E+04**	**-2.24E+04**	0.004%
2002	27	-9.11E+04	9.12E+04	1.19E+02	6.80E+00	8.94E+00	4.39E+01	0.00E+00	4.42E+00	6.37E-02	-8.25E-02	1.30E+04	1.29E+04	3.39E+01	0.00E+00	1.83E+01	2.86E+01	**-9.11E+04**	**-9.11E+04**	0.001%
2002	34	-2.37E+04	2.45E+04	8.23E+02	0.00E+00	1.44E+00	4.28E+00	0.00E+00	1.61E+03	0.00E+00	-5.64E-02	3.45E+03	1.02E+03	4.80E+00	0.00E+00	1.40E+01	1.67E+01	**-2.37E+04**	**-2.37E+04**	0.000%
2002	20	-3.82E+04	3.82E+04	-9.10E+00	0.00E+00	1.29E+00	6.90E+00	0.00E+00	0.00E+00	1.23E-01	-7.29E-04	2.53E+03	2.54E+03	5.09E+00	0.00E+00	2.27E+00	3.67E+00	**-3.82E+04**	**-3.82E+04**	0.000%
2002	33	-2.75E+04	2.84E+04	8.48E+02	4.52E+01	1.46E+00	3.96E+00	0.00E+00	1.76E+03	0.00E+00	-6.01E-02	4.23E+03	1.57E+03	8.27E+00	0.00E+00	1.60E+01	2.04E+01	**-2.75E+04**	**-2.75E+04**	0.000%
2002	32	-5.61E+05	5.61E+05	4.78E+01	4.01E+01	1.11E+01	8.77E+01	2.72E+02	1.75E+04	0.00E+00	-7.78E-02	5.16E+04	3.36E+04	1.15E+02	0.00E+00	3.07E+02	1.99E+02	**-5.61E+05**	**-5.61E+05**	0.000%
2002	22	-1.00E+05	9.89E+04	-1.18E+03	4.67E+01	4.16E+00	3.29E+01	0.00E+00	0.00E+00	3.34E-02	1.07E-04	1.15E+04	1.27E+04	2.49E+01	0.00E+00	1.78E+01	1.51E+01	**-1.00E+05**	**-1.00E+05**	0.000%
2002	26	-3.91E+04	3.94E+04	3.08E+02	0.00E+00	3.08E-01	2.66E+00	0.00E+00	0.00E+00	0.00E+00	-1.60E-02	1.08E+03	7.67E+02	3.09E+00	0.00E+00	4.12E+00	1.87E+00	**-3.91E+04**	**-3.91E+04**	0.000%
2002	25	-1.29E+05	1.30E+05	6.69E+02	8.74E+00	1.27E+00	1.07E+01	0.00E+00	8.63E+00	0.00E+00	-2.64E-02	4.56E+03	3.86E+03	1.74E+01	0.00E+00	1.69E+01	7.76E+00	**-1.29E+05**	**-1.29E+05**	0.000%
2003	1	-2.16E+04	2.18E+04	1.98E+02	0.00E+00	2.42E+00	1.14E+00	0.00E+00	1.33E+02	1.24E-02	-1.78E-02	2.15E+03	1.81E+03	1.23E+00	0.00E+00	3.70E+00	3.63E+00	**-2.16E+04**	**-2.16E+04**	0.000%
2003	38	-5.37E+04	5.38E+04	1.35E+02	0.00E+00	8.01E+00	4.37E+00	0.00E+00	1.60E+02	1.62E+00	2.63E-01	4.02E+03	3.73E+03	-1.34E+00	0.00E+00	2.63E+00	3.71E+00	**-5.37E+04**	**-5.37E+04**	0.009%
2003	23	-4.67E+04	4.67E+04	-7.99E+00	0.00E+00	2.24E+00	1.34E+00	0.00E+00	0.00E+00	3.13E-02	-1.86E-03	7.88E+02	7.96E+02	3.77E-01	0.00E+00	1.40E+00	1.97E+00	**-4.67E+04**	**-4.67E+04**	0.001%
2003	35	-2.31E+05	2.32E+05	1.34E+02	0.00E+00	6.74E+00	1.03E+01	0.00E+00	6.18E+02	0.00E+00	6.83E-01	8.93E+03	8.16E+03	1.84E+01	0.00E+00	4.10E+01	3.94E+01	**-2.31E+05**	**-2.31E+05**	0.000%
2003	39	-8.30E+04	8.30E+04	1.08E+01	3.63E+01	6.52E+00	1.05E+01	0.00E+00	0.00E+00	8.14E-01	-2.60E-02	7.52E+03	7.44E+03	3.55E+01	0.00E+00	9.55E+00	1.05E+01	**-8.30E+04**	**-8.30E+04**	0.001%
2003	21	-1.78E+04	1.78E+04	2.14E+01	0.00E+00	8.95E-01	2.62E+00	0.00E+00	0.00E+00	9.10E-02	-6.62E-03	1.41E+03	1.39E+03	4.46E+00	0.00E+00	1.89E+00	2.12E+00	**-1.78E+04**	**-1.78E+04**	0.004%
2003	27	-7.47E+04	7.49E+04	1.50E+02	1.21E+01	8.94E+00	2.62E+01	0.00E+00	1.01E+01	0.00E+00	3.07E-01	1.37E+04	1.35E+04	4.82E+01	0.00E+00	2.90E+01	2.00E+01	**-7.47E+04**	**-7.47E+04**	0.002%
2003	34	-1.80E+04	1.91E+04	1.06E+03	0.00E+00	1.44E+00	2.53E+00	0.00E+00	9.74E+02	0.00E+00	4.27E-01	2.66E+03	6.22E+02	9.37E+00	0.00E+00	1.72E+01	1.70E+01	**-1.80E+04**	**-1.80E+04**	0.003%
2003	20	-2.96E+04	2.96E+04	3.96E+01	0.00E+00	1.29E+00	4.02E+00	0.00E+00	0.00E+00	6.40E-03	-1.31E-02	1.99E+03	1.94E+03	6.65E+00	0.00E+00	3.66E+00	3.19E+00	**-2.96E+04**	**-2.96E+04**	0.000%
2003	33	-2.16E+04	2.26E+04	9.82E+02	8.47E+01	1.46E+00	2.24E+00	0.00E+00	1.04E+03	0.00E+00	3.76E+00	3.83E+03	1.71E+03	1.00E+01	0.00E+00	2.43E+01	2.38E+01	**-2.16E+04**	**-2.16E+04**	0.018%

Table 4. Mass Balance for Total 4,4'-DDX

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2003	32	-3.82E+05	3.85E+05	2.60E+03	7.41E+01	1.11E+01	4.00E+01	3.22E+02	1.09E+04	0.00E+00	3.92E+01	4.58E+04	3.18E+04	1.20E+02	0.00E+00	2.39E+02	2.50E+02	**-3.82E+05**	**-3.82E+05**	0.010%
2003	22	-6.94E+04	6.84E+04	-9.74E+02	8.63E+01	4.16E+00	1.61E+01	0.00E+00	0.00E+00	6.12E-03	-3.84E-02	8.54E+03	9.40E+03	3.14E+01	0.00E+00	1.51E+01	1.33E+01	**-6.94E+04**	**-6.94E+04**	0.000%
2003	26	-2.85E+04	2.87E+04	2.11E+02	0.00E+00	3.08E-01	1.25E+00	0.00E+00	0.00E+00	0.00E+00	-1.25E-02	7.70E+02	5.56E+02	3.35E+00	0.00E+00	1.86E+00	1.59E+00	**-2.85E+04**	**-2.85E+04**	0.000%
2003	25	-8.04E+04	8.09E+04	5.19E+02	2.30E+01	1.27E+00	4.82E+00	0.00E+00	7.07E+00	0.00E+00	-3.22E-02	3.33E+03	2.77E+03	1.81E+01	0.00E+00	7.75E+00	8.30E+00	**-8.04E+04**	**-8.04E+04**	0.000%
2004	1	-1.89E+04	1.90E+04	1.50E+02	0.00E+00	2.43E+00	9.75E-01	0.00E+00	2.28E+02	2.14E-02	-2.09E-02	2.00E+03	1.62E+03	1.11E+00	0.00E+00	3.63E+00	3.06E+00	**-1.89E+04**	**-1.89E+04**	0.000%
2004	38	-4.58E+04	4.59E+04	1.53E+01	0.00E+00	8.03E+00	3.73E+00	0.00E+00	1.59E+02	2.38E+00	-9.87E-04	3.64E+03	3.47E+03	6.52E-01	0.00E+00	3.71E+00	3.90E+00	**-4.58E+04**	**-4.58E+04**	0.009%
2004	23	-4.00E+04	4.00E+04	1.92E+01	0.00E+00	2.25E+00	1.14E+00	0.00E+00	0.00E+00	1.03E-01	-9.25E-04	8.00E+02	7.77E+02	3.28E+00	0.00E+00	1.97E+00	2.55E+00	**-4.00E+04**	**-4.00E+04**	0.001%
2004	35	-1.95E+05	1.96E+05	2.70E+02	0.00E+00	6.76E+00	8.63E+00	0.00E+00	5.30E+02	0.00E+00	-1.50E-02	8.38E+03	7.57E+03	2.34E+01	0.00E+00	3.94E+01	4.94E+01	**-1.95E+05**	**-1.95E+05**	0.000%
2004	39	-7.11E+04	7.08E+04	-2.40E+02	3.61E+01	6.54E+00	8.86E+00	0.00E+00	0.00E+00	1.98E-01	3.54E-03	6.86E+03	7.04E+03	3.46E+01	0.00E+00	1.05E+01	1.68E+01	**-7.11E+04**	**-7.11E+04**	0.001%
2004	21	-1.47E+04	1.47E+04	1.96E+01	0.00E+00	8.97E-01	2.20E+00	0.00E+00	0.00E+00	5.93E-02	-9.66E-04	1.28E+03	1.25E+03	5.38E+00	0.00E+00	2.12E+00	2.87E+00	**-1.47E+04**	**-1.47E+04**	0.006%
2004	27	-5.96E+04	5.96E+04	2.28E+01	1.21E+01	8.97E+00	2.19E+01	0.00E+00	8.30E+00	0.00E+00	-9.14E-03	1.20E+04	1.20E+04	4.49E+01	0.00E+00	2.00E+01	3.03E+01	**-5.96E+04**	**-5.96E+04**	0.002%
2004	34	-1.46E+04	1.56E+04	1.01E+03	0.00E+00	1.45E+00	2.13E+00	0.00E+00	8.37E+02	0.00E+00	-6.79E-02	2.38E+03	5.25E+02	6.77E+00	0.00E+00	1.70E+01	1.85E+01	**-1.46E+04**	**-1.46E+04**	0.000%
2004	20	-2.40E+04	2.41E+04	3.15E+01	0.00E+00	1.29E+00	3.35E+00	0.00E+00	0.00E+00	2.98E-03	-2.92E-03	1.71E+03	1.67E+03	6.16E+00	0.00E+00	3.19E+00	3.87E+00	**-2.40E+04**	**-2.40E+04**	0.000%
2004	33	-1.76E+04	1.86E+04	9.53E+02	7.71E+01	1.46E+00	1.89E+00	0.00E+00	8.69E+02	0.00E+00	-7.10E-02	3.55E+03	1.64E+03	7.20E+00	0.00E+00	2.38E+01	2.33E+01	**-1.76E+04**	**-1.76E+04**	0.000%
2004	32	-3.15E+05	3.17E+05	2.71E+03	6.63E+01	1.12E+01	3.44E+01	3.13E+02	8.64E+03	0.00E+00	-2.47E-01	3.87E+04	2.70E+04	9.06E+01	0.00E+00	2.50E+02	3.46E+02	**-3.15E+05**	**-3.15E+05**	0.000%
2004	22	-5.63E+04	5.43E+04	-2.00E+03	7.72E+01	4.17E+00	1.30E+01	0.00E+00	0.00E+00	9.34E-02	1.94E-03	7.01E+03	8.90E+03	3.16E+01	0.00E+00	1.33E+01	1.44E+01	**-5.63E+04**	**-5.63E+04**	0.001%
2004	26	-2.30E+04	2.32E+04	1.78E+02	0.00E+00	3.09E-01	1.03E+00	0.00E+00	0.00E+00	0.00E+00	-7.35E-03	6.15E+02	4.36E+02	2.49E+00	0.00E+00	1.59E+00	2.51E+00	**-2.30E+04**	**-2.30E+04**	0.000%
2004	25	-6.42E+04	6.46E+04	4.01E+02	2.00E+01	1.27E+00	3.90E+00	0.00E+00	5.29E+00	0.00E+00	-1.30E-02	2.72E+03	2.28E+03	1.38E+01	0.00E+00	8.30E+00	9.92E+00	**-6.42E+04**	**-6.42E+04**	0.000%
2005	1	-1.94E+04	1.94E+04	8.80E+01	0.00E+00	2.42E+00	1.20E+00	0.00E+00	2.28E+02	8.73E-04	-4.86E-03	2.05E+03	1.73E+03	9.54E-01	0.00E+00	3.06E+00	3.00E+00	**-1.94E+04**	**-1.94E+04**	0.000%
2005	38	-4.94E+04	4.94E+04	-4.35E+01	0.00E+00	8.01E+00	4.61E+00	0.00E+00	1.43E+02	1.25E+00	-4.80E-03	3.67E+03	3.57E+03	3.52E-02	0.00E+00	3.89E+00	1.42E+00	**-4.94E+04**	**-4.94E+04**	0.007%
2005	23	-4.31E+04	4.31E+04	1.11E+01	0.00E+00	2.24E+00	1.37E+00	0.00E+00	0.00E+00	3.01E-02	-8.75E-04	8.26E+02	8.09E+02	4.00E+00	0.00E+00	2.55E+00	1.10E+00	**-4.31E+04**	**-4.31E+04**	0.001%
2005	35	-2.15E+05	2.15E+05	2.56E+02	0.00E+00	6.74E+00	1.08E+01	0.00E+00	7.38E+02	0.00E+00	-1.71E-02	8.65E+03	7.62E+03	3.02E+01	0.00E+00	4.94E+01	3.73E+01	**-2.15E+05**	**-2.15E+05**	0.000%
2005	39	-7.62E+04	7.61E+04	-9.90E+01	2.31E+01	6.52E+00	1.09E+01	0.00E+00	0.00E+00	1.43E-01	-6.04E-04	7.46E+03	7.49E+03	4.57E+01	0.00E+00	1.68E+01	6.16E+00	**-7.62E+04**	**-7.62E+04**	0.000%
2005	21	-1.69E+04	1.69E+04	6.08E+00	0.00E+00	8.95E-01	2.77E+00	0.00E+00	0.00E+00	1.07E-01	-1.46E-02	1.42E+03	1.41E+03	5.60E+00	0.00E+00	2.85E+00	1.13E+00	**-1.69E+04**	**-1.69E+04**	0.004%
2005	27	-6.90E+04	6.91E+04	1.45E+02	7.97E+00	8.94E+00	2.81E+01	0.00E+00	6.86E+00	1.32E-02	-9.78E-03	1.27E+04	1.24E+04	5.64E+01	0.00E+00	3.03E+01	1.80E+01	**-6.90E+04**	**-6.90E+04**	0.001%
2005	34	-1.72E+04	1.81E+04	9.04E+02	0.00E+00	1.44E+00	2.71E+00	0.00E+00	1.08E+03	0.00E+00	-5.31E-02	2.64E+03	6.55E+02	4.62E+00	0.00E+00	1.85E+01	1.68E+01	**-1.72E+04**	**-1.72E+04**	0.000%
2005	20	-2.81E+04	2.81E+04	3.46E+01	0.00E+00	1.29E+00	4.31E+00	0.00E+00	0.00E+00	0.00E+00	-2.40E-03	1.90E+03	1.86E+03	6.91E+00	0.00E+00	3.87E+00	2.28E+00	**-2.81E+04**	**-2.81E+04**	0.000%
2005	33	-2.04E+04	2.12E+04	7.87E+02	3.98E+01	1.46E+00	2.41E+00	0.00E+00	1.17E+03	0.00E+00	-4.98E-02	3.67E+03	1.66E+03	6.63E+00	0.00E+00	2.33E+01	2.22E+01	**-2.04E+04**	**-2.04E+04**	0.000%
2005	32	-3.69E+05	3.69E+05	9.38E+02	3.86E+01	1.11E+01	4.81E+01	2.69E+02	1.15E+04	0.00E+00	-9.98E-02	3.80E+04	2.51E+04	8.67E+01	0.00E+00	3.46E+02	2.26E+02	**-3.69E+05**	**-3.69E+05**	0.000%
2005	22	-6.43E+04	6.34E+04	-8.38E+02	4.49E+01	4.16E+00	1.81E+01	0.00E+00	0.00E+00	4.82E-04	-1.91E-03	7.17E+03	7.94E+03	2.62E+01	0.00E+00	1.44E+01	9.36E+00	**-6.43E+04**	**-6.43E+04**	0.000%
2005	26	-2.57E+04	2.60E+04	2.03E+02	0.00E+00	3.08E-01	1.46E+00	0.00E+00	0.00E+00	0.00E+00	-5.27E-03	6.13E+02	4.08E+02	2.72E+00	0.00E+00	2.51E+00	1.63E+00	**-2.57E+04**	**-2.57E+04**	0.000%
2005	25	-7.57E+04	7.61E+04	3.78E+02	9.27E+00	1.27E+00	5.68E+00	0.00E+00	6.24E+00	0.00E+00	-7.64E-03	2.75E+03	2.34E+03	1.55E+01	0.00E+00	9.92E+00	6.80E+00	**-7.57E+04**	**-7.57E+04**	0.000%
2006	1	-1.78E+04	1.80E+04	1.29E+02	0.00E+00	2.42E+00	9.17E-01	0.00E+00	2.35E+02	4.62E-03	-9.37E-03	1.95E+03	1.58E+03	9.41E-01	0.00E+00	3.00E+00	1.45E+00	**-1.78E+04**	**-1.78E+04**	0.000%
2006	38	-4.44E+04	4.45E+04	9.68E+00	0.00E+00	8.01E+00	3.58E+00	0.00E+00	1.63E+02	1.21E+00	-2.05E-01	3.51E+03	3.34E+03	1.75E-01	0.00E+00	1.23E+00	1.20E+00	**-4.45E+04**	**-4.44E+04**	0.010%
2006	23	-3.92E+04	3.92E+04	4.84E+00	0.00E+00	2.24E+00	1.11E+00	0.00E+00	0.00E+00	4.40E-02	-1.15E-02	7.81E+02	7.72E+02	2.46E+00	0.00E+00	1.09E+00	7.17E-01	**-3.92E+04**	**-3.92E+04**	0.001%
2006	35	-1.91E+05	1.91E+05	2.14E+02	0.00E+00	6.74E+00	8.43E+00	0.00E+00	5.69E+02	0.00E+00	-1.84E-02	8.09E+03	7.26E+03	2.61E+01	0.00E+00	3.73E+01	1.54E+01	**-1.91E+05**	**-1.91E+05**	0.000%

Table 4. Mass Balance for Total 4,4'-DDX

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2006	39	-6.90E+04	6.89E+04	-6.72E+01	4.51E+01	6.52E+00	8.61E+00	0.00E+00	0.00E+00	4.97E-02	-1.35E-01	6.65E+03	6.64E+03	3.65E+01	0.00E+00	6.03E+00	4.22E+00	**-6.90E+04**	**-6.90E+04**	0.001%
2006	21	-1.45E+04	1.45E+04	9.14E+00	0.00E+00	8.95E-01	2.15E+00	0.00E+00	0.00E+00	6.03E-02	-9.54E-02	1.23E+03	1.22E+03	5.42E+00	0.00E+00	1.03E+00	6.73E-01	**-1.45E+04**	**-1.45E+04**	0.006%
2006	27	-5.92E+04	5.93E+04	9.57E+01	1.45E+01	8.94E+00	2.17E+01	0.00E+00	7.83E+00	0.00E+00	-1.94E-01	1.18E+04	1.16E+04	5.65E+01	0.00E+00	1.78E+01	1.02E+01	**-5.92E+04**	**-5.92E+04**	0.001%
2006	34	-1.42E+04	1.51E+04	8.78E+02	0.00E+00	1.44E+00	2.12E+00	0.00E+00	8.43E+02	0.00E+00	-6.09E-02	2.28E+03	5.46E+02	5.70E+00	0.00E+00	1.68E+01	6.08E+00	**-1.42E+04**	**-1.42E+04**	0.000%
2006	20	-2.35E+04	2.35E+04	3.56E+01	0.00E+00	1.29E+00	3.32E+00	0.00E+00	0.00E+00	0.00E+00	-2.70E-02	1.64E+03	1.59E+03	6.90E+00	0.00E+00	2.25E+00	1.14E+00	**-2.35E+04**	**-2.35E+04**	0.000%
2006	33	-1.72E+04	1.79E+04	7.64E+02	8.21E+01	1.46E+00	1.88E+00	0.00E+00	8.98E+02	0.00E+00	-6.53E-02	3.36E+03	1.60E+03	6.93E+00	0.00E+00	2.22E+01	8.02E+00	**-1.72E+04**	**-1.72E+04**	0.000%
2006	32	-2.96E+05	2.97E+05	1.22E+03	7.00E+01	1.11E+01	3.41E+01	3.24E+02	8.88E+03	0.00E+00	-1.70E-01	3.46E+04	2.39E+04	9.05E+01	0.00E+00	2.26E+02	7.94E+01	**-2.96E+05**	**-2.96E+05**	0.000%
2006	22	-5.22E+04	5.13E+04	-8.08E+02	8.17E+01	4.16E+00	1.30E+01	0.00E+00	0.00E+00	9.03E-04	-5.43E-02	6.39E+03	7.09E+03	3.06E+01	0.00E+00	9.31E+00	5.00E+00	**-5.22E+04**	**-5.22E+04**	0.001%
2006	26	-2.16E+04	2.17E+04	1.26E+02	0.00E+00	3.08E-01	1.02E+00	0.00E+00	0.00E+00	0.00E+00	-5.42E-03	5.46E+02	4.17E+02	2.15E+00	0.00E+00	1.63E+00	5.51E-01	**-2.16E+04**	**-2.16E+04**	0.000%
2006	25	-5.88E+04	5.91E+04	3.05E+02	2.22E+01	1.27E+00	3.87E+00	0.00E+00	5.07E+00	0.00E+00	-1.15E-02	2.36E+03	2.01E+03	1.28E+01	0.00E+00	6.80E+00	2.33E+00	**-5.88E+04**	**-5.88E+04**	0.000%
2007	1	-2.05E+04	2.06E+04	1.25E+02	0.00E+00	2.42E+00	8.97E-01	0.00E+00	3.08E+02	5.72E-04	-4.48E-02	1.89E+03	1.45E+03	3.21E-01	0.00E+00	1.45E+00	2.24E+00	**-2.05E+04**	**-2.05E+04**	0.001%
2007	38	-4.67E+04	4.68E+04	8.32E+01	0.00E+00	8.01E+00	3.41E+00	0.00E+00	1.80E+02	1.71E+00	-1.74E-02	3.39E+03	3.13E+03	1.79E-02	0.00E+00	1.20E+00	2.19E+00	**-4.67E+04**	**-4.67E+04**	0.023%
2007	23	-4.08E+04	4.08E+04	2.57E+00	0.00E+00	2.24E+00	1.03E+00	0.00E+00	0.00E+00	2.35E-02	-8.23E-04	7.13E+02	7.08E+02	2.02E+00	0.00E+00	7.17E-01	1.06E+00	**-4.08E+04**	**-4.08E+04**	0.001%
2007	35	-1.98E+05	1.99E+05	2.48E+02	0.00E+00	6.74E+00	7.78E+00	0.00E+00	5.06E+02	0.00E+00	-2.48E-02	7.57E+03	6.81E+03	2.18E+01	0.00E+00	1.54E+01	2.42E+01	**-1.98E+05**	**-1.98E+05**	0.000%
2007	39	-7.14E+04	7.14E+04	3.25E+01	4.32E+01	6.52E+00	8.03E+00	0.00E+00	0.00E+00	1.70E-02	-1.61E-02	6.40E+03	6.30E+03	3.59E+01	0.00E+00	4.22E+00	6.71E+00	**-7.14E+04**	**-7.14E+04**	0.001%
2007	21	-1.54E+04	1.54E+04	4.61E+01	0.00E+00	8.95E-01	1.97E+00	0.00E+00	0.00E+00	1.38E-01	-5.58E-03	1.25E+03	1.20E+03	6.25E+00	0.00E+00	6.73E-01	1.49E+00	**-1.54E+04**	**-1.54E+04**	0.006%
2007	27	-5.84E+04	5.87E+04	2.36E+02	1.43E+01	8.94E+00	1.97E+01	0.00E+00	6.30E+00	0.00E+00	-2.53E-02	1.13E+04	1.10E+04	5.85E+01	0.00E+00	1.02E+01	1.35E+01	**-5.84E+04**	**-5.84E+04**	0.001%
2007	34	-1.45E+04	1.55E+04	9.83E+02	0.00E+00	1.44E+00	1.89E+00	0.00E+00	7.61E+02	0.00E+00	-8.27E-02	2.27E+03	5.25E+02	4.67E+00	0.00E+00	6.08E+00	1.05E+01	**-1.45E+04**	**-1.45E+04**	0.000%
2007	20	-2.43E+04	2.44E+04	7.46E+01	0.00E+00	1.29E+00	2.99E+00	0.00E+00	0.00E+00	0.00E+00	-8.05E-03	1.61E+03	1.53E+03	7.14E+00	0.00E+00	1.14E+00	1.83E+00	**-2.43E+04**	**-2.43E+04**	0.001%
2007	33	-1.72E+04	1.80E+04	8.40E+02	1.00E+02	1.46E+00	1.69E+00	0.00E+00	7.99E+02	0.00E+00	-7.65E-02	3.21E+03	1.47E+03	5.73E+00	0.00E+00	8.02E+00	1.31E+01	**-1.72E+04**	**-1.72E+04**	0.000%
2007	32	-2.84E+05	2.85E+05	1.64E+03	7.86E+01	1.11E+01	3.12E+01	3.57E+02	7.20E+03	0.00E+00	-2.26E-01	3.03E+04	2.12E+04	7.35E+01	0.00E+00	7.94E+01	2.60E+02	**-2.84E+05**	**-2.84E+05**	0.000%
2007	22	-5.03E+04	4.95E+04	-7.54E+02	9.19E+01	4.16E+00	1.17E+01	0.00E+00	0.00E+00	1.14E-02	-8.03E-03	5.89E+03	6.55E+03	2.92E+01	0.00E+00	5.00E+00	1.82E+01	**-5.03E+04**	**-5.03E+04**	0.001%
2007	26	-2.02E+04	2.04E+04	1.73E+02	0.00E+00	3.08E-01	9.29E-01	0.00E+00	0.00E+00	0.00E+00	-7.12E-03	4.96E+02	3.24E+02	1.88E+00	0.00E+00	5.51E-01	2.60E+00	**-2.02E+04**	**-2.02E+04**	0.000%
2007	25	-5.58E+04	5.61E+04	3.00E+02	3.18E+01	1.27E+00	3.54E+00	0.00E+00	4.00E+00	0.00E+00	-1.33E-02	2.15E+03	1.81E+03	9.94E+00	0.00E+00	2.33E+00	1.05E+01	**-5.58E+04**	**-5.58E+04**	0.000%
2008	1	-2.06E+04	2.07E+04	9.28E+01	0.00E+00	2.43E+00	1.23E+00	0.00E+00	4.92E+02	2.61E-02	-9.79E-03	2.35E+03	1.76E+03	-7.96E-02	0.00E+00	2.24E+00	3.39E+00	**-2.06E+04**	**-2.06E+04**	0.000%
2008	38	-5.24E+04	5.24E+04	-4.22E+01	0.00E+00	8.03E+00	4.78E+00	0.00E+00	2.68E+02	1.66E+00	7.57E-03	3.99E+03	3.76E+03	-2.20E+00	0.00E+00	2.19E+00	3.34E+00	**-5.24E+04**	**-5.24E+04**	0.007%
2008	23	-4.63E+04	4.63E+04	1.10E+01	0.00E+00	2.25E+00	1.44E+00	0.00E+00	0.00E+00	1.64E-01	-6.12E-04	8.92E+02	8.78E+02	2.61E+00	0.00E+00	1.06E+00	1.65E+00	**-4.63E+04**	**-4.63E+04**	0.001%
2008	35	-2.29E+05	2.29E+05	2.41E+02	0.00E+00	6.76E+00	1.13E+01	0.00E+00	7.42E+02	0.00E+00	-9.07E-03	9.76E+03	8.77E+03	2.60E+01	0.00E+00	2.42E+01	3.84E+01	**-2.29E+05**	**-2.29E+05**	0.000%
2008	39	-8.18E+04	8.18E+04	-4.93E+01	3.35E+01	6.54E+00	1.13E+01	0.00E+00	0.00E+00	1.08E-02	-9.87E-04	8.19E+03	8.17E+03	4.95E+01	0.00E+00	6.71E+00	1.08E+01	**-8.18E+04**	**-8.18E+04**	0.000%
2008	21	-1.78E+04	1.78E+04	2.59E+01	0.00E+00	8.97E-01	2.87E+00	0.00E+00	0.00E+00	1.91E-01	-6.20E-04	1.68E+03	1.65E+03	9.85E+00	0.00E+00	1.49E+00	1.65E+00	**-1.78E+04**	**-1.78E+04**	0.003%
2008	27	-7.27E+04	7.28E+04	1.41E+02	1.11E+01	8.97E+00	2.90E+01	0.00E+00	9.09E+00	0.00E+00	-6.98E-03	1.44E+04	1.41E+04	8.83E+01	0.00E+00	1.34E+01	2.33E+01	**-7.27E+04**	**-7.27E+04**	0.001%
2008	34	-1.76E+04	1.86E+04	1.08E+03	0.00E+00	1.45E+00	2.86E+00	0.00E+00	1.08E+03	0.00E+00	-6.13E-02	2.89E+03	7.36E+02	5.34E+00	0.00E+00	1.05E+01	1.57E+01	**-1.76E+04**	**-1.76E+04**	0.000%
2008	20	-2.91E+04	2.91E+04	5.02E+01	0.00E+00	1.29E+00	4.46E+00	0.00E+00	0.00E+00	0.00E+00	-2.22E-03	2.14E+03	2.08E+03	1.12E+01	0.00E+00	1.83E+00	3.15E+00	**-2.91E+04**	**-2.91E+04**	0.000%
2008	33	-2.10E+04	2.19E+04	9.80E+02	7.17E+01	1.46E+00	2.51E+00	0.00E+00	1.16E+03	0.00E+00	-6.30E-02	4.09E+03	1.88E+03	7.52E+00	0.00E+00	1.31E+01	2.00E+01	**-2.10E+04**	**-2.10E+04**	0.000%
2008	32	-4.40E+05	4.42E+05	2.30E+03	6.24E+01	1.12E+01	5.84E+01	3.07E+02	1.33E+04	0.00E+00	-1.68E-01	4.99E+04	3.38E+04	1.11E+02	0.00E+00	2.59E+02	2.21E+02	**-4.40E+05**	**-4.40E+05**	0.000%
2008	22	-7.25E+04	7.18E+04	-6.50E+02	7.28E+01	4.17E+00	1.98E+01	0.00E+00	0.00E+00	1.54E-02	-3.93E-03	8.92E+03	9.47E+03	3.78E+01	0.00E+00	1.81E+01	9.42E+00	**-7.25E+04**	**-7.25E+04**	0.000%

Table 4. Mass Balance for Total 4,4'-DDX

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2008	26	-2.98E+04	3.00E+04	2.46E+02	0.00E+00	3.09E-01	1.73E+00	0.00E+00	0.00E+00	0.00E+00	-8.19E-03	8.06E+02	5.58E+02	3.16E+00	0.00E+00	2.60E+00	2.20E+00	**-2.98E+04**	**-2.98E+04**	0.000%
2008	25	-9.20E+04	9.25E+04	4.95E+02	1.96E+01	1.27E+00	6.75E+00	0.00E+00	6.98E+00	0.00E+00	-1.34E-02	3.59E+03	3.05E+03	1.95E+01	0.00E+00	1.05E+01	7.06E+00	**-9.20E+04**	**-9.20E+04**	0.000%
2009	1	-1.84E+04	1.84E+04	4.17E+01	0.00E+00	2.42E+00	1.08E+00	0.00E+00	4.37E+02	1.90E-02	-4.76E-03	2.08E+03	1.60E+03	3.65E-01	0.00E+00	3.39E+00	1.40E+00	**-1.84E+04**	**-1.84E+04**	0.005%
2009	38	-4.36E+04	4.37E+04	4.91E+01	0.00E+00	8.01E+00	4.09E+00	0.00E+00	1.32E+02	1.35E+00	-5.25E-02	3.53E+03	3.35E+03	-5.86E-01	0.00E+00	3.29E+00	7.41E-01	**-4.36E+04**	**-4.36E+04**	0.009%
2009	23	-3.92E+04	3.92E+04	3.82E+00	0.00E+00	2.24E+00	1.22E+00	0.00E+00	0.00E+00	2.42E-02	6.53E-04	7.66E+02	7.60E+02	2.11E+00	0.00E+00	1.65E+00	5.80E-01	**-3.92E+04**	**-3.92E+04**	0.003%
2009	35	-1.91E+05	1.91E+05	1.67E+02	0.00E+00	6.74E+00	9.32E+00	0.00E+00	5.91E+02	0.00E+00	7.43E-02	8.12E+03	7.34E+03	2.27E+01	0.00E+00	3.85E+01	1.83E+01	**-1.91E+05**	**-1.91E+05**	0.010%
2009	39	-6.93E+04	6.93E+04	-4.72E+01	3.33E+01	6.52E+00	9.51E+00	0.00E+00	0.00E+00	6.02E-02	2.19E-03	7.04E+03	7.01E+03	3.52E+01	0.00E+00	1.08E+01	3.01E+00	**-6.93E+04**	**-6.93E+04**	0.004%
2009	21	-1.44E+04	1.44E+04	7.96E-01	0.00E+00	8.95E-01	2.38E+00	0.00E+00	0.00E+00	2.05E-01	-2.32E-05	1.40E+03	1.39E+03	7.48E+00	0.00E+00	1.65E+00	5.10E-01	**-1.44E+04**	**-1.44E+04**	0.008%
2009	27	-5.66E+04	5.67E+04	9.31E+01	1.09E+01	8.94E+00	2.35E+01	0.00E+00	7.67E+00	0.00E+00	-7.80E-03	1.20E+04	1.19E+04	6.69E+01	0.00E+00	2.33E+01	7.55E+00	**-5.66E+04**	**-5.66E+04**	0.006%
2009	34	-1.43E+04	1.51E+04	8.25E+02	0.00E+00	1.44E+00	2.28E+00	0.00E+00	8.78E+02	0.00E+00	4.02E-01	2.31E+03	5.95E+02	4.89E+00	0.00E+00	1.62E+01	7.15E+00	**-1.43E+04**	**-1.43E+04**	0.023%
2009	20	-2.42E+04	2.42E+04	5.54E+00	0.00E+00	1.29E+00	3.62E+00	0.00E+00	0.00E+00	0.00E+00	-1.55E-03	1.77E+03	1.76E+03	6.75E+00	0.00E+00	3.15E+00	9.37E-01	**-2.42E+04**	**-2.42E+04**	0.004%
2009	33	-1.72E+04	1.80E+04	8.73E+02	6.74E+01	1.46E+00	1.98E+00	0.00E+00	9.38E+02	0.00E+00	6.93E-01	3.35E+03	1.45E+03	6.46E+00	0.00E+00	2.07E+01	9.75E+00	**-1.72E+04**	**-1.72E+04**	0.014%
2009	32	-2.96E+05	2.97E+05	1.21E+03	6.11E+01	1.11E+01	3.63E+01	2.99E+02	9.23E+03	0.00E+00	-1.40E+00	3.50E+04	2.40E+04	9.23E+01	0.00E+00	2.20E+02	6.36E+01	**-2.96E+05**	**-2.96E+05**	0.007%
2009	22	-5.15E+04	5.04E+04	-1.10E+03	7.11E+01	4.16E+00	1.39E+01	0.00E+00	0.00E+00	0.00E+00	1.39E-03	6.51E+03	7.51E+03	2.70E+01	0.00E+00	9.42E+00	3.10E+00	**-5.15E+04**	**-5.15E+04**	0.002%
2009	26	-2.12E+04	2.13E+04	1.55E+02	0.00E+00	3.08E-01	1.08E+00	0.00E+00	0.00E+00	0.00E+00	-5.57E-03	5.75E+02	4.16E+02	2.31E+00	0.00E+00	2.20E+00	4.57E-01	**-2.12E+04**	**-2.12E+04**	0.000%
2009	25	-6.02E+04	6.06E+04	3.36E+02	1.68E+01	1.27E+00	4.24E+00	0.00E+00	5.79E+00	0.00E+00	-9.09E-03	2.53E+03	2.16E+03	1.26E+01	0.00E+00	7.06E+00	1.80E+00	**-6.02E+04**	**-6.02E+04**	0.001%
2010	1	-1.96E+04	1.97E+04	8.08E+01	0.00E+00	2.42E+00	9.34E-01	0.00E+00	4.70E+02	2.31E-03	-9.29E-03	1.99E+03	1.47E+03	4.36E-02	0.00E+00	1.40E+00	2.04E+00	**-1.96E+04**	**-1.96E+04**	0.137%
2010	38	-4.73E+04	4.73E+04	4.16E+01	0.00E+00	8.01E+00	3.59E+00	0.00E+00	1.81E+02	1.55E+00	-1.28E-01	3.69E+03	3.48E+03	-7.29E-01	0.00E+00	6.33E-01	1.87E+00	**-4.73E+04**	**-4.73E+04**	0.043%
2010	23	-4.16E+04	4.17E+04	7.80E+00	0.00E+00	2.24E+00	1.09E+00	0.00E+00	0.00E+00	1.14E-01	-4.75E-03	8.06E+02	7.96E+02	2.38E+00	0.00E+00	5.76E-01	9.14E-01	**-4.16E+04**	**-4.16E+04**	0.004%
2010	35	-2.02E+05	2.03E+05	4.56E+02	0.00E+00	6.74E+00	8.37E+00	0.00E+00	5.97E+02	0.00E+00	-2.22E-02	8.46E+03	7.52E+03	2.19E+01	0.00E+00	1.83E+01	2.36E+01	**-2.02E+05**	**-2.02E+05**	0.064%
2010	39	-7.33E+04	7.32E+04	-1.08E+02	2.66E+01	6.52E+00	8.51E+00	0.00E+00	0.00E+00	5.00E-01	-5.40E-02	7.54E+03	7.61E+03	3.78E+01	0.00E+00	2.96E+00	5.03E+00	**-7.33E+04**	**-7.33E+04**	0.030%
2010	21	-1.51E+04	1.52E+04	4.94E+01	0.00E+00	8.95E-01	2.12E+00	0.00E+00	0.00E+00	1.19E-01	-4.60E-02	1.45E+03	1.40E+03	7.17E+00	0.00E+00	4.67E-01	1.16E+00	**-1.51E+04**	**-1.51E+04**	0.024%
2010	27	-6.11E+04	6.16E+04	4.47E+02	8.70E+00	8.94E+00	2.16E+01	0.00E+00	6.76E+00	2.05E-03	-1.03E-01	1.33E+04	1.29E+04	6.65E+01	0.00E+00	7.46E+00	1.59E+01	**-6.12E+04**	**-6.11E+04**	0.174%
2010	34	-1.46E+04	1.55E+04	9.71E+02	0.00E+00	1.44E+00	2.09E+00	0.00E+00	8.44E+02	0.00E+00	-5.87E-02	2.41E+03	6.03E+02	4.67E+00	0.00E+00	7.14E+00	8.79E+00	**-1.46E+04**	**-1.46E+04**	0.039%
2010	20	-2.53E+04	2.53E+04	5.96E+01	0.00E+00	1.29E+00	3.29E+00	0.00E+00	0.00E+00	0.00E+00	-2.20E-02	1.85E+03	1.79E+03	5.92E+00	0.00E+00	9.18E-01	1.99E+00	**-2.53E+04**	**-2.53E+04**	0.027%
2010	33	-1.77E+04	1.87E+04	9.92E+02	5.84E+01	1.46E+00	1.82E+00	0.00E+00	9.13E+02	0.00E+00	-6.73E-02	3.42E+03	1.46E+03	6.00E+00	0.00E+00	9.74E+00	1.19E+01	**-1.77E+04**	**-1.77E+04**	0.059%
2010	32	-3.04E+05	3.06E+05	2.04E+03	5.19E+01	1.11E+01	3.45E+01	2.98E+02	9.26E+03	0.00E+00	-1.64E-01	3.54E+04	2.40E+04	9.11E+01	0.00E+00	6.36E+01	1.72E+02	**-3.05E+05**	**-3.04E+05**	0.065%
2010	22	-5.38E+04	5.32E+04	-6.00E+02	6.05E+01	4.16E+00	1.33E+01	0.00E+00	0.00E+00	4.54E-03	-3.73E-02	6.85E+03	7.39E+03	2.86E+01	0.00E+00	3.07E+00	1.18E+01	**-5.38E+04**	**-5.38E+04**	0.031%
2010	26	-2.22E+04	2.24E+04	1.58E+02	0.00E+00	3.08E-01	1.05E+00	0.00E+00	0.00E+00	0.00E+00	-5.57E-03	5.99E+02	4.44E+02	2.09E+00	0.00E+00	4.56E-01	1.40E+00	**-2.23E+04**	**-2.22E+04**	0.012%
2010	25	-6.24E+04	6.28E+04	3.36E+02	1.87E+01	1.27E+00	4.13E+00	0.00E+00	5.67E+00	0.00E+00	-1.02E-02	2.57E+03	2.21E+03	1.13E+01	0.00E+00	1.80E+00	6.85E+00	**-6.24E+04**	**-6.24E+04**	0.005%
2011	1	-4.34E+04	4.35E+04	1.03E+02	0.00E+00	2.42E+00	8.29E-01	0.00E+00	5.29E+02	2.83E-03	9.31E-03	2.28E+03	1.65E+03	3.25E-02	0.00E+00	2.04E+00	2.85E+00	**-4.34E+04**	**-4.34E+04**	0.002%
2011	38	-8.26E+04	8.37E+04	1.03E+03	0.00E+00	8.01E+00	3.02E+00	0.00E+00	4.36E+02	2.43E+00	-4.70E-01	5.07E+03	3.61E+03	-2.44E-01	0.00E+00	1.87E+00	2.98E+00	**-8.27E+04**	**-8.26E+04**	0.012%
2011	23	-7.19E+04	7.19E+04	8.35E+01	0.00E+00	2.24E+00	9.00E-01	0.00E+00	0.00E+00	1.33E-01	-2.48E-02	1.03E+03	9.46E+02	2.76E+00	0.00E+00	9.14E-01	1.35E+00	**-7.19E+04**	**-7.19E+04**	0.002%
2011	35	-3.28E+05	3.30E+05	1.58E+03	0.00E+00	6.74E+00	6.77E+00	0.00E+00	4.80E+02	0.00E+00	-9.23E-01	1.08E+04	8.73E+03	1.73E+01	0.00E+00	2.36E+01	2.35E+01	**-3.28E+05**	**-3.28E+05**	0.005%
2011	39	-1.21E+05	1.22E+05	1.19E+03	2.49E+01	6.52E+00	7.12E+00	0.00E+00	0.00E+00	1.49E-01	-5.06E-01	1.05E+04	9.24E+03	3.72E+01	0.00E+00	5.02E+00	6.24E+00	**-1.21E+05**	**-1.21E+05**	0.003%
2011	21	-2.33E+04	2.37E+04	3.81E+02	0.00E+00	8.95E-01	1.69E+00	0.00E+00	0.00E+00	3.35E-01	-9.40E-02	2.12E+03	1.74E+03	6.78E+00	0.00E+00	1.16E+00	1.67E+00	**-2.33E+04**	**-2.33E+04**	0.021%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 4. Mass Balance for Total 4,4'-DDX

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2011	27	-7.16E+04	7.36E+04	2.01E+03	1.50E+01	8.94E+00	1.71E+01	0.00E+00	5.21E+00	3.40E-03	-5.98E-01	1.78E+04	1.57E+04	6.42E+01	0.00E+00	1.59E+01	1.29E+01	**-7.16E+04**	**-7.16E+04**	0.005%
2011	34	-2.05E+04	2.29E+04	2.41E+03	0.00E+00	1.44E+00	1.64E+00	0.00E+00	7.11E+02	0.00E+00	-6.37E-01	3.88E+03	7.64E+02	5.95E+00	0.00E+00	8.78E+00	1.10E+01	**-2.05E+04**	**-2.05E+04**	0.016%
2011	20	-3.56E+04	3.60E+04	4.87E+02	0.00E+00	1.29E+00	2.52E+00	0.00E+00	0.00E+00	1.95E-04	-1.52E-01	2.58E+03	2.09E+03	6.40E+00	0.00E+00	1.99E+00	1.83E+00	**-3.56E+04**	**-3.56E+04**	0.008%
2011	33	-2.26E+04	2.47E+04	2.17E+03	6.87E+01	1.46E+00	1.44E+00	0.00E+00	7.17E+02	0.00E+00	-5.23E-01	4.50E+03	1.55E+03	5.98E+00	0.00E+00	1.19E+01	1.34E+01	**-2.26E+04**	**-2.26E+04**	0.007%
2011	32	-2.72E+05	2.77E+05	4.98E+03	4.82E+01	1.11E+01	2.32E+01	2.89E+02	5.39E+03	1.07E-04	-1.37E+00	2.98E+04	2.02E+04	5.89E+01	0.00E+00	1.72E+02	1.28E+03	**-2.72E+05**	**-2.72E+05**	0.021%
2011	22	-4.97E+04	4.94E+04	-2.17E+02	5.61E+01	4.16E+00	8.76E+00	0.00E+00	0.00E+00	2.58E-03	-1.19E-01	6.63E+03	6.78E+03	2.73E+01	0.00E+00	1.18E+01	1.87E+01	**-4.97E+04**	**-4.97E+04**	0.010%
2011	26	-2.01E+04	2.03E+04	1.37E+02	0.00E+00	3.08E-01	6.55E-01	0.00E+00	0.00E+00	0.00E+00	-1.66E-02	5.27E+02	3.96E+02	1.37E+00	0.00E+00	1.40E+00	8.62E+00	**-2.01E+04**	**-2.01E+04**	0.001%
2011	25	-4.87E+04	4.91E+04	4.19E+02	3.57E+01	1.27E+00	2.57E+00	0.00E+00	3.27E+00	0.00E+00	-5.15E-02	2.18E+03	1.72E+03	7.54E+00	0.00E+00	6.85E+00	1.39E+01	**-4.87E+04**	**-4.87E+04**	0.003%
2012	1	-2.06E+04	2.07E+04	9.62E+01	0.00E+00	2.43E+00	9.40E-01	0.00E+00	7.02E+02	6.47E-03	-3.19E-02	2.39E+03	1.59E+03	6.43E-01	0.00E+00	2.84E+00	2.53E+00	**-2.06E+04**	**-2.06E+04**	0.000%
2012	38	-4.80E+04	4.75E+04	-5.45E+02	0.00E+00	8.03E+00	3.43E+00	0.00E+00	5.01E+02	2.20E-01	2.34E-02	3.98E+03	4.03E+03	-1.56E+00	0.00E+00	2.98E+00	1.50E+00	**-4.80E+04**	**-4.80E+04**	0.009%
2012	23	-4.38E+04	4.38E+04	1.80E+01	0.00E+00	2.25E+00	1.01E+00	0.00E+00	0.00E+00	0.00E+00	-1.38E-03	8.72E+02	8.50E+02	1.54E+00	0.00E+00	1.35E+00	6.01E-01	**-4.38E+04**	**-4.38E+04**	0.001%
2012	35	-2.07E+05	2.07E+05	1.96E+02	0.00E+00	6.76E+00	7.56E+00	0.00E+00	5.26E+02	0.00E+00	-1.51E-02	8.99E+03	8.25E+03	1.30E+01	0.00E+00	2.35E+01	1.92E+01	**-2.07E+05**	**-2.07E+05**	0.000%
2012	39	-7.75E+04	7.68E+04	-7.08E+02	8.84E+00	6.54E+00	7.93E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-02	8.38E+03	9.05E+03	3.27E+01	0.00E+00	6.24E+00	4.06E+00	**-7.75E+04**	**-7.75E+04**	0.000%
2012	21	-1.50E+04	1.50E+04	-8.17E+01	0.00E+00	8.97E-01	1.91E+00	0.00E+00	0.00E+00	1.86E-02	6.54E-04	1.61E+03	1.69E+03	4.59E+00	0.00E+00	1.67E+00	8.20E-01	**-1.50E+04**	**-1.50E+04**	0.004%
2012	27	-5.14E+04	5.13E+04	-1.17E+02	5.67E+00	8.97E+00	1.89E+01	0.00E+00	4.17E+00	0.00E+00	-1.25E-03	1.37E+04	1.37E+04	6.44E+01	0.00E+00	1.29E+01	9.12E+00	**-5.14E+04**	**-5.14E+04**	0.000%
2012	34	-1.35E+04	1.46E+04	1.07E+03	0.00E+00	1.45E+00	1.83E+00	0.00E+00	7.89E+02	0.00E+00	-6.62E-02	2.52E+03	6.59E+02	3.75E+00	0.00E+00	1.09E+01	7.38E+00	**-1.35E+04**	**-1.35E+04**	0.000%
2012	20	-2.35E+04	2.35E+04	6.54E+00	0.00E+00	1.29E+00	2.82E+00	0.00E+00	0.00E+00	0.00E+00	-1.89E-03	2.02E+03	2.01E+03	6.89E+00	0.00E+00	1.83E+00	1.21E+00	**-2.35E+04**	**-2.35E+04**	0.000%
2012	33	-1.57E+04	1.69E+04	1.16E+03	2.84E+01	1.46E+00	1.57E+00	0.00E+00	7.55E+02	0.00E+00	-7.76E-02	3.39E+03	1.43E+03	4.65E+00	0.00E+00	1.34E+01	9.16E+00	**-1.57E+04**	**-1.57E+04**	0.000%
2012	32	-2.35E+05	2.35E+05	7.03E+01	1.94E+01	1.12E+01	2.76E+01	2.51E+02	5.57E+03	0.00E+00	-1.59E-01	2.59E+04	1.87E+04	4.83E+01	0.00E+00	1.28E+03	1.01E+02	**-2.35E+05**	**-2.35E+05**	0.000%
2012	22	-4.15E+04	3.94E+04	-2.09E+03	2.26E+01	4.17E+00	9.86E+00	0.00E+00	0.00E+00	0.00E+00	8.06E-03	5.01E+03	7.05E+03	1.85E+01	0.00E+00	1.87E+01	3.73E+00	**-4.15E+04**	**-4.15E+04**	0.001%
2012	26	-1.52E+04	1.54E+04	1.21E+02	0.00E+00	3.09E-01	7.76E-01	0.00E+00	0.00E+00	0.00E+00	-4.30E-03	4.12E+02	2.82E+02	1.21E+00	0.00E+00	8.62E+00	7.11E-01	**-1.52E+04**	**-1.52E+04**	0.000%
2012	25	-4.41E+04	4.43E+04	2.20E+02	1.86E+01	1.27E+00	3.04E+00	0.00E+00	3.40E+00	0.00E+00	-9.99E-03	1.82E+03	1.56E+03	8.51E+00	0.00E+00	1.39E+01	3.19E+00	**-4.41E+04**	**-4.41E+04**	0.000%
2013	1	-1.88E+04	1.88E+04	5.46E+01	0.00E+00	2.42E+00	9.57E-01	0.00E+00	5.98E+02	2.75E-02	-1.37E-02	2.11E+03	1.45E+03	4.19E-01	0.00E+00	2.53E+00	2.00E+00	**-1.88E+04**	**-1.88E+04**	0.000%
2013	38	-4.57E+04	4.54E+04	-2.82E+02	0.00E+00	8.01E+00	3.57E+00	0.00E+00	3.34E+02	1.26E+00	-2.50E-01	3.47E+03	3.42E+03	-1.90E+00	0.00E+00	1.23E+00	1.10E+00	**-4.57E+04**	**-4.57E+04**	0.010%
2013	23	-4.07E+04	4.07E+04	-1.09E+01	0.00E+00	2.24E+00	1.08E+00	0.00E+00	0.00E+00	2.21E-02	-1.45E-02	7.24E+02	7.34E+02	5.50E-01	0.00E+00	5.86E-01	8.21E-01	**-4.07E+04**	**-4.07E+04**	0.001%
2013	35	-2.00E+05	2.00E+05	1.84E+02	0.00E+00	6.74E+00	8.23E+00	0.00E+00	5.24E+02	0.00E+00	-1.73E-02	8.13E+03	7.43E+03	1.40E+01	0.00E+00	1.92E+01	3.07E+01	**-2.00E+05**	**-2.00E+05**	0.000%
2013	39	-7.24E+04	7.23E+04	-7.46E+01	3.26E+01	6.52E+00	8.46E+00	0.00E+00	0.00E+00	8.60E-03	-4.23E-02	7.12E+03	7.14E+03	3.00E+01	0.00E+00	4.02E+00	4.97E+00	**-7.24E+04**	**-7.24E+04**	0.001%
2013	21	-1.55E+04	1.54E+04	-1.08E+02	0.00E+00	8.95E-01	2.07E+00	0.00E+00	0.00E+00	1.16E-01	-5.61E-02	1.46E+03	1.56E+03	3.60E+00	0.00E+00	7.59E-01	9.38E-01	**-1.55E+04**	**-1.55E+04**	0.006%
2013	27	-5.95E+04	5.96E+04	1.16E+02	1.97E+01	8.94E+00	2.11E+01	0.00E+00	5.51E+00	1.97E-04	-4.65E-02	1.33E+04	1.31E+04	6.44E+01	0.00E+00	9.08E+00	1.76E+01	**-5.95E+04**	**-5.95E+04**	0.001%
2013	34	-1.46E+04	1.56E+04	1.00E+03	0.00E+00	1.44E+00	2.03E+00	0.00E+00	7.99E+02	0.00E+00	-8.13E-02	2.47E+03	6.74E+02	4.49E+00	0.00E+00	7.38E+00	1.38E+01	**-1.46E+04**	**-1.46E+04**	0.000%
2013	20	-2.56E+04	2.55E+04	-1.06E+02	0.00E+00	1.29E+00	3.14E+00	0.00E+00	0.00E+00	0.00E+00	3.01E-03	1.90E+03	2.01E+03	4.85E+00	0.00E+00	1.21E+00	1.82E+00	**-2.56E+04**	**-2.56E+04**	0.000%
2013	33	-1.75E+04	1.86E+04	1.12E+03	8.49E+01	1.46E+00	1.76E+00	0.00E+00	8.29E+02	0.00E+00	-1.01E-01	3.54E+03	1.51E+03	6.23E+00	0.00E+00	9.16E+00	1.86E+01	**-1.75E+04**	**-1.75E+04**	0.000%
2013	32	-3.81E+05	3.83E+05	2.54E+03	5.91E+01	1.11E+01	4.60E+01	2.99E+02	8.93E+03	0.00E+00	-2.02E-01	3.88E+04	2.72E+04	5.98E+01	0.00E+00	1.01E+02	3.66E+02	**-3.81E+05**	**-3.81E+05**	0.000%
2013	22	-5.93E+04	5.84E+04	-8.78E+02	6.89E+01	4.16E+00	1.39E+01	0.00E+00	0.00E+00	6.45E-04	3.60E-03	6.78E+03	7.59E+03	2.62E+01	0.00E+00	3.73E+00	1.49E+01	**-5.93E+04**	**-5.93E+04**	0.001%
2013	26	-2.38E+04	2.40E+04	2.27E+02	0.00E+00	3.08E-01	1.24E+00	0.00E+00	0.00E+00	0.00E+00	-7.90E-03	6.26E+02	3.99E+02	1.97E+00	0.00E+00	7.10E-01	1.58E+00	**-2.38E+04**	**-2.38E+04**	0.000%
2013	25	-7.64E+04	7.69E+04	4.37E+02	1.98E+01	1.27E+00	5.03E+00	0.00E+00	4.85E+00	0.00E+00	-1.35E-02	2.81E+03	2.35E+03	1.45E+01	0.00E+00	3.19E+00	1.11E+01	**-7.64E+04**	**-7.64E+04**	0.000%

Table 4. Mass Balance for Total 4,4'-DDX

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2014	1	-2.59E+04	2.60E+04	5.51E+01	0.00E+00	2.42E+00	1.35E+00	0.00E+00	7.55E+02	2.68E-03	-3.40E-03	2.81E+03	2.00E+03	7.53E-02	0.00E+00	2.00E+00	4.04E+00	**-2.59E+04**	**-2.59E+04**	0.000%
2014	38	-6.29E+04	6.30E+04	1.67E+02	0.00E+00	8.00E+00	5.10E+00	0.00E+00	4.26E+02	1.48E+00	-2.04E-01	4.77E+03	4.18E+03	-3.00E+00	0.00E+00	9.02E-01	4.22E+00	**-6.29E+04**	**-6.29E+04**	0.004%
2014	23	-5.55E+04	5.55E+04	-1.16E+00	0.00E+00	2.24E+00	1.49E+00	0.00E+00	0.00E+00	5.96E-02	-1.43E-02	8.11E+02	8.12E+02	1.21E+00	0.00E+00	8.07E-01	2.00E+00	**-5.55E+04**	**-5.55E+04**	0.001%
2014	35	-2.76E+05	2.76E+05	1.88E+02	0.00E+00	6.81E+00	1.19E+01	0.00E+00	7.66E+02	0.00E+00	-6.98E-03	9.62E+03	8.67E+03	1.96E+01	0.00E+00	3.07E+01	4.46E+01	**-2.76E+05**	**-2.76E+05**	0.000%
2014	39	-9.79E+04	9.79E+04	6.95E+01	2.85E+01	6.44E+00	1.20E+01	0.00E+00	0.00E+00	6.05E-02	-1.16E-01	8.88E+03	8.75E+03	4.23E+01	0.00E+00	4.86E+00	1.27E+01	**-9.79E+04**	**-9.79E+04**	0.001%
2014	21	-2.19E+04	2.19E+04	1.82E+01	0.00E+00	8.94E-01	2.98E+00	0.00E+00	0.00E+00	1.88E-01	-6.58E-02	2.05E+03	2.03E+03	5.08E+00	0.00E+00	8.73E-01	2.53E+00	**-2.19E+04**	**-2.19E+04**	0.003%
2014	27	-8.42E+04	8.44E+04	1.84E+02	1.76E+01	8.94E+00	3.03E+01	0.00E+00	5.85E+00	2.93E-03	-1.78E-01	1.56E+04	1.54E+04	8.09E+01	0.00E+00	1.75E+01	2.89E+01	**-8.42E+04**	**-8.42E+04**	0.001%
2014	34	-2.08E+04	2.20E+04	1.20E+03	0.00E+00	1.44E+00	2.95E+00	0.00E+00	1.15E+03	0.00E+00	-7.74E-02	3.35E+03	9.98E+02	4.76E+00	0.00E+00	1.38E+01	1.78E+01	**-2.08E+04**	**-2.08E+04**	0.000%
2014	20	-3.66E+04	3.66E+04	6.98E+01	0.00E+00	1.29E+00	4.60E+00	0.00E+00	0.00E+00	0.00E+00	-2.85E-03	2.69E+03	2.62E+03	6.18E+00	0.00E+00	1.82E+00	3.83E+00	**-3.66E+04**	**-3.66E+04**	0.000%
2014	33	-2.46E+04	2.60E+04	1.36E+03	8.59E+01	1.46E+00	2.58E+00	0.00E+00	1.23E+03	0.00E+00	-9.60E-02	4.53E+03	1.85E+03	6.90E+00	0.00E+00	1.86E+01	2.35E+01	**-2.46E+04**	**-2.46E+04**	0.000%
2014	32	-4.50E+05	4.51E+05	1.48E+03	8.42E+01	1.11E+01	4.81E+01	3.07E+02	1.19E+04	0.00E+00	-1.38E-01	4.65E+04	3.27E+04	9.98E+01	0.00E+00	3.66E+02	3.01E+02	**-4.50E+05**	**-4.50E+05**	0.000%
2014	22	-8.06E+04	8.01E+04	-5.19E+02	6.78E+01	4.15E+00	1.93E+01	0.00E+00	0.00E+00	0.00E+00	6.44E-03	9.88E+03	1.03E+04	3.41E+01	0.00E+00	1.49E+01	2.69E+01	**-8.06E+04**	**-8.06E+04**	0.000%
2014	26	-3.11E+04	3.14E+04	2.32E+02	0.00E+00	3.08E-01	1.51E+00	0.00E+00	0.00E+00	0.00E+00	-9.23E-03	8.56E+02	6.24E+02	2.95E+00	0.00E+00	1.58E+00	2.76E+00	**-3.11E+04**	**-3.11E+04**	0.000%
2014	25	-9.63E+04	9.69E+04	6.00E+02	1.43E+01	1.27E+00	5.98E+00	0.00E+00	6.56E+00	0.00E+00	-1.48E-02	3.72E+03	3.08E+03	1.91E+01	0.00E+00	1.11E+01	1.12E+01	**-9.63E+04**	**-9.63E+04**	0.000%
2015	1	-2.00E+04	2.00E+04	1.57E+01	0.00E+00	2.42E+00	1.14E+00	0.00E+00	5.33E+02	9.88E-03	-5.11E-03	2.16E+03	1.61E+03	-3.87E-02	0.00E+00	4.03E+00	5.25E+00	**-2.00E+04**	**-2.00E+04**	0.000%
2015	38	-4.92E+04	4.90E+04	-1.32E+02	0.00E+00	8.00E+00	4.18E+00	0.00E+00	2.40E+02	2.77E+00	5.63E-03	3.44E+03	3.33E+03	-2.98E+00	0.00E+00	4.22E+00	6.38E+00	**-4.92E+04**	**-4.92E+04**	0.005%
2015	23	-4.39E+04	4.39E+04	-4.59E+00	0.00E+00	2.24E+00	1.21E+00	0.00E+00	0.00E+00	1.39E-02	1.16E-04	6.49E+02	6.52E+02	1.12E+00	0.00E+00	2.00E+00	2.58E+00	**-4.39E+04**	**-4.39E+04**	0.001%
2015	35	-2.18E+05	2.18E+05	-1.64E+01	0.00E+00	6.81E+00	9.59E+00	0.00E+00	5.46E+02	0.00E+00	-1.48E-03	7.53E+03	6.99E+03	1.44E+01	0.00E+00	4.46E+01	4.80E+01	**-2.18E+05**	**-2.18E+05**	0.000%
2015	39	-7.75E+04	7.74E+04	-1.27E+02	2.44E+01	6.44E+00	9.66E+00	0.00E+00	0.00E+00	1.72E-01	-2.85E-04	7.10E+03	7.18E+03	3.44E+01	0.00E+00	1.27E+01	1.63E+01	**-7.75E+04**	**-7.75E+04**	0.001%
2015	21	-1.70E+04	1.69E+04	-1.94E+01	0.00E+00	8.94E-01	2.41E+00	0.00E+00	0.00E+00	7.14E-01	-4.56E-04	1.63E+03	1.64E+03	4.95E+00	0.00E+00	2.53E+00	3.43E+00	**-1.70E+04**	**-1.70E+04**	0.003%
2015	27	-6.58E+04	6.59E+04	6.11E+01	1.42E+01	8.94E+00	2.42E+01	0.00E+00	4.59E+00	2.69E-03	-6.46E-03	1.21E+04	1.20E+04	6.45E+01	0.00E+00	2.89E+01	3.39E+01	**-6.58E+04**	**-6.58E+04**	0.001%
2015	34	-1.59E+04	1.68E+04	9.10E+02	0.00E+00	1.44E+00	2.38E+00	0.00E+00	8.58E+02	0.00E+00	-6.98E-02	2.54E+03	7.72E+02	4.11E+00	0.00E+00	1.78E+01	2.03E+01	**-1.59E+04**	**-1.59E+04**	0.000%
2015	20	-2.83E+04	2.83E+04	1.73E+01	0.00E+00	1.29E+00	3.69E+00	0.00E+00	0.00E+00	0.00E+00	-2.11E-03	2.07E+03	2.05E+03	5.36E+00	0.00E+00	3.83E+00	4.90E+00	**-2.83E+04**	**-2.83E+04**	0.000%
2015	33	-1.90E+04	2.01E+04	1.04E+03	7.23E+01	1.46E+00	2.05E+00	0.00E+00	9.22E+02	0.00E+00	-8.82E-02	3.53E+03	1.49E+03	5.95E+00	0.00E+00	2.35E+01	2.67E+01	**-1.90E+04**	**-1.90E+04**	0.000%
2015	32	-3.59E+05	3.60E+05	1.10E+03	5.24E+01	1.11E+01	3.95E+01	2.73E+02	9.32E+03	0.00E+00	-1.49E-01	3.78E+04	2.69E+04	8.36E+01	0.00E+00	3.01E+02	2.26E+02	**-3.59E+05**	**-3.59E+05**	0.000%
2015	22	-6.25E+04	6.20E+04	-5.13E+02	6.10E+01	4.15E+00	1.56E+01	0.00E+00	0.00E+00	5.94E-03	-1.85E-03	7.82E+03	8.24E+03	3.14E+01	0.00E+00	2.69E+01	1.47E+01	**-6.25E+04**	**-6.25E+04**	0.000%
2015	26	-2.41E+04	2.43E+04	1.91E+02	0.00E+00	3.08E-01	1.23E+00	0.00E+00	0.00E+00	0.00E+00	-1.03E-02	6.61E+02	4.68E+02	2.45E+00	0.00E+00	2.76E+00	2.50E+00	**-2.41E+04**	**-2.41E+04**	0.000%
2015	25	-7.57E+04	7.61E+04	3.93E+02	1.50E+01	1.27E+00	4.88E+00	0.00E+00	5.23E+00	0.00E+00	-1.52E-02	2.96E+03	2.53E+03	1.45E+01	0.00E+00	1.12E+01	9.06E+00	**-7.57E+04**	**-7.57E+04**	0.000%
2016	1	-2.11E+04	2.11E+04	2.45E+01	0.00E+00	2.44E+00	1.23E+00	0.00E+00	6.18E+02	1.03E-03	1.58E-01	2.40E+03	1.76E+03	1.26E-01	0.00E+00	5.24E+00	3.45E+00	**-2.11E+04**	**-2.11E+04**	0.000%
2016	38	-5.20E+04	5.20E+04	-3.80E+01	0.00E+00	8.04E+00	4.55E+00	0.00E+00	2.43E+02	4.46E+00	4.48E-01	3.77E+03	3.56E+03	-3.20E+00	0.00E+00	6.37E+00	2.73E+00	**-5.20E+04**	**-5.20E+04**	0.009%
2016	23	-4.64E+04	4.64E+04	-3.31E+00	0.00E+00	2.25E+00	1.31E+00	0.00E+00	0.00E+00	1.47E-02	1.07E-01	7.16E+02	7.16E+02	1.23E+00	0.00E+00	2.58E+00	9.97E-01	**-4.64E+04**	**-4.64E+04**	0.001%
2016	35	-2.31E+05	2.31E+05	1.48E+02	0.00E+00	6.85E+00	1.05E+01	0.00E+00	5.78E+02	0.00E+00	1.12E+00	8.60E+03	7.85E+03	1.60E+01	0.00E+00	4.80E+01	3.29E+01	**-2.31E+05**	**-2.31E+05**	0.000%
2016	39	-8.18E+04	8.18E+04	-4.04E+01	1.89E+01	6.48E+00	1.04E+01	0.00E+00	0.00E+00	1.76E-02	7.73E-01	7.72E+03	7.71E+03	3.46E+01	0.00E+00	1.63E+01	7.44E+00	**-8.18E+04**	**-8.18E+04**	0.001%
2016	21	-1.82E+04	1.82E+04	-7.93E+00	0.00E+00	8.99E-01	2.64E+00	0.00E+00	0.00E+00	6.11E-01	2.23E-01	1.76E+03	1.76E+03	4.63E+00	0.00E+00	3.43E+00	1.72E+00	**-1.82E+04**	**-1.82E+04**	0.004%
2016	27	-7.09E+04	7.10E+04	1.33E+02	1.11E+01	8.99E+00	2.64E+01	0.00E+00	4.98E+00	3.61E-03	2.29E+00	1.38E+04	1.35E+04	6.90E+01	0.00E+00	3.39E+01	2.51E+01	**-7.09E+04**	**-7.09E+04**	0.001%
2016	34	-1.71E+04	1.81E+04	1.01E+03	0.00E+00	1.45E+00	2.62E+00	0.00E+00	9.82E+02	0.00E+00	2.93E-01	2.87E+03	8.62E+02	5.53E+00	0.00E+00	2.03E+01	1.45E+01	**-1.71E+04**	**-1.71E+04**	0.000%

Table 4. Mass Balance for Total 4,4'-DDX

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2016	20	-3.04E+04	3.04E+04	3.45E+01	0.00E+00	1.30E+00	4.04E+00	0.00E+00	0.00E+00	0.00E+00	3.77E-01	2.28E+03	2.24E+03	5.98E+00	0.00E+00	4.90E+00	3.35E+00	**-3.04E+04**	**-3.04E+04**	0.000%
2016	33	-2.04E+04	2.15E+04	1.13E+03	5.74E+01	1.47E+00	2.25E+00	0.00E+00	1.03E+03	0.00E+00	3.14E-01	3.91E+03	1.68E+03	6.79E+00	0.00E+00	2.67E+01	1.93E+01	**-2.04E+04**	**-2.04E+04**	0.000%
2016	32	-3.88E+05	3.89E+05	1.43E+03	4.01E+01	1.12E+01	4.33E+01	2.51E+02	1.06E+04	0.00E+00	4.58E+00	4.20E+04	2.97E+04	1.06E+02	0.00E+00	2.25E+02	2.48E+02	**-3.88E+05**	**-3.88E+05**	0.000%
2016	22	-6.78E+04	6.74E+04	-4.54E+02	4.68E+01	4.18E+00	1.69E+01	0.00E+00	0.00E+00	0.00E+00	1.47E+00	8.51E+03	8.90E+03	3.19E+01	0.00E+00	1.47E+01	1.84E+01	**-6.78E+04**	**-6.78E+04**	0.000%
2016	26	-2.67E+04	2.69E+04	2.08E+02	0.00E+00	3.10E-01	1.34E+00	0.00E+00	0.00E+00	0.00E+00	8.01E-02	7.38E+02	5.28E+02	3.05E+00	0.00E+00	2.50E+00	2.39E+00	**-2.67E+04**	**-2.67E+04**	0.000%
2016	25	-8.26E+04	8.30E+04	4.83E+02	1.34E+01	1.27E+00	5.31E+00	0.00E+00	5.46E+00	0.00E+00	4.61E-01	3.28E+03	2.76E+03	1.53E+01	0.00E+00	9.06E+00	9.78E+00	**-8.26E+04**	**-8.26E+04**	0.000%

Table 5. Mass Balance of Mercury

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1996	1	-7.81E+05	7.93E+05	1.21E+04	0.00E+00	1.59E+00	1.60E+02	0.00E+00	4.25E+03	2.04E+00	-1.62E+00	8.02E+04	6.39E+04	1.02E+01	0.00E+00	1.58E+02	4.99E+01	**-7.81E+05**	**-7.81E+05**	0.000%
1996	38	-1.81E+06	1.81E+06	-1.22E+03	0.00E+00	4.98E+00	9.68E+02	0.00E+00	6.43E+03	3.29E+02	2.86E-01	1.29E+05	1.24E+05	6.52E+01	0.00E+00	1.58E+02	4.51E+01	**-1.81E+06**	**-1.81E+06**	0.023%
1996	23	-1.60E+06	1.60E+06	1.13E+03	0.00E+00	1.33E+00	2.53E+02	0.00E+00	0.00E+00	9.74E+00	-1.36E-01	2.92E+04	2.82E+04	8.50E+01	0.00E+00	6.90E+01	2.61E+01	**-1.60E+06**	**-1.60E+06**	0.000%
1996	35	-7.83E+06	7.83E+06	-3.39E+02	0.00E+00	1.16E+01	1.05E+03	0.00E+00	2.17E+04	0.00E+00	-4.18E-01	3.31E+05	3.09E+05	5.54E+02	0.00E+00	1.25E+03	5.62E+02	**-7.83E+06**	**-7.83E+06**	0.000%
1996	39	-2.94E+06	2.91E+06	-2.95E+04	7.50E+02	1.06E+01	1.58E+03	0.00E+00	0.00E+00	3.75E+00	2.07E+00	3.16E+05	3.45E+05	7.34E+02	0.00E+00	4.13E+02	1.35E+02	**-2.94E+06**	**-2.94E+06**	0.002%
1996	21	-5.89E+05	5.88E+05	-1.41E+03	0.00E+00	2.59E+00	4.03E+02	0.00E+00	0.00E+00	8.96E+00	1.57E-01	5.68E+04	5.84E+04	2.34E+02	0.00E+00	6.95E+01	3.63E+01	**-5.89E+05**	**-5.89E+05**	0.008%
1996	27	-2.21E+06	2.22E+06	1.50E+04	9.72E+01	2.59E+01	3.07E+03	0.00E+00	2.26E+02	1.26E+00	-7.37E-01	5.27E+05	5.12E+05	1.94E+03	0.00E+00	8.38E+02	3.15E+02	**-2.21E+06**	**-2.21E+06**	0.002%
1996	34	-5.63E+05	6.04E+05	4.12E+04	0.00E+00	4.17E+00	1.13E+02	0.00E+00	3.81E+04	0.00E+00	-2.48E+00	1.05E+05	2.51E+04	4.54E+01	0.00E+00	4.56E+02	2.53E+02	**-5.63E+05**	**-5.63E+05**	0.000%
1996	20	-9.31E+05	9.28E+05	-2.76E+03	0.00E+00	3.74E+00	5.54E+02	0.00E+00	0.00E+00	2.53E+00	-3.33E-02	7.47E+04	7.74E+04	5.69E+02	0.00E+00	1.06E+02	4.43E+01	**-9.31E+05**	**-9.31E+05**	0.001%
1996	33	-6.27E+05	6.57E+05	3.00E+04	1.37E+03	4.22E+00	1.06E+02	0.00E+00	4.15E+04	0.00E+00	-1.91E+00	1.39E+05	6.55E+04	1.44E+02	0.00E+00	4.86E+02	2.81E+02	**-6.27E+05**	**-6.27E+05**	0.000%
1996	32	-6.69E+06	6.69E+06	4.23E+02	3.36E+03	3.23E+01	2.09E+03	1.66E+03	2.01E+05	0.00E+00	-1.60E+00	7.36E+05	5.27E+05	2.96E+03	0.00E+00	3.65E+03	1.97E+03	**-6.69E+06**	**-6.69E+06**	0.000%
1996	22	-1.35E+06	1.33E+06	-2.46E+04	9.79E+02	1.20E+01	1.53E+03	0.00E+00	0.00E+00	2.51E+00	6.45E-02	1.43E+05	1.65E+05	3.13E+03	0.00E+00	3.61E+02	1.61E+02	**-1.35E+06**	**-1.35E+06**	0.000%
1996	26	-5.03E+05	5.06E+05	3.43E+03	0.00E+00	8.93E-01	7.17E+01	0.00E+00	0.00E+00	0.00E+00	-1.01E-01	1.47E+04	1.13E+04	4.43E+01	0.00E+00	4.41E+01	2.03E+01	**-5.03E+05**	**-5.03E+05**	0.000%
1996	25	-1.15E+06	1.15E+06	5.91E+03	2.24E+02	3.67E+00	3.34E+02	0.00E+00	1.97E+02	0.00E+00	-1.13E-01	5.42E+04	4.78E+04	2.77E+02	0.00E+00	1.67E+02	8.36E+01	**-1.15E+06**	**-1.15E+06**	0.000%
1997	1	-6.72E+05	6.80E+05	7.73E+03	0.00E+00	1.58E+00	1.33E+02	0.00E+00	3.08E+03	1.51E-01	-5.13E-01	7.38E+04	6.31E+04	1.94E+01	0.00E+00	4.98E+01	1.04E+02	**-6.72E+05**	**-6.72E+05**	0.000%
1997	38	-1.62E+06	1.62E+06	-8.02E+02	0.00E+00	4.97E+00	8.22E+02	0.00E+00	3.82E+03	1.34E+02	3.75E-02	1.07E+05	1.05E+05	7.61E+01	0.00E+00	4.51E+01	3.95E+01	**-1.62E+06**	**-1.62E+06**	0.012%
1997	23	-1.48E+06	1.48E+06	5.14E+01	0.00E+00	1.33E+00	2.21E+02	0.00E+00	0.00E+00	2.20E+00	-1.33E-02	2.82E+04	2.83E+04	1.02E+02	0.00E+00	2.61E+01	1.97E+01	**-1.48E+06**	**-1.48E+06**	0.000%
1997	35	-7.27E+06	7.27E+06	1.38E+03	0.00E+00	1.16E+01	9.26E+02	0.00E+00	2.23E+04	0.00E+00	-1.46E-01	3.15E+05	2.92E+05	7.38E+02	0.00E+00	5.62E+02	6.22E+02	**-7.27E+06**	**-7.27E+06**	0.000%
1997	39	-2.72E+06	2.68E+06	-4.09E+04	6.67E+02	1.06E+01	1.43E+03	0.00E+00	0.00E+00	2.61E+00	4.88E-01	2.80E+05	3.21E+05	8.16E+02	0.00E+00	1.35E+02	1.14E+02	**-2.72E+06**	**-2.72E+06**	0.001%
1997	21	-5.51E+05	5.49E+05	-2.67E+03	0.00E+00	2.59E+00	3.56E+02	0.00E+00	0.00E+00	2.58E+01	8.92E-03	5.35E+04	5.63E+04	2.06E+02	0.00E+00	3.63E+01	1.90E+01	**-5.51E+05**	**-5.51E+05**	0.005%
1997	27	-2.06E+06	2.06E+06	-3.45E+03	8.84E+01	2.58E+01	2.85E+03	0.00E+00	1.72E+02	0.00E+00	-1.01E-01	4.65E+05	4.68E+05	2.87E+03	0.00E+00	3.15E+02	2.45E+02	**-2.06E+06**	**-2.06E+06**	0.001%
1997	34	-5.31E+05	5.74E+05	4.28E+04	0.00E+00	4.16E+00	1.00E+02	0.00E+00	3.70E+04	0.00E+00	-1.76E+00	1.07E+05	2.73E+04	3.49E+01	0.00E+00	2.53E+02	2.16E+02	**-5.31E+05**	**-5.31E+05**	0.000%
1997	20	-8.73E+05	8.71E+05	-1.88E+03	0.00E+00	3.73E+00	4.96E+02	0.00E+00	0.00E+00	2.80E+00	-3.33E-02	7.10E+04	7.29E+04	5.01E+02	0.00E+00	4.43E+01	3.12E+01	**-8.73E+05**	**-8.73E+05**	0.001%
1997	33	-5.91E+05	6.23E+05	3.27E+04	1.22E+03	4.21E+00	9.58E+01	0.00E+00	3.99E+04	0.00E+00	-1.38E+00	1.38E+05	6.44E+04	1.11E+02	0.00E+00	2.81E+02	2.32E+02	**-5.91E+05**	**-5.91E+05**	0.000%
1997	32	-6.43E+06	6.43E+06	2.22E+03	2.92E+03	3.22E+01	1.96E+03	1.65E+03	1.93E+05	0.00E+00	-1.20E+00	7.32E+05	5.30E+05	3.58E+03	0.00E+00	1.97E+03	1.68E+03	**-6.43E+06**	**-6.43E+06**	0.000%
1997	22	-1.34E+06	1.28E+06	-5.66E+04	8.46E+02	1.20E+01	1.47E+03	0.00E+00	0.00E+00	3.60E+00	2.06E-01	1.43E+05	1.97E+05	2.60E+03	0.00E+00	1.61E+02	9.72E+01	**-1.34E+06**	**-1.34E+06**	0.001%
1997	26	-4.81E+05	4.85E+05	3.91E+03	0.00E+00	8.91E-01	6.77E+01	0.00E+00	0.00E+00	0.00E+00	-8.67E-02	1.50E+04	1.11E+04	2.37E+01	0.00E+00	2.03E+01	1.48E+01	**-4.81E+05**	**-4.81E+05**	0.000%
1997	25	-1.13E+06	1.13E+06	4.82E+03	2.53E+02	3.66E+00	3.19E+02	0.00E+00	1.55E+02	0.00E+00	-8.80E-02	5.62E+04	5.09E+04	3.84E+02	0.00E+00	8.36E+01	5.88E+01	**-1.13E+06**	**-1.13E+06**	0.000%
1998	1	-6.27E+05	6.31E+05	3.82E+03	0.00E+00	1.58E+00	1.37E+02	0.00E+00	3.44E+03	6.04E-01	-2.50E-01	6.87E+04	6.15E+04	1.09E+01	0.00E+00	1.04E+02	4.82E+01	**-6.27E+05**	**-6.27E+05**	0.000%
1998	38	-1.48E+06	1.48E+06	-8.40E+02	0.00E+00	4.97E+00	8.17E+02	0.00E+00	4.35E+03	1.11E+02	-3.46E+00	1.02E+05	9.95E+04	4.78E+01	0.00E+00	3.62E+01	2.58E+01	**-1.48E+06**	**-1.48E+06**	0.016%
1998	23	-1.32E+06	1.32E+06	-1.83E+02	0.00E+00	1.33E+00	2.15E+02	0.00E+00	0.00E+00	1.75E+00	-1.68E-01	2.38E+04	2.41E+04	8.65E+01	0.00E+00	1.95E+01	1.32E+01	**-1.32E+06**	**-1.32E+06**	0.000%
1998	35	-6.55E+06	6.55E+06	-2.04E+03	0.00E+00	1.16E+01	8.99E+02	0.00E+00	2.12E+04	0.00E+00	-3.35E-02	2.71E+05	2.52E+05	5.61E+02	0.00E+00	6.22E+02	4.22E+02	**-6.55E+06**	**-6.55E+06**	0.000%
1998	39	-2.43E+06	2.41E+06	-2.06E+04	6.72E+02	1.06E+01	1.33E+03	0.00E+00	0.00E+00	6.20E+00	-9.35E-01	2.45E+05	2.66E+05	5.98E+02	0.00E+00	1.12E+02	9.53E+01	**-2.43E+06**	**-2.43E+06**	0.001%
1998	21	-5.06E+05	5.05E+05	-1.68E+03	0.00E+00	2.59E+00	3.42E+02	0.00E+00	0.00E+00	9.29E+00	-1.38E+00	4.82E+04	5.00E+04	2.15E+02	0.00E+00	1.76E+01	1.97E+01	**-5.07E+05**	**-5.06E+05**	0.008%
1998	27	-1.93E+06	1.93E+06	1.05E+03	8.71E+01	2.58E+01	2.69E+03	0.00E+00	1.89E+02	3.79E+00	-2.55E+00	4.20E+05	4.19E+05	1.95E+03	0.00E+00	2.42E+02	2.97E+02	**-1.93E+06**	**-1.93E+06**	0.001%

Table 5. Mass Balance of Mercury

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1998	34	-4.88E+05	5.21E+05	3.33E+04	0.00E+00	4.16E+00	9.77E+01	0.00E+00	3.45E+04	0.00E+00	-1.78E+00	9.22E+04	2.45E+04	3.31E+01	0.00E+00	2.16E+02	1.76E+02	**-4.88E+05**	**-4.88E+05**	0.000%
1998	20	-8.00E+05	7.99E+05	-1.36E+03	0.00E+00	3.73E+00	4.75E+02	0.00E+00	0.00E+00	0.00E+00	-6.76E-01	6.38E+04	6.53E+04	4.07E+02	0.00E+00	3.05E+01	3.98E+01	**-8.00E+05**	**-8.00E+05**	0.001%
1998	33	-5.43E+05	5.68E+05	2.52E+04	1.31E+03	4.21E+00	9.58E+01	0.00E+00	3.81E+04	0.00E+00	-1.48E+00	1.18E+05	5.33E+04	1.17E+02	0.00E+00	2.32E+02	2.06E+02	**-5.43E+05**	**-5.43E+05**	0.000%
1998	32	-6.12E+06	6.12E+06	-3.24E+03	3.17E+03	3.22E+01	1.94E+03	1.65E+03	1.84E+05	0.00E+00	-1.27E+00	6.74E+05	4.87E+05	3.29E+03	0.00E+00	1.68E+03	1.53E+03	**-6.12E+06**	**-6.12E+06**	0.000%
1998	22	-1.27E+06	1.23E+06	-3.95E+04	9.23E+02	1.20E+01	1.44E+03	0.00E+00	0.00E+00	0.00E+00	-7.80E-01	1.39E+05	1.76E+05	2.68E+03	0.00E+00	9.62E+01	1.24E+02	**-1.27E+06**	**-1.27E+06**	0.001%
1998	26	-4.65E+05	4.68E+05	3.18E+03	0.00E+00	8.91E-01	6.73E+01	0.00E+00	0.00E+00	0.00E+00	-1.37E-01	1.42E+04	1.11E+04	2.31E+01	0.00E+00	1.48E+01	1.54E+01	**-4.65E+05**	**-4.65E+05**	0.000%
1998	25	-1.08E+06	1.08E+06	3.63E+03	3.10E+02	3.66E+00	3.15E+02	0.00E+00	1.74E+02	0.00E+00	-3.92E-02	5.16E+04	4.74E+04	3.16E+02	0.00E+00	5.88E+01	6.26E+01	**-1.08E+06**	**-1.08E+06**	0.000%
1999	1	-5.55E+05	5.59E+05	4.16E+03	0.00E+00	1.58E+00	1.39E+02	0.00E+00	2.69E+03	2.55E-01	-6.44E-01	5.88E+04	5.21E+04	3.89E+01	0.00E+00	4.82E+01	6.25E+01	**-5.55E+05**	**-5.55E+05**	0.000%
1999	38	-1.25E+06	1.25E+06	1.71E+03	0.00E+00	4.97E+00	7.94E+02	0.00E+00	2.84E+03	1.01E+02	-4.99E+00	8.34E+04	7.96E+04	7.78E+01	0.00E+00	2.11E+01	5.02E+01	**-1.25E+06**	**-1.25E+06**	0.012%
1999	23	-1.07E+06	1.07E+06	8.54E+02	0.00E+00	1.33E+00	2.01E+02	0.00E+00	0.00E+00	8.40E-01	-2.29E-01	1.98E+04	1.91E+04	1.10E+02	0.00E+00	1.31E+01	3.20E+01	**-1.07E+06**	**-1.07E+06**	0.000%
1999	35	-5.41E+06	5.41E+06	1.80E+03	0.00E+00	1.16E+01	8.43E+02	0.00E+00	1.82E+04	0.00E+00	-8.27E-01	2.21E+05	2.02E+05	5.80E+02	0.00E+00	4.22E+02	6.28E+02	**-5.41E+06**	**-5.41E+06**	0.000%
1999	39	-1.95E+06	1.95E+06	-4.87E+03	5.17E+02	1.06E+01	1.23E+03	0.00E+00	0.00E+00	1.53E+00	-1.09E-01	1.92E+05	1.97E+05	5.15E+02	0.00E+00	9.53E+01	1.74E+02	**-1.95E+06**	**-1.95E+06**	0.001%
1999	21	-4.35E+05	4.35E+05	-2.30E+02	0.00E+00	2.59E+00	3.24E+02	0.00E+00	0.00E+00	6.18E+00	-4.09E-01	4.33E+04	4.37E+04	2.04E+02	0.00E+00	1.93E+01	3.15E+01	**-4.35E+05**	**-4.35E+05**	0.005%
1999	27	-1.70E+06	1.70E+06	3.24E+03	6.92E+01	2.58E+01	2.51E+03	0.00E+00	1.22E+02	8.64E-01	-3.62E-01	3.41E+05	3.38E+05	2.08E+03	0.00E+00	2.97E+02	3.38E+02	**-1.70E+06**	**-1.70E+06**	0.001%
1999	34	-4.27E+05	4.51E+05	2.35E+04	0.00E+00	4.16E+00	9.32E+01	0.00E+00	3.13E+04	0.00E+00	-1.14E+00	7.81E+04	2.34E+04	4.24E+01	0.00E+00	1.76E+02	2.67E+02	**-4.27E+05**	**-4.27E+05**	0.000%
1999	20	-6.88E+05	6.87E+05	-9.91E+02	0.00E+00	3.73E+00	4.45E+02	0.00E+00	0.00E+00	0.00E+00	-4.32E-02	5.76E+04	5.86E+04	3.66E+02	0.00E+00	3.98E+01	5.34E+01	**-6.88E+05**	**-6.88E+05**	0.000%
1999	33	-4.64E+05	4.84E+05	2.01E+04	1.04E+03	4.21E+00	8.79E+01	0.00E+00	3.46E+04	0.00E+00	-1.01E+00	9.57E+04	4.00E+04	1.04E+02	0.00E+00	2.06E+02	2.97E+02	**-4.64E+05**	**-4.64E+05**	0.000%
1999	32	-5.43E+06	5.43E+06	-8.17E+03	2.45E+03	3.22E+01	1.89E+03	1.61E+03	1.78E+05	0.00E+00	-1.06E+00	5.78E+05	4.02E+05	3.61E+03	0.00E+00	1.53E+03	1.66E+03	**-5.43E+06**	**-5.43E+06**	0.000%
1999	22	-1.09E+06	1.08E+06	-1.40E+04	7.17E+02	1.20E+01	1.36E+03	0.00E+00	0.00E+00	3.61E-02	-7.27E-02	1.23E+05	1.36E+05	1.96E+03	0.00E+00	1.24E+02	1.57E+02	**-1.09E+06**	**-1.09E+06**	0.001%
1999	26	-3.87E+05	3.91E+05	3.22E+03	0.00E+00	8.91E-01	6.46E+01	0.00E+00	0.00E+00	0.00E+00	-9.20E-02	1.25E+04	9.30E+03	2.51E+01	0.00E+00	1.54E+01	1.96E+01	**-3.87E+05**	**-3.87E+05**	0.000%
1999	25	-9.59E+05	9.64E+05	4.49E+03	2.73E+02	3.66E+00	3.09E+02	0.00E+00	1.68E+02	0.00E+00	-1.15E-01	4.57E+04	4.08E+04	3.05E+02	0.00E+00	6.26E+01	8.36E+01	**-9.59E+05**	**-9.59E+05**	0.000%
2000	1	-5.13E+05	5.15E+05	2.12E+03	0.00E+00	1.59E+00	1.18E+02	0.00E+00	3.40E+03	1.19E-01	-1.02E-01	5.71E+04	5.16E+04	3.13E+01	0.00E+00	6.25E+01	2.29E+01	**-5.13E+05**	**-5.13E+05**	0.000%
2000	38	-1.17E+06	1.16E+06	-1.97E+03	0.00E+00	4.98E+00	6.96E+02	0.00E+00	3.18E+03	1.31E+02	-4.25E-01	7.96E+04	7.89E+04	8.77E+01	0.00E+00	4.98E+01	1.74E+01	**-1.17E+06**	**-1.17E+06**	0.011%
2000	23	-1.04E+06	1.04E+06	-3.76E+02	0.00E+00	1.33E+00	1.81E+02	0.00E+00	0.00E+00	4.75E+00	2.26E-03	2.02E+04	2.06E+04	9.64E+01	0.00E+00	3.20E+01	9.92E+00	**-1.04E+06**	**-1.04E+06**	-0.001%
2000	35	-5.12E+06	5.11E+06	-3.84E+03	0.00E+00	1.16E+01	7.60E+02	0.00E+00	2.09E+04	0.00E+00	-1.67E+00	2.11E+05	1.94E+05	7.26E+02	0.00E+00	6.26E+02	2.78E+02	**-5.12E+06**	**-5.12E+06**	0.000%
2000	39	-1.90E+06	1.88E+06	-1.38E+04	6.26E+02	1.06E+01	1.12E+03	0.00E+00	0.00E+00	7.58E+00	9.81E-02	1.95E+05	2.09E+05	7.17E+02	0.00E+00	1.74E+02	6.17E+01	**-1.90E+06**	**-1.90E+06**	0.001%
2000	21	-3.92E+05	3.90E+05	-1.57E+03	0.00E+00	2.59E+00	2.92E+02	0.00E+00	0.00E+00	1.30E+01	-5.61E-03	3.72E+04	3.89E+04	1.87E+02	0.00E+00	3.15E+01	1.31E+01	**-3.92E+05**	**-3.92E+05**	0.004%
2000	27	-1.54E+06	1.54E+06	-6.75E+02	8.04E+01	2.59E+01	2.29E+03	0.00E+00	1.18E+02	0.00E+00	-1.15E-01	3.37E+05	3.37E+05	1.95E+03	0.00E+00	3.38E+02	1.72E+02	**-1.54E+06**	**-1.54E+06**	0.001%
2000	34	-3.88E+05	4.11E+05	2.23E+04	0.00E+00	4.17E+00	8.19E+01	0.00E+00	2.88E+04	0.00E+00	3.91E+00	7.05E+04	1.94E+04	2.46E+01	0.00E+00	2.72E+02	1.65E+02	**-3.88E+05**	**-3.88E+05**	0.001%
2000	20	-6.40E+05	6.39E+05	-1.11E+03	0.00E+00	3.74E+00	4.04E+02	0.00E+00	0.00E+00	6.13E-01	-3.66E-02	4.83E+04	4.93E+04	4.40E+02	0.00E+00	5.34E+01	2.61E+01	**-6.40E+05**	**-6.40E+05**	0.000%
2000	33	-4.63E+05	4.79E+05	1.58E+04	1.10E+03	4.22E+00	7.91E+01	0.00E+00	3.21E+04	0.00E+00	9.99E+00	9.34E+04	4.42E+04	1.30E+02	0.00E+00	3.08E+02	1.68E+02	**-4.64E+05**	**-4.63E+05**	0.002%
2000	32	-4.96E+06	4.95E+06	-1.25E+04	2.71E+03	3.23E+01	1.68E+03	1.57E+03	1.80E+05	0.00E+00	-1.01E+01	5.40E+05	3.65E+05	4.23E+03	0.00E+00	1.65E+03	8.94E+02	**-4.96E+06**	**-4.96E+06**	0.000%
2000	22	-9.89E+05	9.71E+05	-1.82E+04	7.94E+02	1.20E+01	1.20E+03	0.00E+00	0.00E+00	1.23E-01	-2.38E-02	1.17E+05	1.33E+05	2.01E+03	0.00E+00	1.57E+02	9.00E+01	**-9.89E+05**	**-9.89E+05**	0.001%
2000	26	-3.77E+05	3.79E+05	2.45E+03	0.00E+00	8.93E-01	5.70E+01	0.00E+00	0.00E+00	0.00E+00	-6.59E-02	1.11E+04	8.70E+03	3.34E+01	0.00E+00	1.96E+01	1.00E+01	**-3.77E+05**	**-3.77E+05**	0.000%
2000	25	-8.91E+05	8.94E+05	3.58E+03	2.13E+02	3.67E+00	2.66E+02	0.00E+00	1.46E+02	0.00E+00	-1.01E-01	4.38E+04	3.97E+04	3.22E+02	0.00E+00	8.35E+01	3.45E+01	**-8.91E+05**	**-8.91E+05**	0.000%

Table 5. Mass Balance of Mercury

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2001	1	-4.90E+05	4.93E+05	3.29E+03	0.00E+00	1.58E+00	1.26E+02	0.00E+00	2.54E+03	2.64E-02	-1.23E-01	5.62E+04	5.06E+04	3.10E+01	0.00E+00	2.29E+01	6.15E+01	**-4.90E+05**	**-4.90E+05**	0.000%
2001	38	-1.13E+06	1.13E+06	-6.43E+02	0.00E+00	4.97E+00	6.99E+02	0.00E+00	2.53E+03	5.12E+01	-5.04E-02	7.86E+04	7.74E+04	7.26E+01	0.00E+00	1.74E+01	2.91E+01	**-1.13E+06**	**-1.13E+06**	0.007%
2001	23	-1.00E+06	1.00E+06	-6.35E+02	0.00E+00	1.33E+00	1.77E+02	0.00E+00	0.00E+00	2.05E+00	1.25E-03	2.00E+04	2.07E+04	1.39E+02	0.00E+00	9.92E+00	1.29E+01	**-1.00E+06**	**-1.00E+06**	-0.001%
2001	35	-4.99E+06	4.98E+06	-2.97E+03	0.00E+00	1.16E+01	7.51E+02	0.00E+00	1.95E+04	0.00E+00	-1.96E-02	2.18E+05	2.01E+05	6.90E+02	0.00E+00	2.78E+02	4.24E+02	**-4.99E+06**	**-4.99E+06**	0.000%
2001	39	-1.83E+06	1.83E+06	-9.38E+03	4.89E+02	1.06E+01	1.09E+03	0.00E+00	0.00E+00	1.01E+01	9.84E-02	1.89E+05	1.99E+05	6.67E+02	0.00E+00	6.17E+01	8.06E+01	**-1.83E+06**	**-1.83E+06**	0.001%
2001	21	-3.87E+05	3.85E+05	-1.13E+03	0.00E+00	2.59E+00	2.90E+02	0.00E+00	0.00E+00	1.09E+01	-9.13E-03	3.87E+04	3.99E+04	1.91E+02	0.00E+00	1.31E+01	1.65E+01	**-3.87E+05**	**-3.87E+05**	0.003%
2001	27	-1.50E+06	1.49E+06	-6.48E+03	6.33E+01	2.58E+01	2.25E+03	0.00E+00	1.23E+02	1.28E+00	-6.10E-02	3.21E+05	3.28E+05	1.93E+03	0.00E+00	1.72E+02	2.43E+02	**-1.50E+06**	**-1.50E+06**	0.001%
2001	34	-3.82E+05	4.04E+05	2.24E+04	0.00E+00	4.16E+00	8.09E+01	0.00E+00	2.78E+04	0.00E+00	-1.16E+00	6.87E+04	1.86E+04	2.05E+01	0.00E+00	1.65E+02	1.88E+02	**-3.82E+05**	**-3.82E+05**	0.000%
2001	20	-6.24E+05	6.23E+05	-1.58E+03	0.00E+00	3.73E+00	3.99E+02	0.00E+00	0.00E+00	4.01E-01	-2.49E-02	5.01E+04	5.17E+04	4.20E+02	0.00E+00	2.61E+01	2.91E+01	**-6.24E+05**	**-6.24E+05**	0.001%
2001	33	-4.53E+05	4.70E+05	1.73E+04	8.20E+02	4.21E+00	7.62E+01	0.00E+00	3.10E+04	0.00E+00	-9.46E-01	9.10E+04	4.18E+04	1.19E+02	0.00E+00	1.68E+02	2.08E+02	**-4.53E+05**	**-4.53E+05**	0.000%
2001	32	-4.80E+06	4.79E+06	-6.00E+03	2.10E+03	3.22E+01	1.65E+03	1.48E+03	1.73E+05	0.00E+00	-7.02E-01	5.36E+05	3.64E+05	3.63E+03	0.00E+00	8.94E+02	1.85E+03	**-4.80E+06**	**-4.80E+06**	0.000%
2001	22	-9.62E+05	9.37E+05	-2.44E+04	6.17E+02	1.20E+01	1.18E+03	0.00E+00	0.00E+00	8.32E-01	3.32E-02	1.12E+05	1.34E+05	2.39E+03	0.00E+00	9.00E+01	1.17E+02	**-9.62E+05**	**-9.62E+05**	0.001%
2001	26	-3.58E+05	3.61E+05	2.61E+03	0.00E+00	8.91E-01	5.60E+01	0.00E+00	0.00E+00	0.00E+00	-6.37E-02	1.06E+04	8.03E+03	2.72E+01	0.00E+00	1.00E+01	1.98E+01	**-3.58E+05**	**-3.58E+05**	0.000%
2001	25	-8.53E+05	8.57E+05	4.22E+03	1.32E+02	3.66E+00	2.62E+02	0.00E+00	1.45E+02	0.00E+00	-9.34E-02	4.11E+04	3.66E+04	2.69E+02	0.00E+00	3.45E+01	8.24E+01	**-8.53E+05**	**-8.53E+05**	0.000%
2002	1	-3.91E+05	3.92E+05	7.06E+02	0.00E+00	1.58E+00	1.44E+02	0.00E+00	1.05E+03	6.85E-02	-4.66E-02	4.65E+04	4.48E+04	4.38E+01	0.00E+00	6.15E+01	4.25E+01	**-3.91E+05**	**-3.91E+05**	0.000%
2002	38	-9.50E+05	9.49E+05	-6.27E+02	0.00E+00	4.97E+00	7.72E+02	0.00E+00	1.44E+03	9.92E+01	-4.77E+00	6.06E+04	6.05E+04	8.94E+01	0.00E+00	2.42E+01	2.56E+01	**-9.50E+05**	**-9.50E+05**	0.008%
2002	23	-8.70E+05	8.70E+05	-5.41E+02	0.00E+00	1.33E+00	1.94E+02	0.00E+00	0.00E+00	1.79E+00	-2.64E-01	1.70E+04	1.76E+04	1.24E+02	0.00E+00	1.27E+01	1.54E+01	**-8.70E+05**	**-8.70E+05**	0.000%
2002	35	-4.35E+06	4.34E+06	-2.92E+03	0.00E+00	1.16E+01	8.13E+02	0.00E+00	1.94E+04	0.00E+00	-2.11E-02	1.79E+05	1.62E+05	6.89E+02	0.00E+00	4.24E+02	4.12E+02	**-4.35E+06**	**-4.35E+06**	0.000%
2002	39	-1.57E+06	1.55E+06	-1.47E+04	4.41E+02	1.06E+01	1.20E+03	0.00E+00	0.00E+00	5.07E+01	-3.00E-01	1.61E+05	1.76E+05	5.07E+02	0.00E+00	8.02E+01	1.08E+02	**-1.57E+06**	**-1.57E+06**	0.001%
2002	21	-3.54E+05	3.52E+05	-1.49E+03	0.00E+00	2.59E+00	3.12E+02	0.00E+00	0.00E+00	2.31E+01	-8.73E-01	3.65E+04	3.81E+04	1.96E+02	0.00E+00	1.56E+01	1.95E+01	**-3.54E+05**	**-3.54E+05**	0.004%
2002	27	-1.37E+06	1.37E+06	-5.14E+03	5.84E+01	2.58E+01	2.36E+03	0.00E+00	9.34E+01	2.31E+00	-1.09E+00	2.67E+05	2.73E+05	1.91E+03	0.00E+00	2.42E+02	2.85E+02	**-1.37E+06**	**-1.37E+06**	0.001%
2002	34	-3.63E+05	3.77E+05	1.47E+04	0.00E+00	4.16E+00	8.70E+01	0.00E+00	2.63E+04	0.00E+00	-8.41E-01	6.02E+04	1.92E+04	3.89E+01	0.00E+00	1.88E+02	1.76E+02	**-3.63E+05**	**-3.63E+05**	0.000%
2002	20	-5.78E+05	5.76E+05	-2.02E+03	0.00E+00	3.73E+00	4.22E+02	0.00E+00	0.00E+00	1.63E+00	-1.10E-02	4.86E+04	5.07E+04	3.47E+02	0.00E+00	2.91E+01	3.56E+01	**-5.78E+05**	**-5.78E+05**	0.000%
2002	33	-4.18E+05	4.33E+05	1.49E+04	7.90E+02	4.21E+00	8.15E+01	0.00E+00	3.04E+04	0.00E+00	-8.73E-01	7.61E+04	2.99E+04	9.69E+01	0.00E+00	2.08E+02	2.08E+02	**-4.18E+05**	**-4.18E+05**	0.000%
2002	32	-4.49E+06	4.47E+06	-1.50E+04	1.93E+03	3.22E+01	1.79E+03	1.46E+03	1.65E+05	0.00E+00	-5.45E-01	4.87E+05	3.30E+05	4.92E+03	0.00E+00	1.85E+03	1.48E+03	**-4.49E+06**	**-4.49E+06**	0.000%
2002	22	-8.87E+05	8.64E+05	-2.31E+04	5.64E+02	1.20E+01	1.25E+03	0.00E+00	0.00E+00	3.89E-01	4.43E-02	1.05E+05	1.27E+05	2.16E+03	0.00E+00	1.17E+02	1.23E+02	**-8.87E+05**	**-8.87E+05**	0.001%
2002	26	-3.15E+05	3.17E+05	2.09E+03	0.00E+00	8.91E-01	5.92E+01	0.00E+00	0.00E+00	0.00E+00	-7.69E-02	1.04E+04	8.36E+03	2.86E+01	0.00E+00	1.97E+01	1.51E+01	**-3.15E+05**	**-3.15E+05**	0.000%
2002	25	-8.01E+05	8.05E+05	3.87E+03	1.63E+02	3.66E+00	2.85E+02	0.00E+00	1.64E+02	0.00E+00	-1.22E-01	3.86E+04	3.44E+04	2.47E+02	0.00E+00	8.24E+01	6.08E+01	**-8.01E+05**	**-8.01E+05**	0.000%
2003	1	-4.72E+05	4.77E+05	5.02E+03	0.00E+00	1.58E+00	1.19E+02	0.00E+00	3.23E+03	2.72E-01	-4.17E-01	5.17E+04	4.36E+04	1.52E+01	0.00E+00	4.25E+01	6.02E+01	**-4.72E+05**	**-4.72E+05**	0.000%
2003	38	-1.10E+06	1.10E+06	3.24E+03	0.00E+00	4.97E+00	7.12E+02	0.00E+00	3.85E+03	4.18E+01	2.58E+00	9.67E+04	9.04E+04	6.01E+01	0.00E+00	2.86E+01	6.03E+01	**-1.10E+06**	**-1.10E+06**	0.010%
2003	23	-9.51E+05	9.50E+05	-7.84E+02	0.00E+00	1.33E+00	1.99E+02	0.00E+00	0.00E+00	1.29E+00	-2.42E-02	1.93E+04	2.01E+04	1.30E+02	0.00E+00	1.54E+01	3.30E+01	**-9.51E+05**	**-9.51E+05**	0.001%
2003	35	-4.62E+06	4.62E+06	-2.03E+03	0.00E+00	1.16E+01	8.15E+02	0.00E+00	1.33E+04	0.00E+00	6.47E+00	2.07E+05	1.96E+05	7.68E+02	0.00E+00	4.19E+02	6.54E+02	**-4.62E+06**	**-4.62E+06**	0.000%
2003	39	-1.69E+06	1.69E+06	-5.03E+03	7.92E+02	1.06E+01	1.20E+03	0.00E+00	0.00E+00	3.14E+01	-3.47E-01	1.84E+05	1.89E+05	6.84E+02	0.00E+00	1.08E+02	1.73E+02	**-1.69E+06**	**-1.69E+06**	0.001%
2003	21	-3.46E+05	3.45E+05	-8.99E+02	0.00E+00	2.59E+00	3.18E+02	0.00E+00	0.00E+00	2.99E+00	-7.96E-02	3.27E+04	3.38E+04	2.14E+02	0.00E+00	1.94E+01	3.43E+01	**-3.46E+05**	**-3.46E+05**	0.004%
2003	27	-1.34E+06	1.34E+06	-2.18E+03	1.03E+02	2.58E+01	2.45E+03	0.00E+00	1.99E+02	0.00E+00	2.76E+00	3.18E+05	3.20E+05	1.89E+03	0.00E+00	2.88E+02	3.25E+02	**-1.34E+06**	**-1.34E+06**	0.001%

Table 5. Mass Balance of Mercury

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2003	34	-3.35E+05	3.60E+05	2.43E+04	0.00E+00	4.16E+00	9.05E+01	0.00E+00	2.03E+04	0.00E+00	3.91E+00	5.81E+04	1.36E+04	1.96E+01	0.00E+00	1.81E+02	2.74E+02	**-3.35E+05**	**-3.35E+05**	0.001%
2003	20	-5.51E+05	5.50E+05	-8.44E+02	0.00E+00	3.73E+00	4.41E+02	0.00E+00	0.00E+00	3.28E-01	-1.60E-01	4.37E+04	4.45E+04	4.24E+02	0.00E+00	3.55E+01	5.13E+01	**-5.51E+05**	**-5.51E+05**	0.000%
2003	33	-3.96E+05	4.18E+05	2.20E+04	1.48E+03	4.21E+00	8.41E+01	0.00E+00	2.14E+04	0.00E+00	3.79E+01	8.22E+04	3.75E+04	6.69E+01	0.00E+00	2.47E+02	3.94E+02	**-3.96E+05**	**-3.96E+05**	0.010%
2003	32	-4.18E+06	4.22E+06	3.88E+04	3.57E+03	3.22E+01	1.61E+03	1.71E+03	1.21E+05	0.00E+00	2.83E+02	5.75E+05	4.09E+05	3.28E+03	0.00E+00	1.77E+03	1.79E+03	**-4.18E+06**	**-4.18E+06**	0.007%
2003	22	-8.48E+05	8.32E+05	-1.61E+04	1.04E+03	1.20E+01	1.31E+03	0.00E+00	0.00E+00	2.82E-01	-3.44E-01	1.11E+05	1.25E+05	1.91E+03	0.00E+00	1.23E+02	1.25E+02	**-8.48E+05**	**-8.48E+05**	0.000%
2003	26	-3.12E+05	3.14E+05	2.30E+03	0.00E+00	8.91E-01	6.47E+01	0.00E+00	0.00E+00	0.00E+00	-1.14E-01	9.31E+03	7.04E+03	3.14E+01	0.00E+00	1.50E+01	1.38E+01	**-3.12E+05**	**-3.12E+05**	0.000%
2003	25	-7.05E+05	7.10E+05	5.47E+03	4.51E+02	3.66E+00	2.87E+02	0.00E+00	1.30E+02	0.00E+00	-3.04E-01	3.93E+04	3.33E+04	2.17E+02	0.00E+00	6.07E+01	6.80E+01	**-7.05E+05**	**-7.05E+05**	0.000%
2004	1	-4.69E+05	4.73E+05	4.22E+03	0.00E+00	1.59E+00	1.11E+02	0.00E+00	6.25E+03	7.81E-01	-4.72E-01	5.48E+04	4.45E+04	1.33E+01	0.00E+00	6.01E+01	5.87E+01	**-4.69E+05**	**-4.69E+05**	0.000%
2004	38	-1.06E+06	1.06E+06	8.90E+02	0.00E+00	4.98E+00	6.76E+02	0.00E+00	4.20E+03	7.02E+01	-3.22E-02	9.92E+04	9.48E+04	9.26E+01	0.00E+00	6.03E+01	7.35E+01	**-1.06E+06**	**-1.06E+06**	0.010%
2004	23	-9.14E+05	9.14E+05	5.28E+02	0.00E+00	1.33E+00	1.84E+02	0.00E+00	0.00E+00	4.73E+00	-2.57E-02	2.17E+04	2.13E+04	8.54E+01	0.00E+00	3.30E+01	4.71E+01	**-9.14E+05**	**-9.14E+05**	0.001%
2004	35	-4.39E+06	4.40E+06	4.61E+03	0.00E+00	1.16E+01	7.51E+02	0.00E+00	1.30E+04	0.00E+00	-3.50E-01	2.19E+05	2.02E+05	7.05E+02	0.00E+00	6.54E+02	8.50E+02	**-4.39E+06**	**-4.39E+06**	0.000%
2004	39	-1.63E+06	1.61E+06	-1.36E+04	7.96E+02	1.06E+01	1.14E+03	0.00E+00	0.00E+00	8.22E+00	6.49E-02	1.89E+05	2.03E+05	6.04E+02	0.00E+00	1.73E+02	3.10E+02	**-1.63E+06**	**-1.63E+06**	0.001%
2004	21	-3.23E+05	3.22E+05	-8.18E+02	0.00E+00	2.59E+00	2.93E+02	0.00E+00	0.00E+00	2.30E+00	-2.23E-02	3.40E+04	3.49E+04	2.10E+02	0.00E+00	3.43E+01	5.14E+01	**-3.23E+05**	**-3.23E+05**	0.006%
2004	27	-1.23E+06	1.22E+06	-5.52E+03	1.07E+02	2.59E+01	2.28E+03	0.00E+00	1.79E+02	0.00E+00	-2.04E-01	3.22E+05	3.28E+05	1.74E+03	0.00E+00	3.25E+02	5.24E+02	**-1.23E+06**	**-1.23E+06**	0.001%
2004	34	-3.08E+05	3.34E+05	2.60E+04	0.00E+00	4.17E+00	8.25E+01	0.00E+00	2.06E+04	0.00E+00	-1.46E+00	6.02E+04	1.36E+04	1.77E+01	0.00E+00	2.74E+02	3.09E+02	**-3.08E+05**	**-3.08E+05**	0.000%
2004	20	-5.06E+05	5.06E+05	-5.46E+02	0.00E+00	3.74E+00	4.04E+02	0.00E+00	0.00E+00	1.33E-01	-6.36E-02	4.33E+04	4.39E+04	3.93E+02	0.00E+00	5.13E+01	6.49E+01	**-5.06E+05**	**-5.06E+05**	0.000%
2004	33	-3.64E+05	3.88E+05	2.40E+04	1.36E+03	4.22E+00	7.57E+01	0.00E+00	2.09E+04	0.00E+00	-1.50E+00	8.61E+04	3.99E+04	5.26E+01	0.00E+00	3.94E+02	3.77E+02	**-3.64E+05**	**-3.64E+05**	0.000%
2004	32	-3.67E+06	3.72E+06	5.01E+04	3.22E+03	3.23E+01	1.41E+03	1.66E+03	1.09E+05	0.00E+00	-4.39E+00	5.52E+05	3.87E+05	2.69E+03	0.00E+00	1.79E+03	2.13E+03	**-3.67E+06**	**-3.67E+06**	0.000%
2004	22	-7.66E+05	7.34E+05	-3.26E+04	9.36E+02	1.20E+01	1.16E+03	0.00E+00	0.00E+00	1.72E+00	1.14E-02	1.06E+05	1.38E+05	1.66E+03	0.00E+00	1.25E+02	1.51E+02	**-7.66E+05**	**-7.66E+05**	0.001%
2004	26	-2.73E+05	2.75E+05	2.14E+03	0.00E+00	8.93E-01	5.58E+01	0.00E+00	0.00E+00	0.00E+00	-8.26E-02	8.81E+03	6.70E+03	3.38E+01	0.00E+00	1.38E+01	1.59E+01	**-2.73E+05**	**-2.73E+05**	0.000%
2004	25	-5.99E+05	6.04E+05	4.85E+03	3.94E+02	3.67E+00	2.44E+02	0.00E+00	1.12E+02	0.00E+00	-1.72E-01	3.72E+04	3.19E+04	2.51E+02	0.00E+00	6.80E+01	6.43E+01	**-5.99E+05**	**-5.99E+05**	0.000%
2005	1	-4.32E+05	4.35E+05	2.71E+03	0.00E+00	1.58E+00	9.58E+01	0.00E+00	6.24E+03	1.20E-02	-2.19E-01	5.39E+04	4.50E+04	1.36E+01	0.00E+00	5.87E+01	3.77E+01	**-4.32E+05**	**-4.32E+05**	0.000%
2005	38	-1.03E+06	1.03E+06	-7.16E+02	0.00E+00	4.97E+00	5.73E+02	0.00E+00	3.88E+03	3.76E+01	-2.18E-01	9.75E+04	9.48E+04	6.95E+01	0.00E+00	7.35E+01	1.62E+01	**-1.03E+06**	**-1.03E+06**	0.008%
2005	23	-9.00E+05	9.00E+05	-1.86E+02	0.00E+00	1.33E+00	1.57E+02	0.00E+00	0.00E+00	1.05E+00	-2.41E-02	2.21E+04	2.23E+04	9.19E+01	0.00E+00	4.71E+01	1.38E+01	**-9.00E+05**	**-9.00E+05**	0.001%
2005	35	-4.35E+06	4.35E+06	3.82E+03	0.00E+00	1.16E+01	6.34E+02	0.00E+00	1.74E+04	0.00E+00	-4.84E-01	2.21E+05	2.00E+05	6.65E+02	0.00E+00	8.50E+02	4.18E+02	**-4.35E+06**	**-4.35E+06**	0.000%
2005	39	-1.59E+06	1.58E+06	-8.45E+03	5.09E+02	1.06E+01	9.50E+02	0.00E+00	0.00E+00	5.04E+00	-2.02E-02	2.03E+05	2.11E+05	5.01E+02	0.00E+00	3.10E+02	6.76E+01	**-1.59E+06**	**-1.59E+06**	0.000%
2005	21	-3.30E+05	3.29E+05	-1.23E+03	0.00E+00	2.59E+00	2.49E+02	0.00E+00	0.00E+00	3.63E+00	-2.65E-01	3.60E+04	3.73E+04	1.67E+02	0.00E+00	5.12E+01	1.12E+01	**-3.30E+05**	**-3.30E+05**	0.005%
2005	27	-1.24E+06	1.24E+06	-6.44E+02	6.87E+01	2.58E+01	1.91E+03	0.00E+00	1.60E+02	5.57E-01	-2.13E-01	3.29E+05	3.29E+05	1.49E+03	0.00E+00	5.24E+02	1.69E+02	**-1.24E+06**	**-1.24E+06**	0.001%
2005	34	-3.22E+05	3.44E+05	2.23E+04	0.00E+00	4.16E+00	7.09E+01	0.00E+00	2.41E+04	0.00E+00	-1.05E+00	6.22E+04	1.57E+04	2.26E+01	0.00E+00	3.09E+02	1.52E+02	**-3.22E+05**	**-3.22E+05**	0.000%
2005	20	-5.25E+05	5.25E+05	-1.86E+02	0.00E+00	3.73E+00	3.39E+02	0.00E+00	0.00E+00	0.00E+00	-5.48E-02	4.58E+04	4.60E+04	3.16E+02	0.00E+00	6.49E+01	2.20E+01	**-5.25E+05**	**-5.25E+05**	0.000%
2005	33	-3.80E+05	3.99E+05	1.90E+04	6.76E+02	4.21E+00	6.16E+01	0.00E+00	2.65E+04	0.00E+00	-9.35E-01	8.73E+04	4.10E+04	5.88E+01	0.00E+00	3.77E+02	1.97E+02	**-3.80E+05**	**-3.80E+05**	0.000%
2005	32	-3.82E+06	3.84E+06	1.90E+04	1.82E+03	3.22E+01	1.23E+03	1.21E+03	1.51E+05	0.00E+00	-1.75E+00	5.31E+05	3.57E+05	2.50E+03	0.00E+00	2.13E+03	1.46E+03	**-3.82E+06**	**-3.82E+06**	0.000%
2005	22	-7.66E+05	7.52E+05	-1.42E+04	5.39E+02	1.20E+01	9.76E+02	0.00E+00	0.00E+00	0.00E+00	-2.10E-02	1.05E+05	1.18E+05	1.20E+03	0.00E+00	1.51E+02	6.99E+01	**-7.66E+05**	**-7.66E+05**	0.000%
2005	26	-2.73E+05	2.75E+05	2.13E+03	0.00E+00	8.91E-01	4.85E+01	0.00E+00	0.00E+00	0.00E+00	-4.77E-02	8.56E+03	6.45E+03	2.72E+01	0.00E+00	1.59E+01	1.09E+01	**-2.73E+05**	**-2.73E+05**	0.000%
2005	25	-6.25E+05	6.29E+05	3.94E+03	1.74E+02	3.66E+00	2.16E+02	0.00E+00	1.34E+02	0.00E+00	-8.73E-02	3.61E+04	3.18E+04	2.49E+02	0.00E+00	6.43E+01	4.02E+01	**-6.25E+05**	**-6.25E+05**	0.000%

Table 5. Mass Balance of Mercury

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2006	1	-4.24E+05	4.28E+05	3.49E+03	0.00E+00	1.58E+00	1.04E+02	0.00E+00	6.16E+03	1.76E-01	-3.23E-01	5.18E+04	4.22E+04	1.09E+01	0.00E+00	3.77E+01	2.71E+01	**-4.24E+05**	**-4.24E+05**	0.000%
2006	38	-9.94E+05	9.94E+05	2.56E+02	0.00E+00	4.97E+00	6.36E+02	0.00E+00	4.03E+03	3.51E+01	-2.22E+00	9.22E+04	8.85E+04	6.91E+01	0.00E+00	1.42E+01	2.11E+01	**-9.94E+05**	**-9.94E+05**	0.011%
2006	23	-8.71E+05	8.71E+05	-9.38E+01	0.00E+00	1.33E+00	1.77E+02	0.00E+00	0.00E+00	1.68E+00	-1.48E-01	2.07E+04	2.09E+04	1.08E+02	0.00E+00	1.36E+01	1.35E+01	**-8.71E+05**	**-8.71E+05**	0.001%
2006	35	-4.16E+06	4.16E+06	2.71E+03	0.00E+00	1.16E+01	7.12E+02	0.00E+00	1.37E+04	0.00E+00	-4.58E-01	2.06E+05	1.90E+05	7.82E+02	0.00E+00	4.18E+02	2.94E+02	**-4.16E+06**	**-4.16E+06**	0.000%
2006	39	-1.53E+06	1.52E+06	-7.18E+03	9.95E+02	1.06E+01	1.07E+03	0.00E+00	0.00E+00	3.02E+00	-1.25E+00	1.76E+05	1.83E+05	6.22E+02	0.00E+00	6.65E+01	8.38E+01	**-1.53E+06**	**-1.53E+06**	0.001%
2006	21	-3.09E+05	3.08E+05	-1.00E+03	0.00E+00	2.59E+00	2.83E+02	0.00E+00	0.00E+00	2.41E+00	-8.40E-01	3.16E+04	3.27E+04	2.02E+02	0.00E+00	1.04E+01	1.22E+01	**-3.09E+05**	**-3.09E+05**	0.007%
2006	27	-1.17E+06	1.17E+06	-2.27E+03	1.26E+02	2.58E+01	2.15E+03	0.00E+00	1.82E+02	0.00E+00	-1.85E+00	2.99E+05	3.02E+05	1.65E+03	0.00E+00	1.68E+02	2.03E+02	**-1.17E+06**	**-1.17E+06**	0.001%
2006	34	-2.93E+05	3.15E+05	2.19E+04	0.00E+00	4.16E+00	8.05E+01	0.00E+00	2.00E+04	0.00E+00	-1.26E+00	5.55E+04	1.37E+04	1.47E+01	0.00E+00	1.52E+02	1.18E+02	**-2.93E+05**	**-2.93E+05**	0.000%
2006	20	-4.82E+05	4.81E+05	-3.89E+02	0.00E+00	3.73E+00	3.85E+02	0.00E+00	0.00E+00	0.00E+00	-2.91E-01	4.03E+04	4.07E+04	3.87E+02	0.00E+00	2.18E+01	2.10E+01	**-4.82E+05**	**-4.82E+05**	0.001%
2006	33	-3.48E+05	3.67E+05	1.95E+04	1.44E+03	4.21E+00	7.51E+01	0.00E+00	2.10E+04	0.00E+00	-1.26E+00	8.06E+04	3.86E+04	5.39E+01	0.00E+00	1.97E+02	1.53E+02	**-3.48E+05**	**-3.48E+05**	0.000%
2006	32	-3.57E+06	3.60E+06	2.73E+04	3.42E+03	3.22E+01	1.38E+03	1.72E+03	1.18E+05	0.00E+00	-2.94E+00	5.10E+05	3.58E+05	2.64E+03	0.00E+00	1.46E+03	1.05E+03	**-3.57E+06**	**-3.57E+06**	0.000%
2006	22	-7.24E+05	7.11E+05	-1.32E+04	9.91E+02	1.20E+01	1.10E+03	0.00E+00	0.00E+00	6.41E-02	-4.47E-01	9.99E+04	1.12E+05	1.43E+03	0.00E+00	6.95E+01	7.84E+01	**-7.24E+05**	**-7.24E+05**	0.001%
2006	26	-2.71E+05	2.73E+05	1.74E+03	0.00E+00	8.91E-01	5.52E+01	0.00E+00	0.00E+00	0.00E+00	-5.83E-02	8.08E+03	6.37E+03	2.95E+01	0.00E+00	1.09E+01	8.28E+00	**-2.71E+05**	**-2.71E+05**	0.000%
2006	25	-5.94E+05	5.98E+05	3.98E+03	4.42E+02	3.66E+00	2.39E+02	0.00E+00	1.11E+02	0.00E+00	-1.34E-01	3.48E+04	3.02E+04	2.23E+02	0.00E+00	4.02E+01	3.30E+01	**-5.94E+05**	**-5.94E+05**	0.000%
2007	1	-5.43E+05	5.47E+05	3.55E+03	0.00E+00	1.58E+00	1.23E+02	0.00E+00	8.53E+03	2.40E-02	-1.64E+00	5.23E+04	4.04E+04	-8.04E-01	0.00E+00	2.71E+01	3.31E+01	**-5.43E+05**	**-5.43E+05**	0.001%
2007	38	-1.18E+06	1.18E+06	2.51E+03	0.00E+00	4.97E+00	7.07E+02	0.00E+00	4.88E+03	4.78E+01	-1.35E+00	9.36E+04	8.71E+04	5.41E+01	0.00E+00	2.11E+01	3.12E+01	**-1.18E+06**	**-1.18E+06**	0.024%
2007	23	-1.02E+06	1.02E+06	-2.34E+02	0.00E+00	1.33E+00	1.89E+02	0.00E+00	0.00E+00	1.08E+00	-2.54E-02	1.99E+04	2.02E+04	1.17E+02	0.00E+00	1.35E+01	1.56E+01	**-1.02E+06**	**-1.02E+06**	0.001%
2007	35	-4.91E+06	4.91E+06	3.01E+03	0.00E+00	1.16E+01	7.64E+02	0.00E+00	1.33E+04	0.00E+00	-8.37E-01	2.06E+05	1.90E+05	7.50E+02	0.00E+00	2.94E+02	3.67E+02	**-4.91E+06**	**-4.91E+06**	0.000%
2007	39	-1.78E+06	1.78E+06	-2.68E+03	9.52E+02	1.06E+01	1.14E+03	0.00E+00	0.00E+00	5.88E-01	-5.54E-01	1.79E+05	1.81E+05	6.27E+02	0.00E+00	8.38E+01	9.78E+01	**-1.78E+06**	**-1.78E+06**	0.001%
2007	21	-3.79E+05	3.79E+05	1.33E+02	0.00E+00	2.59E+00	2.99E+02	0.00E+00	0.00E+00	4.86E+00	-1.77E-01	3.34E+04	3.34E+04	1.95E+02	0.00E+00	1.22E+01	2.20E+01	**-3.79E+05**	**-3.79E+05**	0.007%
2007	27	-1.36E+06	1.37E+06	3.25E+03	1.34E+02	2.58E+01	2.26E+03	0.00E+00	1.67E+02	0.00E+00	-8.18E-01	3.08E+05	3.05E+05	1.57E+03	0.00E+00	2.03E+02	1.92E+02	**-1.36E+06**	**-1.36E+06**	0.001%
2007	34	-3.51E+05	3.76E+05	2.53E+04	0.00E+00	4.16E+00	8.42E+01	0.00E+00	1.92E+04	0.00E+00	-2.41E+00	5.82E+04	1.38E+04	2.08E+01	0.00E+00	1.18E+02	1.47E+02	**-3.51E+05**	**-3.51E+05**	0.000%
2007	20	-5.85E+05	5.85E+05	7.99E+02	0.00E+00	3.73E+00	4.06E+02	0.00E+00	0.00E+00	0.00E+00	-2.69E-01	4.19E+04	4.11E+04	3.25E+02	0.00E+00	2.10E+01	2.56E+01	**-5.85E+05**	**-5.85E+05**	0.001%
2007	33	-4.07E+05	4.30E+05	2.22E+04	1.80E+03	4.21E+00	7.87E+01	0.00E+00	2.03E+04	0.00E+00	-2.14E+00	8.25E+04	3.83E+04	5.09E+01	0.00E+00	1.53E+02	1.87E+02	**-4.07E+05**	**-4.07E+05**	0.000%
2007	32	-4.11E+06	4.15E+06	4.01E+04	3.90E+03	3.22E+01	1.43E+03	1.86E+03	1.12E+05	0.00E+00	-5.06E+00	5.20E+05	3.61E+05	2.49E+03	0.00E+00	1.05E+03	1.31E+03	**-4.11E+06**	**-4.11E+06**	0.000%
2007	22	-8.48E+05	8.36E+05	-1.18E+04	1.12E+03	1.20E+01	1.14E+03	0.00E+00	0.00E+00	2.63E-01	-2.08E-01	1.04E+05	1.15E+05	1.45E+03	0.00E+00	7.84E+01	9.95E+01	**-8.48E+05**	**-8.48E+05**	0.001%
2007	26	-3.14E+05	3.17E+05	2.44E+03	0.00E+00	8.91E-01	5.70E+01	0.00E+00	0.00E+00	0.00E+00	-9.40E-02	8.52E+03	6.11E+03	2.55E+01	0.00E+00	8.28E+00	1.14E+01	**-3.14E+05**	**-3.14E+05**	0.000%
2007	25	-6.87E+05	6.92E+05	4.20E+03	6.50E+02	3.66E+00	2.49E+02	0.00E+00	1.01E+02	0.00E+00	-2.13E-01	3.58E+04	3.09E+04	2.37E+02	0.00E+00	3.30E+01	4.56E+01	**-6.87E+05**	**-6.87E+05**	0.000%
2008	1	-3.85E+05	3.87E+05	2.08E+03	0.00E+00	1.59E+00	1.19E+02	0.00E+00	1.12E+04	9.60E-01	-2.16E-01	5.01E+04	3.70E+04	-5.54E+00	0.00E+00	3.30E+01	3.57E+01	**-3.85E+05**	**-3.85E+05**	-0.001%
2008	38	-9.07E+05	9.05E+05	-1.55E+03	0.00E+00	4.98E+00	6.79E+02	0.00E+00	6.11E+03	4.11E+01	2.23E-01	8.59E+04	8.20E+04	4.32E+01	0.00E+00	3.12E+01	3.38E+01	**-9.07E+05**	**-9.07E+05**	0.008%
2008	23	-8.03E+05	8.03E+05	6.71E+00	0.00E+00	1.33E+00	1.75E+02	0.00E+00	0.00E+00	9.64E+00	-1.50E-02	1.97E+04	1.98E+04	8.28E+01	0.00E+00	1.56E+01	1.59E+01	**-8.03E+05**	**-8.03E+05**	0.001%
2008	35	-3.84E+06	3.84E+06	1.28E+03	0.00E+00	1.16E+01	7.18E+02	0.00E+00	1.35E+04	0.00E+00	-2.20E-01	2.01E+05	1.87E+05	5.62E+02	0.00E+00	3.67E+02	3.71E+02	**-3.84E+06**	**-3.84E+06**	0.000%
2008	39	-1.41E+06	1.41E+06	-7.08E+03	7.38E+02	1.06E+01	1.07E+03	0.00E+00	0.00E+00	5.04E-01	2.43E-04	1.78E+05	1.85E+05	6.41E+02	0.00E+00	9.78E+01	1.07E+02	**-1.41E+06**	**-1.41E+06**	0.001%
2008	21	-2.86E+05	2.85E+05	-6.84E+02	0.00E+00	2.59E+00	2.82E+02	0.00E+00	0.00E+00	5.12E+00	-1.04E-02	3.42E+04	3.49E+04	2.33E+02	0.00E+00	2.20E+01	1.61E+01	**-2.86E+05**	**-2.86E+05**	0.004%
2008	27	-1.05E+06	1.05E+06	-3.26E+03	9.62E+01	2.59E+01	2.10E+03	0.00E+00	1.51E+02	0.00E+00	-9.98E-02	2.94E+05	2.98E+05	1.64E+03	0.00E+00	1.92E+02	2.29E+02	**-1.05E+06**	**-1.05E+06**	0.001%

Table 5. Mass Balance of Mercury

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2008	34	-2.67E+05	2.88E+05	2.12E+04	0.00E+00	4.17E+00	7.98E+01	0.00E+00	1.97E+04	0.00E+00	-1.03E+00	5.47E+04	1.39E+04	1.60E+01	0.00E+00	1.47E+02	1.48E+02	**-2.67E+05**	**-2.67E+05**	0.000%
2008	20	-4.40E+05	4.39E+05	-3.85E+02	0.00E+00	3.74E+00	3.80E+02	0.00E+00	0.00E+00	0.00E+00	-3.62E-02	4.08E+04	4.12E+04	3.64E+02	0.00E+00	2.55E+01	3.04E+01	**-4.40E+05**	**-4.40E+05**	0.000%
2008	33	-3.12E+05	3.30E+05	1.86E+04	1.26E+03	4.22E+00	7.19E+01	0.00E+00	2.05E+04	0.00E+00	-1.03E+00	7.51E+04	3.48E+04	4.41E+01	0.00E+00	1.87E+02	1.86E+02	**-3.12E+05**	**-3.12E+05**	0.000%
2008	32	-3.20E+06	3.22E+06	2.46E+04	3.02E+03	3.23E+01	1.37E+03	1.63E+03	1.11E+05	0.00E+00	-2.15E+00	4.65E+05	3.24E+05	2.56E+03	0.00E+00	1.31E+03	1.30E+03	**-3.20E+06**	**-3.20E+06**	0.000%
2008	22	-6.32E+05	6.20E+05	-1.25E+04	8.81E+02	1.20E+01	1.07E+03	0.00E+00	0.00E+00	4.54E-01	-3.07E-02	9.00E+04	1.01E+05	1.24E+03	0.00E+00	9.95E+01	7.73E+01	**-6.32E+05**	**-6.32E+05**	0.000%
2008	26	-2.26E+05	2.27E+05	1.58E+03	0.00E+00	8.93E-01	5.28E+01	0.00E+00	0.00E+00	0.00E+00	-4.99E-02	7.26E+03	5.70E+03	2.83E+01	0.00E+00	1.14E+01	1.07E+01	**-2.26E+05**	**-2.26E+05**	0.000%
2008	25	-5.21E+05	5.25E+05	3.35E+03	3.87E+02	3.67E+00	2.36E+02	0.00E+00	1.03E+02	0.00E+00	-1.04E-01	3.10E+04	2.71E+04	2.56E+02	0.00E+00	4.56E+01	3.94E+01	**-5.21E+05**	**-5.21E+05**	0.000%
2009	1	-3.73E+05	3.74E+05	1.11E+03	0.00E+00	1.58E+00	1.12E+02	0.00E+00	1.01E+04	5.00E-01	-1.29E-01	4.75E+04	3.65E+04	1.34E+00	0.00E+00	3.57E+01	2.13E+01	**-3.73E+05**	**-3.73E+05**	0.006%
2009	38	-8.38E+05	8.39E+05	1.39E+03	0.00E+00	4.97E+00	6.34E+02	0.00E+00	3.03E+03	3.65E+01	-6.06E-01	8.13E+04	7.75E+04	5.74E+01	0.00E+00	3.33E+01	1.07E+01	**-8.38E+05**	**-8.38E+05**	0.010%
2009	23	-7.52E+05	7.52E+05	-1.77E+02	0.00E+00	1.33E+00	1.64E+02	0.00E+00	0.00E+00	1.10E+00	3.23E-03	1.79E+04	1.82E+04	1.01E+02	0.00E+00	1.59E+01	7.73E+00	**-7.52E+05**	**-7.52E+05**	0.004%
2009	35	-3.60E+06	3.60E+06	1.62E+03	0.00E+00	1.16E+01	6.65E+02	0.00E+00	1.24E+04	0.00E+00	5.76E-01	1.82E+05	1.69E+05	5.71E+02	0.00E+00	3.72E+02	2.72E+02	**-3.60E+06**	**-3.60E+06**	0.012%
2009	39	-1.33E+06	1.32E+06	-5.49E+03	7.23E+02	1.06E+01	1.00E+03	0.00E+00	0.00E+00	1.41E+00	-9.10E-03	1.65E+05	1.70E+05	5.31E+02	0.00E+00	1.07E+02	4.06E+01	**-1.33E+06**	**-1.33E+06**	0.005%
2009	21	-2.64E+05	2.63E+05	-9.42E+02	0.00E+00	2.59E+00	2.59E+02	0.00E+00	0.00E+00	6.53E+00	6.02E-03	3.14E+04	3.24E+04	1.82E+02	0.00E+00	1.61E+01	7.19E+00	**-2.64E+05**	**-2.64E+05**	0.010%
2009	27	-9.91E+05	9.90E+05	-1.70E+03	9.33E+01	2.58E+01	1.95E+03	0.00E+00	1.40E+02	0.00E+00	-1.50E-01	2.76E+05	2.78E+05	1.43E+03	0.00E+00	2.29E+02	1.07E+02	**-9.91E+05**	**-9.91E+05**	0.008%
2009	34	-2.53E+05	2.72E+05	1.84E+04	0.00E+00	4.16E+00	7.14E+01	0.00E+00	1.80E+04	0.00E+00	3.39E+00	4.92E+04	1.29E+04	1.17E+01	0.00E+00	1.53E+02	1.02E+02	**-2.53E+05**	**-2.53E+05**	0.025%
2009	20	-4.30E+05	4.29E+05	-1.09E+03	0.00E+00	3.73E+00	3.53E+02	0.00E+00	0.00E+00	0.00E+00	-3.31E-02	3.83E+04	3.95E+04	2.93E+02	0.00E+00	3.04E+01	1.34E+01	**-4.30E+05**	**-4.30E+05**	0.005%
2009	33	-3.02E+05	3.21E+05	1.94E+04	1.16E+03	4.21E+00	6.45E+01	0.00E+00	1.92E+04	0.00E+00	5.94E+00	7.08E+04	3.10E+04	4.71E+01	0.00E+00	1.93E+02	1.43E+02	**-3.02E+05**	**-3.02E+05**	0.014%
2009	32	-3.12E+06	3.14E+06	2.45E+04	2.90E+03	3.22E+01	1.26E+03	1.59E+03	1.06E+05	0.00E+00	-1.26E+01	4.49E+05	3.13E+05	2.58E+03	0.00E+00	1.29E+03	9.39E+02	**-3.12E+06**	**-3.12E+06**	0.014%
2009	22	-6.26E+05	6.10E+05	-1.59E+04	8.53E+02	1.20E+01	9.93E+02	0.00E+00	0.00E+00	0.00E+00	-2.04E-02	8.88E+04	1.04E+05	1.18E+03	0.00E+00	7.73E+01	4.72E+01	**-6.26E+05**	**-6.26E+05**	0.004%
2009	26	-2.32E+05	2.34E+05	1.72E+03	0.00E+00	8.91E-01	4.91E+01	0.00E+00	0.00E+00	0.00E+00	-4.39E-02	7.47E+03	5.77E+03	2.38E+01	0.00E+00	1.07E+01	6.99E+00	**-2.32E+05**	**-2.32E+05**	0.000%
2009	25	-5.16E+05	5.20E+05	3.60E+03	3.29E+02	3.66E+00	2.16E+02	0.00E+00	1.06E+02	0.00E+00	-9.60E-02	3.12E+04	2.72E+04	2.11E+02	0.00E+00	3.94E+01	2.66E+01	**-5.16E+05**	**-5.16E+05**	0.002%
2010	1	-4.33E+05	4.35E+05	2.06E+03	0.00E+00	1.58E+00	9.90E+01	0.00E+00	1.14E+04	5.31E-02	-2.99E-01	4.72E+04	3.44E+04	-1.95E+00	0.00E+00	2.13E+01	3.02E+01	**-4.33E+05**	**-4.33E+05**	0.135%
2010	38	-9.72E+05	9.72E+05	6.15E+02	0.00E+00	4.97E+00	5.70E+02	0.00E+00	4.39E+03	3.86E+01	-2.16E+00	8.75E+04	8.34E+04	3.79E+01	0.00E+00	9.15E+00	2.63E+01	**-9.72E+05**	**-9.72E+05**	0.044%
2010	23	-8.51E+05	8.51E+05	-1.55E+02	0.00E+00	1.33E+00	1.49E+02	0.00E+00	0.00E+00	3.43E+00	-6.49E-02	1.93E+04	1.95E+04	1.32E+02	0.00E+00	7.68E+00	1.35E+01	**-8.51E+05**	**-8.51E+05**	0.005%
2010	35	-4.04E+06	4.05E+06	7.57E+03	0.00E+00	1.16E+01	6.11E+02	0.00E+00	1.23E+04	0.00E+00	-6.42E-01	1.93E+05	1.77E+05	6.17E+02	0.00E+00	2.72E+02	3.10E+02	**-4.05E+06**	**-4.04E+06**	0.089%
2010	39	-1.50E+06	1.49E+06	-1.16E+04	5.84E+02	1.06E+01	9.26E+02	0.00E+00	0.00E+00	1.62E+01	-8.29E-01	1.80E+05	1.93E+05	5.43E+02	0.00E+00	3.99E+01	6.67E+01	**-1.50E+06**	**-1.50E+06**	0.051%
2010	21	-2.96E+05	2.96E+05	1.15E+01	0.00E+00	2.59E+00	2.39E+02	0.00E+00	0.00E+00	3.27E+00	-6.61E-01	3.31E+04	3.33E+04	1.96E+02	0.00E+00	6.59E+00	1.56E+01	**-2.96E+05**	**-2.96E+05**	0.032%
2010	27	-1.09E+06	1.10E+06	8.16E+03	7.46E+01	2.58E+01	1.87E+03	0.00E+00	1.28E+02	1.50E-01	-1.64E+00	3.10E+05	3.06E+05	1.49E+03	0.00E+00	1.06E+02	1.83E+02	**-1.10E+06**	**-1.09E+06**	0.358%
2010	34	-2.71E+05	2.93E+05	2.20E+04	0.00E+00	4.16E+00	6.69E+01	0.00E+00	1.70E+04	0.00E+00	-1.23E+00	5.20E+04	1.32E+04	1.40E+01	0.00E+00	1.02E+02	1.17E+02	**-2.71E+05**	**-2.71E+05**	0.045%
2010	20	-4.68E+05	4.68E+05	1.89E+02	0.00E+00	3.73E+00	3.26E+02	0.00E+00	0.00E+00	0.00E+00	-3.55E-01	4.03E+04	4.02E+04	3.52E+02	0.00E+00	1.32E+01	2.35E+01	**-4.68E+05**	**-4.68E+05**	0.026%
2010	33	-3.22E+05	3.44E+05	2.20E+04	1.02E+03	4.21E+00	5.95E+01	0.00E+00	1.81E+04	0.00E+00	-1.32E+00	7.24E+04	3.15E+04	3.98E+01	0.00E+00	1.42E+02	1.48E+02	**-3.22E+05**	**-3.22E+05**	0.056%
2010	32	-3.31E+06	3.35E+06	3.78E+04	2.51E+03	3.22E+01	1.19E+03	1.58E+03	1.02E+05	0.00E+00	-3.04E+00	4.57E+05	3.16E+05	2.55E+03	0.00E+00	9.39E+02	1.07E+03	**-3.32E+06**	**-3.31E+06**	0.133%
2010	22	-6.66E+05	6.56E+05	-1.03E+04	7.31E+02	1.20E+01	9.33E+02	0.00E+00	0.00E+00	1.18E-01	-5.65E-01	9.35E+04	1.03E+05	1.15E+03	0.00E+00	4.67E+01	8.06E+01	**-6.67E+05**	**-6.66E+05**	0.049%
2010	26	-2.51E+05	2.53E+05	1.70E+03	0.00E+00	8.91E-01	4.74E+01	0.00E+00	0.00E+00	0.00E+00	-5.90E-02	7.81E+03	6.18E+03	1.74E+01	0.00E+00	6.99E+00	9.30E+00	**-2.51E+05**	**-2.51E+05**	0.019%
2010	25	-5.52E+05	5.55E+05	3.25E+03	3.66E+02	3.66E+00	2.08E+02	0.00E+00	9.71E+01	0.00E+00	-1.22E-01	3.14E+04	2.78E+04	2.17E+02	0.00E+00	2.65E+01	3.88E+01	**-5.52E+05**	**-5.52E+05**	0.010%

Table 5. Mass Balance of Mercury

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2011	1	-9.95E+05	9.98E+05	2.85E+03	0.00E+00	1.58E+00	1.34E+02	0.00E+00	1.43E+04	1.61E-01	9.25E-01	6.01E+04	4.32E+04	-3.32E+00	0.00E+00	3.02E+01	6.49E+01	**-9.95E+05**	**-9.95E+05**	0.004%
2011	38	-1.88E+06	1.90E+06	2.20E+04	0.00E+00	4.97E+00	7.18E+02	0.00E+00	1.00E+04	6.50E+01	-1.01E+01	1.28E+05	9.71E+04	2.29E+01	0.00E+00	2.63E+01	6.68E+01	**-1.88E+06**	**-1.88E+06**	0.015%
2011	23	-1.60E+06	1.60E+06	1.54E+03	0.00E+00	1.33E+00	1.75E+02	0.00E+00	0.00E+00	8.05E+00	-4.13E-01	2.69E+04	2.54E+04	1.12E+02	0.00E+00	1.35E+01	3.20E+01	**-1.60E+06**	**-1.60E+06**	0.002%
2011	35	-7.43E+06	7.46E+06	3.19E+04	0.00E+00	1.16E+01	7.47E+02	0.00E+00	1.31E+04	0.00E+00	-1.96E+01	2.81E+05	2.37E+05	5.65E+02	0.00E+00	3.10E+02	5.20E+02	**-7.43E+06**	**-7.43E+06**	0.008%
2011	39	-2.73E+06	2.75E+06	1.65E+04	5.50E+02	1.06E+01	1.14E+03	0.00E+00	0.00E+00	4.81E+00	-9.27E+00	2.67E+05	2.51E+05	6.83E+02	0.00E+00	6.67E+01	1.41E+02	**-2.73E+06**	**-2.73E+06**	0.004%
2011	21	-5.36E+05	5.43E+05	7.05E+03	0.00E+00	2.59E+00	2.88E+02	0.00E+00	0.00E+00	1.25E+01	-1.93E+00	5.34E+04	4.65E+04	2.20E+02	0.00E+00	1.56E+01	3.90E+01	**-5.36E+05**	**-5.36E+05**	0.023%
2011	27	-1.67E+06	1.71E+06	4.35E+04	2.20E+02	2.58E+01	2.28E+03	0.00E+00	1.39E+02	0.00E+00	-1.25E+01	4.67E+05	4.24E+05	1.48E+03	0.00E+00	1.83E+02	2.48E+02	**-1.67E+06**	**-1.67E+06**	0.007%
2011	34	-4.66E+05	5.23E+05	5.73E+04	0.00E+00	4.16E+00	8.16E+01	0.00E+00	1.92E+04	0.00E+00	-1.37E+01	9.59E+04	1.97E+04	2.16E+01	0.00E+00	1.17E+02	2.52E+02	**-4.66E+05**	**-4.66E+05**	0.023%
2011	20	-8.16E+05	8.25E+05	9.24E+03	0.00E+00	3.73E+00	3.93E+02	0.00E+00	0.00E+00	7.77E-03	-3.26E+00	6.49E+04	5.58E+04	3.57E+02	0.00E+00	2.35E+01	3.70E+01	**-8.16E+05**	**-8.16E+05**	0.009%
2011	33	-5.20E+05	5.73E+05	5.30E+04	1.25E+03	4.21E+00	7.30E+01	0.00E+00	1.93E+04	0.00E+00	-1.14E+01	1.14E+05	4.07E+04	3.75E+01	0.00E+00	1.48E+02	2.97E+02	**-5.20E+05**	**-5.20E+05**	0.010%
2011	32	-4.74E+06	4.85E+06	1.08E+05	2.33E+03	3.22E+01	1.28E+03	1.54E+03	9.69E+04	3.09E-03	-3.06E+01	6.05E+05	3.99E+05	1.70E+03	0.00E+00	1.07E+03	1.51E+03	**-4.74E+06**	**-4.74E+06**	0.038%
2011	22	-9.70E+05	9.70E+05	-1.72E+02	6.79E+02	1.20E+01	1.03E+03	0.00E+00	0.00E+00	6.43E-02	-2.64E+00	1.41E+05	1.40E+05	1.25E+03	0.00E+00	8.06E+01	7.52E+01	**-9.71E+05**	**-9.70E+05**	0.014%
2011	26	-3.87E+05	3.90E+05	2.71E+03	0.00E+00	8.91E-01	5.25E+01	0.00E+00	0.00E+00	0.00E+00	-3.30E-01	1.13E+04	8.67E+03	2.26E+01	0.00E+00	9.30E+00	1.17E+01	**-3.87E+05**	**-3.87E+05**	0.001%
2011	25	-7.69E+05	7.77E+05	8.69E+03	7.30E+02	3.66E+00	2.22E+02	0.00E+00	8.78E+01	0.00E+00	-1.08E+00	4.40E+04	3.46E+04	1.83E+02	0.00E+00	3.88E+01	3.88E+01	**-7.69E+05**	**-7.69E+05**	0.006%
2012	1	-4.91E+05	4.94E+05	2.49E+03	0.00E+00	1.59E+00	1.06E+02	0.00E+00	1.87E+04	3.27E-01	-7.76E-01	6.29E+04	4.18E+04	-1.22E+00	0.00E+00	6.47E+01	4.38E+01	**-4.91E+05**	**-4.91E+05**	0.000%
2012	38	-1.09E+06	1.08E+06	-1.06E+04	0.00E+00	4.98E+00	5.76E+02	0.00E+00	1.30E+04	5.37E+00	5.54E-01	1.04E+05	1.02E+05	1.37E+01	0.00E+00	6.68E+01	2.52E+01	**-1.09E+06**	**-1.09E+06**	0.009%
2012	23	-9.90E+05	9.90E+05	3.15E+02	0.00E+00	1.33E+00	1.31E+02	0.00E+00	0.00E+00	0.00E+00	-3.38E-02	2.32E+04	2.29E+04	4.83E+01	0.00E+00	3.20E+01	8.96E+00	**-9.90E+05**	**-9.90E+05**	0.001%
2012	35	-4.63E+06	4.64E+06	3.00E+03	0.00E+00	1.16E+01	5.71E+02	0.00E+00	1.35E+04	0.00E+00	-3.88E-01	2.35E+05	2.19E+05	3.88E+02	0.00E+00	5.20E+02	3.08E+02	**-4.63E+06**	**-4.63E+06**	0.000%
2012	39	-1.76E+06	1.73E+06	-2.06E+04	1.79E+02	1.06E+01	8.48E+02	0.00E+00	0.00E+00	0.00E+00	3.81E-01	2.24E+05	2.45E+05	5.89E+02	0.00E+00	1.41E+02	6.44E+01	**-1.76E+06**	**-1.76E+06**	0.000%
2012	21	-3.32E+05	3.29E+05	-3.02E+03	0.00E+00	2.59E+00	2.30E+02	0.00E+00	0.00E+00	1.15E+00	1.53E-02	4.21E+04	4.52E+04	1.52E+02	0.00E+00	3.90E+01	1.34E+01	**-3.32E+05**	**-3.32E+05**	0.005%
2012	27	-1.10E+06	1.09E+06	-5.18E+03	7.84E+01	2.59E+01	1.69E+03	0.00E+00	1.09E+02	0.00E+00	-1.78E-02	3.63E+05	3.68E+05	1.47E+03	0.00E+00	2.48E+02	1.44E+02	**-1.10E+06**	**-1.10E+06**	0.000%
2012	34	-2.88E+05	3.16E+05	2.77E+04	0.00E+00	4.17E+00	6.14E+01	0.00E+00	1.99E+04	0.00E+00	-1.46E+00	6.48E+04	1.71E+04	1.30E+01	0.00E+00	2.52E+02	1.17E+02	**-2.88E+05**	**-2.88E+05**	0.000%
2012	20	-5.04E+05	5.03E+05	-1.04E+03	0.00E+00	3.74E+00	3.01E+02	0.00E+00	0.00E+00	0.00E+00	-3.94E-02	5.14E+04	5.25E+04	2.92E+02	0.00E+00	3.70E+01	1.91E+01	**-5.04E+05**	**-5.04E+05**	0.000%
2012	33	-3.34E+05	3.64E+05	2.96E+04	4.88E+02	4.22E+00	5.07E+01	0.00E+00	1.91E+04	0.00E+00	-1.71E+00	8.63E+04	3.70E+04	2.96E+01	0.00E+00	2.97E+02	1.44E+02	**-3.34E+05**	**-3.34E+05**	0.000%
2012	32	-3.11E+06	3.15E+06	3.88E+04	8.76E+02	3.23E+01	9.30E+02	1.34E+03	8.92E+04	0.00E+00	-2.98E+00	4.63E+05	3.32E+05	1.59E+03	0.00E+00	1.51E+03	8.60E+02	**-3.11E+06**	**-3.11E+06**	0.000%
2012	22	-6.42E+05	6.10E+05	-3.21E+04	2.63E+02	1.20E+01	7.68E+02	0.00E+00	0.00E+00	0.00E+00	1.29E-01	9.57E+04	1.27E+05	1.14E+03	0.00E+00	7.52E+01	4.80E+01	**-6.42E+05**	**-6.42E+05**	0.000%
2012	26	-2.18E+05	2.20E+05	2.00E+03	0.00E+00	8.93E-01	3.69E+01	0.00E+00	0.00E+00	0.00E+00	-5.56E-02	7.78E+03	5.79E+03	1.50E+01	0.00E+00	1.17E+01	5.79E+00	**-2.18E+05**	**-2.18E+05**	0.000%
2012	25	-4.78E+05	4.81E+05	3.73E+03	3.72E+02	3.67E+00	1.58E+02	0.00E+00	8.55E+01	0.00E+00	-1.17E-01	3.16E+04	2.74E+04	1.71E+02	0.00E+00	3.88E+01	2.37E+01	**-4.78E+05**	**-4.78E+05**	0.000%
2013	1	-4.15E+05	4.16E+05	1.02E+03	0.00E+00	1.58E+00	1.25E+02	0.00E+00	1.49E+04	8.94E-01	-3.54E-01	5.01E+04	3.43E+04	-2.01E+00	0.00E+00	4.38E+01	1.59E+01	**-4.15E+05**	**-4.15E+05**	0.000%
2013	38	-9.24E+05	9.18E+05	-6.07E+03	0.00E+00	4.97E+00	6.73E+02	0.00E+00	8.16E+03	3.38E+01	-3.98E+00	8.22E+04	8.08E+04	1.35E+01	0.00E+00	2.08E+01	8.31E+00	**-9.24E+05**	**-9.24E+05**	0.012%
2013	23	-8.08E+05	8.07E+05	-7.77E+02	0.00E+00	1.33E+00	1.55E+02	0.00E+00	0.00E+00	7.92E-01	-2.13E-01	1.68E+04	1.76E+04	7.59E+01	0.00E+00	8.74E+00	5.32E+00	**-8.08E+05**	**-8.08E+05**	0.001%
2013	35	-3.89E+06	3.89E+06	9.03E+02	0.00E+00	1.16E+01	6.53E+02	0.00E+00	1.10E+04	0.00E+00	-3.82E-01	1.82E+05	1.70E+05	4.20E+02	0.00E+00	3.08E+02	2.00E+02	**-3.89E+06**	**-3.89E+06**	0.000%
2013	39	-1.44E+06	1.43E+06	-5.23E+03	7.12E+02	1.06E+01	9.67E+02	0.00E+00	0.00E+00	1.59E-01	-6.13E-01	1.66E+05	1.71E+05	5.31E+02	0.00E+00	6.39E+01	3.12E+01	**-1.44E+06**	**-1.44E+06**	0.001%
2013	21	-2.98E+05	2.92E+05	-5.27E+03	0.00E+00	2.59E+00	2.59E+02	0.00E+00	0.00E+00	3.43E+00	-9.17E-01	3.26E+04	3.80E+04	1.49E+02	0.00E+00	1.24E+01	5.81E+00	**-2.98E+05**	**-2.98E+05**	0.007%
2013	27	-1.01E+06	1.01E+06	-1.66E+03	2.88E+02	2.58E+01	1.90E+03	0.00E+00	1.11E+02	0.00E+00	-6.31E-01	2.96E+05	2.98E+05	1.36E+03	0.00E+00	1.43E+02	9.00E+01	**-1.01E+06**	**-1.01E+06**	0.002%

Table 5. Mass Balance of Mercury

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2013	34	-2.65E+05	2.88E+05	2.21E+04	0.00E+00	4.16E+00	7.03E+01	0.00E+00	1.66E+04	0.00E+00	-1.35E+00	5.32E+04	1.46E+04	1.11E+01	0.00E+00	1.17E+02	8.47E+01	**-2.65E+05**	**-2.65E+05**	0.000%
2013	20	-4.66E+05	4.60E+05	-5.86E+03	0.00E+00	3.73E+00	3.40E+02	0.00E+00	0.00E+00	0.00E+00	5.42E-02	4.04E+04	4.64E+04	2.50E+02	0.00E+00	1.91E+01	1.11E+01	**-4.66E+05**	**-4.66E+05**	0.001%
2013	33	-3.14E+05	3.37E+05	2.34E+04	1.56E+03	4.21E+00	6.56E+01	0.00E+00	1.68E+04	0.00E+00	-1.62E+00	7.45E+04	3.27E+04	3.52E+01	0.00E+00	1.44E+02	1.04E+02	**-3.14E+05**	**-3.14E+05**	0.000%
2013	32	-3.00E+06	3.03E+06	2.99E+04	2.85E+03	3.22E+01	1.13E+03	1.59E+03	8.32E+04	0.00E+00	-2.81E+00	4.17E+05	2.99E+05	1.44E+03	0.00E+00	8.60E+02	7.70E+02	**-3.00E+06**	**-3.00E+06**	0.000%
2013	22	-6.01E+05	5.85E+05	-1.53E+04	8.33E+02	1.20E+01	8.80E+02	0.00E+00	0.00E+00	0.00E+00	7.44E-03	8.31E+04	9.75E+04	9.96E+02	0.00E+00	4.80E+01	3.90E+01	**-6.01E+05**	**-6.01E+05**	0.001%
2013	26	-2.15E+05	2.17E+05	1.89E+03	0.00E+00	8.91E-01	4.42E+01	0.00E+00	0.00E+00	0.00E+00	-5.73E-02	7.21E+03	5.35E+03	1.48E+01	0.00E+00	5.78E+00	5.34E+00	**-2.15E+05**	**-2.15E+05**	0.000%
2013	25	-4.76E+05	4.80E+05	3.38E+03	3.95E+02	3.66E+00	1.89E+02	0.00E+00	8.68E+01	0.00E+00	-1.20E-01	2.94E+04	2.55E+04	1.40E+02	0.00E+00	2.37E+01	2.17E+01	**-4.76E+05**	**-4.76E+05**	0.000%
2014	1	-4.30E+05	4.31E+05	1.04E+03	0.00E+00	6.09E-05	1.34E+02	0.00E+00	1.44E+04	1.19E-01	-1.59E-01	5.07E+04	3.54E+04	-2.08E+00	0.00E+00	1.59E+01	3.05E+01	**-4.30E+05**	**-4.30E+05**	0.000%
2014	38	-9.37E+05	9.40E+05	2.74E+03	0.00E+00	1.91E-04	6.90E+02	0.00E+00	7.85E+03	3.56E+01	-1.61E+00	8.57E+04	7.58E+04	1.75E+01	0.00E+00	6.91E+00	3.11E+01	**-9.37E+05**	**-9.37E+05**	0.005%
2014	23	-8.20E+05	8.20E+05	-3.35E+02	0.00E+00	5.08E-05	1.59E+02	0.00E+00	0.00E+00	3.14E+00	-8.98E-02	1.55E+04	1.59E+04	9.12E+01	0.00E+00	5.24E+00	1.46E+01	**-8.20E+05**	**-8.20E+05**	0.001%
2014	35	-3.95E+06	3.95E+06	-1.97E+02	0.00E+00	4.54E-04	6.95E+02	0.00E+00	1.09E+04	0.00E+00	-2.03E-01	1.69E+05	1.58E+05	4.35E+02	0.00E+00	2.00E+02	3.24E+02	**-3.95E+06**	**-3.95E+06**	0.000%
2014	39	-1.45E+06	1.45E+06	-2.41E+03	6.29E+02	4.15E-04	9.86E+02	0.00E+00	0.00E+00	1.64E+00	-7.23E-01	1.62E+05	1.65E+05	5.54E+02	0.00E+00	3.05E+01	9.24E+01	**-1.45E+06**	**-1.45E+06**	0.000%
2014	21	-2.99E+05	2.98E+05	-1.11E+03	0.00E+00	1.02E-04	2.72E+02	0.00E+00	0.00E+00	4.77E+00	-3.92E-01	3.40E+04	3.52E+04	1.50E+02	0.00E+00	5.44E+00	1.85E+01	**-2.99E+05**	**-2.99E+05**	0.004%
2014	27	-1.03E+06	1.03E+06	-5.56E+02	2.62E+02	1.02E-03	1.97E+03	0.00E+00	9.71E+01	6.89E-02	-1.05E+00	2.66E+05	2.67E+05	1.19E+03	0.00E+00	8.91E+01	2.07E+02	**-1.03E+06**	**-1.03E+06**	0.001%
2014	34	-2.64E+05	2.85E+05	2.07E+04	0.00E+00	1.64E-04	7.57E+01	0.00E+00	1.62E+04	0.00E+00	-1.10E+00	5.17E+04	1.49E+04	1.44E+01	0.00E+00	8.47E+01	1.31E+02	**-2.64E+05**	**-2.64E+05**	0.000%
2014	20	-4.66E+05	4.66E+05	1.39E+02	0.00E+00	1.47E-04	3.61E+02	0.00E+00	0.00E+00	0.00E+00	-5.19E-02	4.14E+04	4.13E+04	2.76E+02	0.00E+00	1.11E+01	2.73E+01	**-4.66E+05**	**-4.66E+05**	0.001%
2014	33	-3.11E+05	3.32E+05	2.10E+04	1.60E+03	1.66E-04	7.09E+01	0.00E+00	1.66E+04	0.00E+00	-1.31E+00	7.07E+04	3.15E+04	2.99E+01	0.00E+00	1.04E+02	1.70E+02	**-3.11E+05**	**-3.11E+05**	0.000%
2014	32	-3.22E+06	3.24E+06	1.35E+04	4.80E+03	1.27E-03	1.35E+03	1.62E+03	8.57E+04	0.00E+00	-1.68E+00	3.85E+05	2.79E+05	1.84E+03	0.00E+00	7.70E+02	1.36E+03	**-3.22E+06**	**-3.22E+06**	0.000%
2014	22	-6.38E+05	6.27E+05	-1.03E+04	8.22E+02	4.73E-04	1.01E+03	0.00E+00	0.00E+00	0.00E+00	6.56E-03	8.27E+04	9.22E+04	1.08E+03	0.00E+00	3.90E+01	1.27E+02	**-6.38E+05**	**-6.38E+05**	0.001%
2014	26	-2.28E+05	2.30E+05	1.41E+03	0.00E+00	3.51E-05	5.16E+01	0.00E+00	0.00E+00	0.00E+00	-5.42E-02	6.59E+03	5.23E+03	2.18E+01	0.00E+00	5.34E+00	1.26E+01	**-2.28E+05**	**-2.28E+05**	0.000%
2014	25	-5.38E+05	5.41E+05	3.05E+03	3.06E+02	1.44E-04	2.27E+02	0.00E+00	8.35E+01	0.00E+00	-9.99E-02	2.73E+04	2.39E+04	1.67E+02	0.00E+00	2.17E+01	5.14E+01	**-5.38E+05**	**-5.38E+05**	0.000%
2015	1	-3.47E+05	3.47E+05	4.00E+02	0.00E+00	5.88E-05	1.39E+02	0.00E+00	1.05E+04	2.55E-01	-5.25E-02	4.09E+04	3.02E+04	-4.08E+00	0.00E+00	3.05E+01	5.76E+01	**-3.47E+05**	**-3.47E+05**	0.000%
2015	38	-7.88E+05	7.85E+05	-2.41E+03	0.00E+00	1.84E-04	6.80E+02	0.00E+00	4.77E+03	5.84E+01	1.01E-01	6.53E+04	6.36E+04	2.44E+01	0.00E+00	3.11E+01	6.80E+01	**-7.88E+05**	**-7.88E+05**	0.006%
2015	23	-7.01E+05	7.01E+05	-3.45E+02	0.00E+00	4.91E-05	1.52E+02	0.00E+00	0.00E+00	6.59E-01	-1.53E-04	1.30E+04	1.34E+04	6.97E+01	0.00E+00	1.46E+01	2.38E+01	**-7.01E+05**	**-7.01E+05**	0.001%
2015	35	-3.39E+06	3.38E+06	-3.52E+03	0.00E+00	4.38E-04	6.68E+02	0.00E+00	9.07E+03	0.00E+00	-4.84E-02	1.39E+05	1.34E+05	4.88E+02	0.00E+00	3.24E+02	4.23E+02	**-3.39E+06**	**-3.39E+06**	0.000%
2015	39	-1.24E+06	1.23E+06	-6.38E+03	5.34E+02	4.01E-04	9.58E+02	0.00E+00	0.00E+00	5.17E+00	2.64E-03	1.39E+05	1.45E+05	5.70E+02	0.00E+00	9.24E+01	1.46E+02	**-1.24E+06**	**-1.24E+06**	0.001%
2015	21	-2.55E+05	2.54E+05	-1.51E+03	0.00E+00	9.83E-05	2.57E+02	0.00E+00	0.00E+00	1.99E+01	-7.77E-03	2.97E+04	3.13E+04	1.61E+02	0.00E+00	1.85E+01	3.10E+01	**-2.55E+05**	**-2.55E+05**	0.004%
2015	27	-9.02E+05	9.00E+05	-2.06E+03	2.00E+02	9.82E-04	1.89E+03	0.00E+00	7.57E+01	5.17E-02	-7.20E-02	2.24E+05	2.26E+05	1.36E+03	0.00E+00	2.07E+02	2.96E+02	**-9.02E+05**	**-9.02E+05**	0.001%
2015	34	-2.27E+05	2.44E+05	1.66E+04	0.00E+00	1.58E-04	7.23E+01	0.00E+00	1.40E+04	0.00E+00	-9.68E-01	4.36E+04	1.31E+04	1.23E+01	0.00E+00	1.31E+02	1.69E+02	**-2.27E+05**	**-2.27E+05**	0.000%
2015	20	-4.03E+05	4.03E+05	-8.89E+02	0.00E+00	1.42E-04	3.43E+02	0.00E+00	0.00E+00	0.00E+00	-3.11E-02	3.57E+04	3.67E+04	2.78E+02	0.00E+00	2.73E+01	4.24E+01	**-4.03E+05**	**-4.03E+05**	0.000%
2015	33	-2.67E+05	2.85E+05	1.77E+04	1.31E+03	1.60E-04	6.44E+01	0.00E+00	1.47E+04	0.00E+00	-1.17E+00	5.93E+04	2.57E+04	2.44E+01	0.00E+00	1.70E+02	2.22E+02	**-2.67E+05**	**-2.67E+05**	0.000%
2015	32	-2.87E+06	2.87E+06	7.93E+03	4.08E+03	1.22E-03	1.32E+03	1.46E+03	7.74E+04	0.00E+00	-1.35E+00	3.41E+05	2.50E+05	1.70E+03	0.00E+00	1.36E+03	1.45E+03	**-2.87E+06**	**-2.87E+06**	0.000%
2015	22	-5.59E+05	5.49E+05	-9.65E+03	7.34E+02	4.57E-04	9.80E+02	0.00E+00	0.00E+00	1.67E-01	-1.86E-02	7.40E+04	8.25E+04	1.39E+03	0.00E+00	1.27E+02	1.09E+02	**-5.59E+05**	**-5.59E+05**	0.000%
2015	26	-1.95E+05	1.96E+05	1.48E+03	0.00E+00	3.39E-05	4.99E+01	0.00E+00	0.00E+00	0.00E+00	-5.94E-02	5.95E+03	4.50E+03	2.04E+01	0.00E+00	1.26E+01	1.46E+01	**-1.95E+05**	**-1.95E+05**	0.000%
2015	25	-4.79E+05	4.81E+05	2.34E+03	2.89E+02	1.39E-04	2.26E+02	0.00E+00	7.71E+01	0.00E+00	-9.52E-02	2.45E+04	2.19E+04	1.71E+02	0.00E+00	5.14E+01	5.56E+01	**-4.79E+05**	**-4.79E+05**	0.000%

Table 5. Mass Balance of Mercury

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2016	1	-3.58E+05	3.58E+05	5.84E+02	0.00E+00	5.60E-05	1.23E+02	0.00E+00	1.21E+04	1.91E-02	1.62E+00	4.53E+04	3.27E+04	-3.05E+00	0.00E+00	5.74E+01	3.90E+01	**-3.58E+05**	**-3.58E+05**	0.000%
2016	38	-8.04E+05	8.03E+05	-5.88E+02	0.00E+00	1.75E-04	6.16E+02	0.00E+00	4.77E+03	9.16E+01	4.95E+00	7.07E+04	6.71E+04	2.73E+01	0.00E+00	6.80E+01	2.90E+01	**-8.04E+05**	**-8.04E+05**	0.011%
2016	23	-7.13E+05	7.12E+05	-3.06E+02	0.00E+00	4.67E-05	1.40E+02	0.00E+00	0.00E+00	4.68E-01	1.12E+00	1.39E+04	1.43E+04	7.48E+01	0.00E+00	2.38E+01	9.55E+00	**-7.13E+05**	**-7.13E+05**	0.001%
2016	35	-3.44E+06	3.44E+06	8.92E+01	0.00E+00	4.17E-04	6.24E+02	0.00E+00	9.24E+03	0.00E+00	1.10E+01	1.53E+05	1.44E+05	4.29E+02	0.00E+00	4.23E+02	2.93E+02	**-3.44E+06**	**-3.44E+06**	0.000%
2016	39	-1.26E+06	1.25E+06	-5.25E+03	4.18E+02	3.82E-04	8.75E+02	0.00E+00	0.00E+00	4.27E-01	7.98E+00	1.47E+05	1.52E+05	5.54E+02	0.00E+00	1.46E+02	6.77E+01	**-1.26E+06**	**-1.26E+06**	0.001%
2016	21	-2.64E+05	2.62E+05	-1.23E+03	0.00E+00	9.36E-05	2.43E+02	0.00E+00	0.00E+00	1.80E+01	2.28E+00	3.15E+04	3.28E+04	1.53E+02	0.00E+00	3.10E+01	1.54E+01	**-2.64E+05**	**-2.64E+05**	0.005%
2016	27	-9.25E+05	9.24E+05	-1.43E+03	1.61E+02	9.36E-04	1.77E+03	0.00E+00	7.90E+01	5.89E-02	2.21E+01	2.43E+05	2.44E+05	1.30E+03	0.00E+00	2.96E+02	1.94E+02	**-9.26E+05**	**-9.25E+05**	0.001%
2016	34	-2.33E+05	2.51E+05	1.76E+04	0.00E+00	1.51E-04	6.92E+01	0.00E+00	1.53E+04	0.00E+00	2.68E+00	4.75E+04	1.46E+04	1.26E+01	0.00E+00	1.68E+02	1.21E+02	**-2.33E+05**	**-2.33E+05**	0.000%
2016	20	-4.14E+05	4.13E+05	-6.14E+02	0.00E+00	1.35E-04	3.25E+02	0.00E+00	0.00E+00	0.00E+00	3.63E+00	3.81E+04	3.87E+04	2.78E+02	0.00E+00	4.24E+01	2.47E+01	**-4.14E+05**	**-4.14E+05**	0.000%
2016	33	-2.72E+05	2.91E+05	1.87E+04	1.06E+03	1.52E-04	6.07E+01	0.00E+00	1.58E+04	0.00E+00	2.79E+00	6.29E+04	2.73E+04	2.36E+01	0.00E+00	2.22E+02	1.56E+02	**-2.72E+05**	**-2.72E+05**	0.000%
2016	32	-2.94E+06	2.95E+06	1.00E+04	3.15E+03	1.16E-03	1.28E+03	1.34E+03	8.25E+04	0.00E+00	2.81E+01	3.59E+05	2.61E+05	2.16E+03	0.00E+00	1.45E+03	1.46E+03	**-2.94E+06**	**-2.94E+06**	0.000%
2016	22	-5.71E+05	5.62E+05	-9.47E+03	5.66E+02	4.35E-04	9.33E+02	0.00E+00	0.00E+00	0.00E+00	1.06E+01	7.64E+04	8.50E+04	1.31E+03	0.00E+00	1.09E+02	1.03E+02	**-5.71E+05**	**-5.71E+05**	0.000%
2016	26	-2.00E+05	2.01E+05	1.42E+03	0.00E+00	3.23E-05	4.82E+01	0.00E+00	0.00E+00	0.00E+00	6.19E-01	6.20E+03	4.81E+03	2.16E+01	0.00E+00	1.46E+01	1.32E+01	**-2.00E+05**	**-2.00E+05**	0.000%
2016	25	-4.89E+05	4.92E+05	2.67E+03	2.64E+02	1.33E-04	2.17E+02	0.00E+00	7.87E+01	0.00E+00	2.92E+00	2.57E+04	2.28E+04	1.54E+02	0.00E+00	5.56E+01	5.51E+01	**-4.89E+05**	**-4.89E+05**	0.000%

Table 6. Mass Balance for 1,2,3,7,8-PeCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1996	1	-4.74E+00	4.79E+00	4.97E-02	0.00E+00	1.32E-03	2.35E-05	0.00E+00	1.84E-02	6.53E-06	-8.34E-06	3.45E-01	2.75E-01	2.96E-04	0.00E+00	8.42E-04	3.76E-04	**-4.74E+00**	**-4.74E+00**	0.000%
1996	38	-1.12E+01	1.12E+01	-1.76E-03	0.00E+00	4.36E-03	8.46E-05	0.00E+00	2.62E-02	1.31E-03	1.19E-06	5.52E-01	5.23E-01	1.48E-04	0.00E+00	8.67E-04	3.63E-04	**-1.12E+01**	**-1.12E+01**	0.018%
1996	23	-1.08E+01	1.08E+01	3.64E-03	0.00E+00	1.22E-03	3.84E-05	0.00E+00	0.00E+00	2.90E-05	-6.07E-07	1.16E-01	1.11E-01	3.10E-04	0.00E+00	3.81E-04	3.75E-04	**-1.08E+01**	**-1.08E+01**	-0.001%
1996	35	-4.91E+01	4.91E+01	1.53E-02	0.00E+00	3.53E-03	2.05E-04	0.00E+00	7.88E-02	0.00E+00	-1.22E-06	1.25E+00	1.14E+00	3.05E-03	0.00E+00	7.25E-03	7.30E-03	**-4.91E+01**	**-4.91E+01**	-0.008%
1996	39	-1.89E+01	1.89E+01	-3.80E-02	3.14E-03	3.42E-03	2.34E-04	0.00E+00	0.00E+00	9.94E-06	6.90E-06	1.19E+00	1.21E+00	5.24E-03	0.00E+00	2.26E-03	2.20E-03	**-1.89E+01**	**-1.89E+01**	-0.005%
1996	21	-3.43E+00	3.44E+00	4.66E-03	0.00E+00	4.48E-04	4.38E-05	0.00E+00	0.00E+00	2.31E-05	6.93E-07	2.15E-01	2.09E-01	9.33E-04	0.00E+00	4.29E-04	4.93E-04	**-3.43E+00**	**-3.43E+00**	-0.001%
1996	27	-1.18E+01	1.19E+01	5.11E-02	5.38E-03	4.48E-03	3.86E-04	0.00E+00	8.31E-04	2.25E-06	-3.36E-06	1.89E+00	1.81E+00	1.11E-02	0.00E+00	4.86E-03	4.61E-03	**-1.18E+01**	**-1.18E+01**	-0.019%
1996	34	-3.18E+00	3.33E+00	1.48E-01	0.00E+00	7.21E-04	3.99E-05	0.00E+00	1.37E-01	0.00E+00	-1.29E-05	3.79E-01	9.05E-02	1.24E-03	0.00E+00	2.88E-03	3.37E-03	**-3.18E+00**	**-3.18E+00**	-0.053%
1996	20	-5.24E+00	5.25E+00	1.03E-02	0.00E+00	6.46E-04	5.75E-05	0.00E+00	0.00E+00	1.93E-06	-2.63E-07	2.76E-01	2.64E-01	9.87E-04	0.00E+00	6.54E-04	6.43E-04	**-5.24E+00**	**-5.24E+00**	-0.006%
1996	33	-3.42E+00	3.51E+00	9.57E-02	1.75E-02	7.30E-04	3.85E-05	0.00E+00	1.49E-01	0.00E+00	-1.01E-05	5.02E-01	2.36E-01	1.50E-03	0.00E+00	3.07E-03	3.72E-03	**-3.42E+00**	**-3.42E+00**	-0.055%
1996	32	-3.40E+01	3.40E+01	-7.22E-03	2.92E-02	5.57E-03	3.30E-04	4.08E-02	7.06E-01	0.00E+00	-7.60E-06	2.61E+00	1.82E+00	6.57E-03	0.00E+00	1.72E-02	1.99E-02	**-3.40E+01**	**-3.40E+01**	-0.030%
1996	22	-6.99E+00	6.94E+00	-5.04E-02	3.05E-02	2.08E-03	1.41E-04	0.00E+00	0.00E+00	8.18E-06	2.73E-07	4.97E-01	5.12E-01	1.27E-03	0.00E+00	1.69E-03	1.80E-03	**-6.99E+00**	**-6.99E+00**	-0.012%
1996	26	-2.62E+00	2.64E+00	1.20E-02	0.00E+00	1.54E-04	9.06E-06	0.00E+00	0.00E+00	0.00E+00	-5.21E-07	5.13E-02	3.88E-02	2.30E-04	0.00E+00	1.95E-04	2.29E-04	**-2.62E+00**	**-2.62E+00**	-0.004%
1996	25	-5.91E+00	5.93E+00	2.04E-02	2.42E-03	6.34E-04	3.42E-05	0.00E+00	7.18E-04	0.00E+00	-7.14E-07	1.92E-01	1.66E-01	1.04E-03	0.00E+00	7.43E-04	9.10E-04	**-5.91E+00**	**-5.91E+00**	-0.007%
1997	1	-3.93E+00	3.96E+00	2.74E-02	0.00E+00	1.28E-03	2.14E-05	0.00E+00	1.30E-02	5.00E-07	-2.91E-06	2.93E-01	2.51E-01	2.96E-04	0.00E+00	3.75E-04	6.31E-04	**-3.93E+00**	**-3.93E+00**	0.000%
1997	38	-9.50E+00	9.50E+00	-4.54E-03	0.00E+00	4.25E-03	8.00E-05	0.00E+00	1.60E-02	5.29E-04	-1.88E-07	4.39E-01	4.23E-01	1.67E-04	0.00E+00	3.63E-04	2.79E-04	**-9.50E+00**	**-9.50E+00**	0.010%
1997	23	-9.46E+00	9.46E+00	-1.02E-04	0.00E+00	1.19E-03	3.74E-05	0.00E+00	0.00E+00	6.46E-06	-1.19E-07	1.05E-01	1.03E-01	3.72E-04	0.00E+00	1.80E-04	4.27E-04	**-9.46E+00**	**-9.46E+00**	-0.002%
1997	35	-4.27E+01	4.27E+01	1.56E-02	0.00E+00	3.44E-03	1.96E-04	0.00E+00	7.48E-02	0.00E+00	-7.14E-07	1.09E+00	9.94E-01	3.33E-03	0.00E+00	3.50E-03	9.26E-03	**-4.27E+01**	**-4.27E+01**	-0.011%
1997	39	-1.65E+01	1.64E+01	-6.57E-02	3.01E-03	3.34E-03	2.25E-04	0.00E+00	0.00E+00	7.19E-06	3.63E-06	9.80E-01	1.03E+00	5.19E-03	0.00E+00	1.03E-03	1.91E-03	**-1.65E+01**	**-1.65E+01**	-0.005%
1997	21	-2.98E+00	2.98E+00	-9.02E-04	0.00E+00	4.37E-04	4.15E-05	0.00E+00	0.00E+00	6.36E-05	3.07E-08	1.84E-01	1.83E-01	8.04E-04	0.00E+00	2.37E-04	2.79E-04	**-2.98E+00**	**-2.98E+00**	0.000%
1997	27	-1.03E+01	1.03E+01	5.95E-03	4.84E-03	4.37E-03	3.66E-04	0.00E+00	5.86E-04	0.00E+00	-6.83E-07	1.57E+00	1.54E+00	9.62E-03	0.00E+00	2.17E-03	3.14E-03	**-1.02E+01**	**-1.03E+01**	-0.014%
1997	34	-2.76E+00	2.90E+00	1.36E-01	0.00E+00	7.04E-04	3.76E-05	0.00E+00	1.22E-01	0.00E+00	-9.37E-06	3.48E-01	8.88E-02	1.07E-03	0.00E+00	1.68E-03	2.35E-03	**-2.76E+00**	**-2.76E+00**	-0.041%
1997	20	-4.52E+00	4.52E+00	6.11E-03	0.00E+00	6.30E-04	5.41E-05	0.00E+00	0.00E+00	5.65E-06	-1.90E-07	2.38E-01	2.30E-01	8.39E-04	0.00E+00	3.04E-04	4.04E-04	**-4.52E+00**	**-4.52E+00**	-0.004%
1997	33	-2.95E+00	3.04E+00	8.97E-02	1.53E-02	7.12E-04	3.64E-05	0.00E+00	1.31E-01	0.00E+00	-7.40E-06	4.50E-01	2.12E-01	1.22E-03	0.00E+00	1.83E-03	2.72E-03	**-2.95E+00**	**-2.95E+00**	-0.046%
1997	32	-2.99E+01	2.98E+01	-1.41E-02	2.52E-02	5.44E-03	3.10E-04	4.05E-02	6.18E-01	0.00E+00	-5.95E-06	2.34E+00	1.66E+00	5.61E-03	0.00E+00	9.81E-03	1.73E-02	**-2.99E+01**	**-2.99E+01**	-0.029%
1997	22	-6.22E+00	6.14E+00	-8.53E-02	2.64E-02	2.03E-03	1.31E-04	0.00E+00	0.00E+00	8.49E-06	1.11E-06	4.51E-01	5.06E-01	8.84E-04	0.00E+00	8.80E-04	1.07E-03	**-6.22E+00**	**-6.22E+00**	-0.008%
1997	26	-2.31E+00	2.32E+00	1.20E-02	0.00E+00	1.51E-04	8.49E-06	0.00E+00	0.00E+00	0.00E+00	-4.34E-07	4.67E-02	3.44E-02	1.48E-04	0.00E+00	1.17E-04	1.59E-04	**-2.31E+00**	**-2.31E+00**	-0.004%
1997	25	-5.27E+00	5.28E+00	1.55E-02	2.42E-03	6.19E-04	3.21E-05	0.00E+00	5.17E-04	0.00E+00	-4.77E-07	1.78E-01	1.58E-01	8.09E-04	0.00E+00	4.67E-04	6.13E-04	**-5.27E+00**	**-5.27E+00**	-0.006%
1998	1	-4.02E+00	4.04E+00	1.57E-02	0.00E+00	1.30E-03	2.62E-05	0.00E+00	1.51E-02	1.96E-06	-1.48E-06	2.78E-01	2.46E-01	2.94E-04	0.00E+00	6.31E-04	3.95E-04	**-4.02E+00**	**-4.02E+00**	0.000%
1998	38	-9.66E+00	9.66E+00	-3.22E-04	0.00E+00	4.30E-03	9.21E-05	0.00E+00	1.86E-02	4.10E-04	-2.61E-05	4.22E-01	4.01E-01	1.01E-04	0.00E+00	2.53E-04	2.68E-04	**-9.66E+00**	**-9.66E+00**	0.015%
1998	23	-9.56E+00	9.56E+00	-1.04E-03	0.00E+00	1.21E-03	4.10E-05	0.00E+00	0.00E+00	5.51E-06	-1.94E-06	9.09E-02	9.06E-02	2.58E-04	0.00E+00	2.06E-04	3.23E-04	**-9.56E+00**	**-9.56E+00**	0.000%
1998	35	-4.31E+01	4.31E+01	4.16E-04	0.00E+00	3.48E-03	2.16E-04	0.00E+00	6.84E-02	0.00E+00	7.50E-08	9.42E-01	8.65E-01	3.24E-03	0.00E+00	4.47E-03	6.33E-03	**-4.31E+01**	**-4.31E+01**	-0.007%
1998	39	-1.66E+01	1.66E+01	-2.71E-02	2.81E-03	3.38E-03	2.47E-04	0.00E+00	0.00E+00	1.54E-05	-9.69E-06	8.69E-01	8.85E-01	5.61E-03	0.00E+00	9.29E-04	1.60E-03	**-1.66E+01**	**-1.66E+01**	-0.004%
1998	21	-3.01E+00	3.01E+00	4.38E-04	0.00E+00	4.43E-04	4.58E-05	0.00E+00	0.00E+00	2.64E-05	-9.37E-06	1.66E-01	1.64E-01	8.43E-04	0.00E+00	1.21E-04	2.95E-04	**-3.01E+00**	**-3.01E+00**	0.001%
1998	27	-1.03E+01	1.03E+01	1.11E-02	4.80E-03	4.42E-03	3.98E-04	0.00E+00	6.10E-04	8.60E-06	-1.65E-05	1.41E+00	1.38E+00	8.40E-03	0.00E+00	1.61E-03	3.29E-03	**-1.03E+01**	**-1.03E+01**	-0.015%
1998	34	-2.76E+00	2.86E+00	1.07E-01	0.00E+00	7.13E-04	4.07E-05	0.00E+00	1.09E-01	0.00E+00	-9.41E-06	2.95E-01	7.73E-02	1.09E-03	0.00E+00	1.21E-03	2.32E-03	**-2.75E+00**	**-2.76E+00**	-0.041%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 6. Mass Balance for 1,2,3,7,8-PeCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1998	20	-4.52E+00	4.52E+00	4.74E-03	0.00E+00	6.38E-04	5.85E-05	0.00E+00	0.00E+00	0.00E+00	-4.19E-06	2.10E-01	2.04E-01	8.14E-04	0.00E+00	1.95E-04	4.62E-04	**-4.52E+00**	**-4.52E+00**	-0.004%
1998	33	-2.94E+00	3.01E+00	6.58E-02	1.66E-02	7.21E-04	3.99E-05	0.00E+00	1.20E-01	0.00E+00	-7.73E-06	3.76E-01	1.71E-01	1.24E-03	0.00E+00	1.35E-03	2.45E-03	**-2.94E+00**	**-2.94E+00**	-0.041%
1998	32	-2.99E+01	2.98E+01	-3.50E-02	2.75E-02	5.51E-03	3.31E-04	4.03E-02	5.60E-01	0.00E+00	-5.80E-06	2.07E+00	1.47E+00	5.92E-03	0.00E+00	8.67E-03	1.43E-02	**-2.99E+01**	**-2.99E+01**	-0.024%
1998	22	-6.28E+00	6.21E+00	-7.11E-02	2.88E-02	2.06E-03	1.40E-04	0.00E+00	0.00E+00	0.00E+00	-4.30E-06	4.20E-01	4.59E-01	1.04E-03	0.00E+00	5.22E-04	1.17E-03	**-6.28E+00**	**-6.28E+00**	-0.009%
1998	26	-2.34E+00	2.35E+00	9.35E-03	0.00E+00	1.53E-04	9.04E-06	0.00E+00	0.00E+00	0.00E+00	-5.04E-07	4.27E-02	3.31E-02	1.33E-04	0.00E+00	7.69E-05	1.46E-04	**-2.34E+00**	**-2.34E+00**	-0.003%
1998	25	-5.30E+00	5.32E+00	1.16E-02	2.86E-03	6.27E-04	3.44E-05	0.00E+00	5.48E-04	0.00E+00	-3.42E-07	1.58E-01	1.42E-01	8.22E-04	0.00E+00	3.10E-04	5.91E-04	**-5.30E+00**	**-5.30E+00**	-0.006%
1999	1	-3.65E+00	3.67E+00	1.93E-02	0.00E+00	1.26E-03	2.80E-05	0.00E+00	1.22E-02	8.15E-07	-3.78E-06	2.40E-01	2.07E-01	3.06E-04	0.00E+00	3.95E-04	3.97E-04	**-3.65E+00**	**-3.65E+00**	0.000%
1999	38	-8.35E+00	8.36E+00	9.62E-03	0.00E+00	4.17E-03	9.30E-05	0.00E+00	1.24E-02	3.64E-04	-5.95E-05	3.38E-01	3.13E-01	-3.06E-05	0.00E+00	2.10E-04	3.62E-04	**-8.35E+00**	**-8.35E+00**	0.009%
1999	23	-8.00E+00	8.00E+00	5.66E-03	0.00E+00	1.17E-03	3.80E-05	0.00E+00	0.00E+00	2.28E-06	-3.38E-06	8.01E-02	7.33E-02	1.69E-04	0.00E+00	1.62E-04	4.08E-04	**-8.00E+00**	**-8.00E+00**	-0.001%
1999	35	-3.64E+01	3.64E+01	3.94E-02	0.00E+00	3.37E-03	2.04E-04	0.00E+00	6.01E-02	0.00E+00	-5.74E-06	8.09E-01	7.04E-01	2.53E-03	0.00E+00	3.28E-03	7.48E-03	**-3.64E+01**	**-3.64E+01**	-0.010%
1999	39	-1.38E+01	1.38E+01	3.31E-03	2.25E-03	3.27E-03	2.28E-04	0.00E+00	0.00E+00	4.63E-06	-9.85E-07	7.02E-01	6.89E-01	5.06E-03	0.00E+00	7.89E-04	2.46E-03	**-1.38E+01**	**-1.38E+01**	-0.007%
1999	21	-2.59E+00	2.59E+00	4.77E-03	0.00E+00	4.27E-04	4.37E-05	0.00E+00	0.00E+00	2.09E-05	-3.18E-06	1.53E-01	1.47E-01	8.48E-04	0.00E+00	1.46E-04	4.63E-04	**-2.59E+00**	**-2.59E+00**	-0.004%
1999	27	-8.95E+00	8.98E+00	2.85E-02	3.86E-03	4.27E-03	3.59E-04	0.00E+00	4.13E-04	2.19E-06	-2.64E-06	1.18E+00	1.13E+00	6.94E-03	0.00E+00	1.61E-03	4.59E-03	**-8.95E+00**	**-8.95E+00**	-0.023%
1999	34	-2.40E+00	2.48E+00	7.93E-02	0.00E+00	6.88E-04	3.79E-05	0.00E+00	1.02E-01	0.00E+00	-6.74E-06	2.57E-01	7.51E-02	1.03E-03	0.00E+00	1.18E-03	3.51E-03	**-2.40E+00**	**-2.40E+00**	-0.075%
1999	20	-3.86E+00	3.87E+00	4.93E-03	0.00E+00	6.16E-04	5.38E-05	0.00E+00	0.00E+00	0.00E+00	-3.07E-07	1.93E-01	1.87E-01	7.77E-04	0.00E+00	2.36E-04	7.02E-04	**-3.86E+00**	**-3.86E+00**	-0.009%
1999	33	-2.52E+00	2.57E+00	5.67E-02	1.32E-02	6.96E-04	3.60E-05	0.00E+00	1.11E-01	0.00E+00	-6.05E-06	3.14E-01	1.32E-01	1.13E-03	0.00E+00	1.23E-03	3.70E-03	**-2.51E+00**	**-2.52E+00**	-0.069%
1999	32	-2.58E+01	2.58E+01	-2.39E-02	2.15E-02	5.31E-03	2.86E-04	4.01E-02	5.57E-01	0.00E+00	-6.07E-06	1.85E+00	1.24E+00	5.51E-03	0.00E+00	7.31E-03	1.69E-02	**-2.58E+01**	**-2.58E+01**	-0.032%
1999	22	-5.33E+00	5.30E+00	-3.40E-02	2.25E-02	1.98E-03	1.19E-04	0.00E+00	0.00E+00	1.03E-07	-4.65E-07	3.86E-01	3.95E-01	1.18E-03	0.00E+00	5.82E-04	1.83E-03	**-5.33E+00**	**-5.33E+00**	-0.016%
1999	26	-1.91E+00	1.92E+00	1.03E-02	0.00E+00	1.47E-04	7.71E-06	0.00E+00	0.00E+00	0.00E+00	-4.60E-07	3.94E-02	2.89E-02	1.19E-04	0.00E+00	7.19E-05	2.02E-04	**-1.91E+00**	**-1.91E+00**	-0.005%
1999	25	-4.52E+00	4.54E+00	1.40E-02	2.35E-03	6.05E-04	2.93E-05	0.00E+00	5.49E-04	0.00E+00	-6.17E-07	1.45E-01	1.27E-01	7.36E-04	0.00E+00	2.95E-04	8.72E-04	**-4.52E+00**	**-4.52E+00**	-0.009%
2000	1	-3.74E+00	3.74E+00	8.83E-03	0.00E+00	1.28E-03	2.39E-05	0.00E+00	1.65E-02	4.84E-07	-7.02E-07	2.62E-01	2.35E-01	2.74E-04	0.00E+00	3.97E-04	2.92E-04	**-3.74E+00**	**-3.74E+00**	0.000%
2000	38	-8.81E+00	8.80E+00	-5.84E-03	0.00E+00	4.23E-03	8.58E-05	0.00E+00	1.50E-02	5.15E-04	-3.38E-06	3.75E-01	3.61E-01	3.58E-04	0.00E+00	3.59E-04	3.47E-04	**-8.81E+00**	**-8.81E+00**	0.009%
2000	23	-8.71E+00	8.71E+00	-1.36E-03	0.00E+00	1.19E-03	3.93E-05	0.00E+00	0.00E+00	1.67E-05	2.72E-08	8.42E-02	8.40E-02	5.16E-04	0.00E+00	2.18E-04	3.80E-04	**-8.71E+00**	**-8.71E+00**	-0.001%
2000	35	-3.91E+01	3.91E+01	-6.38E-03	0.00E+00	3.42E-03	2.07E-04	0.00E+00	7.73E-02	0.00E+00	-9.56E-06	8.21E-01	7.41E-01	4.74E-03	0.00E+00	3.81E-03	6.21E-03	**-3.91E+01**	**-3.91E+01**	-0.008%
2000	39	-1.51E+01	1.51E+01	-2.29E-02	2.68E-03	3.32E-03	2.37E-04	0.00E+00	0.00E+00	2.18E-05	7.73E-07	7.78E-01	7.89E-01	6.85E-03	0.00E+00	1.33E-03	2.21E-03	**-1.51E+01**	**-1.51E+01**	-0.006%
2000	21	-2.70E+00	2.70E+00	-9.89E-04	0.00E+00	4.34E-04	4.39E-05	0.00E+00	0.00E+00	2.97E-05	-4.84E-08	1.46E-01	1.45E-01	1.11E-03	0.00E+00	2.23E-04	3.78E-04	**-2.70E+00**	**-2.70E+00**	-0.002%
2000	27	-9.41E+00	9.42E+00	4.48E-03	4.54E-03	4.34E-03	3.86E-04	0.00E+00	4.45E-04	0.00E+00	-8.45E-07	1.26E+00	1.24E+00	9.45E-03	0.00E+00	2.36E-03	4.21E-03	**-9.41E+00**	**-9.41E+00**	-0.020%
2000	34	-2.53E+00	2.61E+00	7.99E-02	0.00E+00	6.99E-04	3.88E-05	0.00E+00	1.05E-01	0.00E+00	2.32E-05	2.58E-01	7.04E-02	1.03E-03	0.00E+00	1.73E-03	2.56E-03	**-2.53E+00**	**-2.53E+00**	-0.054%
2000	20	-4.18E+00	4.19E+00	3.33E-03	0.00E+00	6.26E-04	5.63E-05	0.00E+00	0.00E+00	1.50E-06	-2.75E-07	1.83E-01	1.78E-01	1.00E-03	0.00E+00	3.48E-04	5.33E-04	**-4.18E+00**	**-4.18E+00**	-0.006%
2000	33	-2.87E+00	2.91E+00	4.61E-02	1.43E-02	7.07E-04	3.71E-05	0.00E+00	1.17E-01	0.00E+00	6.35E-05	3.42E-01	1.62E-01	1.12E-03	0.00E+00	2.03E-03	2.64E-03	**-2.86E+00**	**-2.87E+00**	-0.051%
2000	32	-2.77E+01	2.77E+01	-5.10E-02	2.38E-02	5.40E-03	3.18E-04	3.94E-02	6.36E-01	0.00E+00	-5.52E-05	1.93E+00	1.26E+00	6.73E-03	0.00E+00	8.65E-03	1.36E-02	**-2.77E+01**	**-2.77E+01**	-0.031%
2000	22	-5.68E+00	5.64E+00	-4.60E-02	2.49E-02	2.02E-03	1.33E-04	0.00E+00	0.00E+00	3.68E-07	-1.65E-07	4.11E-01	4.29E-01	1.62E-03	0.00E+00	8.97E-04	1.36E-03	**-5.68E+00**	**-5.68E+00**	-0.012%
2000	26	-2.18E+00	2.19E+00	9.27E-03	0.00E+00	1.50E-04	8.62E-06	0.00E+00	0.00E+00	0.00E+00	-4.16E-07	3.94E-02	2.99E-02	1.16E-04	0.00E+00	1.05E-04	1.56E-04	**-2.18E+00**	**-2.18E+00**	-0.005%
2000	25	-5.00E+00	5.02E+00	1.38E-02	2.38E-03	6.14E-04	3.27E-05	0.00E+00	5.36E-04	0.00E+00	-6.96E-07	1.57E-01	1.38E-01	7.90E-04	0.00E+00	4.59E-04	5.51E-04	**-5.00E+00**	**-5.00E+00**	-0.007%
2001	1	-3.29E+00	3.30E+00	1.26E-02	0.00E+00	1.24E-03	2.35E-05	0.00E+00	1.14E-02	8.24E-08	-9.24E-07	2.35E-01	2.10E-01	3.41E-04	0.00E+00	2.92E-04	5.12E-04	**-3.29E+00**	**-3.29E+00**	0.000%
2001	38	-7.82E+00	7.82E+00	-5.96E-03	0.00E+00	4.09E-03	8.11E-05	0.00E+00	1.10E-02	1.91E-04	-2.57E-07	3.31E-01	3.22E-01	2.23E-04	0.00E+00	3.47E-04	2.97E-04	**-7.82E+00**	**-7.82E+00**	0.005%

Table 6. Mass Balance for 1,2,3,7,8-PeCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2001	23	-7.73E+00	7.72E+00	-1.96E-03	0.00E+00	1.15E-03	3.56E-05	0.00E+00	0.00E+00	6.13E-06	3.40E-11	7.85E-02	7.91E-02	3.35E-04	0.00E+00	2.24E-04	4.75E-04	**-7.73E+00**	**-7.73E+00**	-0.002%
2001	35	-3.48E+01	3.48E+01	-7.08E-04	0.00E+00	3.31E-03	1.87E-04	0.00E+00	6.70E-02	0.00E+00	-5.09E-07	7.88E-01	7.16E-01	3.75E-03	0.00E+00	2.96E-03	8.74E-03	**-3.48E+01**	**-3.48E+01**	-0.012%
2001	39	-1.34E+01	1.34E+01	-1.44E-02	2.08E-03	3.21E-03	2.14E-04	0.00E+00	0.00E+00	3.11E-05	3.71E-07	7.02E-01	7.06E-01	5.20E-03	0.00E+00	1.24E-03	2.10E-03	**-1.34E+01**	**-1.34E+01**	-0.007%
2001	21	-2.42E+00	2.42E+00	-8.99E-05	0.00E+00	4.19E-04	3.98E-05	0.00E+00	0.00E+00	3.13E-05	-6.66E-08	1.40E-01	1.39E-01	8.76E-04	0.00E+00	1.81E-04	3.04E-04	**-2.42E+00**	**-2.42E+00**	-0.003%
2001	27	-8.31E+00	8.30E+00	-1.00E-02	3.59E-03	4.19E-03	3.45E-04	0.00E+00	4.26E-04	3.18E-06	-1.66E-08	1.12E+00	1.12E+00	6.31E-03	0.00E+00	2.15E-03	4.06E-03	**-8.31E+00**	**-8.31E+00**	-0.024%
2001	34	-2.25E+00	2.32E+00	7.55E-02	0.00E+00	6.76E-04	3.43E-05	0.00E+00	9.45E-02	0.00E+00	-6.59E-06	2.34E-01	6.29E-02	9.42E-04	0.00E+00	1.15E-03	2.73E-03	**-2.25E+00**	**-2.25E+00**	-0.061%
2001	20	-3.68E+00	3.69E+00	2.37E-03	0.00E+00	6.05E-04	4.99E-05	0.00E+00	0.00E+00	1.15E-06	-1.32E-07	1.76E-01	1.72E-01	8.59E-04	0.00E+00	2.54E-04	4.63E-04	**-3.68E+00**	**-3.68E+00**	-0.005%
2001	33	-2.54E+00	2.59E+00	5.03E-02	1.09E-02	6.83E-04	3.27E-05	0.00E+00	1.05E-01	0.00E+00	-5.25E-06	3.10E-01	1.42E-01	9.97E-04	0.00E+00	1.11E-03	3.00E-03	**-2.54E+00**	**-2.54E+00**	-0.057%
2001	32	-2.42E+01	2.42E+01	-3.14E-02	1.86E-02	5.22E-03	2.76E-04	3.85E-02	5.68E-01	0.00E+00	-3.86E-06	1.77E+00	1.17E+00	5.66E-03	0.00E+00	5.09E-03	1.97E-02	**-2.42E+01**	**-2.42E+01**	-0.039%
2001	22	-4.95E+00	4.89E+00	-5.28E-02	1.94E-02	1.95E-03	1.15E-04	0.00E+00	0.00E+00	1.81E-06	3.06E-07	3.63E-01	3.93E-01	1.16E-03	0.00E+00	6.50E-04	1.39E-03	**-4.95E+00**	**-4.95E+00**	-0.013%
2001	26	-1.87E+00	1.88E+00	8.83E-03	0.00E+00	1.45E-04	7.48E-06	0.00E+00	0.00E+00	0.00E+00	-3.34E-07	3.49E-02	2.58E-02	1.10E-04	0.00E+00	5.38E-05	1.93E-04	**-1.87E+00**	**-1.87E+00**	-0.005%
2001	25	-4.33E+00	4.34E+00	1.36E-02	1.56E-03	5.95E-04	2.83E-05	0.00E+00	4.93E-04	0.00E+00	-5.20E-07	1.36E-01	1.19E-01	6.21E-04	0.00E+00	1.81E-04	7.82E-04	**-4.33E+00**	**-4.33E+00**	-0.008%
2002	1	-2.97E+00	2.97E+00	1.15E-03	0.00E+00	1.22E-03	3.36E-05	0.00E+00	4.65E-03	2.13E-07	-4.70E-07	1.77E-01	1.70E-01	4.65E-04	0.00E+00	5.12E-04	4.88E-04	**-2.97E+00**	**-2.97E+00**	0.000%
2002	38	-7.15E+00	7.14E+00	-7.84E-03	0.00E+00	4.04E-03	1.06E-04	0.00E+00	5.94E-03	3.55E-04	-5.22E-05	2.31E-01	2.29E-01	1.04E-04	0.00E+00	2.45E-04	3.73E-04	**-7.15E+00**	**-7.15E+00**	0.006%
2002	23	-7.18E+00	7.18E+00	-2.04E-03	0.00E+00	1.13E-03	4.10E-05	0.00E+00	0.00E+00	4.08E-06	-5.61E-06	5.82E-02	5.90E-02	2.69E-04	0.00E+00	2.40E-04	4.60E-04	**-7.18E+00**	**-7.18E+00**	-0.002%
2002	35	-3.19E+01	3.19E+01	-6.63E-03	0.00E+00	3.27E-03	2.21E-04	0.00E+00	6.02E-02	0.00E+00	-2.67E-07	5.75E-01	5.15E-01	3.71E-03	0.00E+00	4.51E-03	8.16E-03	**-3.19E+01**	**-3.19E+01**	-0.012%
2002	39	-1.22E+01	1.21E+01	-2.69E-02	1.87E-03	3.17E-03	2.42E-04	0.00E+00	0.00E+00	1.45E-04	-4.94E-06	5.17E-01	5.34E-01	5.23E-03	0.00E+00	1.07E-03	2.49E-03	**-1.22E+01**	**-1.22E+01**	-0.010%
2002	21	-2.26E+00	2.26E+00	-2.18E-03	0.00E+00	4.14E-04	4.72E-05	0.00E+00	0.00E+00	5.67E-05	-8.42E-06	1.17E-01	1.18E-01	8.24E-04	0.00E+00	1.43E-04	4.16E-04	**-2.26E+00**	**-2.26E+00**	-0.006%
2002	27	-7.47E+00	7.46E+00	-1.10E-02	3.25E-03	4.14E-03	3.66E-04	0.00E+00	3.08E-04	5.05E-06	-1.14E-05	8.37E-01	8.35E-01	5.51E-03	0.00E+00	2.00E-03	4.80E-03	**-7.47E+00**	**-7.47E+00**	-0.032%
2002	34	-2.14E+00	2.19E+00	4.45E-02	0.00E+00	6.67E-04	3.91E-05	0.00E+00	8.01E-02	0.00E+00	-5.05E-06	1.84E-01	5.85E-02	9.31E-04	0.00E+00	1.36E-03	3.08E-03	**-2.14E+00**	**-2.14E+00**	-0.070%
2002	20	-3.41E+00	3.41E+00	-6.20E-05	0.00E+00	5.98E-04	5.59E-05	0.00E+00	0.00E+00	3.27E-06	-7.83E-08	1.52E-01	1.51E-01	8.26E-04	0.00E+00	2.30E-04	6.25E-04	**-3.41E+00**	**-3.41E+00**	-0.009%
2002	33	-2.35E+00	2.38E+00	3.68E-02	1.01E-02	6.75E-04	3.66E-05	0.00E+00	9.28E-02	0.00E+00	-5.06E-06	2.34E-01	9.29E-02	1.04E-03	0.00E+00	1.54E-03	3.48E-03	**-2.34E+00**	**-2.35E+00**	-0.074%
2002	32	-2.17E+01	2.16E+01	-6.04E-02	1.69E-02	5.16E-03	2.76E-04	3.83E-02	4.95E-01	0.00E+00	-2.69E-06	1.48E+00	9.80E-01	5.47E-03	0.00E+00	1.02E-02	2.03E-02	**-2.17E+01**	**-2.17E+01**	-0.047%
2002	22	-4.35E+00	4.31E+00	-4.60E-02	1.77E-02	1.92E-03	1.12E-04	0.00E+00	0.00E+00	8.70E-07	2.17E-07	3.11E-01	3.37E-01	1.00E-03	0.00E+00	7.20E-04	1.86E-03	**-4.35E+00**	**-4.35E+00**	-0.022%
2002	26	-1.57E+00	1.58E+00	6.65E-03	0.00E+00	1.43E-04	7.21E-06	0.00E+00	0.00E+00	0.00E+00	-3.57E-07	3.16E-02	2.47E-02	1.19E-04	0.00E+00	1.03E-04	2.24E-04	**-1.57E+00**	**-1.57E+00**	-0.007%
2002	25	-3.83E+00	3.84E+00	1.12E-02	1.66E-03	5.87E-04	2.73E-05	0.00E+00	5.25E-04	0.00E+00	-5.96E-07	1.18E-01	1.03E-01	6.52E-04	0.00E+00	4.17E-04	8.87E-04	**-3.83E+00**	**-3.83E+00**	-0.012%
2003	1	-3.74E+00	3.77E+00	2.49E-02	0.00E+00	1.33E-03	2.49E-05	0.00E+00	1.66E-02	9.94E-07	-2.99E-06	2.55E-01	2.12E-01	4.06E-04	0.00E+00	4.88E-04	5.13E-04	**-3.74E+00**	**-3.74E+00**	0.000%
2003	38	-9.35E+00	9.37E+00	2.03E-02	0.00E+00	4.40E-03	9.49E-05	0.00E+00	1.90E-02	1.83E-04	4.06E-05	4.94E-01	4.51E-01	4.92E-04	0.00E+00	4.17E-04	5.43E-04	**-9.35E+00**	**-9.35E+00**	0.010%
2003	23	-9.16E+00	9.16E+00	-2.11E-03	0.00E+00	1.23E-03	4.35E-05	0.00E+00	0.00E+00	3.81E-06	-3.35E-07	9.12E-02	9.18E-02	4.48E-04	0.00E+00	2.42E-04	5.41E-04	**-9.16E+00**	**-9.16E+00**	-0.002%
2003	35	-4.05E+01	4.06E+01	1.42E-02	0.00E+00	3.56E-03	2.30E-04	0.00E+00	5.03E-02	0.00E+00	5.53E-05	8.67E-01	7.96E-01	4.34E-03	0.00E+00	4.29E-03	9.75E-03	**-4.05E+01**	**-4.05E+01**	-0.012%
2003	39	-1.57E+01	1.57E+01	4.83E-03	3.62E-03	3.46E-03	2.69E-04	0.00E+00	0.00E+00	7.75E-05	-3.61E-06	7.96E-01	7.77E-01	7.75E-03	0.00E+00	1.24E-03	3.08E-03	**-1.56E+01**	**-1.57E+01**	-0.009%
2003	21	-2.78E+00	2.78E+00	1.41E-03	0.00E+00	4.52E-04	4.93E-05	0.00E+00	0.00E+00	9.66E-06	-7.83E-07	1.39E-01	1.36E-01	1.15E-03	0.00E+00	2.01E-04	6.18E-04	**-2.78E+00**	**-2.78E+00**	-0.007%
2003	27	-9.59E+00	9.60E+00	9.57E-03	5.81E-03	4.52E-03	4.44E-04	0.00E+00	7.52E-04	0.00E+00	1.46E-05	1.27E+00	1.24E+00	9.59E-03	0.00E+00	2.38E-03	5.74E-03	**-9.58E+00**	**-9.59E+00**	-0.029%
2003	34	-2.58E+00	2.67E+00	9.31E-02	0.00E+00	7.29E-04	4.29E-05	0.00E+00	7.73E-02	0.00E+00	3.64E-05	2.24E-01	5.17E-02	1.62E-03	0.00E+00	1.61E-03	4.52E-03	**-2.58E+00**	**-2.58E+00**	-0.087%
2003	20	-4.18E+00	4.19E+00	6.75E-03	0.00E+00	6.52E-04	6.27E-05	0.00E+00	0.00E+00	4.91E-07	-1.35E-06	1.75E-01	1.66E-01	1.34E-03	0.00E+00	3.08E-04	8.71E-04	**-4.18E+00**	**-4.18E+00**	-0.010%
2003	33	-2.86E+00	2.93E+00	6.94E-02	1.91E-02	7.37E-04	4.02E-05	0.00E+00	8.00E-02	0.00E+00	3.22E-04	3.11E-01	1.41E-01	1.59E-03	0.00E+00	2.09E-03	5.98E-03	**-2.85E+00**	**-2.86E+00**	-0.098%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 6. Mass Balance for 1,2,3,7,8-PeCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2003	32	-2.69E+01	2.70E+01	1.37E-01	3.12E-02	5.63E-03	3.48E-04	4.09E-02	4.19E-01	0.00E+00	1.89E-03	2.07E+00	1.42E+00	9.40E-03	0.00E+00	1.20E-02	2.34E-02	**-2.69E+01**	**-2.69E+01**	-0.038%
2003	22	-5.69E+00	5.64E+00	-4.79E-02	3.27E-02	2.10E-03	1.54E-04	0.00E+00	0.00E+00	8.05E-07	-2.56E-06	3.93E-01	4.04E-01	2.54E-03	0.00E+00	8.88E-04	1.71E-03	**-5.69E+00**	**-5.69E+00**	-0.015%
2003	26	-2.13E+00	2.14E+00	8.77E-03	0.00E+00	1.56E-04	9.71E-06	0.00E+00	0.00E+00	0.00E+00	-8.43E-07	3.35E-02	2.43E-02	2.91E-04	0.00E+00	1.07E-04	2.01E-04	**-2.13E+00**	**-2.13E+00**	-0.005%
2003	25	-4.60E+00	4.62E+00	1.85E-02	3.78E-03	6.40E-04	3.63E-05	0.00E+00	4.78E-04	0.00E+00	-2.23E-06	1.42E-01	1.17E-01	1.30E-03	0.00E+00	4.20E-04	9.99E-04	**-4.60E+00**	**-4.60E+00**	-0.011%
2004	1	-3.55E+00	3.57E+00	2.05E-02	0.00E+00	1.31E-03	2.24E-05	0.00E+00	3.15E-02	2.89E-06	-3.67E-06	2.72E-01	2.18E-01	3.68E-04	0.00E+00	5.12E-04	6.36E-04	**-3.55E+00**	**-3.55E+00**	0.000%
2004	38	-8.63E+00	8.63E+00	5.25E-03	0.00E+00	4.34E-03	8.78E-05	0.00E+00	2.12E-02	3.32E-04	-7.58E-07	5.07E-01	4.76E-01	8.20E-04	0.00E+00	5.43E-04	7.36E-04	**-8.63E+00**	**-8.63E+00**	0.010%
2004	23	-8.36E+00	8.36E+00	1.44E-03	0.00E+00	1.22E-03	4.05E-05	0.00E+00	0.00E+00	1.25E-05	-1.77E-07	1.02E-01	9.84E-02	1.18E-03	0.00E+00	2.70E-04	1.07E-03	**-8.36E+00**	**-8.36E+00**	-0.006%
2004	35	-3.70E+01	3.70E+01	3.18E-02	0.00E+00	3.51E-03	2.13E-04	0.00E+00	5.00E-02	0.00E+00	-2.71E-06	9.19E-01	8.31E-01	5.29E-03	0.00E+00	4.85E-03	1.76E-02	**-3.70E+01**	**-3.70E+01**	-0.027%
2004	39	-1.43E+01	1.43E+01	-1.71E-02	3.34E-03	3.40E-03	2.51E-04	0.00E+00	0.00E+00	2.29E-05	7.09E-08	8.25E-01	8.29E-01	8.02E-03	0.00E+00	1.52E-03	6.10E-03	**-1.43E+01**	**-1.43E+01**	-0.023%
2004	21	-2.52E+00	2.52E+00	2.10E-03	0.00E+00	4.45E-04	4.60E-05	0.00E+00	0.00E+00	6.99E-06	-2.12E-07	1.46E-01	1.43E-01	1.29E-03	0.00E+00	2.87E-04	8.99E-04	**-2.52E+00**	**-2.52E+00**	-0.011%
2004	27	-8.60E+00	8.60E+00	2.21E-03	5.68E-03	4.45E-03	4.13E-04	0.00E+00	6.73E-04	0.00E+00	-1.68E-06	1.29E+00	1.27E+00	9.12E-03	0.00E+00	2.86E-03	9.98E-03	**-8.59E+00**	**-8.60E+00**	-0.059%
2004	34	-2.30E+00	2.40E+00	1.00E-01	0.00E+00	7.17E-04	4.00E-05	0.00E+00	7.93E-02	0.00E+00	-1.12E-05	2.34E-01	5.28E-02	1.35E-03	0.00E+00	2.23E-03	4.86E-03	**-2.30E+00**	**-2.30E+00**	-0.093%
2004	20	-3.77E+00	3.78E+00	7.14E-03	0.00E+00	6.42E-04	5.83E-05	0.00E+00	0.00E+00	4.33E-07	-5.32E-07	1.77E-01	1.68E-01	1.29E-03	0.00E+00	4.26E-04	1.11E-03	**-3.77E+00**	**-3.77E+00**	-0.013%
2004	33	-2.56E+00	2.64E+00	7.80E-02	1.69E-02	7.25E-04	3.73E-05	0.00E+00	7.87E-02	0.00E+00	-1.12E-05	3.27E-01	1.52E-01	1.28E-03	0.00E+00	2.86E-03	6.29E-03	**-2.56E+00**	**-2.56E+00**	-0.114%
2004	32	-2.38E+01	2.40E+01	1.68E-01	2.79E-02	5.54E-03	3.23E-04	4.05E-02	3.90E-01	0.00E+00	-3.00E-05	2.01E+00	1.38E+00	7.51E-03	0.00E+00	1.14E-02	3.80E-02	**-2.38E+01**	**-2.38E+01**	-0.083%
2004	22	-5.05E+00	4.98E+00	-6.97E-02	2.91E-02	2.07E-03	1.42E-04	0.00E+00	0.00E+00	3.63E-06	7.05E-08	3.84E-01	4.21E-01	2.67E-03	0.00E+00	8.56E-04	2.66E-03	**-5.05E+00**	**-5.05E+00**	-0.024%
2004	26	-1.88E+00	1.88E+00	8.56E-03	0.00E+00	1.53E-04	8.94E-06	0.00E+00	0.00E+00	0.00E+00	-6.14E-07	3.23E-02	2.34E-02	2.40E-04	0.00E+00	9.68E-05	3.36E-04	**-1.87E+00**	**-1.88E+00**	-0.009%
2004	25	-4.02E+00	4.04E+00	1.79E-02	3.20E-03	6.30E-04	3.32E-05	0.00E+00	4.22E-04	0.00E+00	-1.34E-06	1.38E-01	1.15E-01	1.07E-03	0.00E+00	4.74E-04	1.33E-03	**-4.02E+00**	**-4.02E+00**	-0.017%
2005	1	-3.02E+00	3.03E+00	1.04E-02	0.00E+00	1.22E-03	2.13E-05	0.00E+00	3.03E-02	4.67E-08	-1.28E-06	2.43E-01	2.01E-01	3.06E-04	0.00E+00	6.36E-04	2.66E-04	**-3.02E+00**	**-3.02E+00**	0.000%
2005	38	-7.54E+00	7.53E+00	-6.56E-03	0.00E+00	4.04E-03	8.09E-05	0.00E+00	1.90E-02	1.62E-04	-1.04E-06	4.50E-01	4.32E-01	7.13E-04	0.00E+00	7.36E-04	1.51E-04	**-7.54E+00**	**-7.54E+00**	0.009%
2005	23	-7.24E+00	7.24E+00	3.72E-04	0.00E+00	1.13E-03	3.48E-05	0.00E+00	0.00E+00	3.79E-06	-1.63E-07	9.69E-02	9.42E-02	1.01E-03	0.00E+00	4.28E-04	2.55E-04	**-7.24E+00**	**-7.24E+00**	0.000%
2005	35	-3.23E+01	3.23E+01	2.40E-02	0.00E+00	3.26E-03	1.86E-04	0.00E+00	6.41E-02	0.00E+00	-2.86E-06	8.89E-01	7.88E-01	4.94E-03	0.00E+00	7.68E-03	5.65E-03	**-3.23E+01**	**-3.23E+01**	-0.009%
2005	39	-1.23E+01	1.23E+01	-9.34E-03	2.14E-03	3.17E-03	2.16E-04	0.00E+00	0.00E+00	1.50E-05	-3.68E-07	8.24E-01	8.19E-01	7.39E-03	0.00E+00	2.69E-03	1.13E-03	**-1.23E+01**	**-1.23E+01**	-0.004%
2005	21	-2.26E+00	2.26E+00	-3.55E-04	0.00E+00	4.13E-04	4.06E-05	0.00E+00	0.00E+00	1.23E-05	-2.40E-06	1.45E-01	1.43E-01	1.05E-03	0.00E+00	4.55E-04	1.60E-04	**-2.26E+00**	**-2.26E+00**	0.001%
2005	27	-7.78E+00	7.79E+00	7.72E-03	3.80E-03	4.13E-03	3.57E-04	0.00E+00	6.07E-04	1.47E-06	-1.40E-06	1.27E+00	1.24E+00	8.23E-03	0.00E+00	4.78E-03	2.07E-03	**-7.78E+00**	**-7.78E+00**	-0.012%
2005	34	-2.11E+00	2.19E+00	8.38E-02	0.00E+00	6.65E-04	3.51E-05	0.00E+00	8.96E-02	0.00E+00	-6.98E-06	2.35E-01	5.86E-02	9.59E-04	0.00E+00	2.71E-03	1.69E-03	**-2.11E+00**	**-2.11E+00**	-0.040%
2005	20	-3.44E+00	3.44E+00	6.12E-03	0.00E+00	5.96E-04	5.12E-05	0.00E+00	0.00E+00	0.00E+00	-3.73E-07	1.77E-01	1.69E-01	1.08E-03	0.00E+00	5.93E-04	2.71E-04	**-3.43E+00**	**-3.44E+00**	-0.004%
2005	33	-2.37E+00	2.44E+00	6.31E-02	9.43E-03	6.73E-04	3.22E-05	0.00E+00	9.71E-02	0.00E+00	-6.11E-06	3.26E-01	1.53E-01	9.99E-04	0.00E+00	3.35E-03	2.14E-03	**-2.37E+00**	**-2.37E+00**	-0.045%
2005	32	-2.21E+01	2.22E+01	4.46E-02	1.63E-02	5.14E-03	2.84E-04	3.81E-02	5.32E-01	0.00E+00	-1.05E-05	1.92E+00	1.27E+00	6.54E-03	0.00E+00	1.83E-02	1.41E-02	**-2.21E+01**	**-2.21E+01**	-0.032%
2005	22	-4.59E+00	4.56E+00	-3.29E-02	1.71E-02	1.92E-03	1.24E-04	0.00E+00	0.00E+00	0.00E+00	-1.35E-07	3.74E-01	3.85E-01	2.04E-03	0.00E+00	1.40E-03	7.16E-04	**-4.59E+00**	**-4.59E+00**	-0.007%
2005	26	-1.67E+00	1.68E+00	7.70E-03	0.00E+00	1.42E-04	7.97E-06	0.00E+00	0.00E+00	0.00E+00	-3.16E-07	3.10E-02	2.29E-02	1.98E-04	0.00E+00	1.64E-04	1.06E-04	**-1.67E+00**	**-1.67E+00**	-0.003%
2005	25	-3.71E+00	3.72E+00	1.41E-02	1.74E-03	5.85E-04	2.99E-05	0.00E+00	4.88E-04	0.00E+00	-5.87E-07	1.31E-01	1.13E-01	8.75E-04	0.00E+00	6.26E-04	4.09E-04	**-3.71E+00**	**-3.71E+00**	-0.006%
2006	1	-3.44E+00	3.46E+00	1.82E-02	0.00E+00	1.32E-03	2.10E-05	0.00E+00	3.25E-02	6.60E-07	-1.79E-06	2.68E-01	2.16E-01	3.46E-04	0.00E+00	2.67E-04	2.98E-04	**-3.44E+00**	**-3.44E+00**	0.000%
2006	38	-8.62E+00	8.63E+00	4.57E-03	0.00E+00	4.35E-03	8.41E-05	0.00E+00	2.14E-02	1.69E-04	-2.46E-05	4.97E-01	4.67E-01	7.42E-04	0.00E+00	1.28E-04	2.78E-04	**-8.63E+00**	**-8.62E+00**	0.011%
2006	23	-8.47E+00	8.47E+00	1.30E-04	0.00E+00	1.22E-03	4.04E-05	0.00E+00	0.00E+00	7.26E-06	-1.50E-06	1.05E-01	1.02E-01	9.84E-04	0.00E+00	1.26E-04	2.88E-04	**-8.47E+00**	**-8.47E+00**	0.000%
2006	35	-3.73E+01	3.73E+01	2.76E-02	0.00E+00	3.52E-03	2.11E-04	0.00E+00	5.51E-02	0.00E+00	-3.51E-06	9.21E-01	8.29E-01	5.83E-03	0.00E+00	2.80E-03	5.09E-03	**-3.73E+01**	**-3.73E+01**	-0.006%

Table 6. Mass Balance for 1,2,3,7,8-PeCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2006	39	-1.44E+01	1.44E+01	-1.58E-03	4.17E-03	3.42E-03	2.49E-04	0.00E+00	0.00E+00	4.32E-06	-1.09E-05	8.26E-01	8.12E-01	8.85E-03	0.00E+00	5.52E-04	1.71E-03	**-1.44E+01**	**-1.44E+01**	-0.005%
2006	21	-2.56E+00	2.56E+00	9.79E-04	0.00E+00	4.48E-04	4.57E-05	0.00E+00	0.00E+00	8.96E-06	-6.45E-06	1.44E-01	1.41E-01	1.33E-03	0.00E+00	7.56E-05	2.75E-04	**-2.56E+00**	**-2.56E+00**	0.001%
2006	27	-8.72E+00	8.72E+00	7.57E-03	6.89E-03	4.48E-03	4.18E-04	0.00E+00	7.18E-04	0.00E+00	-1.31E-05	1.29E+00	1.26E+00	1.14E-02	0.00E+00	1.05E-03	3.10E-03	**-8.72E+00**	**-8.72E+00**	-0.016%
2006	34	-2.33E+00	2.42E+00	9.14E-02	0.00E+00	7.22E-04	4.09E-05	0.00E+00	8.05E-02	0.00E+00	-9.69E-06	2.30E-01	5.59E-02	1.31E-03	0.00E+00	8.44E-04	1.99E-03	**-2.33E+00**	**-2.33E+00**	-0.041%
2006	20	-3.82E+00	3.82E+00	6.83E-03	0.00E+00	6.46E-04	5.91E-05	0.00E+00	0.00E+00	0.00E+00	-2.11E-06	1.74E-01	1.65E-01	1.43E-03	0.00E+00	1.38E-04	3.79E-04	**-3.82E+00**	**-3.82E+00**	-0.004%
2006	33	-2.60E+00	2.67E+00	6.83E-02	1.81E-02	7.30E-04	3.84E-05	0.00E+00	8.35E-02	0.00E+00	-9.58E-06	3.28E-01	1.57E-01	1.35E-03	0.00E+00	1.07E-03	2.43E-03	**-2.60E+00**	**-2.60E+00**	-0.046%
2006	32	-2.45E+01	2.46E+01	9.41E-02	2.94E-02	5.58E-03	3.36E-04	4.12E-02	4.39E-01	0.00E+00	-2.02E-05	1.97E+00	1.35E+00	8.09E-03	0.00E+00	7.03E-03	1.39E-02	**-2.45E+01**	**-2.45E+01**	-0.028%
2006	22	-5.15E+00	5.11E+00	-4.28E-02	3.08E-02	2.08E-03	1.48E-04	0.00E+00	0.00E+00	2.00E-07	-2.46E-06	3.83E-01	3.90E-01	2.93E-03	0.00E+00	3.64E-04	1.07E-03	**-5.15E+00**	**-5.15E+00**	-0.010%
2006	26	-1.97E+00	1.97E+00	7.11E-03	0.00E+00	1.54E-04	9.39E-06	0.00E+00	0.00E+00	0.00E+00	-4.19E-07	3.14E-02	2.40E-02	2.33E-04	0.00E+00	5.31E-05	1.25E-04	**-1.97E+00**	**-1.97E+00**	-0.003%
2006	25	-4.19E+00	4.21E+00	1.53E-02	3.44E-03	6.34E-04	3.49E-05	0.00E+00	4.29E-04	0.00E+00	-9.86E-07	1.35E-01	1.14E-01	1.10E-03	0.00E+00	1.95E-04	5.07E-04	**-4.19E+00**	**-4.19E+00**	-0.006%
2007	1	-4.19E+00	4.21E+00	1.78E-02	0.00E+00	1.34E-03	2.39E-05	0.00E+00	4.60E-02	9.08E-08	-8.69E-06	2.80E-01	2.15E-01	2.53E-04	0.00E+00	2.98E-04	2.95E-04	**-4.19E+00**	**-4.19E+00**	0.000%
2007	38	-1.00E+01	1.00E+01	1.29E-02	0.00E+00	4.43E-03	9.18E-05	0.00E+00	2.67E-02	2.42E-04	-6.06E-06	5.12E-01	4.69E-01	7.68E-04	0.00E+00	2.78E-04	2.97E-04	**-1.00E+01**	**-1.00E+01**	0.017%
2007	23	-9.69E+00	9.69E+00	-2.18E-04	0.00E+00	1.24E-03	4.18E-05	0.00E+00	0.00E+00	4.38E-06	-1.88E-07	1.03E-01	1.01E-01	9.35E-04	0.00E+00	1.59E-04	2.97E-04	**-9.69E+00**	**-9.69E+00**	0.000%
2007	35	-4.31E+01	4.31E+01	3.44E-02	0.00E+00	3.59E-03	2.21E-04	0.00E+00	5.55E-02	0.00E+00	-5.03E-06	9.50E-01	8.51E-01	5.72E-03	0.00E+00	2.68E-03	5.42E-03	**-4.31E+01**	**-4.31E+01**	-0.006%
2007	39	-1.65E+01	1.65E+01	1.20E-02	3.99E-03	3.48E-03	2.61E-04	0.00E+00	0.00E+00	1.98E-06	-3.36E-06	8.54E-01	8.26E-01	9.30E-03	0.00E+00	8.05E-04	1.72E-03	**-1.65E+01**	**-1.65E+01**	-0.005%
2007	21	-3.05E+00	3.05E+00	5.95E-03	0.00E+00	4.57E-04	4.73E-05	0.00E+00	0.00E+00	1.84E-05	-1.02E-06	1.57E-01	1.50E-01	1.60E-03	0.00E+00	1.36E-04	3.84E-04	**-3.05E+00**	**-3.05E+00**	0.000%
2007	27	-1.02E+01	1.02E+01	2.88E-02	6.54E-03	4.56E-03	4.26E-04	0.00E+00	6.76E-04	0.00E+00	-5.12E-06	1.36E+00	1.31E+00	1.28E-02	0.00E+00	1.58E-03	3.43E-03	**-1.02E+01**	**-1.02E+01**	-0.016%
2007	34	-2.74E+00	2.85E+00	1.11E-01	0.00E+00	7.35E-04	4.14E-05	0.00E+00	8.05E-02	0.00E+00	-1.60E-05	2.52E-01	5.81E-02	1.26E-03	0.00E+00	1.02E-03	2.44E-03	**-2.73E+00**	**-2.74E+00**	-0.044%
2007	20	-4.52E+00	4.53E+00	1.25E-02	0.00E+00	6.58E-04	6.03E-05	0.00E+00	0.00E+00	0.00E+00	-1.64E-06	1.87E-01	1.72E-01	1.62E-03	0.00E+00	1.97E-04	4.92E-04	**-4.52E+00**	**-4.52E+00**	-0.005%
2007	33	-3.02E+00	3.10E+00	8.19E-02	2.09E-02	7.44E-04	3.84E-05	0.00E+00	8.36E-02	0.00E+00	-1.42E-05	3.48E-01	1.60E-01	1.29E-03	0.00E+00	1.24E-03	2.92E-03	**-3.02E+00**	**-3.02E+00**	-0.048%
2007	32	-2.85E+01	2.86E+01	1.52E-01	3.30E-02	5.68E-03	3.36E-04	4.31E-02	4.36E-01	0.00E+00	-3.22E-05	2.09E+00	1.41E+00	7.53E-03	0.00E+00	7.00E-03	1.41E-02	**-2.84E+01**	**-2.85E+01**	-0.025%
2007	22	-6.04E+00	6.00E+00	-4.17E-02	3.45E-02	2.12E-03	1.46E-04	0.00E+00	0.00E+00	6.33E-07	-1.24E-06	4.18E-01	4.21E-01	3.10E-03	0.00E+00	5.36E-04	1.23E-03	**-6.04E+00**	**-6.04E+00**	-0.009%
2007	26	-2.27E+00	2.28E+00	1.03E-02	0.00E+00	1.57E-04	9.29E-06	0.00E+00	0.00E+00	0.00E+00	-6.65E-07	3.48E-02	2.41E-02	2.43E-04	0.00E+00	6.11E-05	1.30E-04	**-2.27E+00**	**-2.27E+00**	-0.003%
2007	25	-4.88E+00	4.89E+00	1.72E-02	4.45E-03	6.46E-04	3.47E-05	0.00E+00	4.01E-04	0.00E+00	-1.50E-06	1.46E-01	1.22E-01	1.01E-03	0.00E+00	2.43E-04	5.49E-04	**-4.88E+00**	**-4.88E+00**	-0.005%
2008	1	-3.34E+00	3.35E+00	1.00E-02	0.00E+00	1.30E-03	2.84E-05	0.00E+00	5.94E-02	3.59E-06	-1.69E-06	2.68E-01	1.97E-01	1.81E-04	0.00E+00	2.94E-04	5.59E-04	**-3.34E+00**	**-3.34E+00**	0.000%
2008	38	-8.29E+00	8.28E+00	-9.40E-03	0.00E+00	4.28E-03	1.05E-04	0.00E+00	3.34E-02	1.98E-04	1.29E-06	4.65E-01	4.37E-01	4.00E-04	0.00E+00	2.97E-04	4.71E-04	**-8.29E+00**	**-8.29E+00**	0.007%
2008	23	-8.12E+00	8.12E+00	3.94E-04	0.00E+00	1.20E-03	4.38E-05	0.00E+00	0.00E+00	2.24E-05	-1.53E-07	1.00E-01	9.80E-02	9.36E-04	0.00E+00	1.35E-04	4.50E-04	**-8.12E+00**	**-8.12E+00**	-0.002%
2008	35	-3.58E+01	3.58E+01	2.24E-02	0.00E+00	3.47E-03	2.34E-04	0.00E+00	5.80E-02	0.00E+00	-1.82E-06	9.25E-01	8.37E-01	5.34E-03	0.00E+00	2.67E-03	9.10E-03	**-3.58E+01**	**-3.58E+01**	-0.014%
2008	39	-1.37E+01	1.37E+01	-9.44E-03	3.11E-03	3.37E-03	2.70E-04	0.00E+00	0.00E+00	2.05E-06	-9.73E-08	8.32E-01	8.26E-01	9.35E-03	0.00E+00	8.18E-04	2.34E-03	**-1.37E+01**	**-1.37E+01**	-0.008%
2008	21	-2.46E+00	2.46E+00	1.48E-03	0.00E+00	4.41E-04	5.08E-05	0.00E+00	0.00E+00	1.86E-05	-1.08E-07	1.60E-01	1.56E-01	1.79E-03	0.00E+00	1.82E-04	3.84E-04	**-2.46E+00**	**-2.46E+00**	-0.004%
2008	27	-8.22E+00	8.22E+00	1.48E-03	5.29E-03	4.41E-03	4.37E-04	0.00E+00	6.53E-04	0.00E+00	-8.83E-07	1.29E+00	1.26E+00	1.34E-02	0.00E+00	1.59E-03	4.69E-03	**-8.22E+00**	**-8.22E+00**	-0.028%
2008	34	-2.24E+00	2.33E+00	9.20E-02	0.00E+00	7.10E-04	4.38E-05	0.00E+00	8.38E-02	0.00E+00	-8.65E-06	2.38E-01	6.05E-02	1.17E-03	0.00E+00	1.24E-03	3.06E-03	**-2.23E+00**	**-2.24E+00**	-0.066%
2008	20	-3.65E+00	3.66E+00	5.87E-03	0.00E+00	6.36E-04	6.33E-05	0.00E+00	0.00E+00	0.00E+00	-3.34E-07	1.82E-01	1.74E-01	1.76E-03	0.00E+00	2.34E-04	5.80E-04	**-3.65E+00**	**-3.65E+00**	-0.007%
2008	33	-2.47E+00	2.54E+00	6.94E-02	1.58E-02	7.18E-04	4.03E-05	0.00E+00	8.65E-02	0.00E+00	-8.45E-06	3.21E-01	1.48E-01	1.23E-03	0.00E+00	1.47E-03	3.83E-03	**-2.47E+00**	**-2.47E+00**	-0.077%
2008	32	-2.30E+01	2.31E+01	8.90E-02	2.63E-02	5.49E-03	3.40E-04	4.02E-02	4.45E-01	0.00E+00	-1.55E-05	1.92E+00	1.31E+00	7.50E-03	0.00E+00	6.99E-03	2.30E-02	**-2.30E+01**	**-2.30E+01**	-0.051%
2008	22	-4.74E+00	4.70E+00	-3.87E-02	2.75E-02	2.05E-03	1.48E-04	0.00E+00	0.00E+00	1.75E-06	-2.60E-07	3.64E-01	3.71E-01	2.84E-03	0.00E+00	6.14E-04	1.53E-03	**-4.74E+00**	**-4.74E+00**	-0.015%

Table 6. Mass Balance for 1,2,3,7,8-PeCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2008	26	-1.71E+00	1.72E+00	7.05E-03	0.00E+00	1.52E-04	9.30E-06	0.00E+00	0.00E+00	0.00E+00	-3.96E-07	3.03E-02	2.29E-02	2.21E-04	0.00E+00	6.71E-05	2.01E-04	**-1.71E+00**	**-1.71E+00**	-0.006%
2008	25	-3.83E+00	3.85E+00	1.42E-02	3.09E-03	6.24E-04	3.47E-05	0.00E+00	4.39E-04	0.00E+00	-8.50E-07	1.29E-01	1.10E-01	1.01E-03	0.00E+00	2.87E-04	7.71E-04	**-3.83E+00**	**-3.83E+00**	-0.010%
2009	1	-3.38E+00	3.38E+00	5.21E-03	0.00E+00	1.28E-03	2.75E-05	0.00E+00	5.91E-02	2.14E-06	-9.67E-07	2.72E-01	2.07E-01	2.68E-04	0.00E+00	5.59E-04	2.97E-04	**-3.38E+00**	**-3.38E+00**	0.005%
2009	38	-8.16E+00	8.17E+00	8.61E-03	0.00E+00	4.25E-03	1.04E-04	0.00E+00	1.80E-02	1.90E-04	-9.01E-06	4.74E-01	4.43E-01	6.63E-04	0.00E+00	4.64E-04	1.91E-04	**-8.16E+00**	**-8.16E+00**	0.010%
2009	23	-8.18E+00	8.18E+00	-3.14E-04	0.00E+00	1.19E-03	4.49E-05	0.00E+00	0.00E+00	4.06E-06	5.40E-08	9.52E-02	9.37E-02	9.21E-04	0.00E+00	2.09E-04	3.74E-04	**-8.18E+00**	**-8.18E+00**	0.001%
2009	35	-3.59E+01	3.59E+01	1.97E-02	0.00E+00	3.44E-03	2.37E-04	0.00E+00	5.44E-02	0.00E+00	6.81E-06	8.71E-01	7.91E-01	5.43E-03	0.00E+00	4.20E-03	7.16E-03	**-3.59E+01**	**-3.59E+01**	-0.002%
2009	39	-1.39E+01	1.39E+01	-2.60E-03	3.42E-03	3.34E-03	2.78E-04	0.00E+00	0.00E+00	7.73E-06	-1.45E-07	8.16E-01	8.04E-01	8.59E-03	0.00E+00	1.14E-03	1.69E-03	**-1.39E+01**	**-1.39E+01**	-0.003%
2009	21	-2.42E+00	2.42E+00	-5.99E-05	0.00E+00	4.37E-04	5.12E-05	0.00E+00	0.00E+00	2.33E-05	-1.49E-08	1.53E-01	1.51E-01	1.69E-03	0.00E+00	1.91E-04	2.31E-04	**-2.42E+00**	**-2.42E+00**	0.004%
2009	27	-8.16E+00	8.16E+00	5.11E-03	5.22E-03	4.36E-03	4.48E-04	0.00E+00	6.14E-04	0.00E+00	-1.32E-06	1.27E+00	1.24E+00	1.29E-02	0.00E+00	2.32E-03	3.07E-03	**-8.16E+00**	**-8.16E+00**	-0.012%
2009	34	-2.22E+00	2.30E+00	8.15E-02	0.00E+00	7.03E-04	4.31E-05	0.00E+00	7.93E-02	0.00E+00	3.53E-05	2.20E-01	5.73E-02	1.22E-03	0.00E+00	1.62E-03	2.06E-03	**-2.22E+00**	**-2.22E+00**	-0.028%
2009	20	-3.73E+00	3.74E+00	4.44E-03	0.00E+00	6.29E-04	6.37E-05	0.00E+00	0.00E+00	0.00E+00	-3.26E-07	1.77E-01	1.71E-01	1.46E-03	0.00E+00	3.04E-04	3.64E-04	**-3.73E+00**	**-3.73E+00**	-0.001%
2009	33	-2.50E+00	2.57E+00	7.39E-02	1.56E-02	7.11E-04	3.98E-05	0.00E+00	8.33E-02	0.00E+00	6.33E-05	3.11E-01	1.36E-01	1.27E-03	0.00E+00	2.00E-03	2.69E-03	**-2.50E+00**	**-2.50E+00**	-0.044%
2009	32	-2.34E+01	2.35E+01	8.49E-02	2.58E-02	5.43E-03	3.46E-04	3.97E-02	4.36E-01	0.00E+00	-1.05E-04	1.90E+00	1.30E+00	7.60E-03	0.00E+00	1.11E-02	1.63E-02	**-2.34E+01**	**-2.34E+01**	-0.022%
2009	22	-4.90E+00	4.85E+00	-4.63E-02	2.71E-02	2.03E-03	1.52E-04	0.00E+00	0.00E+00	0.00E+00	-3.04E-07	3.69E-01	3.84E-01	2.64E-03	0.00E+00	7.82E-04	9.56E-04	**-4.90E+00**	**-4.90E+00**	-0.006%
2009	26	-1.85E+00	1.86E+00	7.64E-03	0.00E+00	1.51E-04	9.59E-06	0.00E+00	0.00E+00	0.00E+00	-3.84E-07	3.19E-02	2.38E-02	2.33E-04	0.00E+00	1.03E-04	1.33E-04	**-1.85E+00**	**-1.85E+00**	-0.003%
2009	25	-4.01E+00	4.02E+00	1.53E-02	2.76E-03	6.19E-04	3.56E-05	0.00E+00	4.60E-04	0.00E+00	-8.71E-07	1.33E-01	1.13E-01	1.00E-03	0.00E+00	3.80E-04	5.27E-04	**-4.01E+00**	**-4.01E+00**	-0.005%
2010	1	-3.38E+00	3.39E+00	1.02E-02	0.00E+00	1.29E-03	1.83E-05	0.00E+00	6.48E-02	2.47E-07	-1.97E-06	2.62E-01	1.89E-01	1.67E-04	0.00E+00	2.97E-04	1.94E-04	**-3.38E+00**	**-3.38E+00**	0.095%
2010	38	-8.05E+00	8.06E+00	8.56E-03	0.00E+00	4.27E-03	7.05E-05	0.00E+00	2.71E-02	1.98E-04	-3.28E-05	5.04E-01	4.66E-01	4.92E-04	0.00E+00	1.61E-04	1.89E-04	**-8.05E+00**	**-8.05E+00**	0.034%
2010	23	-7.85E+00	7.85E+00	6.86E-04	0.00E+00	1.20E-03	3.24E-05	0.00E+00	0.00E+00	1.70E-05	-1.82E-06	1.07E-01	1.05E-01	7.90E-04	0.00E+00	1.90E-04	1.78E-04	**-7.85E+00**	**-7.85E+00**	0.004%
2010	35	-3.45E+01	3.46E+01	6.13E-02	0.00E+00	3.46E-03	1.70E-04	0.00E+00	5.60E-02	0.00E+00	-4.19E-06	9.69E-01	8.61E-01	4.37E-03	0.00E+00	3.52E-03	3.62E-03	**-3.46E+01**	**-3.45E+01**	0.048%
2010	39	-1.33E+01	1.33E+01	1.51E-03	2.52E-03	3.36E-03	2.03E-04	0.00E+00	0.00E+00	5.57E-05	-1.38E-05	9.30E-01	9.17E-01	7.44E-03	0.00E+00	8.16E-04	9.82E-04	**-1.33E+01**	**-1.33E+01**	0.016%
2010	21	-2.31E+00	2.32E+00	6.31E-03	0.00E+00	4.40E-04	3.64E-05	0.00E+00	0.00E+00	1.26E-05	-9.84E-06	1.66E-01	1.58E-01	1.31E-03	0.00E+00	9.85E-05	1.98E-04	**-2.31E+00**	**-2.31E+00**	0.020%
2010	27	-7.95E+00	8.00E+00	5.26E-02	4.17E-03	4.39E-03	3.38E-04	0.00E+00	5.81E-04	5.02E-07	-2.45E-05	1.47E+00	1.41E+00	1.07E-02	0.00E+00	1.52E-03	2.16E-03	**-7.96E+00**	**-7.95E+00**	0.131%
2010	34	-2.06E+00	2.17E+00	1.06E-01	0.00E+00	7.08E-04	3.19E-05	0.00E+00	7.66E-02	0.00E+00	-9.56E-06	2.44E-01	6.08E-02	1.00E-03	0.00E+00	9.83E-04	1.43E-03	**-2.06E+00**	**-2.06E+00**	0.005%
2010	20	-3.54E+00	3.55E+00	1.12E-02	0.00E+00	6.34E-04	4.67E-05	0.00E+00	0.00E+00	0.00E+00	-4.20E-06	1.93E-01	1.80E-01	1.07E-03	0.00E+00	1.68E-04	2.86E-04	**-3.54E+00**	**-3.54E+00**	0.012%
2010	33	-2.36E+00	2.45E+00	9.37E-02	1.31E-02	7.16E-04	2.99E-05	0.00E+00	8.06E-02	0.00E+00	-1.02E-05	3.32E-01	1.44E-01	1.02E-03	0.00E+00	1.29E-03	1.81E-03	**-2.36E+00**	**-2.36E+00**	0.003%
2010	32	-2.26E+01	2.27E+01	1.68E-01	2.18E-02	5.47E-03	2.73E-04	3.97E-02	4.31E-01	0.00E+00	-2.15E-05	2.02E+00	1.36E+00	6.49E-03	0.00E+00	8.20E-03	1.08E-02	**-2.26E+01**	**-2.26E+01**	0.066%
2010	22	-4.68E+00	4.66E+00	-2.76E-02	2.29E-02	2.04E-03	1.20E-04	0.00E+00	0.00E+00	4.43E-07	-5.70E-06	4.11E-01	4.13E-01	2.37E-03	0.00E+00	4.62E-04	8.61E-04	**-4.68E+00**	**-4.68E+00**	0.012%
2010	26	-1.80E+00	1.81E+00	7.60E-03	0.00E+00	1.52E-04	7.73E-06	0.00E+00	0.00E+00	0.00E+00	-4.47E-07	3.47E-02	2.69E-02	1.95E-04	0.00E+00	6.68E-05	1.00E-04	**-1.80E+00**	**-1.80E+00**	0.006%
2010	25	-3.85E+00	3.87E+00	1.57E-02	3.03E-03	6.23E-04	2.91E-05	0.00E+00	4.22E-04	0.00E+00	-9.50E-07	1.40E-01	1.19E-01	8.13E-04	0.00E+00	2.68E-04	4.25E-04	**-3.85E+00**	**-3.85E+00**	0.003%
2011	1	-5.22E+00	5.23E+00	1.08E-02	0.00E+00	1.36E-03	1.70E-05	0.00E+00	7.34E-02	6.81E-07	1.35E-07	3.05E-01	2.19E-01	1.41E-04	0.00E+00	1.93E-04	2.74E-04	**-5.22E+00**	**-5.22E+00**	0.005%
2011	38	-1.07E+01	1.08E+01	8.72E-02	0.00E+00	4.51E-03	6.23E-05	0.00E+00	4.72E-02	3.33E-04	-4.11E-05	6.41E-01	5.03E-01	4.02E-04	0.00E+00	1.89E-04	2.85E-04	**-1.07E+01**	**-1.07E+01**	0.015%
2011	23	-9.88E+00	9.88E+00	7.49E-03	0.00E+00	1.26E-03	2.77E-05	0.00E+00	0.00E+00	1.86E-05	-1.92E-06	1.31E-01	1.22E-01	8.10E-04	0.00E+00	9.46E-05	2.90E-04	**-9.88E+00**	**-9.88E+00**	0.001%
2011	35	-4.41E+01	4.42E+01	1.54E-01	0.00E+00	3.66E-03	1.48E-04	0.00E+00	5.80E-02	0.00E+00	-7.41E-05	1.27E+00	1.06E+00	3.64E-03	0.00E+00	1.85E-03	5.23E-03	**-4.41E+01**	**-4.41E+01**	0.002%
2011	39	-1.67E+01	1.68E+01	8.88E-02	2.32E-03	3.55E-03	1.78E-04	0.00E+00	0.00E+00	1.62E-05	-3.56E-05	1.21E+00	1.11E+00	7.11E-03	0.00E+00	4.98E-04	1.42E-03	**-1.67E+01**	**-1.67E+01**	0.000%
2011	21	-3.05E+00	3.08E+00	3.14E-02	0.00E+00	4.66E-04	3.15E-05	0.00E+00	0.00E+00	4.81E-05	-7.21E-06	2.39E-01	2.06E-01	1.22E-03	0.00E+00	1.03E-04	3.35E-04	**-3.05E+00**	**-3.05E+00**	0.015%

Table 6. Mass Balance for 1,2,3,7,8-PeCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2011	27	-9.50E+00	9.69E+00	1.85E-01	4.57E-03	4.66E-03	2.93E-04	0.00E+00	6.16E-04	0.00E+00	-4.73E-05	2.03E+00	1.83E+00	1.00E-02	0.00E+00	1.11E-03	2.58E-03	**-9.50E+00**	**-9.50E+00**	-0.007%
2011	34	-2.64E+00	2.88E+00	2.39E-01	0.00E+00	7.51E-04	2.75E-05	0.00E+00	8.36E-02	0.00E+00	-5.45E-05	4.08E-01	8.50E-02	9.37E-04	0.00E+00	7.13E-04	2.17E-03	**-2.64E+00**	**-2.64E+00**	-0.015%
2011	20	-4.56E+00	4.60E+00	4.67E-02	0.00E+00	6.72E-04	4.00E-05	0.00E+00	0.00E+00	2.86E-08	-1.22E-05	2.83E-01	2.35E-01	1.05E-03	0.00E+00	1.43E-04	3.80E-04	**-4.56E+00**	**-4.56E+00**	0.003%
2011	33	-2.91E+00	3.12E+00	2.11E-01	1.40E-02	7.59E-04	2.60E-05	0.00E+00	8.41E-02	0.00E+00	-4.63E-05	4.85E-01	1.75E-01	9.43E-04	0.00E+00	8.84E-04	2.67E-03	**-2.91E+00**	**-2.91E+00**	-0.036%
2011	32	-2.63E+01	2.67E+01	4.42E-01	2.03E-02	5.80E-03	2.28E-04	3.92E-02	4.12E-01	2.09E-08	-1.21E-04	2.58E+00	1.67E+00	5.08E-03	0.00E+00	5.66E-03	1.23E-02	**-2.63E+01**	**-2.63E+01**	0.020%
2011	22	-5.43E+00	5.44E+00	1.16E-02	2.12E-02	2.16E-03	9.91E-05	0.00E+00	0.00E+00	3.62E-07	-9.74E-06	5.85E-01	5.48E-01	2.39E-03	0.00E+00	4.41E-04	7.86E-04	**-5.43E+00**	**-5.43E+00**	0.007%
2011	26	-2.17E+00	2.18E+00	1.15E-02	0.00E+00	1.61E-04	6.35E-06	0.00E+00	0.00E+00	0.00E+00	-1.35E-06	4.82E-02	3.64E-02	1.57E-04	0.00E+00	5.28E-05	8.91E-05	**-2.17E+00**	**-2.17E+00**	-0.001%
2011	25	-4.37E+00	4.41E+00	3.58E-02	4.95E-03	6.60E-04	2.39E-05	0.00E+00	3.85E-04	0.00E+00	-4.32E-06	1.87E-01	1.45E-01	7.02E-04	0.00E+00	2.32E-04	3.65E-04	**-4.37E+00**	**-4.37E+00**	0.003%
2012	1	-2.74E+00	2.75E+00	1.00E-02	0.00E+00	1.26E-03	1.16E-05	0.00E+00	8.52E-02	1.35E-06	-4.10E-06	2.91E-01	1.94E-01	1.65E-04	0.00E+00	2.73E-04	2.77E-04	**-2.74E+00**	**-2.74E+00**	0.000%
2012	38	-6.29E+00	6.24E+00	-4.93E-02	0.00E+00	4.18E-03	4.29E-05	0.00E+00	6.17E-02	2.49E-05	2.47E-06	4.88E-01	4.71E-01	1.15E-04	0.00E+00	2.86E-04	1.65E-04	**-6.29E+00**	**-6.29E+00**	0.009%
2012	23	-6.04E+00	6.04E+00	8.59E-04	0.00E+00	1.17E-03	1.88E-05	0.00E+00	0.00E+00	0.00E+00	-1.59E-07	1.02E-01	9.99E-02	3.83E-04	0.00E+00	1.33E-04	1.51E-04	**-6.04E+00**	**-6.04E+00**	-0.001%
2012	35	-2.72E+01	2.72E+01	2.05E-02	0.00E+00	3.38E-03	1.03E-04	0.00E+00	5.68E-02	0.00E+00	-1.71E-06	9.97E-01	9.14E-01	2.01E-03	0.00E+00	2.24E-03	3.92E-03	**-2.72E+01**	**-2.72E+01**	-0.007%
2012	39	-1.05E+01	1.04E+01	-6.08E-02	1.29E-03	3.28E-03	1.22E-04	0.00E+00	0.00E+00	0.00E+00	1.35E-06	9.56E-01	1.01E+00	4.30E-03	0.00E+00	6.14E-04	8.30E-04	**-1.05E+01**	**-1.05E+01**	-0.003%
2012	21	-1.86E+00	1.86E+00	-7.67E-03	0.00E+00	4.30E-04	2.25E-05	0.00E+00	0.00E+00	2.87E-06	6.68E-08	1.79E-01	1.86E-01	6.58E-04	0.00E+00	1.62E-04	1.47E-04	**-1.86E+00**	**-1.86E+00**	0.001%
2012	27	-6.11E+00	6.10E+00	-8.99E-03	1.86E-03	4.29E-03	2.06E-04	0.00E+00	4.76E-04	0.00E+00	-3.48E-07	1.51E+00	1.51E+00	7.09E-03	0.00E+00	1.15E-03	1.69E-03	**-6.11E+00**	**-6.11E+00**	-0.013%
2012	34	-1.62E+00	1.73E+00	1.12E-01	0.00E+00	6.92E-04	2.01E-05	0.00E+00	8.25E-02	0.00E+00	-8.02E-06	2.67E-01	7.14E-02	5.74E-04	0.00E+00	1.06E-03	1.30E-03	**-1.62E+00**	**-1.62E+00**	-0.039%
2012	20	-2.80E+00	2.80E+00	4.19E-03	0.00E+00	6.20E-04	2.88E-05	0.00E+00	0.00E+00	0.00E+00	-2.52E-07	2.16E-01	2.10E-01	8.30E-04	0.00E+00	1.66E-04	2.13E-04	**-2.80E+00**	**-2.80E+00**	-0.003%
2012	33	-1.83E+00	1.95E+00	1.14E-01	6.62E-03	7.00E-04	1.84E-05	0.00E+00	7.91E-02	0.00E+00	-9.29E-06	3.57E-01	1.55E-01	5.84E-04	0.00E+00	1.27E-03	1.60E-03	**-1.83E+00**	**-1.83E+00**	-0.043%
2012	32	-1.69E+01	1.70E+01	1.35E-01	8.33E-03	5.35E-03	1.64E-04	3.73E-02	3.68E-01	0.00E+00	-1.64E-05	1.92E+00	1.36E+00	3.34E-03	0.00E+00	6.10E-03	9.49E-03	**-1.69E+01**	**-1.69E+01**	-0.028%
2012	22	-3.45E+00	3.39E+00	-6.48E-02	8.86E-03	2.00E-03	7.00E-05	0.00E+00	0.00E+00	0.00E+00	6.00E-07	3.89E-01	4.41E-01	1.52E-03	0.00E+00	3.55E-04	5.28E-04	**-3.45E+00**	**-3.45E+00**	-0.007%
2012	26	-1.25E+00	1.26E+00	8.65E-03	0.00E+00	1.48E-04	4.60E-06	0.00E+00	0.00E+00	0.00E+00	-3.17E-07	3.27E-02	2.37E-02	1.07E-04	0.00E+00	4.80E-05	6.84E-05	**-1.25E+00**	**-1.25E+00**	-0.003%
2012	25	-2.70E+00	2.72E+00	1.54E-02	2.79E-03	6.08E-04	1.72E-05	0.00E+00	3.66E-04	0.00E+00	-6.97E-07	1.33E-01	1.13E-01	5.63E-04	0.00E+00	1.85E-04	2.77E-04	**-2.70E+00**	**-2.70E+00**	-0.005%
2013	1	-3.18E+00	3.18E+00	4.76E-03	0.00E+00	1.28E-03	1.91E-05	0.00E+00	7.69E-02	3.63E-06	-2.61E-06	2.63E-01	1.80E-01	2.28E-04	0.00E+00	2.77E-04	2.59E-04	**-3.18E+00**	**-3.18E+00**	0.000%
2013	38	-7.78E+00	7.75E+00	-2.86E-02	0.00E+00	4.25E-03	7.10E-05	0.00E+00	4.39E-02	1.56E-04	-2.85E-05	4.42E-01	4.23E-01	2.18E-04	0.00E+00	1.34E-04	1.70E-04	**-7.78E+00**	**-7.78E+00**	0.011%
2013	23	-7.78E+00	7.78E+00	-2.10E-03	0.00E+00	1.19E-03	3.23E-05	0.00E+00	0.00E+00	3.20E-06	-1.86E-06	8.78E-02	8.86E-02	3.92E-04	0.00E+00	7.23E-05	3.49E-04	**-7.78E+00**	**-7.78E+00**	-0.001%
2013	35	-3.44E+01	3.44E+01	1.76E-02	0.00E+00	3.43E-03	1.68E-04	0.00E+00	5.05E-02	0.00E+00	-2.65E-06	8.60E-01	7.87E-01	3.36E-03	0.00E+00	1.93E-03	5.99E-03	**-3.44E+01**	**-3.44E+01**	-0.008%
2013	39	-1.33E+01	1.33E+01	-8.02E-03	3.18E-03	3.33E-03	2.00E-04	0.00E+00	0.00E+00	6.11E-07	-4.52E-06	8.01E-01	7.97E-01	6.17E-03	0.00E+00	4.18E-04	1.51E-03	**-1.33E+01**	**-1.33E+01**	-0.004%
2013	21	-2.35E+00	2.34E+00	-1.21E-02	0.00E+00	4.36E-04	3.58E-05	0.00E+00	0.00E+00	1.42E-05	-5.03E-06	1.55E-01	1.66E-01	8.57E-04	0.00E+00	7.19E-05	2.05E-04	**-2.35E+00**	**-2.35E+00**	0.002%
2013	27	-7.71E+00	7.72E+00	1.60E-03	6.05E-03	4.35E-03	3.24E-04	0.00E+00	5.18E-04	0.00E+00	-5.03E-06	1.35E+00	1.33E+00	1.03E-02	0.00E+00	8.57E-04	2.58E-03	**-7.71E+00**	**-7.71E+00**	-0.016%
2013	34	-2.07E+00	2.16E+00	9.66E-02	0.00E+00	7.01E-04	3.14E-05	0.00E+00	7.38E-02	0.00E+00	-1.02E-05	2.37E-01	6.52E-02	9.55E-04	0.00E+00	6.61E-04	1.79E-03	**-2.07E+00**	**-2.07E+00**	-0.044%
2013	20	-3.57E+00	3.56E+00	-7.01E-03	0.00E+00	6.28E-04	4.53E-05	0.00E+00	0.00E+00	0.00E+00	2.44E-07	1.86E-01	1.91E-01	9.65E-04	0.00E+00	1.10E-04	3.39E-04	**-3.57E+00**	**-3.57E+00**	-0.004%
2013	33	-2.33E+00	2.42E+00	9.16E-02	1.67E-02	7.09E-04	2.94E-05	0.00E+00	7.48E-02	0.00E+00	-1.19E-05	3.30E-01	1.46E-01	1.02E-03	0.00E+00	8.07E-04	2.20E-03	**-2.33E+00**	**-2.33E+00**	-0.048%
2013	32	-2.15E+01	2.16E+01	1.05E-01	2.49E-02	5.42E-03	2.56E-04	3.97E-02	3.62E-01	0.00E+00	-1.96E-05	1.84E+00	1.30E+00	5.41E-03	0.00E+00	4.74E-03	1.34E-02	**-2.15E+01**	**-2.15E+01**	-0.031%
2013	22	-4.46E+00	4.41E+00	-4.58E-02	2.60E-02	2.02E-03	1.12E-04	0.00E+00	0.00E+00	0.00E+00	5.94E-08	3.64E-01	3.79E-01	2.26E-03	0.00E+00	2.70E-04	8.42E-04	**-4.45E+00**	**-4.46E+00**	-0.009%
2013	26	-1.67E+00	1.67E+00	8.18E-03	0.00E+00	1.50E-04	7.15E-06	0.00E+00	0.00E+00	0.00E+00	-4.39E-07	3.21E-02	2.36E-02	1.79E-04	0.00E+00	3.34E-05	1.05E-04	**-1.67E+00**	**-1.67E+00**	-0.003%
2013	25	-3.59E+00	3.61E+00	1.49E-02	3.05E-03	6.17E-04	2.67E-05	0.00E+00	3.94E-04	0.00E+00	-9.55E-07	1.30E-01	1.10E-01	9.15E-04	0.00E+00	1.39E-04	4.12E-04	**-3.59E+00**	**-3.59E+00**	-0.006%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 6. Mass Balance for 1,2,3,7,8-PeCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2014	1	-3.72E+00	3.73E+00	5.32E-03	0.00E+00	1.28E-03	2.31E-05	0.00E+00	8.83E-02	6.51E-07	-1.22E-06	3.15E-01	2.20E-01	2.17E-04	0.00E+00	2.59E-04	2.42E-04	**-3.72E+00**	**-3.72E+00**	0.000%
2014	38	-8.64E+00	8.65E+00	1.54E-02	0.00E+00	4.23E-03	8.28E-05	0.00E+00	4.90E-02	1.94E-04	-3.35E-05	5.37E-01	4.69E-01	2.64E-04	0.00E+00	1.39E-04	2.62E-04	**-8.64E+00**	**-8.64E+00**	0.006%
2014	23	-8.41E+00	8.41E+00	-1.33E-03	0.00E+00	1.19E-03	3.38E-05	0.00E+00	0.00E+00	8.11E-06	-3.52E-06	9.07E-02	9.03E-02	5.43E-04	0.00E+00	1.73E-04	2.45E-04	**-8.41E+00**	**-8.41E+00**	0.000%
2014	35	-3.74E+01	3.74E+01	1.52E-02	0.00E+00	3.47E-03	1.86E-04	0.00E+00	5.48E-02	0.00E+00	-1.52E-06	9.03E-01	8.25E-01	3.83E-03	0.00E+00	3.17E-03	4.77E-03	**-3.74E+01**	**-3.74E+01**	-0.006%
2014	39	-1.43E+01	1.43E+01	5.90E-03	2.63E-03	3.28E-03	2.12E-04	0.00E+00	0.00E+00	6.70E-06	-1.42E-05	8.83E-01	8.65E-01	6.93E-03	0.00E+00	7.21E-04	1.53E-03	**-1.43E+01**	**-1.43E+01**	-0.005%
2014	21	-2.59E+00	2.59E+00	4.64E-04	0.00E+00	4.35E-04	4.02E-05	0.00E+00	0.00E+00	2.24E-05	-6.65E-06	1.82E-01	1.81E-01	1.00E-03	0.00E+00	8.87E-05	3.01E-04	**-2.59E+00**	**-2.59E+00**	-0.002%
2014	27	-8.34E+00	8.35E+00	6.62E-03	5.22E-03	4.34E-03	3.48E-04	0.00E+00	4.81E-04	2.98E-07	-1.21E-05	1.36E+00	1.33E+00	1.06E-02	0.00E+00	1.19E-03	3.11E-03	**-8.34E+00**	**-8.34E+00**	-0.017%
2014	34	-2.25E+00	2.35E+00	1.04E-01	0.00E+00	7.00E-04	3.56E-05	0.00E+00	8.06E-02	0.00E+00	-1.01E-05	2.61E-01	7.48E-02	1.03E-03	0.00E+00	8.85E-04	2.05E-03	**-2.25E+00**	**-2.25E+00**	-0.046%
2014	20	-3.92E+00	3.93E+00	7.16E-03	0.00E+00	6.27E-04	5.10E-05	0.00E+00	0.00E+00	0.00E+00	-4.54E-07	2.14E-01	2.05E-01	1.06E-03	0.00E+00	1.62E-04	4.30E-04	**-3.92E+00**	**-3.92E+00**	-0.005%
2014	33	-2.55E+00	2.64E+00	9.55E-02	1.64E-02	7.08E-04	3.33E-05	0.00E+00	8.14E-02	0.00E+00	-1.16E-05	3.53E-01	1.58E-01	1.08E-03	0.00E+00	1.09E-03	2.58E-03	**-2.54E+00**	**-2.55E+00**	-0.052%
2014	32	-2.41E+01	2.41E+01	3.88E-02	3.70E-02	5.41E-03	2.81E-04	4.02E-02	3.96E-01	0.00E+00	-1.35E-05	1.84E+00	1.32E+00	5.96E-03	0.00E+00	6.77E-03	1.42E-02	**-2.41E+01**	**-2.41E+01**	-0.029%
2014	22	-4.93E+00	4.90E+00	-3.68E-02	2.56E-02	2.02E-03	1.22E-04	0.00E+00	0.00E+00	0.00E+00	5.77E-08	3.93E-01	4.00E-01	2.35E-03	0.00E+00	3.92E-04	1.31E-03	**-4.93E+00**	**-4.93E+00**	-0.012%
2014	26	-1.80E+00	1.80E+00	6.65E-03	0.00E+00	1.50E-04	7.75E-06	0.00E+00	0.00E+00	0.00E+00	-4.14E-07	3.16E-02	2.47E-02	1.76E-04	0.00E+00	5.20E-05	1.40E-04	**-1.80E+00**	**-1.80E+00**	-0.004%
2014	25	-4.06E+00	4.08E+00	1.50E-02	1.63E-03	6.15E-04	2.88E-05	0.00E+00	3.98E-04	0.00E+00	-8.06E-07	1.31E-01	1.13E-01	9.21E-04	0.00E+00	1.99E-04	6.16E-04	**-4.06E+00**	**-4.06E+00**	-0.008%
2015	1	-3.24E+00	3.24E+00	1.41E-03	0.00E+00	1.27E-03	2.50E-05	0.00E+00	6.40E-02	1.24E-06	-6.06E-07	2.54E-01	1.87E-01	1.72E-04	0.00E+00	2.41E-04	3.75E-04	**-3.24E+00**	**-3.24E+00**	0.000%
2015	38	-7.64E+00	7.63E+00	-1.75E-02	0.00E+00	4.18E-03	8.59E-05	0.00E+00	2.99E-02	3.39E-04	8.07E-07	4.08E-01	3.91E-01	1.37E-04	0.00E+00	2.62E-04	4.17E-04	**-7.64E+00**	**-7.64E+00**	0.006%
2015	23	-7.47E+00	7.47E+00	-1.58E-03	0.00E+00	1.17E-03	3.33E-05	0.00E+00	0.00E+00	2.89E-06	-5.06E-09	7.49E-02	7.49E-02	5.36E-04	0.00E+00	1.24E-04	2.73E-04	**-7.47E+00**	**-7.47E+00**	-0.001%
2015	35	-3.32E+01	3.32E+01	-4.04E-03	0.00E+00	3.42E-03	1.86E-04	0.00E+00	4.43E-02	0.00E+00	-3.98E-07	7.30E-01	6.83E-01	3.56E-03	0.00E+00	2.35E-03	5.50E-03	**-3.32E+01**	**-3.32E+01**	-0.008%
2015	39	-1.27E+01	1.26E+01	-1.63E-02	2.40E-03	3.24E-03	2.11E-04	0.00E+00	0.00E+00	2.26E-05	7.22E-08	7.45E-01	7.50E-01	6.75E-03	0.00E+00	7.89E-04	1.64E-03	**-1.27E+01**	**-1.27E+01**	-0.005%
2015	21	-2.27E+00	2.26E+00	-2.70E-03	0.00E+00	4.29E-04	4.00E-05	0.00E+00	0.00E+00	7.33E-05	-6.32E-08	1.56E-01	1.58E-01	1.10E-03	0.00E+00	1.55E-04	3.42E-04	**-2.27E+00**	**-2.27E+00**	-0.004%
2015	27	-7.35E+00	7.35E+00	-4.84E-03	4.54E-03	4.29E-03	3.45E-04	0.00E+00	3.60E-04	2.04E-07	-6.19E-07	1.11E+00	1.10E+00	1.04E-02	0.00E+00	1.57E-03	3.54E-03	**-7.35E+00**	**-7.35E+00**	-0.020%
2015	34	-1.97E+00	2.05E+00	7.98E-02	0.00E+00	6.91E-04	3.54E-05	0.00E+00	6.78E-02	0.00E+00	-8.30E-06	2.13E-01	6.38E-02	9.73E-04	0.00E+00	1.01E-03	2.08E-03	**-1.97E+00**	**-1.97E+00**	-0.051%
2015	20	-3.46E+00	3.46E+00	2.33E-03	0.00E+00	6.19E-04	5.03E-05	0.00E+00	0.00E+00	0.00E+00	-2.79E-07	1.80E-01	1.76E-01	1.07E-03	0.00E+00	2.14E-04	4.69E-04	**-3.46E+00**	**-3.46E+00**	-0.006%
2015	33	-2.23E+00	2.30E+00	7.60E-02	1.48E-02	6.99E-04	3.24E-05	0.00E+00	7.03E-02	0.00E+00	-9.79E-06	2.87E-01	1.24E-01	1.05E-03	0.00E+00	1.26E-03	2.96E-03	**-2.22E+00**	**-2.23E+00**	-0.057%
2015	32	-2.11E+01	2.11E+01	2.14E-02	2.21E-02	5.34E-03	2.74E-04	3.66E-02	3.46E-01	0.00E+00	-9.80E-06	1.57E+00	1.13E+00	6.12E-03	0.00E+00	7.18E-03	1.55E-02	**-2.11E+01**	**-2.11E+01**	-0.033%
2015	22	-4.28E+00	4.25E+00	-3.45E-02	2.32E-02	1.99E-03	1.19E-04	0.00E+00	0.00E+00	6.57E-07	-1.37E-07	3.34E-01	3.41E-01	2.30E-03	0.00E+00	6.81E-04	1.25E-03	**-4.28E+00**	**-4.28E+00**	-0.011%
2015	26	-1.51E+00	1.52E+00	6.88E-03	0.00E+00	1.48E-04	7.58E-06	0.00E+00	0.00E+00	0.00E+00	-4.25E-07	2.75E-02	2.03E-02	1.89E-04	0.00E+00	7.06E-05	1.45E-04	**-1.51E+00**	**-1.51E+00**	-0.004%
2015	25	-3.53E+00	3.54E+00	1.01E-02	2.61E-03	6.08E-04	2.86E-05	0.00E+00	3.59E-04	0.00E+00	-7.29E-07	1.13E-01	9.86E-02	9.05E-04	0.00E+00	3.06E-04	5.72E-04	**-3.53E+00**	**-3.53E+00**	-0.007%
2016	1	-3.02E+00	3.03E+00	2.52E-03	0.00E+00	1.25E-03	2.19E-05	0.00E+00	6.90E-02	1.39E-07	1.87E-05	2.63E-01	1.90E-01	1.62E-04	0.00E+00	3.74E-04	4.42E-04	**-3.02E+00**	**-3.02E+00**	0.000%
2016	38	-7.02E+00	7.01E+00	-7.82E-03	0.00E+00	4.13E-03	7.52E-05	0.00E+00	2.79E-02	5.09E-04	6.14E-05	4.14E-01	3.90E-01	1.23E-04	0.00E+00	4.17E-04	3.50E-04	**-7.02E+00**	**-7.02E+00**	0.010%
2016	23	-6.77E+00	6.77E+00	-1.25E-03	0.00E+00	1.16E-03	2.77E-05	0.00E+00	0.00E+00	2.31E-06	1.72E-05	7.48E-02	7.46E-02	4.30E-04	0.00E+00	1.51E-04	1.64E-04	**-6.77E+00**	**-6.77E+00**	0.001%
2016	35	-3.03E+01	3.03E+01	1.22E-02	0.00E+00	3.38E-03	1.55E-04	0.00E+00	4.43E-02	0.00E+00	1.01E-04	7.69E-01	7.07E-01	2.95E-03	0.00E+00	2.70E-03	3.29E-03	**-3.03E+01**	**-3.03E+01**	0.000%
2016	39	-1.14E+01	1.14E+01	-8.25E-03	1.75E-03	3.20E-03	1.73E-04	0.00E+00	0.00E+00	1.87E-06	1.08E-04	7.43E-01	7.41E-01	5.16E-03	0.00E+00	9.12E-04	8.21E-04	**-1.14E+01**	**-1.14E+01**	0.001%
2016	21	-2.13E+00	2.12E+00	-1.85E-03	0.00E+00	4.23E-04	3.43E-05	0.00E+00	0.00E+00	6.47E-05	2.35E-05	1.60E-01	1.61E-01	8.52E-04	0.00E+00	1.83E-04	1.56E-04	**-2.13E+00**	**-2.13E+00**	0.005%
2016	27	-6.96E+00	6.96E+00	-4.03E-04	3.47E-03	4.23E-03	2.81E-04	0.00E+00	3.80E-04	2.39E-07	1.85E-04	1.17E+00	1.15E+00	8.42E-03	0.00E+00	2.00E-03	1.74E-03	**-6.96E+00**	**-6.96E+00**	0.001%
2016	34	-1.85E+00	1.93E+00	8.40E-02	0.00E+00	6.82E-04	2.97E-05	0.00E+00	7.28E-02	0.00E+00	2.25E-05	2.28E-01	7.00E-02	8.70E-04	0.00E+00	1.07E-03	1.06E-03	**-1.85E+00**	**-1.85E+00**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 6. Mass Balance for 1,2,3,7,8-PeCDD

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2016	20	-3.25E+00	3.25E+00	3.00E-03	0.00E+00	6.11E-04	4.23E-05	0.00E+00	0.00E+00	0.00E+00	2.81E-05	1.87E-01	1.82E-01	8.96E-04	0.00E+00	2.53E-04	2.18E-04	**-3.25E+00**	**-3.25E+00**	0.000%
2016	33	-2.09E+00	2.17E+00	8.18E-02	1.13E-02	6.90E-04	2.71E-05	0.00E+00	7.46E-02	0.00E+00	2.31E-05	3.00E-01	1.30E-01	8.77E-04	0.00E+00	1.69E-03	1.37E-03	**-2.09E+00**	**-2.09E+00**	0.000%
2016	32	-2.02E+01	2.02E+01	3.55E-02	1.69E-02	5.27E-03	2.23E-04	3.47E-02	3.70E-01	0.00E+00	1.91E-04	1.66E+00	1.19E+00	5.03E-03	0.00E+00	8.54E-03	9.25E-03	**-2.02E+01**	**-2.02E+01**	0.000%
2016	22	-4.07E+00	4.04E+00	-2.83E-02	1.77E-02	1.97E-03	9.54E-05	0.00E+00	0.00E+00	0.00E+00	7.95E-05	3.44E-01	3.51E-01	1.81E-03	0.00E+00	7.83E-04	6.84E-04	**-4.07E+00**	**-4.07E+00**	0.001%
2016	26	-1.43E+00	1.44E+00	6.58E-03	0.00E+00	1.46E-04	6.13E-06	0.00E+00	0.00E+00	0.00E+00	4.72E-06	2.87E-02	2.18E-02	1.54E-04	0.00E+00	8.58E-05	7.93E-05	**-1.43E+00**	**-1.43E+00**	0.000%
2016	25	-3.35E+00	3.36E+00	1.20E-02	2.14E-03	6.00E-04	2.30E-05	0.00E+00	3.70E-04	0.00E+00	2.04E-05	1.19E-01	1.03E-01	6.99E-04	0.00E+00	3.29E-04	3.21E-04	**-3.35E+00**	**-3.35E+00**	0.000%

Table 7. Mass Balance for 2,3,4,7,8-PeCDF

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1996	1	-1.02E+01	1.03E+01	1.49E-01	0.00E+00	5.78E-04	6.06E-05	0.00E+00	5.03E-02	1.99E-05	-2.31E-05	9.03E-01	7.02E-01	3.86E-04	0.00E+00	1.08E-03	6.66E-04	**-1.02E+01**	**-1.02E+01**	0.000%
1996	38	-2.36E+01	2.36E+01	-3.51E-02	0.00E+00	1.89E-03	2.27E-04	0.00E+00	7.76E-02	4.11E-03	2.90E-06	1.45E+00	1.41E+00	2.38E-04	0.00E+00	1.11E-03	6.24E-04	**-2.36E+01**	**-2.36E+01**	0.024%
1996	23	-2.17E+01	2.17E+01	6.94E-03	0.00E+00	5.22E-04	9.39E-05	0.00E+00	0.00E+00	1.96E-04	-1.76E-06	3.30E-01	3.22E-01	4.04E-04	0.00E+00	4.88E-04	3.32E-04	**-2.17E+01**	**-2.17E+01**	0.001%
1996	35	-1.02E+02	1.02E+02	-1.10E-01	0.00E+00	2.24E-03	5.22E-04	0.00E+00	2.14E-01	0.00E+00	-5.06E-06	3.53E+00	3.42E+00	4.28E-03	0.00E+00	9.30E-03	6.74E-03	**-1.02E+02**	**-1.02E+02**	0.000%
1996	39	-3.89E+01	3.87E+01	-2.73E-01	3.62E-03	2.11E-03	6.00E-04	0.00E+00	0.00E+00	4.39E-05	2.27E-05	3.47E+00	3.73E+00	7.05E-03	0.00E+00	2.90E-03	1.81E-03	**-3.89E+01**	**-3.89E+01**	0.002%
1996	21	-7.34E+00	7.34E+00	-1.94E-03	0.00E+00	3.90E-04	1.20E-04	0.00E+00	0.00E+00	7.65E-05	2.30E-06	6.05E-01	6.06E-01	1.33E-03	0.00E+00	5.50E-04	4.48E-04	**-7.34E+00**	**-7.34E+00**	0.008%
1996	27	-2.57E+01	2.59E+01	1.78E-01	6.04E-03	3.90E-03	1.08E-03	0.00E+00	2.20E-03	8.30E-06	-9.21E-06	5.44E+00	5.23E+00	1.59E-02	0.00E+00	6.26E-03	3.98E-03	**-2.57E+01**	**-2.57E+01**	0.002%
1996	34	-6.80E+00	7.23E+00	4.28E-01	0.00E+00	6.28E-04	9.69E-05	0.00E+00	3.75E-01	0.00E+00	-3.06E-05	1.05E+00	2.46E-01	1.78E-03	0.00E+00	3.70E-03	3.14E-03	**-6.80E+00**	**-6.80E+00**	0.000%
1996	20	-1.13E+01	1.13E+01	2.25E-02	0.00E+00	5.63E-04	1.62E-04	0.00E+00	0.00E+00	7.43E-06	-6.77E-07	7.69E-01	7.45E-01	1.44E-03	0.00E+00	8.41E-04	5.58E-04	**-1.13E+01**	**-1.13E+01**	0.001%
1996	33	-7.40E+00	7.71E+00	3.04E-01	1.98E-02	6.36E-04	9.11E-05	0.00E+00	4.01E-01	0.00E+00	-2.34E-05	1.38E+00	6.50E-01	2.15E-03	0.00E+00	3.94E-03	3.46E-03	**-7.40E+00**	**-7.40E+00**	0.000%
1996	32	-7.37E+01	7.38E+01	8.73E-02	3.28E-02	4.86E-03	9.21E-04	5.17E-02	1.85E+00	0.00E+00	-1.85E-05	6.91E+00	4.87E+00	1.05E-02	0.00E+00	2.25E-02	2.00E-02	**-7.37E+01**	**-7.37E+01**	0.000%
1996	22	-1.49E+01	1.48E+01	-1.26E-01	3.43E-02	1.81E-03	4.14E-04	0.00E+00	0.00E+00	2.35E-05	6.34E-07	1.32E+00	1.41E+00	2.72E-03	0.00E+00	2.20E-03	1.71E-03	**-1.49E+01**	**-1.49E+01**	0.001%
1996	26	-5.57E+00	5.60E+00	3.10E-02	0.00E+00	1.35E-04	2.63E-05	0.00E+00	0.00E+00	0.00E+00	-1.10E-06	1.35E-01	1.03E-01	3.56E-04	0.00E+00	2.55E-04	2.17E-04	**-5.57E+00**	**-5.57E+00**	0.000%
1996	25	-1.25E+01	1.26E+01	5.69E-02	2.73E-03	5.52E-04	9.96E-05	0.00E+00	1.82E-03	0.00E+00	-1.37E-06	5.02E-01	4.38E-01	1.60E-03	0.00E+00	9.73E-04	8.90E-04	**-1.25E+01**	**-1.25E+01**	0.000%
1997	1	-8.20E+00	8.28E+00	8.11E-02	0.00E+00	5.69E-04	5.23E-05	0.00E+00	3.40E-02	1.43E-06	-6.28E-06	7.71E-01	6.56E-01	3.57E-04	0.00E+00	6.65E-04	1.36E-03	**-8.20E+00**	**-8.20E+00**	0.000%
1997	38	-1.96E+01	1.96E+01	-3.36E-02	0.00E+00	1.85E-03	2.01E-04	0.00E+00	4.37E-02	1.47E-03	3.86E-08	1.13E+00	1.12E+00	2.36E-04	0.00E+00	6.24E-04	5.48E-04	**-1.96E+01**	**-1.96E+01**	0.012%
1997	23	-1.87E+01	1.87E+01	-7.84E-03	0.00E+00	5.14E-04	8.62E-05	0.00E+00	0.00E+00	2.21E-05	-2.06E-07	2.96E-01	3.03E-01	4.71E-04	0.00E+00	3.32E-04	3.27E-04	**-1.87E+01**	**-1.87E+01**	0.000%
1997	35	-8.73E+01	8.73E+01	-2.68E-02	0.00E+00	2.20E-03	4.65E-04	0.00E+00	2.02E-01	0.00E+00	-1.70E-06	3.05E+00	2.87E+00	4.34E-03	0.00E+00	6.74E-03	8.23E-03	**-8.73E+01**	**-8.73E+01**	0.000%
1997	39	-3.35E+01	3.30E+01	-4.31E-01	3.46E-03	2.08E-03	5.43E-04	0.00E+00	0.00E+00	2.84E-05	6.79E-06	2.85E+00	3.26E+00	6.51E-03	0.00E+00	1.81E-03	1.63E-03	**-3.35E+01**	**-3.35E+01**	0.001%
1997	21	-6.28E+00	6.25E+00	-2.34E-02	0.00E+00	3.84E-04	1.06E-04	0.00E+00	0.00E+00	2.23E-04	1.19E-07	5.16E-01	5.38E-01	1.06E-03	0.00E+00	4.48E-04	2.44E-04	**-6.28E+00**	**-6.28E+00**	0.005%
1997	27	-2.19E+01	2.19E+01	-1.66E-02	5.43E-03	3.83E-03	9.55E-04	0.00E+00	1.50E-03	0.00E+00	-1.27E-06	4.42E+00	4.42E+00	1.33E-02	0.00E+00	3.98E-03	2.99E-03	**-2.19E+01**	**-2.19E+01**	0.001%
1997	34	-5.85E+00	6.23E+00	3.87E-01	0.00E+00	6.18E-04	8.45E-05	0.00E+00	3.34E-01	0.00E+00	-1.96E-05	9.72E-01	2.48E-01	1.39E-03	0.00E+00	3.14E-03	2.36E-03	**-5.85E+00**	**-5.85E+00**	0.000%
1997	20	-9.56E+00	9.57E+00	8.93E-03	0.00E+00	5.53E-04	1.42E-04	0.00E+00	0.00E+00	2.03E-05	-3.81E-07	6.59E-01	6.49E-01	1.12E-03	0.00E+00	5.58E-04	3.73E-04	**-9.56E+00**	**-9.56E+00**	0.001%
1997	33	-6.31E+00	6.59E+00	2.82E-01	1.73E-02	6.25E-04	8.03E-05	0.00E+00	3.55E-01	0.00E+00	-1.53E-05	1.24E+00	5.78E-01	1.58E-03	0.00E+00	3.46E-03	2.55E-03	**-6.31E+00**	**-6.31E+00**	0.000%
1997	32	-6.39E+01	6.39E+01	4.17E-02	2.83E-02	4.77E-03	8.09E-04	5.19E-02	1.62E+00	0.00E+00	-1.25E-05	6.18E+00	4.42E+00	8.57E-03	0.00E+00	2.00E-02	1.72E-02	**-6.39E+01**	**-6.39E+01**	0.000%
1997	22	-1.32E+01	1.29E+01	-2.80E-01	2.96E-02	1.78E-03	3.63E-04	0.00E+00	0.00E+00	3.03E-05	2.35E-06	1.20E+00	1.45E+00	2.02E-03	0.00E+00	1.71E-03	1.01E-03	**-1.32E+01**	**-1.32E+01**	0.001%
1997	26	-4.81E+00	4.84E+00	3.17E-02	0.00E+00	1.32E-04	2.31E-05	0.00E+00	0.00E+00	0.00E+00	-8.71E-07	1.23E-01	9.14E-02	2.08E-04	0.00E+00	2.17E-04	1.48E-04	**-4.81E+00**	**-4.81E+00**	0.000%
1997	25	-1.11E+01	1.11E+01	4.06E-02	2.74E-03	5.43E-04	8.78E-05	0.00E+00	1.31E-03	0.00E+00	-9.13E-07	4.69E-01	4.23E-01	1.18E-03	0.00E+00	8.90E-04	6.00E-04	**-1.11E+01**	**-1.11E+01**	0.000%
1998	1	-7.71E+00	7.75E+00	3.81E-02	0.00E+00	5.73E-04	6.04E-05	0.00E+00	3.68E-02	5.66E-06	-2.96E-06	6.92E-01	6.16E-01	3.31E-04	0.00E+00	1.36E-03	6.36E-04	**-7.71E+00**	**-7.71E+00**	0.000%
1998	38	-1.82E+01	1.82E+01	-3.11E-02	0.00E+00	1.87E-03	2.20E-04	0.00E+00	4.81E-02	1.15E-03	-4.99E-05	1.04E+00	1.02E+00	1.30E-04	0.00E+00	5.00E-04	3.91E-04	**-1.82E+01**	**-1.82E+01**	0.016%
1998	23	-1.72E+01	1.72E+01	-8.13E-03	0.00E+00	5.18E-04	9.15E-05	0.00E+00	0.00E+00	1.65E-05	-2.93E-06	2.40E-01	2.48E-01	3.24E-04	0.00E+00	3.25E-04	2.25E-04	**-1.72E+01**	**-1.72E+01**	0.001%
1998	35	-8.01E+01	8.01E+01	-6.54E-02	0.00E+00	2.22E-03	4.92E-04	0.00E+00	1.80E-01	0.00E+00	-2.96E-07	2.51E+00	2.38E+00	3.98E-03	0.00E+00	8.24E-03	5.30E-03	**-8.01E+01**	**-8.01E+01**	0.000%
1998	39	-3.06E+01	3.04E+01	-2.23E-01	3.24E-03	2.10E-03	5.72E-04	0.00E+00	0.00E+00	6.12E-05	-1.58E-05	2.38E+00	2.59E+00	6.79E-03	0.00E+00	1.61E-03	1.25E-03	**-3.06E+01**	**-3.06E+01**	0.001%
1998	21	-5.82E+00	5.80E+00	-1.34E-02	0.00E+00	3.86E-04	1.11E-04	0.00E+00	0.00E+00	8.71E-05	-1.72E-05	4.46E-01	4.58E-01	1.07E-03	0.00E+00	2.27E-04	2.45E-04	**-5.82E+00**	**-5.82E+00**	0.007%
1998	27	-2.03E+01	2.04E+01	5.31E-03	5.38E-03	3.86E-03	9.86E-04	0.00E+00	1.52E-03	3.04E-05	-3.02E-05	3.81E+00	3.79E+00	1.08E-02	0.00E+00	2.96E-03	3.02E-03	**-2.03E+01**	**-2.03E+01**	0.002%

Table 7. Mass Balance for 2,3,4,7,8-PeCDF

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1998	34	-5.39E+00	5.68E+00	2.88E-01	0.00E+00	6.22E-04	8.72E-05	0.00E+00	2.94E-01	0.00E+00	-1.94E-05	7.93E-01	2.09E-01	1.33E-03	0.00E+00	2.36E-03	2.00E-03	**-5.39E+00**	**-5.39E+00**	0.000%
1998	20	-8.82E+00	8.82E+00	6.47E-03	0.00E+00	5.57E-04	1.46E-04	0.00E+00	0.00E+00	0.00E+00	-7.97E-06	5.64E-01	5.56E-01	1.04E-03	0.00E+00	3.65E-04	4.27E-04	**-8.82E+00**	**-8.82E+00**	0.001%
1998	33	-5.81E+00	6.02E+00	2.05E-01	1.88E-02	6.29E-04	8.41E-05	0.00E+00	3.20E-01	0.00E+00	-1.57E-05	9.97E-01	4.51E-01	1.54E-03	0.00E+00	2.55E-03	2.19E-03	**-5.81E+00**	**-5.81E+00**	0.000%
1998	32	-5.95E+01	5.94E+01	-2.45E-02	3.09E-02	4.81E-03	8.26E-04	5.13E-02	1.42E+00	0.00E+00	-1.22E-05	5.28E+00	3.79E+00	8.58E-03	0.00E+00	1.72E-02	1.40E-02	**-5.95E+01**	**-5.95E+01**	0.000%
1998	22	-1.24E+01	1.22E+01	-2.23E-01	3.23E-02	1.79E-03	3.70E-04	0.00E+00	0.00E+00	0.00E+00	-8.24E-06	1.08E+00	1.27E+00	2.24E-03	0.00E+00	1.00E-03	1.13E-03	**-1.24E+01**	**-1.24E+01**	0.001%
1998	26	-4.55E+00	4.58E+00	2.37E-02	0.00E+00	1.33E-04	2.35E-05	0.00E+00	0.00E+00	0.00E+00	-1.09E-06	1.09E-01	8.47E-02	1.78E-04	0.00E+00	1.48E-04	1.39E-04	**-4.55E+00**	**-4.55E+00**	0.000%
1998	25	-1.04E+01	1.04E+01	2.79E-02	3.24E-03	5.47E-04	8.96E-05	0.00E+00	1.35E-03	0.00E+00	-5.89E-07	4.00E-01	3.66E-01	1.13E-03	0.00E+00	6.00E-04	5.69E-04	**-1.04E+01**	**-1.04E+01**	0.000%
1999	1	-7.06E+00	7.11E+00	5.16E-02	0.00E+00	5.61E-04	6.30E-05	0.00E+00	3.14E-02	2.38E-06	-9.07E-06	6.13E-01	5.29E-01	3.51E-04	0.00E+00	6.36E-04	8.32E-04	**-7.06E+00**	**-7.06E+00**	0.000%
1999	38	-1.55E+01	1.55E+01	1.10E-02	0.00E+00	1.83E-03	2.16E-04	0.00E+00	3.37E-02	1.04E-03	-8.29E-05	8.64E-01	8.19E-01	3.45E-05	0.00E+00	3.12E-04	7.10E-04	**-1.55E+01**	**-1.55E+01**	0.012%
1999	23	-1.39E+01	1.39E+01	8.37E-03	0.00E+00	5.07E-04	8.20E-05	0.00E+00	0.00E+00	7.28E-06	-4.64E-06	2.09E-01	2.00E-01	2.68E-04	0.00E+00	2.22E-04	4.40E-04	**-1.39E+01**	**-1.39E+01**	0.001%
1999	35	-6.61E+01	6.61E+01	2.58E-02	0.00E+00	2.18E-03	4.51E-04	0.00E+00	1.58E-01	0.00E+00	-1.24E-05	2.12E+00	1.94E+00	3.16E-03	0.00E+00	5.30E-03	7.97E-03	**-6.61E+01**	**-6.61E+01**	0.000%
1999	39	-2.47E+01	2.46E+01	-4.52E-02	2.59E-03	2.05E-03	5.13E-04	0.00E+00	0.00E+00	1.53E-05	-1.95E-06	1.87E+00	1.90E+00	6.02E-03	0.00E+00	1.25E-03	2.54E-03	**-2.47E+01**	**-2.47E+01**	0.001%
1999	21	-4.96E+00	4.96E+00	2.50E-03	0.00E+00	3.79E-04	1.04E-04	0.00E+00	0.00E+00	6.24E-05	-5.20E-06	4.06E-01	4.03E-01	1.06E-03	0.00E+00	2.41E-04	4.38E-04	**-4.96E+00**	**-4.96E+00**	0.005%
1999	27	-1.76E+01	1.77E+01	4.79E-02	4.33E-03	3.79E-03	8.69E-04	0.00E+00	1.02E-03	6.48E-06	-5.30E-06	3.10E+00	3.04E+00	9.03E-03	0.00E+00	3.02E-03	4.58E-03	**-1.76E+01**	**-1.76E+01**	0.001%
1999	34	-4.66E+00	4.87E+00	2.12E-01	0.00E+00	6.11E-04	7.92E-05	0.00E+00	2.70E-01	0.00E+00	-1.27E-05	6.82E-01	2.01E-01	1.23E-03	0.00E+00	2.00E-03	3.54E-03	**-4.66E+00**	**-4.66E+00**	0.000%
1999	20	-7.49E+00	7.50E+00	7.56E-03	0.00E+00	5.47E-04	1.32E-04	0.00E+00	0.00E+00	0.00E+00	-5.92E-07	5.11E-01	5.03E-01	9.91E-04	0.00E+00	4.27E-04	7.00E-04	**-7.49E+00**	**-7.49E+00**	0.001%
1999	33	-4.93E+00	5.10E+00	1.71E-01	1.49E-02	6.18E-04	7.43E-05	0.00E+00	2.93E-01	0.00E+00	-1.11E-05	8.23E-01	3.44E-01	1.37E-03	0.00E+00	2.19E-03	3.94E-03	**-4.93E+00**	**-4.93E+00**	0.000%
1999	32	-5.15E+01	5.15E+01	-8.08E-03	2.41E-02	4.72E-03	7.07E-04	5.08E-02	1.41E+00	0.00E+00	-1.24E-05	4.64E+00	3.16E+00	8.12E-03	0.00E+00	1.40E-02	1.80E-02	**-5.15E+01**	**-5.15E+01**	0.000%
1999	22	-1.05E+01	1.04E+01	-9.41E-02	2.52E-02	1.76E-03	3.13E-04	0.00E+00	0.00E+00	2.86E-07	-9.28E-07	9.85E-01	1.05E+00	2.23E-03	0.00E+00	1.13E-03	1.81E-03	**-1.05E+01**	**-1.05E+01**	0.001%
1999	26	-3.74E+00	3.76E+00	2.57E-02	0.00E+00	1.31E-04	1.99E-05	0.00E+00	0.00E+00	0.00E+00	-8.64E-07	9.88E-02	7.29E-02	1.59E-04	0.00E+00	1.39E-04	2.19E-04	**-3.74E+00**	**-3.74E+00**	0.000%
1999	25	-8.91E+00	8.95E+00	3.77E-02	2.67E-03	5.37E-04	7.60E-05	0.00E+00	1.33E-03	0.00E+00	-1.14E-06	3.63E-01	3.20E-01	1.02E-03	0.00E+00	5.69E-04	9.50E-04	**-8.91E+00**	**-8.91E+00**	0.000%
2000	1	-6.62E+00	6.64E+00	1.94E-02	0.00E+00	5.67E-04	5.44E-05	0.00E+00	3.80E-02	1.15E-06	-1.25E-06	6.03E-01	5.45E-01	3.09E-04	0.00E+00	8.32E-04	3.99E-04	**-6.62E+00**	**-6.62E+00**	0.000%
2000	38	-1.54E+01	1.53E+01	-4.55E-02	0.00E+00	1.85E-03	2.01E-04	0.00E+00	3.65E-02	1.48E-03	-6.14E-06	8.44E-01	8.51E-01	4.44E-04	0.00E+00	7.04E-04	4.18E-04	**-1.54E+01**	**-1.54E+01**	0.010%
2000	23	-1.45E+01	1.45E+01	-1.08E-02	0.00E+00	5.12E-04	8.56E-05	0.00E+00	0.00E+00	5.35E-05	4.77E-08	2.14E-01	2.23E-01	6.00E-04	0.00E+00	4.40E-04	2.61E-04	**-1.45E+01**	**-1.45E+01**	0.000%
2000	35	-6.76E+01	6.75E+01	-6.04E-02	0.00E+00	2.20E-03	4.57E-04	0.00E+00	1.95E-01	0.00E+00	-2.01E-05	2.07E+00	1.92E+00	5.59E-03	0.00E+00	7.95E-03	4.31E-03	**-6.76E+01**	**-6.76E+01**	0.000%
2000	39	-2.58E+01	2.56E+01	-1.43E-01	3.09E-03	2.08E-03	5.32E-04	0.00E+00	0.00E+00	7.81E-05	1.37E-06	1.97E+00	2.10E+00	7.82E-03	0.00E+00	2.54E-03	1.49E-03	**-2.58E+01**	**-2.58E+01**	0.001%
2000	21	-4.86E+00	4.85E+00	-1.26E-02	0.00E+00	3.83E-04	1.04E-04	0.00E+00	0.00E+00	1.25E-04	-7.71E-08	3.64E-01	3.75E-01	1.33E-03	0.00E+00	4.38E-04	2.42E-04	**-4.86E+00**	**-4.86E+00**	0.004%
2000	27	-1.78E+01	1.78E+01	-8.10E-03	5.09E-03	3.83E-03	9.22E-04	0.00E+00	1.09E-03	0.00E+00	-1.45E-06	3.21E+00	3.20E+00	1.16E-02	0.00E+00	4.58E-03	2.98E-03	**-1.78E+01**	**-1.78E+01**	0.001%
2000	34	-4.65E+00	4.86E+00	2.04E-01	0.00E+00	6.17E-04	8.00E-05	0.00E+00	2.67E-01	0.00E+00	5.16E-05	6.54E-01	1.80E-01	1.19E-03	0.00E+00	3.61E-03	2.00E-03	**-4.65E+00**	**-4.65E+00**	0.001%
2000	20	-7.67E+00	7.67E+00	2.86E-03	0.00E+00	5.52E-04	1.36E-04	0.00E+00	0.00E+00	5.18E-06	-4.80E-07	4.57E-01	4.53E-01	1.23E-03	0.00E+00	7.00E-04	3.84E-04	**-7.67E+00**	**-7.67E+00**	0.001%
2000	33	-5.37E+00	5.51E+00	1.38E-01	1.62E-02	6.24E-04	7.57E-05	0.00E+00	2.95E-01	0.00E+00	1.31E-04	8.59E-01	4.05E-01	1.35E-03	0.00E+00	4.09E-03	1.98E-03	**-5.37E+00**	**-5.37E+00**	0.003%
2000	32	-5.35E+01	5.34E+01	-7.25E-02	2.67E-02	4.77E-03	7.67E-04	4.87E-02	1.59E+00	0.00E+00	-1.12E-04	4.78E+00	3.17E+00	9.65E-03	0.00E+00	1.78E-02	9.97E-03	**-5.35E+01**	**-5.35E+01**	0.000%
2000	22	-1.08E+01	1.07E+01	-1.27E-01	2.80E-02	1.78E-03	3.40E-04	0.00E+00	0.00E+00	1.00E-06	-3.08E-07	1.03E+00	1.12E+00	2.71E-03	0.00E+00	1.81E-03	1.12E-03	**-1.08E+01**	**-1.08E+01**	0.001%
2000	26	-4.11E+00	4.14E+00	2.28E-02	0.00E+00	1.32E-04	2.16E-05	0.00E+00	0.00E+00	0.00E+00	-7.53E-07	9.78E-02	7.46E-02	1.51E-04	0.00E+00	2.19E-04	1.09E-04	**-4.11E+00**	**-4.11E+00**	0.000%
2000	25	-9.52E+00	9.56E+00	3.49E-02	2.69E-03	5.42E-04	8.24E-05	0.00E+00	1.31E-03	0.00E+00	-1.22E-06	3.86E-01	3.45E-01	1.07E-03	0.00E+00	9.50E-04	3.76E-04	**-9.52E+00**	**-9.52E+00**	0.000%

Table 7. Mass Balance for 2,3,4,7,8-PeCDF

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2001	1	-6.16E+00	6.19E+00	3.42E-02	0.00E+00	5.56E-04	5.38E-05	0.00E+00	2.82E-02	2.32E-07	-1.59E-06	5.84E-01	5.22E-01	3.86E-04	0.00E+00	3.99E-04	8.52E-04	**-6.16E+00**	**-6.16E+00**	0.000%
2001	38	-1.42E+01	1.41E+01	-2.35E-02	0.00E+00	1.81E-03	1.90E-04	0.00E+00	2.87E-02	5.31E-04	-6.07E-07	8.12E-01	8.05E-01	2.85E-04	0.00E+00	4.18E-04	4.53E-04	**-1.42E+01**	**-1.42E+01**	0.007%
2001	23	-1.33E+01	1.33E+01	-1.24E-02	0.00E+00	5.02E-04	7.71E-05	0.00E+00	0.00E+00	1.96E-05	8.65E-09	2.04E-01	2.16E-01	4.30E-04	0.00E+00	2.61E-04	3.07E-04	**-1.33E+01**	**-1.33E+01**	0.000%
2001	35	-6.23E+01	6.22E+01	-5.15E-02	0.00E+00	2.16E-03	4.16E-04	0.00E+00	1.74E-01	0.00E+00	-5.29E-07	2.06E+00	1.93E+00	4.53E-03	0.00E+00	4.31E-03	6.65E-03	**-6.23E+01**	**-6.23E+01**	0.000%
2001	39	-2.36E+01	2.35E+01	-9.45E-02	2.40E-03	2.03E-03	4.81E-04	0.00E+00	0.00E+00	9.99E-05	1.04E-06	1.85E+00	1.93E+00	6.11E-03	0.00E+00	1.49E-03	1.47E-03	**-2.36E+01**	**-2.36E+01**	0.001%
2001	21	-4.53E+00	4.52E+00	-7.54E-03	0.00E+00	3.75E-04	9.47E-05	0.00E+00	0.00E+00	9.90E-05	-1.22E-07	3.67E-01	3.73E-01	1.07E-03	0.00E+00	2.42E-04	2.34E-04	**-4.53E+00**	**-4.53E+00**	0.003%
2001	27	-1.62E+01	1.61E+01	-6.04E-02	4.02E-03	3.75E-03	8.31E-04	0.00E+00	1.07E-03	1.07E-05	-4.07E-07	2.95E+00	3.00E+00	8.09E-03	0.00E+00	2.98E-03	3.24E-03	**-1.62E+01**	**-1.62E+01**	0.001%
2001	34	-4.30E+00	4.50E+00	1.99E-01	0.00E+00	6.04E-04	7.17E-05	0.00E+00	2.47E-01	0.00E+00	-1.30E-05	6.13E-01	1.66E-01	1.11E-03	0.00E+00	2.00E-03	2.28E-03	**-4.30E+00**	**-4.30E+00**	0.000%
2001	20	-7.02E+00	7.02E+00	3.15E-04	0.00E+00	5.41E-04	1.22E-04	0.00E+00	0.00E+00	3.49E-06	-2.69E-07	4.57E-01	4.55E-01	1.08E-03	0.00E+00	3.84E-04	3.73E-04	**-7.02E+00**	**-7.02E+00**	0.001%
2001	33	-4.94E+00	5.09E+00	1.48E-01	1.23E-02	6.11E-04	6.75E-05	0.00E+00	2.72E-01	0.00E+00	-1.04E-05	8.02E-01	3.67E-01	1.22E-03	0.00E+00	1.98E-03	2.55E-03	**-4.94E+00**	**-4.94E+00**	0.000%
2001	32	-4.81E+01	4.80E+01	-2.41E-02	2.08E-02	4.67E-03	6.75E-04	4.60E-02	1.44E+00	0.00E+00	-7.43E-06	4.50E+00	3.01E+00	8.25E-03	0.00E+00	9.97E-03	1.84E-02	**-4.81E+01**	**-4.81E+01**	0.000%
2001	22	-9.74E+00	9.56E+00	-1.77E-01	2.18E-02	1.74E-03	3.00E-04	0.00E+00	0.00E+00	6.01E-06	4.53E-07	9.32E-01	1.08E+00	2.31E-03	0.00E+00	1.12E-03	1.25E-03	**-9.74E+00**	**-9.74E+00**	0.001%
2001	26	-3.64E+00	3.66E+00	2.20E-02	0.00E+00	1.29E-04	1.90E-05	0.00E+00	0.00E+00	0.00E+00	-6.48E-07	8.83E-02	6.60E-02	1.47E-04	0.00E+00	1.09E-04	1.86E-04	**-3.64E+00**	**-3.64E+00**	0.000%
2001	25	-8.46E+00	8.49E+00	3.61E-02	1.76E-03	5.31E-04	7.23E-05	0.00E+00	1.22E-03	0.00E+00	-9.84E-07	3.43E-01	3.03E-01	8.58E-04	0.00E+00	3.76E-04	7.68E-04	**-8.46E+00**	**-8.46E+00**	0.000%
2002	1	-5.08E+00	5.08E+00	5.04E-03	0.00E+00	5.53E-04	7.38E-05	0.00E+00	1.13E-02	6.09E-07	-6.55E-07	4.54E-01	4.37E-01	5.06E-04	0.00E+00	8.52E-04	6.84E-04	**-5.08E+00**	**-5.08E+00**	0.000%
2002	38	-1.21E+01	1.20E+01	-2.85E-02	0.00E+00	1.80E-03	2.40E-04	0.00E+00	1.60E-02	1.05E-03	-7.73E-05	5.87E-01	5.98E-01	1.62E-04	0.00E+00	3.75E-04	4.80E-04	**-1.21E+01**	**-1.21E+01**	0.008%
2002	23	-1.17E+01	1.17E+01	-1.13E-02	0.00E+00	4.99E-04	8.72E-05	0.00E+00	0.00E+00	1.66E-05	-6.91E-06	1.65E-01	1.75E-01	3.51E-04	0.00E+00	3.00E-04	3.09E-04	**-1.17E+01**	**-1.17E+01**	0.000%
2002	35	-5.42E+01	5.42E+01	-4.85E-02	0.00E+00	2.14E-03	4.76E-04	0.00E+00	1.61E-01	0.00E+00	-3.12E-07	1.57E+00	1.45E+00	4.36E-03	0.00E+00	6.65E-03	6.05E-03	**-5.42E+01**	**-5.42E+01**	0.000%
2002	39	-2.03E+01	2.02E+01	-1.51E-01	2.15E-03	2.02E-03	5.35E-04	0.00E+00	0.00E+00	5.08E-04	-6.26E-06	1.47E+00	1.61E+00	6.18E-03	0.00E+00	1.46E-03	1.73E-03	**-2.03E+01**	**-2.03E+01**	0.001%
2002	21	-4.05E+00	4.04E+00	-1.35E-02	0.00E+00	3.73E-04	1.09E-04	0.00E+00	0.00E+00	2.04E-04	-1.28E-05	3.19E-01	3.31E-01	9.84E-04	0.00E+00	2.22E-04	2.87E-04	**-4.05E+00**	**-4.05E+00**	0.004%
2002	27	-1.40E+01	1.40E+01	-5.68E-02	3.65E-03	3.73E-03	8.64E-04	0.00E+00	7.55E-04	1.55E-05	-1.67E-05	2.26E+00	2.30E+00	7.05E-03	0.00E+00	3.22E-03	3.64E-03	**-1.40E+01**	**-1.40E+01**	0.001%
2002	34	-3.95E+00	4.07E+00	1.20E-01	0.00E+00	6.01E-04	7.93E-05	0.00E+00	2.15E-01	0.00E+00	-9.18E-06	4.94E-01	1.58E-01	1.05E-03	0.00E+00	2.28E-03	2.34E-03	**-3.95E+00**	**-3.95E+00**	0.000%
2002	20	-6.27E+00	6.26E+00	-5.62E-03	0.00E+00	5.38E-04	1.33E-04	0.00E+00	0.00E+00	1.62E-05	-1.31E-07	4.07E-01	4.11E-01	1.00E-03	0.00E+00	3.73E-04	4.63E-04	**-6.27E+00**	**-6.27E+00**	0.000%
2002	33	-4.40E+00	4.52E+00	1.15E-01	1.14E-02	6.08E-04	7.34E-05	0.00E+00	2.47E-01	0.00E+00	-9.38E-06	6.18E-01	2.43E-01	1.21E-03	0.00E+00	2.55E-03	2.67E-03	**-4.40E+00**	**-4.40E+00**	0.000%
2002	32	-4.18E+01	4.17E+01	-1.04E-01	1.90E-02	4.65E-03	6.63E-04	4.54E-02	1.26E+00	0.00E+00	-5.13E-06	3.74E+00	2.50E+00	8.14E-03	0.00E+00	1.84E-02	1.63E-02	**-4.18E+01**	**-4.18E+01**	0.000%
2002	22	-8.34E+00	8.18E+00	-1.54E-01	1.98E-02	1.73E-03	2.87E-04	0.00E+00	0.00E+00	2.67E-06	4.58E-07	7.96E-01	9.27E-01	2.08E-03	0.00E+00	1.25E-03	1.41E-03	**-8.34E+00**	**-8.34E+00**	0.001%
2002	26	-2.96E+00	2.98E+00	1.62E-02	0.00E+00	1.29E-04	1.81E-05	0.00E+00	0.00E+00	0.00E+00	-6.82E-07	7.93E-02	6.28E-02	1.56E-04	0.00E+00	1.86E-04	1.70E-04	**-2.96E+00**	**-2.96E+00**	0.000%
2002	25	-7.30E+00	7.33E+00	2.96E-02	1.88E-03	5.29E-04	6.91E-05	0.00E+00	1.27E-03	0.00E+00	-1.11E-06	2.94E-01	2.60E-01	8.81E-04	0.00E+00	7.67E-04	6.74E-04	**-7.30E+00**	**-7.30E+00**	0.000%
2003	1	-6.33E+00	6.39E+00	5.51E-02	0.00E+00	5.80E-04	5.55E-05	0.00E+00	3.56E-02	2.62E-06	-5.29E-06	5.53E-01	4.61E-01	4.38E-04	0.00E+00	6.83E-04	9.06E-04	**-6.33E+00**	**-6.33E+00**	0.000%
2003	38	-1.52E+01	1.52E+01	2.79E-02	0.00E+00	1.89E-03	2.19E-04	0.00E+00	4.34E-02	4.70E-04	5.07E-05	1.05E+00	9.79E-01	5.14E-04	0.00E+00	5.36E-04	9.31E-04	**-1.52E+01**	**-1.52E+01**	0.010%
2003	23	-1.41E+01	1.41E+01	-1.32E-02	0.00E+00	5.24E-04	9.45E-05	0.00E+00	0.00E+00	1.45E-05	-4.52E-07	2.05E-01	2.18E-01	5.29E-04	0.00E+00	3.09E-04	4.87E-04	**-1.41E+01**	**-1.41E+01**	0.001%
2003	35	-6.46E+01	6.46E+01	-2.72E-02	0.00E+00	2.25E-03	5.00E-04	0.00E+00	1.20E-01	0.00E+00	8.35E-05	2.02E+00	1.92E+00	5.06E-03	0.00E+00	6.14E-03	8.91E-03	**-6.46E+01**	**-6.46E+01**	0.000%
2003	39	-2.45E+01	2.45E+01	-3.29E-02	4.16E-03	2.12E-03	5.95E-04	0.00E+00	0.00E+00	3.76E-04	-5.28E-06	1.88E+00	1.89E+00	8.69E-03	0.00E+00	1.73E-03	2.63E-03	**-2.45E+01**	**-2.45E+01**	0.001%
2003	21	-4.56E+00	4.56E+00	-5.78E-03	0.00E+00	3.92E-04	1.14E-04	0.00E+00	0.00E+00	2.50E-05	-1.15E-06	3.24E-01	3.28E-01	1.34E-03	0.00E+00	2.86E-04	5.02E-04	**-4.56E+00**	**-4.56E+00**	0.004%
2003	27	-1.61E+01	1.61E+01	-2.36E-02	6.51E-03	3.92E-03	1.03E-03	0.00E+00	1.74E-03	0.00E+00	2.55E-05	3.02E+00	3.02E+00	1.14E-02	0.00E+00	3.67E-03	4.82E-03	**-1.61E+01**	**-1.61E+01**	0.001%

Table 7. Mass Balance for 2,3,4,7,8-PeCDF

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2003	34	-4.26E+00	4.49E+00	2.24E-01	0.00E+00	6.31E-04	8.70E-05	0.00E+00	1.84E-01	0.00E+00	5.29E-05	5.32E-01	1.24E-01	1.83E-03	0.00E+00	2.41E-03	3.97E-03	**-4.26E+00**	**-4.26E+00**	0.002%
2003	20	-6.94E+00	6.95E+00	9.58E-03	0.00E+00	5.65E-04	1.48E-04	0.00E+00	0.00E+00	1.50E-06	-2.09E-06	4.11E-01	4.00E-01	1.57E-03	0.00E+00	4.62E-04	7.41E-04	**-6.94E+00**	**-6.94E+00**	0.000%
2003	33	-4.80E+00	4.99E+00	1.90E-01	2.16E-02	6.38E-04	7.98E-05	0.00E+00	1.89E-01	0.00E+00	4.87E-04	7.33E-01	3.32E-01	1.82E-03	0.00E+00	3.17E-03	5.31E-03	**-4.80E+00**	**-4.80E+00**	0.010%
2003	32	-4.61E+01	4.64E+01	3.57E-01	3.51E-02	4.88E-03	8.02E-04	5.33E-02	9.83E-01	0.00E+00	3.08E-03	4.78E+00	3.34E+00	1.22E-02	0.00E+00	1.95E-02	2.05E-02	**-4.61E+01**	**-4.61E+01**	0.007%
2003	22	-9.58E+00	9.45E+00	-1.23E-01	3.67E-02	1.82E-03	3.81E-04	0.00E+00	0.00E+00	2.10E-06	-4.07E-06	9.29E-01	1.01E+00	3.68E-03	0.00E+00	1.41E-03	1.50E-03	**-9.58E+00**	**-9.58E+00**	0.000%
2003	26	-3.54E+00	3.55E+00	1.97E-02	0.00E+00	1.35E-04	2.37E-05	0.00E+00	0.00E+00	0.00E+00	-1.34E-06	7.70E-02	5.68E-02	3.55E-04	0.00E+00	1.69E-04	1.66E-04	**-3.54E+00**	**-3.54E+00**	0.000%
2003	25	-7.72E+00	7.77E+00	4.62E-02	4.29E-03	5.55E-04	8.85E-05	0.00E+00	1.08E-03	0.00E+00	-3.57E-06	3.25E-01	2.72E-01	1.63E-03	0.00E+00	6.73E-04	8.23E-04	**-7.72E+00**	**-7.72E+00**	0.000%
2004	1	-6.09E+00	6.14E+00	4.60E-02	0.00E+00	5.75E-04	5.10E-05	0.00E+00	6.82E-02	7.60E-06	-6.58E-06	5.87E-01	4.72E-01	4.03E-04	0.00E+00	9.04E-04	9.55E-04	**-6.09E+00**	**-6.09E+00**	0.000%
2004	38	-1.43E+01	1.43E+01	-1.68E-03	0.00E+00	1.88E-03	2.05E-04	0.00E+00	4.73E-02	7.93E-04	-7.25E-07	1.08E+00	1.03E+00	8.87E-04	0.00E+00	9.31E-04	1.17E-03	**-1.43E+01**	**-1.43E+01**	0.010%
2004	23	-1.32E+01	1.32E+01	3.06E-03	0.00E+00	5.19E-04	8.85E-05	0.00E+00	0.00E+00	5.51E-05	-3.25E-07	2.36E-01	2.31E-01	1.28E-03	0.00E+00	4.87E-04	7.36E-04	**-1.32E+01**	**-1.32E+01**	0.001%
2004	35	-6.00E+01	6.00E+01	3.93E-02	0.00E+00	2.23E-03	4.68E-04	0.00E+00	1.18E-01	0.00E+00	-4.49E-06	2.16E+00	2.00E+00	6.16E-03	0.00E+00	8.91E-03	1.31E-02	**-6.00E+01**	**-6.00E+01**	0.000%
2004	39	-2.29E+01	2.28E+01	-1.25E-01	3.85E-03	2.11E-03	5.60E-04	0.00E+00	0.00E+00	8.99E-05	4.78E-07	1.94E+00	2.06E+00	9.05E-03	0.00E+00	2.63E-03	4.77E-03	**-2.29E+01**	**-2.29E+01**	0.001%
2004	21	-4.17E+00	4.17E+00	-4.08E-03	0.00E+00	3.89E-04	1.08E-04	0.00E+00	0.00E+00	2.04E-05	-3.33E-07	3.39E-01	3.42E-01	1.51E-03	0.00E+00	5.02E-04	7.87E-04	**-4.17E+00**	**-4.17E+00**	0.006%
2004	27	-1.46E+01	1.46E+01	-4.91E-02	6.37E-03	3.89E-03	9.73E-04	0.00E+00	1.55E-03	0.00E+00	-2.65E-06	3.09E+00	3.12E+00	1.10E-02	0.00E+00	4.82E-03	8.15E-03	**-1.46E+01**	**-1.46E+01**	0.002%
2004	34	-3.84E+00	4.08E+00	2.39E-01	0.00E+00	6.26E-04	8.20E-05	0.00E+00	1.88E-01	0.00E+00	-1.85E-05	5.54E-01	1.26E-01	1.53E-03	0.00E+00	3.97E-03	4.66E-03	**-3.84E+00**	**-3.84E+00**	0.000%
2004	20	-6.29E+00	6.30E+00	1.04E-02	0.00E+00	5.61E-04	1.39E-04	0.00E+00	0.00E+00	1.16E-06	-8.39E-07	4.11E-01	3.99E-01	1.51E-03	0.00E+00	7.41E-04	1.00E-03	**-6.29E+00**	**-6.29E+00**	0.000%
2004	33	-4.34E+00	4.54E+00	2.07E-01	1.91E-02	6.33E-04	7.48E-05	0.00E+00	1.85E-01	0.00E+00	-1.84E-05	7.67E-01	3.54E-01	1.47E-03	0.00E+00	5.31E-03	5.64E-03	**-4.34E+00**	**-4.34E+00**	0.000%
2004	32	-4.06E+01	4.11E+01	4.43E-01	3.13E-02	4.84E-03	7.49E-04	5.19E-02	9.02E-01	0.00E+00	-5.08E-05	4.63E+00	3.20E+00	9.69E-03	0.00E+00	2.05E-02	3.13E-02	**-4.06E+01**	**-4.06E+01**	0.000%
2004	22	-8.55E+00	8.33E+00	-2.23E-01	3.27E-02	1.81E-03	3.51E-04	0.00E+00	0.00E+00	1.30E-05	1.24E-07	8.99E-01	1.08E+00	3.73E-03	0.00E+00	1.50E-03	2.29E-03	**-8.55E+00**	**-8.55E+00**	0.001%
2004	26	-3.10E+00	3.12E+00	1.88E-02	0.00E+00	1.34E-04	2.18E-05	0.00E+00	0.00E+00	0.00E+00	-9.90E-07	7.40E-02	5.49E-02	2.94E-04	0.00E+00	1.66E-04	2.61E-04	**-3.10E+00**	**-3.10E+00**	0.000%
2004	25	-6.69E+00	6.73E+00	4.32E-02	3.64E-03	5.50E-04	8.10E-05	0.00E+00	9.41E-04	0.00E+00	-2.11E-06	3.13E-01	2.64E-01	1.35E-03	0.00E+00	8.23E-04	1.01E-03	**-6.69E+00**	**-6.69E+00**	0.000%
2005	1	-5.49E+00	5.52E+00	2.84E-02	0.00E+00	5.51E-04	4.75E-05	0.00E+00	6.96E-02	1.14E-07	-2.49E-06	5.65E-01	4.66E-01	3.34E-04	0.00E+00	9.55E-04	4.70E-04	**-5.49E+00**	**-5.49E+00**	0.000%
2005	38	-1.33E+01	1.32E+01	-2.05E-02	0.00E+00	1.80E-03	1.86E-04	0.00E+00	4.38E-02	4.00E-04	-2.38E-06	1.03E+00	1.01E+00	7.58E-04	0.00E+00	1.17E-03	2.32E-04	**-1.33E+01**	**-1.33E+01**	0.009%
2005	23	-1.21E+01	1.21E+01	-3.92E-03	0.00E+00	4.98E-04	7.51E-05	0.00E+00	0.00E+00	1.01E-05	-3.06E-07	2.33E-01	2.35E-01	1.10E-03	0.00E+00	7.36E-04	1.99E-04	**-1.21E+01**	**-1.21E+01**	0.001%
2005	35	-5.59E+01	5.59E+01	3.29E-02	0.00E+00	2.14E-03	4.05E-04	0.00E+00	1.58E-01	0.00E+00	-5.89E-06	2.18E+00	1.97E+00	5.76E-03	0.00E+00	1.31E-02	4.93E-03	**-5.59E+01**	**-5.59E+01**	0.000%
2005	39	-2.09E+01	2.08E+01	-7.50E-02	2.47E-03	2.02E-03	4.78E-04	0.00E+00	0.00E+00	4.74E-05	-6.09E-07	2.04E+00	2.10E+00	8.40E-03	0.00E+00	4.77E-03	8.99E-04	**-2.09E+01**	**-2.09E+01**	0.001%
2005	21	-4.04E+00	4.03E+00	-9.49E-03	0.00E+00	3.72E-04	9.47E-05	0.00E+00	0.00E+00	3.27E-05	-4.10E-06	3.54E-01	3.61E-01	1.23E-03	0.00E+00	7.83E-04	1.35E-04	**-4.04E+00**	**-4.04E+00**	0.005%
2005	27	-1.42E+01	1.42E+01	-8.37E-03	4.27E-03	3.72E-03	8.42E-04	0.00E+00	1.44E-03	5.17E-06	-2.66E-06	3.15E+00	3.14E+00	1.00E-02	0.00E+00	8.15E-03	1.86E-03	**-1.42E+01**	**-1.42E+01**	0.001%
2005	34	-3.82E+00	4.03E+00	2.10E-01	0.00E+00	6.00E-04	7.20E-05	0.00E+00	2.21E-01	0.00E+00	-1.27E-05	5.80E-01	1.44E-01	1.11E-03	0.00E+00	4.66E-03	1.54E-03	**-3.82E+00**	**-3.82E+00**	0.000%
2005	20	-6.21E+00	6.22E+00	1.14E-02	0.00E+00	5.37E-04	1.22E-04	0.00E+00	0.00E+00	0.00E+00	-6.91E-07	4.34E-01	4.20E-01	1.29E-03	0.00E+00	1.00E-03	2.44E-04	**-6.21E+00**	**-6.21E+00**	0.000%
2005	33	-4.36E+00	4.53E+00	1.71E-01	1.06E-02	6.06E-04	6.49E-05	0.00E+00	2.37E-01	0.00E+00	-1.10E-05	7.98E-01	3.73E-01	1.17E-03	0.00E+00	5.64E-03	1.96E-03	**-4.36E+00**	**-4.36E+00**	0.000%
2005	32	-4.09E+01	4.11E+01	1.72E-01	1.83E-02	4.63E-03	6.63E-04	4.49E-02	1.28E+00	0.00E+00	-1.98E-05	4.62E+00	3.07E+00	8.64E-03	0.00E+00	3.13E-02	1.34E-02	**-4.09E+01**	**-4.09E+01**	0.000%
2005	22	-8.38E+00	8.28E+00	-1.00E-01	1.92E-02	1.73E-03	3.11E-04	0.00E+00	0.00E+00	0.00E+00	-2.30E-07	9.14E-01	9.89E-01	2.92E-03	0.00E+00	2.29E-03	6.74E-04	**-8.38E+00**	**-8.38E+00**	0.000%
2005	26	-3.01E+00	3.03E+00	1.85E-02	0.00E+00	1.28E-04	1.96E-05	0.00E+00	0.00E+00	0.00E+00	-5.36E-07	7.43E-02	5.53E-02	2.47E-04	0.00E+00	2.61E-04	1.01E-04	**-3.01E+00**	**-3.01E+00**	0.000%
2005	25	-6.70E+00	6.74E+00	3.57E-02	1.97E-03	5.27E-04	7.36E-05	0.00E+00	1.15E-03	0.00E+00	-1.01E-06	3.13E-01	2.72E-01	1.14E-03	0.00E+00	1.01E-03	3.66E-04	**-6.70E+00**	**-6.70E+00**	0.000%

Table 7. Mass Balance for 2,3,4,7,8-PeCDF

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2006	1	-5.56E+00	5.60E+00	3.71E-02	0.00E+00	5.77E-04	4.63E-05	0.00E+00	6.76E-02	1.69E-06	-3.82E-06	5.48E-01	4.42E-01	3.65E-04	0.00E+00	4.70E-04	4.21E-04	**-5.56E+00**	**-5.56E+00**	0.000%
2006	38	-1.35E+01	1.35E+01	-1.04E-02	0.00E+00	1.88E-03	1.91E-04	0.00E+00	4.59E-02	3.83E-04	-3.49E-05	9.93E-01	9.56E-01	7.71E-04	0.00E+00	2.00E-04	3.68E-04	**-1.35E+01**	**-1.35E+01**	0.011%
2006	23	-1.27E+01	1.27E+01	-3.90E-03	0.00E+00	5.21E-04	8.64E-05	0.00E+00	0.00E+00	1.78E-05	-2.25E-06	2.23E-01	2.25E-01	1.06E-03	0.00E+00	1.97E-04	2.21E-04	**-1.27E+01**	**-1.27E+01**	0.001%
2006	35	-5.75E+01	5.76E+01	2.36E-02	0.00E+00	2.24E-03	4.52E-04	0.00E+00	1.24E-01	0.00E+00	-6.08E-06	2.03E+00	1.87E+00	6.63E-03	0.00E+00	4.93E-03	4.02E-03	**-5.75E+01**	**-5.75E+01**	0.000%
2006	39	-2.18E+01	2.18E+01	-5.02E-02	4.81E-03	2.11E-03	5.42E-04	0.00E+00	0.00E+00	1.09E-05	-1.66E-05	1.80E+00	1.84E+00	9.65E-03	0.00E+00	8.84E-04	1.20E-03	**-2.18E+01**	**-2.18E+01**	0.001%
2006	21	-4.05E+00	4.04E+00	-7.05E-03	0.00E+00	3.89E-04	1.04E-04	0.00E+00	0.00E+00	2.16E-05	-1.02E-05	3.14E-01	3.19E-01	1.50E-03	0.00E+00	1.25E-04	1.89E-04	**-4.05E+00**	**-4.05E+00**	0.007%
2006	27	-1.43E+01	1.42E+01	-2.46E-02	7.73E-03	3.89E-03	9.56E-04	0.00E+00	1.61E-03	0.00E+00	-2.15E-05	2.89E+00	2.89E+00	1.32E-02	0.00E+00	1.84E-03	2.53E-03	**-1.43E+01**	**-1.43E+01**	0.002%
2006	34	-3.72E+00	3.92E+00	2.05E-01	0.00E+00	6.27E-04	8.15E-05	0.00E+00	1.81E-01	0.00E+00	-1.57E-05	5.14E-01	1.26E-01	1.46E-03	0.00E+00	1.54E-03	1.55E-03	**-3.72E+00**	**-3.72E+00**	0.000%
2006	20	-6.10E+00	6.11E+00	9.56E-03	0.00E+00	5.61E-04	1.38E-04	0.00E+00	0.00E+00	0.00E+00	-3.50E-06	3.83E-01	3.72E-01	1.64E-03	0.00E+00	2.41E-04	2.89E-04	**-6.10E+00**	**-6.10E+00**	0.001%
2006	33	-4.23E+00	4.40E+00	1.73E-01	2.04E-02	6.34E-04	7.51E-05	0.00E+00	1.87E-01	0.00E+00	-1.55E-05	7.31E-01	3.48E-01	1.52E-03	0.00E+00	1.96E-03	1.93E-03	**-4.23E+00**	**-4.23E+00**	0.000%
2006	32	-4.09E+01	4.12E+01	2.54E-01	3.30E-02	4.84E-03	7.65E-04	5.39E-02	9.92E-01	0.00E+00	-3.46E-05	4.39E+00	3.04E+00	1.06E-02	0.00E+00	1.34E-02	1.16E-02	**-4.09E+01**	**-4.09E+01**	0.000%
2006	22	-8.47E+00	8.37E+00	-1.03E-01	3.45E-02	1.81E-03	3.60E-04	0.00E+00	0.00E+00	5.07E-07	-4.49E-06	8.66E-01	9.30E-01	3.98E-03	0.00E+00	6.70E-04	8.86E-04	**-8.47E+00**	**-8.47E+00**	0.001%
2006	26	-3.21E+00	3.22E+00	1.55E-02	0.00E+00	1.34E-04	2.27E-05	0.00E+00	0.00E+00	0.00E+00	-6.83E-07	6.98E-02	5.40E-02	2.86E-04	0.00E+00	1.01E-04	9.70E-05	**-3.21E+00**	**-3.21E+00**	0.000%
2006	25	-6.90E+00	6.93E+00	3.64E-02	3.91E-03	5.51E-04	8.41E-05	0.00E+00	9.45E-04	0.00E+00	-1.60E-06	3.00E-01	2.57E-01	1.39E-03	0.00E+00	3.66E-04	3.85E-04	**-6.90E+00**	**-6.90E+00**	0.000%
2007	1	-7.20E+00	7.23E+00	3.84E-02	0.00E+00	5.84E-04	5.23E-05	0.00E+00	9.42E-02	2.39E-07	-1.98E-05	5.70E-01	4.36E-01	2.63E-04	0.00E+00	4.21E-04	4.54E-04	**-7.20E+00**	**-7.20E+00**	0.001%
2007	38	-1.64E+01	1.64E+01	2.17E-02	0.00E+00	1.90E-03	2.07E-04	0.00E+00	5.48E-02	5.29E-04	-1.51E-05	1.03E+00	9.55E-01	7.87E-04	0.00E+00	3.68E-04	4.44E-04	**-1.64E+01**	**-1.64E+01**	0.022%
2007	23	-1.51E+01	1.51E+01	-5.37E-03	0.00E+00	5.27E-04	8.94E-05	0.00E+00	0.00E+00	1.05E-05	-3.57E-07	2.18E-01	2.22E-01	1.01E-03	0.00E+00	2.21E-04	2.10E-04	**-1.51E+01**	**-1.51E+01**	0.001%
2007	35	-6.94E+01	6.94E+01	3.56E-02	0.00E+00	2.26E-03	4.69E-04	0.00E+00	1.26E-01	0.00E+00	-1.06E-05	2.09E+00	1.92E+00	6.41E-03	0.00E+00	4.02E-03	4.43E-03	**-6.94E+01**	**-6.94E+01**	0.000%
2007	39	-2.59E+01	2.59E+01	-8.17E-03	4.60E-03	2.13E-03	5.65E-04	0.00E+00	0.00E+00	5.33E-06	-7.46E-06	1.87E+00	1.86E+00	1.01E-02	0.00E+00	1.20E-03	1.29E-03	**-2.59E+01**	**-2.59E+01**	0.001%
2007	21	-5.08E+00	5.09E+00	6.11E-03	0.00E+00	3.93E-04	1.07E-04	0.00E+00	0.00E+00	4.42E-05	-2.32E-06	3.43E-01	3.35E-01	1.79E-03	0.00E+00	1.89E-04	2.87E-04	**-5.09E+00**	**-5.08E+00**	0.007%
2007	27	-1.73E+01	1.74E+01	3.58E-02	7.33E-03	3.93E-03	9.65E-04	0.00E+00	1.54E-03	0.00E+00	-1.10E-05	3.07E+00	3.01E+00	1.46E-02	0.00E+00	2.53E-03	2.49E-03	**-1.73E+01**	**-1.73E+01**	0.002%
2007	34	-4.60E+00	4.85E+00	2.56E-01	0.00E+00	6.33E-04	8.17E-05	0.00E+00	1.81E-01	0.00E+00	-3.12E-05	5.70E-01	1.32E-01	1.38E-03	0.00E+00	1.55E-03	1.94E-03	**-4.60E+00**	**-4.60E+00**	0.000%
2007	20	-7.64E+00	7.66E+00	2.40E-02	0.00E+00	5.67E-04	1.39E-04	0.00E+00	0.00E+00	0.00E+00	-3.55E-06	4.16E-01	3.90E-01	1.83E-03	0.00E+00	2.89E-04	3.53E-04	**-7.64E+00**	**-7.64E+00**	0.001%
2007	33	-5.16E+00	5.37E+00	2.14E-01	2.36E-02	6.41E-04	7.45E-05	0.00E+00	1.88E-01	0.00E+00	-2.72E-05	7.88E-01	3.61E-01	1.44E-03	0.00E+00	1.93E-03	2.36E-03	**-5.16E+00**	**-5.16E+00**	0.000%
2007	32	-4.95E+01	4.99E+01	4.02E-01	3.70E-02	4.89E-03	7.58E-04	5.96E-02	9.94E-01	0.00E+00	-6.29E-05	4.74E+00	3.23E+00	9.41E-03	0.00E+00	1.16E-02	1.28E-02	**-4.95E+01**	**-4.95E+01**	0.000%
2007	22	-1.04E+01	1.03E+01	-9.35E-02	3.87E-02	1.83E-03	3.51E-04	0.00E+00	0.00E+00	2.02E-06	-2.72E-06	9.61E-01	1.01E+00	4.10E-03	0.00E+00	8.86E-04	1.04E-03	**-1.04E+01**	**-1.04E+01**	0.001%
2007	26	-3.89E+00	3.92E+00	2.31E-02	0.00E+00	1.36E-04	2.21E-05	0.00E+00	0.00E+00	0.00E+00	-1.19E-06	7.86E-02	5.51E-02	2.87E-04	0.00E+00	9.70E-05	1.16E-04	**-3.89E+00**	**-3.89E+00**	0.000%
2007	25	-8.38E+00	8.43E+00	4.30E-02	5.06E-03	5.57E-04	8.24E-05	0.00E+00	8.95E-04	0.00E+00	-2.74E-06	3.28E-01	2.78E-01	1.24E-03	0.00E+00	3.85E-04	4.83E-04	**-8.38E+00**	**-8.38E+00**	0.000%
2008	1	-5.41E+00	5.43E+00	2.27E-02	0.00E+00	5.72E-04	6.11E-05	0.00E+00	1.26E-01	9.51E-06	-2.76E-06	5.61E-01	4.12E-01	1.87E-04	0.00E+00	4.53E-04	6.59E-04	**-5.41E+00**	**-5.41E+00**	-0.001%
2008	38	-1.31E+01	1.31E+01	-3.06E-02	0.00E+00	1.86E-03	2.34E-04	0.00E+00	6.94E-02	4.54E-04	2.61E-06	9.69E-01	9.28E-01	4.01E-04	0.00E+00	4.44E-04	5.82E-04	**-1.31E+01**	**-1.31E+01**	0.008%
2008	23	-1.23E+01	1.23E+01	-2.10E-03	0.00E+00	5.17E-04	9.25E-05	0.00E+00	0.00E+00	9.16E-05	-2.34E-07	2.22E-01	2.23E-01	9.85E-04	0.00E+00	2.10E-04	2.70E-04	**-1.23E+01**	**-1.23E+01**	0.001%
2008	35	-5.58E+01	5.59E+01	1.46E-02	0.00E+00	2.22E-03	4.94E-04	0.00E+00	1.32E-01	0.00E+00	-3.01E-06	2.10E+00	1.94E+00	5.88E-03	0.00E+00	4.43E-03	5.69E-03	**-5.58E+01**	**-5.58E+01**	0.000%
2008	39	-2.11E+01	2.10E+01	-5.93E-02	3.59E-03	2.09E-03	5.81E-04	0.00E+00	0.00E+00	5.18E-06	-7.03E-08	1.90E+00	1.94E+00	1.02E-02	0.00E+00	1.29E-03	1.58E-03	**-2.11E+01**	**-2.11E+01**	0.001%
2008	21	-3.94E+00	3.93E+00	-3.64E-03	0.00E+00	3.86E-04	1.14E-04	0.00E+00	0.00E+00	5.06E-05	-1.55E-07	3.59E-01	3.60E-01	2.02E-03	0.00E+00	2.87E-04	2.54E-04	**-3.94E+00**	**-3.94E+00**	0.004%
2008	27	-1.35E+01	1.35E+01	-3.12E-02	5.94E-03	3.86E-03	9.91E-04	0.00E+00	1.45E-03	0.00E+00	-1.36E-06	2.97E+00	2.98E+00	1.53E-02	0.00E+00	2.49E-03	3.29E-03	**-1.35E+01**	**-1.35E+01**	0.001%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 7. Mass Balance for 2,3,4,7,8-PeCDF

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2008	34	-3.59E+00	3.81E+00	2.13E-01	0.00E+00	6.22E-04	8.63E-05	0.00E+00	1.92E-01	0.00E+00	-1.37E-05	5.44E-01	1.38E-01	1.29E-03	0.00E+00	1.94E-03	2.19E-03	**-3.59E+00**	**-3.59E+00**	0.000%
2008	20	-5.87E+00	5.88E+00	9.41E-03	0.00E+00	5.57E-04	1.46E-04	0.00E+00	0.00E+00	0.00E+00	-5.09E-07	4.12E-01	4.01E-01	1.99E-03	0.00E+00	3.53E-04	4.31E-04	**-5.87E+00**	**-5.87E+00**	0.000%
2008	33	-4.03E+00	4.21E+00	1.78E-01	1.79E-02	6.29E-04	7.79E-05	0.00E+00	1.96E-01	0.00E+00	-1.34E-05	7.31E-01	3.37E-01	1.37E-03	0.00E+00	2.36E-03	2.69E-03	**-4.03E+00**	**-4.03E+00**	0.000%
2008	32	-3.82E+01	3.85E+01	2.50E-01	2.95E-02	4.80E-03	7.63E-04	5.09E-02	1.00E+00	0.00E+00	-2.60E-05	4.30E+00	2.96E+00	9.39E-03	0.00E+00	1.28E-02	1.69E-02	**-3.82E+01**	**-3.82E+01**	0.000%
2008	22	-7.74E+00	7.64E+00	-9.56E-02	3.08E-02	1.79E-03	3.56E-04	0.00E+00	0.00E+00	4.70E-06	-3.98E-07	8.27E-01	8.87E-01	3.71E-03	0.00E+00	1.04E-03	1.11E-03	**-7.74E+00**	**-7.74E+00**	0.000%
2008	26	-2.78E+00	2.79E+00	1.53E-02	0.00E+00	1.33E-04	2.20E-05	0.00E+00	0.00E+00	0.00E+00	-6.16E-07	6.73E-02	5.17E-02	2.62E-04	0.00E+00	1.16E-04	1.50E-04	**-2.78E+00**	**-2.78E+00**	0.000%
2008	25	-6.24E+00	6.28E+00	3.40E-02	3.51E-03	5.46E-04	8.24E-05	0.00E+00	9.53E-04	0.00E+00	-1.32E-06	2.87E-01	2.47E-01	1.26E-03	0.00E+00	4.83E-04	5.51E-04	**-6.24E+00**	**-6.24E+00**	0.000%
2009	1	-5.22E+00	5.23E+00	1.13E-02	0.00E+00	5.68E-04	5.93E-05	0.00E+00	1.14E-01	5.16E-06	-1.59E-06	5.29E-01	4.02E-01	2.75E-04	0.00E+00	6.59E-04	3.77E-04	**-5.22E+00**	**-5.22E+00**	0.006%
2009	38	-1.23E+01	1.23E+01	4.36E-03	0.00E+00	1.85E-03	2.30E-04	0.00E+00	3.54E-02	4.06E-04	-1.10E-05	9.10E-01	8.68E-01	6.75E-04	0.00E+00	5.73E-04	2.25E-04	**-1.23E+01**	**-1.23E+01**	0.010%
2009	23	-1.19E+01	1.19E+01	-3.82E-03	0.00E+00	5.13E-04	9.47E-05	0.00E+00	0.00E+00	1.11E-05	5.75E-08	2.00E-01	2.02E-01	9.78E-04	0.00E+00	2.70E-04	2.19E-04	**-1.19E+01**	**-1.19E+01**	0.003%
2009	35	-5.36E+01	5.36E+01	1.59E-02	0.00E+00	2.20E-03	4.97E-04	0.00E+00	1.19E-01	0.00E+00	8.97E-06	1.87E+00	1.73E+00	5.94E-03	0.00E+00	5.70E-03	4.68E-03	**-5.36E+01**	**-5.36E+01**	0.010%
2009	39	-2.05E+01	2.04E+01	-4.78E-02	3.92E-03	2.08E-03	5.95E-04	0.00E+00	0.00E+00	1.71E-05	-2.02E-07	1.75E+00	1.79E+00	9.22E-03	0.00E+00	1.58E-03	9.73E-04	**-2.05E+01**	**-2.05E+01**	0.004%
2009	21	-3.70E+00	3.69E+00	-7.31E-03	0.00E+00	3.84E-04	1.14E-04	0.00E+00	0.00E+00	6.17E-05	2.23E-08	3.24E-01	3.29E-01	1.86E-03	0.00E+00	2.54E-04	1.36E-04	**-3.70E+00**	**-3.70E+00**	0.010%
2009	27	-1.29E+01	1.29E+01	-2.04E-02	5.85E-03	3.83E-03	1.00E-03	0.00E+00	1.34E-03	0.00E+00	-2.02E-06	2.76E+00	2.76E+00	1.45E-02	0.00E+00	3.29E-03	1.97E-03	**-1.29E+01**	**-1.29E+01**	0.008%
2009	34	-3.44E+00	3.62E+00	1.80E-01	0.00E+00	6.18E-04	8.37E-05	0.00E+00	1.74E-01	0.00E+00	4.88E-05	4.81E-01	1.25E-01	1.31E-03	0.00E+00	2.25E-03	1.43E-03	**-3.44E+00**	**-3.44E+00**	0.025%
2009	20	-5.80E+00	5.80E+00	3.37E-03	0.00E+00	5.53E-04	1.45E-04	0.00E+00	0.00E+00	0.00E+00	-4.75E-07	3.81E-01	3.76E-01	1.61E-03	0.00E+00	4.31E-04	2.27E-04	**-5.80E+00**	**-5.80E+00**	0.005%
2009	33	-3.95E+00	4.13E+00	1.80E-01	1.76E-02	6.25E-04	7.58E-05	0.00E+00	1.82E-01	0.00E+00	8.72E-05	6.79E-01	2.97E-01	1.39E-03	0.00E+00	2.79E-03	1.92E-03	**-3.95E+00**	**-3.95E+00**	0.014%
2009	32	-3.80E+01	3.82E+01	2.33E-01	2.90E-02	4.77E-03	7.62E-04	4.95E-02	9.59E-01	0.00E+00	-1.61E-04	4.14E+00	2.85E+00	9.32E-03	0.00E+00	1.67E-02	1.23E-02	**-3.80E+01**	**-3.80E+01**	0.015%
2009	22	-7.80E+00	7.68E+00	-1.25E-01	3.04E-02	1.78E-03	3.59E-04	0.00E+00	0.00E+00	0.00E+00	-4.01E-07	8.15E-01	9.05E-01	3.39E-03	0.00E+00	1.11E-03	6.65E-04	**-7.80E+00**	**-7.80E+00**	0.004%
2009	26	-2.91E+00	2.93E+00	1.64E-02	0.00E+00	1.32E-04	2.23E-05	0.00E+00	0.00E+00	0.00E+00	-5.74E-07	6.91E-02	5.22E-02	2.70E-04	0.00E+00	1.50E-04	9.65E-05	**-2.91E+00**	**-2.91E+00**	0.000%
2009	25	-6.35E+00	6.38E+00	3.53E-02	3.14E-03	5.43E-04	8.25E-05	0.00E+00	9.88E-04	0.00E+00	-1.30E-06	2.89E-01	2.48E-01	1.20E-03	0.00E+00	5.51E-04	3.81E-04	**-6.35E+00**	**-6.35E+00**	0.002%
2010	1	-5.63E+00	5.66E+00	2.40E-02	0.00E+00	5.70E-04	4.01E-05	0.00E+00	1.29E-01	5.51E-07	-3.78E-06	5.22E-01	3.77E-01	1.74E-04	0.00E+00	3.76E-04	3.24E-04	**-5.64E+00**	**-5.63E+00**	0.145%
2010	38	-1.30E+01	1.30E+01	2.85E-03	0.00E+00	1.86E-03	1.59E-04	0.00E+00	5.18E-02	4.25E-04	-4.15E-05	9.83E-01	9.32E-01	4.98E-04	0.00E+00	1.91E-04	2.96E-04	**-1.30E+01**	**-1.30E+01**	0.046%
2010	23	-1.21E+01	1.21E+01	-3.54E-03	0.00E+00	5.15E-04	6.82E-05	0.00E+00	0.00E+00	3.99E-05	-2.02E-06	2.18E-01	2.21E-01	8.66E-04	0.00E+00	2.17E-04	1.48E-04	**-1.21E+01**	**-1.21E+01**	0.005%
2010	35	-5.49E+01	5.50E+01	9.27E-02	0.00E+00	2.21E-03	3.61E-04	0.00E+00	1.21E-01	0.00E+00	-8.04E-06	2.03E+00	1.85E+00	4.92E-03	0.00E+00	4.68E-03	3.21E-03	**-5.50E+01**	**-5.49E+01**	0.083%
2010	39	-2.09E+01	2.08E+01	-8.93E-02	2.90E-03	2.09E-03	4.37E-04	0.00E+00	0.00E+00	1.72E-04	-1.71E-05	1.94E+00	2.02E+00	8.04E-03	0.00E+00	9.58E-04	7.59E-04	**-2.09E+01**	**-2.09E+01**	0.037%
2010	21	-3.81E+00	3.81E+00	4.68E-03	0.00E+00	3.85E-04	8.27E-05	0.00E+00	0.00E+00	3.12E-05	-1.25E-05	3.46E-01	3.41E-01	1.49E-03	0.00E+00	1.24E-04	1.69E-04	**-3.81E+00**	**-3.81E+00**	0.031%
2010	27	-1.34E+01	1.35E+01	9.56E-02	4.67E-03	3.85E-03	7.72E-04	0.00E+00	1.25E-03	1.43E-06	-3.10E-05	3.18E+00	3.11E+00	1.23E-02	0.00E+00	1.94E-03	1.92E-03	**-1.35E+01**	**-1.34E+01**	0.310%
2010	34	-3.42E+00	3.64E+00	2.24E-01	0.00E+00	6.20E-04	6.36E-05	0.00E+00	1.65E-01	0.00E+00	-1.57E-05	5.20E-01	1.30E-01	1.12E-03	0.00E+00	1.43E-03	1.23E-03	**-3.42E+00**	**-3.42E+00**	0.047%
2010	20	-5.87E+00	5.89E+00	1.70E-02	0.00E+00	5.55E-04	1.09E-04	0.00E+00	0.00E+00	0.00E+00	-5.76E-06	4.08E-01	3.91E-01	1.24E-03	0.00E+00	2.22E-04	2.44E-04	**-5.87E+00**	**-5.87E+00**	0.024%
2010	33	-3.95E+00	4.17E+00	2.14E-01	1.48E-02	6.27E-04	5.83E-05	0.00E+00	1.74E-01	0.00E+00	-1.66E-05	7.10E-01	3.08E-01	1.16E-03	0.00E+00	1.92E-03	1.54E-03	**-3.96E+00**	**-3.95E+00**	0.057%
2010	32	-3.85E+01	3.89E+01	3.92E-01	2.45E-02	4.79E-03	6.21E-04	4.97E-02	9.34E-01	0.00E+00	-3.68E-05	4.31E+00	2.94E+00	8.42E-03	0.00E+00	1.23E-02	1.02E-02	**-3.86E+01**	**-3.85E+01**	0.117%
2010	22	-7.88E+00	7.81E+00	-7.22E-02	2.57E-02	1.79E-03	2.91E-04	0.00E+00	0.00E+00	1.06E-06	-8.15E-06	8.85E-01	9.30E-01	3.17E-03	0.00E+00	6.58E-04	7.79E-04	**-7.88E+00**	**-7.88E+00**	0.032%
2010	26	-3.01E+00	3.03E+00	1.63E-02	0.00E+00	1.33E-04	1.86E-05	0.00E+00	0.00E+00	0.00E+00	-7.17E-07	7.38E-02	5.75E-02	2.35E-04	0.00E+00	9.65E-05	9.19E-05	**-3.01E+00**	**-3.01E+00**	0.013%
2010	25	-6.46E+00	6.49E+00	3.44E-02	3.44E-03	5.45E-04	6.98E-05	0.00E+00	9.00E-04	0.00E+00	-1.52E-06	2.97E-01	2.57E-01	1.02E-03	0.00E+00	3.81E-04	3.94E-04	**-6.46E+00**	**-6.46E+00**	0.009%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 7. Mass Balance for 2,3,4,7,8-PeCDF

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2011	1	-1.47E+01	1.47E+01	3.96E-02	0.00E+00	5.90E-04	3.98E-05	0.00E+00	1.72E-01	1.64E-06	1.34E-05	7.46E-01	5.34E-01	1.51E-04	0.00E+00	3.24E-04	9.73E-04	**-1.47E+01**	**-1.47E+01**	0.003%
2011	38	-2.77E+01	2.80E+01	3.55E-01	0.00E+00	1.92E-03	1.49E-04	0.00E+00	1.41E-01	7.39E-04	-1.59E-04	1.68E+00	1.19E+00	4.37E-04	0.00E+00	2.96E-04	1.02E-03	**-2.77E+01**	**-2.77E+01**	0.013%
2011	23	-2.44E+01	2.44E+01	2.43E-02	0.00E+00	5.33E-04	6.10E-05	0.00E+00	0.00E+00	7.09E-05	-7.52E-06	3.45E-01	3.20E-01	9.33E-04	0.00E+00	1.48E-04	4.49E-04	**-2.44E+01**	**-2.44E+01**	0.002%
2011	35	-1.10E+02	1.10E+02	5.00E-01	0.00E+00	2.29E-03	3.37E-04	0.00E+00	1.45E-01	0.00E+00	-3.23E-04	3.47E+00	2.83E+00	4.44E-03	0.00E+00	3.21E-03	7.17E-03	**-1.10E+02**	**-1.10E+02**	0.007%
2011	39	-4.07E+01	4.10E+01	3.61E-01	2.67E-03	2.16E-03	4.07E-04	0.00E+00	0.00E+00	4.97E-05	-1.67E-04	3.39E+00	3.02E+00	8.54E-03	0.00E+00	7.59E-04	2.00E-03	**-4.07E+01**	**-4.07E+01**	0.004%
2011	21	-7.67E+00	7.79E+00	1.22E-01	0.00E+00	3.99E-04	7.72E-05	0.00E+00	0.00E+00	1.20E-04	-3.24E-05	6.76E-01	5.54E-01	1.54E-03	0.00E+00	1.69E-04	5.45E-04	**-7.67E+00**	**-7.67E+00**	0.023%
2011	27	-2.28E+01	2.35E+01	6.80E-01	5.15E-03	3.98E-03	7.28E-04	0.00E+00	1.47E-03	0.00E+00	-2.09E-04	5.75E+00	5.05E+00	1.31E-02	0.00E+00	1.92E-03	3.46E-03	**-2.28E+01**	**-2.28E+01**	0.007%
2011	34	-6.60E+00	7.39E+00	7.88E-01	0.00E+00	6.42E-04	6.05E-05	0.00E+00	2.09E-01	0.00E+00	-2.20E-04	1.23E+00	2.36E-01	1.26E-03	0.00E+00	1.23E-03	3.49E-03	**-6.60E+00**	**-6.60E+00**	0.021%
2011	20	-1.15E+01	1.17E+01	1.72E-01	0.00E+00	5.75E-04	1.01E-04	0.00E+00	0.00E+00	7.42E-08	-5.44E-05	8.14E-01	6.42E-01	1.39E-03	0.00E+00	2.44E-04	5.20E-04	**-1.15E+01**	**-1.15E+01**	0.009%
2011	33	-7.19E+00	7.90E+00	7.12E-01	1.59E-02	6.49E-04	5.58E-05	0.00E+00	2.07E-01	0.00E+00	-1.81E-04	1.40E+00	4.70E-01	1.24E-03	0.00E+00	1.54E-03	4.04E-03	**-7.19E+00**	**-7.19E+00**	0.010%
2011	32	-6.32E+01	6.47E+01	1.51E+00	2.27E-02	4.96E-03	5.68E-04	4.81E-02	9.92E-01	3.87E-08	-4.81E-04	6.90E+00	4.34E+00	7.22E-03	0.00E+00	1.02E-02	1.67E-02	**-6.33E+01**	**-6.32E+01**	0.035%
2011	22	-1.31E+01	1.32E+01	9.00E-02	2.38E-02	1.85E-03	2.64E-04	0.00E+00	0.00E+00	8.31E-07	-4.28E-05	1.69E+00	1.58E+00	3.67E-03	0.00E+00	7.79E-04	8.69E-04	**-1.31E+01**	**-1.31E+01**	0.013%
2011	26	-5.31E+00	5.35E+00	3.48E-02	0.00E+00	1.38E-04	1.68E-05	0.00E+00	0.00E+00	0.00E+00	-5.09E-06	1.33E-01	9.81E-02	2.15E-04	0.00E+00	9.19E-05	1.23E-04	**-5.31E+00**	**-5.31E+00**	0.001%
2011	25	-1.04E+01	1.05E+01	1.25E-01	5.64E-03	5.65E-04	6.30E-05	0.00E+00	8.89E-04	0.00E+00	-1.68E-05	5.17E-01	3.85E-01	9.97E-04	0.00E+00	3.94E-04	4.50E-04	**-1.04E+01**	**-1.04E+01**	0.005%
2012	1	-6.71E+00	6.74E+00	2.96E-02	0.00E+00	5.64E-04	3.14E-05	0.00E+00	2.42E-01	4.01E-06	-1.09E-05	8.06E-01	5.34E-01	2.28E-04	0.00E+00	9.70E-04	5.36E-04	**-6.71E+00**	**-6.71E+00**	0.000%
2012	38	-1.48E+01	1.46E+01	-1.93E-01	0.00E+00	1.84E-03	1.16E-04	0.00E+00	1.74E-01	7.78E-05	7.77E-06	1.35E+00	1.37E+00	1.89E-04	0.00E+00	1.02E-03	3.11E-04	**-1.48E+01**	**-1.48E+01**	0.010%
2012	23	-1.37E+01	1.37E+01	2.73E-03	0.00E+00	5.09E-04	4.37E-05	0.00E+00	0.00E+00	0.00E+00	-4.26E-07	2.95E-01	2.91E-01	4.74E-04	0.00E+00	4.49E-04	1.20E-04	**-1.37E+01**	**-1.37E+01**	0.001%
2012	35	-6.21E+01	6.22E+01	2.70E-02	0.00E+00	2.19E-03	2.58E-04	0.00E+00	1.55E-01	0.00E+00	-4.55E-06	2.81E+00	2.62E+00	2.81E-03	0.00E+00	7.17E-03	3.68E-03	**-6.21E+01**	**-6.21E+01**	0.000%
2012	39	-2.39E+01	2.37E+01	-2.64E-01	1.47E-03	2.06E-03	3.02E-04	0.00E+00	0.00E+00	0.00E+00	4.41E-06	2.77E+00	3.03E+00	5.85E-03	0.00E+00	2.00E-03	7.85E-04	**-2.39E+01**	**-2.39E+01**	0.000%
2012	21	-4.31E+00	4.27E+00	-3.53E-02	0.00E+00	3.80E-04	6.13E-05	0.00E+00	0.00E+00	1.19E-05	1.64E-07	5.07E-01	5.41E-01	9.52E-04	0.00E+00	5.45E-04	1.57E-04	**-4.31E+00**	**-4.31E+00**	0.005%
2012	27	-1.34E+01	1.34E+01	-6.84E-02	2.10E-03	3.80E-03	5.66E-04	0.00E+00	1.11E-03	0.00E+00	-3.09E-07	4.25E+00	4.30E+00	1.03E-02	0.00E+00	3.46E-03	1.68E-03	**-1.34E+01**	**-1.34E+01**	0.000%
2012	34	-3.64E+00	3.96E+00	3.14E-01	0.00E+00	6.13E-04	4.82E-05	0.00E+00	2.24E-01	0.00E+00	-1.86E-05	7.35E-01	1.94E-01	7.93E-04	0.00E+00	3.49E-03	1.35E-03	**-3.64E+00**	**-3.64E+00**	0.000%
2012	20	-6.31E+00	6.31E+00	3.51E-03	0.00E+00	5.48E-04	8.05E-05	0.00E+00	0.00E+00	0.00E+00	-5.10E-07	5.93E-01	5.88E-01	1.21E-03	0.00E+00	5.20E-04	2.20E-04	**-6.31E+00**	**-6.31E+00**	0.000%
2012	33	-4.09E+00	4.42E+00	3.23E-01	7.47E-03	6.20E-04	4.29E-05	0.00E+00	2.07E-01	0.00E+00	-2.12E-05	9.46E-01	4.05E-01	8.01E-04	0.00E+00	4.04E-03	1.64E-03	**-4.09E+00**	**-4.09E+00**	0.000%
2012	32	-3.58E+01	3.62E+01	3.80E-01	9.35E-03	4.73E-03	4.38E-04	4.23E-02	8.95E-01	0.00E+00	-3.54E-05	4.72E+00	3.38E+00	5.16E-03	0.00E+00	1.67E-02	9.34E-03	**-3.58E+01**	**-3.58E+01**	0.000%
2012	22	-7.33E+00	7.09E+00	-2.44E-01	9.95E-03	1.77E-03	2.00E-04	0.00E+00	0.00E+00	0.00E+00	1.53E-06	9.91E-01	1.22E+00	2.47E-03	0.00E+00	8.69E-04	5.26E-04	**-7.33E+00**	**-7.33E+00**	0.000%
2012	26	-2.56E+00	2.58E+00	2.05E-02	0.00E+00	1.31E-04	1.30E-05	0.00E+00	0.00E+00	0.00E+00	-6.38E-07	7.96E-02	5.88E-02	1.54E-04	0.00E+00	1.23E-04	6.36E-05	**-2.56E+00**	**-2.56E+00**	0.000%
2012	25	-5.51E+00	5.55E+00	4.07E-02	3.18E-03	5.38E-04	4.82E-05	0.00E+00	8.41E-04	0.00E+00	-1.39E-06	3.24E-01	2.78E-01	8.33E-04	0.00E+00	4.50E-04	2.63E-04	**-5.51E+00**	**-5.51E+00**	0.000%
2013	1	-5.80E+00	5.81E+00	9.76E-03	0.00E+00	5.68E-04	4.39E-05	0.00E+00	1.78E-01	9.77E-06	-4.70E-06	5.97E-01	4.08E-01	2.50E-04	0.00E+00	5.36E-04	3.36E-04	**-5.80E+00**	**-5.80E+00**	0.000%
2013	38	-1.34E+01	1.33E+01	-1.10E-01	0.00E+00	1.85E-03	1.65E-04	0.00E+00	9.87E-02	3.98E-04	-5.01E-05	9.73E-01	9.83E-01	2.20E-04	0.00E+00	2.56E-04	2.07E-04	**-1.34E+01**	**-1.34E+01**	0.012%
2013	23	-1.26E+01	1.25E+01	-1.17E-02	0.00E+00	5.13E-04	6.93E-05	0.00E+00	0.00E+00	8.53E-06	-2.90E-06	1.98E-01	2.09E-01	4.34E-04	0.00E+00	1.17E-04	1.94E-04	**-1.26E+01**	**-1.26E+01**	0.002%
2013	35	-5.74E+01	5.74E+01	2.30E-03	0.00E+00	2.20E-03	3.67E-04	0.00E+00	1.17E-01	0.00E+00	-5.02E-06	2.01E+00	1.88E+00	3.84E-03	0.00E+00	3.68E-03	4.08E-03	**-5.74E+01**	**-5.74E+01**	0.000%
2013	39	-2.18E+01	2.18E+01	-5.27E-02	3.65E-03	2.08E-03	4.42E-04	0.00E+00	0.00E+00	1.98E-06	-7.92E-06	1.89E+00	1.93E+00	6.93E-03	0.00E+00	7.78E-04	8.53E-04	**-2.18E+01**	**-2.18E+01**	0.001%
2013	21	-4.13E+00	4.08E+00	-5.23E-02	0.00E+00	3.84E-04	8.35E-05	0.00E+00	0.00E+00	3.51E-05	-1.04E-05	3.64E-01	4.16E-01	1.00E-03	0.00E+00	1.45E-04	1.20E-04	**-4.13E+00**	**-4.13E+00**	0.007%
2013	27	-1.33E+01	1.33E+01	-3.04E-02	6.81E-03	3.83E-03	7.56E-04	0.00E+00	1.11E-03	0.00E+00	-8.49E-06	3.22E+00	3.23E+00	1.22E-02	0.00E+00	1.67E-03	1.63E-03	**-1.33E+01**	**-1.33E+01**	0.002%

Table 7. Mass Balance for 2,3,4,7,8-PeCDF

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2013	34	-3.61E+00	3.84E+00	2.33E-01	0.00E+00	6.18E-04	6.41E-05	0.00E+00	1.75E-01	0.00E+00	-1.80E-05	5.64E-01	1.54E-01	1.09E-03	0.00E+00	1.35E-03	1.29E-03	**-3.61E+00**	**-3.61E+00**	0.000%
2013	20	-6.26E+00	6.22E+00	-3.66E-02	0.00E+00	5.53E-04	1.08E-04	0.00E+00	0.00E+00	0.00E+00	6.53E-07	4.37E-01	4.72E-01	1.14E-03	0.00E+00	2.20E-04	2.12E-04	**-6.26E+00**	**-6.26E+00**	0.001%
2013	33	-4.10E+00	4.34E+00	2.42E-01	1.89E-02	6.25E-04	5.88E-05	0.00E+00	1.73E-01	0.00E+00	-2.10E-05	7.73E-01	3.37E-01	1.18E-03	0.00E+00	1.63E-03	1.58E-03	**-4.10E+00**	**-4.10E+00**	0.000%
2013	32	-3.71E+01	3.74E+01	2.85E-01	2.79E-02	4.77E-03	5.88E-04	4.96E-02	8.07E-01	0.00E+00	-3.52E-05	4.09E+00	2.91E+00	6.88E-03	0.00E+00	9.34E-03	1.03E-02	**-3.71E+01**	**-3.71E+01**	0.000%
2013	22	-7.57E+00	7.45E+00	-1.22E-01	2.93E-02	1.78E-03	2.75E-04	0.00E+00	0.00E+00	0.00E+00	1.04E-07	8.23E-01	9.11E-01	3.00E-03	0.00E+00	5.26E-04	5.67E-04	**-7.57E+00**	**-7.57E+00**	0.001%
2013	26	-2.76E+00	2.78E+00	1.82E-02	0.00E+00	1.32E-04	1.73E-05	0.00E+00	0.00E+00	0.00E+00	-7.27E-07	7.11E-02	5.25E-02	2.18E-04	0.00E+00	6.36E-05	7.64E-05	**-2.76E+00**	**-2.76E+00**	0.000%
2013	25	-5.99E+00	6.02E+00	3.53E-02	3.46E-03	5.43E-04	6.43E-05	0.00E+00	8.43E-04	0.00E+00	-1.58E-06	2.90E-01	2.49E-01	1.13E-03	0.00E+00	2.63E-04	2.94E-04	**-5.99E+00**	**-5.99E+00**	0.000%
2014	1	-6.16E+00	6.17E+00	1.14E-02	0.00E+00	5.67E-04	5.00E-05	0.00E+00	1.79E-01	1.24E-06	-2.16E-06	6.21E-01	4.30E-01	2.40E-04	0.00E+00	3.36E-04	3.84E-04	**-6.16E+00**	**-6.16E+00**	0.000%
2014	38	-1.38E+01	1.38E+01	3.28E-02	0.00E+00	1.85E-03	1.84E-04	0.00E+00	1.01E-01	4.08E-04	-4.07E-05	1.05E+00	9.19E-01	2.69E-04	0.00E+00	1.69E-04	4.02E-04	**-1.38E+01**	**-1.38E+01**	0.005%
2014	23	-1.28E+01	1.28E+01	-5.89E-03	0.00E+00	5.12E-04	7.08E-05	0.00E+00	0.00E+00	2.73E-05	-3.74E-06	1.87E-01	1.92E-01	5.92E-04	0.00E+00	1.90E-04	1.91E-04	**-1.28E+01**	**-1.28E+01**	0.001%
2014	35	-5.86E+01	5.86E+01	-2.36E-04	0.00E+00	2.21E-03	3.92E-04	0.00E+00	1.18E-01	0.00E+00	-2.71E-06	1.92E+00	1.79E+00	4.22E-03	0.00E+00	4.09E-03	3.81E-03	**-5.86E+01**	**-5.86E+01**	0.000%
2014	39	-2.21E+01	2.21E+01	-1.44E-02	3.03E-03	2.06E-03	4.53E-04	0.00E+00	0.00E+00	1.82E-05	-1.72E-05	1.88E+00	1.88E+00	7.54E-03	0.00E+00	8.37E-04	1.21E-03	**-2.21E+01**	**-2.21E+01**	0.000%
2014	21	-4.21E+00	4.20E+00	-8.67E-03	0.00E+00	3.83E-04	9.03E-05	0.00E+00	0.00E+00	4.93E-05	-8.32E-06	3.86E-01	3.94E-01	1.14E-03	0.00E+00	1.12E-04	2.38E-04	**-4.21E+00**	**-4.21E+00**	0.004%
2014	27	-1.37E+01	1.36E+01	-1.46E-02	5.88E-03	3.83E-03	7.88E-04	0.00E+00	9.98E-04	7.17E-07	-1.73E-05	2.95E+00	2.94E+00	1.21E-02	0.00E+00	1.61E-03	2.48E-03	**-1.37E+01**	**-1.37E+01**	0.001%
2014	34	-3.65E+00	3.87E+00	2.25E-01	0.00E+00	6.17E-04	7.02E-05	0.00E+00	1.73E-01	0.00E+00	-1.58E-05	5.61E-01	1.61E-01	1.13E-03	0.00E+00	1.29E-03	1.60E-03	**-3.65E+00**	**-3.65E+00**	0.000%
2014	20	-6.39E+00	6.40E+00	1.06E-02	0.00E+00	5.52E-04	1.17E-04	0.00E+00	0.00E+00	0.00E+00	-7.34E-07	4.56E-01	4.44E-01	1.21E-03	0.00E+00	2.12E-04	3.33E-04	**-6.39E+00**	**-6.39E+00**	0.001%
2014	33	-4.17E+00	4.39E+00	2.21E-01	1.86E-02	6.24E-04	6.43E-05	0.00E+00	1.74E-01	0.00E+00	-1.82E-05	7.51E-01	3.36E-01	1.20E-03	0.00E+00	1.58E-03	2.02E-03	**-4.17E+00**	**-4.17E+00**	0.000%
2014	32	-3.98E+01	4.00E+01	1.36E-01	4.15E-02	4.76E-03	6.39E-04	5.10E-02	8.37E-01	0.00E+00	-2.19E-05	3.84E+00	2.77E+00	7.49E-03	0.00E+00	1.03E-02	1.25E-02	**-3.98E+01**	**-3.98E+01**	0.000%
2014	22	-8.04E+00	7.95E+00	-8.73E-02	2.87E-02	1.78E-03	2.94E-04	0.00E+00	0.00E+00	0.00E+00	9.62E-08	8.30E-01	8.85E-01	3.10E-03	0.00E+00	5.67E-04	1.18E-03	**-8.04E+00**	**-8.04E+00**	0.001%
2014	26	-2.90E+00	2.91E+00	1.35E-02	0.00E+00	1.32E-04	1.85E-05	0.00E+00	0.00E+00	0.00E+00	-6.54E-07	6.56E-02	5.19E-02	2.10E-04	0.00E+00	7.64E-05	1.20E-04	**-2.90E+00**	**-2.90E+00**	0.000%
2014	25	-6.60E+00	6.63E+00	3.19E-02	1.87E-03	5.42E-04	6.89E-05	0.00E+00	8.11E-04	0.00E+00	-1.26E-06	2.71E-01	2.35E-01	1.13E-03	0.00E+00	2.94E-04	5.08E-04	**-6.60E+00**	**-6.60E+00**	0.000%
2015	1	-4.92E+00	4.92E+00	2.39E-03	0.00E+00	5.63E-04	5.33E-05	0.00E+00	1.22E-01	2.80E-06	-7.64E-07	4.77E-01	3.52E-01	1.77E-04	0.00E+00	3.84E-04	7.55E-04	**-4.92E+00**	**-4.92E+00**	0.000%
2015	38	-1.14E+01	1.13E+01	-4.76E-02	0.00E+00	1.84E-03	1.87E-04	0.00E+00	5.68E-02	7.30E-04	1.25E-06	7.52E-01	7.41E-01	1.21E-04	0.00E+00	4.02E-04	8.53E-04	**-1.14E+01**	**-1.14E+01**	0.006%
2015	23	-1.07E+01	1.07E+01	-6.12E-03	0.00E+00	5.09E-04	6.86E-05	0.00E+00	0.00E+00	6.67E-06	-5.55E-09	1.47E-01	1.52E-01	5.61E-04	0.00E+00	1.91E-04	2.90E-04	**-1.07E+01**	**-1.07E+01**	0.001%
2015	35	-4.91E+01	4.90E+01	-4.46E-02	0.00E+00	2.20E-03	3.84E-04	0.00E+00	9.12E-02	0.00E+00	-5.99E-07	1.47E+00	1.42E+00	3.85E-03	0.00E+00	3.81E-03	4.98E-03	**-4.91E+01**	**-4.91E+01**	0.000%
2015	39	-1.85E+01	1.84E+01	-6.33E-02	2.76E-03	2.05E-03	4.44E-04	0.00E+00	0.00E+00	5.38E-05	1.19E-07	1.52E+00	1.57E+00	7.20E-03	0.00E+00	1.21E-03	1.73E-03	**-1.85E+01**	**-1.85E+01**	0.001%
2015	21	-3.47E+00	3.46E+00	-1.52E-02	0.00E+00	3.80E-04	8.82E-05	0.00E+00	0.00E+00	1.74E-04	-1.04E-07	3.17E-01	3.31E-01	1.21E-03	0.00E+00	2.38E-04	3.60E-04	**-3.47E+00**	**-3.47E+00**	0.004%
2015	27	-1.14E+01	1.14E+01	-3.56E-02	5.11E-03	3.80E-03	7.65E-04	0.00E+00	7.17E-04	4.94E-07	-9.22E-07	2.30E+00	2.32E+00	1.17E-02	0.00E+00	2.48E-03	3.57E-03	**-1.14E+01**	**-1.14E+01**	0.001%
2015	34	-3.03E+00	3.19E+00	1.65E-01	0.00E+00	6.12E-04	6.82E-05	0.00E+00	1.39E-01	0.00E+00	-1.28E-05	4.37E-01	1.32E-01	1.03E-03	0.00E+00	1.60E-03	1.96E-03	**-3.03E+00**	**-3.03E+00**	0.000%
2015	20	-5.32E+00	5.32E+00	-1.17E-03	0.00E+00	5.48E-04	1.13E-04	0.00E+00	0.00E+00	0.00E+00	-4.22E-07	3.66E-01	3.66E-01	1.18E-03	0.00E+00	3.33E-04	4.75E-04	**-5.32E+00**	**-5.32E+00**	0.000%
2015	33	-3.45E+00	3.62E+00	1.70E-01	1.67E-02	6.19E-04	6.12E-05	0.00E+00	1.44E-01	0.00E+00	-1.51E-05	5.83E-01	2.52E-01	1.13E-03	0.00E+00	2.02E-03	2.85E-03	**-3.45E+00**	**-3.45E+00**	0.000%
2015	32	-3.34E+01	3.35E+01	6.93E-02	2.48E-02	4.73E-03	6.09E-04	4.53E-02	7.03E-01	0.00E+00	-1.56E-05	3.14E+00	2.29E+00	7.49E-03	0.00E+00	1.25E-02	1.50E-02	**-3.34E+01**	**-3.34E+01**	0.000%
2015	22	-6.66E+00	6.58E+00	-8.01E-02	2.60E-02	1.77E-03	2.81E-04	0.00E+00	0.00E+00	1.50E-06	-2.19E-07	6.84E-01	7.33E-01	3.10E-03	0.00E+00	1.18E-03	1.30E-03	**-6.66E+00**	**-6.66E+00**	0.000%
2015	26	-2.33E+00	2.34E+00	1.36E-02	0.00E+00	1.31E-04	1.77E-05	0.00E+00	0.00E+00	0.00E+00	-6.63E-07	5.50E-02	4.11E-02	2.21E-04	0.00E+00	1.19E-04	1.44E-04	**-2.33E+00**	**-2.33E+00**	0.000%
2015	25	-5.51E+00	5.53E+00	2.13E-02	2.96E-03	5.38E-04	6.67E-05	0.00E+00	7.07E-04	0.00E+00	-1.11E-06	2.26E-01	2.00E-01	1.10E-03	0.00E+00	5.07E-04	5.59E-04	**-5.51E+00**	**-5.51E+00**	0.000%

Table 7. Mass Balance for 2,3,4,7,8-PeCDF

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2016	1	-4.98E+00	4.99E+00	5.01E-03	0.00E+00	5.60E-04	4.72E-05	0.00E+00	1.45E-01	2.12E-07	2.68E-05	5.37E-01	3.86E-01	1.79E-04	0.00E+00	7.53E-04	6.52E-04	**-4.98E+00**	**-4.98E+00**	0.000%
2016	38	-1.12E+01	1.12E+01	-1.85E-02	0.00E+00	1.83E-03	1.66E-04	0.00E+00	5.76E-02	1.10E-03	8.45E-05	8.23E-01	7.82E-01	1.21E-04	0.00E+00	8.52E-04	4.99E-04	**-1.12E+01**	**-1.12E+01**	0.011%
2016	23	-1.04E+01	1.04E+01	-5.13E-03	0.00E+00	5.06E-04	5.75E-05	0.00E+00	0.00E+00	4.91E-06	2.21E-05	1.61E-01	1.65E-01	4.73E-04	0.00E+00	2.90E-04	2.04E-04	**-1.04E+01**	**-1.04E+01**	0.001%
2016	35	-4.80E+01	4.80E+01	2.81E-03	0.00E+00	2.19E-03	3.29E-04	0.00E+00	9.58E-02	0.00E+00	1.57E-04	1.66E+00	1.56E+00	3.33E-03	0.00E+00	4.98E-03	4.71E-03	**-4.80E+01**	**-4.80E+01**	0.000%
2016	39	-1.79E+01	1.79E+01	-4.50E-02	2.01E-03	2.04E-03	3.71E-04	0.00E+00	0.00E+00	5.60E-06	1.43E-04	1.61E+00	1.65E+00	5.73E-03	0.00E+00	1.73E-03	1.14E-03	**-1.79E+01**	**-1.79E+01**	0.001%
2016	21	-3.50E+00	3.49E+00	-1.15E-02	0.00E+00	3.78E-04	7.74E-05	0.00E+00	0.00E+00	1.88E-04	3.47E-05	3.43E-01	3.53E-01	9.78E-04	0.00E+00	3.60E-04	2.34E-04	**-3.50E+00**	**-3.50E+00**	0.005%
2016	27	-1.15E+01	1.15E+01	-2.33E-02	3.91E-03	3.78E-03	6.48E-04	0.00E+00	7.83E-04	5.87E-07	2.99E-04	2.54E+00	2.54E+00	9.92E-03	0.00E+00	3.57E-03	2.69E-03	**-1.15E+01**	**-1.15E+01**	0.001%
2016	34	-3.04E+00	3.22E+00	1.82E-01	0.00E+00	6.09E-04	5.93E-05	0.00E+00	1.57E-01	0.00E+00	3.68E-05	4.92E-01	1.51E-01	9.68E-04	0.00E+00	1.96E-03	1.65E-03	**-3.04E+00**	**-3.04E+00**	0.000%
2016	20	-5.34E+00	5.34E+00	1.90E-03	0.00E+00	5.46E-04	9.83E-05	0.00E+00	0.00E+00	0.00E+00	4.69E-05	3.99E-01	3.96E-01	1.04E-03	0.00E+00	4.75E-04	3.38E-04	**-5.34E+00**	**-5.34E+00**	0.000%
2016	33	-3.45E+00	3.64E+00	1.87E-01	1.28E-02	6.16E-04	5.30E-05	0.00E+00	1.59E-01	0.00E+00	3.73E-05	6.37E-01	2.76E-01	9.82E-04	0.00E+00	2.85E-03	2.12E-03	**-3.45E+00**	**-3.45E+00**	0.000%
2016	32	-3.38E+01	3.39E+01	1.03E-01	1.90E-02	4.71E-03	5.17E-04	4.17E-02	7.73E-01	0.00E+00	3.24E-04	3.43E+00	2.48E+00	6.64E-03	0.00E+00	1.50E-02	1.56E-02	**-3.38E+01**	**-3.38E+01**	0.000%
2016	22	-6.70E+00	6.62E+00	-7.20E-02	1.98E-02	1.76E-03	2.35E-04	0.00E+00	0.00E+00	0.00E+00	1.32E-04	7.25E-01	7.73E-01	2.61E-03	0.00E+00	1.30E-03	1.14E-03	**-6.70E+00**	**-6.70E+00**	0.000%
2016	26	-2.34E+00	2.35E+00	1.32E-02	0.00E+00	1.30E-04	1.50E-05	0.00E+00	0.00E+00	0.00E+00	7.72E-06	5.90E-02	4.55E-02	1.91E-04	0.00E+00	1.44E-04	1.35E-04	**-2.34E+00**	**-2.34E+00**	0.000%
2016	25	-5.52E+00	5.55E+00	2.58E-02	2.44E-03	5.36E-04	5.62E-05	0.00E+00	7.46E-04	0.00E+00	3.40E-05	2.45E-01	2.14E-01	8.91E-04	0.00E+00	5.58E-04	5.53E-04	**-5.52E+00**	**-5.52E+00**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 8. Mass Balance for 1,2,3,4,6,7,8-HPCDF

Water Year	Region	FlAux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1996	1	-1.70E+02	1.73E+02	2.98E+00	0.00E+00	2.85E-04	3.30E-05	0.00E+00	1.06E+00	4.67E-04	-3.73E-04	1.91E+01	1.51E+01	9.52E-03	0.00E+00	8.96E-03	9.30E-03	**-1.70E+02**	**-1.70E+02**	0.000%
1996	38	-3.77E+02	3.76E+02	-9.55E-01	0.00E+00	9.24E-04	1.26E-04	0.00E+00	1.64E+00	8.51E-02	3.35E-05	3.09E+01	3.02E+01	1.76E-02	0.00E+00	9.15E-03	8.43E-03	**-3.77E+02**	**-3.77E+02**	0.026%
1996	23	-3.59E+02	3.59E+02	2.91E-02	0.00E+00	2.55E-04	6.10E-05	0.00E+00	0.00E+00	4.55E-03	-3.02E-05	6.87E+00	6.82E+00	1.34E-02	0.00E+00	3.87E-03	4.68E-03	**-3.59E+02**	**-3.59E+02**	0.001%
1996	35	-1.60E+03	1.60E+03	-3.50E+00	0.00E+00	1.24E-03	3.07E-04	0.00E+00	4.49E+00	0.00E+00	-7.35E-05	7.37E+01	7.26E+01	8.36E-02	0.00E+00	7.27E-02	8.77E-02	**-1.60E+03**	**-1.60E+03**	0.000%
1996	39	-6.32E+02	6.27E+02	-5.04E+00	1.02E-01	1.16E-03	3.64E-04	0.00E+00	0.00E+00	7.44E-04	3.81E-04	7.20E+01	7.69E+01	1.28E-01	0.00E+00	2.25E-02	2.27E-02	**-6.32E+02**	**-6.32E+02**	0.002%
1996	21	-1.05E+02	1.05E+02	1.60E-01	0.00E+00	2.31E-04	6.55E-05	0.00E+00	0.00E+00	1.95E-03	3.59E-05	1.32E+01	1.30E+01	2.41E-02	0.00E+00	4.16E-03	6.21E-03	**-1.05E+02**	**-1.05E+02**	0.009%
1996	27	-3.21E+02	3.25E+02	4.33E+00	9.80E-02	2.31E-03	5.68E-04	0.00E+00	3.43E-02	1.41E-04	-1.21E-04	1.14E+02	1.09E+02	2.39E-01	0.00E+00	4.98E-02	4.35E-02	**-3.21E+02**	**-3.21E+02**	0.002%
1996	34	-8.93E+01	9.94E+01	1.02E+01	0.00E+00	3.72E-04	5.27E-05	0.00E+00	1.02E+01	0.00E+00	-4.17E-04	2.60E+01	5.64E+00	3.25E-02	0.00E+00	2.85E-02	3.90E-02	**-8.93E+01**	**-8.93E+01**	0.000%
1996	20	-1.52E+02	1.52E+02	7.52E-01	0.00E+00	3.33E-04	8.42E-05	0.00E+00	0.00E+00	5.58E-05	-8.01E-06	1.64E+01	1.56E+01	2.73E-02	0.00E+00	6.58E-03	6.42E-03	**-1.52E+02**	**-1.52E+02**	0.001%
1996	33	-9.82E+01	1.05E+02	7.06E+00	3.87E-01	3.76E-04	5.07E-05	0.00E+00	9.53E+00	0.00E+00	-3.18E-04	3.13E+01	1.43E+01	3.42E-02	0.00E+00	3.04E-02	4.44E-02	**-9.82E+01**	**-9.82E+01**	0.000%
1996	32	-8.54E+02	8.57E+02	3.79E+00	5.45E-01	2.87E-03	4.51E-04	1.82E-01	3.52E+01	0.00E+00	-2.37E-04	1.33E+02	9.32E+01	1.49E-01	0.00E+00	1.88E-01	2.43E-01	**-8.54E+02**	**-8.54E+02**	0.000%
1996	22	-1.67E+02	1.65E+02	-1.75E+00	5.84E-01	1.07E-03	1.96E-04	0.00E+00	0.00E+00	5.73E-04	5.72E-06	2.70E+01	2.81E+01	6.00E-02	0.00E+00	1.91E-02	1.77E-02	**-1.67E+02**	**-1.67E+02**	0.000%
1996	26	-5.92E+01	5.98E+01	6.25E-01	0.00E+00	7.96E-05	1.24E-05	0.00E+00	0.00E+00	0.00E+00	-1.25E-05	2.60E+00	1.97E+00	4.92E-03	0.00E+00	2.10E-03	2.26E-03	**-5.92E+01**	**-5.92E+01**	0.000%
1996	25	-1.33E+02	1.34E+02	1.21E+00	5.56E-02	3.27E-04	4.67E-05	0.00E+00	2.87E-02	0.00E+00	-1.32E-05	9.40E+00	8.09E+00	2.06E-02	0.00E+00	7.82E-03	9.69E-03	**-1.33E+02**	**-1.33E+02**	0.000%
1997	1	-1.39E+02	1.41E+02	1.68E+00	0.00E+00	2.76E-04	2.81E-05	0.00E+00	7.39E-01	4.96E-05	-1.05E-04	1.64E+01	1.40E+01	8.65E-03	0.00E+00	9.28E-03	2.63E-02	**-1.39E+02**	**-1.39E+02**	0.000%
1997	38	-3.20E+02	3.20E+02	-8.18E-01	0.00E+00	8.95E-04	1.13E-04	0.00E+00	9.57E-01	3.29E-02	2.53E-06	2.41E+01	2.39E+01	1.51E-02	0.00E+00	8.43E-03	1.04E-02	**-3.20E+02**	**-3.20E+02**	0.014%
1997	23	-3.22E+02	3.22E+02	-2.58E-01	0.00E+00	2.47E-04	5.82E-05	0.00E+00	0.00E+00	4.54E-04	-3.79E-06	6.31E+00	6.55E+00	1.42E-02	0.00E+00	4.68E-03	6.36E-03	**-3.22E+02**	**-3.22E+02**	0.000%
1997	35	-1.41E+03	1.41E+03	-1.00E+00	0.00E+00	1.20E-03	2.83E-04	0.00E+00	4.25E+00	0.00E+00	-2.54E-05	6.43E+01	6.10E+01	8.59E-02	0.00E+00	8.77E-02	1.40E-01	**-1.41E+03**	**-1.41E+03**	0.000%
1997	39	-5.64E+02	5.55E+02	-8.89E+00	9.43E-02	1.13E-03	3.41E-04	0.00E+00	0.00E+00	5.74E-04	8.80E-05	6.05E+01	6.91E+01	1.20E-01	0.00E+00	2.27E-02	2.84E-02	**-5.64E+02**	**-5.64E+02**	0.001%
1997	21	-9.23E+01	9.21E+01	-1.86E-01	0.00E+00	2.23E-04	5.99E-05	0.00E+00	0.00E+00	4.49E-03	1.83E-06	1.13E+01	1.15E+01	2.02E-02	0.00E+00	6.21E-03	3.60E-03	**-9.23E+01**	**-9.23E+01**	0.006%
1997	27	-2.81E+02	2.81E+02	4.14E-01	8.83E-02	2.23E-03	5.22E-04	0.00E+00	2.25E-02	0.00E+00	-1.94E-05	9.31E+01	9.24E+01	2.12E-01	0.00E+00	4.35E-02	3.85E-02	**-2.81E+02**	**-2.81E+02**	0.001%
1997	34	-7.87E+01	8.79E+01	9.26E+00	0.00E+00	3.60E-04	4.83E-05	0.00E+00	9.17E+00	0.00E+00	-2.41E-04	2.42E+01	5.72E+00	2.72E-02	0.00E+00	3.90E-02	2.80E-02	**-7.87E+01**	**-7.87E+01**	0.000%
1997	20	-1.32E+02	1.32E+02	4.09E-01	0.00E+00	3.22E-04	7.67E-05	0.00E+00	0.00E+00	4.08E-04	-4.81E-06	1.42E+01	1.37E+01	2.33E-02	0.00E+00	6.42E-03	4.66E-03	**-1.32E+02**	**-1.32E+02**	0.001%
1997	33	-8.55E+01	9.21E+01	6.60E+00	3.40E-01	3.64E-04	4.67E-05	0.00E+00	8.63E+00	0.00E+00	-1.85E-04	2.83E+01	1.27E+01	2.83E-02	0.00E+00	4.44E-02	3.01E-02	**-8.55E+01**	**-8.55E+01**	0.000%
1997	32	-7.55E+02	7.58E+02	2.63E+00	4.71E-01	2.78E-03	4.12E-04	1.85E-01	3.15E+01	0.00E+00	-1.45E-04	1.20E+02	8.48E+01	1.30E-01	0.00E+00	2.43E-01	2.00E-01	**-7.55E+02**	**-7.55E+02**	0.000%
1997	22	-1.52E+02	1.47E+02	-4.26E+00	5.04E-01	1.04E-03	1.79E-04	0.00E+00	0.00E+00	5.52E-04	2.01E-05	2.45E+01	2.83E+01	4.86E-02	0.00E+00	1.77E-02	1.01E-02	**-1.52E+02**	**-1.52E+02**	0.001%
1997	26	-5.29E+01	5.35E+01	6.53E-01	0.00E+00	7.70E-05	1.13E-05	0.00E+00	0.00E+00	0.00E+00	-8.47E-06	2.41E+00	1.76E+00	3.72E-03	0.00E+00	2.26E-03	1.46E-03	**-5.29E+01**	**-5.29E+01**	0.000%
1997	25	-1.21E+02	1.22E+02	9.14E-01	5.76E-02	3.16E-04	4.28E-05	0.00E+00	2.09E-02	0.00E+00	-9.27E-06	8.82E+00	7.80E+00	1.76E-02	0.00E+00	9.69E-03	5.89E-03	**-1.21E+02**	**-1.21E+02**	0.000%
1998	1	-1.36E+02	1.36E+02	8.94E-01	0.00E+00	2.81E-04	3.57E-05	0.00E+00	8.66E-01	1.18E-04	-5.24E-05	1.55E+01	1.37E+01	8.84E-03	0.00E+00	2.63E-02	1.08E-02	**-1.36E+02**	**-1.36E+02**	0.000%
1998	38	-3.04E+02	3.03E+02	-6.75E-01	0.00E+00	9.11E-04	1.32E-04	0.00E+00	1.13E+00	2.69E-02	-9.27E-04	2.36E+01	2.32E+01	1.48E-02	0.00E+00	9.48E-03	6.45E-03	**-3.04E+02**	**-3.04E+02**	0.019%
1998	23	-2.99E+02	2.99E+02	-3.03E-01	0.00E+00	2.51E-04	6.23E-05	0.00E+00	0.00E+00	3.67E-04	-5.67E-05	5.35E+00	5.64E+00	1.32E-02	0.00E+00	6.30E-03	3.80E-03	**-2.99E+02**	**-2.99E+02**	0.001%
1998	35	-1.32E+03	1.31E+03	-1.72E+00	0.00E+00	1.23E-03	3.09E-04	0.00E+00	3.95E+00	0.00E+00	8.74E-06	5.58E+01	5.34E+01	8.32E-02	0.00E+00	1.40E-01	7.46E-02	**-1.32E+03**	**-1.32E+03**	0.000%
1998	39	-5.22E+02	5.18E+02	-4.34E+00	9.12E-02	1.15E-03	3.69E-04	0.00E+00	0.00E+00	1.21E-03	-2.16E-04	5.33E+01	5.74E+01	1.23E-01	0.00E+00	2.81E-02	1.79E-02	**-5.22E+02**	**-5.22E+02**	0.001%
1998	21	-8.68E+01	8.67E+01	-8.05E-02	0.00E+00	2.28E-04	6.56E-05	0.00E+00	0.00E+00	1.97E-03	-2.10E-04	1.03E+01	1.04E+01	2.12E-02	0.00E+00	3.39E-03	3.40E-03	**-8.68E+01**	**-8.68E+01**	0.008%
1998	27	-2.64E+02	2.65E+02	8.25E-01	8.74E-02	2.27E-03	5.64E-04	0.00E+00	2.32E-02	5.88E-04	-3.58E-04	8.47E+01	8.36E+01	1.98E-01	0.00E+00	3.82E-02	3.52E-02	**-2.64E+02**	**-2.64E+02**	0.001%

Table 8. Mass Balance for 1,2,3,4,6,7,8-HPCDF

Water Year	Region	FlAux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1998	34	-7.34E+01	8.10E+01	7.58E+00	0.00E+00	3.67E-04	5.18E-05	0.00E+00	8.77E+00	0.00E+00	-2.44E-04	2.14E+01	5.04E+00	2.88E-02	0.00E+00	2.80E-02	2.17E-02	**-7.34E+01**	**-7.34E+01**	0.000%
1998	20	-1.23E+02	1.23E+02	3.32E-01	0.00E+00	3.28E-04	8.23E-05	0.00E+00	0.00E+00	0.00E+00	-9.94E-05	1.27E+01	1.24E+01	2.36E-02	0.00E+00	4.56E-03	5.58E-03	**-1.23E+02**	**-1.23E+02**	0.001%
1998	33	-7.96E+01	8.48E+01	5.24E+00	3.67E-01	3.71E-04	5.08E-05	0.00E+00	8.22E+00	0.00E+00	-2.02E-04	2.44E+01	1.06E+01	2.96E-02	0.00E+00	3.01E-02	2.29E-02	**-7.96E+01**	**-7.96E+01**	0.000%
1998	32	-7.13E+02	7.15E+02	1.53E+00	5.14E-01	2.83E-03	4.37E-04	1.79E-01	2.88E+01	0.00E+00	-1.50E-04	1.07E+02	7.54E+01	1.38E-01	0.00E+00	2.00E-01	1.38E-01	**-7.13E+02**	**-7.13E+02**	0.000%
1998	22	-1.44E+02	1.41E+02	-3.37E+00	5.50E-01	1.06E-03	1.88E-04	0.00E+00	0.00E+00	8.64E-06	-5.45E-05	2.32E+01	2.60E+01	5.52E-02	0.00E+00	1.00E-02	1.06E-02	**-1.44E+02**	**-1.44E+02**	0.001%
1998	26	-5.08E+01	5.13E+01	5.10E-01	0.00E+00	7.84E-05	1.19E-05	0.00E+00	0.00E+00	0.00E+00	-1.26E-05	2.19E+00	1.68E+00	3.80E-03	0.00E+00	1.46E-03	1.14E-03	**-5.08E+01**	**-5.08E+01**	0.000%
1998	25	-1.16E+02	1.16E+02	7.36E-01	6.88E-02	3.22E-04	4.54E-05	0.00E+00	2.12E-02	0.00E+00	-3.28E-06	7.77E+00	6.93E+00	1.84E-02	0.00E+00	5.89E-03	5.07E-03	**-1.16E+02**	**-1.16E+02**	0.000%
1999	1	-1.22E+02	1.23E+02	1.02E+00	0.00E+00	2.69E-04	3.68E-05	0.00E+00	6.75E-01	6.29E-05	-1.59E-04	1.29E+01	1.12E+01	8.82E-03	0.00E+00	1.08E-02	1.33E-02	**-1.22E+02**	**-1.22E+02**	0.000%
1999	38	-2.56E+02	2.56E+02	-1.76E-02	0.00E+00	8.71E-04	1.27E-04	0.00E+00	7.30E-01	2.35E-02	-1.35E-03	1.82E+01	1.75E+01	1.18E-02	0.00E+00	5.16E-03	1.05E-02	**-2.56E+02**	**-2.56E+02**	0.014%
1999	23	-2.39E+02	2.39E+02	5.71E-02	0.00E+00	2.40E-04	5.49E-05	0.00E+00	0.00E+00	2.06E-04	-8.21E-05	4.50E+00	4.43E+00	1.03E-02	0.00E+00	3.75E-03	7.49E-03	**-2.39E+02**	**-2.39E+02**	0.000%
1999	35	-1.08E+03	1.08E+03	-7.96E-02	0.00E+00	1.17E-03	2.78E-04	0.00E+00	3.50E+00	0.00E+00	-2.18E-04	4.60E+01	4.25E+01	6.66E-02	0.00E+00	7.46E-02	1.21E-01	**-1.08E+03**	**-1.08E+03**	0.000%
1999	39	-4.16E+02	4.16E+02	-8.99E-01	7.17E-02	1.10E-03	3.23E-04	0.00E+00	0.00E+00	4.62E-04	-3.64E-05	4.05E+01	4.12E+01	1.01E-01	0.00E+00	1.79E-02	4.08E-02	**-4.16E+02**	**-4.16E+02**	0.001%
1999	21	-7.40E+01	7.42E+01	1.67E-01	0.00E+00	2.18E-04	5.98E-05	0.00E+00	0.00E+00	1.32E-03	-6.91E-05	9.07E+00	8.89E+00	1.95E-02	0.00E+00	3.35E-03	6.10E-03	**-7.40E+01**	**-7.40E+01**	0.006%
1999	27	-2.29E+02	2.30E+02	1.50E+00	7.03E-02	2.18E-03	4.84E-04	0.00E+00	1.62E-02	1.56E-04	-8.48E-05	6.65E+01	6.48E+01	1.63E-01	0.00E+00	3.52E-02	5.84E-02	**-2.29E+02**	**-2.29E+02**	0.002%
1999	34	-6.40E+01	6.97E+01	5.67E+00	0.00E+00	3.51E-04	4.61E-05	0.00E+00	8.34E+00	0.00E+00	-1.69E-04	1.88E+01	4.76E+00	2.56E-02	0.00E+00	2.17E-02	4.97E-02	**-6.40E+01**	**-6.40E+01**	0.000%
1999	20	-1.05E+02	1.05E+02	2.92E-01	0.00E+00	3.14E-04	7.22E-05	0.00E+00	0.00E+00	0.00E+00	-8.55E-06	1.12E+01	1.09E+01	2.09E-02	0.00E+00	5.58E-03	9.72E-03	**-1.05E+02**	**-1.05E+02**	0.001%
1999	33	-6.76E+01	7.20E+01	4.42E+00	2.92E-01	3.55E-04	4.37E-05	0.00E+00	7.87E+00	0.00E+00	-1.46E-04	2.07E+01	8.15E+00	2.61E-02	0.00E+00	2.29E-02	5.74E-02	**-6.76E+01**	**-6.76E+01**	0.000%
1999	32	-6.27E+02	6.29E+02	2.15E+00	4.01E-01	2.71E-03	3.59E-04	1.75E-01	2.94E+01	0.00E+00	-1.76E-04	9.76E+01	6.54E+01	1.25E-01	0.00E+00	1.38E-01	2.34E-01	**-6.27E+02**	**-6.27E+02**	0.000%
1999	22	-1.24E+02	1.22E+02	-1.34E+00	4.29E-01	1.01E-03	1.53E-04	0.00E+00	0.00E+00	1.94E-06	-1.22E-05	2.15E+01	2.24E+01	5.05E-02	0.00E+00	1.06E-02	2.26E-02	**-1.24E+02**	**-1.24E+02**	0.001%
1999	26	-4.23E+01	4.29E+01	5.81E-01	0.00E+00	7.51E-05	9.65E-06	0.00E+00	0.00E+00	0.00E+00	-9.09E-06	2.07E+00	1.49E+00	3.25E-03	0.00E+00	1.14E-03	2.63E-03	**-4.23E+01**	**-4.23E+01**	0.000%
1999	25	-1.01E+02	1.02E+02	9.02E-01	5.77E-02	3.08E-04	3.66E-05	0.00E+00	2.22E-02	0.00E+00	-1.14E-05	7.39E+00	6.40E+00	1.60E-02	0.00E+00	5.07E-03	1.22E-02	**-1.01E+02**	**-1.01E+02**	0.000%
2000	1	-1.18E+02	1.18E+02	5.06E-01	0.00E+00	2.74E-04	3.10E-05	0.00E+00	8.96E-01	8.18E-05	-2.04E-05	1.42E+01	1.28E+01	8.48E-03	0.00E+00	1.33E-02	5.29E-03	**-1.18E+02**	**-1.18E+02**	0.000%
2000	38	-2.56E+02	2.55E+02	-7.54E-01	0.00E+00	8.89E-04	1.18E-04	0.00E+00	8.65E-01	3.25E-02	-8.98E-05	2.03E+01	2.02E+01	1.85E-02	0.00E+00	1.05E-02	6.66E-03	**-2.56E+02**	**-2.56E+02**	0.011%
2000	23	-2.54E+02	2.54E+02	-3.10E-01	0.00E+00	2.45E-04	5.82E-05	0.00E+00	0.00E+00	1.12E-03	6.50E-07	4.88E+00	5.17E+00	1.48E-02	0.00E+00	7.49E-03	4.53E-03	**-2.54E+02**	**-2.54E+02**	-0.001%
2000	35	-1.11E+03	1.11E+03	-1.23E+00	0.00E+00	1.19E-03	2.86E-04	0.00E+00	4.65E+00	0.00E+00	-2.93E-04	4.85E+01	4.49E+01	1.01E-01	0.00E+00	1.21E-01	5.51E-02	**-1.11E+03**	**-1.11E+03**	0.000%
2000	39	-4.39E+02	4.37E+02	-2.68E+00	8.61E-02	1.12E-03	3.42E-04	0.00E+00	0.00E+00	1.69E-03	2.45E-05	4.56E+01	4.80E+01	1.34E-01	0.00E+00	4.08E-02	2.40E-02	**-4.39E+02**	**-4.39E+02**	0.001%
2000	21	-7.19E+01	7.18E+01	-1.25E-01	0.00E+00	2.21E-04	6.08E-05	0.00E+00	0.00E+00	2.24E-03	-1.33E-06	8.88E+00	8.98E+00	2.40E-02	0.00E+00	6.10E-03	3.23E-03	**-7.19E+01**	**-7.19E+01**	0.004%
2000	27	-2.33E+02	2.34E+02	5.07E-01	8.26E-02	2.21E-03	5.27E-04	0.00E+00	1.89E-02	6.66E-06	-1.71E-05	7.37E+01	7.29E+01	2.01E-01	0.00E+00	5.84E-02	3.70E-02	**-2.33E+02**	**-2.33E+02**	0.001%
2000	34	-6.35E+01	6.95E+01	5.99E+00	0.00E+00	3.56E-04	4.78E-05	0.00E+00	8.78E+00	0.00E+00	7.90E-04	1.94E+01	4.60E+00	2.67E-02	0.00E+00	5.06E-02	2.25E-02	**-6.35E+01**	**-6.35E+01**	0.002%
2000	20	-1.07E+02	1.07E+02	2.40E-01	0.00E+00	3.19E-04	7.65E-05	0.00E+00	0.00E+00	1.18E-04	-6.26E-06	1.10E+01	1.07E+01	2.54E-02	0.00E+00	9.72E-03	4.11E-03	**-1.07E+02**	**-1.07E+02**	0.001%
2000	33	-7.49E+01	7.88E+01	3.95E+00	3.14E-01	3.60E-04	4.56E-05	0.00E+00	8.19E+00	0.00E+00	1.95E-03	2.29E+01	1.04E+01	2.70E-02	0.00E+00	5.95E-02	2.11E-02	**-7.49E+01**	**-7.49E+01**	0.003%
2000	32	-6.68E+02	6.69E+02	9.48E-01	4.44E-01	2.75E-03	4.05E-04	1.52E-01	3.51E+01	0.00E+00	-1.13E-03	1.07E+02	6.98E+01	1.45E-01	0.00E+00	2.33E-01	9.66E-02	**-6.68E+02**	**-6.68E+02**	0.000%
2000	22	-1.31E+02	1.29E+02	-1.91E+00	4.76E-01	1.03E-03	1.74E-04	0.00E+00	0.00E+00	3.85E-05	-5.09E-06	2.37E+01	2.51E+01	5.78E-02	0.00E+00	2.26E-02	9.17E-03	**-1.31E+02**	**-1.31E+02**	0.001%
2000	26	-4.76E+01	4.81E+01	5.36E-01	0.00E+00	7.62E-05	1.10E-05	0.00E+00	0.00E+00	0.00E+00	-8.18E-06	2.18E+00	1.64E+00	3.38E-03	0.00E+00	2.63E-03	9.04E-04	**-4.76E+01**	**-4.76E+01**	0.000%
2000	25	-1.11E+02	1.12E+02	9.14E-01	5.43E-02	3.13E-04	4.17E-05	0.00E+00	2.30E-02	0.00E+00	-1.32E-05	8.28E+00	7.26E+00	1.74E-02	0.00E+00	1.22E-02	2.79E-03	**-1.11E+02**	**-1.11E+02**	0.000%
2001	1	-1.06E+02	1.07E+02	7.78E-01	0.00E+00	2.63E-04	2.95E-05	0.00E+00	6.58E-01	8.24E-06	-2.42E-05	1.33E+01	1.19E+01	8.98E-03	0.00E+00	5.29E-03	1.58E-02	**-1.06E+02**	**-1.06E+02**	0.000%

Table 8. Mass Balance for 1,2,3,4,6,7,8-HPCDF

Water Year	Region	FlAux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2001	38	-2.31E+02	2.31E+02	-5.47E-01	0.00E+00	8.53E-04	1.07E-04	0.00E+00	6.76E-01	1.34E-02	-9.68E-06	1.87E+01	1.86E+01	1.58E-02	0.00E+00	6.66E-03	8.39E-03	**-2.31E+02**	**-2.31E+02**	0.008%
2001	23	-2.28E+02	2.28E+02	-3.85E-01	0.00E+00	2.35E-04	5.02E-05	0.00E+00	0.00E+00	4.01E-04	2.96E-07	4.70E+00	5.07E+00	1.31E-02	0.00E+00	4.53E-03	5.97E-03	**-2.28E+02**	**-2.28E+02**	0.000%
2001	35	-1.00E+03	1.00E+03	-1.42E+00	0.00E+00	1.14E-03	2.48E-04	0.00E+00	4.14E+00	0.00E+00	-8.88E-06	4.80E+01	4.53E+01	8.27E-02	0.00E+00	5.51E-02	1.12E-01	**-1.00E+03**	**-1.00E+03**	0.000%
2001	39	-3.94E+02	3.93E+02	-1.68E+00	6.70E-02	1.07E-03	2.95E-04	0.00E+00	0.00E+00	1.64E-03	2.02E-05	4.29E+01	4.44E+01	1.05E-01	0.00E+00	2.40E-02	2.55E-02	**-3.94E+02**	**-3.94E+02**	0.001%
2001	21	-6.62E+01	6.62E+01	-6.02E-02	0.00E+00	2.12E-04	5.28E-05	0.00E+00	0.00E+00	2.27E-03	-1.47E-06	8.90E+00	8.94E+00	1.95E-02	0.00E+00	3.23E-03	3.61E-03	**-6.62E+01**	**-6.62E+01**	0.004%
2001	27	-2.08E+02	2.08E+02	-5.25E-01	6.52E-02	2.12E-03	4.52E-04	0.00E+00	1.79E-02	2.49E-04	-1.61E-06	6.83E+01	6.86E+01	1.47E-01	0.00E+00	3.70E-02	4.61E-02	**-2.08E+02**	**-2.08E+02**	0.001%
2001	34	-5.77E+01	6.35E+01	5.76E+00	0.00E+00	3.42E-04	4.05E-05	0.00E+00	8.28E+00	0.00E+00	-1.67E-04	1.83E+01	4.26E+00	2.31E-02	0.00E+00	2.25E-02	2.76E-02	**-5.77E+01**	**-5.77E+01**	0.000%
2001	20	-9.64E+01	9.66E+01	1.89E-01	0.00E+00	3.06E-04	6.51E-05	0.00E+00	0.00E+00	5.04E-05	-3.14E-06	1.09E+01	1.07E+01	2.15E-02	0.00E+00	4.11E-03	5.00E-03	**-9.64E+01**	**-9.64E+01**	0.001%
2001	33	-6.76E+01	7.18E+01	4.18E+00	2.39E-01	3.46E-04	3.86E-05	0.00E+00	7.74E+00	0.00E+00	-1.35E-04	2.14E+01	9.28E+00	2.32E-02	0.00E+00	2.11E-02	2.94E-02	**-6.76E+01**	**-6.76E+01**	0.000%
2001	32	-5.83E+02	5.85E+02	1.70E+00	3.46E-01	2.64E-03	3.37E-04	1.27E-01	3.17E+01	0.00E+00	-9.05E-05	9.91E+01	6.52E+01	1.21E-01	0.00E+00	9.66E-02	2.38E-01	**-5.83E+02**	**-5.83E+02**	0.000%
2001	22	-1.14E+02	1.11E+02	-2.84E+00	3.70E-01	9.85E-04	1.45E-04	0.00E+00	0.00E+00	1.36E-04	6.60E-06	2.13E+01	2.38E+01	4.93E-02	0.00E+00	9.17E-03	1.40E-02	**-1.14E+02**	**-1.14E+02**	0.001%
2001	26	-4.03E+01	4.09E+01	5.24E-01	0.00E+00	7.31E-05	9.13E-06	0.00E+00	0.00E+00	0.00E+00	-6.89E-06	1.95E+00	1.43E+00	2.94E-03	0.00E+00	9.04E-04	2.04E-03	**-4.03E+01**	**-4.03E+01**	0.000%
2001	25	-9.45E+01	9.54E+01	9.07E-01	3.50E-02	3.00E-04	3.45E-05	0.00E+00	2.15E-02	0.00E+00	-9.87E-06	7.27E+00	6.30E+00	1.36E-02	0.00E+00	2.79E-03	8.53E-03	**-9.45E+01**	**-9.45E+01**	0.000%
2002	1	-9.04E+01	9.05E+01	1.14E-01	0.00E+00	2.59E-04	4.62E-05	0.00E+00	2.66E-01	2.79E-05	-1.36E-05	9.97E+00	9.57E+00	1.20E-02	0.00E+00	1.58E-02	1.27E-02	**-9.04E+01**	**-9.04E+01**	-0.001%
2002	38	-2.05E+02	2.04E+02	-6.73E-01	0.00E+00	8.40E-04	1.49E-04	0.00E+00	3.79E-01	2.36E-02	-1.43E-03	1.31E+01	1.33E+01	1.54E-02	0.00E+00	6.94E-03	8.77E-03	**-2.05E+02**	**-2.05E+02**	0.009%
2002	23	-2.08E+02	2.08E+02	-4.07E-01	0.00E+00	2.32E-04	5.88E-05	0.00E+00	0.00E+00	4.28E-04	-1.37E-04	3.71E+00	4.11E+00	1.15E-02	0.00E+00	5.83E-03	5.95E-03	**-2.08E+02**	**-2.08E+02**	0.000%
2002	35	-9.07E+02	9.06E+02	-1.16E+00	0.00E+00	1.13E-03	3.01E-04	0.00E+00	3.74E+00	0.00E+00	-5.36E-06	3.59E+01	3.32E+01	8.06E-02	0.00E+00	1.12E-01	9.77E-02	**-9.07E+02**	**-9.07E+02**	0.000%
2002	39	-3.53E+02	3.50E+02	-3.14E+00	6.02E-02	1.06E-03	3.40E-04	0.00E+00	0.00E+00	9.32E-03	-1.11E-04	3.28E+01	3.58E+01	9.94E-02	0.00E+00	2.53E-02	3.03E-02	**-3.53E+02**	**-3.53E+02**	0.001%
2002	21	-6.18E+01	6.17E+01	-1.88E-01	0.00E+00	2.09E-04	6.46E-05	0.00E+00	0.00E+00	4.06E-03	-1.90E-04	7.44E+00	7.60E+00	1.91E-02	0.00E+00	3.42E-03	4.44E-03	**-6.18E+01**	**-6.18E+01**	0.005%
2002	27	-1.85E+02	1.84E+02	-6.19E-01	5.92E-02	2.09E-03	4.87E-04	0.00E+00	1.24E-02	3.23E-04	-2.04E-04	4.99E+01	5.03E+01	1.38E-01	0.00E+00	4.59E-02	5.17E-02	**-1.85E+02**	**-1.85E+02**	0.001%
2002	34	-5.55E+01	5.91E+01	3.66E+00	0.00E+00	3.37E-04	4.75E-05	0.00E+00	7.59E+00	0.00E+00	-1.30E-04	1.52E+01	3.90E+00	2.46E-02	0.00E+00	2.76E-02	3.20E-02	**-5.55E+01**	**-5.55E+01**	0.000%
2002	20	-8.95E+01	8.95E+01	2.83E-02	0.00E+00	3.02E-04	7.45E-05	0.00E+00	0.00E+00	2.86E-04	-1.90E-06	9.34E+00	9.29E+00	2.14E-02	0.00E+00	5.00E-03	6.69E-03	**-8.95E+01**	**-8.95E+01**	0.001%
2002	33	-6.21E+01	6.54E+01	3.30E+00	2.24E-01	3.41E-04	4.40E-05	0.00E+00	7.15E+00	0.00E+00	-1.29E-04	1.67E+01	6.05E+00	2.50E-02	0.00E+00	2.94E-02	3.56E-02	**-6.21E+01**	**-6.21E+01**	0.000%
2002	32	-5.18E+02	5.18E+02	-7.50E-02	3.16E-01	2.60E-03	3.39E-04	1.22E-01	2.71E+01	0.00E+00	-6.58E-05	8.12E+01	5.35E+01	1.27E-01	0.00E+00	2.38E-01	2.05E-01	**-5.18E+02**	**-5.18E+02**	0.000%
2002	22	-9.99E+01	9.75E+01	-2.35E+00	3.38E-01	9.72E-04	1.40E-04	0.00E+00	0.00E+00	1.29E-04	7.47E-06	1.76E+01	1.96E+01	4.57E-02	0.00E+00	1.40E-02	1.71E-02	**-9.99E+01**	**-9.99E+01**	0.001%
2002	26	-3.38E+01	3.42E+01	3.92E-01	0.00E+00	7.22E-05	8.79E-06	0.00E+00	0.00E+00	0.00E+00	-7.67E-06	1.71E+00	1.31E+00	3.09E-03	0.00E+00	2.04E-03	1.91E-03	**-3.38E+01**	**-3.38E+01**	0.000%
2002	25	-8.37E+01	8.44E+01	7.31E-01	3.89E-02	2.96E-04	3.33E-05	0.00E+00	2.16E-02	0.00E+00	-1.19E-05	6.12E+00	5.31E+00	1.39E-02	0.00E+00	8.53E-03	7.66E-03	**-8.37E+01**	**-8.37E+01**	0.000%
2003	1	-1.16E+02	1.17E+02	1.25E+00	0.00E+00	2.88E-04	3.45E-05	0.00E+00	8.36E-01	1.50E-04	-9.50E-05	1.24E+01	1.03E+01	1.14E-02	0.00E+00	1.27E-02	1.50E-02	**-1.16E+02**	**-1.16E+02**	0.000%
2003	38	-2.71E+02	2.72E+02	7.16E-01	0.00E+00	9.34E-04	1.38E-04	0.00E+00	1.02E+00	1.05E-02	9.07E-04	2.40E+01	2.23E+01	2.42E-02	0.00E+00	9.77E-03	1.48E-02	**-2.71E+02**	**-2.71E+02**	0.010%
2003	23	-2.65E+02	2.64E+02	-5.42E-01	0.00E+00	2.58E-04	6.73E-05	0.00E+00	0.00E+00	1.77E-04	-8.53E-06	4.66E+00	5.19E+00	1.65E-02	0.00E+00	5.95E-03	8.28E-03	**-2.65E+02**	**-2.65E+02**	0.001%
2003	35	-1.14E+03	1.14E+03	-8.94E-01	0.00E+00	1.26E-03	3.39E-04	0.00E+00	2.42E+00	0.00E+00	1.23E-03	4.37E+01	4.21E+01	1.08E-01	0.00E+00	9.90E-02	1.44E-01	**-1.14E+03**	**-1.14E+03**	0.000%
2003	39	-4.48E+02	4.47E+02	-5.69E-01	1.13E-01	1.18E-03	4.11E-04	0.00E+00	0.00E+00	5.84E-03	-8.80E-05	4.23E+01	4.26E+01	1.59E-01	0.00E+00	3.03E-02	4.15E-02	**-4.48E+02**	**-4.48E+02**	0.001%
2003	21	-7.36E+01	7.36E+01	-3.11E-02	0.00E+00	2.33E-04	7.33E-05	0.00E+00	0.00E+00	5.95E-04	-1.80E-05	7.37E+00	7.38E+00	2.73E-02	0.00E+00	4.43E-03	7.65E-03	**-7.36E+01**	**-7.36E+01**	0.005%
2003	27	-2.37E+02	2.38E+02	1.65E-01	1.06E-01	2.33E-03	6.55E-04	0.00E+00	2.43E-02	0.00E+00	2.45E-04	6.58E+01	6.53E+01	2.29E-01	0.00E+00	5.20E-02	6.71E-02	**-2.37E+02**	**-2.37E+02**	0.001%
2003	34	-6.39E+01	6.92E+01	5.26E+00	0.00E+00	3.76E-04	5.70E-05	0.00E+00	4.91E+00	0.00E+00	7.34E-04	1.29E+01	2.76E+00	3.69E-02	0.00E+00	3.30E-02	6.01E-02	**-6.39E+01**	**-6.39E+01**	0.001%
2003	20	-1.06E+02	1.06E+02	3.28E-01	0.00E+00	3.36E-04	9.21E-05	0.00E+00	0.00E+00	2.59E-05	-3.01E-05	8.75E+00	8.40E+00	3.29E-02	0.00E+00	6.67E-03	1.11E-02	**-1.06E+02**	**-1.06E+02**	0.000%

Table 8. Mass Balance for 1,2,3,4,6,7,8-HPCDF

Water Year	Region	FlAux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2003	33	-7.15E+01	7.56E+01	4.12E+00	4.21E-01	3.80E-04	5.32E-05	0.00E+00	4.14E+00	0.00E+00	6.44E-03	1.55E+01	6.78E+00	3.54E-02	0.00E+00	4.23E-02	8.68E-02	**-7.15E+01**	**-7.15E+01**	0.009%
2003	32	-6.31E+02	6.38E+02	7.59E+00	5.83E-01	2.90E-03	4.85E-04	1.99E-01	1.72E+01	0.00E+00	3.89E-02	8.32E+01	5.75E+01	2.12E-01	0.00E+00	2.44E-01	2.86E-01	**-6.31E+02**	**-6.31E+02**	0.006%
2003	22	-1.29E+02	1.27E+02	-1.92E+00	6.24E-01	1.08E-03	2.21E-04	0.00E+00	0.00E+00	3.63E-05	-4.94E-05	1.74E+01	1.87E+01	7.87E-02	0.00E+00	1.70E-02	1.98E-02	**-1.29E+02**	**-1.29E+02**	0.000%
2003	26	-4.63E+01	4.66E+01	3.45E-01	0.00E+00	8.04E-05	1.38E-05	0.00E+00	0.00E+00	0.00E+00	-1.71E-05	1.34E+00	9.86E-01	6.46E-03	0.00E+00	1.90E-03	2.12E-03	**-4.63E+01**	**-4.63E+01**	0.000%
2003	25	-1.01E+02	1.02E+02	8.27E-01	9.34E-02	3.30E-04	5.15E-05	0.00E+00	1.53E-02	0.00E+00	-4.39E-05	5.52E+00	4.56E+00	2.70E-02	0.00E+00	7.65E-03	1.12E-02	**-1.01E+02**	**-1.01E+02**	0.000%
2004	1	-1.09E+02	1.10E+02	9.35E-01	0.00E+00	2.82E-04	2.92E-05	0.00E+00	1.50E+00	2.35E-04	-1.22E-04	1.25E+01	1.00E+01	9.74E-03	0.00E+00	1.50E-02	1.80E-02	**-1.09E+02**	**-1.09E+02**	0.000%
2004	38	-2.50E+02	2.50E+02	-1.71E-01	0.00E+00	9.16E-04	1.23E-04	0.00E+00	1.07E+00	1.74E-02	-1.07E-05	2.29E+01	2.20E+01	2.69E-02	0.00E+00	1.48E-02	2.25E-02	**-2.50E+02**	**-2.50E+02**	0.010%
2004	23	-2.42E+02	2.42E+02	-8.33E-02	0.00E+00	2.53E-04	6.19E-05	0.00E+00	0.00E+00	1.14E-03	-6.06E-06	4.91E+00	4.97E+00	2.41E-02	0.00E+00	8.28E-03	1.42E-02	**-2.42E+02**	**-2.42E+02**	0.001%
2004	35	-1.05E+03	1.05E+03	5.56E-01	0.00E+00	1.23E-03	3.08E-04	0.00E+00	2.28E+00	0.00E+00	-7.28E-05	4.37E+01	4.08E+01	1.16E-01	0.00E+00	1.44E-01	2.38E-01	**-1.05E+03**	**-1.05E+03**	0.000%
2004	39	-4.11E+02	4.08E+02	-2.77E+00	1.08E-01	1.15E-03	3.77E-04	0.00E+00	0.00E+00	1.78E-03	1.37E-05	4.07E+01	4.32E+01	1.53E-01	0.00E+00	4.15E-02	9.04E-02	**-4.11E+02**	**-4.11E+02**	0.001%
2004	21	-6.71E+01	6.71E+01	-2.28E-02	0.00E+00	2.28E-04	6.69E-05	0.00E+00	0.00E+00	4.36E-04	-5.01E-06	7.14E+00	7.14E+00	2.68E-02	0.00E+00	7.65E-03	1.48E-02	**-6.71E+01**	**-6.71E+01**	0.007%
2004	27	-2.16E+02	2.15E+02	-4.90E-01	1.04E-01	2.28E-03	5.98E-04	0.00E+00	2.19E-02	0.00E+00	-3.42E-05	6.24E+01	6.26E+01	2.03E-01	0.00E+00	6.71E-02	1.43E-01	**-2.16E+02**	**-2.16E+02**	0.002%
2004	34	-5.78E+01	6.30E+01	5.22E+00	0.00E+00	3.68E-04	5.21E-05	0.00E+00	4.57E+00	0.00E+00	-2.60E-04	1.24E+01	2.61E+00	3.09E-02	0.00E+00	6.01E-02	7.86E-02	**-5.78E+01**	**-5.78E+01**	0.000%
2004	20	-9.61E+01	9.64E+01	2.98E-01	0.00E+00	3.29E-04	8.38E-05	0.00E+00	0.00E+00	2.47E-05	-1.23E-05	8.19E+00	7.87E+00	2.93E-02	0.00E+00	1.11E-02	1.78E-02	**-9.61E+01**	**-9.61E+01**	0.001%
2004	33	-6.45E+01	6.87E+01	4.17E+00	3.76E-01	3.72E-04	4.84E-05	0.00E+00	3.78E+00	0.00E+00	-2.61E-04	1.52E+01	6.82E+00	2.91E-02	0.00E+00	8.68E-02	9.59E-02	**-6.45E+01**	**-6.45E+01**	0.000%
2004	32	-5.59E+02	5.68E+02	8.55E+00	5.20E-01	2.84E-03	4.42E-04	1.84E-01	1.50E+01	0.00E+00	-6.95E-04	7.71E+01	5.29E+01	1.68E-01	0.00E+00	2.86E-01	4.98E-01	**-5.59E+02**	**-5.59E+02**	0.000%
2004	22	-1.17E+02	1.13E+02	-3.64E+00	5.57E-01	1.06E-03	1.99E-04	0.00E+00	0.00E+00	2.23E-04	3.94E-06	1.58E+01	1.88E+01	7.07E-02	0.00E+00	1.98E-02	3.67E-02	**-1.17E+02**	**-1.17E+02**	0.001%
2004	26	-4.11E+01	4.14E+01	3.16E-01	0.00E+00	7.87E-05	1.24E-05	0.00E+00	0.00E+00	0.00E+00	-1.28E-05	1.21E+00	8.95E-01	5.22E-03	0.00E+00	2.12E-03	4.01E-03	**-4.11E+01**	**-4.11E+01**	0.000%
2004	25	-8.81E+01	8.88E+01	7.22E-01	8.00E-02	3.23E-04	4.62E-05	0.00E+00	1.32E-02	0.00E+00	-2.69E-05	5.04E+00	4.21E+00	2.19E-02	0.00E+00	1.12E-02	1.56E-02	**-8.81E+01**	**-8.81E+01**	0.000%
2005	1	-9.33E+01	9.39E+01	5.57E-01	0.00E+00	2.58E-04	2.61E-05	0.00E+00	1.44E+00	1.45E-05	-4.65E-05	1.15E+01	9.53E+00	7.72E-03	0.00E+00	1.80E-02	7.54E-03	**-9.33E+01**	**-9.33E+01**	0.000%
2005	38	-2.21E+02	2.20E+02	-5.88E-01	0.00E+00	8.37E-04	1.06E-04	0.00E+00	9.37E-01	8.75E-03	-5.07E-05	2.12E+01	2.08E+01	2.23E-02	0.00E+00	2.25E-02	3.52E-03	**-2.21E+02**	**-2.21E+02**	0.009%
2005	23	-2.12E+02	2.12E+02	-1.45E-01	0.00E+00	2.31E-04	4.99E-05	0.00E+00	0.00E+00	3.07E-04	-6.28E-06	4.86E+00	4.98E+00	1.90E-02	0.00E+00	1.42E-02	3.50E-03	**-2.12E+02**	**-2.12E+02**	0.001%
2005	35	-9.22E+02	9.23E+02	5.24E-01	0.00E+00	1.13E-03	2.49E-04	0.00E+00	3.38E+00	0.00E+00	-1.07E-04	4.59E+01	4.17E+01	9.47E-02	0.00E+00	2.38E-01	7.42E-02	**-9.22E+02**	**-9.22E+02**	0.000%
2005	39	-3.57E+02	3.55E+02	-1.56E+00	6.93E-02	1.05E-03	3.02E-04	0.00E+00	0.00E+00	1.06E-03	-1.18E-05	4.29E+01	4.42E+01	1.26E-01	0.00E+00	9.04E-02	1.32E-02	**-3.57E+02**	**-3.57E+02**	0.001%
2005	21	-6.09E+01	6.08E+01	-1.08E-01	0.00E+00	2.09E-04	5.47E-05	0.00E+00	0.00E+00	6.98E-04	-7.50E-05	7.68E+00	7.76E+00	2.05E-02	0.00E+00	1.47E-02	1.68E-03	**-6.09E+01**	**-6.09E+01**	0.005%
2005	27	-1.93E+02	1.94E+02	3.51E-01	6.93E-02	2.09E-03	4.76E-04	0.00E+00	2.25E-02	1.06E-04	-3.97E-05	6.64E+01	6.57E+01	1.63E-01	0.00E+00	1.43E-01	1.88E-02	**-1.93E+02**	**-1.93E+02**	0.001%
2005	34	-5.30E+01	5.82E+01	5.20E+00	0.00E+00	3.37E-04	4.21E-05	0.00E+00	6.35E+00	0.00E+00	-1.67E-04	1.50E+01	3.33E+00	2.25E-02	0.00E+00	7.86E-02	1.51E-02	**-5.30E+01**	**-5.30E+01**	0.000%
2005	20	-8.82E+01	8.85E+01	3.40E-01	0.00E+00	3.02E-04	6.79E-05	0.00E+00	0.00E+00	0.00E+00	-9.76E-06	9.29E+00	8.91E+00	2.29E-02	0.00E+00	1.78E-02	2.83E-03	**-8.82E+01**	**-8.82E+01**	0.000%
2005	33	-6.07E+01	6.48E+01	4.11E+00	2.04E-01	3.41E-04	3.86E-05	0.00E+00	5.77E+00	0.00E+00	-1.44E-04	1.84E+01	8.21E+00	2.19E-02	0.00E+00	9.59E-02	1.83E-02	**-6.07E+01**	**-6.07E+01**	0.000%
2005	32	-5.20E+02	5.25E+02	4.84E+00	3.05E-01	2.60E-03	3.54E-04	1.16E-01	2.48E+01	0.00E+00	-2.73E-04	8.94E+01	5.88E+01	1.31E-01	0.00E+00	4.98E-01	1.31E-01	**-5.20E+02**	**-5.20E+02**	0.000%
2005	22	-1.03E+02	1.02E+02	-1.47E+00	3.26E-01	9.71E-04	1.61E-04	0.00E+00	0.00E+00	3.21E-06	-2.84E-06	1.84E+01	1.95E+01	5.16E-02	0.00E+00	3.67E-02	4.68E-03	**-1.03E+02**	**-1.03E+02**	0.001%
2005	26	-3.57E+01	3.61E+01	3.84E-01	0.00E+00	7.22E-05	1.01E-05	0.00E+00	0.00E+00	0.00E+00	-5.86E-06	1.43E+00	1.04E+00	3.87E-03	0.00E+00	4.01E-03	7.69E-04	**-3.57E+01**	**-3.57E+01**	0.000%
2005	25	-7.90E+01	7.97E+01	7.53E-01	4.08E-02	2.96E-04	3.77E-05	0.00E+00	1.82E-02	0.00E+00	-1.08E-05	5.87E+00	5.03E+00	1.63E-02	0.00E+00	1.56E-02	2.49E-03	**-7.90E+01**	**-7.90E+01**	0.000%
2006	1	-1.01E+02	1.02E+02	8.16E-01	0.00E+00	2.85E-04	2.74E-05	0.00E+00	1.49E+00	5.35E-05	-6.33E-05	1.20E+01	9.69E+00	9.76E-03	0.00E+00	7.54E-03	7.60E-03	**-1.01E+02**	**-1.01E+02**	0.000%
2006	38	-2.41E+02	2.41E+02	-1.66E-01	0.00E+00	9.23E-04	1.19E-04	0.00E+00	1.02E+00	8.93E-03	-5.12E-04	2.19E+01	2.10E+01	2.76E-02	0.00E+00	3.06E-03	6.46E-03	**-2.41E+02**	**-2.41E+02**	0.011%
2006	23	-2.38E+02	2.38E+02	-1.68E-01	0.00E+00	2.55E-04	6.23E-05	0.00E+00	0.00E+00	4.56E-04	-3.95E-05	4.78E+00	4.93E+00	2.37E-02	0.00E+00	3.47E-03	4.13E-03	**-2.38E+02**	**-2.38E+02**	0.002%

Table 8. Mass Balance for 1,2,3,4,6,7,8-HPCDF

Water Year	Region	FlAux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2006	35	-1.02E+03	1.02E+03	3.27E-01	0.00E+00	1.24E-03	3.06E-04	0.00E+00	2.55E+00	0.00E+00	-1.07E-04	4.28E+01	3.98E+01	1.27E-01	0.00E+00	7.42E-02	6.22E-02	**-1.02E+03**	**-1.02E+03**	0.000%
2006	39	-3.99E+02	3.98E+02	-1.10E+00	1.35E-01	1.16E-03	3.78E-04	0.00E+00	0.00E+00	1.56E-04	-1.85E-04	3.86E+01	3.94E+01	1.75E-01	0.00E+00	1.30E-02	2.00E-02	**-3.99E+02**	**-3.99E+02**	0.001%
2006	21	-6.57E+01	6.56E+01	-7.49E-02	0.00E+00	2.30E-04	6.67E-05	0.00E+00	0.00E+00	5.35E-04	-1.03E-04	6.90E+00	6.95E+00	2.88E-02	0.00E+00	1.59E-03	2.76E-03	**-6.57E+01**	**-6.57E+01**	0.007%
2006	27	-2.12E+02	2.12E+02	9.93E-03	1.26E-01	2.30E-03	6.07E-04	0.00E+00	2.39E-02	0.00E+00	-1.98E-04	6.08E+01	6.04E+01	2.46E-01	0.00E+00	1.87E-02	3.56E-02	**-2.12E+02**	**-2.12E+02**	0.002%
2006	34	-5.59E+01	6.08E+01	4.84E+00	0.00E+00	3.71E-04	5.34E-05	0.00E+00	4.81E+00	0.00E+00	-2.27E-04	1.25E+01	2.84E+00	3.20E-02	0.00E+00	1.51E-02	2.04E-02	**-5.59E+01**	**-5.59E+01**	0.000%
2006	20	-9.38E+01	9.41E+01	2.93E-01	0.00E+00	3.32E-04	8.54E-05	0.00E+00	0.00E+00	0.00E+00	-4.34E-05	8.05E+00	7.73E+00	3.27E-02	0.00E+00	2.80E-03	3.76E-03	**-9.38E+01**	**-9.38E+01**	0.001%
2006	33	-6.35E+01	6.73E+01	3.80E+00	4.01E-01	3.75E-04	5.04E-05	0.00E+00	4.15E+00	0.00E+00	-2.24E-04	1.56E+01	7.19E+00	3.13E-02	0.00E+00	1.83E-02	2.56E-02	**-6.35E+01**	**-6.35E+01**	0.000%
2006	32	-5.69E+02	5.74E+02	5.93E+00	5.49E-01	2.87E-03	4.64E-04	2.05E-01	1.77E+01	0.00E+00	-5.09E-04	7.84E+01	5.38E+01	1.84E-01	0.00E+00	1.31E-01	1.40E-01	**-5.69E+02**	**-5.69E+02**	0.000%
2006	22	-1.16E+02	1.15E+02	-1.60E+00	5.88E-01	1.07E-03	2.10E-04	0.00E+00	0.00E+00	9.65E-06	-3.04E-05	1.62E+01	1.72E+01	7.66E-02	0.00E+00	4.66E-03	1.04E-02	**-1.16E+02**	**-1.16E+02**	0.001%
2006	26	-4.29E+01	4.32E+01	2.85E-01	0.00E+00	7.94E-05	1.32E-05	0.00E+00	0.00E+00	0.00E+00	-8.52E-06	1.23E+00	9.43E-01	5.36E-03	0.00E+00	7.69E-04	1.08E-03	**-4.29E+01**	**-4.29E+01**	0.000%
2006	25	-9.16E+01	9.23E+01	6.62E-01	8.71E-02	3.26E-04	4.93E-05	0.00E+00	1.40E-02	0.00E+00	-2.03E-05	5.16E+00	4.37E+00	2.28E-02	0.00E+00	2.49E-03	4.35E-03	**-9.16E+01**	**-9.16E+01**	0.000%
2007	1	-1.27E+02	1.28E+02	8.70E-01	0.00E+00	2.91E-04	3.29E-05	0.00E+00	2.22E+00	1.27E-05	-2.93E-04	1.28E+01	9.73E+00	8.30E-03	0.00E+00	7.60E-03	7.97E-03	**-1.27E+02**	**-1.27E+02**	0.001%
2007	38	-2.85E+02	2.86E+02	5.34E-01	0.00E+00	9.45E-04	1.34E-04	0.00E+00	1.33E+00	1.29E-02	-1.65E-04	2.36E+01	2.18E+01	3.01E-02	0.00E+00	6.47E-03	7.47E-03	**-2.85E+02**	**-2.85E+02**	0.025%
2007	23	-2.77E+02	2.77E+02	-2.25E-01	0.00E+00	2.60E-04	6.60E-05	0.00E+00	0.00E+00	2.40E-04	-5.68E-06	4.94E+00	5.15E+00	2.44E-02	0.00E+00	4.13E-03	3.59E-03	**-2.77E+02**	**-2.77E+02**	0.001%
2007	35	-1.20E+03	1.20E+03	8.05E-01	0.00E+00	1.27E-03	3.29E-04	0.00E+00	2.70E+00	0.00E+00	-1.23E-04	4.65E+01	4.29E+01	1.31E-01	0.00E+00	6.22E-02	7.30E-02	**-1.20E+03**	**-1.20E+03**	0.000%
2007	39	-4.63E+02	4.63E+02	-2.86E-02	1.29E-01	1.19E-03	4.04E-04	0.00E+00	0.00E+00	1.28E-04	-7.39E-05	4.22E+01	4.19E+01	1.87E-01	0.00E+00	2.00E-02	2.12E-02	**-4.63E+02**	**-4.63E+02**	0.001%
2007	21	-8.05E+01	8.08E+01	2.25E-01	0.00E+00	2.36E-04	7.12E-05	0.00E+00	0.00E+00	1.08E-03	-2.87E-05	7.92E+00	7.67E+00	3.41E-02	0.00E+00	2.76E-03	4.85E-03	**-8.05E+01**	**-8.05E+01**	0.007%
2007	27	-2.50E+02	2.52E+02	1.40E+00	1.20E-01	2.36E-03	6.35E-04	0.00E+00	2.33E-02	0.00E+00	-9.99E-05	6.85E+01	6.66E+01	2.83E-01	0.00E+00	3.56E-02	3.69E-02	**-2.50E+02**	**-2.50E+02**	0.001%
2007	34	-6.73E+01	7.35E+01	6.27E+00	0.00E+00	3.80E-04	5.57E-05	0.00E+00	5.05E+00	0.00E+00	-3.85E-04	1.45E+01	3.12E+00	3.42E-02	0.00E+00	2.04E-02	3.02E-02	**-6.73E+01**	**-6.73E+01**	0.000%
2007	20	-1.14E+02	1.15E+02	6.56E-01	0.00E+00	3.40E-04	8.95E-05	0.00E+00	0.00E+00	0.00E+00	-3.51E-05	9.21E+00	8.52E+00	3.77E-02	0.00E+00	3.76E-03	5.46E-03	**-1.14E+02**	**-1.14E+02**	0.001%
2007	33	-7.56E+01	8.05E+01	4.98E+00	4.72E-01	3.84E-04	5.18E-05	0.00E+00	4.36E+00	0.00E+00	-3.42E-04	1.76E+01	7.78E+00	3.24E-02	0.00E+00	2.56E-02	3.72E-02	**-7.56E+01**	**-7.56E+01**	0.000%
2007	32	-6.66E+02	6.75E+02	9.53E+00	6.16E-01	2.94E-03	4.74E-04	2.61E-01	1.83E+01	0.00E+00	-7.77E-04	8.86E+01	5.97E+01	1.80E-01	0.00E+00	1.40E-01	1.79E-01	**-6.66E+02**	**-6.66E+02**	0.000%
2007	22	-1.37E+02	1.36E+02	-1.35E+00	6.60E-01	1.10E-03	2.12E-04	0.00E+00	0.00E+00	6.13E-05	-3.01E-05	1.89E+01	1.96E+01	8.51E-02	0.00E+00	1.04E-02	1.36E-02	**-1.37E+02**	**-1.37E+02**	0.001%
2007	26	-4.93E+01	4.98E+01	4.49E-01	0.00E+00	8.14E-05	1.33E-05	0.00E+00	0.00E+00	0.00E+00	-1.32E-05	1.46E+00	1.01E+00	5.76E-03	0.00E+00	1.08E-03	1.46E-03	**-4.93E+01**	**-4.93E+01**	0.000%
2007	25	-1.06E+02	1.06E+02	8.50E-01	1.18E-01	3.34E-04	4.97E-05	0.00E+00	1.39E-02	0.00E+00	-2.98E-05	5.98E+00	4.97E+00	2.33E-02	0.00E+00	4.35E-03	6.25E-03	**-1.06E+02**	**-1.06E+02**	0.000%
2008	1	-1.02E+02	1.03E+02	4.70E-01	0.00E+00	2.79E-04	3.94E-05	0.00E+00	2.62E+00	2.41E-04	-5.51E-05	1.16E+01	8.54E+00	6.28E-03	0.00E+00	7.95E-03	1.40E-02	**-1.02E+02**	**-1.02E+02**	-0.001%
2008	38	-2.47E+02	2.47E+02	-7.53E-01	0.00E+00	9.05E-04	1.54E-04	0.00E+00	1.46E+00	9.76E-03	5.38E-05	2.03E+01	1.96E+01	1.93E-02	0.00E+00	7.47E-03	1.19E-02	**-2.47E+02**	**-2.47E+02**	0.008%
2008	23	-2.45E+02	2.45E+02	-1.40E-01	0.00E+00	2.50E-04	6.92E-05	0.00E+00	0.00E+00	1.91E-03	-5.16E-06	4.83E+00	4.95E+00	2.15E-02	0.00E+00	3.59E-03	5.31E-03	**-2.45E+02**	**-2.45E+02**	0.001%
2008	35	-1.06E+03	1.06E+03	7.65E-02	0.00E+00	1.22E-03	3.47E-04	0.00E+00	2.83E+00	0.00E+00	-5.65E-05	4.51E+01	4.21E+01	1.14E-01	0.00E+00	7.30E-02	1.05E-01	**-1.06E+03**	**-1.06E+03**	0.000%
2008	39	-4.10E+02	4.09E+02	-1.26E+00	1.01E-01	1.14E-03	4.17E-04	0.00E+00	0.00E+00	1.30E-04	2.18E-08	4.10E+01	4.20E+01	1.68E-01	0.00E+00	2.12E-02	2.98E-02	**-4.10E+02**	**-4.10E+02**	0.001%
2008	21	-6.88E+01	6.88E+01	-7.15E-03	0.00E+00	2.25E-04	7.62E-05	0.00E+00	0.00E+00	1.07E-03	-2.80E-06	7.82E+00	7.79E+00	3.32E-02	0.00E+00	4.85E-03	4.60E-03	**-6.88E+01**	**-6.88E+01**	0.004%
2008	27	-2.14E+02	2.14E+02	-9.98E-02	9.64E-02	2.25E-03	6.47E-04	0.00E+00	2.42E-02	0.00E+00	-2.11E-05	6.37E+01	6.34E+01	2.56E-01	0.00E+00	3.69E-02	5.71E-02	**-2.14E+02**	**-2.14E+02**	0.001%
2008	34	-5.87E+01	6.38E+01	5.15E+00	0.00E+00	3.63E-04	5.83E-05	0.00E+00	5.25E+00	0.00E+00	-2.21E-04	1.36E+01	3.14E+00	2.97E-02	0.00E+00	3.02E-02	3.70E-02	**-5.87E+01**	**-5.87E+01**	0.000%
2008	20	-9.75E+01	9.78E+01	2.91E-01	0.00E+00	3.25E-04	9.32E-05	0.00E+00	0.00E+00	0.00E+00	-8.50E-06	8.84E+00	8.52E+00	3.52E-02	0.00E+00	5.46E-03	7.59E-03	**-9.75E+01**	**-9.75E+01**	0.000%
2008	33	-6.52E+01	6.93E+01	4.12E+00	3.51E-01	3.67E-04	5.32E-05	0.00E+00	4.60E+00	0.00E+00	-2.13E-04	1.64E+01	7.36E+00	2.90E-02	0.00E+00	3.72E-02	4.52E-02	**-6.52E+01**	**-6.52E+01**	0.000%
2008	32	-5.68E+02	5.75E+02	6.53E+00	4.90E-01	2.80E-03	4.68E-04	1.74E-01	1.97E+01	0.00E+00	-4.04E-04	8.49E+01	5.78E+01	1.67E-01	0.00E+00	1.79E-01	2.71E-01	**-5.68E+02**	**-5.68E+02**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 8. Mass Balance for 1,2,3,4,6,7,8-HPCDF

Water Year	Region	FlAux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2008	22	-1.13E+02	1.12E+02	-1.41E+00	5.25E-01	1.05E-03	2.10E-04	0.00E+00	0.00E+00	1.60E-04	-5.67E-06	1.67E+01	1.75E+01	7.06E-02	0.00E+00	1.36E-02	1.74E-02	**-1.13E+02**	**-1.13E+02**	0.000%
2008	26	-3.93E+01	3.96E+01	3.20E-01	0.00E+00	7.77E-05	1.29E-05	0.00E+00	0.00E+00	0.00E+00	-8.33E-06	1.32E+00	9.98E-01	4.88E-03	0.00E+00	1.46E-03	2.18E-03	**-3.93E+01**	**-3.93E+01**	0.000%
2008	25	-8.79E+01	8.86E+01	7.20E-01	7.76E-02	3.19E-04	4.83E-05	0.00E+00	1.59E-02	0.00E+00	-1.76E-05	5.51E+00	4.68E+00	2.09E-02	0.00E+00	6.25E-03	8.07E-03	**-8.79E+01**	**-8.79E+01**	0.000%
2009	1	-1.00E+02	1.00E+02	2.43E-01	0.00E+00	2.76E-04	3.85E-05	0.00E+00	2.45E+00	1.30E-04	-3.31E-05	1.13E+01	8.59E+00	8.20E-03	0.00E+00	1.40E-02	6.87E-03	**-1.00E+02**	**-1.00E+02**	0.006%
2009	38	-2.32E+02	2.32E+02	1.37E-01	0.00E+00	8.95E-04	1.54E-04	0.00E+00	7.71E-01	8.80E-03	-2.23E-04	1.96E+01	1.87E+01	2.52E-02	0.00E+00	1.17E-02	4.20E-03	**-2.32E+02**	**-2.32E+02**	0.011%
2009	23	-2.35E+02	2.35E+02	-1.95E-01	0.00E+00	2.47E-04	7.18E-05	0.00E+00	0.00E+00	2.62E-04	9.32E-07	4.25E+00	4.43E+00	2.19E-02	0.00E+00	5.31E-03	4.72E-03	**-2.35E+02**	**-2.35E+02**	0.003%
2009	35	-1.01E+03	1.01E+03	1.73E-01	0.00E+00	1.20E-03	3.58E-04	0.00E+00	2.54E+00	0.00E+00	1.55E-04	3.99E+01	3.71E+01	1.17E-01	0.00E+00	1.05E-01	8.59E-02	**-1.01E+03**	**-1.01E+03**	0.011%
2009	39	-3.97E+02	3.96E+02	-1.02E+00	1.05E-01	1.13E-03	4.36E-04	0.00E+00	0.00E+00	3.69E-04	-4.29E-06	3.75E+01	3.83E+01	1.65E-01	0.00E+00	2.98E-02	1.93E-02	**-3.97E+02**	**-3.97E+02**	0.004%
2009	21	-6.44E+01	6.43E+01	-9.92E-02	0.00E+00	2.23E-04	7.76E-05	0.00E+00	0.00E+00	1.29E-03	7.86E-07	7.07E+00	7.14E+00	3.22E-02	0.00E+00	4.60E-03	2.35E-03	**-6.44E+01**	**-6.44E+01**	0.011%
2009	27	-2.06E+02	2.06E+02	3.91E-02	9.50E-02	2.23E-03	6.73E-04	0.00E+00	2.22E-02	0.00E+00	-3.36E-05	5.89E+01	5.84E+01	2.54E-01	0.00E+00	5.71E-02	3.25E-02	**-2.06E+02**	**-2.06E+02**	0.010%
2009	34	-5.60E+01	6.04E+01	4.37E+00	0.00E+00	3.60E-04	5.81E-05	0.00E+00	4.76E+00	0.00E+00	8.66E-04	1.20E+01	2.83E+00	3.02E-02	0.00E+00	3.81E-02	2.04E-02	**-5.60E+01**	**-5.60E+01**	0.028%
2009	20	-9.60E+01	9.62E+01	1.88E-01	0.00E+00	3.22E-04	9.51E-05	0.00E+00	0.00E+00	0.00E+00	-8.23E-06	8.11E+00	7.89E+00	3.18E-02	0.00E+00	7.59E-03	3.64E-03	**-9.60E+01**	**-9.60E+01**	0.006%
2009	33	-6.37E+01	6.78E+01	4.10E+00	3.41E-01	3.64E-04	5.32E-05	0.00E+00	4.20E+00	0.00E+00	1.47E-03	1.51E+01	6.41E+00	2.96E-02	0.00E+00	4.69E-02	2.75E-02	**-6.37E+01**	**-6.37E+01**	0.016%
2009	32	-5.72E+02	5.78E+02	5.98E+00	4.82E-01	2.78E-03	4.85E-04	1.62E-01	1.89E+01	0.00E+00	-2.63E-03	8.14E+01	5.56E+01	1.69E-01	0.00E+00	2.68E-01	1.71E-01	**-5.72E+02**	**-5.72E+02**	0.017%
2009	22	-1.16E+02	1.14E+02	-2.00E+00	5.16E-01	1.04E-03	2.20E-04	0.00E+00	0.00E+00	0.00E+00	-6.83E-06	1.65E+01	1.80E+01	6.85E-02	0.00E+00	1.74E-02	8.72E-03	**-1.16E+02**	**-1.16E+02**	0.005%
2009	26	-4.21E+01	4.24E+01	3.41E-01	0.00E+00	7.70E-05	1.36E-05	0.00E+00	0.00E+00	0.00E+00	-8.27E-06	1.35E+00	1.00E+00	5.03E-03	0.00E+00	2.18E-03	1.26E-03	**-4.21E+01**	**-4.21E+01**	0.000%
2009	25	-9.14E+01	9.22E+01	7.44E-01	6.83E-02	3.16E-04	5.05E-05	0.00E+00	1.65E-02	0.00E+00	-1.88E-05	5.57E+00	4.71E+00	2.07E-02	0.00E+00	8.07E-03	4.99E-03	**-9.14E+01**	**-9.14E+01**	0.002%
2010	1	-9.79E+01	9.83E+01	4.72E-01	0.00E+00	2.78E-04	2.28E-05	0.00E+00	2.70E+00	1.15E-05	-6.74E-05	1.10E+01	7.93E+00	5.19E-03	0.00E+00	6.87E-03	4.30E-03	**-9.80E+01**	**-9.79E+01**	0.153%
2010	38	-2.26E+02	2.26E+02	-6.42E-02	0.00E+00	9.02E-04	9.58E-05	0.00E+00	1.11E+00	9.67E-03	-7.73E-04	2.08E+01	1.99E+01	1.78E-02	0.00E+00	3.57E-03	3.50E-03	**-2.26E+02**	**-2.26E+02**	0.048%
2010	23	-2.22E+02	2.22E+02	-1.99E-01	0.00E+00	2.49E-04	4.88E-05	0.00E+00	0.00E+00	8.68E-04	-4.39E-05	4.73E+00	4.92E+00	1.88E-02	0.00E+00	4.68E-03	1.89E-03	**-2.22E+02**	**-2.22E+02**	0.006%
2010	35	-9.57E+02	9.59E+02	1.80E+00	0.00E+00	1.21E-03	2.45E-04	0.00E+00	2.59E+00	0.00E+00	-1.38E-04	4.36E+01	4.01E+01	9.18E-02	0.00E+00	8.59E-02	3.60E-02	**-9.58E+02**	**-9.57E+02**	0.100%
2010	39	-3.76E+02	3.74E+02	-2.02E+00	8.06E-02	1.13E-03	3.02E-04	0.00E+00	0.00E+00	2.94E-03	-3.03E-04	4.23E+01	4.42E+01	1.38E-01	0.00E+00	1.90E-02	7.26E-03	**-3.76E+02**	**-3.76E+02**	0.046%
2010	21	-6.08E+01	6.10E+01	1.65E-01	0.00E+00	2.25E-04	5.29E-05	0.00E+00	0.00E+00	6.83E-04	-2.12E-04	7.67E+00	7.50E+00	2.45E-02	0.00E+00	2.16E-03	1.75E-03	**-6.09E+01**	**-6.08E+01**	0.037%
2010	27	-1.99E+02	2.02E+02	2.58E+00	7.59E-02	2.25E-03	4.82E-04	0.00E+00	2.07E-02	3.11E-05	-5.15E-04	6.90E+01	6.70E+01	2.04E-01	0.00E+00	3.21E-02	1.61E-02	**-2.00E+02**	**-1.99E+02**	0.464%
2010	34	-5.04E+01	5.58E+01	5.34E+00	0.00E+00	3.62E-04	4.03E-05	0.00E+00	4.55E+00	0.00E+00	-2.11E-04	1.29E+01	2.97E+00	2.30E-02	0.00E+00	2.03E-02	1.01E-02	**-5.04E+01**	**-5.04E+01**	0.061%
2010	20	-8.90E+01	8.94E+01	4.55E-01	0.00E+00	3.24E-04	6.54E-05	0.00E+00	0.00E+00	0.00E+00	-9.26E-05	8.85E+00	8.40E+00	2.33E-02	0.00E+00	3.56E-03	2.06E-03	**-8.90E+01**	**-8.90E+01**	0.029%
2010	33	-5.86E+01	6.35E+01	4.88E+00	2.89E-01	3.66E-04	3.78E-05	0.00E+00	4.11E+00	0.00E+00	-2.23E-04	1.59E+01	6.65E+00	2.26E-02	0.00E+00	2.75E-02	1.33E-02	**-5.86E+01**	**-5.86E+01**	0.068%
2010	32	-5.36E+02	5.46E+02	9.04E+00	4.08E-01	2.80E-03	3.64E-04	1.64E-01	1.90E+01	0.00E+00	-5.20E-04	8.60E+01	5.80E+01	1.39E-01	0.00E+00	1.71E-01	8.73E-02	**-5.37E+02**	**-5.36E+02**	0.153%
2010	22	-1.07E+02	1.06E+02	-9.95E-01	4.37E-01	1.04E-03	1.65E-04	0.00E+00	0.00E+00	1.68E-05	-1.00E-04	1.84E+01	1.90E+01	5.68E-02	0.00E+00	8.63E-03	5.06E-03	**-1.07E+02**	**-1.07E+02**	0.038%
2010	26	-4.00E+01	4.04E+01	3.47E-01	0.00E+00	7.75E-05	1.05E-05	0.00E+00	0.00E+00	0.00E+00	-8.52E-06	1.48E+00	1.13E+00	4.02E-03	0.00E+00	1.26E-03	6.53E-04	**-4.01E+01**	**-4.00E+01**	0.017%
2010	25	-8.53E+01	8.61E+01	7.46E-01	7.52E-02	3.18E-04	3.95E-05	0.00E+00	1.53E-02	0.00E+00	-1.80E-05	5.85E+00	5.01E+00	1.64E-02	0.00E+00	4.99E-03	2.86E-03	**-8.53E+01**	**-8.53E+01**	0.013%
2011	1	-2.34E+02	2.34E+02	6.85E-01	0.00E+00	2.99E-04	2.11E-05	0.00E+00	3.43E+00	4.85E-05	1.02E-04	1.46E+01	1.05E+01	4.13E-03	0.00E+00	4.30E-03	1.35E-02	**-2.34E+02**	**-2.34E+02**	0.004%
2011	38	-4.41E+02	4.47E+02	5.69E+00	0.00E+00	9.68E-04	8.18E-05	0.00E+00	2.61E+00	1.53E-02	-2.27E-03	3.20E+01	2.37E+01	1.32E-02	0.00E+00	3.50E-03	1.34E-02	**-4.41E+02**	**-4.41E+02**	0.015%
2011	23	-3.97E+02	3.98E+02	3.10E-01	0.00E+00	2.67E-04	3.97E-05	0.00E+00	0.00E+00	1.27E-03	-1.04E-04	6.68E+00	6.36E+00	1.69E-02	0.00E+00	1.89E-03	6.42E-03	**-3.97E+02**	**-3.97E+02**	0.002%
2011	35	-1.74E+03	1.75E+03	8.03E+00	0.00E+00	1.30E-03	1.99E-04	0.00E+00	2.87E+00	0.00E+00	-4.47E-03	6.63E+01	5.56E+01	7.48E-02	0.00E+00	3.60E-02	9.23E-02	**-1.74E+03**	**-1.74E+03**	0.008%
2011	39	-6.57E+02	6.62E+02	5.10E+00	7.50E-02	1.22E-03	2.51E-04	0.00E+00	0.00E+00	9.61E-04	-2.19E-03	6.45E+01	5.93E+01	1.25E-01	0.00E+00	7.26E-03	2.37E-02	**-6.57E+02**	**-6.57E+02**	0.004%

Table 8. Mass Balance for 1,2,3,4,6,7,8-HPCDF

Water Year	Region	FlAux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2011	21	-1.16E+02	1.18E+02	1.92E+00	0.00E+00	2.42E-04	4.25E-05	0.00E+00	0.00E+00	2.79E-03	-4.40E-04	1.27E+01	1.08E+01	2.22E-02	0.00E+00	1.75E-03	7.53E-03	**-1.16E+02**	**-1.16E+02**	0.026%
2011	27	-3.24E+02	3.36E+02	1.16E+01	9.21E-02	2.41E-03	3.94E-04	0.00E+00	2.45E-02	2.21E-05	-2.83E-03	1.09E+02	9.76E+01	1.82E-01	0.00E+00	1.61E-02	3.36E-02	**-3.24E+02**	**-3.24E+02**	0.007%
2011	34	-9.45E+01	1.09E+02	1.44E+01	0.00E+00	3.89E-04	3.29E-05	0.00E+00	4.89E+00	0.00E+00	-3.06E-03	2.39E+01	4.62E+00	1.98E-02	0.00E+00	1.01E-02	4.59E-02	**-9.45E+01**	**-9.45E+01**	0.024%
2011	20	-1.68E+02	1.71E+02	2.91E+00	0.00E+00	3.48E-04	5.31E-05	0.00E+00	0.00E+00	1.65E-06	-7.44E-04	1.51E+01	1.22E+01	2.15E-02	0.00E+00	2.06E-03	5.41E-03	**-1.68E+02**	**-1.68E+02**	0.010%
2011	33	-1.03E+02	1.16E+02	1.28E+01	3.19E-01	3.94E-04	3.14E-05	0.00E+00	4.38E+00	0.00E+00	-2.48E-03	2.66E+01	9.17E+00	1.93E-02	0.00E+00	1.33E-02	5.36E-02	**-1.03E+02**	**-1.03E+02**	0.011%
2011	32	-8.52E+02	8.79E+02	2.75E+01	3.78E-01	3.01E-03	2.87E-04	1.48E-01	1.87E+01	4.97E-07	-6.71E-03	1.26E+02	7.94E+01	1.05E-01	0.00E+00	8.73E-02	2.05E-01	**-8.52E+02**	**-8.52E+02**	0.040%
2011	22	-1.73E+02	1.75E+02	1.59E+00	4.05E-01	1.12E-03	1.29E-04	0.00E+00	0.00E+00	2.79E-05	-5.73E-04	3.06E+01	2.86E+01	5.26E-02	0.00E+00	5.06E-03	9.20E-03	**-1.73E+02**	**-1.73E+02**	0.016%
2011	26	-6.84E+01	6.90E+01	6.08E-01	0.00E+00	8.33E-05	8.12E-06	0.00E+00	0.00E+00	0.00E+00	-6.58E-05	2.37E+00	1.76E+00	3.14E-03	0.00E+00	6.53E-04	1.41E-03	**-6.84E+01**	**-6.84E+01**	0.001%
2011	25	-1.31E+02	1.33E+02	2.14E+00	1.31E-01	3.42E-04	3.05E-05	0.00E+00	1.48E-02	0.00E+00	-2.12E-04	9.14E+00	6.85E+00	1.36E-02	0.00E+00	2.86E-03	5.13E-03	**-1.31E+02**	**-1.31E+02**	0.006%
2012	1	-1.03E+02	1.03E+02	5.36E-01	0.00E+00	2.70E-04	1.02E-05	0.00E+00	4.53E+00	1.18E-04	-1.69E-04	1.51E+01	1.00E+01	3.39E-03	0.00E+00	1.35E-02	8.31E-03	**-1.03E+02**	**-1.03E+02**	0.000%
2012	38	-2.20E+02	2.17E+02	-3.16E+00	0.00E+00	8.76E-04	4.20E-05	0.00E+00	3.17E+00	1.49E-03	1.18E-04	2.52E+01	2.52E+01	4.96E-03	0.00E+00	1.34E-02	4.53E-03	**-2.20E+02**	**-2.20E+02**	0.011%
2012	23	-2.10E+02	2.10E+02	3.21E-03	0.00E+00	2.42E-04	2.17E-05	0.00E+00	0.00E+00	0.00E+00	-6.65E-06	5.64E+00	5.63E+00	7.32E-03	0.00E+00	6.42E-03	1.41E-03	**-2.10E+02**	**-2.10E+02**	0.001%
2012	35	-9.22E+02	9.22E+02	4.03E-01	0.00E+00	1.18E-03	1.13E-04	0.00E+00	2.99E+00	0.00E+00	-7.29E-05	5.39E+01	5.05E+01	3.65E-02	0.00E+00	9.23E-02	4.64E-02	**-9.22E+02**	**-9.22E+02**	0.000%
2012	39	-3.64E+02	3.59E+02	-4.89E+00	3.35E-02	1.10E-03	1.40E-04	0.00E+00	0.00E+00	0.00E+00	6.49E-05	5.37E+01	5.85E+01	6.49E-02	0.00E+00	2.37E-02	9.77E-03	**-3.64E+02**	**-3.64E+02**	0.000%
2012	21	-5.98E+01	5.93E+01	-5.31E-01	0.00E+00	2.18E-04	2.47E-05	0.00E+00	0.00E+00	1.83E-04	2.52E-06	9.88E+00	1.04E+01	1.10E-02	0.00E+00	7.53E-03	2.03E-03	**-5.98E+01**	**-5.98E+01**	0.005%
2012	27	-1.71E+02	1.71E+02	-6.93E-01	3.68E-02	2.18E-03	2.31E-04	0.00E+00	1.81E-02	0.00E+00	-1.51E-06	8.33E+01	8.39E+01	1.05E-01	0.00E+00	3.36E-02	1.79E-02	**-1.71E+02**	**-1.71E+02**	0.000%
2012	34	-4.65E+01	5.32E+01	6.63E+00	0.00E+00	3.52E-04	1.98E-05	0.00E+00	5.26E+00	0.00E+00	-2.34E-04	1.59E+01	3.94E+00	9.70E-03	0.00E+00	4.59E-02	1.31E-02	**-4.65E+01**	**-4.65E+01**	0.000%
2012	20	-8.31E+01	8.33E+01	2.14E-01	0.00E+00	3.15E-04	3.16E-05	0.00E+00	0.00E+00	0.00E+00	-6.04E-06	1.15E+01	1.12E+01	1.33E-02	0.00E+00	5.41E-03	2.46E-03	**-8.31E+01**	**-8.31E+01**	0.001%
2012	33	-5.28E+01	5.93E+01	6.57E+00	1.44E-01	3.56E-04	1.86E-05	0.00E+00	4.42E+00	0.00E+00	-2.75E-04	1.92E+01	8.03E+00	9.80E-03	0.00E+00	5.36E-02	1.65E-02	**-5.28E+01**	**-5.28E+01**	0.000%
2012	32	-4.27E+02	4.35E+02	8.13E+00	1.55E-01	2.72E-03	1.73E-04	9.03E-02	1.69E+01	0.00E+00	-4.56E-04	8.80E+01	6.25E+01	5.84E-02	0.00E+00	2.05E-01	9.24E-02	**-4.27E+02**	**-4.27E+02**	0.000%
2012	22	-8.48E+01	8.08E+01	-3.92E+00	1.68E-01	1.01E-03	7.69E-05	0.00E+00	0.00E+00	0.00E+00	1.61E-05	1.87E+01	2.24E+01	3.00E-02	0.00E+00	9.20E-03	4.48E-03	**-8.48E+01**	**-8.48E+01**	0.000%
2012	26	-2.76E+01	2.81E+01	4.06E-01	0.00E+00	7.53E-05	4.94E-06	0.00E+00	0.00E+00	0.00E+00	-6.27E-06	1.47E+00	1.06E+00	1.64E-03	0.00E+00	1.41E-03	4.63E-04	**-2.76E+01**	**-2.76E+01**	0.000%
2012	25	-5.88E+01	5.96E+01	7.90E-01	7.16E-02	3.09E-04	1.85E-05	0.00E+00	1.44E-02	0.00E+00	-1.42E-05	5.91E+00	5.02E+00	8.27E-03	0.00E+00	5.13E-03	1.88E-03	**-5.88E+01**	**-5.88E+01**	0.000%
2013	1	-1.00E+02	1.01E+02	2.04E-01	0.00E+00	2.75E-04	2.44E-05	0.00E+00	3.70E+00	2.56E-04	-8.87E-05	1.23E+01	8.41E+00	6.63E-03	0.00E+00	8.31E-03	5.98E-03	**-1.00E+02**	**-1.00E+02**	0.000%
2013	38	-2.28E+02	2.26E+02	-1.83E+00	0.00E+00	8.92E-04	9.53E-05	0.00E+00	2.04E+00	8.84E-03	-6.54E-04	2.04E+01	2.02E+01	1.39E-02	0.00E+00	3.78E-03	3.66E-03	**-2.28E+02**	**-2.28E+02**	0.012%
2013	23	-2.23E+02	2.23E+02	-2.93E-01	0.00E+00	2.46E-04	4.63E-05	0.00E+00	0.00E+00	1.94E-04	-3.29E-05	4.14E+00	4.43E+00	1.27E-02	0.00E+00	1.37E-03	4.05E-03	**-2.23E+02**	**-2.23E+02**	0.002%
2013	35	-9.76E+02	9.76E+02	7.03E-02	0.00E+00	1.20E-03	2.29E-04	0.00E+00	2.41E+00	0.00E+00	-8.09E-05	4.16E+01	3.91E+01	7.80E-02	0.00E+00	4.64E-02	7.26E-02	**-9.76E+02**	**-9.76E+02**	0.000%
2013	39	-3.81E+02	3.80E+02	-9.91E-01	1.00E-01	1.13E-03	2.83E-04	0.00E+00	0.00E+00	9.53E-05	-8.79E-05	3.98E+01	4.06E+01	1.26E-01	0.00E+00	9.70E-03	1.58E-02	**-3.81E+02**	**-3.81E+02**	0.001%
2013	21	-6.56E+01	6.48E+01	-8.67E-01	0.00E+00	2.23E-04	4.91E-05	0.00E+00	0.00E+00	1.03E-03	-1.37E-04	7.76E+00	8.61E+00	2.01E-02	0.00E+00	1.87E-03	1.97E-03	**-6.56E+01**	**-6.56E+01**	0.007%
2013	27	-1.96E+02	1.96E+02	-2.69E-02	1.22E-01	2.23E-03	4.40E-04	0.00E+00	1.87E-02	3.31E-06	-6.05E-05	6.79E+01	6.76E+01	2.11E-01	0.00E+00	1.78E-02	2.27E-02	**-1.96E+02**	**-1.96E+02**	0.002%
2013	34	-5.37E+01	5.90E+01	5.39E+00	0.00E+00	3.60E-04	3.83E-05	0.00E+00	4.40E+00	0.00E+00	-2.49E-04	1.31E+01	3.33E+00	2.36E-02	0.00E+00	1.31E-02	1.63E-02	**-5.37E+01**	**-5.37E+01**	0.000%
2013	20	-9.52E+01	9.47E+01	-4.86E-01	0.00E+00	3.22E-04	6.13E-05	0.00E+00	0.00E+00	0.00E+00	1.22E-05	9.01E+00	9.48E+00	2.34E-02	0.00E+00	2.46E-03	3.32E-03	**-9.52E+01**	**-9.52E+01**	0.001%
2013	33	-6.13E+01	6.65E+01	5.18E+00	3.86E-01	3.64E-04	3.64E-05	0.00E+00	3.79E+00	0.00E+00	-2.98E-04	1.65E+01	7.08E+00	2.29E-02	0.00E+00	1.65E-02	2.07E-02	**-6.13E+01**	**-6.13E+01**	0.000%
2013	32	-5.15E+02	5.22E+02	6.79E+00	4.65E-01	2.78E-03	3.27E-04	1.62E-01	1.55E+01	0.00E+00	-4.95E-04	7.85E+01	5.55E+01	1.19E-01	0.00E+00	9.24E-02	1.34E-01	**-5.15E+02**	**-5.15E+02**	0.000%
2013	22	-1.03E+02	1.01E+02	-1.91E+00	4.98E-01	1.04E-03	1.48E-04	0.00E+00	0.00E+00	4.70E-06	7.64E-07	1.61E+01	1.75E+01	5.74E-02	0.00E+00	4.48E-03	6.60E-03	**-1.03E+02**	**-1.03E+02**	0.001%
2013	26	-3.63E+01	3.66E+01	3.61E-01	0.00E+00	7.70E-05	9.26E-06	0.00E+00	0.00E+00	0.00E+00	-8.79E-06	1.35E+00	9.83E-01	3.82E-03	0.00E+00	4.62E-04	9.01E-04	**-3.63E+01**	**-3.63E+01**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 8. Mass Balance for 1,2,3,4,6,7,8-HPCDF

Water Year	Region	FlAux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2013	25	-7.81E+01	7.88E+01	7.22E-01	7.74E-02	3.16E-04	3.45E-05	0.00E+00	1.42E-02	0.00E+00	-1.88E-05	5.44E+00	4.61E+00	1.78E-02	0.00E+00	1.88E-03	3.32E-03	**-7.81E+01**	**-7.81E+01**	0.000%
2014	1	-1.19E+02	1.19E+02	2.52E-01	0.00E+00	2.74E-04	3.35E-05	0.00E+00	3.93E+00	3.78E-05	-4.48E-05	1.37E+01	9.54E+00	7.34E-03	0.00E+00	5.98E-03	5.99E-03	**-1.19E+02**	**-1.19E+02**	0.000%
2014	38	-2.60E+02	2.61E+02	7.17E-01	0.00E+00	8.90E-04	1.27E-04	0.00E+00	2.17E+00	8.95E-03	-7.01E-04	2.34E+01	2.05E+01	1.68E-02	0.00E+00	3.03E-03	5.82E-03	**-2.60E+02**	**-2.60E+02**	0.006%
2014	23	-2.52E+02	2.52E+02	-1.65E-01	0.00E+00	2.45E-04	5.69E-05	0.00E+00	0.00E+00	5.63E-04	-7.93E-05	4.10E+00	4.25E+00	1.64E-02	0.00E+00	3.97E-03	2.90E-03	**-2.52E+02**	**-2.52E+02**	0.001%
2014	35	-1.10E+03	1.10E+03	4.69E-02	0.00E+00	1.20E-03	2.91E-04	0.00E+00	2.63E+00	0.00E+00	-5.03E-05	4.24E+01	3.96E+01	9.40E-02	0.00E+00	7.27E-02	5.32E-02	**-1.10E+03**	**-1.10E+03**	0.000%
2014	39	-4.28E+02	4.27E+02	-1.92E-01	8.54E-02	1.12E-03	3.46E-04	0.00E+00	0.00E+00	3.35E-04	-2.81E-04	4.16E+01	4.16E+01	1.50E-01	0.00E+00	1.55E-02	1.74E-02	**-4.28E+02**	**-4.28E+02**	0.000%
2014	21	-7.37E+01	7.36E+01	-7.94E-02	0.00E+00	2.22E-04	6.30E-05	0.00E+00	0.00E+00	1.26E-03	-1.35E-04	8.73E+00	8.79E+00	2.48E-02	0.00E+00	1.84E-03	3.25E-03	**-7.37E+01**	**-7.37E+01**	0.004%
2014	27	-2.16E+02	2.16E+02	2.78E-01	1.06E-01	2.22E-03	5.35E-04	0.00E+00	1.82E-02	1.63E-05	-2.15E-04	6.59E+01	6.53E+01	2.33E-01	0.00E+00	2.25E-02	2.84E-02	**-2.16E+02**	**-2.16E+02**	0.001%
2014	34	-5.94E+01	6.51E+01	5.65E+00	0.00E+00	3.58E-04	4.94E-05	0.00E+00	4.83E+00	0.00E+00	-2.34E-04	1.43E+01	3.76E+00	2.86E-02	0.00E+00	1.63E-02	2.05E-02	**-5.94E+01**	**-5.94E+01**	0.000%
2014	20	-1.06E+02	1.07E+02	3.43E-01	0.00E+00	3.20E-04	7.83E-05	0.00E+00	0.00E+00	0.00E+00	-1.21E-05	1.01E+01	9.77E+00	2.79E-02	0.00E+00	3.32E-03	3.98E-03	**-1.06E+02**	**-1.06E+02**	0.001%
2014	33	-6.80E+01	7.33E+01	5.28E+00	3.83E-01	3.62E-04	4.63E-05	0.00E+00	4.25E+00	0.00E+00	-2.76E-04	1.76E+01	7.64E+00	2.76E-02	0.00E+00	2.06E-02	2.64E-02	**-6.80E+01**	**-6.80E+01**	0.000%
2014	32	-5.98E+02	6.02E+02	4.71E+00	6.84E-01	2.77E-03	4.04E-04	1.77E-01	1.85E+01	0.00E+00	-3.33E-04	8.38E+01	5.96E+01	1.47E-01	0.00E+00	1.34E-01	1.45E-01	**-5.98E+02**	**-5.98E+02**	0.000%
2014	22	-1.18E+02	1.16E+02	-1.28E+00	4.89E-01	1.03E-03	1.79E-04	0.00E+00	0.00E+00	0.00E+00	6.58E-07	1.83E+01	1.90E+01	6.68E-02	0.00E+00	6.60E-03	1.37E-02	**-1.18E+02**	**-1.18E+02**	0.001%
2014	26	-4.11E+01	4.14E+01	3.26E-01	0.00E+00	7.66E-05	1.12E-05	0.00E+00	0.00E+00	0.00E+00	-8.47E-06	1.44E+00	1.11E+00	4.50E-03	0.00E+00	9.00E-04	1.19E-03	**-4.11E+01**	**-4.11E+01**	0.000%
2014	25	-9.34E+01	9.41E+01	7.76E-01	4.75E-02	3.15E-04	4.16E-05	0.00E+00	1.49E-02	0.00E+00	-1.62E-05	5.84E+00	4.99E+00	2.07E-02	0.00E+00	3.32E-03	5.31E-03	**-9.34E+01**	**-9.34E+01**	0.000%
2015	1	-9.86E+01	9.87E+01	5.64E-02	0.00E+00	2.70E-04	3.89E-05	0.00E+00	2.68E+00	7.15E-05	-1.16E-05	1.05E+01	7.72E+00	6.40E-03	0.00E+00	5.98E-03	1.39E-02	**-9.86E+01**	**-9.86E+01**	0.000%
2015	38	-2.24E+02	2.23E+02	-9.38E-01	0.00E+00	8.77E-04	1.41E-04	0.00E+00	1.25E+00	1.54E-02	2.33E-05	1.67E+01	1.64E+01	1.43E-02	0.00E+00	5.82E-03	1.61E-02	**-2.24E+02**	**-2.24E+02**	0.006%
2015	23	-2.21E+02	2.21E+02	-1.73E-01	0.00E+00	2.42E-04	5.87E-05	0.00E+00	0.00E+00	1.45E-04	-1.99E-07	3.24E+00	3.40E+00	1.58E-02	0.00E+00	2.90E-03	5.26E-03	**-2.21E+02**	**-2.21E+02**	0.001%
2015	35	-9.65E+02	9.64E+02	-9.64E-01	0.00E+00	1.18E-03	3.06E-04	0.00E+00	1.98E+00	0.00E+00	-9.06E-06	3.23E+01	3.12E+01	8.95E-02	0.00E+00	5.32E-02	7.98E-02	**-9.65E+02**	**-9.65E+02**	0.000%
2015	39	-3.75E+02	3.73E+02	-1.24E+00	7.53E-02	1.10E-03	3.64E-04	0.00E+00	0.00E+00	1.06E-03	2.42E-06	3.37E+01	3.47E+01	1.47E-01	0.00E+00	1.74E-02	3.04E-02	**-3.75E+02**	**-3.75E+02**	0.001%
2015	21	-6.35E+01	6.33E+01	-2.39E-01	0.00E+00	2.19E-04	6.60E-05	0.00E+00	0.00E+00	3.95E-03	-2.17E-06	7.13E+00	7.34E+00	2.60E-02	0.00E+00	3.25E-03	6.44E-03	**-6.35E+01**	**-6.35E+01**	0.004%
2015	27	-1.86E+02	1.86E+02	-3.13E-01	9.04E-02	2.19E-03	5.61E-04	0.00E+00	1.22E-02	1.13E-05	-1.35E-05	5.11E+01	5.11E+01	2.28E-01	0.00E+00	2.84E-02	5.71E-02	**-1.86E+02**	**-1.86E+02**	0.001%
2015	34	-5.16E+01	5.57E+01	4.15E+00	0.00E+00	3.52E-04	5.15E-05	0.00E+00	3.93E+00	0.00E+00	-2.00E-04	1.11E+01	3.03E+00	2.75E-02	0.00E+00	2.04E-02	2.94E-02	**-5.16E+01**	**-5.16E+01**	0.000%
2015	20	-9.22E+01	9.23E+01	8.03E-02	0.00E+00	3.16E-04	8.12E-05	0.00E+00	0.00E+00	0.00E+00	-6.74E-06	8.06E+00	7.96E+00	2.76E-02	0.00E+00	3.98E-03	7.99E-03	**-9.22E+01**	**-9.22E+01**	0.000%
2015	33	-5.83E+01	6.23E+01	4.04E+00	3.36E-01	3.57E-04	4.67E-05	0.00E+00	3.45E+00	0.00E+00	-2.39E-04	1.35E+01	5.62E+00	2.68E-02	0.00E+00	2.64E-02	4.38E-02	**-5.83E+01**	**-5.83E+01**	0.000%
2015	32	-5.15E+02	5.18E+02	2.83E+00	4.13E-01	2.72E-03	4.10E-04	1.44E-01	1.50E+01	0.00E+00	-2.38E-04	6.62E+01	4.77E+01	1.48E-01	0.00E+00	1.45E-01	2.06E-01	**-5.15E+02**	**-5.15E+02**	0.000%
2015	22	-1.01E+02	9.94E+01	-1.21E+00	4.42E-01	1.02E-03	1.81E-04	0.00E+00	0.00E+00	2.43E-05	-3.11E-06	1.46E+01	1.53E+01	6.61E-02	0.00E+00	1.37E-02	1.85E-02	**-1.01E+02**	**-1.01E+02**	0.000%
2015	26	-3.42E+01	3.45E+01	3.02E-01	0.00E+00	7.54E-05	1.14E-05	0.00E+00	0.00E+00	0.00E+00	-9.73E-06	1.15E+00	8.48E-01	4.57E-03	0.00E+00	1.19E-03	1.75E-03	**-3.42E+01**	**-3.42E+01**	0.000%
2015	25	-8.07E+01	8.13E+01	5.22E-01	6.31E-02	3.10E-04	4.29E-05	0.00E+00	1.23E-02	0.00E+00	-1.55E-05	4.71E+00	4.09E+00	2.01E-02	0.00E+00	5.31E-03	6.66E-03	**-8.07E+01**	**-8.07E+01**	0.000%
2016	1	-9.64E+01	9.65E+01	1.01E-01	0.00E+00	2.66E-04	3.13E-05	0.00E+00	3.09E+00	1.52E-05	5.23E-04	1.14E+01	8.24E+00	5.39E-03	0.00E+00	1.38E-02	1.37E-02	**-9.64E+01**	**-9.64E+01**	0.000%
2016	38	-2.12E+02	2.11E+02	-3.83E-01	0.00E+00	8.62E-04	1.13E-04	0.00E+00	1.23E+00	2.43E-02	1.66E-03	1.78E+01	1.69E+01	1.24E-02	0.00E+00	1.61E-02	1.04E-02	**-2.12E+02**	**-2.12E+02**	0.012%
2016	23	-2.05E+02	2.05E+02	-1.48E-01	0.00E+00	2.38E-04	4.51E-05	0.00E+00	0.00E+00	1.09E-04	4.53E-04	3.49E+00	3.63E+00	1.22E-02	0.00E+00	5.26E-03	4.40E-03	**-2.05E+02**	**-2.05E+02**	0.001%
2016	35	-8.98E+02	8.98E+02	-4.72E-03	0.00E+00	1.16E-03	2.34E-04	0.00E+00	2.13E+00	0.00E+00	2.67E-03	3.63E+01	3.41E+01	7.03E-02	0.00E+00	7.98E-02	8.71E-02	**-8.98E+02**	**-8.98E+02**	0.000%
2016	39	-3.45E+02	3.44E+02	-9.05E-01	5.67E-02	1.08E-03	2.70E-04	0.00E+00	0.00E+00	1.06E-04	2.69E-03	3.54E+01	3.62E+01	1.06E-01	0.00E+00	3.04E-02	2.14E-02	**-3.45E+02**	**-3.45E+02**	0.001%
2016	21	-6.11E+01	6.09E+01	-1.70E-01	0.00E+00	2.15E-04	5.15E-05	0.00E+00	0.00E+00	3.69E-03	5.93E-04	7.65E+00	7.80E+00	1.97E-02	0.00E+00	6.44E-03	4.23E-03	**-6.11E+01**	**-6.11E+01**	0.006%
2016	27	-1.78E+02	1.78E+02	-3.69E-02	6.95E-02	2.15E-03	4.09E-04	0.00E+00	1.42E-02	9.64E-06	4.42E-03	5.62E+01	5.59E+01	1.77E-01	0.00E+00	5.71E-02	4.33E-02	**-1.78E+02**	**-1.78E+02**	0.001%

Table 8. Mass Balance for 1,2,3,4,6,7,8-HPCDF

Water Year	Region	FlAux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2016	34	-4.91E+01	5.37E+01	4.58E+00	0.00E+00	3.46E-04	3.93E-05	0.00E+00	4.43E+00	0.00E+00	4.56E-04	1.25E+01	3.48E+00	2.25E-02	0.00E+00	2.94E-02	2.32E-02	**-4.91E+01**	**-4.91E+01**	0.000%
2016	20	-8.81E+01	8.82E+01	1.36E-01	0.00E+00	3.10E-04	6.18E-05	0.00E+00	0.00E+00	0.00E+00	7.32E-04	8.81E+00	8.64E+00	2.21E-02	0.00E+00	7.99E-03	5.35E-03	**-8.81E+01**	**-8.81E+01**	0.000%
2016	33	-5.55E+01	6.00E+01	4.46E+00	2.60E-01	3.50E-04	3.56E-05	0.00E+00	3.92E+00	0.00E+00	5.00E-04	1.50E+01	6.32E+00	2.13E-02	0.00E+00	4.37E-02	2.88E-02	**-5.55E+01**	**-5.55E+01**	0.000%
2016	32	-4.99E+02	5.03E+02	3.79E+00	3.15E-01	2.67E-03	3.00E-04	1.19E-01	1.72E+01	0.00E+00	4.14E-03	7.54E+01	5.38E+01	1.18E-01	0.00E+00	2.06E-01	2.18E-01	**-4.99E+02**	**-4.99E+02**	0.000%
2016	22	-9.59E+01	9.49E+01	-1.03E+00	3.38E-01	9.98E-04	1.32E-04	0.00E+00	0.00E+00	0.00E+00	1.72E-03	1.62E+01	1.68E+01	5.35E-02	0.00E+00	1.85E-02	1.49E-02	**-9.59E+01**	**-9.59E+01**	0.000%
2016	26	-3.22E+01	3.25E+01	3.23E-01	0.00E+00	7.41E-05	8.28E-06	0.00E+00	0.00E+00	0.00E+00	8.92E-05	1.31E+00	9.81E-01	3.63E-03	0.00E+00	1.75E-03	1.58E-03	**-3.22E+01**	**-3.22E+01**	0.000%
2016	25	-7.68E+01	7.74E+01	6.55E-01	5.36E-02	3.04E-04	3.09E-05	0.00E+00	1.42E-02	0.00E+00	3.79E-04	5.34E+00	4.60E+00	1.54E-02	0.00E+00	6.66E-03	5.95E-03	**-7.68E+01**	**-7.68E+01**	0.000%

Table 9. Mass Balance for PCB-126

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1996	1	-8.64E+01	8.73E+01	8.23E-01	0.00E+00	0.00E+00	2.48E-03	0.00E+00	3.46E-01	1.41E-04	-1.38E-04	6.46E+00	5.17E+00	4.11E-03	0.00E+00	1.25E-01	5.49E-03	**-8.64E+01**	**-8.64E+01**	0.000%
1996	38	-2.01E+02	2.01E+02	-1.85E-01	0.00E+00	0.00E+00	1.14E-02	0.00E+00	5.28E-01	2.42E-02	2.26E-05	1.05E+01	1.01E+01	-5.72E-04	0.00E+00	1.20E-01	5.28E-03	**-2.01E+02**	**-2.01E+02**	0.017%
1996	23	-1.91E+02	1.91E+02	6.20E-02	0.00E+00	0.00E+00	4.19E-03	0.00E+00	0.00E+00	8.19E-04	-1.14E-05	2.33E+00	2.23E+00	3.40E-03	0.00E+00	4.13E-02	2.59E-03	**-1.91E+02**	**-1.91E+02**	0.001%
1996	35	-8.74E+02	8.74E+02	-6.77E-02	0.00E+00	0.00E+00	1.91E-02	0.00E+00	1.28E+00	0.00E+00	-3.07E-05	2.22E+01	2.05E+01	4.80E-02	0.00E+00	5.67E-01	4.95E-02	**-8.74E+02**	**-8.74E+02**	0.000%
1996	39	-3.36E+02	3.34E+02	-1.66E+00	2.24E-01	0.00E+00	2.45E-02	0.00E+00	0.00E+00	2.49E-04	1.33E-04	2.29E+01	2.41E+01	8.22E-02	0.00E+00	1.83E-01	1.49E-02	**-3.36E+02**	**-3.36E+02**	0.001%
1996	21	-6.24E+01	6.23E+01	-4.83E-02	0.00E+00	0.00E+00	5.31E-03	0.00E+00	0.00E+00	4.27E-04	1.32E-05	3.96E+00	3.98E+00	1.49E-02	0.00E+00	2.86E-02	3.43E-03	**-6.24E+01**	**-6.24E+01**	0.006%
1996	27	-1.95E+02	1.96E+02	6.45E-01	7.20E-02	0.00E+00	4.34E-02	0.00E+00	9.13E-03	5.72E-05	-6.05E-05	3.31E+01	3.19E+01	2.03E-01	0.00E+00	3.30E-01	3.02E-02	**-1.95E+02**	**-1.95E+02**	0.002%
1996	34	-5.84E+01	6.06E+01	2.19E+00	0.00E+00	0.00E+00	2.67E-03	0.00E+00	2.29E+00	0.00E+00	-2.18E-04	6.20E+00	1.54E+00	2.19E-02	0.00E+00	1.92E-01	2.47E-02	**-5.84E+01**	**-5.84E+01**	0.000%
1996	20	-9.45E+01	9.46E+01	8.35E-02	0.00E+00	0.00E+00	7.21E-03	0.00E+00	0.00E+00	4.09E-05	-4.49E-06	4.90E+00	4.77E+00	1.64E-02	0.00E+00	4.38E-02	4.35E-03	**-9.45E+01**	**-9.45E+01**	0.001%
1996	33	-6.20E+01	6.31E+01	1.08E+00	5.12E-01	0.00E+00	2.47E-03	0.00E+00	2.55E+00	0.00E+00	-1.75E-04	8.16E+00	3.81E+00	3.06E-02	0.00E+00	2.04E-01	2.68E-02	**-6.20E+01**	**-6.20E+01**	0.000%
1996	32	-6.28E+02	6.13E+02	-1.42E+01	4.45E-01	0.00E+00	3.82E-02	1.01E+01	1.09E+01	0.00E+00	-1.33E-04	3.79E+01	2.93E+01	1.50E-01	0.00E+00	1.36E+00	1.91E-01	**-6.28E+02**	**-6.28E+02**	0.000%
1996	22	-1.26E+02	1.25E+02	-1.31E+00	5.21E-01	0.00E+00	2.01E-02	0.00E+00	0.00E+00	9.20E-05	5.04E-06	7.65E+00	8.34E+00	2.85E-02	0.00E+00	1.07E-01	1.63E-02	**-1.26E+02**	**-1.26E+02**	0.001%
1996	26	-4.87E+01	4.89E+01	1.77E-01	0.00E+00	0.00E+00	1.20E-03	0.00E+00	0.00E+00	0.00E+00	-1.01E-05	7.57E-01	5.66E-01	5.30E-03	0.00E+00	1.31E-02	2.63E-03	**-4.87E+01**	**-4.87E+01**	0.000%
1996	25	-1.18E+02	1.18E+02	2.28E-01	4.22E-02	0.00E+00	4.86E-03	0.00E+00	9.26E-03	0.00E+00	-1.14E-05	2.86E+00	2.52E+00	2.47E-02	0.00E+00	5.61E-02	9.27E-03	**-1.18E+02**	**-1.18E+02**	0.000%
1997	1	-6.38E+01	6.43E+01	5.21E-01	0.00E+00	0.00E+00	2.21E-03	0.00E+00	2.27E-01	6.12E-06	-4.71E-05	4.94E+00	4.20E+00	4.07E-03	0.00E+00	5.48E-03	1.00E-02	**-6.38E+01**	**-6.38E+01**	0.000%
1997	38	-1.53E+02	1.53E+02	-8.36E-02	0.00E+00	0.00E+00	9.96E-03	0.00E+00	2.96E-01	9.32E-03	-2.93E-06	7.52E+00	7.32E+00	-1.18E-04	0.00E+00	5.28E-03	4.26E-03	**-1.53E+02**	**-1.53E+02**	0.011%
1997	23	-1.50E+02	1.50E+02	6.99E-03	0.00E+00	0.00E+00	3.71E-03	0.00E+00	0.00E+00	9.51E-05	-1.79E-06	1.96E+00	1.95E+00	4.06E-03	0.00E+00	2.59E-03	3.12E-03	**-1.50E+02**	**-1.50E+02**	0.000%
1997	35	-6.84E+02	6.84E+02	2.11E-01	0.00E+00	0.00E+00	1.68E-02	0.00E+00	1.08E+00	0.00E+00	-1.20E-05	1.80E+01	1.67E+01	5.08E-02	0.00E+00	4.95E-02	7.18E-02	**-6.84E+02**	**-6.84E+02**	0.000%
1997	39	-2.63E+02	2.61E+02	-1.99E+00	2.01E-01	0.00E+00	2.16E-02	0.00E+00	0.00E+00	1.32E-04	5.82E-05	1.75E+01	1.92E+01	7.92E-02	0.00E+00	1.49E-02	1.46E-02	**-2.63E+02**	**-2.63E+02**	0.001%
1997	21	-4.83E+01	4.82E+01	-1.53E-01	0.00E+00	0.00E+00	4.57E-03	0.00E+00	0.00E+00	1.19E-03	1.03E-06	3.07E+00	3.21E+00	1.24E-02	0.00E+00	3.43E-03	2.17E-03	**-4.83E+01**	**-4.83E+01**	0.005%
1997	27	-1.58E+02	1.58E+02	-1.41E-01	6.51E-02	0.00E+00	3.76E-02	0.00E+00	6.51E-03	0.00E+00	-1.04E-05	2.54E+01	2.54E+01	1.70E-01	0.00E+00	3.02E-02	2.82E-02	**-1.58E+02**	**-1.58E+02**	0.001%
1997	34	-4.51E+01	4.73E+01	2.20E+00	0.00E+00	0.00E+00	2.35E-03	0.00E+00	1.75E+00	0.00E+00	-1.49E-04	5.34E+00	1.36E+00	1.87E-02	0.00E+00	2.47E-02	2.21E-02	**-4.51E+01**	**-4.51E+01**	0.000%
1997	20	-7.35E+01	7.35E+01	4.87E-02	0.00E+00	0.00E+00	6.14E-03	0.00E+00	0.00E+00	1.19E-04	-3.05E-06	3.81E+00	3.75E+00	1.33E-02	0.00E+00	4.35E-03	3.56E-03	**-7.35E+01**	**-7.35E+01**	0.001%
1997	33	-4.82E+01	4.94E+01	1.25E+00	4.52E-01	0.00E+00	2.17E-03	0.00E+00	1.91E+00	0.00E+00	-1.22E-04	6.86E+00	3.23E+00	2.35E-02	0.00E+00	2.68E-02	2.64E-02	**-4.82E+01**	**-4.82E+01**	0.000%
1997	32	-5.36E+02	5.23E+02	-1.26E+01	3.84E-01	0.00E+00	3.46E-02	1.01E+01	8.88E+00	0.00E+00	-9.95E-05	3.24E+01	2.56E+01	1.30E-01	0.00E+00	1.91E-01	1.71E-01	**-5.36E+02**	**-5.36E+02**	0.000%
1997	22	-1.09E+02	1.06E+02	-2.26E+00	4.50E-01	0.00E+00	1.76E-02	0.00E+00	0.00E+00	1.81E-04	1.81E-05	6.63E+00	8.43E+00	1.98E-02	0.00E+00	1.63E-02	1.06E-02	**-1.09E+02**	**-1.09E+02**	0.001%
1997	26	-4.20E+01	4.22E+01	1.66E-01	0.00E+00	0.00E+00	1.09E-03	0.00E+00	0.00E+00	0.00E+00	-8.57E-06	6.55E-01	4.85E-01	3.13E-03	0.00E+00	2.63E-03	1.55E-03	**-4.20E+01**	**-4.20E+01**	0.000%
1997	25	-1.05E+02	1.05E+02	1.57E-01	4.38E-02	0.00E+00	4.41E-03	0.00E+00	6.05E-03	0.00E+00	-8.56E-06	2.55E+00	2.33E+00	1.87E-02	0.00E+00	9.27E-03	6.38E-03	**-1.05E+02**	**-1.05E+02**	0.000%
1998	1	-6.62E+01	6.64E+01	2.92E-01	0.00E+00	0.00E+00	2.50E-03	0.00E+00	2.64E-01	3.33E-05	-2.37E-05	4.91E+00	4.35E+00	3.81E-03	0.00E+00	1.00E-02	6.05E-03	**-6.62E+01**	**-6.62E+01**	0.000%
1998	38	-1.59E+02	1.59E+02	8.83E-03	0.00E+00	0.00E+00	1.12E-02	0.00E+00	3.35E-01	7.27E-03	-3.90E-04	7.46E+00	7.15E+00	-1.36E-03	0.00E+00	3.88E-03	3.95E-03	**-1.60E+02**	**-1.59E+02**	0.015%
1998	23	-1.55E+02	1.55E+02	-2.84E-03	0.00E+00	0.00E+00	4.14E-03	0.00E+00	0.00E+00	1.00E-04	-2.86E-05	1.80E+00	1.80E+00	2.31E-03	0.00E+00	3.09E-03	2.46E-03	**-1.55E+02**	**-1.55E+02**	0.001%
1998	35	-7.11E+02	7.11E+02	2.74E-02	0.00E+00	0.00E+00	1.88E-02	0.00E+00	1.11E+00	0.00E+00	-4.15E-07	1.66E+01	1.54E+01	4.90E-02	0.00E+00	7.18E-02	5.35E-02	**-7.11E+02**	**-7.11E+02**	0.000%
1998	39	-2.72E+02	2.71E+02	-9.57E-01	2.00E-01	0.00E+00	2.40E-02	0.00E+00	0.00E+00	3.52E-04	-1.49E-04	1.61E+01	1.68E+01	8.92E-02	0.00E+00	1.44E-02	1.26E-02	**-2.72E+02**	**-2.72E+02**	0.001%
1998	21	-5.08E+01	5.07E+01	-6.83E-02	0.00E+00	0.00E+00	5.11E-03	0.00E+00	0.00E+00	5.16E-04	-1.67E-04	2.93E+00	3.00E+00	1.31E-02	0.00E+00	2.01E-03	2.42E-03	**-5.08E+01**	**-5.08E+01**	0.007%
1998	27	-1.71E+02	1.71E+02	7.35E-02	6.43E-02	0.00E+00	4.20E-02	0.00E+00	8.38E-03	1.79E-04	-2.93E-04	2.42E+01	2.40E+01	1.47E-01	0.00E+00	2.80E-02	3.00E-02	**-1.71E+02**	**-1.71E+02**	0.002%
1998	34	-4.76E+01	4.94E+01	1.81E+00	0.00E+00	0.00E+00	2.63E-03	0.00E+00	1.74E+00	0.00E+00	-1.68E-04	4.86E+00	1.30E+00	1.91E-02	0.00E+00	2.21E-02	2.03E-02	**-4.76E+01**	**-4.76E+01**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 9. Mass Balance for PCB-126

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1998	20	-7.77E+01	7.77E+01	5.12E-02	0.00E+00	0.00E+00	6.87E-03	0.00E+00	0.00E+00	0.00E+00	-7.56E-05	3.63E+00	3.57E+00	1.31E-02	0.00E+00	3.49E-03	4.12E-03	**-7.77E+01**	**-7.77E+01**	0.001%
1998	33	-5.13E+01	5.22E+01	8.98E-01	4.86E-01	0.00E+00	2.46E-03	0.00E+00	1.96E+00	0.00E+00	-1.46E-04	6.25E+00	2.87E+00	2.45E-02	0.00E+00	2.64E-02	2.20E-02	**-5.13E+01**	**-5.13E+01**	0.000%
1998	32	-5.91E+02	5.78E+02	-1.28E+01	4.20E-01	0.00E+00	3.90E-02	1.01E+01	9.57E+00	0.00E+00	-1.10E-04	3.36E+01	2.63E+01	1.49E-01	0.00E+00	1.71E-01	1.76E-01	**-5.91E+02**	**-5.91E+02**	0.000%
1998	22	-1.21E+02	1.19E+02	-1.83E+00	4.91E-01	0.00E+00	2.02E-02	0.00E+00	0.00E+00	0.00E+00	-8.44E-05	7.14E+00	8.47E+00	2.39E-02	0.00E+00	1.05E-02	1.36E-02	**-1.21E+02**	**-1.21E+02**	0.001%
1998	26	-4.74E+01	4.75E+01	1.53E-01	0.00E+00	0.00E+00	1.25E-03	0.00E+00	0.00E+00	0.00E+00	-1.09E-05	7.03E-01	5.48E-01	3.04E-03	0.00E+00	1.55E-03	1.72E-03	**-4.74E+01**	**-4.74E+01**	0.000%
1998	25	-1.17E+02	1.17E+02	1.53E-01	5.25E-02	0.00E+00	5.06E-03	0.00E+00	7.86E-03	0.00E+00	-6.45E-06	2.64E+00	2.42E+00	2.01E-02	0.00E+00	6.38E-03	6.52E-03	**-1.17E+02**	**-1.17E+02**	0.000%
1999	1	-6.13E+01	6.17E+01	3.79E-01	0.00E+00	0.00E+00	2.84E-03	0.00E+00	2.24E-01	1.20E-05	-6.55E-05	4.31E+00	3.71E+00	4.02E-03	0.00E+00	6.05E-03	6.13E-03	**-6.13E+01**	**-6.13E+01**	0.000%
1999	38	-1.40E+02	1.40E+02	2.30E-01	0.00E+00	0.00E+00	1.25E-02	0.00E+00	2.35E-01	6.36E-03	-8.61E-04	6.13E+00	5.69E+00	-3.81E-03	0.00E+00	3.12E-03	5.41E-03	**-1.40E+02**	**-1.40E+02**	0.009%
1999	23	-1.32E+02	1.32E+02	1.25E-01	0.00E+00	0.00E+00	4.45E-03	0.00E+00	0.00E+00	3.02E-05	-4.85E-05	1.56E+00	1.44E+00	9.88E-04	0.00E+00	2.43E-03	3.23E-03	**-1.32E+02**	**-1.32E+02**	0.001%
1999	35	-6.09E+02	6.10E+02	7.44E-01	0.00E+00	0.00E+00	1.98E-02	0.00E+00	9.41E-01	0.00E+00	-9.57E-05	1.39E+01	1.22E+01	3.91E-02	0.00E+00	5.35E-02	5.86E-02	**-6.09E+02**	**-6.09E+02**	0.000%
1999	39	-2.30E+02	2.30E+02	-1.35E-01	1.55E-01	0.00E+00	2.51E-02	0.00E+00	0.00E+00	6.90E-05	-1.46E-05	1.26E+01	1.26E+01	8.63E-02	0.00E+00	1.26E-02	1.93E-02	**-2.30E+02**	**-2.30E+02**	0.001%
1999	21	-4.40E+01	4.40E+01	3.68E-02	0.00E+00	0.00E+00	5.47E-03	0.00E+00	0.00E+00	3.82E-04	-5.18E-05	2.62E+00	2.58E+00	1.38E-02	0.00E+00	2.38E-03	3.37E-03	**-4.40E+01**	**-4.40E+01**	0.005%
1999	27	-1.48E+02	1.49E+02	4.05E-01	5.15E-02	0.00E+00	4.28E-02	0.00E+00	5.42E-03	3.44E-05	-4.31E-05	1.93E+01	1.88E+01	1.25E-01	0.00E+00	3.00E-02	3.55E-02	**-1.48E+02**	**-1.48E+02**	0.002%
1999	34	-4.17E+01	4.29E+01	1.26E+00	0.00E+00	0.00E+00	2.72E-03	0.00E+00	1.53E+00	0.00E+00	-1.16E-04	3.98E+00	1.19E+00	1.82E-02	0.00E+00	2.03E-02	2.71E-02	**-4.17E+01**	**-4.17E+01**	0.000%
1999	20	-6.67E+01	6.68E+01	6.23E-02	0.00E+00	0.00E+00	7.16E-03	0.00E+00	0.00E+00	0.00E+00	-5.08E-06	3.18E+00	3.12E+00	1.29E-02	0.00E+00	4.12E-03	5.35E-03	**-6.67E+01**	**-6.67E+01**	0.001%
1999	33	-4.38E+01	4.45E+01	7.13E-01	3.86E-01	0.00E+00	2.46E-03	0.00E+00	1.72E+00	0.00E+00	-1.08E-04	4.89E+00	2.06E+00	2.25E-02	0.00E+00	2.20E-02	3.03E-02	**-4.38E+01**	**-4.38E+01**	0.000%
1999	32	-5.36E+02	5.24E+02	-1.20E+01	3.27E-01	0.00E+00	4.06E-02	1.01E+01	9.15E+00	0.00E+00	-1.15E-04	2.87E+01	2.10E+01	1.46E-01	0.00E+00	1.76E-01	1.44E-01	**-5.36E+02**	**-5.36E+02**	0.000%
1999	22	-1.08E+02	1.07E+02	-9.11E-01	3.82E-01	0.00E+00	2.09E-02	0.00E+00	0.00E+00	0.00E+00	-8.17E-06	6.32E+00	6.84E+00	2.85E-02	0.00E+00	1.36E-02	1.43E-02	**-1.08E+02**	**-1.08E+02**	0.001%
1999	26	-4.09E+01	4.10E+01	1.60E-01	0.00E+00	0.00E+00	1.29E-03	0.00E+00	0.00E+00	0.00E+00	-1.28E-05	6.09E-01	4.47E-01	3.11E-03	0.00E+00	1.72E-03	1.78E-03	**-4.09E+01**	**-4.09E+01**	0.000%
1999	25	-1.08E+02	1.09E+02	2.04E-01	4.41E-02	0.00E+00	5.34E-03	0.00E+00	7.28E-03	0.00E+00	-1.46E-05	2.36E+00	2.09E+00	2.08E-02	0.00E+00	6.52E-03	7.94E-03	**-1.08E+02**	**-1.08E+02**	0.000%
2000	1	-5.78E+01	5.79E+01	1.52E-01	0.00E+00	0.00E+00	2.25E-03	0.00E+00	2.78E-01	6.05E-06	-1.12E-05	4.24E+00	3.81E+00	3.66E-03	0.00E+00	6.13E-03	3.92E-03	**-5.78E+01**	**-5.78E+01**	0.000%
2000	38	-1.34E+02	1.34E+02	-1.44E-01	0.00E+00	0.00E+00	1.05E-02	0.00E+00	2.63E-01	8.78E-03	-5.12E-05	6.09E+00	5.99E+00	3.24E-03	0.00E+00	5.37E-03	4.53E-03	**-1.34E+02**	**-1.34E+02**	0.010%
2000	23	-1.31E+02	1.31E+02	-1.40E-02	0.00E+00	0.00E+00	4.09E-03	0.00E+00	0.00E+00	3.11E-04	3.39E-07	1.53E+00	1.54E+00	6.15E-03	0.00E+00	3.23E-03	3.00E-03	**-1.31E+02**	**-1.31E+02**	0.000%
2000	35	-5.94E+02	5.94E+02	-1.84E-01	0.00E+00	0.00E+00	1.82E-02	0.00E+00	1.09E+00	0.00E+00	-1.48E-04	1.28E+01	1.18E+01	7.35E-02	0.00E+00	5.85E-02	3.98E-02	**-5.94E+02**	**-5.94E+02**	0.000%
2000	39	-2.29E+02	2.28E+02	-7.49E-01	1.87E-01	0.00E+00	2.34E-02	0.00E+00	0.00E+00	4.12E-04	9.66E-06	1.30E+01	1.35E+01	1.06E-01	0.00E+00	1.93E-02	1.62E-02	**-2.29E+02**	**-2.29E+02**	0.001%
2000	21	-4.16E+01	4.16E+01	-7.62E-02	0.00E+00	0.00E+00	4.97E-03	0.00E+00	0.00E+00	7.79E-04	-7.12E-07	2.28E+00	2.34E+00	1.73E-02	0.00E+00	3.37E-03	2.39E-03	**-4.16E+01**	**-4.16E+01**	0.005%
2000	27	-1.41E+02	1.41E+02	-6.64E-02	6.03E-02	0.00E+00	4.13E-02	0.00E+00	5.51E-03	0.00E+00	-1.29E-05	1.91E+01	1.89E+01	1.59E-01	0.00E+00	3.55E-02	2.85E-02	**-1.41E+02**	**-1.41E+02**	0.001%
2000	34	-3.94E+01	4.06E+01	1.14E+00	0.00E+00	0.00E+00	2.48E-03	0.00E+00	1.45E+00	0.00E+00	3.70E-04	3.63E+00	1.01E+00	1.68E-02	0.00E+00	2.75E-02	1.64E-02	**-3.94E+01**	**-3.94E+01**	0.001%
2000	20	-6.49E+01	6.49E+01	1.62E-02	0.00E+00	0.00E+00	6.72E-03	0.00E+00	0.00E+00	2.42E-05	-4.28E-06	2.73E+00	2.70E+00	1.59E-02	0.00E+00	5.34E-03	3.46E-03	**-6.49E+01**	**-6.49E+01**	0.001%
2000	33	-4.47E+01	4.52E+01	4.46E-01	4.11E-01	0.00E+00	2.31E-03	0.00E+00	1.64E+00	0.00E+00	9.78E-04	4.81E+00	2.28E+00	2.06E-02	0.00E+00	3.14E-02	1.57E-02	**-4.47E+01**	**-4.47E+01**	0.002%
2000	32	-4.97E+02	4.84E+02	-1.25E+01	3.62E-01	0.00E+00	3.70E-02	1.01E+01	9.32E+00	0.00E+00	-6.98E-04	2.68E+01	1.92E+01	1.57E-01	0.00E+00	1.44E-01	5.38E-02	**-4.97E+02**	**-4.97E+02**	0.000%
2000	22	-9.79E+01	9.68E+01	-1.16E+00	4.23E-01	0.00E+00	1.90E-02	0.00E+00	0.00E+00	3.43E-06	-3.14E-06	5.93E+00	6.65E+00	3.45E-02	0.00E+00	1.43E-02	8.87E-03	**-9.79E+01**	**-9.79E+01**	0.001%
2000	26	-3.97E+01	3.99E+01	1.23E-01	0.00E+00	0.00E+00	1.16E-03	0.00E+00	0.00E+00	0.00E+00	-7.26E-06	5.51E-01	4.25E-01	2.48E-03	0.00E+00	1.78E-03	5.49E-04	**-3.97E+01**	**-3.97E+01**	0.000%
2000	25	-9.96E+01	9.98E+01	1.56E-01	4.11E-02	0.00E+00	4.62E-03	0.00E+00	6.62E-03	0.00E+00	-1.23E-05	2.25E+00	2.02E+00	1.89E-02	0.00E+00	7.93E-03	1.63E-03	**-9.96E+01**	**-9.96E+01**	0.000%
2001	1	-5.44E+01	5.46E+01	2.46E-01	0.00E+00	0.00E+00	2.36E-03	0.00E+00	2.00E-01	1.35E-06	-1.53E-05	4.10E+00	3.66E+00	4.82E-03	0.00E+00	3.92E-03	8.20E-03	**-5.44E+01**	**-5.44E+01**	0.000%
2001	38	-1.30E+02	1.30E+02	-5.40E-02	0.00E+00	0.00E+00	1.07E-02	0.00E+00	2.00E-01	3.21E-03	-4.68E-06	5.80E+00	5.67E+00	4.90E-04	0.00E+00	4.53E-03	4.59E-03	**-1.30E+02**	**-1.30E+02**	0.005%

Table 9. Mass Balance for PCB-126

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2001	23	-1.28E+02	1.28E+02	-2.02E-02	0.00E+00	0.00E+00	4.03E-03	0.00E+00	0.00E+00	1.10E-04	-1.40E-07	1.53E+00	1.55E+00	4.09E-03	0.00E+00	3.00E-03	3.65E-03	**-1.28E+02**	**-1.28E+02**	0.001%
2001	35	-5.80E+02	5.80E+02	-2.36E-02	0.00E+00	0.00E+00	1.75E-02	0.00E+00	1.03E+00	0.00E+00	-7.39E-06	1.35E+01	1.24E+01	6.35E-02	0.00E+00	3.98E-02	7.17E-02	**-5.80E+02**	**-5.80E+02**	0.000%
2001	39	-2.23E+02	2.22E+02	-4.73E-01	1.46E-01	0.00E+00	2.25E-02	0.00E+00	0.00E+00	6.33E-04	8.18E-06	1.26E+01	1.29E+01	8.84E-02	0.00E+00	1.62E-02	1.65E-02	**-2.23E+02**	**-2.23E+02**	0.001%
2001	21	-4.07E+01	4.07E+01	-3.96E-02	0.00E+00	0.00E+00	4.76E-03	0.00E+00	0.00E+00	5.89E-04	-1.18E-06	2.39E+00	2.42E+00	1.45E-02	0.00E+00	2.39E-03	2.46E-03	**-4.07E+01**	**-4.07E+01**	0.003%
2001	27	-1.38E+02	1.38E+02	-3.18E-01	4.76E-02	0.00E+00	3.83E-02	0.00E+00	5.65E-03	6.80E-05	-1.81E-06	1.85E+01	1.87E+01	1.13E-01	0.00E+00	2.85E-02	3.46E-02	**-1.38E+02**	**-1.38E+02**	0.001%
2001	34	-3.85E+01	3.98E+01	1.21E+00	0.00E+00	0.00E+00	2.31E-03	0.00E+00	1.43E+00	0.00E+00	-1.14E-04	3.65E+00	1.01E+00	1.71E-02	0.00E+00	1.64E-02	2.42E-02	**-3.85E+01**	**-3.85E+01**	0.000%
2001	20	-6.29E+01	6.29E+01	3.20E-03	0.00E+00	0.00E+00	6.25E-03	0.00E+00	0.00E+00	2.28E-05	-2.30E-06	2.88E+00	2.87E+00	1.49E-02	0.00E+00	3.46E-03	4.06E-03	**-6.29E+01**	**-6.29E+01**	0.001%
2001	33	-4.37E+01	4.43E+01	6.72E-01	3.09E-01	0.00E+00	2.11E-03	0.00E+00	1.60E+00	0.00E+00	-9.33E-05	4.81E+00	2.22E+00	2.00E-02	0.00E+00	1.57E-02	2.78E-02	**-4.37E+01**	**-4.37E+01**	0.000%
2001	32	-4.94E+02	4.82E+02	-1.18E+01	2.82E-01	0.00E+00	3.56E-02	1.01E+01	9.27E+00	0.00E+00	-7.26E-05	2.78E+01	2.01E+01	1.48E-01	0.00E+00	5.38E-02	2.60E-01	**-4.94E+02**	**-4.94E+02**	0.000%
2001	22	-9.74E+01	9.59E+01	-1.46E+00	3.29E-01	0.00E+00	1.79E-02	0.00E+00	0.00E+00	1.61E-05	6.56E-06	5.87E+00	7.00E+00	2.88E-02	0.00E+00	8.87E-03	1.78E-02	**-9.74E+01**	**-9.74E+01**	0.001%
2001	26	-3.89E+01	3.90E+01	1.41E-01	0.00E+00	0.00E+00	1.12E-03	0.00E+00	0.00E+00	0.00E+00	-8.01E-06	5.50E-01	4.10E-01	2.80E-03	0.00E+00	5.49E-04	3.23E-03	**-3.89E+01**	**-3.89E+01**	0.000%
2001	25	-9.96E+01	9.98E+01	2.15E-01	2.65E-02	0.00E+00	4.56E-03	0.00E+00	7.00E-03	0.00E+00	-1.10E-05	2.21E+00	1.96E+00	1.68E-02	0.00E+00	1.63E-03	1.34E-02	**-9.96E+01**	**-9.96E+01**	0.000%
2002	1	-4.91E+01	4.92E+01	4.94E-02	0.00E+00	0.00E+00	3.15E-03	0.00E+00	8.64E-02	2.85E-06	-7.76E-06	3.43E+00	3.29E+00	6.04E-03	0.00E+00	8.20E-03	8.06E-03	**-4.91E+01**	**-4.91E+01**	0.000%
2002	38	-1.21E+02	1.21E+02	-5.79E-02	0.00E+00	0.00E+00	1.36E-02	0.00E+00	1.14E-01	6.67E-03	-7.96E-04	4.51E+00	4.47E+00	-2.00E-03	0.00E+00	3.79E-03	5.80E-03	**-1.21E+02**	**-1.21E+02**	0.006%
2002	23	-1.21E+02	1.21E+02	-1.61E-02	0.00E+00	0.00E+00	4.88E-03	0.00E+00	0.00E+00	6.86E-05	-8.23E-05	1.27E+00	1.29E+00	3.02E-03	0.00E+00	3.57E-03	3.80E-03	**-1.21E+02**	**-1.21E+02**	0.001%
2002	35	-5.45E+02	5.45E+02	-7.73E-02	0.00E+00	0.00E+00	2.15E-02	0.00E+00	1.03E+00	0.00E+00	-3.76E-06	1.08E+01	9.81E+00	6.30E-02	0.00E+00	7.17E-02	7.54E-02	**-5.45E+02**	**-5.45E+02**	0.000%
2002	39	-2.06E+02	2.05E+02	-7.01E-01	1.32E-01	0.00E+00	2.72E-02	0.00E+00	0.00E+00	3.09E-03	-7.04E-05	1.03E+01	1.08E+01	9.17E-02	0.00E+00	1.64E-02	2.07E-02	**-2.06E+02**	**-2.06E+02**	0.001%
2002	21	-3.93E+01	3.92E+01	-7.19E-02	0.00E+00	0.00E+00	5.88E-03	0.00E+00	0.00E+00	1.29E-03	-1.36E-04	2.18E+00	2.24E+00	1.33E-02	0.00E+00	2.33E-03	3.56E-03	**-3.93E+01**	**-3.93E+01**	0.004%
2002	27	-1.30E+02	1.30E+02	-2.58E-01	4.35E-02	0.00E+00	4.54E-02	0.00E+00	4.34E-03	1.02E-04	-1.87E-04	1.48E+01	1.50E+01	9.92E-02	0.00E+00	3.44E-02	4.61E-02	**-1.30E+02**	**-1.30E+02**	0.001%
2002	34	-3.83E+01	3.90E+01	7.51E-01	0.00E+00	0.00E+00	2.81E-03	0.00E+00	1.30E+00	0.00E+00	-8.98E-05	3.07E+00	1.01E+00	1.57E-02	0.00E+00	2.42E-02	2.90E-02	**-3.83E+01**	**-3.83E+01**	0.000%
2002	20	-6.07E+01	6.07E+01	-2.18E-02	0.00E+00	0.00E+00	7.57E-03	0.00E+00	0.00E+00	8.22E-05	-1.32E-06	2.70E+00	2.72E+00	1.42E-02	0.00E+00	4.06E-03	5.94E-03	**-6.07E+01**	**-6.07E+01**	0.000%
2002	33	-4.23E+01	4.28E+01	5.04E-01	2.95E-01	0.00E+00	2.54E-03	0.00E+00	1.55E+00	0.00E+00	-9.41E-05	3.91E+00	1.55E+00	2.05E-02	0.00E+00	2.78E-02	3.44E-02	**-4.23E+01**	**-4.23E+01**	0.000%
2002	32	-4.84E+02	4.72E+02	-1.19E+01	2.57E-01	0.00E+00	4.19E-02	1.01E+01	9.12E+00	0.00E+00	-6.36E-05	2.56E+01	1.80E+01	1.55E-01	0.00E+00	2.60E-01	2.44E-01	**-4.84E+02**	**-4.84E+02**	0.000%
2002	22	-9.41E+01	9.28E+01	-1.28E+00	3.01E-01	0.00E+00	2.09E-02	0.00E+00	0.00E+00	1.32E-05	2.37E-06	5.57E+00	6.54E+00	2.86E-02	0.00E+00	1.78E-02	2.00E-02	**-9.41E+01**	**-9.41E+01**	0.001%
2002	26	-3.59E+01	3.60E+01	1.16E-01	0.00E+00	0.00E+00	1.31E-03	0.00E+00	0.00E+00	0.00E+00	-1.12E-05	5.38E-01	4.19E-01	3.51E-03	0.00E+00	3.23E-03	2.50E-03	**-3.59E+01**	**-3.59E+01**	0.000%
2002	25	-9.87E+01	9.89E+01	1.96E-01	2.95E-02	0.00E+00	5.37E-03	0.00E+00	7.79E-03	0.00E+00	-1.88E-05	2.12E+00	1.87E+00	2.02E-02	0.00E+00	1.34E-02	1.01E-02	**-9.87E+01**	**-9.87E+01**	0.000%
2003	1	-6.30E+01	6.35E+01	4.91E-01	0.00E+00	0.00E+00	2.32E-03	0.00E+00	3.09E-01	1.45E-05	-5.20E-05	4.95E+00	4.15E+00	5.32E-03	0.00E+00	8.05E-03	9.09E-03	**-6.30E+01**	**-6.30E+01**	0.000%
2003	38	-1.59E+02	1.59E+02	4.34E-01	0.00E+00	0.00E+00	1.14E-02	0.00E+00	3.61E-01	3.54E-03	6.37E-04	9.54E+00	8.77E+00	4.16E-03	0.00E+00	6.48E-03	9.46E-03	**-1.59E+02**	**-1.59E+02**	0.009%
2003	23	-1.51E+02	1.51E+02	-1.43E-02	0.00E+00	0.00E+00	4.49E-03	0.00E+00	0.00E+00	7.95E-05	-5.36E-06	2.00E+00	2.02E+00	4.92E-03	0.00E+00	3.79E-03	4.82E-03	**-1.51E+02**	**-1.51E+02**	0.001%
2003	35	-6.90E+02	6.90E+02	3.45E-01	0.00E+00	0.00E+00	1.97E-02	0.00E+00	1.08E+00	0.00E+00	1.07E-03	1.84E+01	1.70E+01	6.51E-02	0.00E+00	7.65E-02	8.89E-02	**-6.90E+02**	**-6.90E+02**	0.000%
2003	39	-2.60E+02	2.60E+02	-3.29E-02	2.39E-01	0.00E+00	2.59E-02	0.00E+00	0.00E+00	2.29E-03	-6.20E-05	1.69E+01	1.66E+01	1.18E-01	0.00E+00	2.06E-02	2.64E-02	**-2.60E+02**	**-2.60E+02**	0.001%
2003	21	-4.89E+01	4.89E+01	1.08E-02	0.00E+00	0.00E+00	5.57E-03	0.00E+00	0.00E+00	2.28E-04	-1.37E-05	2.91E+00	2.89E+00	1.69E-02	0.00E+00	3.55E-03	5.16E-03	**-4.89E+01**	**-4.89E+01**	0.004%
2003	27	-1.78E+02	1.78E+02	2.79E-01	7.72E-02	0.00E+00	4.62E-02	0.00E+00	1.51E-02	0.00E+00	3.65E-04	2.69E+01	2.64E+01	1.53E-01	0.00E+00	4.65E-02	4.96E-02	**-1.78E+02**	**-1.78E+02**	0.001%
2003	34	-4.71E+01	4.91E+01	2.05E+00	0.00E+00	0.00E+00	2.72E-03	0.00E+00	1.61E+00	0.00E+00	6.78E-04	4.83E+00	1.15E+00	2.81E-02	0.00E+00	2.99E-02	4.11E-02	**-4.71E+01**	**-4.71E+01**	0.002%
2003	20	-7.62E+01	7.64E+01	1.38E-01	0.00E+00	0.00E+00	7.44E-03	0.00E+00	0.00E+00	8.50E-06	-2.54E-05	3.79E+00	3.64E+00	2.10E-02	0.00E+00	5.92E-03	7.60E-03	**-7.62E+01**	**-7.62E+01**	0.000%
2003	33	-5.35E+01	5.50E+01	1.45E+00	5.52E-01	0.00E+00	2.42E-03	0.00E+00	1.74E+00	0.00E+00	6.30E-03	6.87E+00	3.11E+00	2.92E-02	0.00E+00	4.09E-02	5.34E-02	**-5.35E+01**	**-5.35E+01**	0.012%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 9. Mass Balance for PCB-126

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2003	32	-5.90E+02	5.82E+02	-8.26E+00	4.75E-01	0.00E+00	3.50E-02	1.01E+01	1.03E+01	0.00E+00	4.71E-02	4.88E+01	3.59E+01	2.06E-01	0.00E+00	2.92E-01	2.49E-01	**-5.90E+02**	**-5.90E+02**	0.008%
2003	22	-1.19E+02	1.17E+02	-1.11E+00	5.56E-01	0.00E+00	2.07E-02	0.00E+00	0.00E+00	1.45E-05	-5.53E-05	9.22E+00	9.74E+00	5.10E-02	0.00E+00	2.00E-02	1.80E-02	**-1.19E+02**	**-1.19E+02**	0.000%
2003	26	-4.60E+01	4.63E+01	2.22E-01	0.00E+00	0.00E+00	1.22E-03	0.00E+00	0.00E+00	0.00E+00	-1.80E-05	8.11E-01	5.83E-01	6.16E-03	0.00E+00	2.49E-03	2.13E-03	**-4.60E+01**	**-4.60E+01**	0.000%
2003	25	-1.08E+02	1.09E+02	4.60E-01	7.16E-02	0.00E+00	4.72E-03	0.00E+00	1.07E-02	0.00E+00	-4.86E-05	3.43E+00	2.87E+00	3.00E-02	0.00E+00	1.01E-02	1.05E-02	**-1.08E+02**	**-1.08E+02**	0.000%
2004	1	-5.83E+01	5.86E+01	3.97E-01	0.00E+00	0.00E+00	2.44E-03	0.00E+00	5.69E-01	4.36E-05	-6.05E-05	4.97E+00	4.00E+00	4.86E-03	0.00E+00	9.07E-03	1.00E-02	**-5.83E+01**	**-5.83E+01**	0.000%
2004	38	-1.42E+02	1.42E+02	1.43E-01	0.00E+00	0.00E+00	1.19E-02	0.00E+00	3.91E-01	5.93E-03	-1.06E-05	9.33E+00	8.81E+00	8.97E-03	0.00E+00	9.46E-03	1.19E-02	**-1.42E+02**	**-1.42E+02**	0.010%
2004	23	-1.34E+02	1.34E+02	5.79E-02	0.00E+00	0.00E+00	4.60E-03	0.00E+00	0.00E+00	2.41E-04	-2.78E-06	2.13E+00	2.06E+00	1.57E-02	0.00E+00	4.82E-03	7.23E-03	**-1.34E+02**	**-1.34E+02**	0.001%
2004	35	-6.07E+02	6.07E+02	6.40E-01	0.00E+00	0.00E+00	1.98E-02	0.00E+00	9.57E-01	0.00E+00	-4.48E-05	1.80E+01	1.64E+01	7.86E-02	0.00E+00	8.89E-02	1.30E-01	**-6.07E+02**	**-6.07E+02**	0.000%
2004	39	-2.32E+02	2.31E+02	-5.76E-01	2.37E-01	0.00E+00	2.65E-02	0.00E+00	0.00E+00	5.51E-04	1.98E-06	1.65E+01	1.68E+01	1.20E-01	0.00E+00	2.64E-02	4.67E-02	**-2.32E+02**	**-2.32E+02**	0.001%
2004	21	-4.20E+01	4.21E+01	1.10E-02	0.00E+00	0.00E+00	5.61E-03	0.00E+00	0.00E+00	1.32E-04	-3.36E-06	2.83E+00	2.81E+00	1.93E-02	0.00E+00	5.16E-03	7.74E-03	**-4.20E+01**	**-4.20E+01**	0.006%
2004	27	-1.47E+02	1.47E+02	-1.04E-03	7.71E-02	0.00E+00	4.56E-02	0.00E+00	1.18E-02	0.00E+00	-2.83E-05	2.51E+01	2.50E+01	1.44E-01	0.00E+00	4.96E-02	8.02E-02	**-1.47E+02**	**-1.47E+02**	0.002%
2004	34	-3.95E+01	4.15E+01	1.97E+00	0.00E+00	0.00E+00	2.63E-03	0.00E+00	1.48E+00	0.00E+00	-1.93E-04	4.50E+00	1.04E+00	2.17E-02	0.00E+00	4.11E-02	4.68E-02	**-3.95E+01**	**-3.95E+01**	0.000%
2004	20	-6.44E+01	6.45E+01	1.25E-01	0.00E+00	0.00E+00	7.36E-03	0.00E+00	0.00E+00	8.48E-06	-8.91E-06	3.46E+00	3.33E+00	1.96E-02	0.00E+00	7.60E-03	9.96E-03	**-6.44E+01**	**-6.44E+01**	0.000%
2004	33	-4.48E+01	4.62E+01	1.39E+00	5.02E-01	0.00E+00	2.30E-03	0.00E+00	1.51E+00	0.00E+00	-1.99E-04	6.41E+00	2.99E+00	2.19E-02	0.00E+00	5.34E-02	5.86E-02	**-4.48E+01**	**-4.48E+01**	0.000%
2004	32	-4.80E+02	4.73E+02	-7.55E+00	4.25E-01	0.00E+00	3.38E-02	1.01E+01	8.30E+00	0.00E+00	-5.34E-04	4.11E+01	2.98E+01	1.58E-01	0.00E+00	2.49E-01	3.35E-01	**-4.80E+02**	**-4.80E+02**	0.000%
2004	22	-9.67E+01	9.48E+01	-1.84E+00	4.97E-01	0.00E+00	1.95E-02	0.00E+00	0.00E+00	9.21E-05	1.28E-06	7.88E+00	9.19E+00	5.19E-02	0.00E+00	1.80E-02	2.40E-02	**-9.67E+01**	**-9.67E+01**	0.001%
2004	26	-3.73E+01	3.75E+01	1.77E-01	0.00E+00	0.00E+00	1.16E-03	0.00E+00	0.00E+00	0.00E+00	-1.21E-05	6.68E-01	4.88E-01	4.80E-03	0.00E+00	2.13E-03	2.86E-03	**-3.73E+01**	**-3.73E+01**	0.000%
2004	25	-8.70E+01	8.73E+01	3.61E-01	6.14E-02	0.00E+00	4.46E-03	0.00E+00	8.10E-03	0.00E+00	-2.53E-05	2.87E+00	2.42E+00	2.37E-02	0.00E+00	1.05E-02	1.10E-02	**-8.70E+01**	**-8.70E+01**	0.000%
2005	1	-5.06E+01	5.08E+01	2.06E-01	0.00E+00	0.00E+00	2.40E-03	0.00E+00	5.42E-01	5.90E-07	-2.02E-05	4.35E+00	3.60E+00	4.28E-03	0.00E+00	1.00E-02	4.93E-03	**-5.06E+01**	**-5.06E+01**	0.000%
2005	38	-1.27E+02	1.27E+02	-7.80E-02	0.00E+00	0.00E+00	1.15E-02	0.00E+00	3.41E-01	2.72E-03	-1.87E-05	8.11E+00	7.85E+00	8.16E-03	0.00E+00	1.19E-02	2.81E-03	**-1.27E+02**	**-1.27E+02**	0.008%
2005	23	-1.21E+02	1.21E+02	3.19E-02	0.00E+00	0.00E+00	4.15E-03	0.00E+00	0.00E+00	5.48E-05	-2.87E-06	1.91E+00	1.87E+00	1.55E-02	0.00E+00	7.23E-03	2.67E-03	**-1.21E+02**	**-1.21E+02**	0.001%
2005	35	-5.46E+02	5.47E+02	4.50E-01	0.00E+00	0.00E+00	1.82E-02	0.00E+00	1.06E+00	0.00E+00	-5.00E-05	1.58E+01	1.42E+01	8.51E-02	0.00E+00	1.30E-01	5.98E-02	**-5.46E+02**	**-5.46E+02**	0.000%
2005	39	-2.06E+02	2.05E+02	-3.88E-01	1.52E-01	0.00E+00	2.36E-02	0.00E+00	0.00E+00	3.24E-04	-5.66E-06	1.54E+01	1.55E+01	1.28E-01	0.00E+00	4.67E-02	1.19E-02	**-2.06E+02**	**-2.06E+02**	0.001%
2005	21	-3.88E+01	3.87E+01	-5.08E-02	0.00E+00	0.00E+00	5.17E-03	0.00E+00	0.00E+00	2.43E-04	-4.03E-05	2.57E+00	2.61E+00	1.75E-02	0.00E+00	7.70E-03	1.72E-03	**-3.88E+01**	**-3.88E+01**	0.005%
2005	27	-1.36E+02	1.36E+02	5.89E-02	5.09E-02	0.00E+00	4.16E-02	0.00E+00	8.96E-03	2.96E-05	-2.46E-05	2.22E+01	2.19E+01	1.51E-01	0.00E+00	8.02E-02	2.46E-02	**-1.36E+02**	**-1.36E+02**	0.001%
2005	34	-3.71E+01	3.85E+01	1.44E+00	0.00E+00	0.00E+00	2.50E-03	0.00E+00	1.44E+00	0.00E+00	-1.24E-04	3.91E+00	9.97E-01	1.67E-02	0.00E+00	4.68E-02	2.00E-02	**-3.71E+01**	**-3.71E+01**	0.000%
2005	20	-6.00E+01	6.01E+01	8.88E-02	0.00E+00	0.00E+00	6.83E-03	0.00E+00	0.00E+00	0.00E+00	-6.66E-06	3.08E+00	2.97E+00	1.90E-02	0.00E+00	9.96E-03	3.12E-03	**-6.00E+01**	**-6.00E+01**	0.000%
2005	33	-4.18E+01	4.28E+01	9.59E-01	2.59E-01	0.00E+00	2.11E-03	0.00E+00	1.56E+00	0.00E+00	-1.11E-04	5.36E+00	2.53E+00	1.92E-02	0.00E+00	5.86E-02	2.58E-02	**-4.18E+01**	**-4.18E+01**	0.000%
2005	32	-4.69E+02	4.60E+02	-9.82E+00	2.48E-01	0.00E+00	3.58E-02	1.01E+01	9.31E+00	0.00E+00	-1.93E-04	3.27E+01	2.27E+01	1.55E-01	0.00E+00	3.35E-01	2.14E-01	**-4.69E+02**	**-4.69E+02**	0.000%
2005	22	-9.26E+01	9.17E+01	-9.05E-01	2.89E-01	0.00E+00	1.97E-02	0.00E+00	0.00E+00	0.00E+00	-2.73E-06	6.51E+00	7.09E+00	4.53E-02	0.00E+00	2.40E-02	1.04E-02	**-9.26E+01**	**-9.26E+01**	0.000%
2005	26	-3.56E+01	3.58E+01	1.35E-01	0.00E+00	0.00E+00	1.23E-03	0.00E+00	0.00E+00	0.00E+00	-6.83E-06	5.35E-01	3.95E-01	4.76E-03	0.00E+00	2.86E-03	1.69E-03	**-3.56E+01**	**-3.56E+01**	0.000%
2005	25	-8.81E+01	8.83E+01	2.33E-01	3.10E-02	0.00E+00	4.95E-03	0.00E+00	7.80E-03	0.00E+00	-1.20E-05	2.30E+00	2.00E+00	2.40E-02	0.00E+00	1.10E-02	6.86E-03	**-8.81E+01**	**-8.81E+01**	0.000%
2006	1	-5.54E+01	5.57E+01	3.41E-01	0.00E+00	0.00E+00	2.05E-03	0.00E+00	5.78E-01	9.46E-06	-3.03E-05	4.77E+00	3.85E+00	4.48E-03	0.00E+00	4.93E-03	4.10E-03	**-5.54E+01**	**-5.54E+01**	0.000%
2006	38	-1.38E+02	1.38E+02	1.19E-01	0.00E+00	0.00E+00	1.00E-02	0.00E+00	3.85E-01	2.85E-03	-4.51E-04	8.87E+00	8.38E+00	7.62E-03	0.00E+00	2.39E-03	3.67E-03	**-1.38E+02**	**-1.38E+02**	0.010%
2006	23	-1.33E+02	1.33E+02	2.45E-02	0.00E+00	0.00E+00	3.91E-03	0.00E+00	0.00E+00	1.14E-04	-3.06E-05	2.10E+00	2.07E+00	1.23E-02	0.00E+00	2.65E-03	2.15E-03	**-1.33E+02**	**-1.33E+02**	0.001%
2006	35	-5.95E+02	5.96E+02	5.18E-01	0.00E+00	0.00E+00	1.73E-02	0.00E+00	9.92E-01	0.00E+00	-5.63E-05	1.72E+01	1.56E+01	8.65E-02	0.00E+00	5.98E-02	3.89E-02	**-5.95E+02**	**-5.95E+02**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 9. Mass Balance for PCB-126

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2006	39	-2.27E+02	2.26E+02	-2.68E-01	2.97E-01	0.00E+00	2.28E-02	0.00E+00	0.00E+00	9.31E-05	-2.32E-04	1.59E+01	1.58E+01	1.28E-01	0.00E+00	1.17E-02	1.15E-02	**-2.27E+02**	**-2.27E+02**	0.001%
2006	21	-4.16E+01	4.16E+01	-1.21E-02	0.00E+00	0.00E+00	4.89E-03	0.00E+00	0.00E+00	1.66E-04	-1.41E-04	2.66E+00	2.66E+00	1.94E-02	0.00E+00	1.59E-03	1.89E-03	**-4.17E+01**	**-4.16E+01**	0.006%
2006	27	-1.45E+02	1.45E+02	1.16E-01	9.27E-02	0.00E+00	4.09E-02	0.00E+00	1.18E-02	0.00E+00	-2.91E-04	2.40E+01	2.37E+01	1.78E-01	0.00E+00	2.44E-02	2.39E-02	**-1.45E+02**	**-1.45E+02**	0.002%
2006	34	-3.88E+01	4.05E+01	1.68E+00	0.00E+00	0.00E+00	2.46E-03	0.00E+00	1.41E+00	0.00E+00	-1.65E-04	4.13E+00	1.02E+00	2.03E-02	0.00E+00	2.00E-02	1.53E-02	**-3.88E+01**	**-3.88E+01**	0.000%
2006	20	-6.33E+01	6.34E+01	1.15E-01	0.00E+00	0.00E+00	6.55E-03	0.00E+00	0.00E+00	0.00E+00	-4.34E-05	3.22E+00	3.09E+00	2.17E-02	0.00E+00	3.09E-03	2.90E-03	**-6.33E+01**	**-6.33E+01**	0.001%
2006	33	-4.40E+01	4.51E+01	1.07E+00	5.35E-01	0.00E+00	2.19E-03	0.00E+00	1.51E+00	0.00E+00	-1.70E-04	6.02E+00	2.88E+00	2.29E-02	0.00E+00	2.58E-02	1.90E-02	**-4.40E+01**	**-4.40E+01**	0.000%
2006	32	-4.74E+02	4.65E+02	-9.01E+00	4.49E-01	0.00E+00	3.20E-02	1.01E+01	8.72E+00	0.00E+00	-3.58E-04	3.77E+01	2.72E+01	1.59E-01	0.00E+00	2.14E-01	1.28E-01	**-4.74E+02**	**-4.74E+02**	0.000%
2006	22	-9.49E+01	9.39E+01	-1.01E+00	5.26E-01	0.00E+00	1.81E-02	0.00E+00	0.00E+00	2.45E-06	-6.40E-05	7.40E+00	7.85E+00	5.38E-02	0.00E+00	1.03E-02	8.89E-03	**-9.49E+01**	**-9.49E+01**	0.001%
2006	26	-3.73E+01	3.75E+01	1.39E-01	0.00E+00	0.00E+00	1.10E-03	0.00E+00	0.00E+00	0.00E+00	-8.51E-06	6.09E-01	4.66E-01	4.41E-03	0.00E+00	1.68E-03	1.05E-03	**-3.73E+01**	**-3.73E+01**	0.000%
2006	25	-8.64E+01	8.67E+01	2.83E-01	6.69E-02	0.00E+00	4.20E-03	0.00E+00	7.71E-03	0.00E+00	-1.95E-05	2.62E+00	2.24E+00	2.34E-02	0.00E+00	6.86E-03	4.24E-03	**-8.64E+01**	**-8.64E+01**	0.000%
2007	1	-6.42E+01	6.45E+01	3.26E-01	0.00E+00	0.00E+00	2.27E-03	0.00E+00	7.76E-01	1.41E-06	-1.37E-04	4.81E+00	3.71E+00	2.82E-03	0.00E+00	4.10E-03	4.56E-03	**-6.42E+01**	**-6.42E+01**	0.000%
2007	38	-1.52E+02	1.52E+02	2.45E-01	0.00E+00	0.00E+00	1.07E-02	0.00E+00	4.50E-01	4.08E-03	-8.35E-05	8.82E+00	8.15E+00	7.34E-03	0.00E+00	3.67E-03	4.51E-03	**-1.52E+02**	**-1.52E+02**	0.019%
2007	23	-1.45E+02	1.45E+02	1.79E-02	0.00E+00	0.00E+00	3.92E-03	0.00E+00	0.00E+00	6.01E-05	-3.09E-06	1.99E+00	1.97E+00	1.11E-02	0.00E+00	2.15E-03	2.07E-03	**-1.45E+02**	**-1.45E+02**	0.001%
2007	35	-6.55E+02	6.56E+02	5.92E-01	0.00E+00	0.00E+00	1.73E-02	0.00E+00	9.28E-01	0.00E+00	-8.21E-05	1.68E+01	1.52E+01	7.94E-02	0.00E+00	3.89E-02	4.15E-02	**-6.55E+02**	**-6.55E+02**	0.000%
2007	39	-2.48E+02	2.48E+02	-4.34E-03	2.84E-01	0.00E+00	2.29E-02	0.00E+00	0.00E+00	4.07E-05	-5.45E-05	1.58E+01	1.54E+01	1.31E-01	0.00E+00	1.15E-02	1.27E-02	**-2.48E+02**	**-2.48E+02**	0.001%
2007	21	-4.68E+01	4.69E+01	7.76E-02	0.00E+00	0.00E+00	4.82E-03	0.00E+00	0.00E+00	3.22E-04	-1.71E-05	2.76E+00	2.67E+00	2.26E-02	0.00E+00	1.89E-03	2.81E-03	**-4.68E+01**	**-4.68E+01**	0.006%
2007	27	-1.58E+02	1.59E+02	4.68E-01	9.16E-02	0.00E+00	3.96E-02	0.00E+00	1.00E-02	0.00E+00	-8.57E-05	2.39E+01	2.32E+01	1.90E-01	0.00E+00	2.39E-02	2.43E-02	**-1.58E+02**	**-1.58E+02**	0.002%
2007	34	-4.28E+01	4.47E+01	1.92E+00	0.00E+00	0.00E+00	2.35E-03	0.00E+00	1.31E+00	0.00E+00	-2.56E-04	4.24E+00	9.95E-01	1.81E-02	0.00E+00	1.53E-02	1.99E-02	**-4.28E+01**	**-4.28E+01**	0.000%
2007	20	-7.05E+01	7.07E+01	2.06E-01	0.00E+00	0.00E+00	6.32E-03	0.00E+00	0.00E+00	0.00E+00	-2.74E-05	3.27E+00	3.04E+00	2.34E-02	0.00E+00	2.90E-03	3.59E-03	**-7.05E+01**	**-7.05E+01**	0.001%
2007	33	-4.79E+01	4.90E+01	1.13E+00	6.53E-01	0.00E+00	2.07E-03	0.00E+00	1.40E+00	0.00E+00	-2.33E-04	5.92E+00	2.72E+00	2.05E-02	0.00E+00	1.90E-02	2.36E-02	**-4.79E+01**	**-4.79E+01**	0.000%
2007	32	-5.08E+02	5.00E+02	-8.16E+00	5.04E-01	0.00E+00	3.08E-02	1.02E+01	7.70E+00	0.00E+00	-5.39E-04	3.59E+01	2.56E+01	1.37E-01	0.00E+00	1.28E-01	1.94E-01	**-5.08E+02**	**-5.08E+02**	0.000%
2007	22	-1.03E+02	1.02E+02	-9.85E-01	5.92E-01	0.00E+00	1.73E-02	0.00E+00	0.00E+00	1.25E-05	-2.15E-05	7.36E+00	7.73E+00	5.37E-02	0.00E+00	8.89E-03	1.75E-02	**-1.03E+02**	**-1.03E+02**	0.001%
2007	26	-4.00E+01	4.02E+01	1.82E-01	0.00E+00	0.00E+00	1.06E-03	0.00E+00	0.00E+00	0.00E+00	-1.27E-05	6.05E-01	4.21E-01	4.28E-03	0.00E+00	1.05E-03	2.30E-03	**-4.00E+01**	**-4.00E+01**	0.000%
2007	25	-9.28E+01	9.31E+01	2.74E-01	9.09E-02	0.00E+00	4.08E-03	0.00E+00	6.51E-03	0.00E+00	-2.68E-05	2.56E+00	2.17E+00	1.99E-02	0.00E+00	4.24E-03	8.94E-03	**-9.28E+01**	**-9.28E+01**	0.000%
2008	1	-5.24E+01	5.26E+01	2.07E-01	0.00E+00	0.00E+00	2.59E-03	0.00E+00	1.08E+00	6.18E-05	-2.72E-05	4.88E+00	3.60E+00	1.93E-03	0.00E+00	4.55E-03	8.18E-03	**-5.24E+01**	**-5.24E+01**	0.000%
2008	38	-1.29E+02	1.29E+02	-8.32E-02	0.00E+00	0.00E+00	1.18E-02	0.00E+00	5.99E-01	3.53E-03	2.21E-05	8.50E+00	8.01E+00	2.66E-03	0.00E+00	4.51E-03	7.18E-03	**-1.29E+02**	**-1.29E+02**	0.007%
2008	23	-1.23E+02	1.23E+02	3.19E-02	0.00E+00	0.00E+00	4.21E-03	0.00E+00	0.00E+00	3.82E-04	-2.20E-06	2.00E+00	1.97E+00	1.15E-02	0.00E+00	2.07E-03	3.22E-03	**-1.23E+02**	**-1.23E+02**	0.001%
2008	35	-5.54E+02	5.55E+02	4.22E-01	0.00E+00	0.00E+00	1.85E-02	0.00E+00	1.01E+00	0.00E+00	-2.71E-05	1.70E+01	1.55E+01	7.67E-02	0.00E+00	4.15E-02	6.74E-02	**-5.54E+02**	**-5.54E+02**	0.000%
2008	39	-2.10E+02	2.09E+02	-3.67E-01	2.20E-01	0.00E+00	2.43E-02	0.00E+00	0.00E+00	3.27E-05	-1.67E-06	1.59E+01	1.59E+01	1.38E-01	0.00E+00	1.27E-02	1.86E-02	**-2.10E+02**	**-2.10E+02**	0.001%
2008	21	-3.88E+01	3.88E+01	4.58E-03	0.00E+00	0.00E+00	5.16E-03	0.00E+00	0.00E+00	3.66E-04	-1.68E-06	2.93E+00	2.90E+00	2.70E-02	0.00E+00	2.81E-03	3.05E-03	**-3.88E+01**	**-3.88E+01**	0.004%
2008	27	-1.31E+02	1.31E+02	-1.79E-02	7.10E-02	0.00E+00	4.11E-02	0.00E+00	9.86E-03	0.00E+00	-1.37E-05	2.33E+01	2.30E+01	2.15E-01	0.00E+00	2.43E-02	3.81E-02	**-1.31E+02**	**-1.31E+02**	0.001%
2008	34	-3.61E+01	3.77E+01	1.62E+00	0.00E+00	0.00E+00	2.55E-03	0.00E+00	1.40E+00	0.00E+00	-1.39E-04	4.10E+00	1.07E+00	1.77E-02	0.00E+00	1.99E-02	2.66E-02	**-3.61E+01**	**-3.61E+01**	0.000%
2008	20	-5.86E+01	5.87E+01	9.73E-02	0.00E+00	0.00E+00	6.72E-03	0.00E+00	0.00E+00	0.00E+00	-5.11E-06	3.29E+00	3.18E+00	2.77E-02	0.00E+00	3.59E-03	5.05E-03	**-5.86E+01**	**-5.86E+01**	0.000%
2008	33	-4.03E+01	4.14E+01	1.04E+00	4.67E-01	0.00E+00	2.20E-03	0.00E+00	1.48E+00	0.00E+00	-1.39E-04	5.57E+00	2.57E+00	2.07E-02	0.00E+00	2.36E-02	3.29E-02	**-4.03E+01**	**-4.03E+01**	0.000%
2008	32	-4.48E+02	4.39E+02	-9.14E+00	4.01E-01	0.00E+00	3.42E-02	1.01E+01	8.32E+00	0.00E+00	-2.70E-04	3.45E+01	2.47E+01	1.58E-01	0.00E+00	1.94E-01	2.22E-01	**-4.48E+02**	**-4.48E+02**	0.000%
2008	22	-8.72E+01	8.63E+01	-9.43E-01	4.68E-01	0.00E+00	1.85E-02	0.00E+00	0.00E+00	2.42E-05	-5.07E-06	6.68E+00	7.11E+00	5.60E-02	0.00E+00	1.75E-02	1.36E-02	**-8.72E+01**	**-8.72E+01**	0.000%

Table 9. Mass Balance for PCB-126

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2008	26	-3.33E+01	3.34E+01	1.30E-01	0.00E+00	0.00E+00	1.15E-03	0.00E+00	0.00E+00	0.00E+00	-9.51E-06	5.50E-01	4.17E-01	4.61E-03	0.00E+00	2.30E-03	2.36E-03	**-3.33E+01**	**-3.33E+01**	0.000%
2008	25	-8.31E+01	8.33E+01	2.41E-01	5.95E-02	0.00E+00	4.58E-03	0.00E+00	7.42E-03	0.00E+00	-1.78E-05	2.38E+00	2.05E+00	2.44E-02	0.00E+00	8.94E-03	7.95E-03	**-8.31E+01**	**-8.31E+01**	0.000%
2009	1	-5.23E+01	5.24E+01	1.10E-01	0.00E+00	0.00E+00	2.37E-03	0.00E+00	1.05E+00	3.64E-05	-1.59E-05	4.82E+00	3.66E+00	3.07E-03	0.00E+00	8.18E-03	4.26E-03	**-5.23E+01**	**-5.23E+01**	0.005%
2009	38	-1.24E+02	1.24E+02	1.97E-01	0.00E+00	0.00E+00	1.11E-02	0.00E+00	3.22E-01	3.17E-03	-1.31E-04	8.45E+00	7.95E+00	6.15E-03	0.00E+00	7.06E-03	2.60E-03	**-1.24E+02**	**-1.24E+02**	0.010%
2009	23	-1.21E+02	1.21E+02	1.75E-02	0.00E+00	0.00E+00	4.18E-03	0.00E+00	0.00E+00	5.69E-05	8.67E-07	1.88E+00	1.86E+00	1.10E-02	0.00E+00	3.22E-03	2.67E-03	**-1.21E+02**	**-1.21E+02**	0.003%
2009	35	-5.42E+02	5.43E+02	3.61E-01	0.00E+00	0.00E+00	1.83E-02	0.00E+00	9.37E-01	0.00E+00	1.12E-04	1.58E+01	1.45E+01	7.65E-02	0.00E+00	6.76E-02	5.25E-02	**-5.42E+02**	**-5.42E+02**	0.009%
2009	39	-2.08E+02	2.08E+02	-2.34E-01	2.19E-01	0.00E+00	2.43E-02	0.00E+00	0.00E+00	1.49E-04	-1.64E-06	1.54E+01	1.53E+01	1.20E-01	0.00E+00	1.86E-02	1.16E-02	**-2.08E+02**	**-2.08E+02**	0.004%
2009	21	-3.72E+01	3.72E+01	-2.35E-02	0.00E+00	0.00E+00	5.11E-03	0.00E+00	0.00E+00	4.32E-04	-2.30E-08	2.75E+00	2.75E+00	2.44E-02	0.00E+00	3.05E-03	1.54E-03	**-3.72E+01**	**-3.72E+01**	0.009%
2009	27	-1.27E+02	1.27E+02	5.75E-02	6.96E-02	0.00E+00	4.18E-02	0.00E+00	1.00E-02	0.00E+00	-2.08E-05	2.26E+01	2.23E+01	1.97E-01	0.00E+00	3.81E-02	2.24E-02	**-1.27E+02**	**-1.27E+02**	0.008%
2009	34	-3.50E+01	3.64E+01	1.41E+00	0.00E+00	0.00E+00	2.45E-03	0.00E+00	1.31E+00	0.00E+00	5.97E-04	3.73E+00	9.96E-01	1.79E-02	0.00E+00	2.73E-02	1.56E-02	**-3.50E+01**	**-3.50E+01**	0.023%
2009	20	-5.85E+01	5.86E+01	6.12E-02	0.00E+00	0.00E+00	6.69E-03	0.00E+00	0.00E+00	0.00E+00	-5.02E-06	3.14E+00	3.06E+00	2.12E-02	0.00E+00	5.05E-03	2.56E-03	**-5.85E+01**	**-5.85E+01**	0.005%
2009	33	-3.98E+01	4.09E+01	1.11E+00	4.39E-01	0.00E+00	2.13E-03	0.00E+00	1.42E+00	0.00E+00	1.09E-03	5.32E+00	2.33E+00	2.08E-02	0.00E+00	3.41E-02	2.08E-02	**-3.98E+01**	**-3.98E+01**	0.013%
2009	32	-4.40E+02	4.31E+02	-8.97E+00	3.92E-01	0.00E+00	3.27E-02	1.01E+01	8.17E+00	0.00E+00	-1.84E-03	3.38E+01	2.40E+01	1.56E-01	0.00E+00	2.20E-01	1.37E-01	**-4.40E+02**	**-4.40E+02**	0.012%
2009	22	-8.68E+01	8.56E+01	-1.13E+00	4.58E-01	0.00E+00	1.83E-02	0.00E+00	0.00E+00	0.00E+00	-2.20E-06	6.69E+00	7.34E+00	5.00E-02	0.00E+00	1.36E-02	7.46E-03	**-8.68E+01**	**-8.68E+01**	0.003%
2009	26	-3.43E+01	3.44E+01	1.36E-01	0.00E+00	0.00E+00	1.12E-03	0.00E+00	0.00E+00	0.00E+00	-8.14E-06	5.69E-01	4.28E-01	4.68E-03	0.00E+00	2.36E-03	1.07E-03	**-3.43E+01**	**-3.43E+01**	0.000%
2009	25	-8.23E+01	8.26E+01	2.62E-01	5.23E-02	0.00E+00	4.31E-03	0.00E+00	7.84E-03	0.00E+00	-1.63E-05	2.44E+00	2.09E+00	2.28E-02	0.00E+00	7.95E-03	4.24E-03	**-8.23E+01**	**-8.23E+01**	0.001%
2010	1	-5.23E+01	5.24E+01	1.84E-01	0.00E+00	0.00E+00	1.74E-03	0.00E+00	1.06E+00	4.81E-06	-3.16E-05	4.35E+00	3.16E+00	1.84E-03	0.00E+00	4.26E-03	4.04E-03	**-5.23E+01**	**-5.23E+01**	0.104%
2010	38	-1.25E+02	1.25E+02	5.78E-02	0.00E+00	0.00E+00	8.11E-03	0.00E+00	4.07E-01	3.25E-03	-4.48E-04	8.18E+00	7.76E+00	4.49E-03	0.00E+00	2.21E-03	3.92E-03	**-1.25E+02**	**-1.25E+02**	0.035%
2010	23	-1.21E+02	1.21E+02	2.55E-02	0.00E+00	0.00E+00	3.04E-03	0.00E+00	0.00E+00	2.92E-04	-2.45E-05	1.92E+00	1.89E+00	1.04E-02	0.00E+00	2.65E-03	2.01E-03	**-1.21E+02**	**-1.21E+02**	0.005%
2010	35	-5.40E+02	5.41E+02	9.27E-01	0.00E+00	0.00E+00	1.36E-02	0.00E+00	9.09E-01	0.00E+00	-6.56E-05	1.62E+01	1.46E+01	6.63E-02	0.00E+00	5.25E-02	4.15E-02	**-5.40E+02**	**-5.40E+02**	0.059%
2010	39	-2.06E+02	2.05E+02	-4.13E-01	1.75E-01	0.00E+00	1.78E-02	0.00E+00	0.00E+00	1.29E-03	-1.95E-04	1.60E+01	1.62E+01	1.12E-01	0.00E+00	1.14E-02	1.09E-02	**-2.06E+02**	**-2.06E+02**	0.023%
2010	21	-3.69E+01	3.70E+01	6.37E-02	0.00E+00	0.00E+00	3.74E-03	0.00E+00	0.00E+00	2.22E-04	-1.40E-04	2.77E+00	2.70E+00	2.06E-02	0.00E+00	1.41E-03	2.24E-03	**-3.69E+01**	**-3.69E+01**	0.026%
2010	27	-1.29E+02	1.30E+02	7.94E-01	5.56E-02	0.00E+00	3.16E-02	0.00E+00	9.10E-03	7.49E-06	-3.38E-04	2.46E+01	2.39E+01	1.76E-01	0.00E+00	2.21E-02	2.67E-02	**-1.29E+02**	**-1.29E+02**	0.181%
2010	34	-3.38E+01	3.55E+01	1.71E+00	0.00E+00	0.00E+00	1.92E-03	0.00E+00	1.21E+00	0.00E+00	-1.52E-04	3.91E+00	9.96E-01	1.61E-02	0.00E+00	1.56E-02	1.62E-02	**-3.38E+01**	**-3.38E+01**	0.040%
2010	20	-5.76E+01	5.77E+01	1.50E-01	0.00E+00	0.00E+00	5.02E-03	0.00E+00	0.00E+00	0.00E+00	-6.22E-05	3.19E+00	3.04E+00	1.71E-02	0.00E+00	2.50E-03	3.41E-03	**-5.76E+01**	**-5.76E+01**	0.019%
2010	33	-3.89E+01	4.03E+01	1.38E+00	3.80E-01	0.00E+00	1.64E-03	0.00E+00	1.30E+00	0.00E+00	-1.65E-04	5.42E+00	2.36E+00	1.80E-02	0.00E+00	2.08E-02	2.06E-02	**-3.89E+01**	**-3.89E+01**	0.048%
2010	32	-4.36E+02	4.28E+02	-7.94E+00	3.33E-01	0.00E+00	2.76E-02	1.01E+01	7.68E+00	0.00E+00	-3.51E-04	3.41E+01	2.43E+01	1.41E-01	0.00E+00	1.37E-01	1.97E-01	**-4.37E+02**	**-4.36E+02**	0.092%
2010	22	-8.60E+01	8.53E+01	-7.26E-01	3.89E-01	0.00E+00	1.47E-02	0.00E+00	0.00E+00	6.09E-06	-9.10E-05	7.02E+00	7.35E+00	4.89E-02	0.00E+00	7.38E-03	1.46E-02	**-8.60E+01**	**-8.60E+01**	0.024%
2010	26	-3.43E+01	3.44E+01	1.31E-01	0.00E+00	0.00E+00	9.36E-04	0.00E+00	0.00E+00	0.00E+00	-8.65E-06	5.88E-01	4.58E-01	4.05E-03	0.00E+00	1.07E-03	1.75E-03	**-3.43E+01**	**-3.43E+01**	0.009%
2010	25	-8.18E+01	8.20E+01	2.44E-01	5.76E-02	0.00E+00	3.74E-03	0.00E+00	7.14E-03	0.00E+00	-1.78E-05	2.42E+00	2.10E+00	1.95E-02	0.00E+00	4.24E-03	8.21E-03	**-8.18E+01**	**-8.18E+01**	0.006%
2011	1	-9.05E+01	9.07E+01	2.00E-01	0.00E+00	0.00E+00	1.61E-03	0.00E+00	1.23E+00	9.22E-06	1.88E-05	5.15E+00	3.72E+00	1.72E-03	0.00E+00	4.03E-03	5.82E-03	**-9.05E+01**	**-9.05E+01**	0.004%
2011	38	-1.82E+02	1.84E+02	1.65E+00	0.00E+00	0.00E+00	7.32E-03	0.00E+00	8.11E-01	5.74E-03	-7.16E-04	1.09E+01	8.44E+00	4.66E-03	0.00E+00	3.92E-03	6.20E-03	**-1.82E+02**	**-1.82E+02**	0.015%
2011	23	-1.67E+02	1.67E+02	1.59E-01	0.00E+00	0.00E+00	2.80E-03	0.00E+00	0.00E+00	3.16E-04	-3.70E-05	2.42E+00	2.26E+00	1.16E-02	0.00E+00	2.01E-03	2.71E-03	**-1.67E+02**	**-1.67E+02**	0.003%
2011	35	-7.49E+02	7.52E+02	2.77E+00	0.00E+00	0.00E+00	1.25E-02	0.00E+00	9.24E-01	0.00E+00	-1.41E-03	2.20E+01	1.83E+01	5.62E-02	0.00E+00	4.15E-02	4.54E-02	**-7.49E+02**	**-7.49E+02**	0.009%
2011	39	-2.82E+02	2.84E+02	1.75E+00	1.64E-01	0.00E+00	1.66E-02	0.00E+00	0.00E+00	3.80E-04	-6.57E-04	2.19E+01	1.99E+01	1.12E-01	0.00E+00	1.09E-02	1.30E-02	**-2.82E+02**	**-2.82E+02**	0.005%
2011	21	-5.20E+01	5.26E+01	5.84E-01	0.00E+00	0.00E+00	3.43E-03	0.00E+00	0.00E+00	8.13E-04	-1.36E-04	4.16E+00	3.57E+00	1.98E-02	0.00E+00	2.24E-03	3.32E-03	**-5.20E+01**	**-5.20E+01**	0.023%

Table 9. Mass Balance for PCB-126

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2011	27	-1.58E+02	1.61E+02	3.35E+00	9.73E-02	0.00E+00	2.93E-02	0.00E+00	8.99E-03	0.00E+00	-8.98E-04	3.48E+01	3.12E+01	1.72E-01	0.00E+00	2.67E-02	2.41E-02	**-1.58E+02**	**-1.58E+02**	0.008%
2011	34	-4.54E+01	4.96E+01	4.22E+00	0.00E+00	0.00E+00	1.73E-03	0.00E+00	1.30E+00	0.00E+00	-1.04E-03	6.93E+00	1.41E+00	1.65E-02	0.00E+00	1.62E-02	2.17E-02	**-4.54E+01**	**-4.54E+01**	0.027%
2011	20	-7.79E+01	7.88E+01	8.56E-01	0.00E+00	0.00E+00	4.53E-03	0.00E+00	0.00E+00	3.90E-07	-2.35E-04	4.86E+00	4.00E+00	1.76E-02	0.00E+00	3.41E-03	3.53E-03	**-7.79E+01**	**-7.79E+01**	0.009%
2011	33	-4.97E+01	5.32E+01	3.47E+00	4.48E-01	0.00E+00	1.51E-03	0.00E+00	1.33E+00	0.00E+00	-8.77E-04	8.09E+00	2.83E+00	1.75E-02	0.00E+00	2.06E-02	2.53E-02	**-4.97E+01**	**-4.97E+01**	0.012%
2011	32	-4.77E+02	4.74E+02	-3.55E+00	3.09E-01	0.00E+00	2.22E-02	1.01E+01	6.71E+00	3.21E-07	-2.30E-03	4.17E+01	2.82E+01	1.04E-01	0.00E+00	1.97E-01	1.49E-01	**-4.78E+02**	**-4.77E+02**	0.040%
2011	22	-9.55E+01	9.55E+01	1.05E-03	3.61E-01	0.00E+00	1.21E-02	0.00E+00	0.00E+00	2.50E-06	-1.89E-04	9.78E+00	9.38E+00	4.80E-02	0.00E+00	1.46E-02	7.17E-03	**-9.55E+01**	**-9.55E+01**	0.014%
2011	26	-3.87E+01	3.89E+01	1.93E-01	0.00E+00	0.00E+00	7.58E-04	0.00E+00	0.00E+00	0.00E+00	-2.68E-05	7.77E-01	5.82E-01	3.05E-03	0.00E+00	1.75E-03	1.16E-03	**-3.87E+01**	**-3.87E+01**	0.001%
2011	25	-8.30E+01	8.35E+01	5.68E-01	1.02E-01	0.00E+00	2.89E-03	0.00E+00	5.93E-03	0.00E+00	-8.46E-05	3.07E+00	2.38E+00	1.55E-02	0.00E+00	8.20E-03	3.54E-03	**-8.30E+01**	**-8.30E+01**	0.006%
2012	1	-5.04E+01	5.06E+01	2.09E-01	0.00E+00	0.00E+00	1.66E-03	0.00E+00	1.51E+00	1.75E-05	-7.41E-05	5.16E+00	3.44E+00	2.54E-03	0.00E+00	5.80E-03	5.80E-03	**-5.04E+01**	**-5.04E+01**	0.000%
2012	38	-1.18E+02	1.17E+02	-8.00E-01	0.00E+00	0.00E+00	7.55E-03	0.00E+00	1.09E+00	4.43E-04	4.56E-05	8.67E+00	8.39E+00	1.90E-04	0.00E+00	6.21E-03	3.56E-03	**-1.18E+02**	**-1.18E+02**	0.008%
2012	23	-1.15E+02	1.15E+02	4.02E-02	0.00E+00	0.00E+00	2.88E-03	0.00E+00	0.00E+00	0.00E+00	-2.94E-06	1.96E+00	1.91E+00	6.24E-03	0.00E+00	2.71E-03	1.86E-03	**-1.15E+02**	**-1.15E+02**	0.001%
2012	35	-5.11E+02	5.12E+02	3.24E-01	0.00E+00	0.00E+00	1.23E-02	0.00E+00	9.27E-01	0.00E+00	-3.00E-05	1.74E+01	1.61E+01	3.79E-02	0.00E+00	4.54E-02	4.24E-02	**-5.11E+02**	**-5.11E+02**	0.000%
2012	39	-1.98E+02	1.97E+02	-1.31E+00	5.79E-02	0.00E+00	1.63E-02	0.00E+00	0.00E+00	0.00E+00	2.69E-05	1.74E+01	1.86E+01	8.44E-02	0.00E+00	1.30E-02	9.54E-03	**-1.98E+02**	**-1.98E+02**	0.001%
2012	21	-3.44E+01	3.43E+01	-1.82E-01	0.00E+00	0.00E+00	3.32E-03	0.00E+00	0.00E+00	8.00E-05	1.22E-06	3.14E+00	3.32E+00	1.24E-02	0.00E+00	3.32E-03	1.64E-03	**-3.44E+01**	**-3.44E+01**	0.005%
2012	27	-1.08E+02	1.08E+02	-2.82E-01	3.67E-02	0.00E+00	2.73E-02	0.00E+00	6.74E-03	0.00E+00	-5.05E-06	2.58E+01	2.59E+01	1.49E-01	0.00E+00	2.41E-02	1.83E-02	**-1.08E+02**	**-1.08E+02**	0.001%
2012	34	-3.00E+01	3.18E+01	1.86E+00	0.00E+00	0.00E+00	1.65E-03	0.00E+00	1.29E+00	0.00E+00	-1.46E-04	4.34E+00	1.17E+00	1.13E-02	0.00E+00	2.17E-02	1.42E-02	**-3.00E+01**	**-3.00E+01**	0.000%
2012	20	-5.14E+01	5.15E+01	4.83E-02	0.00E+00	0.00E+00	4.35E-03	0.00E+00	0.00E+00	0.00E+00	-4.53E-06	3.67E+00	3.60E+00	1.67E-02	0.00E+00	3.53E-03	2.33E-03	**-5.14E+01**	**-5.14E+01**	0.001%
2012	33	-3.35E+01	3.53E+01	1.81E+00	1.85E-01	0.00E+00	1.36E-03	0.00E+00	1.23E+00	0.00E+00	-1.68E-04	5.69E+00	2.45E+00	1.23E-02	0.00E+00	2.53E-02	1.71E-02	**-3.35E+01**	**-3.35E+01**	0.000%
2012	32	-3.46E+02	3.38E+02	-8.18E+00	1.25E-01	0.00E+00	2.27E-02	1.00E+01	5.79E+00	0.00E+00	-2.92E-04	2.96E+01	2.18E+01	8.14E-02	0.00E+00	1.49E-01	1.18E-01	**-3.46E+02**	**-3.46E+02**	0.000%
2012	22	-6.77E+01	6.59E+01	-1.72E+00	1.46E-01	0.00E+00	1.16E-02	0.00E+00	0.00E+00	0.00E+00	1.27E-05	6.24E+00	7.80E+00	3.30E-02	0.00E+00	7.17E-03	5.96E-03	**-6.77E+01**	**-6.77E+01**	0.001%
2012	26	-2.52E+01	2.53E+01	1.30E-01	0.00E+00	0.00E+00	7.58E-04	0.00E+00	0.00E+00	0.00E+00	-7.04E-06	5.00E-01	3.68E-01	2.54E-03	0.00E+00	1.16E-03	9.52E-04	**-2.52E+01**	**-2.52E+01**	0.000%
2012	25	-6.11E+01	6.13E+01	2.15E-01	5.51E-02	0.00E+00	2.98E-03	0.00E+00	5.33E-03	0.00E+00	-1.43E-05	2.09E+00	1.80E+00	1.53E-02	0.00E+00	3.54E-03	4.03E-03	**-6.11E+01**	**-6.11E+01**	0.000%
2013	1	-5.29E+01	5.30E+01	1.03E-01	0.00E+00	0.00E+00	1.89E-03	0.00E+00	1.40E+00	5.82E-05	-4.58E-05	4.78E+00	3.28E+00	3.01E-03	0.00E+00	5.80E-03	3.57E-03	**-5.29E+01**	**-5.29E+01**	0.000%
2013	38	-1.27E+02	1.26E+02	-4.45E-01	0.00E+00	0.00E+00	8.62E-03	0.00E+00	8.00E-01	2.70E-03	-6.21E-04	8.07E+00	7.73E+00	1.21E-03	0.00E+00	2.89E-03	2.24E-03	**-1.27E+02**	**-1.27E+02**	0.012%
2013	23	-1.24E+02	1.24E+02	-1.98E-02	0.00E+00	0.00E+00	3.33E-03	0.00E+00	0.00E+00	5.19E-05	-4.64E-05	1.78E+00	1.80E+00	4.69E-03	0.00E+00	1.82E-03	2.51E-03	**-1.24E+02**	**-1.24E+02**	0.002%
2013	35	-5.55E+02	5.55E+02	2.85E-01	0.00E+00	0.00E+00	1.43E-02	0.00E+00	8.54E-01	0.00E+00	-4.33E-05	1.55E+01	1.44E+01	5.04E-02	0.00E+00	4.24E-02	4.56E-02	**-5.55E+02**	**-5.55E+02**	0.000%
2013	39	-2.14E+02	2.13E+02	-3.05E-01	2.14E-01	0.00E+00	1.93E-02	0.00E+00	0.00E+00	9.03E-06	-9.85E-05	1.52E+01	1.52E+01	9.53E-02	0.00E+00	9.46E-03	1.03E-02	**-2.14E+02**	**-2.14E+02**	0.001%
2013	21	-3.84E+01	3.81E+01	-3.01E-01	0.00E+00	0.00E+00	3.86E-03	0.00E+00	0.00E+00	2.16E-04	-1.07E-04	2.78E+00	3.07E+00	1.29E-02	0.00E+00	1.52E-03	1.28E-03	**-3.84E+01**	**-3.84E+01**	0.007%
2013	27	-1.23E+02	1.23E+02	-4.33E-02	1.28E-01	0.00E+00	3.23E-02	0.00E+00	7.71E-03	0.00E+00	-1.05E-04	2.39E+01	2.37E+01	1.72E-01	0.00E+00	1.82E-02	1.74E-02	**-1.23E+02**	**-1.23E+02**	0.002%
2013	34	-3.40E+01	3.56E+01	1.64E+00	0.00E+00	0.00E+00	1.95E-03	0.00E+00	1.20E+00	0.00E+00	-1.71E-04	3.96E+00	1.11E+00	1.54E-02	0.00E+00	1.41E-02	1.29E-02	**-3.40E+01**	**-3.40E+01**	0.000%
2013	20	-5.83E+01	5.82E+01	-1.76E-01	0.00E+00	0.00E+00	5.03E-03	0.00E+00	0.00E+00	0.00E+00	5.31E-06	3.26E+00	3.43E+00	1.51E-02	0.00E+00	2.33E-03	2.25E-03	**-5.83E+01**	**-5.83E+01**	0.001%
2013	33	-3.84E+01	3.97E+01	1.31E+00	5.54E-01	0.00E+00	1.73E-03	0.00E+00	1.24E+00	0.00E+00	-2.11E-04	5.54E+00	2.42E+00	1.83E-02	0.00E+00	1.71E-02	1.60E-02	**-3.84E+01**	**-3.84E+01**	0.000%
2013	32	-3.96E+02	3.87E+02	-8.57E+00	3.79E-01	0.00E+00	2.51E-02	1.01E+01	6.19E+00	0.00E+00	-3.34E-04	3.03E+01	2.22E+01	1.11E-01	0.00E+00	1.18E-01	1.20E-01	**-3.96E+02**	**-3.96E+02**	0.000%
2013	22	-7.78E+01	7.67E+01	-1.11E+00	4.44E-01	0.00E+00	1.33E-02	0.00E+00	0.00E+00	0.00E+00	3.28E-06	6.20E+00	6.85E+00	4.30E-02	0.00E+00	5.96E-03	6.47E-03	**-7.78E+01**	**-7.78E+01**	0.001%
2013	26	-2.97E+01	2.98E+01	1.40E-01	0.00E+00	0.00E+00	8.38E-04	0.00E+00	0.00E+00	0.00E+00	-8.89E-06	5.28E-01	3.85E-01	3.58E-03	0.00E+00	9.52E-04	8.17E-04	**-2.97E+01**	**-2.97E+01**	0.000%
2013	25	-7.12E+01	7.14E+01	2.39E-01	5.95E-02	0.00E+00	3.21E-03	0.00E+00	6.16E-03	0.00E+00	-1.77E-05	2.21E+00	1.89E+00	2.05E-02	0.00E+00	4.02E-03	3.68E-03	**-7.12E+01**	**-7.12E+01**	0.000%

Table 9. Mass Balance for PCB-126

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2014	1	-5.87E+01	5.88E+01	1.07E-01	0.00E+00	0.00E+00	2.03E-03	0.00E+00	1.51E+00	7.31E-06	-1.86E-05	5.38E+00	3.76E+00	2.68E-03	0.00E+00	3.57E-03	5.07E-03	**-5.87E+01**	**-5.87E+01**	0.000%
2014	38	-1.34E+02	1.34E+02	3.21E-01	0.00E+00	0.00E+00	8.87E-03	0.00E+00	8.47E-01	3.41E-03	-4.22E-04	9.21E+00	8.06E+00	1.58E-03	0.00E+00	1.84E-03	5.55E-03	**-1.34E+02**	**-1.34E+02**	0.006%
2014	23	-1.25E+02	1.25E+02	-4.90E-03	0.00E+00	0.00E+00	2.98E-03	0.00E+00	0.00E+00	1.28E-04	-4.85E-05	1.65E+00	1.65E+00	6.10E-03	0.00E+00	2.46E-03	2.58E-03	**-1.25E+02**	**-1.25E+02**	0.001%
2014	35	-5.73E+02	5.73E+02	2.47E-01	0.00E+00	0.00E+00	1.45E-02	0.00E+00	9.13E-01	0.00E+00	-2.33E-05	1.55E+01	1.43E+01	5.44E-02	0.00E+00	4.56E-02	5.33E-02	**-5.73E+02**	**-5.73E+02**	0.000%
2014	39	-2.15E+02	2.15E+02	-5.30E-02	1.88E-01	0.00E+00	1.82E-02	0.00E+00	0.00E+00	1.48E-04	-1.97E-04	1.56E+01	1.54E+01	1.00E-01	0.00E+00	1.01E-02	1.67E-02	**-2.15E+02**	**-2.15E+02**	0.001%
2014	21	-4.12E+01	4.11E+01	-2.47E-02	0.00E+00	0.00E+00	4.06E-03	0.00E+00	0.00E+00	3.71E-04	-8.92E-05	3.14E+00	3.16E+00	1.43E-02	0.00E+00	1.20E-03	3.32E-03	**-4.12E+01**	**-4.12E+01**	0.004%
2014	27	-1.36E+02	1.36E+02	6.65E-02	1.14E-01	0.00E+00	3.39E-02	0.00E+00	7.22E-03	6.09E-06	-1.80E-04	2.31E+01	2.28E+01	1.71E-01	0.00E+00	1.72E-02	3.69E-02	**-1.36E+02**	**-1.36E+02**	0.001%
2014	34	-3.67E+01	3.85E+01	1.72E+00	0.00E+00	0.00E+00	2.11E-03	0.00E+00	1.28E+00	0.00E+00	-1.63E-04	4.25E+00	1.25E+00	1.59E-02	0.00E+00	1.29E-02	2.28E-02	**-3.67E+01**	**-3.67E+01**	0.000%
2014	20	-6.38E+01	6.40E+01	1.16E-01	0.00E+00	0.00E+00	5.51E-03	0.00E+00	0.00E+00	0.00E+00	-7.30E-06	3.63E+00	3.51E+00	1.60E-02	0.00E+00	2.25E-03	4.95E-03	**-6.38E+01**	**-6.38E+01**	0.001%
2014	33	-4.21E+01	4.34E+01	1.32E+00	5.61E-01	0.00E+00	1.87E-03	0.00E+00	1.34E+00	0.00E+00	-1.94E-04	5.84E+00	2.61E+00	1.88E-02	0.00E+00	1.60E-02	2.89E-02	**-4.21E+01**	**-4.21E+01**	0.000%
2014	32	-4.81E+02	4.72E+02	-9.35E+00	5.39E-01	0.00E+00	3.03E-02	1.01E+01	7.11E+00	0.00E+00	-2.34E-04	3.17E+01	2.33E+01	1.35E-01	0.00E+00	1.20E-01	2.44E-01	**-4.81E+02**	**-4.81E+02**	0.000%
2014	22	-9.44E+01	9.36E+01	-8.18E-01	4.37E-01	0.00E+00	1.66E-02	0.00E+00	0.00E+00	0.00E+00	9.95E-07	6.89E+00	7.25E+00	4.98E-02	0.00E+00	6.47E-03	2.33E-02	**-9.44E+01**	**-9.44E+01**	0.001%
2014	26	-3.59E+01	3.61E+01	1.22E-01	0.00E+00	0.00E+00	1.05E-03	0.00E+00	0.00E+00	0.00E+00	-1.01E-05	5.44E-01	4.20E-01	4.06E-03	0.00E+00	8.17E-04	2.51E-03	**-3.59E+01**	**-3.59E+01**	0.000%
2014	25	-9.17E+01	9.19E+01	2.12E-01	9.42E-02	0.00E+00	4.16E-03	0.00E+00	6.31E-03	0.00E+00	-1.81E-05	2.32E+00	2.00E+00	2.34E-02	0.00E+00	3.68E-03	1.05E-02	**-9.17E+01**	**-9.17E+01**	0.000%
2015	1	-5.04E+01	5.05E+01	4.04E-02	0.00E+00	0.00E+00	2.10E-03	0.00E+00	1.14E+00	1.97E-05	-9.98E-06	4.49E+00	3.32E+00	1.91E-03	0.00E+00	5.07E-03	7.28E-03	**-5.04E+01**	**-5.04E+01**	0.000%
2015	38	-1.17E+02	1.16E+02	-2.43E-01	0.00E+00	0.00E+00	8.94E-03	0.00E+00	5.30E-01	5.91E-03	1.40E-05	7.23E+00	6.96E+00	-4.98E-04	0.00E+00	5.55E-03	8.21E-03	**-1.17E+02**	**-1.17E+02**	0.006%
2015	23	-1.09E+02	1.09E+02	-9.29E-03	0.00E+00	0.00E+00	2.88E-03	0.00E+00	0.00E+00	3.71E-05	2.04E-08	1.39E+00	1.40E+00	5.70E-03	0.00E+00	2.58E-03	2.97E-03	**-1.09E+02**	**-1.09E+02**	0.001%
2015	35	-5.03E+02	5.03E+02	-9.69E-02	0.00E+00	0.00E+00	1.41E-02	0.00E+00	7.63E-01	0.00E+00	-5.76E-06	1.29E+01	1.22E+01	4.86E-02	0.00E+00	5.33E-02	5.54E-02	**-5.03E+02**	**-5.03E+02**	0.000%
2015	39	-1.88E+02	1.87E+02	-4.13E-01	1.61E-01	0.00E+00	1.76E-02	0.00E+00	0.00E+00	4.30E-04	4.91E-07	1.35E+01	1.37E+01	9.39E-02	0.00E+00	1.67E-02	1.87E-02	**-1.88E+02**	**-1.88E+02**	0.001%
2015	21	-3.60E+01	3.60E+01	-7.13E-02	0.00E+00	0.00E+00	3.98E-03	0.00E+00	0.00E+00	1.36E-03	-8.94E-07	2.77E+00	2.83E+00	1.52E-02	0.00E+00	3.32E-03	3.84E-03	**-3.60E+01**	**-3.60E+01**	0.003%
2015	27	-1.21E+02	1.20E+02	-1.03E-01	9.18E-02	0.00E+00	3.27E-02	0.00E+00	5.71E-03	2.82E-06	-1.10E-05	1.94E+01	1.93E+01	1.64E-01	0.00E+00	3.69E-02	3.92E-02	**-1.21E+02**	**-1.21E+02**	0.001%
2015	34	-3.23E+01	3.36E+01	1.35E+00	0.00E+00	0.00E+00	2.07E-03	0.00E+00	1.11E+00	0.00E+00	-1.39E-04	3.58E+00	1.10E+00	1.48E-02	0.00E+00	2.28E-02	2.26E-02	**-3.23E+01**	**-3.23E+01**	0.000%
2015	20	-5.64E+01	5.65E+01	3.31E-02	0.00E+00	0.00E+00	5.40E-03	0.00E+00	0.00E+00	0.00E+00	-4.52E-06	3.15E+00	3.11E+00	1.58E-02	0.00E+00	4.95E-03	5.22E-03	**-5.64E+01**	**-5.64E+01**	0.000%
2015	33	-3.71E+01	3.82E+01	1.09E+00	4.71E-01	0.00E+00	1.79E-03	0.00E+00	1.20E+00	0.00E+00	-1.69E-04	4.90E+00	2.13E+00	1.81E-02	0.00E+00	2.89E-02	3.36E-02	**-3.71E+01**	**-3.71E+01**	0.000%
2015	32	-4.39E+02	4.30E+02	-9.02E+00	3.36E-01	0.00E+00	3.03E-02	9.36E+00	6.63E+00	0.00E+00	-1.94E-04	2.88E+01	2.13E+01	1.40E-01	0.00E+00	2.44E-01	1.88E-01	**-4.39E+02**	**-4.39E+02**	0.000%
2015	22	-8.47E+01	8.39E+01	-7.64E-01	3.93E-01	0.00E+00	1.65E-02	0.00E+00	0.00E+00	6.83E-06	-2.70E-06	6.22E+00	6.55E+00	5.03E-02	0.00E+00	2.33E-02	1.53E-02	**-8.47E+01**	**-8.47E+01**	0.000%
2015	26	-3.17E+01	3.18E+01	1.30E-01	0.00E+00	0.00E+00	1.04E-03	0.00E+00	0.00E+00	0.00E+00	-1.10E-05	5.03E-01	3.70E-01	4.36E-03	0.00E+00	2.51E-03	2.24E-03	**-3.17E+01**	**-3.17E+01**	0.000%
2015	25	-8.42E+01	8.43E+01	1.43E-01	9.83E-02	0.00E+00	4.23E-03	0.00E+00	6.10E-03	0.00E+00	-1.73E-05	2.14E+00	1.87E+00	2.34E-02	0.00E+00	1.05E-02	8.05E-03	**-8.42E+01**	**-8.42E+01**	0.000%
2016	1	-4.75E+01	4.75E+01	5.26E-02	0.00E+00	0.00E+00	2.16E-03	0.00E+00	1.19E+00	2.05E-06	2.81E-04	4.53E+00	3.28E+00	1.97E-03	0.00E+00	7.26E-03	6.48E-03	**-4.75E+01**	**-4.75E+01**	0.000%
2016	38	-1.09E+02	1.09E+02	-7.85E-02	0.00E+00	0.00E+00	9.14E-03	0.00E+00	4.84E-01	8.93E-03	8.99E-04	7.14E+00	6.75E+00	-5.40E-04	0.00E+00	8.21E-03	5.11E-03	**-1.09E+02**	**-1.09E+02**	0.010%
2016	23	-1.01E+02	1.01E+02	-6.79E-03	0.00E+00	0.00E+00	2.86E-03	0.00E+00	0.00E+00	2.95E-05	2.44E-04	1.34E+00	1.34E+00	5.07E-03	0.00E+00	2.97E-03	2.22E-03	**-1.01E+02**	**-1.01E+02**	0.001%
2016	35	-4.68E+02	4.68E+02	1.68E-01	0.00E+00	0.00E+00	1.41E-02	0.00E+00	7.20E-01	0.00E+00	1.67E-03	1.30E+01	1.20E+01	4.42E-02	0.00E+00	5.54E-02	5.36E-02	**-4.68E+02**	**-4.68E+02**	0.000%
2016	39	-1.74E+02	1.73E+02	-2.66E-01	1.25E-01	0.00E+00	1.75E-02	0.00E+00	0.00E+00	3.11E-05	1.63E-03	1.29E+01	1.30E+01	7.91E-02	0.00E+00	1.87E-02	1.29E-02	**-1.74E+02**	**-1.74E+02**	0.001%
2016	21	-3.42E+01	3.41E+01	-5.72E-02	0.00E+00	0.00E+00	3.99E-03	0.00E+00	0.00E+00	1.32E-03	3.68E-04	2.71E+00	2.76E+00	1.25E-02	0.00E+00	3.84E-03	2.65E-03	**-3.42E+01**	**-3.42E+01**	0.005%
2016	27	-1.15E+02	1.15E+02	-5.40E-02	7.21E-02	0.00E+00	3.25E-02	0.00E+00	5.55E-03	5.00E-06	3.28E-03	1.94E+01	1.92E+01	1.46E-01	0.00E+00	3.92E-02	3.33E-02	**-1.15E+02**	**-1.15E+02**	0.001%
2016	34	-3.06E+01	3.19E+01	1.34E+00	0.00E+00	0.00E+00	2.05E-03	0.00E+00	1.13E+00	0.00E+00	4.01E-04	3.63E+00	1.14E+00	1.48E-02	0.00E+00	2.26E-02	2.01E-02	**-3.06E+01**	**-3.06E+01**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 9. Mass Balance for PCB-126

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2016	20	-5.35E+01	5.35E+01	3.93E-02	0.00E+00	0.00E+00	5.35E-03	0.00E+00	0.00E+00	0.00E+00	4.97E-04	3.11E+00	3.06E+00	1.45E-02	0.00E+00	5.22E-03	4.34E-03	**-5.35E+01**	**-5.35E+01**	0.000%
2016	33	-3.49E+01	3.61E+01	1.13E+00	3.75E-01	0.00E+00	1.75E-03	0.00E+00	1.19E+00	0.00E+00	4.51E-04	4.80E+00	2.09E+00	1.66E-02	0.00E+00	3.36E-02	2.72E-02	**-3.49E+01**	**-3.49E+01**	0.000%
2016	32	-4.24E+02	4.15E+02	-8.48E+00	2.58E-01	0.00E+00	3.00E-02	9.03E+00	6.74E+00	0.00E+00	4.51E-03	2.87E+01	2.10E+01	1.36E-01	0.00E+00	1.88E-01	2.15E-01	**-4.24E+02**	**-4.24E+02**	0.000%
2016	22	-8.12E+01	8.06E+01	-6.63E-01	3.01E-01	0.00E+00	1.61E-02	0.00E+00	0.00E+00	0.00E+00	1.61E-03	6.00E+00	6.33E+00	4.46E-02	0.00E+00	1.53E-02	1.72E-02	**-8.12E+01**	**-8.12E+01**	0.001%
2016	26	-3.06E+01	3.07E+01	1.17E-01	0.00E+00	0.00E+00	1.03E-03	0.00E+00	0.00E+00	0.00E+00	9.62E-05	4.92E-01	3.71E-01	4.32E-03	0.00E+00	2.23E-03	2.11E-03	**-3.06E+01**	**-3.06E+01**	0.000%
2016	25	-8.14E+01	8.16E+01	1.67E-01	8.77E-02	0.00E+00	4.18E-03	0.00E+00	5.74E-03	0.00E+00	4.87E-04	2.12E+00	1.84E+00	2.10E-02	0.00E+00	8.05E-03	8.52E-03	**-8.14E+01**	**-8.14E+01**	0.000%

Table 10. Mass Balance for PCB-167

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1996	1	-5.98E+02	6.10E+02	1.23E+01	0.00E+00	0.00E+00	4.84E-03	0.00E+00	4.20E+00	1.18E-03	-1.61E-03	6.62E+01	4.96E+01	2.32E-02	0.00E+00	1.50E-01	2.43E-02	**-5.98E+02**	**-5.98E+02**	0.000%
1996	38	-1.10E+03	1.10E+03	2.27E+00	0.00E+00	0.00E+00	2.04E-02	0.00E+00	6.15E+00	2.88E-01	5.08E-07	1.04E+02	9.54E+01	1.99E-02	0.00E+00	1.44E-01	2.21E-02	**-1.10E+03**	**-1.10E+03**	0.034%
1996	23	-9.06E+02	9.07E+02	1.13E+00	0.00E+00	0.00E+00	5.34E-03	0.00E+00	0.00E+00	5.13E-03	-1.13E-04	1.98E+01	1.86E+01	1.43E-02	0.00E+00	5.00E-02	1.15E-02	**-9.06E+02**	**-9.06E+02**	0.001%
1996	35	-4.24E+03	4.25E+03	8.40E+00	0.00E+00	0.00E+00	2.89E-02	0.00E+00	1.16E+01	0.00E+00	-5.48E-04	2.12E+02	1.91E+02	2.16E-01	0.00E+00	7.10E-01	2.15E-01	**-4.24E+03**	**-4.24E+03**	0.000%
1996	39	-1.64E+03	1.63E+03	-4.86E+00	2.04E-01	0.00E+00	3.60E-02	0.00E+00	0.00E+00	1.61E-03	7.92E-04	2.08E+02	2.12E+02	3.28E-01	0.00E+00	2.30E-01	5.44E-02	**-1.64E+03**	**-1.64E+03**	0.002%
1996	21	-2.97E+02	2.99E+02	1.27E+00	0.00E+00	0.00E+00	9.19E-03	0.00E+00	0.00E+00	4.26E-03	1.73E-04	3.86E+01	3.72E+01	6.91E-02	0.00E+00	3.64E-02	1.58E-02	**-2.97E+02**	**-2.97E+02**	0.011%
1996	27	-8.74E+02	8.86E+02	1.14E+01	6.86E-02	0.00E+00	7.28E-02	0.00E+00	8.26E-02	3.18E-04	-4.59E-04	3.13E+02	3.01E+02	8.10E-01	0.00E+00	4.18E-01	1.04E-01	**-8.74E+02**	**-8.74E+02**	0.002%
1996	34	-2.50E+02	2.78E+02	2.74E+01	0.00E+00	0.00E+00	4.09E-03	0.00E+00	2.69E+01	0.00E+00	-1.32E-03	6.92E+01	1.46E+01	1.05E-01	0.00E+00	2.39E-01	9.83E-02	**-2.50E+02**	**-2.50E+02**	0.000%
1996	20	-4.22E+02	4.25E+02	2.68E+00	0.00E+00	0.00E+00	1.23E-02	0.00E+00	0.00E+00	1.04E-04	-5.18E-05	4.58E+01	4.30E+01	7.59E-02	0.00E+00	5.47E-02	1.57E-02	**-4.22E+02**	**-4.22E+02**	0.001%
1996	33	-2.73E+02	2.92E+02	1.89E+01	4.73E-01	0.00E+00	3.53E-03	0.00E+00	2.52E+01	0.00E+00	-1.00E-03	8.28E+01	3.79E+01	1.25E-01	0.00E+00	2.54E-01	1.10E-01	**-2.73E+02**	**-2.73E+02**	0.000%
1996	32	-2.32E+03	2.32E+03	2.04E+00	4.21E-01	0.00E+00	5.03E-02	3.33E+00	8.69E+01	0.00E+00	-7.97E-04	3.32E+02	2.38E+02	5.56E-01	0.00E+00	1.73E+00	5.76E-01	**-2.32E+03**	**-2.32E+03**	0.000%
1996	22	-4.55E+02	4.50E+02	-5.54E+00	4.90E-01	0.00E+00	3.01E-02	0.00E+00	0.00E+00	1.41E-03	5.26E-06	6.84E+01	7.32E+01	1.48E-01	0.00E+00	1.41E-01	4.31E-02	**-4.55E+02**	**-4.55E+02**	0.001%
1996	26	-1.64E+02	1.65E+02	1.47E+00	0.00E+00	0.00E+00	1.61E-03	0.00E+00	0.00E+00	0.00E+00	-3.32E-05	6.40E+00	4.90E+00	1.82E-02	0.00E+00	1.73E-02	5.50E-03	**-1.64E+02**	**-1.64E+02**	0.000%
1996	25	-3.67E+02	3.70E+02	2.46E+00	2.45E-01	0.00E+00	6.54E-03	0.00E+00	6.82E-02	0.00E+00	-3.52E-05	2.33E+01	2.03E+01	8.84E-02	0.00E+00	7.33E-02	2.33E-02	**-3.67E+02**	**-3.67E+02**	0.000%
1997	1	-4.32E+02	4.37E+02	5.50E+00	0.00E+00	0.00E+00	4.46E-03	0.00E+00	2.38E+00	9.94E-05	-3.30E-04	4.99E+01	4.21E+01	1.98E-02	0.00E+00	2.42E-02	9.35E-02	**-4.32E+02**	**-4.32E+02**	-0.001%
1997	38	-8.21E+02	8.20E+02	-8.90E-01	0.00E+00	0.00E+00	1.82E-02	0.00E+00	2.99E+00	9.67E-02	-5.11E-05	7.35E+01	7.14E+01	1.77E-02	0.00E+00	2.21E-02	3.21E-02	**-8.21E+02**	**-8.21E+02**	0.016%
1997	23	-7.03E+02	7.03E+02	5.55E-02	0.00E+00	0.00E+00	4.67E-03	0.00E+00	0.00E+00	9.66E-04	-6.50E-06	1.50E+01	1.49E+01	1.37E-02	0.00E+00	1.15E-02	1.15E-02	**-7.03E+02**	**-7.03E+02**	0.000%
1997	35	-3.29E+03	3.29E+03	2.48E+00	0.00E+00	0.00E+00	2.53E-02	0.00E+00	1.01E+01	0.00E+00	-8.00E-05	1.59E+02	1.47E+02	1.87E-01	0.00E+00	2.15E-01	3.28E-01	**-3.29E+03**	**-3.29E+03**	0.000%
1997	39	-1.26E+03	1.25E+03	-1.15E+01	1.83E-01	0.00E+00	3.16E-02	0.00E+00	0.00E+00	1.18E-03	1.89E-04	1.50E+02	1.61E+02	2.70E-01	0.00E+00	5.44E-02	6.02E-02	**-1.26E+03**	**-1.26E+03**	0.002%
1997	21	-2.35E+02	2.35E+02	-3.38E-01	0.00E+00	0.00E+00	7.95E-03	0.00E+00	0.00E+00	1.05E-02	7.96E-06	2.92E+01	2.95E+01	4.99E-02	0.00E+00	1.58E-02	9.48E-03	**-2.35E+02**	**-2.35E+02**	0.007%
1997	27	-6.96E+02	6.98E+02	1.42E+00	6.20E-02	0.00E+00	6.29E-02	0.00E+00	5.00E-02	0.00E+00	-4.77E-05	2.30E+02	2.28E+02	6.35E-01	0.00E+00	1.04E-01	9.28E-02	**-6.96E+02**	**-6.96E+02**	0.002%
1997	34	-2.01E+02	2.24E+02	2.31E+01	0.00E+00	0.00E+00	3.49E-03	0.00E+00	2.16E+01	0.00E+00	-6.20E-04	5.86E+01	1.39E+01	7.34E-02	0.00E+00	9.83E-02	6.91E-02	**-2.01E+02**	**-2.01E+02**	0.000%
1997	20	-3.35E+02	3.37E+02	1.11E+00	0.00E+00	0.00E+00	1.04E-02	0.00E+00	0.00E+00	8.90E-04	-1.30E-05	3.57E+01	3.45E+01	5.29E-02	0.00E+00	1.57E-02	1.16E-02	**-3.35E+02**	**-3.35E+02**	0.001%
1997	33	-2.18E+02	2.34E+02	1.62E+01	4.18E-01	0.00E+00	3.05E-03	0.00E+00	2.05E+01	0.00E+00	-4.70E-04	6.87E+01	3.15E+01	8.26E-02	0.00E+00	1.10E-01	7.12E-02	**-2.18E+02**	**-2.18E+02**	0.000%
1997	32	-1.93E+03	1.93E+03	-1.07E+00	3.64E-01	0.00E+00	4.31E-02	3.34E+00	7.33E+01	0.00E+00	-3.70E-04	2.81E+02	2.04E+02	4.40E-01	0.00E+00	5.76E-01	4.85E-01	**-1.93E+03**	**-1.93E+03**	0.000%
1997	22	-3.93E+02	3.79E+02	-1.38E+01	4.24E-01	0.00E+00	2.55E-02	0.00E+00	0.00E+00	1.40E-03	5.95E-05	5.93E+01	7.26E+01	1.07E-01	0.00E+00	4.31E-02	2.46E-02	**-3.93E+02**	**-3.93E+02**	0.001%
1997	26	-1.38E+02	1.39E+02	1.49E+00	0.00E+00	0.00E+00	1.38E-03	0.00E+00	0.00E+00	0.00E+00	-2.13E-05	5.66E+00	4.16E+00	9.93E-03	0.00E+00	5.50E-03	3.56E-03	**-1.38E+02**	**-1.38E+02**	0.000%
1997	25	-3.18E+02	3.19E+02	1.60E+00	2.79E-01	0.00E+00	5.60E-03	0.00E+00	4.86E-02	0.00E+00	-2.28E-05	2.09E+01	1.89E+01	6.29E-02	0.00E+00	2.33E-02	1.44E-02	**-3.18E+02**	**-3.18E+02**	0.000%
1998	1	-3.91E+02	3.94E+02	3.03E+00	0.00E+00	0.00E+00	4.43E-03	0.00E+00	2.64E+00	2.86E-04	-1.91E-04	4.55E+01	3.97E+01	1.64E-02	0.00E+00	9.35E-02	2.03E-02	**-3.91E+02**	**-3.91E+02**	0.000%
1998	38	-7.33E+02	7.33E+02	3.84E-01	0.00E+00	0.00E+00	1.80E-02	0.00E+00	3.35E+00	7.15E-02	-2.69E-03	6.86E+01	6.49E+01	1.09E-02	0.00E+00	2.96E-02	1.08E-02	**-7.33E+02**	**-7.33E+02**	0.019%
1998	23	-6.22E+02	6.22E+02	-5.95E-02	0.00E+00	0.00E+00	4.71E-03	0.00E+00	0.00E+00	7.38E-04	-9.68E-05	1.29E+01	1.29E+01	7.68E-03	0.00E+00	1.14E-02	4.74E-03	**-6.22E+02**	**-6.22E+02**	0.000%
1998	35	-2.90E+03	2.90E+03	3.57E-01	0.00E+00	0.00E+00	2.49E-02	0.00E+00	9.19E+00	0.00E+00	-3.99E-05	1.37E+02	1.27E+02	1.56E-01	0.00E+00	3.28E-01	1.27E-01	**-2.90E+03**	**-2.90E+03**	0.000%
1998	39	-1.11E+03	1.11E+03	-4.06E+00	1.82E-01	0.00E+00	3.11E-02	0.00E+00	0.00E+00	2.19E-03	-5.54E-04	1.31E+02	1.35E+02	2.66E-01	0.00E+00	5.95E-02	2.91E-02	**-1.11E+03**	**-1.11E+03**	0.001%
1998	21	-2.08E+02	2.08E+02	-3.18E-02	0.00E+00	0.00E+00	7.85E-03	0.00E+00	0.00E+00	4.58E-03	-5.30E-04	2.58E+01	2.58E+01	4.58E-02	0.00E+00	8.95E-03	6.18E-03	**-2.08E+02**	**-2.08E+02**	0.007%
1998	27	-6.24E+02	6.26E+02	2.47E+00	6.13E-02	0.00E+00	6.15E-02	0.00E+00	5.15E-02	1.23E-03	-8.92E-04	2.08E+02	2.05E+02	4.68E-01	0.00E+00	9.20E-02	7.20E-02	**-6.24E+02**	**-6.24E+02**	0.001%
1998	34	-1.75E+02	1.94E+02	1.84E+01	0.00E+00	0.00E+00	3.39E-03	0.00E+00	2.02E+01	0.00E+00	-6.27E-04	5.05E+01	1.17E+01	6.36E-02	0.00E+00	6.91E-02	4.19E-02	**-1.75E+02**	**-1.75E+02**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 10. Mass Balance for PCB-167

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
1998	20	-2.93E+02	2.94E+02	9.06E-01	0.00E+00	0.00E+00	1.03E-02	0.00E+00	0.00E+00	0.00E+00	-2.51E-04	3.10E+01	3.00E+01	4.45E-02	0.00E+00	1.14E-02	1.10E-02	**-2.93E+02**	**-2.93E+02**	0.001%
1998	33	-1.91E+02	2.04E+02	1.26E+01	4.49E-01	0.00E+00	2.98E-03	0.00E+00	1.91E+01	0.00E+00	-4.89E-04	5.80E+01	2.58E+01	7.26E-02	0.00E+00	7.12E-02	4.60E-02	**-1.91E+02**	**-1.91E+02**	0.000%
1998	32	-1.74E+03	1.74E+03	-3.00E+00	3.97E-01	0.00E+00	4.22E-02	3.30E+00	6.67E+01	0.00E+00	-4.11E-04	2.48E+02	1.80E+02	4.10E-01	0.00E+00	4.85E-01	3.24E-01	**-1.74E+03**	**-1.74E+03**	0.000%
1998	22	-3.56E+02	3.45E+02	-1.07E+01	4.62E-01	0.00E+00	2.53E-02	0.00E+00	0.00E+00	1.49E-05	-1.49E-04	5.57E+01	6.58E+01	1.16E-01	0.00E+00	2.44E-02	2.55E-02	**-3.56E+02**	**-3.56E+02**	0.001%
1998	26	-1.26E+02	1.27E+02	1.13E+00	0.00E+00	0.00E+00	1.36E-03	0.00E+00	0.00E+00	0.00E+00	-3.27E-05	5.09E+00	3.96E+00	7.72E-03	0.00E+00	3.55E-03	2.79E-03	**-1.26E+02**	**-1.26E+02**	0.000%
1998	25	-2.88E+02	2.89E+02	1.20E+00	3.44E-01	0.00E+00	5.53E-03	0.00E+00	4.88E-02	0.00E+00	-1.23E-05	1.82E+01	1.66E+01	5.52E-02	0.00E+00	1.44E-02	1.20E-02	**-2.88E+02**	**-2.88E+02**	0.000%
1999	1	-4.07E+02	4.12E+02	5.11E+00	0.00E+00	0.00E+00	5.15E-03	0.00E+00	2.43E+00	1.48E-04	-7.55E-04	4.20E+01	3.45E+01	2.04E-02	0.00E+00	2.03E-02	4.27E-02	**-4.07E+02**	**-4.07E+02**	0.000%
1999	38	-6.78E+02	6.81E+02	3.36E+00	0.00E+00	0.00E+00	1.99E-02	0.00E+00	2.48E+00	6.36E-02	-2.31E-03	5.59E+01	5.02E+01	1.07E-02	0.00E+00	8.87E-03	3.23E-02	**-6.78E+02**	**-6.78E+02**	0.016%
1999	23	-5.10E+02	5.12E+02	1.74E+00	0.00E+00	0.00E+00	4.93E-03	0.00E+00	0.00E+00	3.97E-04	-1.77E-04	1.26E+01	1.09E+01	9.31E-03	0.00E+00	4.69E-03	2.28E-02	**-5.10E+02**	**-5.10E+02**	0.001%
1999	35	-2.50E+03	2.51E+03	1.24E+01	0.00E+00	0.00E+00	2.61E-02	0.00E+00	8.18E+00	0.00E+00	-1.08E-03	1.26E+02	1.06E+02	1.53E-01	0.00E+00	1.27E-01	3.84E-01	**-2.50E+03**	**-2.50E+03**	0.000%
1999	39	-9.39E+02	9.42E+02	2.14E+00	1.41E-01	0.00E+00	3.27E-02	0.00E+00	0.00E+00	9.97E-04	-1.77E-04	1.05E+02	1.03E+02	2.78E-01	0.00E+00	2.91E-02	1.20E-01	**-9.39E+02**	**-9.39E+02**	0.001%
1999	21	-1.86E+02	1.88E+02	1.22E+00	0.00E+00	0.00E+00	8.46E-03	0.00E+00	0.00E+00	4.38E-03	-1.47E-04	2.40E+01	2.28E+01	5.33E-02	0.00E+00	6.07E-03	1.88E-02	**-1.86E+02**	**-1.86E+02**	0.007%
1999	27	-5.77E+02	5.86E+02	8.77E+00	4.91E-02	0.00E+00	6.38E-02	0.00E+00	3.81E-02	3.25E-04	-3.87E-04	1.72E+02	1.63E+02	4.50E-01	0.00E+00	7.20E-02	1.81E-01	**-5.77E+02**	**-5.77E+02**	0.002%
1999	34	-1.59E+02	1.73E+02	1.43E+01	0.00E+00	0.00E+00	3.57E-03	0.00E+00	1.87E+01	0.00E+00	-4.45E-04	4.37E+01	1.07E+01	6.56E-02	0.00E+00	4.19E-02	1.64E-01	**-1.59E+02**	**-1.59E+02**	0.000%
1999	20	-2.58E+02	2.59E+02	1.17E+00	0.00E+00	0.00E+00	1.08E-02	0.00E+00	0.00E+00	0.00E+00	-3.55E-05	2.73E+01	2.61E+01	4.96E-02	0.00E+00	1.10E-02	3.05E-02	**-2.58E+02**	**-2.58E+02**	0.001%
1999	33	-1.66E+02	1.76E+02	1.09E+01	3.57E-01	0.00E+00	3.07E-03	0.00E+00	1.76E+01	0.00E+00	-3.72E-04	4.82E+01	1.94E+01	6.80E-02	0.00E+00	4.60E-02	1.80E-01	**-1.66E+02**	**-1.66E+02**	0.000%
1999	32	-1.58E+03	1.59E+03	3.05E+00	3.10E-01	0.00E+00	4.27E-02	3.26E+00	6.67E+01	0.00E+00	-7.04E-04	2.26E+02	1.53E+02	4.36E-01	0.00E+00	3.24E-01	6.87E-01	**-1.58E+03**	**-1.58E+03**	0.000%
1999	22	-3.17E+02	3.13E+02	-4.06E+00	3.60E-01	0.00E+00	2.58E-02	0.00E+00	0.00E+00	4.10E-06	-5.37E-05	5.12E+01	5.49E+01	1.22E-01	0.00E+00	2.55E-02	6.87E-02	**-3.17E+02**	**-3.17E+02**	0.001%
1999	26	-1.12E+02	1.13E+02	1.27E+00	0.00E+00	0.00E+00	1.38E-03	0.00E+00	0.00E+00	0.00E+00	-2.39E-05	4.75E+00	3.47E+00	7.73E-03	0.00E+00	2.79E-03	8.35E-03	**-1.12E+02**	**-1.12E+02**	0.000%
1999	25	-2.66E+02	2.68E+02	1.80E+00	3.03E-01	0.00E+00	5.65E-03	0.00E+00	4.84E-02	0.00E+00	-3.15E-05	1.71E+01	1.50E+01	5.63E-02	0.00E+00	1.20E-02	3.79E-02	**-2.66E+02**	**-2.66E+02**	0.000%
2000	1	-3.31E+02	3.33E+02	1.42E+00	0.00E+00	0.00E+00	3.99E-03	0.00E+00	2.87E+00	1.94E-04	-4.92E-05	4.20E+01	3.77E+01	1.61E-02	0.00E+00	4.27E-02	8.91E-03	**-3.31E+02**	**-3.31E+02**	-0.001%
2000	38	-5.79E+02	5.77E+02	-2.42E+00	0.00E+00	0.00E+00	1.68E-02	0.00E+00	2.59E+00	8.68E-02	-2.68E-04	5.73E+01	5.71E+01	2.67E-02	0.00E+00	3.20E-02	8.97E-03	**-5.79E+02**	**-5.79E+02**	0.013%
2000	23	-4.89E+02	4.89E+02	-1.99E-01	0.00E+00	0.00E+00	4.55E-03	0.00E+00	0.00E+00	3.04E-03	2.07E-06	1.13E+01	1.14E+01	1.89E-02	0.00E+00	2.28E-02	3.85E-03	**-4.89E+02**	**-4.89E+02**	-0.001%
2000	35	-2.27E+03	2.27E+03	-2.40E+00	0.00E+00	0.00E+00	2.40E-02	0.00E+00	1.02E+01	0.00E+00	-9.28E-04	1.11E+02	1.03E+02	2.28E-01	0.00E+00	3.83E-01	7.69E-02	**-2.27E+03**	**-2.27E+03**	0.000%
2000	39	-8.72E+02	8.68E+02	-4.33E+00	1.70E-01	0.00E+00	3.01E-02	0.00E+00	0.00E+00	3.60E-03	4.83E-05	1.08E+02	1.11E+02	3.05E-01	0.00E+00	1.20E-01	2.27E-02	**-8.72E+02**	**-8.72E+02**	0.001%
2000	21	-1.62E+02	1.62E+02	-3.91E-01	0.00E+00	0.00E+00	7.60E-03	0.00E+00	0.00E+00	5.56E-03	-3.12E-06	2.13E+01	2.16E+01	5.78E-02	0.00E+00	1.88E-02	4.49E-03	**-1.62E+02**	**-1.62E+02**	0.004%
2000	27	-5.01E+02	5.02E+02	1.97E-01	5.75E-02	0.00E+00	6.00E-02	0.00E+00	3.63E-02	1.37E-05	-3.71E-05	1.64E+02	1.63E+02	5.12E-01	0.00E+00	1.81E-01	4.90E-02	**-5.01E+02**	**-5.01E+02**	0.001%
2000	34	-1.43E+02	1.56E+02	1.29E+01	0.00E+00	0.00E+00	3.19E-03	0.00E+00	1.93E+01	0.00E+00	2.78E-03	4.25E+01	1.02E+01	5.46E-02	0.00E+00	1.67E-01	4.17E-02	**-1.43E+02**	**-1.43E+02**	0.002%
2000	20	-2.38E+02	2.38E+02	4.09E-01	0.00E+00	0.00E+00	9.98E-03	0.00E+00	0.00E+00	2.32E-04	-1.54E-05	2.49E+01	2.45E+01	5.24E-02	0.00E+00	3.05E-02	6.50E-03	**-2.38E+02**	**-2.38E+02**	0.001%
2000	33	-1.67E+02	1.75E+02	8.48E+00	3.80E-01	0.00E+00	2.78E-03	0.00E+00	1.79E+01	0.00E+00	6.24E-03	4.93E+01	2.24E+01	6.23E-02	0.00E+00	1.87E-01	3.99E-02	**-1.67E+02**	**-1.67E+02**	0.004%
2000	32	-1.47E+03	1.46E+03	-5.99E+00	3.43E-01	0.00E+00	4.07E-02	3.10E+00	7.23E+01	0.00E+00	-3.11E-03	2.16E+02	1.45E+02	4.65E-01	0.00E+00	6.84E-01	1.76E-01	**-1.47E+03**	**-1.47E+03**	0.000%
2000	22	-2.88E+02	2.82E+02	-6.11E+00	3.99E-01	0.00E+00	2.43E-02	0.00E+00	0.00E+00	7.39E-05	-1.50E-05	4.97E+01	5.52E+01	1.31E-01	0.00E+00	6.87E-02	1.68E-02	**-2.88E+02**	**-2.88E+02**	0.000%
2000	26	-1.05E+02	1.06E+02	9.94E-01	0.00E+00	0.00E+00	1.30E-03	0.00E+00	0.00E+00	0.00E+00	-1.89E-05	4.40E+00	3.40E+00	6.48E-03	0.00E+00	8.35E-03	1.85E-03	**-1.05E+02**	**-1.05E+02**	0.000%
2000	25	-2.49E+02	2.51E+02	1.39E+00	2.32E-01	0.00E+00	5.26E-03	0.00E+00	4.62E-02	0.00E+00	-3.09E-05	1.68E+01	1.51E+01	5.26E-02	0.00E+00	3.79E-02	5.62E-03	**-2.49E+02**	**-2.49E+02**	0.000%
2001	1	-3.08E+02	3.11E+02	2.76E+00	0.00E+00	0.00E+00	4.17E-03	0.00E+00	2.15E+00	1.80E-05	-6.62E-05	3.95E+01	3.46E+01	2.08E-02	0.00E+00	8.91E-03	3.65E-02	**-3.08E+02**	**-3.08E+02**	-0.001%
2001	38	-5.44E+02	5.43E+02	-6.54E-01	0.00E+00	0.00E+00	1.65E-02	0.00E+00	2.00E+00	3.43E-02	-2.18E-05	5.18E+01	5.04E+01	1.91E-02	0.00E+00	8.97E-03	1.61E-02	**-5.44E+02**	**-5.44E+02**	0.008%

Table 10. Mass Balance for PCB-167

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2001	23	-4.58E+02	4.58E+02	-2.17E-01	0.00E+00	0.00E+00	4.18E-03	0.00E+00	0.00E+00	8.42E-04	4.25E-07	1.07E+01	1.09E+01	1.26E-02	0.00E+00	3.85E-03	6.33E-03	**-4.58E+02**	**-4.58E+02**	-0.001%
2001	35	-2.15E+03	2.15E+03	-6.32E-01	0.00E+00	0.00E+00	2.18E-02	0.00E+00	9.01E+00	0.00E+00	-7.67E-06	1.11E+02	1.02E+02	1.97E-01	0.00E+00	7.69E-02	1.75E-01	**-2.15E+03**	**-2.15E+03**	0.000%
2001	39	-8.17E+02	8.15E+02	-2.37E+00	1.33E-01	0.00E+00	2.73E-02	0.00E+00	0.00E+00	3.86E-03	5.70E-05	9.93E+01	1.01E+02	2.60E-01	0.00E+00	2.27E-02	3.40E-02	**-8.17E+02**	**-8.17E+02**	0.001%
2001	21	-1.56E+02	1.56E+02	-9.00E-02	0.00E+00	0.00E+00	6.94E-03	0.00E+00	0.00E+00	4.83E-03	-3.66E-06	2.12E+01	2.13E+01	4.95E-02	0.00E+00	4.49E-03	6.72E-03	**-1.56E+02**	**-1.56E+02**	0.004%
2001	27	-4.75E+02	4.74E+02	-1.56E+00	4.54E-02	0.00E+00	5.28E-02	0.00E+00	3.64E-02	5.48E-04	-1.35E-05	1.52E+02	1.53E+02	3.80E-01	0.00E+00	4.90E-02	8.25E-02	**-4.75E+02**	**-4.75E+02**	0.001%
2001	34	-1.36E+02	1.49E+02	1.26E+01	0.00E+00	0.00E+00	2.87E-03	0.00E+00	1.78E+01	0.00E+00	-4.19E-04	3.98E+01	9.28E+00	5.43E-02	0.00E+00	4.17E-02	5.48E-02	**-1.36E+02**	**-1.36E+02**	0.000%
2001	20	-2.25E+02	2.25E+02	3.81E-01	0.00E+00	0.00E+00	8.83E-03	0.00E+00	0.00E+00	1.41E-04	-8.17E-06	2.47E+01	2.43E+01	4.93E-02	0.00E+00	6.50E-03	9.61E-03	**-2.25E+02**	**-2.25E+02**	0.002%
2001	33	-1.58E+02	1.67E+02	9.17E+00	2.86E-01	0.00E+00	2.49E-03	0.00E+00	1.67E+01	0.00E+00	-3.37E-04	4.62E+01	2.01E+01	5.98E-02	0.00E+00	3.99E-02	5.71E-02	**-1.58E+02**	**-1.58E+02**	0.000%
2001	32	-1.37E+03	1.37E+03	-3.08E+00	2.67E-01	0.00E+00	3.54E-02	2.90E+00	6.69E+01	0.00E+00	-2.15E-04	2.08E+02	1.41E+02	4.25E-01	0.00E+00	1.76E-01	4.98E-01	**-1.37E+03**	**-1.37E+03**	0.000%
2001	22	-2.73E+02	2.63E+02	-9.39E+00	3.10E-01	0.00E+00	2.10E-02	0.00E+00	0.00E+00	3.16E-04	1.33E-05	4.60E+01	5.50E+01	1.21E-01	0.00E+00	1.68E-02	3.00E-02	**-2.73E+02**	**-2.73E+02**	0.001%
2001	26	-9.70E+01	9.81E+01	1.05E+00	0.00E+00	0.00E+00	1.12E-03	0.00E+00	0.00E+00	0.00E+00	-1.76E-05	4.07E+00	3.02E+00	6.91E-03	0.00E+00	1.85E-03	4.58E-03	**-9.70E+01**	**-9.70E+01**	0.000%
2001	25	-2.30E+02	2.32E+02	1.60E+00	1.43E-01	0.00E+00	4.54E-03	0.00E+00	4.53E-02	0.00E+00	-2.52E-05	1.53E+01	1.35E+01	4.58E-02	0.00E+00	5.62E-03	1.94E-02	**-2.30E+02**	**-2.30E+02**	0.000%
2002	1	-2.13E+02	2.13E+02	3.74E-01	0.00E+00	0.00E+00	4.77E-03	0.00E+00	7.81E-01	6.14E-05	-3.26E-05	2.66E+01	2.54E+01	2.36E-02	0.00E+00	3.65E-02	1.78E-02	**-2.13E+02**	**-2.13E+02**	-0.001%
2002	38	-3.94E+02	3.93E+02	-1.51E+00	0.00E+00	0.00E+00	1.82E-02	0.00E+00	9.74E-01	5.63E-02	-2.58E-03	3.17E+01	3.22E+01	1.27E-02	0.00E+00	1.35E-02	1.08E-02	**-3.94E+02**	**-3.94E+02**	0.010%
2002	23	-3.47E+02	3.47E+02	-2.15E-01	0.00E+00	0.00E+00	4.66E-03	0.00E+00	0.00E+00	6.02E-04	-1.32E-04	7.14E+00	7.35E+00	9.81E-03	0.00E+00	6.20E-03	6.48E-03	**-3.47E+02**	**-3.47E+02**	0.000%
2002	35	-1.63E+03	1.63E+03	-1.26E+00	0.00E+00	0.00E+00	2.36E-02	0.00E+00	7.67E+00	0.00E+00	-2.32E-06	7.36E+01	6.70E+01	1.71E-01	0.00E+00	1.75E-01	1.37E-01	**-1.63E+03**	**-1.63E+03**	0.000%
2002	39	-6.08E+02	6.04E+02	-4.73E+00	1.20E-01	0.00E+00	2.96E-02	0.00E+00	0.00E+00	2.09E-02	-1.36E-04	6.56E+01	7.00E+01	2.43E-01	0.00E+00	3.38E-02	3.98E-02	**-6.08E+02**	**-6.08E+02**	0.001%
2002	21	-1.26E+02	1.25E+02	-5.24E-01	0.00E+00	0.00E+00	7.51E-03	0.00E+00	0.00E+00	8.70E-03	-3.45E-04	1.59E+01	1.63E+01	3.99E-02	0.00E+00	6.38E-03	6.32E-03	**-1.26E+02**	**-1.26E+02**	0.005%
2002	27	-3.81E+02	3.79E+02	-1.91E+00	4.14E-02	0.00E+00	5.50E-02	0.00E+00	2.53E-02	7.35E-04	-3.46E-04	1.02E+02	1.04E+02	3.01E-01	0.00E+00	8.22E-02	8.22E-02	**-3.81E+02**	**-3.81E+02**	0.001%
2002	34	-1.16E+02	1.23E+02	7.28E+00	0.00E+00	0.00E+00	3.03E-03	0.00E+00	1.51E+01	0.00E+00	-2.52E-04	3.04E+01	7.95E+00	4.32E-02	0.00E+00	5.48E-02	4.91E-02	**-1.16E+02**	**-1.16E+02**	0.000%
2002	20	-1.85E+02	1.85E+02	-4.28E-02	0.00E+00	0.00E+00	9.39E-03	0.00E+00	0.00E+00	4.74E-04	-3.26E-06	1.94E+01	1.94E+01	4.10E-02	0.00E+00	9.61E-03	1.05E-02	**-1.85E+02**	**-1.85E+02**	0.000%
2002	33	-1.30E+02	1.37E+02	6.71E+00	2.72E-01	0.00E+00	2.61E-03	0.00E+00	1.44E+01	0.00E+00	-2.54E-04	3.39E+01	1.24E+01	5.15E-02	0.00E+00	5.71E-02	5.68E-02	**-1.30E+02**	**-1.30E+02**	0.000%
2002	32	-1.16E+03	1.16E+03	-6.82E+00	2.44E-01	0.00E+00	3.60E-02	2.85E+00	5.75E+01	0.00E+00	-1.40E-04	1.69E+02	1.15E+02	3.94E-01	0.00E+00	4.98E-01	3.67E-01	**-1.16E+03**	**-1.16E+03**	0.000%
2002	22	-2.27E+02	2.19E+02	-7.98E+00	2.83E-01	0.00E+00	2.11E-02	0.00E+00	0.00E+00	2.93E-04	1.43E-05	3.79E+01	4.55E+01	1.10E-01	0.00E+00	3.00E-02	2.98E-02	**-2.27E+02**	**-2.27E+02**	0.001%
2002	26	-7.72E+01	7.80E+01	7.62E-01	0.00E+00	0.00E+00	1.12E-03	0.00E+00	0.00E+00	0.00E+00	-1.81E-05	3.56E+00	2.79E+00	6.86E-03	0.00E+00	4.58E-03	3.32E-03	**-7.72E+01**	**-7.72E+01**	0.000%
2002	25	-1.97E+02	1.98E+02	1.23E+00	1.79E-01	0.00E+00	4.59E-03	0.00E+00	4.51E-02	0.00E+00	-2.81E-05	1.29E+01	1.14E+01	4.46E-02	0.00E+00	1.94E-02	1.36E-02	**-1.97E+02**	**-1.97E+02**	0.000%
2003	1	-3.18E+02	3.22E+02	4.19E+00	0.00E+00	0.00E+00	3.41E-03	0.00E+00	2.46E+00	3.54E-04	-2.53E-04	3.67E+01	3.01E+01	1.75E-02	0.00E+00	1.78E-02	4.65E-02	**-3.18E+02**	**-3.18E+02**	0.000%
2003	38	-5.98E+02	6.02E+02	3.41E+00	0.00E+00	0.00E+00	1.51E-02	0.00E+00	2.92E+00	3.16E-02	9.28E-04	7.05E+01	6.43E+01	2.21E-02	0.00E+00	1.20E-02	4.48E-02	**-5.98E+02**	**-5.98E+02**	0.011%
2003	23	-4.88E+02	4.88E+02	-2.45E-01	0.00E+00	0.00E+00	4.21E-03	0.00E+00	0.00E+00	4.33E-04	-1.19E-05	1.12E+01	1.14E+01	1.24E-02	0.00E+00	6.48E-03	2.58E-02	**-4.88E+02**	**-4.88E+02**	0.001%
2003	35	-2.25E+03	2.25E+03	1.67E+00	0.00E+00	0.00E+00	2.12E-02	0.00E+00	5.91E+00	0.00E+00	1.91E-03	1.11E+02	1.03E+02	1.73E-01	0.00E+00	1.39E-01	4.45E-01	**-2.25E+03**	**-2.25E+03**	0.000%
2003	39	-8.50E+02	8.51E+02	7.61E-01	2.18E-01	0.00E+00	2.71E-02	0.00E+00	0.00E+00	1.59E-02	-1.42E-04	1.08E+02	1.07E+02	2.88E-01	0.00E+00	3.97E-02	1.24E-01	**-8.50E+02**	**-8.50E+02**	0.001%
2003	21	-1.58E+02	1.58E+02	8.89E-02	0.00E+00	0.00E+00	6.84E-03	0.00E+00	0.00E+00	1.23E-03	-3.05E-05	1.94E+01	1.93E+01	4.82E-02	0.00E+00	6.30E-03	2.32E-02	**-1.58E+02**	**-1.58E+02**	0.004%
2003	27	-4.90E+02	4.91E+02	1.12E+00	7.35E-02	0.00E+00	5.40E-02	0.00E+00	6.16E-02	0.00E+00	4.52E-04	1.64E+02	1.62E+02	4.17E-01	0.00E+00	8.28E-02	1.90E-01	**-4.90E+02**	**-4.90E+02**	0.001%
2003	34	-1.36E+02	1.49E+02	1.34E+01	0.00E+00	0.00E+00	2.84E-03	0.00E+00	1.18E+01	0.00E+00	9.46E-04	3.20E+01	6.87E+00	7.35E-02	0.00E+00	5.06E-02	1.88E-01	**-1.36E+02**	**-1.36E+02**	0.001%
2003	20	-2.25E+02	2.26E+02	9.46E-01	0.00E+00	0.00E+00	8.85E-03	0.00E+00	0.00E+00	4.75E-05	-5.59E-05	2.25E+01	2.15E+01	5.70E-02	0.00E+00	1.05E-02	3.29E-02	**-2.25E+02**	**-2.25E+02**	0.000%
2003	33	-1.52E+02	1.63E+02	1.09E+01	5.10E-01	0.00E+00	2.35E-03	0.00E+00	1.00E+01	0.00E+00	1.01E-02	3.82E+01	1.69E+01	6.81E-02	0.00E+00	6.74E-02	2.70E-01	**-1.52E+02**	**-1.52E+02**	0.007%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 10. Mass Balance for PCB-167

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2003	32	-1.33E+03	1.34E+03	1.28E+01	4.50E-01	0.00E+00	3.25E-02	3.45E+00	4.24E+01	0.00E+00	7.03E-02	2.04E+02	1.45E+02	4.58E-01	0.00E+00	4.39E-01	7.66E-01	**-1.33E+03**	**-1.33E+03**	0.005%
2003	22	-2.68E+02	2.63E+02	-5.67E+00	5.23E-01	0.00E+00	2.16E-02	0.00E+00	0.00E+00	7.63E-05	-9.22E-05	4.37E+01	4.87E+01	1.52E-01	0.00E+00	2.97E-02	5.16E-02	**-2.68E+02**	**-2.68E+02**	0.000%
2003	26	-9.52E+01	9.59E+01	7.71E-01	0.00E+00	0.00E+00	1.16E-03	0.00E+00	0.00E+00	0.00E+00	-3.41E-05	3.26E+00	2.48E+00	1.25E-02	0.00E+00	3.31E-03	5.38E-03	**-9.52E+01**	**-9.52E+01**	0.000%
2003	25	-2.11E+02	2.12E+02	1.60E+00	5.02E-01	0.00E+00	4.53E-03	0.00E+00	3.95E-02	0.00E+00	-8.94E-05	1.36E+01	1.14E+01	6.27E-02	0.00E+00	1.36E-02	2.98E-02	**-2.11E+02**	**-2.11E+02**	0.000%
2004	1	-2.93E+02	2.96E+02	2.97E+00	0.00E+00	0.00E+00	3.36E-03	0.00E+00	4.38E+00	5.33E-04	-3.59E-04	3.56E+01	2.82E+01	1.63E-02	0.00E+00	4.64E-02	4.91E-02	**-2.93E+02**	**-2.93E+02**	0.000%
2004	38	-5.53E+02	5.53E+02	2.14E-01	0.00E+00	0.00E+00	1.55E-02	0.00E+00	3.05E+00	5.02E-02	2.71E-05	6.49E+01	6.16E+01	3.30E-02	0.00E+00	4.48E-02	6.50E-02	**-5.53E+02**	**-5.53E+02**	0.012%
2004	23	-4.54E+02	4.55E+02	2.97E-01	0.00E+00	0.00E+00	4.30E-03	0.00E+00	0.00E+00	1.85E-03	-1.27E-05	1.19E+01	1.16E+01	3.25E-02	0.00E+00	2.58E-02	4.28E-02	**-4.54E+02**	**-4.54E+02**	0.001%
2004	35	-2.08E+03	2.08E+03	3.70E+00	0.00E+00	0.00E+00	2.15E-02	0.00E+00	5.48E+00	0.00E+00	-1.50E-04	1.09E+02	9.97E+01	2.11E-01	0.00E+00	4.45E-01	7.08E-01	**-2.08E+03**	**-2.08E+03**	0.000%
2004	39	-7.88E+02	7.85E+02	-3.32E+00	2.16E-01	0.00E+00	2.78E-02	0.00E+00	0.00E+00	3.50E-03	3.00E-05	1.02E+02	1.05E+02	3.02E-01	0.00E+00	1.24E-01	2.85E-01	**-7.88E+02**	**-7.88E+02**	0.001%
2004	21	-1.43E+02	1.44E+02	7.08E-02	0.00E+00	0.00E+00	6.99E-03	0.00E+00	0.00E+00	9.37E-04	-1.13E-05	1.84E+01	1.83E+01	5.52E-02	0.00E+00	2.32E-02	4.49E-02	**-1.43E+02**	**-1.43E+02**	0.006%
2004	27	-4.42E+02	4.41E+02	-6.70E-01	7.34E-02	0.00E+00	5.50E-02	0.00E+00	5.36E-02	0.00E+00	-6.92E-05	1.52E+02	1.53E+02	4.15E-01	0.00E+00	1.90E-01	4.26E-01	**-4.42E+02**	**-4.42E+02**	0.002%
2004	34	-1.23E+02	1.35E+02	1.27E+01	0.00E+00	0.00E+00	2.88E-03	0.00E+00	1.09E+01	0.00E+00	-5.67E-04	3.01E+01	6.42E+00	6.15E-02	0.00E+00	1.88E-01	2.36E-01	**-1.23E+02**	**-1.23E+02**	0.000%
2004	20	-2.02E+02	2.03E+02	8.19E-01	0.00E+00	0.00E+00	9.04E-03	0.00E+00	0.00E+00	5.16E-05	-2.44E-05	2.06E+01	1.98E+01	5.65E-02	0.00E+00	3.29E-02	5.20E-02	**-2.02E+02**	**-2.02E+02**	0.001%
2004	33	-1.36E+02	1.47E+02	1.07E+01	4.64E-01	0.00E+00	2.35E-03	0.00E+00	9.08E+00	0.00E+00	-5.60E-04	3.68E+01	1.66E+01	5.59E-02	0.00E+00	2.70E-01	2.75E-01	**-1.36E+02**	**-1.36E+02**	0.000%
2004	32	-1.17E+03	1.18E+03	1.57E+01	4.02E-01	0.00E+00	3.25E-02	3.35E+00	3.64E+01	0.00E+00	-1.44E-03	1.85E+02	1.29E+02	3.76E-01	0.00E+00	7.66E-01	1.23E+00	**-1.17E+03**	**-1.17E+03**	0.000%
2004	22	-2.43E+02	2.32E+02	-1.13E+01	4.68E-01	0.00E+00	2.14E-02	0.00E+00	0.00E+00	5.91E-04	6.28E-06	3.92E+01	4.99E+01	1.54E-01	0.00E+00	5.16E-02	9.30E-02	**-2.43E+02**	**-2.43E+02**	0.000%
2004	26	-8.39E+01	8.46E+01	6.93E-01	0.00E+00	0.00E+00	1.15E-03	0.00E+00	0.00E+00	0.00E+00	-2.49E-05	2.93E+00	2.23E+00	1.07E-02	0.00E+00	5.38E-03	8.69E-03	**-8.39E+01**	**-8.39E+01**	0.000%
2004	25	-1.82E+02	1.83E+02	1.28E+00	4.40E-01	0.00E+00	4.46E-03	0.00E+00	3.35E-02	0.00E+00	-5.16E-05	1.22E+01	1.04E+01	5.35E-02	0.00E+00	2.98E-02	3.41E-02	**-1.82E+02**	**-1.82E+02**	0.000%
2005	1	-2.57E+02	2.59E+02	1.86E+00	0.00E+00	0.00E+00	3.38E-03	0.00E+00	4.46E+00	3.48E-05	-1.36E-04	3.21E+01	2.58E+01	1.48E-02	0.00E+00	4.91E-02	1.91E-02	**-2.57E+02**	**-2.57E+02**	0.000%
2005	38	-5.17E+02	5.17E+02	-3.44E-01	0.00E+00	0.00E+00	1.49E-02	0.00E+00	2.80E+00	2.25E-02	-1.67E-04	5.90E+01	5.65E+01	3.00E-02	0.00E+00	6.50E-02	7.75E-03	**-5.17E+02**	**-5.17E+02**	0.010%
2005	23	-4.35E+02	4.35E+02	2.36E-01	0.00E+00	0.00E+00	3.96E-03	0.00E+00	0.00E+00	6.75E-04	-1.45E-05	1.20E+01	1.17E+01	3.31E-02	0.00E+00	4.28E-02	5.48E-03	**-4.35E+02**	**-4.35E+02**	0.001%
2005	35	-1.99E+03	1.99E+03	4.07E+00	0.00E+00	0.00E+00	1.99E-02	0.00E+00	7.50E+00	0.00E+00	-3.12E-04	1.13E+02	1.00E+02	2.27E-01	0.00E+00	7.08E-01	1.48E-01	**-1.99E+03**	**-1.99E+03**	0.000%
2005	39	-7.45E+02	7.43E+02	-1.41E+00	1.38E-01	0.00E+00	2.54E-02	0.00E+00	0.00E+00	2.31E-03	-4.58E-05	1.05E+02	1.06E+02	3.22E-01	0.00E+00	2.85E-01	2.41E-02	**-7.45E+02**	**-7.45E+02**	0.001%
2005	21	-1.42E+02	1.42E+02	-1.74E-01	0.00E+00	0.00E+00	6.49E-03	0.00E+00	0.00E+00	1.57E-03	-2.25E-04	1.91E+01	1.92E+01	5.12E-02	0.00E+00	4.47E-02	3.90E-03	**-1.42E+02**	**-1.42E+02**	0.006%
2005	27	-4.39E+02	4.40E+02	1.03E+00	4.85E-02	0.00E+00	5.08E-02	0.00E+00	4.88E-02	2.06E-04	-1.16E-04	1.59E+02	1.57E+02	4.34E-01	0.00E+00	4.26E-01	4.64E-02	**-4.39E+02**	**-4.39E+02**	0.001%
2005	34	-1.24E+02	1.37E+02	1.27E+01	0.00E+00	0.00E+00	2.76E-03	0.00E+00	1.40E+01	0.00E+00	-4.25E-04	3.46E+01	7.69E+00	5.20E-02	0.00E+00	2.36E-01	3.84E-02	**-1.24E+02**	**-1.24E+02**	0.000%
2005	20	-2.05E+02	2.06E+02	9.54E-01	0.00E+00	0.00E+00	8.44E-03	0.00E+00	0.00E+00	0.00E+00	-2.81E-05	2.24E+01	2.13E+01	5.57E-02	0.00E+00	5.20E-02	6.75E-03	**-2.05E+02**	**-2.05E+02**	0.000%
2005	33	-1.41E+02	1.51E+02	1.00E+01	2.40E-01	0.00E+00	2.24E-03	0.00E+00	1.26E+01	0.00E+00	-3.58E-04	4.20E+01	1.89E+01	5.21E-02	0.00E+00	2.75E-01	4.76E-02	**-1.41E+02**	**-1.41E+02**	0.000%
2005	32	-1.22E+03	1.22E+03	6.94E+00	2.35E-01	0.00E+00	3.19E-02	2.81E+00	5.42E+01	0.00E+00	-7.22E-04	1.99E+02	1.34E+02	3.88E-01	0.00E+00	1.23E+00	3.58E-01	**-1.22E+03**	**-1.22E+03**	0.000%
2005	22	-2.43E+02	2.38E+02	-5.06E+00	2.72E-01	0.00E+00	2.08E-02	0.00E+00	0.00E+00	6.32E-06	-4.80E-06	4.25E+01	4.71E+01	1.37E-01	0.00E+00	9.30E-02	1.44E-02	**-2.43E+02**	**-2.43E+02**	0.001%
2005	26	-8.48E+01	8.56E+01	7.72E-01	0.00E+00	0.00E+00	1.12E-03	0.00E+00	0.00E+00	0.00E+00	-1.27E-05	3.17E+00	2.38E+00	1.05E-02	0.00E+00	8.69E-03	2.33E-03	**-8.48E+01**	**-8.48E+01**	0.000%
2005	25	-1.89E+02	1.91E+02	1.38E+00	1.91E-01	0.00E+00	4.46E-03	0.00E+00	4.01E-02	0.00E+00	-2.60E-05	1.31E+01	1.14E+01	5.27E-02	0.00E+00	3.41E-02	8.16E-03	**-1.89E+02**	**-1.89E+02**	0.000%
2006	1	-2.58E+02	2.60E+02	2.44E+00	0.00E+00	0.00E+00	2.72E-03	0.00E+00	4.26E+00	1.16E-04	-1.88E-04	3.25E+01	2.58E+01	1.35E-02	0.00E+00	1.91E-02	1.06E-02	**-2.58E+02**	**-2.58E+02**	0.000%
2006	38	-5.08E+02	5.08E+02	1.02E-02	0.00E+00	0.00E+00	1.27E-02	0.00E+00	2.98E+00	2.41E-02	-1.11E-03	5.92E+01	5.62E+01	2.69E-02	0.00E+00	6.82E-03	8.01E-03	**-5.08E+02**	**-5.08E+02**	0.013%
2006	23	-4.26E+02	4.26E+02	3.78E-02	0.00E+00	0.00E+00	3.62E-03	0.00E+00	0.00E+00	1.03E-03	-6.09E-05	1.13E+01	1.13E+01	2.55E-02	0.00E+00	5.43E-03	5.23E-03	**-4.26E+02**	**-4.26E+02**	0.001%
2006	35	-1.93E+03	1.93E+03	3.00E+00	0.00E+00	0.00E+00	1.83E-02	0.00E+00	5.80E+00	0.00E+00	-2.66E-04	1.03E+02	9.36E+01	2.14E-01	0.00E+00	1.48E-01	9.06E-02	**-1.93E+03**	**-1.93E+03**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 10. Mass Balance for PCB-167

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2006	39	-7.30E+02	7.29E+02	-7.11E-01	2.70E-01	0.00E+00	2.35E-02	0.00E+00	0.00E+00	5.26E-04	-4.15E-04	9.42E+01	9.44E+01	2.98E-01	0.00E+00	2.38E-02	2.77E-02	**-7.30E+02**	**-7.30E+02**	0.002%
2006	21	-1.34E+02	1.34E+02	-9.62E-02	0.00E+00	0.00E+00	5.93E-03	0.00E+00	0.00E+00	1.16E-03	-2.60E-04	1.71E+01	1.72E+01	5.17E-02	0.00E+00	3.66E-03	3.63E-03	**-1.34E+02**	**-1.34E+02**	0.008%
2006	27	-4.22E+02	4.23E+02	6.30E-01	8.83E-02	0.00E+00	4.78E-02	0.00E+00	5.38E-02	0.00E+00	-5.21E-04	1.46E+02	1.45E+02	4.63E-01	0.00E+00	4.60E-02	5.62E-02	**-4.22E+02**	**-4.22E+02**	0.002%
2006	34	-1.12E+02	1.24E+02	1.16E+01	0.00E+00	0.00E+00	2.56E-03	0.00E+00	1.07E+01	0.00E+00	-4.73E-04	2.88E+01	6.55E+00	5.29E-02	0.00E+00	3.84E-02	3.11E-02	**-1.12E+02**	**-1.12E+02**	0.000%
2006	20	-1.89E+02	1.89E+02	7.52E-01	0.00E+00	0.00E+00	7.81E-03	0.00E+00	0.00E+00	0.00E+00	-1.02E-04	1.94E+01	1.86E+01	5.65E-02	0.00E+00	6.68E-03	5.38E-03	**-1.89E+02**	**-1.89E+02**	0.001%
2006	33	-1.28E+02	1.38E+02	9.54E+00	4.94E-01	0.00E+00	2.12E-03	0.00E+00	9.29E+00	0.00E+00	-4.64E-04	3.61E+01	1.67E+01	5.33E-02	0.00E+00	4.76E-02	4.01E-02	**-1.28E+02**	**-1.28E+02**	0.000%
2006	32	-1.15E+03	1.16E+03	9.28E+00	4.25E-01	0.00E+00	3.03E-02	3.50E+00	4.04E+01	0.00E+00	-1.10E-03	1.80E+02	1.26E+02	3.82E-01	0.00E+00	3.58E-01	2.44E-01	**-1.15E+03**	**-1.15E+03**	0.000%
2006	22	-2.32E+02	2.27E+02	-4.58E+00	4.95E-01	0.00E+00	1.97E-02	0.00E+00	0.00E+00	1.78E-05	-9.07E-05	3.90E+01	4.29E+01	1.53E-01	0.00E+00	1.44E-02	1.84E-02	**-2.32E+02**	**-2.32E+02**	0.001%
2006	26	-8.42E+01	8.48E+01	6.11E-01	0.00E+00	0.00E+00	1.09E-03	0.00E+00	0.00E+00	0.00E+00	-1.67E-05	2.85E+00	2.23E+00	9.73E-03	0.00E+00	2.33E-03	1.79E-03	**-8.42E+01**	**-8.42E+01**	0.000%
2006	25	-1.82E+02	1.83E+02	1.06E+00	4.94E-01	0.00E+00	4.25E-03	0.00E+00	3.33E-02	0.00E+00	-4.04E-05	1.19E+01	1.03E+01	5.19E-02	0.00E+00	8.16E-03	7.24E-03	**-1.82E+02**	**-1.82E+02**	0.000%
2007	1	-3.62E+02	3.65E+02	2.72E+00	0.00E+00	0.00E+00	3.01E-03	0.00E+00	6.32E+00	2.74E-05	-1.30E-03	3.54E+01	2.64E+01	9.97E-03	0.00E+00	1.06E-02	1.58E-02	**-3.62E+02**	**-3.62E+02**	0.001%
2007	38	-6.63E+02	6.67E+02	3.32E+00	0.00E+00	0.00E+00	1.35E-02	0.00E+00	3.86E+00	3.77E-02	-5.22E-04	6.56E+01	5.87E+01	2.54E-02	0.00E+00	8.01E-03	1.38E-02	**-6.64E+02**	**-6.63E+02**	0.048%
2007	23	-5.51E+02	5.51E+02	6.16E-02	0.00E+00	0.00E+00	3.63E-03	0.00E+00	0.00E+00	4.67E-04	-1.83E-05	1.16E+01	1.16E+01	2.30E-02	0.00E+00	5.23E-03	6.61E-03	**-5.51E+02**	**-5.51E+02**	0.001%
2007	35	-2.55E+03	2.56E+03	5.92E+00	0.00E+00	0.00E+00	1.81E-02	0.00E+00	6.24E+00	0.00E+00	-4.60E-04	1.16E+02	1.04E+02	2.01E-01	0.00E+00	9.06E-02	1.39E-01	**-2.55E+03**	**-2.55E+03**	0.000%
2007	39	-9.40E+02	9.42E+02	2.73E+00	2.58E-01	0.00E+00	2.34E-02	0.00E+00	0.00E+00	2.55E-04	-3.37E-04	1.07E+02	1.04E+02	3.05E-01	0.00E+00	2.77E-02	3.84E-02	**-9.40E+02**	**-9.40E+02**	0.001%
2007	21	-1.89E+02	1.90E+02	1.15E+00	0.00E+00	0.00E+00	5.82E-03	0.00E+00	0.00E+00	2.36E-03	-1.34E-04	2.10E+01	1.98E+01	5.95E-02	0.00E+00	3.63E-03	9.26E-03	**-1.89E+02**	**-1.89E+02**	0.009%
2007	27	-5.63E+02	5.69E+02	5.72E+00	8.71E-02	0.00E+00	4.62E-02	0.00E+00	5.32E-02	0.00E+00	-4.28E-04	1.74E+02	1.68E+02	4.97E-01	0.00E+00	5.62E-02	6.35E-02	**-5.63E+02**	**-5.63E+02**	0.001%
2007	34	-1.54E+02	1.71E+02	1.73E+01	0.00E+00	0.00E+00	2.47E-03	0.00E+00	1.15E+01	0.00E+00	-1.25E-03	3.64E+01	7.66E+00	5.05E-02	0.00E+00	3.11E-02	5.50E-02	**-1.54E+02**	**-1.54E+02**	0.000%
2007	20	-2.65E+02	2.67E+02	2.25E+00	0.00E+00	0.00E+00	7.53E-03	0.00E+00	0.00E+00	0.00E+00	-1.47E-04	2.39E+01	2.16E+01	6.15E-02	0.00E+00	5.38E-03	9.53E-03	**-2.65E+02**	**-2.65E+02**	0.000%
2007	33	-1.72E+02	1.86E+02	1.42E+01	6.03E-01	0.00E+00	2.03E-03	0.00E+00	9.92E+00	0.00E+00	-1.05E-03	4.35E+01	1.88E+01	5.09E-02	0.00E+00	4.01E-02	6.87E-02	**-1.72E+02**	**-1.72E+02**	0.000%
2007	32	-1.51E+03	1.53E+03	2.18E+01	4.77E-01	0.00E+00	2.91E-02	3.93E+00	4.17E+01	0.00E+00	-2.37E-03	2.11E+02	1.43E+02	3.54E-01	0.00E+00	2.44E-01	3.79E-01	**-1.51E+03**	**-1.51E+03**	0.000%
2007	22	-3.09E+02	3.05E+02	-3.44E+00	5.57E-01	0.00E+00	1.86E-02	0.00E+00	0.00E+00	1.31E-04	-1.27E-04	4.78E+01	5.06E+01	1.58E-01	0.00E+00	1.84E-02	2.88E-02	**-3.09E+02**	**-3.09E+02**	0.001%
2007	26	-1.13E+02	1.14E+02	1.07E+00	0.00E+00	0.00E+00	1.03E-03	0.00E+00	0.00E+00	0.00E+00	-3.55E-05	3.59E+00	2.51E+00	9.99E-03	0.00E+00	1.79E-03	3.15E-03	**-1.13E+02**	**-1.13E+02**	0.000%
2007	25	-2.41E+02	2.42E+02	1.52E+00	7.32E-01	0.00E+00	4.06E-03	0.00E+00	3.22E-02	0.00E+00	-8.52E-05	1.45E+01	1.22E+01	4.75E-02	0.00E+00	7.24E-03	1.30E-02	**-2.41E+02**	**-2.41E+02**	0.000%
2008	1	-2.60E+02	2.62E+02	1.44E+00	0.00E+00	0.00E+00	3.45E-03	0.00E+00	7.56E+00	5.99E-04	-1.37E-04	3.27E+01	2.36E+01	8.80E-03	0.00E+00	1.58E-02	1.94E-02	**-2.60E+02**	**-2.60E+02**	-0.001%
2008	38	-5.20E+02	5.18E+02	-1.94E+00	0.00E+00	0.00E+00	1.49E-02	0.00E+00	4.26E+00	2.72E-02	1.45E-04	5.61E+01	5.38E+01	1.78E-02	0.00E+00	1.38E-02	1.66E-02	**-5.20E+02**	**-5.20E+02**	0.010%
2008	23	-4.42E+02	4.42E+02	1.26E-01	0.00E+00	0.00E+00	3.90E-03	0.00E+00	0.00E+00	3.17E-03	-8.47E-06	1.14E+01	1.13E+01	2.55E-02	0.00E+00	6.61E-03	6.69E-03	**-4.42E+02**	**-4.42E+02**	0.001%
2008	35	-2.02E+03	2.02E+03	2.66E+00	0.00E+00	0.00E+00	1.96E-02	0.00E+00	6.44E+00	0.00E+00	-1.11E-04	1.09E+02	1.00E+02	2.05E-01	0.00E+00	1.39E-01	1.42E-01	**-2.02E+03**	**-2.02E+03**	0.000%
2008	39	-7.60E+02	7.58E+02	-1.92E+00	2.01E-01	0.00E+00	2.52E-02	0.00E+00	0.00E+00	3.10E-04	2.69E-06	9.96E+01	1.01E+02	3.47E-01	0.00E+00	3.84E-02	4.19E-02	**-7.60E+02**	**-7.60E+02**	0.000%
2008	21	-1.43E+02	1.43E+02	2.18E-02	0.00E+00	0.00E+00	6.29E-03	0.00E+00	0.00E+00	3.12E-03	-4.77E-06	1.97E+01	1.96E+01	7.49E-02	0.00E+00	9.26E-03	6.21E-03	**-1.43E+02**	**-1.43E+02**	0.004%
2008	27	-4.22E+02	4.22E+02	-2.36E-01	6.76E-02	0.00E+00	4.82E-02	0.00E+00	5.10E-02	0.00E+00	-3.30E-05	1.50E+02	1.50E+02	5.88E-01	0.00E+00	6.35E-02	8.00E-02	**-4.22E+02**	**-4.22E+02**	0.001%
2008	34	-1.21E+02	1.33E+02	1.27E+01	0.00E+00	0.00E+00	2.72E-03	0.00E+00	1.18E+01	0.00E+00	-4.17E-04	3.19E+01	7.43E+00	5.47E-02	0.00E+00	5.50E-02	5.09E-02	**-1.21E+02**	**-1.21E+02**	0.000%
2008	20	-1.98E+02	1.99E+02	6.99E-01	0.00E+00	0.00E+00	8.02E-03	0.00E+00	0.00E+00	0.00E+00	-1.44E-05	2.14E+01	2.06E+01	7.56E-02	0.00E+00	9.53E-03	1.09E-02	**-1.98E+02**	**-1.98E+02**	0.000%
2008	33	-1.32E+02	1.43E+02	1.03E+01	4.32E-01	0.00E+00	2.20E-03	0.00E+00	1.02E+01	0.00E+00	-4.00E-04	3.79E+01	1.69E+01	5.36E-02	0.00E+00	6.87E-02	6.32E-02	**-1.32E+02**	**-1.32E+02**	0.000%
2008	32	-1.14E+03	1.15E+03	1.01E+01	3.79E-01	0.00E+00	2.98E-02	3.27E+00	4.25E+01	0.00E+00	-7.77E-04	1.86E+02	1.29E+02	3.74E-01	0.00E+00	3.79E-01	4.11E-01	**-1.14E+03**	**-1.14E+03**	0.000%
2008	22	-2.24E+02	2.19E+02	-4.32E+00	4.41E-01	0.00E+00	1.89E-02	0.00E+00	0.00E+00	4.19E-04	-9.59E-06	3.77E+01	4.15E+01	1.53E-01	0.00E+00	2.88E-02	2.38E-02	**-2.24E+02**	**-2.24E+02**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 10. Mass Balance for PCB-167

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2008	26	-7.81E+01	7.87E+01	6.30E-01	0.00E+00	0.00E+00	1.02E-03	0.00E+00	0.00E+00	0.00E+00	-1.53E-05	2.89E+00	2.25E+00	9.74E-03	0.00E+00	3.15E-03	3.20E-03	**-7.81E+01**	**-7.81E+01**	0.000%
2008	25	-1.77E+02	1.78E+02	1.10E+00	4.33E-01	0.00E+00	4.07E-03	0.00E+00	3.51E-02	0.00E+00	-3.20E-05	1.21E+01	1.05E+01	5.15E-02	0.00E+00	1.30E-02	1.16E-02	**-1.77E+02**	**-1.77E+02**	0.000%
2009	1	-2.41E+02	2.42E+02	8.19E-01	0.00E+00	0.00E+00	3.15E-03	0.00E+00	6.85E+00	3.14E-04	-8.15E-05	3.05E+01	2.29E+01	1.07E-02	0.00E+00	1.94E-02	1.17E-02	**-2.41E+02**	**-2.41E+02**	0.008%
2009	38	-4.52E+02	4.53E+02	4.94E-01	0.00E+00	0.00E+00	1.39E-02	0.00E+00	2.11E+00	2.45E-02	-2.86E-04	5.16E+01	4.90E+01	2.40E-02	0.00E+00	1.64E-02	6.17E-03	**-4.52E+02**	**-4.52E+02**	0.013%
2009	23	-3.89E+02	3.89E+02	9.05E-03	0.00E+00	0.00E+00	3.74E-03	0.00E+00	0.00E+00	5.18E-04	8.34E-07	9.65E+00	9.64E+00	2.26E-02	0.00E+00	6.69E-03	4.03E-03	**-3.89E+02**	**-3.89E+02**	0.005%
2009	35	-1.78E+03	1.78E+03	2.07E+00	0.00E+00	0.00E+00	1.86E-02	0.00E+00	5.51E+00	0.00E+00	1.89E-04	9.21E+01	8.47E+01	1.88E-01	0.00E+00	1.43E-01	1.12E-01	**-1.78E+03**	**-1.78E+03**	0.021%
2009	39	-6.76E+02	6.76E+02	-7.99E-01	2.00E-01	0.00E+00	2.41E-02	0.00E+00	0.00E+00	1.56E-03	-7.06E-06	8.90E+01	8.94E+01	2.80E-01	0.00E+00	4.19E-02	1.88E-02	**-6.76E+02**	**-6.76E+02**	0.008%
2009	21	-1.22E+02	1.22E+02	-2.48E-01	0.00E+00	0.00E+00	5.95E-03	0.00E+00	0.00E+00	3.11E-03	2.42E-06	1.70E+01	1.72E+01	6.23E-02	0.00E+00	6.21E-03	3.06E-03	**-1.22E+02**	**-1.22E+02**	0.014%
2009	27	-3.76E+02	3.76E+02	6.29E-02	6.63E-02	0.00E+00	4.65E-02	0.00E+00	4.60E-02	0.00E+00	-5.60E-05	1.34E+02	1.33E+02	4.96E-01	0.00E+00	8.00E-02	3.99E-02	**-3.76E+02**	**-3.76E+02**	0.017%
2009	34	-1.05E+02	1.15E+02	1.01E+01	0.00E+00	0.00E+00	2.45E-03	0.00E+00	1.02E+01	0.00E+00	1.18E-03	2.67E+01	6.35E+00	4.87E-02	0.00E+00	5.24E-02	3.15E-02	**-1.05E+02**	**-1.05E+02**	0.051%
2009	20	-1.79E+02	1.79E+02	4.15E-01	0.00E+00	0.00E+00	7.63E-03	0.00E+00	0.00E+00	0.00E+00	-1.33E-05	1.87E+01	1.82E+01	5.46E-02	0.00E+00	1.09E-02	4.90E-03	**-1.79E+02**	**-1.79E+02**	0.010%
2009	33	-1.19E+02	1.28E+02	9.48E+00	4.06E-01	0.00E+00	2.00E-03	0.00E+00	8.95E+00	0.00E+00	1.97E-03	3.29E+01	1.40E+01	4.93E-02	0.00E+00	6.55E-02	4.34E-02	**-1.19E+02**	**-1.19E+02**	0.027%
2009	32	-1.06E+03	1.07E+03	8.06E+00	3.71E-01	0.00E+00	2.86E-02	3.17E+00	3.94E+01	0.00E+00	-4.04E-03	1.69E+02	1.18E+02	3.45E-01	0.00E+00	4.08E-01	2.69E-01	**-1.06E+03**	**-1.06E+03**	0.033%
2009	22	-2.11E+02	2.05E+02	-6.01E+00	4.31E-01	0.00E+00	1.85E-02	0.00E+00	0.00E+00	0.00E+00	-7.90E-06	3.57E+01	4.12E+01	1.30E-01	0.00E+00	2.38E-02	1.29E-02	**-2.11E+02**	**-2.11E+02**	0.008%
2009	26	-7.55E+01	7.62E+01	6.30E-01	0.00E+00	0.00E+00	1.01E-03	0.00E+00	0.00E+00	0.00E+00	-1.40E-05	2.79E+00	2.15E+00	9.25E-03	0.00E+00	3.20E-03	1.88E-03	**-7.55E+01**	**-7.55E+01**	0.000%
2009	25	-1.67E+02	1.69E+02	1.12E+00	3.66E-01	0.00E+00	3.92E-03	0.00E+00	3.49E-02	0.00E+00	-3.07E-05	1.16E+01	1.01E+01	4.53E-02	0.00E+00	1.16E-02	7.26E-03	**-1.67E+02**	**-1.67E+02**	0.004%
2010	1	-2.63E+02	2.65E+02	1.75E+00	0.00E+00	0.00E+00	2.64E-03	0.00E+00	7.15E+00	3.09E-05	-1.91E-04	2.84E+01	2.02E+01	6.88E-03	0.00E+00	1.17E-02	1.21E-02	**-2.64E+02**	**-2.63E+02**	0.270%
2010	38	-5.10E+02	5.11E+02	7.89E-01	0.00E+00	0.00E+00	1.15E-02	0.00E+00	3.00E+00	2.53E-02	-1.42E-03	5.39E+01	5.05E+01	1.77E-02	0.00E+00	5.26E-03	1.07E-02	**-5.10E+02**	**-5.10E+02**	0.083%
2010	23	-4.27E+02	4.27E+02	6.79E-02	0.00E+00	0.00E+00	3.03E-03	0.00E+00	0.00E+00	2.01E-03	-3.54E-05	1.05E+01	1.04E+01	2.26E-02	0.00E+00	4.00E-03	5.17E-03	**-4.27E+02**	**-4.27E+02**	0.005%
2010	35	-1.95E+03	1.95E+03	7.25E+00	0.00E+00	0.00E+00	1.54E-02	0.00E+00	5.59E+00	0.00E+00	-3.85E-04	9.98E+01	8.94E+01	1.68E-01	0.00E+00	1.12E-01	1.02E-01	**-1.95E+03**	**-1.95E+03**	0.133%
2010	39	-7.38E+02	7.37E+02	-1.20E+00	1.59E-01	0.00E+00	1.99E-02	0.00E+00	0.00E+00	7.64E-03	-3.85E-04	9.75E+01	9.87E+01	2.68E-01	0.00E+00	1.85E-02	2.35E-02	**-7.38E+02**	**-7.38E+02**	0.044%
2010	21	-1.34E+02	1.35E+02	5.71E-01	0.00E+00	0.00E+00	4.95E-03	0.00E+00	0.00E+00	1.52E-03	-2.95E-04	1.81E+01	1.75E+01	5.57E-02	0.00E+00	2.80E-03	5.41E-03	**-1.34E+02**	**-1.34E+02**	0.049%
2010	27	-4.21E+02	4.27E+02	6.25E+00	5.30E-02	0.00E+00	3.96E-02	0.00E+00	4.41E-02	5.66E-05	-6.36E-04	1.57E+02	1.52E+02	4.63E-01	0.00E+00	3.94E-02	5.23E-02	**-4.22E+02**	**-4.21E+02**	0.383%
2010	34	-1.09E+02	1.22E+02	1.24E+01	0.00E+00	0.00E+00	2.10E-03	0.00E+00	9.40E+00	0.00E+00	-4.31E-04	2.82E+01	6.51E+00	4.44E-02	0.00E+00	3.15E-02	3.34E-02	**-1.09E+02**	**-1.09E+02**	0.065%
2010	20	-1.92E+02	1.94E+02	1.18E+00	0.00E+00	0.00E+00	6.42E-03	0.00E+00	0.00E+00	0.00E+00	-1.44E-04	2.01E+01	1.89E+01	4.67E-02	0.00E+00	4.80E-03	6.85E-03	**-1.93E+02**	**-1.92E+02**	0.031%
2010	33	-1.26E+02	1.37E+02	1.13E+01	3.51E-01	0.00E+00	1.69E-03	0.00E+00	8.52E+00	0.00E+00	-4.46E-04	3.45E+01	1.44E+01	4.42E-02	0.00E+00	4.33E-02	4.26E-02	**-1.26E+02**	**-1.26E+02**	0.073%
2010	32	-1.14E+03	1.16E+03	1.65E+01	3.15E-01	0.00E+00	2.52E-02	3.18E+00	3.90E+01	0.00E+00	-1.09E-03	1.81E+02	1.24E+02	3.30E-01	0.00E+00	2.69E-01	2.73E-01	**-1.15E+03**	**-1.14E+03**	0.166%
2010	22	-2.29E+02	2.26E+02	-3.10E+00	3.66E-01	0.00E+00	1.61E-02	0.00E+00	0.00E+00	3.44E-05	-1.51E-04	4.09E+01	4.36E+01	1.32E-01	0.00E+00	1.27E-02	1.90E-02	**-2.29E+02**	**-2.29E+02**	0.050%
2010	26	-8.52E+01	8.58E+01	6.65E-01	0.00E+00	0.00E+00	8.95E-04	0.00E+00	0.00E+00	0.00E+00	-1.69E-05	3.13E+00	2.47E+00	8.62E-03	0.00E+00	1.87E-03	2.23E-03	**-8.52E+01**	**-8.52E+01**	0.020%
2010	25	-1.83E+02	1.84E+02	1.16E+00	4.08E-01	0.00E+00	3.52E-03	0.00E+00	3.28E-02	0.00E+00	-3.60E-05	1.24E+01	1.08E+01	4.15E-02	0.00E+00	7.26E-03	9.27E-03	**-1.83E+02**	**-1.83E+02**	0.013%
2011	1	-1.29E+03	1.30E+03	3.88E+00	0.00E+00	0.00E+00	4.44E-03	0.00E+00	1.08E+01	1.03E-04	3.58E-03	5.11E+01	3.65E+01	7.00E-03	0.00E+00	1.21E-02	1.08E-01	**-1.29E+03**	**-1.29E+03**	0.002%
2011	38	-2.16E+03	2.20E+03	3.80E+01	0.00E+00	0.00E+00	1.92E-02	0.00E+00	1.23E+01	4.13E-02	-1.44E-02	1.29E+02	7.89E+01	2.08E-02	0.00E+00	1.07E-02	1.16E-01	**-2.16E+03**	**-2.16E+03**	0.013%
2011	23	-1.84E+03	1.84E+03	2.83E+00	0.00E+00	0.00E+00	5.22E-03	0.00E+00	0.00E+00	1.82E-03	-6.11E-04	2.46E+01	2.18E+01	3.68E-02	0.00E+00	5.17E-03	4.59E-02	**-1.84E+03**	**-1.84E+03**	0.001%
2011	35	-8.27E+03	8.33E+03	5.95E+01	0.00E+00	0.00E+00	2.84E-02	0.00E+00	8.88E+00	0.00E+00	-3.27E-02	2.64E+02	1.96E+02	2.24E-01	0.00E+00	1.02E-01	6.58E-01	**-8.27E+03**	**-8.27E+03**	0.005%
2011	39	-3.08E+03	3.15E+03	6.29E+01	1.49E-01	0.00E+00	3.72E-02	0.00E+00	0.00E+00	2.40E-03	-1.58E-02	2.78E+02	2.15E+02	4.44E-01	0.00E+00	2.35E-02	1.90E-01	**-3.09E+03**	**-3.08E+03**	0.004%
2011	21	-5.63E+02	5.79E+02	1.52E+01	0.00E+00	0.00E+00	9.35E-03	0.00E+00	0.00E+00	7.05E-03	-3.29E-03	5.59E+01	4.08E+01	8.55E-02	0.00E+00	5.41E-03	5.40E-02	**-5.63E+02**	**-5.63E+02**	0.029%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 10. Mass Balance for PCB-167

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2011	27	-1.45E+03	1.53E+03	7.73E+01	9.08E-02	0.00E+00	8.03E-02	0.00E+00	6.97E-02	3.95E-05	-2.08E-02	4.42E+02	3.64E+02	7.72E-01	0.00E+00	5.23E-02	2.83E-01	**-1.45E+03**	**-1.45E+03**	0.006%
2011	34	-4.63E+02	5.36E+02	7.31E+01	0.00E+00	0.00E+00	3.91E-03	0.00E+00	1.43E+01	0.00E+00	-2.20E-02	1.05E+02	1.76E+01	8.73E-02	0.00E+00	3.34E-02	3.27E-01	**-4.63E+02**	**-4.63E+02**	0.015%
2011	20	-8.07E+02	8.26E+02	1.88E+01	0.00E+00	0.00E+00	1.26E-02	0.00E+00	0.00E+00	2.81E-06	-5.73E-03	6.47E+01	4.60E+01	8.48E-02	0.00E+00	6.85E-03	4.48E-02	**-8.07E+02**	**-8.07E+02**	0.013%
2011	33	-4.74E+02	5.35E+02	6.17E+01	4.14E-01	0.00E+00	3.20E-03	0.00E+00	1.28E+01	0.00E+00	-1.70E-02	1.07E+02	3.24E+01	7.67E-02	0.00E+00	4.26E-02	3.63E-01	**-4.74E+02**	**-4.74E+02**	0.007%
2011	32	-3.81E+03	3.94E+03	1.31E+02	2.92E-01	0.00E+00	4.82E-02	3.06E+00	5.31E+01	1.39E-06	-4.55E-02	4.54E+02	2.68E+02	4.23E-01	0.00E+00	2.73E-01	1.13E+00	**-3.81E+03**	**-3.81E+03**	0.027%
2011	22	-7.93E+02	8.06E+02	1.30E+01	3.40E-01	0.00E+00	3.17E-02	0.00E+00	0.00E+00	5.01E-05	-4.10E-03	1.25E+02	1.11E+02	2.32E-01	0.00E+00	1.90E-02	4.58E-02	**-7.93E+02**	**-7.93E+02**	0.011%
2011	26	-3.24E+02	3.27E+02	2.54E+00	0.00E+00	0.00E+00	1.83E-03	0.00E+00	0.00E+00	0.00E+00	-4.43E-04	9.06E+00	6.52E+00	1.26E-02	0.00E+00	2.23E-03	6.72E-03	**-3.24E+02**	**-3.24E+02**	0.001%
2011	25	-6.01E+02	6.11E+02	9.79E+00	8.24E-01	0.00E+00	7.01E-03	0.00E+00	4.10E-02	0.00E+00	-1.44E-03	3.50E+01	2.44E+01	6.31E-02	0.00E+00	9.27E-03	2.42E-02	**-6.01E+02**	**-6.01E+02**	0.004%
2012	1	-5.48E+02	5.51E+02	2.77E+00	0.00E+00	0.00E+00	5.23E-03	0.00E+00	2.12E+01	3.56E-04	-9.35E-04	7.04E+01	4.63E+01	2.24E-02	0.00E+00	1.08E-01	3.47E-02	**-5.48E+02**	**-5.48E+02**	0.000%
2012	38	-1.07E+03	1.05E+03	-1.87E+01	0.00E+00	0.00E+00	2.16E-02	0.00E+00	1.47E+01	6.78E-03	7.18E-04	1.15E+02	1.19E+02	2.02E-02	0.00E+00	1.16E-01	1.91E-02	**-1.07E+03**	**-1.07E+03**	0.012%
2012	23	-9.51E+02	9.52E+02	6.15E-01	0.00E+00	0.00E+00	5.37E-03	0.00E+00	0.00E+00	0.00E+00	-2.98E-05	2.39E+01	2.32E+01	3.16E-02	0.00E+00	4.59E-02	6.45E-03	**-9.51E+02**	**-9.51E+02**	0.000%
2012	35	-4.24E+03	4.24E+03	3.56E+00	0.00E+00	0.00E+00	2.92E-02	0.00E+00	1.15E+01	0.00E+00	-2.85E-04	2.19E+02	2.03E+02	2.45E-01	0.00E+00	6.58E-01	1.97E-01	**-4.24E+03**	**-4.24E+03**	0.000%
2012	39	-1.66E+03	1.64E+03	-2.60E+01	5.31E-02	0.00E+00	3.70E-02	0.00E+00	0.00E+00	0.00E+00	2.98E-04	2.29E+02	2.54E+02	5.20E-01	0.00E+00	1.90E-01	4.20E-02	**-1.66E+03**	**-1.66E+03**	0.000%
2012	21	-2.85E+02	2.82E+02	-2.95E+00	0.00E+00	0.00E+00	9.32E-03	0.00E+00	0.00E+00	1.68E-04	9.84E-06	4.14E+01	4.43E+01	8.69E-02	0.00E+00	5.40E-02	8.68E-03	**-2.85E+02**	**-2.85E+02**	0.005%
2012	27	-7.43E+02	7.38E+02	-4.66E+00	3.43E-02	0.00E+00	7.33E-02	0.00E+00	4.88E-02	0.00E+00	4.09E-06	3.30E+02	3.33E+02	9.30E-01	0.00E+00	2.83E-01	8.09E-02	**-7.43E+02**	**-7.43E+02**	0.000%
2012	34	-2.20E+02	2.45E+02	2.55E+01	0.00E+00	0.00E+00	4.08E-03	0.00E+00	1.92E+01	0.00E+00	-1.11E-03	5.99E+01	1.49E+01	7.54E-02	0.00E+00	3.27E-01	6.33E-02	**-2.20E+02**	**-2.20E+02**	0.000%
2012	20	-3.84E+02	3.84E+02	1.49E-01	0.00E+00	0.00E+00	1.20E-02	0.00E+00	0.00E+00	0.00E+00	-2.80E-05	4.51E+01	4.49E+01	1.08E-01	0.00E+00	4.48E-02	1.08E-02	**-3.84E+02**	**-3.84E+02**	0.001%
2012	33	-2.36E+02	2.61E+02	2.44E+01	1.71E-01	0.00E+00	3.16E-03	0.00E+00	1.52E+01	0.00E+00	-1.23E-03	6.84E+01	2.82E+01	7.05E-02	0.00E+00	3.63E-01	7.60E-02	**-2.36E+02**	**-2.36E+02**	0.000%
2012	32	-1.73E+03	1.75E+03	1.96E+01	1.18E-01	0.00E+00	4.15E-02	2.61E+00	4.95E+01	0.00E+00	-1.82E-03	2.66E+02	1.93E+02	3.94E-01	0.00E+00	1.13E+00	3.84E-01	**-1.73E+03**	**-1.73E+03**	0.000%
2012	22	-3.51E+02	3.36E+02	-1.47E+01	1.37E-01	0.00E+00	2.58E-02	0.00E+00	0.00E+00	0.00E+00	8.17E-05	6.05E+01	7.49E+01	1.80E-01	0.00E+00	4.58E-02	2.03E-02	**-3.51E+02**	**-3.51E+02**	0.000%
2012	26	-1.16E+02	1.17E+02	1.06E+00	0.00E+00	0.00E+00	1.44E-03	0.00E+00	0.00E+00	0.00E+00	-2.70E-05	4.38E+00	3.31E+00	1.19E-02	0.00E+00	6.72E-03	2.31E-03	**-1.16E+02**	**-1.16E+02**	0.000%
2012	25	-2.46E+02	2.48E+02	1.94E+00	4.17E-01	0.00E+00	5.43E-03	0.00E+00	3.83E-02	0.00E+00	-6.03E-05	1.78E+01	1.54E+01	6.67E-02	0.00E+00	2.42E-02	9.66E-03	**-2.46E+02**	**-2.46E+02**	0.000%
2013	1	-3.49E+02	3.50E+02	6.33E-01	0.00E+00	0.00E+00	3.67E-03	0.00E+00	1.34E+01	7.20E-04	-3.30E-04	4.47E+01	3.07E+01	1.34E-02	0.00E+00	3.47E-02	1.15E-02	**-3.49E+02**	**-3.49E+02**	0.000%
2013	38	-6.65E+02	6.54E+02	-1.07E+01	0.00E+00	0.00E+00	1.52E-02	0.00E+00	7.36E+00	3.15E-02	-2.82E-03	7.07E+01	7.40E+01	1.07E-02	0.00E+00	1.58E-02	6.35E-03	**-6.65E+02**	**-6.65E+02**	0.013%
2013	23	-5.58E+02	5.58E+02	-3.39E-01	0.00E+00	0.00E+00	3.96E-03	0.00E+00	0.00E+00	5.95E-04	-1.52E-04	1.29E+01	1.32E+01	1.32E-02	0.00E+00	6.30E-03	3.55E-03	**-5.58E+02**	**-5.58E+02**	0.002%
2013	35	-2.58E+03	2.58E+03	7.31E-01	0.00E+00	0.00E+00	2.07E-02	0.00E+00	7.16E+00	0.00E+00	-2.31E-04	1.28E+02	1.20E+02	1.74E-01	0.00E+00	1.97E-01	1.07E-01	**-2.58E+03**	**-2.58E+03**	0.000%
2013	39	-9.73E+02	9.70E+02	-3.27E+00	1.95E-01	0.00E+00	2.65E-02	0.00E+00	0.00E+00	3.19E-04	-3.92E-04	1.27E+02	1.30E+02	3.14E-01	0.00E+00	4.17E-02	1.78E-02	**-9.73E+02**	**-9.73E+02**	0.001%
2013	21	-1.90E+02	1.87E+02	-3.67E+00	0.00E+00	0.00E+00	6.57E-03	0.00E+00	0.00E+00	2.79E-03	-5.65E-04	2.51E+01	2.87E+01	4.99E-02	0.00E+00	8.01E-03	3.06E-03	**-1.90E+02**	**-1.90E+02**	0.007%
2013	27	-5.14E+02	5.12E+02	-1.53E+00	1.19E-01	0.00E+00	5.20E-02	0.00E+00	4.27E-02	0.00E+00	-3.34E-04	2.06E+02	2.07E+02	6.09E-01	0.00E+00	8.06E-02	3.72E-02	**-5.14E+02**	**-5.14E+02**	0.002%
2013	34	-1.52E+02	1.68E+02	1.60E+01	0.00E+00	0.00E+00	2.85E-03	0.00E+00	1.29E+01	0.00E+00	-7.14E-04	3.89E+01	9.96E+00	5.72E-02	0.00E+00	6.33E-02	3.05E-02	**-1.52E+02**	**-1.52E+02**	0.000%
2013	20	-2.69E+02	2.66E+02	-3.04E+00	0.00E+00	0.00E+00	8.42E-03	0.00E+00	0.00E+00	0.00E+00	5.75E-05	2.78E+01	3.08E+01	5.64E-02	0.00E+00	1.08E-02	5.37E-03	**-2.69E+02**	**-2.69E+02**	0.000%
2013	33	-1.71E+02	1.87E+02	1.60E+01	5.11E-01	0.00E+00	2.28E-03	0.00E+00	1.08E+01	0.00E+00	-8.60E-04	4.72E+01	1.99E+01	5.98E-02	0.00E+00	7.59E-02	3.82E-02	**-1.71E+02**	**-1.71E+02**	0.000%
2013	32	-1.32E+03	1.33E+03	1.31E+01	3.59E-01	0.00E+00	3.08E-02	3.17E+00	3.87E+01	0.00E+00	-1.33E-03	1.98E+02	1.42E+02	3.37E-01	0.00E+00	3.84E-01	2.58E-01	**-1.32E+03**	**-1.32E+03**	0.000%
2013	22	-2.60E+02	2.54E+02	-6.16E+00	4.18E-01	0.00E+00	1.93E-02	0.00E+00	0.00E+00	1.29E-05	5.44E-06	4.26E+01	4.82E+01	1.45E-01	0.00E+00	2.03E-02	1.22E-02	**-2.60E+02**	**-2.60E+02**	0.001%
2013	26	-8.86E+01	8.95E+01	8.72E-01	0.00E+00	0.00E+00	1.08E-03	0.00E+00	0.00E+00	0.00E+00	-2.33E-05	3.38E+00	2.49E+00	1.06E-02	0.00E+00	2.31E-03	1.63E-03	**-8.86E+01**	**-8.86E+01**	0.000%
2013	25	-1.94E+02	1.96E+02	1.42E+00	4.43E-01	0.00E+00	4.11E-03	0.00E+00	3.41E-02	0.00E+00	-4.93E-05	1.38E+01	1.19E+01	5.63E-02	0.00E+00	9.66E-03	6.24E-03	**-1.94E+02**	**-1.94E+02**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 10. Mass Balance for PCB-167

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2014	1	-3.62E+02	3.63E+02	9.84E-01	0.00E+00	0.00E+00	3.53E-03	0.00E+00	1.29E+01	1.00E-04	-1.39E-04	4.49E+01	3.10E+01	1.37E-02	0.00E+00	1.15E-02	1.32E-02	**-3.62E+02**	**-3.62E+02**	0.000%
2014	38	-6.61E+02	6.65E+02	3.57E+00	0.00E+00	0.00E+00	1.44E-02	0.00E+00	7.44E+00	2.90E-02	-1.33E-03	7.50E+01	6.40E+01	1.38E-02	0.00E+00	5.20E-03	1.23E-02	**-6.61E+02**	**-6.61E+02**	0.005%
2014	23	-5.52E+02	5.52E+02	-1.53E-01	0.00E+00	0.00E+00	3.63E-03	0.00E+00	0.00E+00	1.09E-03	-6.30E-05	1.19E+01	1.20E+01	1.78E-02	0.00E+00	3.49E-03	5.93E-03	**-5.52E+02**	**-5.52E+02**	0.001%
2014	35	-2.56E+03	2.56E+03	1.73E+00	0.00E+00	0.00E+00	1.95E-02	0.00E+00	7.29E+00	0.00E+00	-1.43E-04	1.22E+02	1.13E+02	1.79E-01	0.00E+00	1.07E-01	1.14E-01	**-2.56E+03**	**-2.56E+03**	0.000%
2014	39	-9.62E+02	9.62E+02	-1.58E-01	1.71E-01	0.00E+00	2.42E-02	0.00E+00	0.00E+00	1.05E-03	-3.57E-04	1.23E+02	1.23E+02	3.14E-01	0.00E+00	1.75E-02	3.58E-02	**-9.62E+02**	**-9.62E+02**	0.000%
2014	21	-1.86E+02	1.85E+02	-4.12E-01	0.00E+00	0.00E+00	6.27E-03	0.00E+00	0.00E+00	3.59E-03	-2.08E-04	2.59E+01	2.63E+01	5.23E-02	0.00E+00	2.86E-03	6.77E-03	**-1.86E+02**	**-1.86E+02**	0.003%
2014	27	-5.02E+02	5.02E+02	1.48E-01	1.06E-01	0.00E+00	4.80E-02	0.00E+00	4.03E-02	4.97E-05	-3.97E-04	1.86E+02	1.86E+02	5.53E-01	0.00E+00	3.69E-02	6.18E-02	**-5.02E+02**	**-5.02E+02**	0.001%
2014	34	-1.46E+02	1.62E+02	1.58E+01	0.00E+00	0.00E+00	2.73E-03	0.00E+00	1.29E+01	0.00E+00	-5.34E-04	3.91E+01	1.04E+01	5.49E-02	0.00E+00	3.05E-02	4.47E-02	**-1.46E+02**	**-1.46E+02**	0.000%
2014	20	-2.60E+02	2.61E+02	8.07E-01	0.00E+00	0.00E+00	8.06E-03	0.00E+00	0.00E+00	0.00E+00	-2.90E-05	2.88E+01	2.80E+01	5.56E-02	0.00E+00	5.38E-03	8.49E-03	**-2.60E+02**	**-2.60E+02**	0.001%
2014	33	-1.65E+02	1.79E+02	1.46E+01	5.16E-01	0.00E+00	2.21E-03	0.00E+00	1.11E+01	0.00E+00	-6.24E-04	4.66E+01	2.03E+01	5.39E-02	0.00E+00	3.82E-02	5.78E-02	**-1.65E+02**	**-1.65E+02**	0.000%
2014	32	-1.35E+03	1.36E+03	8.15E+00	5.11E-01	0.00E+00	3.01E-02	3.28E+00	4.31E+01	0.00E+00	-7.53E-04	1.98E+02	1.42E+02	3.32E-01	0.00E+00	2.58E-01	3.47E-01	**-1.35E+03**	**-1.35E+03**	0.000%
2014	22	-2.64E+02	2.60E+02	-3.84E+00	4.11E-01	0.00E+00	1.89E-02	0.00E+00	0.00E+00	0.00E+00	1.99E-06	4.53E+01	4.86E+01	1.38E-01	0.00E+00	1.22E-02	3.37E-02	**-2.64E+02**	**-2.64E+02**	0.000%
2014	26	-9.07E+01	9.14E+01	6.79E-01	0.00E+00	0.00E+00	1.04E-03	0.00E+00	0.00E+00	0.00E+00	-1.86E-05	3.32E+00	2.64E+00	8.63E-03	0.00E+00	1.63E-03	3.00E-03	**-9.07E+01**	**-9.07E+01**	0.000%
2014	25	-2.07E+02	2.08E+02	1.67E+00	8.60E-02	0.00E+00	4.01E-03	0.00E+00	3.28E-02	0.00E+00	-3.54E-05	1.36E+01	1.17E+01	5.02E-02	0.00E+00	6.24E-03	1.30E-02	**-2.07E+02**	**-2.07E+02**	0.000%
2015	1	-2.67E+02	2.68E+02	3.70E-01	0.00E+00	0.00E+00	3.38E-03	0.00E+00	8.43E+00	2.01E-04	-8.60E-06	3.35E+01	2.47E+01	9.69E-03	0.00E+00	1.32E-02	5.71E-02	**-2.67E+02**	**-2.67E+02**	0.000%
2015	38	-4.95E+02	4.92E+02	-3.45E+00	0.00E+00	0.00E+00	1.31E-02	0.00E+00	3.94E+00	5.19E-02	6.23E-05	5.04E+01	4.99E+01	7.59E-03	0.00E+00	1.23E-02	6.16E-02	**-4.95E+02**	**-4.95E+02**	0.007%
2015	23	-4.23E+02	4.23E+02	-1.95E-01	0.00E+00	0.00E+00	3.21E-03	0.00E+00	0.00E+00	3.35E-04	-3.52E-07	8.57E+00	8.76E+00	1.57E-02	0.00E+00	5.93E-03	1.70E-02	**-4.23E+02**	**-4.23E+02**	0.001%
2015	35	-1.96E+03	1.96E+03	-2.20E+00	0.00E+00	0.00E+00	1.70E-02	0.00E+00	5.16E+00	0.00E+00	-2.11E-05	8.61E+01	8.31E+01	1.46E-01	0.00E+00	1.14E-01	2.49E-01	**-1.96E+03**	**-1.96E+03**	0.000%
2015	39	-7.37E+02	7.34E+02	-3.73E+00	1.46E-01	0.00E+00	2.11E-02	0.00E+00	0.00E+00	3.01E-03	8.24E-06	9.27E+01	9.61E+01	2.70E-01	0.00E+00	3.58E-02	9.54E-02	**-7.37E+02**	**-7.37E+02**	0.001%
2015	21	-1.42E+02	1.41E+02	-9.99E-01	0.00E+00	0.00E+00	5.41E-03	0.00E+00	0.00E+00	1.02E-02	-4.70E-06	2.00E+01	2.10E+01	5.00E-02	0.00E+00	6.76E-03	2.14E-02	**-1.42E+02**	**-1.42E+02**	0.004%
2015	27	-3.85E+02	3.83E+02	-1.73E+00	8.59E-02	0.00E+00	4.05E-02	0.00E+00	2.66E-02	2.60E-05	-2.54E-05	1.35E+02	1.36E+02	4.79E-01	0.00E+00	6.18E-02	1.65E-01	**-3.85E+02**	**-3.85E+02**	0.001%
2015	34	-1.12E+02	1.23E+02	1.08E+01	0.00E+00	0.00E+00	2.31E-03	0.00E+00	9.91E+00	0.00E+00	-4.33E-04	2.86E+01	7.92E+00	4.25E-02	0.00E+00	4.47E-02	8.95E-02	**-1.12E+02**	**-1.12E+02**	0.000%
2015	20	-2.00E+02	2.00E+02	-6.75E-02	0.00E+00	0.00E+00	6.86E-03	0.00E+00	0.00E+00	0.00E+00	-1.44E-05	2.16E+01	2.16E+01	4.76E-02	0.00E+00	8.49E-03	2.35E-02	**-2.00E+02**	**-2.00E+02**	0.000%
2015	33	-1.25E+02	1.36E+02	1.07E+01	4.35E-01	0.00E+00	1.83E-03	0.00E+00	8.59E+00	0.00E+00	-5.10E-04	3.38E+01	1.41E+01	4.45E-02	0.00E+00	5.78E-02	1.15E-01	**-1.25E+02**	**-1.25E+02**	0.000%
2015	32	-1.06E+03	1.07E+03	2.31E+00	3.18E-01	0.00E+00	2.54E-02	2.89E+00	3.41E+01	0.00E+00	-4.98E-04	1.50E+02	1.10E+02	2.96E-01	0.00E+00	3.47E-01	5.04E-01	**-1.06E+03**	**-1.06E+03**	0.000%
2015	22	-2.04E+02	2.01E+02	-3.56E+00	3.70E-01	0.00E+00	1.59E-02	0.00E+00	0.00E+00	4.85E-05	-6.84E-06	3.48E+01	3.78E+01	1.30E-01	0.00E+00	3.37E-02	4.42E-02	**-2.04E+02**	**-2.04E+02**	0.000%
2015	26	-6.80E+01	6.86E+01	6.49E-01	0.00E+00	0.00E+00	8.67E-04	0.00E+00	0.00E+00	0.00E+00	-1.96E-05	2.61E+00	1.96E+00	8.22E-03	0.00E+00	3.00E-03	4.32E-03	**-6.80E+01**	**-6.80E+01**	0.000%
2015	25	-1.64E+02	1.65E+02	1.06E+00	9.04E-02	0.00E+00	3.42E-03	0.00E+00	2.79E-02	0.00E+00	-3.07E-05	1.07E+01	9.51E+00	4.41E-02	0.00E+00	1.30E-02	1.66E-02	**-1.64E+02**	**-1.64E+02**	0.000%
2016	1	-2.78E+02	2.78E+02	3.05E-01	0.00E+00	0.00E+00	3.69E-03	0.00E+00	9.90E+00	4.30E-05	1.17E-03	3.63E+01	2.61E+01	1.14E-02	0.00E+00	5.69E-02	3.01E-02	**-2.78E+02**	**-2.78E+02**	0.000%
2016	38	-5.12E+02	5.10E+02	-1.31E+00	0.00E+00	0.00E+00	1.47E-02	0.00E+00	3.93E+00	7.93E-02	3.40E-03	5.37E+01	5.10E+01	8.59E-03	0.00E+00	6.16E-02	2.03E-02	**-5.12E+02**	**-5.12E+02**	0.014%
2016	23	-4.34E+02	4.34E+02	-1.30E-01	0.00E+00	0.00E+00	3.59E-03	0.00E+00	0.00E+00	2.75E-04	7.82E-04	9.38E+00	9.49E+00	1.64E-02	0.00E+00	1.70E-02	5.62E-03	**-4.34E+02**	**-4.34E+02**	0.001%
2016	35	-2.01E+03	2.01E+03	8.41E-01	0.00E+00	0.00E+00	1.92E-02	0.00E+00	5.42E+00	0.00E+00	6.24E-03	9.66E+01	9.01E+01	1.55E-01	0.00E+00	2.49E-01	1.58E-01	**-2.01E+03**	**-2.01E+03**	0.000%
2016	39	-7.50E+02	7.48E+02	-2.19E+00	1.13E-01	0.00E+00	2.40E-02	0.00E+00	0.00E+00	3.65E-04	4.92E-03	9.53E+01	9.71E+01	2.63E-01	0.00E+00	9.54E-02	3.61E-02	**-7.50E+02**	**-7.50E+02**	0.001%
2016	21	-1.50E+02	1.49E+02	-7.18E-01	0.00E+00	0.00E+00	6.17E-03	0.00E+00	0.00E+00	1.04E-02	1.34E-03	2.10E+01	2.17E+01	4.76E-02	0.00E+00	2.14E-02	8.76E-03	**-1.50E+02**	**-1.50E+02**	0.006%
2016	27	-4.03E+02	4.02E+02	-9.91E-01	6.74E-02	0.00E+00	4.61E-02	0.00E+00	3.01E-02	2.84E-05	1.09E-02	1.44E+02	1.44E+02	4.86E-01	0.00E+00	1.65E-01	8.84E-02	**-4.03E+02**	**-4.03E+02**	0.001%
2016	34	-1.18E+02	1.30E+02	1.16E+01	0.00E+00	0.00E+00	2.66E-03	0.00E+00	1.11E+01	0.00E+00	1.22E-03	3.16E+01	8.90E+00	4.94E-02	0.00E+00	8.95E-02	4.95E-02	**-1.18E+02**	**-1.18E+02**	0.000%

Subject to Attorney Client, Work Product, Deliberative Process and/or Joint Prosecution Privileges; FOIA/OPRA Exempt

Table 10. Mass Balance for PCB-167

Water Year	Region	Flux out (g/yr)	Flux in (g/yr)	Net Flux (g/yr)	NPS (g/yr)	ATM (g/yr)	Volatilization (g/yr)	PS (g/yr)	Navigation Scour (g/yr)	Mass added to prevent negative WC conc (g/yr)	Mass lost with bathymtery adjustments (negative with deposition) (g/yr)	Deposition (g/yr)	Resuspension (g/yr)	Source to water column from sediment (diffusion) (g/yr)	Account for negative mass - sed (g/yr)	Initial mass in WC (g)	Final mass in WC (g)	Flux Out Cal (g)	Flux Out Model (g)	Percent Error
2016	20	-2.10E+02	2.10E+02	1.25E-01	0.00E+00	0.00E+00	7.83E-03	0.00E+00	0.00E+00	0.00E+00	1.87E-03	2.30E+01	2.28E+01	5.02E-02	0.00E+00	2.35E-02	1.12E-02	**-2.10E+02**	**-2.10E+02**	0.000%
2016	33	-1.31E+02	1.42E+02	1.13E+01	3.46E-01	0.00E+00	2.08E-03	0.00E+00	9.57E+00	0.00E+00	1.30E-03	3.66E+01	1.53E+01	4.71E-02	0.00E+00	1.15E-01	5.99E-02	**-1.31E+02**	**-1.31E+02**	0.000%
2016	32	-1.12E+03	1.12E+03	4.23E+00	2.44E-01	0.00E+00	2.82E-02	2.63E+00	3.78E+01	0.00E+00	1.04E-02	1.65E+02	1.19E+02	3.15E-01	0.00E+00	5.04E-01	4.39E-01	**-1.12E+03**	**-1.12E+03**	0.000%
2016	22	-2.14E+02	2.11E+02	-3.32E+00	2.83E-01	0.00E+00	1.75E-02	0.00E+00	0.00E+00	0.00E+00	4.18E-03	3.67E+01	3.96E+01	1.25E-01	0.00E+00	4.42E-02	3.12E-02	**-2.14E+02**	**-2.14E+02**	0.000%
2016	26	-7.18E+01	7.25E+01	6.30E-01	0.00E+00	0.00E+00	9.53E-04	0.00E+00	0.00E+00	0.00E+00	2.22E-04	2.81E+00	2.17E+00	8.56E-03	0.00E+00	4.32E-03	3.38E-03	**-7.18E+01**	**-7.18E+01**	0.000%
2016	25	-1.72E+02	1.73E+02	1.25E+00	8.05E-02	0.00E+00	3.73E-03	0.00E+00	3.03E-02	0.00E+00	9.48E-04	1.16E+01	1.02E+01	4.25E-02	0.00E+00	1.66E-02	1.27E-02	**-1.72E+02**	**-1.72E+02**	0.000%

Appendix J-2

Newark Bay Study Area Bioaccumulation Model Calibration Report (Prepared by Warren Pinnacle Consulting, Inc.)

NEWARK BAY STUDY AREA BIOACCUMULATION MODEL CALIBRATION REPORT

February 2022



performed under contract to WSP USA

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ABBREVIATIONS USED

AE	assimilation efficiency
AFDW	ash-free dry weight
BERA	baseline ecological risk assessment
BHHRA	baseline human health risk assessment
BMF	biomagnification factor
CFT	contaminant fate and transport model
C/O	carnivore and omnivore invertebrates
CPG	Cooperating Parties Group
CTE	central-tendency exposure
DDx	DDT and DDT compounds
DEP	deposit-feeding invertebrate
DET	detritivore invertebrate
DO-Sat	dissolved-oxygen saturation
FB4	Fish Bioenergetics 4.0 models
MLLW	mean lower low water
NBSA	Newark Bay study area
NJHDG	New Jersey Harbor Dischargers Group
NLOC	non-lipid organic carbon
NLOM	non-lipid organic matter
LPRSA	Lower Passaic River study area
K_{OW}	octanol-water partition coefficient
OC	organic carbon
PCBs	polychlorinated biphenyls
Tetra CB	tetrachlorobiphenyls
TPCB	total polychlorinated biphenyls
SEM	standard error of the mean
SPAF	species predictive accuracy factor
TCDD	tetrachlorodibenzo-*p*-dioxin
RME	reasonable maximum exposure

INTRODUCTION

This document presents the bioaccumulation model developed for the Newark Bay Study Area (NBSA, Figure 1). The model is an extension of the bioaccumulation model developed by Arnot and Gobas (2004), with details related to formulation of the underlying model equations provided therein. Differences from that model include use of an alternative bioenergetics model and implementation of an explicit migration routine to account for species that are on site for only a portion of their life history.

TECHNICAL DESCRIPTION OF THE MODEL

CODE

The Arnot and Gobas model (2004) forms the basis for the NBSA modeling effort. Calibration was performed using a steady-state model that was then tested using a time-varying (kinetic) model code. The original model code was written for the Lower Passaic River Study area (LPRSA) by the Cooperating Parties Group (Windward Environmental, DRAFT 2021) using the R platform with Microsoft Excel based inputs. This code was modified for NBSA to account for alternative species and migration.

Growth and consumption rates within the model are estimated using meta models derived from the Fish Bioenergetics 4 suite of models (Deslauriers et al. 2017). The selected models and assumptions used are characterized within the "Model Development" section of this document. Additionally, an empirical approach, using a biomagnification factor (BMF) that relates tissue concentrations to water column exposures, was used for modeling softshell clam within NBSA.

MODELED CHEMICALS

The Baseline Ecological Risk assessment (BERA) (Glenn Springs Holdings, Inc. 2019a) shows that ecological risk is dominated by exposure to 2,3,7,8-TCDD. The Baseline Human Health Risk assessment (BHHRA) (Glenn Springs Holdings, Inc. 2019b) states that "Consumption of fish or crab represents the primary source of risk to human health in the NBSA." Further evaluation of the BHHRA suggests that 2,3,7,8-TCDD and Tetra CB are the primary contributors of risk for these endpoints. The human-health endpoints evaluated were Fish RME Cancer, Fish RME Non-cancer, Fish CTE Non-cancer, Crab RME Cancer, Crab RME Non-cancer, and Crab CTE Non-cancer. Furthermore, regression analysis of biotic tissue indicates that risks for other PCDD/F, PCB-126, and non-dioxin-like PCBs can be estimated from 2,3,7,8-TCDD and Tetra CB concentrations in fish tissue (Figure 2 and Figure 3).

Based on the preceding drivers of ecological risk and human-health risk the NBSA bioaccumulation model initially estimated tissue concentrations for Tetra CB and 2,3,7,8-TCDD. Chemical exposure concentrations for Tetra CB and 2,3,7,8-TCDD in the water column and sediment were included in the model based on values calculated by the NBSA contaminant fate and transport (CFT) model (HDR 2021).

In the second-round of model calibration (after receiving final CFT model results in October of 2021) DDx was included in the NBSA bioaccumulation model due to human health and ecological risk. Total 4,4'-DDx was modeled, comprising the sum of 4,4'-DDT, 4,4'-DDD, and 4,4-DDE. The best overall calibration results were obtained by calibrating to all three chemicals simultaneously; the addition of 4,4'-DDx had very little impact on the quality of calibration for 2,3,7,8-TCDD and Tetra CB.

MODEL DEVELOPMENT

SPATIAL DOMAIN

Three distinct bioaccumulation reaches were used to be consistent with the ecological assessment zones defined in the BERA (Glenn Springs Holdings, Inc. 2019a) (see Figure 4). The three reaches over which the NBSA bioaccumulation model was calibrated are "North," "Southeast," and "Southwest." The regularly-dredged navigation channel zone was not included in the bioaccumulation model as biotic data were not collected from this zone (Figure 4). These three bioaccumulation reaches (BERA assessment zones) were defined based on geographic considerations and features, habitat, and data distribution for the biotic datasets (Glenn Springs Holdings, Inc. 2019a, section 3.3.2).

MUDFLAT DESIGNATION

Consistent with the CPG bioaccumulation model for the Lower Passaic River, the assumed forage fish habitat area was limited to mudflats and shallow areas. For the Newark Bay Study Area, forage fish habitat was defined as model cells with a depth of less than 2 meters at MLLW (Figure 1). All mummichog (*Fundulus heteroclitus*) and striped killifish (*Fundulus majalis*) samples that were analyzed for chemical contamination were collected within the spatial areas that correspond to these cells. The two-meter depth is also consistent with life history data for these species (Able and Fahay 2010; Abraham 1985; Ruiz et al. 1993). Forage fish were assumed to be exclusively exposed to sediments and invertebrates within the shallow areas; however, these forage fish could be eaten by predators that would not be assumed to exclusively occupy these zones (e.g. Striped Bass).

MODELED ORGANISMS

The selection of organisms for the model spans trophic levels and feeding guilds to produce a comprehensive and representative food web. In choosing specific species to model, preference was given to those species that were heavily sampled within the study area to assist in model calibration and verification (Table 1).

The full list of feeding guilds and representative species modeled is as follows:

- Plankton
  - Phytoplankton/algae
  - Zooplankton
- Invertebrates
  - Benthic invertebrate deposit feeders (DEPs)
  - Benthic invertebrate detritivores (DETs)
  - Benthic invertebrate carnivores/omnivores (C/Os)
  - Blue crab (*Callinectes sapidus*)
  - Filter Feeder – soft-shell clam (*Mya arenaria*)
- Small forage fish
  - Mummichog (*Fundulus heteroclitus*)/striped killifish (*Fundulus majalis*)
  - Atlantic silverside (*Menidia menidia*)
- Benthic omnivorous/invertivorous fish – summer flounder (*Paralichthys dentatus*)
- Invertivorous fish – white perch (*Morone americana*)
- Piscivorous fish
  - American eel (*Anguilla rostrate*)
  - Bluefish (*Pomatomus saltatrix*)
  - Striped bass (*Morone saxatilis*)

TABLE 1. BIOTIC SAMPLES USED TO CALIBRATE THE NBSA BIOACCUMULATION MODEL BY SPECIES AND LOCATION

Species	North	Southeast	Southwest	Total
Atlantic Silverside	1	3	3	**7**
Soft-Shell Clam	8	4	6	**18**
Blue crab	12	12	13	**37**
Bluefish	3	13	2	**18**
Large American eel	8	7	7	**22**
Small American eel	4	5	5	**14**
Small forage fish	8	3	6	**17**
Striped Bass			18	**18**
Summer Flounder	8	8	10	**26**
White perch	15	15	15	**45**

While winter flounder were also sampled in NBSA (n=10), all of these samples were juvenile (<22 cm). Furthermore, the adult winter-flounder feeding guild is already well represented by the summer flounder samples-- these two species have very similar diets. For these reasons, a winter flounder compartment was not added as a unique category within the bioaccumulation model.

As was done for the CPG LPRSA bioaccumulation model, the American eel category was split into large and small size classes. These two groups have different life histories and assumed dietary compositions. As was the case for that model, those American eels greater than 50 cm in size are classified as "Large American eel." For other (non-eel) species a single model compartment was used to calculate bioaccumulation estimates. To calibrate the model to available data, the weights and lipid contents of each species were set to the central tendency of collected data on a reach-by-reach basis.

MIGRATION

Many of the species found within NBSA study area move into and out of the study area seasonally. To account for this, modeled organisms were moved into and out of NBSA based on the organisms' life histories and their expected residence time within Newark Bay (see Appendix E). Based on life histories, a series of "representative off-site locations" were defined to calculate on-site and off-site exposure to contaminants in migratory species (Figure 5).

For each off-site location, a model simulation runs independently and organisms are moved into and out of each segment each year based on their estimated residence times. To calculate migration in the kinetic code (the time varying code) when organisms move from one segment to the next, their chemical concentrations move with them.

Off-site contributions were also estimated using the steady-state model formulation, which was the primary model used for calibration. A series of equations were derived to estimate steady-state concentrations for an organism migrating through multiple spatial compartments (Equations 1-5). These equations take into account the time to equilibrium for each species (governed by their predicted elimination rate) and the order and timing of their migration. Using these factors, the method assigns a "weight" to the steady-state concentration calculated for

each compartment. Results from these equations were verified against a number of kinetic-model predictions reflecting different migration patterns and schedules (Figure 6 to Figure 9). The steady-state-migration model predictions were also verified by running the bioaccumulation model through the kinetic model (that explicitly included migration) following the calibration step.

$$SS_{YearEnd} = \left(\sum_{n\,comp}^{i=1} SS_{comp}\, Weight_{comp}\right) \quad \text{Equation 1}$$

$$Weight_{comp} = Weight_{Remain}\left(\left(1 - 0.5^{Days_{comp}}\right)\Big/ HalfEquil\right) \quad \text{Equation 2}$$

$$Weight_{Remain} = Weight_{Remain\_prev\_comp} - Weight_{comp} \quad \text{Equation 3}$$

$$HalfEquil = \ln(2)/Elim_{comp} \quad \text{Equation 4}$$

$$SS_{Equil} = SS_{YearEnd}\Big/\left(1 - Weight_{Remain,\,YearEnd}\right) \quad \text{Equation 5}$$

where:

$SS_{YearEnd}$ = steady-state chemical concentration in tissue estimate at the end of one year,(g/wet weight)
SS_{comp} = steady-state concentration in a single location (compartment), (g/wet weight)
$Days_{comp}$ = days spent in the year in a single location (days)
$Elim_{comp}$ = elimination rate for organism in compartment (1/days)
SS_{Equil} = steady-state concentration estimate at the end of multiple years (g/wet weight)
$Weight_{Remain}$ = the fractional weight to the combined steady-state calculation from the given spatial compartment. The $Weight_{Remain\_previous\ compartment}$ is 1.0 at the start of calculation.

For simplicity, simulations of "representative offsite locations" south of NBSA are assumed to have the same set of representative species and trophic guilds. Lower Passaic River and Hackensack reaches were only relevant for white perch migrations; the model was only run for white perch and its prey in these reaches.

Blue-crab life histories differ based on the sex of the organism. 75% of collected blue crabs were males. (Collected crabs were generally adults, with an average reported length of 13.9 cm.) Within these model simulations, females are assumed to move out of NBSA to the ocean-estuary interface during the winter migration and then to return to NBSA after that time. Males and females are not modeled separately within NBSA. Instead, 25% of the crabs are assumed to undergo migration and when these crabs return to NBSA, a weighted average of migrating and non-migrating crabs within the study area is calculated.

White perch captured in the North and Southeast study areas are assumed to comprise a different population than the white perch captured in the Southwest study area. There were several lines of evidence used to make this determination.

- 2,3,7,8-TCDD concentrations in these groups are different relative to sediment (The Biota-Sediment Accumulation Factor or BSAF was calculated at 0.2 for the Southwest compared to 1.0 for the

Southeast and 0.9 for the North. These are lipid-normalized BSAFs calculated using a one-mile radius between tissue samples and sediment samples.) This same general contamination pattern also applies to Total PCB and other contaminants.

- The mean wet weight of the captured white perch in these reaches are different (North and Southeast have mean weight of 127 and 130 grams respectively; white perch in the south have a mean wet weight of 206 g).
- A principal-component analysis of contaminants within the two groups also provides evidence that these fish have been exposed to different sets of contaminants through their life history (Figure 10).
- There is literature support for a multiple-contingent life history for white perch in the study area (Kerr et al. 2009; Secor and Gallagher 2016).

Based on these lines of evidence, white perch in the North and Southeast are assumed to migrate into the Lower Passaic River and Lower Hackensack representative off-site locations. White perch in the Southwest are assumed to migrate into the Arthur Kill and Kill Van Kull representative off-site locations during spawning. These life-history assumptions were made *a priori,* that is to say, prior to completing any calibration of the bioaccumulation model.

The full set of life-history assumptions underlying the migration model may be found in Appendix E of this document. Specific migration parameters used for the final model calibration may be found in the "Fixed Parameters" section.

SOFT-SHELL CLAM

The soft-shell clam (*Mya arenaria*) is an obligate suspension feeder that takes its food from the water column (Abraham and Dillon 1986; Forster and Zettler 2004; Kamermans 1994; Zwarts and Wanink 1989). The Arnot and Gobas model (2004) does include a specific equation for filter-feeding species' dietary uptake that includes the scavenging efficiency of particles absorbed from the water. However, literature sources for scavenging efficiency or examples of other model applications using this parameter were not readily available.

To keep the soft-shell clam model simple, and closely tied to observed data, a modeling approach using a biomagnification factor was used (U.S. Environmental Protection Agency 2000, 2009). Lipid-normalized clam body burdens were estimated as a function of the predicted organic-carbon normalized (OC-normalized) concentration of contaminants in near-bottom particulate matter (Equation 6). OC-normalized near bottom concentrations are assumed to be the surrogate for the soft-shell clam filter-feeding diet that is composed of near-bottom algae and near-bottom particulate matter. OC-normalized concentrations were estimated using CFT model results for the bottom of the water column. This approach is consistent with the work of Friedman and Lohmann (2014) that found correlation between soft-shell clam dioxin/furan concentrations in Newark Bay and deep-water chemical concentrations.

$$C_{lipid} = BMF(C_{food})$$ Equation 6

where:

C_{lipid} = lipid-normalized concentration of chemical in tissue of clam (ng / g lipid)
BMF = derived biomagnification factor for given chemical (ng / g lipid per ng/g OC)
C_{food} = OC-normalized concentration in near-bottom water detrital particles (ng / g OC)

The derived BMF for 2,3,7,8-TCDD was 1.315 (ng/g lipid per ng/g OC) and for Tetra CB was 4.496 (ng/g lipid per ng/g OC). Figure 11 shows calibrated-model predictions for soft-shell clam based on these values.

The derived BMF for 4,4'-DDx was 2.978 (ng/g lipid per ng/g OC). Figure 11 shows calibrated model predictions for soft-shell clam based on these values. This value was not subject to further calibration.

BIOENERGETICS

Following the approach of the CPG LPRSA bioaccumulation model (Windward Environmental DRAFT 2021), this application uses a suite of bioenergetics models provided by Fish Bioenergetics 4.0 (Deslauriers et al. 2017) to calculate consumption and growth-rate estimates for modeled species. The published bioaccumulation model (Arnot and Gobas 2004) includes simple allometric estimations for organism growth and consumption rates based on cold-water species (Sheldon et al. 1972; Thomann et al. 1992); these equations were not found to produce accurate estimates for NBSA fish species.

As was the approach in the LPRSA, Fish Bioenergetics 4.0 (FB4) is used in the following fashion

- Annual growth rates for each species are estimated based on site-specific data and literature resources.
- Growth rates are linked to FB4 to produce an energy-budget model through a one-year simulation.
- Relationships between growth, food-consumption rates, and temperature are developed from FB4 output (meta-models are derived).
- The meta-models are used to estimate growth and consumption rates as a function of temperature within the steady-state and kinetic models.

Table 2 shows the FB4 models used for the model calibration. In many cases a surrogate organism was required and these were selected on the basis of similarity of diet, growth rates, and habitat.

TABLE 2. FISH BIOENERGETICS 4.0 MODELS USED TO CALCULATE GROWTH AND CONSUMPTION RATES

Species in model	FB4 model	Surrogate Source	Reference
Atlantic Silverside	Bluegill sunfish adult	CPG LPRSA Model (forage fish)	Kitchell et al. 1974
Small forage fish	Bluegill sunfish adult	CPG LPRSA Model	Kitchell et al. 1974
Small American eel	Brown Bullhead	CPG LPRSA Model *	Hartman 2017
Blue crab	Blue Crab	*Surrogate not required*	Brylawski and Miller 2003**
Summer Flounder	Southern Flounder	Life history similarity	Burke and Rice 2002
White perch	Yellow perch adult	CPG LPRSA Model	Kitchell et al. 1977
Large American eel	Brown Bullhead	CPG LPRSA Model *	Hartman 2017
Bluefish	Largemouth Bass	Trophic guild similarity	Rice et al. 1983
Striped Bass	Striped Bass	*Surrogate not required*	Hartmart and Brandt 1995

* surrogate was selected on the basis of similar diets and growth rates
** formulation was corrected for adult crabs using Batterton and Cameron 1978; Booth and McMahon 1992; Leffler 1972.

The form of the meta-model derived is as follows:

$$C_T = e^{\mathrm{CvTa+(CvTb)T}} \qquad \text{Equation 7}$$

$$KG_T = \mathrm{KGvCa} + (KGvCb)C_T \qquad \text{Equation 8}$$

where:

C_T	=	consumption rate at a given temperature for the species (g consumed / g body-weight day)
CvTa	=	intercept of temperature vs. consumption rate relationship (ln g consumption)
CvTb	=	slope of temperature vs. consumption rate relationship
KG_T	=	growth rate at a given temperature for the species (g growth / g body-weight day)
KGvCa	=	intercept of consumption rate vs. growth relationship (g growth)
CGvCb	=	slope of consumption rate vs. growth relationship (g growth / g consumption)

Maximum consumption rates and minimum and maximum growth rates may also be defined to ensure that the meta-model does not produce predictions that are outside of the range predicted by the FB4 models used. Graphs of Equations 7 and 8 for the new bioenergetics meta-models derived for NBSA may be found in Figure 13 through Figure 15.

As shown in Figure 14 the Striped Bass model was slightly modified to avoid negative growth rates during summer months. Based on data in Coutant and Suffern (1977) negative growth will not occur in this organism until temperatures exceed 30 degrees C. As shown in Figure 15, the Blue Crab model was modified from Brylawski and Miller (2003) to account for adult crab data in Booth and McMahon (1992). The updated Blue-Crab respiration model is also consistent with data from other studies of adult-crab metabolism (Batterton and Cameron 1978; Leffler 1972).

For non-crab invertebrates, the allometric equations from the Arnot and Gobas bioaccumulation model (2004) are used as best estimates of consumption and growth rates (for deposit feeders, detritivores, and non-blue-crab carnivore/omnivores).

MODEL CALIBRATION PROCEDURE

During model production, bioaccumulation model inputs were split into two categories – "static parameters" and "uncertain parameters." Static parameters were not modified during model calibration for one of several reasons:

- The parameter has a site-specific measurement (e.g. the central tendency of fish weights per reach);
- The parameter was based on *a priori* professional judgment (e.g. migration-timeline assumptions);
- The parameter is part of another embedded model, so was kept constant for simplicity and consistency with the other model (e.g. bioenergetics meta-model parameters).

Uncertain model parameters were those remaining parameters with uncertainty in their derivation and expected model sensitivity. These parameters were examined within their range of uncertainty by an auto-calibration procedure. Chemical-exposure inputs were derived from the Contaminant Fate and Transport model and were not modified.

An auto-calibration procedure was used to calibrate to two calibration targets. The first calibration target was to minimize the species predictive accuracy factor (SPAF) for all species in the model (Windward Environmental, LLC 2005). The SPAF is defined as follows:

$$SPAF = \mathrm{MAX}\left(\frac{Predicted}{Empirical}, \frac{Empirical}{Predicted}\right) \qquad \text{Equation 9}$$

where:

$SPAF$ = species predictive accuracy factor (unitless)
$Predicted$ = predicted central tendency of tissue concentration for species and reach (ng chemical/kg wet weight)
$Empirical$ = observed central tendency of tissue concentration for species and reach (ng chemical/kg wet weight)

When SPAFs are presented in this document, to indicate whether the model is over- or under-predicting relative to the empirical average concentration, SPAFs were labeled with a plus (+) or minus (–), respectively. Therefore:

- SPAF 1.0 would be perfect prediction;
- SPAF -1.5 would be under-prediction by a factor of 1.5; and
- SPAF 1.5 would be over-prediction by a factor of 1.5.

However, when minimizing the *sum* of SPAFs, the "absolute value" was used. The calibration goal for this project was to achieve an SPAF of less than 2.0 for most species and chemicals. This means the model would have a factor-of-two accuracy in the worst case.

The second calibration target was to maximize the likelihood function for all species and reaches, assuming that observed data are log-normally distributed. The likelihood function sums the probability that each modeled result represents the mean of the log-transformed observed biotic data. This function takes into account the number of

samples in each biotic group (species by reach), and requires a better fit to a central tendency that has more sample sizes and lower variance (Kashin 2014). The likelihood function shown here is maximized by the optimizer.

$$\log LE = \sum \left[\ln \left(\sqrt{\frac{1}{2\pi\sigma^2}} \right) - n \left(\frac{(\log(pred.) - \mu))^2}{2\sigma^2} \right) \right] \quad \text{Equation 10}$$

where:

$\log LE$	=	log of the likelihood estimate – the metric to be maximized;
σ	=	standard deviation of the log-transformed data set (data for one species and reach);
log(*pred.*)	=	log-transformed model prediction;
μ	=	mean of the log-transformed data set (data for one species and reach).

Model-parameter optimization was performed using a technique called simulated annealing. This procedure allows for efficient optimization of complex systems with multiple uncertain inputs (Bertsimas and Tsitsiklis 1993; Kirkpatrick et al. 1983). The range of uncertainty that was assumed for each calibration parameter is presented below. In general, parameters were not allowed to vary outside of observed variability. Each model calibration was optimized for all three modeled chemicals simultaneously (2,3,7,8-TCDD, Tetra-CB, and 4,4'-DDx).

Two model calibrations were performed: allowing the "octanol-water partition coefficient" (K_{OW}) to vary, and keeping K_{OW} values constant. K_{OW} is one of the most sensitive parameters in the model, and is subject to measurement uncertainty. This parameter was modeled both ways to provide additional unique model calibrations (to help assess model uncertainty) and to examine the impact that calibrating the K_{OW} value has on final model results.

Static Parameters (not modified during calibration) included

- Exposure to chemicals (from CFT model)
- OC contents (from CFT model)
- Fish weights or lipid content (measured)
- Parameters derived from Fish Bioenergetics 4.0 models
- Migration assumptions (dates and reaches)

Uncertain Parameters included

- K_{OW} (in half of the simulations)
- Dietary assimilation efficiencies
- Invertebrate weights
- Chemical metabolism rates (especially 2,3,7,8-TCDD)
- Proportion of invertebrates per reach
- Dietary preferences

The derivation of these parameters is explored in more detail in the following sections.

STATIC PARAMETERS

PHYSICAL PARAMETERS

Physical parameters included in the model include the organic-carbon content of bottom and suspended sediment, the water temperature, and the degree of oxygen saturation in the water column. When available, these parameters were taken from the CFT model as detailed in the "Model Linkage" section below. For the steady-state model, CFT data were averaged from September 2013 to August 2015 to represent exposure prior to and during the 2014 and 2015 biotic sampling seasons.

Temperature data were also taken from the CFT model; for the steady-state calibration, May to October CFT temperatures were averaged to match temperatures during biota sampling dates.

Oxygen saturation (DO-Sat) inputs were based on water quality data from the New Jersey Harbor Dischargers Group (NJHDG) as posted in the EPA STORET database (U.S. Environmental Protection Agency 2020). Data from 2003 to 2018 were available in the database from north, central, and southeastern Newark Bay (n=921, Figure 16). As expected, these data indicate seasonality in oxygen-saturation levels. To match the temperature data used, the steady-state model calibration used DO-Sat data collected during the May-October time period. The kinetic model was run using monthly averages. A slight upward trend in DO-Sat by year was also present in the data. Because of this, DO-SAT data were averaged from 2012-2017. This time period maintains a robust number of samples (n=347) but avoids using samples collected a decade prior to biological sampling.

The steady-state model averages used for model calibration are shown in Table 3 below. For the Kinetic model, daily-average time series from the CFT model were used for physical parameters except for oxygen saturation which uses monthly averages from 2012-2017 data. Time-series plots for these variables may be found in Appendix C.

TABLE 3. PHYSICAL PARAMETERS USED IN STEADY-STATE MODEL CALIBRATION

Physical Parameters	Units	North	South-east	South-west	North	South-east	South-west
		Entire Seg.	Entire Seg.	Entire Seg.	Mud-flat	Mud-flat	Mud-flat
Organic carbon content of sediment	unitless	0.017	0.023	0.022	0.019	0.023	0.023
Organic carbon content of detrital particulate	unitless	6.3%	5.8%	5.9%	6.6%	6.0%	6.0%
Organic carbon content of near-bottom particulates	unitless	6.9%	6.4%	6.6%	7.5%	6.6%	6.8%
Mean water temperature	deg. C	20.2	20.1	19.9	20.2	20.1	19.9
Degree of oxygen saturation in the water column	fraction	0.82	0.86	0.83	0.82	0.86	0.83

CHEMICAL PARAMETERS

Chemical parameters in the model include concentrations of chemicals in bed and suspended sediments, the bioavailable concentration of chemical in water and pore waters, and the predicted concentration in algal particulates from the CFT model.

Chemical parameters that are subject to uncertainty, and that were modified in the auto calibration procedure, are the "octanol-water partition coefficient" (Log K_{OW}) and the "chemical-specific dietary-transfer efficiency." The ranges explored for these parameters are discussed in the section on uncertain model parameters below. Also, to explore calibration uncertainty and sensitivity to the Log K_{OW} parameter, separate model calibrations were produced while holding the Log K_{OW} constant at its *a priori* estimate.

The steady-state CFT model averages used for input to the bioaccumulation model calibration are shown in Table 4 and Table 5 below. Time-series plots for these variables may be found in Appendix C.

TABLE 4. CHEMICAL PARAMETERS USED IN STEADY-STATE MODEL CALIBRATION

Chemical Parameters	Units	Chem.	North	South-east	South-west	North	South-east	South-west
			Entire Seg.	Entire Seg.	Entire Seg.	Mud-flat	Mud-flat	Mud-flat
Concentration in sediment solids (CST)	ng/g dry	2,3,7,8-TCDD	0.085	0.055	0.053	0.086	0.059	0.064
Concentration in detrital particulates (CPART)	ng/g dry	2,3,7,8-TCDD	0.073	0.058	0.033	0.077	0.061	0.033
Bioavailable conc. in water (CWB)	ng/g	2,3,7,8-TCDD	7.4E-08	6.0E-08	4.2E-08	7.6E-08	6.2E-08	4.2E-08
Conc. in sediment porewater (CSD)	ng/g	2,3,7,8-TCDD	1.1E-06	3.8E-07	4.0E-07	8.0E-07	4.1E-07	4.5E-07
Conc. in near-bottom particulates (CPART_DET)	ng/g dry	2,3,7,8-TCDD	0.070	0.055	0.031	0.076	0.059	0.032
Concentration in algal particulates (CAC)	ng/g OC	2,3,7,8-TCDD	0.413	0.342	0.240	0.425	0.354	0.242
Concentration in sediment solids (CST)	ng/g dry	tetraCB	104.9	89.0	149.6	119.3	93.4	182.1
Concentration in detrital particulates (CPART)	ng/g dry	tetraCB	86.3	80.5	69.9	90.2	82.8	70.6
Bioavailable conc. in water (CWB)	ng/g	tetraCB	4.9E-04	4.6E-04	3.9E-04	5.0E-04	4.7E-04	3.9E-04
Conc. in sediment porewater (CSD)	ng/g	tetraCB	3.7E-03	1.8E-03	3.2E-03	3.2E-03	1.9E-03	3.7E-03
Conc. in near-bottom particulates (CPART_DET)	ng/g dry	tetraCB	85.05	79.04	69.08	91.30	82.36	70.74
Concentration in algal particulates (CAC)	ng/g OC	tetraCB	1017.8	965.3	810.6	1044.9	983.7	817.1

TABLE 5. 4,4'-DDX CHEMICAL PARAMETERS USED IN STEADY-STATE MODEL CALIBRATION

Chemical Parameters	Units	North	South-east	South-west	North	South-east	South-west
		Entire Seg.	Entire Seg.	Entire Seg.	Mud-flat	Mud-flat	Mud-flat
Concentration in sediment solids (CST)	ng/g dry	24.7	27.0	171.1	25.4	27.4	218.7
Concentration in detrital particulates (CPART)	ng/g dry	50.9	50.3	91.9	52.3	51.2	100.8
Bioavailable conc. in water (CWB)	ng/g	2.2E-04	2.3E-04	3.2E-04	2.3E-04	2.3E-04	3.4E-04
Conc. in sediment porewater (CSD)	ng/g	4.5E-04	3.1E-04	1.9E-03	3.7E-04	3.0E-04	2.4E-03
Conc. in near-bottom particulates (CPART_DET)	ng/g dry	50.75	50.07	91.05	53.5	51.62	101.15
Concentration in algal particulates (CAC)	ng/g OC	827.4	840.0	1188.8	836.3	845.5	1266.1

OBSERVED BIOLOGICAL PARAMETERS

To best model the central tendency of observed chemical concentrations within biota, observed organism weights, lipid fractions, and water contents for organisms were used, whenever available (Table 6, Table 7).

Whole-body lipid content for bluefish and striped bass were estimated as 2.8 times their fillet lipid content based on data in gamefish from Bevelheimer (1997). The resulting estimated whole-body lipid content of 8.44% for striped bass is consistent with other measurements of the species (Jacobs et al. 2008). The estimated lipid content for bluefish ranged from 1.7% to 4.8% by reach.

Blue crab lipid contents were estimated using the same method used to estimate whole-body chemical concentrations from discrete carcass, hepatopancreas, and muscle samples (see the section "Chemical Concentrations in Biota" below). Blue-crab percent moisture was estimated using data from Lower Passaic River.

TABLE 6. AVERAGE OBSERVED WEIGHT FOR MODELED SPECIES BY REACH

	Wet Weight in Grams (sample size)		
Species	North	Southeast	Southwest
Atlantic Silverside	5.31 (n=1)	4.19 (n=3)	4.11 (n=3)
Forage Fish	7.02 (n=8)	6.51 (n=3)	4.02 (n=6)
Small American Eel	105.6 (n=4)	153.0 (n=5)	165.0 (n=5)
Blue Crab	162.0 (n=12)	160.1 (n=12)	147.4 (n=13)
Summer Flounder	608.3 (n=8)	823.5 (n=8)	571.5 (n=10)
White Perch	129.7 (n=18)	132.8 (n=18)	215.7 (n=20)
Large American Eel	358.4 (n=8)	451.9 (n=7)	578.8 (n=7)
Bluefish	880.0 (n=3)	437.8 (n=13)	526.5 (n=2)
Striped Bass			4968 (n=18)

TABLE 7. MEAN OBSERVED AND ESTIMATED LIPID FRACTIONS AND PERCENT MOISTURE FOR MODELED SPECIES

	Fraction Lipid, Whole Body			Percent Moisture
Species	North	Southeast	Southwest	NBSA Average
Atlantic Silverside	1.4%	1.4%	1.5%	75.9%
Forage Fish	3.4%	4.3%	3.4%	73.1%
Small American Eel	3.0%	6.0%	1.7%	73.4%
Blue Crab	2.0%	2.0%	1.7%	79.0%
Summer Flounder	0.6%	1.8%	1.9%	76.9%
White Perch	2.9%	1.6%	3.4%	75.2%
Large American Eel	5.4%	9.1%	8.9%	71.4%
Bluefish	3.2%	4.8%	1.7%	77.1%
Striped Bass			8.4%	75.8%

The NBSA-wide average percent moisture was used for all species and reaches as there was little variation in measurements and the model is not sensitive to this parameter.

MIGRATION INPUTS

Migration inputs were generally set *a priori* based on the life-history analysis shown in Appendix E of this document. The full set of migration dates and compartments may be found in Table 8 below. The spatial domain for representative offsite locations is shown in Figure 5.

The one species for which migration inputs were calibrated was the striped-bass category. After initial calibration, striped bass were modified to have a 30-day residence time in NBSA (prior to collection), up from 15 days. This change was made for two reasons. First model predictions for chemicals in striped bass were too low. Second, it was discovered that the goal of striped-bass collection was to collect fish after they had been in the system for approximately one month. Striped bass were collected from Newark Bay from 27 April through 8 May, 2015. It was noted that there were some striped bass in the bycatch of the April 2nd, 2015 white perch sampling event. Based on these lines of evidence, the period of residence prior to collection for striped bass in NBSA was increased from two weeks to four weeks.

TABLE 8. MIGRATION ASSUMPTIONS FOR NEWARK BAY MIGRATORY SPECIES

Species	Segment in Model	Arrival	Departure	Duration
Atlantic Silverside	Newark Bay Segment	16-Apr	15-Dec	244
Atlantic Silverside	Arthur Kill/Kill Van Kull	16-Dec	15-Jan	31
Atlantic Silverside	Ocean/Estuary Interface	16-Jan	15-Mar	60
Atlantic Silverside	Arthur Kill/Kill Van Kull	16-Mar	14-Apr	30
Blue Crab (female)	Newark Bay Segment	2-May	30-Oct	182
Blue Crab (female)	Arthur Kill/Kill Van Kull	31-Oct	24-Nov	25
Blue Crab (female)	Ocean/Estuary Interface	25-Nov	5-Apr	133
Blue Crab (female)	Arthur Kill/Kill Van Kull	6-Apr	30-Apr	25
Summer Flounder	Newark Bay Segment	31-May	1-Oct	124
Summer Flounder	Arthur Kill/Kill Van Kull	2-Oct	15-Oct	14
Summer Flounder	Ocean/Estuary Interface	16-Oct	15-May	213
Summer Flounder	Arthur Kill/Kill Van Kull	16-May	29-May	14
White Perch (North, SE)	Newark Bay Segment	1-Nov	30-Apr	181
White Perch (North, SE)	Hackensack/Lower Passaic	1-May	31-Oct	184
White Perch (Southwest)	Newark Bay Segment	1-Nov	30-Apr	181
White Perch (Southwest)	Arthur Kill/Kill Van Kull	1-May	31-Oct	184
Bluefish	Newark Bay Segment	6-May	5-Sep	123
Bluefish	Arthur Kill/Kill Van Kull	6-Sep	12-Sep	7
Bluefish	Ocean/Estuary Interface	13-Sep	19-Sep	7
Bluefish	Ocean	20-Sep	20-Apr	214
Bluefish	Ocean/Estuary Interface	21-Apr	27-Apr	7
Bluefish	Arthur Kill/Kill Van Kull	28-Apr	4-May	7
Striped Bass	Newark Bay Segment	5-Apr	28-Aug	146
Striped Bass	Arthur Kill/Kill Van Kull	29-Aug	12-Sep	15
Striped Bass	Ocean/Estuary Interface	13-Sep	27-Sep	15
Striped Bass	Ocean	28-Sep	4-Mar	159
Striped Bass	Ocean/Estuary Interface	5-Mar	19-Mar	15
Striped Bass	Arthur Kill/Kill Van Kull	20-Mar	3-Apr	15

MODEL PARAMETERS (UNCERTAIN)

CHEMICAL PARAMETERS

In half of the auto-calibration simulations, the octanol-water partition coefficient (Log K_{OW}) was held constant at its *a priori* best estimate. In the other half, the Log K_{OW} was allowed to vary within a range of uncertainty as defined below.

Octanol-water partition coefficient 2,3,7,8-TCDD

The Log K_{OW} for 2,3,7,8-TCDD was set to 6.65 within the CFT model. For the Log-K_{OW} constant simulations in the bioaccumulation model, this was the value chosen. Based on research performed by Windward Environmental, an acceptable range of Log K_{OW} for 2,3,7,8-TCDD was defined as a range of 5.38-8.93 (Mackay et al. 2006). To avoid sampling the extremes of this distribution, the range of uncertainty for the Log K_{OW} for 2,3,7,8-TCDD was set at 6.0 to 6.8 using a triangular distribution with the most-likely value at 6.65.

Octanol-water partition coefficient Tetra CB

The Log K_{OW} for Tetra CB was set to 6.0 within the CFT model. For the Log-K_{OW} constant bioaccumulation simulations, this was the value chosen. Based on work performed by Windward Environmental, an acceptable range of Log K_{OW} for Tetra CB was defined as a range of 5.38-6.65 (Hawker and Connell 1988; Hydroqual 2007). This range was used for auto calibration using a triangular distribution with the most-likely value at 6.0.

Octanol-water partition coefficient 4,4'-DDx

The Log K_{OW} for 2,3,7,8-TCDD was set to 6.57 within the CFT model (Anchor QEA 2019 Table 3-2). For the *a priori* model validation and the Log-K_{OW} constant simulations, this was the value chosen (6.57). The range of uncertainty for this parameter was defined as a range of 6.18-6.79 based on the range of Log-K_{OW} estimates for 4,4'-DDx components (4,4'-DDD at 6.18; 4,4'DDE at 6.79; 4,4'DDT at 6.73) (Louis Berger Group, Inc. 2014 Appendix BIII, Table 3-7).

Fish Dietary Transfer Efficiency 2,3,7,8-TCDD

In a departure from the original Arnot and Gobas model, the dietary transfer efficiency or E_D was decoupled from an estimation based on a regression to K_{OW}. This was due to the wide range of uncertainty and variability within E_D values measured at different K_{OW} values (Arnot and Gobas 2004, Supplemental Figure S.3). The dietary transfer efficiency of 2,3,7,8-TCDD remains an uncertain parameter. The range of E_D values for 2,3,7,8-TCDD was set to 0.10 – 0.76 with a most likely value of 0.49 (Heiden et al. 2005; Muir et al. 1986, 1992; Tietge et al. 1998).

Fish Dietary Transfer Efficiency Tetra CB

Similarly, the E_D value for Tetra CB was defined based on literature search, primarily performed by Windward Environmental. The range of E_D values for Tetra CB was set to 0.34 – 0.83 with a most likely value of 0.57 (Fadaei et al. 2017).

Fish Dietary Transfer Efficiency 4,4'-DDx

The dietary absorption efficiency (AE) for DDx has generally been estimated to be relatively high. Three studies were used to evaluate this parameter:

- (Wang and Wang 2005) found that the dietary absorption efficiency (AE) of DDT was 72-99% in fish;
- (Bayen et al. 2005) found that virtually all p,p'-DDT in pellets bioaccumulated in fish and estimated an uptake efficiency of 98%
- (Konwick et al. 2006) as cited in (Arnot and Quinn 2015) estimated an assimilation efficiency of 67% for p,p'-DDD in rainbow trout.

For this model, the average of those three studies was used as the *a priori* estimate or 84%. Within model calibration, this parameter was allowed to vary from 67% to 99%.

NLOC Proportionality (sorption) αPOC

For sorption to non-lipid organic carbon (NLOC), Arnot and Gobas' paper (2004) states "Based on a literature survey . . . αPOC can be estimated as 0.35 (with error bars equivalent to a factor of 2.5) for chemicals that range in log KOW from 1.5 to 7.5." Based on this, a triangular distribution was used for αPOC with a range to 0.14 to 0.875 with the most likely value set to 0.35.

NLOM proportionality (sorption) β

For sorption to non-lipid organic matter (NLOM) Arnot and Gobas' paper (2004) states "Based on previous work . . . a value of approximately 0.035 is a reasonable first estimate of β; however, further research is required to better characterize β". Based on this, a triangular distribution was used for β with a range to 0.020 to 0.070 with the most likely value set to 0.035 (Gobas et al. 1999).

Uncertain Biological Parameters

Metabolism Rates

Fish and invertebrates will metabolize 2,3,7,8-TCDD, though rates of metabolism are uncertain and depend on organism weight, water temperature, and species. To characterize metabolism of 2,3,7,8-TCDD in modeled species, a published database of metabolism rates (Arnot et al. 2008) was used to derive a confidence interval. Reported metabolism rates were adjusted for the observed weights of species using the equation presented in that paper (Arnot et al, 2008, p 2264). In most cases, extrapolation of data from surrogate species was required to derive a best estimate and range of uncertainty. Data from guppy and minnow are used to represent small forage fish, data from carp are used to represent bottom fish, and data from rainbow trout are used to represent game fish. The bioaccumulation model input is the estimated metabolism rate at 15 deg. C; the model then adjusts for water temperature impacts.

Small Forage Fish Metabolism 2,3,7,8-TCDD

The average metabolism rate for forage fish in the Arnot database was 0.82% (K_M in percent/day normalized to a 10 g fish at 15 deg. C). The minimum and maximum of the 95th percentiles defined were 0.16% and 4.37% (K_M %/day normalized). When these values are adjusted for the mean forage fish weight of 5.9 grams, the minimum, most likely, and maximum values become 0.18%, 0.93%, and 4.99% (K_M %/day).

Atlantic Silverside Metabolism 2,3,7,8-TCDD

As above, forage fish data were used to estimate metabolism rates for Atlantic silverside. When these values are adjusted for the mean Atlantic silverside weight of 4.3 grams, the minimum, most likely, and maximum values become 0.20%, 1.01%, and 5.39% (K_M %/day).

Flounder Metabolism 2,3,7,8-TCDD

Bottom fish data were used as a surrogate for summer-flounder metabolism. The average metabolism rate for bottom fish in the Arnot database was 1.36% (K_M in percent/day normalized to a 10 g fish at 15 deg. C). The minimum and maximum of the 95th percentiles defined were 0.16% and 5.66% (K_M %/day normalized). When these values are adjusted for the mean summer flounder weight of 660 grams, the minimum, most likely, and maximum values become 0.06%, 0.48%, and 1.99% (K_M %/day).

EEL METABOLISM 2,3,7,8-TCDD

As above, bottom fish data were used to estimate metabolism rates for American eel. When these values are adjusted for the mean American eel weight of 301 grams, the minimum, most likely, and maximum values become 0.07%, 0.58%, and 2.42% (K_M %/day).

WHITE PERCH METABOLISM 2,3,7,8-TCDD

Gamefish data were used as a surrogate for white perch metabolism. The average metabolism rate for gamefish in the Arnot database was 2.40% (K_M in percent/day normalized to a 10 g fish at 15 deg. C). The minimum and maximum of the 95th percentiles defined were 0.71% and 8.17% (K_M %/day normalized). When these values are adjusted for the mean white perch weight of 161 grams, the minimum, most likely, and maximum values become 0.35%, 1.20%, and 4.08% (K_M %/day).

STRIPED BASS / BLUEFISH METABOLISM 2,3,7,8-TCDD

As above, gamefish data were used to estimate metabolism rates for Striped Bass and Bluefish. When these values are adjusted for the mean Striped Bass weight of 4,968 grams, the minimum, most likely, and maximum values become 0.15%, 0.51%, and 1.73%. When they are adjusted for the mean Bluefish weight of 521 grams, the min, most likely, and max values are 0.26%, 0.89%, and 3.04% (K_M %/day).

BLUE CRAB AND INVERTEBRATE METABOLISM 2,3,7,8-TCDD

Based on professional judgment, invertebrates were assumed to metabolize 2,3,7,8-TCDD at a lower rate than most fish, as some metabolic/enzymatic pathways for metabolism may be lacking within invertebrates. The uncertainty for invertebrate metabolism of 2,3,7,8-TCDD was estimated as ranging from 0.0% to 2.0% (percent/day) using a uniform distribution (K_M %/day).

BLUE CRAB AND AMERICAN EEL METABOLISM OF TETRA CB

There is limited evidence of widespread metabolism of Tetra CB within the modeled food web. However, there is some evidence that crabs and eel have limited capacity to metabolize Tetra CB (Porte and Albaigés 1994). A range of relatively low metabolism rates was estimated for Tetra CB for crab and eel only, using a uniform distribution from 0% to 1% (K_M %/day).

TABLE 9. DEFINED RANGE OF UNCERTAINTY IN METABOLISM RATES FOR MODELED SPECIES

Organism and Chemical	Distribution	Minimum	Most Likely	Maximum
Invert (no crab); 2,3,7,8-TCDD	Uniform	0.00%		2.00%
Blue Crab; 2,3,7,8-TCDD	Uniform	0.00%		2.00%
Atlantic Silverside; 2,3,7,8-TCDD	Triangular	0.20%	1.01%	5.39%
Small Forage Fish; 2,3,7,8-TCDD	Triangular	0.18%	0.93%	4.99%
Flounder; 2,3,7,8-TCDD	Triangular	0.06%	0.48%	1.99%
Eel; 2,3,7,8 TCDD	Triangular	0.07%	0.58%	2.42%
Perch; 2,3,7,8-TCDD	Triangular	0.35%	1.20%	4.08%
Striped Bass; 2,3,7,8 TCDD	Triangular	0.15%	0.51%	1.73%
Bluefish; 2,3,7,8 TCDD	Triangular	0.26%	0.89%	3.04%
Blue Crab; Tetra PCB	Uniform	0.00%		1.00%
American Eel; Tetra PCB	Uniform	0.00%		1.00%

Biotransformation rates for 4,4'-DDx are estimated to be relatively low given its persistent bioaccumulation within fish (Schlenk 2005). DDT initially will metabolize into DDE and DDD which are also components of the 4,4'-DDx grouping (Schlenk 2005). This means that metabolism data on 4,4'-DDT do not describe losses from the 4,4'-DDx compartment. The primary metabolic pathway out of the DDx category appears to be via metabolism of 4,4'-DDD (Kwong et al. 2008; Schlenk 2005). For this reason, metabolism rates were estimated based on data for 4,4'-DDD and were further adjusted given that 4,4'-DDD constitutes a fraction of 4,4'-DDx within fish tissues. Metabolism rates for 4,4'-DDD in trout were available from (Konwick et al. 2006) as cited in (Arnot et al. 2008).

To estimate the fraction of 4,4'-DDD within Total DDx, all NBSA tissue data were extracted from the database and a regression line was calculated. This analysis indicated that the best estimate of 4,4'-DDD within tissues is 39% of 4,4'-DDx (Figure 17). Metabolism rates in Konwick et al. for 4,4'-DDD were therefore multiplied by 39% to get an estimated metabolism rate for the entire 4,4'-DDx grouping. Arnot and coworkers found that metabolism rates in fish are size dependent (Arnot et al, 2008, p 2264). Metabolism rates were extrapolated to all fish in the study based on the mean weight of each fish category using the equation presented in that paper (Arnot et al, 2008, p 2264). The results of this calculation are shown in Table 10.

TABLE 10. BEST ESTIMATES AND RANGE OF UNCERTAINTY IN DDx METABOLISM RATES FOR MODELED SPECIES

Organism and Chemical	Distribution	Minimum	Most Likely	Maximum
Invert (non-crab); 4,4'-DDx	Uniform	0.00%		0.50%
Blue Crab; 4,4'-DDx	Triangular	0.00%	0.05%	0.59%
Atlantic Silverside; 4,4'-DDx	Triangular	0.01%	0.06%	1.45%
Small Forage Fish; 4,4'-DDx	Triangular	0.01%	0.06%	1.35%
Flounder; 4,4'-DDx	Triangular	0.00%	0.03%	0.41%
Eel; 2,3,7,8 TCDD	Triangular	0.00%	0.05%	0.60%
Perch; 4,4'-DDx	Triangular	0.00%	0.05%	0.59%
Striped Bass; 4,4'-DDx	Triangular	0.00%	0.04%	0.44%
Bluefish; 4,4'-DDx	Triangular	0.00%	0.04%	0.45%

Values are KM in %/day at 15 Degrees C.

No data on 4,4'-DDx metabolism in non-crab invertebrates were available so a uniform distribution between 0% and 0.5% (per day) was chosen based on professional judgment.

BENTHIC COMPOSITION

To set feeding fractions for opportunistic feeders of benthos (such as small forage fish, blue crab, and small American eel), a reach-wide estimate of benthic-biomass organized by feeding guild was required. This model input was defined as a calibration range due to uncertainty – measured biomass data by species or feeding guild are not available.

Within the bioaccumulation model, benthic invertebrates are modeled within four feeding guilds:

- Deposit Feeders—feed predominantly on sediment-solids within the top six inches of sediment.
- Detritivores—feed predominantly on organic matter and detritus that has sunk to the bottom of the system.
- Filter Feeders—feed on near-bottom organic matter, phytoplankton, and zooplankton.
- Carnivore / Omnivore – feed predominantly on other benthic invertebrates.

To obtain biomass estimates, the process used for the Lower Passaic River (LPR) model was to combine data on species abundance with species mean-biomass estimates from the Chesapeake Bay Benthic Monitoring Program (CBBMP 2016). This process is uncertain as the variabilities in measured invertebrate masses are wide. Furthermore, mean invertebrate weights by species can be site specific due to food availability and other local factors. Despite the uncertainty, this type of analysis can provide more information than abundance alone, as species that are typically larger will make up a larger proportion of the overall estimated benthic biomass.

There are 30 Newark Bay benthos stations where taxonomic data were collected in 2015. For these stations, total benthic biomass data (AFDW g/m^2) are available, which was not the case for the Lower Passaic River. This additional constraint on the derived estimates of benthic biomass should reduce overall parameter uncertainty.

The process used to estimate benthic composition for NBSA is documented below.

- For each of the 105 observed invertebrate taxa, mean biomass estimates were derived using the mean weight of invertebrate species measured over 19 years of Chesapeake Bay monitoring.
- Following the mean-weight estimation, feeding guilds were assigned using expert feedback and literature sources.
- Total AFDW biomass by station could then be calculated and compared to observed biomass by station in g/m^2.
- A calibration step was undertaken in which estimated biomasses by station were made to match observed biomasses more closely by adjusting the weights of all invertebrate species within their measurement uncertainty. Results by station are shown in Figure 18.

Each station was then assigned to the North, Southeast, and Southwest bioaccumulation modeling reaches. The proportion of benthic biomass by feeding guild for each reach could then be estimated. Figure 19 shows these proportions for both the calibrated and non-calibrated steps and suggests that the calibration of these invertebrate weights did not have a large effect on final predicted proportions. In general, filter feeders appear to predominate in the north, detritivores in the Southeast reach, and filter feeders and detritivores have roughly equal proportion in the Southwest reach (Table 11). As a simplifying assumption, the off-site migration locations to the north and northwest (LPR and Lower Hackensack) were assumed to have the same benthic feeding-guild composition as the North segment, and those off-site to the south and southeast (the Kills and ocean/estuary segments) were assumed to have the same benthic feeding-guild composition as the Southwest segment.

TABLE 11. BEST ESTIMATES OF BENTHIC INVERTEBRATE BIOMASS BY REACH AND PROPOSED CALIBRATION RANGE

		Min Cal. Range	**Best Estimate**	*Max Cal. Range*
North	DEP	*25%*	**35.0%**	*45%*
North	FF	*40%*	**49.9%**	*60%*
North	DET	*2%*	**11.6%**	*22%*
North	C/O	*1%*	**3.5%**	*13%*
North	**Total**		100.0%	
Southeast	DEP	*13%*	**22.8%**	*33%*
Southeast	FF	*8%*	**17.7%**	*28%*
Southeast	DET	*44%*	**54.0%**	*64%*
Southeast	C/O	*1%*	**5.6%**	*16%*
Southeast	**Total**		100.0%	
Southwest	DEP	*21%*	**31.2%**	*41%*
Southwest	FF	*24%*	**33.6%**	*44%*
Southwest	DET	*18%*	**27.7%**	*38%*
Southwest	C/O	*1%*	**7.5%**	*18%*
Southwest	**Total**		100.0%	

More detail on the estimation of benthic biomass by feeding guild may be found in Appendix B of this document.

INVERTEBRATE WEIGHTS

The average wet weight of invertebrates by feeding guild is an uncertain parameter; site-specific invertebrate weights were not available. To estimate the possible range of invertebrate weights, the 2015 NBSA taxonomic data were again used in conjunction with species-biomass data from the Chesapeake Bay Benthic Monitoring Program (CBBMP 2016).

A triangular distribution was used to define the uncertainty in feeding-guild weights. The "most-likely" weight value for each feeding guild was determined using a weighted average. The mean weight of each identified species was weighted by its calculated percent of total biomass within NBSA (calculated in the benthic-composition analysis above). To calculate the minimum and maximum of the triangular distribution, a weighted average was again calculated using the 5th and 95th percentile weights determined for each invertebrate species (Table 12). The 5th and 95th percentiles were used as the minimum and maximum estimate within the triangular distribution.

Ash-free dry weights were converted to wet weight using a ratio of 5.6 (wet weight to AFDW) based on a meta-analysis by Ricciardi and Bourget (1998). The uncertainty in this conversion is relatively small in comparison to the overall parameter uncertainty that spans several orders of magnitude for each feeding guild.

TABLE 12. RANGE OF INVERTEBRATE WET WEIGHTS USED IN AUTO-CALIBRATION

	5th Percentile, Organism Weight in g	Best Estimate, Organism Weight in g	95th Percentile Organism, Weight in g
C/O	2.71E-03	6.32E-02	2.90E-01
DEP	4.76E-03	4.40E-02	1.60E-01
DET	5.50E-02	9.67E-02	1.64E-01
FF	1.56E-03	6.02E-01	4.05E+00

ASSIMILATION EFFICIENCIES

Assimilation efficiencies (AE) of lipid, organic carbon, and organic matter are sensitive model parameters within the bioaccumulation model formulation.

Fish AE Lipid

The average assimilation efficiency of lipids by fish is assumed to be high based on the literature analysis and data presented in Arnot and Gobas (2004). The range of assimilation was evaluated over a uniform distribution from 0.9 to 0.95.

Fish AE NLOM and NLOC

The average assimilation efficiency of non-lipid organic matter and organic carbon is assumed to be somewhat lower based on the analysis in Arnot and Gobas (2004). The range of assimilation was varied using a triangular distribution with 0.6 being the most likely and the minimum and maximum being 0.5 to 0.65 respectively.

Invertebrate AE lipid, NLOM, NLOC

The assimilation efficiency of lipids and organic matter by invertebrates is highly uncertain. Arnot and Gobas (2004) noted that this parameter has been measured in a range from 15-96%. The assimilation of lipids was varied using a triangular distribution with 0.5 being the most likely and the minimum and maximum being 0.15 to 0.96 respectively. As was the case for fish, the range of assimilation for non-lipid organic matter was assumed to be somewhat lower, with 0.4 being the most likely and the minimum and maximum being 0.15 to 0.7. Given their differences in life history and physiology, crab parameters were separated from the general invertebrate parameters but crab parameters were varied using the same distributions.

Zooplankton AE

Arnot and Gobas (2004) present zooplankton-specific assimilation efficiency data that suggest a most-likely parameter value is 72% The assimilation efficiency for zooplankton was therefore varied using a triangular distribution with 0.72 being the most likely and the minimum to maximum being 0.55 to 0.85 (the range cited by Arnot and Gobas).

DIETARY MATRIX FRACTIONS

For each organism in the model, dietary fractions must be defined that represent the types of food consumed. These parameters are entered as percentages on a wet-weight basis. Many organisms are opportunistic feeders

and there is uncertainty in terms of the fraction of prey that is consumed due to site-specific variability and difficulty in precise measurement. To address this uncertainty, an initial "most likely" predator to prey matrix was constructed, and then uncertainty was defined to modify this matrix.

INITIAL DIETARY FRACTIONS

The *a priori* predator to prey matrix defined for this project is shown in Table 13. This matrix was defined based on literature research, professional judgment, and an examination of measured trophic levels, as discussed below.

TABLE 13. INITIAL DIETARY FRACTION FOR EACH PREDATOR IN MODEL, PERCENT OF DIETARY UPTAKE FOR EACH PREY ITEM

Predators: Prey:	Sediment Solids (particles)	Detrital Particulates	Near-Bottom Detrital Particulates	Phytoplankton	Zooplankton	Benthic Inverts Split by Abundance	Atlantic Silverside	Small forage fish	Small American eel	Blue crab	Summer Flounder
Zooplankton		25		75							
Benthic invert deposit feeder	85		10	2.5	2.5						
Benthic invert filter feeder			50	25	25						
Benthic invert detritivore	7.5		83	5	5						
Benthic invert carnivore/omnivore	5		25			70					
Atlantic Silverside		5		5	43	48					
Small forage fish	5		15	20	5	55					
Small American eel	2		3			80	3	12			
Blue crab	2		1			78	10	10			
Summer Flounder	5					20	25	25		25	
White perch			5	2	3	70	2	18			
Large American eel	2		3			46	25	25			
Bluefish						15	25	20	20	15	5
Striped Bass						33	28	15	10	10	5

- Zooplankton are expected to consume a diet of phytoplankton and a smaller component of suspended particulate organic matter (Edwards 2001).
- Based on their guild designation, benthic-invertebrate deposit feeders primarily feed on deposited sediment. Some near-bottom detrital particulate feeding (fluff layer) and water column feeding is also possible (Levinton et al. 1984).
- Benthic invert. filter feeder: Feeding is primarily near-bottom organic matter but some feeding on phytoplankton and zooplankton are also assumed (Abraham and Dillon 1986; Forster and Zettler 2004; Kamermans 1994; Zwarts and Wanink 1989). Feeding preferences are only relevant for out-of-NBSA reaches as a BMF approach is used within the primary study area (see Equation 6 above).
- Benthic invert detritivore: Diet is primarily composed of settling (near-bottom) detrital particulates, as defined by the feeding guild. However, some phytoplankton and zooplankton may also settle and be consumed by these invertebrates. In addition, some proportion of detritivore direct feeding on the

sediment bed is possible based on different life histories of organisms within the category (Fauchald and Jumars 1979).

- Benthic invert carnivore/omnivore: The primary food sources are benthic invertebrates split by abundance. Some incidental ingestion of sediment is also included.
- Atlantic Silverside: Silverside are omnivores, feeding opportunistically on a variety of available organisms including zooplankton, benthic crustaceans, small mollusks, worms, and insects. Plant food may include algae, diatoms, and detritus (Warkentine and Rachlin 1989).
- Small forage fish: Small forage fish are assumed to feed primarily on benthic invertebrates (split by abundance); some feeding on phytoplankton and particulate organic matter is also included (Abraham 1985; Allen et al. 1994; Griffin and Valiela 2001; Samaritan and Schmidt 1982).
- Small American eel: Eels less than 50 cm feed primarily on benthic inverts and crustaceans (Lookabaugh and Angermeier 1992; Ogden 1970).
- Blue crab: Opportunistic feeders with diet dominated by benthic invertebrates based on literature sources (Hines et al. 1990; Laughlin 1982; Stehlik et al. 1998; Van Heukelem 1991).
- Summer Flounder: Adult summer flounder prey includes shrimp, blue crab, mysids, anchovy, silverside, and other flatfishes (Able and Fahay 2010; Packer et al. 1999; Pereira et al. 1999).
- White perch: White perch diet includes small fish, invertebrates, and blue crab. (McGrath 2005; Stanley and Danie 1983; Weis 2005) A lower proportion of silverside was assumed in the diet as white perch and silverside are only assumed to be together in NBSA for a short period based on their life histories (see Appendix E).
- Large American eel: Eels greater than 50 cm in length have a higher proportion of fish in their diet (Lookabaugh and Angermeier 1992; Ogden 1970).
- Bluefish: Adult bluefish are voracious carnivores (Able and Fahay 2010) and are assumed to feed on all small and medium sized fish in the model. White perch are excluded as a prey item due to the expectation that they will be out of NBSA when the bluefish are present (Appendix E).
- Striped Bass: According to Able and Fahay (2010), adult striped bass feed mostly on fishes and crustaceans. Flounder and perch were omitted due to their life-history migration dates.

TROPHIC LEVEL ANALYSIS

The trophic level for each species was estimated using the following equation (U.S. Environmental Protection Agency 2018)

$$TL_{Predator} = \sum \left(TL_{Prey} + 1.0\right) Frac_{Prey} \qquad \text{Equation 11}$$

where:

$TL_{Predator}$ = calculated trophic level of the predator (unitless);

TL_{Prey} = calculated trophic level of one prey item (unitless, algae and organic matter are assigned to TL of 1.0);

$Frac_{Prey}$ = fraction of the prey item consumed compared to all food being consumed in that time step by the predator (unitless).

Trophic level calculations can be instructive to interpret how feeding preferences in a matrix translate into trophic structure. In addition, calculations can be compared to values derived via stable isotope analysis. For many NBSA species, trophic level values are available from a study performed in the adjacent Lower Passaic River (Khairy et al. 2014). Table 14 shows that calculated trophic-level estimates from defined feeding preferences agree with these

observations. The largest point of departure is the small American eel which measured the lowest trophic level via isotopic analysis (2.4). Based on the observed trophic level (2.4), a small eel would primarily be assumed to consume vegetative matter and detritus. However, stomach content studies have shown that small American eels nearly exclusively consume invertebrates (Lookabaugh and Angermeier 1992; Ogden 1970), which would make their trophic level closer to 3.0. Also, the cutoff for small American eel in the stable-isotope study (12 cm) was much smaller than the 50 cm threshold used in the model.

TABLE 14. TROPHIC LEVEL MEASURED BY STABLE ISOTOPE COMPARED TO THAT CALCULATED FROM FEEDING MATRIX

Organism	Size reported in Khairy (2014)	TL reported in Khairy et al.	TL in feeding matrix
Zooplankton			2
Benthic invert deposit feeder			2
Benthic invert filter feeder			2.3
Benthic invert detritivore			2.1
Benthic invert carnivore/omnivore			2.8
Atlantic Silverside	2-9 cm	3.3	3.0
Small forage fish (striped killifish)		2.9*	2.7
Small American eel	11-12 cm	2.4	3.3
Blue crab		2.7	3.4
Summer Flounder			3.5
Winter Flounder (Juv.)			3.2
White perch		3.6	3.3
Large American eel	28-110 cm	3.5	3.5
Bluefish			4.0
Striped Bass	18-32 cm	3.6	3.8

*2.0 was used as an *a priori* estimate for mummichog in Khairy et al. (2014). 2.9 was measured in killifish.

UNCERTAINTY COMPONENT OF DIET

Distributions were defined to represent the uncertain components of organism diets. After these distributions were sampled, all dietary preferences for each predator were renormalized to produce a sum of 100% across all prey items.

- Zooplankton: Uncertainty in the percentage that zooplankton feed on detritus as opposed to phytoplankton was evaluated using a uniform distribution from 0% to 50% based on the work of Edwards (2001).
- Deposit Feeder: Direct feeding on buried sediment ranged from 70% to 94% using a uniform distribution. This range was chosen based on the likelihood of some alternative food sources in this feeding guild's diet (Levinton et al. 1984).
- Detritivore: Feeding on the sediment bed ranged from 0% to 15%, reflecting the likelihood of some sediment-bed inclusion within the diet of those invertebrates that are predominantly detritivores.
- Atlantic Silverside: The extent of feeding on zooplankton as compared to other benthic invertebrates is uncertain, with a range estimated from 25% to 60%.

- Small Forage Fish: The extent that small forage fish feed on (or have incidental dietary uptake of) near-bottom detrital particulates is represented by a uniform distribution, ranging from 5% to 25% of their diet.
- Small American Eel: The quantity that small American eel feed on non-blue-crab invertebrates ranged from 70% to 95% using a triangular distribution. 80% was deemed as the most-likely value (Lookabaugh and Angermeier 1992; Ogden 1970).
- Blue Crab: Blue crabs are opportunistic feeders. The proportion that these crabs feed on invertebrates, as opposed to small fish, was defined as a uniform range from 70% to 85%.
- Summer Flounder: Similar to blue crabs, the proportion that summer flounder feed on benthic invertebrates, as opposed to small fish and crabs, was defined as a uniform range from 10% to 30%.
- White Perch: Uncertainty in the extent of white-perch feeding on invertebrates, as opposed to small game fish, was defined as a uniform range from 60% to 80%.
- Large American Eel: The extent that large American eel feed on invertebrates as opposed to silverside and small game fish was defined as a range from 26% to 65%.
- Bluefish feeding: Feeding on Atlantic silverside (as opposed to other fish, invertebrates, and crabs) was set to range from 15% to 35%
- Smallmouth Bass: Feeding on Atlantic silverside (as opposed to other fish, benthic invertebrates, and crabs) was set to range from 15% to 40%

MODEL LINKAGE

Data passed from the Contaminant-Fate and Transport (CFT) model included water temperature, organic carbon concentration of sediments and chemical concentrations for water, detritus, and algae. Data were horizontally averaged over each biotic reach for both forage-fish habitats and deeper water (Figure 1). Sediment-bed data were vertically averaged over the top 15cm of sediment. In addition, particulate-matter data from the bottommost water-column segment were provided to represent the small particulate layer that settles and resuspends over the sediment bed (the fluff layer, consumed by detritivores). The full set of CFT inputs provided is listed here:

	PARAMETER	DESCRIPTION	UNITS
Physical Parameters	TW	Temperature	°C
	CPW	Concentration of suspended solids	mg/L
	OCSS	Organic carbon (OC) content of sediment	fraction of total
	OCPart	OC content of detrital particulates	fraction of total
	OCPart_Det	OC content of near-bottom detrital particulates	fraction of total
Chemical Specific	CWB	Bioavailable concentration in water	ng/g
	CSD	Bioavailable conc. in sediment porewater	ng/g
	CST	Concentration in sediment solids	ng/g
	CPart	Concentration in detrital particulates	ng/g
	CPart_Det	Concentration in near-bottom particulates	ng/g
	CAC	Concentration in algal particulates	ng/g OC
	CAC_Det	Conc. in near-bottom algal particulates	ng/g OC
	CST_OCNorm	Concentration in sediment solids	ng/g

Steady-state model inputs were based on CFT data averaged from September 2013 to August 2015 to represent exposure prior to and during the 2014 and 2015 sampling seasons. The steady-state calibration was then verified against the kinetic model, which was driven by daily time-series data. Graphs of the full set of data passed from the CFT model may be found in Appendix C of this document.

EXPOSURE ESTIMATES AND PARAMETERS FOR REPRESENTATIVE OFF-SITE LOCATIONS

Figure 5 shows a map of off-site locations assumed to be representative of habitats visited by migratory species (when they depart from Newark Bay Study area).

Time-series CFT model results are available for the Lower Passaic River. White perch moving into the Lower Passaic River are assumed to spend equal time in two LPR segments (River mile 0-6 and river mile 6-14.7.) Time-series CFT model results are also available for the two "Kills" segments (The Arthur Kill River and the Kill Van Kull river segments, Figure 20). These locations are assumed representative of the exposure that migratory fish receive while passing through these segments to the ocean/estuary interface and the ocean segments beyond (Figure 5). As was the case for NBSA, for the steady-state model run, CFT data were averaged from September 2013 to August 2015. For the kinetic model run, CFT data were averaged daily.

For the Lower Hackensack River, CFT model results were available but were initialized based on limited data, so were not chosen for direct linkage. For the other off-site migration locations (the ocean/estuary interface, and the ocean segment) CFT model results were not available. For these three segments, data from the CARP study (HydroQual 2007) and REMAP studies (Adams et al. 1998) were used to characterize relationships between the segments and NBSA-study-area segments for the purpose of model calibration (Figure 5). CARP and REMAP data suggest that sediment concentrations of 2,3,7,8-TCDD systematically decline moving south of the study area; PCB concentrations plateau to some degree until the ocean/estuary interface segment is reached (Figure 21).

For 4,4'-DDx, Figure 22 shows the result of the CARP and REMAP data analyses. The highest concentration in surface sediments were encountered in the Arthur Kill River which is also reflected in the linkage data from the CFT model.

A summary of model exposure inputs for non-modeled representative-offsite locations may be found in Table 15. For the kinetic model, to create daily time series, the ratios between steady-state model inputs in NBSA and steady state model inputs in the off-site locations was first calculated. Those percentages were then applied to NBSA inputs to create a daily time series for off-site locations that reflects seasonal and annual fluctuations.

TABLE 15. DATA ASSUMPTIONS USED TO CHARACTERIZE NON CFT MODELED EXPOSURE REGIONS

Symbol	Text	Source	Units
CST	Chemical in Surficial Surface Sediments	Scaled from NBSA using CARP and REMAP data	ng/g
CPART	Chemical in detrital particulates	Scaled from NBSA using CARP water data	ng/g
CWB	Bioavailable concentration of chemical in water	Developed regressions using the NBSA particulate to bioavailable ratio	ng/g
CSD	Concentration in sediment porewater	Developed regressions using the NBSA surface sediment to pore-water ratio	ng/g
CAC	Concentration in algal particulates	Scaled from CPART using NBSA modeled ratio	ng/g C
OCSS	Organic carbon content of sediment	Scaled from NBSA using CARP and REMAP data	unitless
OCPart	Organic carbon content of detrital particulate	Scaled from NBSA using CARP and REMAP data	unitless
OCPart_Det	Organic carbon content of near-bottom particulates	Scaled from OCPart using NBSA modeled ratio	unitless
TW	Mean water temperature	Scaled to NBSA using REMAP observed temperatures. (Adjusted for relevant migration period in steady-state model.)	deg. C
DO SAT	Degree of oxygen saturation in the water column	Calculated using REMAP water quality data on DO, Salinity, and Temperature. Held constant.	fraction

CHEMICAL CONCENTRATIONS IN BIOTA

Central tendencies of chemical concentrations in biota were derived for each model reach (Table 16 to Table 18). Chemical concentrations were derived by averaging original analyses with lab duplicates when they were available. Following that, average concentrations were derived for the entire reach.

Whole-body concentrations in blue crab were converted from carcass, muscle, and hepatopancreas data using the following formulation from section 4.5 of the BERA (Glenn Springs Holdings, Inc. 2019a):

$$Crab_{whole-body} = 0.27(Crab_{carcass}) + 0.54(Crab_{muscle}) + 0.19\left(Crab_{hepat.}\right) \quad \text{Equation 9}$$

For fish fillet data, a conversion to whole-body estimates was required to compare chemical data to model results. Based on data from the Lower Passaic River, (Louis Berger Group, Inc. and Battelle 2014, Table 3-9), skinless fillets for American eel are on average 60% of whole body wet weight. This ratio was used to estimate whole-body chemical burdens for eel samples in NBSA. For bluefish and striped bass, fillets with skin were assumed to have 27% of the chemical burdens of whole-body samples. This was again based on a conversion of fillet to whole body data from the Lower Passaic River using white perch as a surrogate species (Louis Berger Group, Inc. and Battelle 2014, Table 3-7). Model calibrations for eel, bluefish, and striped bass are subject to additional uncertainty based on this required conversion.

For comparison to model results, an average collection date was calculated for each species and reach combination. This average-collection date was used when graphing tissue concentrations compared to kinetic-

model results (See Appendix A). For composite samples, the average-collection date of samples within the composite was used. In addition, prior to averaging, when a set of samples were collected over multiple years, the *year* in the collection date was modified to reflect the year with the most samples (for that species and reach). This resulted in an average-collection date that reflects the year when the most sampling occurred and also the month when sampling occurred. (This procedure also avoided the average-collection date being calculated as occurring during the winter months, when sampling was not occurring.)

TABLE 16. MEASUREMENTS OR ESTIMATES OF 2,3,7,8-TCDD WHOLE-BODY BURDEN, CENTRAL TENDENCIES BY REACH AND SPECIES

Species	Location	Whole-Body Conc. (ng/g)	n	SEM (ng/g)	Avg. Collection Date
Benthic invert filter feeder	North	0.0062	8	0.0011	9/19/2014
Atlantic Silverside	North	0.0145	1		10/13/2014
Small forage fish	North	0.0295	8	0.0040	10/17/2014
Small American eel	North	0.0060	4	0.0005	8/8/2015
Blue crab	North	0.0310	12	0.0021	10/5/2014
Summer Flounder	North	0.0158	8	0.0075	7/22/2015
White perch	North	0.0738	15	0.0132	4/3/2015
Large American eel	North	0.0128	8	0.0025	8/20/2015
Bluefish	North	0.0062	3	0.0030	6/4/2015
Benthic invert filter feeder	Southeast	0.0050	4	0.0016	9/26/2014
Atlantic Silverside	Southeast	0.0072	3	0.0005	10/17/2014
Small forage fish	Southeast	0.0160	3	0.0011	10/14/2014
Small American eel	Southeast	0.0047	5	0.0013	8/4/2015
Blue crab	Southeast	0.0224	12	0.0019	10/11/2014
Summer Flounder	Southeast	0.0109	8	0.0044	7/23/2015
White perch	Southeast	0.0486	15	0.0070	3/31/2015
Large American eel	Southeast	0.0124	7	0.0032	7/17/2015
Bluefish	Southeast	0.0032	13	0.0008	6/4/2015
Benthic invert filter feeder	Southwest	0.0040	6	0.0008	9/21/2014
Atlantic Silverside	Southwest	0.0067	3	0.0004	10/10/2014
Small forage fish	Southwest	0.0110	6	0.0027	10/13/2014
Small American eel	Southwest	0.0019	5	0.0005	8/26/2015
Blue crab	Southwest	0.0147	13	0.0014	10/11/2014
Summer Flounder	Southwest	0.0121	10	0.0078	8/7/2015
White perch	Southwest	0.0234	15	0.0051	3/31/2015
Large American eel	Southwest	0.0093	7	0.0013	8/18/2015
Bluefish	Southwest	0.0018	2	0.0006	6/3/2015
Striped Bass	Southwest	0.0111	18	0.0054	5/4/2015

TABLE 17. MEASUREMENTS OR ESTIMATES OF TETRA CB WHOLE-BODY BURDEN, CENTRAL TENDENCIES BY REACH AND SPECIES

Species	Location	Whole-Body Conc. (ng/g)	n	SEM (ng/g)	Avg. Collection Date
Benthic invert filter feeder	North	23.7	8	4.7	9/19/2014
Atlantic Silverside	North	139.0	1		10/13/2014
Small forage fish	North	436.6	8	143.9	10/17/2014
Small American eel	North	101.5	4	11.4	8/8/2015
Blue crab	North	110.2	12	5.9	10/5/2014
Summer Flounder	North	85.8	8	30.0	7/22/2015
White perch	North	560.6	15	62.7	4/3/2015
Large American eel	North	158.1	8	25.5	8/20/2015
Bluefish	North	135.9	3	63.2	6/4/2015
Benthic invert filter feeder	Southeast	20.6	4	2.9	9/26/2014
Atlantic Silverside	Southeast	119.7	3	2.6	10/17/2014
Small forage fish	Southeast	193.3	3	16.3	10/14/2014
Small American eel	Southeast	92.4	5	18.0	8/4/2015
Blue crab	Southeast	74.9	12	5.7	10/11/2014
Summer Flounder	Southeast	107.6	8	88.0	7/23/2015
White perch	Southeast	502.2	15	49.1	3/31/2015
Large American eel	Southeast	191.6	7	48.6	7/17/2015
Bluefish	Southeast	47.2	13	9.6	6/4/2015
Benthic invert filter feeder	Southwest	68.6	6	28.2	9/21/2014
Atlantic Silverside	Southwest	309.3	3	82.7	10/10/2014
Small forage fish	Southwest	497.0	6	197.2	10/13/2014
Small American eel	Southwest	90.3	5	37.6	8/26/2015
Blue crab	Southwest	55.4	13	4.0	10/11/2014
Summer Flounder	Southwest	96.6	10	41.0	8/7/2015
White perch	Southwest	405.4	15	46.5	3/31/2015
Large American eel	Southwest	251.7	7	44.0	8/18/2015
Bluefish	Southwest	56.5	2	1.3	6/3/2015
Striped Bass	Southwest	310.4	18	140.0	5/4/2015

TABLE 18. MEASUREMENTS OR ESTIMATES OF 4,4'-DDX WHOLE-BODY BURDEN, CENTRAL TENDENCIES BY REACH AND SPECIES

Species	Location	Whole-Body Conc. (ng/g)	n	SEM (ng/g)	Avg. Collection Date
Benthic invert filter feeder	North	5.8	8	1.8	9/19/2014
Atlantic Silverside	North	83.0	1	0.0	10/13/2014
Small forage fish	North	147.7	8	36.3	10/17/2014
Small American eel	North	180.0	4	31.6	8/8/2015
Blue crab	North	94.4	12	22.0	10/5/2014
Summer Flounder	North	52.4	8	32.5	7/22/2015
White perch	North	471.9	15	184.8	4/3/2015
Large American eel	North	290.8	8	145.7	8/20/2015
Bluefish	North	80.5	3	64.5	6/4/2015
Benthic invert filter feeder	Southeast	6.2	4	2.3	9/26/2014
Atlantic Silverside	Southeast	81.7	3	14.3	10/17/2014
Small forage fish	Southeast	156.7	3	35.3	10/14/2014
Small American eel	Southeast	182.6	5	60.1	8/4/2015
Blue crab	Southeast	81.3	12	10.4	10/11/2014
Summer Flounder	Southeast	67.5	8	51.1	7/23/2015
White perch	Southeast	338.1	15	124.9	3/31/2015
Large American eel	Southeast	384.3	7	76.2	7/17/2015
Bluefish	Southeast	50.8	13	11.4	6/4/2015
Benthic invert filter feeder	Southwest	26.7	6	7.1	9/21/2014
Atlantic Silverside	Southwest	203.3	3	35.3	10/10/2014
Small forage fish	Southwest	341.7	6	67.2	10/13/2014
Small American eel	Southwest	300.7	5	61.2	8/26/2015
Blue crab	Southwest	132.2	13	31.9	10/11/2014
Summer Flounder	Southwest	111.1	10	91.2	8/7/2015
White perch	Southwest	660.9	15	203.4	3/31/2015
Large American eel	Southwest	869.0	7	295.7	8/18/2015
Bluefish	Southwest	329.6	2	525.9	6/3/2015
Striped Bass	Southwest	321.7	18	353.0	5/4/2015

EVALUATION OF MODEL CALIBRATION

A summary of the steady-state model calibration is presented here, and the full set of kinetic model results as compared to observed tissue data may be found in Appendix A. While the model was calibrated for 4,4'-DDx simultaneously, those results are presented following the calibration results for 2,3,7,8-TCDD and Tetra CB.

As noted above, the calibration goal for this project was to achieve an SPAF of less than 2.0 for most species and chemicals. This means the model would have a factor-of-two accuracy in the worst case. For the "optimize SPAF" simulation, Table 22 shows that this goal was achieved for all species and reaches for 2,3,7,8-TCDD and for most species and reaches for Tetra CB. As shown in Appendix D, most of the misses on the factor-of-two goal still fall within two standard errors of the mean for the reach. Some details of these "misses" follow:

- For Tetra CB, softshell clam (the benthic invertebrate filter feeder) is underpredicted by a factor of 3.1 in the Southwest. However, as shown in Appendix A, page 19, softshell clams have significant variability in this reach and the prediction falls within two standard errors of the mean. The model performs better in other reaches where variability is smaller.
- For Tetra CB, bluefish are overpredicted in the southern reaches and this is also reflected in the kinetic model results. The off-site exposure and timing of migration is especially uncertain for this species and chemical combination.

The average SPAF for 2,3,7,8-TCDD was 1.20 which indicates that on average, the model is precise within 20% of observed central tendencies. For Tetra CB, the average SPAF was 1.55. Note that the SPAF metric does not take into account the variability of measurement or the number of samples in a group.

TABLE 19. SUMMARY OF SPAF RESULTS FOR THE "OPTIMIZE SPAF" SIMULATION

	2,3,7,8-TCDD			Tetra CB		
	North	Southeast	Southwest	North	Southeast	Southwest
Softshell Clam	-1.4	-1.2	-1.4	-1.3	-1.0	-3.1
Atlantic Silverside	-1.0	1.4	-1.0	1.0	1.0	-2.5
Small forage fish	-1.3	1.0	1.0	-2.0	-1.0	-2.5
Small American eel	1.2	1.1	1.7	1.4	1.5	1.3
Blue crab	1.1	1.0	-1.0	-1.2	-1.0	1.4
Summer Flounder	-1.3	-1.2	-1.8	-1.3	-1.8	-1.5
White perch	**-1.0**	**1.3**	**-1.3**	**-1.5**	**-1.5**	**-1.1**
Large American eel	1.3	-1.0	-1.1	1.3	1.0	-1.3
Bluefish	-1.4	-1.0	1.2	1.2	3.1	2.3
Striped Bass			-1.0			1.6
Average by Reach	**1.23**	**1.13**	**1.25**	**1.36**	**1.44**	**1.86**
Average		**1.20**			**1.55**	

Red cells are model over-predictions and blue cells are under-predictions.

Table 20 shows that holding K_{OW} constant has minimal effects on the 2,3,7,8-TCDD simulation but does result in a less accurate Tetra CB simulation. Given that Tetra CB is comprised of many substances with differing K_{OW}, allowing some leeway in this parameter seems warranted. However, this K_{OW}-constant simulation will continue to be utilized as an alternative model calibration.

TABLE 20. SUMMARY OF SPAF RESULTS FOR THE "OPTIMIZE SPAF, K_{OW} CONSTANT" SIMULATION

	2,3,7,8-TCDD			Tetra CB		
	North	Southeast	Southwest	North	Southeast	Southwest
Softshell Clam	-1.4	-1.2	-1.4	-1.3	-1.0	-3.1
Atlantic Silverside	1.0	1.5	1.0	-1.3	-1.2	-3.2
Small forage fish	-1.4	1.0	1.0	-2.3	-1.0	-2.9
Small American eel	1.0	-1.0	1.5	1.3	1.8	1.3
Blue crab	1.0	-1.0	-1.0	-1.3	1.0	1.3
Summer Flounder	-1.6	-1.4	-2.2	-2.0	-2.2	-2.0
White perch	**-1.0**	**1.3**	**-1.4**	**-2.6**	**-3.0**	**-1.8**
Large American eel	1.3	-1.0	-1.2	1.1	1.0	-1.3
Bluefish	-1.4	1.0	1.1	1.0	3.0	1.9
Striped Bass			1.0			1.5
Average by Reach	**1.25**	**1.16**	**1.28**	**1.59**	**1.71**	**2.02**
Average		**1.23**			**1.77**	

TABLE 21. SUMMARY OF SPAF RESULTS FOR THE "MAXIMIZE LIKELIHOOD" SIMULATION

	2,3,7,8-TCDD			Tetra CB		
	North	Southeast	Southwest	North	Southeast	Southwest
Softshell Clam	-1.4	-1.2	-1.4	-1.3	-1.0	-3.1
Atlantic Silverside	-1.2	1.2	-1.2	1.0	-1.0	-2.7
Small forage fish	-1.3	1.0	-1.0	-2.0	-1.0	-2.7
Small American eel	1.1	-1.0	1.4	1.3	1.4	1.2
Blue crab	1.0	-1.1	-1.1	-1.2	-1.0	1.3
Summer Flounder	-1.7	-1.6	-2.4	-1.4	-1.8	-1.6
White perch	**-1.3**	**-1.0**	**-1.7**	**-1.6**	**-1.6**	**-1.3**
Large American eel	1.2	-1.1	-1.3	1.2	-1.1	-1.5
Bluefish	-1.8	-1.3	-1.2	1.2	3.1	2.1
Striped Bass			-3.1			1.5
Average by Reach	**1.34**	**1.17**	**1.60**	**1.35**	**1.46**	**1.90**
Average		**1.37**			**1.57**	

Table 21 shows the SPAF results for the maximum-likelihood simulation. As this simulation does not try to maximize SPAF it fares a bit worse by this metric, but still produces reasonable results. Unlike SPAF, this simulation does take into account the degree of variability in the observed data and the number of samples in order to calculate the likelihood that the model result matches the observed data. This may be the reason that this calibration has a better prediction of Tetra CB in White Perch in the southern reaches (high sample sizes and low variability).

Table 22 shows the SPAF results for the maximum likelihood simulation with K_{OW} held constant. As was the case in the SPAF simulations, this penalizes the accuracy of the Tetra CB simulation more than the 2,3,7,8-TCDD results.

TABLE 22. SUMMARY OF SPAF RESULTS FOR THE "MAXIMIZE LIKELIHOOD, K_{OW} CONSTANT" SIMULATION

	2,3,7,8-TCDD			Tetra CB		
	North	Southeast	Southwest	North	Southeast	Southwest
Softshell Clam	-1.4	-1.2	-1.4	-1.3	-1.0	-3.1
Atlantic Silverside	-1.3	1.3	-1.3	-1.2	-1.1	-3.0
Small forage fish	-1.5	1.0	-1.1	-2.2	1.1	-2.8
Small American eel	-1.0	1.0	1.4	1.3	2.1	1.3
Blue crab	-1.0	1.0	-1.1	-1.3	1.2	1.3
Summer Flounder	-1.8	-1.5	-2.5	-1.9	-2.0	-1.9
White perch	**-1.4**	**-1.0**	**-2.0**	**-2.5**	**-2.6**	**-1.7**
Large American eel	1.2	-1.0	-1.3	1.0	1.0	-1.4
Bluefish	-2.0	-1.3	-1.2	1.0	3.4	1.9
Striped Bass			-3.1			1.5
Average by Reach	**1.41**	**1.15**	**1.64**	**1.53**	**1.72**	**2.01**
Average		**1.40**			**1.75**	

Figure 23 shows that the comparison of model results to observations is quite similar across all four simulations. This is despite a fairly wide degree of variability in many of the selected parameters across the four calibrations (Figure 25 and Figure 26). Modeled vs. observed biotic central tendencies are shown in Figure 28 and Figure 29 for all four calibrations and both chemicals modeled.

Appendix A shows the full set of time-series results for 2,3,7,8-TCDD and Tetra CB with observed data plotted at the time it was collected against the model-output time series. The vast majority of model results pass directly through or quite near the central tendency with very few sets of model results occurring outside of two standard errors from the mean. These results indicate that the procedure of calibrating a steady-state model and applying those parameters in a kinetic-model framework was successful.

4,4'-DDx Model Calibration

While calibrating the other two chemicals, the model was also auto-calibrated for 4,4'-DDx using the four calibration goals as discussed above. Table 23 presents SPAF results for the "optimize SPAF" calibration, with and without K_{OW} held constant. Overall, the average SPAF of 1.26-1.29 is intermediate between the 2,3,7,8-TCDD calibrations (1.20-123 SPAFs) and the Tetra CB calibrations (SPAFs of 1.55-1.77). The calibration goal for this project was to achieve an SPAF of less than 2.0 for most species and chemicals. For 4,4'-DDx under the "optimize SPAF" simulations this goal was met except for white perch in the Southwest biotic reach.

Looking at plots for these categories within the kinetic results (Appendix A) can provide some insight into these lower-accuracy comparisons. For example, for white perch in the southwest (page 42 of Appendix A), white perch arrive contaminated and depurate while on site. Model inputs (observed data) show that Arthur Kill sediment is significantly more contaminated with 4,4'-DDx than NBSA. CARP and REMAP data suggest that the Arthur Kill is approximately an order of magnitude higher than NBSA contamination for 4,4'-DDx, (Figure 22) but these data are highly variable, and comprised of older data (ranging from 1999-2003). To improve this data set, the CFT model was updated with sediment data from 2015 in the Arthur Kill, as described in the CFT model documentation report (HDR 2021). This updated analysis confirmed the high concentration of 4,4'-DDx in Arthur Kill sediments. White perch are estimated to spend half of their time when spawning in the Arthur Kill and its freshwater tributaries (that are assumed to have the same degree of contamination). However, this assumption is also uncertain so off-site exposure to Arthur Kill sediments may be overestimated for this species.

TABLE 23. SUMMARY OF SPAF RESULTS FOR THE OPTIMIZE-SPAF SIMULATIONS

	Optimize SPAF			SPAF K_{OW} Constant		
	North	Southeast	Southwest	North	Southeast	Southwest
Softshell Clam	1.2	1.4	-1.3	1.2	1.4	-1.3
Atlantic Silverside	1.1	1.2	-1.0	1.0	1.3	1.1
Small forage fish	-1.1	1.0	1.2	-1.1	1.1	1.3
Small American eel	-1.3	-1.1	1.1	-1.5	-1.0	1.2
Blue crab	-1.2	-1.0	1.4	-1.4	1.0	1.4
Summer Flounder	1.1	-1.0	-1.0	1.0	-1.1	1.0
White perch	**-1.7**	**-1.3**	**2.4**	**-1.8**	**-1.3**	**2.5**
Large American eel	-1.0	-1.1	-1.0	-1.2	-1.1	-1.0
Bluefish	1.1	2.0	-1.7	-1.0	2.0	-1.7
Striped Bass			1.3			1.3
Average by Reach	**1.21**	**1.22**	**1.35**	**1.25**	**1.24**	**1.39**
Average		**1.26**			**1.29**	

Red cells are model over-predictions and blue cells are under-predictions.

Table 24 presents SPAF results for the "maximize likelihood estimate" calibration, with and without K_{OW} held constant. The average SPAF for these MLE simulations of 1.36 is similar in quality to the 2,3,7,8-TCDD MLE calibrations (SPAFs of 1.37-1.40) and better than the Tetra CB calibrations (SPAFs of 1.57-1.75). Additionally, the majority of all species and reach simulations are within the factor of 2 target.

	Maximize Likelihood			MLE K_{OW} Constant		
	North	Southeast	Southwest	North	Southeast	Southwest
Softshell Clam	1.2	1.4	-1.3	1.2	1.4	-1.3
Atlantic Silverside	1.1	1.2	-1.1	-1.1	1.2	1.0
Small forage fish	-1.2	-1.1	-1.0	-1.4	-1.1	1.0
Small American eel	-1.5	-1.2	-1.1	-1.7	-1.1	1.1
Blue crab	-1.3	-1.1	1.2	-1.5	-1.0	1.3
Summer Flounder	-1.3	-1.5	-1.5	-1.4	-1.5	-1.5
White perch	**-2.3**	**-1.7**	**1.6**	**-2.6**	**-1.8**	**1.7**
Large American eel	-1.1	-1.2	-1.2	-1.4	-1.2	-1.2
Bluefish	-1.1	1.7	-2.2	-1.4	1.5	-2.3
Striped Bass			-1.0			1.0
Average by Reach	**1.33**	**1.33**	**1.31**	**1.52**	**1.31**	**1.35**
Average		**1.33**			**1.39**	

TABLE 24. SUMMARY OF SPAF RESULTS FOR THE MAXIMUM LIKELIHOOD SIMULATIONS

Red cells are model over-predictions and blue cells are under-predictions.

Figure 24 shows the comparison of model results to observations across all four simulations; most model results fall within two standard errors of the mean.

Figure 27 shows the value of parameters selected within their range of uncertainty. For each model parameter labeled on the X axis the minimum Y-axis value corresponds to the minimum value of the indicated calibration range considered and the maximum value corresponds to the maximum value considered. Model simulations with variable K_{OW} were improved using higher K_{OW} values than the *a priori* estimate (a Log K_{OW} of approximately 6.57). There also were some patterns within metabolism rates selected by the optimizers, with flounder, bass, and bluefish metabolism tending to be higher and eel metabolism rates tending to be lower within their ranges of uncertainty.

Figure 30 presents cross plots of predicted vs. observed for all four scenarios, highlighting the model to data comparisons that are furthest from agreement.

Appendix A presents the full set of time-series results for 4,4'-DDx with observed data plotted at the time it was collected against the model-output time series. As before, the majority of model results pass directly through or

quite near the central tendency with very few sets of model results occurring outside of two standard errors from the mean.

The quality of these four model calibrations for 4,4'-DDx are comparable. For all chemicals, the primary model calibration will remain the SPAF (variable K_{OW}) simulation. In addition, the quality of the 4,4'-DDx model is comparable to the other chemicals modeled.

DISCUSSION

Based on the steady-state metrics examined and the plotting of the kinetic-model results, the primary model calibration is the SPAF (variable K_{OW}) simulation. The other three model calibrations will be retained to determine if their parameter differences have any significant impact on future model projections.

Working with the primary model calibration, Figure 31 illustrates how the model predicts uptake from sediment vs. water column sources into a mixed-fish diet for the two contaminants modeled. The top chart suggests that 88% of 2,3,7,8-TCDD comes from sediment sources (including the fluff layer at the bottom of the water column). The bottom chart shows that a somewhat higher percentage of Tetra CB in fish tissue originates from water-column sources, driven by a higher uptake of truly-dissolved Tetra CB.

The calibrated model can also be used to explore the impacts of off-site exposure on migratory species. Figure 33 shows that off-site exposure is by far most important for white perch which can get as much as 70% of its exposure to modeled chemicals from off site. This is due to the assumption that white perch in the north spend their growing season in the Lower Passaic River and the Lower Hackensack River, and the white perch in the south spend their growing season in the two "Kills" reaches. Striped bass, bluefish, and flounder are predicted to get from 5-31% of their exposure from off-site locations during their southern migration into more saline waters. Blue crab and silverside are predicted to receive negligible tissue concentrations during their off-site migrations. Details as to which off-site segments are predicted to be the source of 2,3,7,8-TCDD and Tetra CB in the northern population of white perch, and those that are predicted to be the sources of chemicals in the southern population are shown in Figures 35 and 36. Figure 37 shows this same detail for 2,3,7,8-TCDD in summer flounder (Southeast segment) and Tetra CB in Striped Bass (Southwest segment).

Working with the primary model calibration, Figure 32 illustrates how the model predicts uptake from sediment vs. water column sources into a mixed-fish diet for 4,4'-DDx. Similar to 2,3,7,8-TCDD, the vast majority of uptake (77%) originates from sediment sources (including the fluff layer at the bottom of the water column).

For 4,4'-DDx, Figure 34 shows that off-site exposure is again most important for white perch which can get as much as 80% of its exposure to modeled chemicals from off site. However, the off-site exposure is greater for other species than it was for Tetra CB and 2,3,7,8 TCDD. This appears to be due to the high concentration in sediments in the Arthur Kill Migration (Figure 22) which are reflected in CFT inputs for this segment. Organisms that are predicted to pass through the Arthur Kill during migration are predicted to take up 4,4'-DDx from this segment. For example, Figure 38 (bottom) shows that white perch in the Southwest biotic reach are predicted to take up 76% of their total body burden from the Arthur Kill migration reach even though only half of white perch are predicted to spawn in the Arthur Kill or its tributaries. Figure 39 shows that Striped Bass (of which 50% are estimated to pass through the Arthur Kill River during migration) are predicted to take up over half of their body burden of 4,4'-DDx from this site. As a reminder, the kinetic model predicts body burdens at the time of fish collection; for Striped Bass this is assumed to be approximately 30 days following their return migration through the Kills.

Overall, examination of calibrated fish-tissue concentrations as compared to observed data, suggests that this model is successfully calibrated and suitable for use in forecast simulations.

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FIGURES

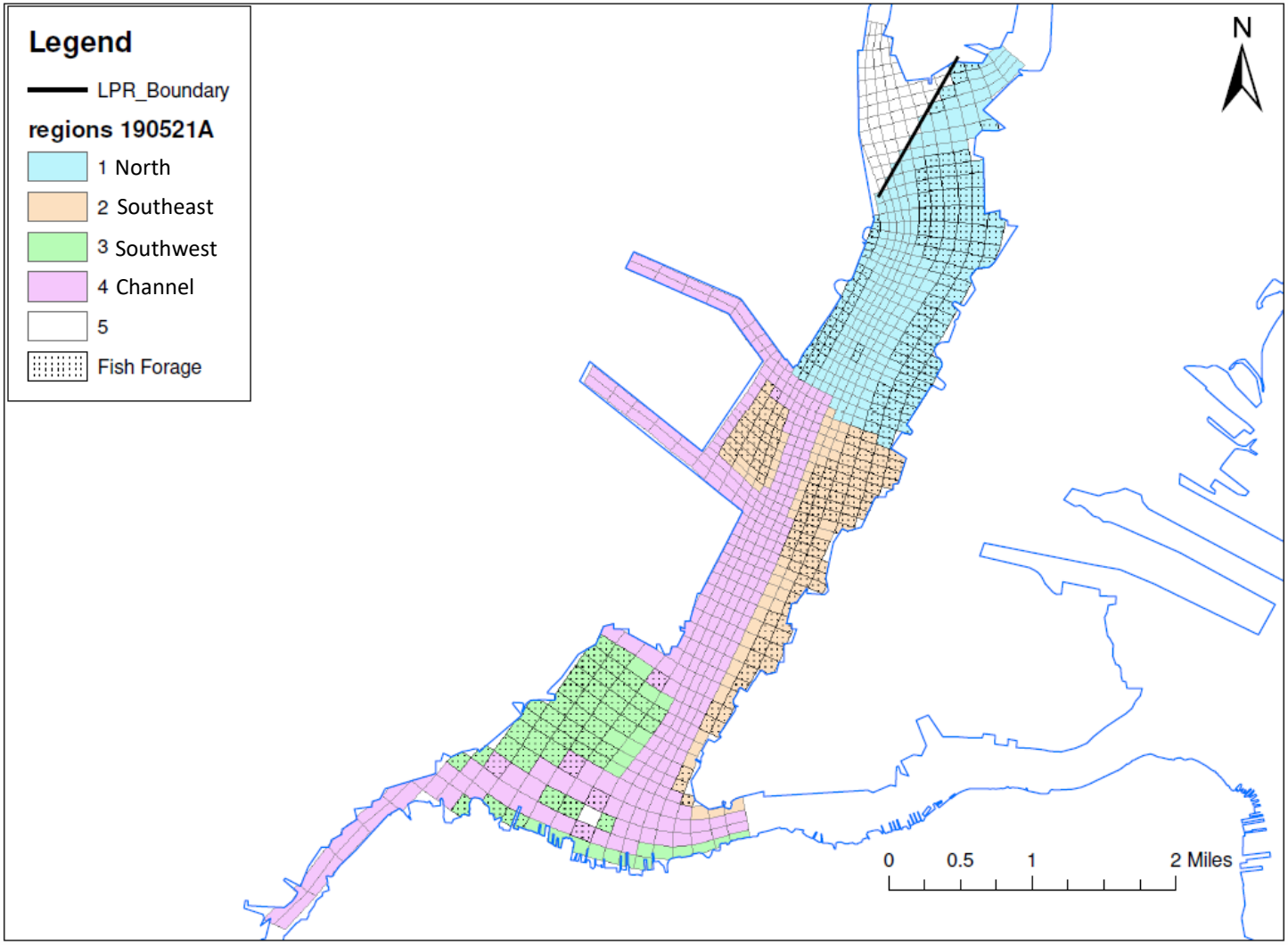
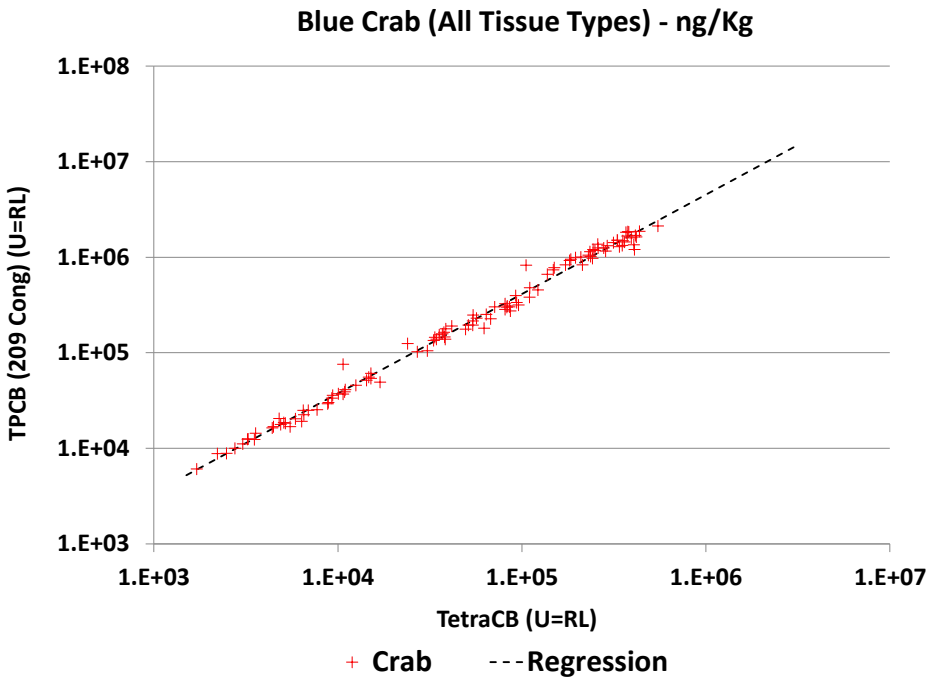
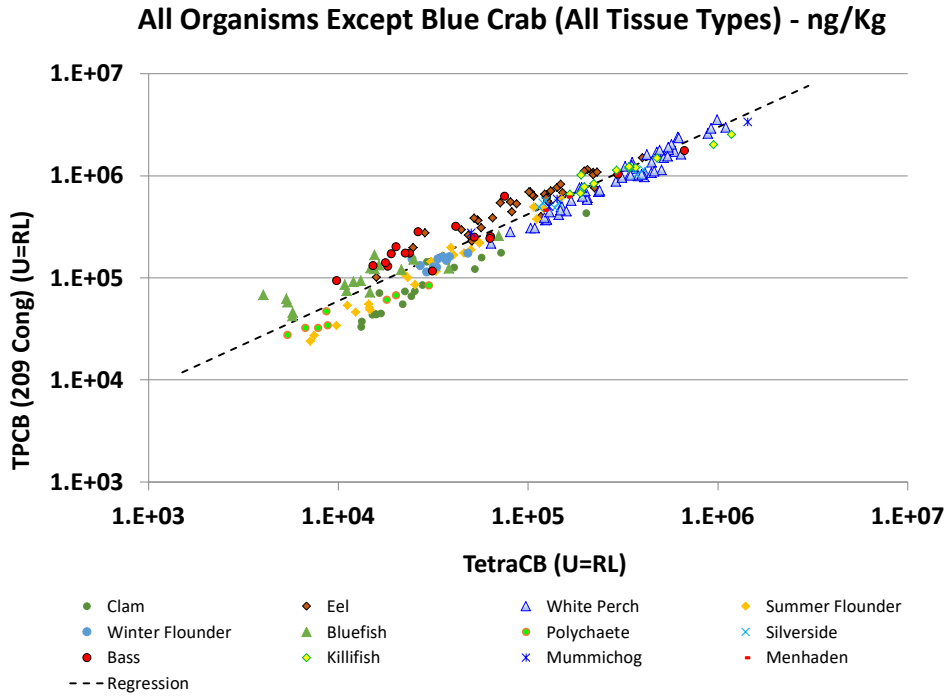


FIGURE 1. NEWARK BAY STUDY AREA AND BIOLOGICAL-MODELING REGIONS

Forage-fish habitat cells are demarcated with dots

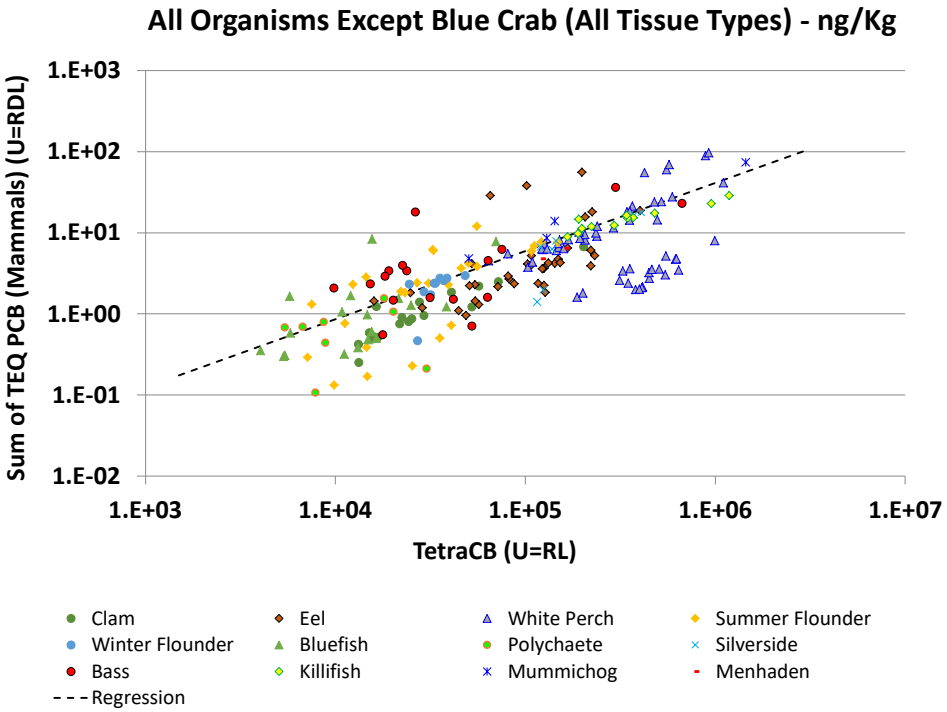


Blue Crab	$TPCB(209Cong) = 1.012 \times \exp\left[0.9542 + 1.040 \times \ln(TetraCB)\right]$	$R^2 = 0.99$	n = 111

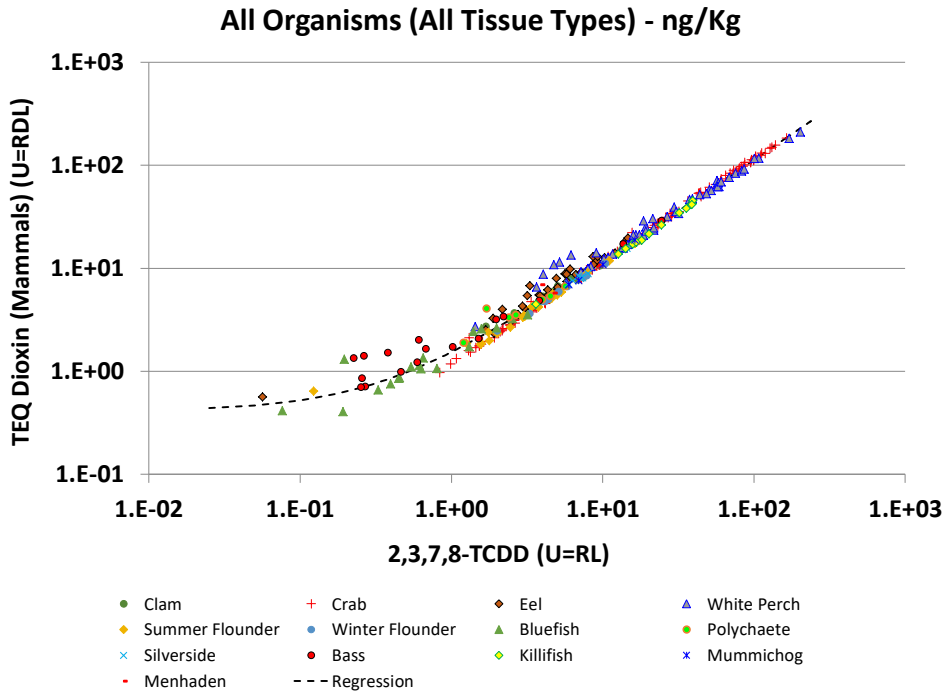


All Others	$TPCB(209Cong) = 1.055 \times \exp\left[3.103 + 0.8508 \times \ln(TetraCB)\right]$	$R^2 = 0.93$	n = 216

FIGURE 2. TISSUE REGRESSIONS FOR TOTAL PCBS FROM TETRA CB



All Others	$TEQPCBMammals = 1.314 \times \exp\left[-8.172 + 0.8406 \times \ln(TetraCB)\right]$	$R^2 = 0.59$	n = 216;



All Organisms	*TEQDioxinPCBFish* = 1.1126 × (*2,3,7,8-TCDD*) +0.9163	$R^2 = 0.99$	n = 327

FIGURE 3. TISSUE REGRESSIONS FOR TEQ PCB FROM TETRA CB AND TEQ DIOXIN FROM 2,3,7,8-TCDD

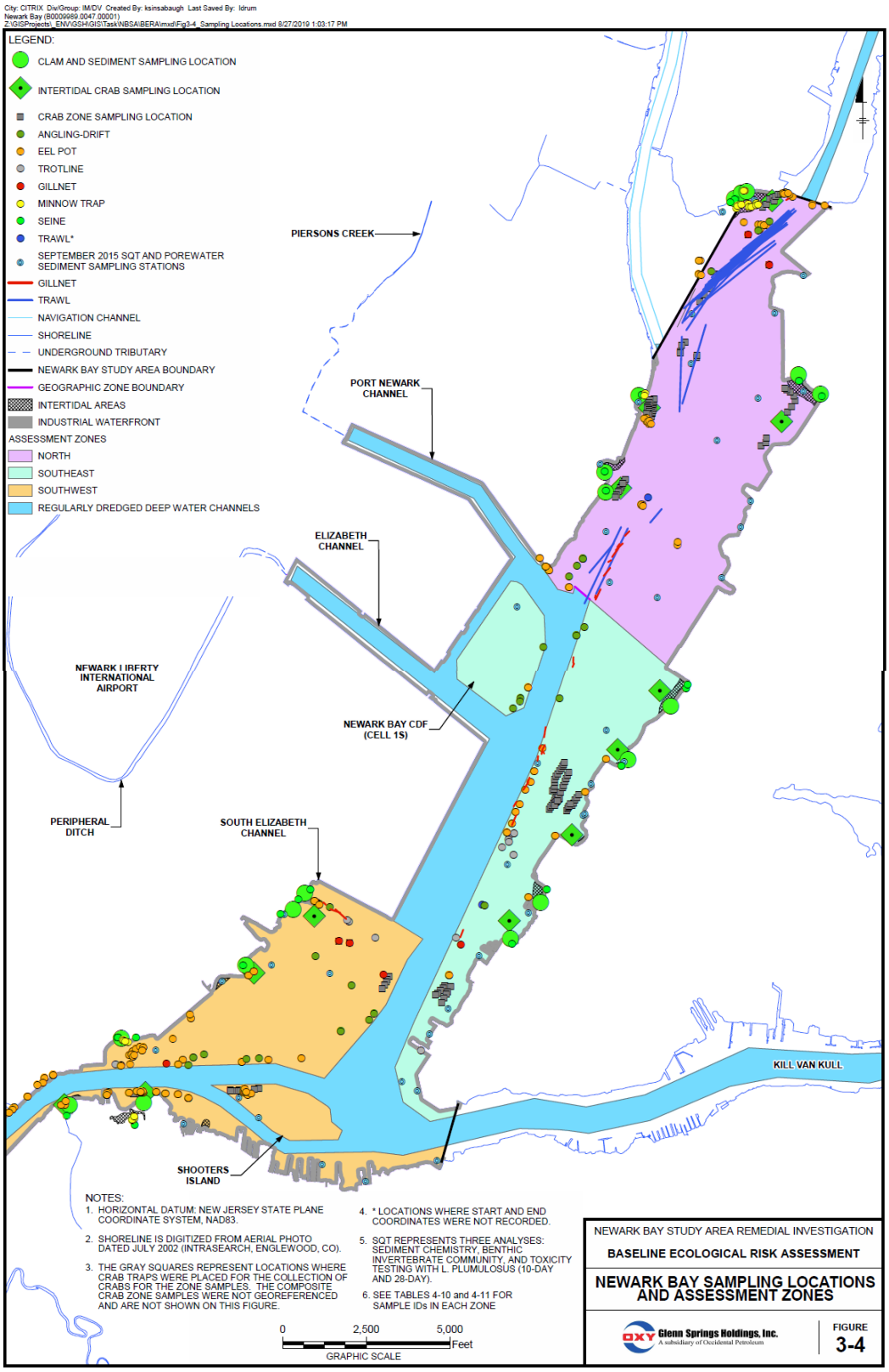


FIGURE 4. BIOLOGICAL ASSESSMENT ZONES USED IN THE BIOACCUMULATION MODELING.
FIGURE 3-4 FROM (GLENN SPRINGS HOLDINGS, INC. 2019A)

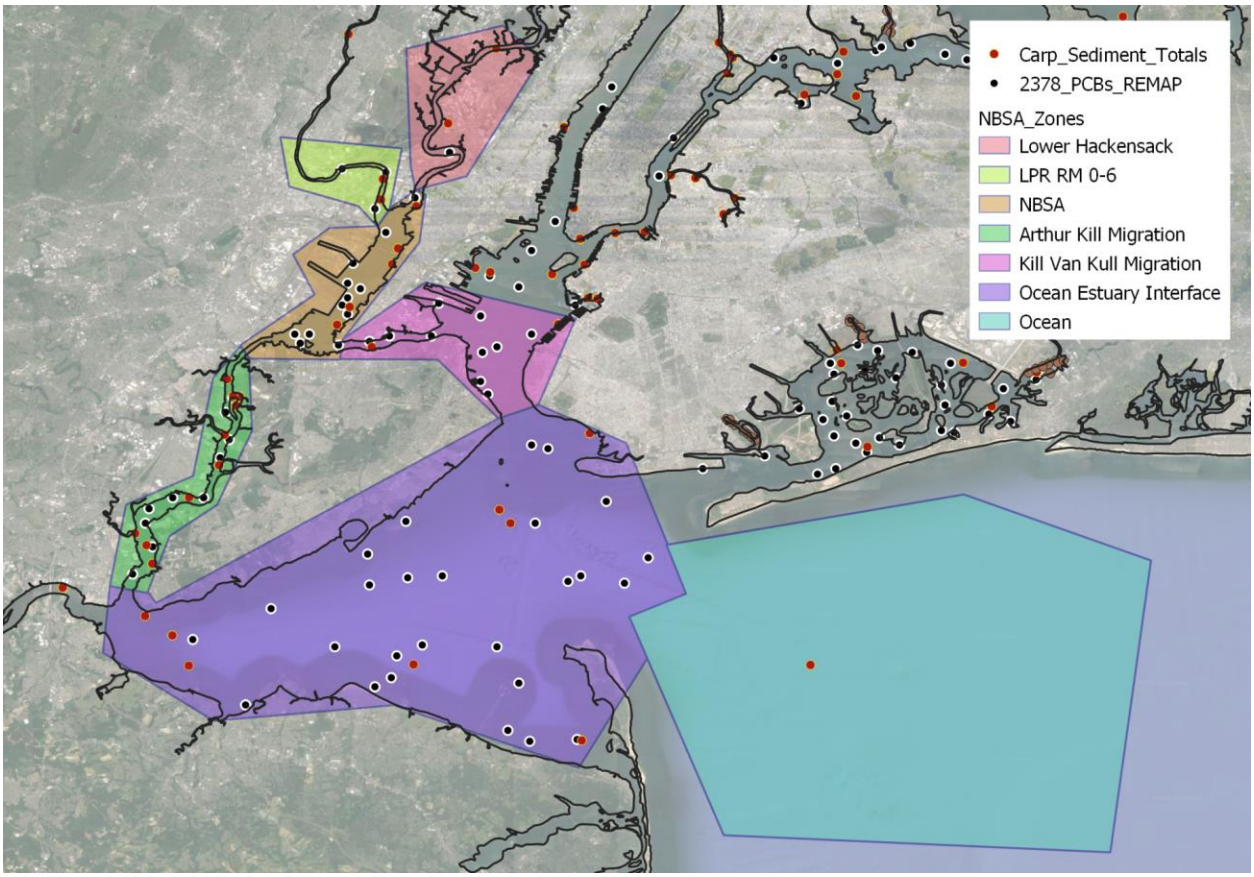


FIGURE 5. DEFINED "REPRESENTATIVE OFF-SITE LOCATIONS" FOR NBSA WITH CARP AND REMAP SAMPLE LOCATIONS

Striped Bass Migration Model

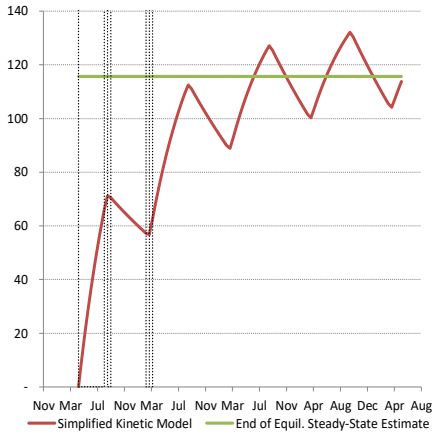
Expected Residence Time in Newark Bay for Striped Bass by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Young-of-the-Year (<10 cm)	November - April of First Year	6 months
Juveniles (10 – 25 cm)	Year round	2 years
Adults (> 25cm)	May – August, October (Fall Migration)	4 -6 months per year

Modeled Months in NBSA – 4.8

Location	Date Arrived	Date Departed	Duration
NBSA	4-May	28-Aug	116
AK/KVK	29-Aug	12-Sep	15
O/E Int.	13-Sep	27-Sep	15
Ocean	28-Sep	4-Mar	159
O/E Int.	5-Mar	19-Mar	15
AK/KVK	20-Mar	3-Apr	15
NBSA	4-Apr	**3-May**	30

Avg. Collection Date 3-May



Blue Crab Migration Model

Expected Residence Time in Newark Bay for Blue Crab by Life Stage.

Life Stage (approx. size in CW)	Months	Approx. Duration
Young-of-the-Year	October - June of First Year	9 months
Juveniles (<12 cm CW)	June - October of 2nd year	5 months
Adult – male* (>12 cm CW)	May – October of 3rd Year	6 months

* Adult females expected to remain offshore after breeding during Year 2.

Modeled Months in NBSA – 6

Location	Date Arrived	Date Departed	Duration
NBSA	10-Oct	30-Oct	21
AK/KVK	31-Oct	24-Nov	25
O/E Int.	25-Nov	5-Apr	133
AK/KVK	6-Apr	30-Apr	25
NBSA	1-May	**8-Oct**	161

Avg. Collection Date 8-Oct, 75% males

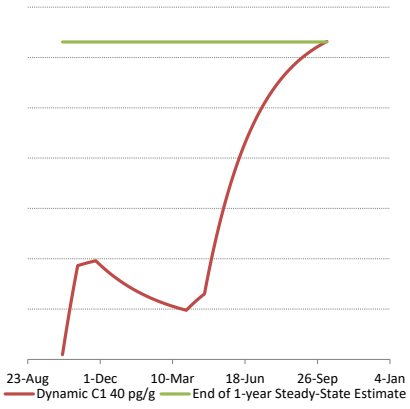


FIGURE 6. PARAMETERS GOVERNING TIMING OF MIGRATION AND GRAPH OF STEADY-STATE VS. SIMPLIFIED KINETIC MODEL FORMULATION FOR STRIPED BASS AND BLUE CRAB

White Perch Model (N-SE)

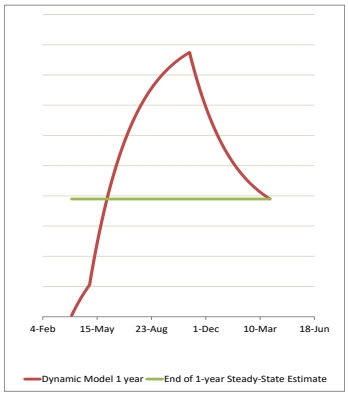
Expected Residence Time in Newark Bay for White Perch by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Young-of-the-Year (<8 cm)	November – April of first year	6 months
Juveniles (8 – 15 cm)	November - April of 2nd year	6 months
Adults (>15 cm)	November - April (but more sporadically than juveniles)	4-6 months per year

Modeled Months in NBSA – 6

Location	Date Arrived	Date Departed	Duration
NBSA	29-Mar	30-Apr	33
LPR / Hackensack	1-May	31-Oct	184
NBSA	1-Nov	**28-Mar**	149

Avg. Collection Date: 28 March



White Perch Model (SW)

Expected Residence Time in Newark Bay for White Perch by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Young-of-the-Year (<8 cm)	November – April of first year	6 months
Juveniles (8 – 15 cm)	November - April of 2nd year	6 months
Adults (>15 cm)	November - April (but more sporadically than juveniles)	4-6 months per year

Modeled Months in NBSA – 6

Location	Date Arrived	Date Departed	Duration
NBSA	29-Mar	30-Apr	33
KVK/AK	1-May	31-Oct	184
NBSA	1-Nov	**28-Mar**	149

Avg. Collection Date: 28 March

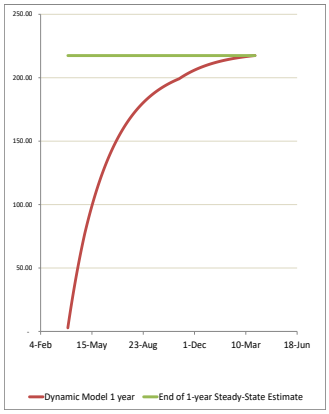


FIGURE 7. PARAMETERS GOVERNING TIMING OF MIGRATION AND GRAPH OF STEADY-STATE VS. SIMPLIFIED KINETIC MODEL FORMULATION FOR WHITE PERCH IN THE NORTH, SOUTHEAST, AND SOUTHWEST REGIONS OF NBSA

Summer Flounder Model

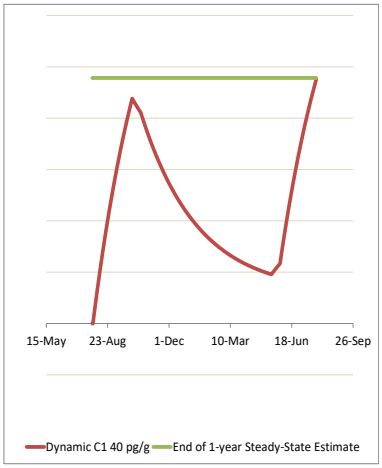
Expected Residence Time in Newark Bay for Summer Flounder by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Juveniles (15 – 30 cm)	May - September	4 months
Adults (>30 cm)	May - September	4 months per year

Modeled Months in NBSA – 4

Location	Date Arrived	Date Departed	Duration
NBSA	30-Jul	1-Oct	64
AK/KVK	2-Oct	15-Oct	14
O/E Int.	16-Oct	15-May	213
AK/KVK	16-May	29-May	14
NBSA	30-May	**28-Jul**	60

Avg. Collection Date: Jul 28



Atlantic Silverside Model

Expected Residence Time in Newark Bay for Atlantic Silverside by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Young-of-the-Year (<4 cm)	April - December	8 months
Juveniles (4-9 cm)	April - December	8 months
Adults (9-13 cm)	April - December	8 months per year

Modeled Months in NBSA – 8

Location	Date Arrived	Date Departed	Duration
NBSA	15-Oct	15-Dec	62
AK/KVK	16-Dec	15-Jan	31
O/E Int.	16-Jan	15-Mar	60
AK/KVK	16-Mar	14-Apr	30
NBSA	15-Apr	**13-Oct**	182

Avg. Collection Date: Oct 13

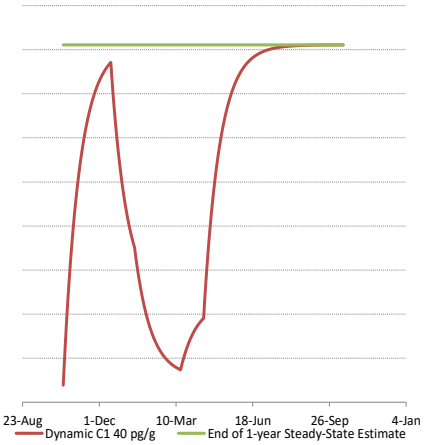


FIGURE 8. PARAMETERS GOVERNING TIMING OF MIGRATION AND GRAPH OF STEADY-STATE VS. SIMPLIFIED KINETIC MODEL FORMULATION FOR SUMMER FLOUNDER AND ATLANTIC SILVERSIDE

Bluefish Migration Model

Expected Residence Time in Newark Bay for Bluefish by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Juveniles (< 30 cm)	May - September	4 months
Adults (≥ 30 cm)	May - September	4 months per year

Modeled Months in NBSA – 4.0

Location	Date Arrived	Date Departed	Duration
NBSA	5-Jun	5-Sep	93
AK/KVK	6-Sep	12-Sep	7
O/E Int.	13-Sep	19-Sep	7
Ocean	20-Sep	20-Apr	214
O/E Int.	21-Apr	27-Apr	7
AK/KVK	28-Apr	4-May	7
NBSA	5-May	**3-Jun**	30

Avg. Collection Date 3-June

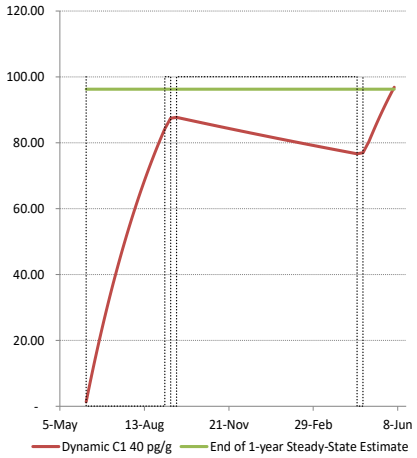
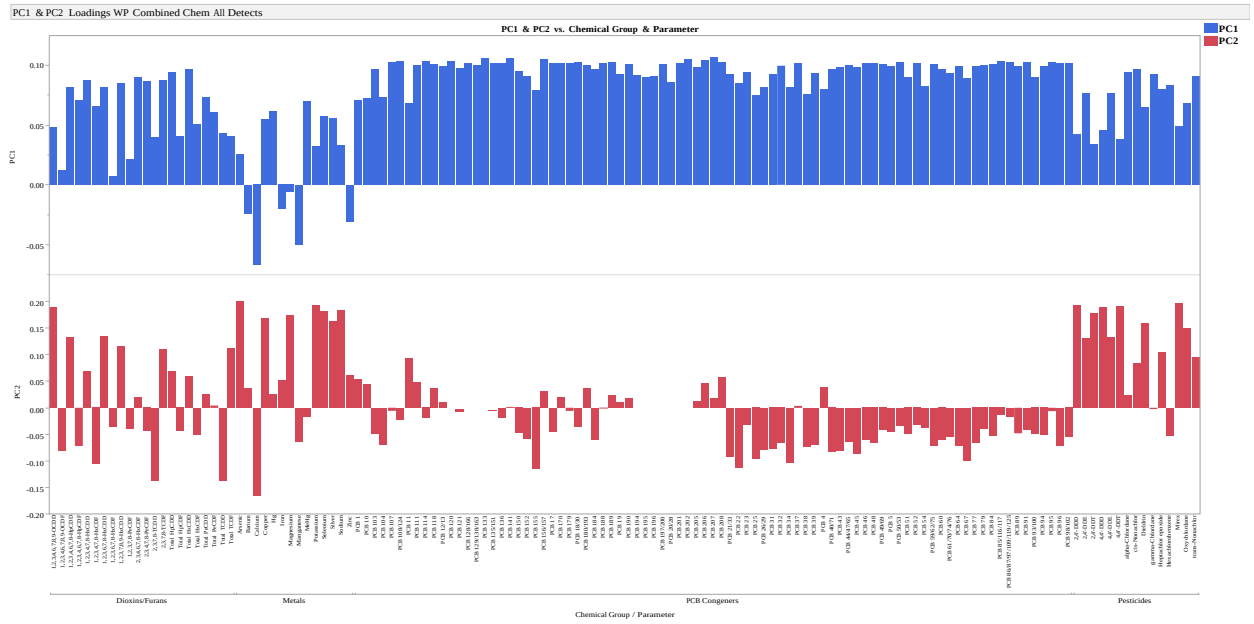


FIGURE 9. PARAMETERS GOVERNING TIMING OF MIGRATION AND GRAPH OF STEADY-STATE VS. SIMPLIFIED KINETIC MODEL FORMULATION FOR BLUEFISH



PC1 – All Chemicals excluding some metals
PC2 – Lower in 2,3,7,8 TCDD and some PCBs
PC2 – Higher in DDD, DDE, and DDT, Potassium, Sodium

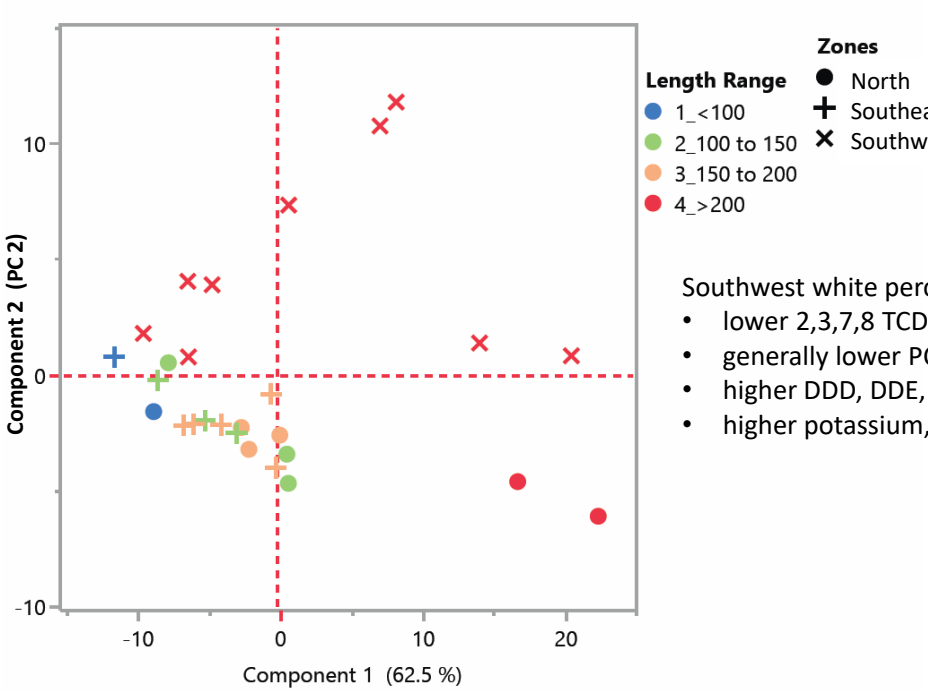
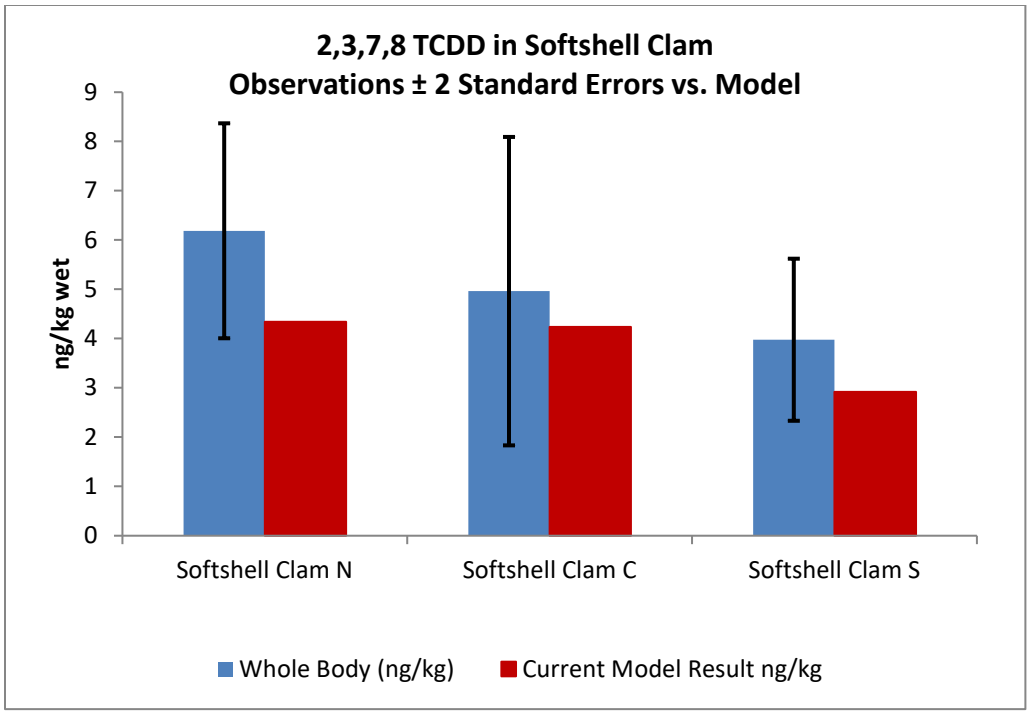


FIGURE 10. SUMMARY OF RESULTS FROM WHITE-PERCH PRINCIPAL COMPONENT ANALYSIS

PC1 and PC2 are the principal component axes. Southwestern Perch are shown as a red "x" in bottom graph The bottom graph shows that the "x" marks representing Southwestern white perch are in a distinct region from the other symbols that represent the North and Southeast. This means that the chemical composition for Southwest perch is dissimilar; this likely reflects a different life history from perch collected in the other segments.



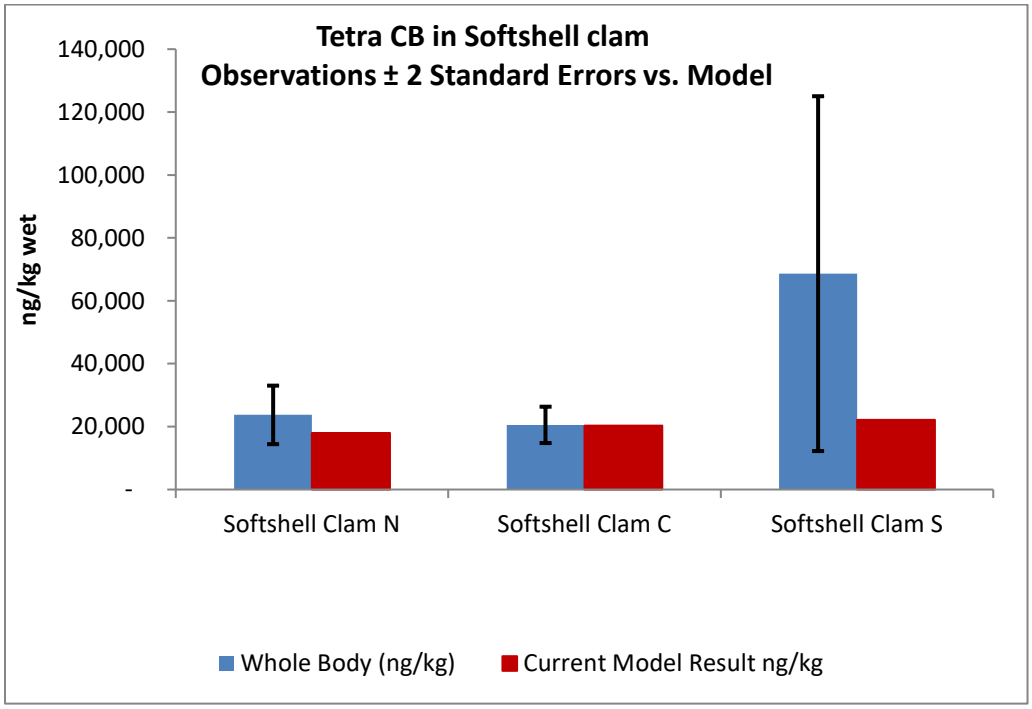
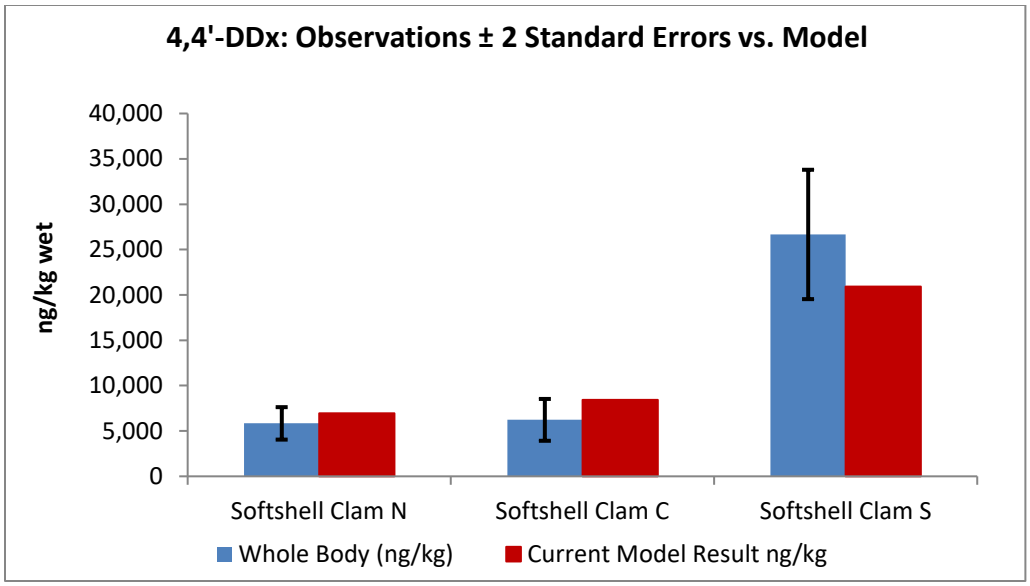


FIGURE 11. SOFTSHELL CLAM BMF MODEL



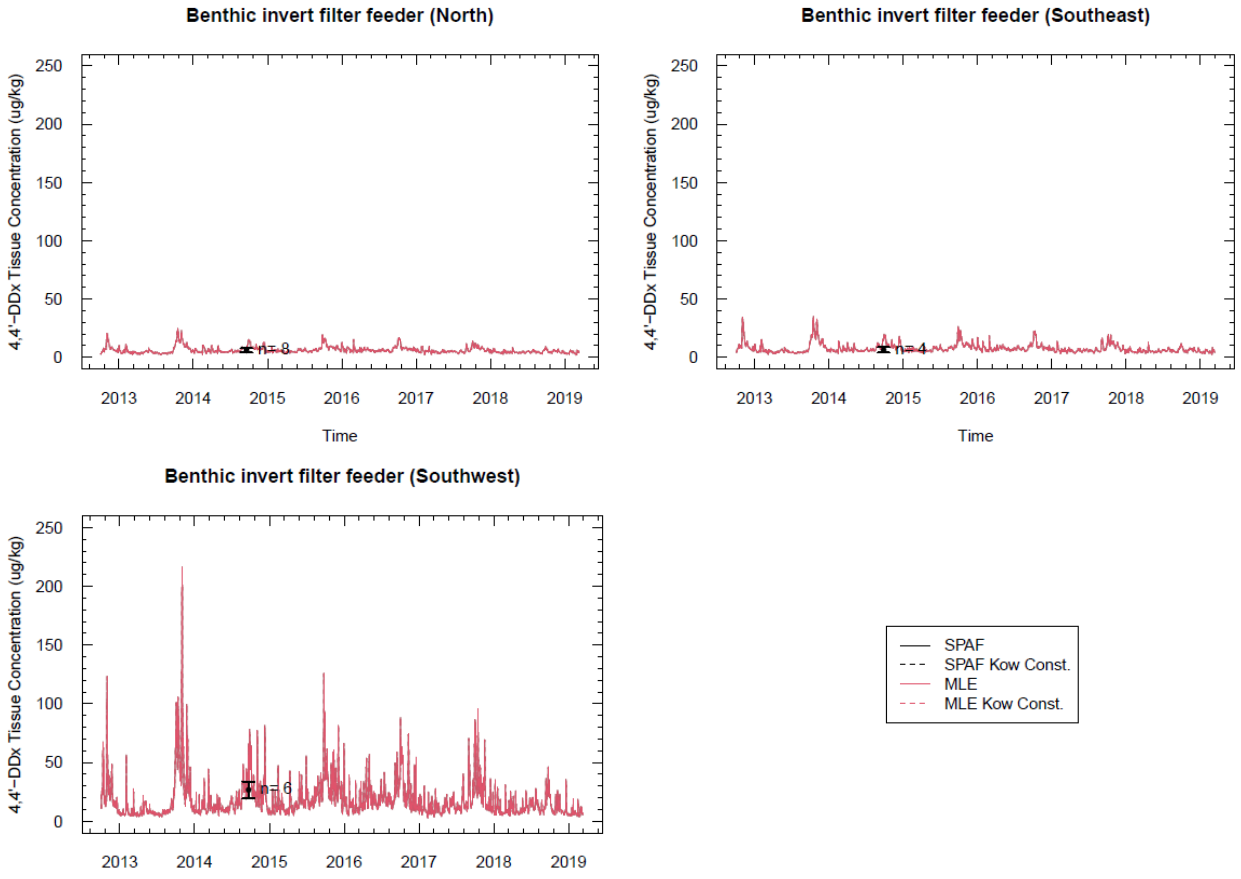
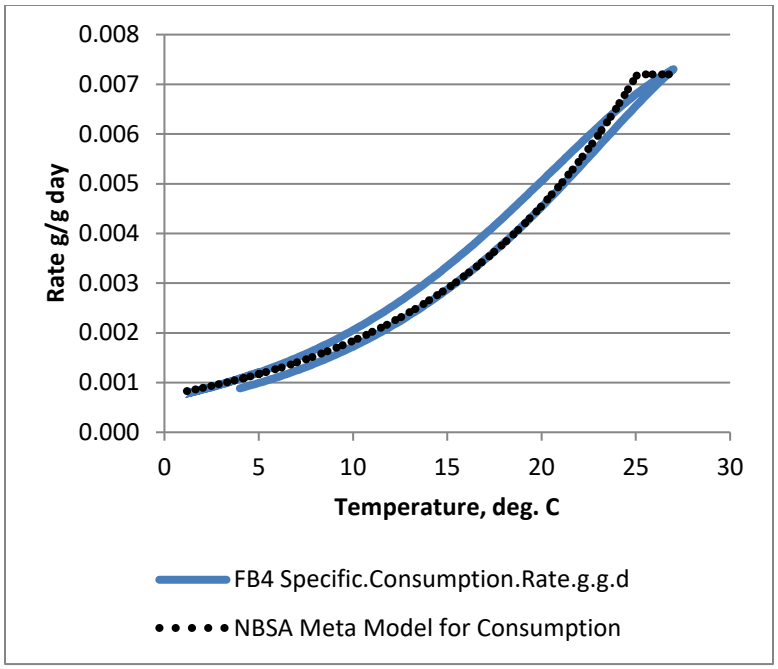


FIGURE 12. SOFTSHELL CLAM BMF MODEL RESULTS FOR 4,4'-DDx. STEADY STATE MODEL ABOVE, KINETIC MODEL BELOW.



Symbol	Summer Flounder
CvTa	-7.2038
CvTb	0.0906
Cmax	0.0072
KGvCa	0.0000
KGvCb	0.6560
KGmin	n / a
KGmax	0.0060

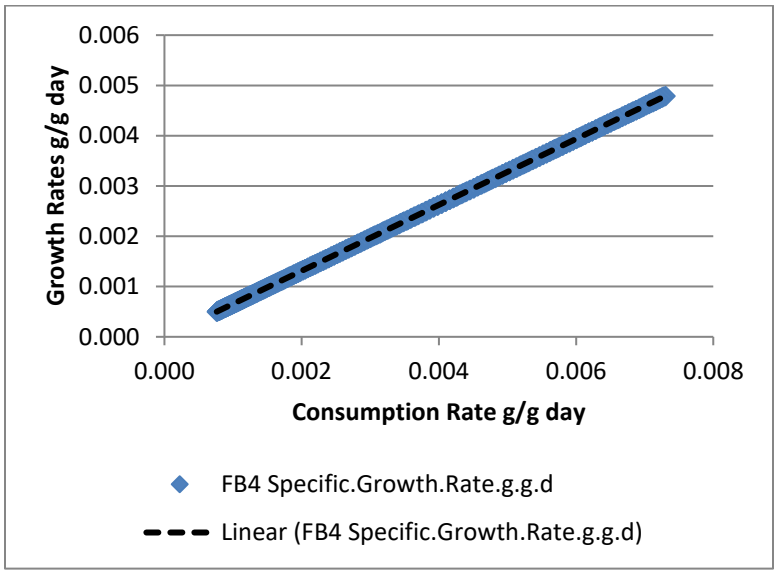
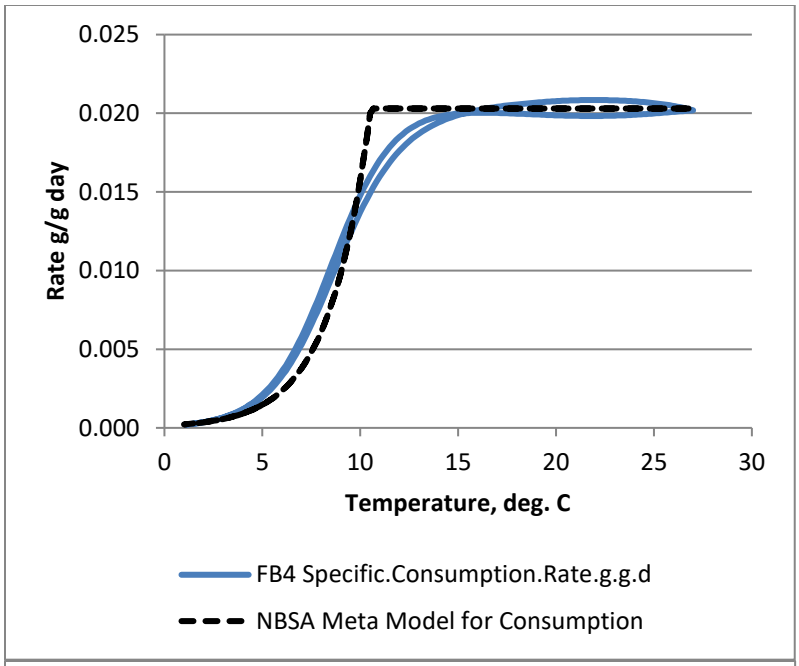
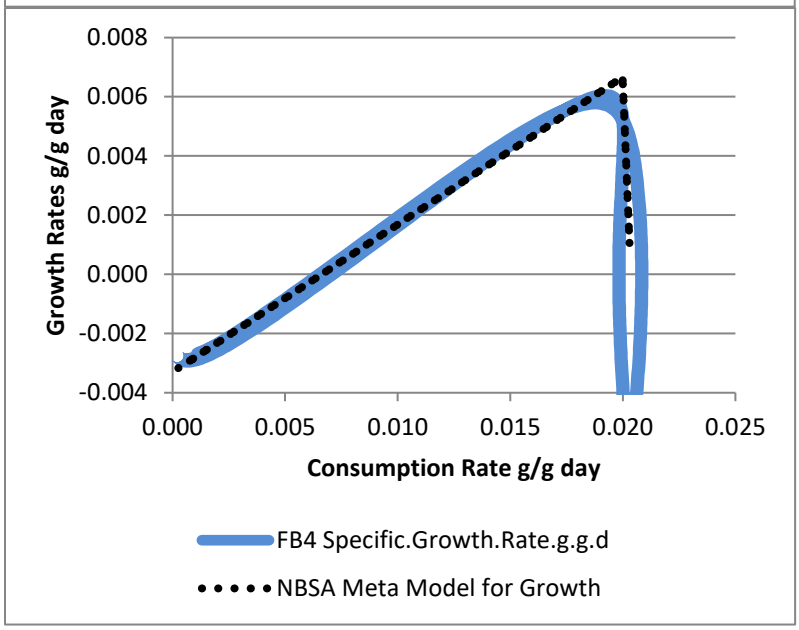


FIGURE 13. FB4 PLOTS OF FLOUNDER BIOENERGETICS (BLUE) VS. META-MODEL PLOTS (BLACK DOTTED LINES) AND META-MODEL PARAMETERS

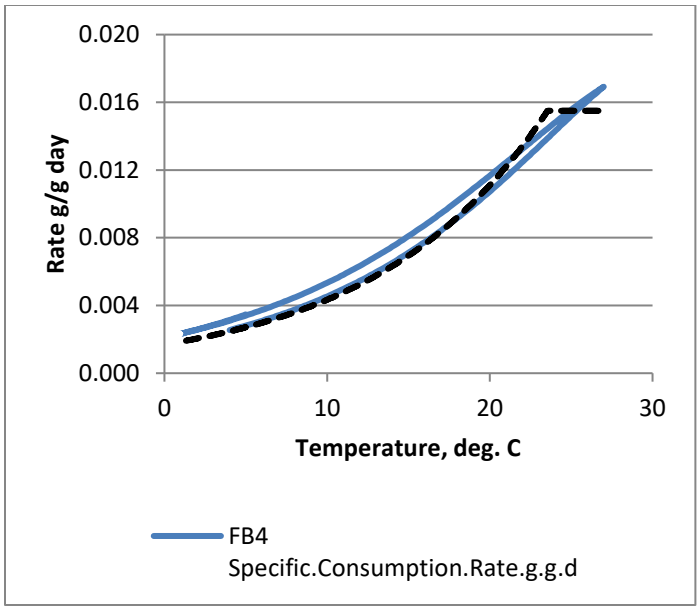




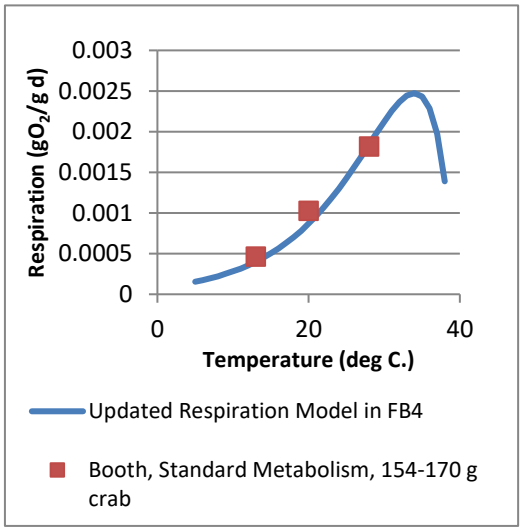
Symbol	Striped Bass
CvTa	-8.9
CvTb	0.475
CMax	0.0203
KGvCa	-0.0033
KGGvCb	0.4984
KGmin	n / a
KGmax	0.007

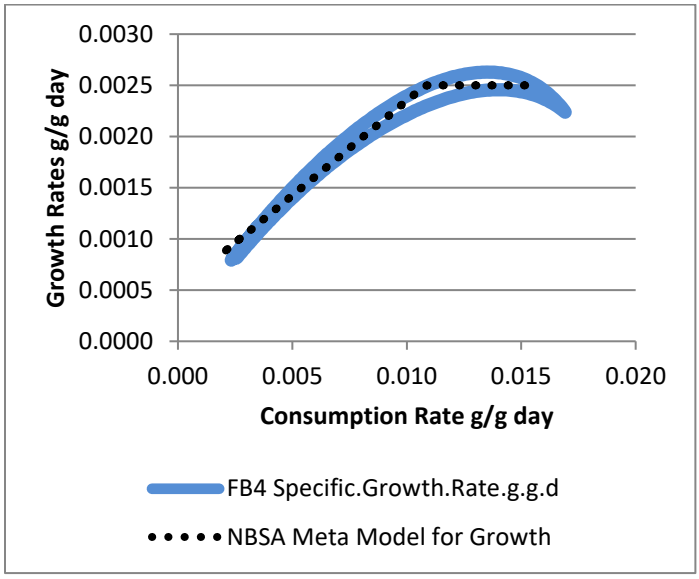
The FB4 model of Hartman and Brandt (1995) predicts highly variable and negative growth rates for Striped Bass during summer months. As a simplification, Striped Bass are set to a growth rate of 0.001 g/g day when they have reached their maximum consumption rate. This produces an estimate of annual growth for the species that matches model assumptions. Furthermore, this minor modification is consistent with data from Coutant and Suffern (1977) which suggests that negative growth in Striped Bass does not occur until temperatures exceed 30 deg C. (higher than water temperatures encountered in these NBSA simulations.)

FIGURE 14. FB4 PLOTS OF STRIPED BASS (BLUE) VS. META-MODEL PLOTS (BLACK DOTTED LINES) AND META-MODEL PARAMETERS



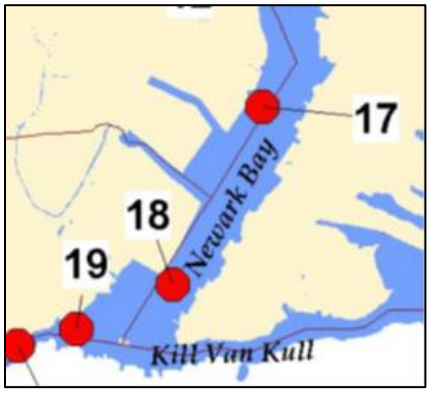
Symbol	Blue Crab
CvTa	-6.38
CvTb	0.094
CMax	0.0155
KGvCa	0.0005
KGGvCb	0.185
KGmin	n / a
KGmax	0.0025



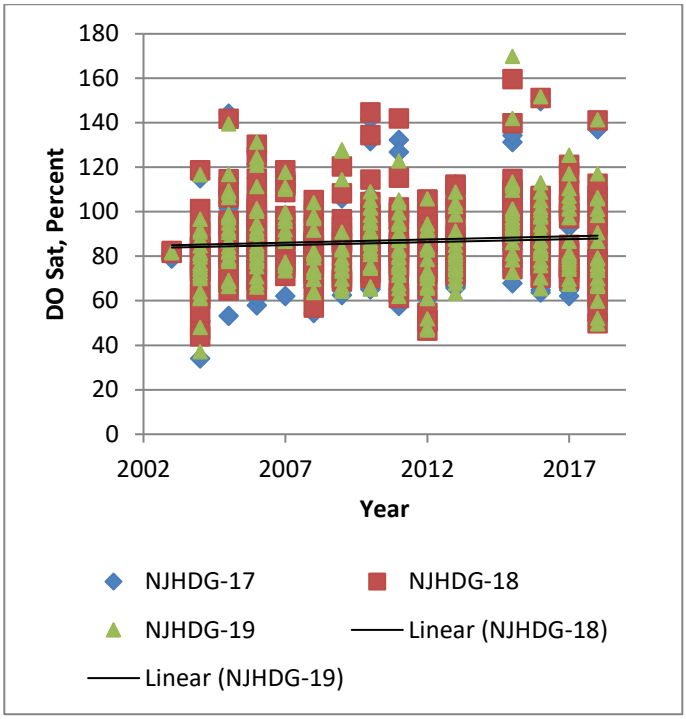


An FB4 model was derived based on the Blue-Crab model published by Brylawski and Miller (2003). This model was updated with respiration data from Booth and McMahon (1992) to reflect adult-crab respiration rates (above).

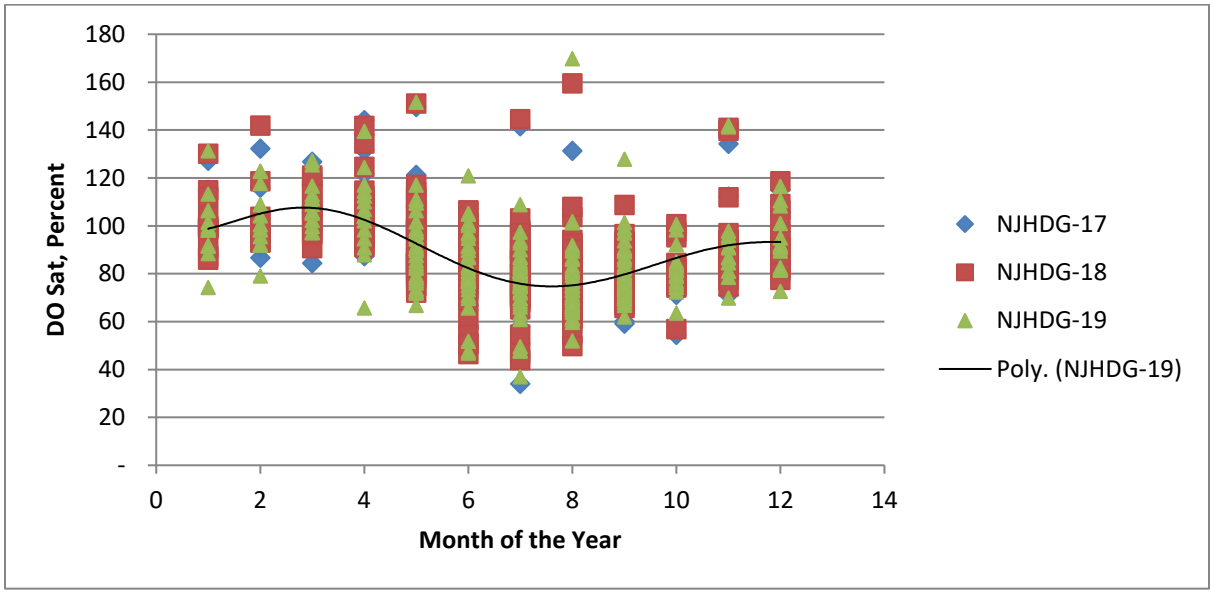
FIGURE 15. FB4 PLOTS OF BLUE CRAB (BLUE LINES) VS. META-MODEL PLOTS (BLACK DOTTED LINES) AND META-MODEL PARAMETERS



NJHDG Stations In the Study Area



Subtle upward trend when data are binned by year



Seasonality evident within DO-Sat Data

FIGURE 16. SUMMARY OF AVAILABLE OXYGEN-SATURATION DATA IN NBSA STUDY AREA FROM NJHDG

(New Jersey Harbor Dischargers Group)

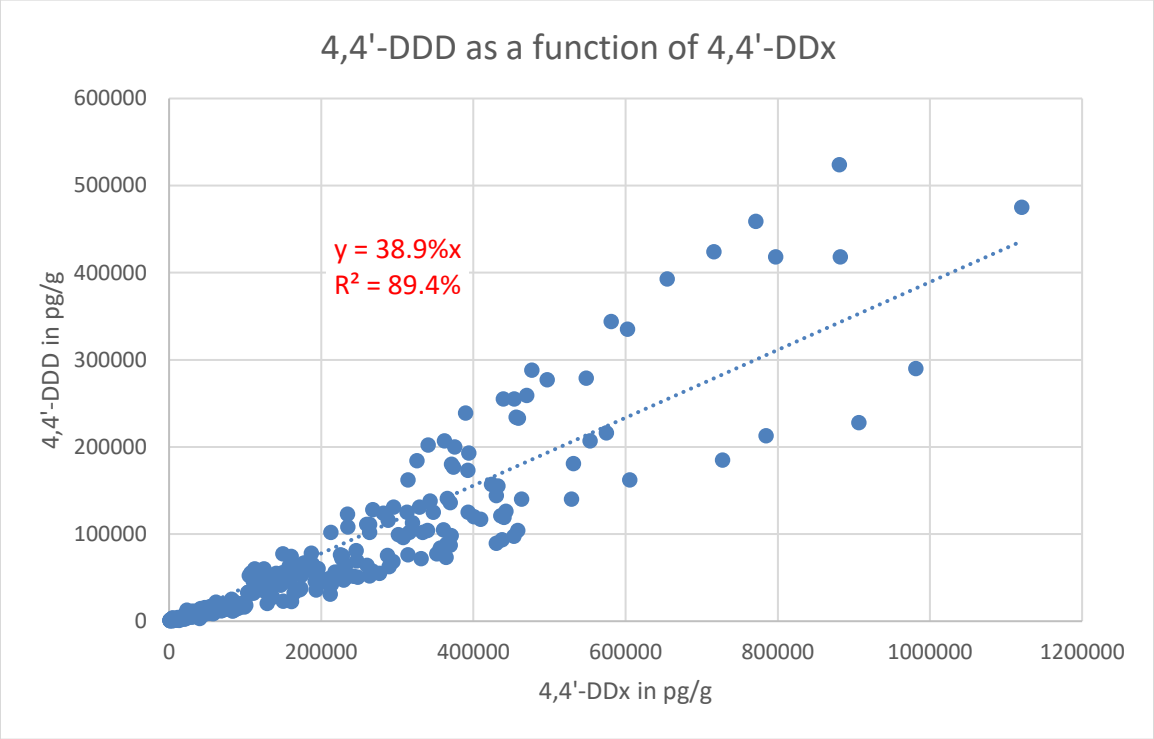


FIGURE 17. 4,4'-DDD AS A FUNCTION OF 4,4'-DDx IN ALL BIOTIC TISSUE SAMPLES

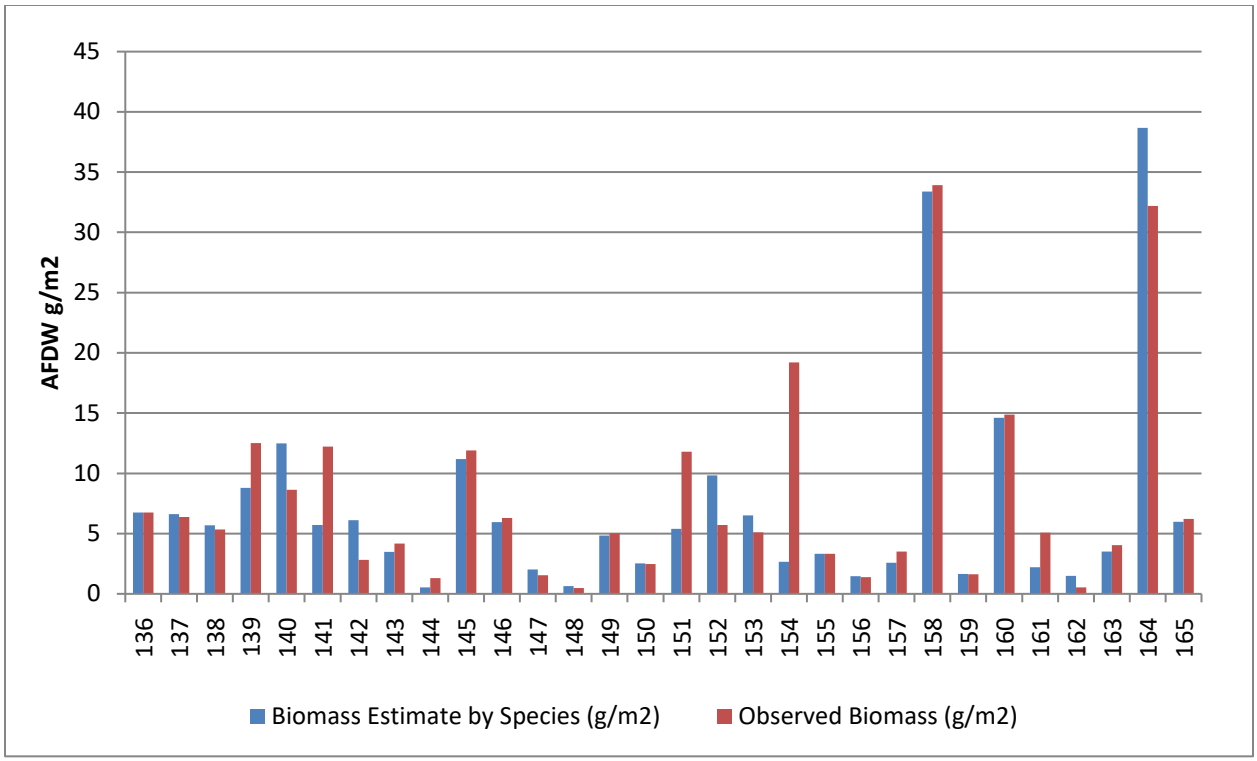


FIGURE 18. STATION BY STATION ESTIMATED BENTHIC BIOMASS (CALIBRATED) VS. OBSERVED

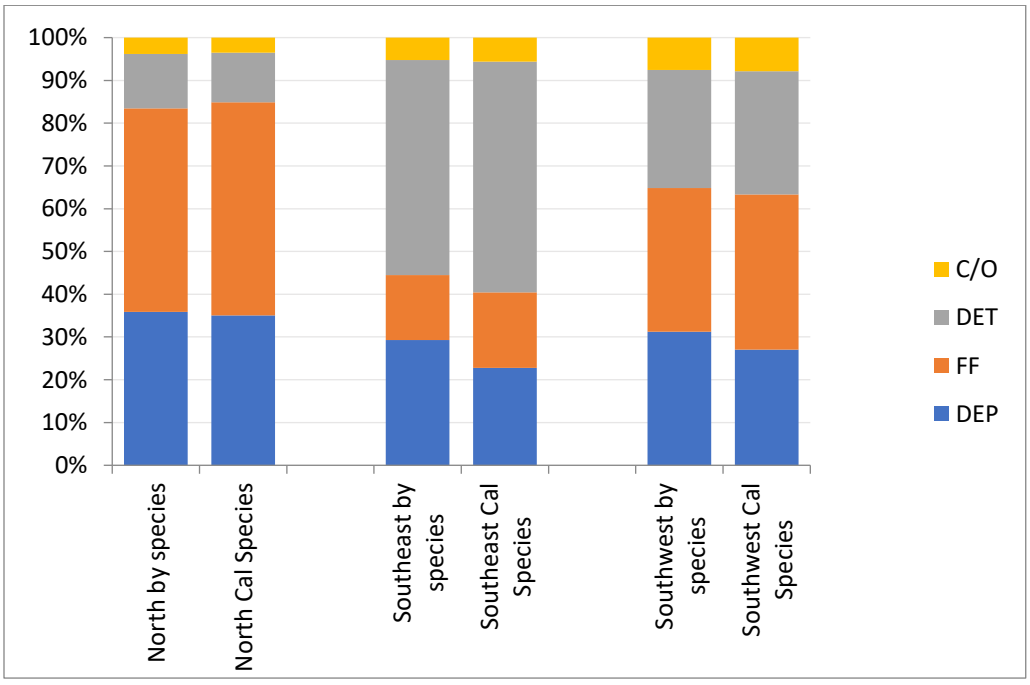


FIGURE 19. PROPORTION OF BENTHIC BIOMASS BY FEEDING GUILD FOR EACH BIOACCUMULATION REACH. ESTIMATES ARE BASED ON ABUNDANCE DATA AND UNCALIBRATED (LEFT) AND CALIBRATED (RIGHT) MEAN WEIGHT ESTIMATES BY SPECIES.

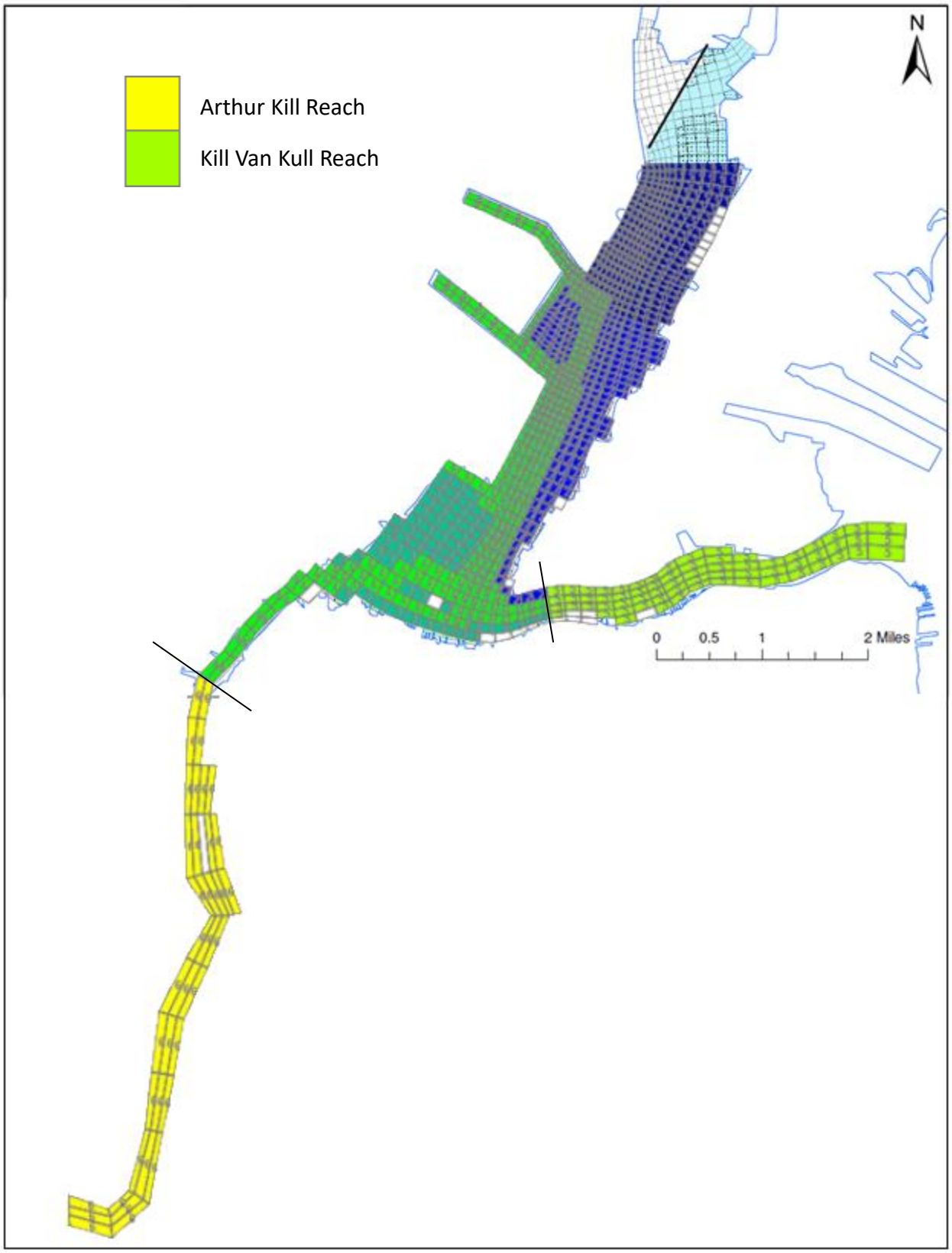


FIGURE 20. CFT LINKAGE CELLS FOR "THE KILLS"

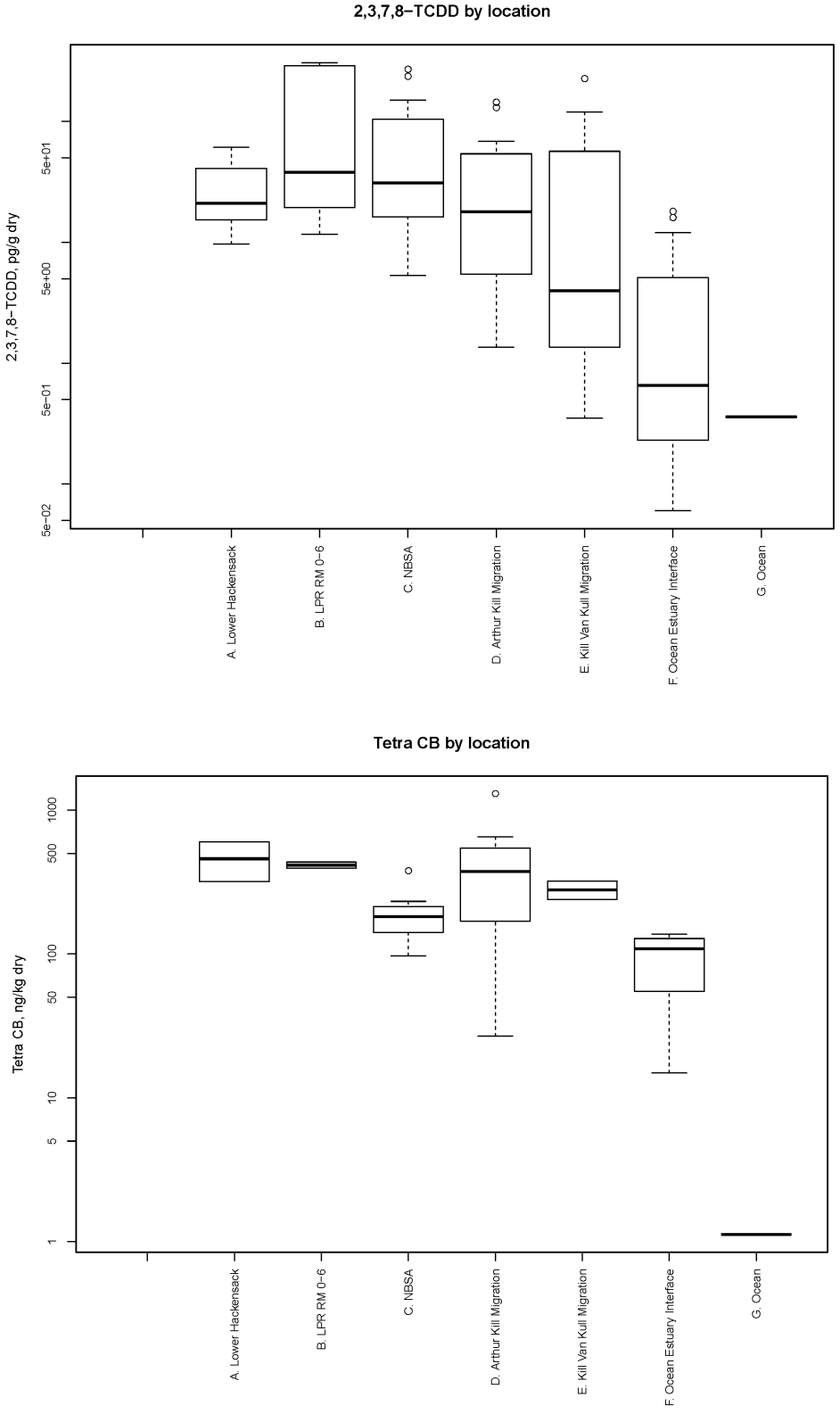


FIGURE 21. CARP AND REMAP SURFACE SEDIMENT DATA FOR NBSA AND REPRESENTATIVE OFF-SITE LOCATIONS

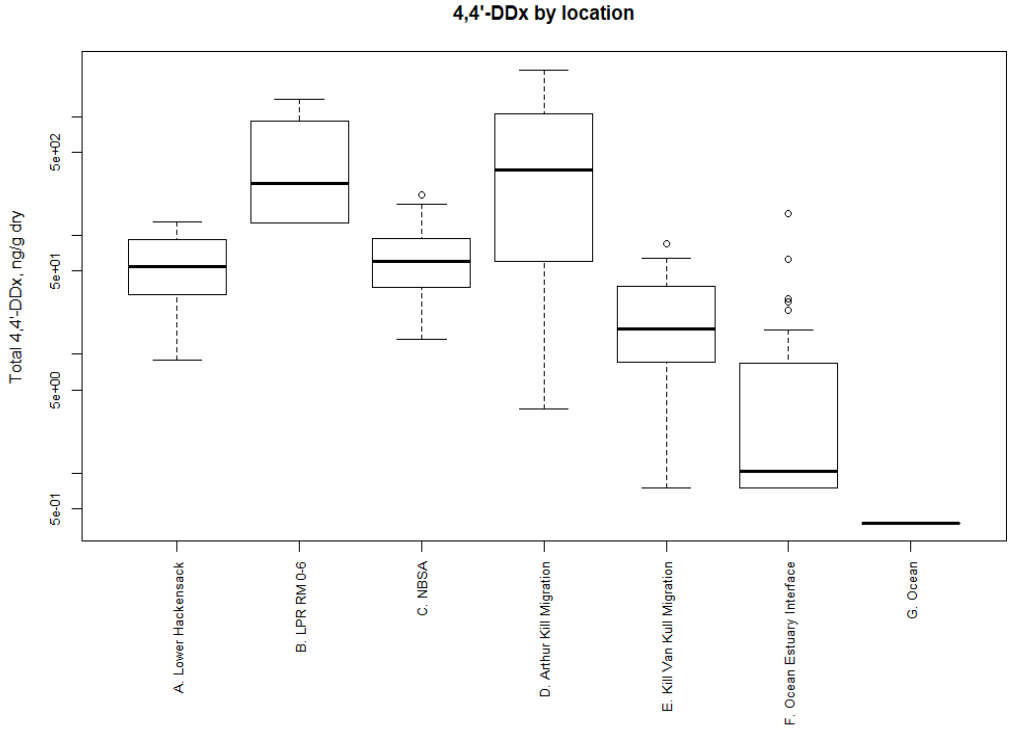


FIGURE 22: CARP AND REMAP SURFACE SEDIMENT 4,4'-DDX DATA FOR NBSA AND REPRESENTATIVE OFF-SITE LOCATIONS

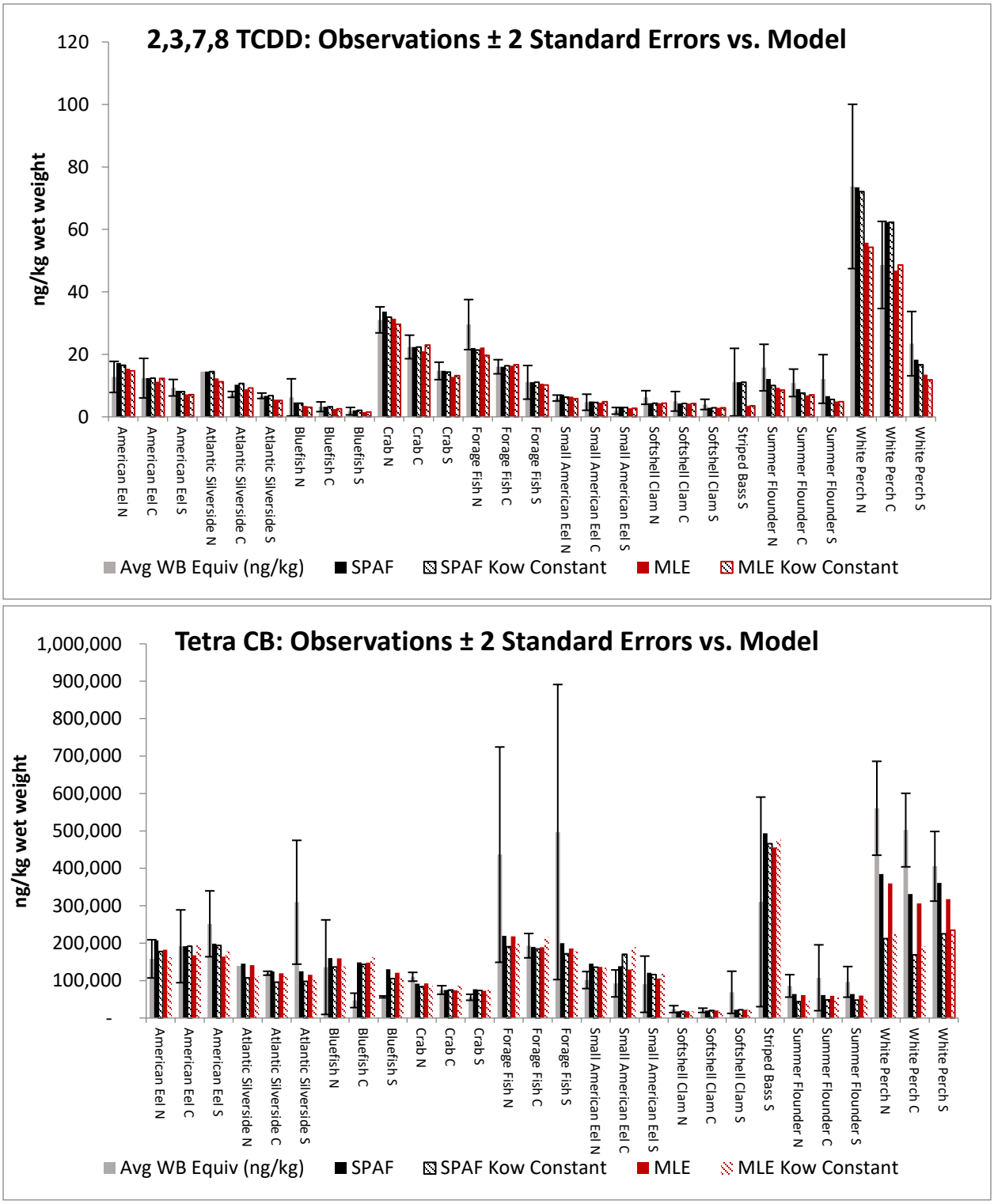


FIGURE 23. MODEL RESULTS VS. OBSERVED DATA FOR 2,3,7,8-TCDD AND TETRA CB

"N" = North; "C" = Central or Southeast; "S" = Southwest. Error bars show the mean ± two standard errors of the mean.

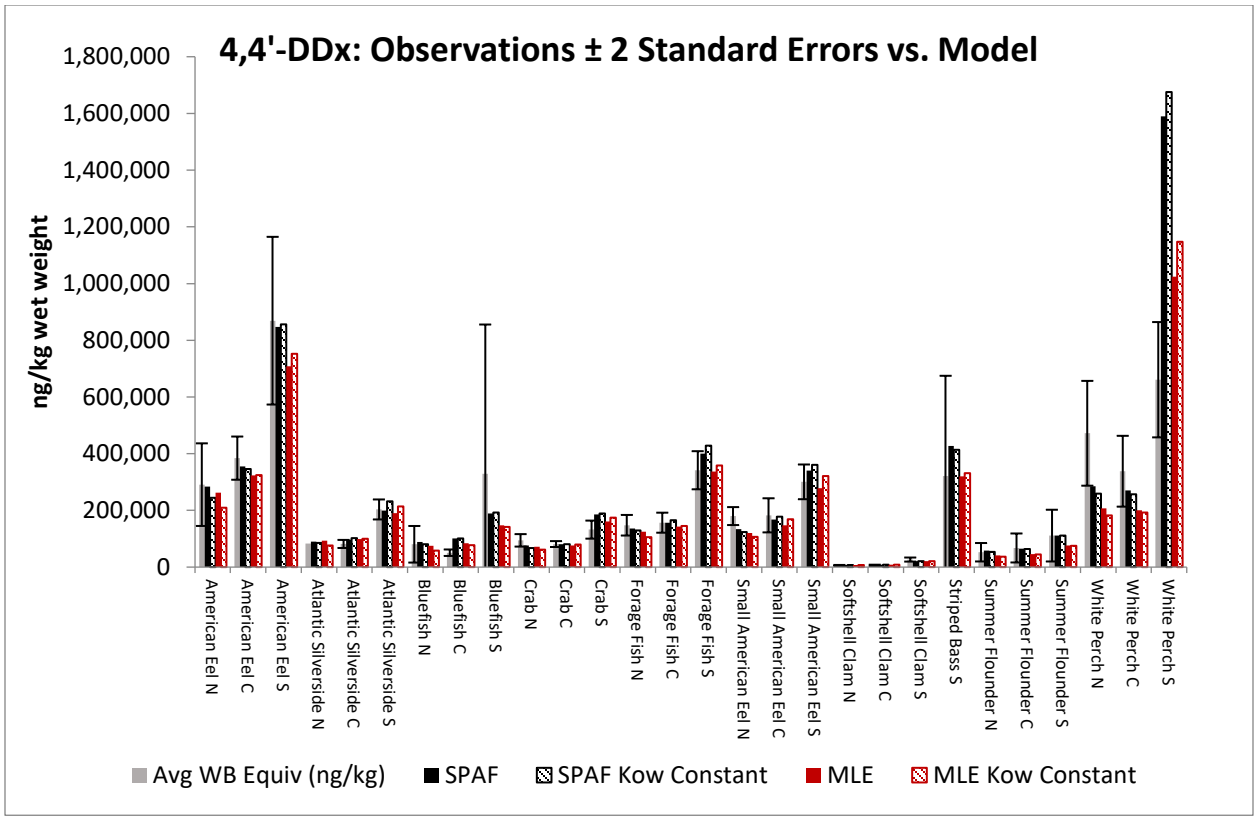


FIGURE 24. MODEL RESULTS VS. OBSERVED DATA FOR 4,4'-DDx

"N" = North; "C" = Central or Southeast; "S" = Southwest. Error bars show the mean ± two standard errors of the mean.

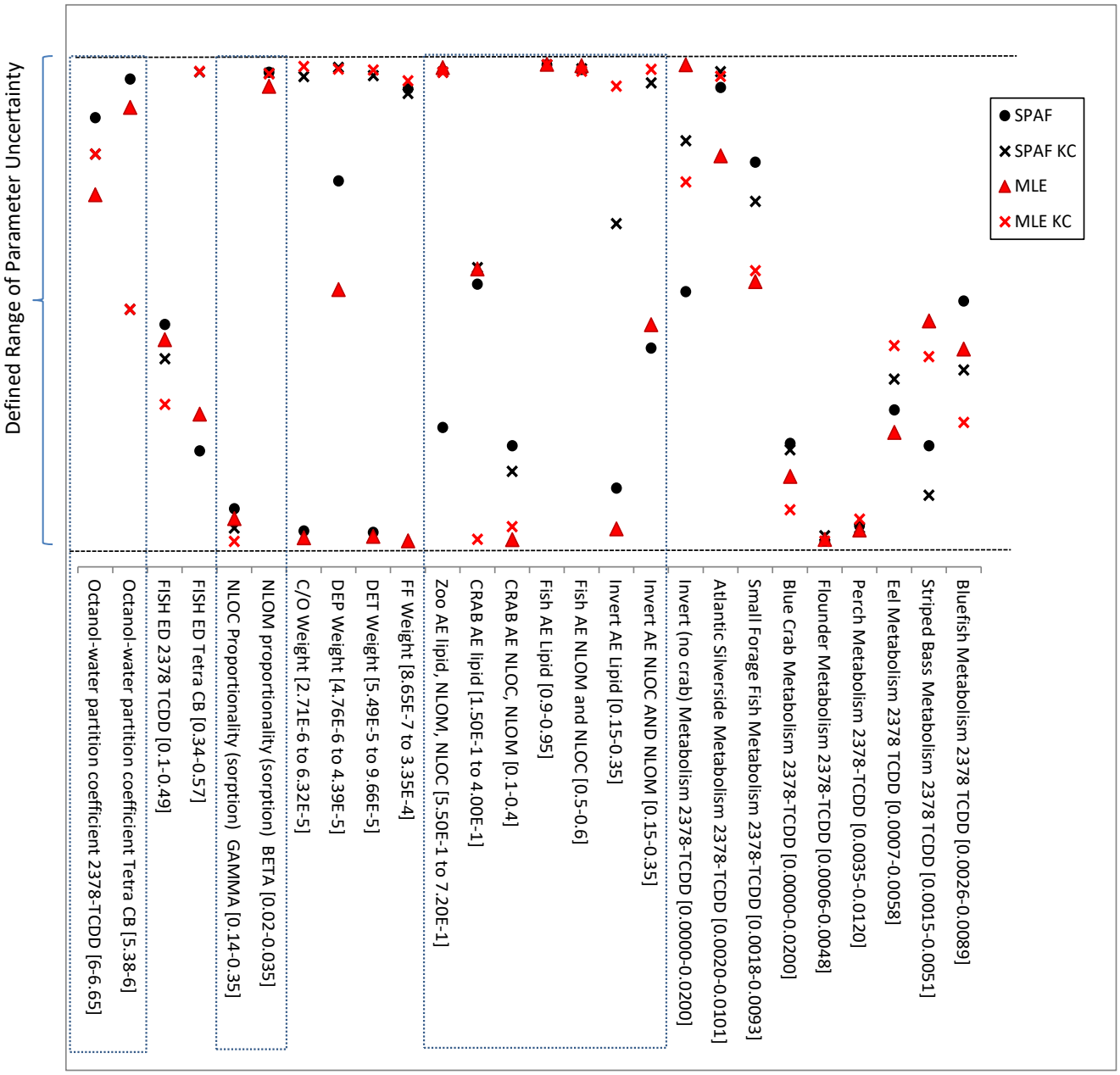


FIGURE 25. RANGE OF VALUES SELECTED ACROSS CALIBRATIONS FOR EACH UNCERTAIN PARAMETER (PART 1)

The symbols show the parameter values selected for each of the four automated calibration within the range of uncertainty defined for each parameter (defined in the brackets after the parameter name). KC = K_{OW} Constant. Symbols plotted at the bottom of the range would be the minimum defined within the brackets, and those at the top would be the maximum defined within the brackets.

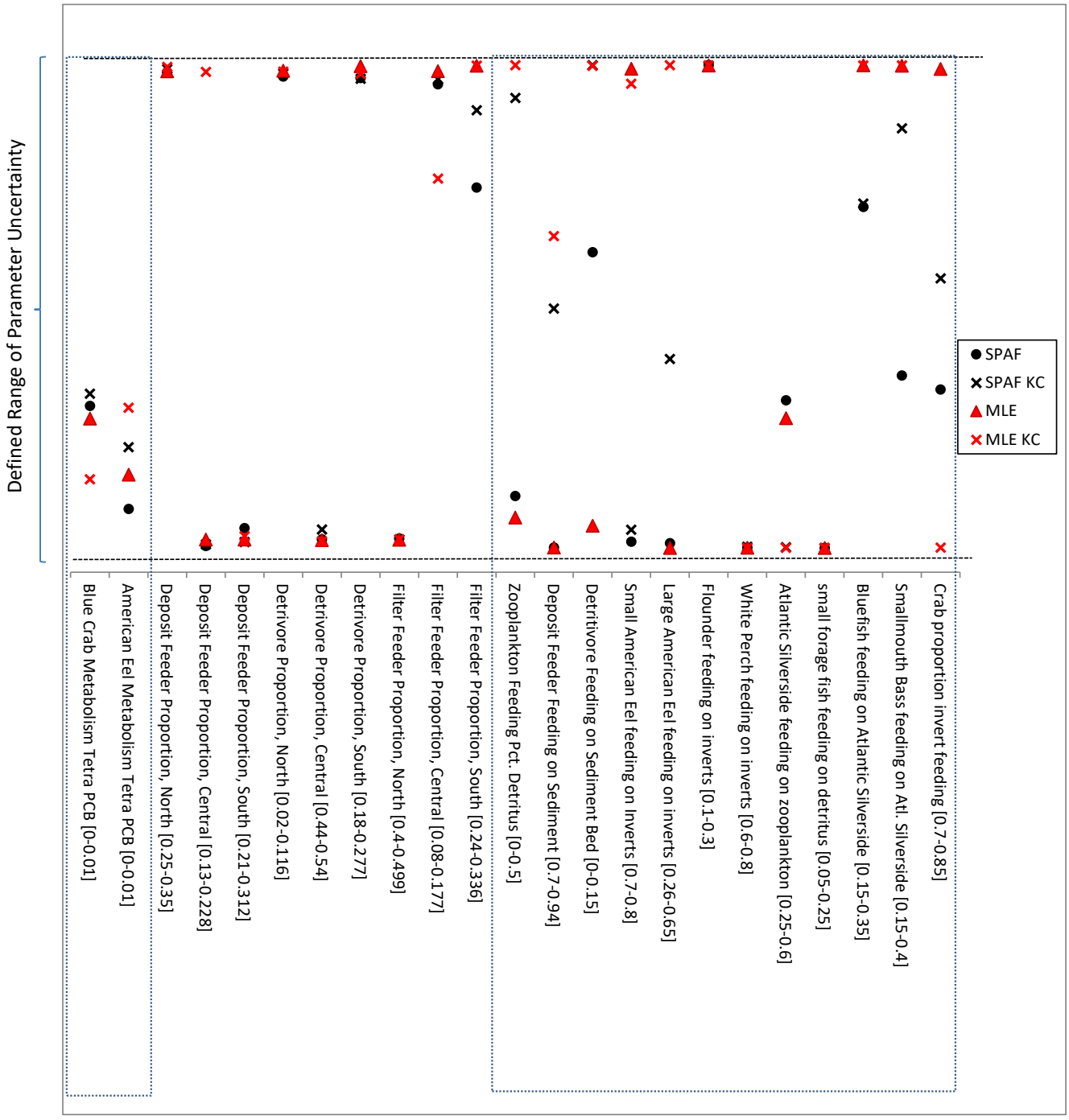


FIGURE 26. RANGE OF VALUES SELECTED ACROSS CALIBRATIONS FOR EACH UNCERTAIN PARAMETER (PART 2)

The symbols show the parameter values selected for each of the four automated calibration within the range of uncertainty defined for each parameter (defined in the brackets after the parameter name) . KC = K_{OW} Constant. Symbols plotted at the bottom of the range would be the minimum defined within the brackets, and those at the top would be the maximum defined within the brackets.

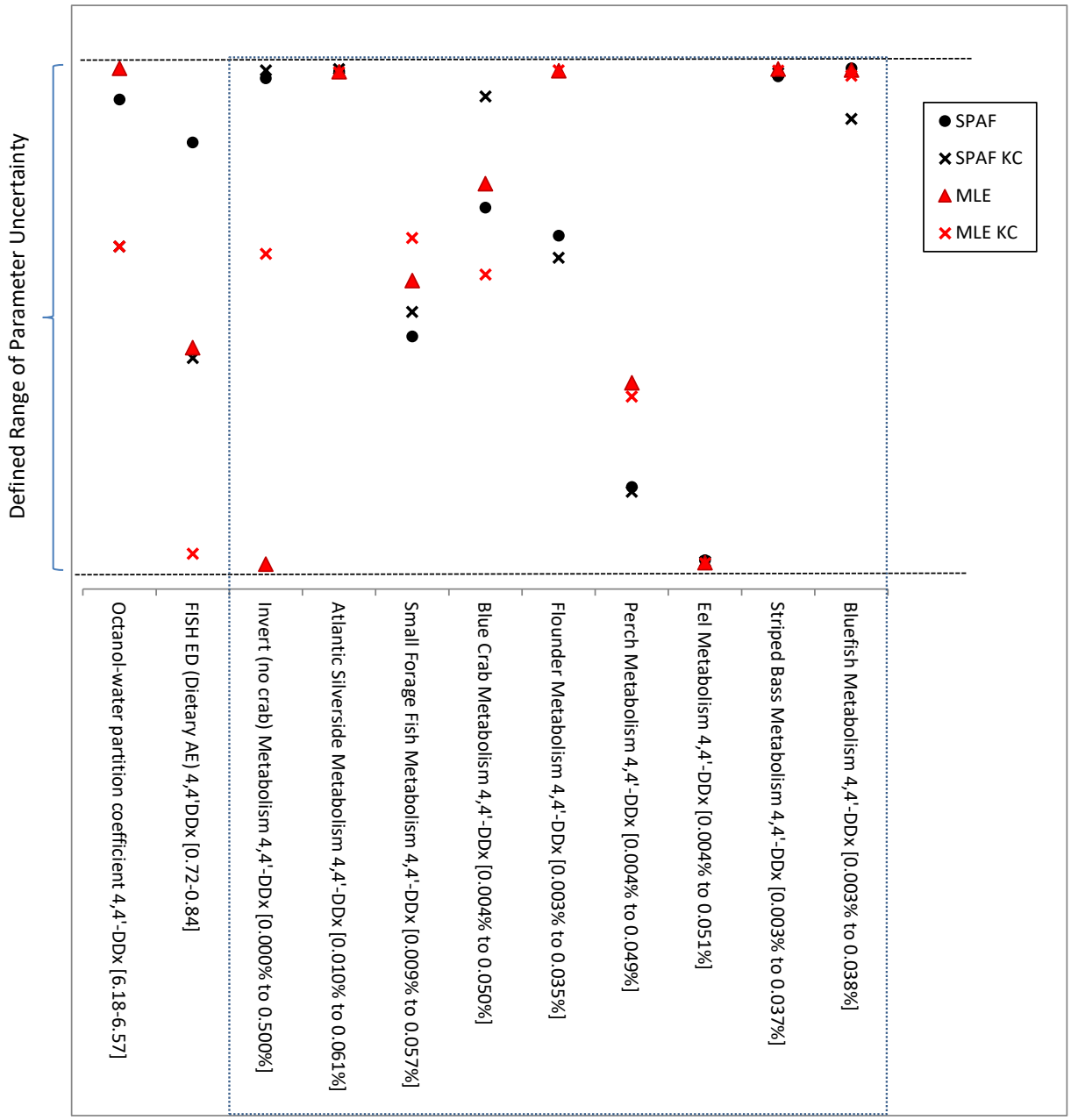


FIGURE 27. RANGE OF VALUES SELECTED ACROSS CALIBRATIONS FOR EACH UNCERTAIN PARAMETER (4,4'-DDx)

Symbols show the parameter values selected for each of the four automated calibrations within the range of uncertainty defined for each parameter (defined in the brackets after the parameter name). KC = K_{OW} Constant. Symbols plotted at the bottom of the range would be the minimum defined within the brackets, and those at the top would be the maximum defined within the brackets.

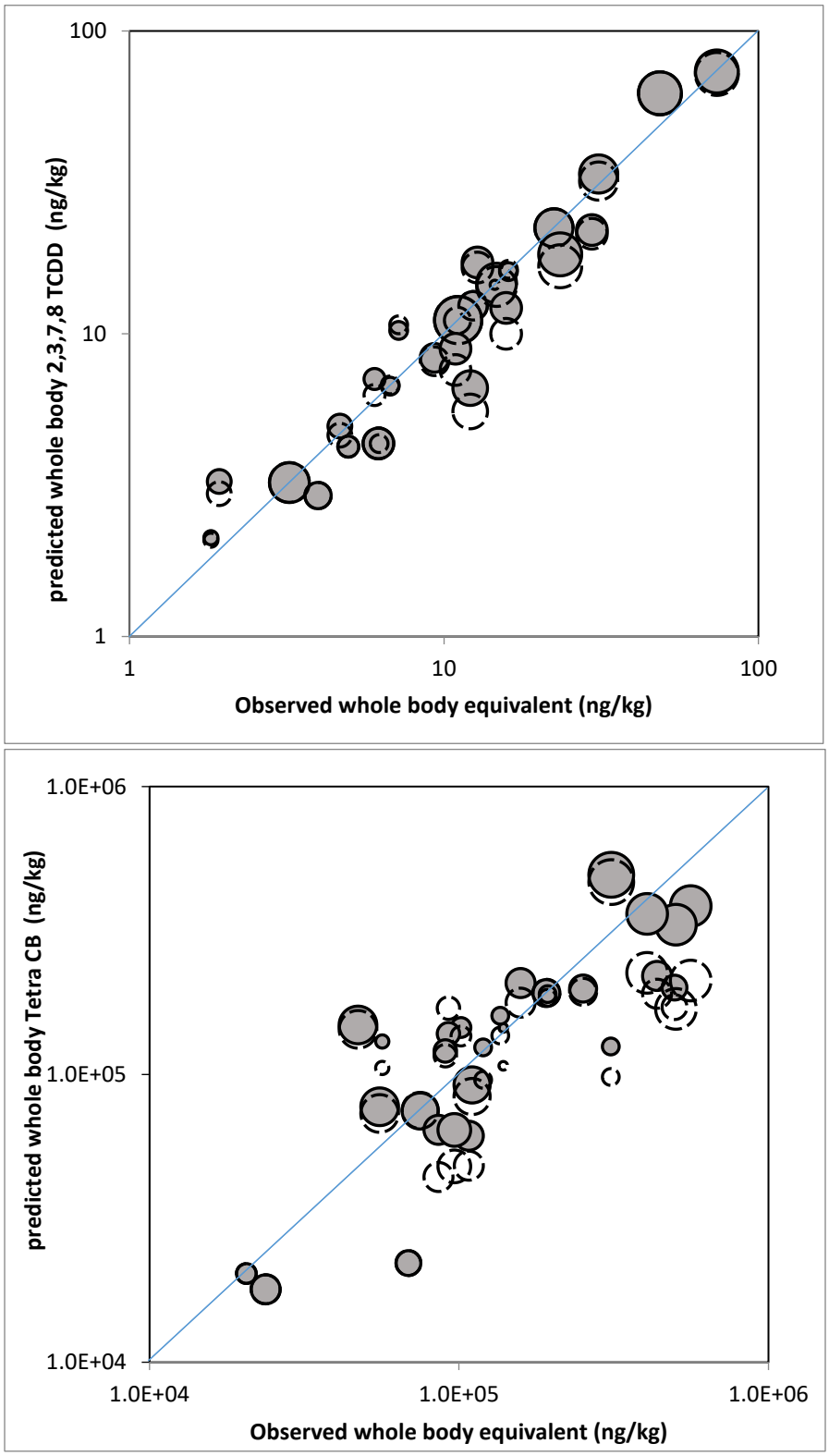
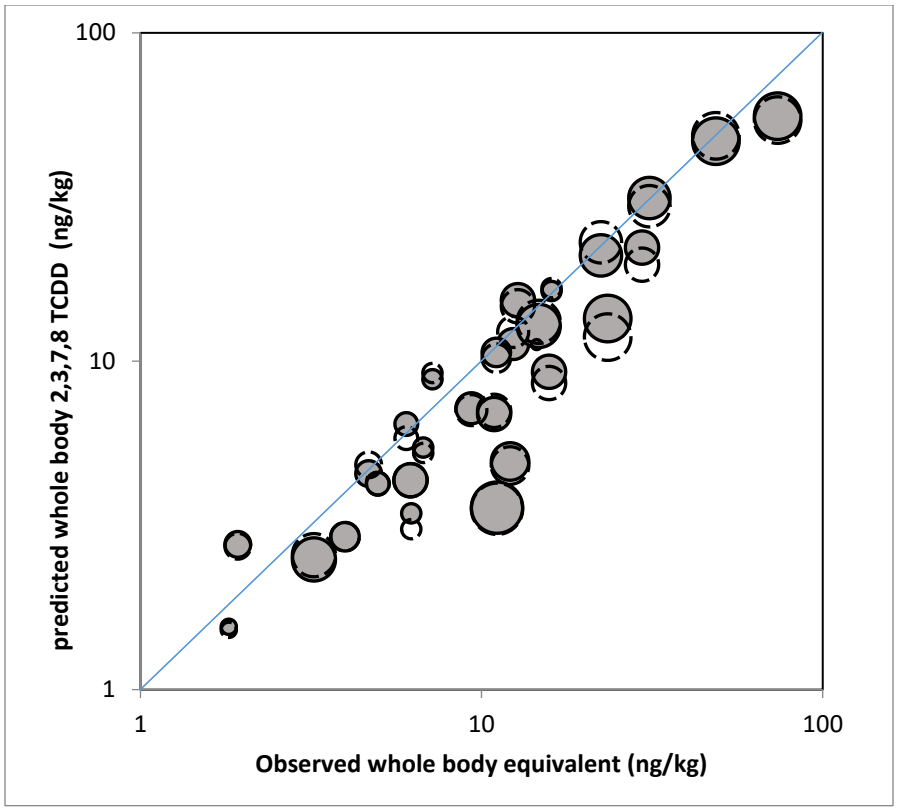


FIGURE 28. PREDICTED VS. OBSERVED CHEMICALS FROM SPAF CALIBRATIONS

Circles are proportional to the number of samples in the central tendency being compared.
The K_{OW}-Constant simulation is shown as open circles and the filled circles represent the K_{OW}-Variable calibration.



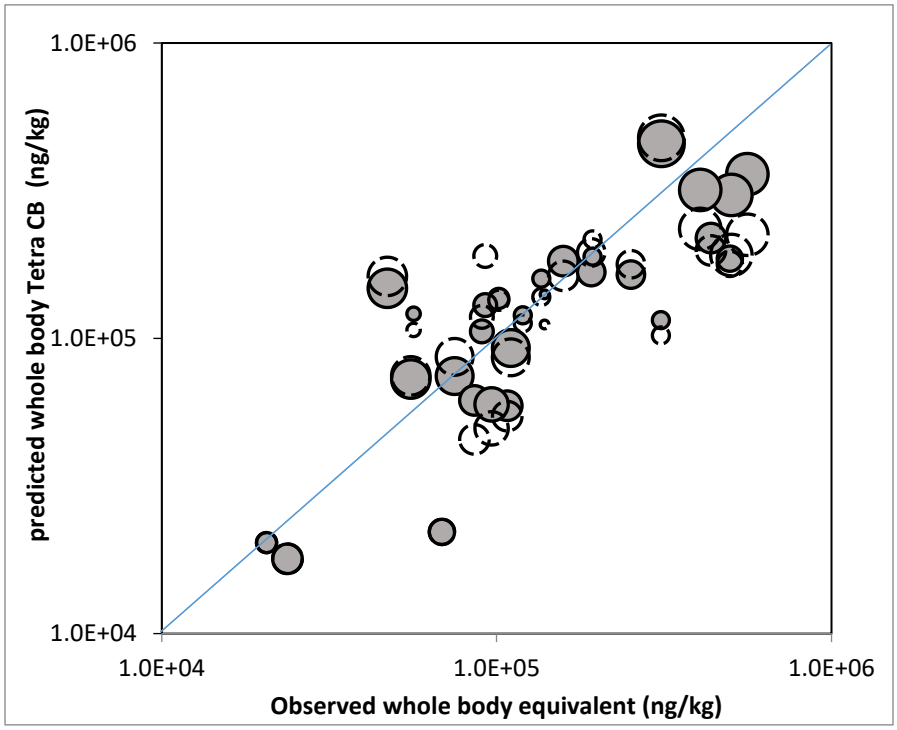


FIGURE 29. PREDICTED VS. OBSERVED CHEMICALS FROM MAXIMUM LIKELIHOOD CALIBRATIONS

Circles are proportional to the number of samples in the central tendency being compared.
The K_{OW}-Constant simulation is shown as open circles and the filled circles represent the K_{OW}-Variable calibration.

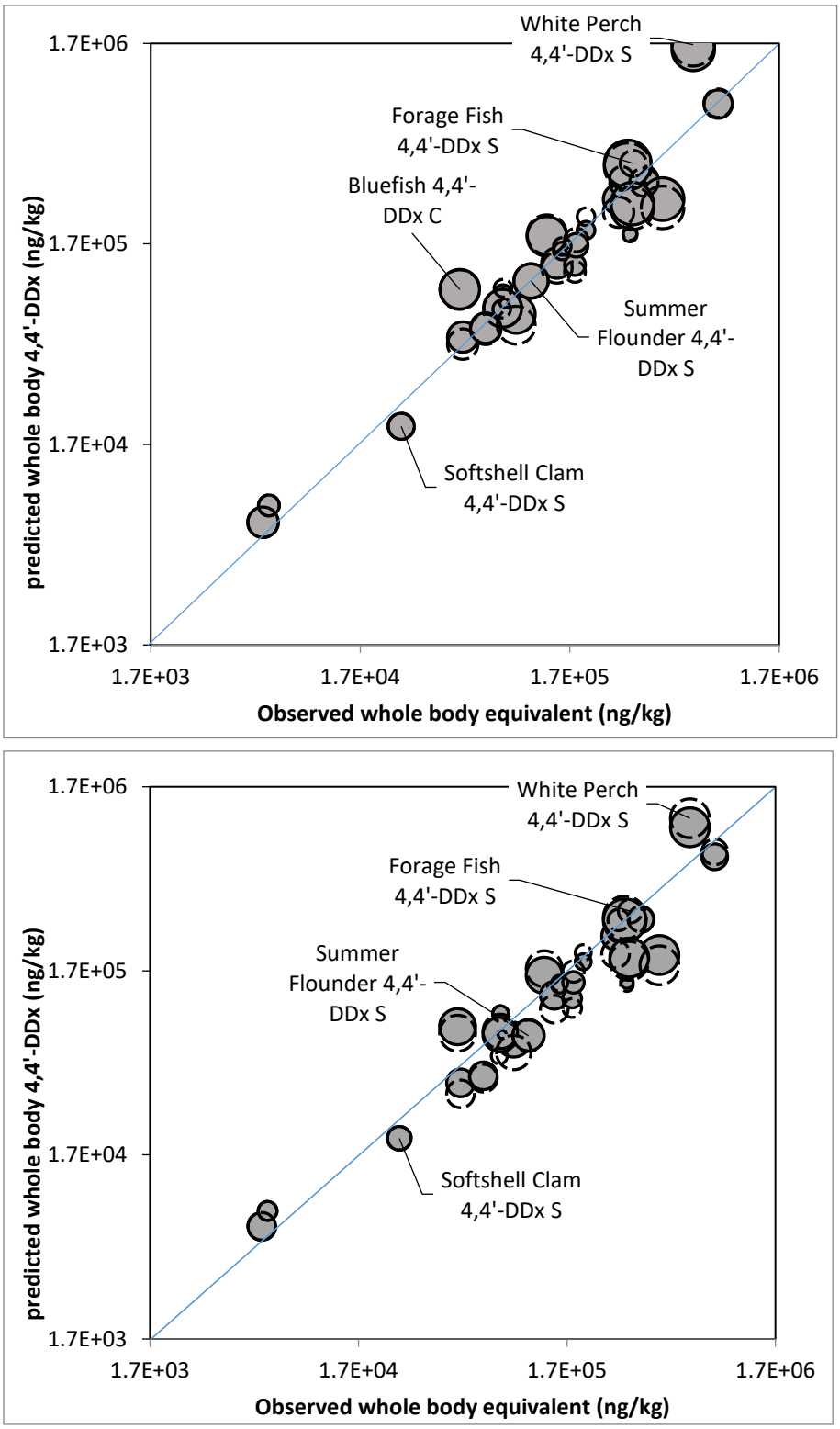


FIGURE 30. 4,4'-DDx PREDICTED VS. OBSERVED FROM SPAF CALIBRATIONS (TOP) AND MLE CALIBRATIONS (BOTTOM)

Circles are proportional to the number of samples in the central tendency being compared.
The K_{OW}-Constant simulation is shown as open circles and the filled circles represent the K_{OW}-Variable calibration.

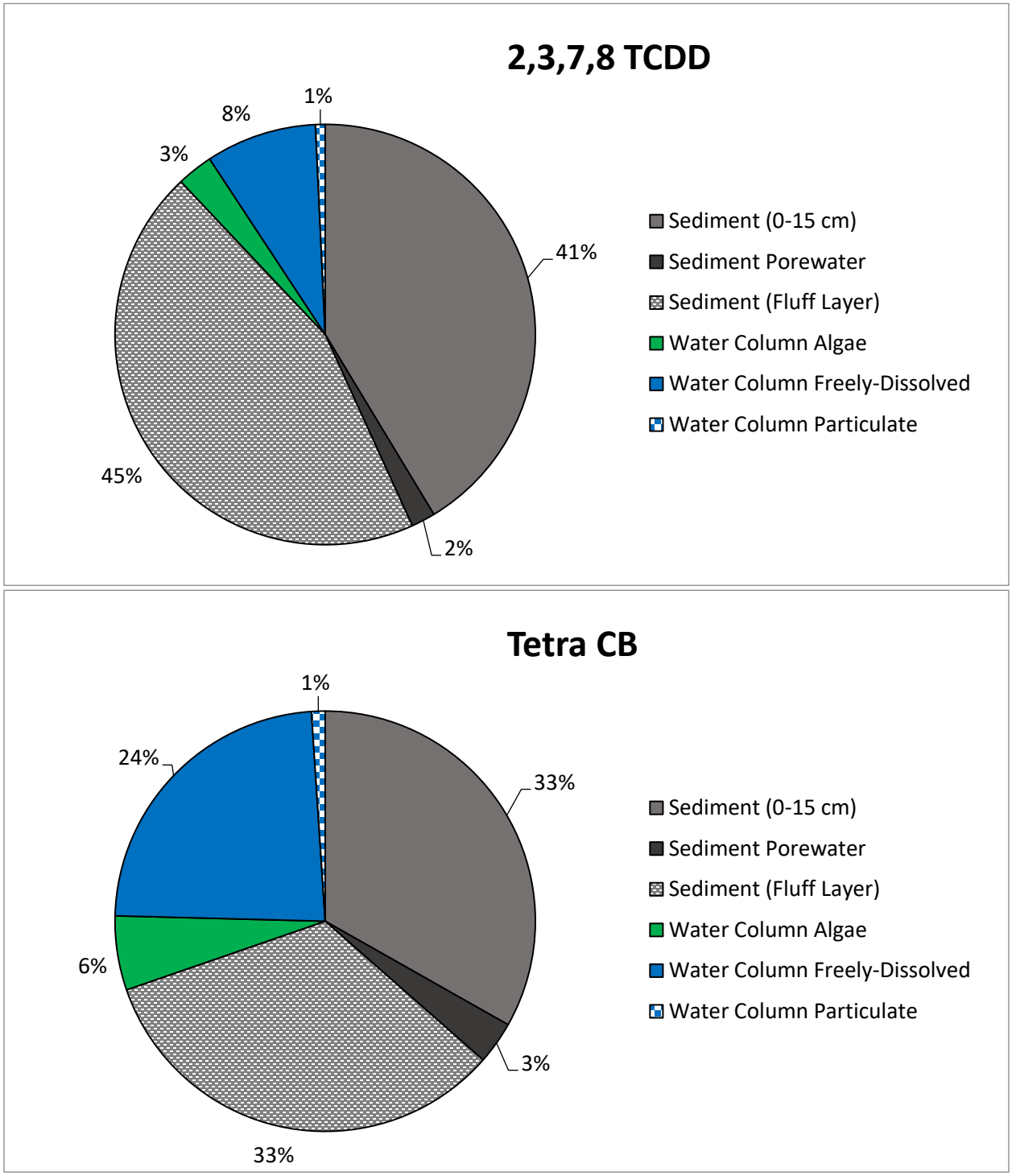


FIGURE 31. PREDICTED PERCENTAGE OF UPTAKE INTO TISSUE WITHIN MIXED-FISH DIET FROM SEDIMENT VS. WATER COLUMN SOURCES

Mixed-fish diet is an equal component of summer flounder, white perch, large American eel, bluefish, and striped bass

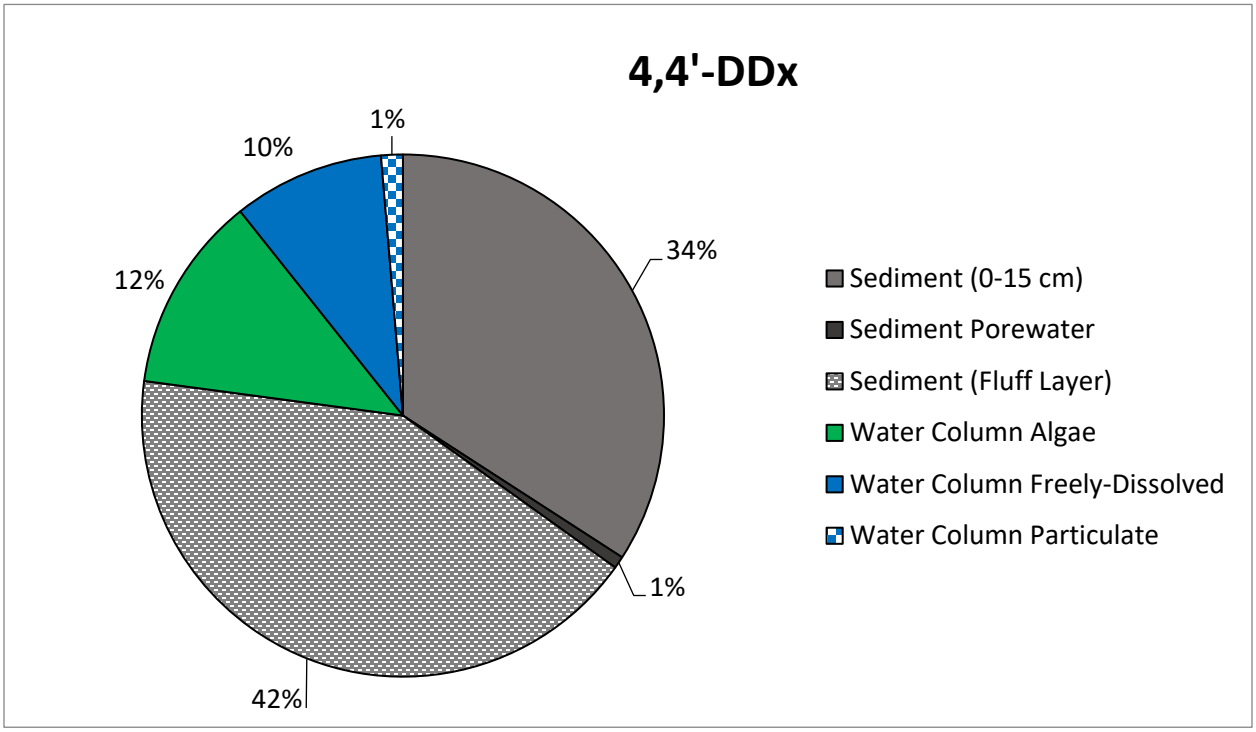
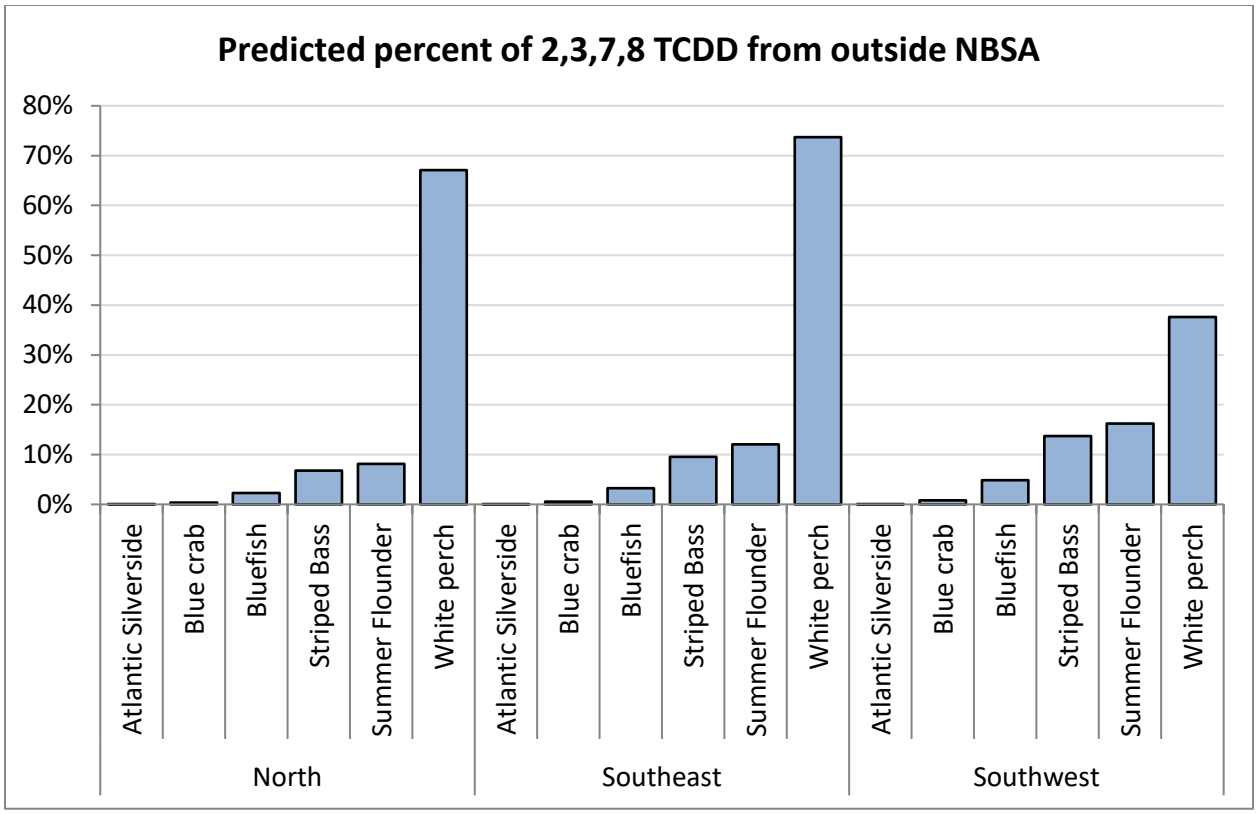


FIGURE 32. PREDICTED PERCENTAGE OF 4,4'-DDX UPTAKE INTO TISSUE WITHIN MIXED-FISH DIET; SEDIMENT VS. WATER COLUMN SOURCES

Mixed-fish diet is an equal component of summer flounder, white perch, large American eel, bluefish, and striped bass



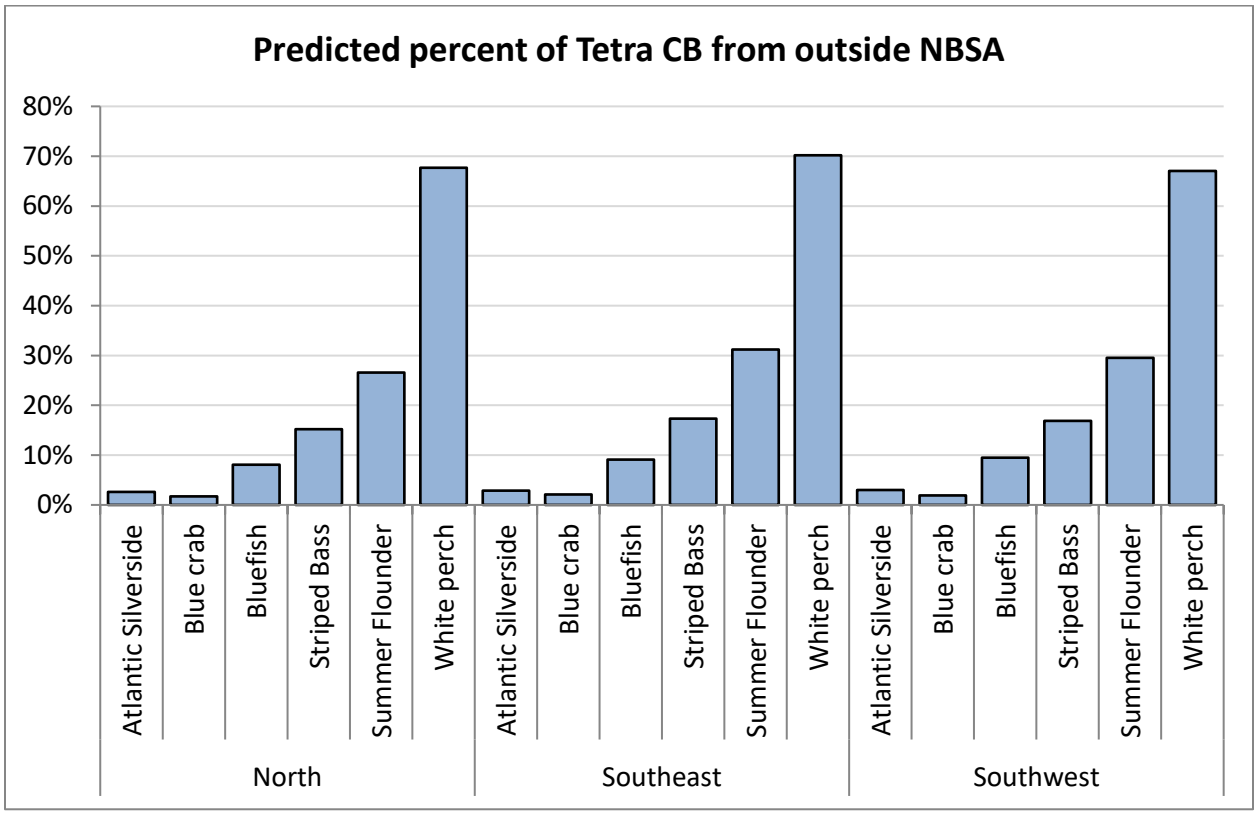


FIGURE 33. PREDICTED PERCENTAGE OF UPTAKE INTO TISSUE FROM OUTSIDE NBSA FOR MIGRATORY SPECIES

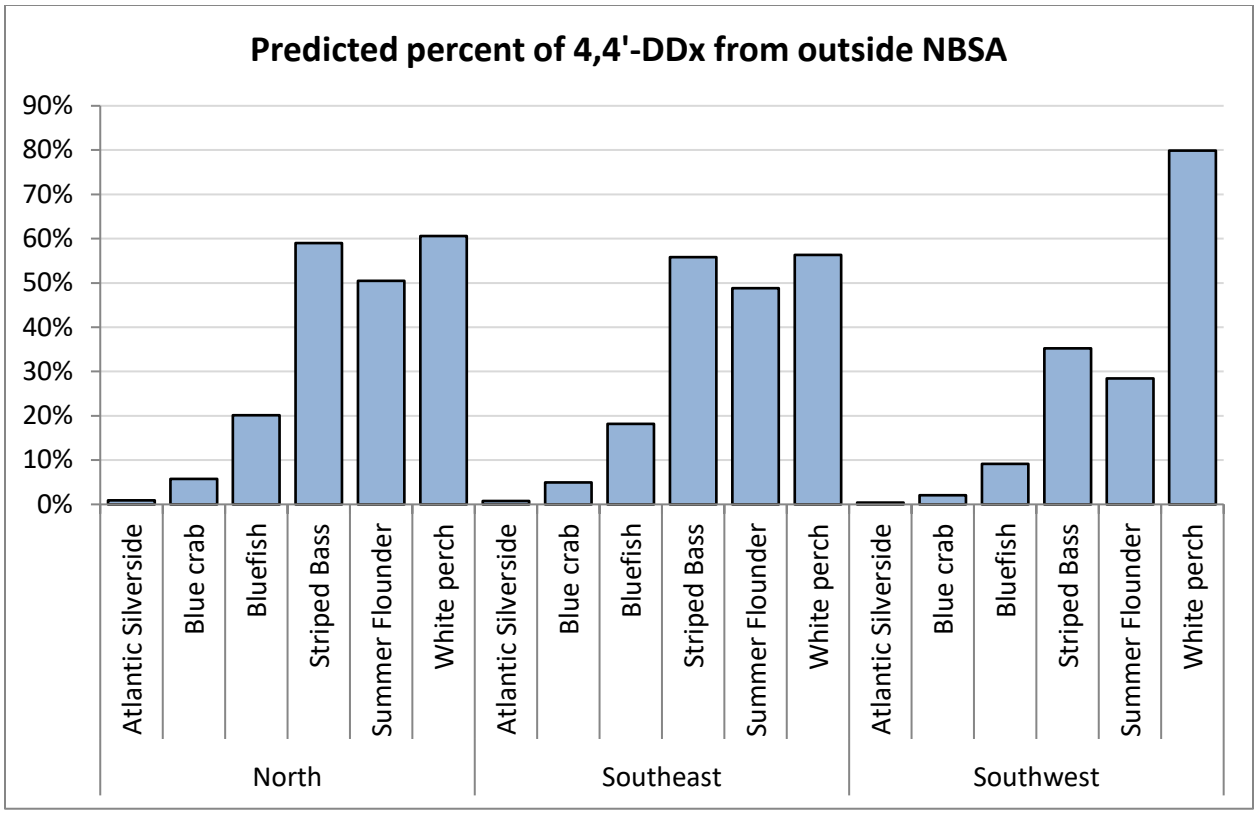


FIGURE 34. PREDICTED PERCENTAGE OF UPTAKE OF 4,4'-DDXINTO TISSUE FROM OUTSIDE NBSA FOR MIGRATORY SPECIES

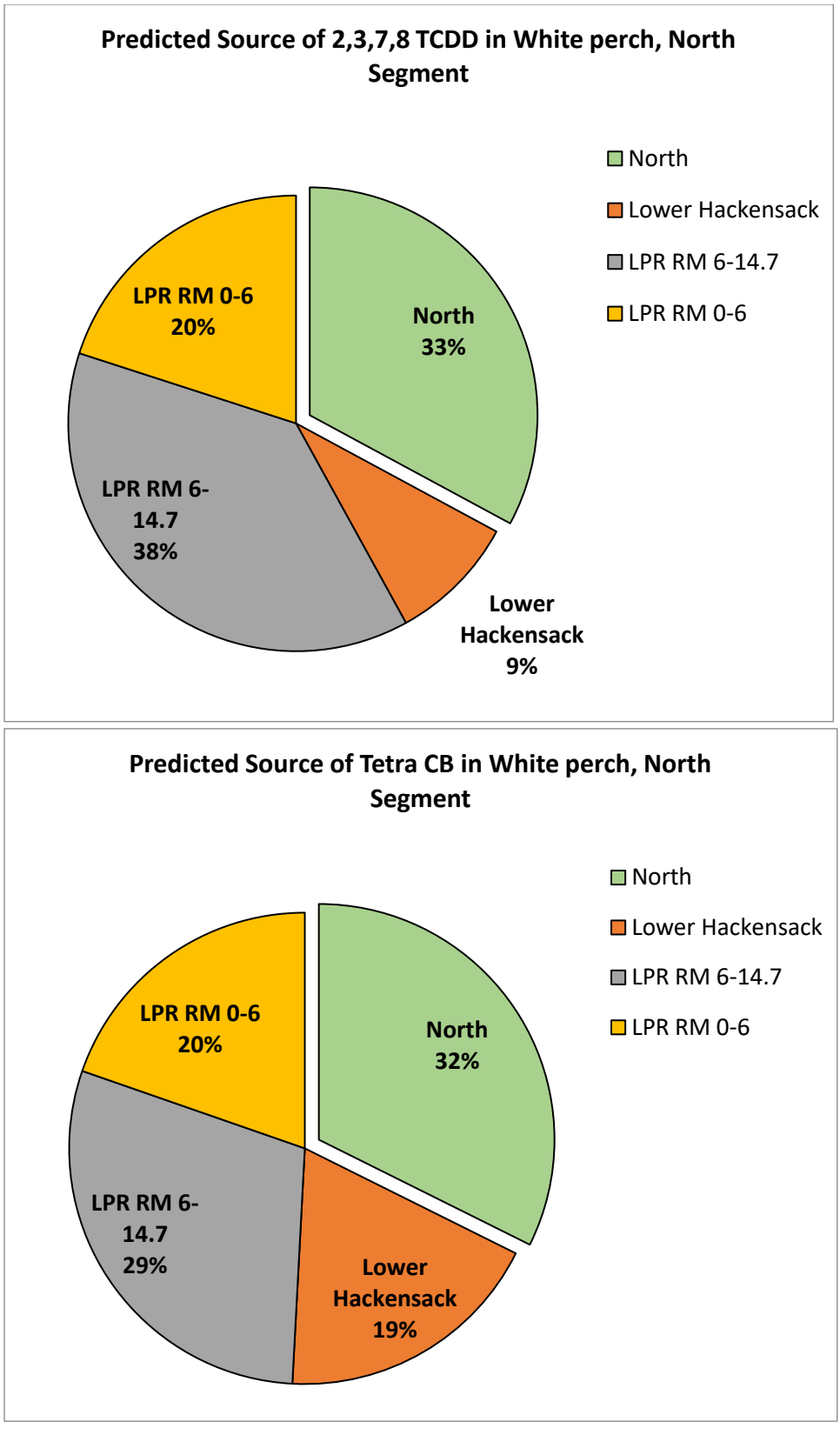
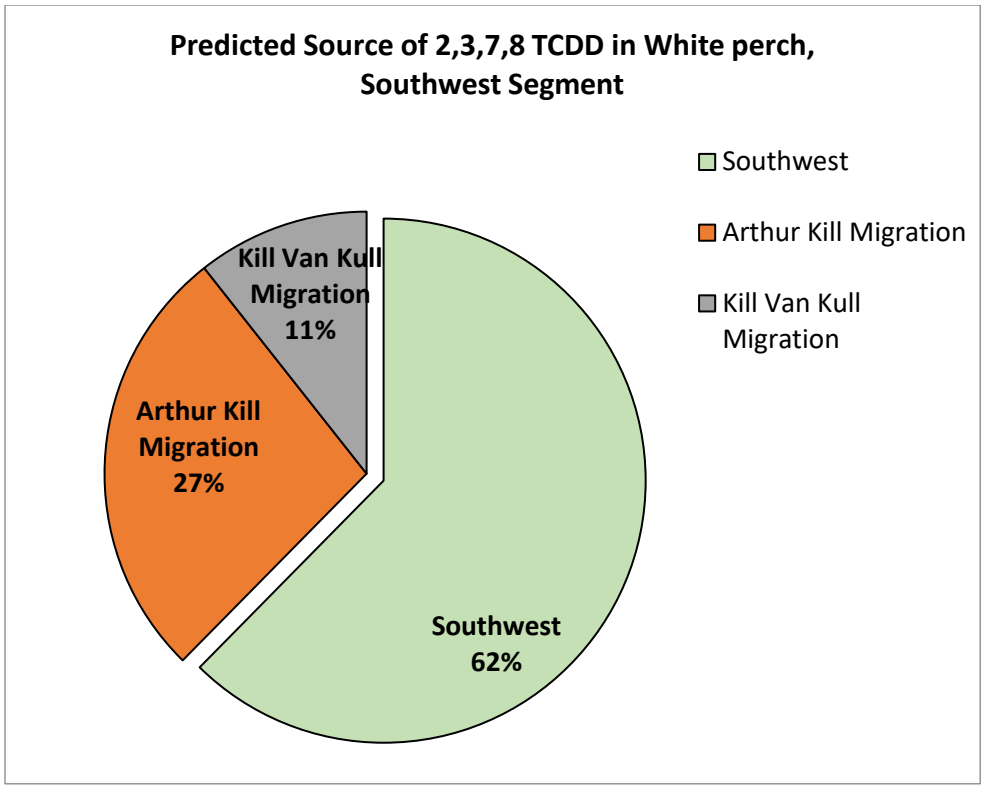


FIGURE 35. PREDICTED SOURCES OF 2,3,7,8-TCDD AND TETRA CB IN WHITE PERCH (N) BY EXPOSURE LOCATION



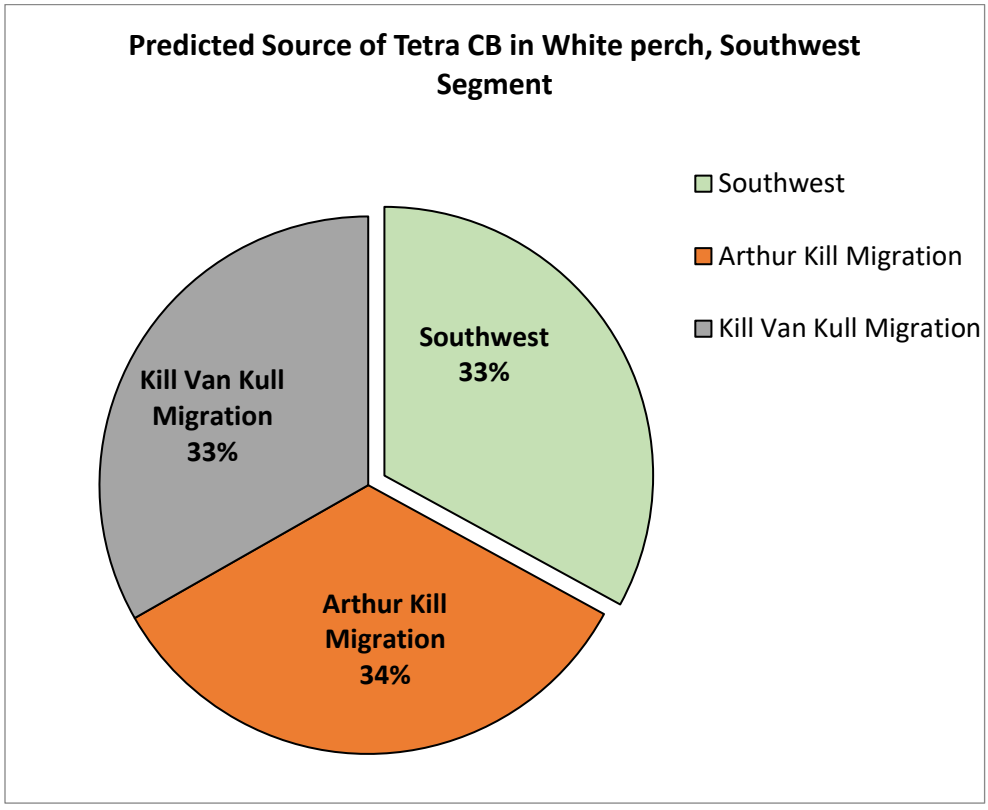
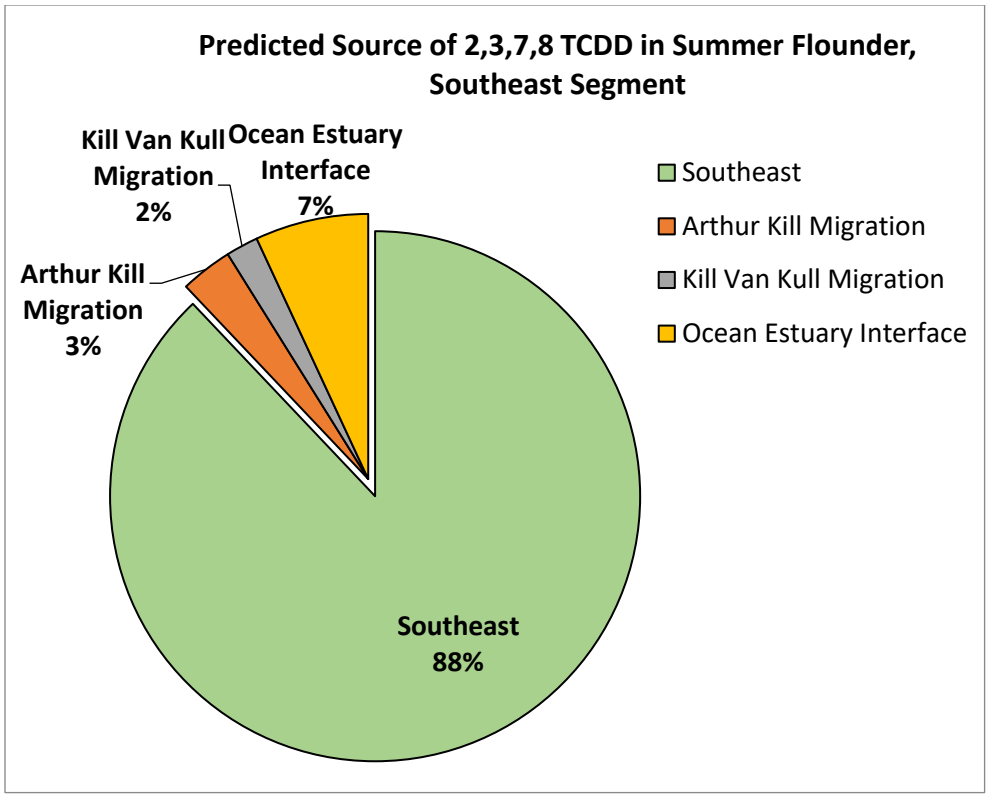


FIGURE 36. PREDICTED SOURCES OF 2,3,7,8-TCDD AND TETRA CB IN WHITE PERCH (SW) BY EXPOSURE LOCATION



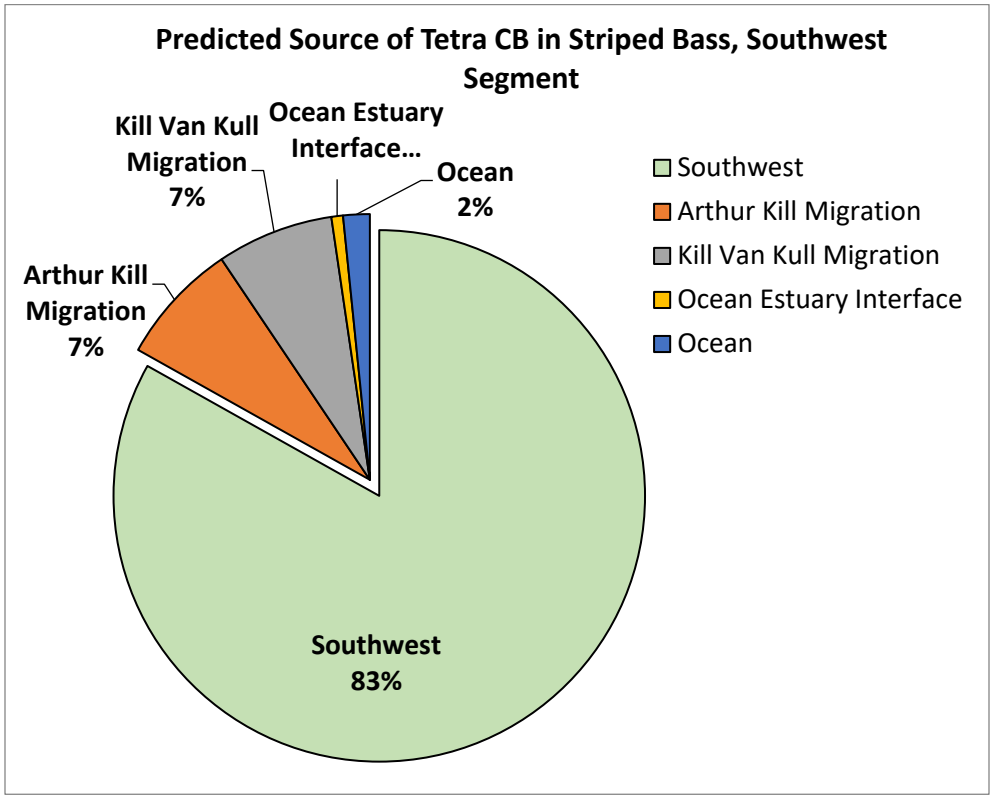
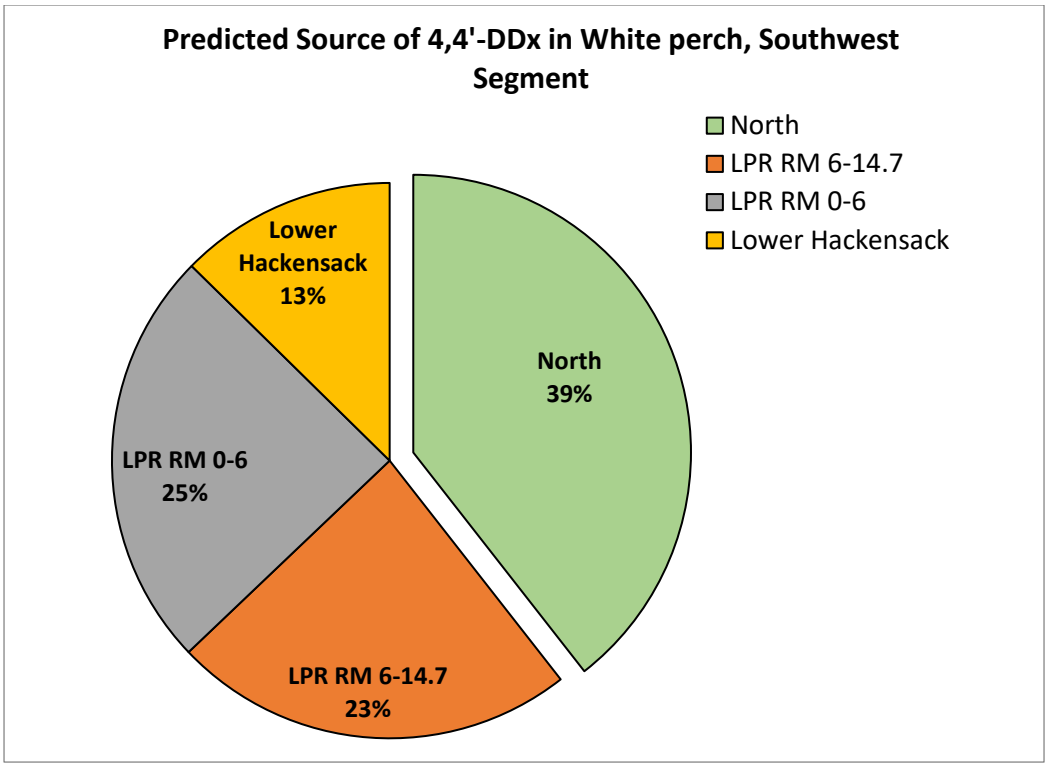


FIGURE 37. PREDICTED SOURCES OF 2,3,7,8-TCDD IN SUMMER FLOUNDER (SE) AND TETRA CB IN STRIPED BASS (SW) BY LOCATION



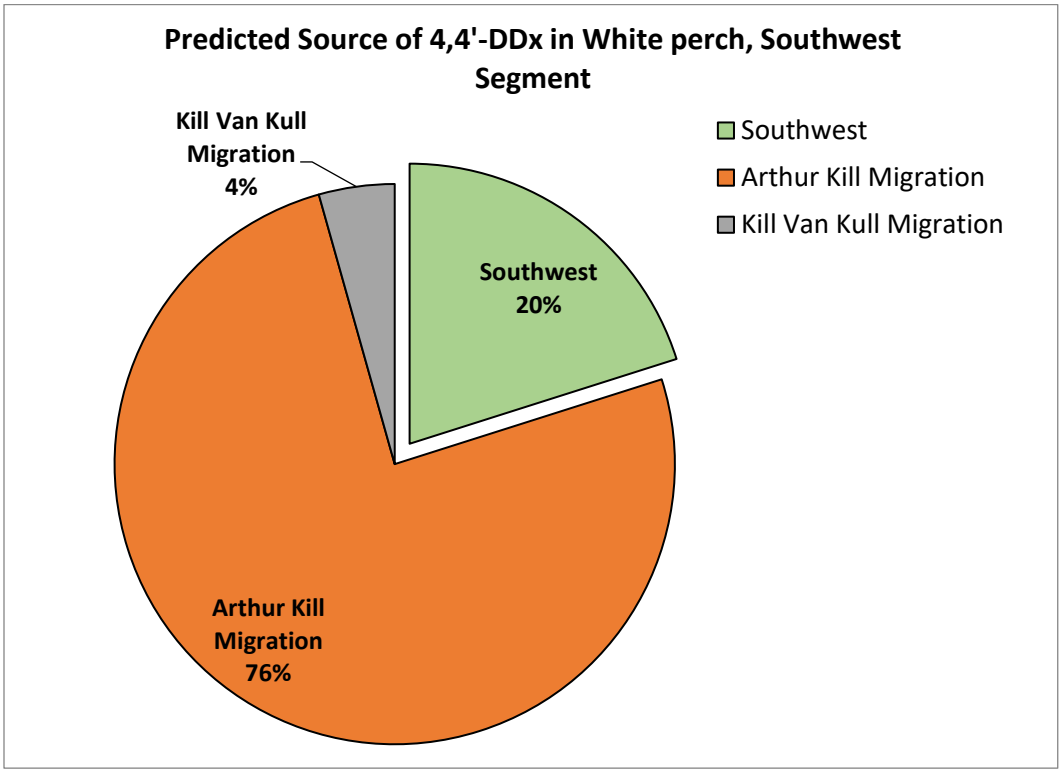


FIGURE 38. PREDICTED SOURCES OF 4,4'-DDx IN WHITE PERCH IN NORTH AND SOUTHWEST SEGIMENTS

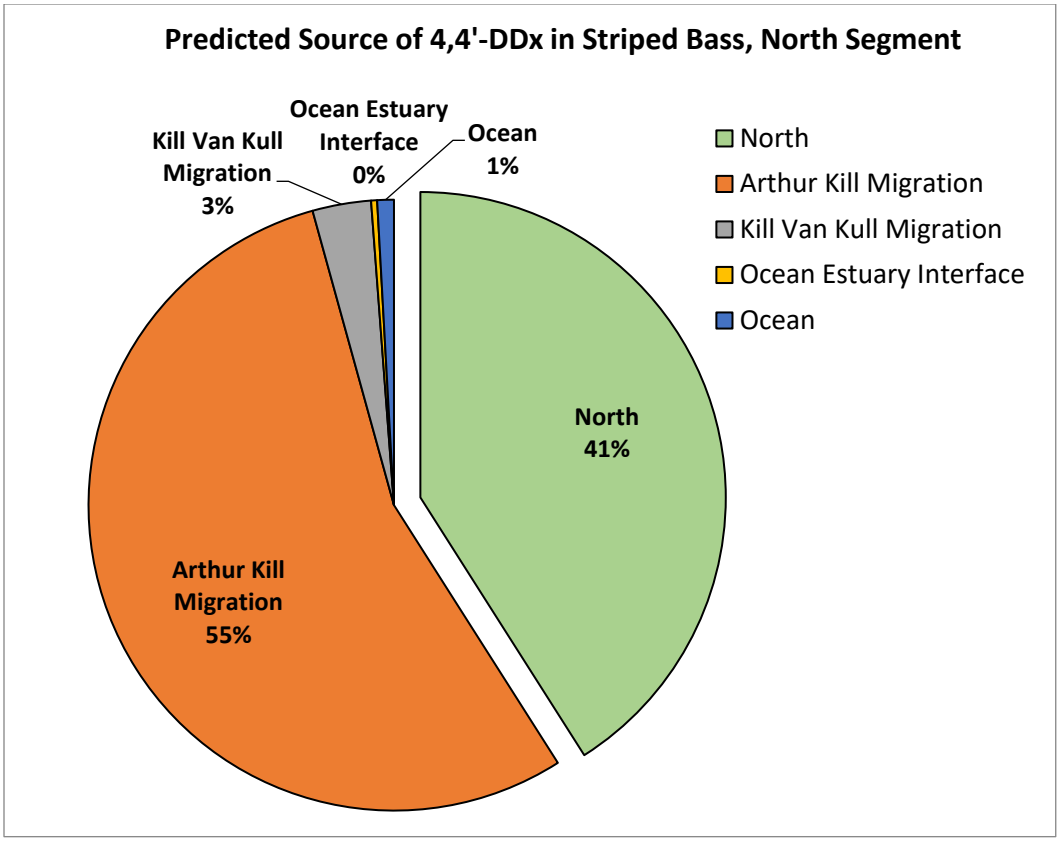


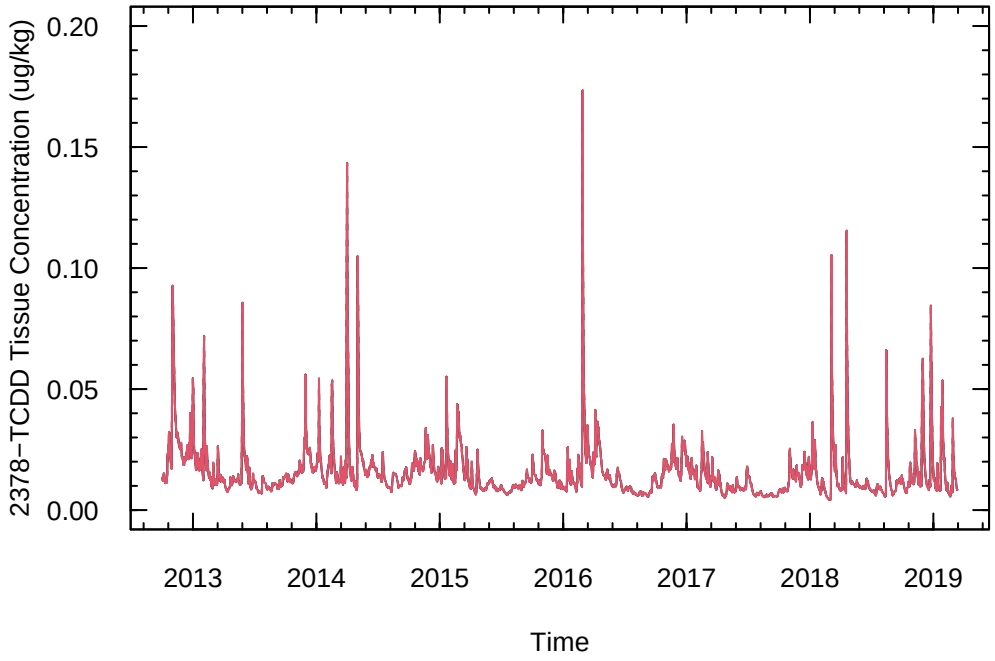
FIGURE 39. PREDICTED SOURCES OF 4,4'-DDx IN STRIPED BASS IN NORTH SEGIMENT

APPENDIX A: KINETIC MODEL RESULTS COMPARED TO OBSERVATIONS

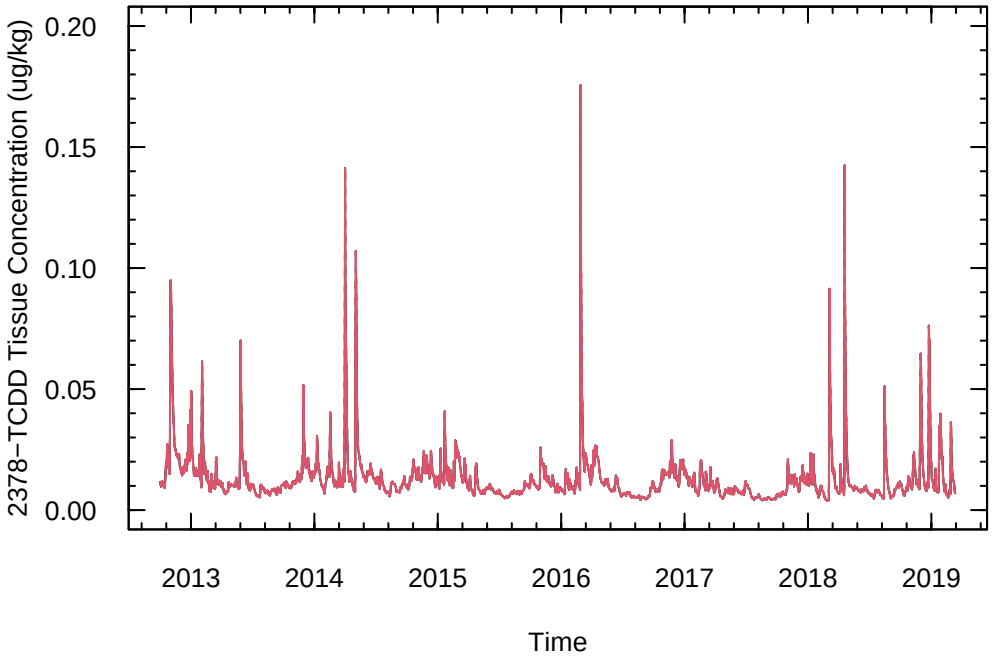
The following graphs show daily time-series of kinetic model results as compared to observed tissue data. Observed tissue data are shown on the average collection date as discussed in the "Chemical Concentrations in Biota" section above. Measured data show average concentrations with error bars representing the average plus and minus two standard errors.

When migratory species are not present in a NBSA reach, the modeled time series represents this as an empty gap in the prediction.

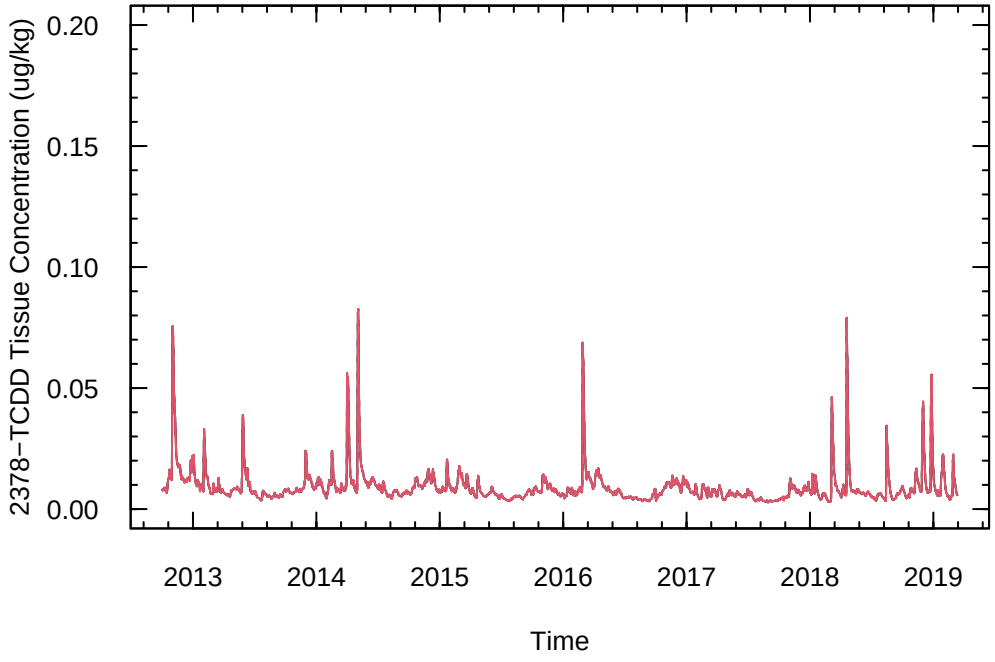
Phytoplankton (North)

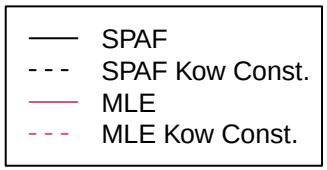


Phytoplankton (Southeast)

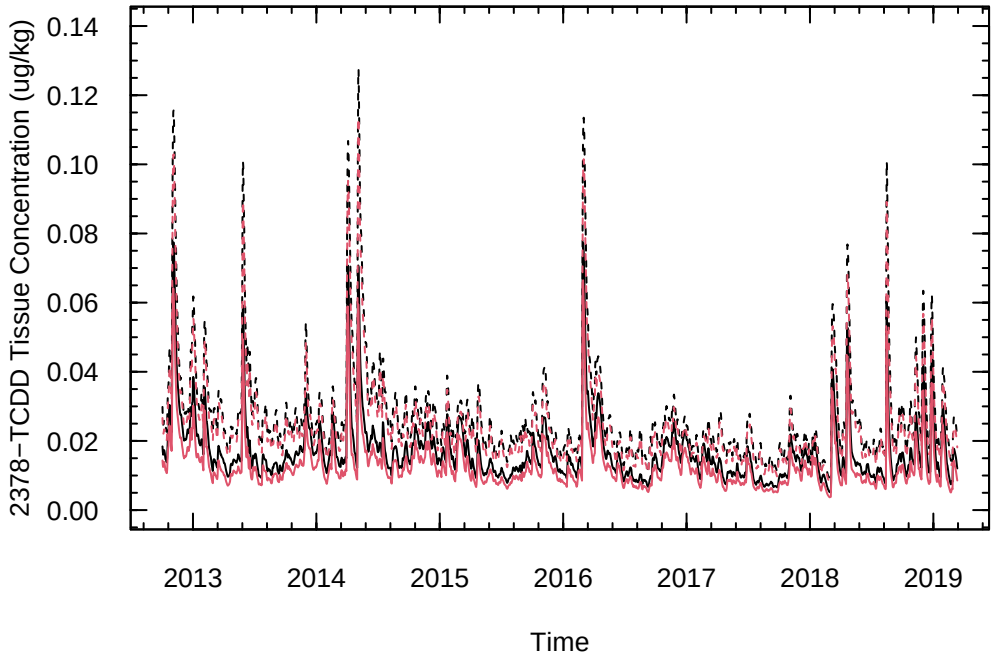


Phytoplankton (Southwest)

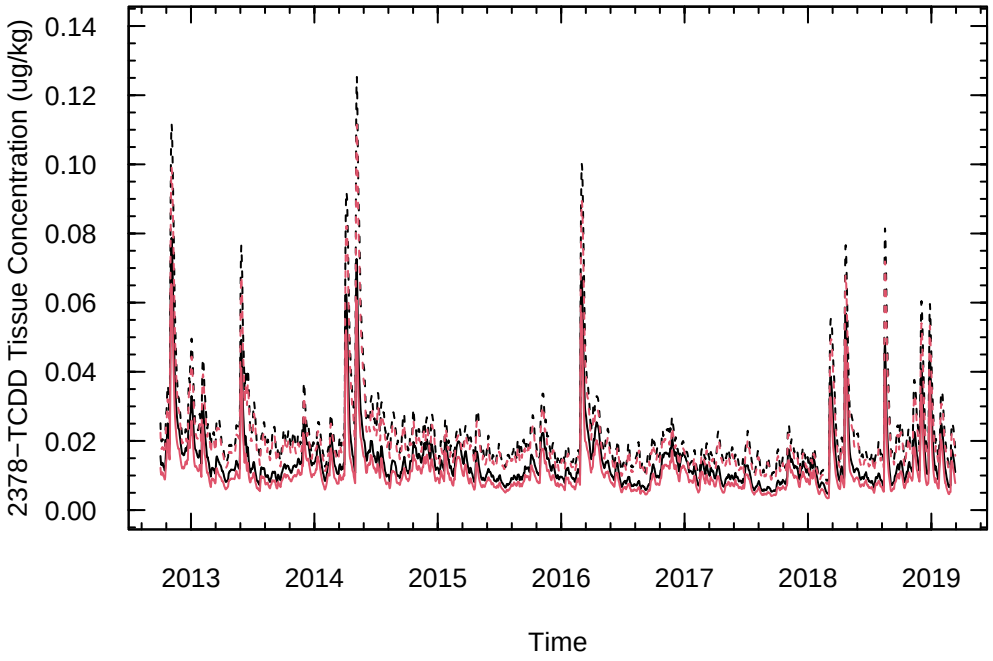




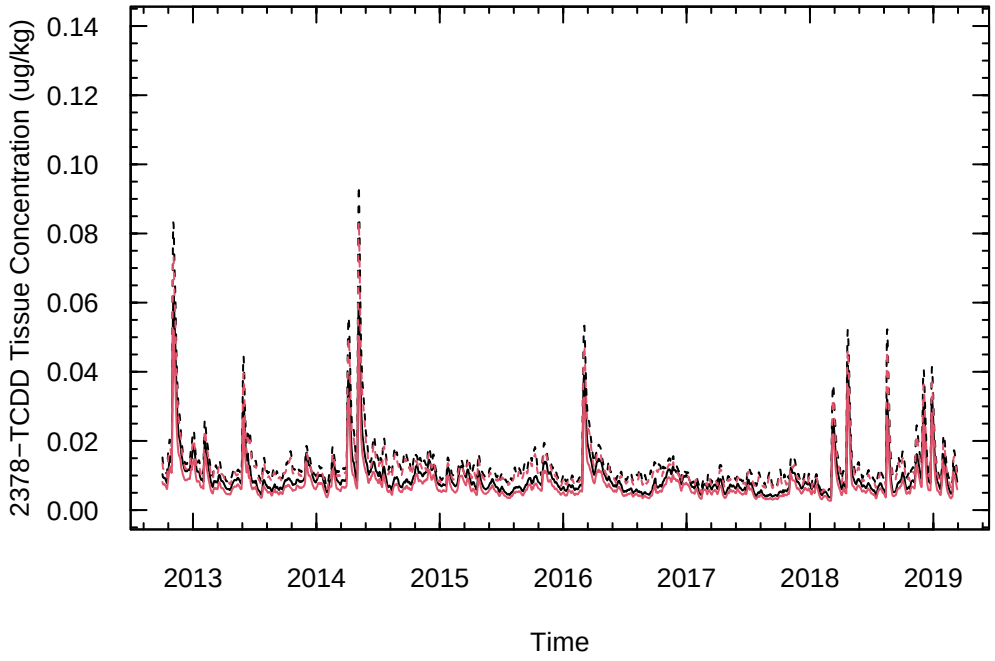
Zooplankton (North)

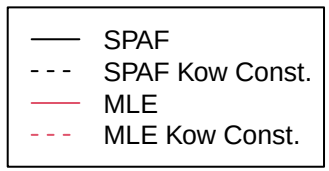


Zooplankton (Southeast)

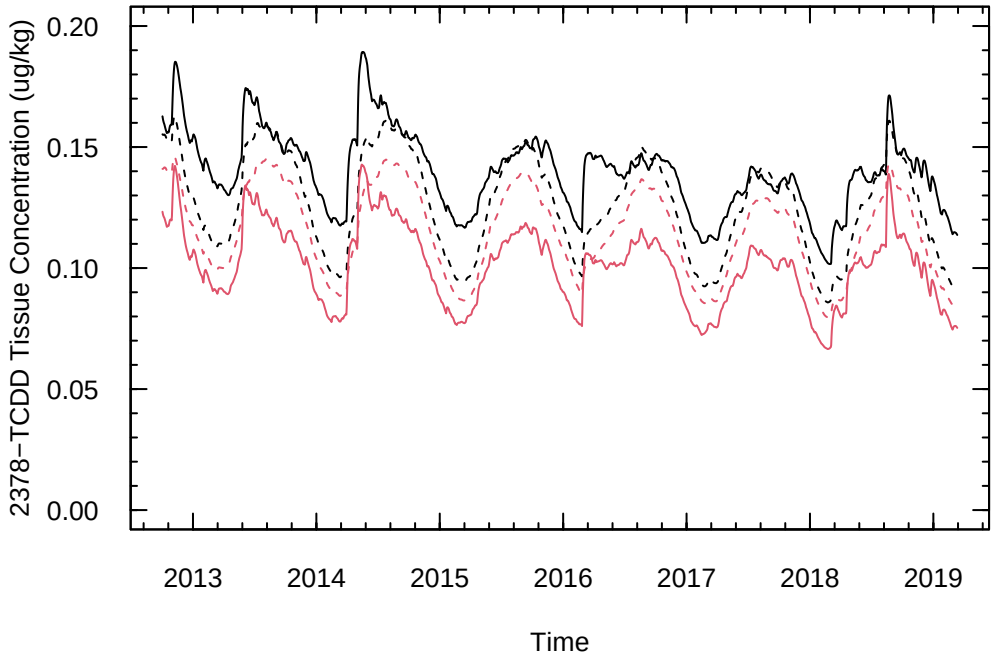


Zooplankton (Southwest)

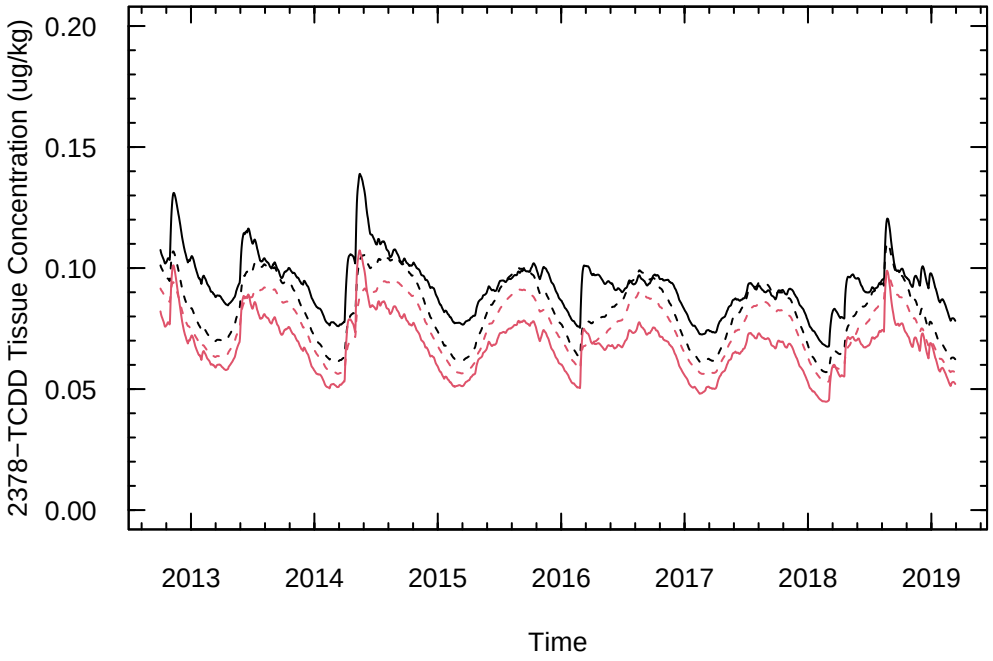




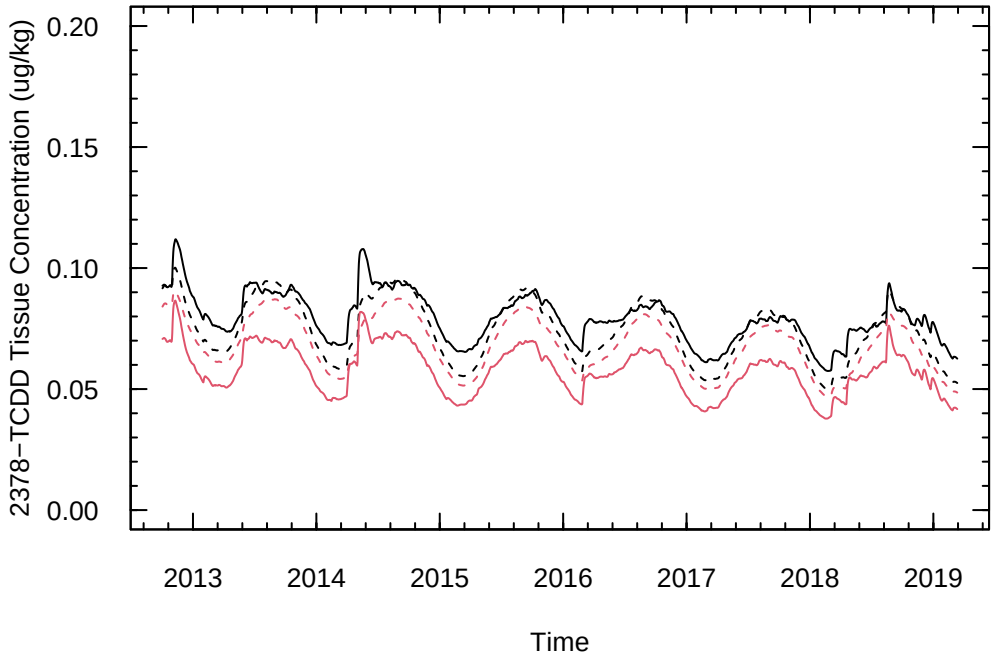
Benthic invert deposit feeder (North)

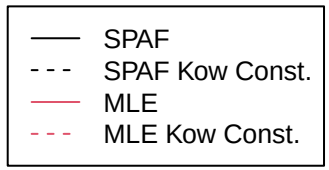


Benthic invert deposit feeder (Southeast)

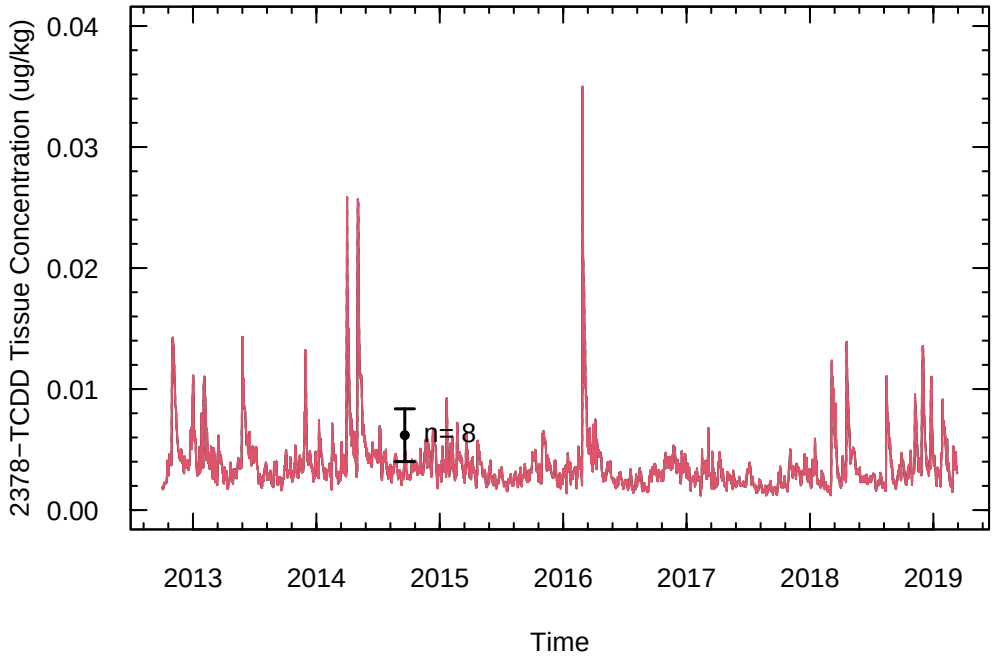


Benthic invert deposit feeder (Southwest)

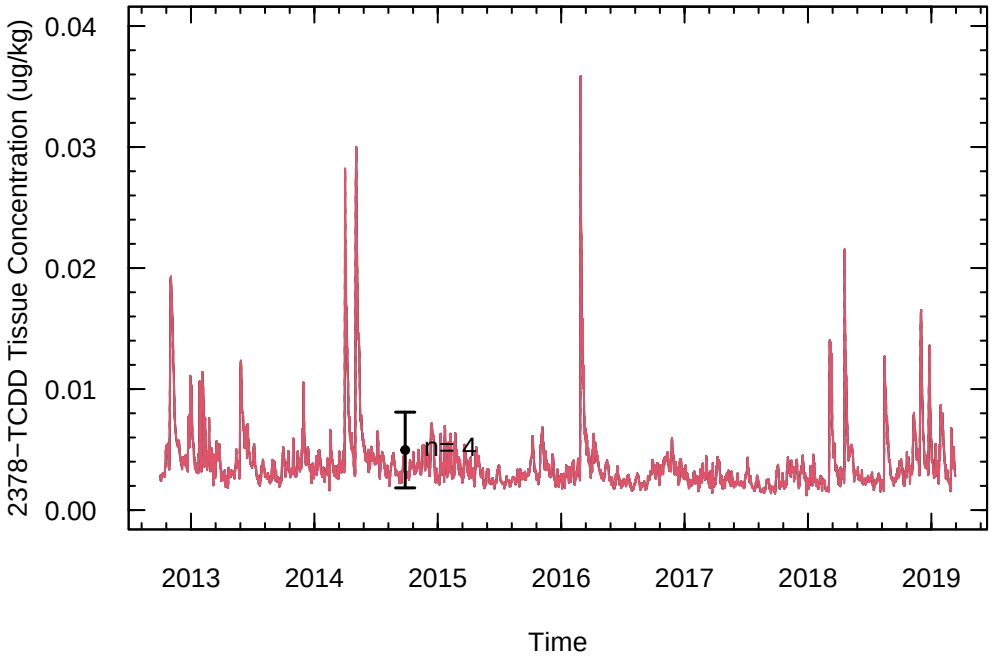




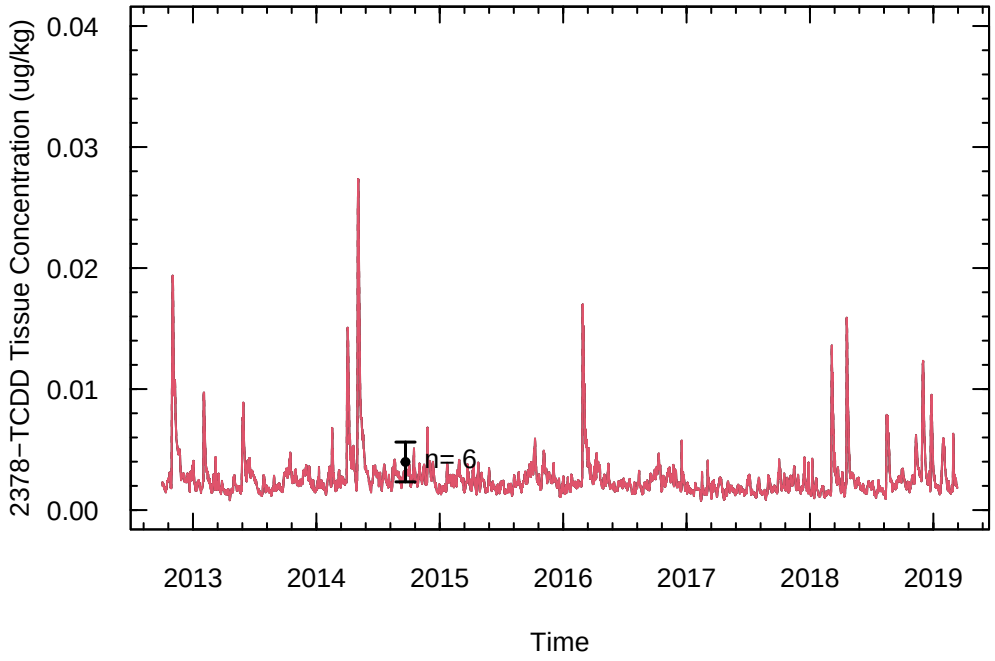
Benthic invert filter feeder (North)

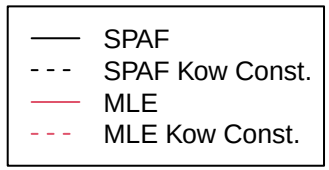


Benthic invert filter feeder (Southeast)

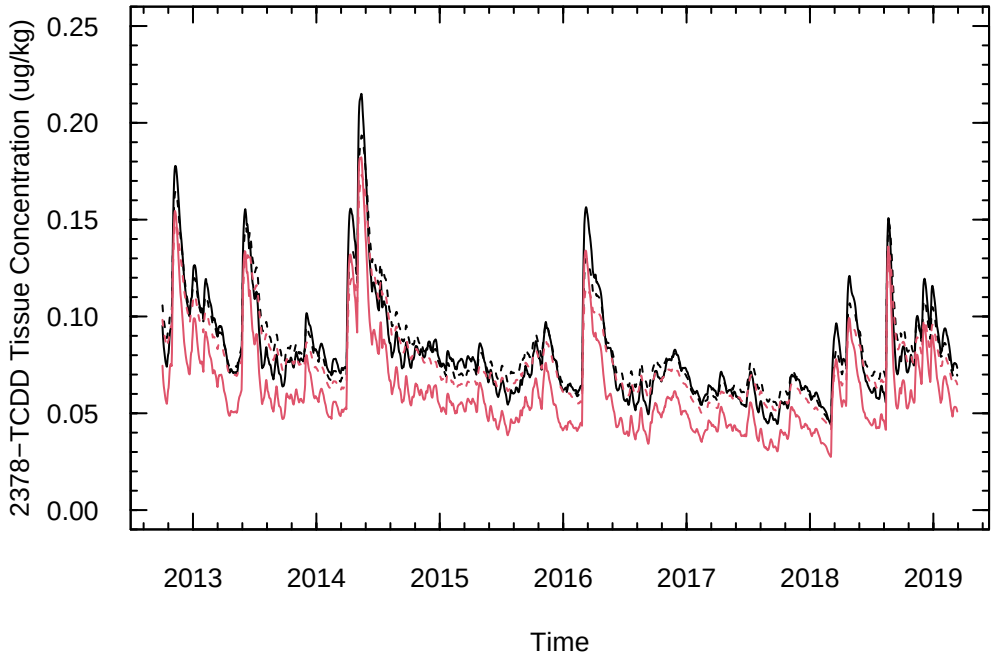


Benthic invert filter feeder (Southwest)

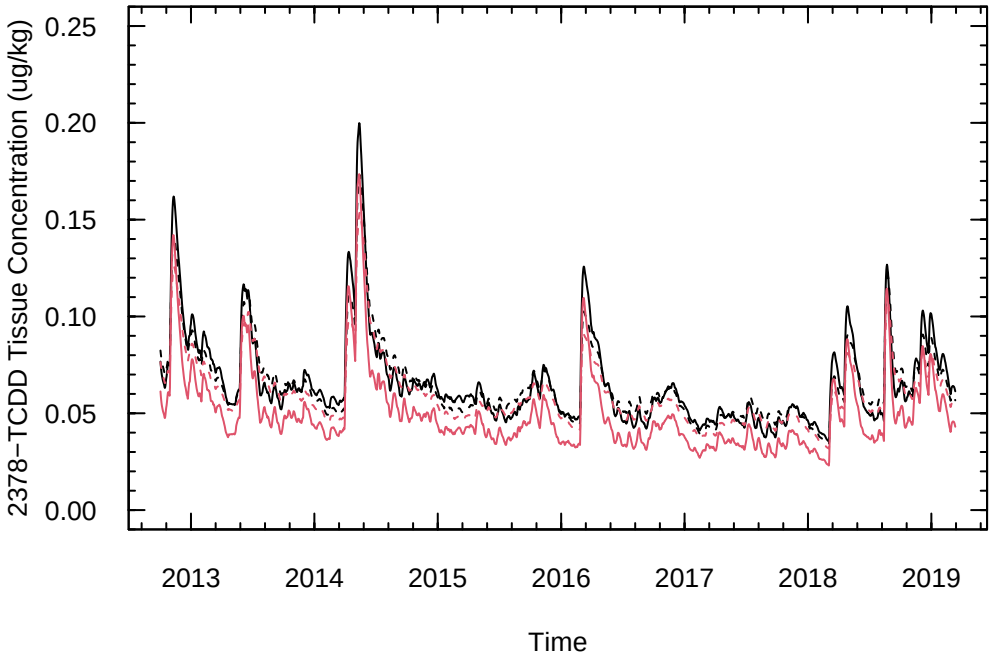




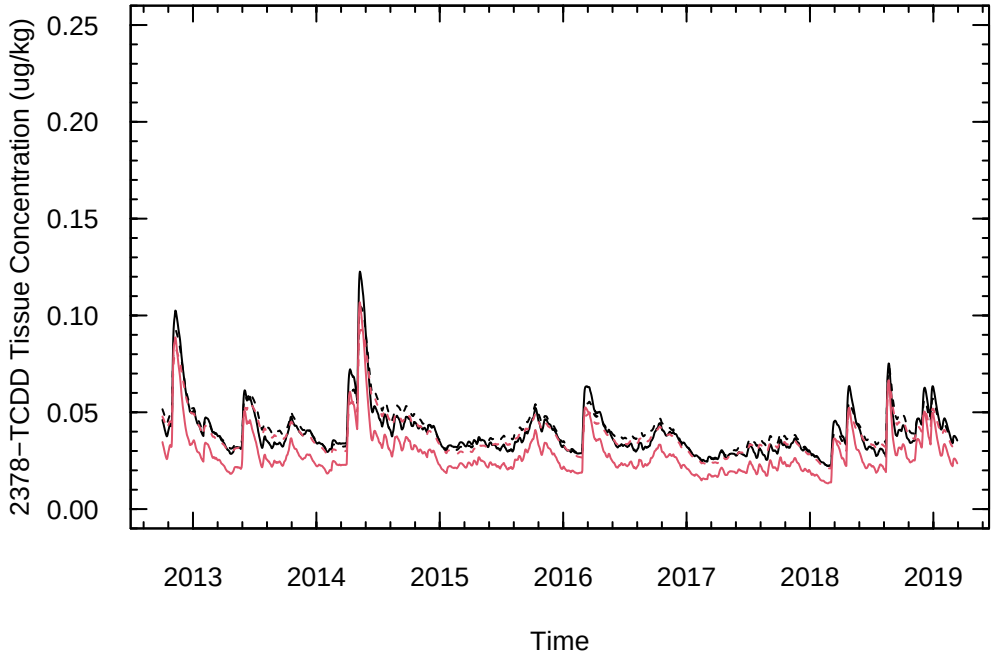
Benthic invert detritivore (North)

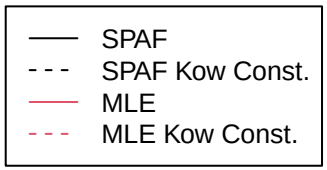


Benthic invert detritivore (Southeast)

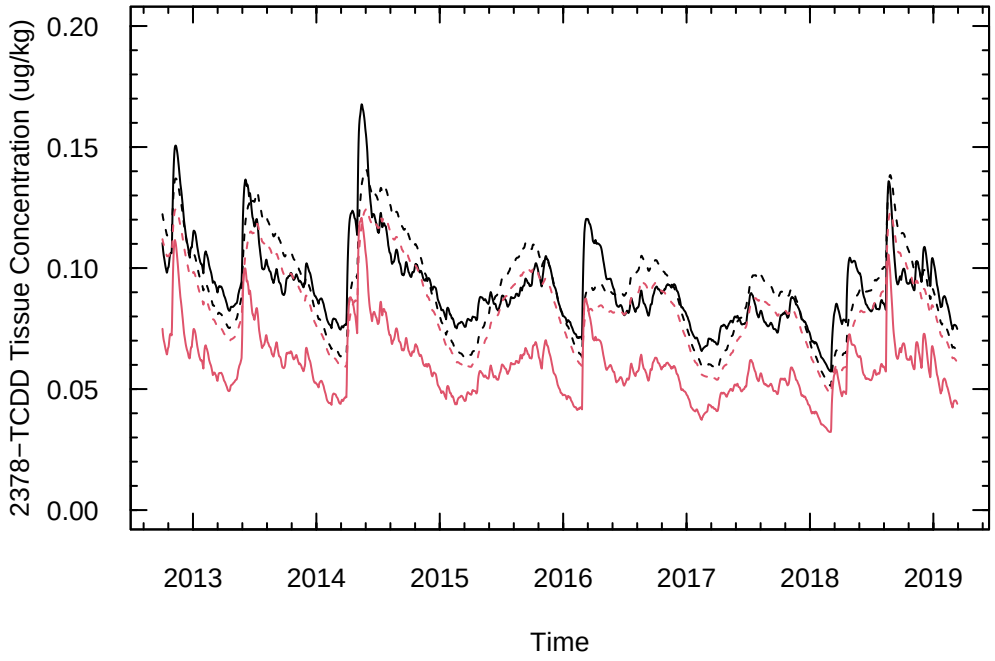


Benthic invert detritivore (Southwest)

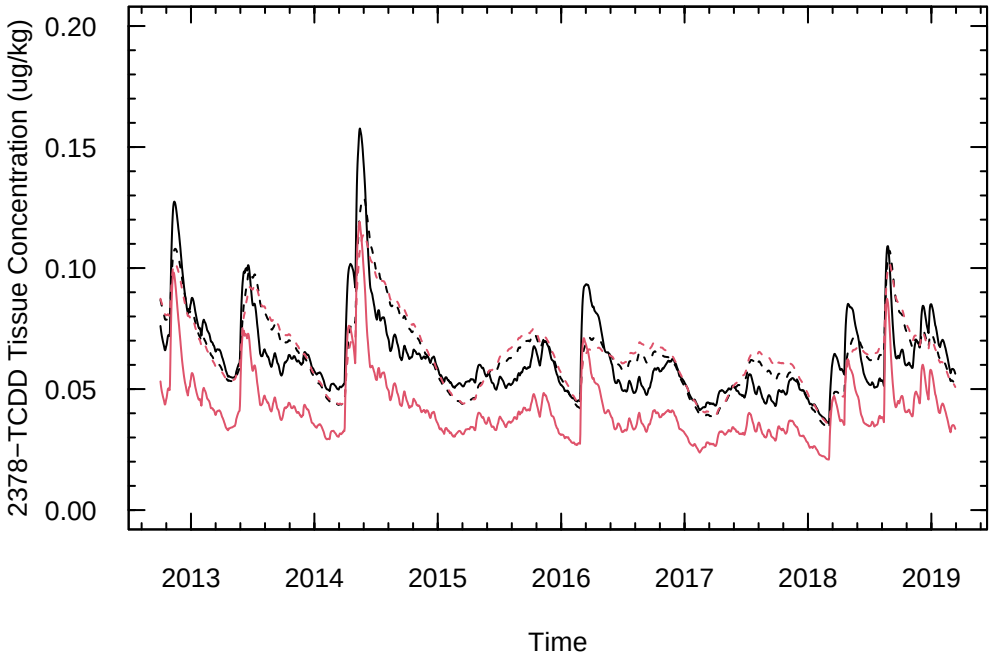




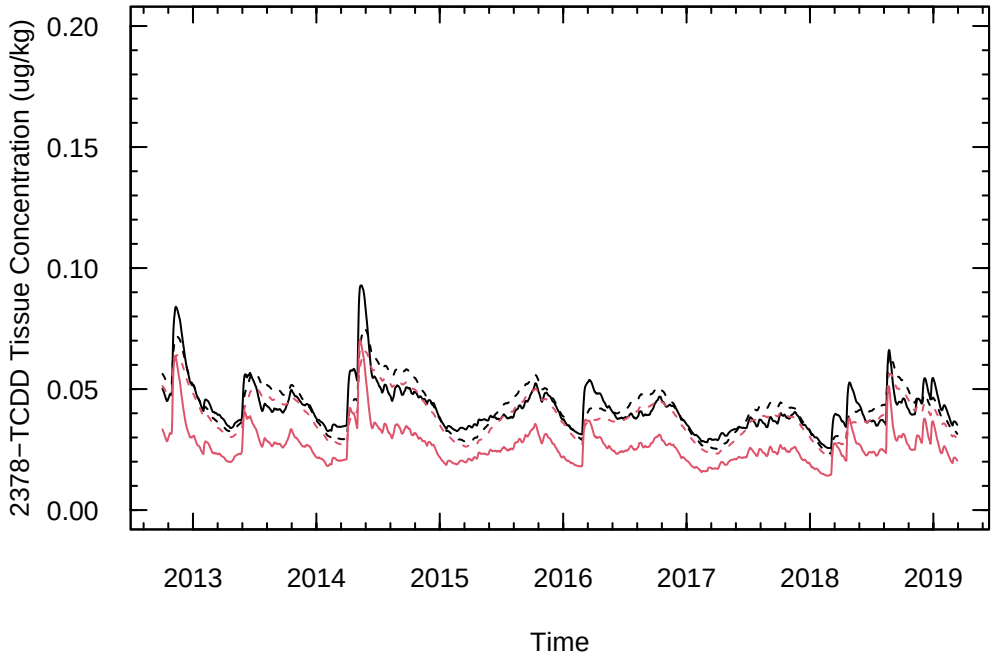
Benthic invert carnivore/omnivore (North)

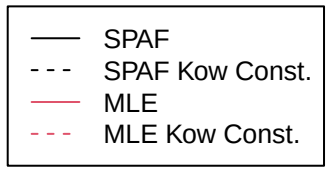


Benthic invert carnivore/omnivore (Southeast)

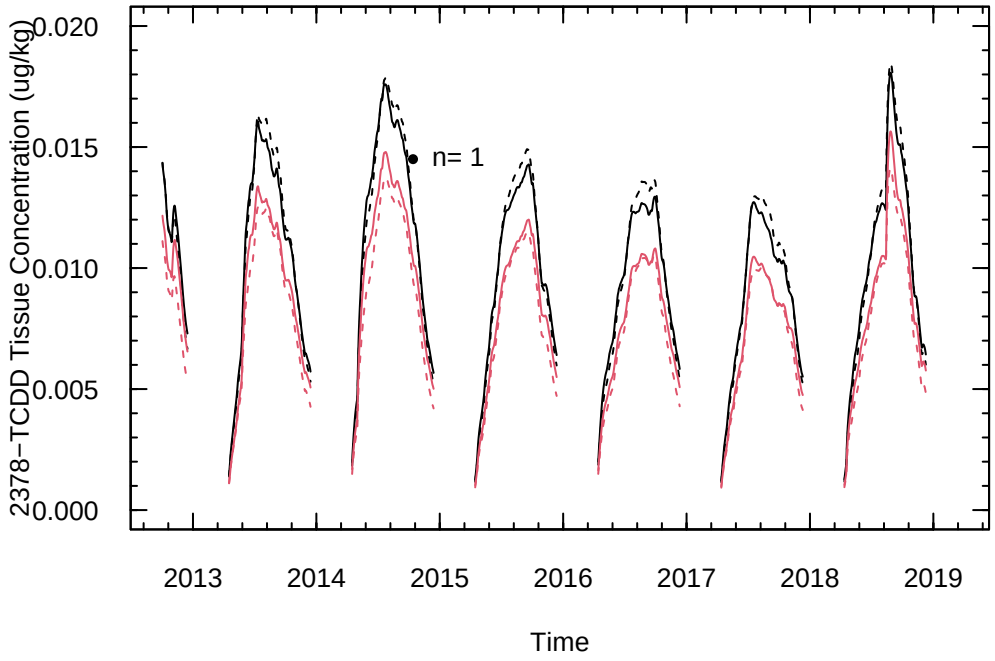


Benthic invert carnivore/omnivore (Southwest)

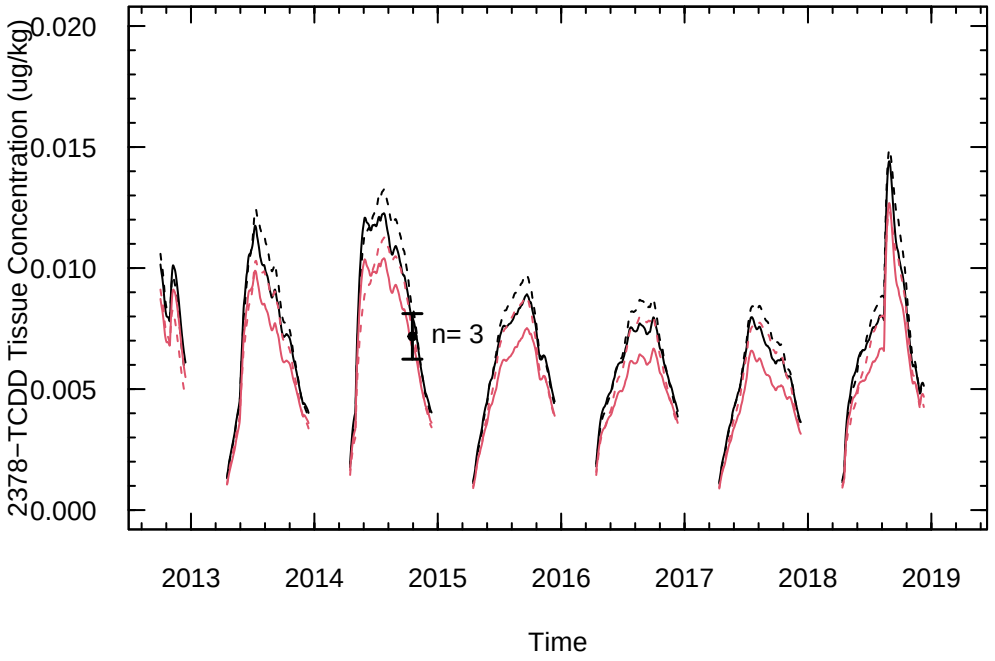




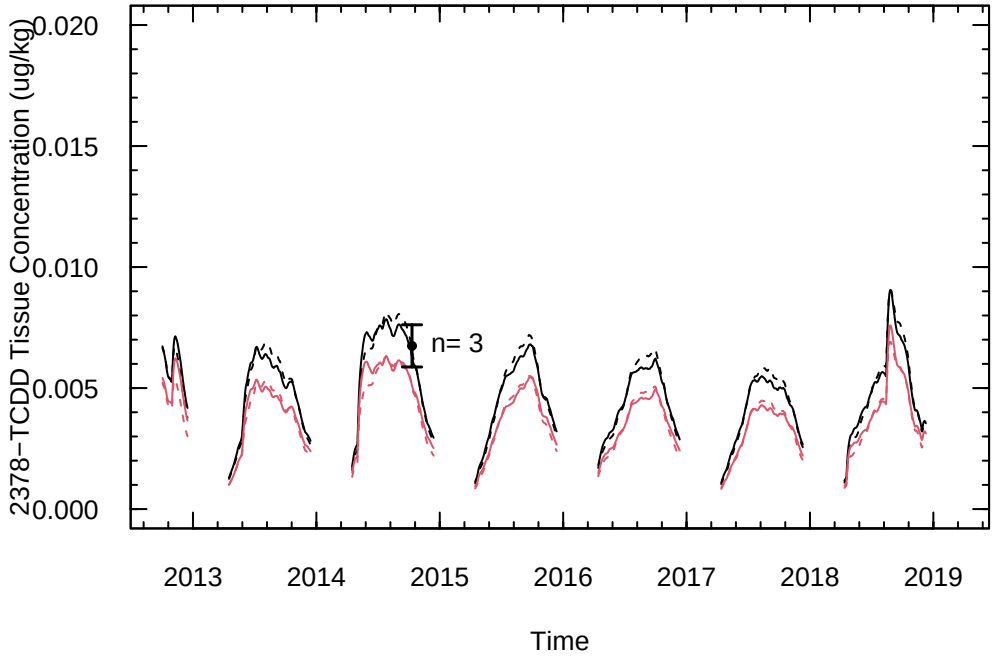
Atlantic Silverside (North)

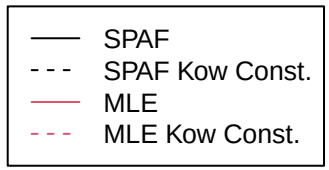


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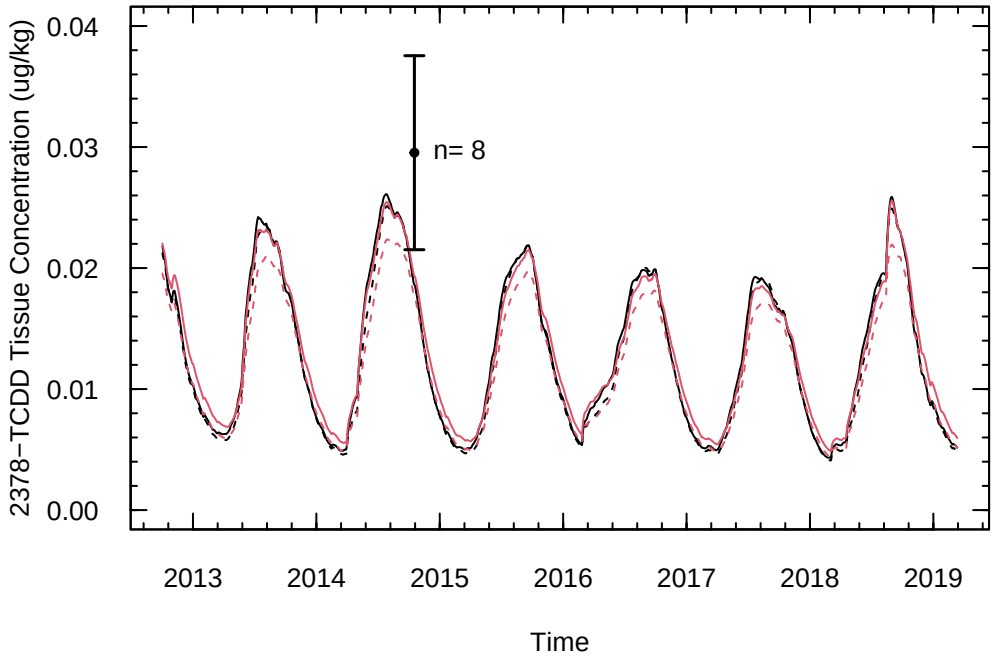


Atlantic Silverside (Southwest)

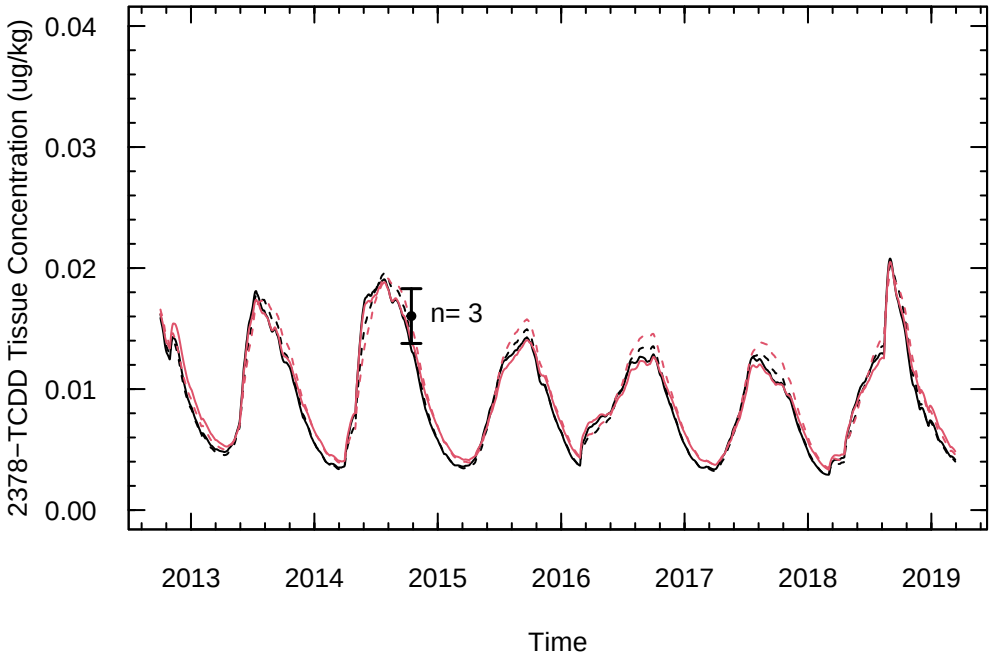




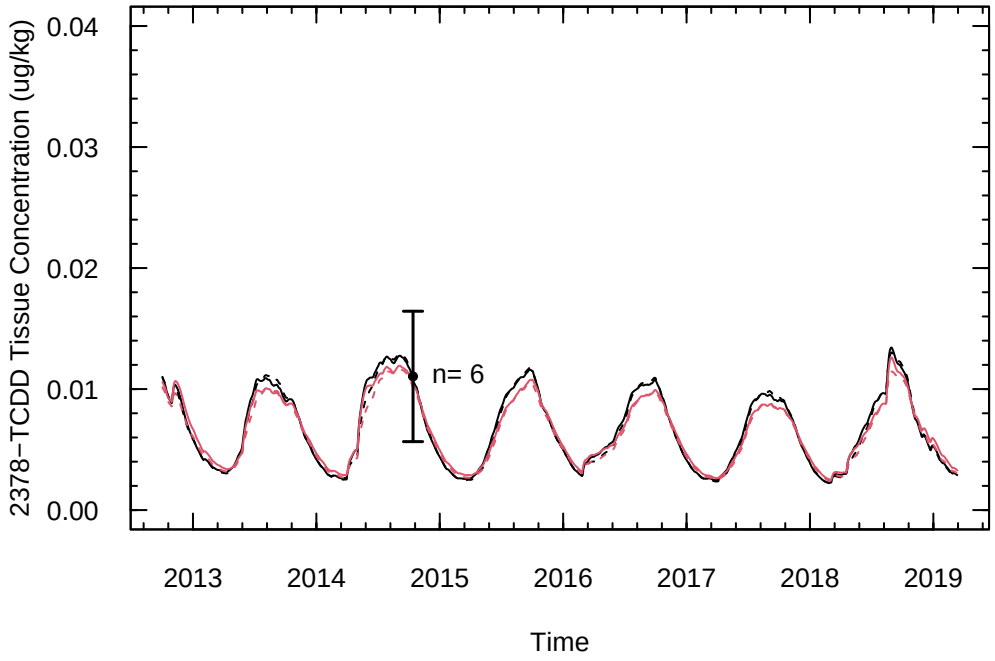
Small forage fish (North)

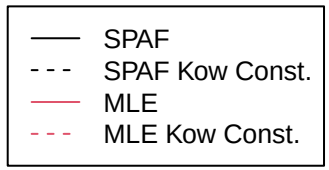


Small forage fish (Southeast)

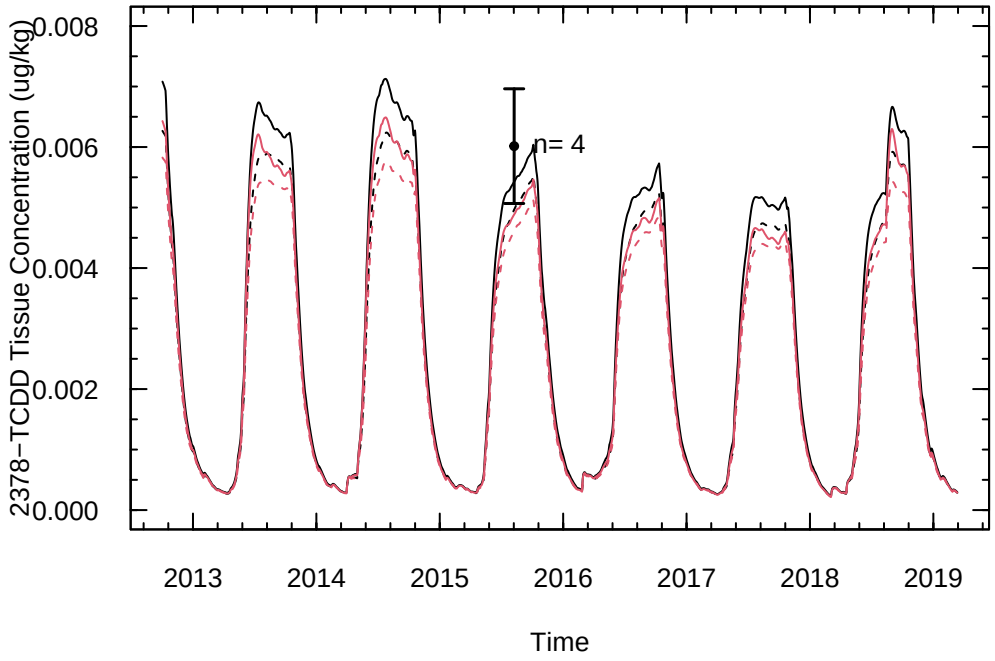


Small forage fish (Southwest)

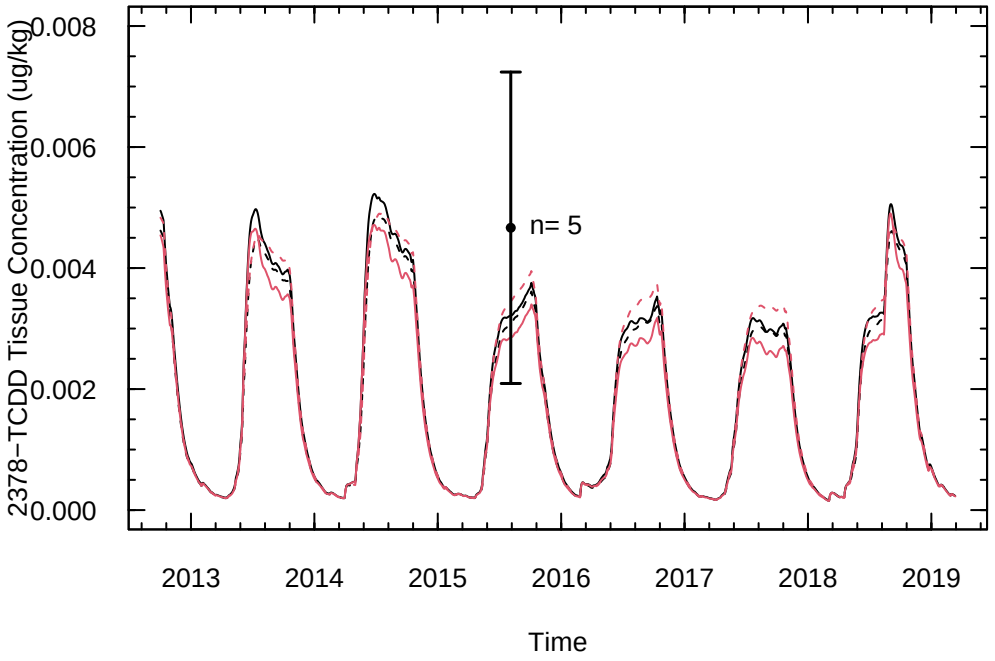




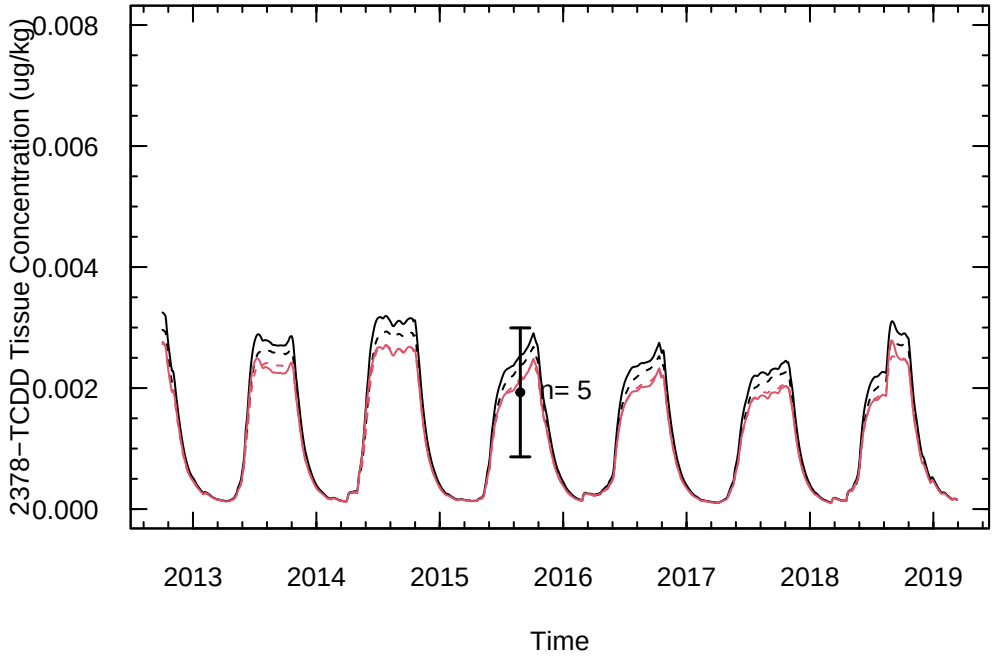
Small American eel (North)

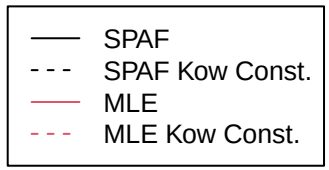


Small American eel (Southeast)

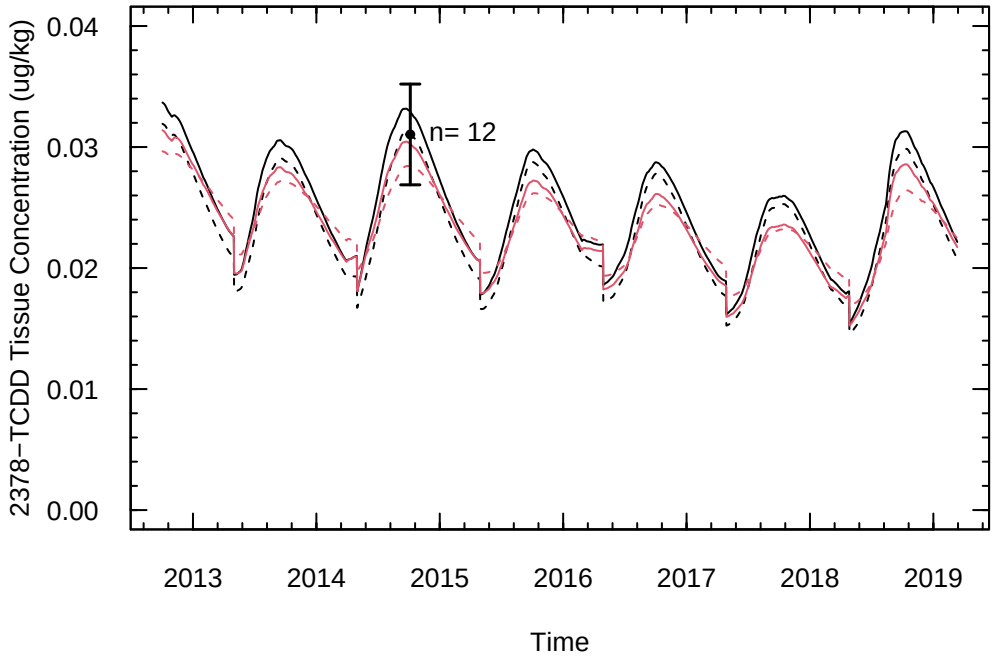


Small American eel (Southwest)

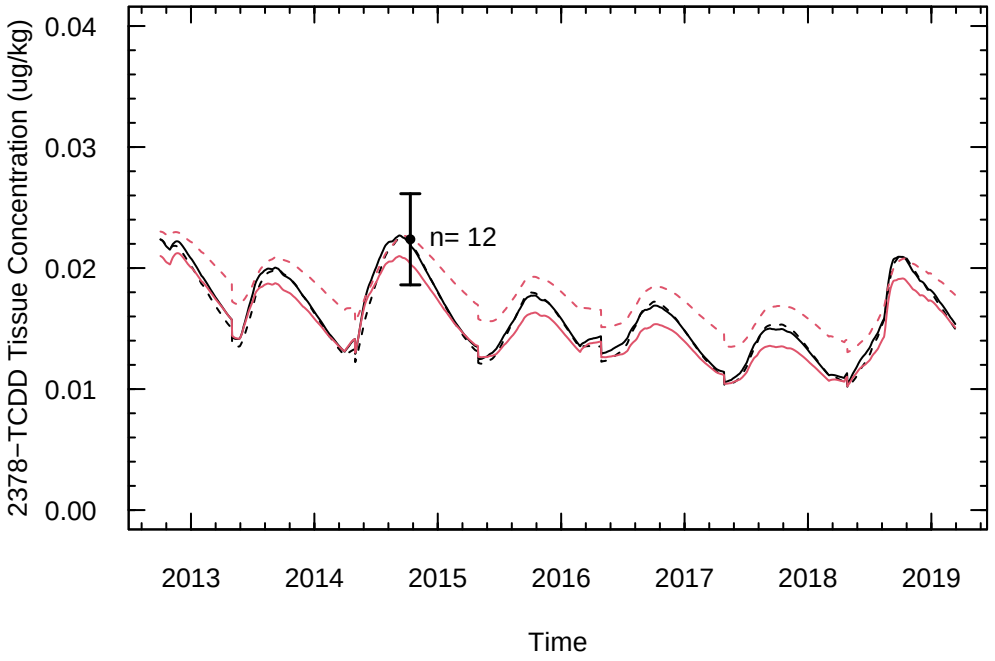




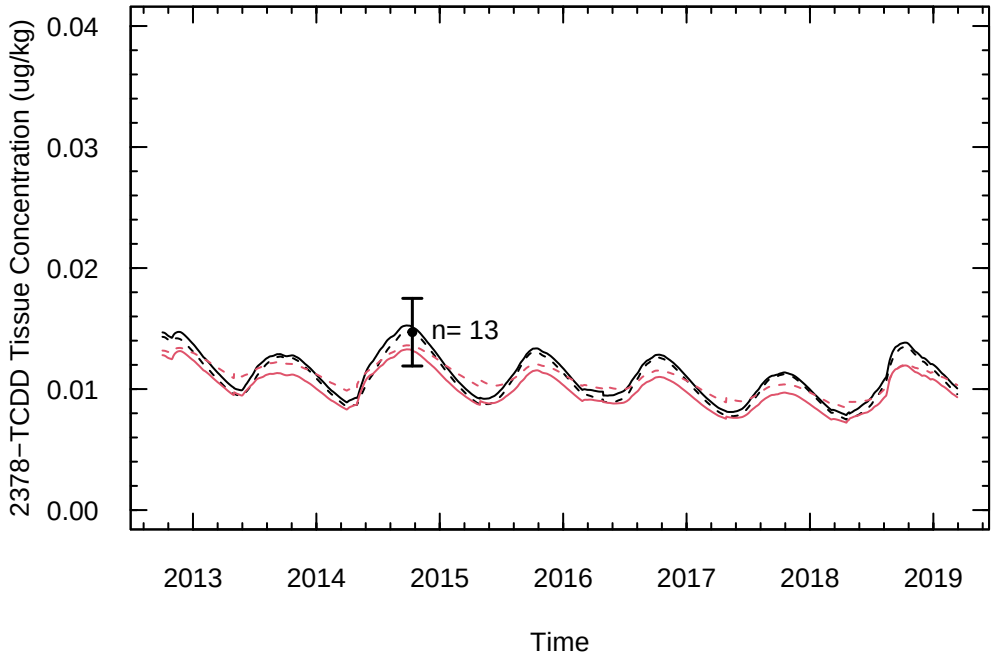
Blue crab (North)

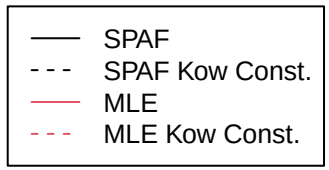


Blue crab (Southeast)

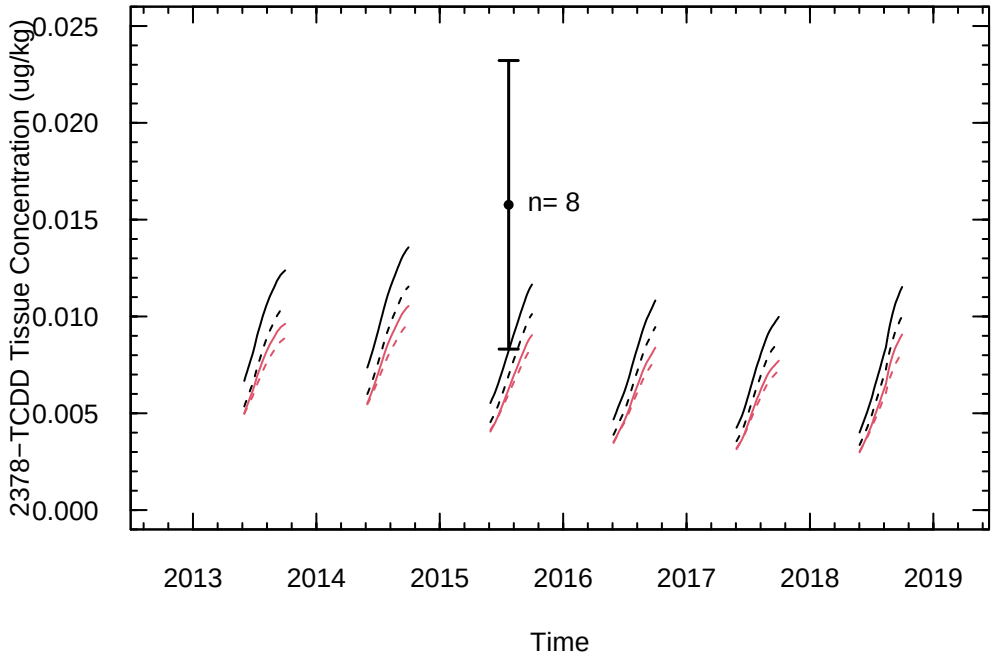


Blue crab (Southwest)

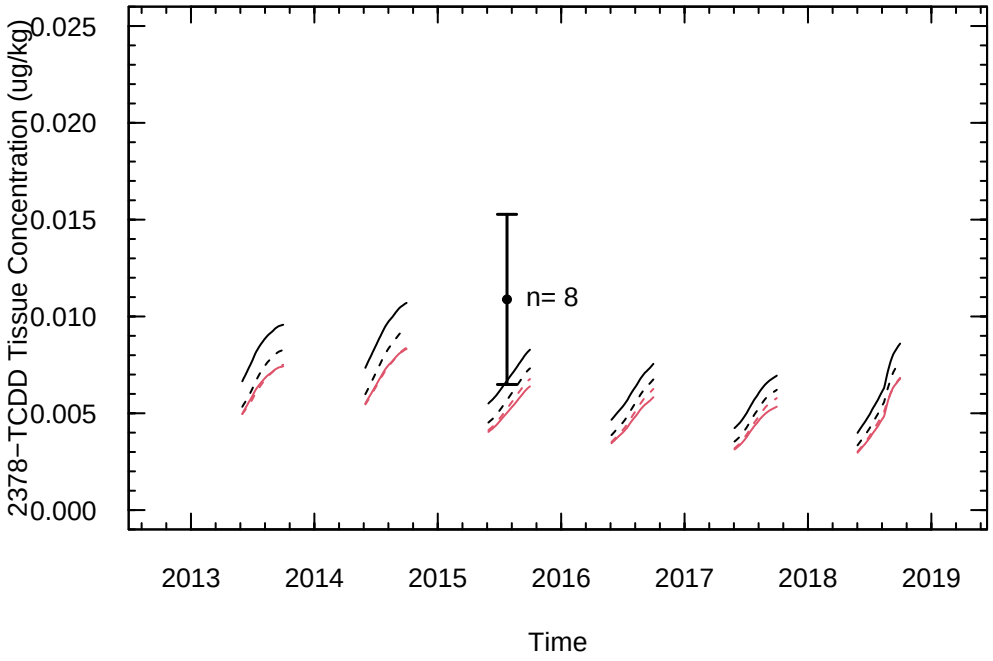




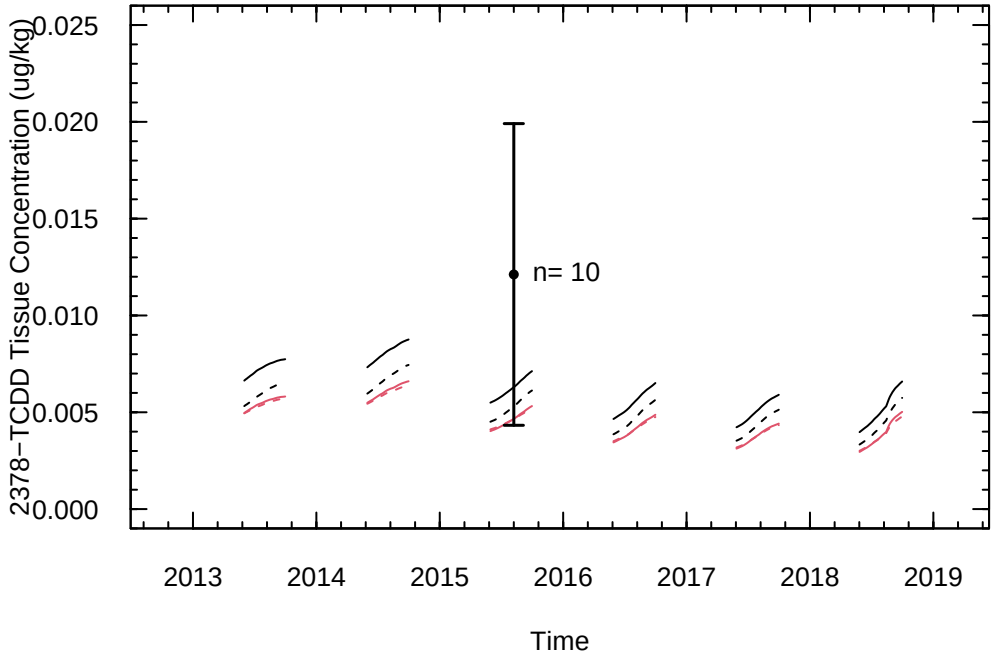
Summer Flounder (North)

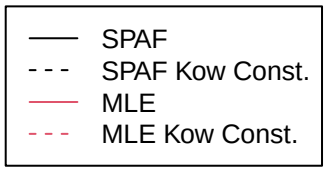


Summer Flounder (Southeast)

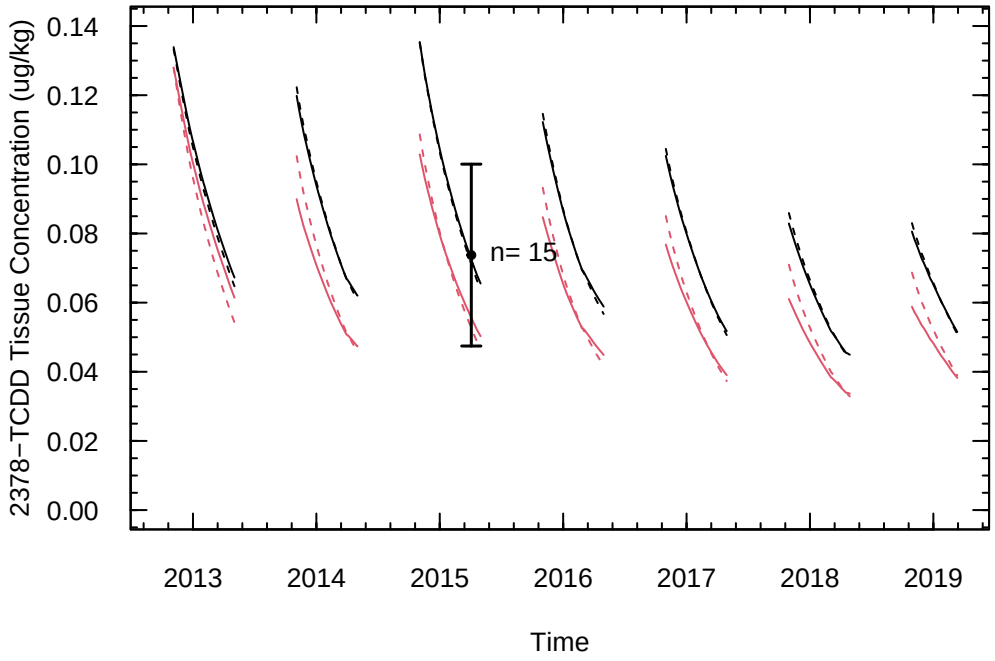


Summer Flounder (Southwest)

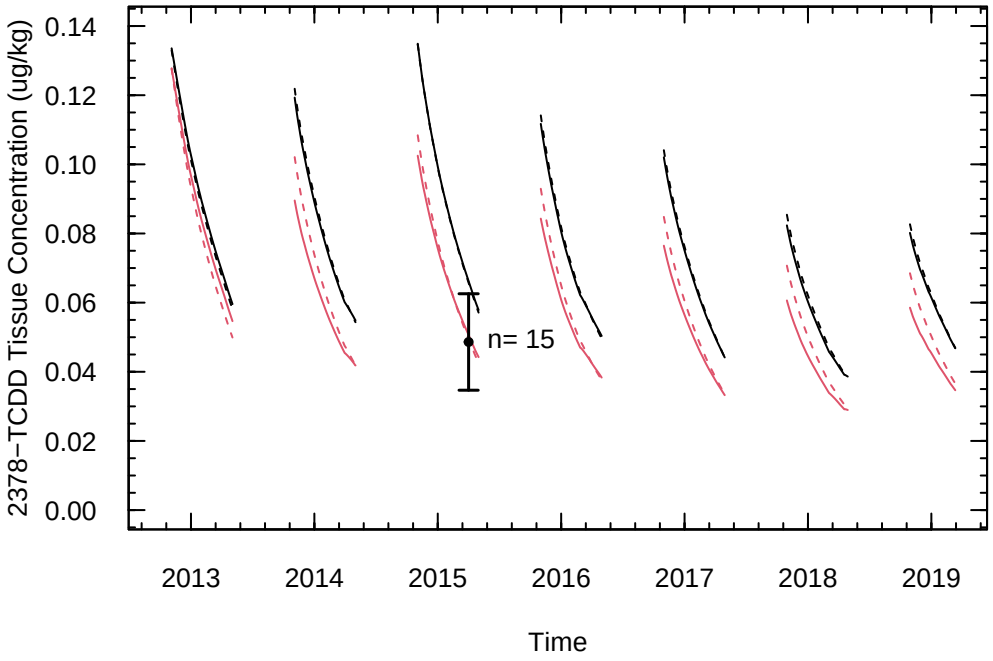




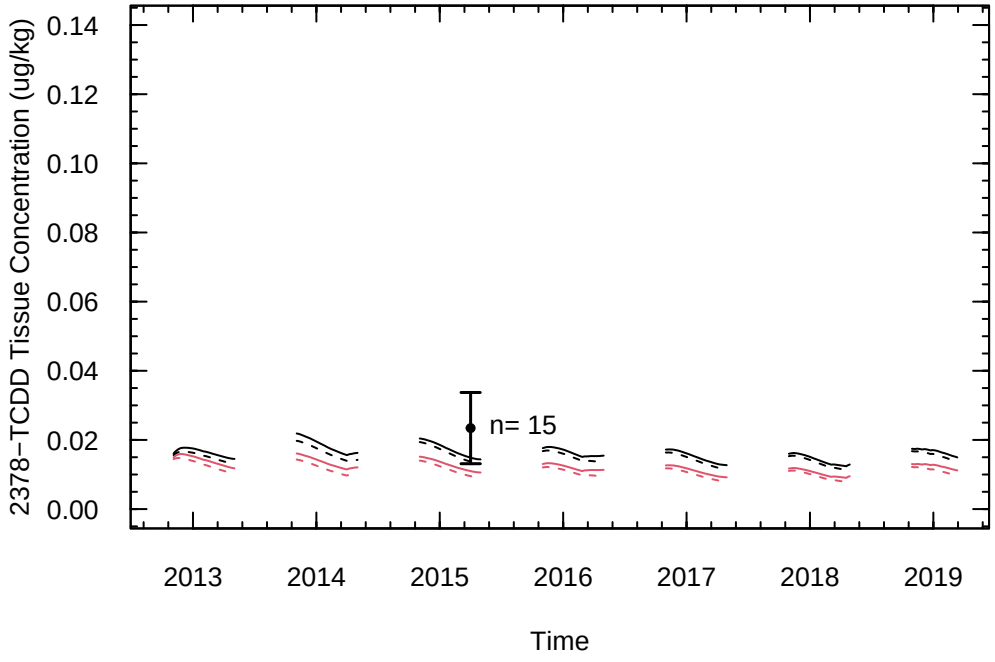
White perch (North)

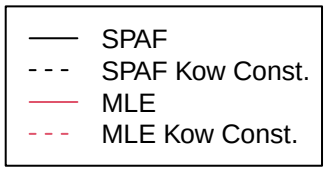


White perch (Southeast)

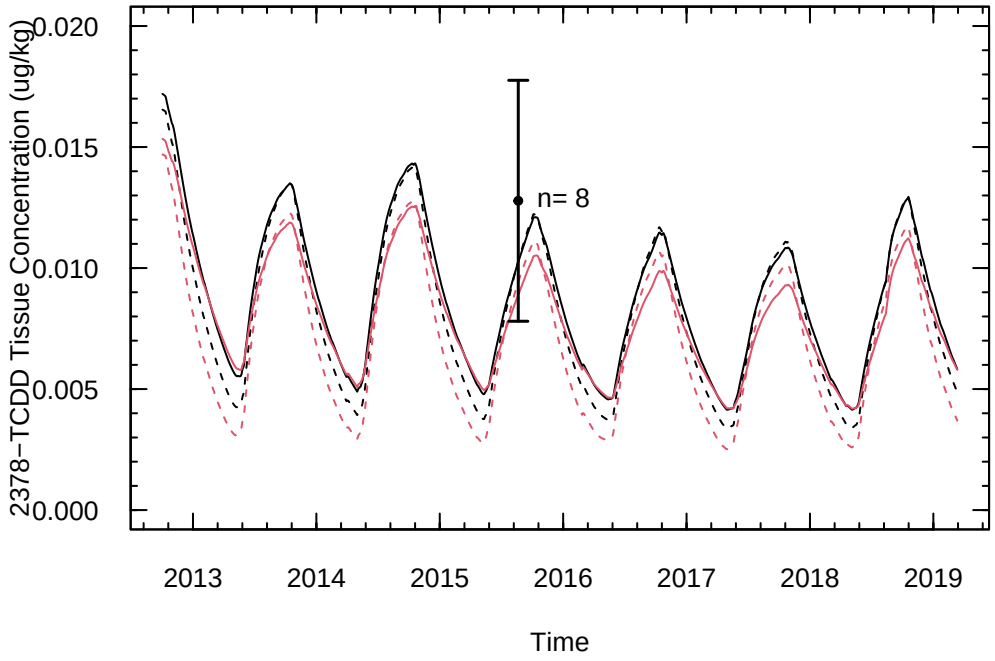


White perch (Southwest)

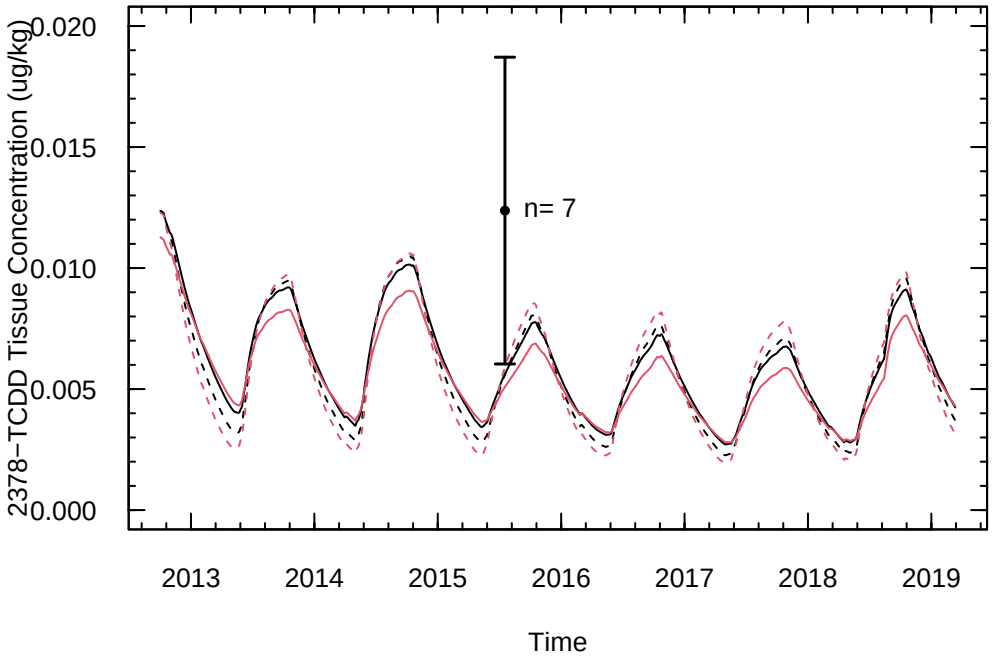




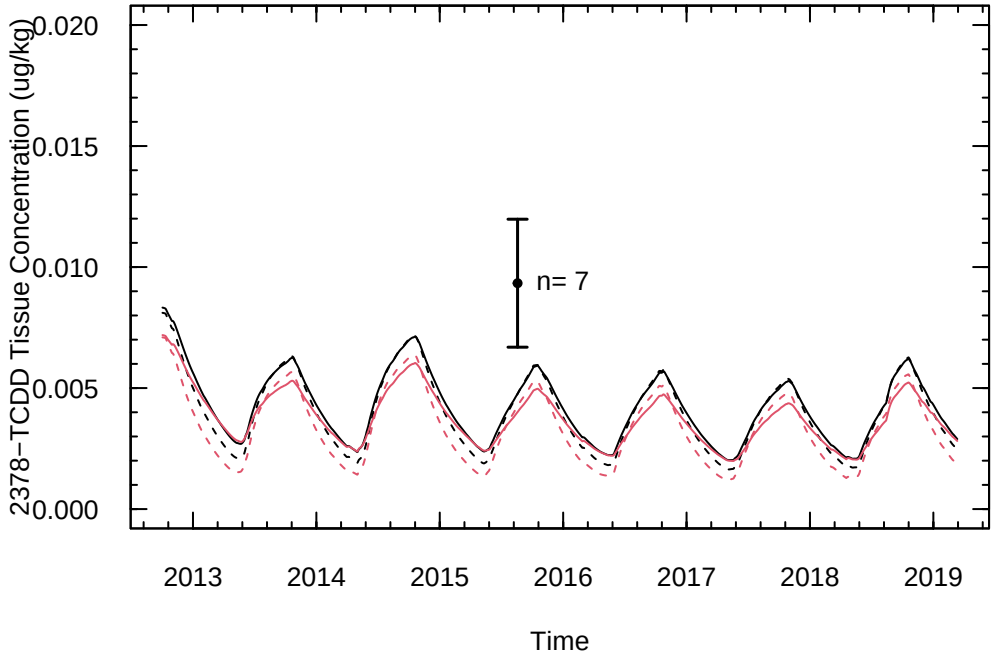
Large American eel (North)

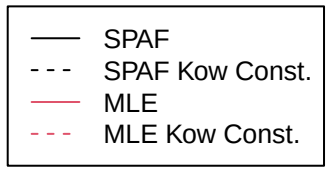


Large American eel (Southeast)

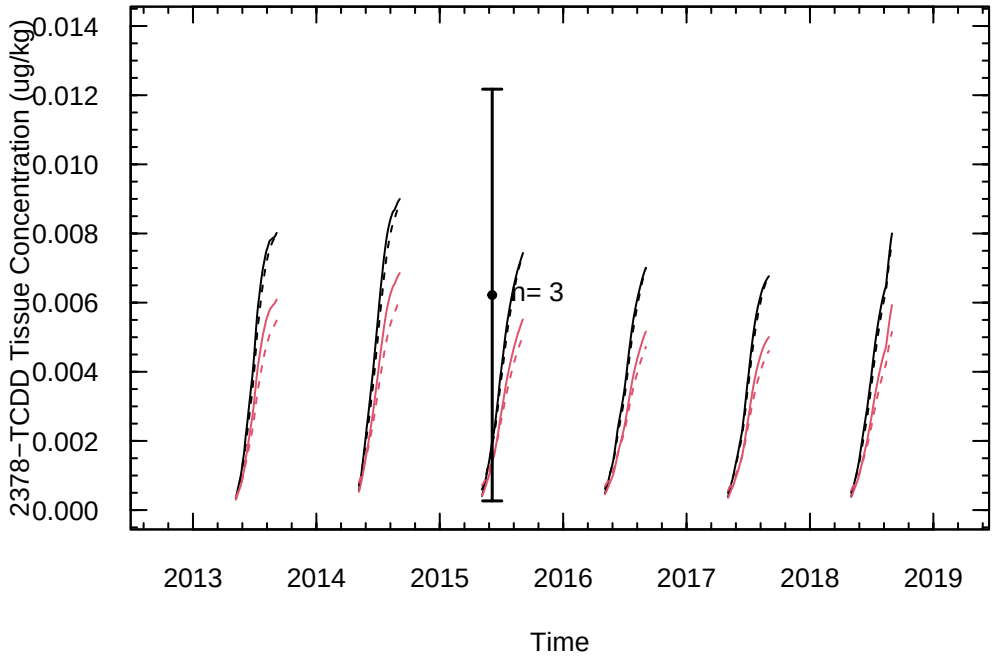


Large American eel (Southwest)

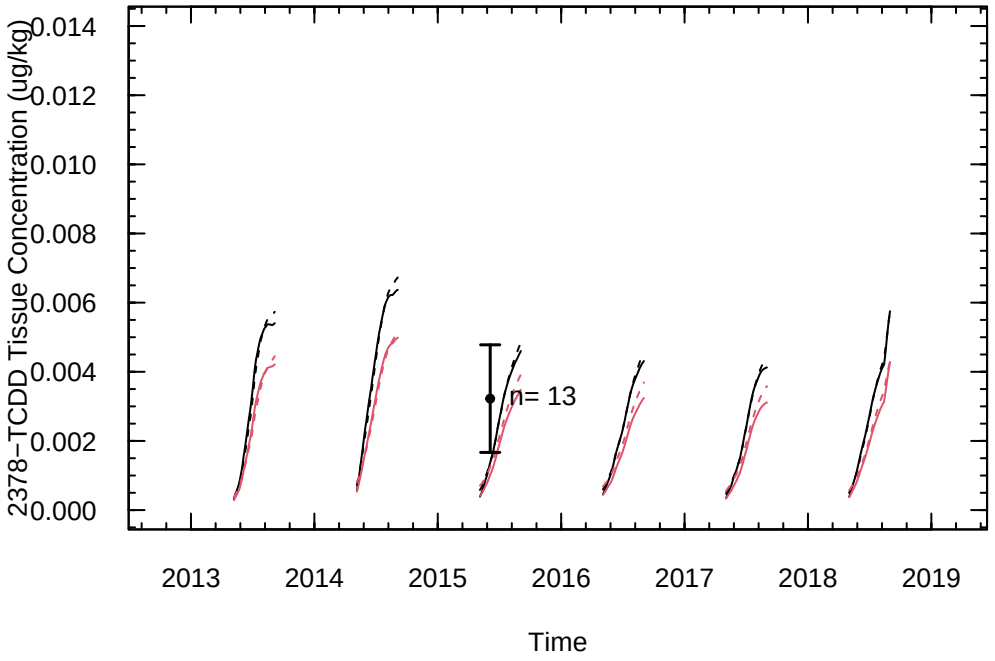




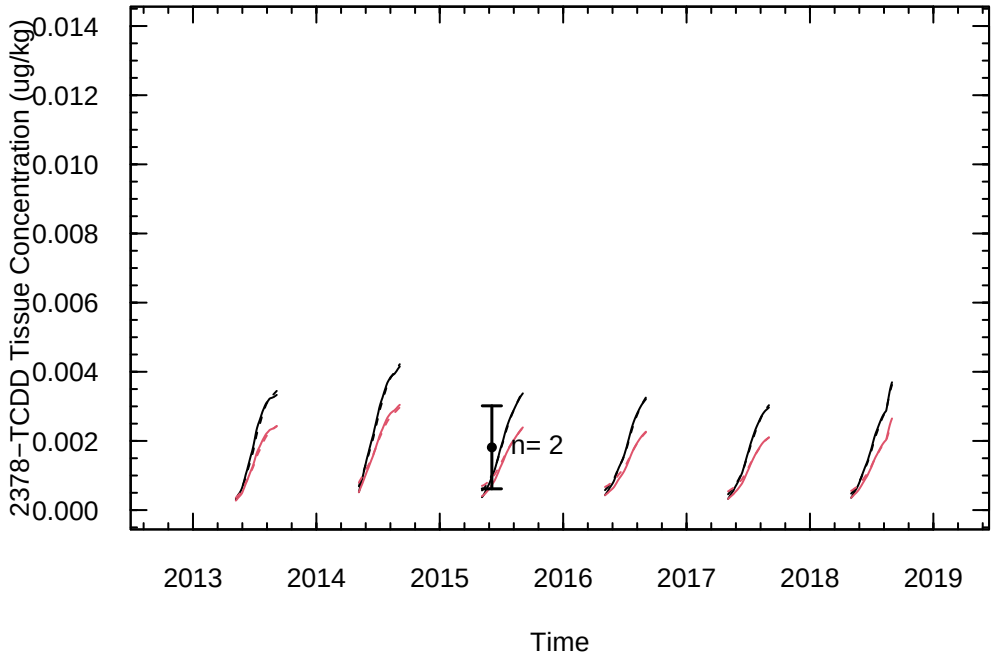
Bluefish (North)

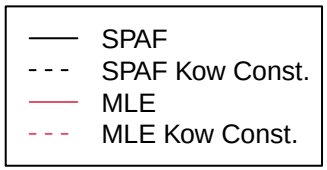


Bluefish (Southeast)

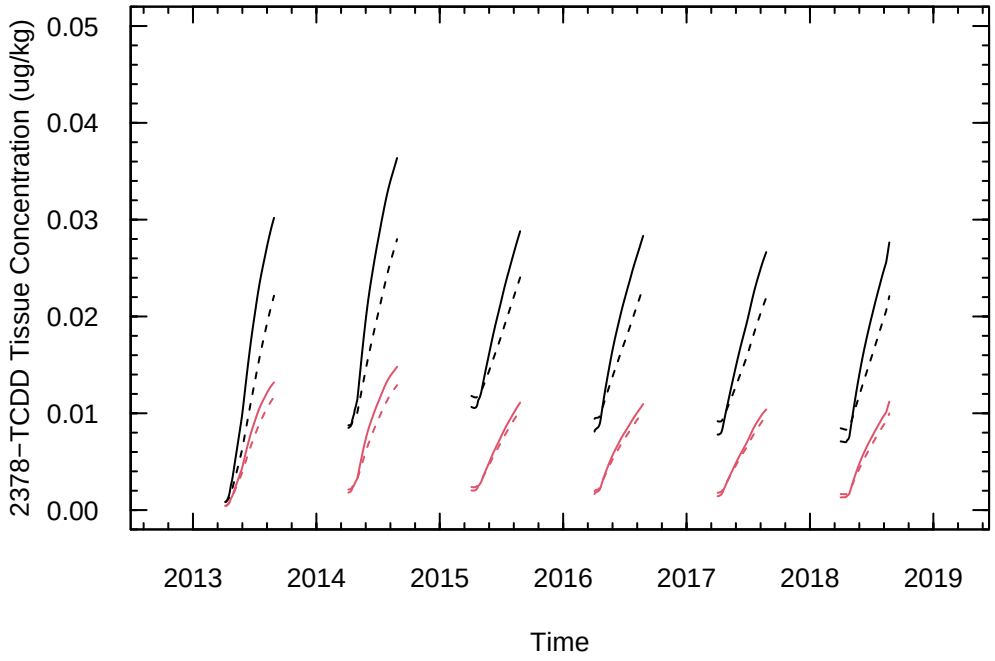


Bluefish (Southwest)

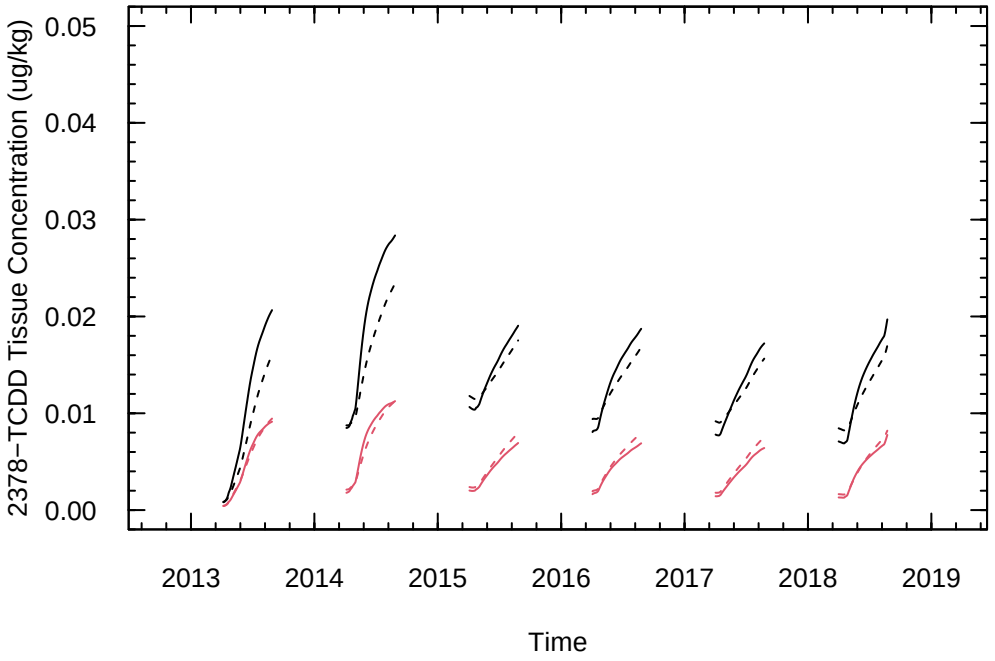




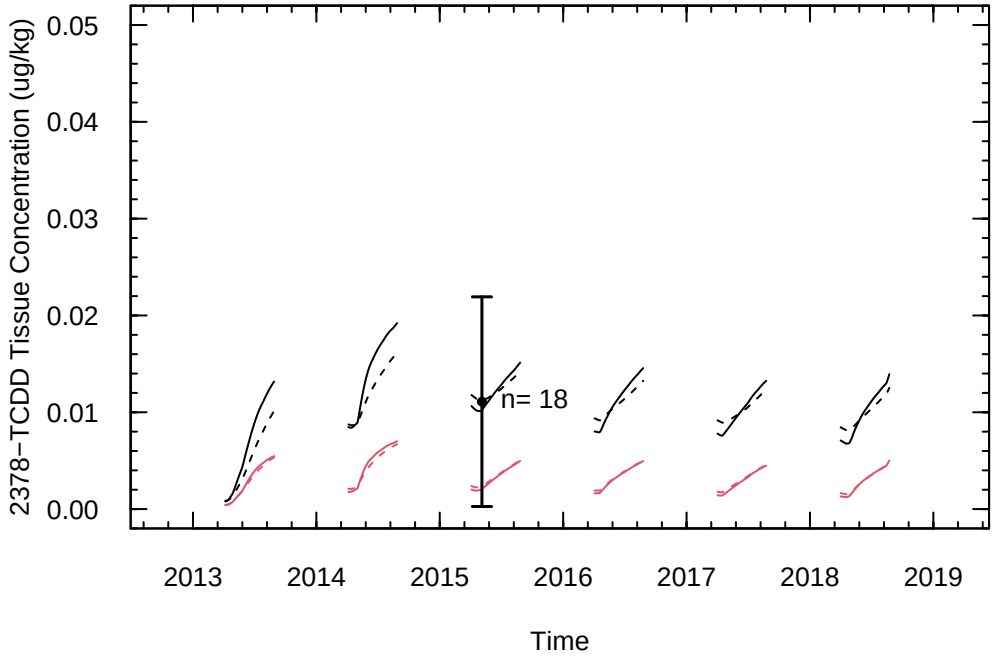
Striped Bass (North)

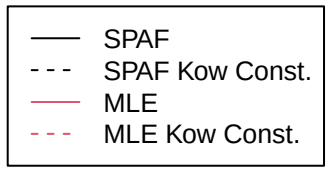


Striped Bass (Southeast)

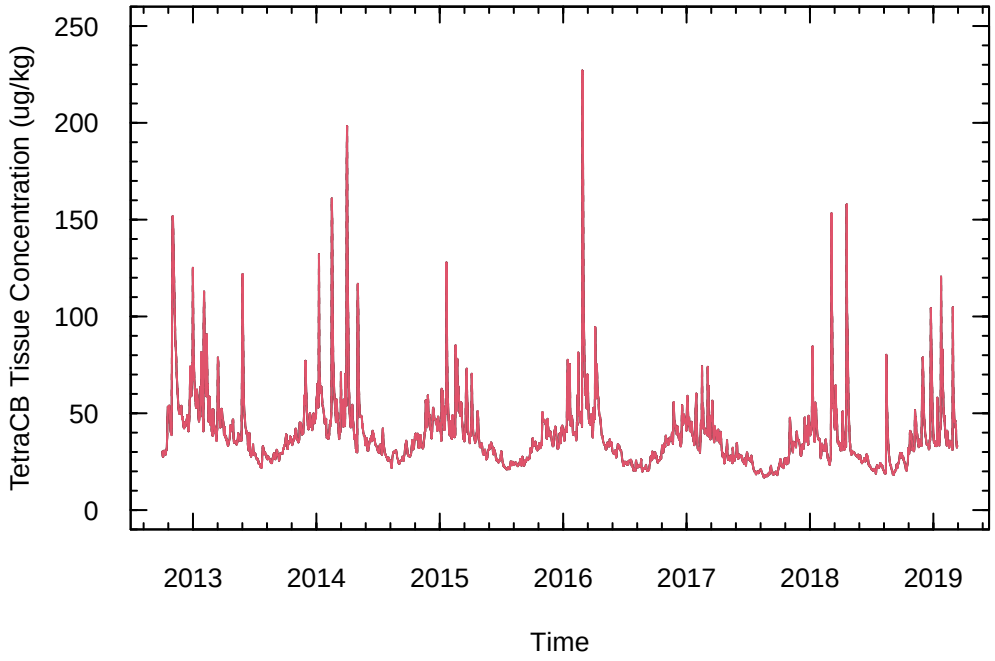


Striped Bass (Southwest)

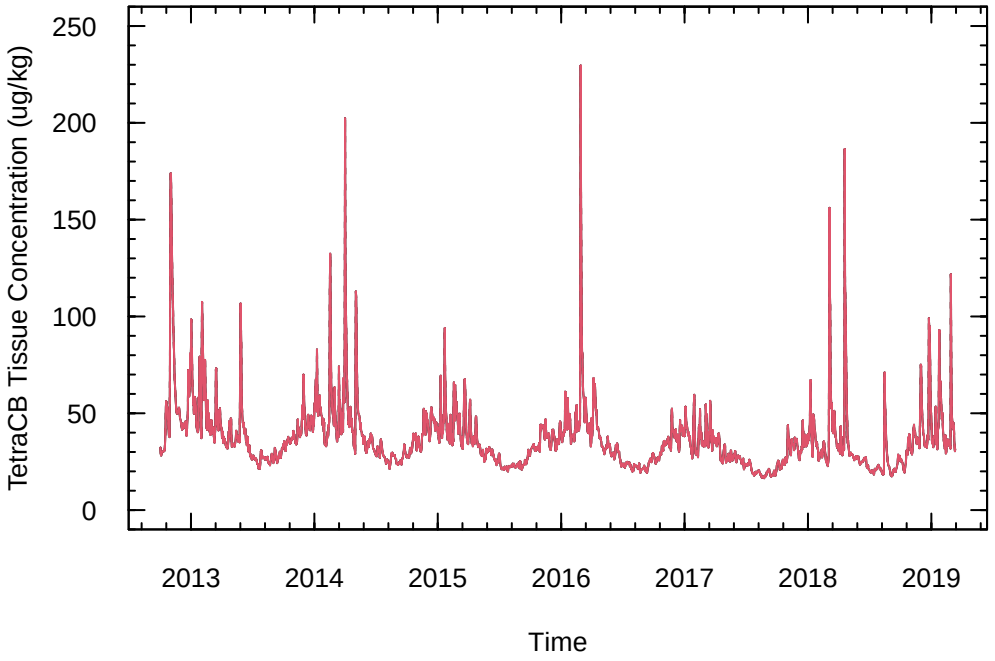




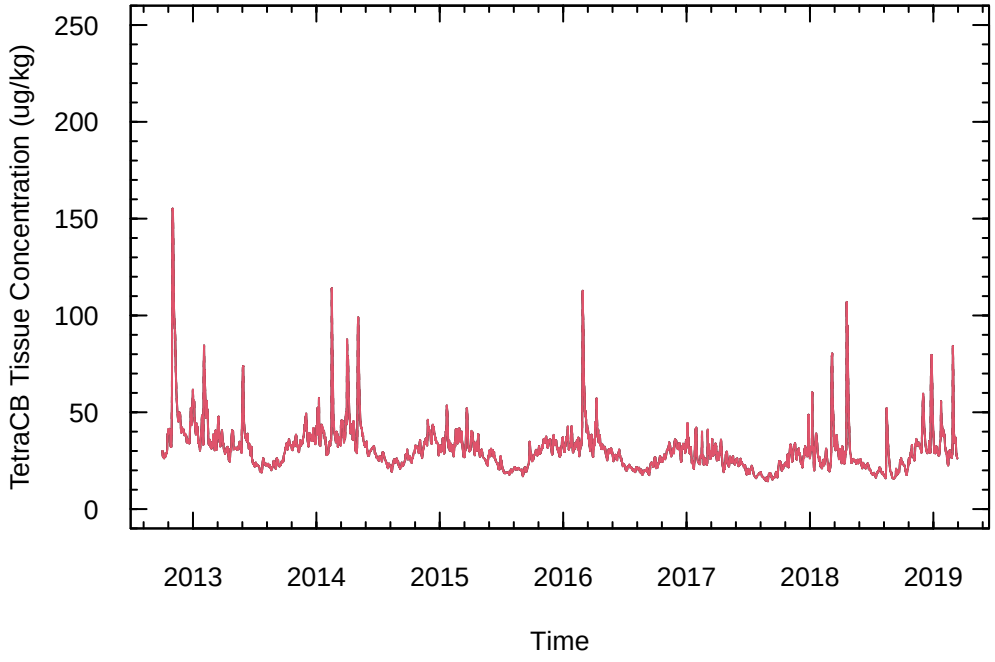
Phytoplankton (North)

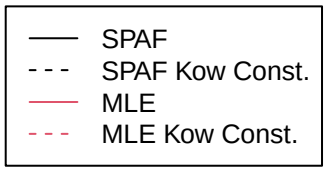


Phytoplankton (Southeast)

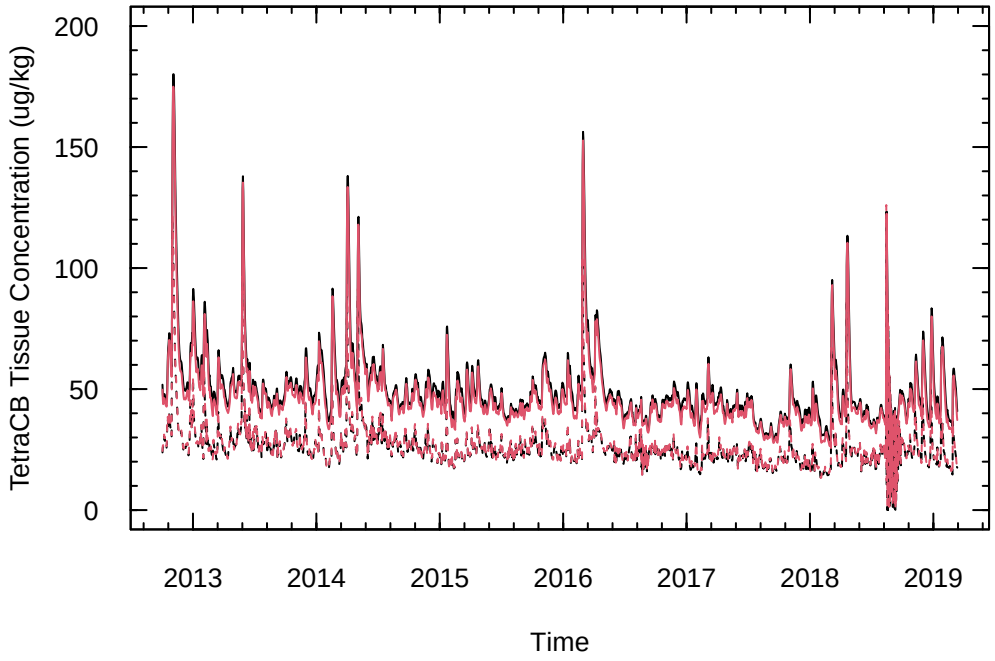


Phytoplankton (Southwest)

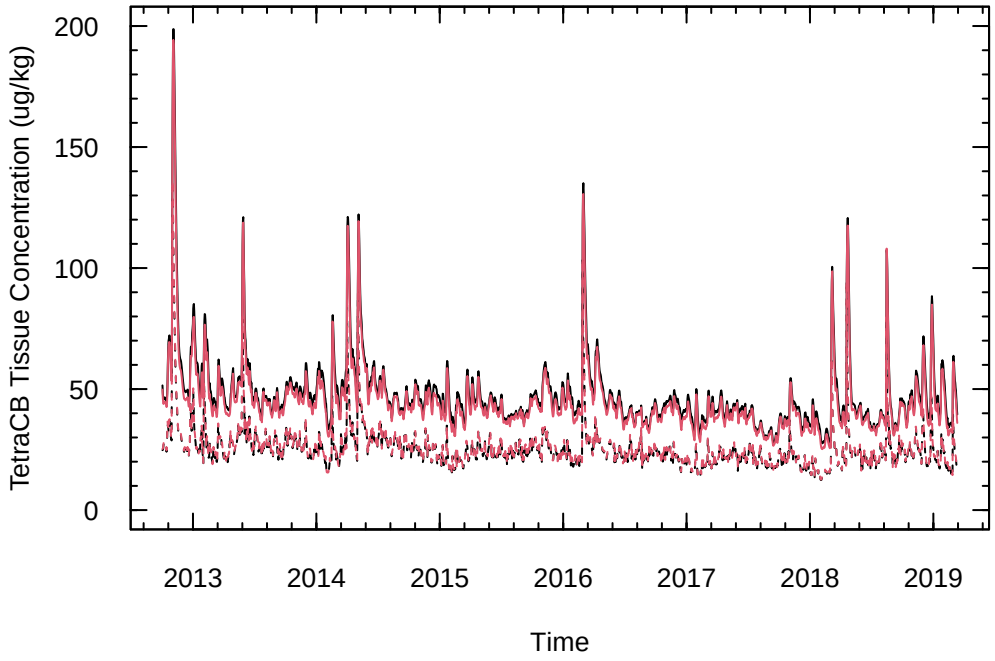




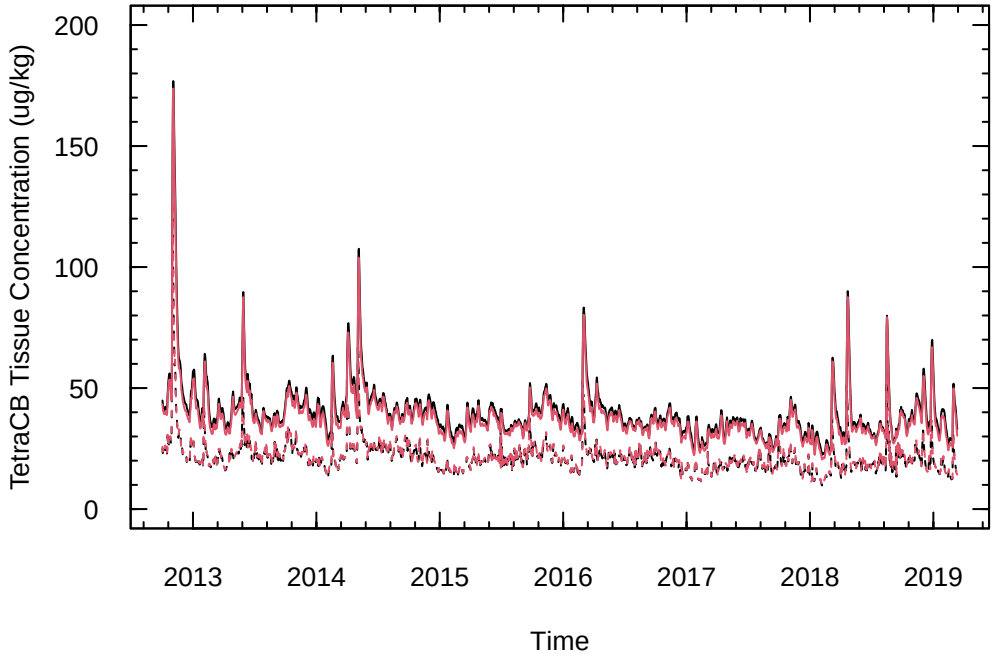
Zooplankton (North)

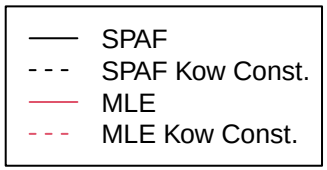


Zooplankton (Southeast)

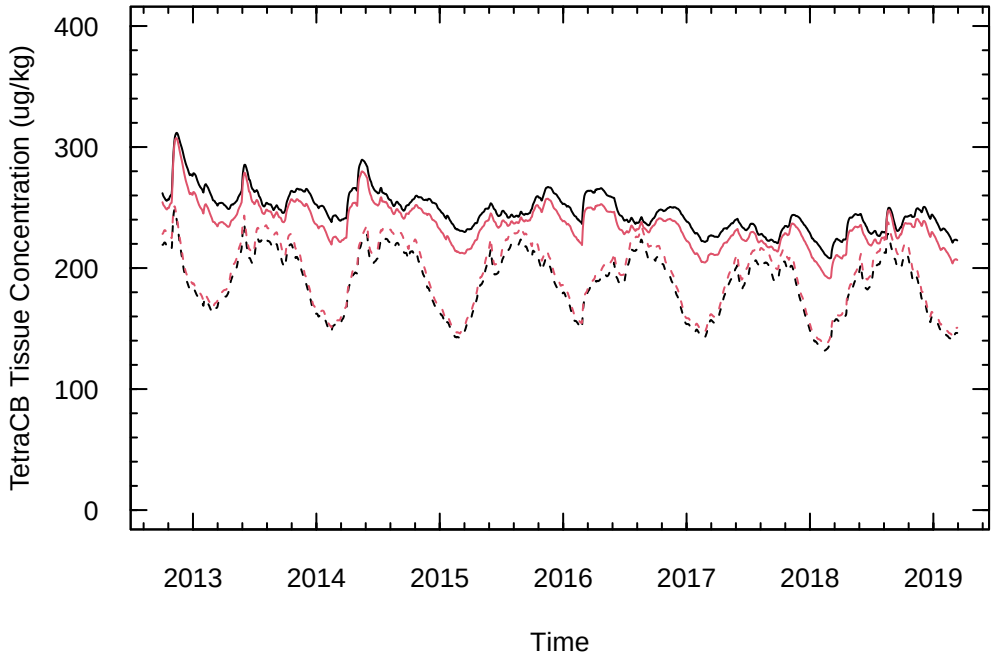


Zooplankton (Southwest)

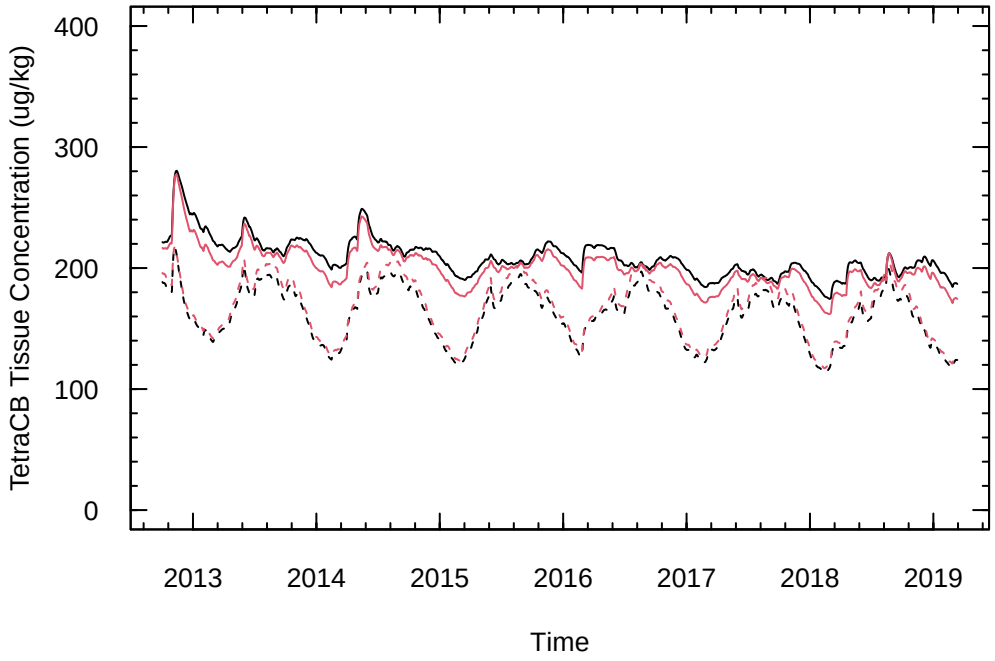




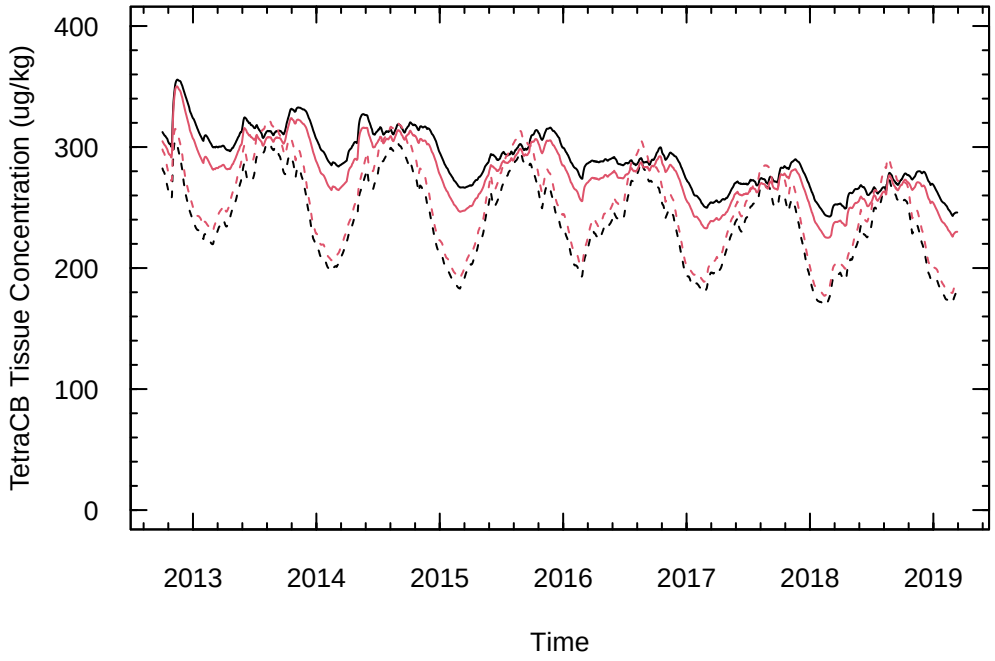
Benthic invert deposit feeder (North)

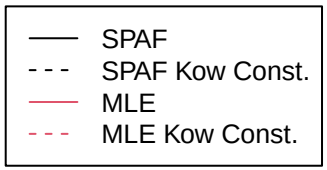


Benthic invert deposit feeder (Southeast)

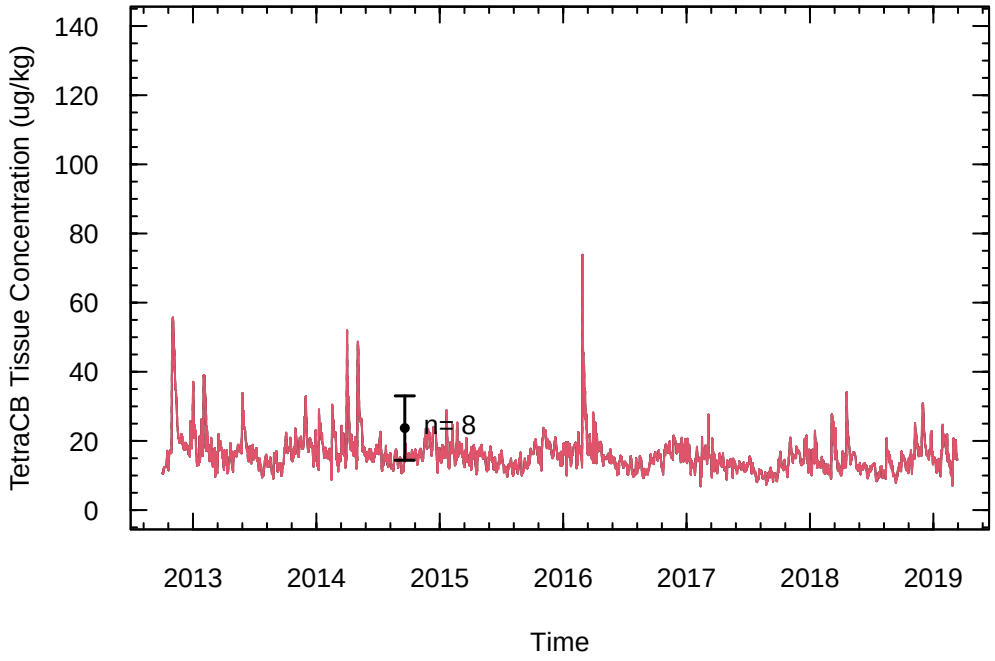


Benthic invert deposit feeder (Southwest)

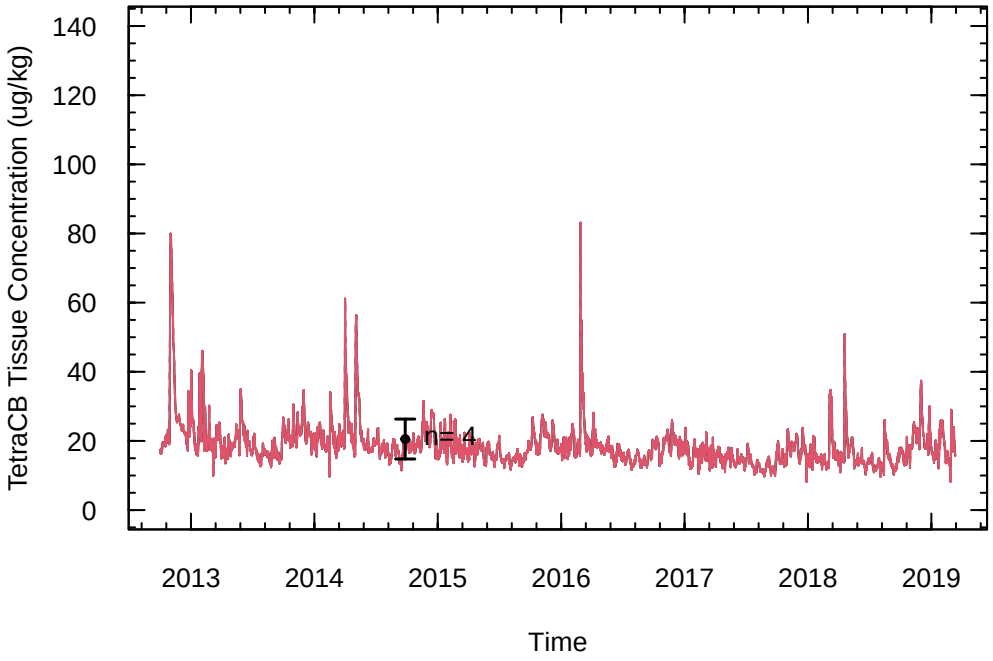




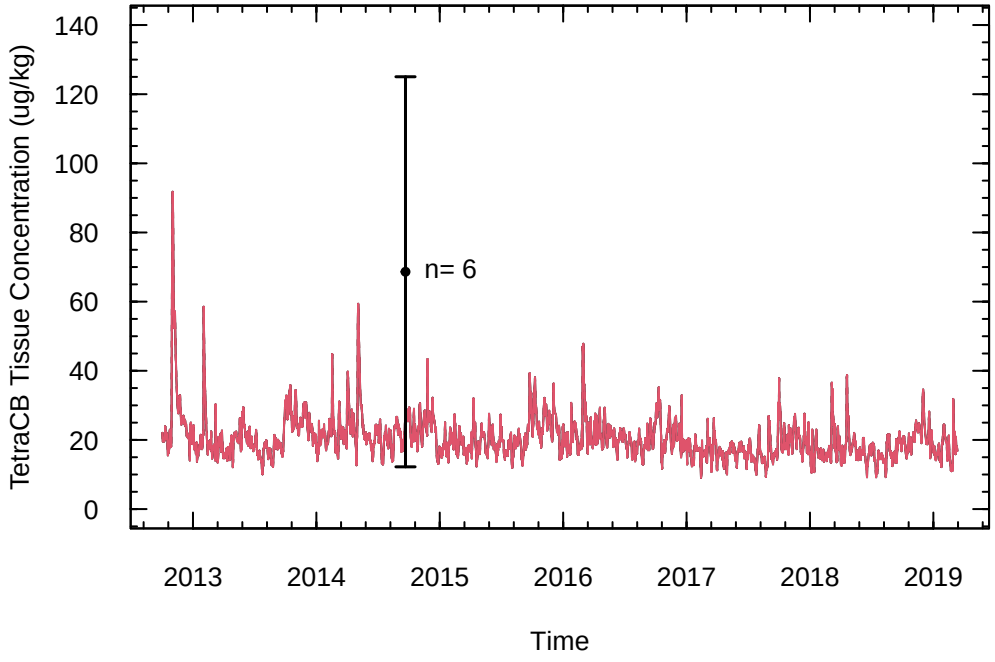
Benthic invert filter feeder (North)

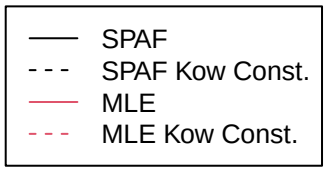


Benthic invert filter feeder (Southeast)

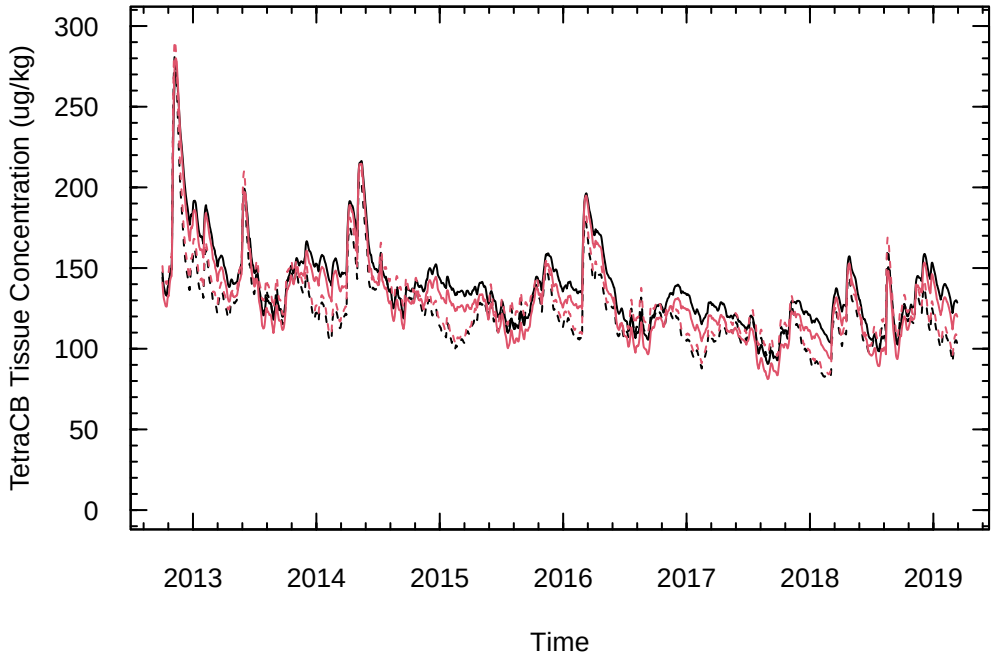


Benthic invert filter feeder (Southwest)

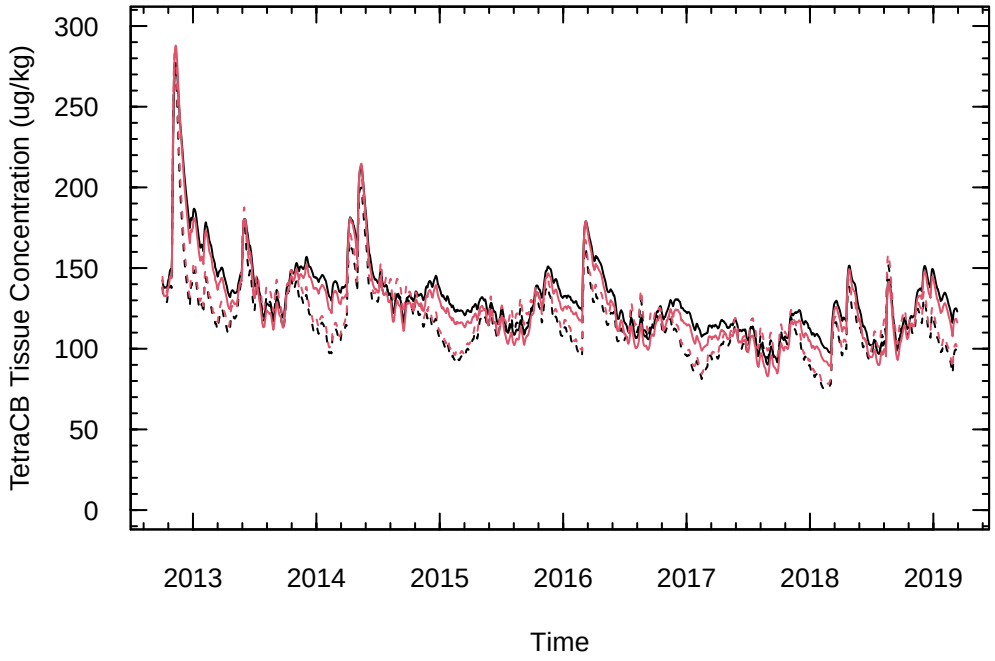




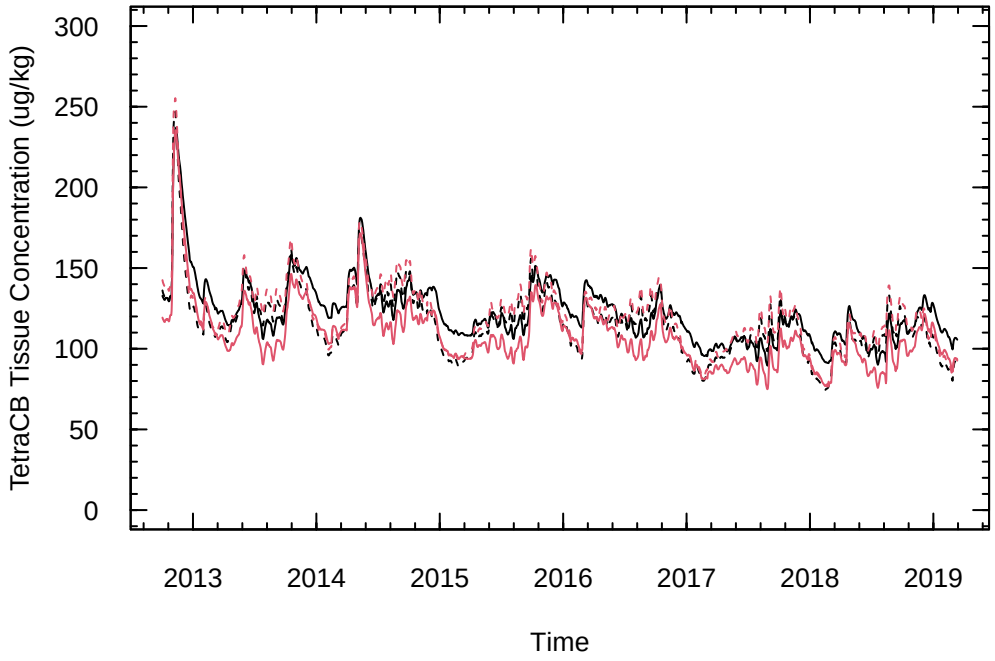
Benthic invert detritivore (North)

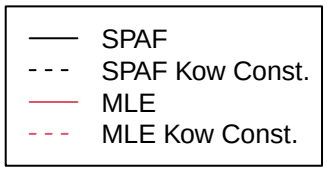


Benthic invert detritivore (Southeast)

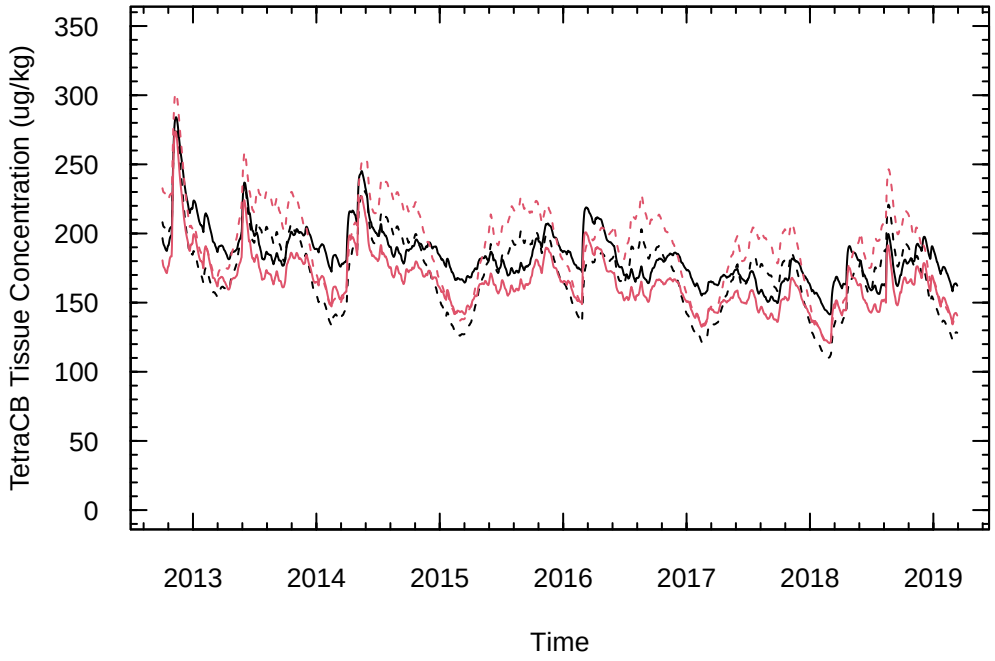


Benthic invert detritivore (Southwest)

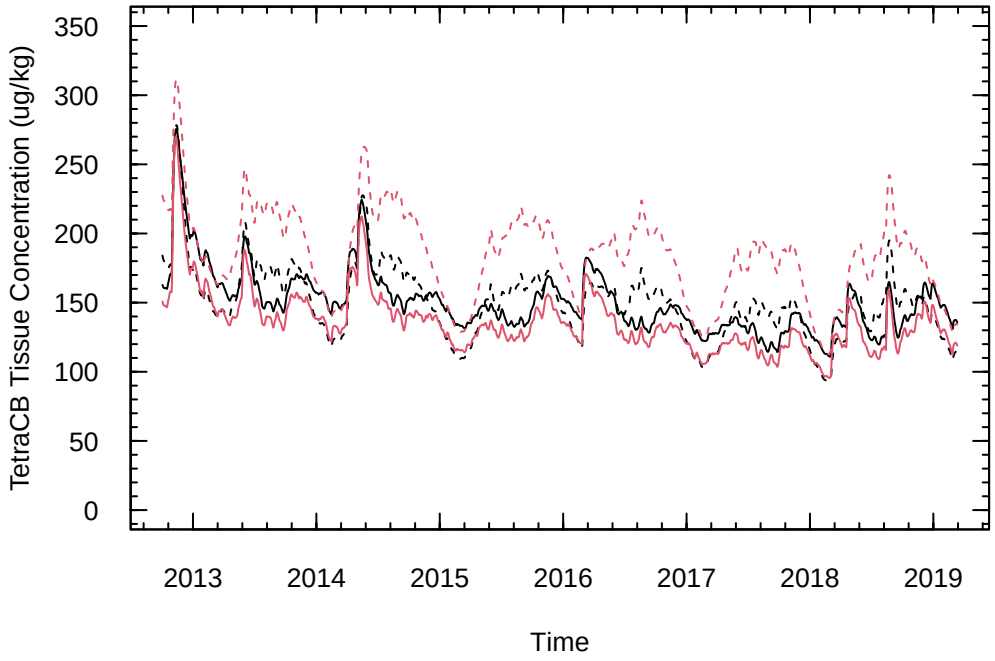




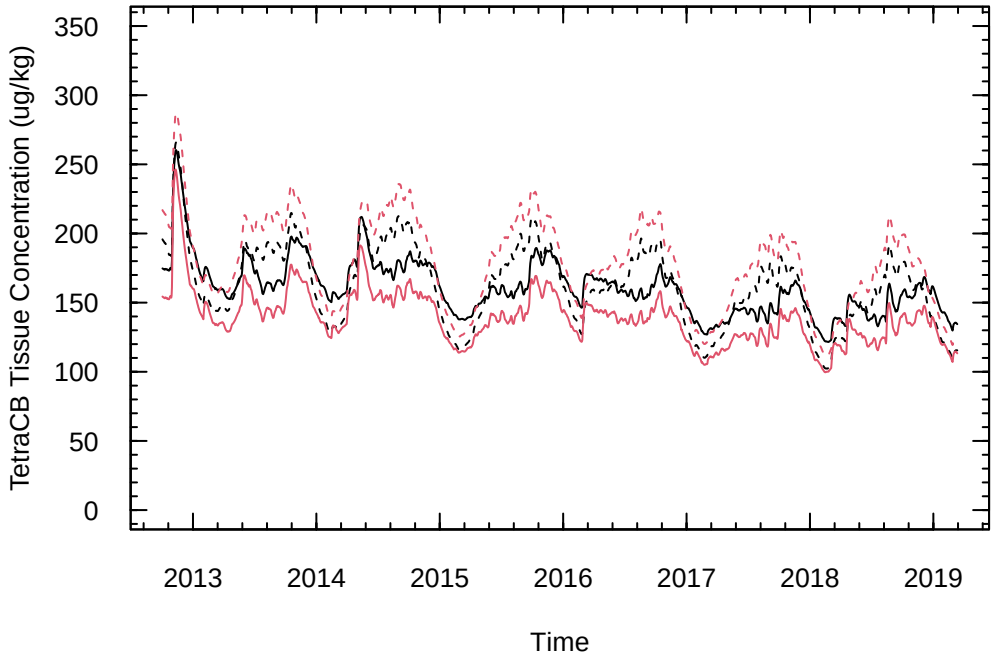
Benthic invert carnivore/omnivore (North)

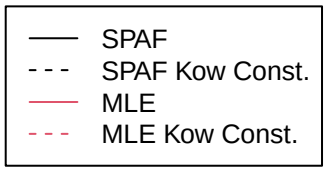


Benthic invert carnivore/omnivore (Southeast)

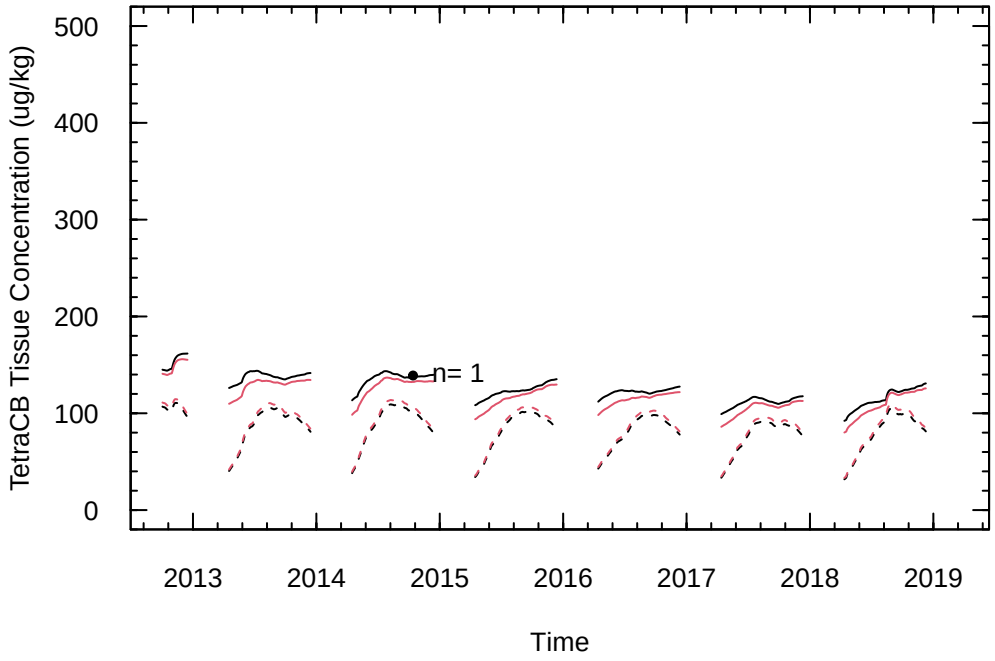


Benthic invert carnivore/omnivore (Southwest)

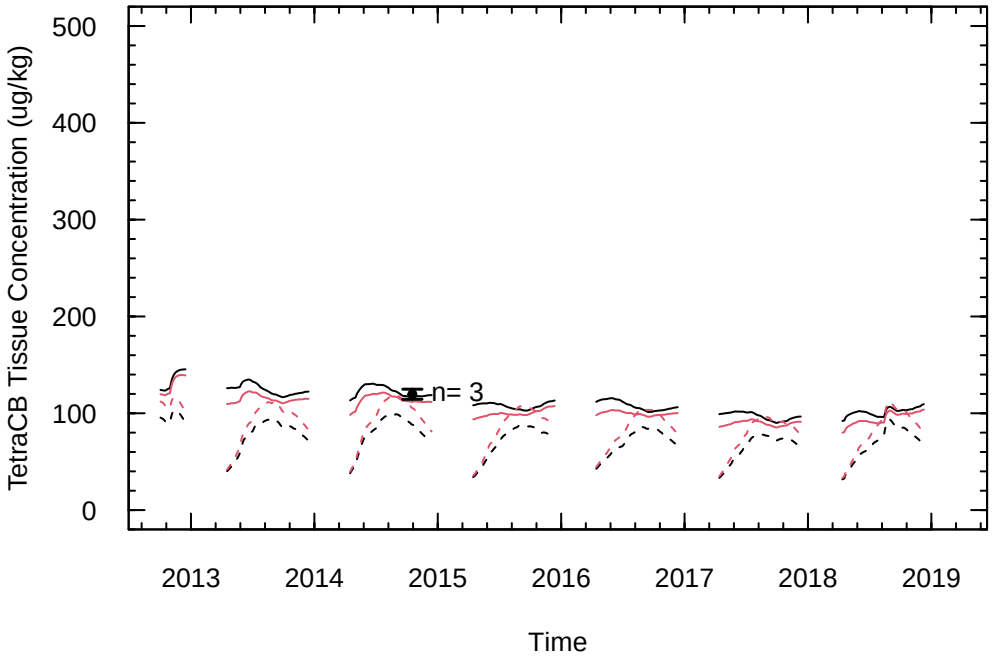




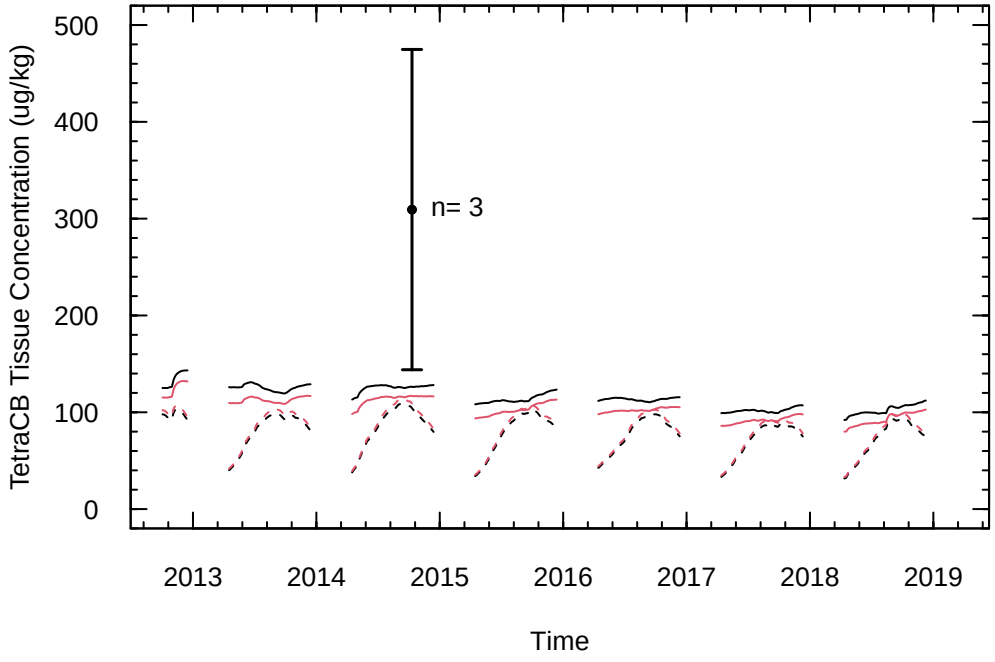
Atlantic Silverside (North)

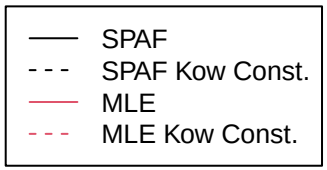


Atlantic Silverside (Southeast)

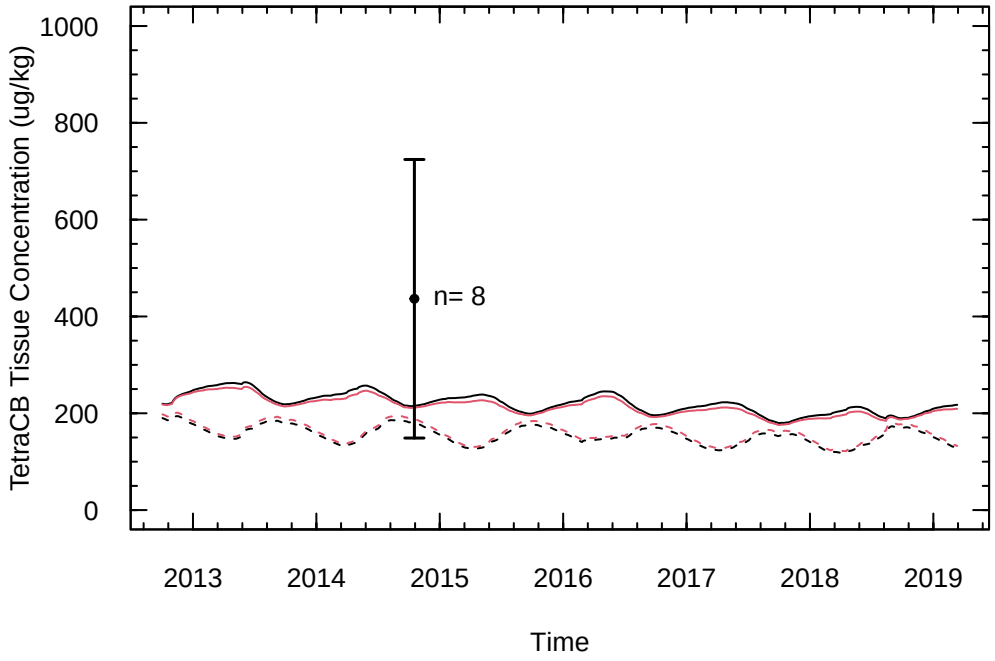


Atlantic Silverside (Southwest)

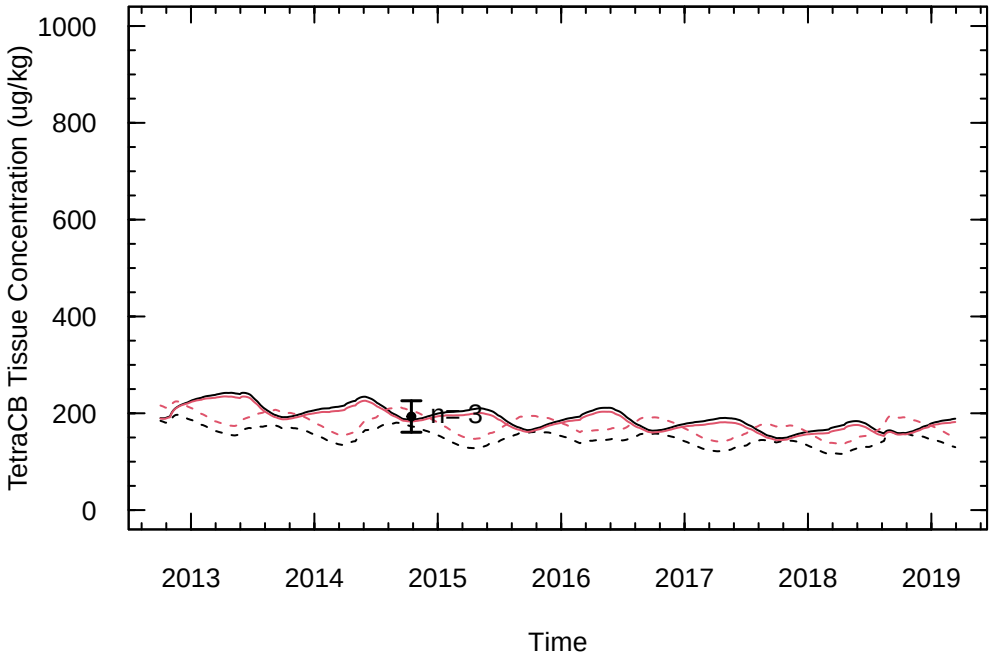




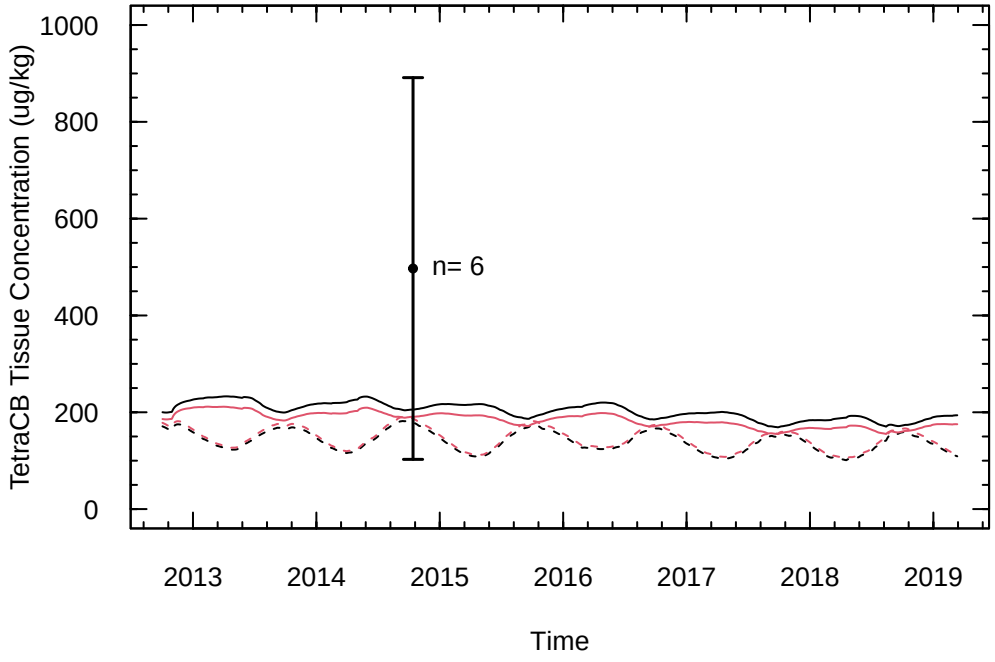
Small forage fish (North)

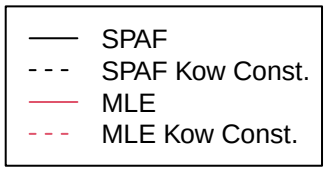


Small forage fish (Southeast)

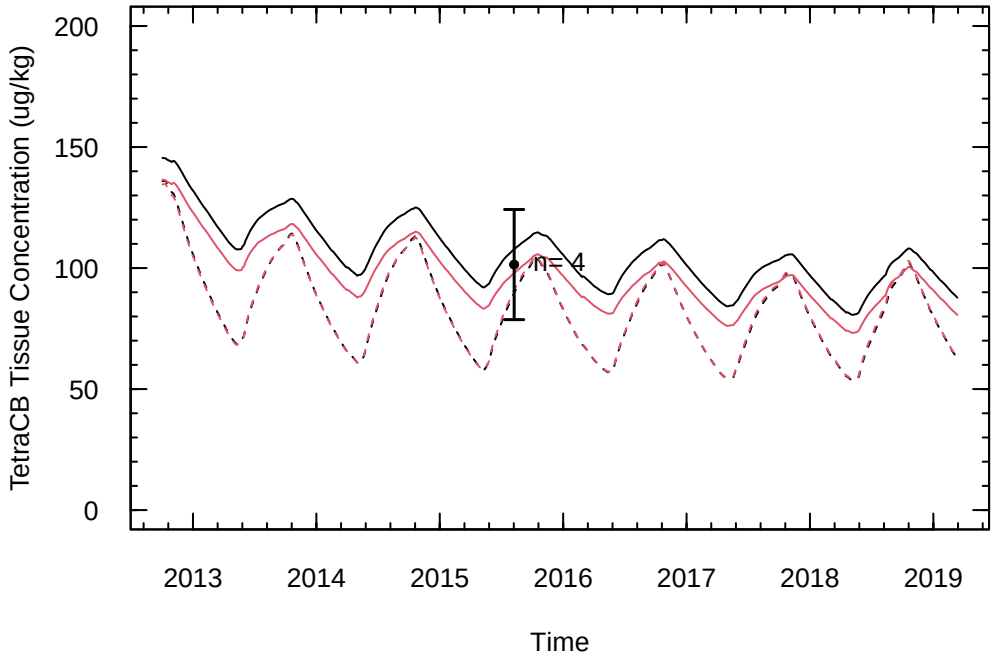


Small forage fish (Southwest)

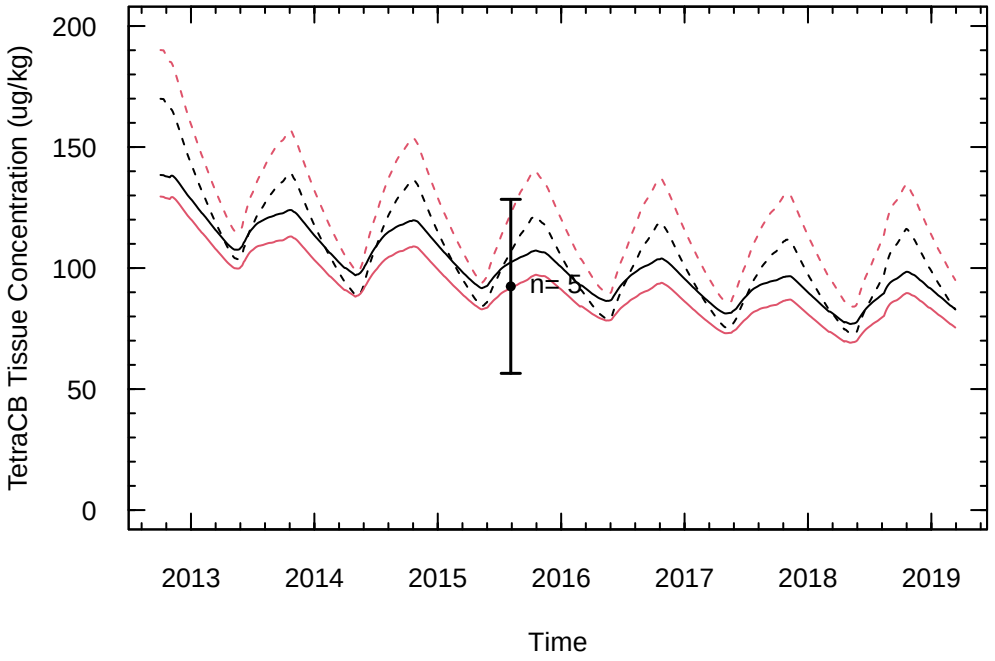




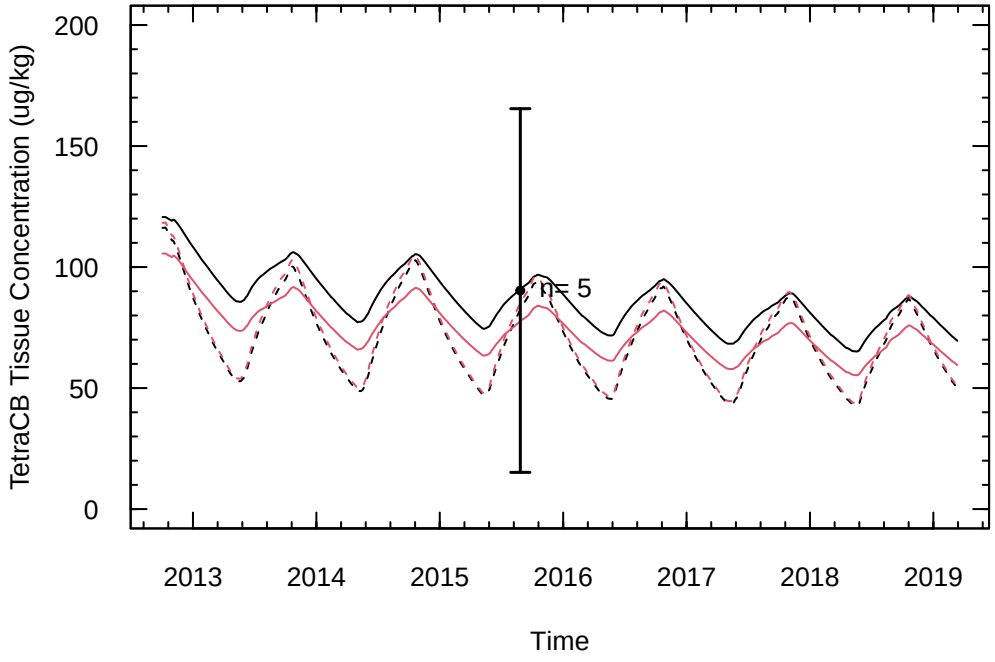
Small American eel (North)

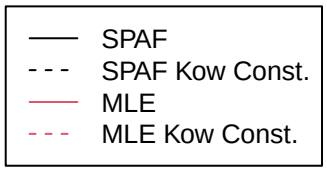


Small American eel (Southeast)

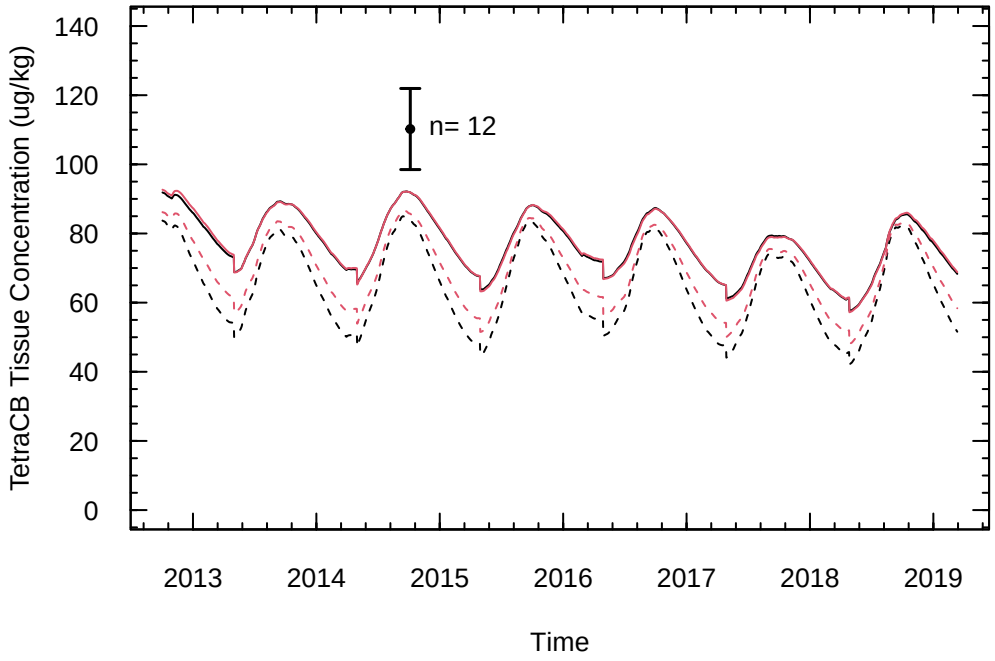


Small American eel (Southwest)

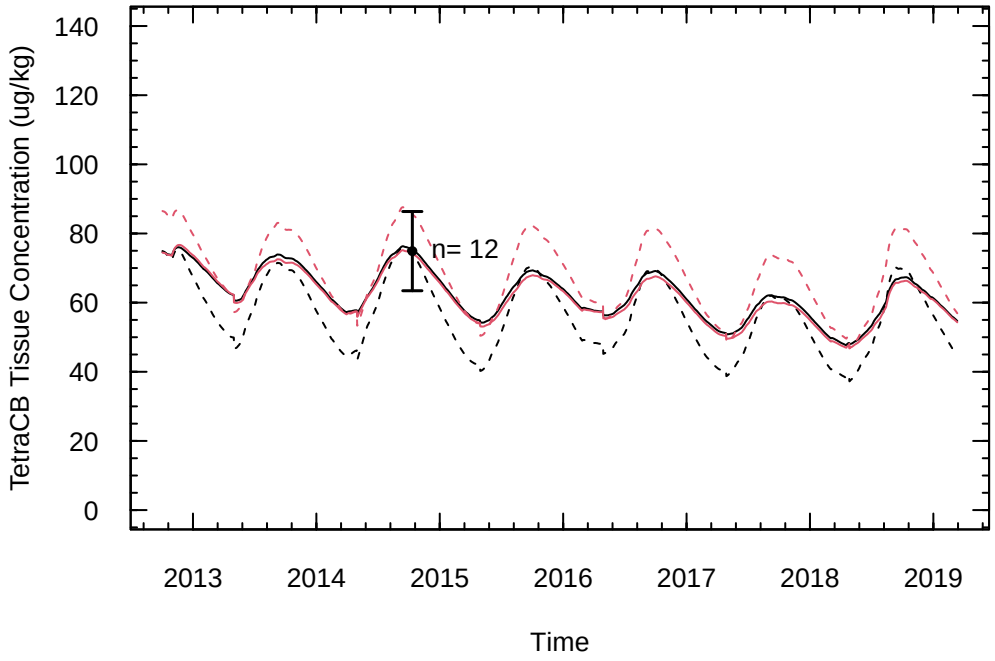




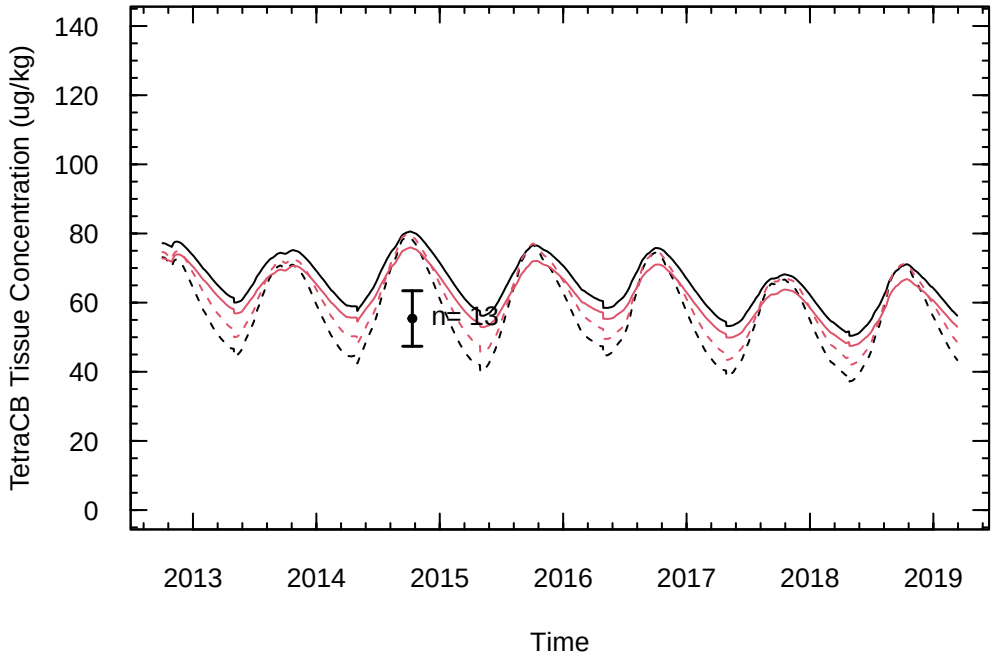
Blue crab (North)

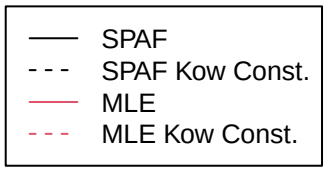


Blue crab (Southeast)

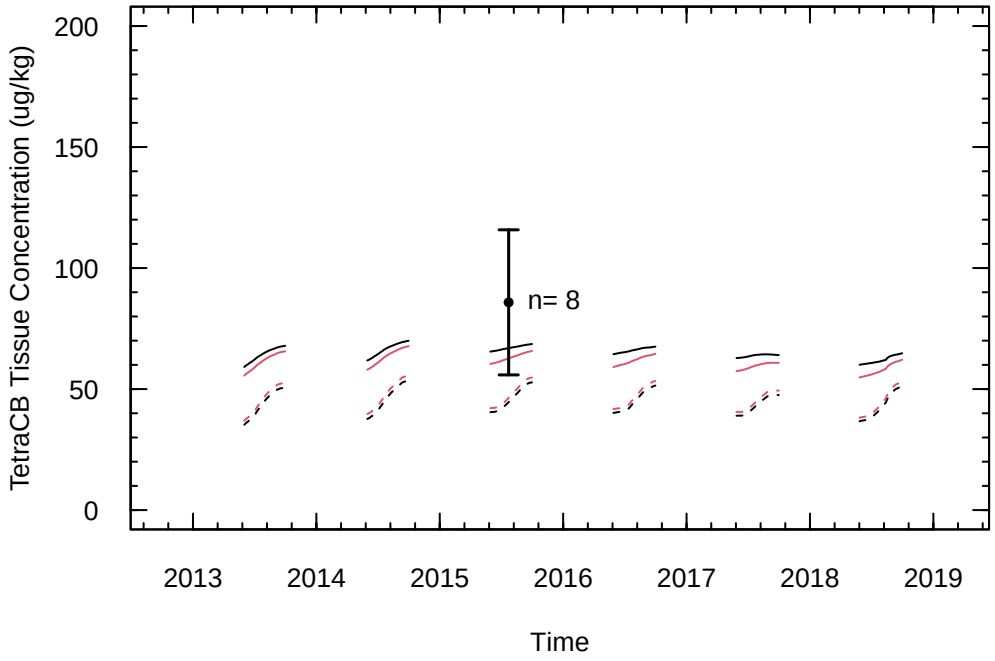


Blue crab (Southwest)

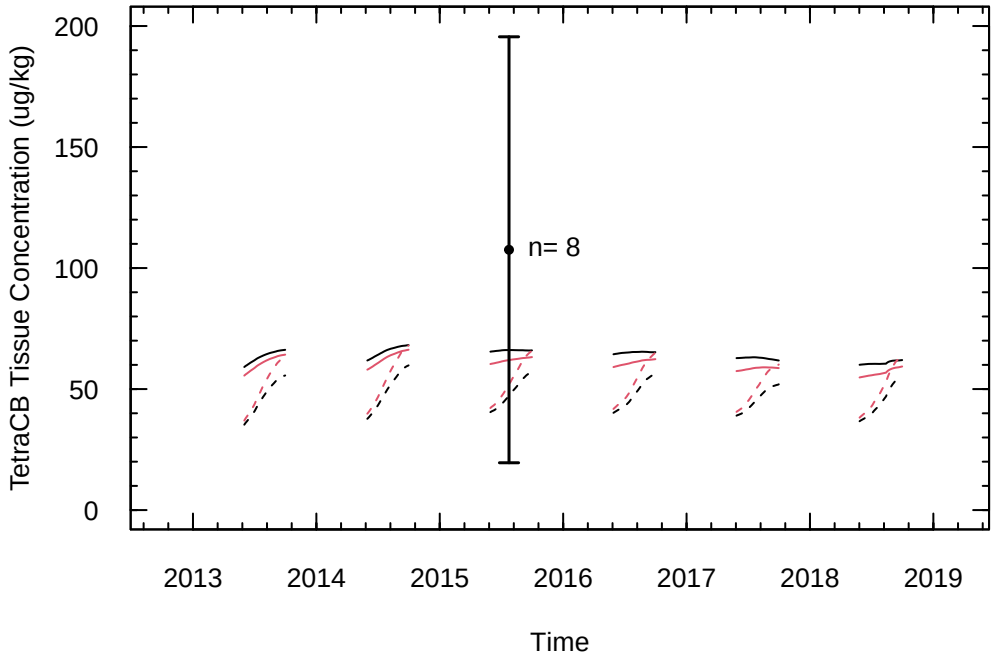




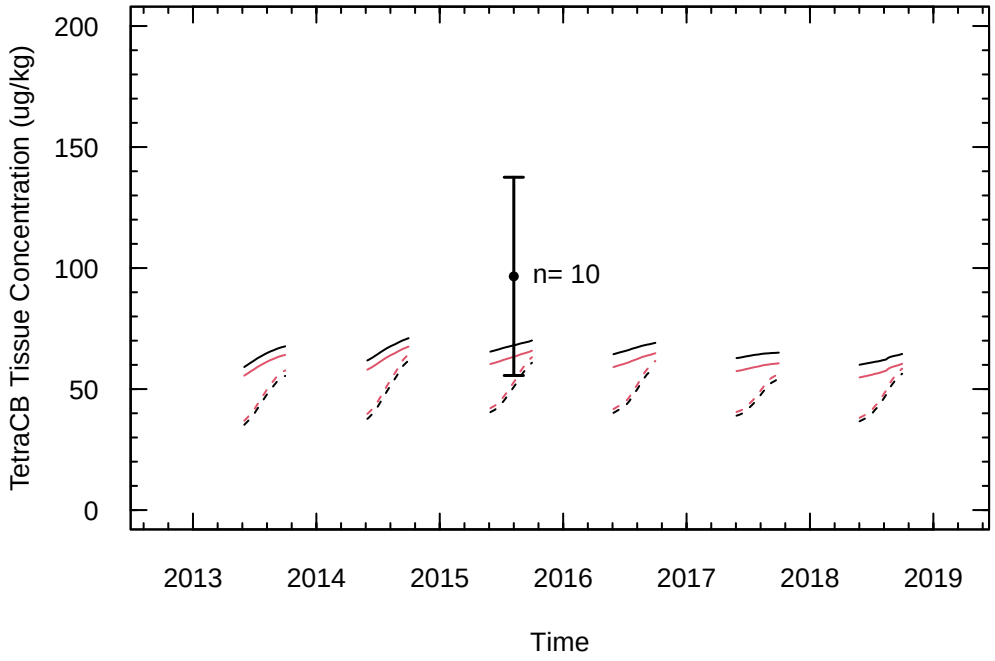
Summer Flounder (North)

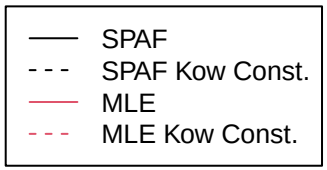


Summer Flounder (Southeast)

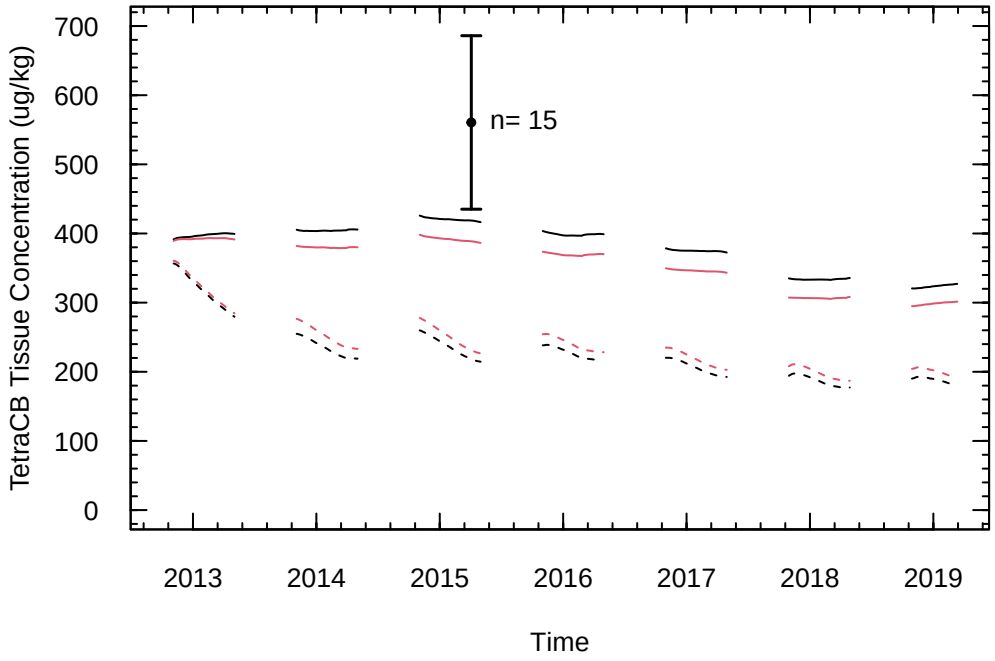


Summer Flounder (Southwest)

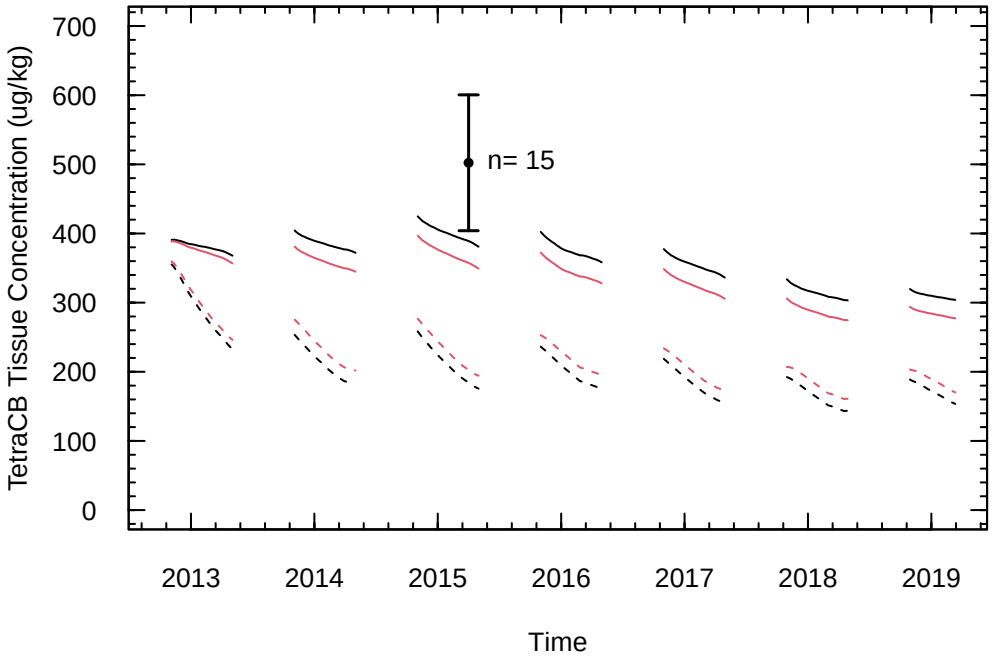




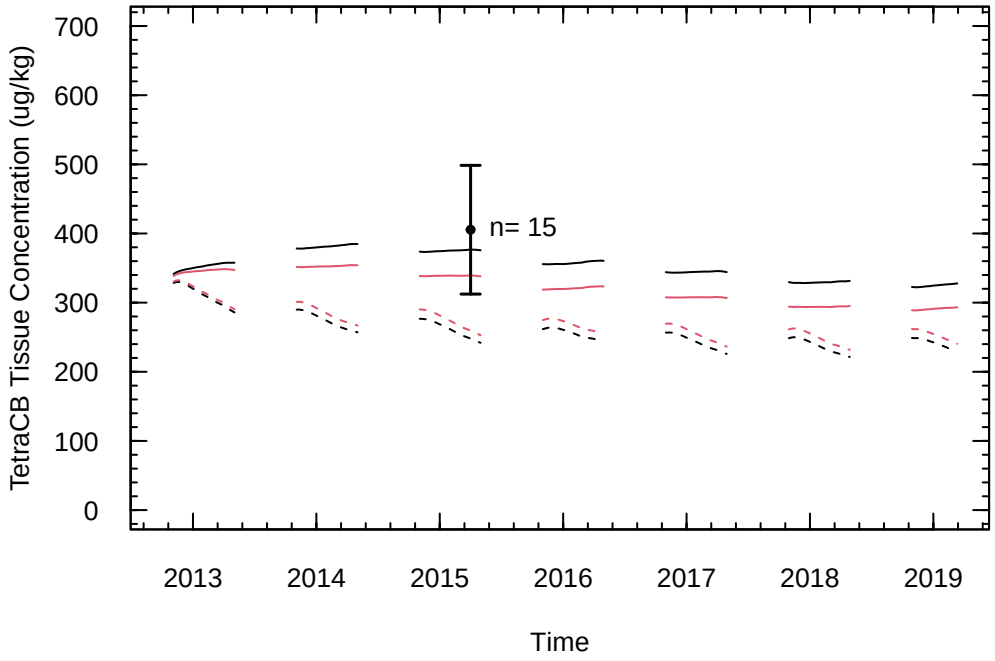
White perch (North)

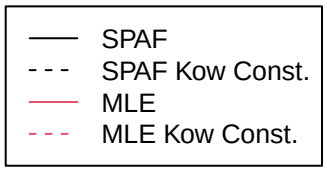


White perch (Southeast)

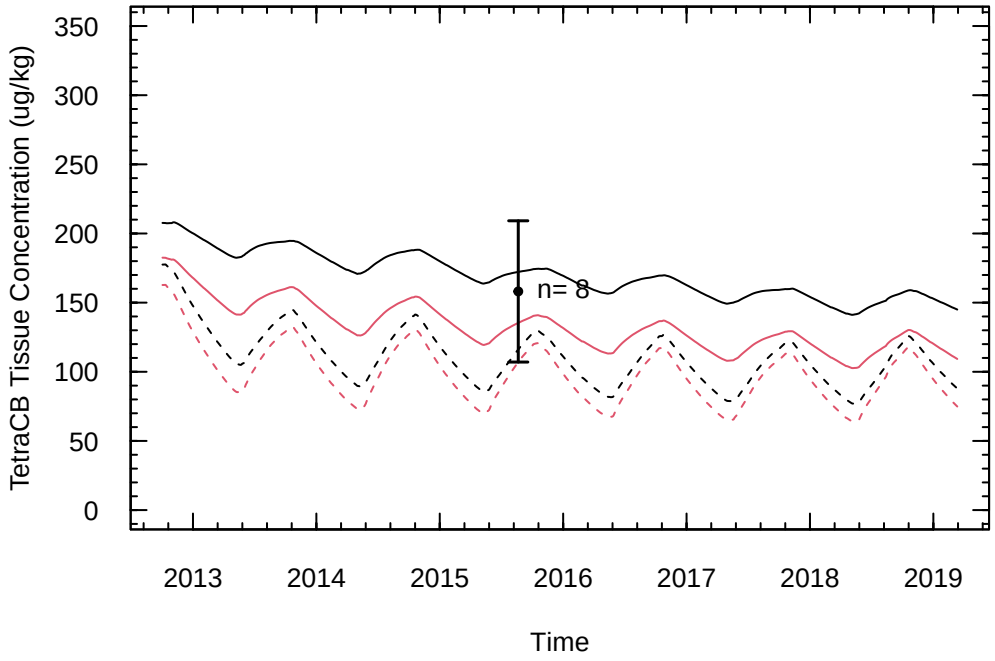


White perch (Southwest)

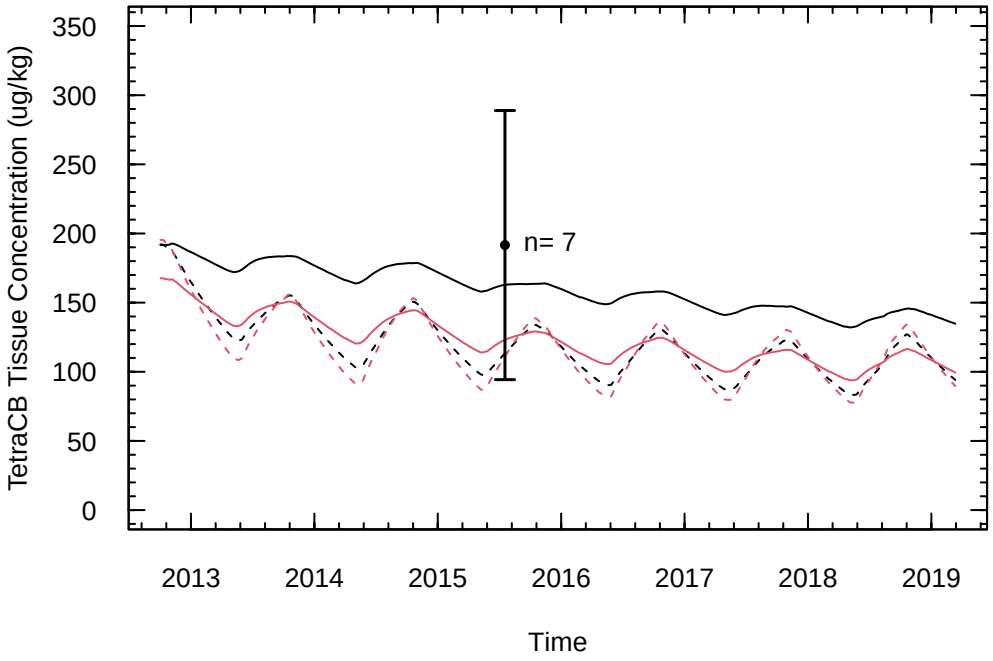




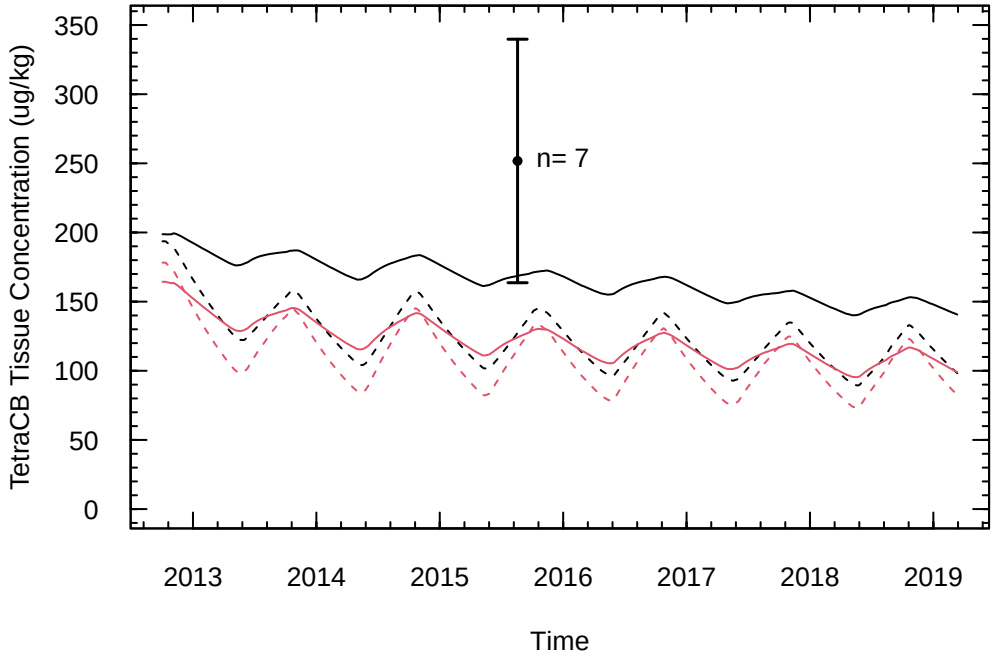
Large American eel (North)

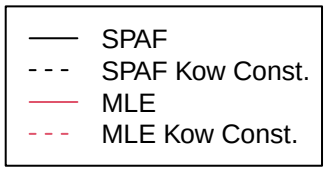


Large American eel (Southeast)

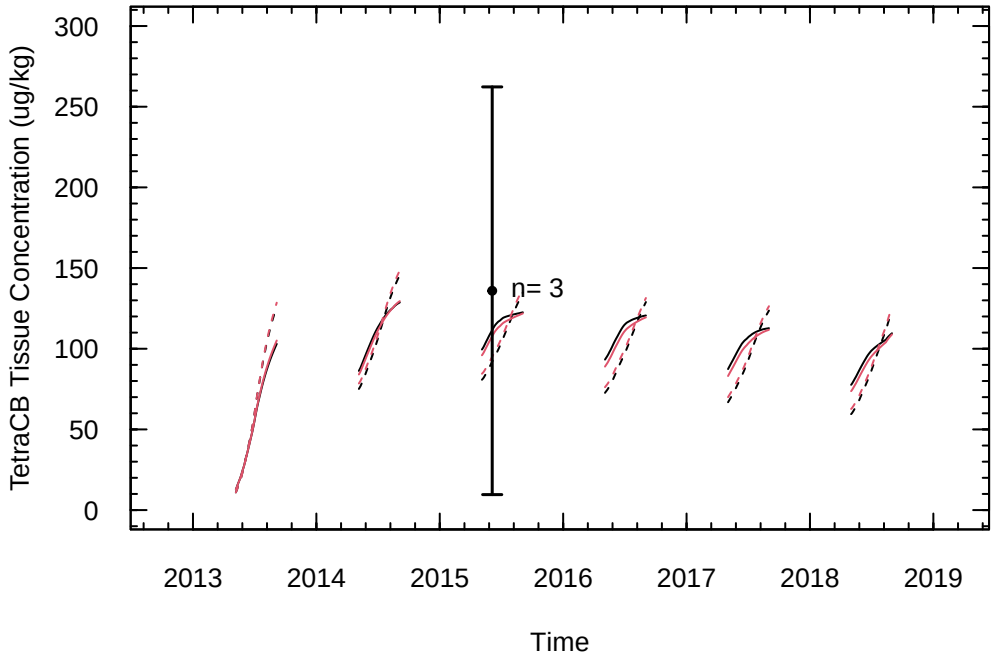


Large American eel (Southwest)

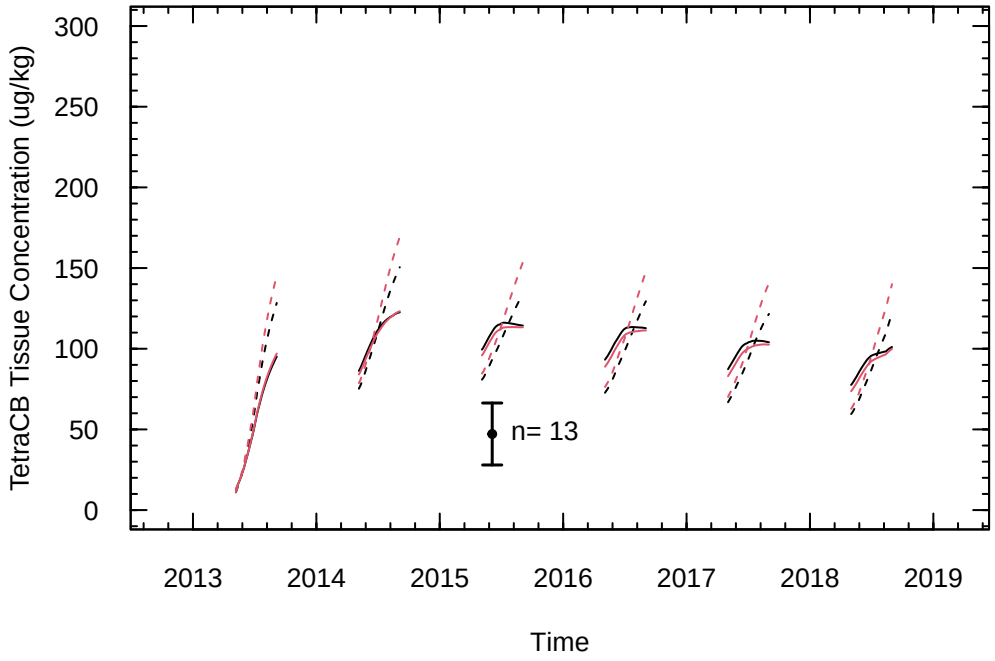




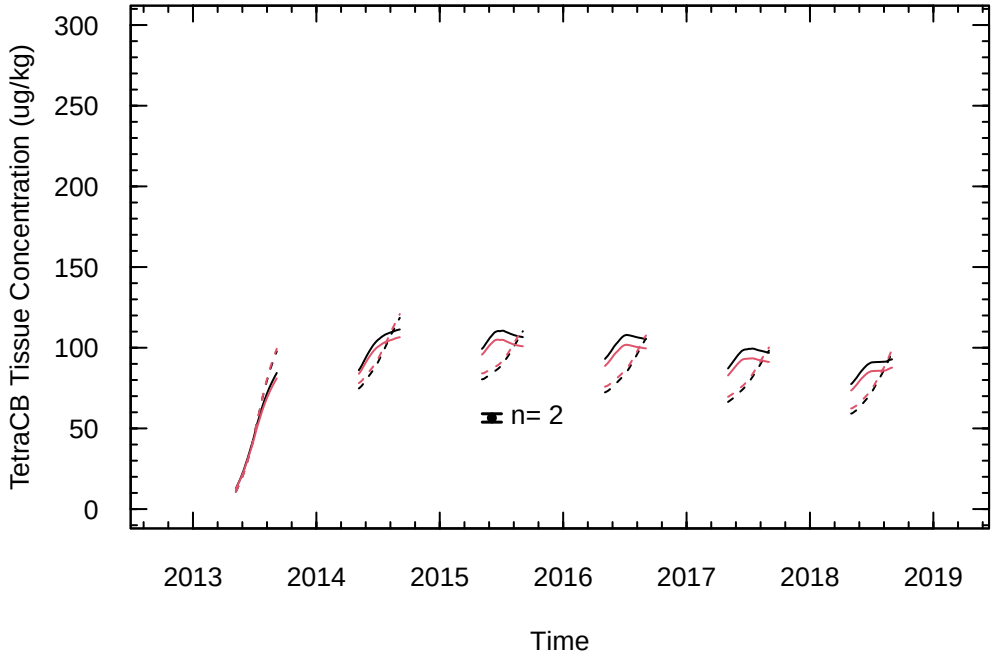
Bluefish (North)

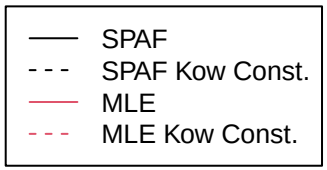


Bluefish (Southeast)

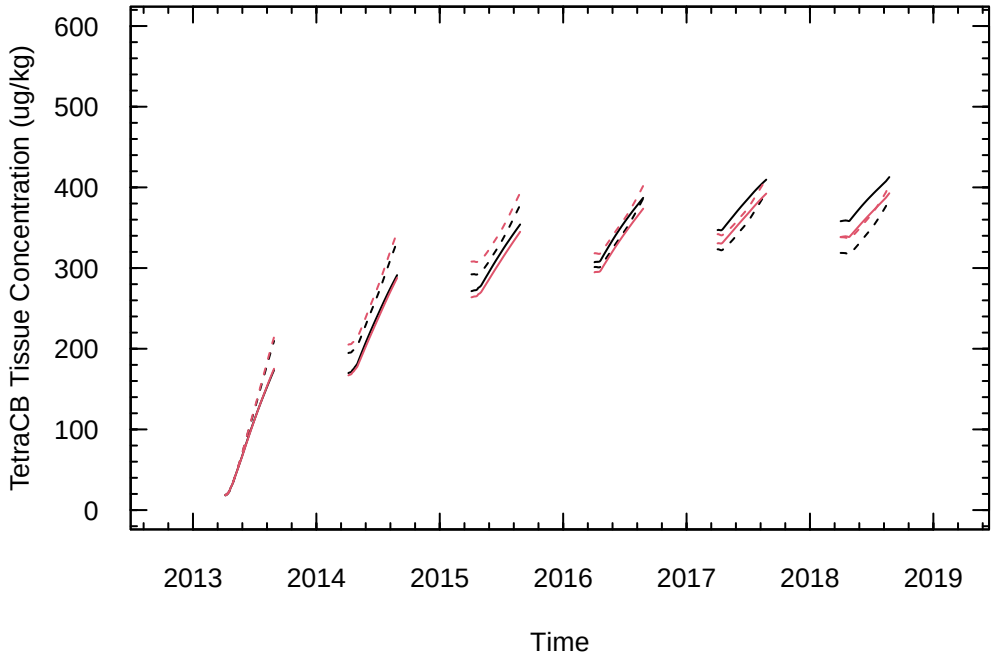


Bluefish (Southwest)

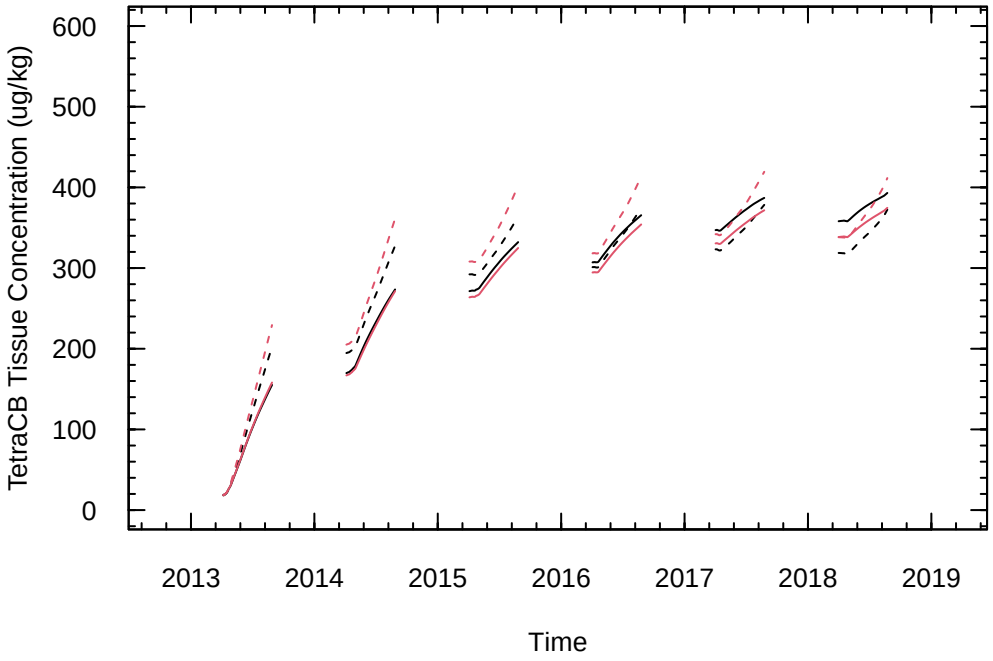




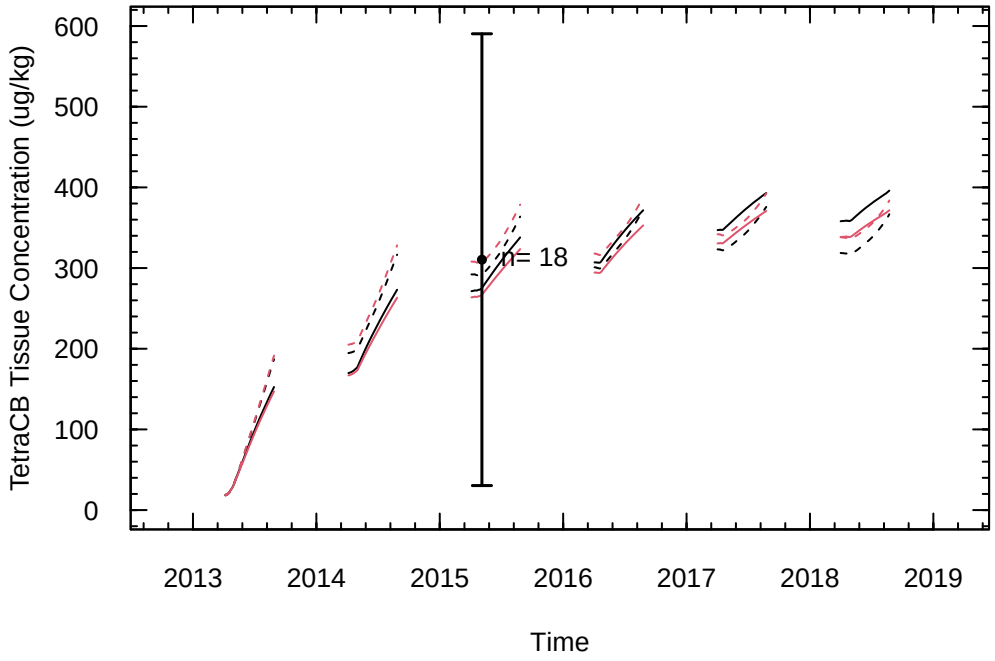
Striped Bass (North)

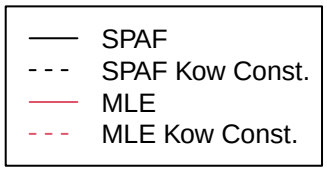


Striped Bass (Southeast)

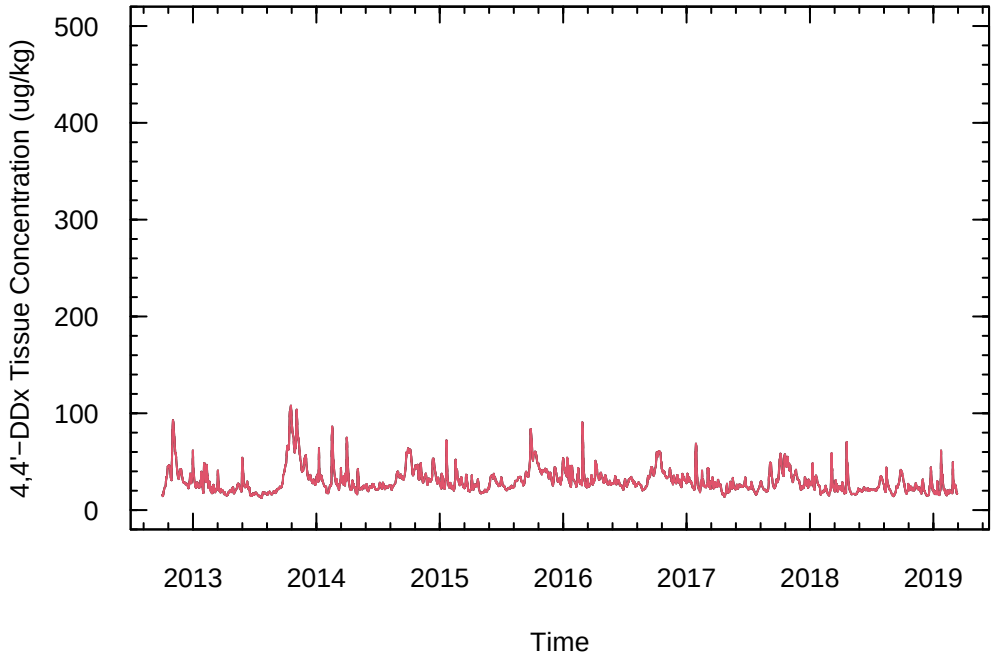


Striped Bass (Southwest)

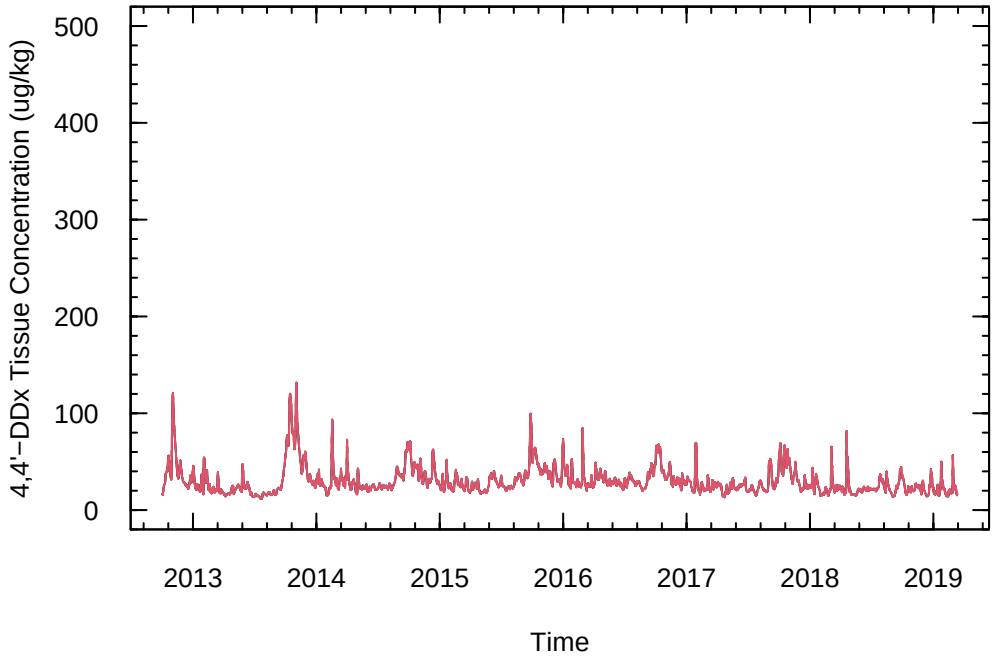




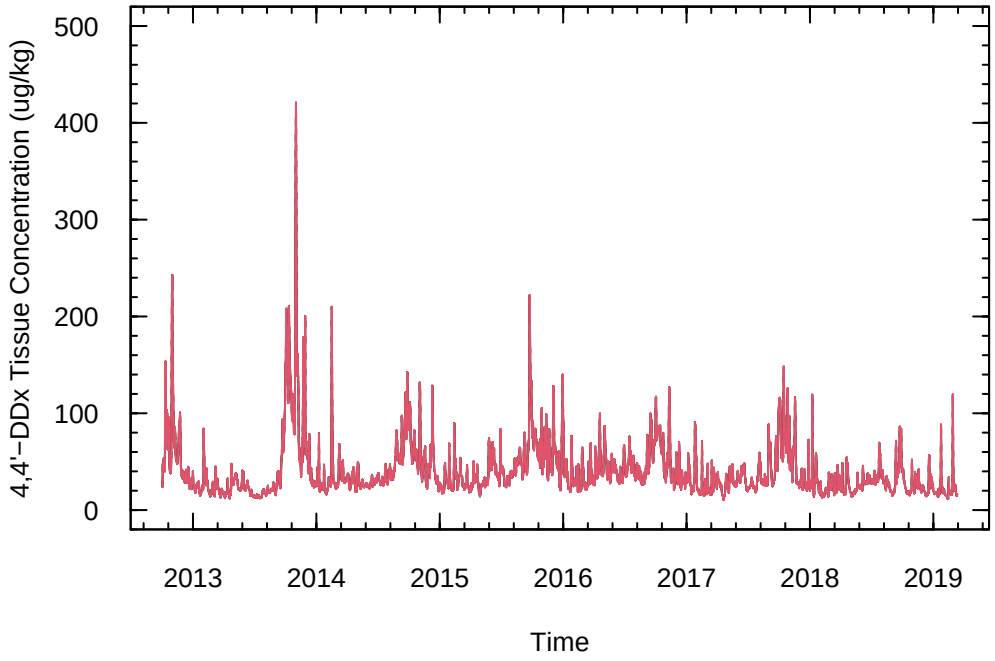
Phytoplankton (North)

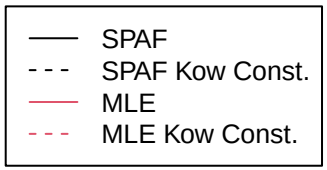


Phytoplankton (Southeast)

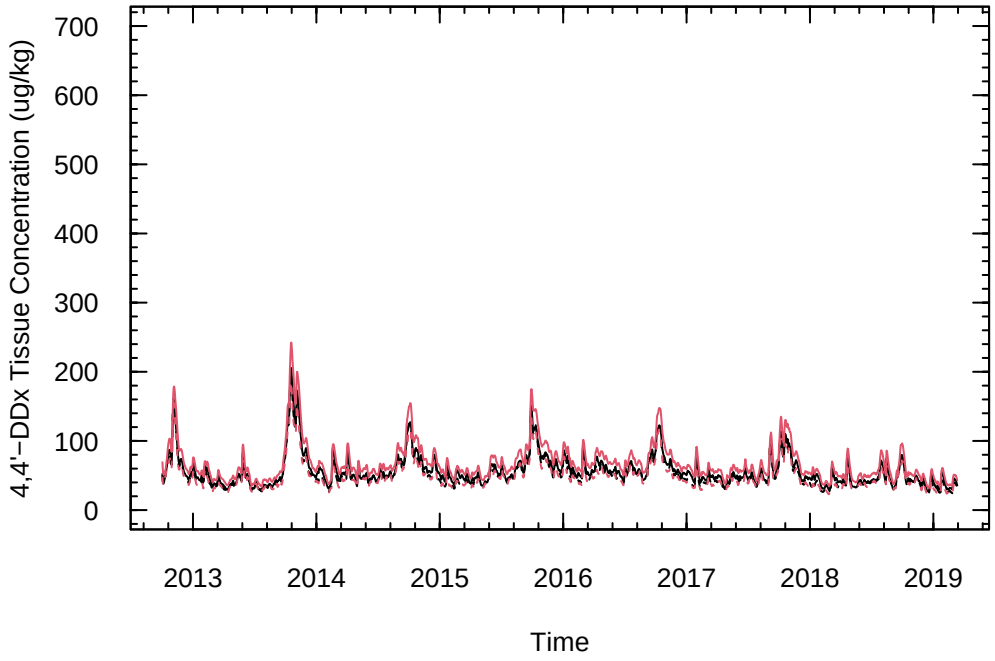


Phytoplankton (Southwest)

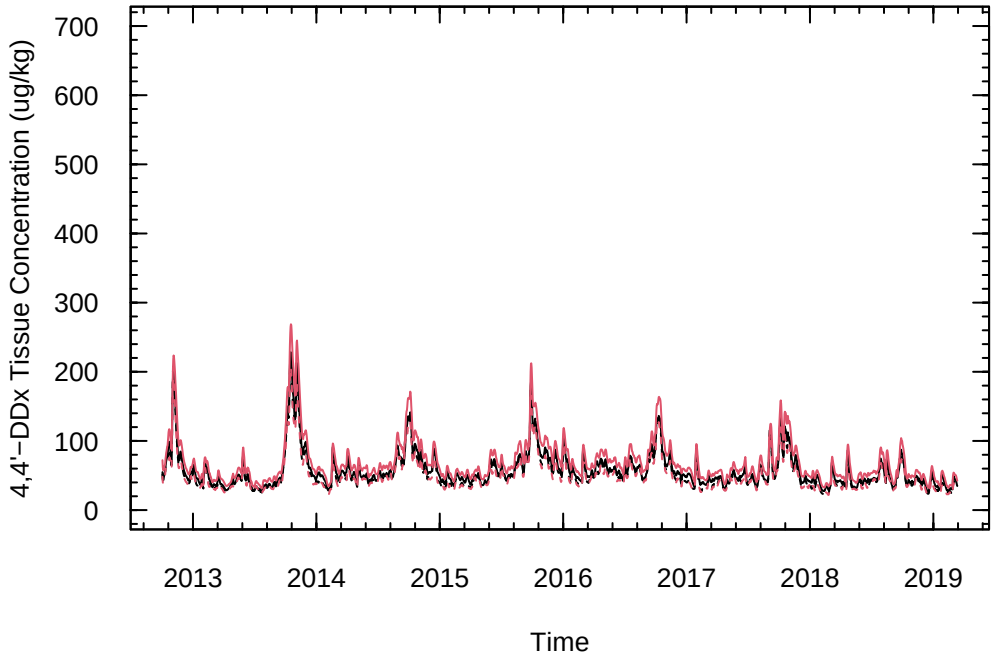




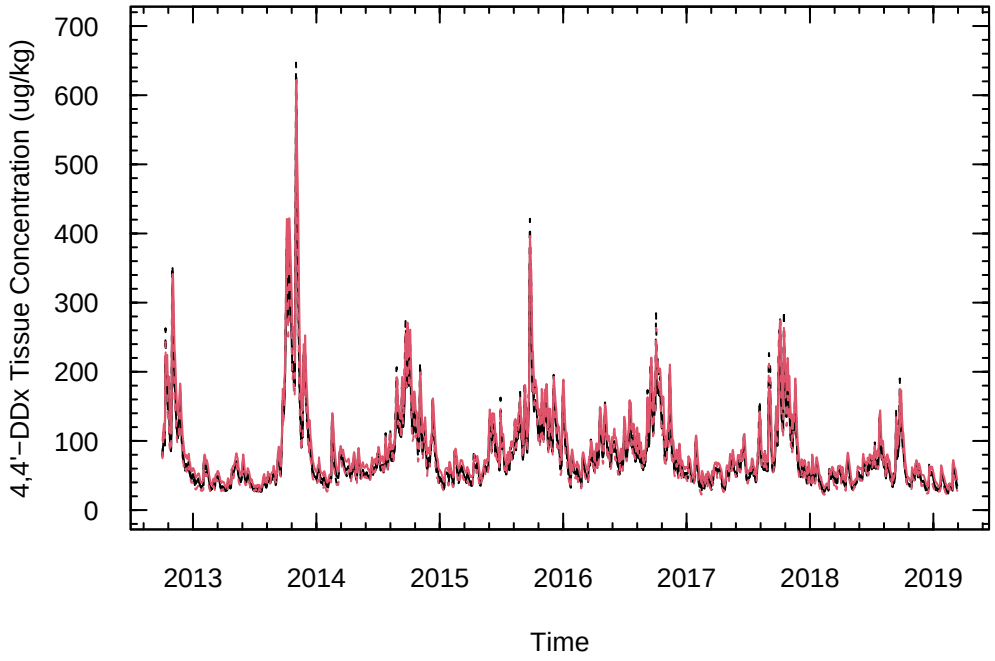
Zooplankton (North)

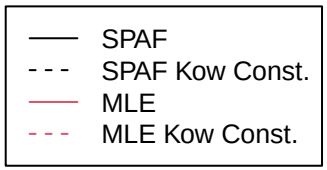


Zooplankton (Southeast)

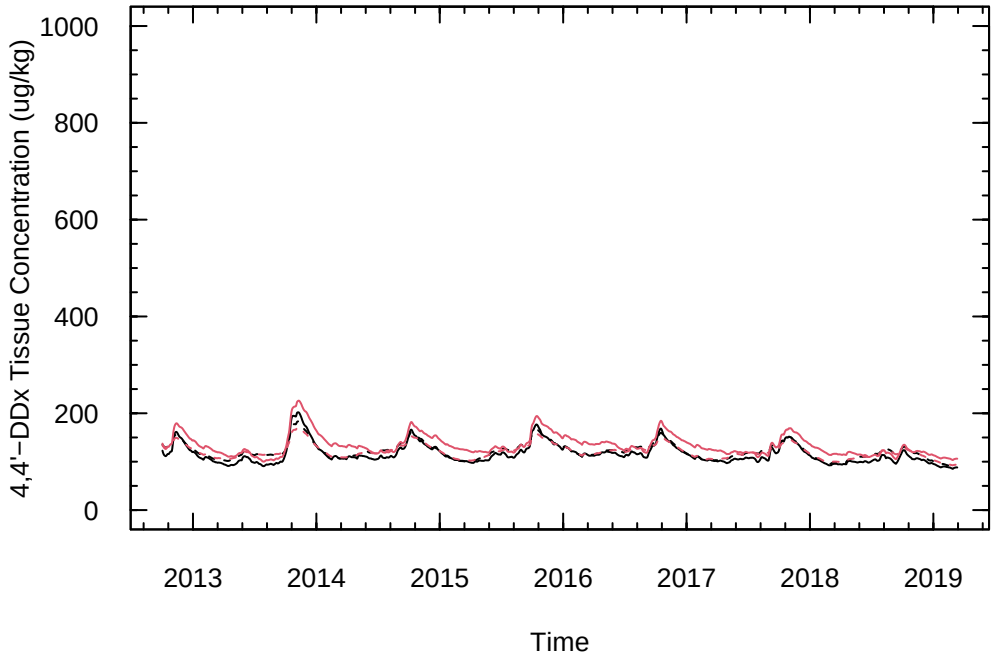


Zooplankton (Southwest)

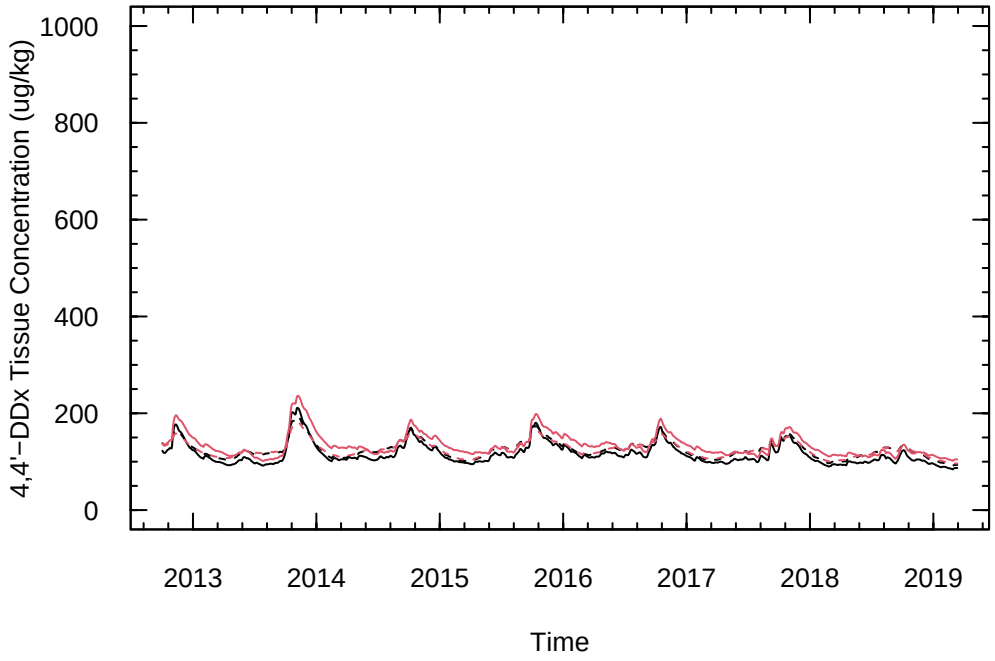




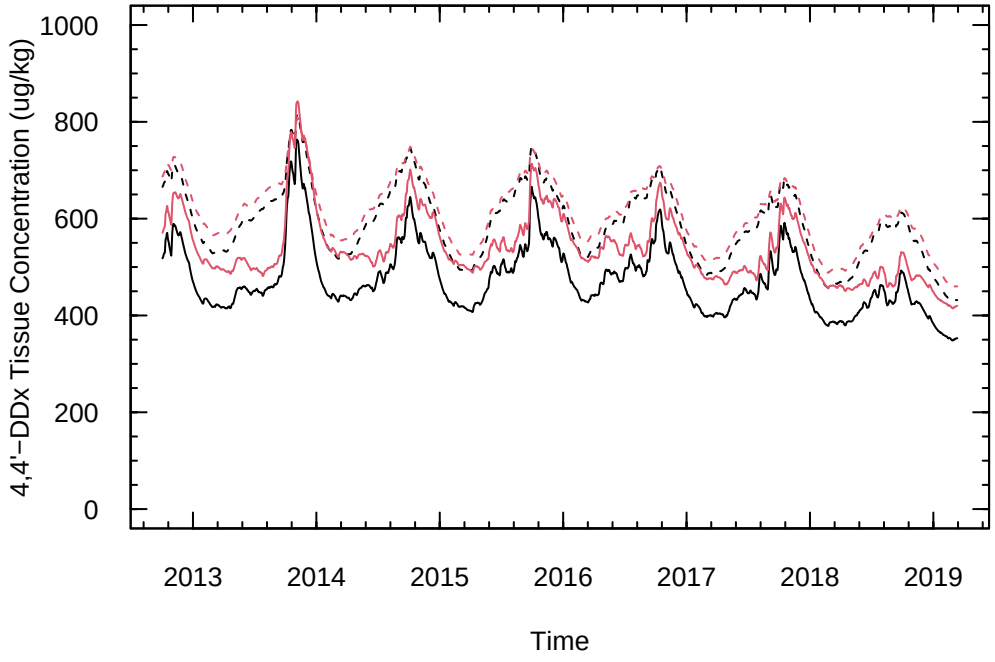
Benthic invert deposit feeder (North)

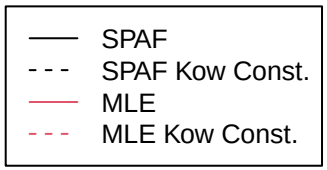


Benthic invert deposit feeder (Southeast)

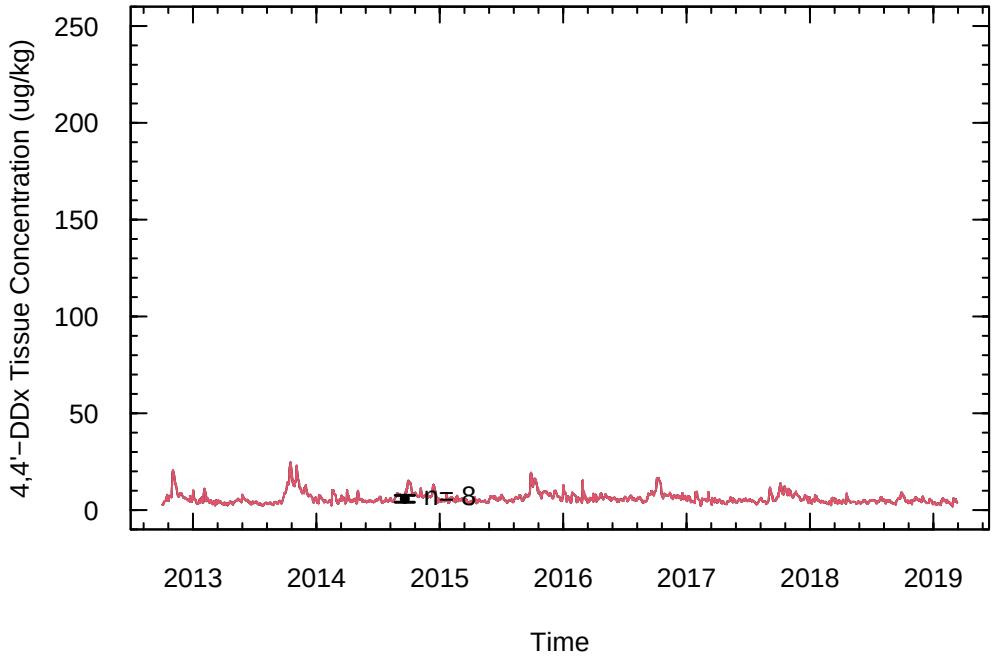


Benthic invert deposit feeder (Southwest)

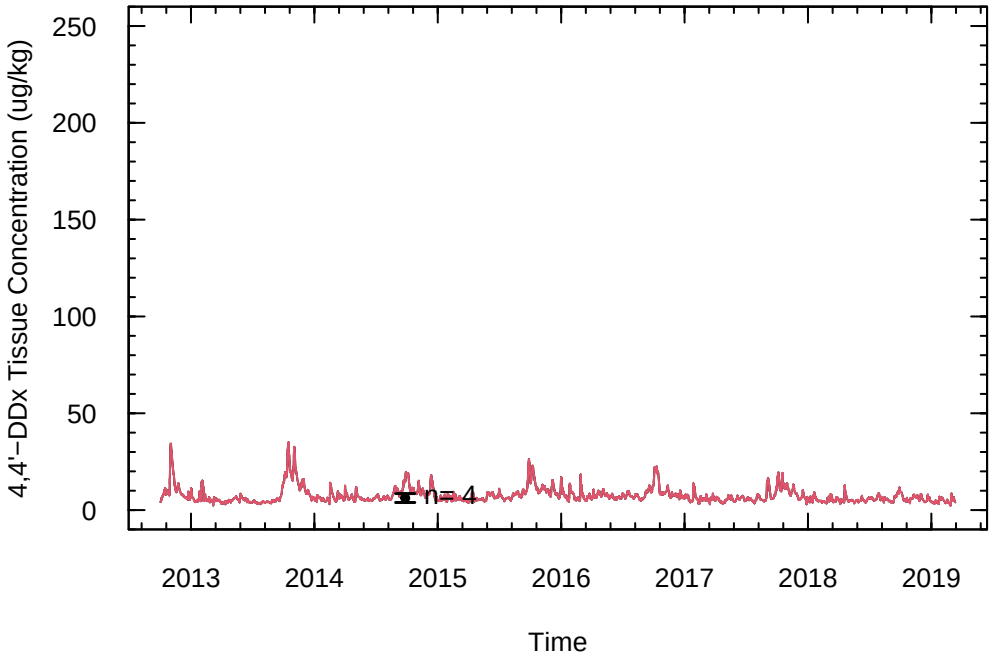




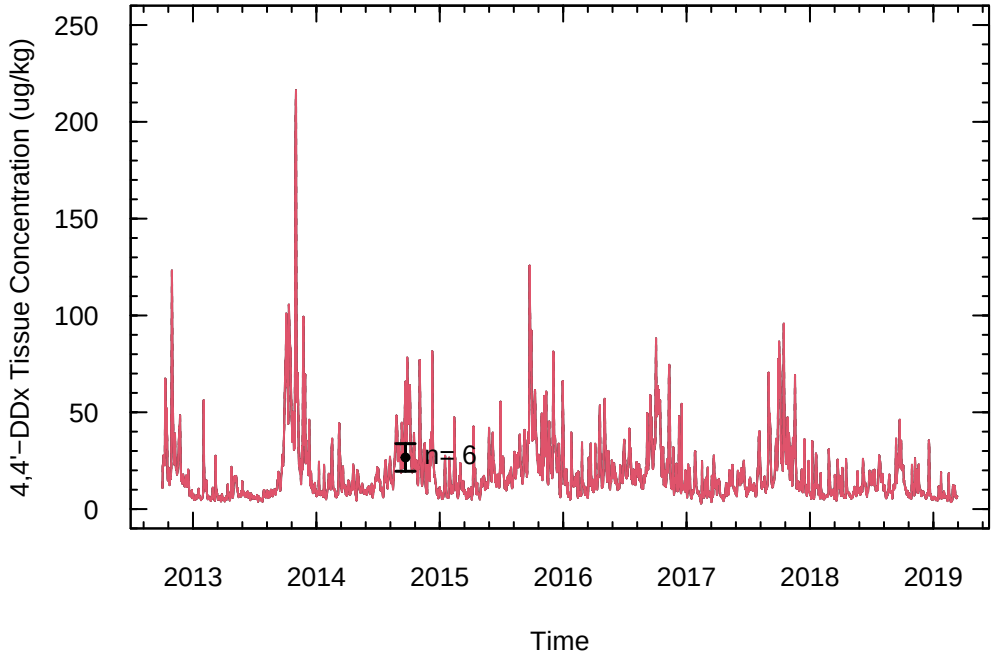
Benthic invert filter feeder (North)

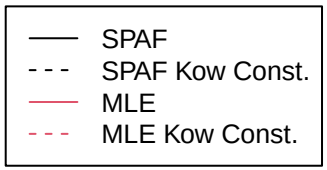


Benthic invert filter feeder (Southeast)

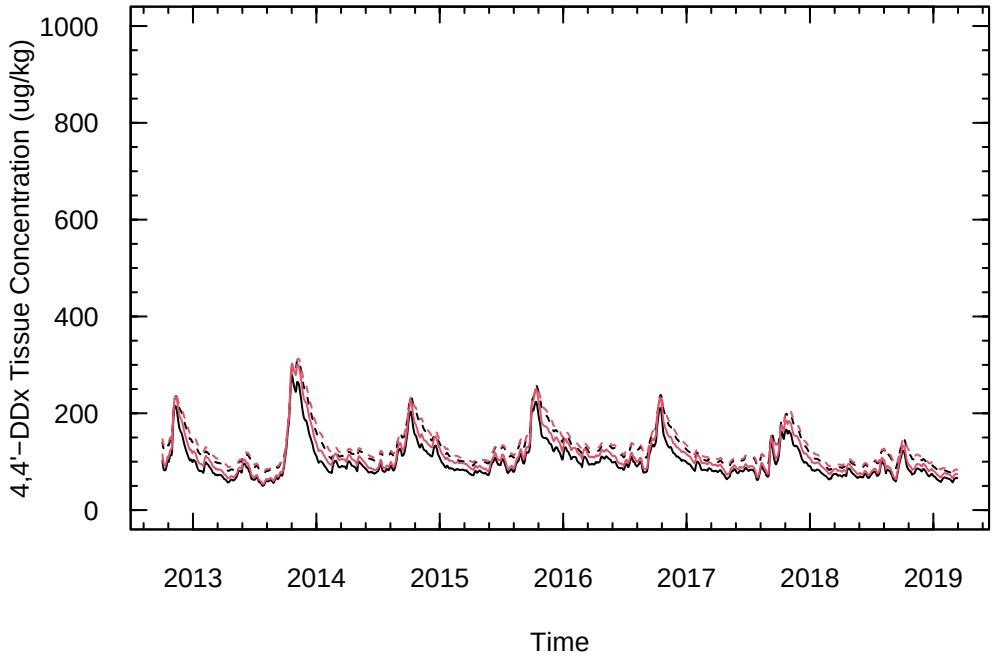


Benthic invert filter feeder (Southwest)

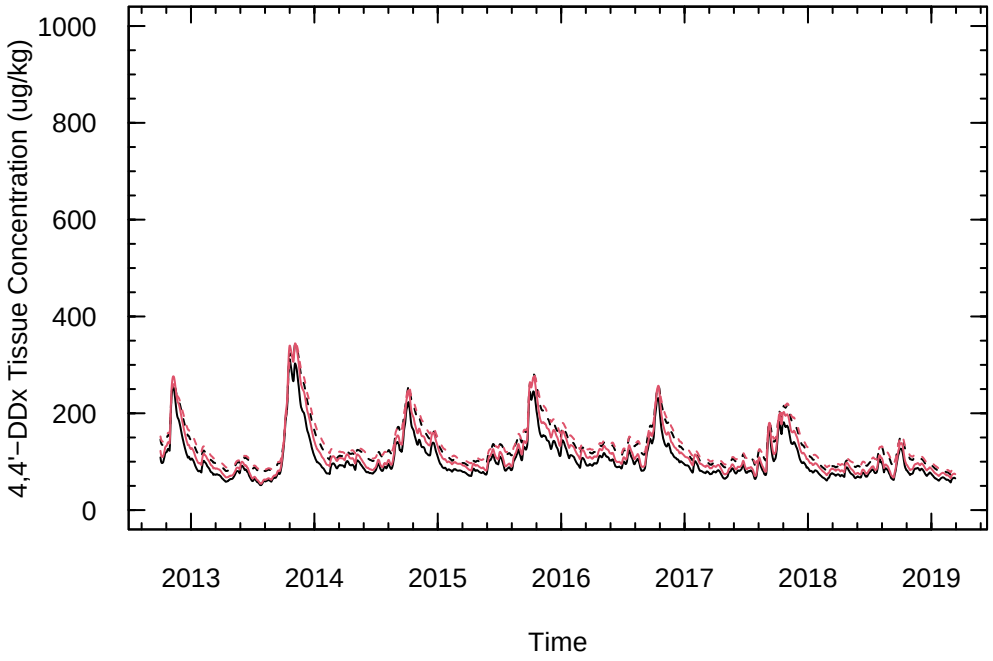




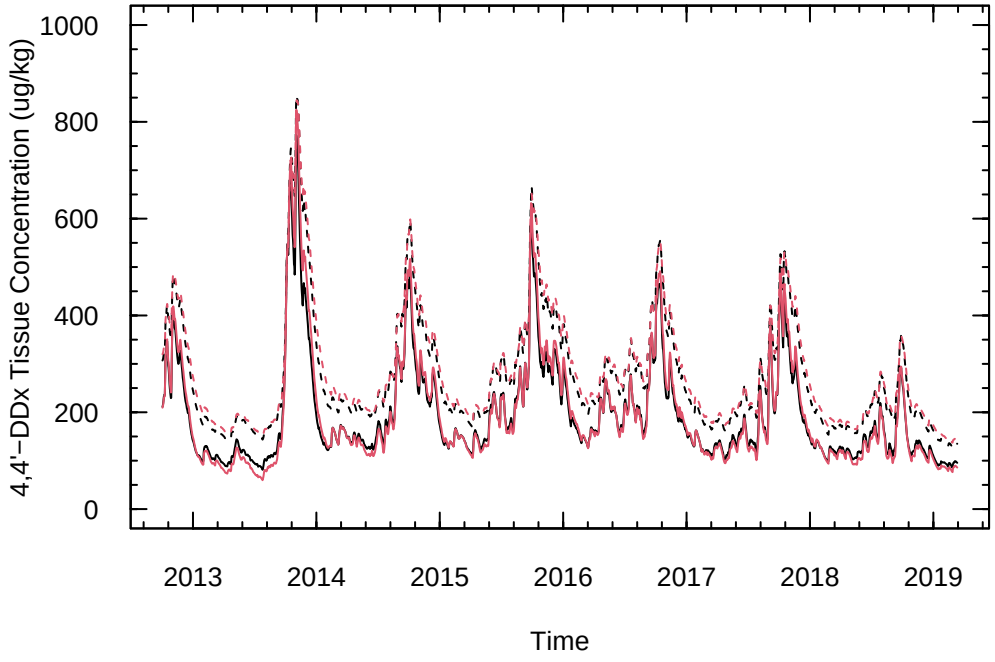
Benthic invert detritivore (North)

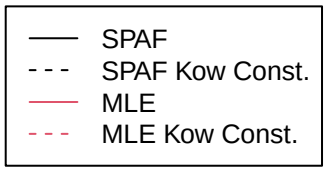


Benthic invert detritivore (Southeast)

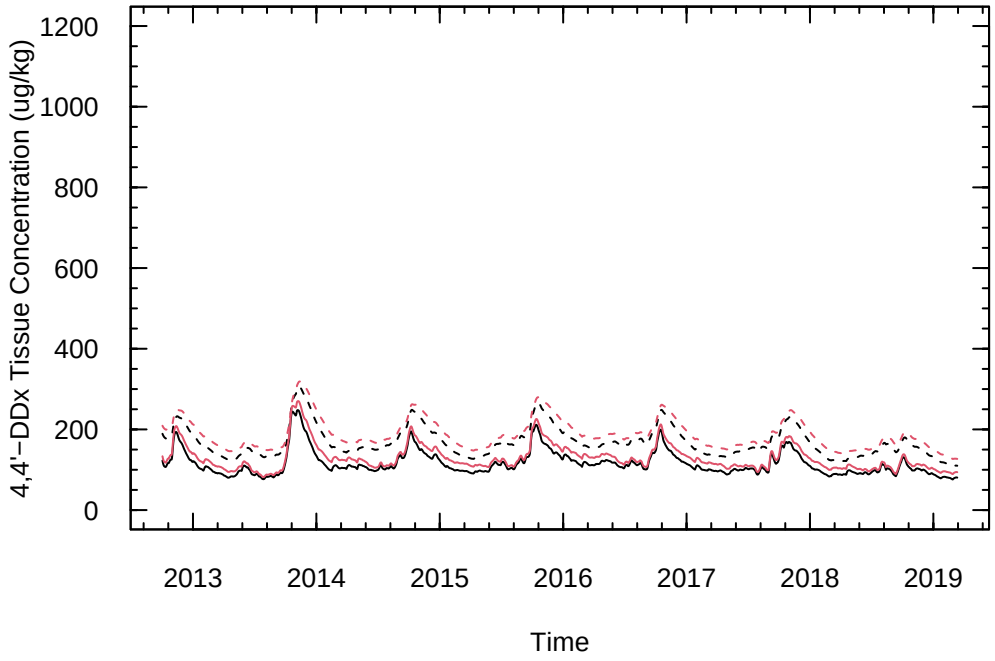


Benthic invert detritivore (Southwest)

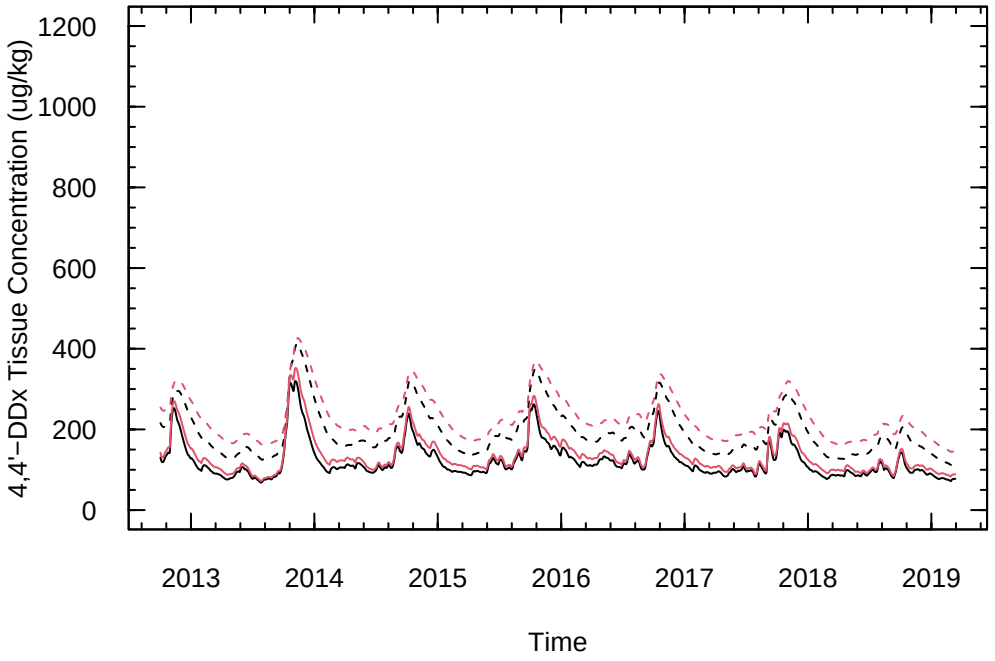




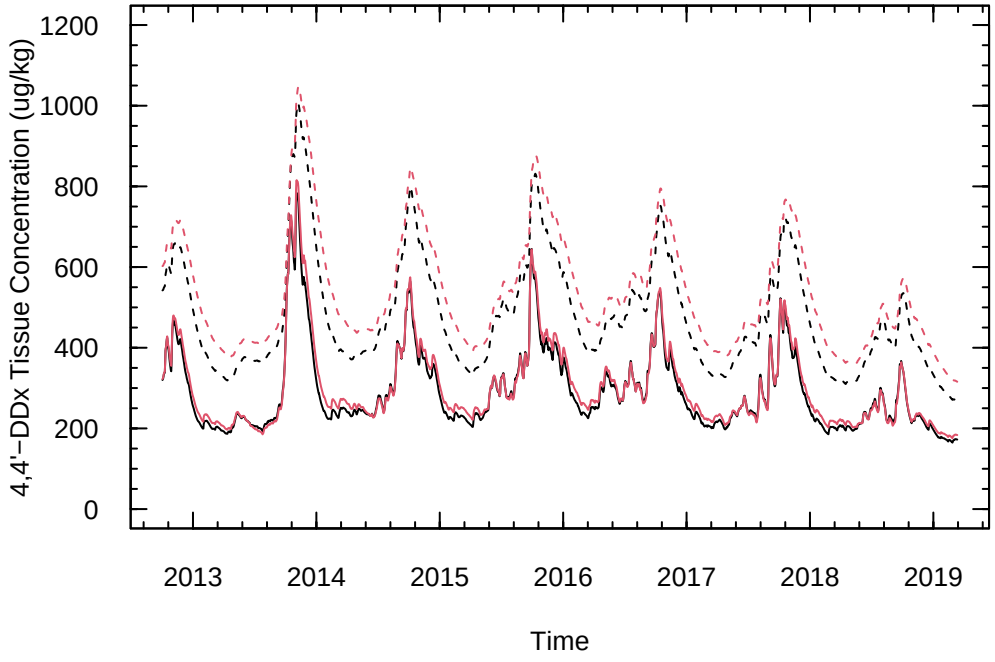
Benthic invert carnivore/omnivore (North)

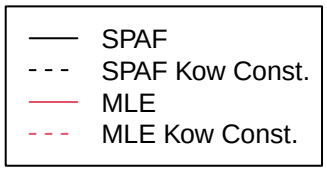


Benthic invert carnivore/omnivore (Southeast)

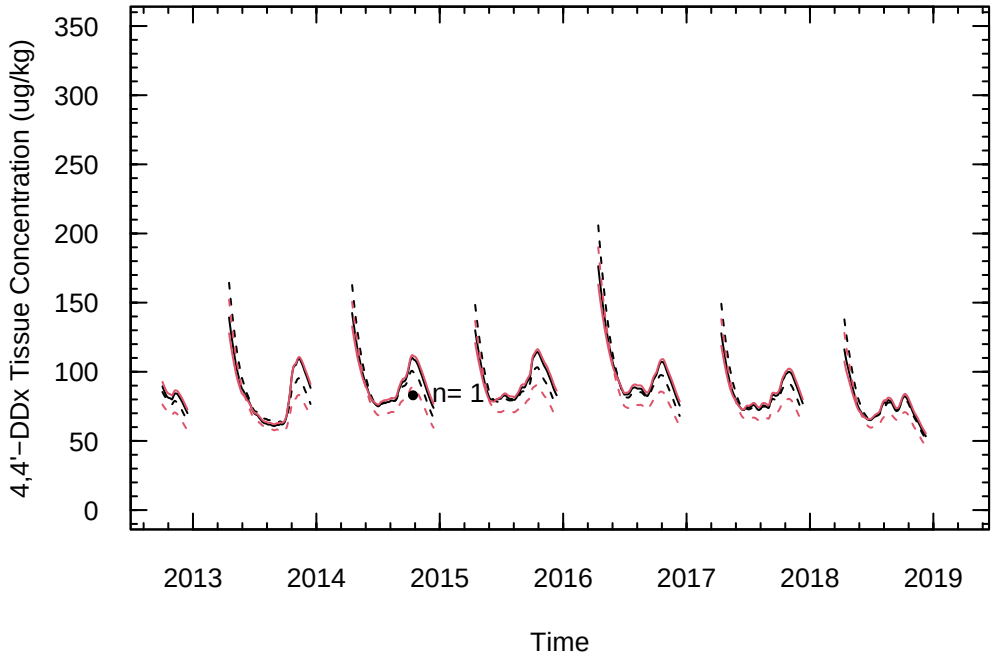


Benthic invert carnivore/omnivore (Southwest)

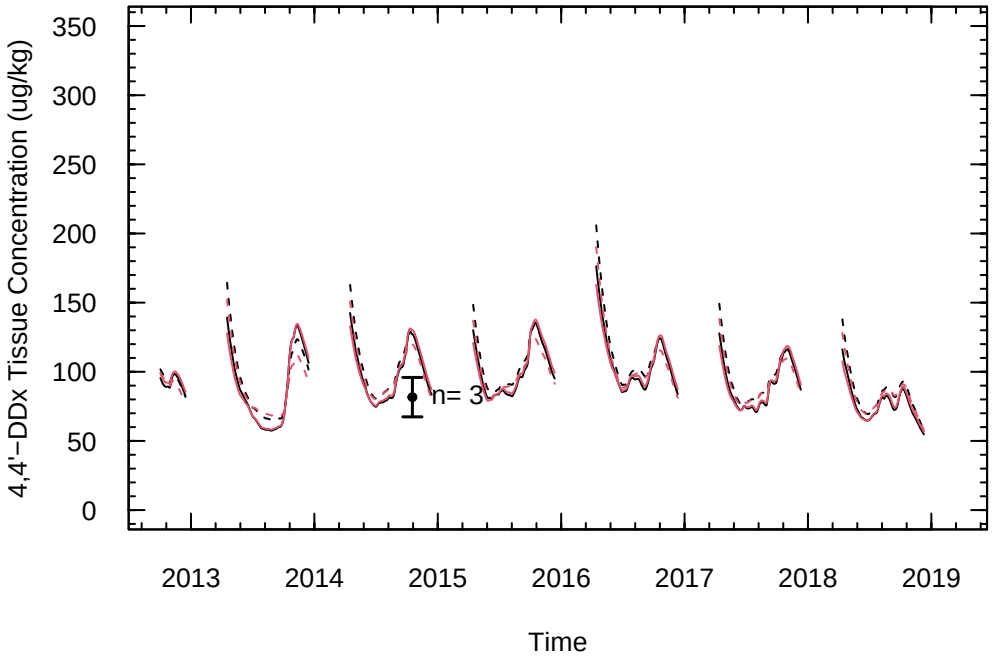




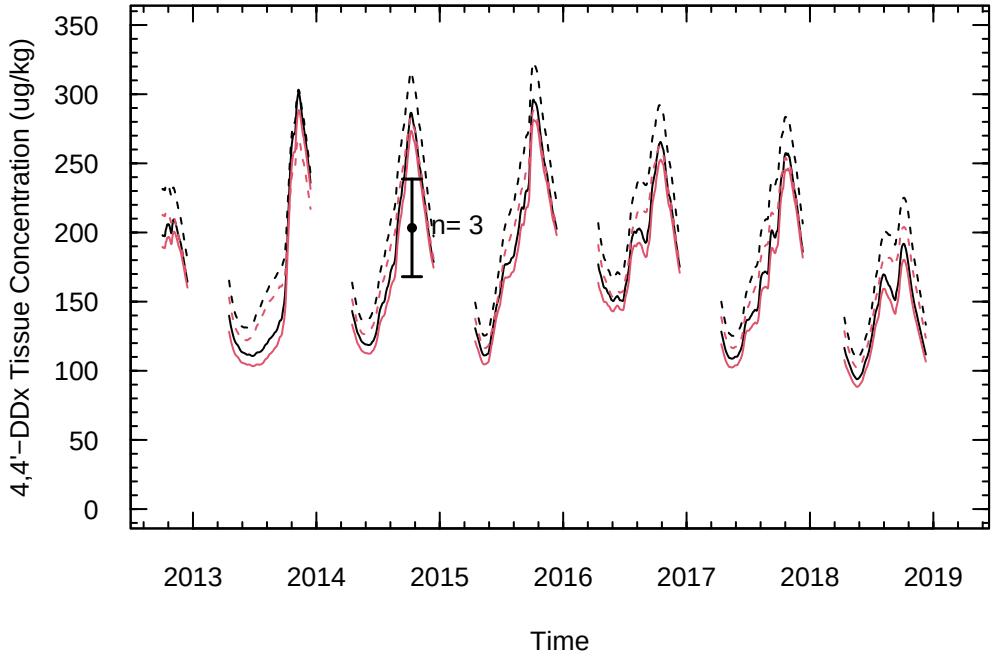
Atlantic Silverside (North)

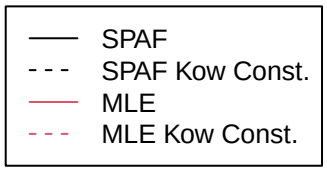


Atlantic Silverside (Southeast)

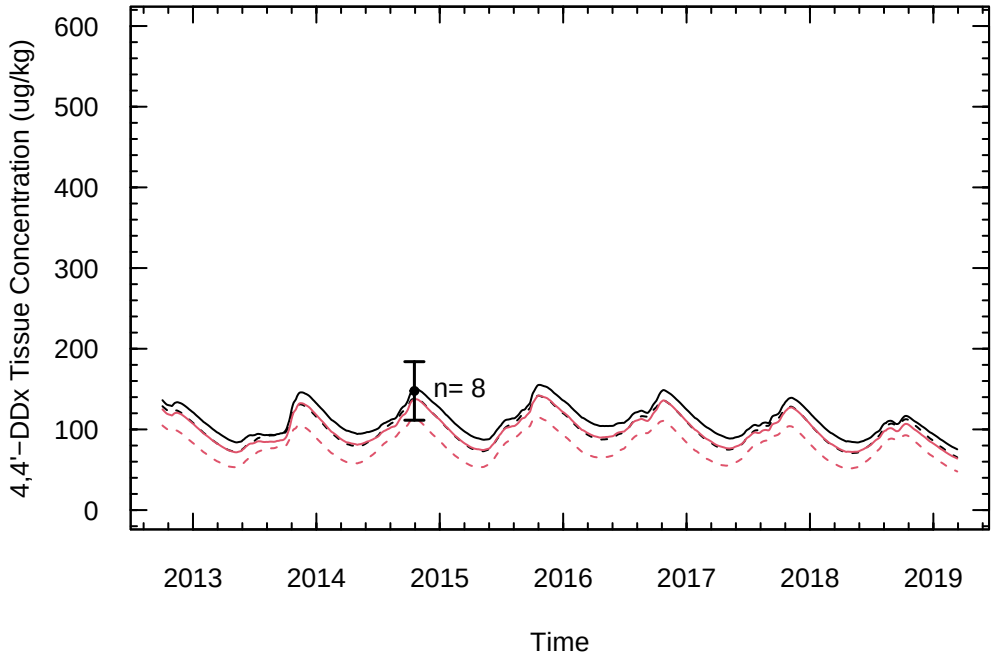


Atlantic Silverside (Southwest)

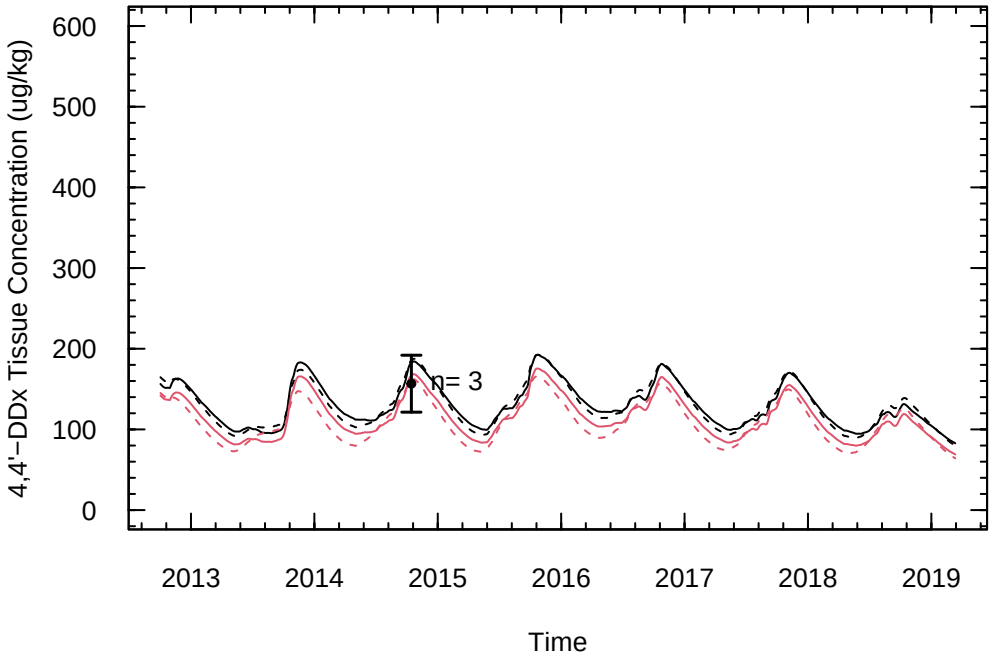




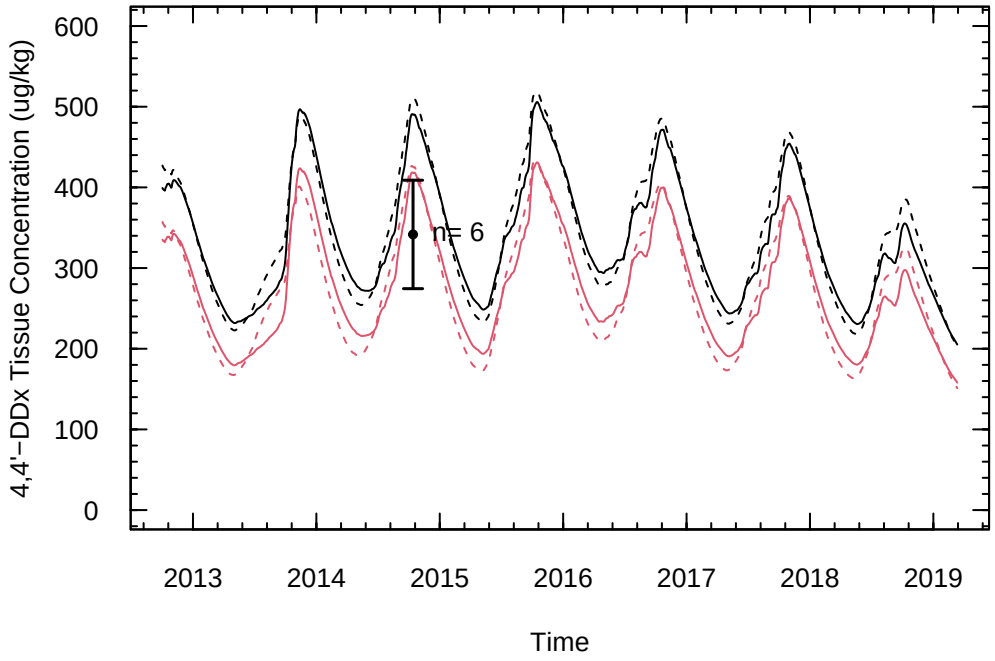
Small forage fish (North)

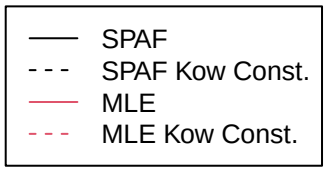


Small forage fish (Southeast)

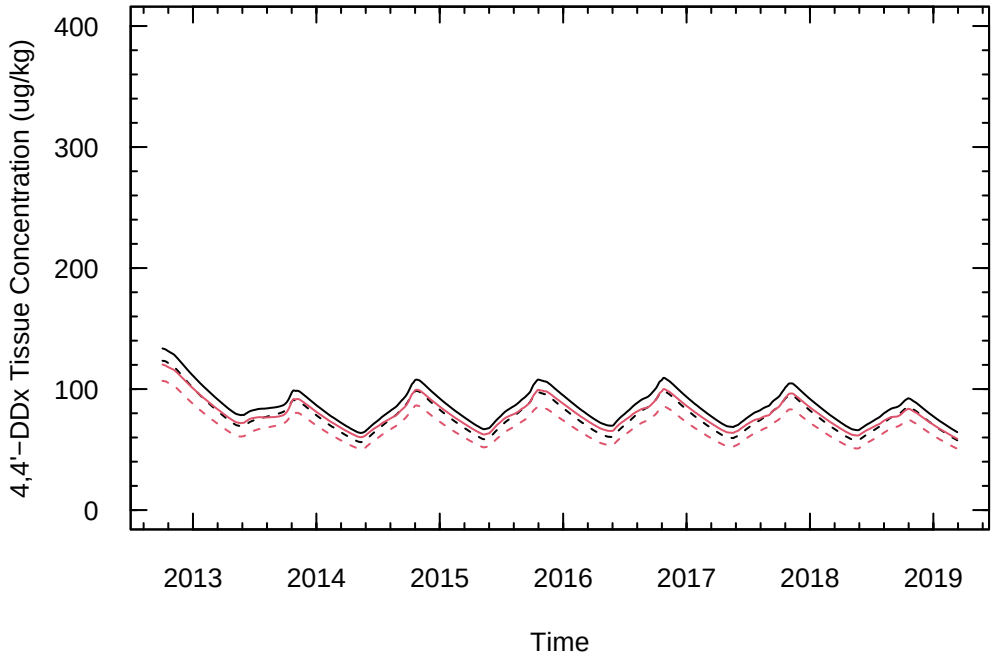


Small forage fish (Southwest)

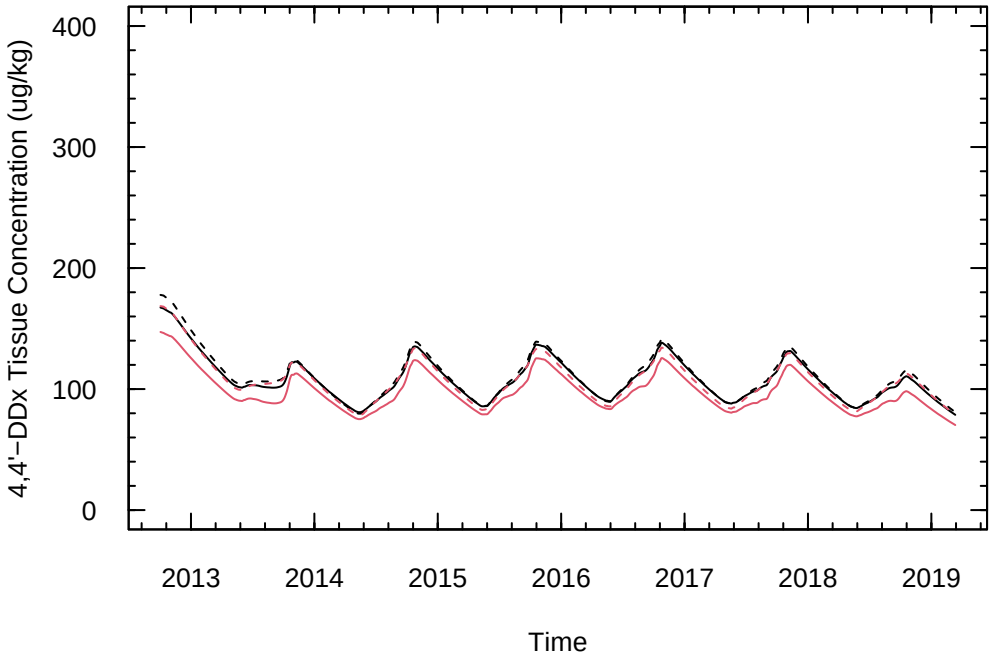




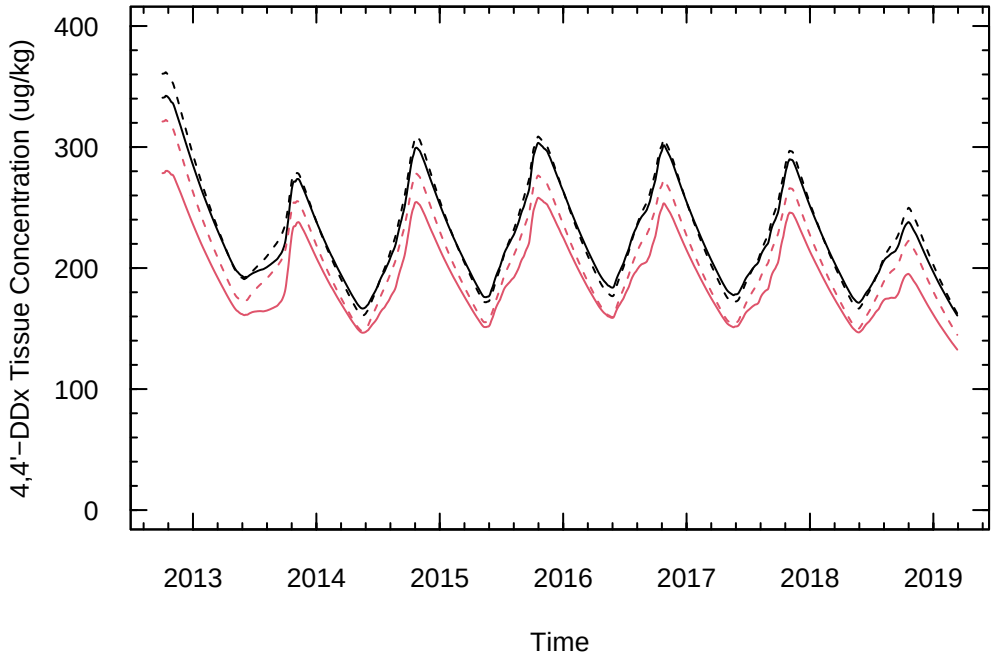
Small American eel (North)

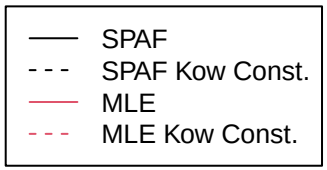


Small American eel (Southeast)

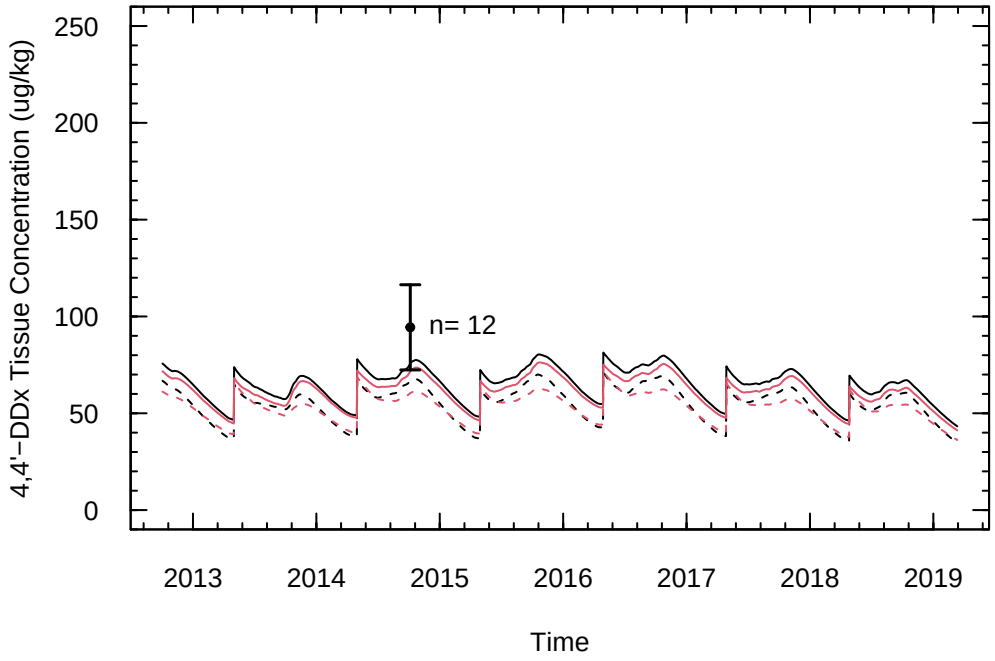


Small American eel (Southwest)

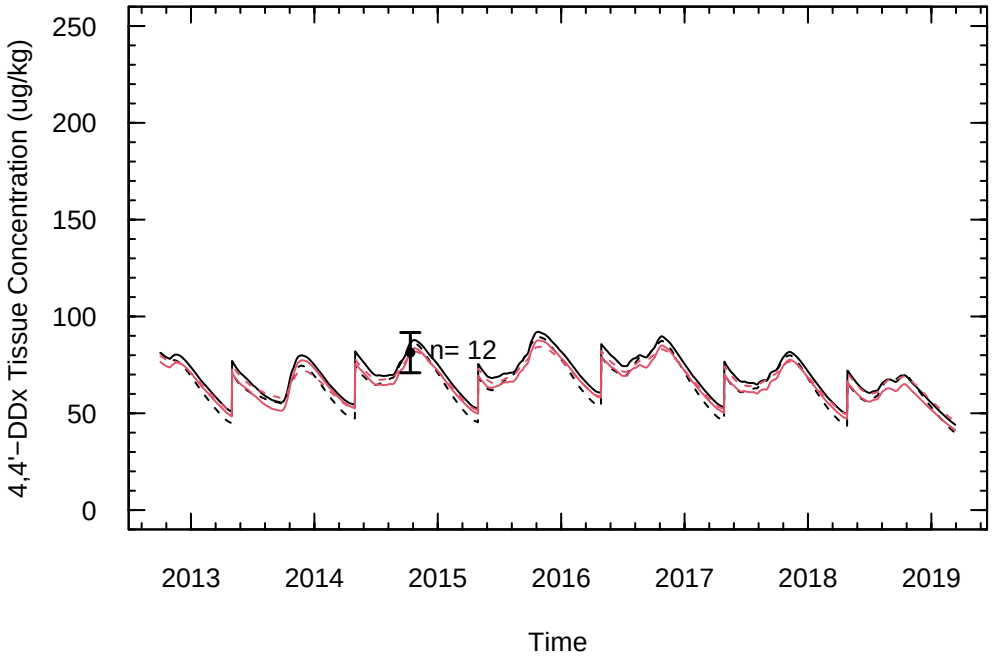




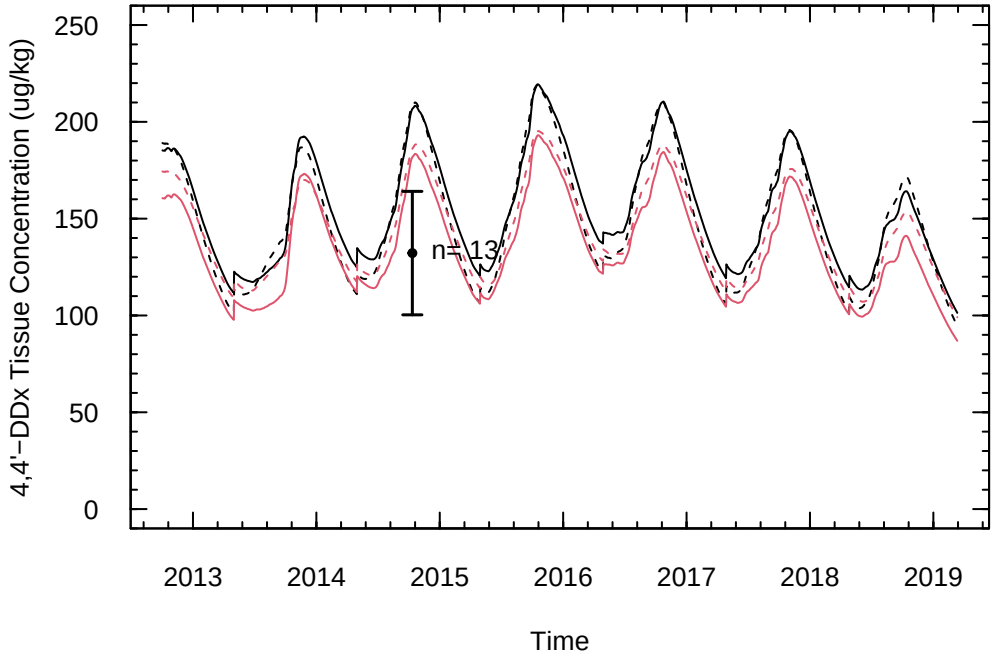
Blue crab (North)

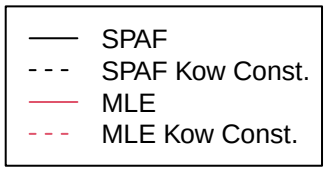


Blue crab (Southeast)

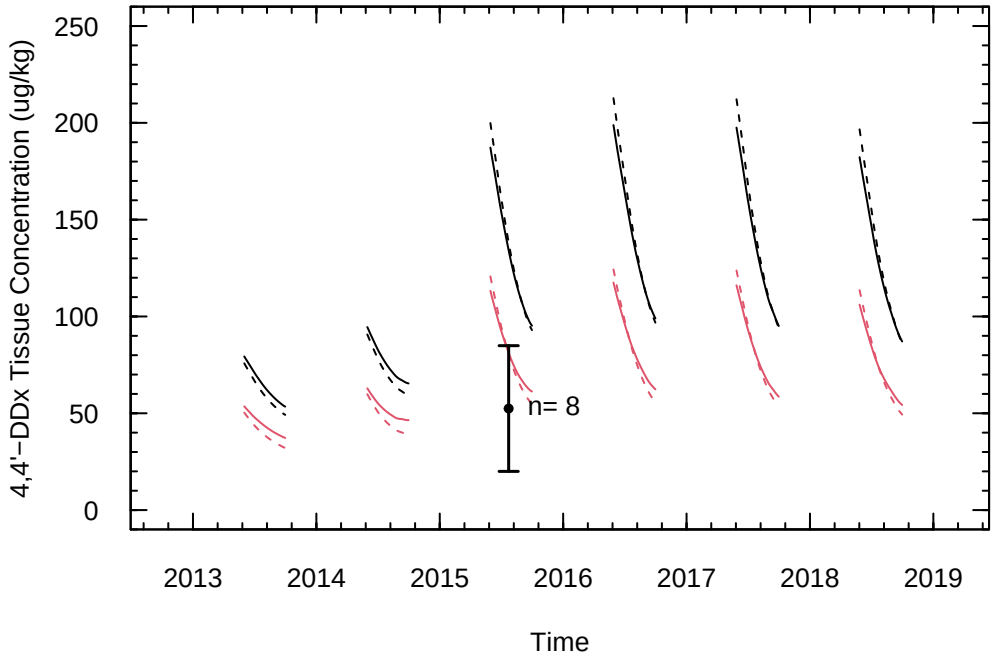


Blue crab (Southwest)

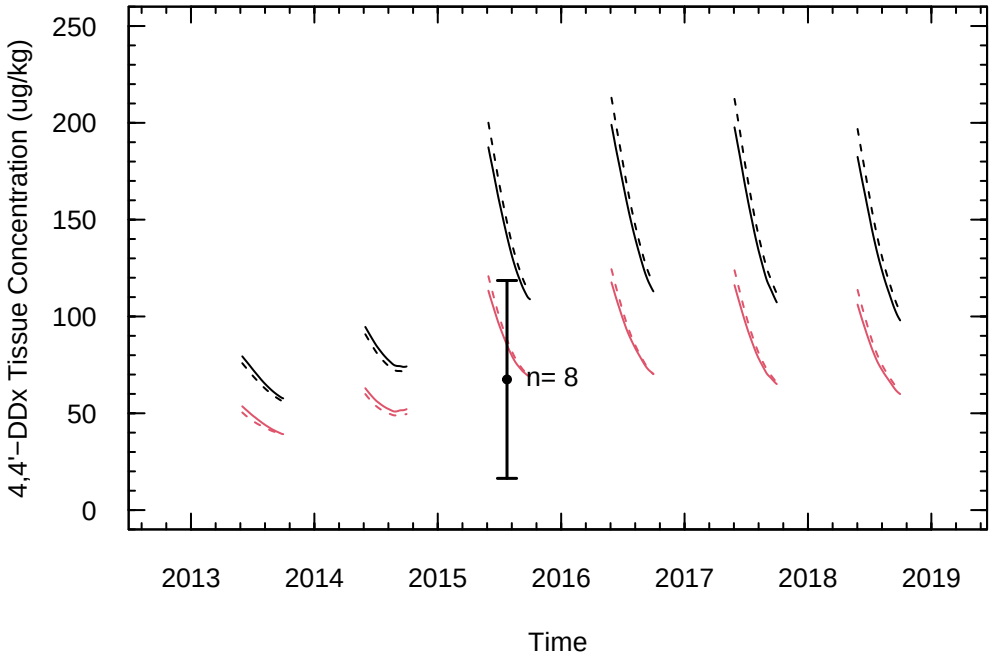




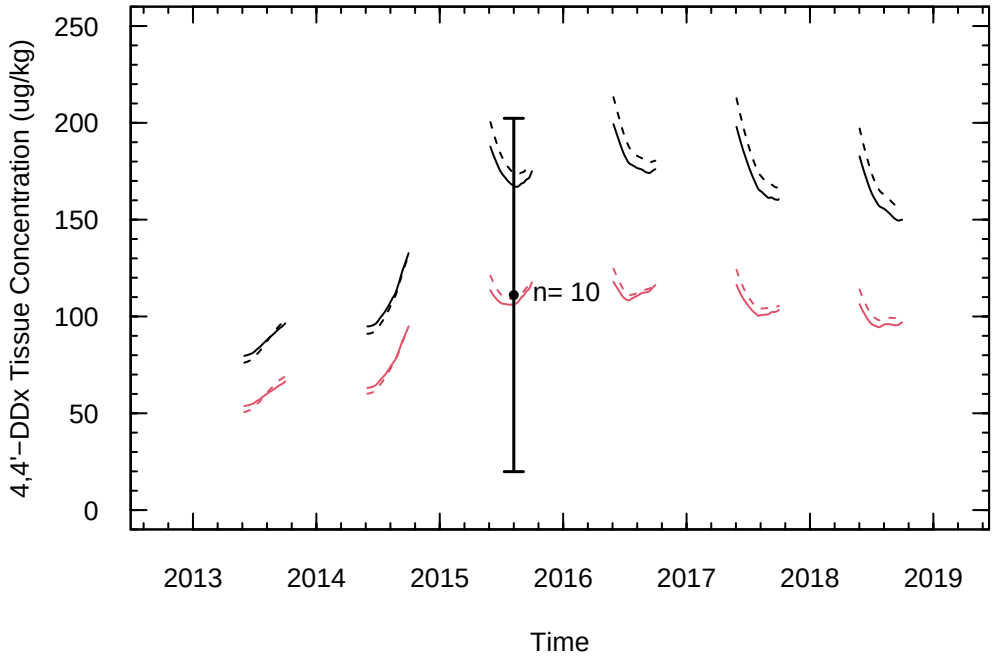
Summer Flounder (North)

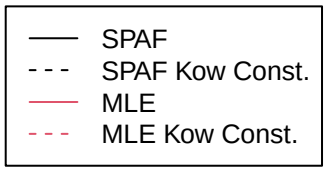


Summer Flounder (Southeast)

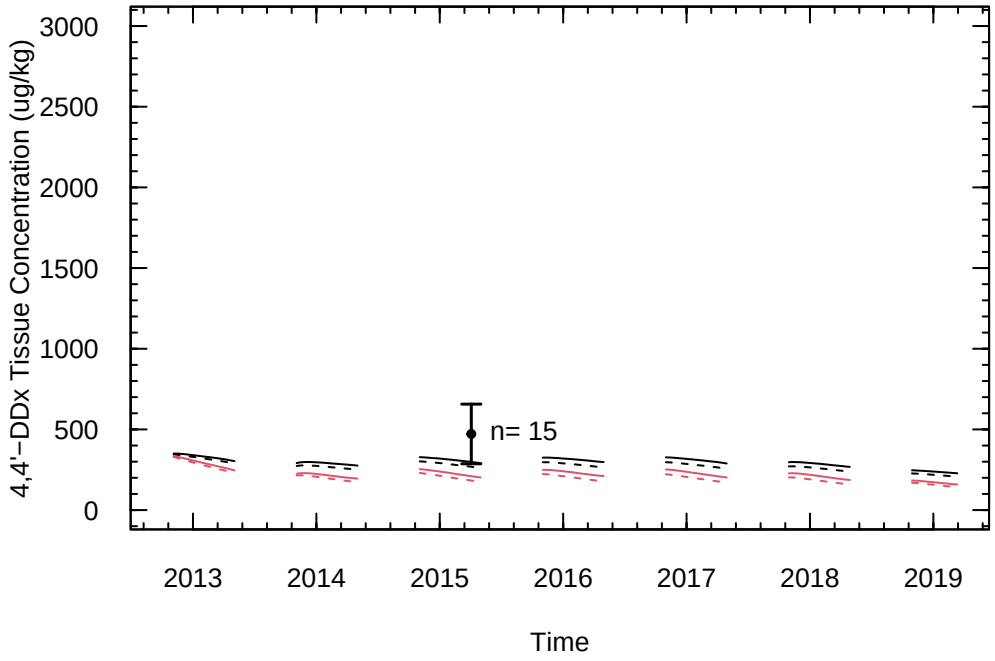


Summer Flounder (Southwest)

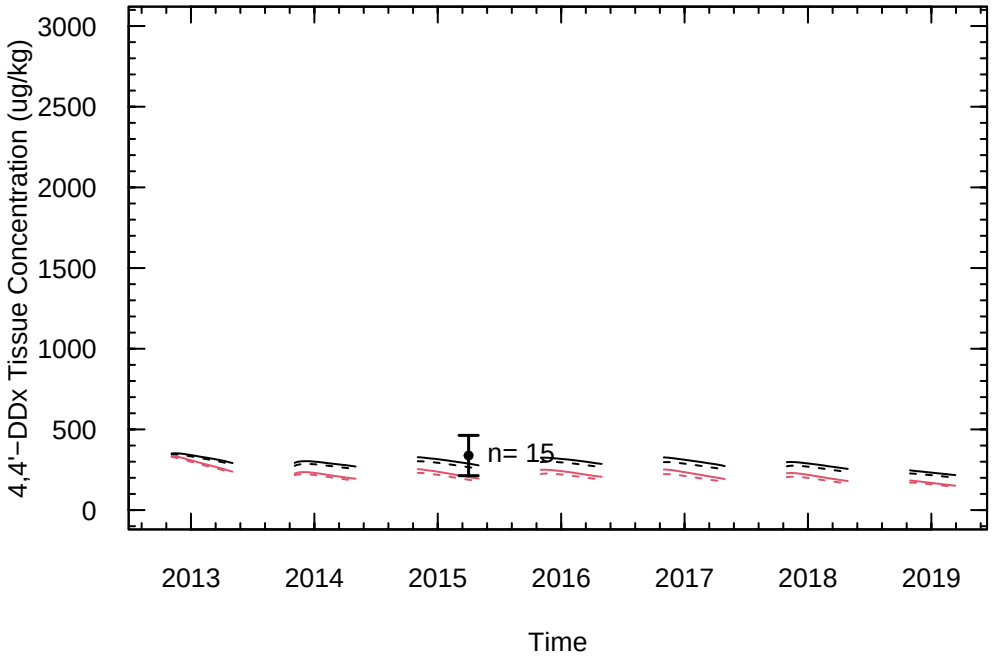




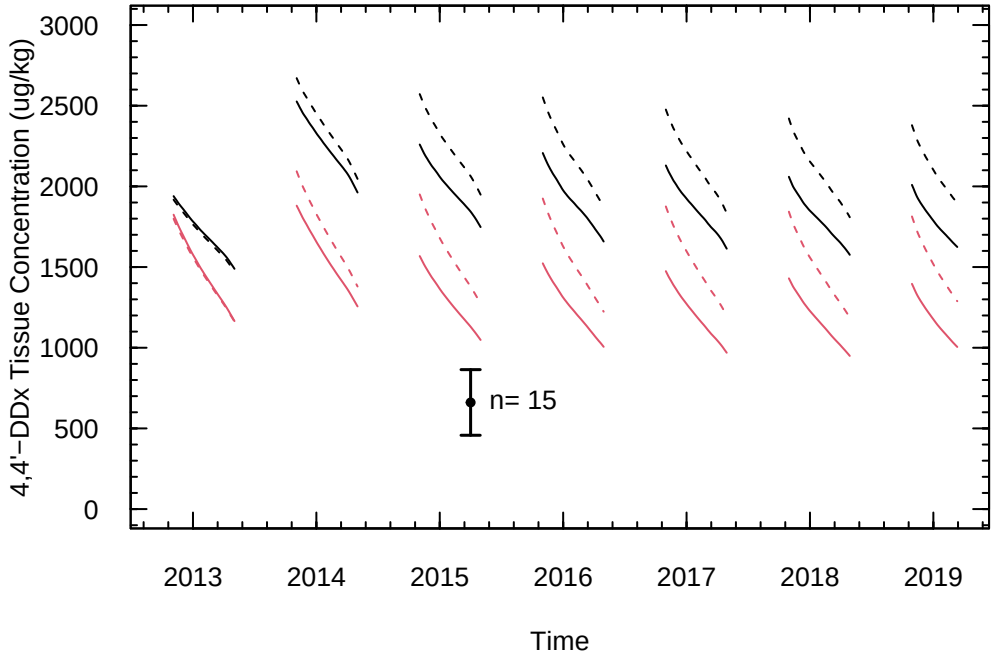
White perch (North)

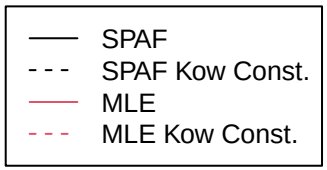


White perch (Southeast)

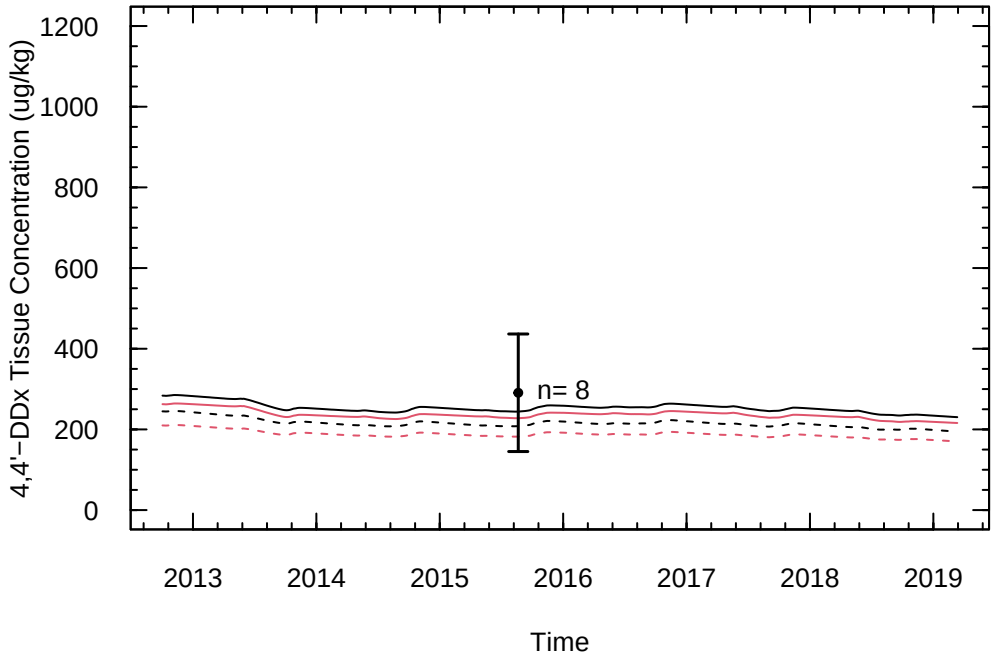


White perch (Southwest)

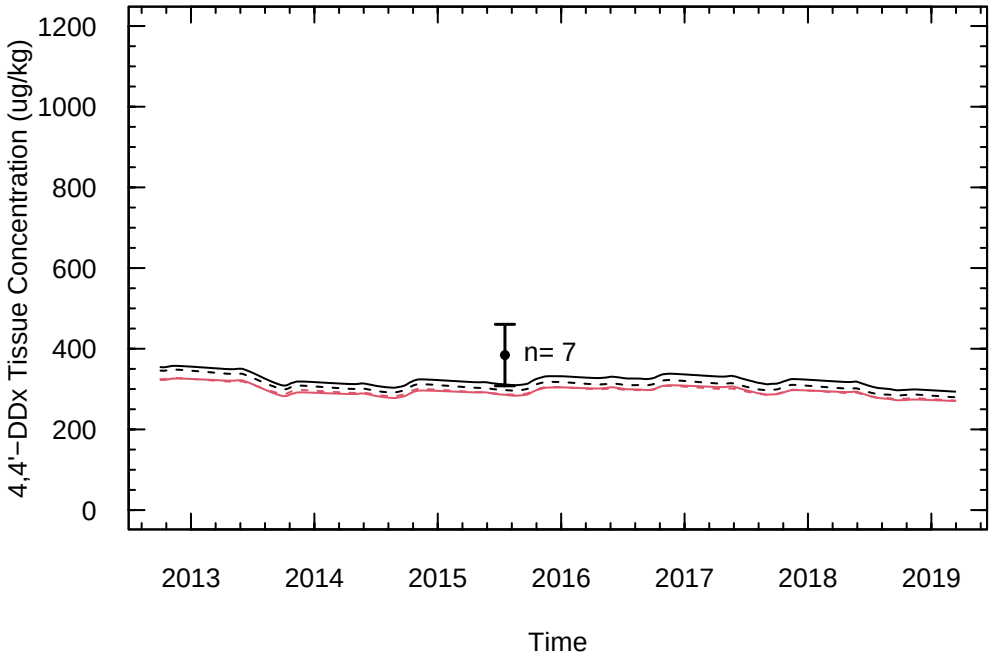




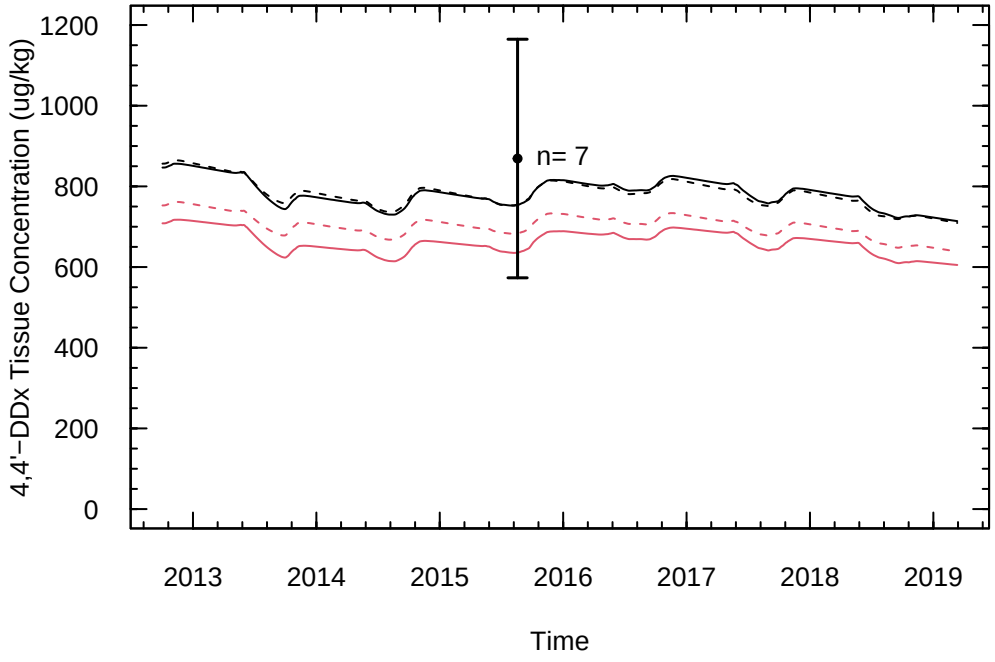
Large American eel (North)

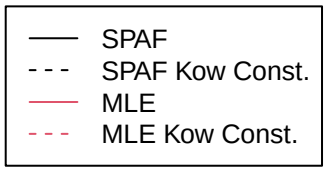


Large American eel (Southeast)

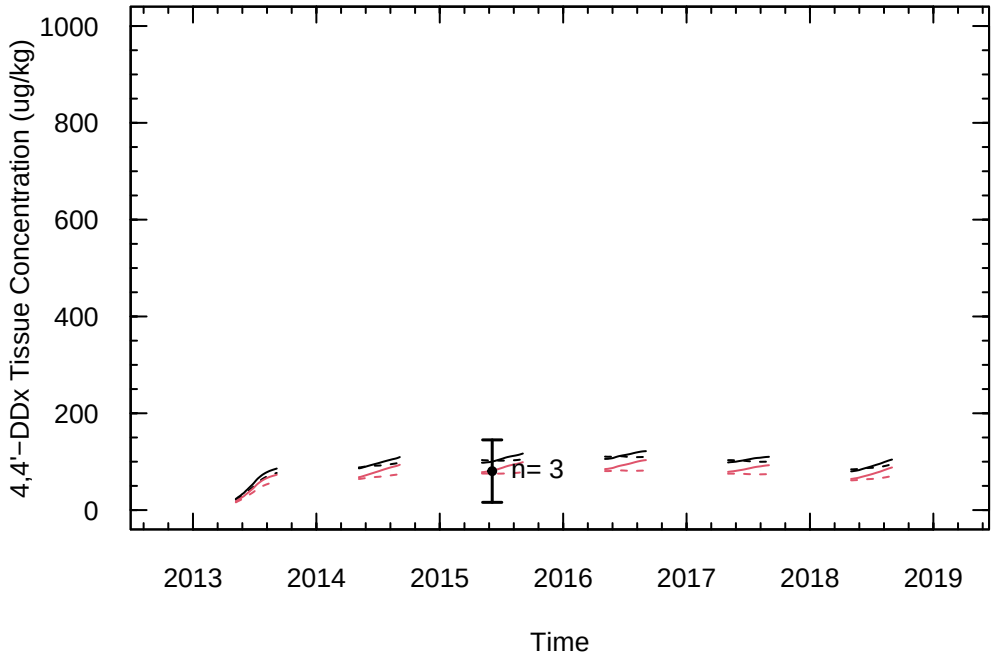


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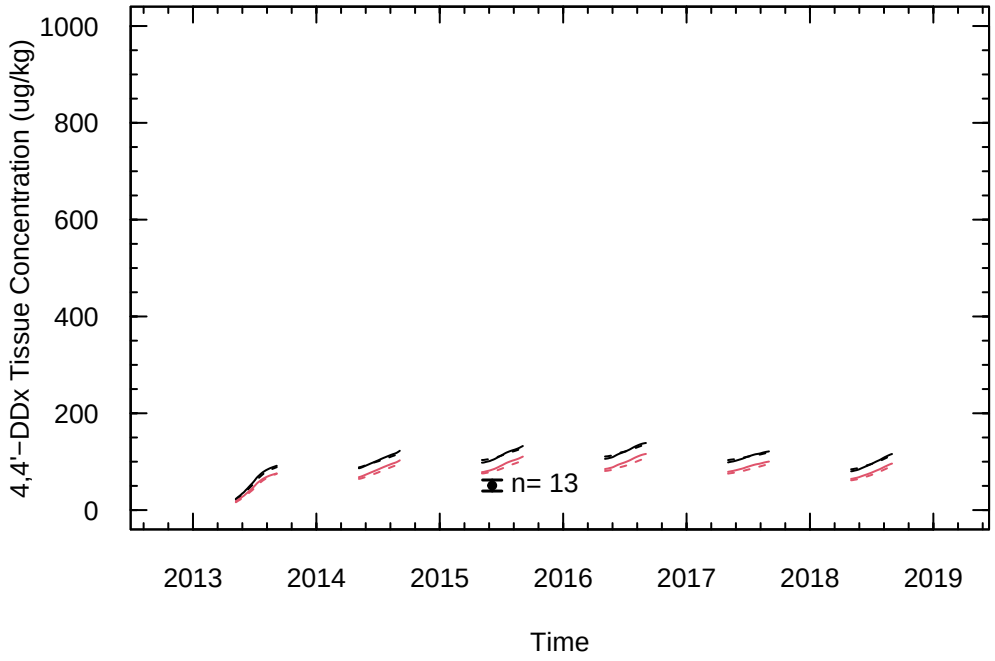




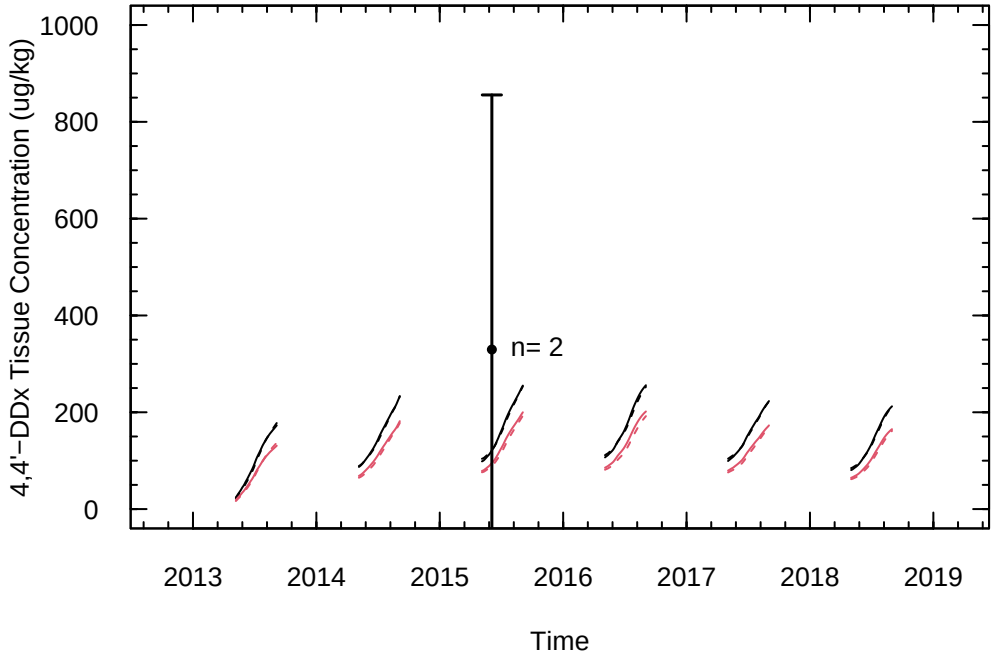
Bluefish (North)

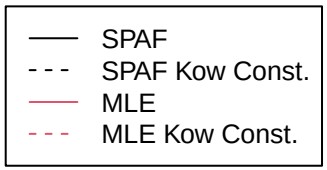


Bluefish (Southeast)

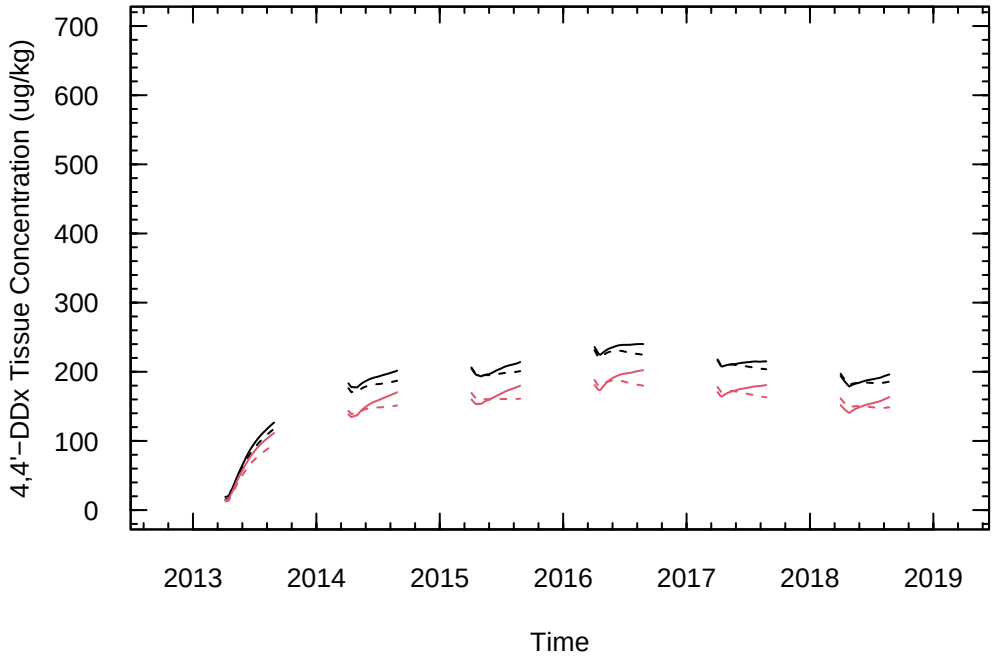


Bluefish (Southwest)

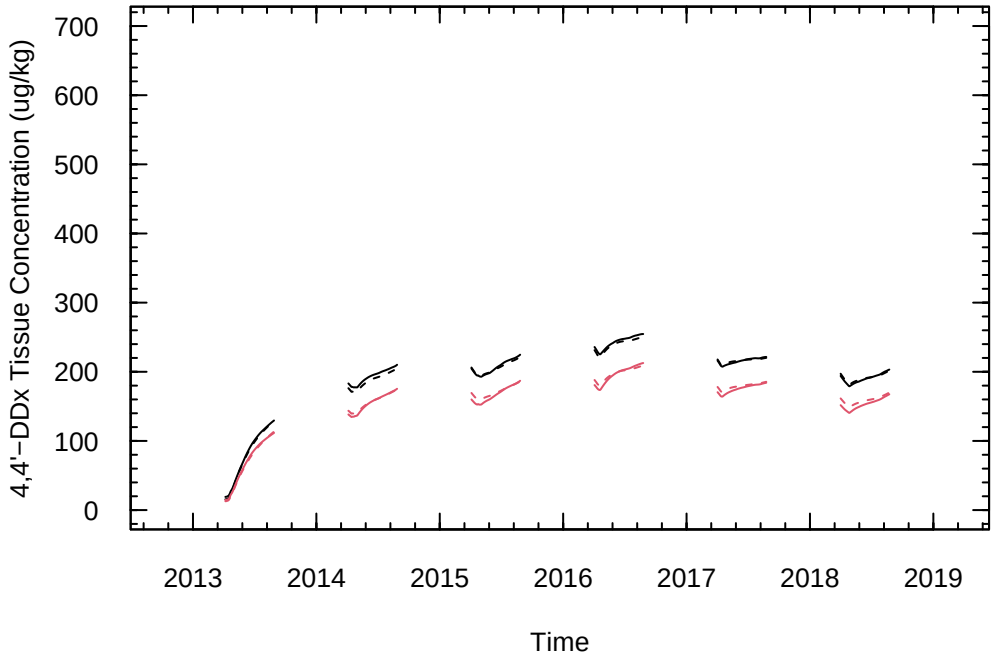




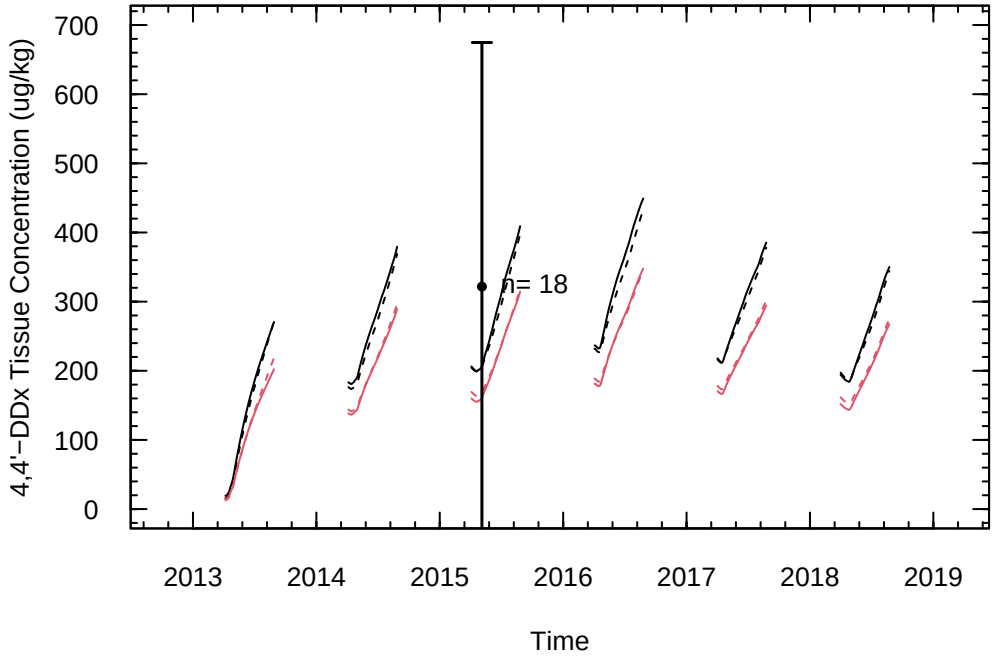
Striped Bass (North)

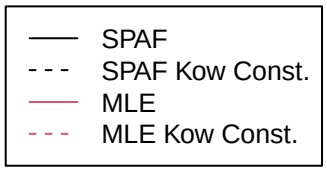


Striped Bass (Southeast)



Striped Bass (Southwest)





APPENDIX B: BENTHIC BIOMASS ANALYSIS

For the bioaccumulation model, a reach-wide estimate of benthic-biomass organized by feeding guild is required. This parameter directly feeds into the model when setting feeding fractions for opportunistic feeders of benthos (such as small forage fish, blue crab, and small American eel.) This model input may also be considered a calibration parameter due to uncertainty – measured biomass data by species or feeding guild are not available.

Within the bioaccumulation model, benthic invertebrates are modeled within four feeding guilds:

- Deposit Feeders—feed predominantly on sediment-solids within the top six inches of sediment.
- Detritivores—feed predominantly on organic matter and detritus that has sunk to the bottom of the system.
- Filter Feeders—feed on near-bottom organic matter, phytoplankton, and zooplankton.
- Carnivore / Omnivore – feed predominantly on other benthic invertebrates.

To obtain biomass estimates, the process used for the Lower Passaic River (LPR) model was to combine data on species abundance with species mean-biomass estimates from the Chesapeake Bay Benthic Monitoring Program (CBBMP 2014). This process is uncertain as the variabilities in measured invertebrate masses are wide. Furthermore, mean invertebrate weights by species can be site specific due to food availability and other local factors. Despite the uncertainty, this type of analysis can provide more information than abundance alone, as species that are typically larger will make up a larger proportion of the overall estimated benthic biomass.

There are 30 Newark Bay benthos stations where taxonomic data were collected in 2015. For these stations, total benthic biomass data (g/m^2) are available, which was not the case for the Lower Passaic River. This additional constraint on the derived estimates of benthic biomass should reduce overall parameter uncertainty.

The process used for NBSA is documented below.

- For each of the 105 observed invertebrate taxa, mean biomass estimates were derived using the mean weight of invertebrate species measured over 19 years of Chesapeake Bay monitoring.
    - When the species named in the Newark Bay data set did not precisely match the Chesapeake Bay data set, the name was modified. (e.g. "*Pectinaria gouldii*" to "*Pectinaria gouldi*".)
    - When the precise species was not found in the Chesapeake Bay data set a surrogate species was chosen (e.g. "*Grandidierella japonica*" to "*Grandidierella spp.*")
    - When a species was not found in the Chesapeake Bay data set, a surrogate species based on genus or family was chosen (e.g. "*Alitta succinea*" to "*Neanthes succinea*"). In many cases in the dataset, these are not surrogate species but taxonomic synonymies due to reclassifications (in this case at the genus level); this can reduces overall uncertainty.
    - For a small number of species where no surrogate data at all was found in the Chesapeake Bay data set, a rough estimate was derived based on observed lengths from literature sources and invertebrate length-weight data (Fuller et al, 2014).

- The full set of mean-weight estimates and the proportion of NBSA biomass estimated for each species are provided in Attachment A. The assignment of NBSA species to Chesapeake species or surrogate may be found in Attachment B.

- Following the mean-weight estimation, feeding guilds were assigned using a spreadsheet provided by CPG and refined and edited by Dr. Robert Prezant as part of the LPR modeling effort (Prezant, Personal Communication, email 7/14/2016).
  - Due to the time required to locate references and assign feeding guilds, only those NBSA species that are estimated to make up > 0.05% of NBSA biomass were assigned to one of the feeding guilds identified above. This process was completed using a variety of literature references as documented in Attachment A. When mixed-feeding strategies were encountered, a species was assigned to the feeding strategy that was designated as dominant from the literature resource or professional judgment.
  - Species that are estimated to make up 0.05% of biomass or lower were not assigned to feeding guilds. It was assumed that this small proportion of biomass would not have a significant impact on the estimate of feeding-guild biomass by reach.

Total biomass by station could then be calculated and compared to observed biomass by station in g/m^2. While stations with high observed biomass did correlate closely with higher estimates, overall estimates were approximately a factor of two greater than observed data (Figure B1).

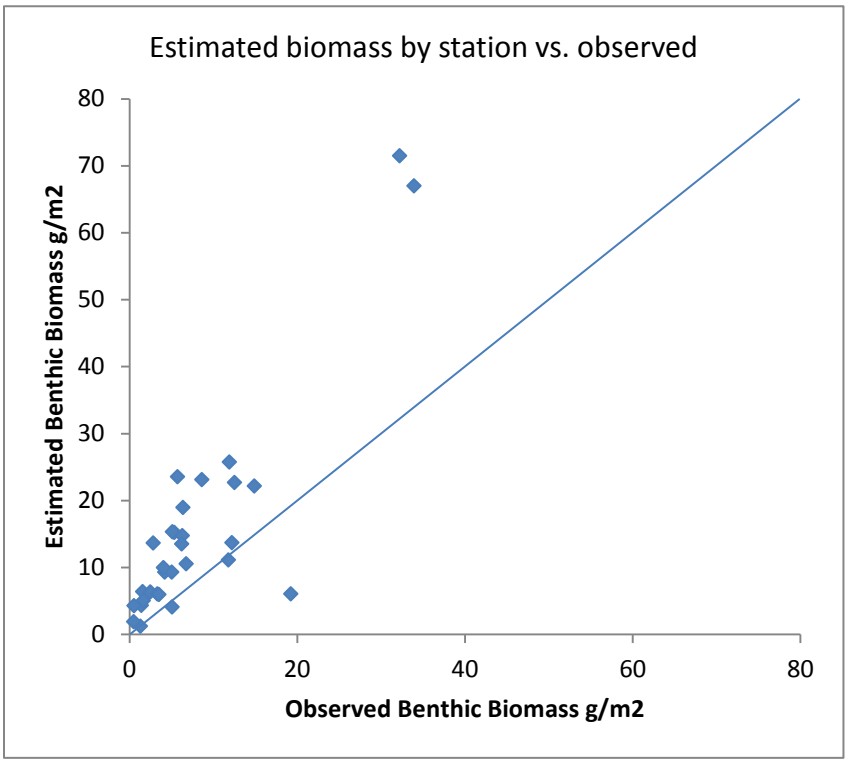


Figure B1. Observed benthic biomass from 2015 NBSA benthic data vs. estimates derived from species abundance

A calibration step was undertaken in which estimated biomasses by station were made to match observed biomasses more closely. First, the mean weights of all invertebrate species were multiplied by 45% (based on best resulting fit following this general multiplication). Second, the three highest-biomass invertebrates (estimated to make up over 60% of total bay benthic biomass) were manually calibrated (within their observed Chesapeake Bay confidence intervals), to improve the match to station-by-station data (Table B1). These steps improved the match between estimates and observed station biomasses (Figure B2, Figure B3)

Table B1. Calibrated biomass values for three highest-biomass invertebrates

Species	Calibrated individual biomass (g shell-free AFDW)	Estimated percent of Newark Bay Benthic BIomass	Chesapeake Biomass 5th percentile (g AFDW)	Chesapeake Mean Biomass (g AFDW)	Chesapeake Biomass 95th percentile (g AFDW)
Mya arenaria	1.21E-02	31.0%	5.00E-05	2.34E-02	1.22E-01
Leitoscoloplos sp.	1.50E-03	19.9%	1.36E-03	5.84E-03	2.13E-02
Macoma balthica	1.17E-02	9.8%	1.33E-04	1.46E-02	5.35E-02

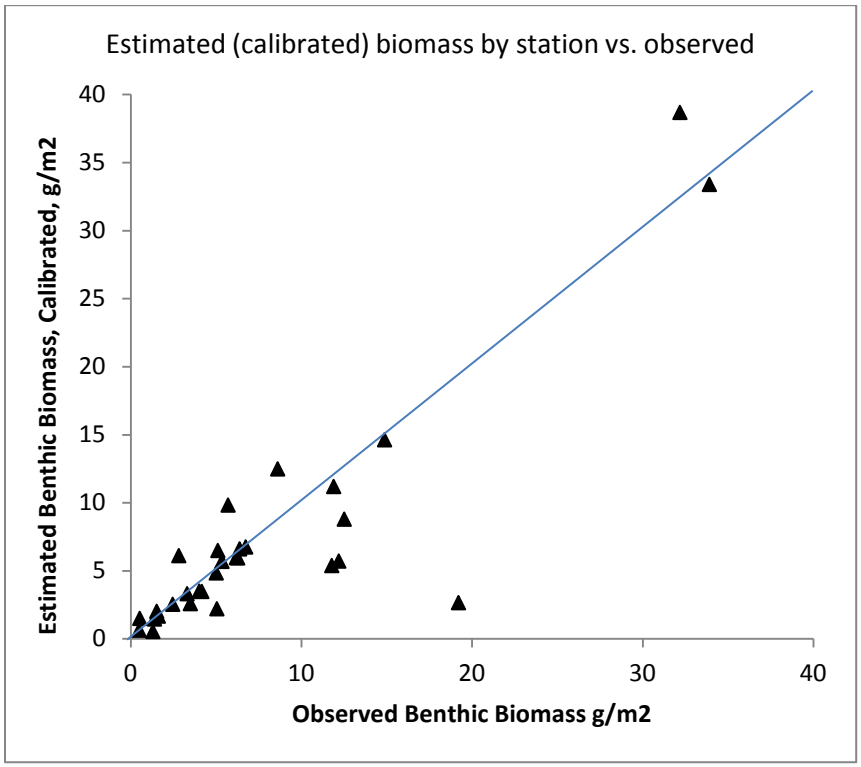


Figure B2. Observed benthic biomass from 2015 NBSA benthic data vs. calibrated estimates derived from species abundance

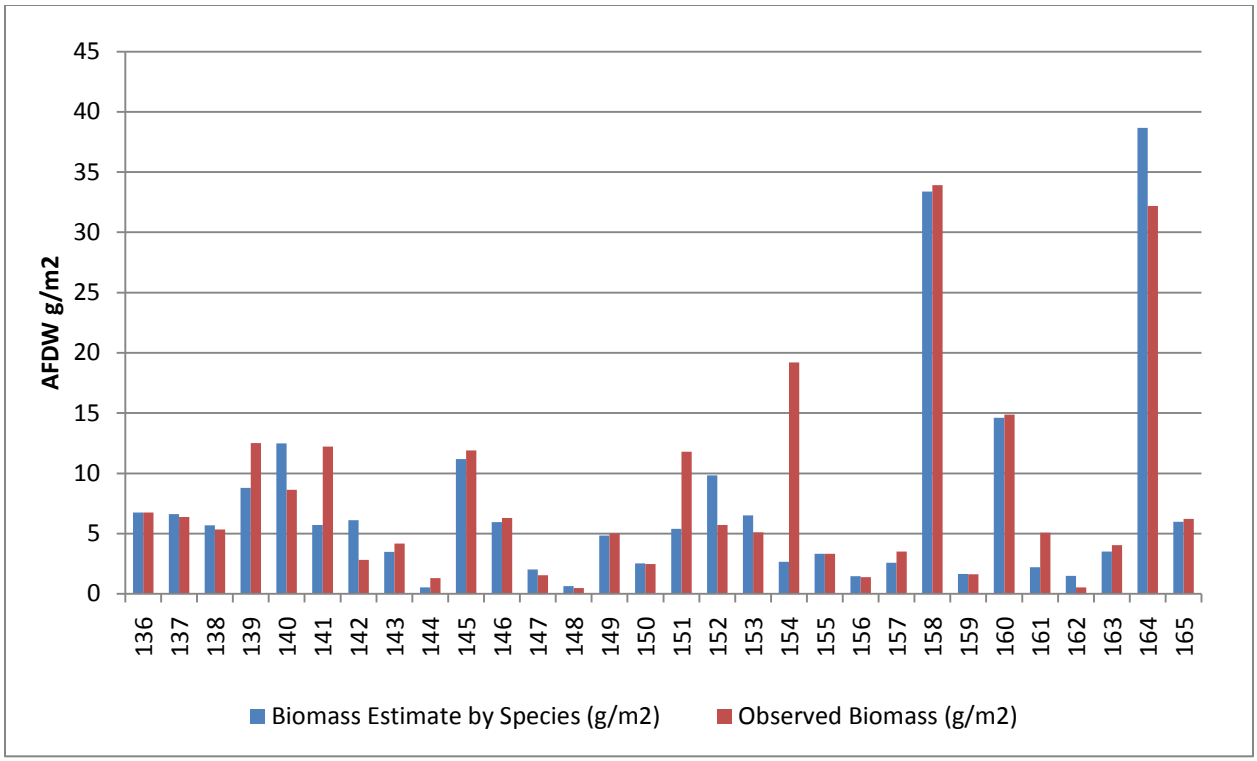


Figure B3. Station by station estimated biomass (calibrated) vs. observed

Each station was then assigned to the North, Southeast, and Southwest bioaccumulation modeling reaches. The proportion of benthic biomass by feeding guild for each reach could then be estimated (Figure B4). Filter feeders appear to predominate in the north, detritivores in the Southeast reach, and filter feeders and detritivores have roughly equal proportion in the Southwest.

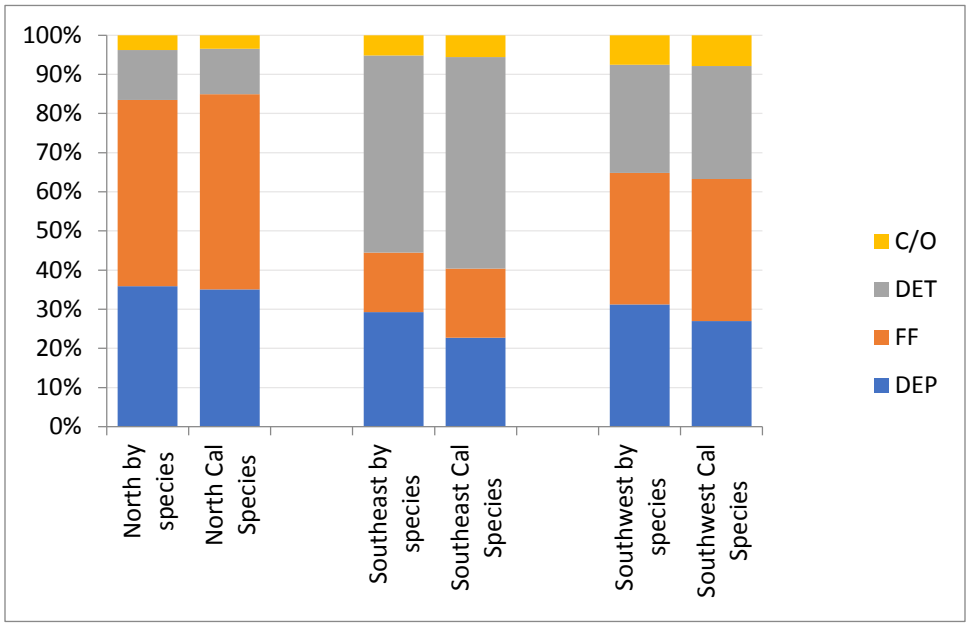


Figure B4. Proportion of benthic biomass by feeding guild for each bioaccumulation reach. Estimates are based on abundance data and uncalibrated (left) and calibrated (right) mean weight estimates by species.

For the Lower Passaic River, uncertainty was estimated by running a Monte-Carlo analysis. Each Monte-Carlo iteration sampled from mean-weight distributions derived from the variability in Chesapeake Bay data. Results were extremely wide confidence intervals (e.g. filter feeders could comprise 10% to 90% of biomass for some river reaches).

For NBSA, estimates have been calibrated to station-by-station observed benthic biomass reducing overall parameter uncertainty. Because of this calibration step, a Monte-Carlo analysis to derive confidence intervals is less appropriate[1]. Based on variability in calibrated vs. uncalibrated estimates and professional judgment, the proposed calibration range for this parameter is the best estimate plus or minus approximately 10% (Table B2).

Table B2. Best estimates of benthic invertebrate biomass by reach and proposed calibration range

		Min Cal. Range	**Best Estimate**	*Max Cal. Range*
North	DEP	*25%*	**35.0%**	*45%*
North	FF	*40%*	**49.9%**	*60%*
North	DET	*2%*	**11.6%**	*22%*
North	C/O	*1%*	**3.5%**	*13%*
North	**Total**		100.0%	
Southeast	DEP	*13%*	**22.8%**	*33%*
Southeast	FF	*8%*	**17.7%**	*28%*
Southeast	DET	*44%*	**54.0%**	*64%*
Southeast	C/O	*1%*	**5.6%**	*16%*
Southeast	**Total**		100.0%	
Southwest	DEP	*21%*	**31.2%**	*41%*
Southwest	FF	*24%*	**33.6%**	*44%*
Southwest	DET	*18%*	**27.7%**	*38%*
Southwest	C/O	*1%*	**7.5%**	*18%*
Southwest	**Total**		100.0%	

[1] A Monte-Carlo analysis in which the quality of calibration is assessed for each sample and better calibrations are assigned higher weights could be undertaken. However, this seems overly complex and time consuming at this time especially given the extent of uncertainties in applying mean weights from one site to another site.

Appendix B References Cited:

CBBMP. 2014. Scientific data: Data sets. Chesapeake Bay Benthic Monitoring Program [online database]. Versar, Inc., Columbia, MD. Updated 05/15/14. Available from: http://www.baybenthos.versar.com/data.htm.

Furler et al. 2014. Length-Weight Relationships of the Amphipods Americorophium spinicorne and A. stimpsoni in the San Francisco Estuary Alison Furler (Alison.Furler@wildlife.ca.gov), Danae Jordan, Tricia Bippus, and Steven Slater (Steve.Slater@wildlife.ca.gov) California Department of Fish and Wildlife, Long-Term Monitoring Unit, Stockton, California. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentId=97975

Appendix B Attachment A: NBSA Benthic Invertebrate species, feeding guilds, and mean weights

Species Name	Feed. Guild	Mean Weight AFDW g	Estimated Pct. of NBSA Biomass	Feeding Guild Source
Mya arenaria	FF	2.34E-02	31.0%	
Leitoscoloplos sp	DEP	5.84E-03	19.9%	
Macoma balthica	DEP	1.46E-02	9.8%	
Ilyanassa obsoleta	DET	3.80E-02	8.7%	
Leitoscoloplos fragilis	DET	0.0058356	7.4%	
Mercenaria mercenaria	FF	0.2262776	7.2%	https://www.chesapeakebay.net/S=0/fieldguide/critter/hard_clam
Glycera americana	C/O	0.0130986	4.1%	https://en.wikipedia.org/wiki/Glycera_(annelid)
Microdeutopus gryllotalpa	DET	0.002	1.7%	5 mm from https://invasions.si.edu/nemesis/calnemo/SpeciesSummary.jsp?TSN=93477 https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentId=97975
Oligochaeta	DEP	0.0004999	1.5%	
Streblospio benedicti	DET	0.0001847	1.4%	
Grandidierella japonica	DET	0.0004692	1.2%	https://core.ac.uk/download/pdf/36687305.pdf
Laeonereis culveri	DET	0.0026958	0.8%	
Mediomastus ambiseta	DEP	0.0002576	0.8%	
Mulinia lateralis	FF	0.0020821	0.6%	
Pectinaria gouldii	DEP	0.00089	0.6%	
Diopatra cuprea	DEP	0.0118393	0.4%	https://en.wikipedia.org/wiki/Diopatra_cuprea
Tharyx acutus	DEP	0.000537	0.3%	https://www.bigelow.org/files/library/technical-reports/blos-technical-report-119.pdf
Cyathura burbancki	C/O	0.0005292	0.3%	https://books.google.com/books?hl=en&lr=&id=AQIp45KfidMC&oi=fnd&pg=PA293&dq=Cyathura+burbancki+feeding&ots=CoJqf3yYTI&sig=4dA08PAmpn4MdiiOw6SoQL9x0dM#v=onepage&q=Cyathura%20burbancki%20feeding&f=false
Haminoea solitaria	DET	0.0004764	0.2%	
Hypereteone heteropoda	C/O	0.0004035	0.2%	https://www.biodiversitylibrary.org/page/45940576#page/101/mode/1up
Cirratulidae	DEP	0.0007929	0.2%	
Heteromastus filiformis	DEP	0.0007835	0.1%	
Alitta succinea	DEP	0.0018928	0.1%	
Ampelisca abdita	FF	0.0001217	0.1%	
Leucon americanus	FF	0.0003999	0.1%	
Glycinde solitaria	C/O	0.0004021	0.1%	
Edotia triloba	DET	0.000755	0.1%	

Species Name	Feed. Guild	Mean Weight AFDW g	Estimated Pct. of NBSA Biomass	Feeding Guild Source
Dyspanopeus sayi	C/O	0.0056	0.1%	https://en.wikipedia.org/wiki/Dyspanopeus_sayi
Spiochaetopterus costarum	FF	0.0006569	0.1%	
Crepidula sp	FF	0.0108601	0.1%	
Glycera dibranchiata	C/O	0.011793	0.1%	
Japonactaeon punctostriatus	DET	0.0004545	0.1%	
Spio filicornis	DET	0.0016	0.1%	
Amphibalanus improvisus	FF	0.021	0.1%	Bay Barnacle-- http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.869.8083&rep=rep1&type=pdf
Ampithoe valida	DET	0.000491	0.1%	
Lyonsia arenosa		0.0007264	0.05%	Feeding guilds not assigned below this point. (Unless already in LPR database)
Chaetopteridae		0.0299092	0.0%	
Gyptis vittata		0.0007621	0.0%	
Nephtys incisa		0.006164	0.0%	
Spionidae	DET	0.0010142	0.0%	
Eumida sanguinea		0.0011	0.0%	
Marenzelleria viridis	DET	0.0016846	0.0%	
Sabaco elongatus		0.0105549	0.0%	
Crepidula fornicata		0.0108601	0.0%	
Polydora cornuta		0.0002885	0.0%	
Goniadidae		0.000729	0.0%	
Petricolaria pholadiformis		0.0031742	0.0%	
Pygospio elegans		0.0010142	0.0%	
Pagurus longicarpus		0.0066179	0.0%	
Parasabella microphthalma		0.0005992	0.0%	
Acteocina canaliculata		0.0003867	0.0%	
Amphiporus bioculatus		0.0002058	0.0%	
Capitella capitata		0.000613	0.0%	
Tellina agilis		0.001067	0.0%	
Oxyurostylis smithi		0.0006913	0.0%	
Crepidula convexa		0.0108601	0.0%	
Glycera sp		0.000729	0.0%	
Crangon septemspinosa	C/O	0.0021625	0.0%	
Sabellaria vulgaris	DET	0.0005602	0.0%	
Monocorophium		0.0007912	0.0%	

Species Name	Feed. Guild	Mean Weight AFDW g	Estimated Pct. of NBSA Biomass	Feeding Guild Source
acherusicum				
Nereididae	DET	0.0008348	0.0%	
Odontosyllis fulgurans		0.001	0.0%	
Scolelepis sp		0.00081	0.0%	
Gammarus mucronatus	DET	0.0001343	0.0%	
Cossura longocirrata		0.00075	0.0%	
Streptosyllis websteri	DET	0.0001847	0.0%	
Tellinidae		0.0003219	0.0%	
Tubulanus pellucidus		0.0004999	0.0%	Potentially weak surrogate. Assume 2cm
Lineidae	C/O	0.0033155	0.0%	nemertean worms
Paracaprella tenuis		0.0004614	0.0%	
Lyonsia sp		0.0007264	0.0%	
Ampharete oculata		0.000075	0.0%	
Molgula manhattensis		0.0008517	0.0%	
Melita nitida		0.000316	0.0%	
Stylochus ellipticus		0.0006131	0.0%	
Elasmopus levis		0.0005426	0.0%	
Prionospio sp		0.0005043	0.0%	
Unciola serrata		0.0006965	0.0%	
Neomysis americana	FF	0.0004775	0.0%	
Neanthes arenaceodentata		0.0006604	0.0%	
Lepidonotus sublevis		0.001055	0.0%	
Spiophanes bombyx		0.0010142	0.0%	
Nephtys sp		0.0007909	0.0%	
Haustorius canadensis	DET	0.0007778	0.0%	
Urosalpinx cinerea		0.00075	0.0%	
Schistomeringos annulata	DET	0.0008348	0.0%	polychaetes
Apocorophium acutum		0.0007222	0.0%	
Salvatoria clavata	C/O	0.0006825	0.0%	
Synidotea laevidorsalis	C/O	0.0006825	0.0%	
Cerapus sp		0.000633	0.0%	
Idoteidae	DET	0.0006	0.0%	
Eusarsiella zostericola	C/O	0.00005	0.0%	https://invasions.si.edu/nemesis/calnemo/SpeciesSummary.jsp?TSN=205822 Weight uncertain
Boonea bisuturalis		0.00005	0.0%	
Streptosyllis verrilli		0.0004206	0.0%	
Ameroculodes edwardsi		0.0012273	0.0%	

Species Name	Feed. Guild	Mean Weight AFDW g	Estimated Pct. of NBSA Biomass	Feeding Guild Source
Diadumene leucolena		0.0011281	0.0%	
Paranaitis speciosa		0.001	0.0%	
Alitta virens	DET	0.0008348	0.0%	annelid worm
Odostomia eburnea		0.0007575	0.0%	
Limulus polyphemus		0.0006	0.0%	
Ampharetidae		0.000075	0.0%	
Spurwinkia salsa	DET	0.00008	0.0%	Weight uncertain. Small gastropod
Gammarus sp	DET	0.0001343	0.0%	
Ampharete sp		0.000075	0.0%	
Actiniaria	N /A	N /A		No data available, sea anenome
Doropygus laticornis	N /A	N /A		not benthic, zooplankton

Appendix B Attachment B: NBSA Benthic Invertebrate species and Chesapeake Species or Surrogate

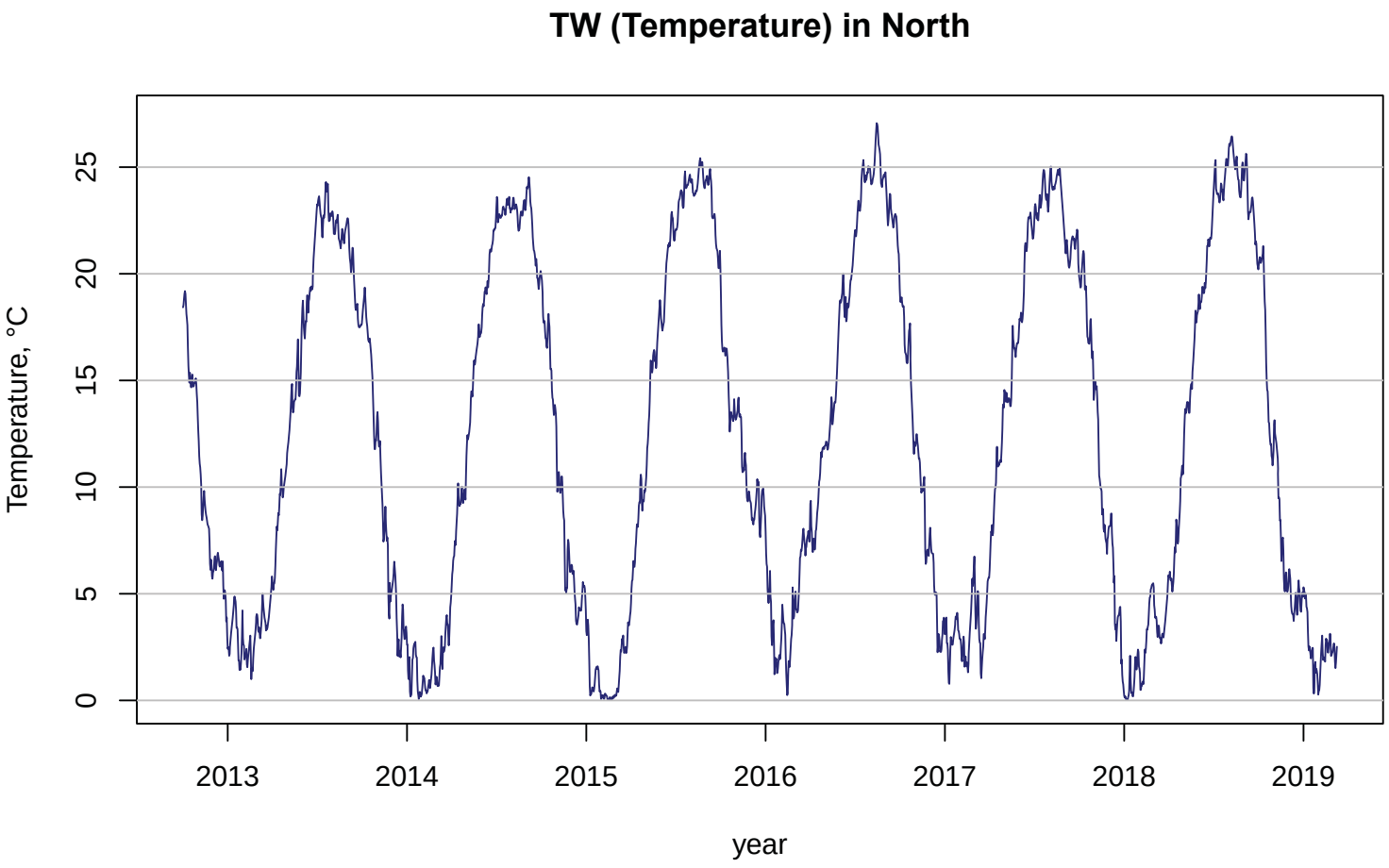
Sorted by estimated proportion of Newark Bay biomass, largest to smallest

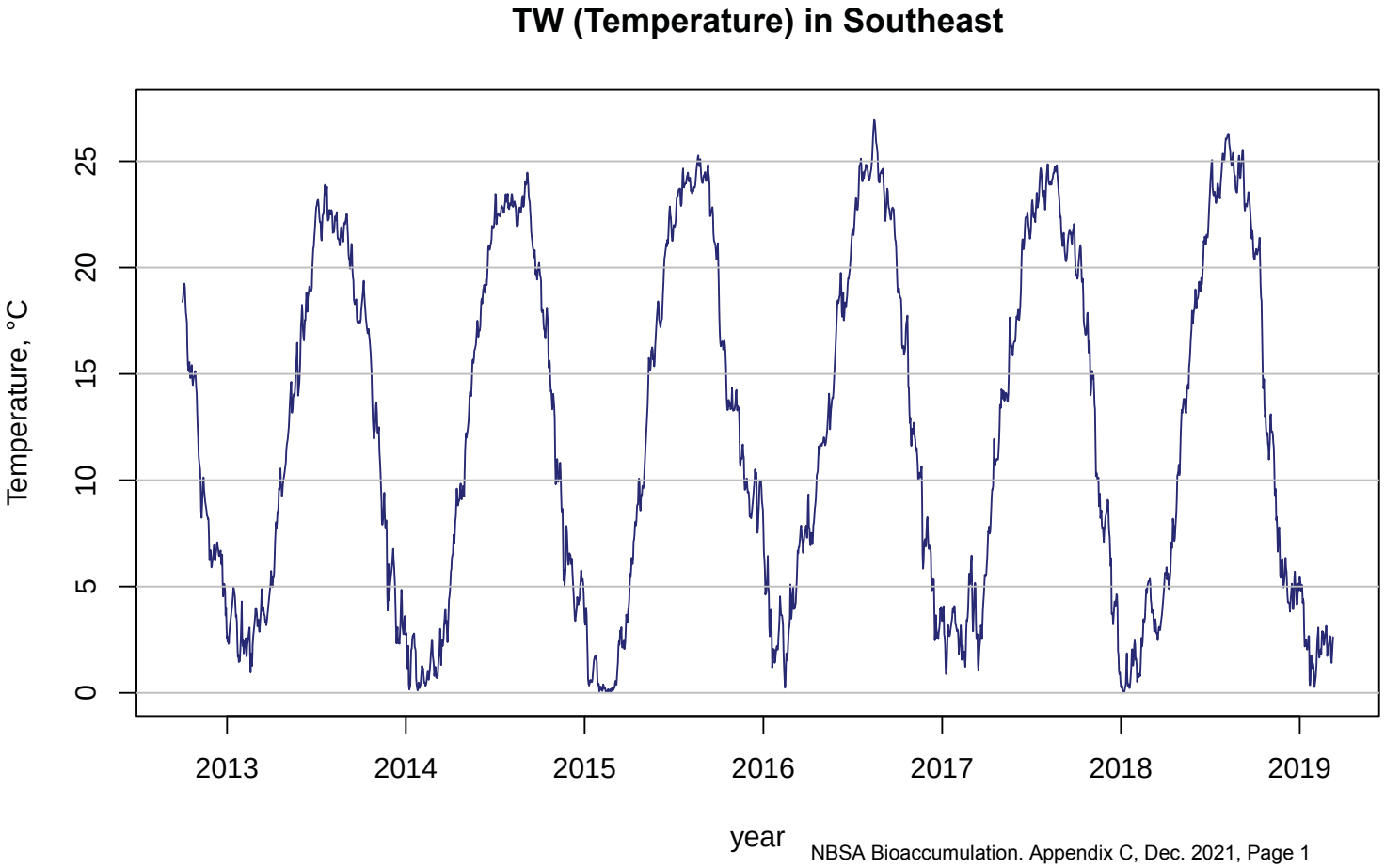
NBSA Species Name	Chesapeake Species or Surrogate
Leitoscoloplos sp	*Leitoscoloplos fragilis*
Grandidierella japonica	*Grandidierella spp.*
Pectinaria gouldii	*Pectinaria gouldi*
Tharyx acutus	*Tharyx sp. A Morris*
Hypereteone heteropoda	*Eteone heteropoda*
Alitta succinea	*Neanthes succinea*
Edotia triloba	*Edotea triloba*
Crepidula sp	*Crepidula fornicata*
Japonactaeon punctostriatus	*Rictaxis punctostriatus*
Spio filicornis	*Spio setosa*
Lyonsia arenosa	*Lyonsia hyalina*
Chaetopteridae	*Chaetopterus variopedatus*
Gyptis vittata	*Gyptis crypta*
Spionidae	*Spiophanes bombyx*
Eumida sanguinea	*Phyllodocidae*
Goniadidae	*Glycera spp.*
Petricolaria pholadiformis	*Petricola pholadiformis*
Pygospio elegans	*Spiophanes bombyx*
Parasabella microphthalma	*Microphthalmus spp.*
Capitella capitata	*Capitella capitata complex*
Crepidula convexa	*Crepidula fornicata*
Glycera sp	*Glycera spp.*
Scolelepis sp	*Scolelepis spp.*
Gammarus mucronatus	*Gammarus spp.*
Cossura longocirrata	*Cossuridae*
Streptosyllis websteri	*Streblospio benedicti*
Tubulanus pellucidus	*Oligochaeta*
Lineidae	*Nemertina*
Lyonsia sp	*Lyonsia hyalina*
Ampharete oculata	*Ampharetidae*
Elasmopus levis	*Elasmopus laevis*
Prionospio sp	*Prionospio perkinsi*
Nephtys sp	*Nephtyidae*
Haustorius canadensis	*Amphipoda*
Schistomeringos annulata	*Nereididae*
Salvatoria clavata	*Synidotea spp.*

NBSA Species Name	Chesapeake Species or Surrogate
Synidotea laevidorsalis	*Synidotea spp.*
Cerapus sp	*Cerapus tubularis*
Boonea bisuturalis	*Boonea impressa*
Streptosyllis verrilli	*Streptosyllis pettiboneae*
Ameroculodes edwardsi	*Ameroculodes species complex*
Alitta virens	*Nereididae*
Odostomia eburnea	*Odostomia spp.*
Spurwinkia salsa	*Gastropoda*
Gammarus sp	*Gammarus spp.*
Ampharete sp	*Ampharetidae*

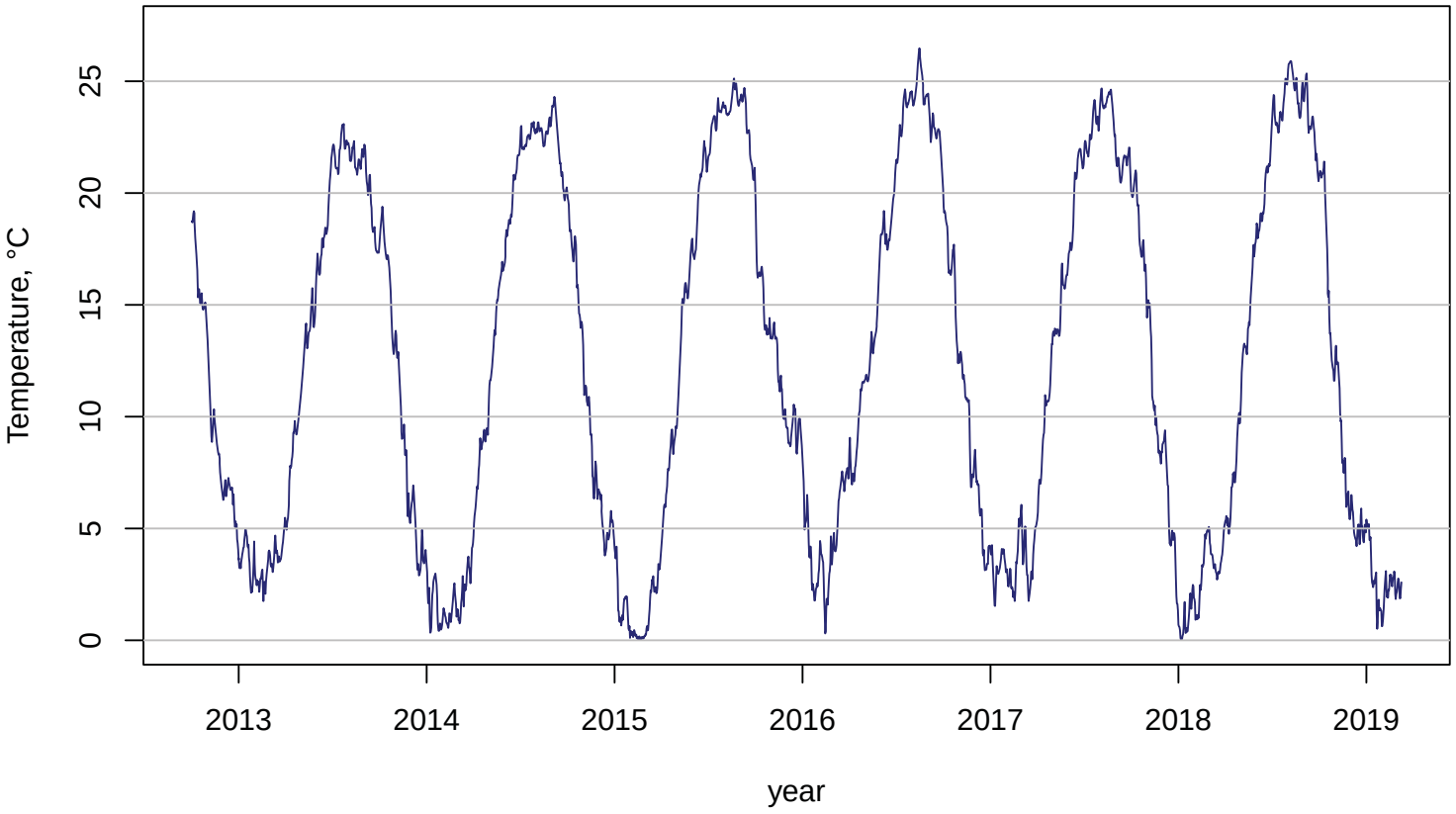
APPENDIX C: MODEL LINKAGE INPUTS

CFT Model linkage results for the Newark Bay Study Area follow:

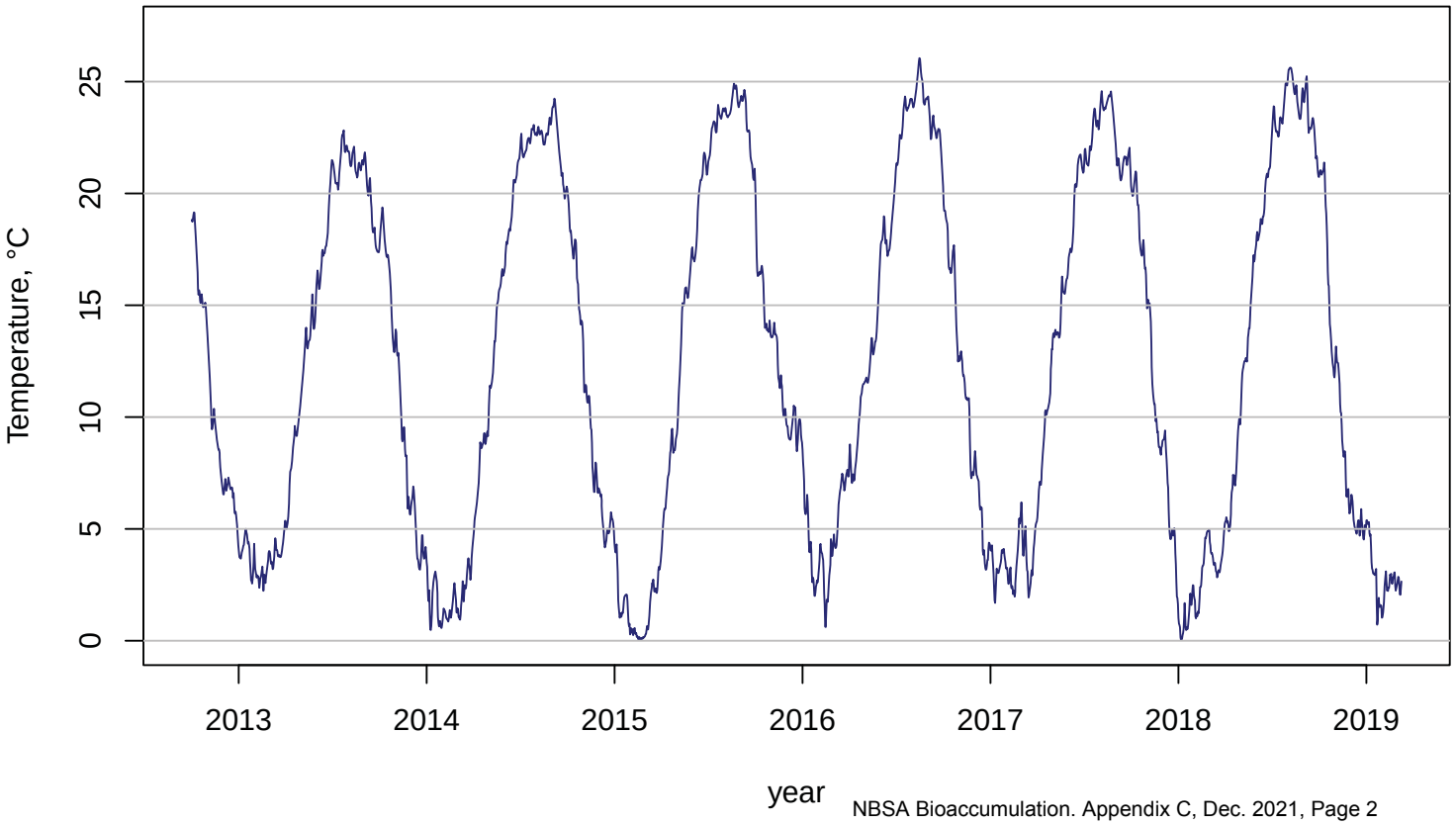

TW (Temperature) in North
Temperature, °C
0
5
10
15
20
25
2013
2014
2015
2016
2017
2018
2019
year

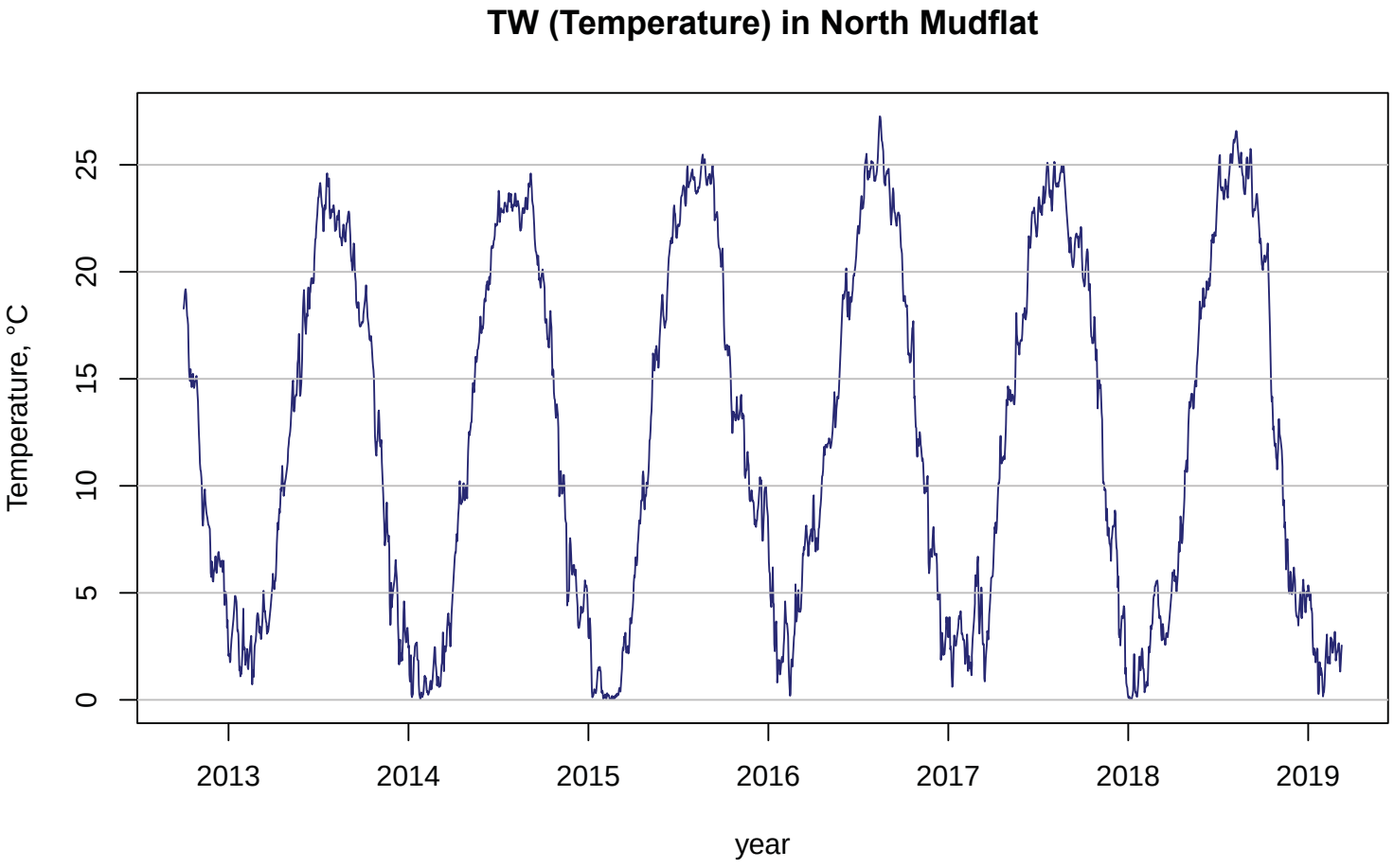

TW (Temperature) in Southeast
Temperature, °C
0
5
10
15
20
25
2013
2014
2015
2016
2017
2018
2019
year

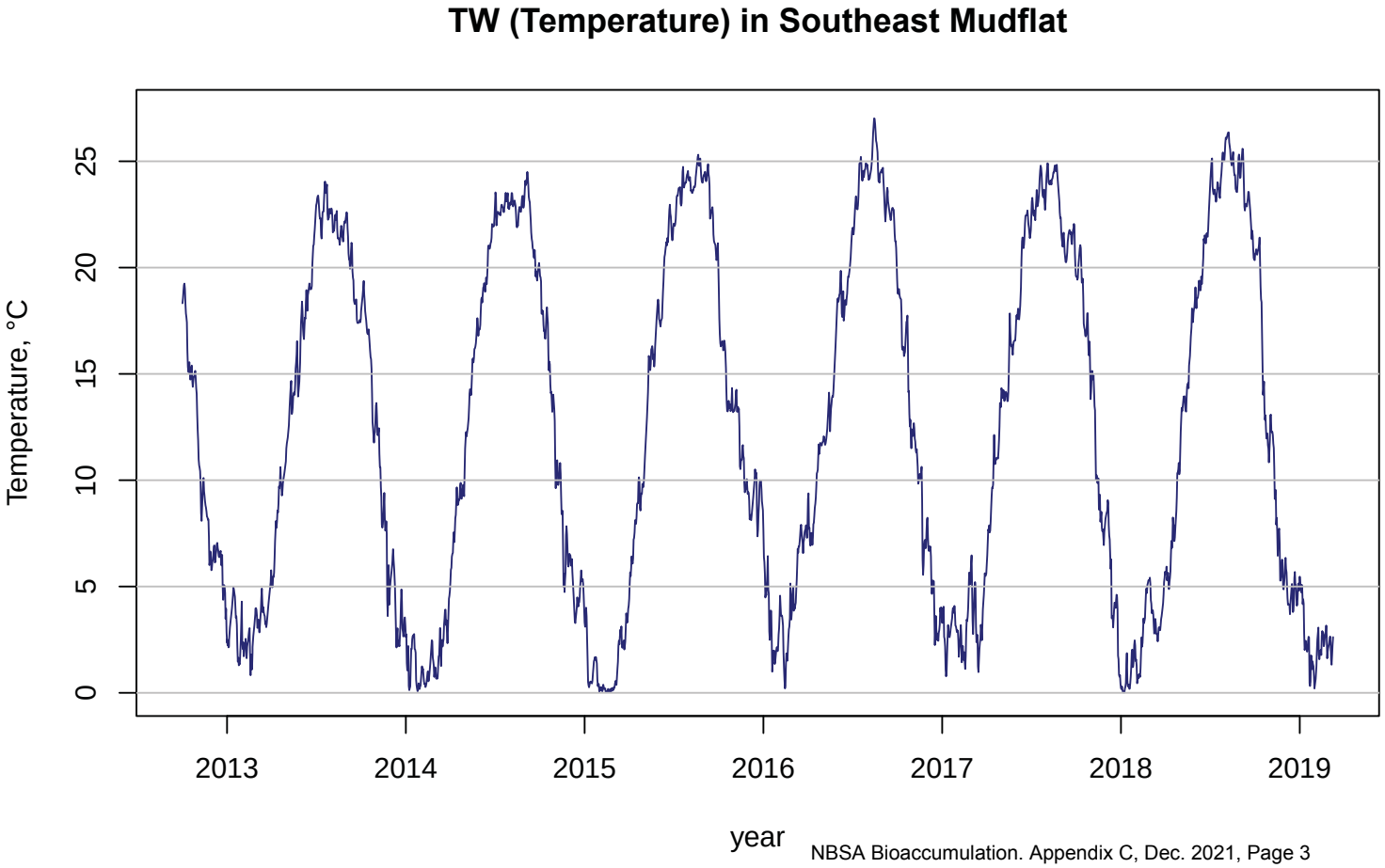
TW (Temperature) in Southwest

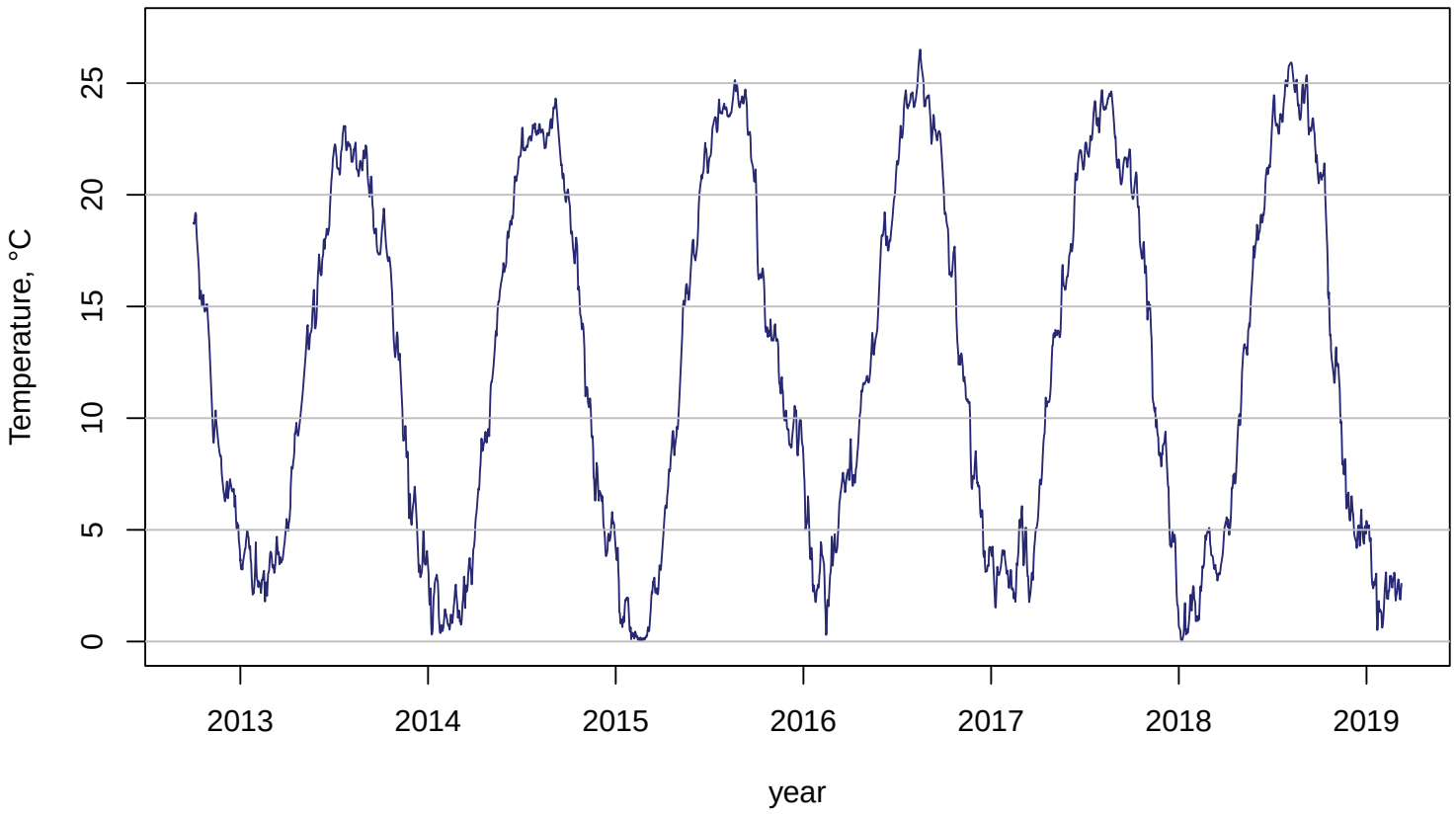


TW (Temperature) in Channel

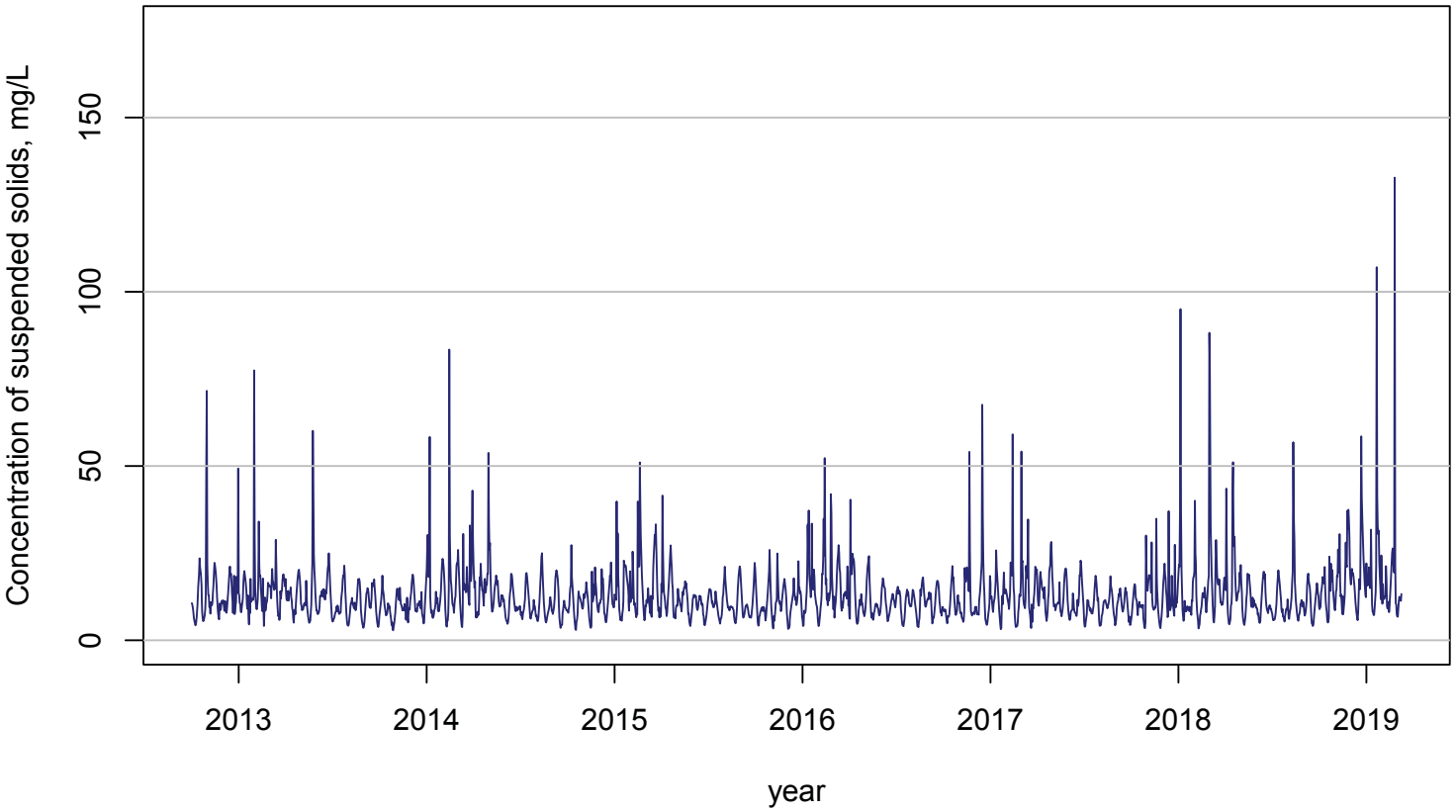



TW (Temperature) in North Mudflat
Temperature, °C
0
5
10
15
20
25
2013
2014
2015
2016
2017
2018
2019
year

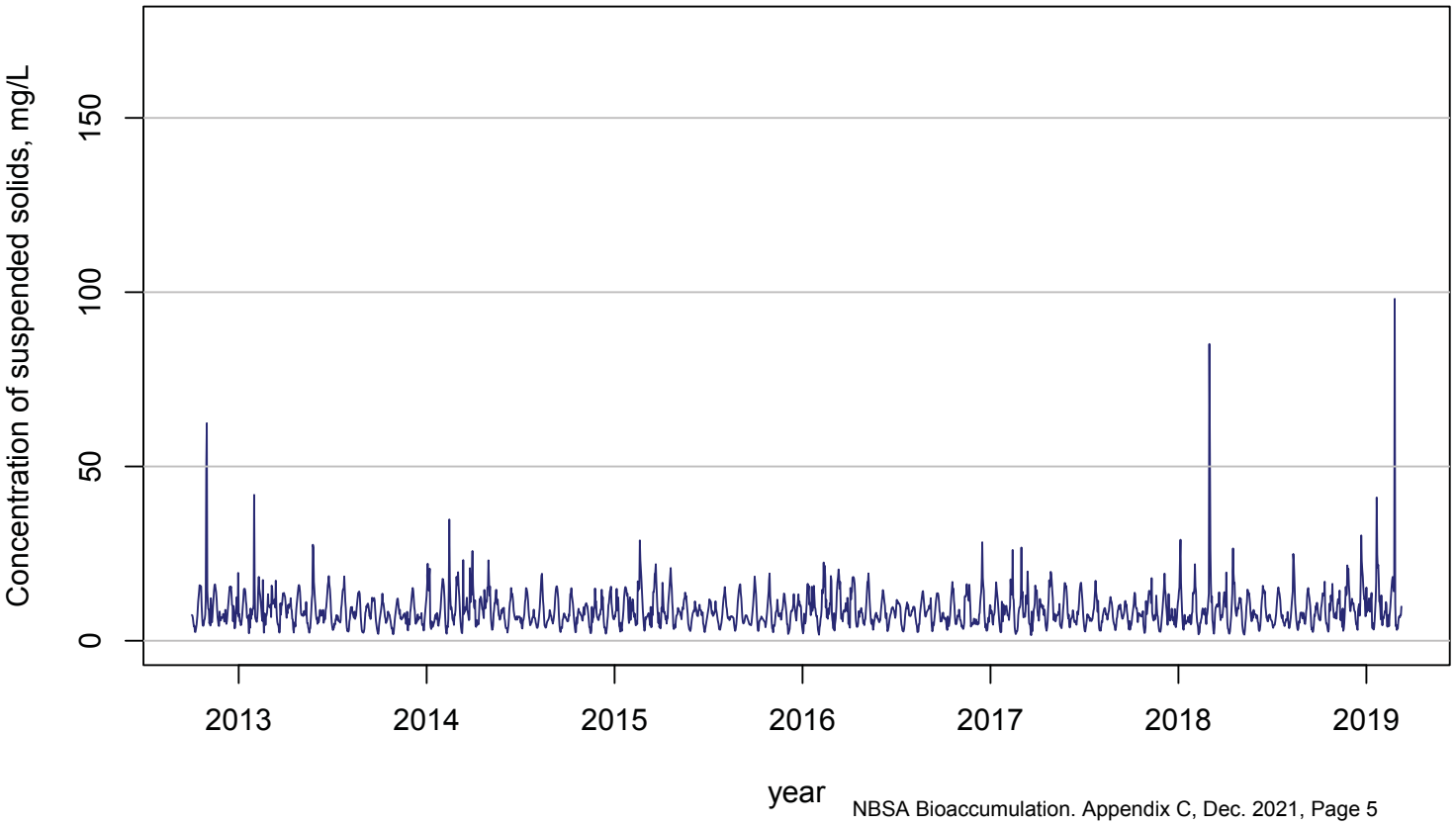

TW (Temperature) in Southeast Mudflat
Temperature, °C
0
5
10
15
20
25
2013
2014
2015
2016
2017
2018
2019
year


TW (Temperature) in Southwest Mudflat
Temperature, °C
0
5
10
15
20
25
2013
2014
2015
2016
2017
2018
2019
year

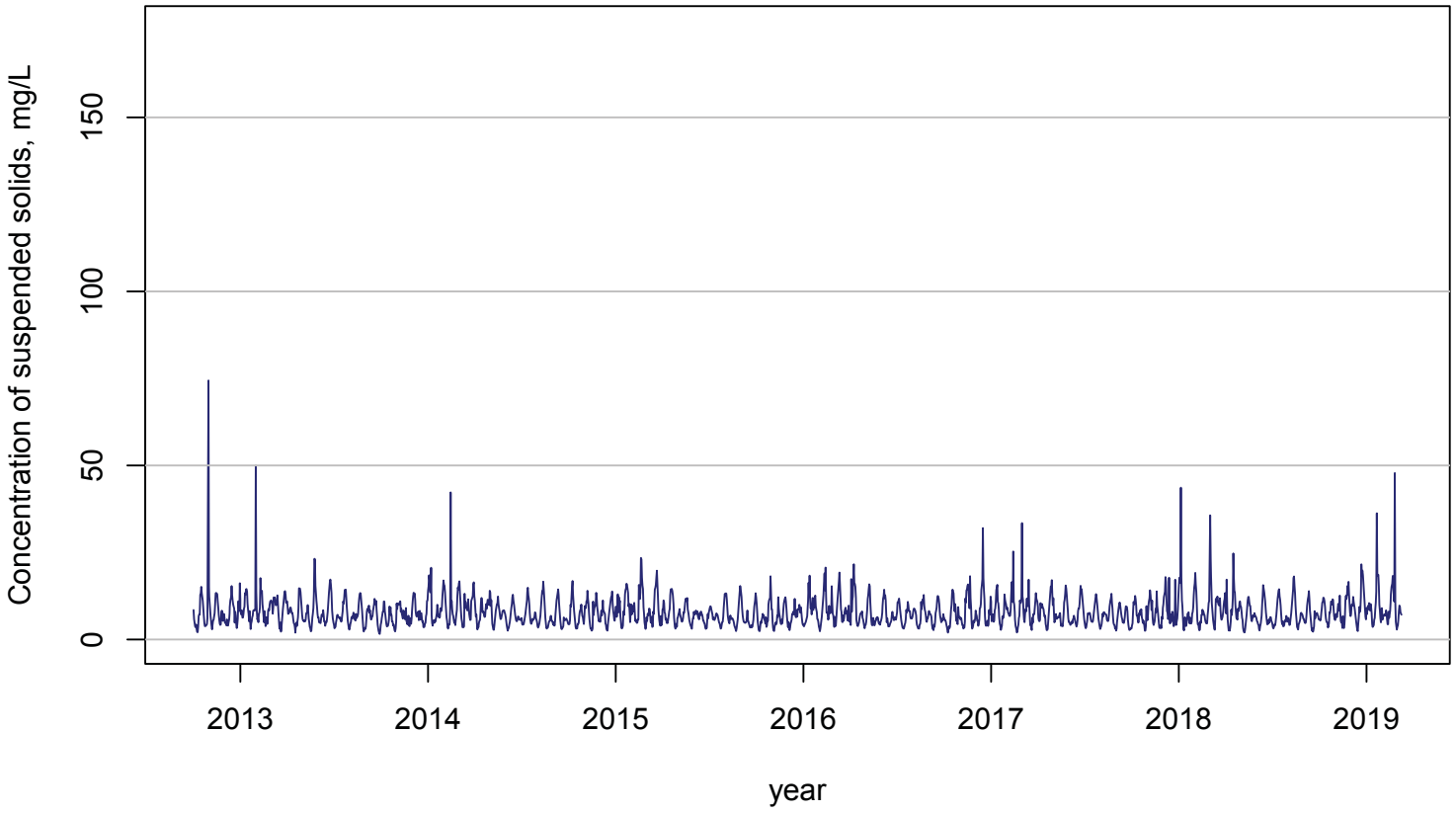
CPW (Conc. of suspended solids) in North



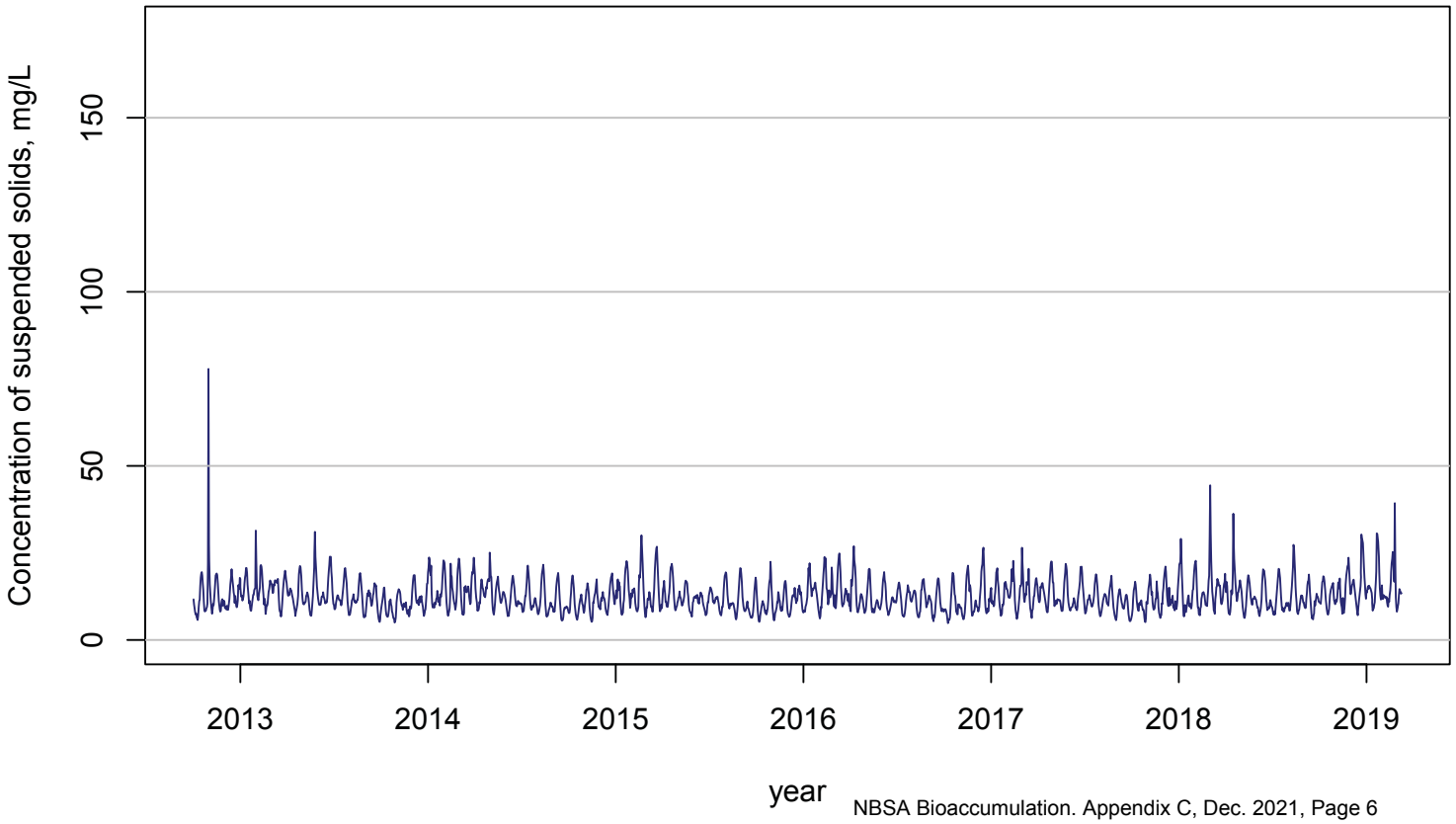
CPW (Conc. of suspended solids) in Southeast

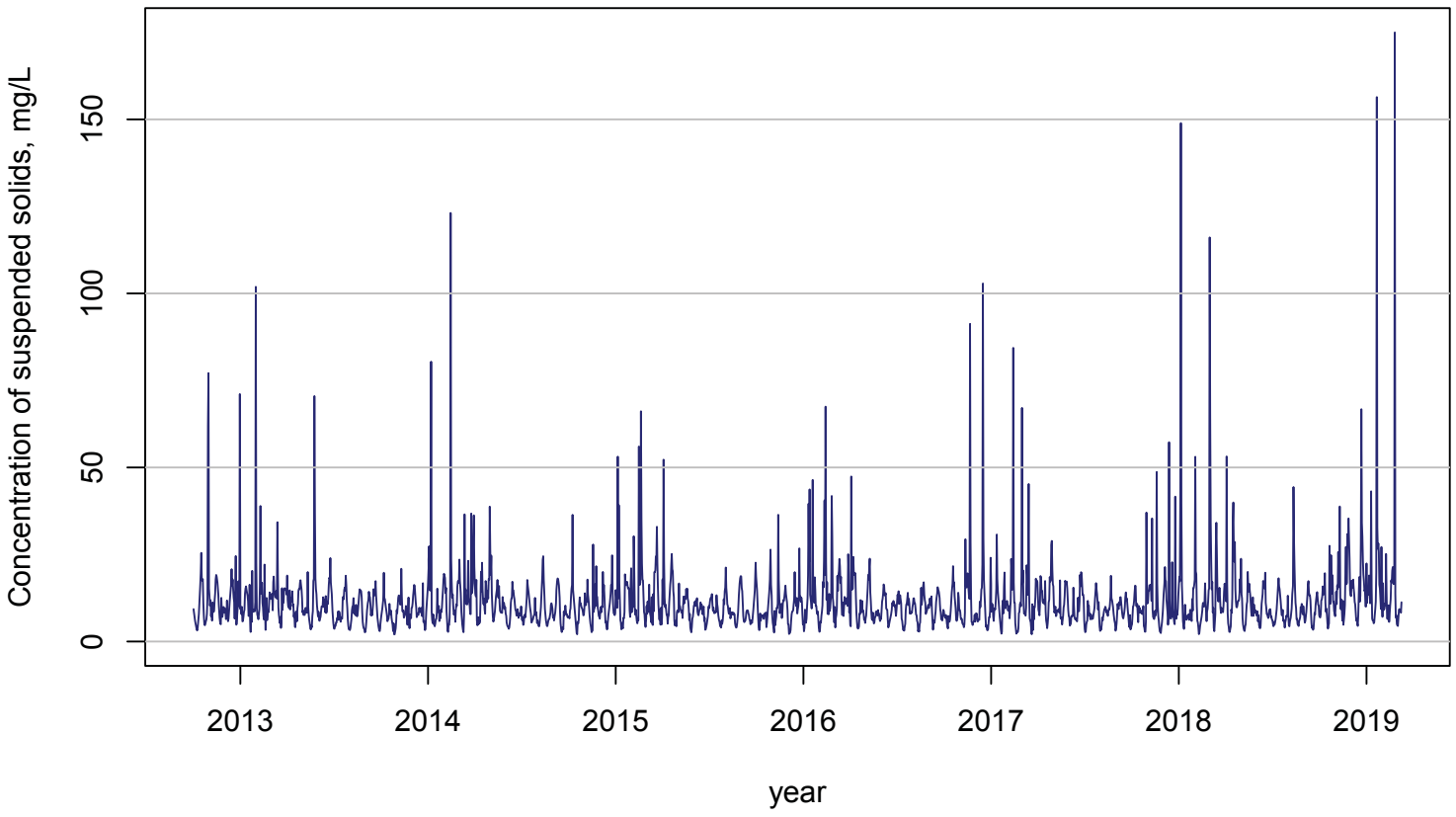


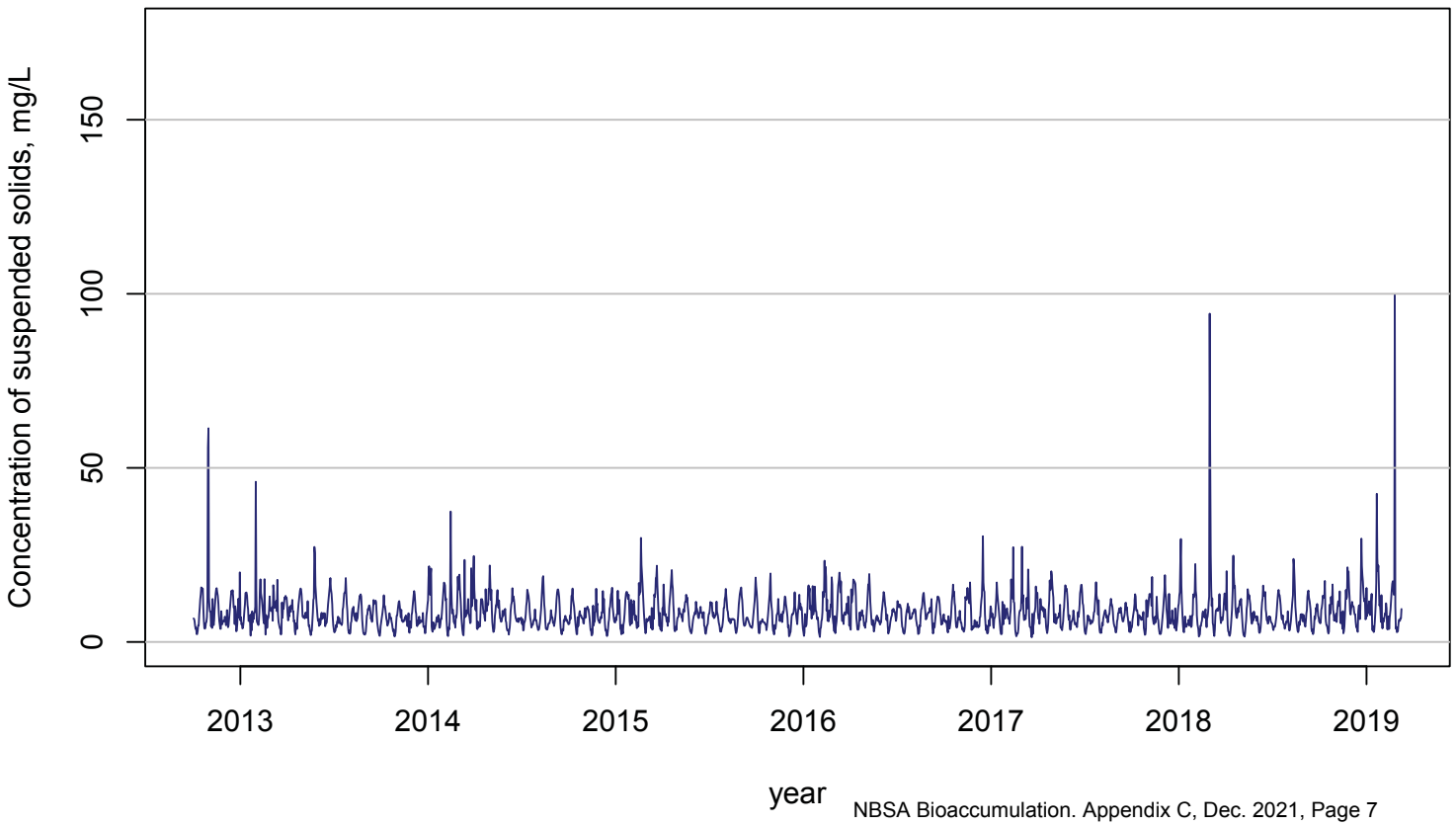
CPW (Conc. of suspended solids) in Southwest

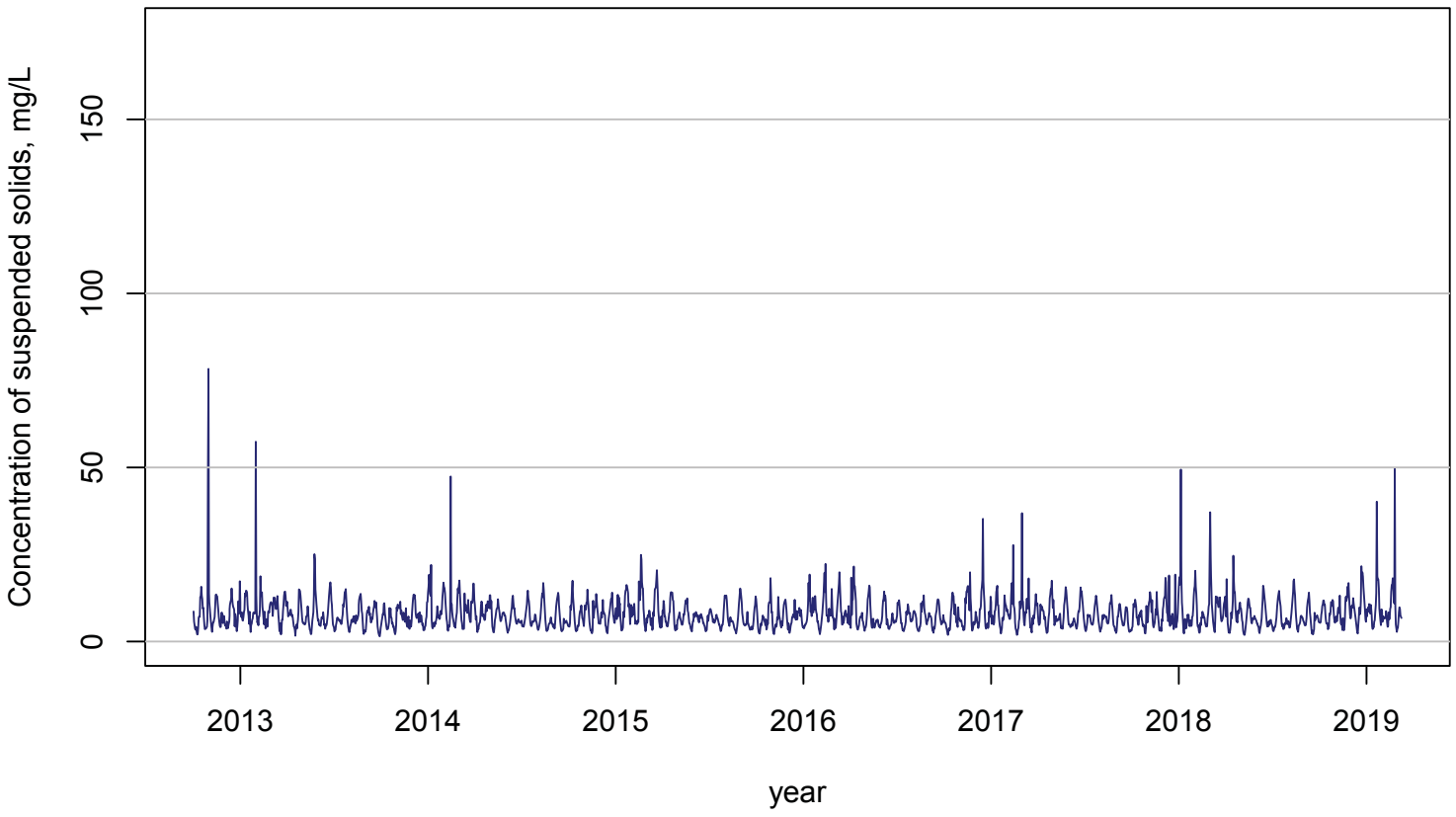


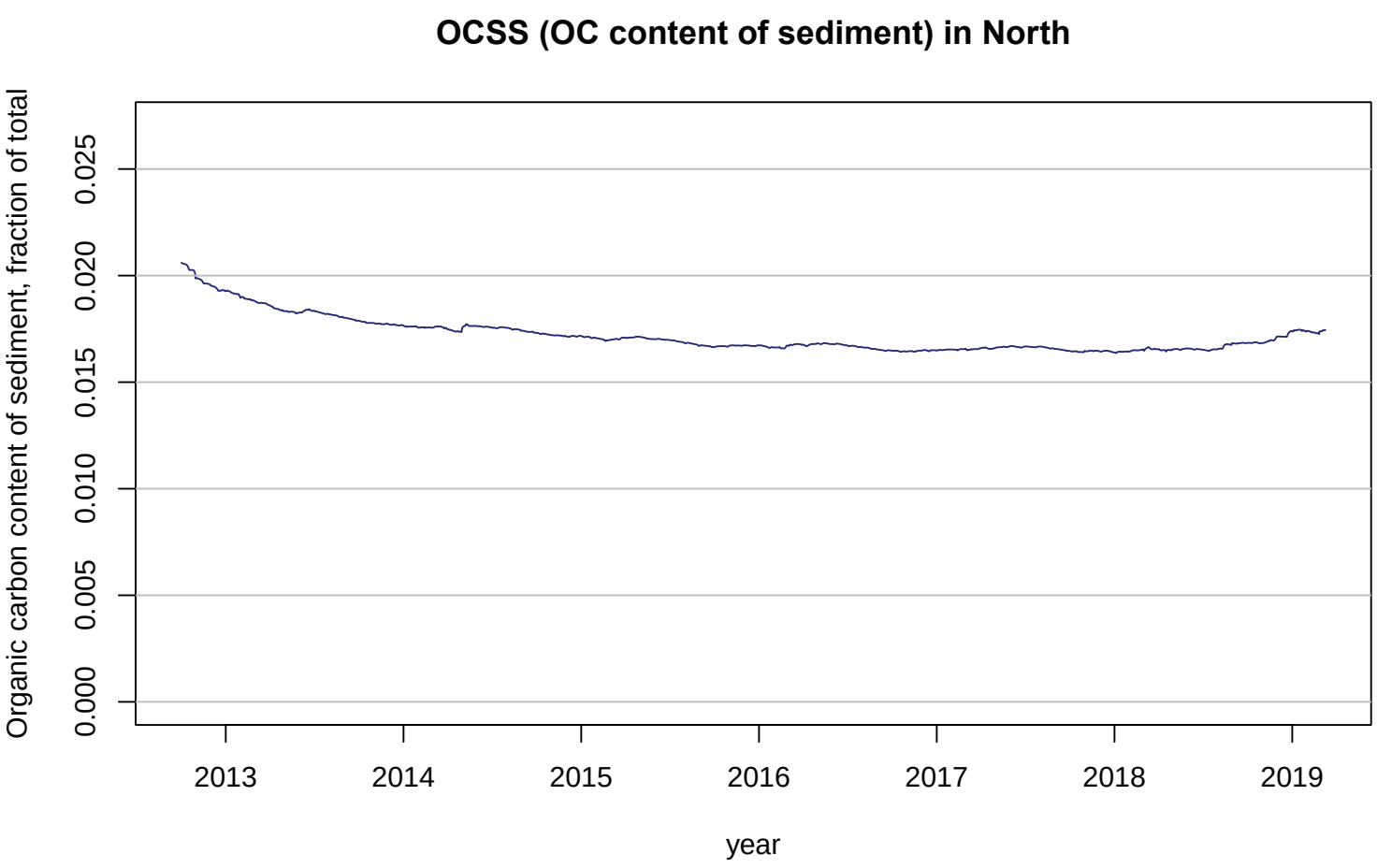
CPW (Conc. of suspended solids) in Channel

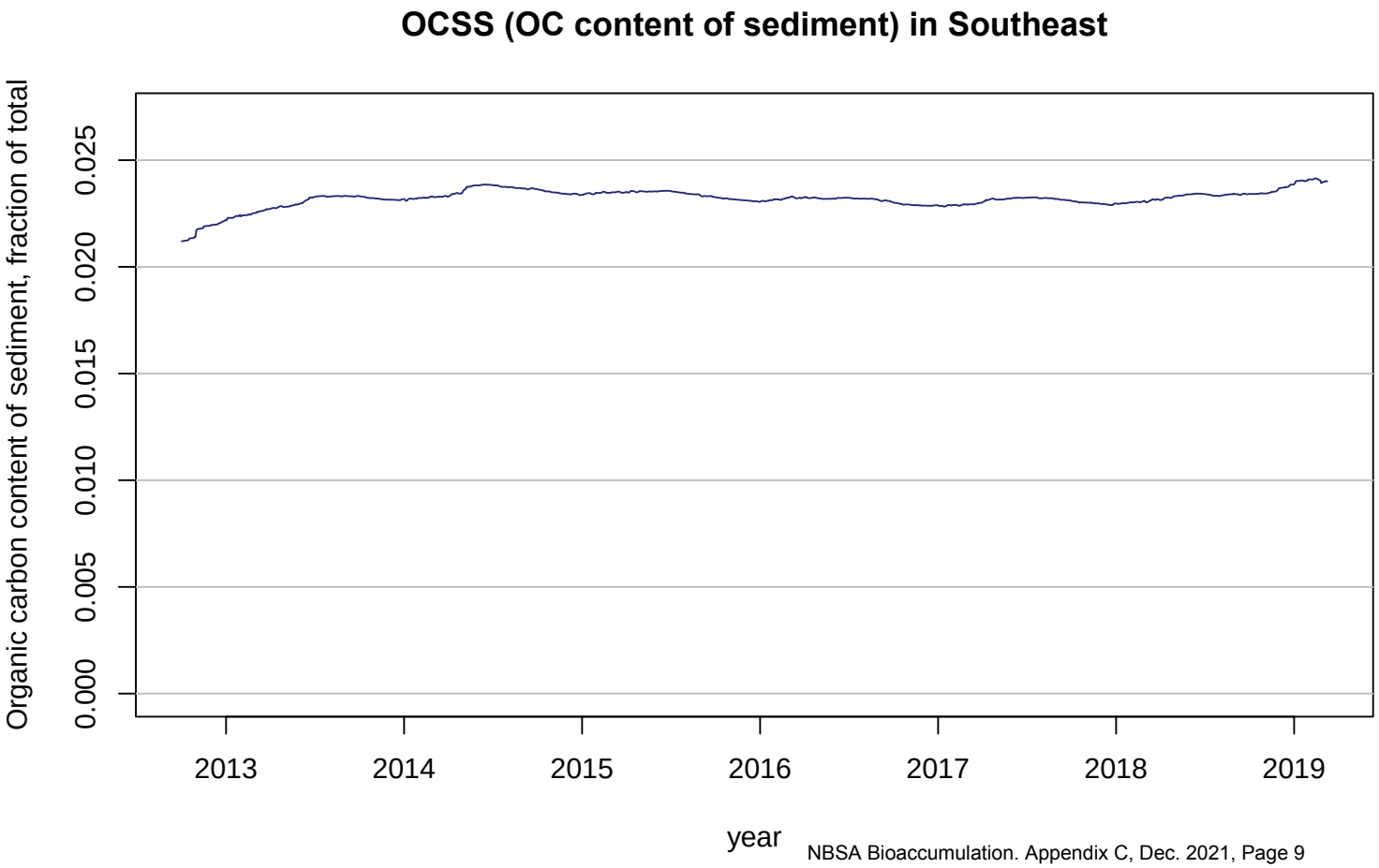


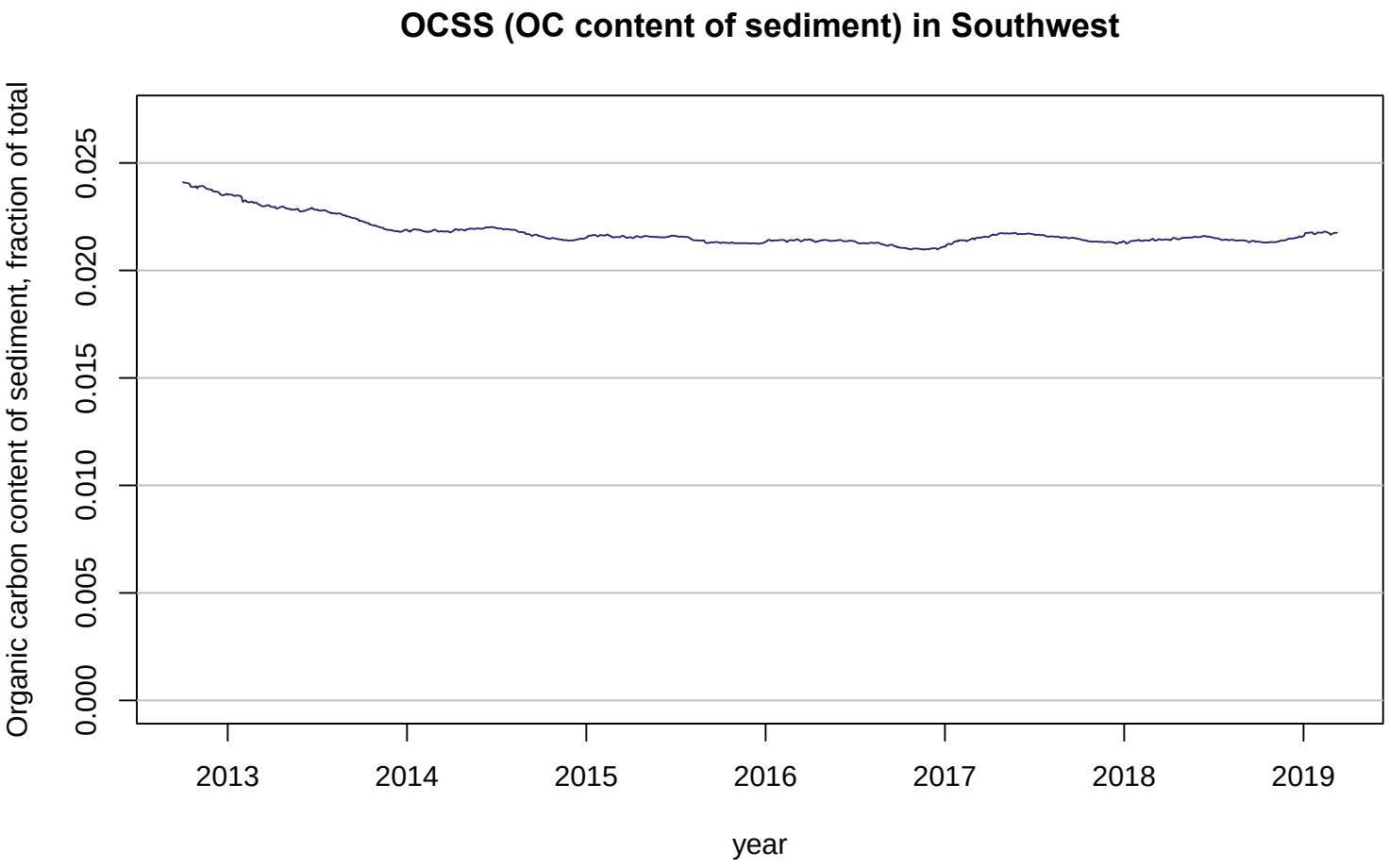

CPW (Conc. of suspended solids) in North Mudflat
Concentration of suspended solids, mg/L
0
50
100
150
2013
2014
2015
2016
2017
2018
2019
year

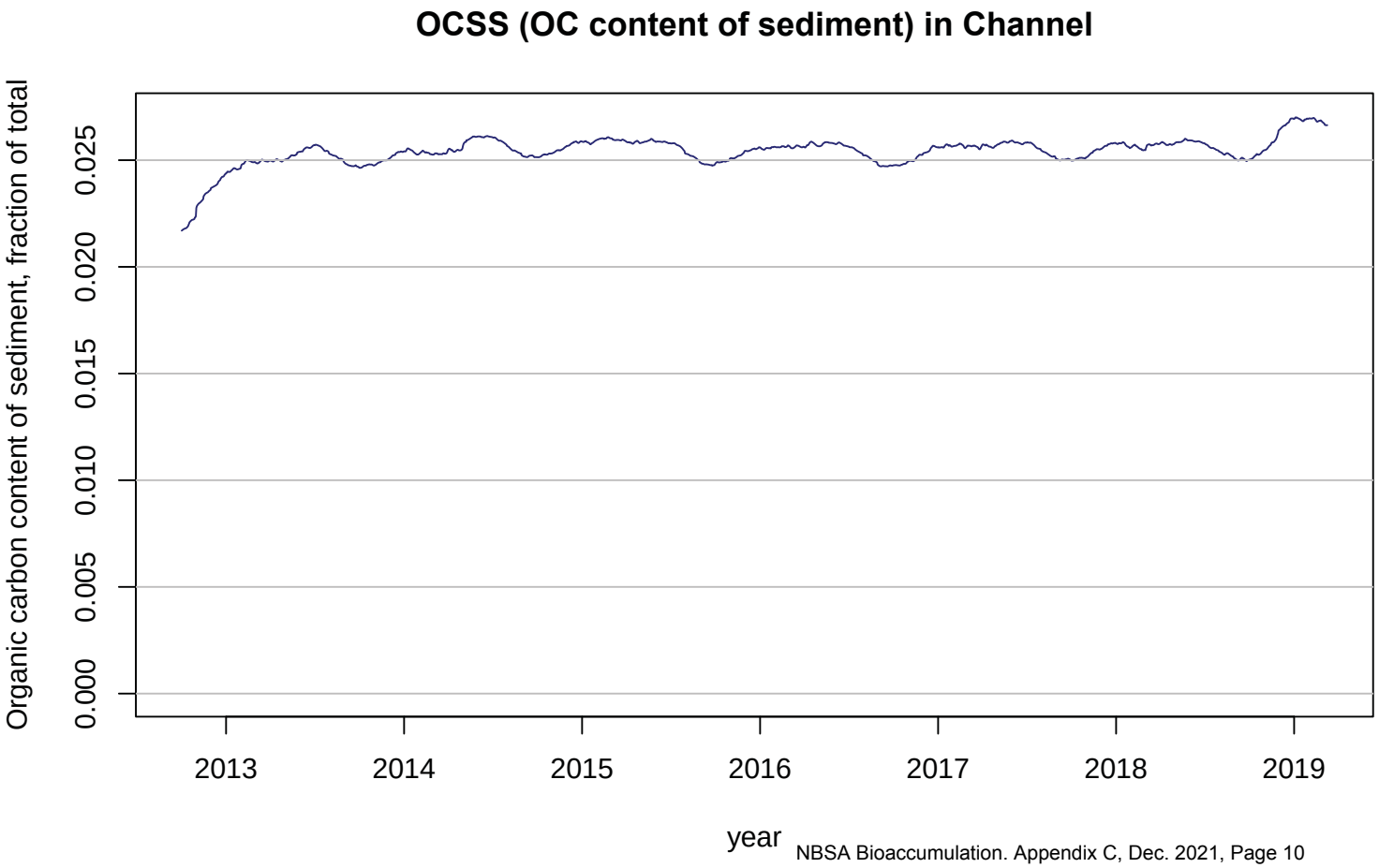

CPW (Conc. of suspended solids) in Southeast Mudflat
Concentration of suspended solids, mg/L
0
50
100
150
2013
2014
2015
2016
2017
2018
2019
year


CPW (Conc. of suspended solids) in Southwest Mudflat
Concentration of suspended solids, mg/L
0
50
100
150
2013
2014
2015
2016
2017
2018
2019
year

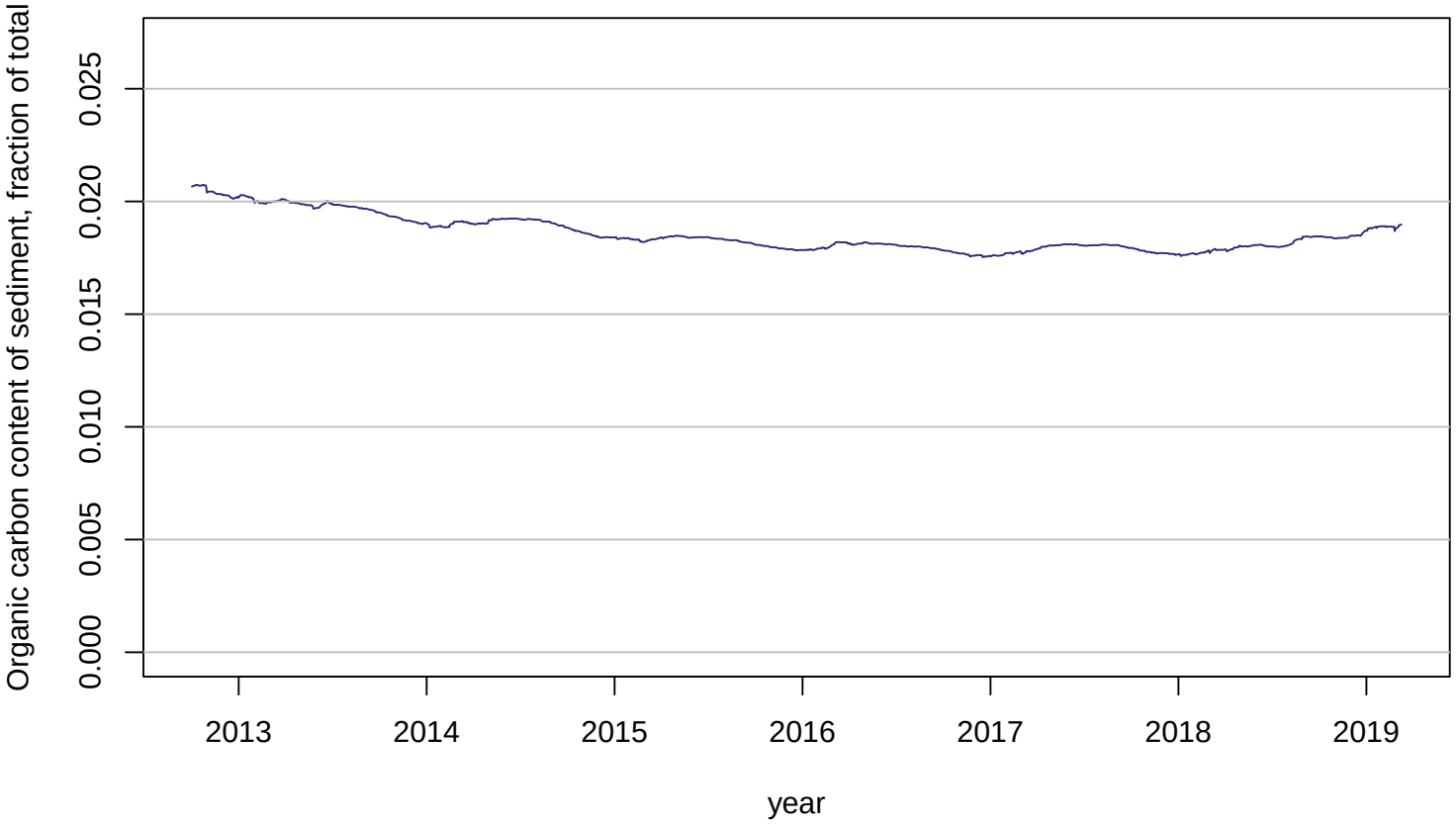

OCSS (OC content of sediment) in North
Organic carbon content of sediment, fraction of total
0.000
0.005
0.010
0.015
0.020
0.025
2013
2014
2015
2016
2017
2018
2019
year


OCSS (OC content of sediment) in Southeast
Organic carbon content of sediment, fraction of total
0.000
0.005
0.010
0.015
0.020
0.025
2013
2014
2015
2016
2017
2018
2019
year

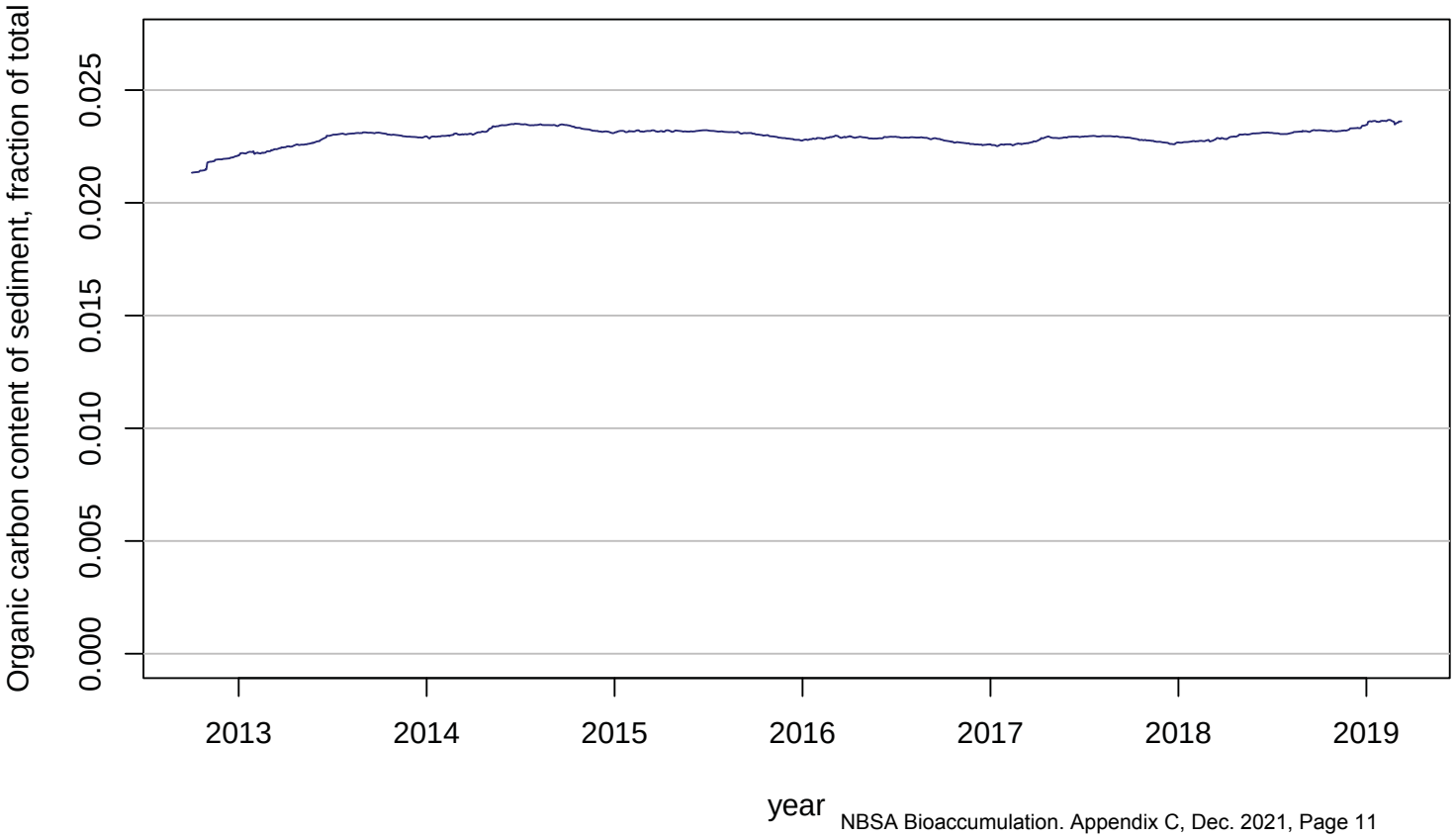

OCSS (OC content of sediment) in Southwest
Organic carbon content of sediment, fraction of total
0.000
0.005
0.010
0.015
0.020
0.025
2013
2014
2015
2016
2017
2018
2019
year

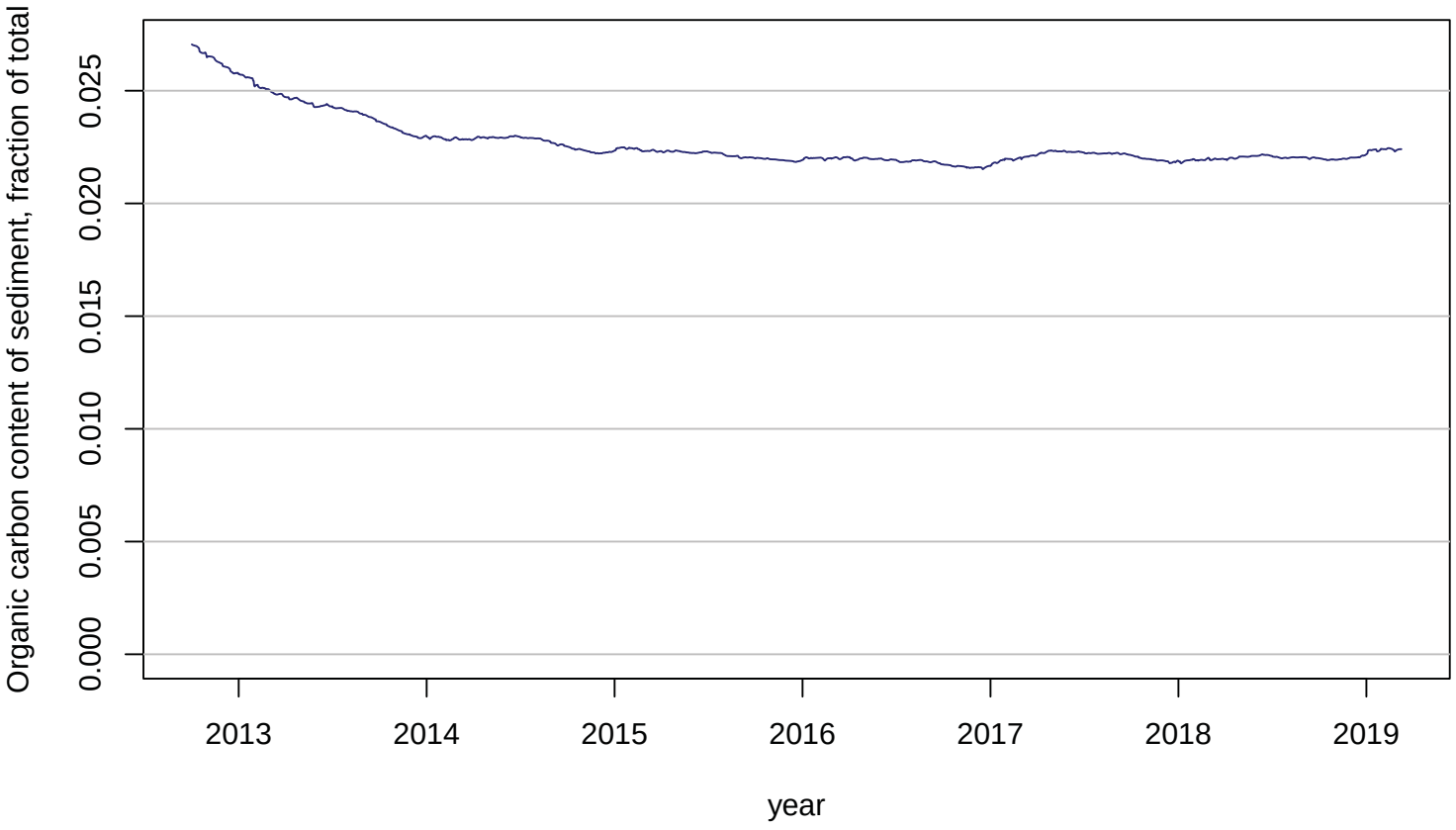

OCSS (OC content of sediment) in Channel
Organic carbon content of sediment, fraction of total
0.000
0.005
0.010
0.015
0.020
0.025
2013
2014
2015
2016
2017
2018
2019
year

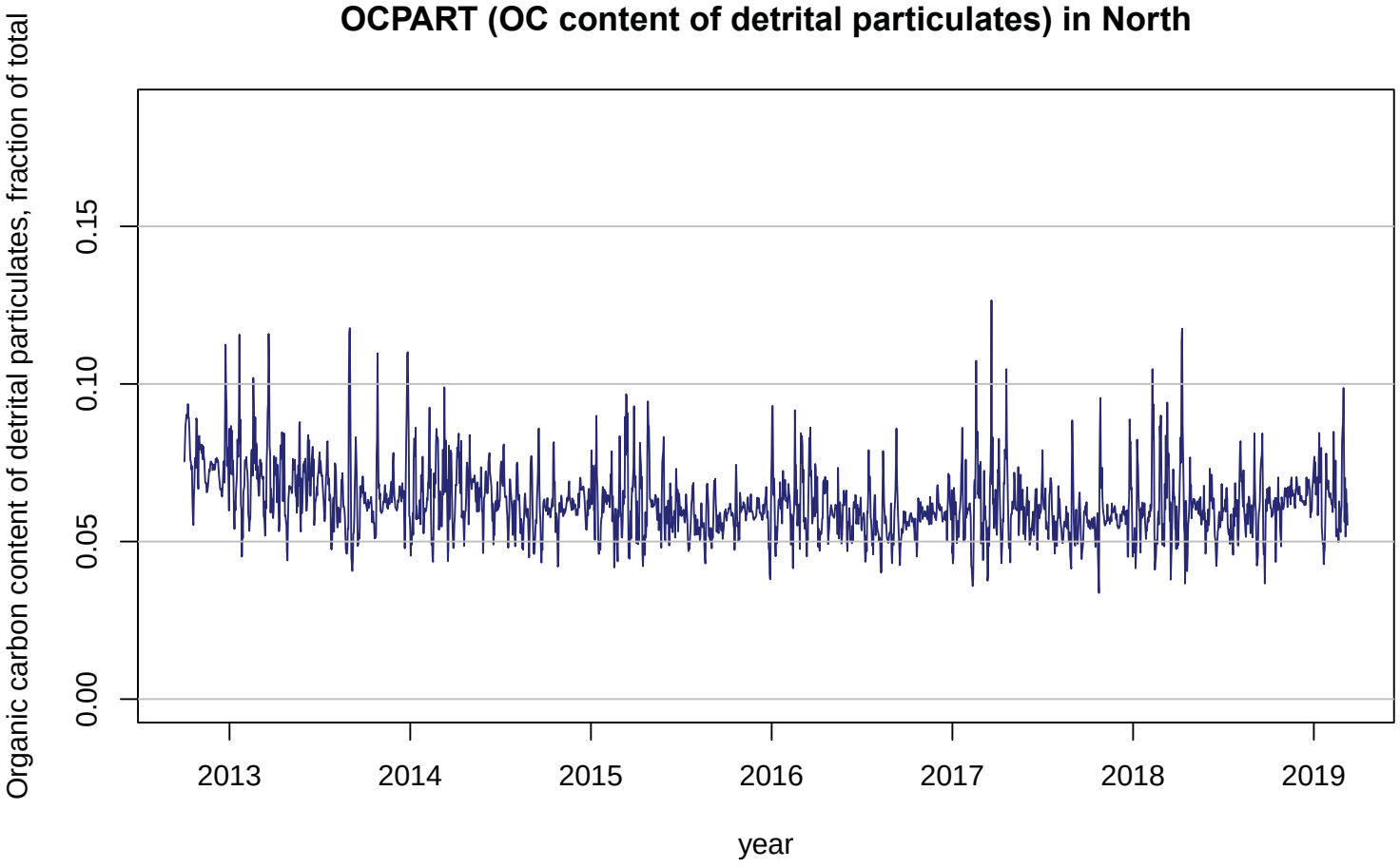
OCSS (OC content of sediment) in North Mudflat

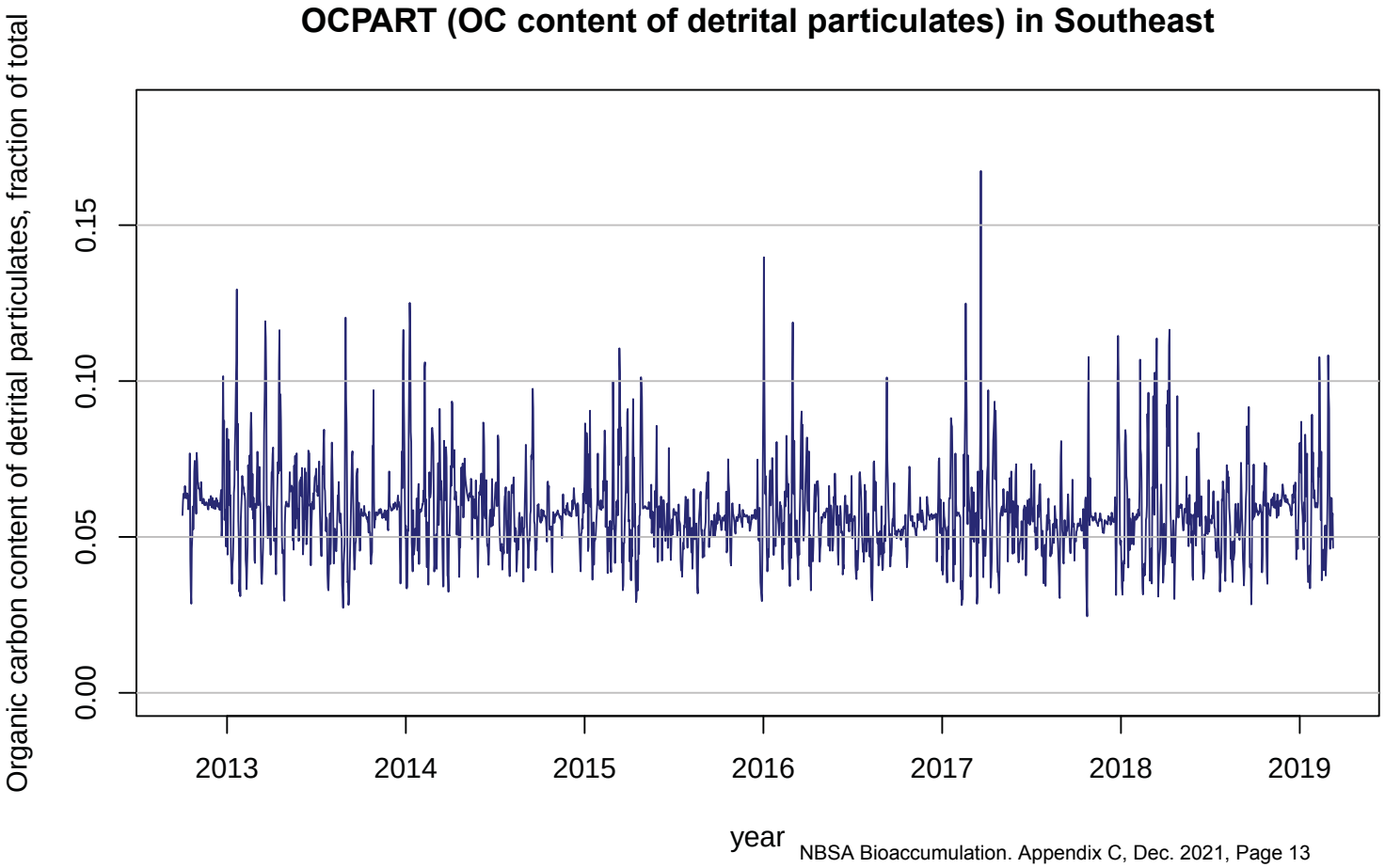


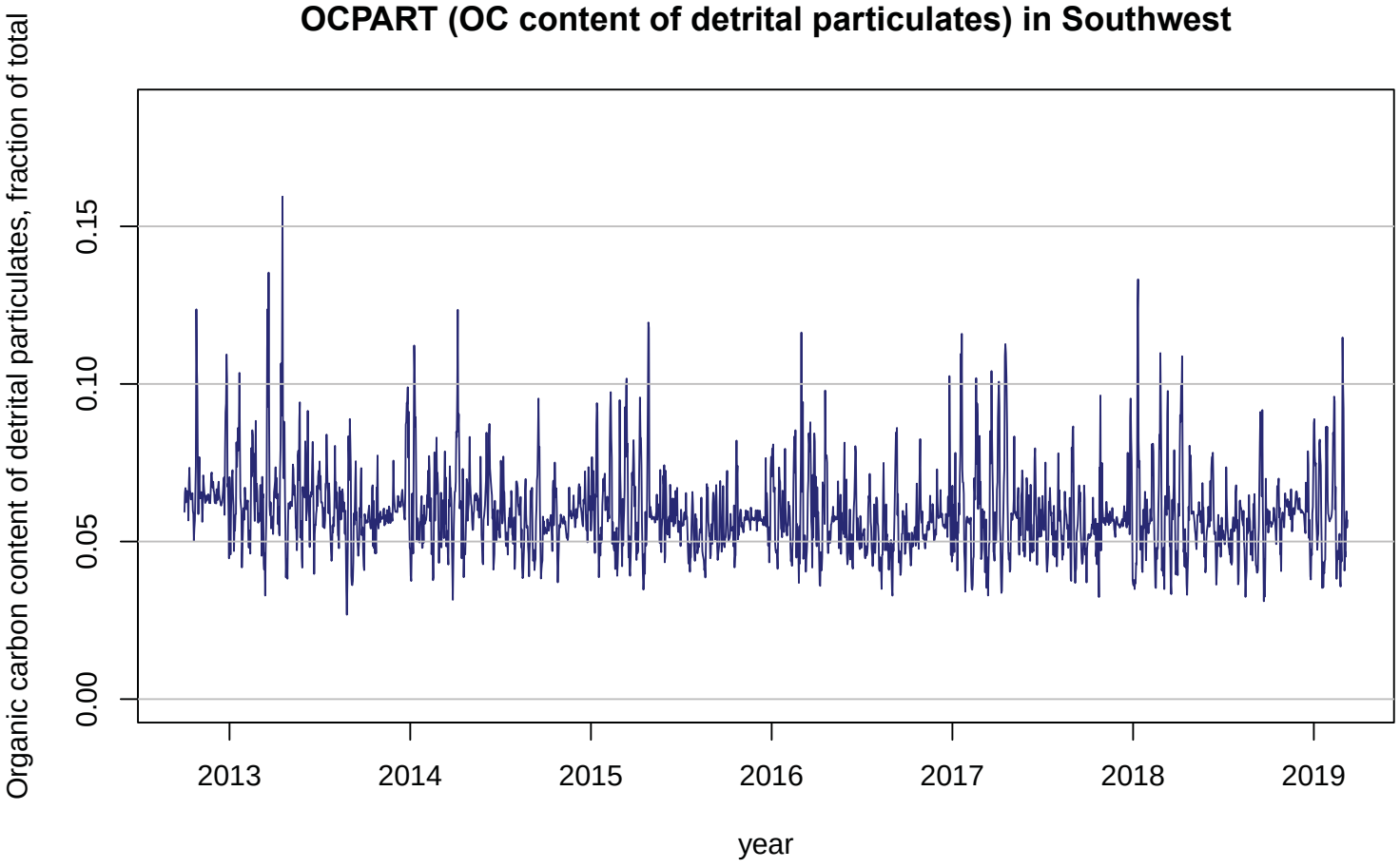
OCSS (OC content of sediment) in Southeast Mudflat

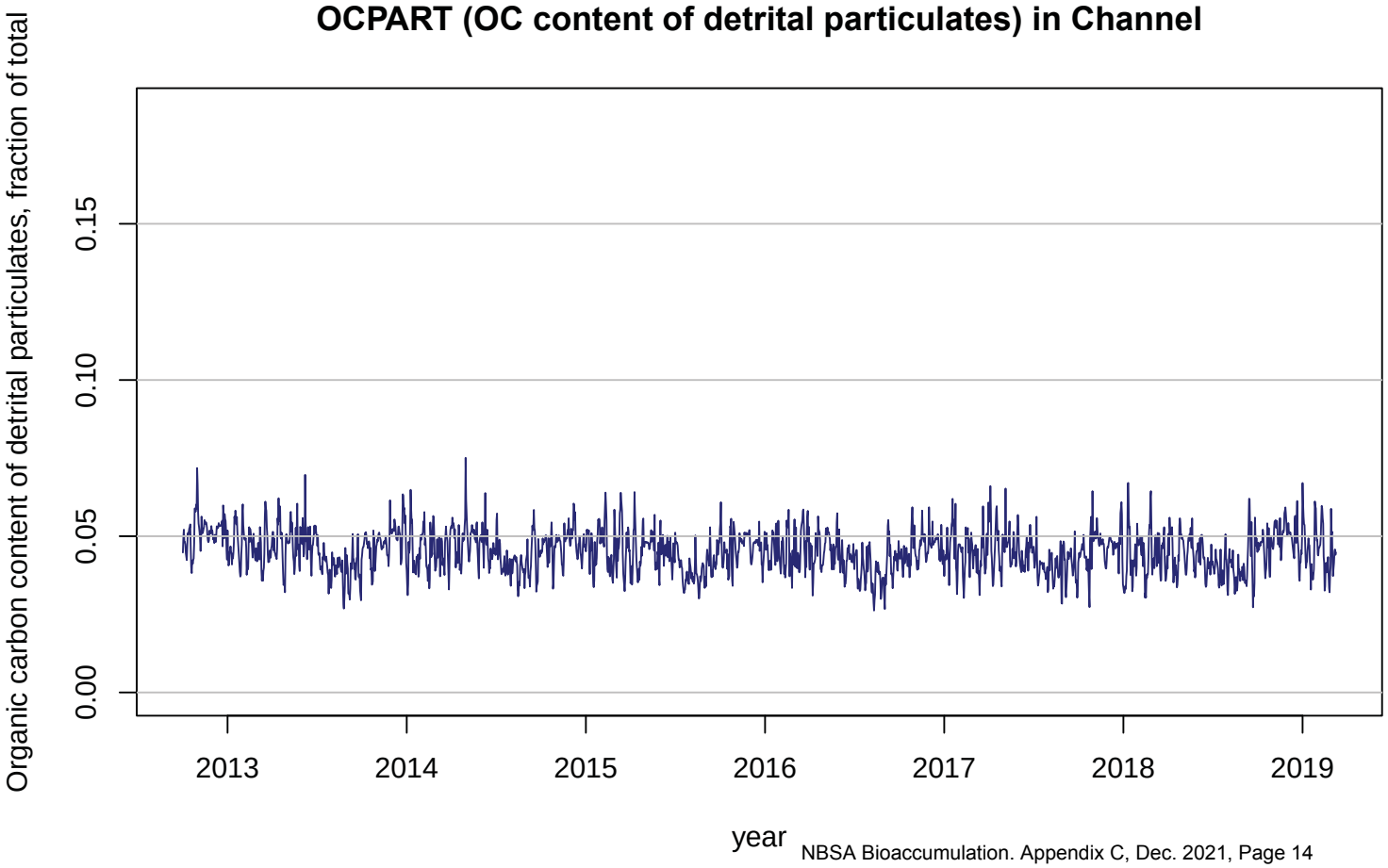


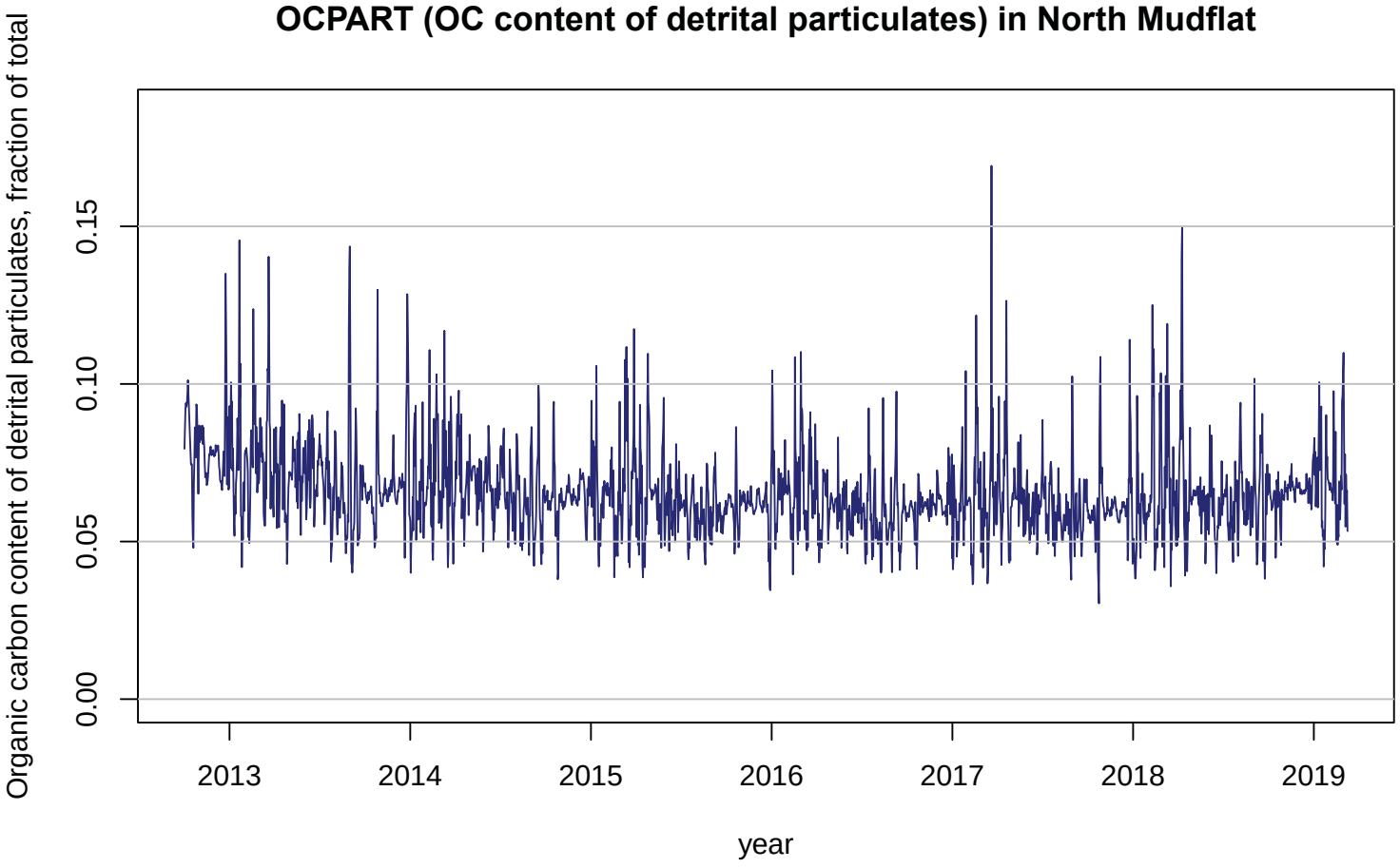

OCSS (OC content of sediment) in Southwest Mudflat
Organic carbon content of sediment, fraction of total
0.000
0.005
0.010
0.015
0.020
0.025
2013
2014
2015
2016
2017
2018
2019
year

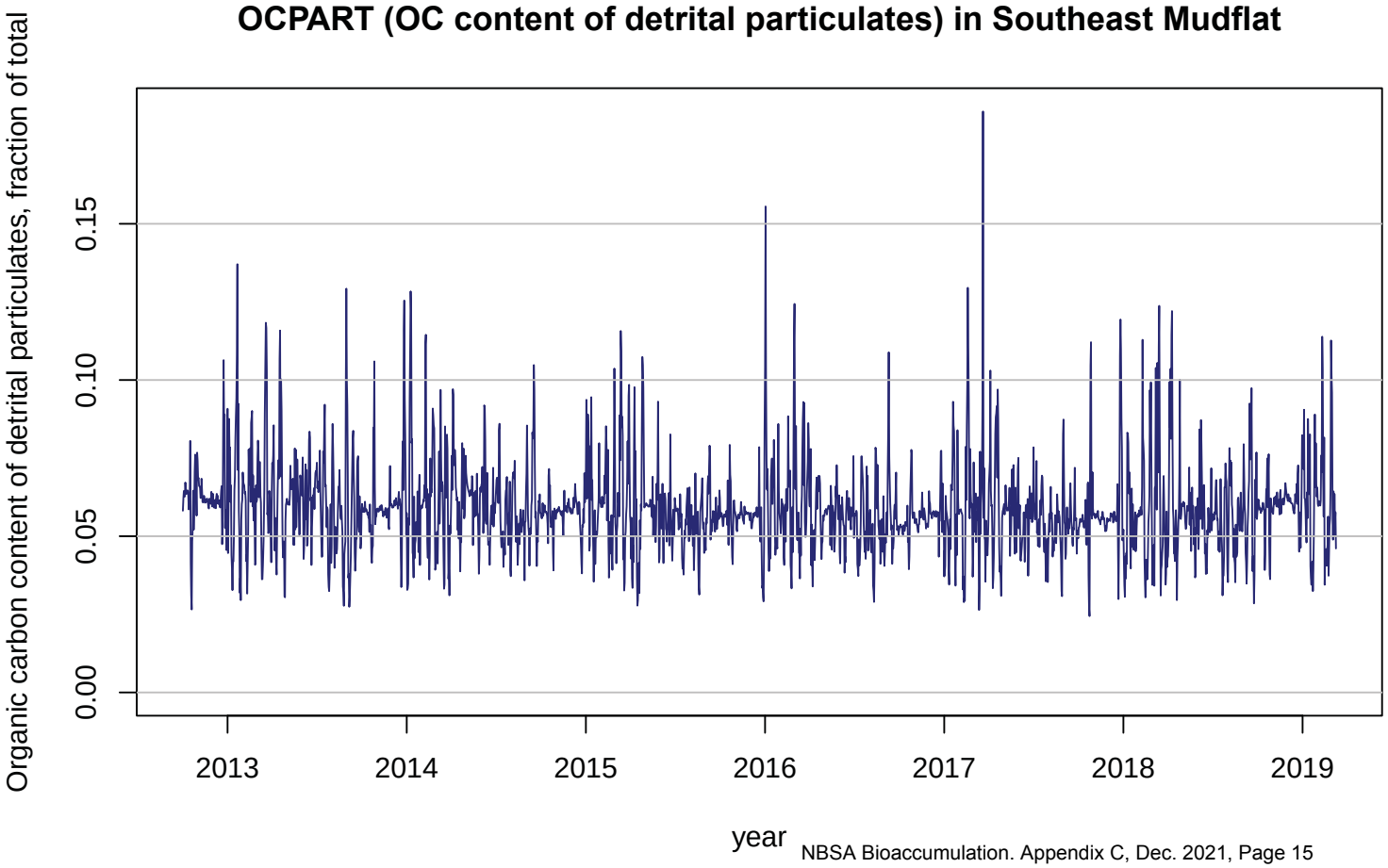

OCPART (OC content of detrital particulates) in North
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

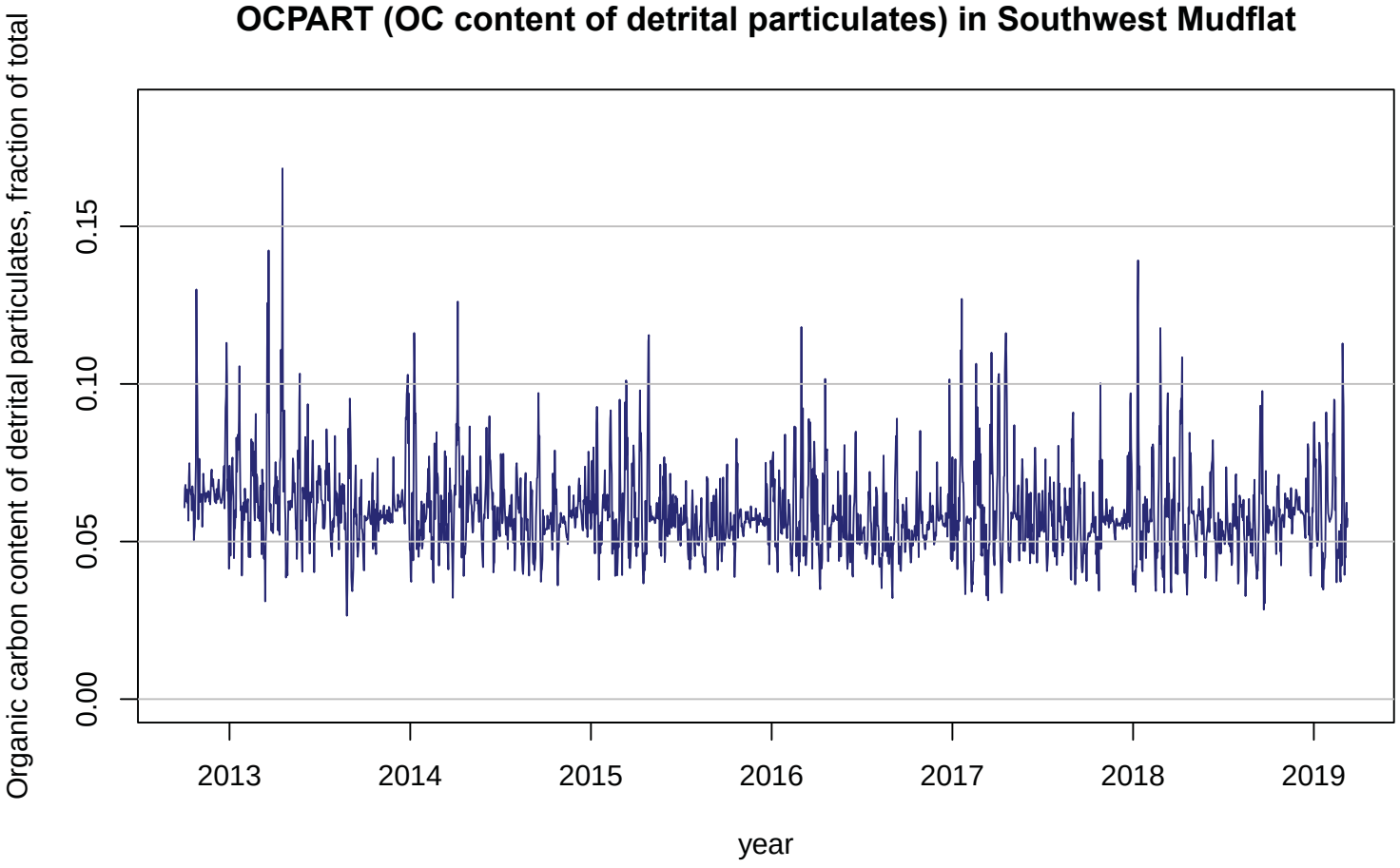

OCPART (OC content of detrital particulates) in Southeast
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

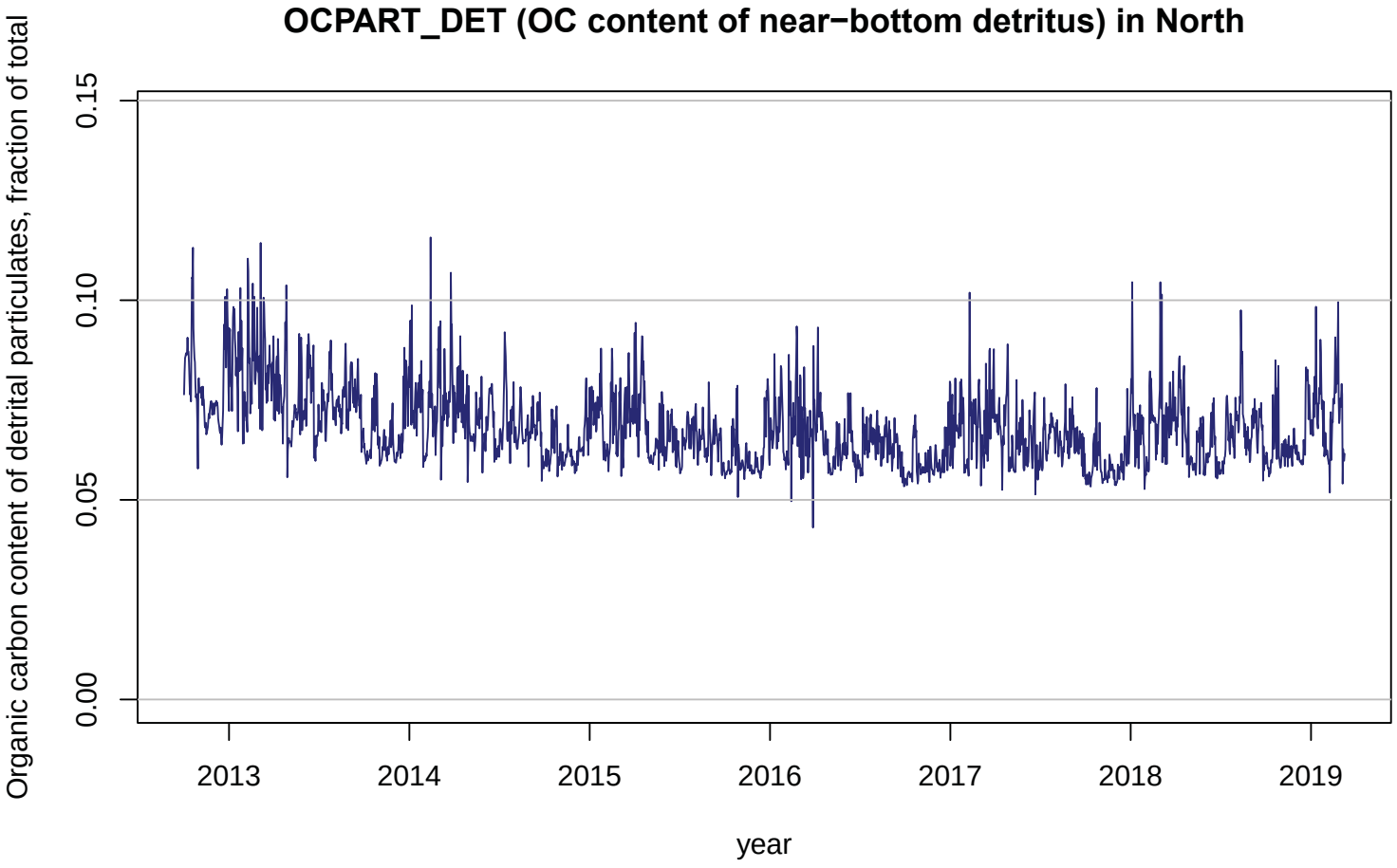

OCPART (OC content of detrital particulates) in Southwest
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

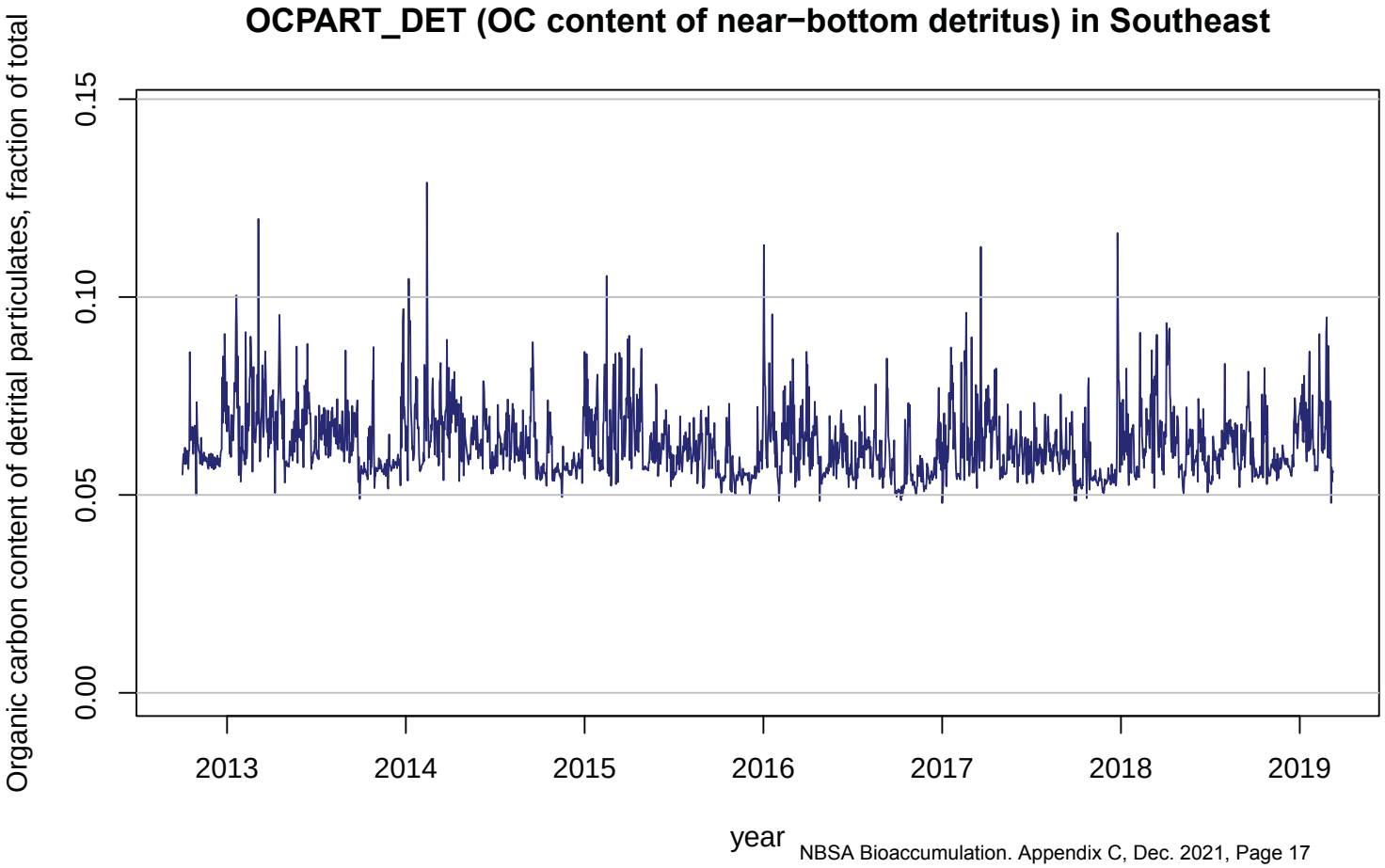

OCPART (OC content of detrital particulates) in Channel
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

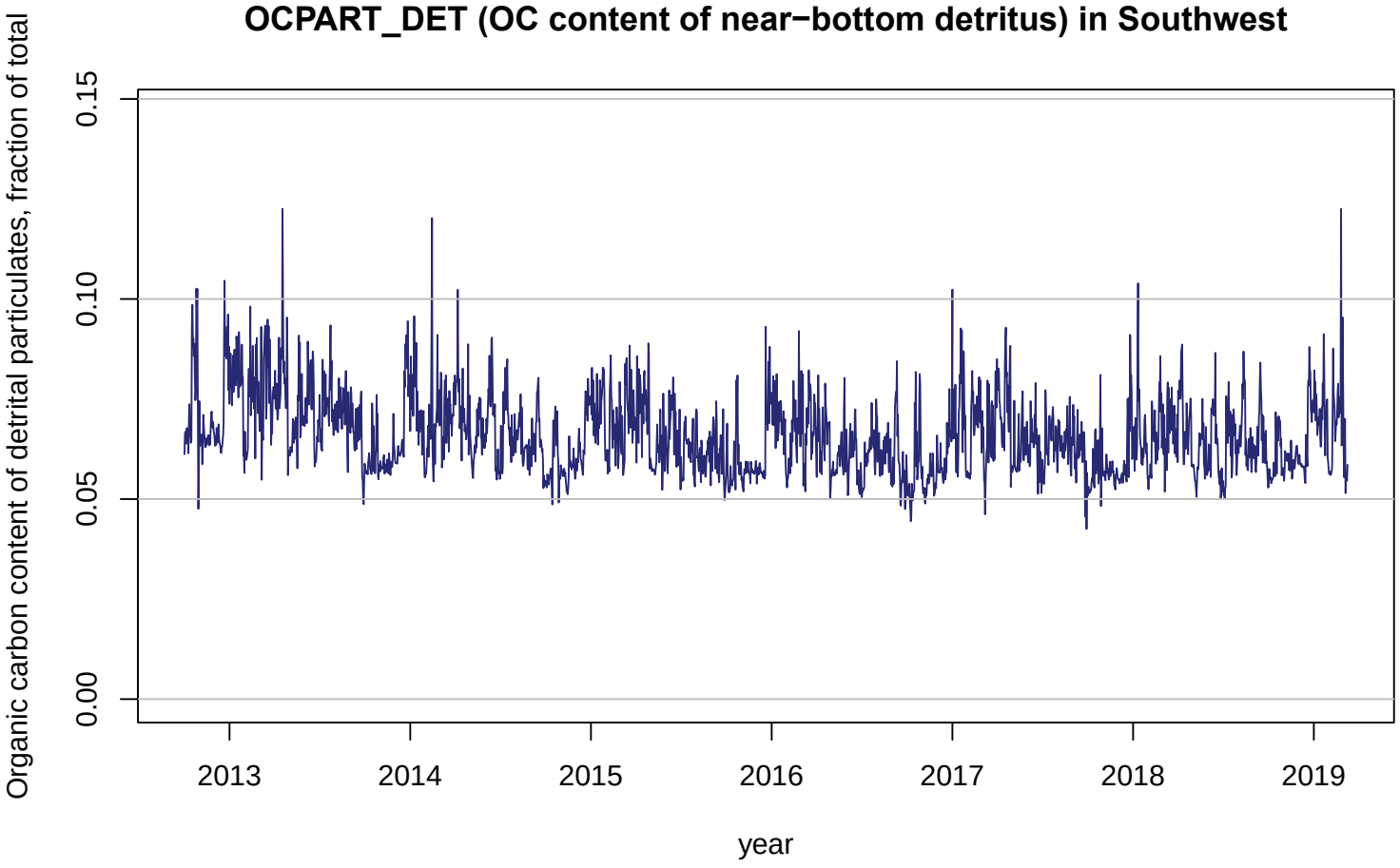

OCPART (OC content of detrital particulates) in North Mudflat
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

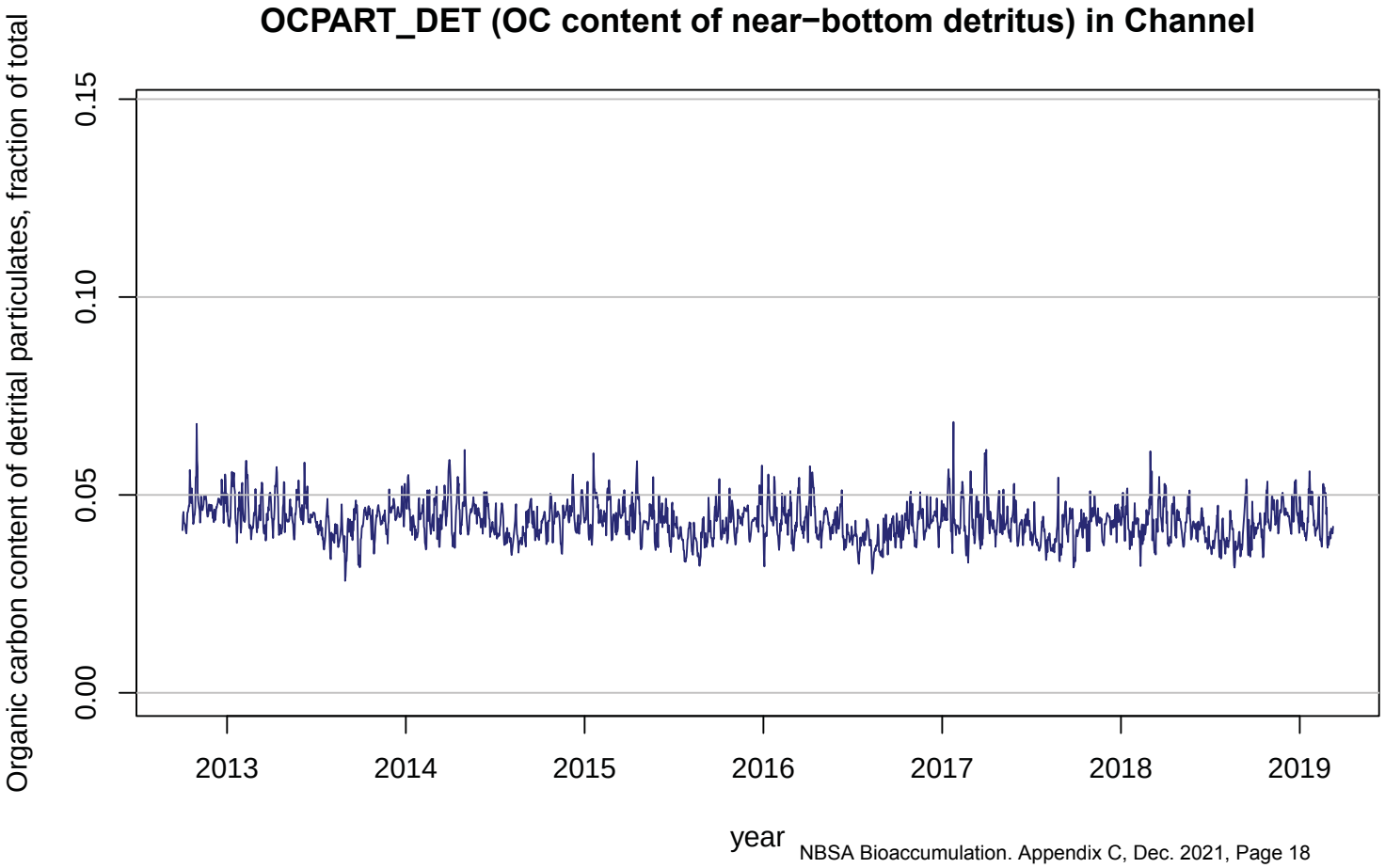

OCPART (OC content of detrital particulates) in Southeast Mudflat
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

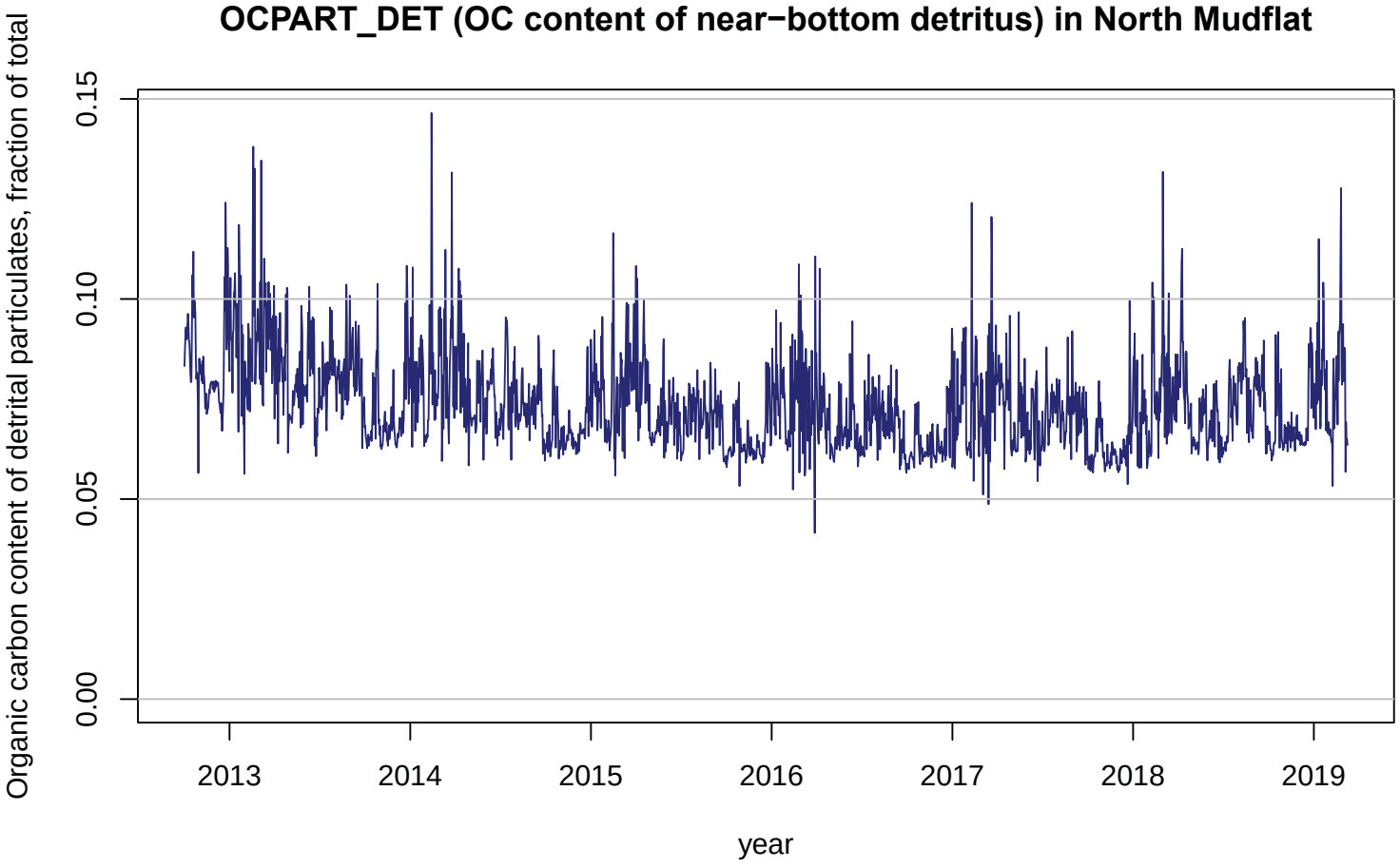

OCPART (OC content of detrital particulates) in Southwest Mudflat
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

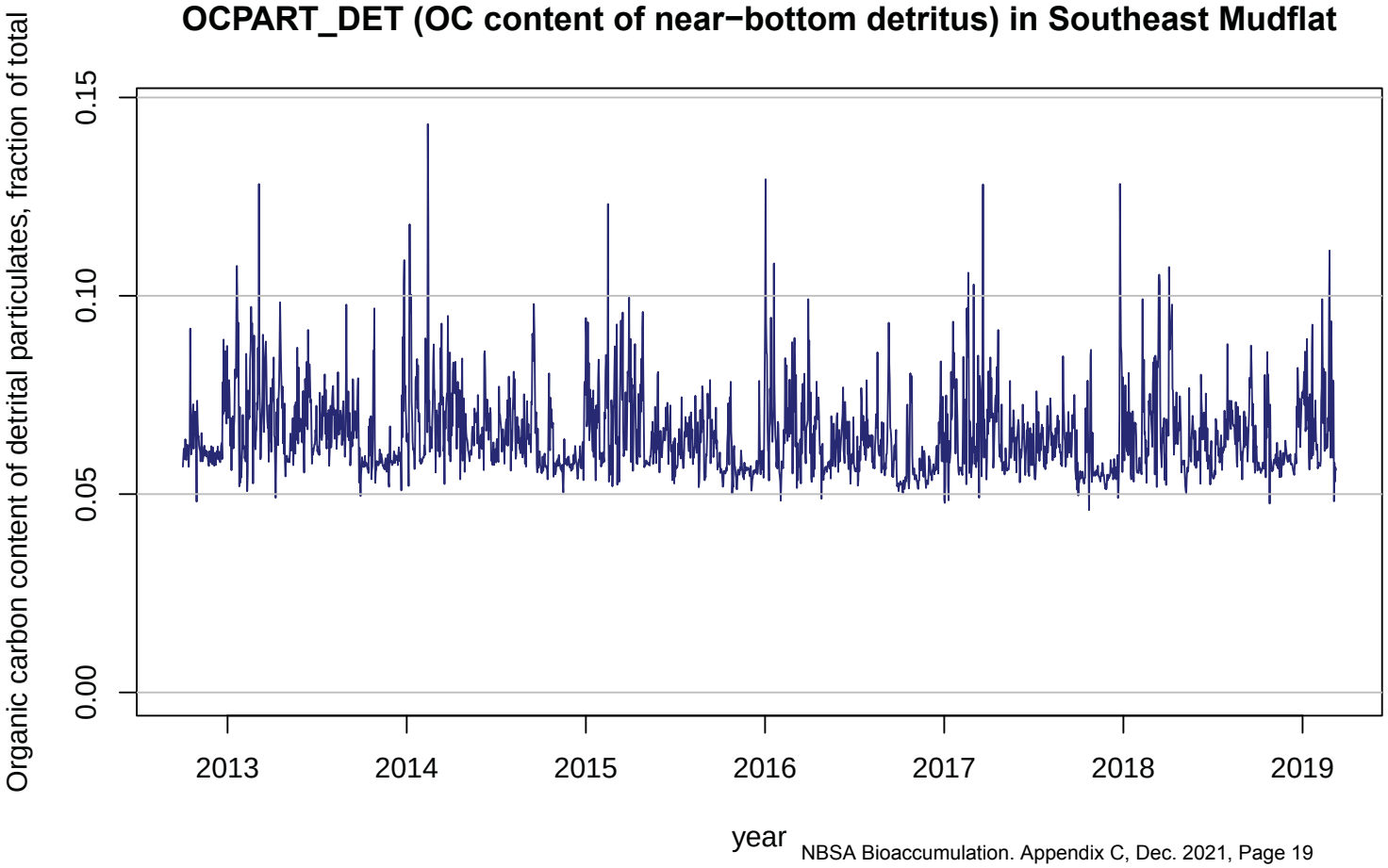

OCPART_DET (OC content of near−bottom detritus) in North
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

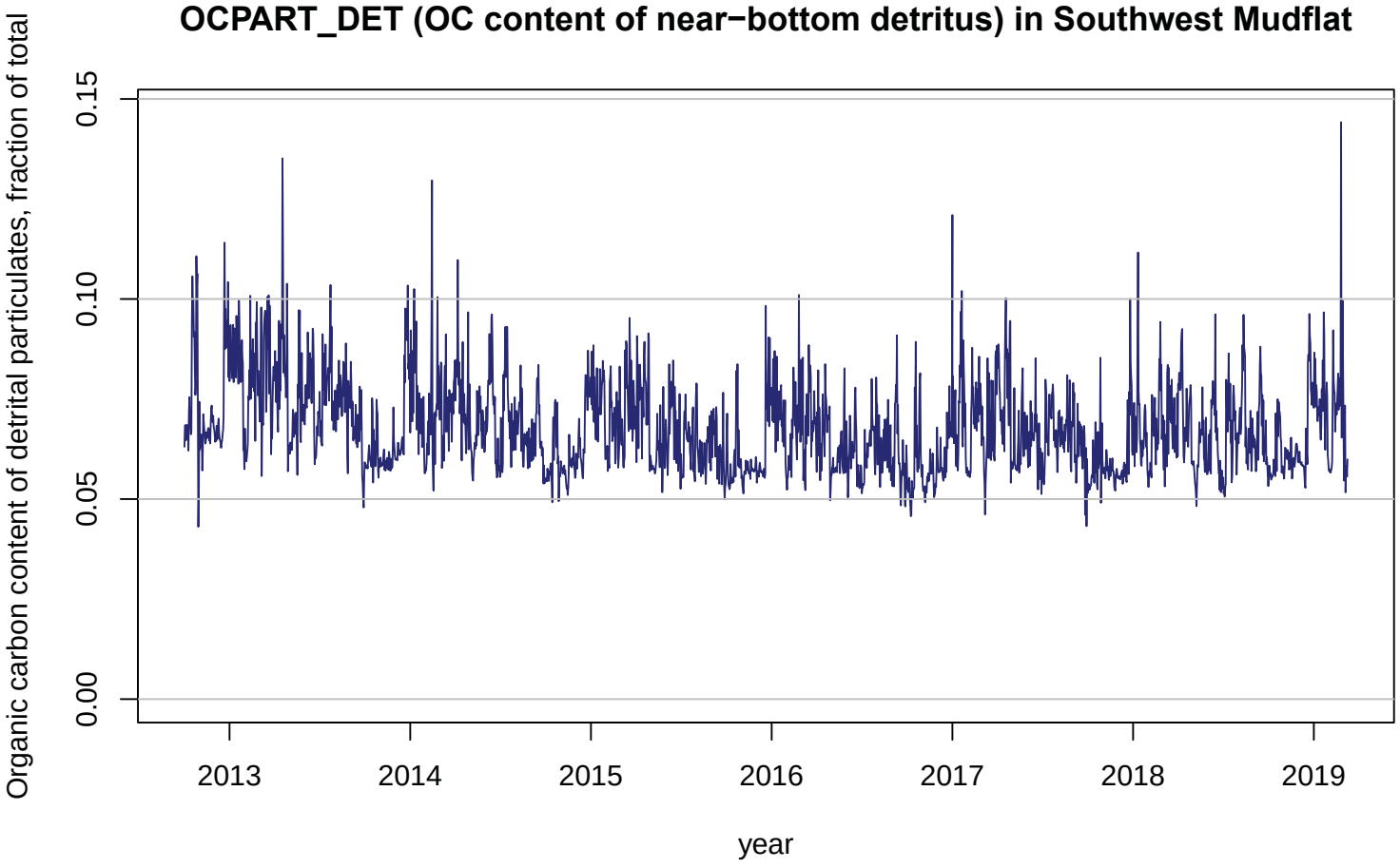

OCPART_DET (OC content of near−bottom detritus) in Southeast
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year


OCPART_DET (OC content of near−bottom detritus) in Southwest
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

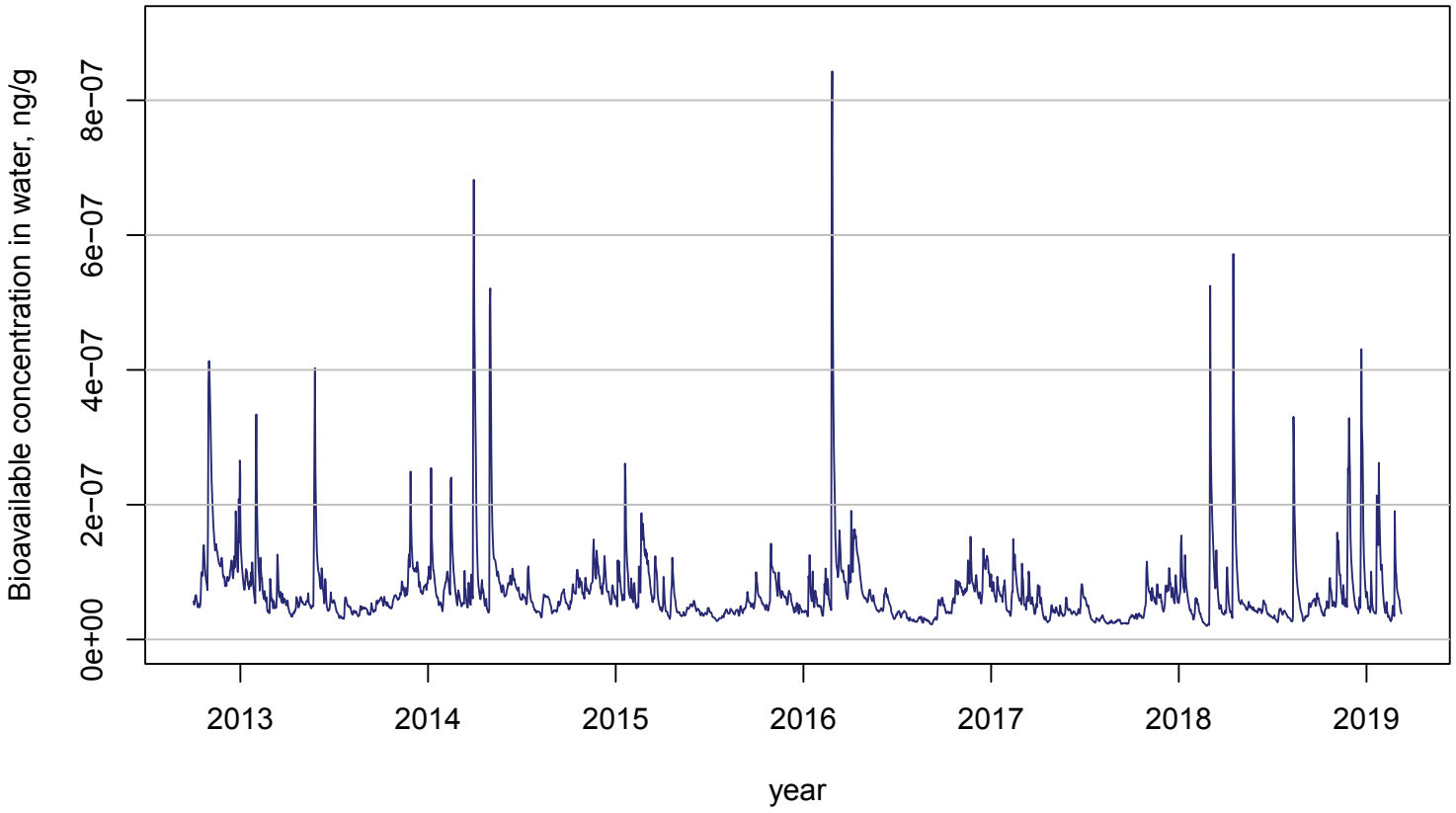

OCPART_DET (OC content of near−bottom detritus) in Channel
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year


OCPART_DET (OC content of near−bottom detritus) in North Mudflat
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

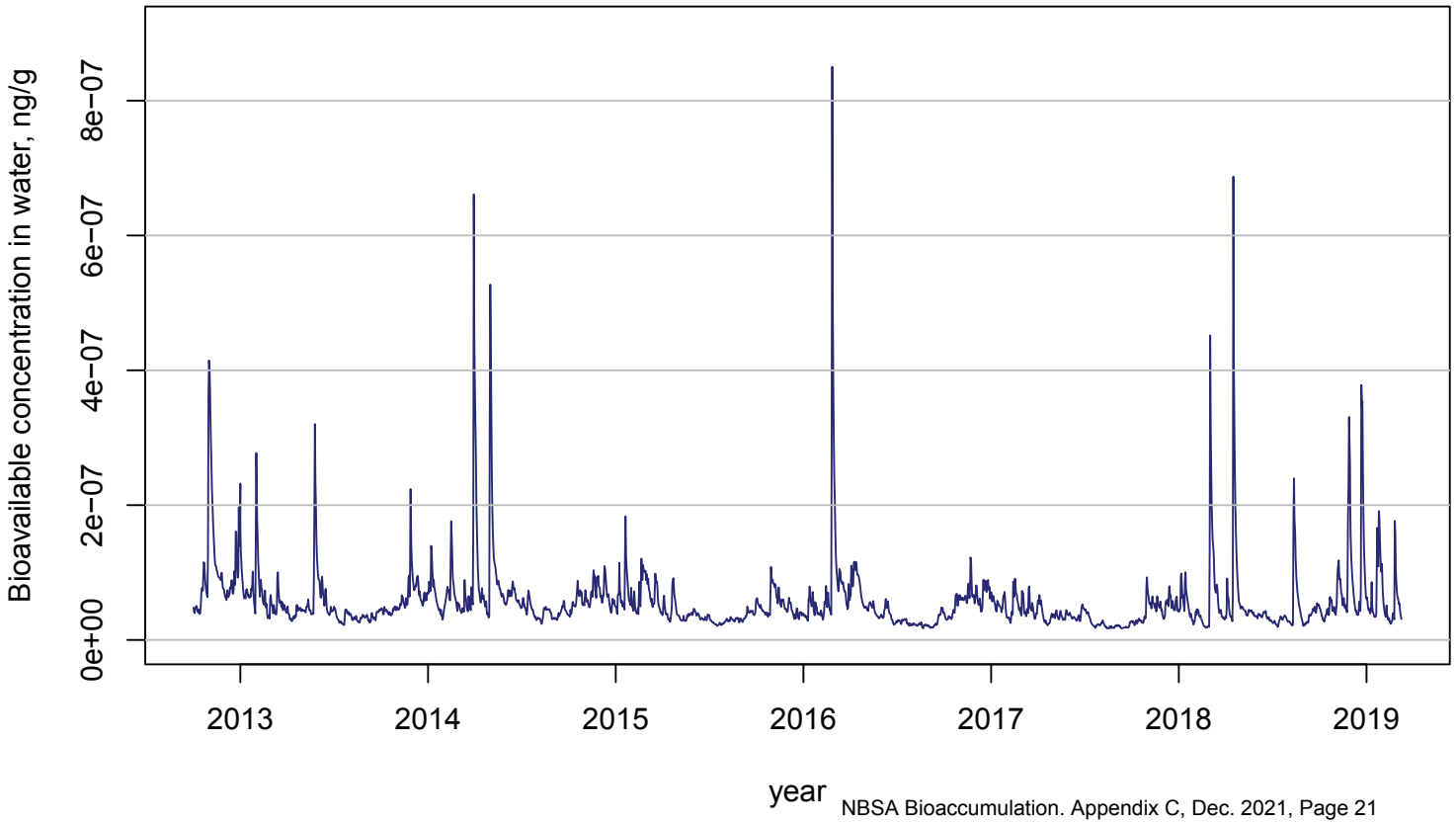

OCPART_DET (OC content of near−bottom detritus) in Southeast Mudflat
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year


OCPART_DET (OC content of near−bottom detritus) in Southwest Mudflat
Organic carbon content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
2013
2014
2015
2016
2017
2018
2019
year

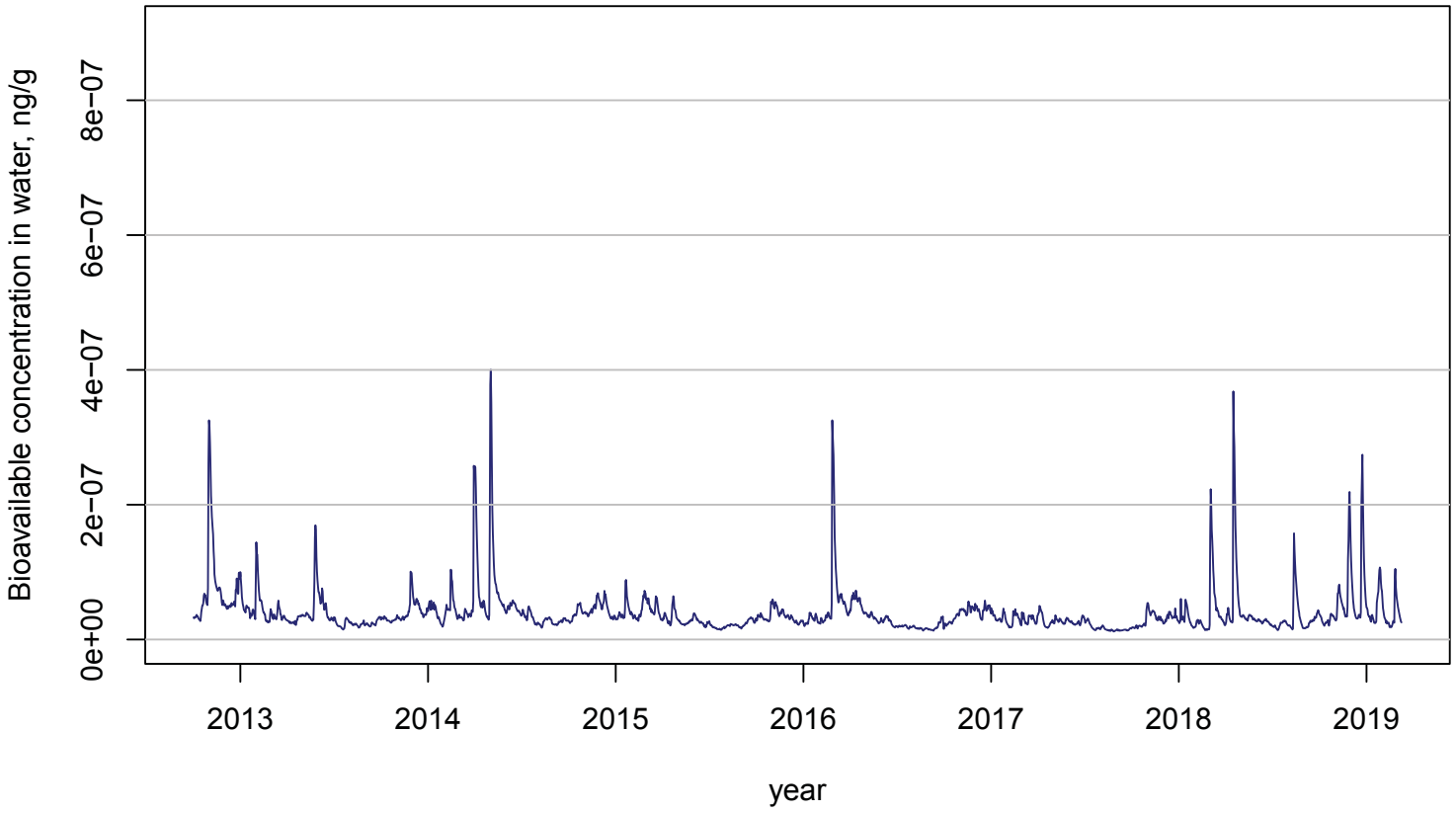
2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in North



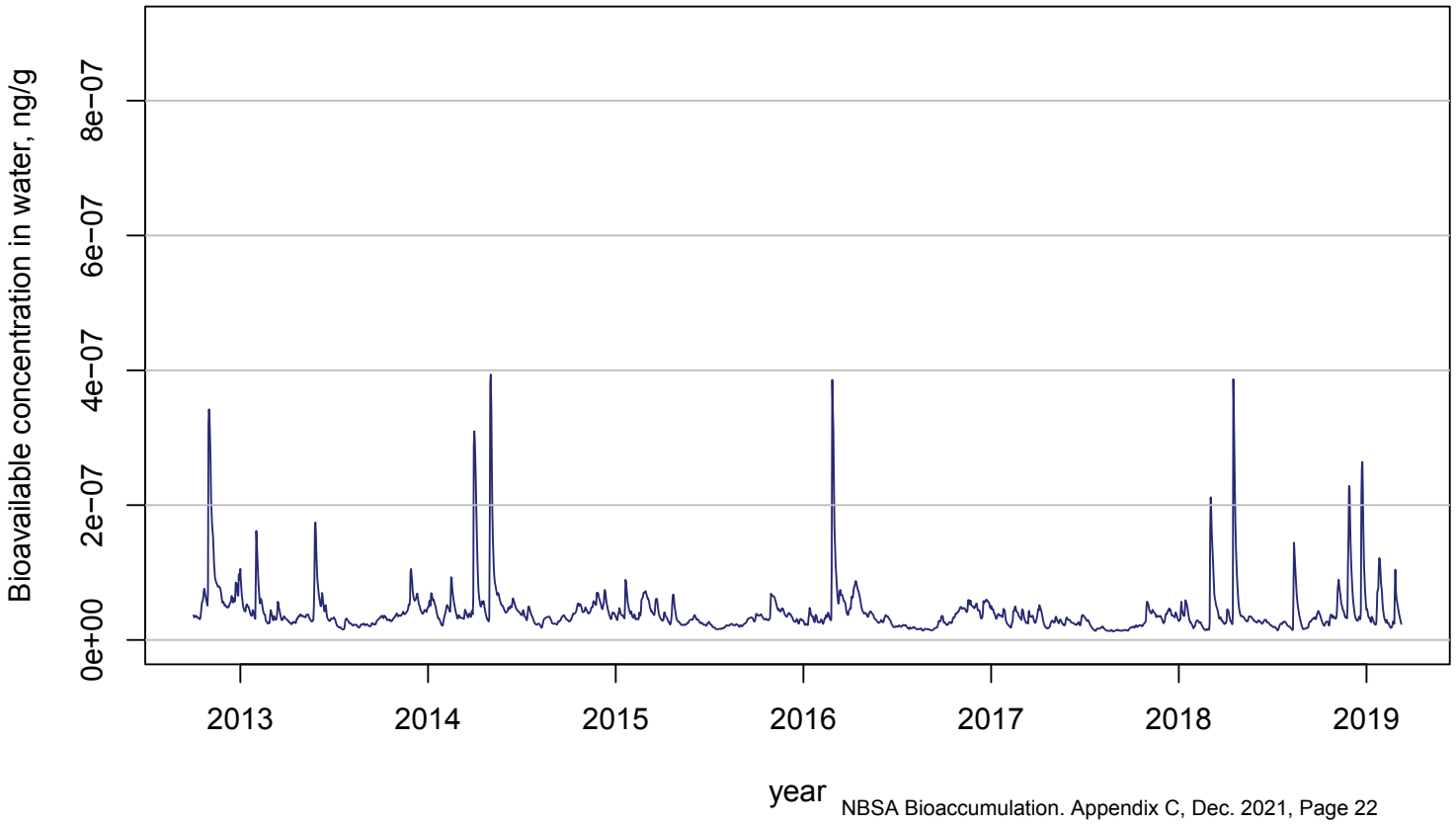
2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in Southeast



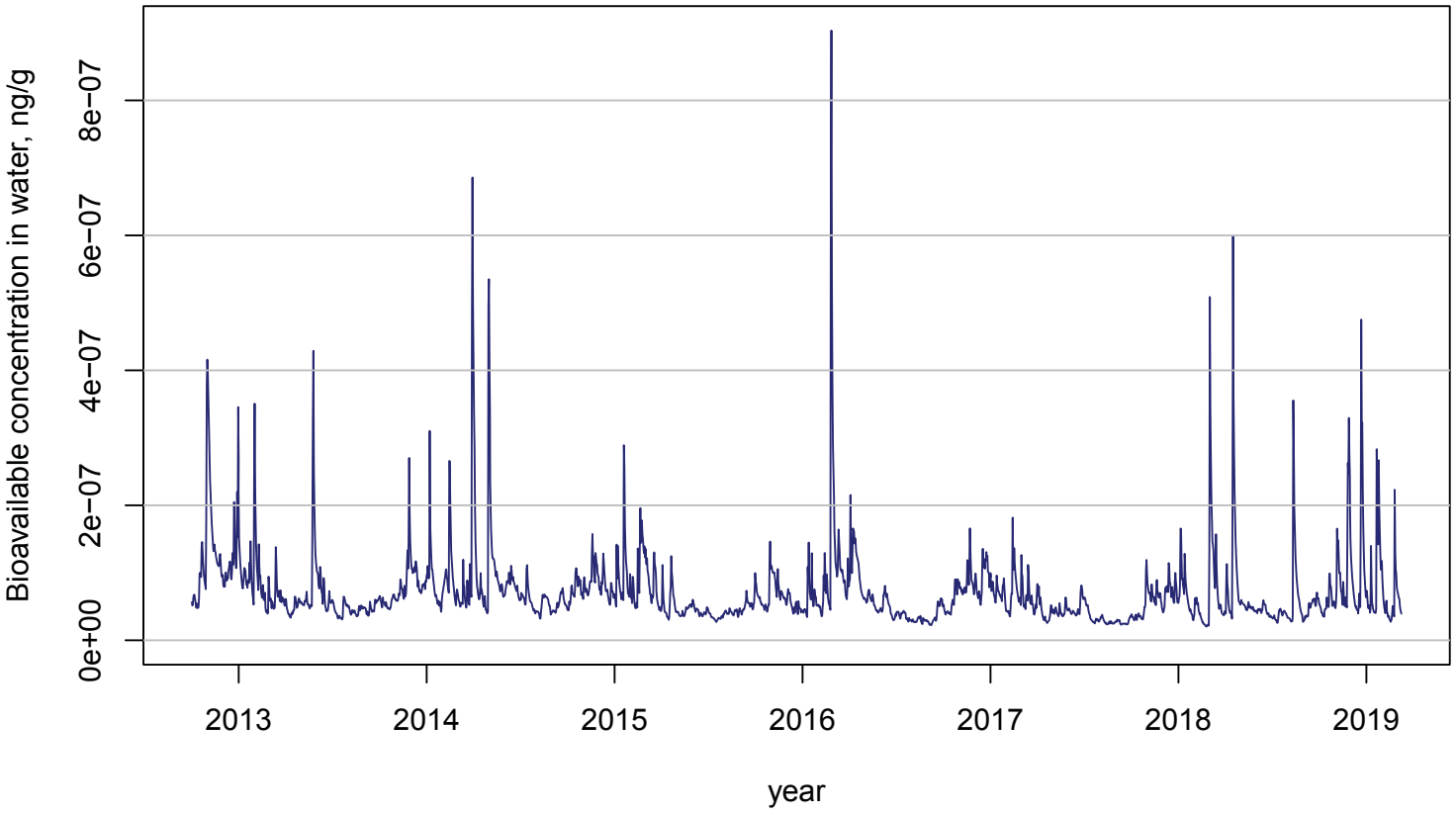
2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in Southwest



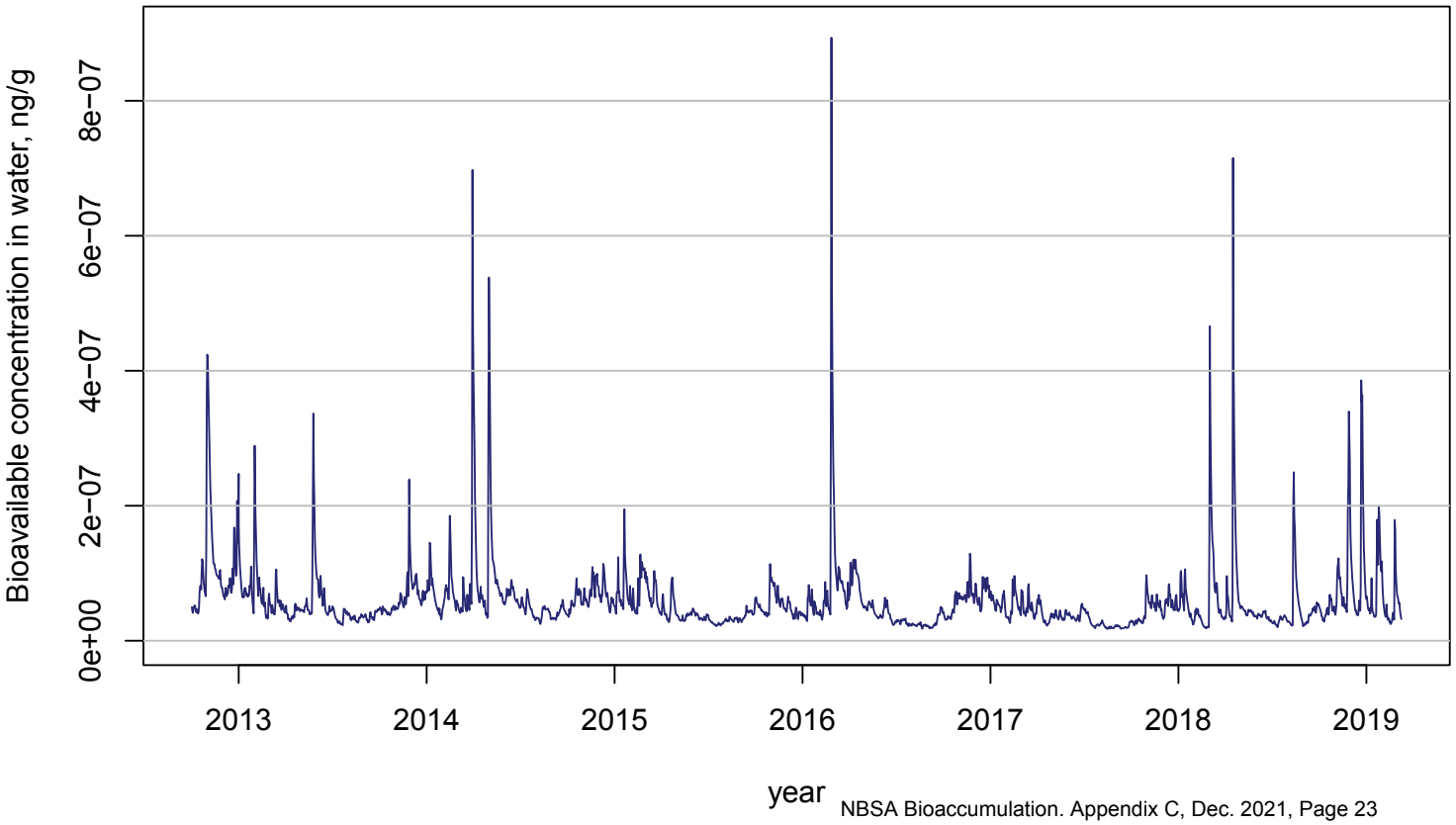
2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in Channel

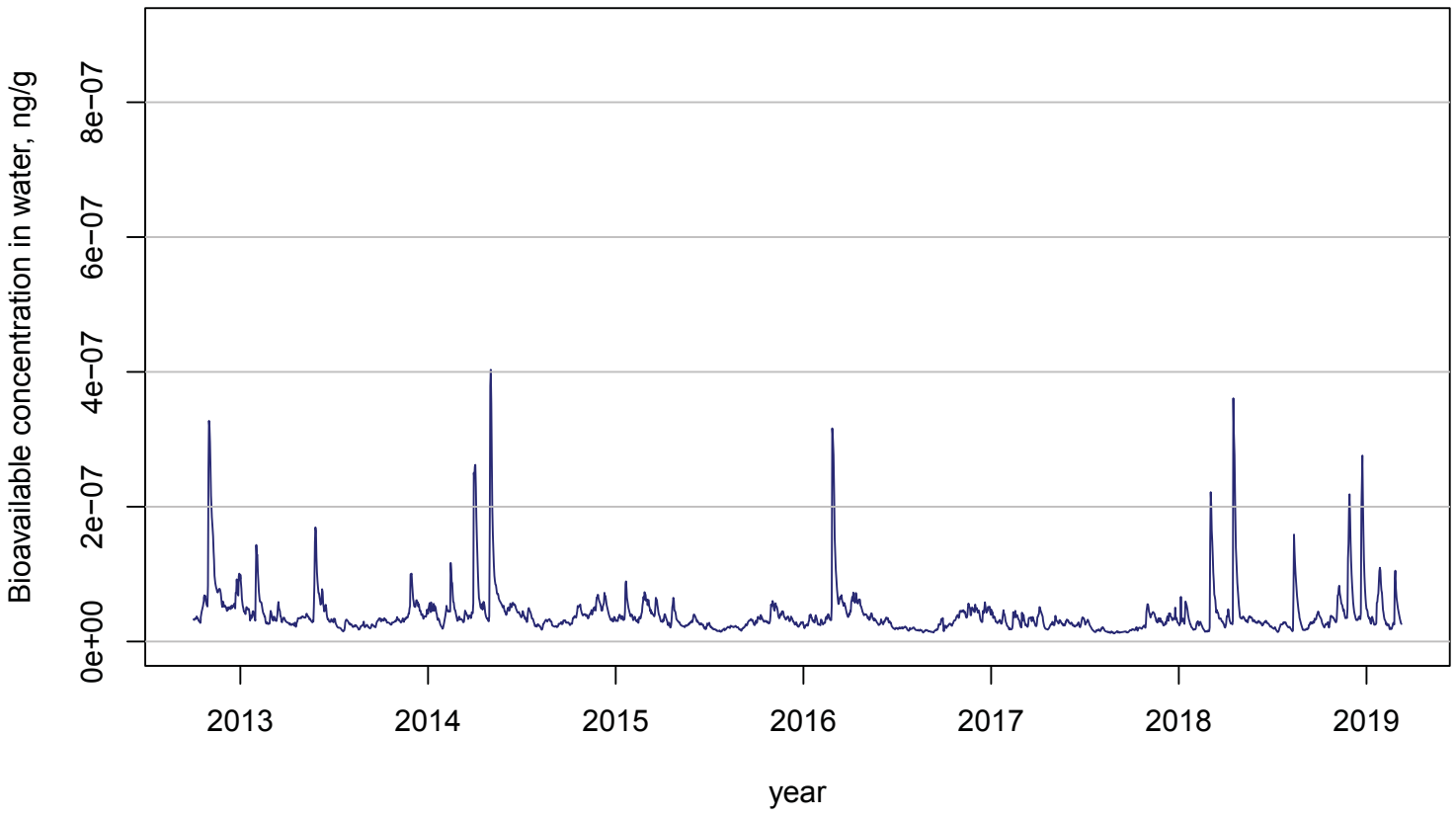


2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in North Mudflat

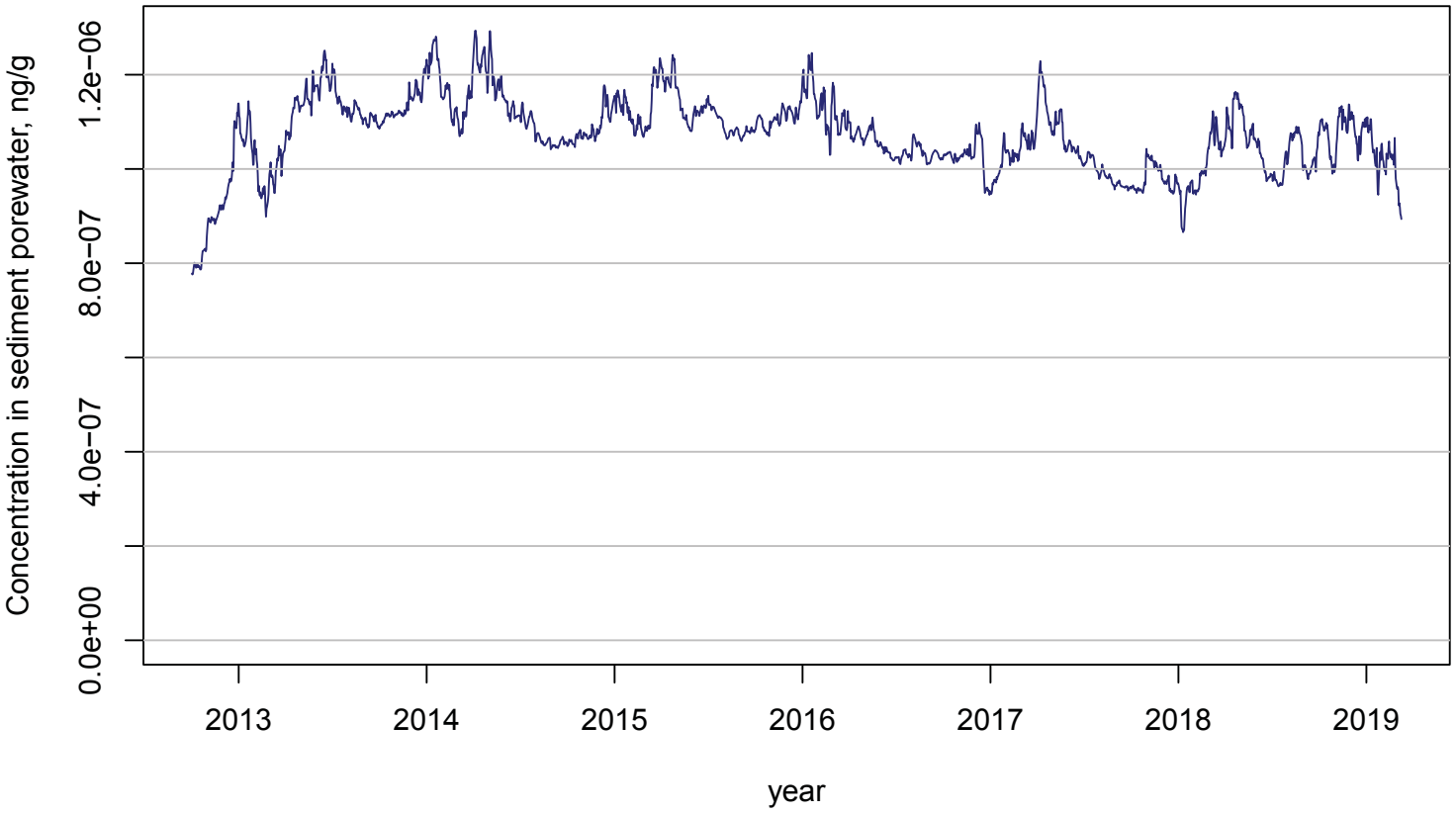


2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in Southeast Mudflat

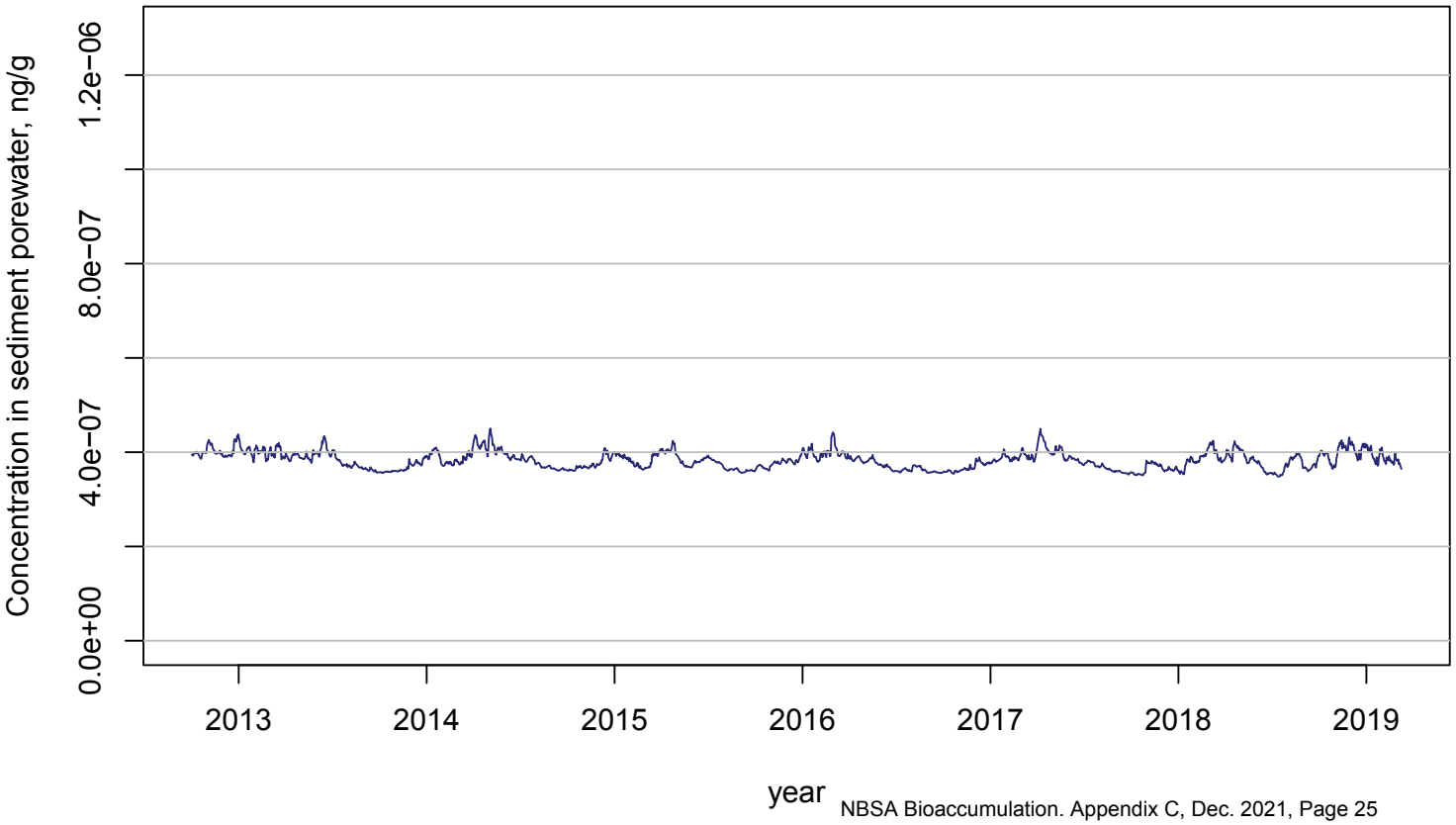



2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in Southwest Mudflat
Bioavailable concentration in water, ng/g
0e+00
2e−07
4e−07
6e−07
8e−07
2013
2014
2015
2016
2017
2018
2019
year

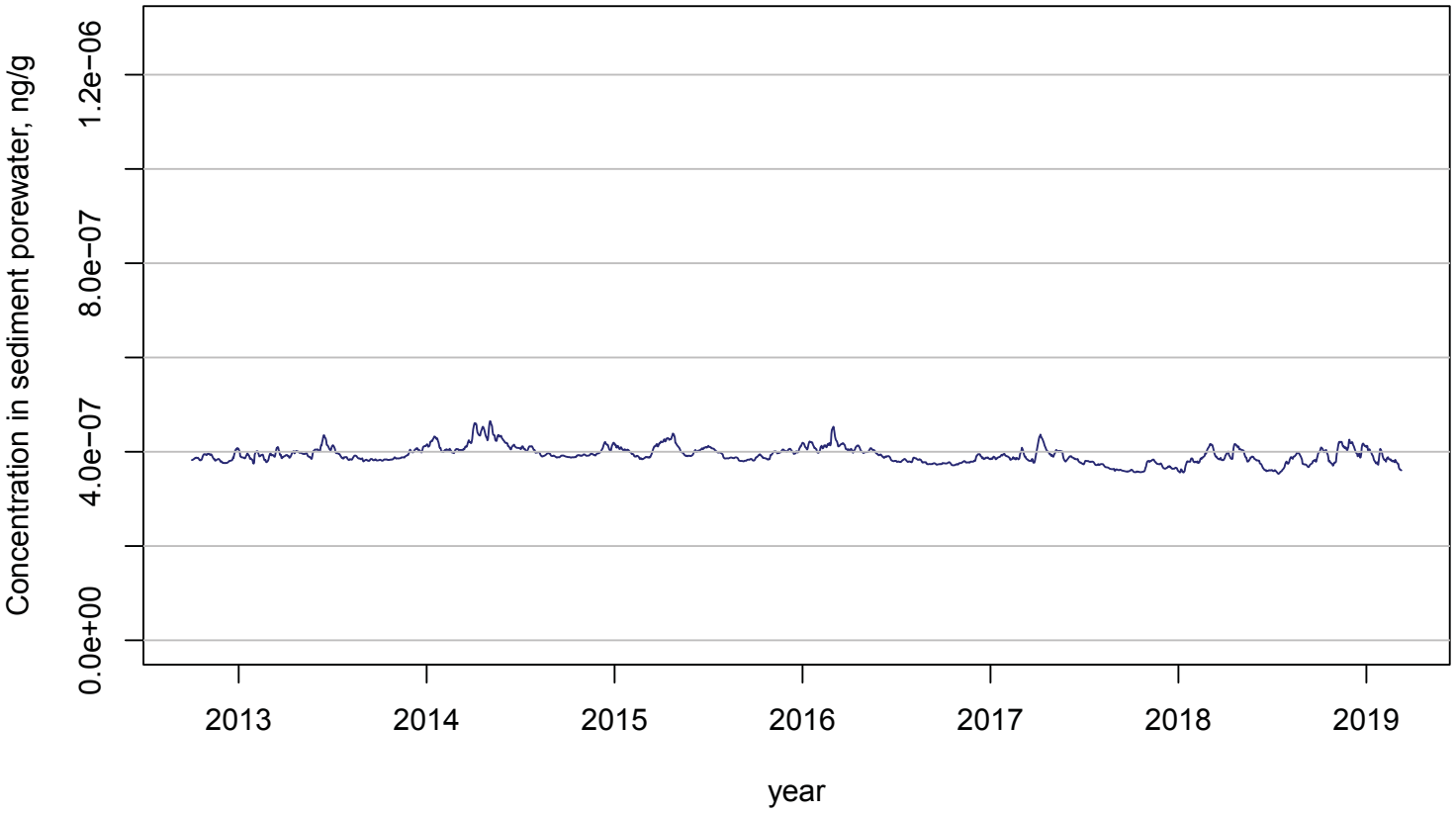
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in North



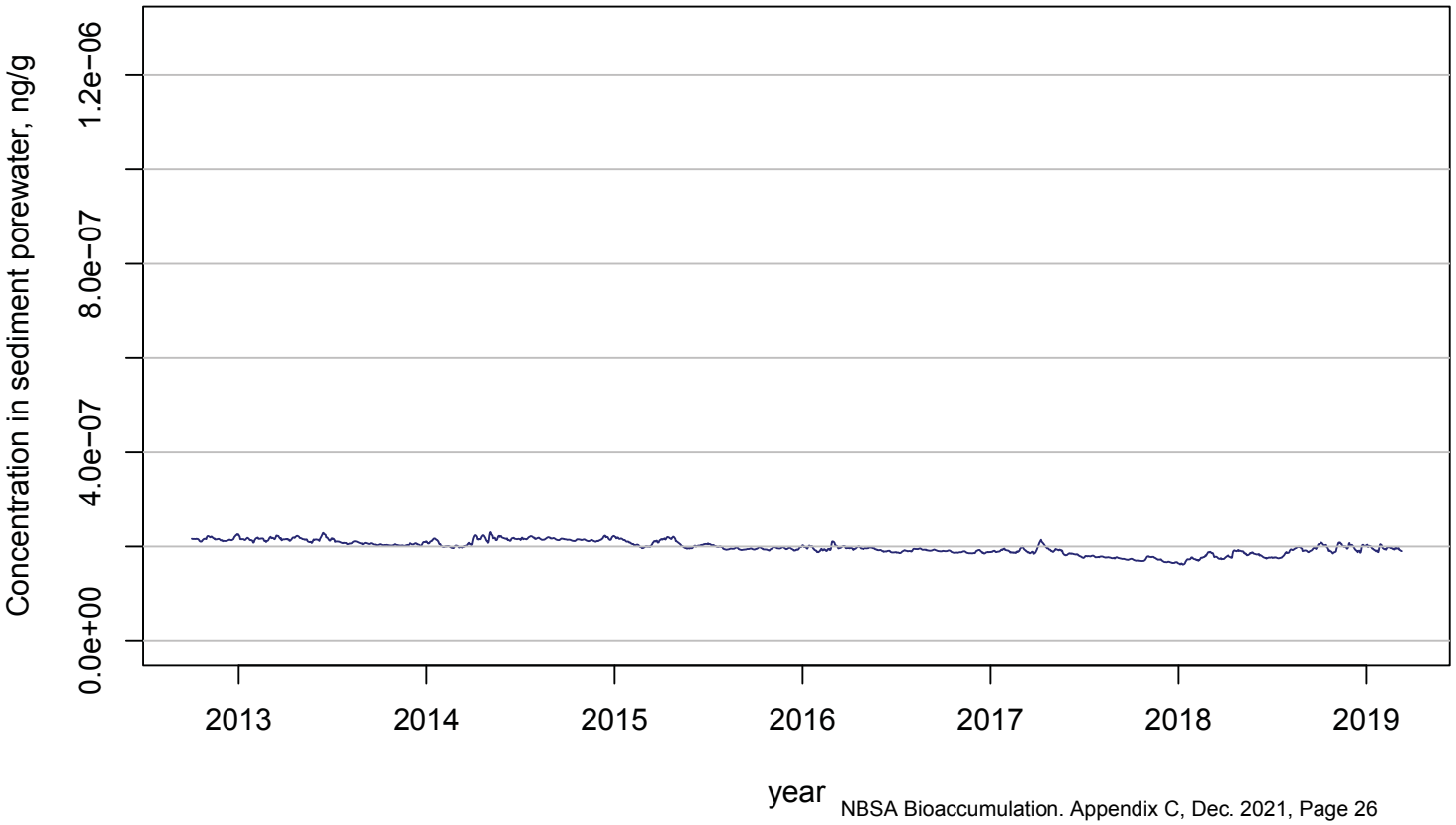
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in Southeast



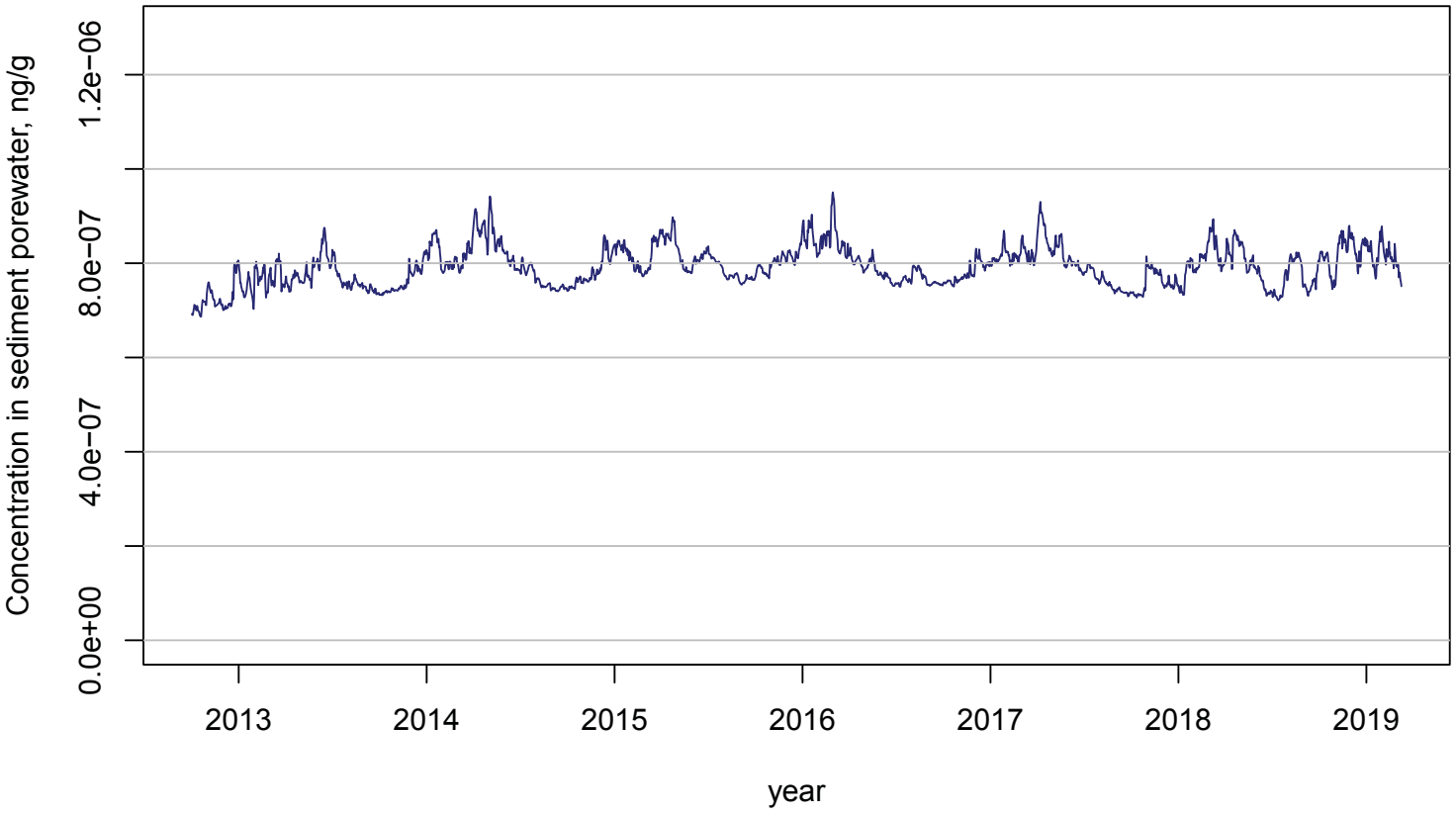
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in Southwest



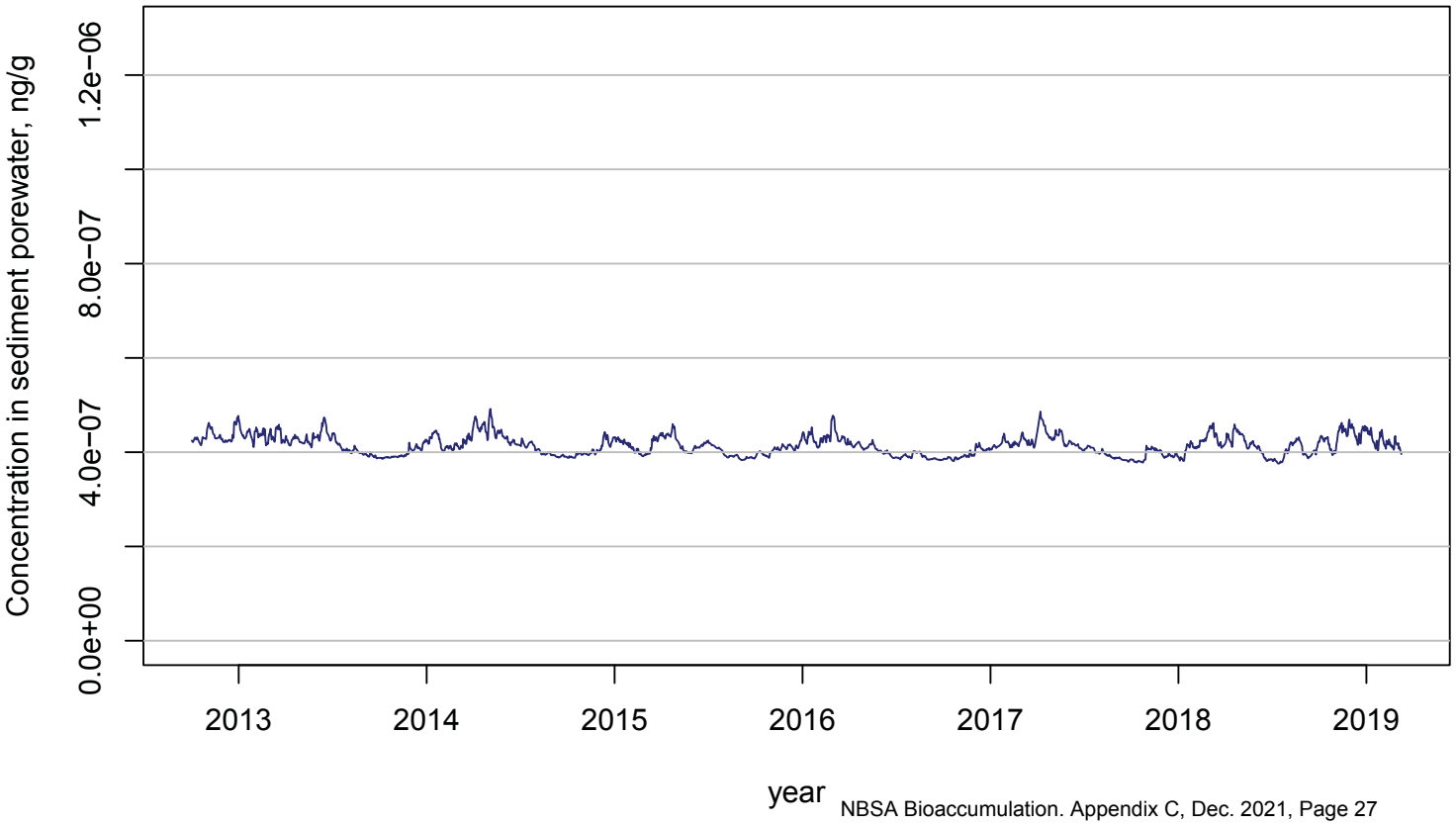
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in Channel



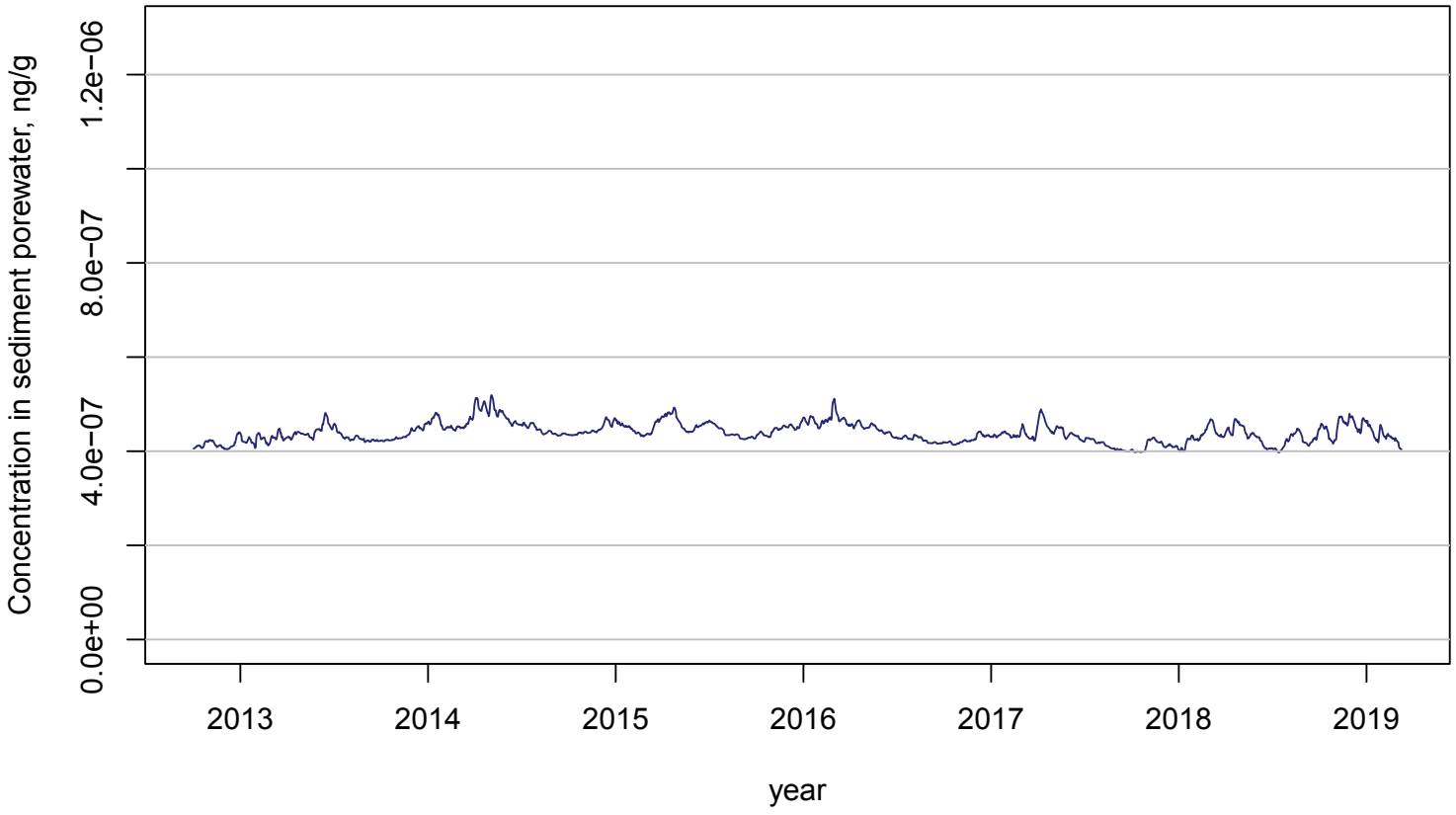
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in North Mudflat

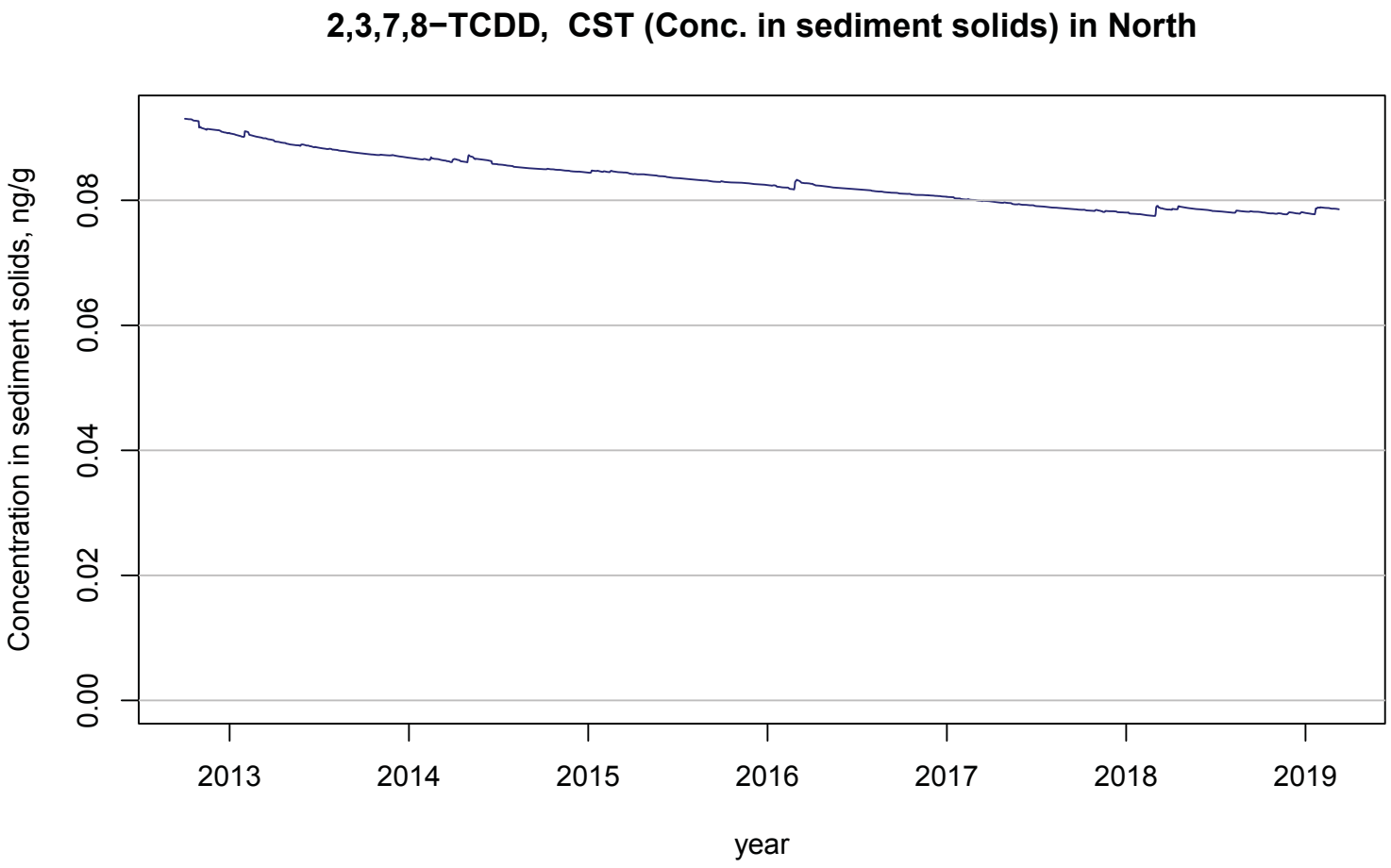


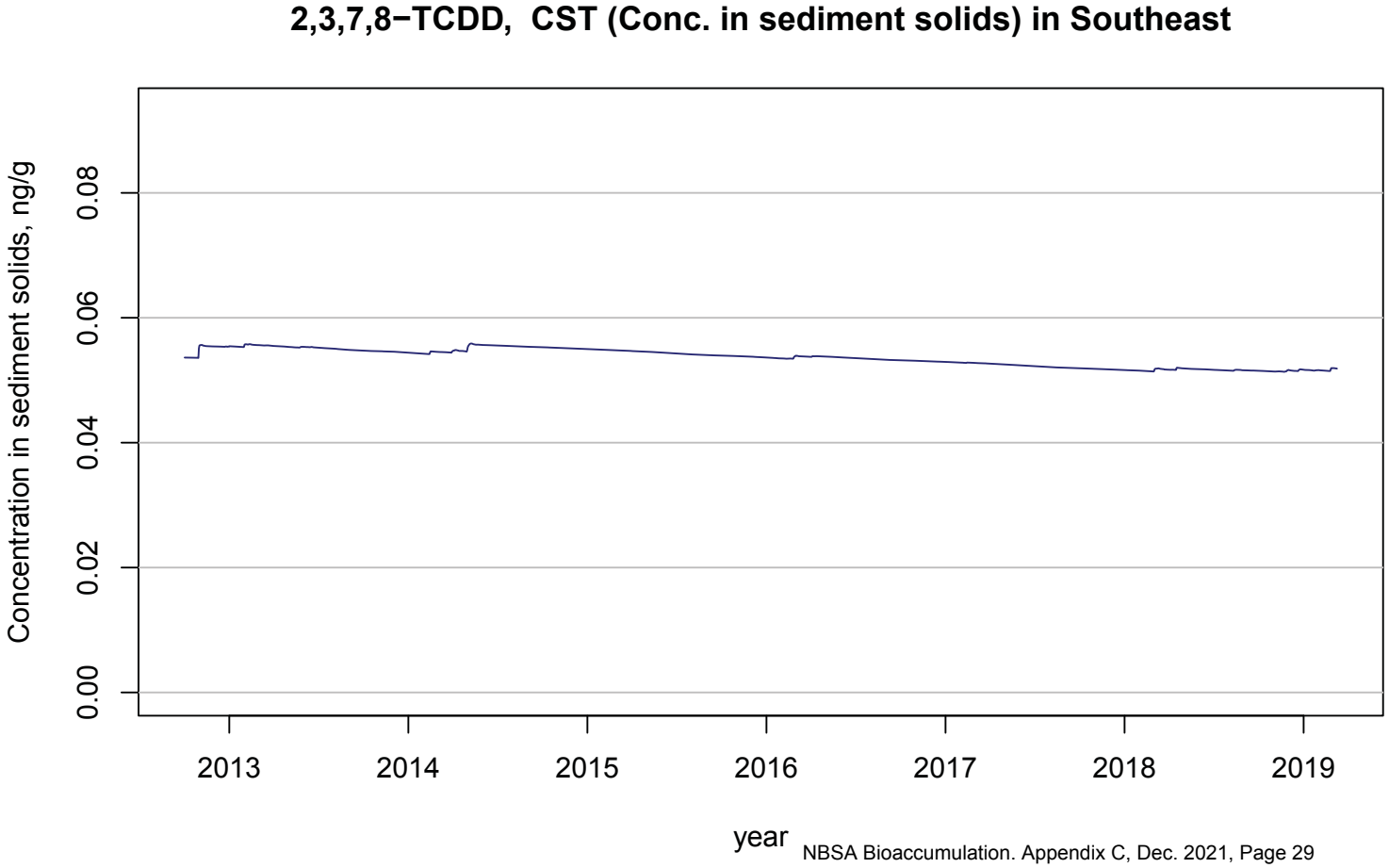
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in Southeast Mudflat



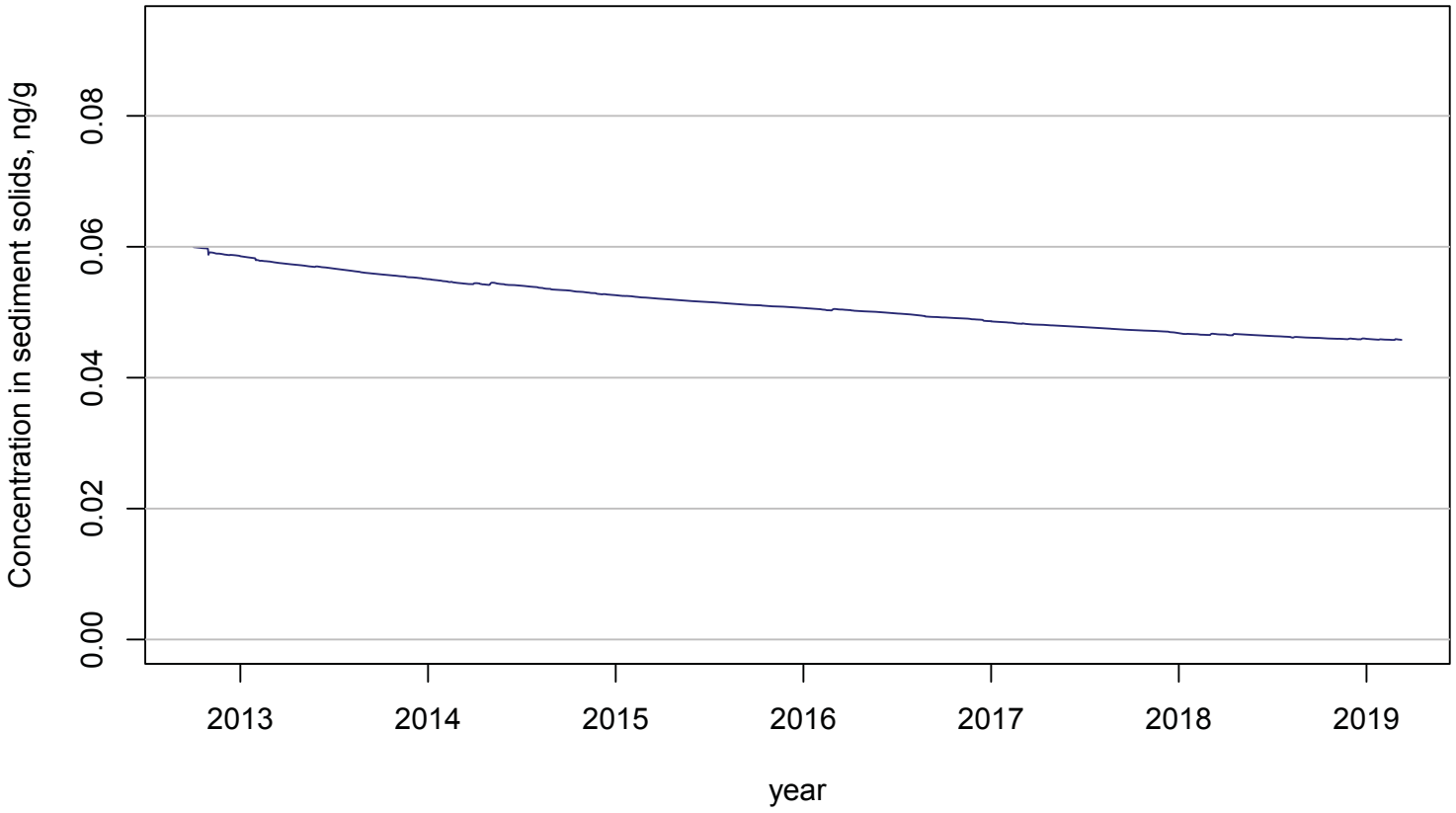
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in Southwest Mudflat



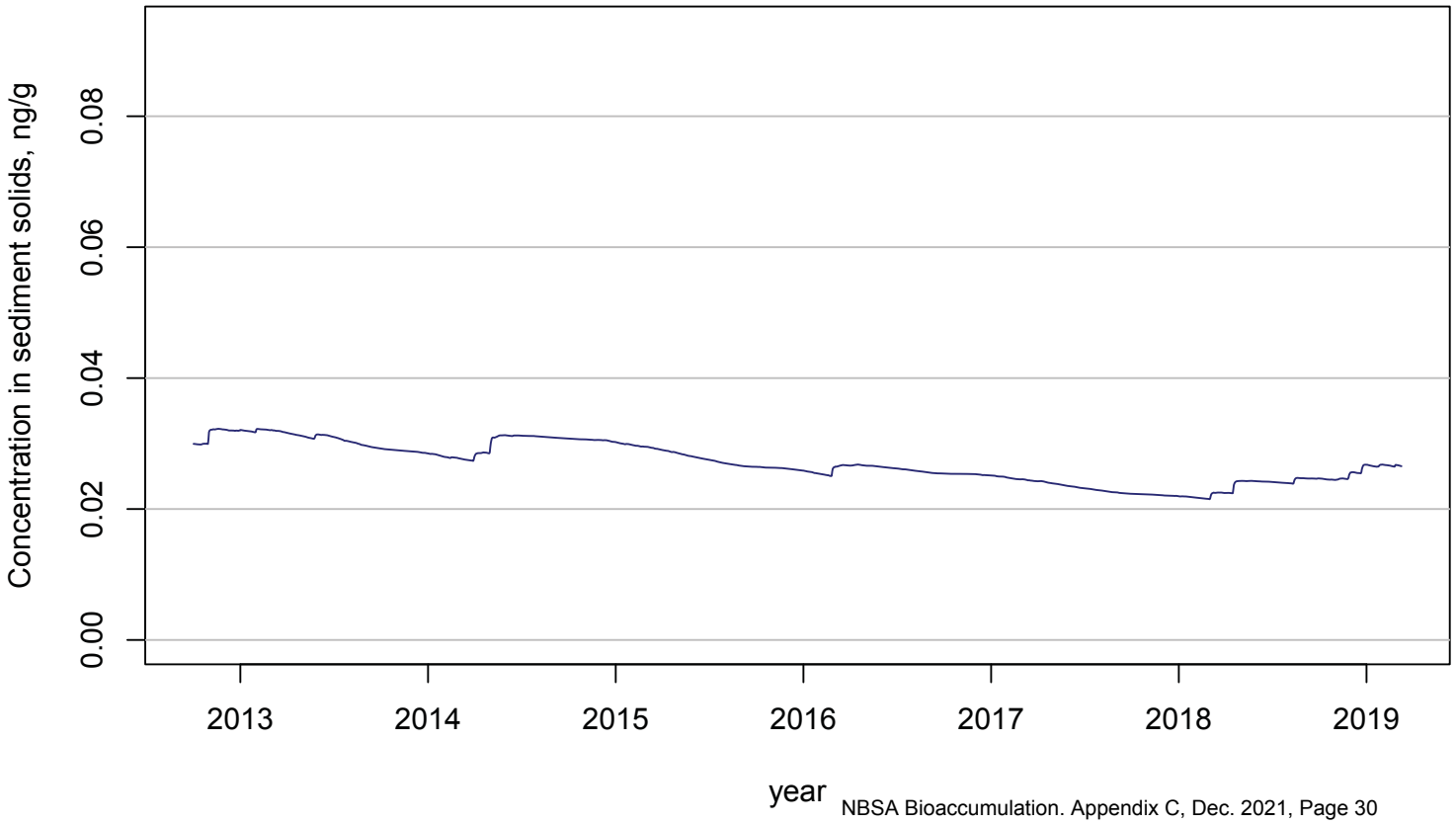

2,3,7,8−TCDD, CST (Conc. in sediment solids) in North
Concentration in sediment solids, ng/g
0.00
0.02
0.04
0.06
0.08
2013
2014
2015
2016
2017
2018
2019
year


2,3,7,8−TCDD, CST (Conc. in sediment solids) in Southeast
Concentration in sediment solids, ng/g
0.00
0.02
0.04
0.06
0.08
2013
2014
2015
2016
2017
2018
2019
year

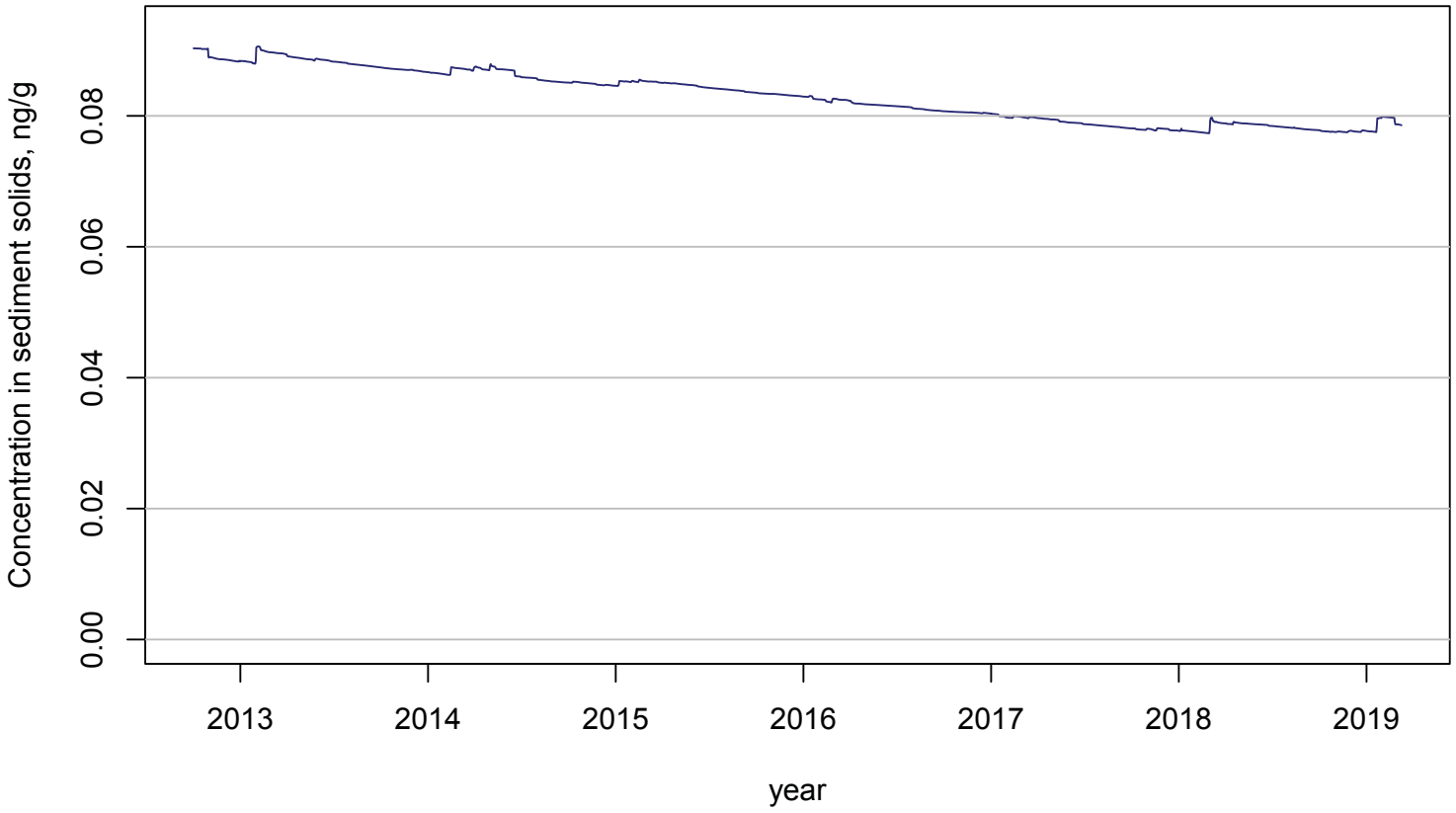
2,3,7,8−TCDD, CST (Conc. in sediment solids) in Southwest



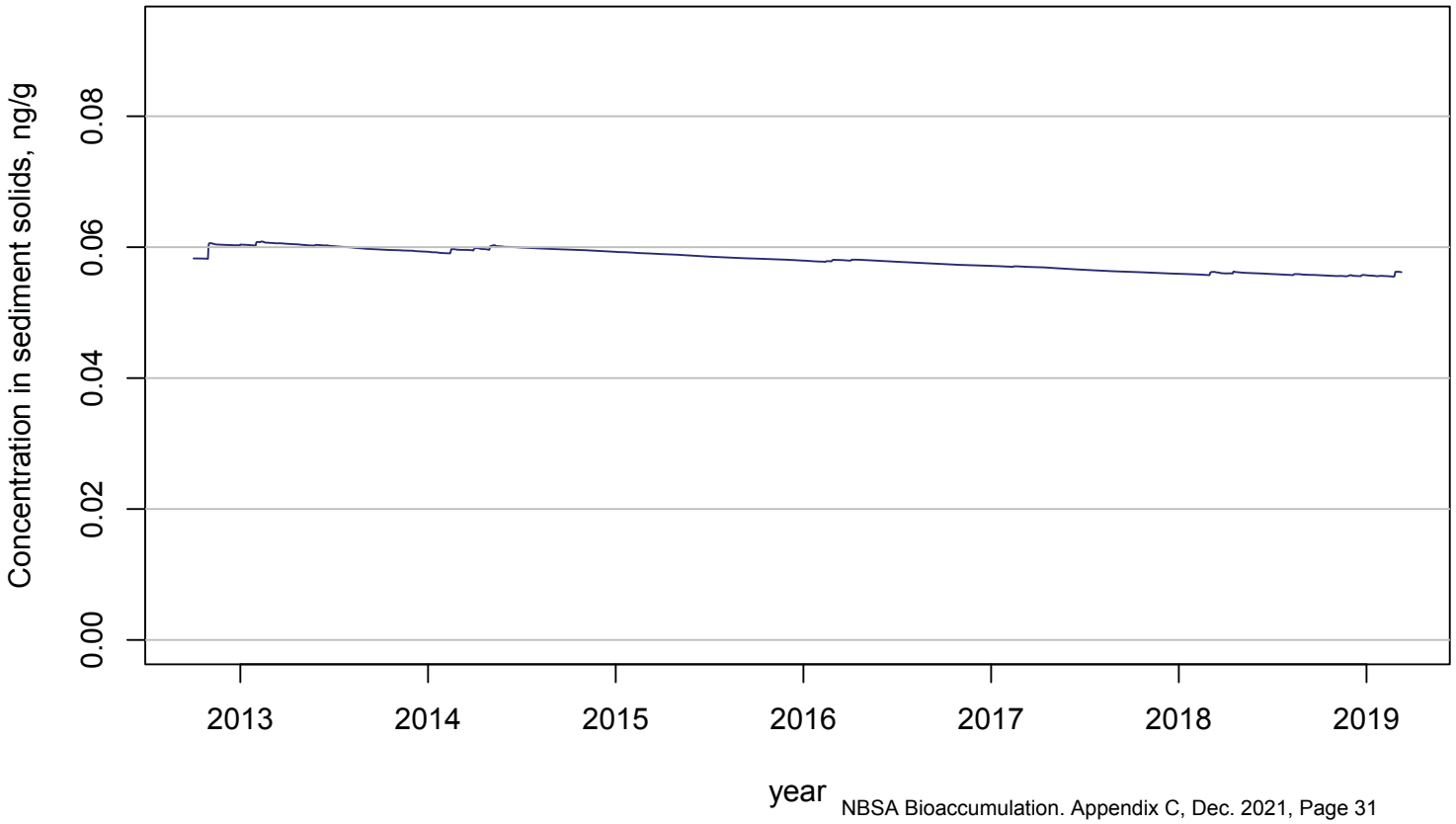
2,3,7,8−TCDD, CST (Conc. in sediment solids) in Channel

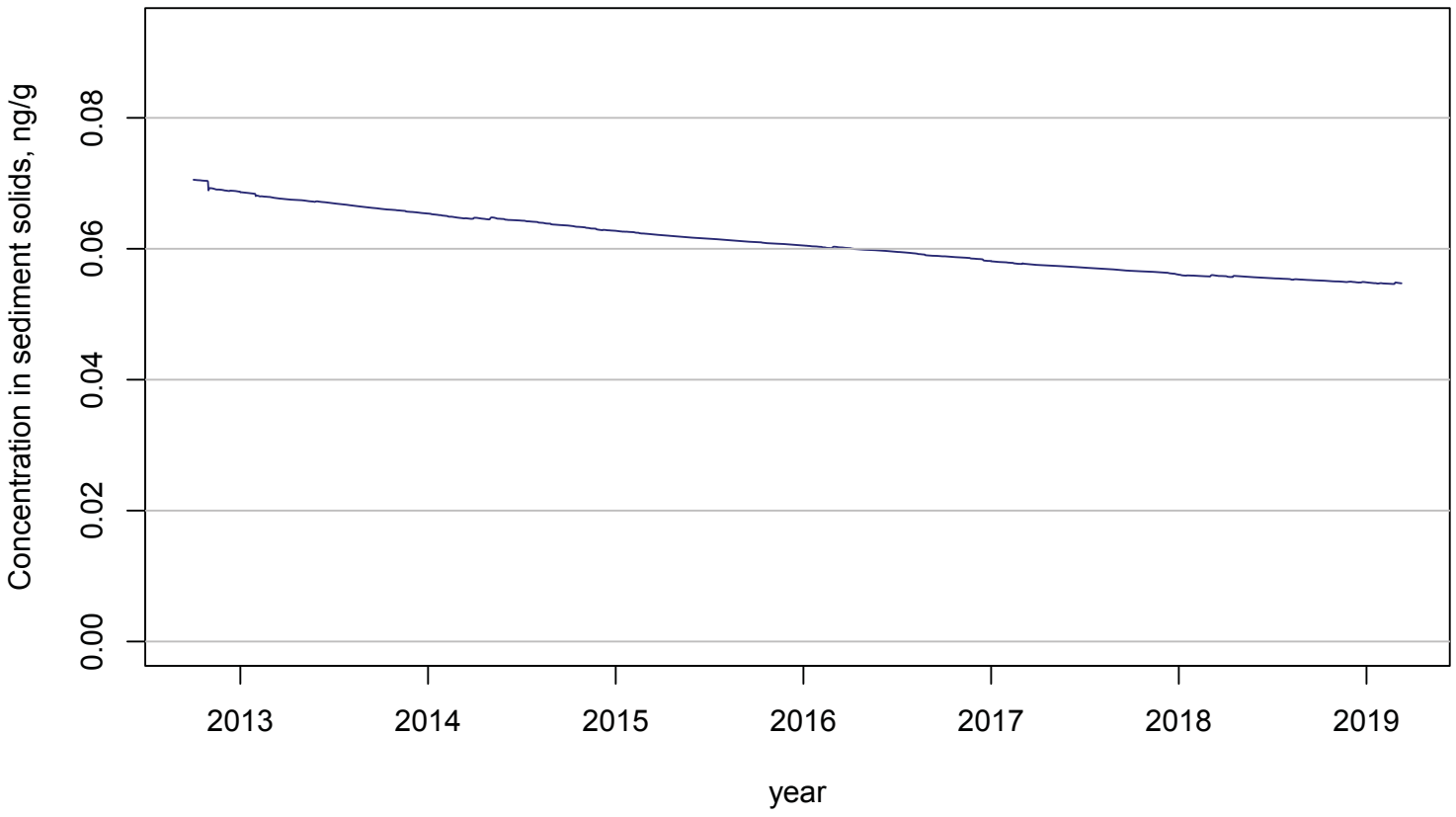


2,3,7,8−TCDD, CST (Conc. in sediment solids) in North Mudflat

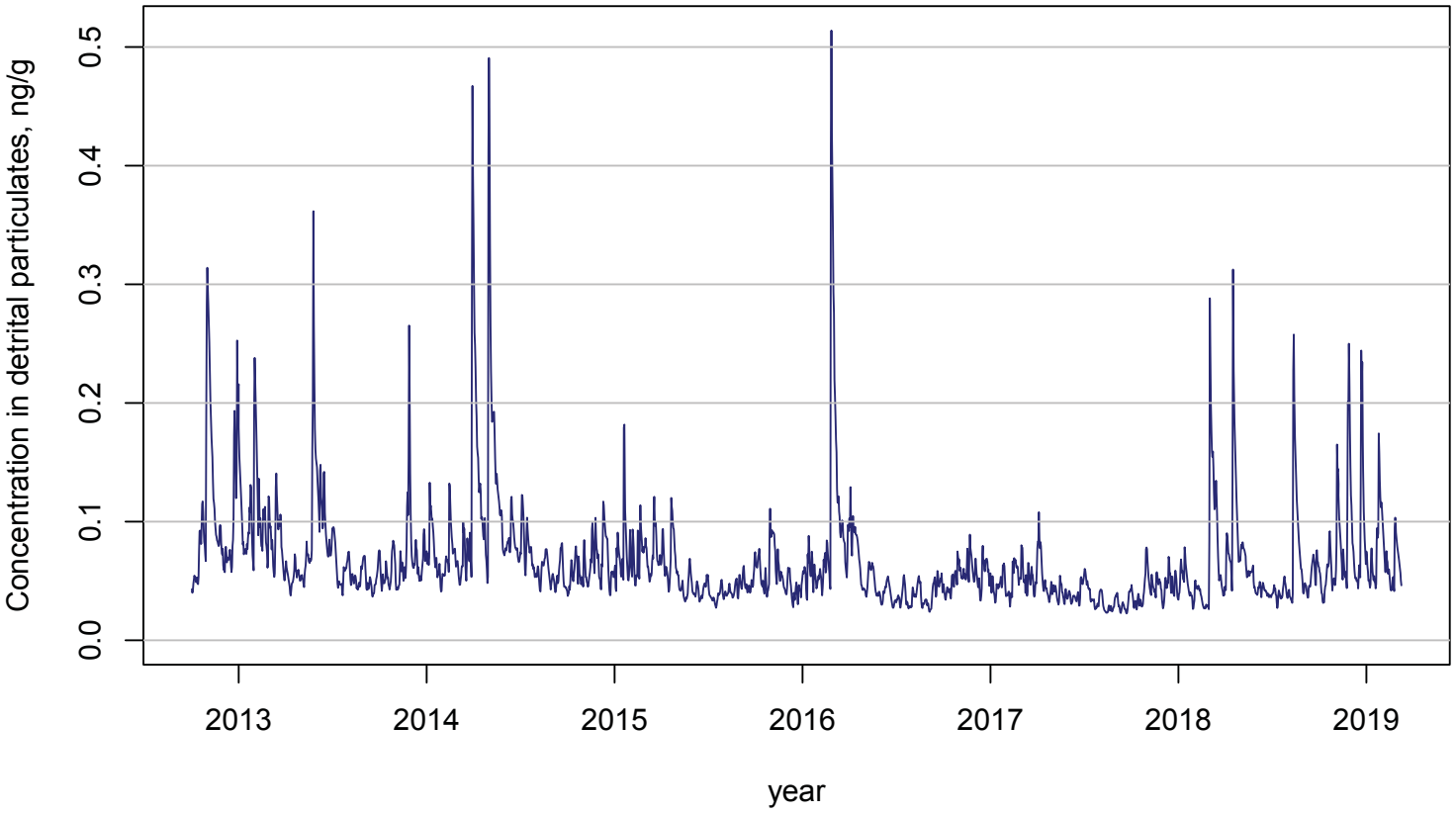


2,3,7,8−TCDD, CST (Conc. in sediment solids) in Southeast Mudflat

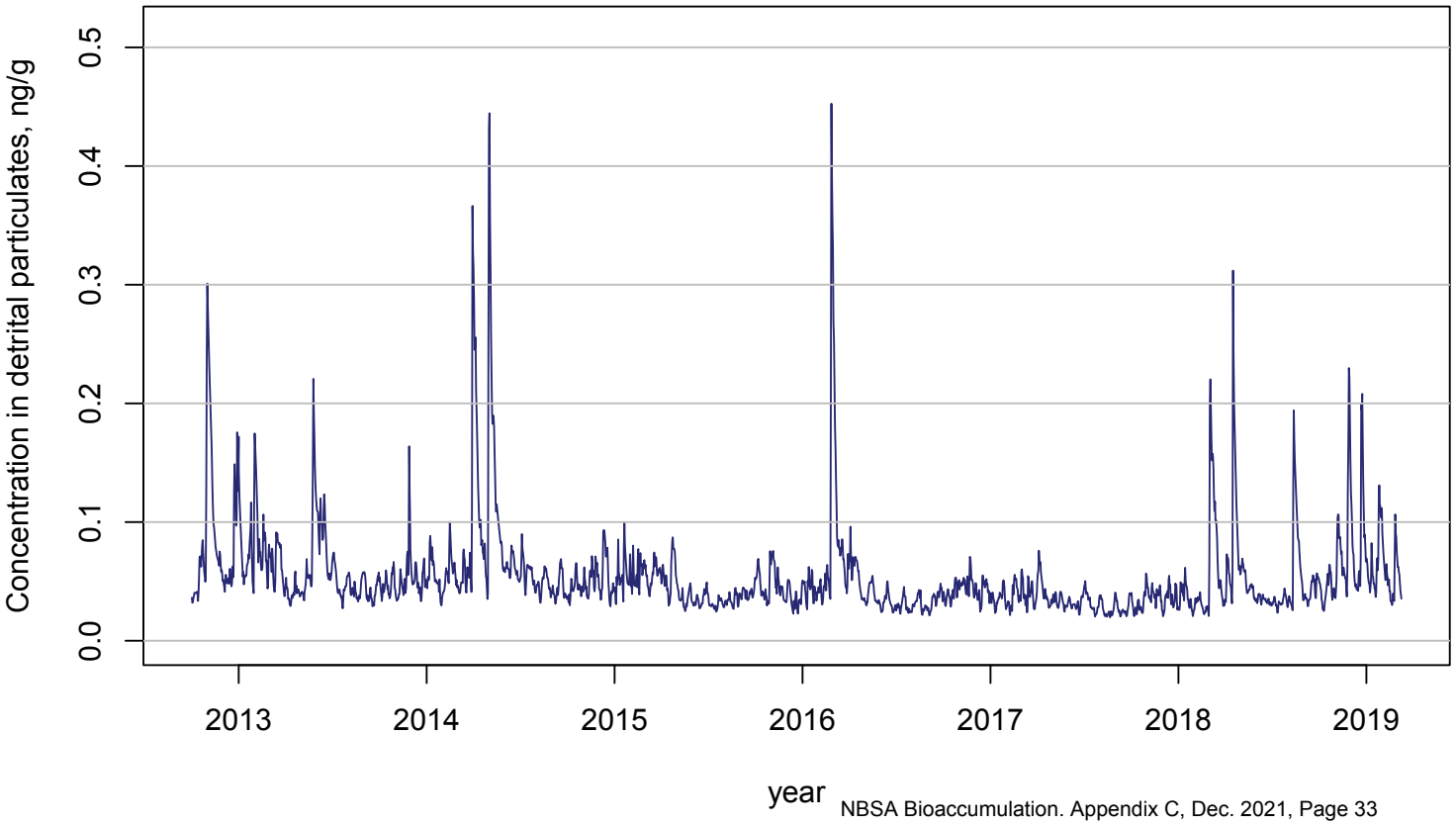



2,3,7,8−TCDD, CST (Conc. in sediment solids) in Southwest Mudflat
Concentration in sediment solids, ng/g
0.00
0.02
0.04
0.06
0.08
2013
2014
2015
2016
2017
2018
2019
year

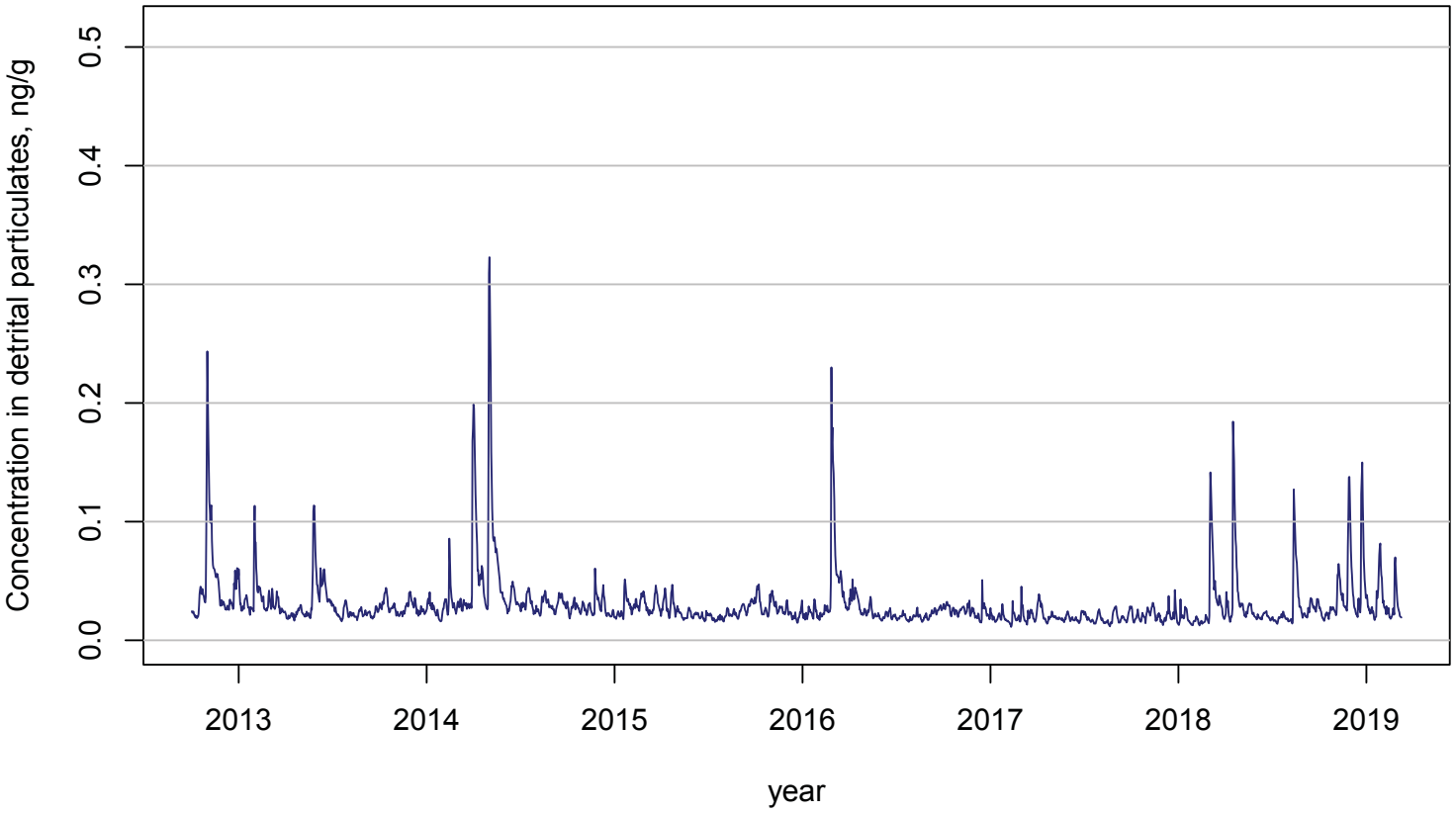
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in North



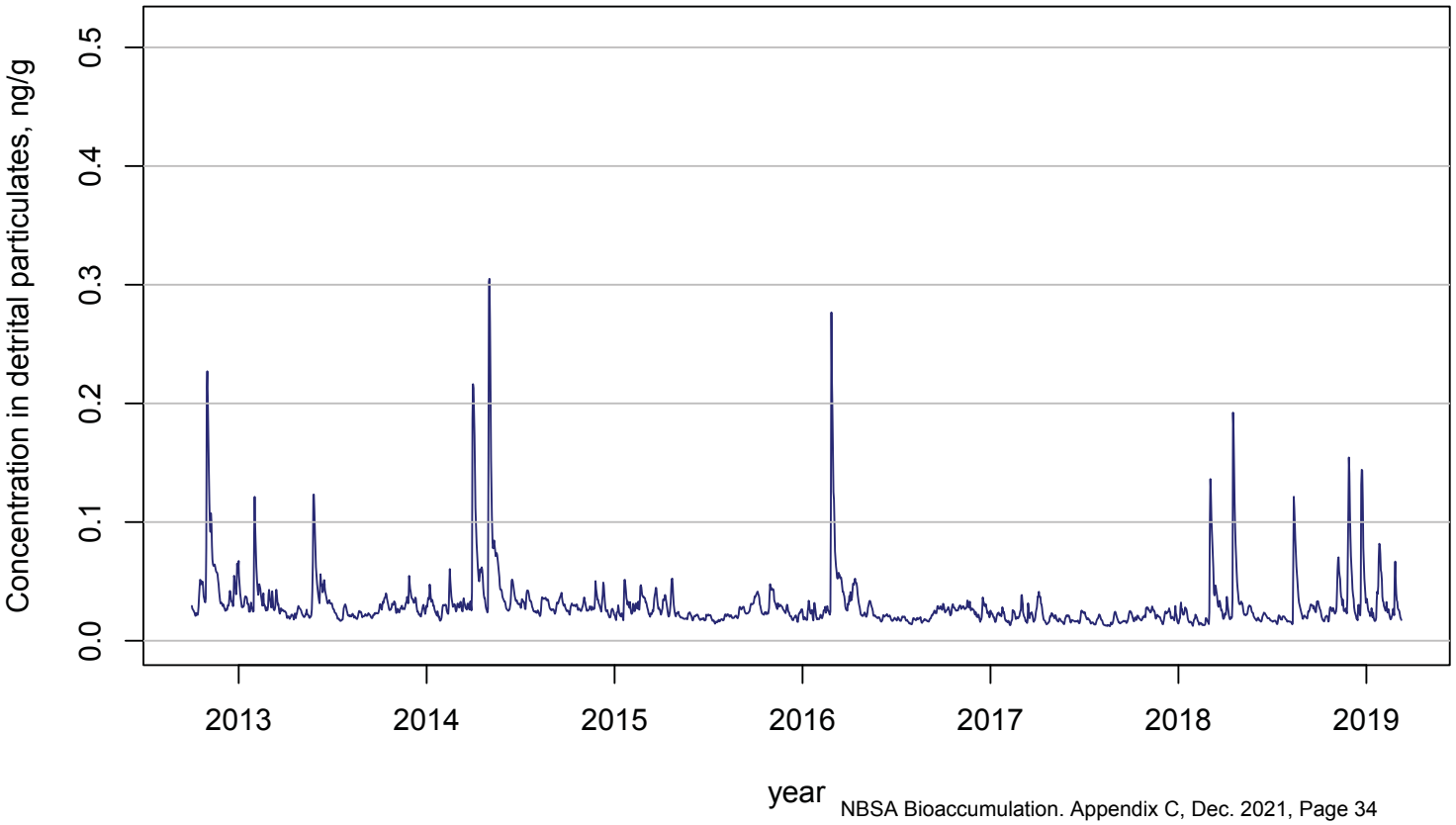
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in Southeast



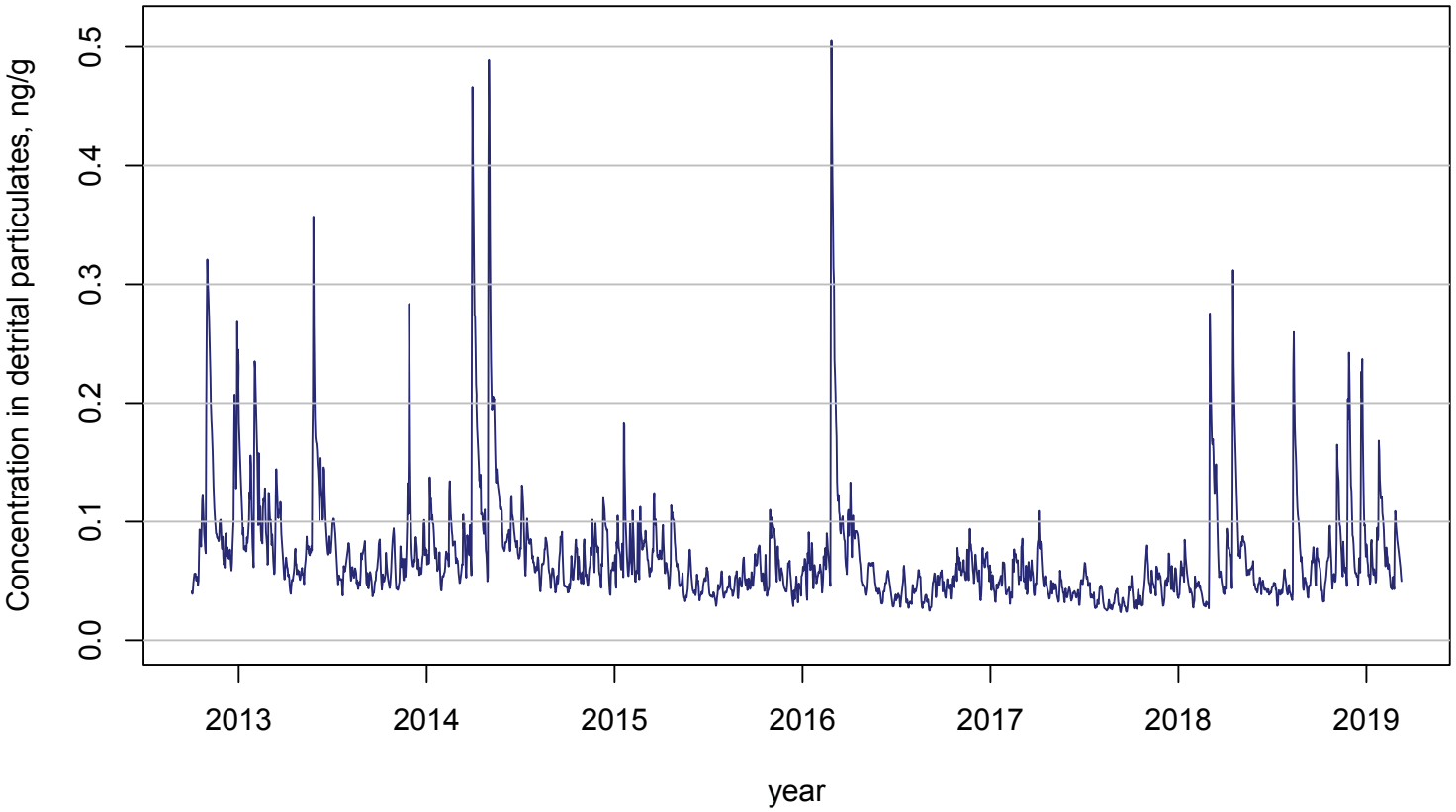
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in Southwest



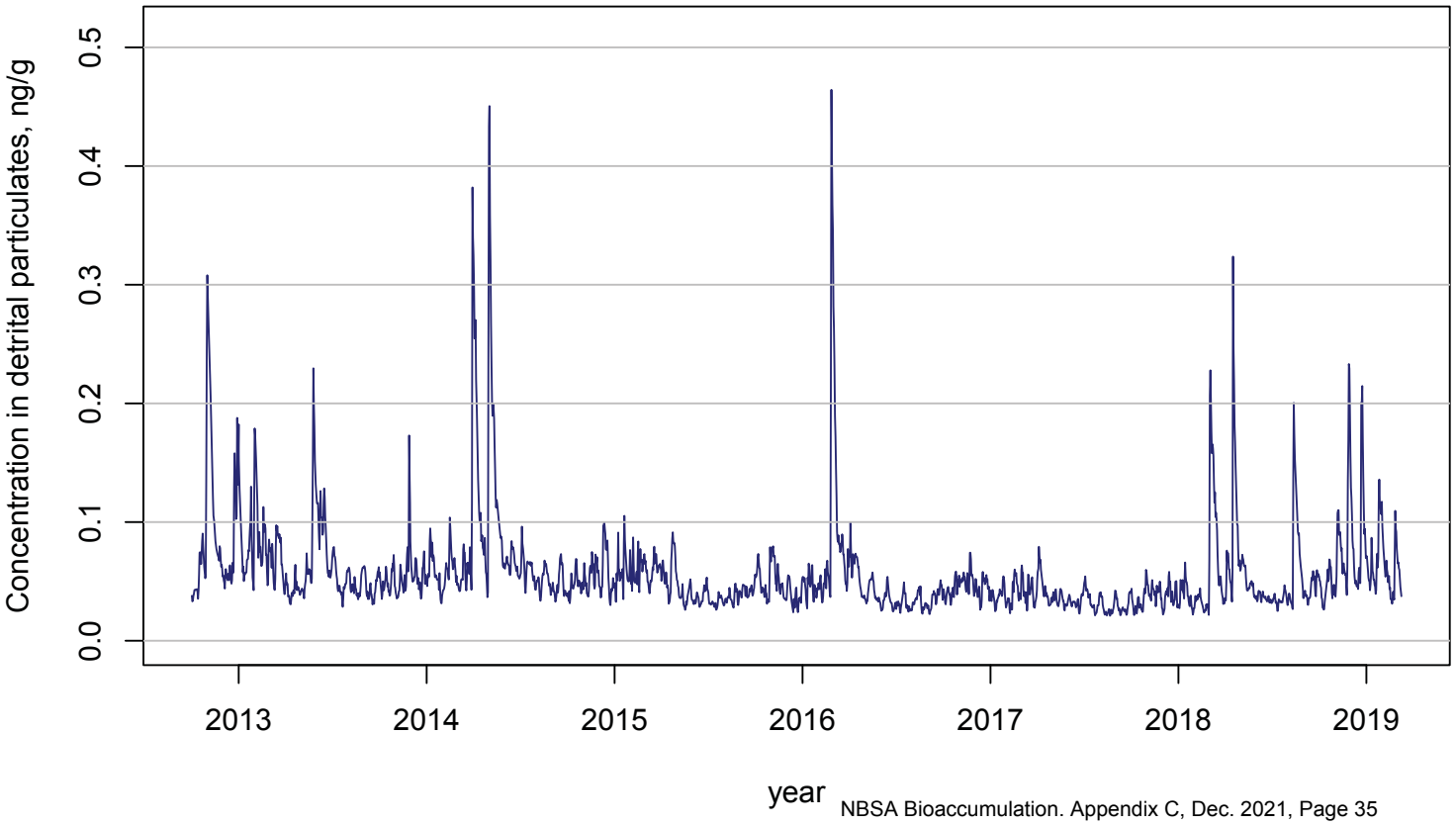
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in Channel



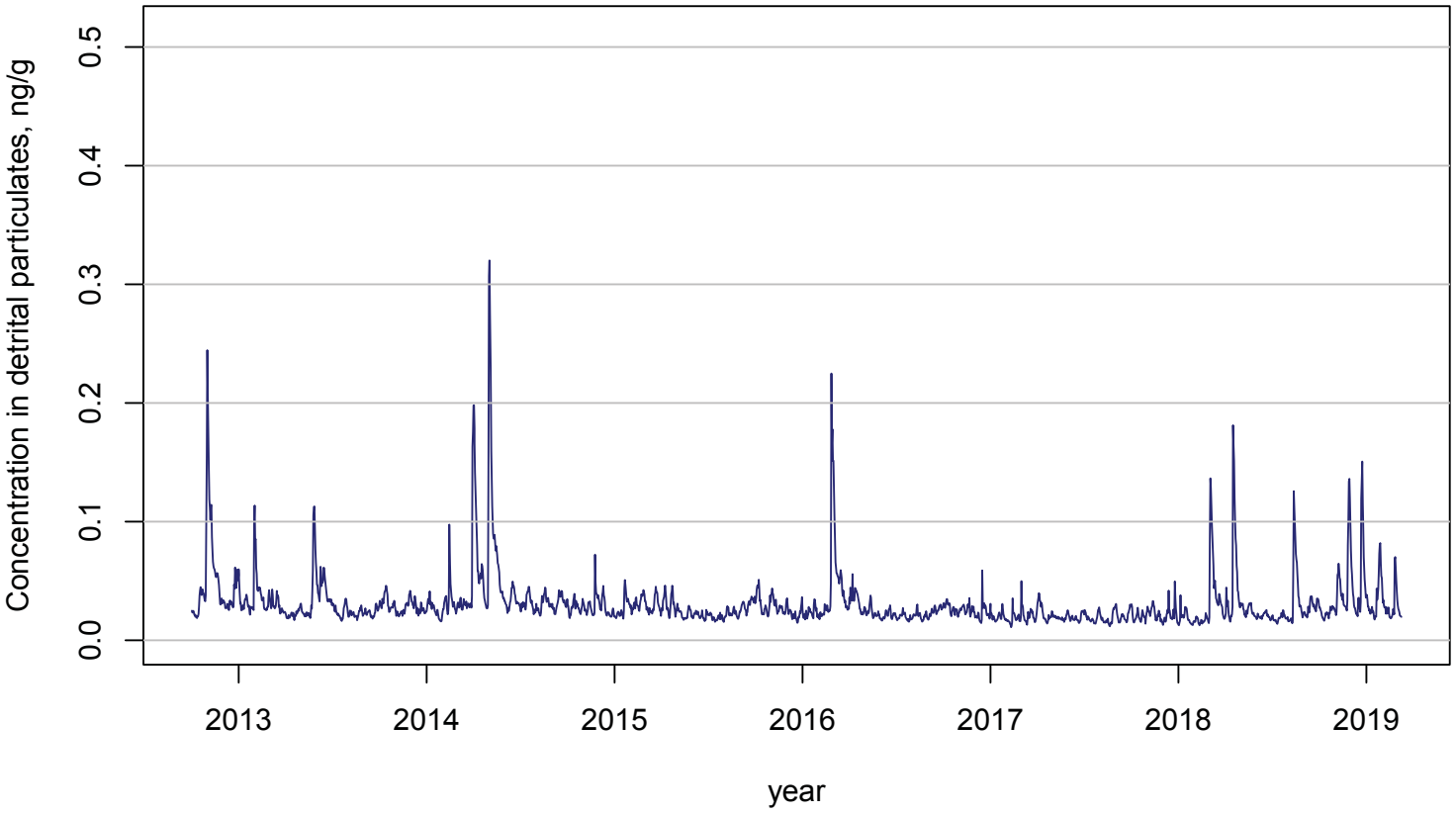
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in North Mudflat

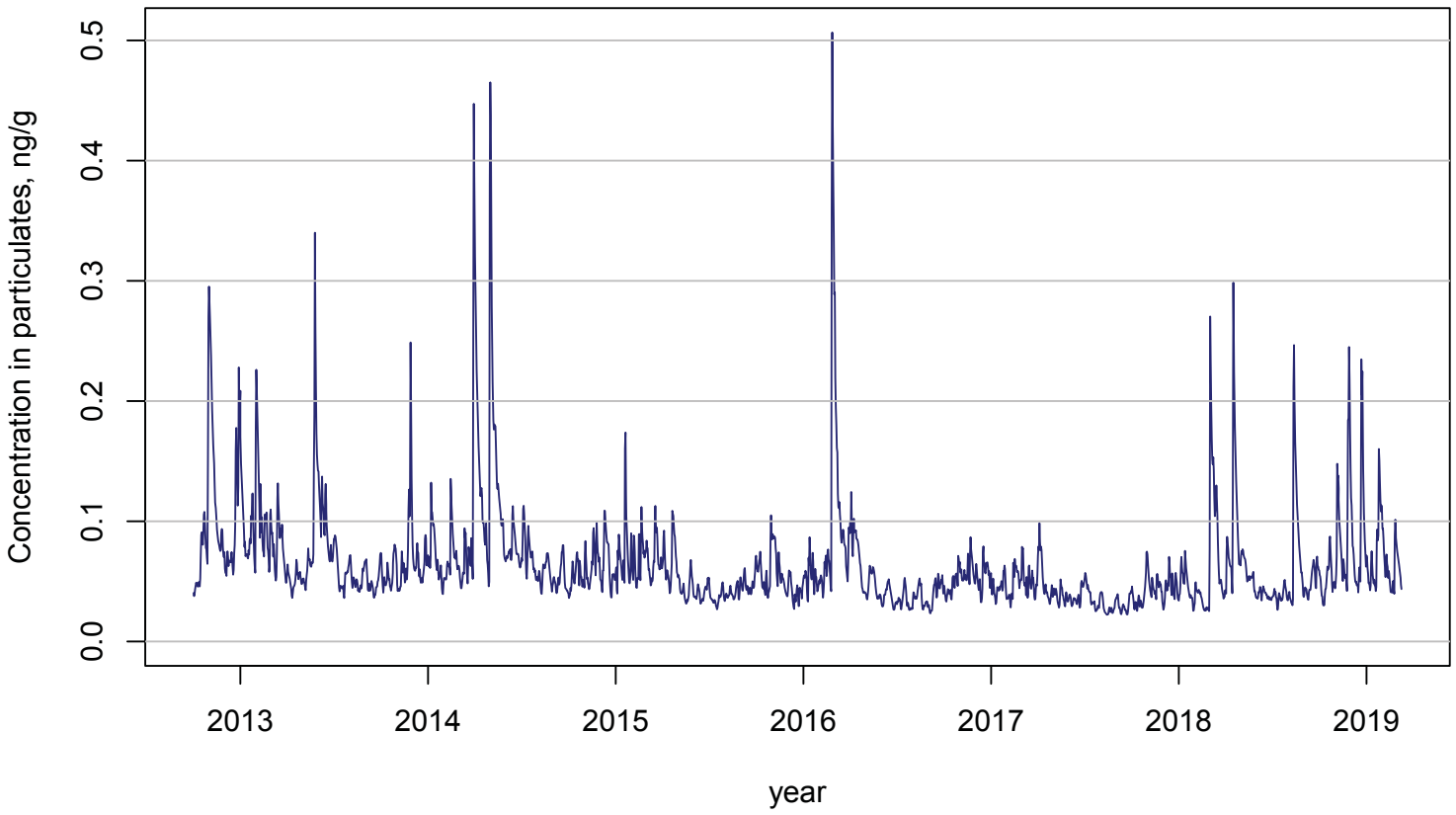


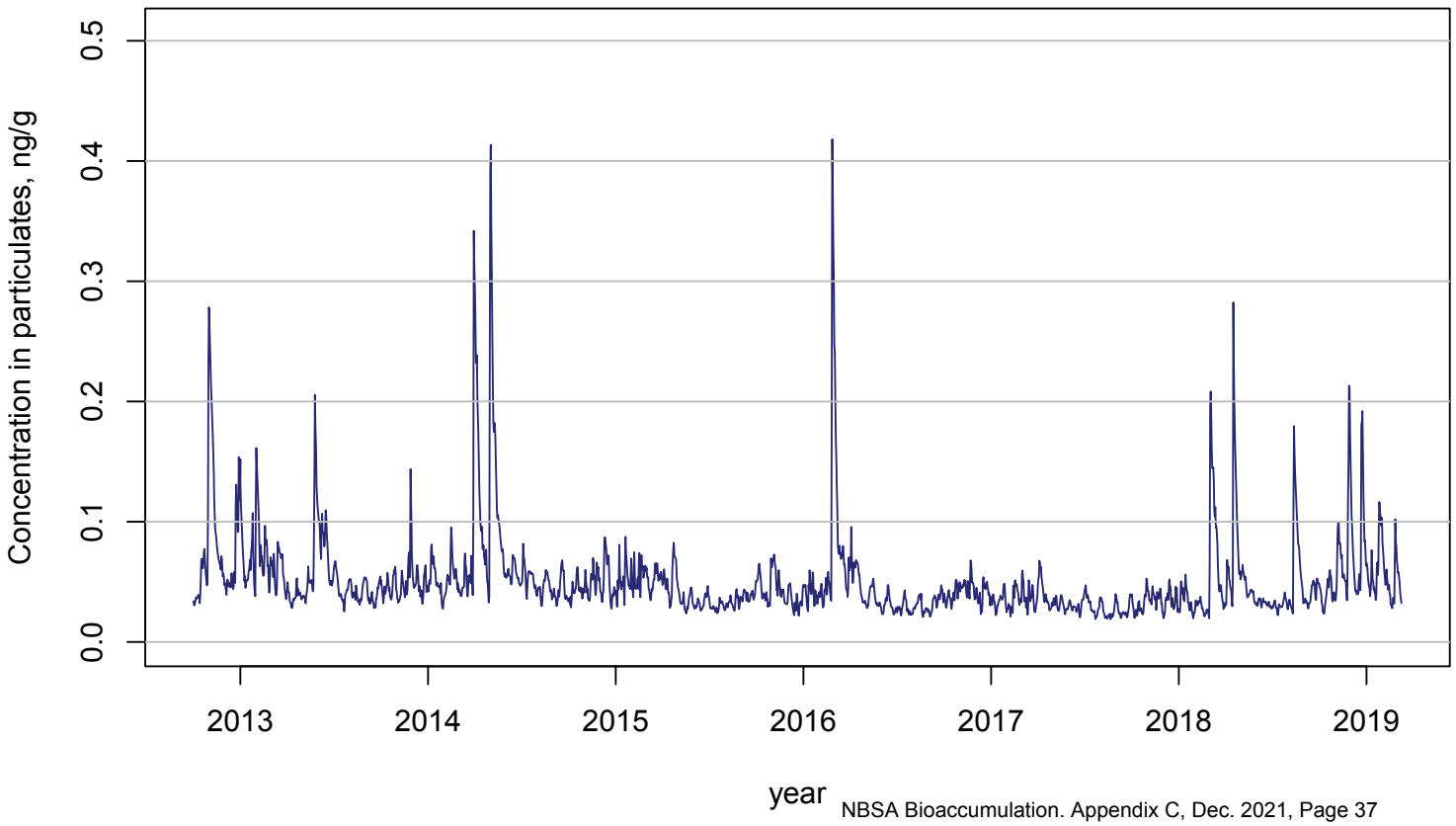
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in Southeast Mudflat

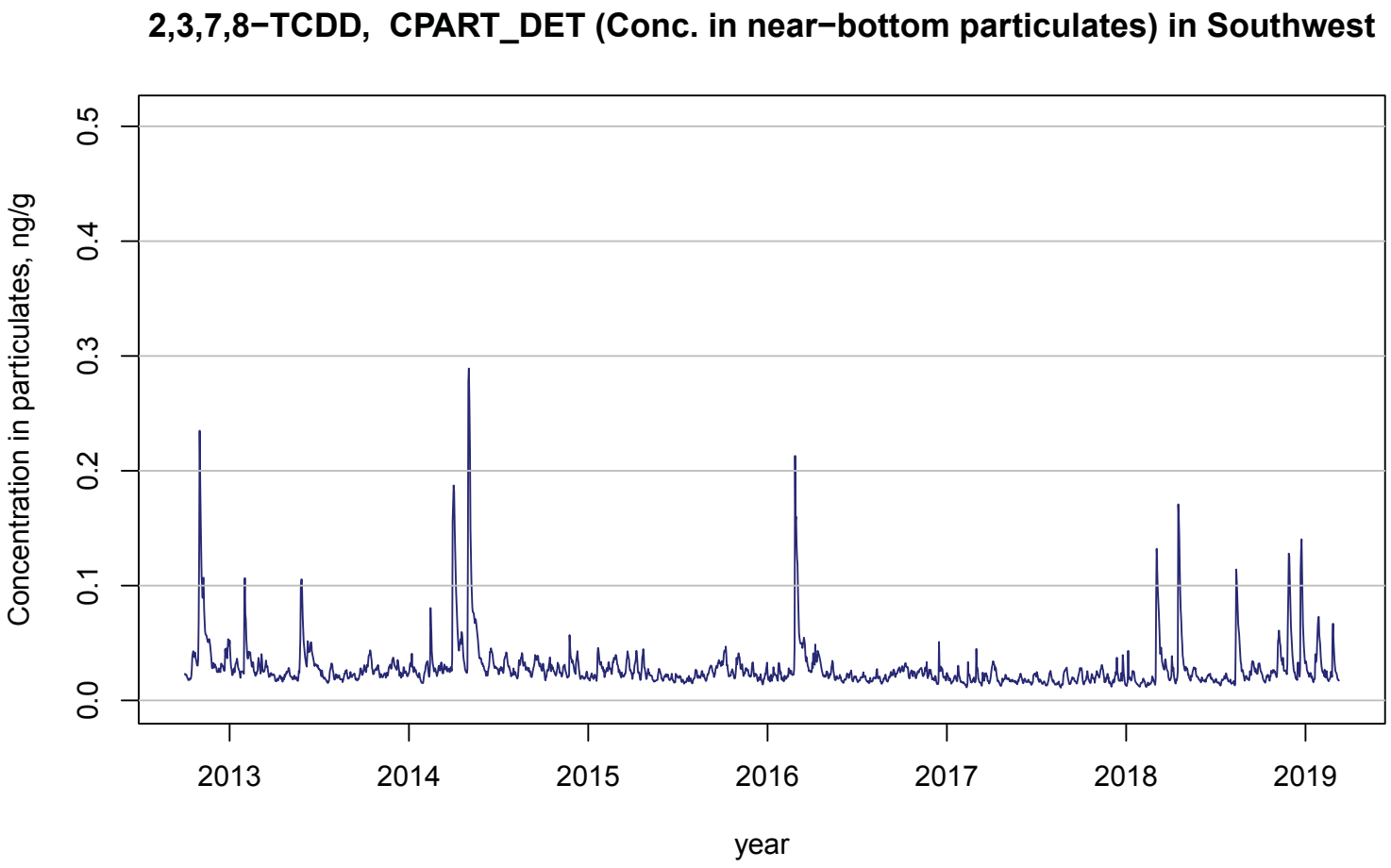


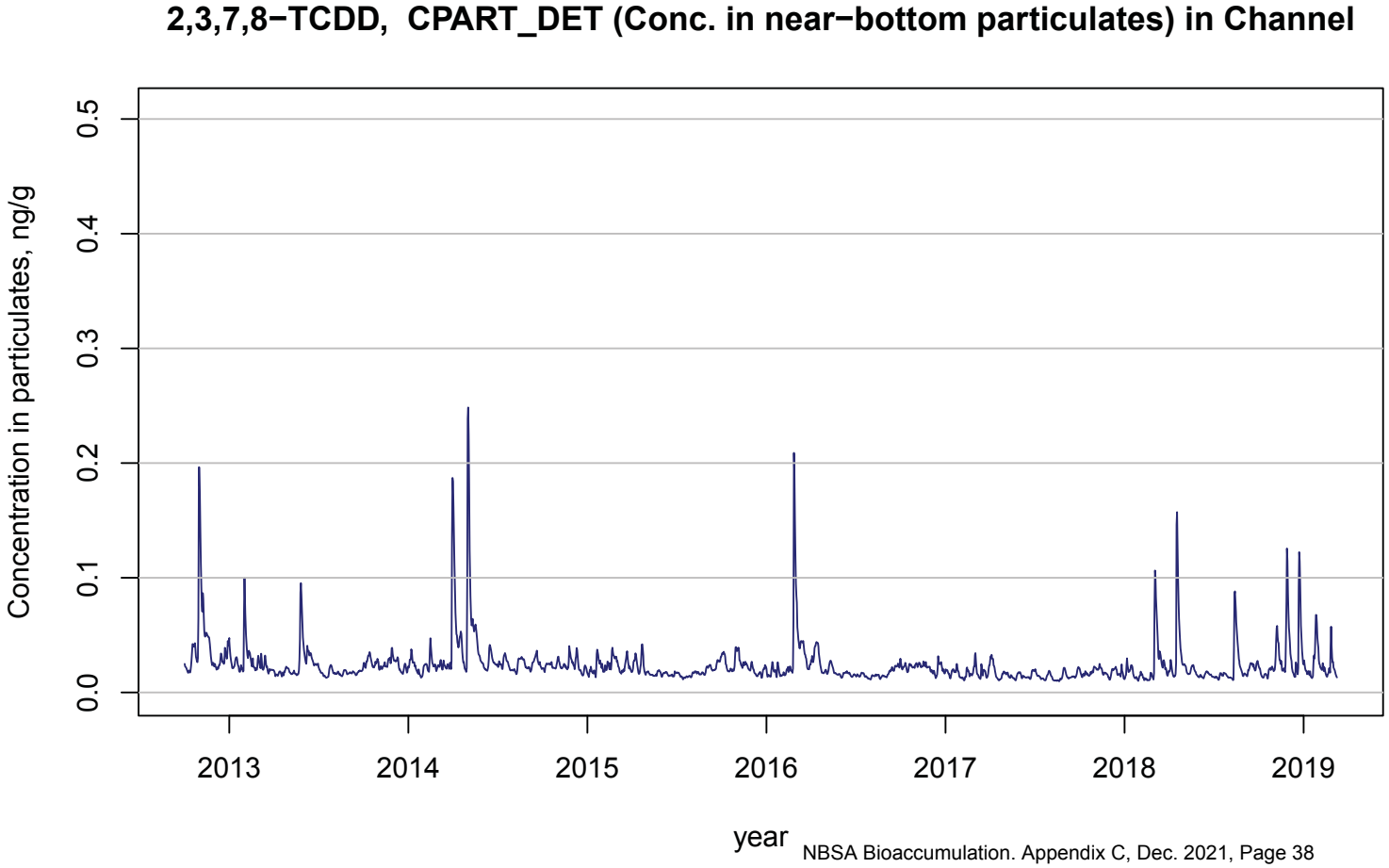
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in Southwest Mudflat



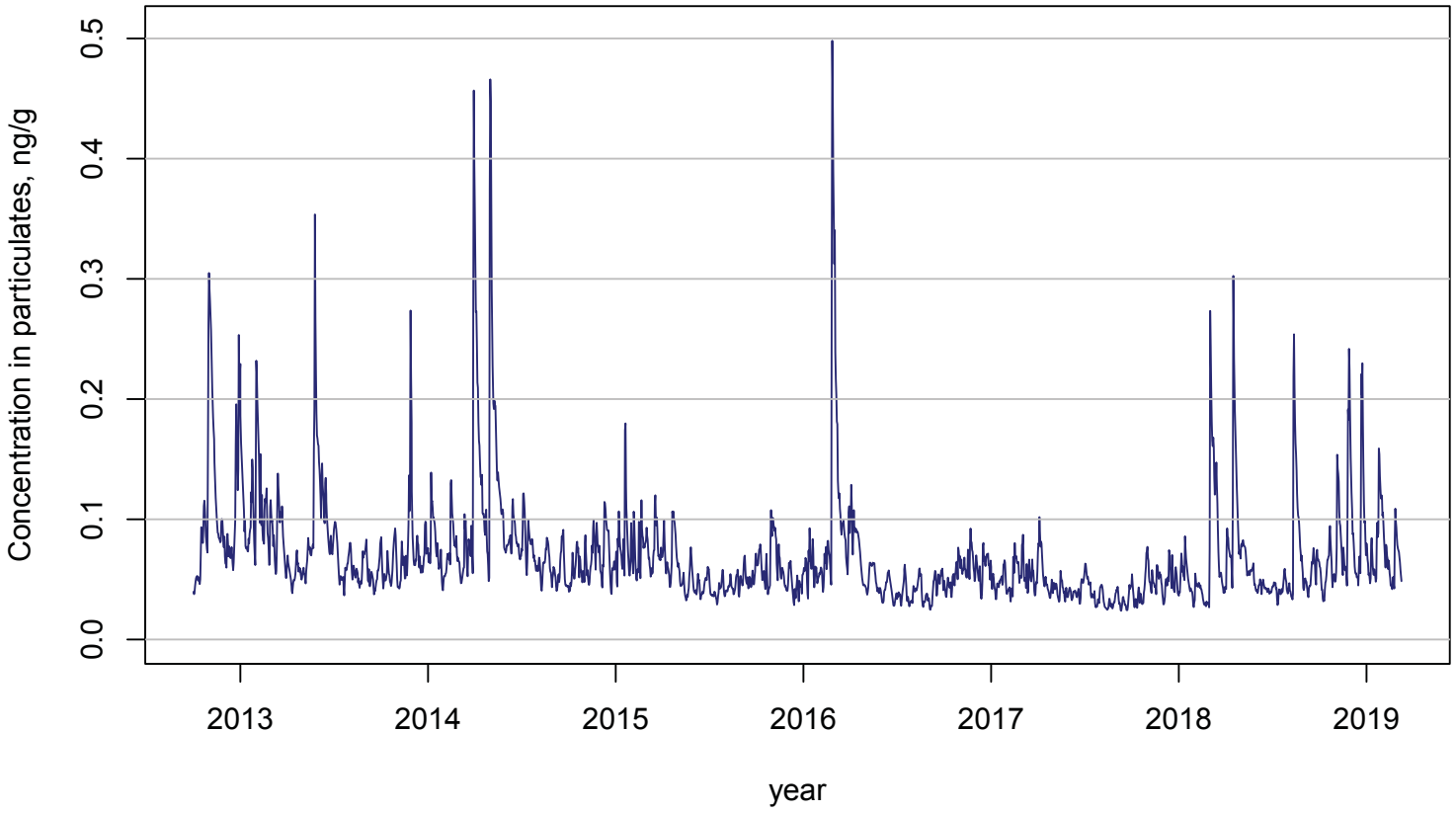

2,3,7,8−TCDD, CPART_DET (Conc. in near−bottom particulates) in North
Concentration in particulates, ng/g
0.0
0.1
0.2
0.3
0.4
0.5
2013
2014
2015
2016
2017
2018
2019
year


2,3,7,8−TCDD, CPART_DET (Conc. in near−bottom particulates) in Southeast
Concentration in particulates, ng/g
0.0
0.1
0.2
0.3
0.4
0.5
2013
2014
2015
2016
2017
2018
2019
year

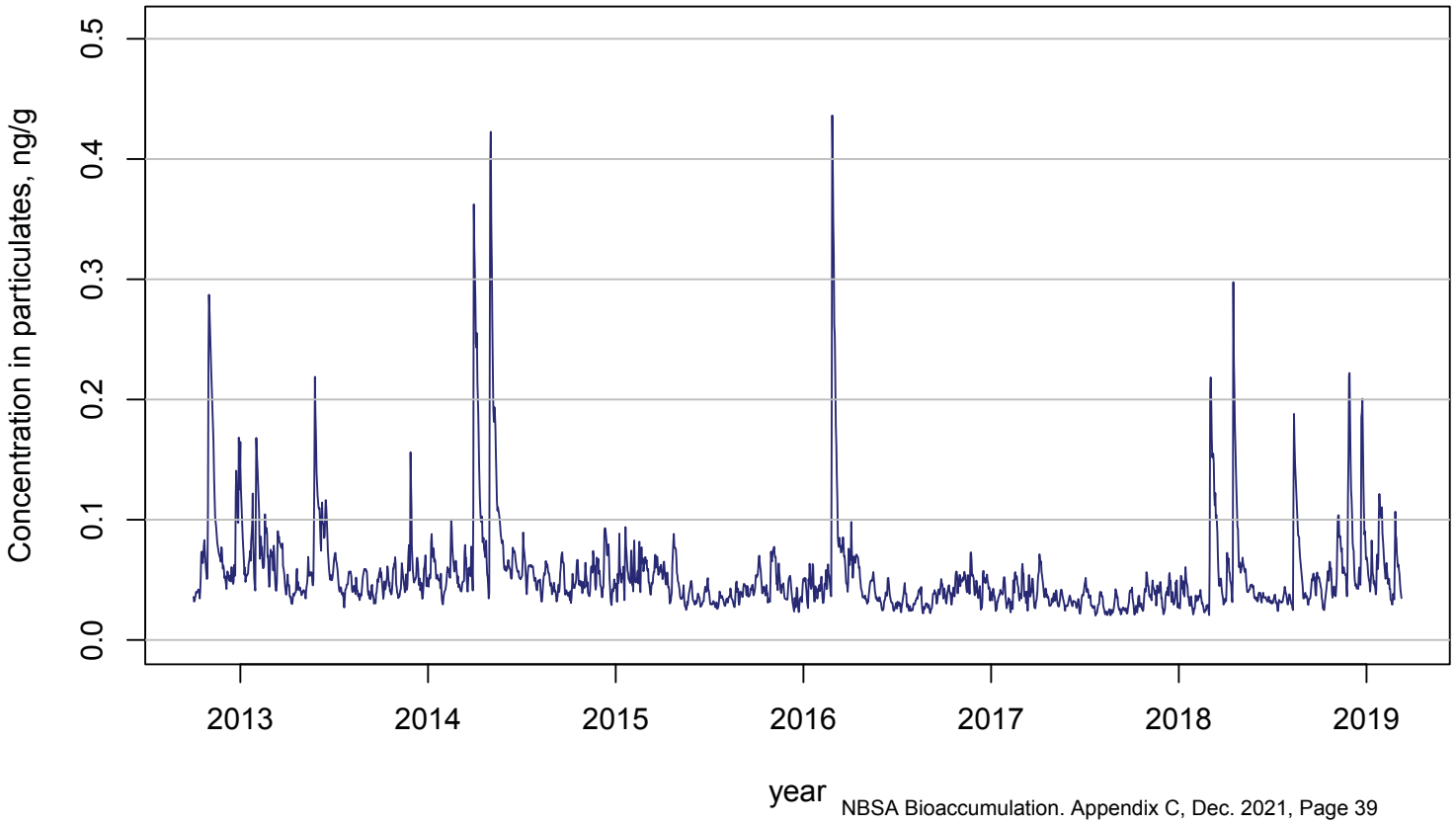

2,3,7,8−TCDD, CPART_DET (Conc. in near−bottom particulates) in Southwest
Concentration in particulates, ng/g
0.0
0.1
0.2
0.3
0.4
0.5
2013
2014
2015
2016
2017
2018
2019
year


2,3,7,8−TCDD, CPART_DET (Conc. in near−bottom particulates) in Channel
Concentration in particulates, ng/g
0.0
0.1
0.2
0.3
0.4
0.5
2013
2014
2015
2016
2017
2018
2019
year

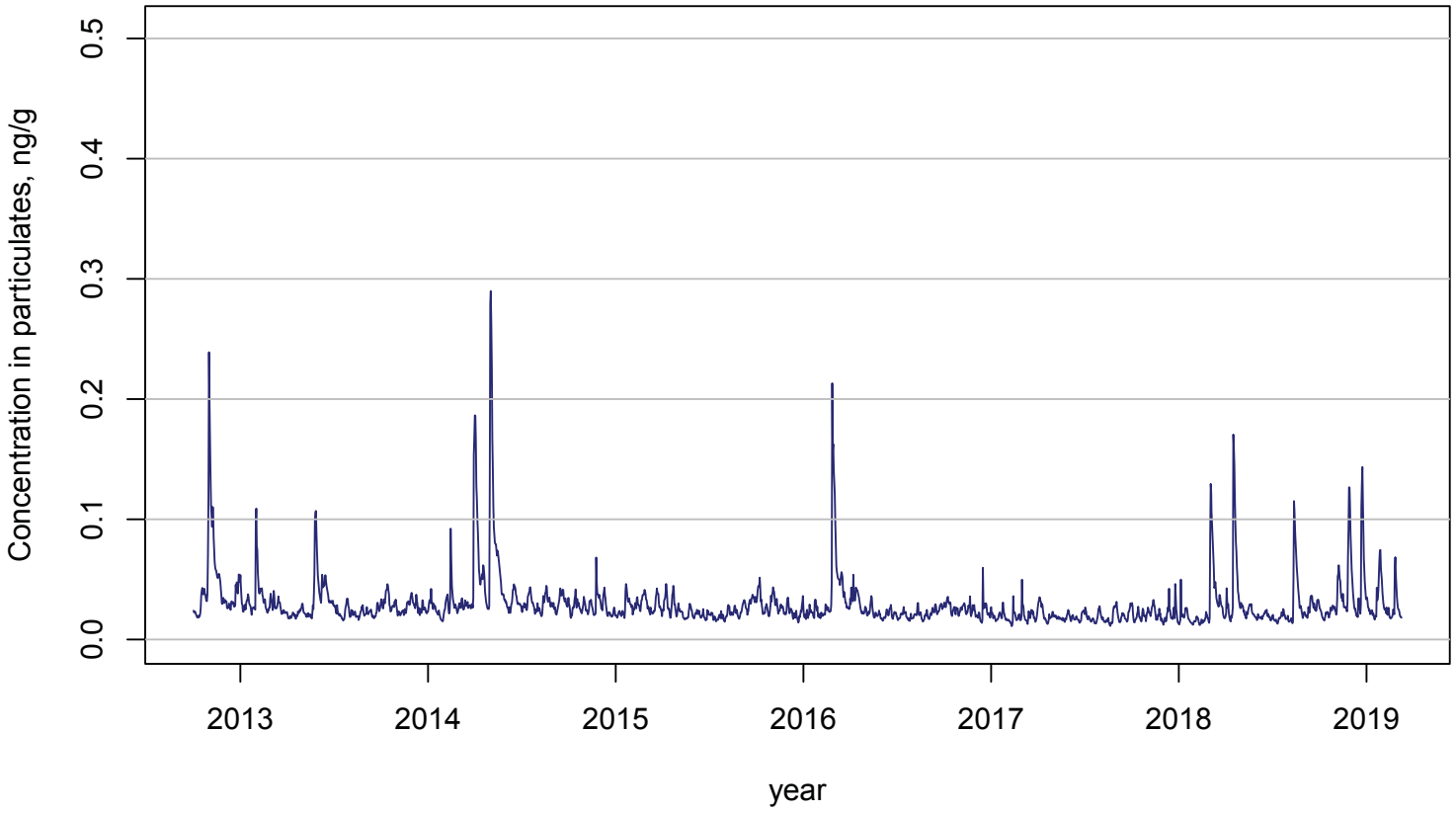
2,3,7,8−TCDD, CPART_DET (Conc. in near−bottom particulates) in North Mudflat



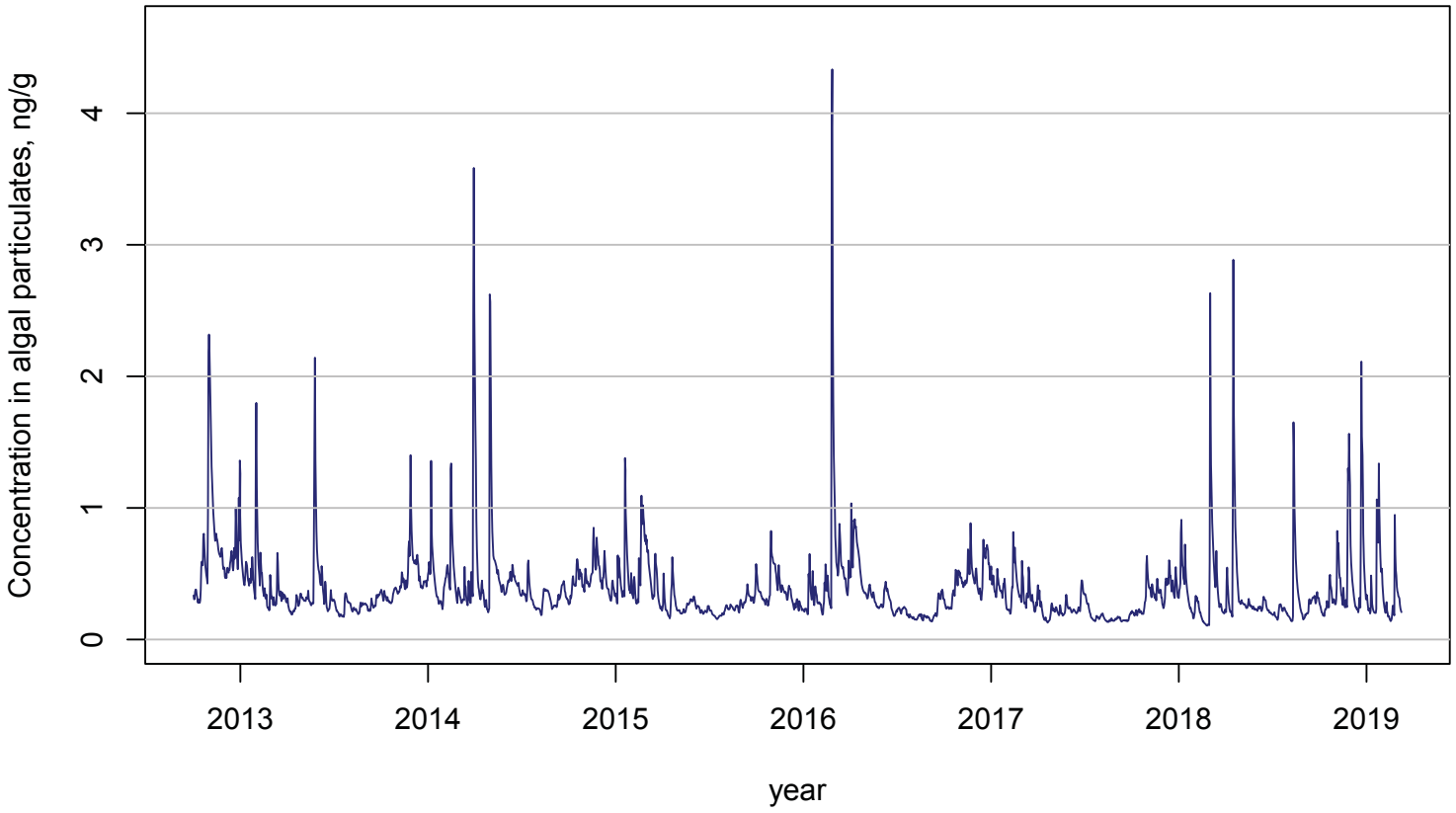
2,3,7,8−TCDD, CPART_DET (Conc. in near−bottom particulates) in Southeast Mudflat



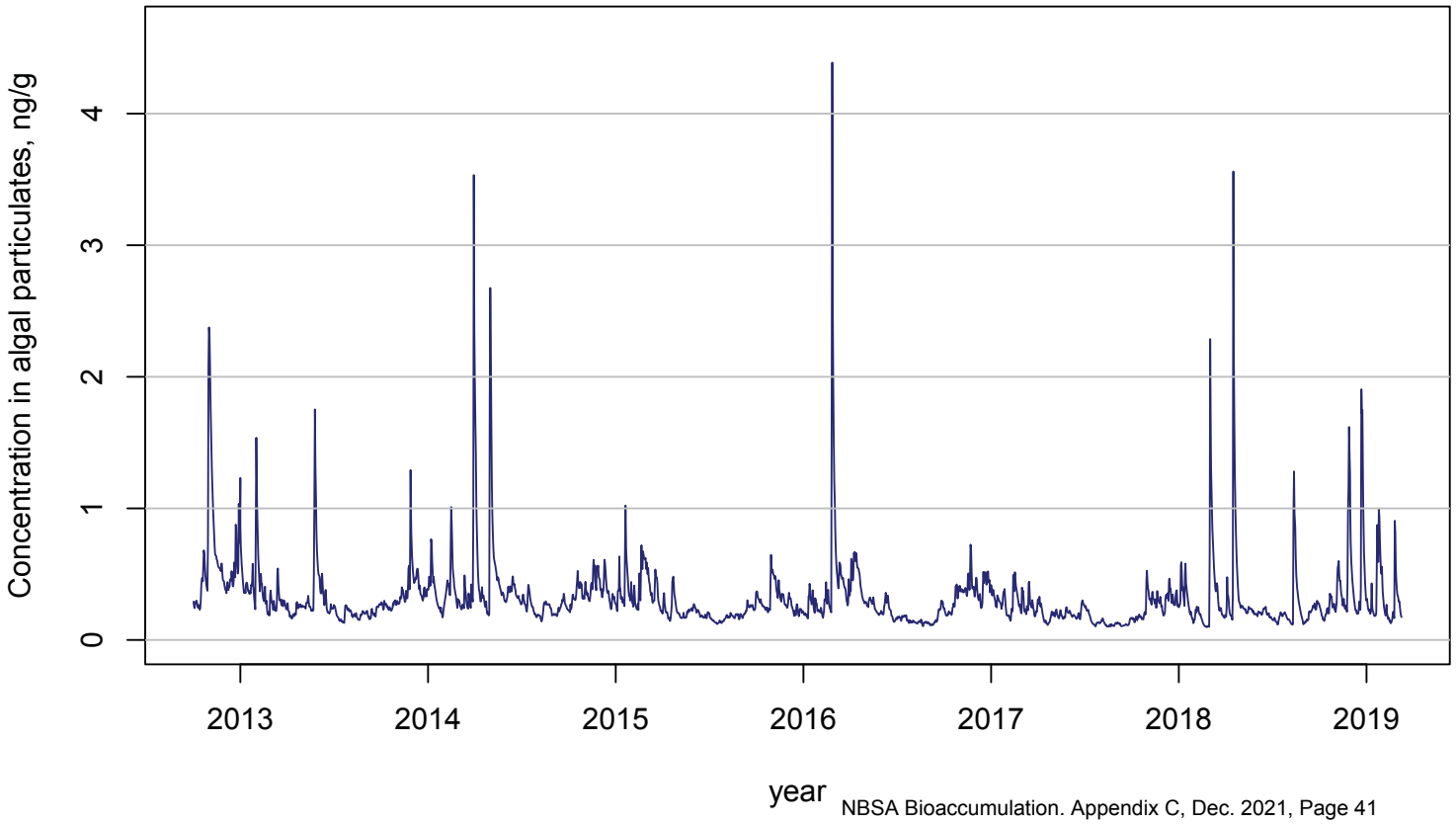
2,3,7,8−TCDD, CPART_DET (Conc. in near−bottom particulates) in Southwest Mudflat



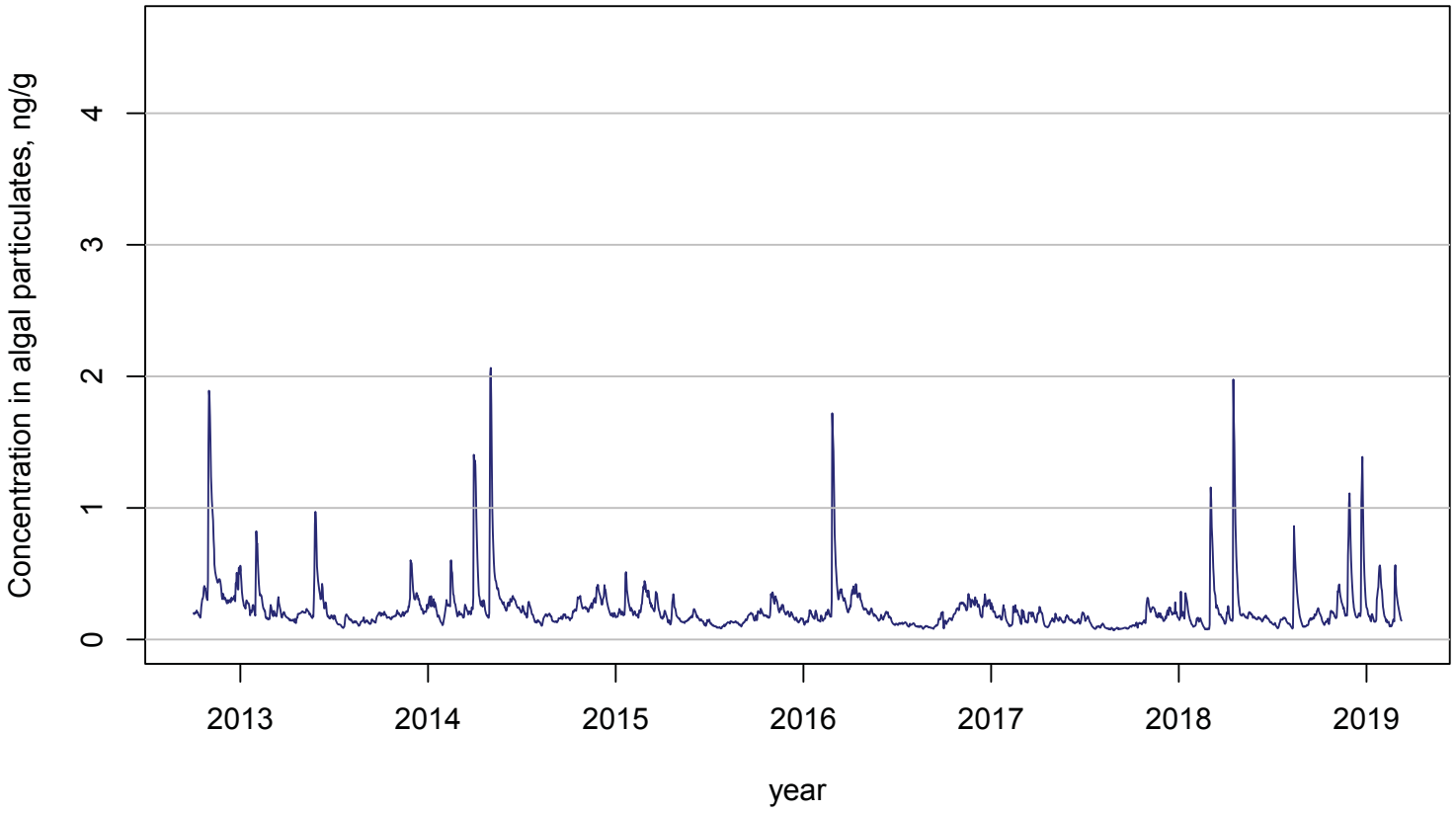
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in North



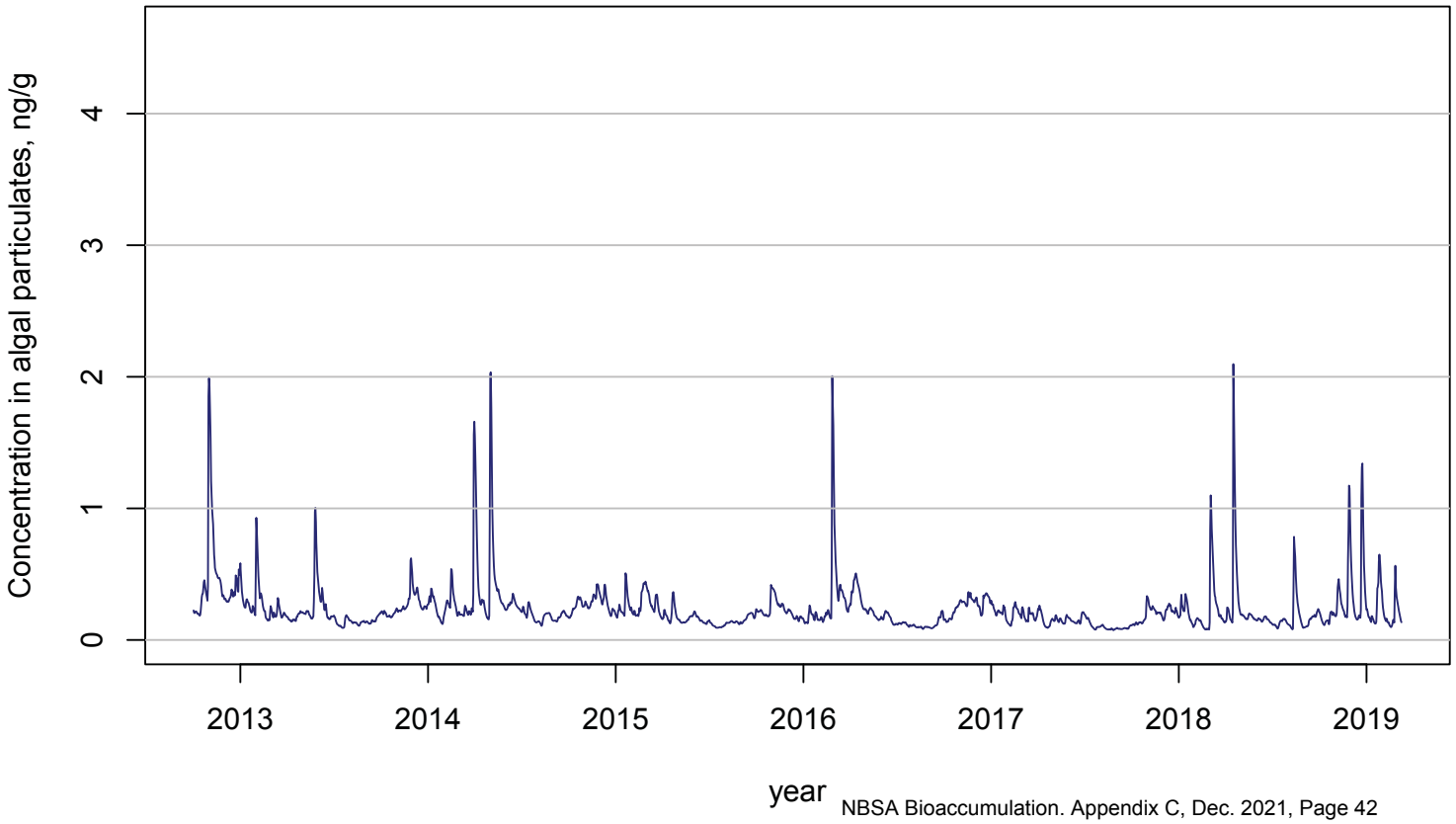
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in Southeast



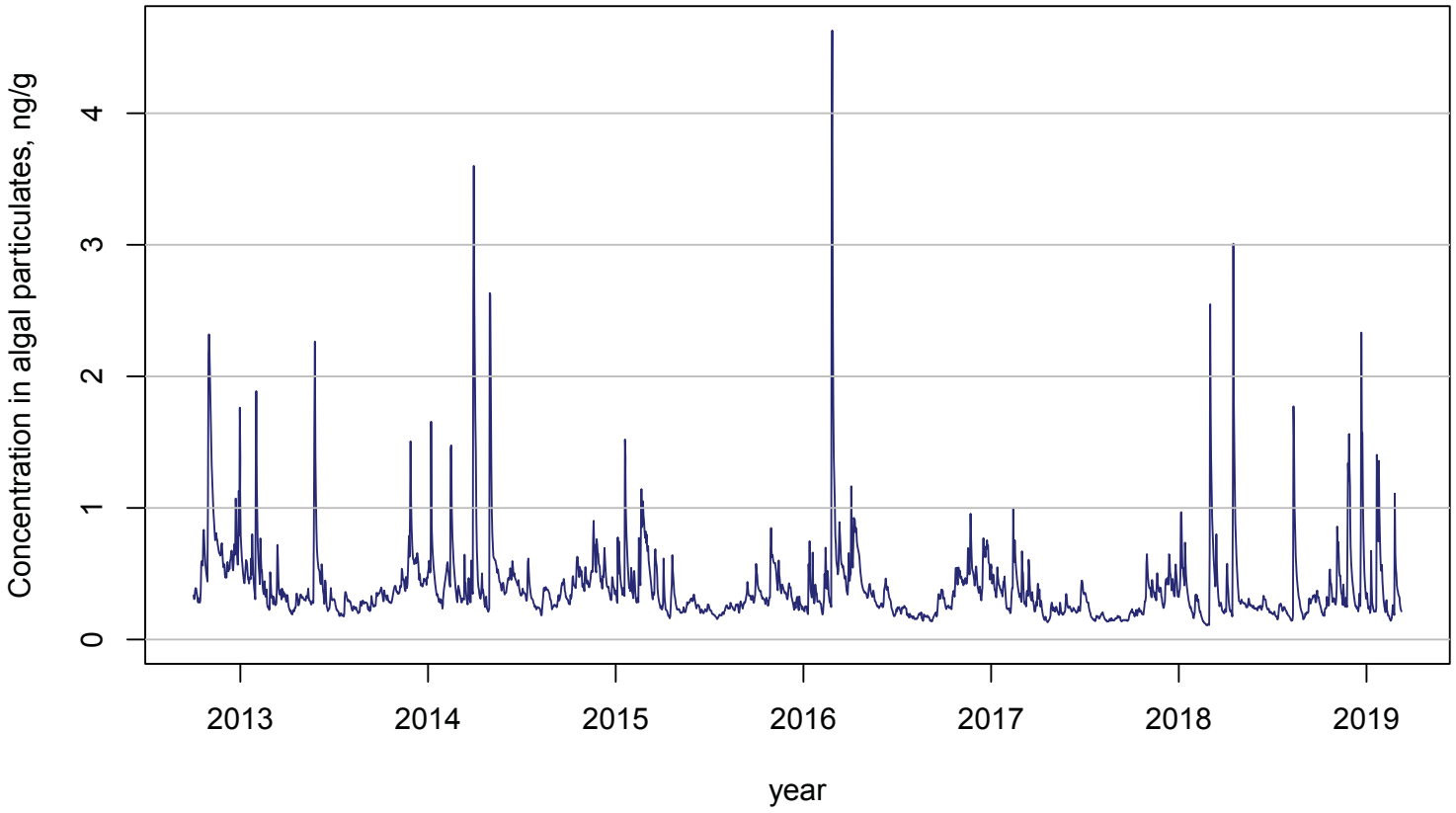
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in Southwest



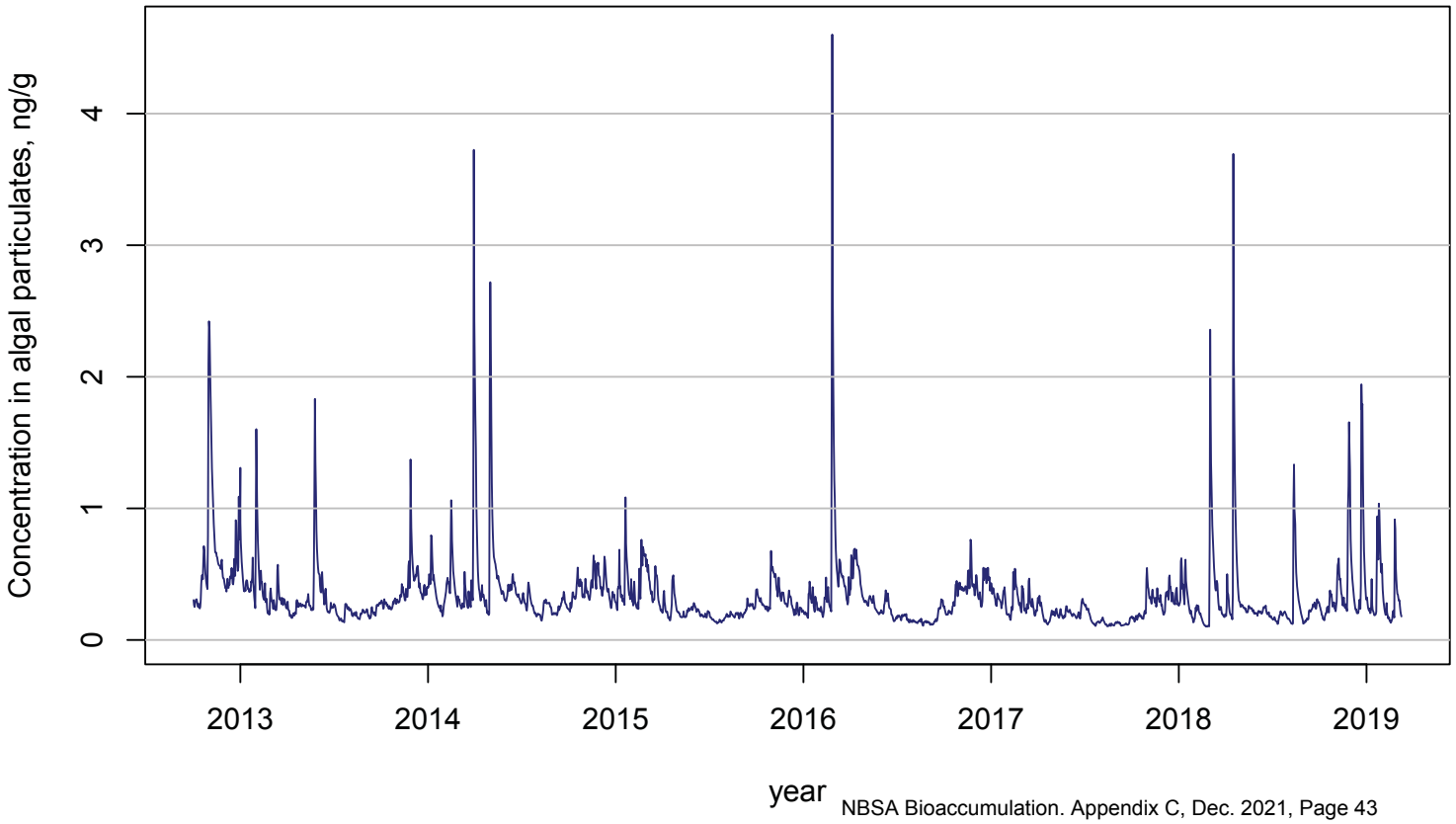
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in Channel

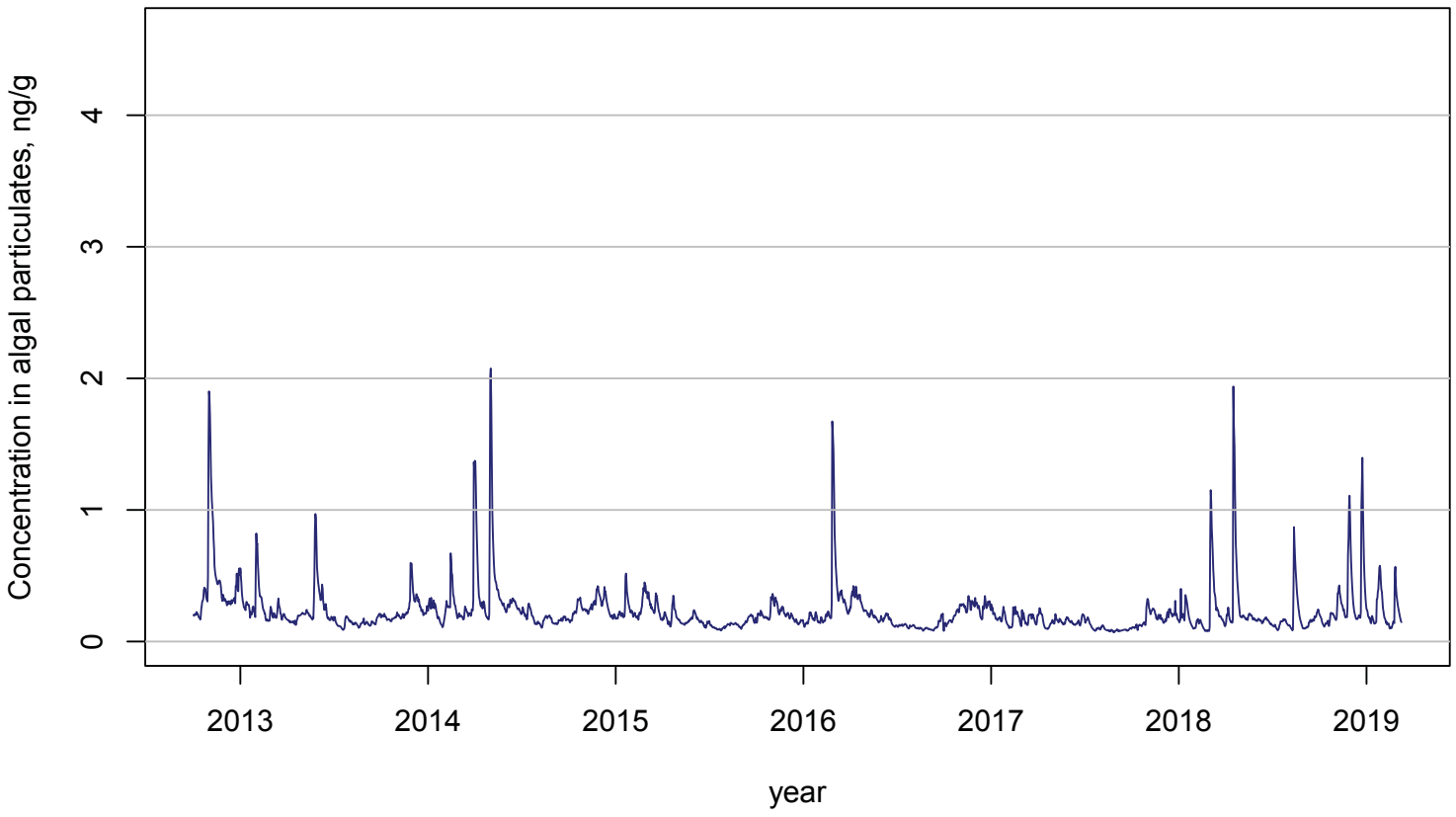


2,3,7,8−TCDD, CAC (Concentration in algal particulates) in North Mudflat

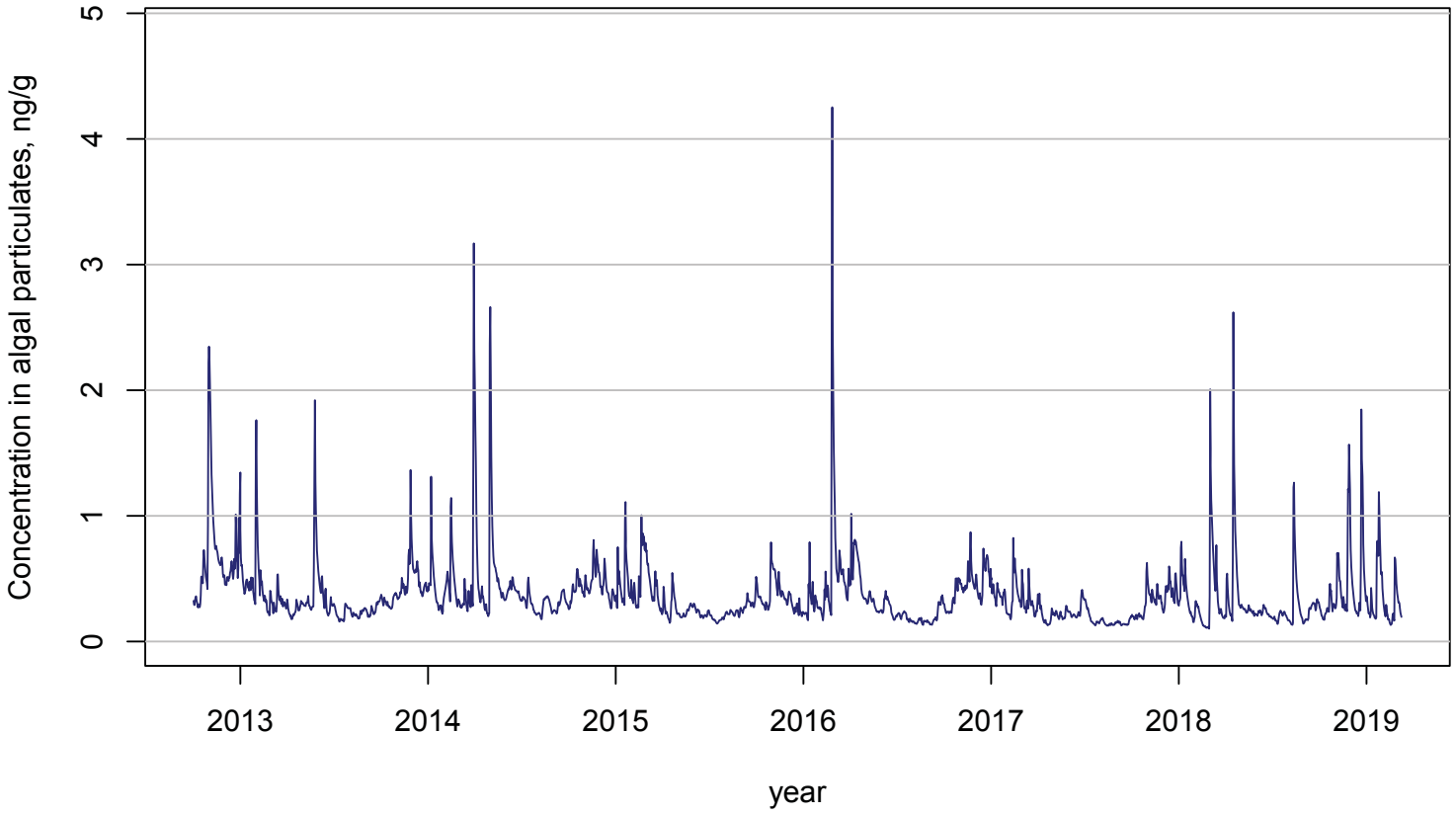


2,3,7,8−TCDD, CAC (Concentration in algal particulates) in Southeast Mudflat

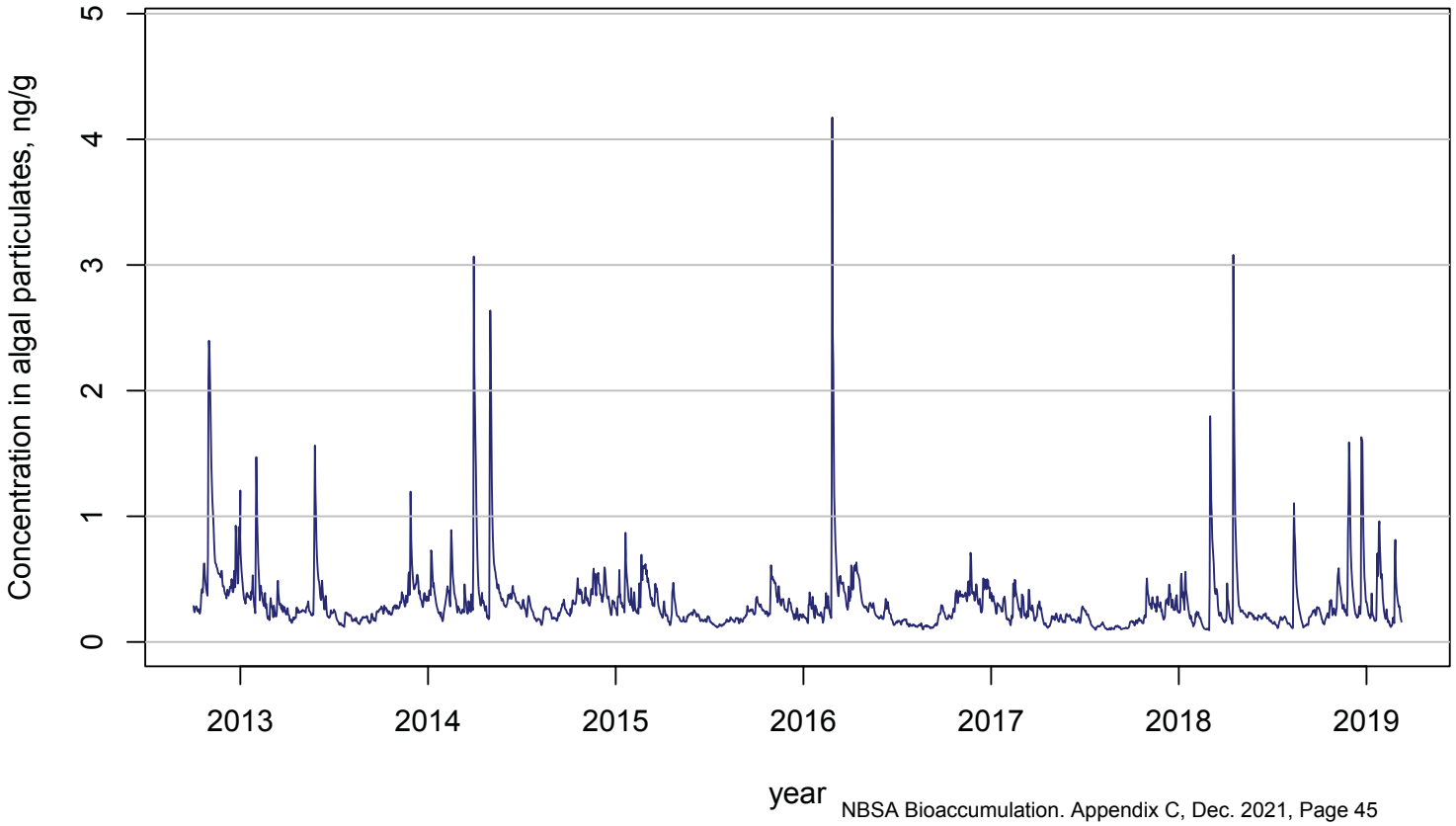



2,3,7,8−TCDD, CAC (Concentration in algal particulates) in Southwest Mudflat
Concentration in algal particulates, ng/g
0
1
2
3
4
2013
2014
2015
2016
2017
2018
2019
year

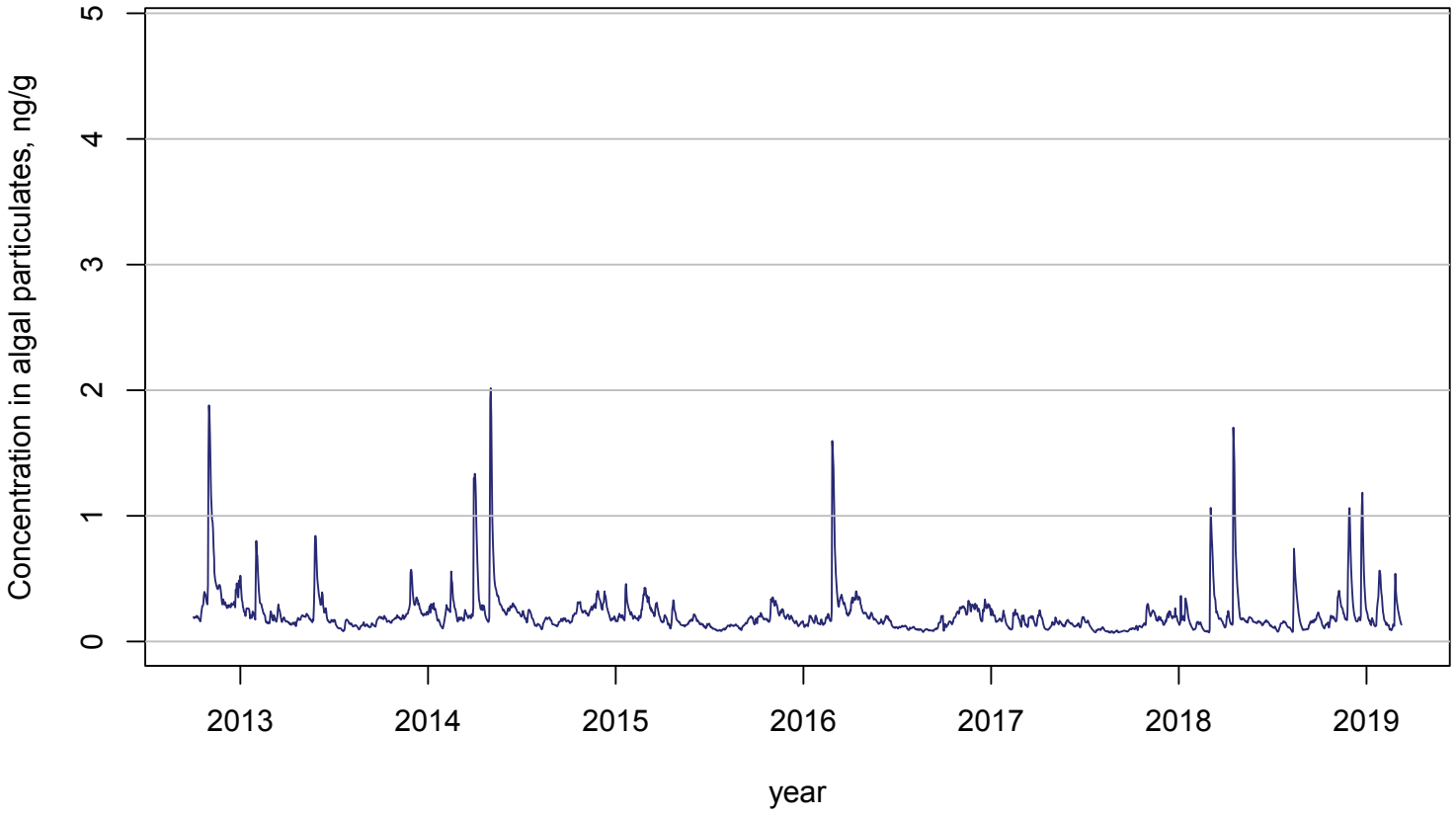
2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in North



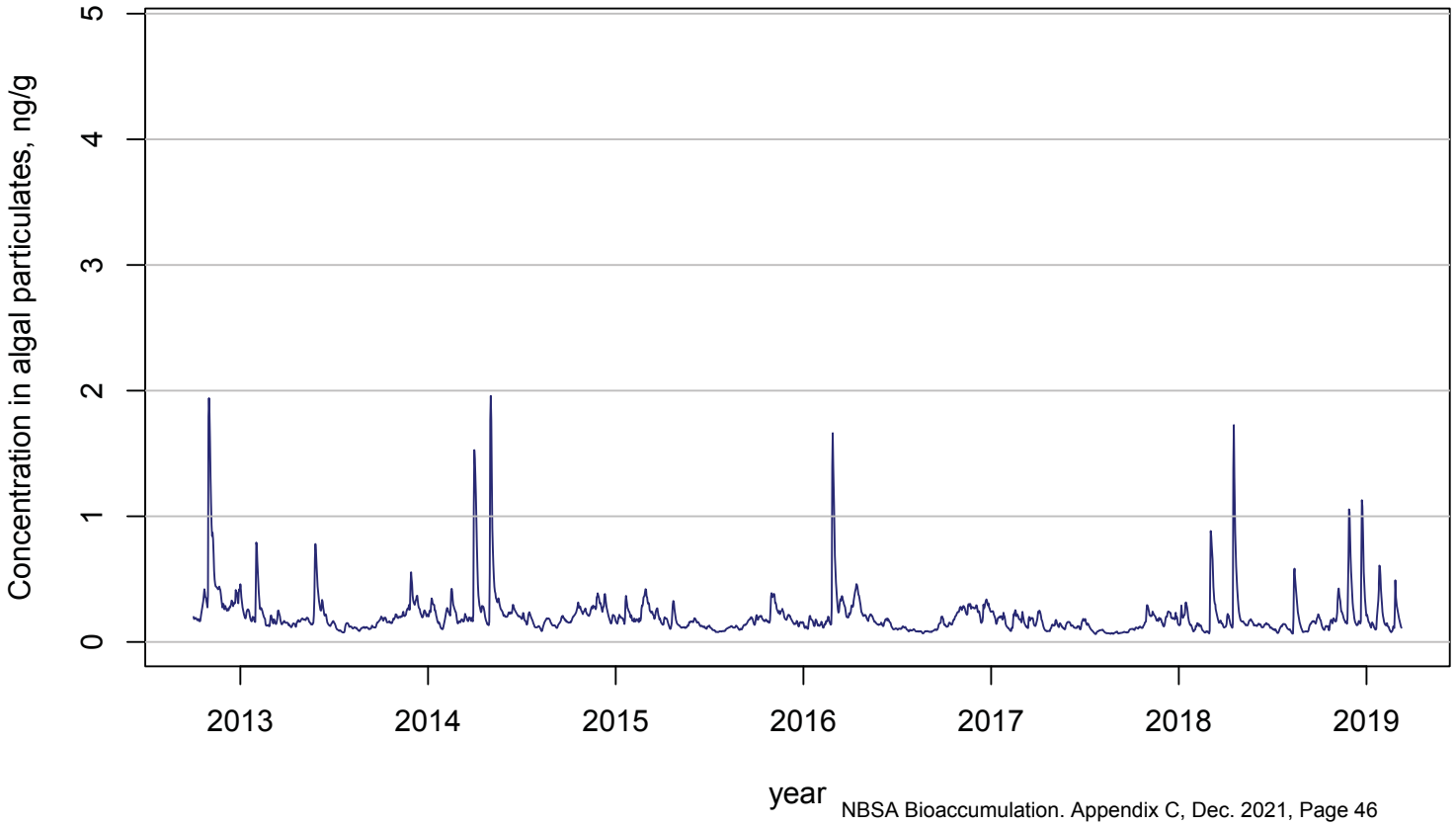
2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in Southeast



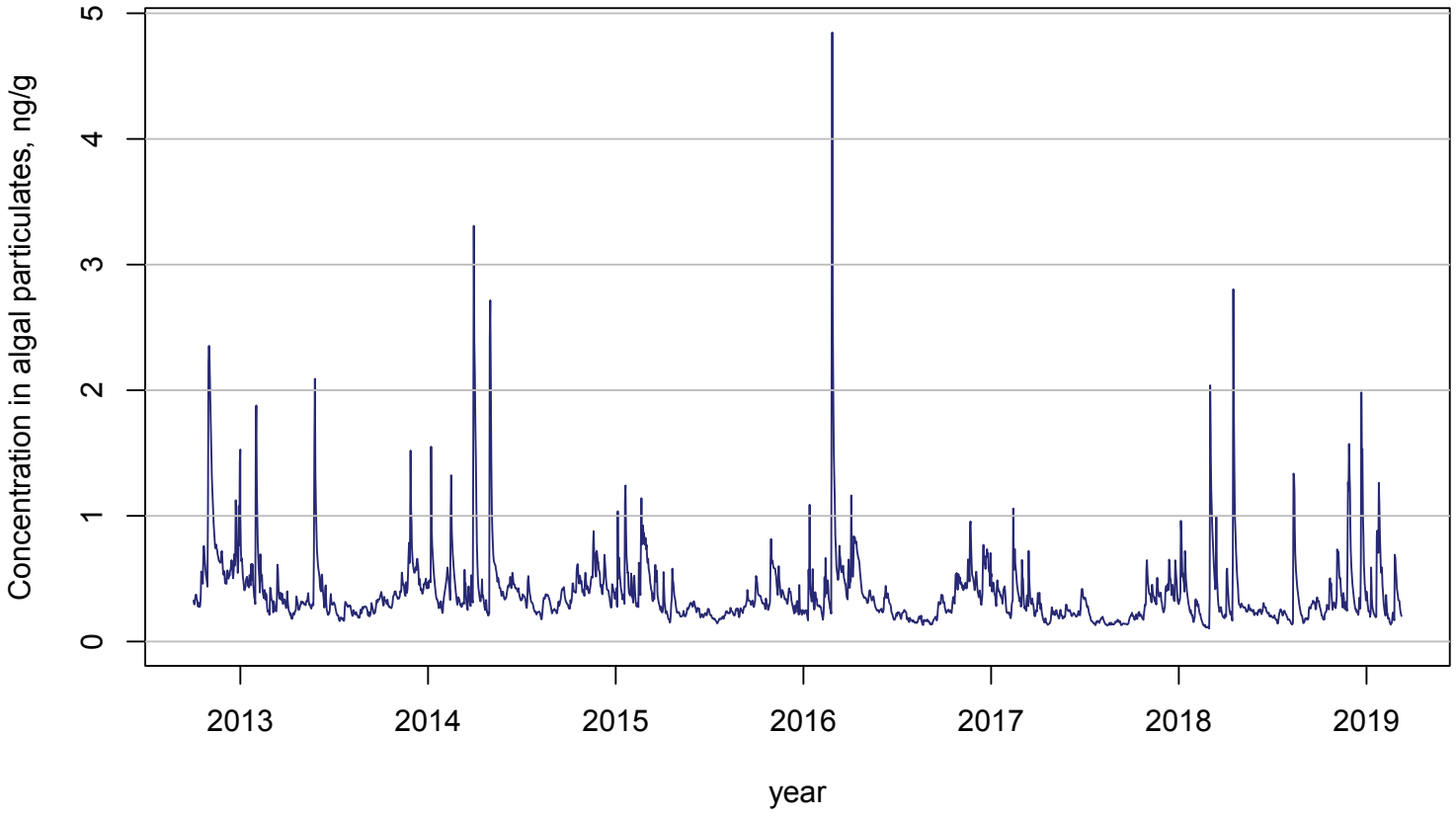
2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in Southwest



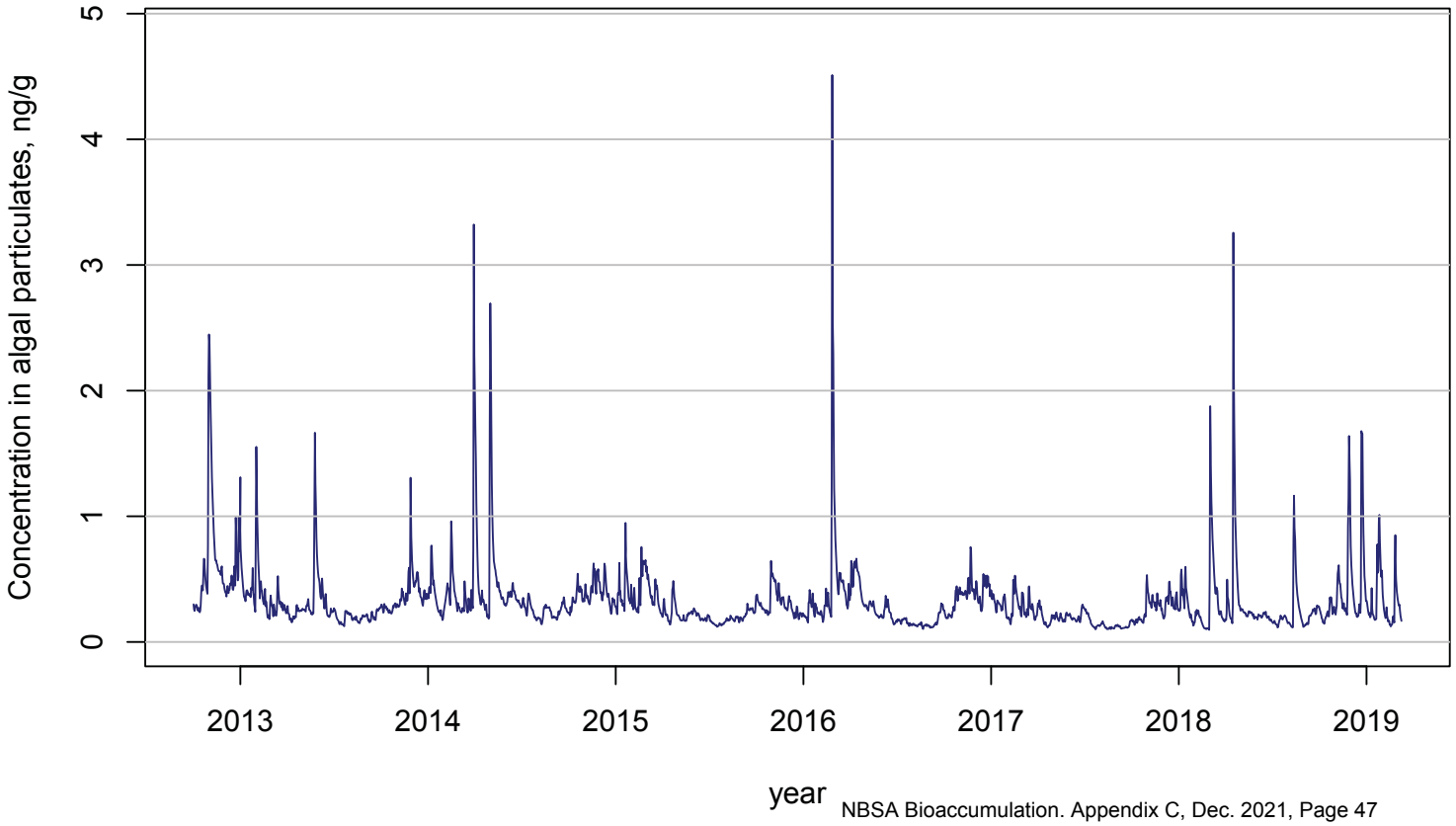
2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in Channel

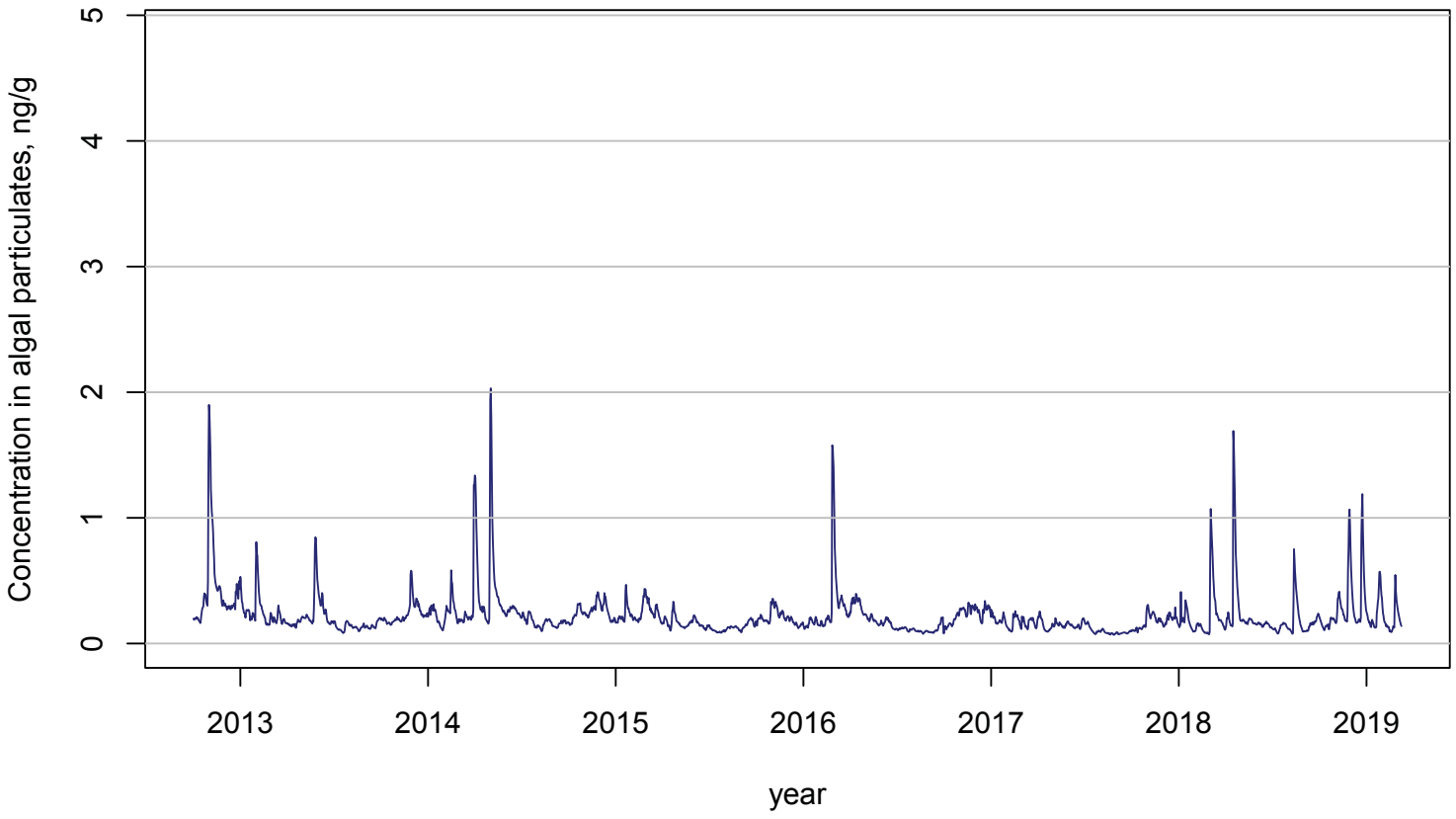


2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in North Mudflat

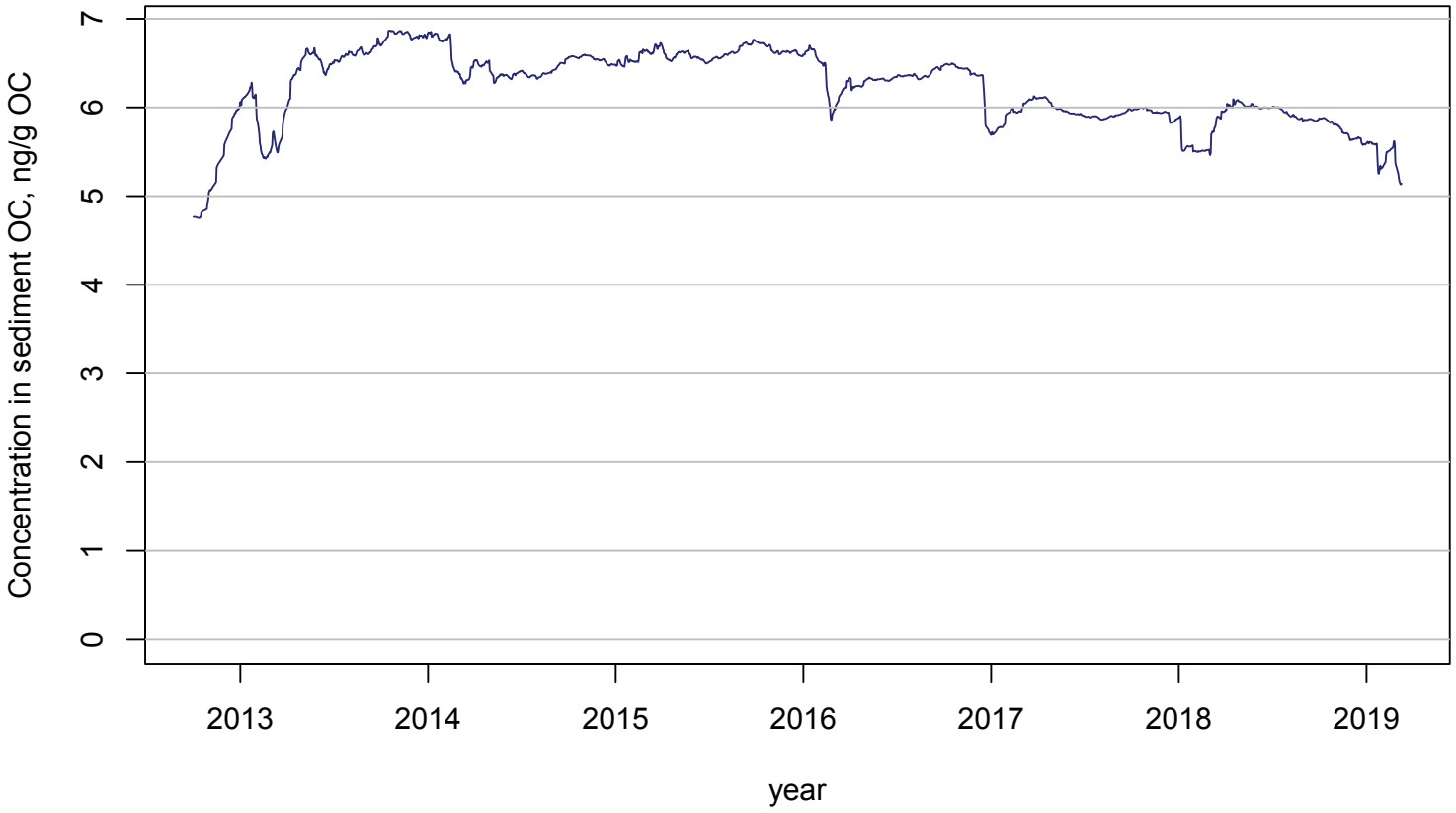


2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in Southeast Mudflat

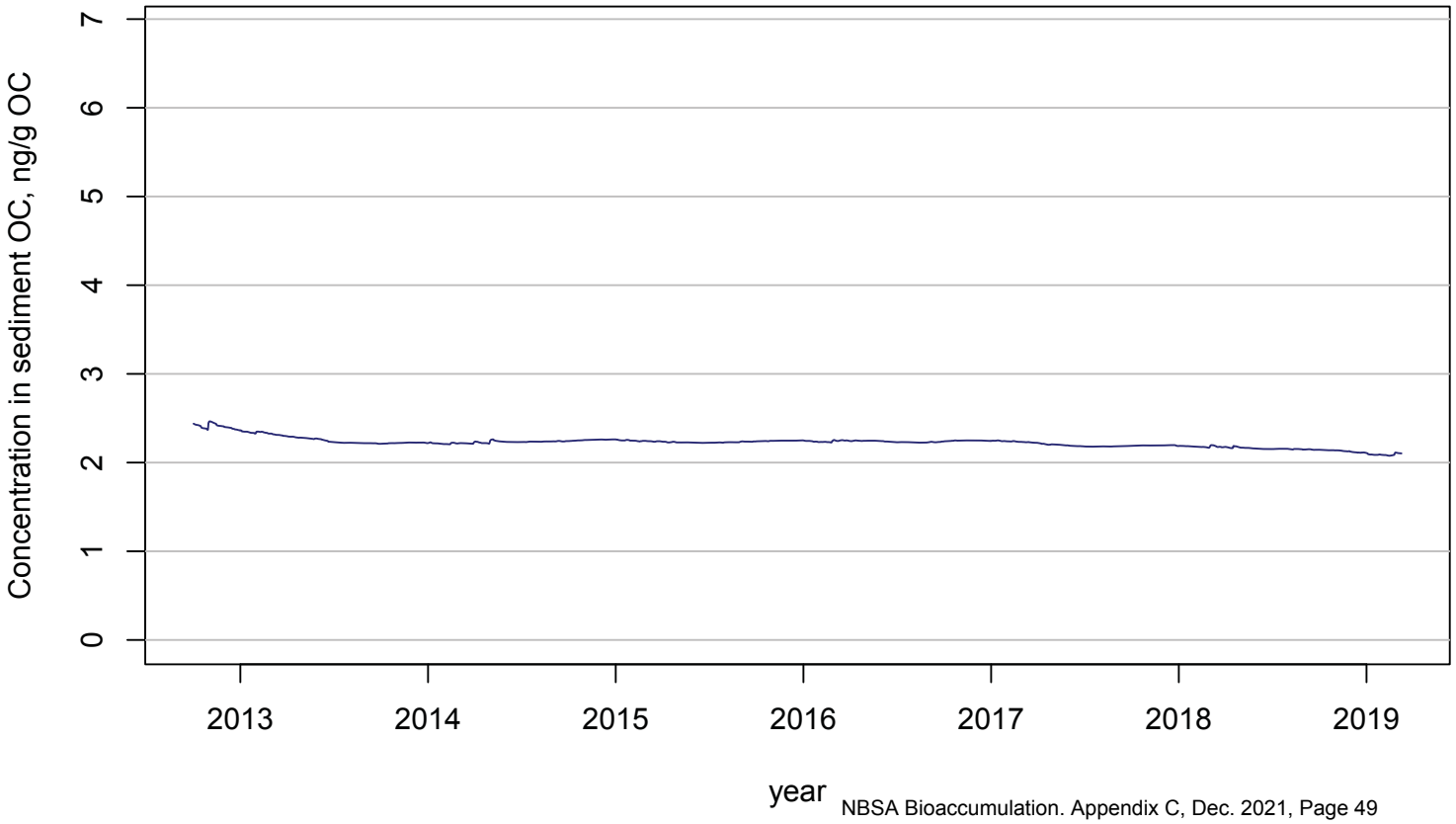



2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in Southwest Mudflat
Concentration in algal particulates, ng/g
0
1
2
3
4
5
2013
2014
2015
2016
2017
2018
2019
year

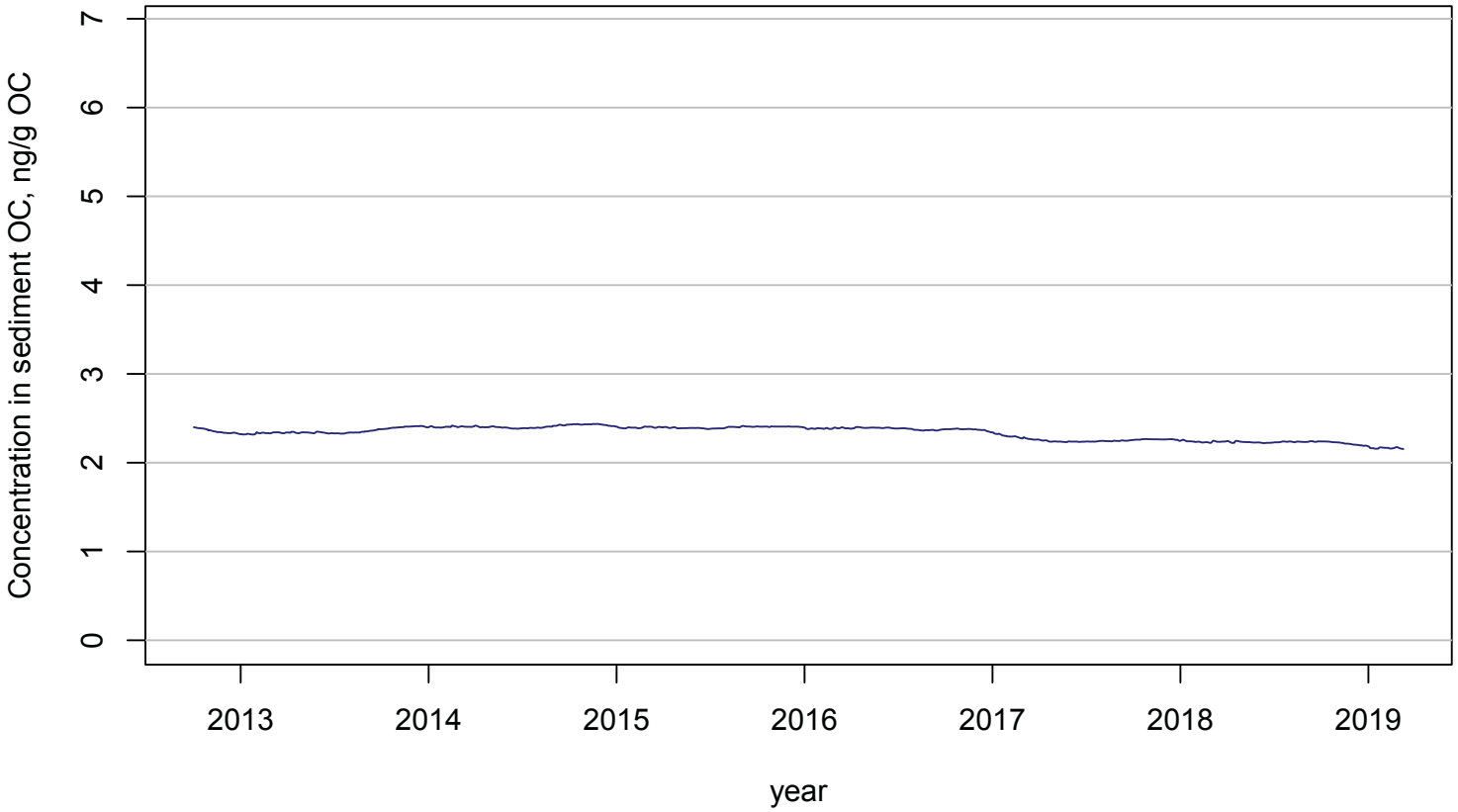
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized conc. in sediment) in North



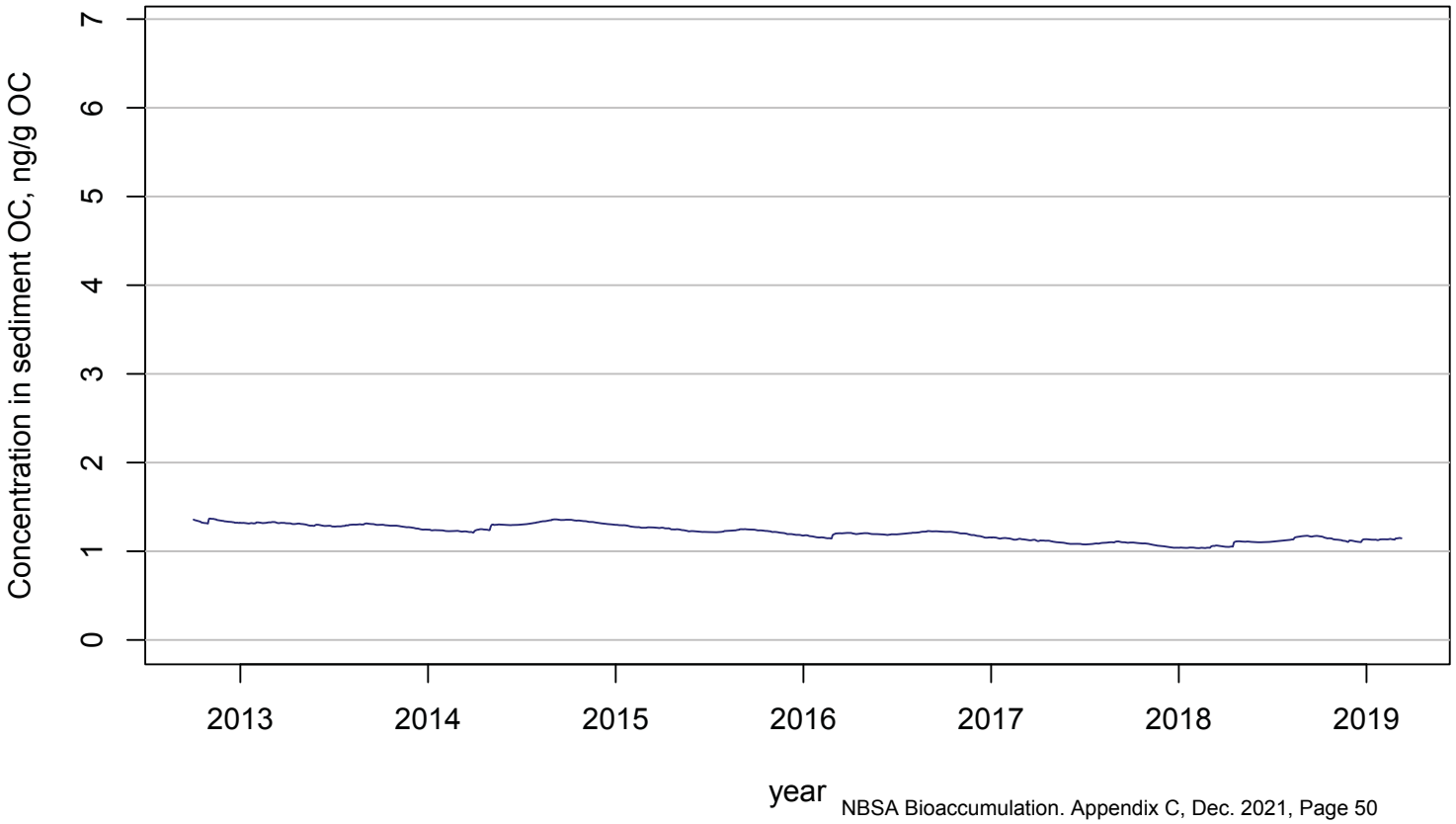
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized conc. in sediment) in Southeast



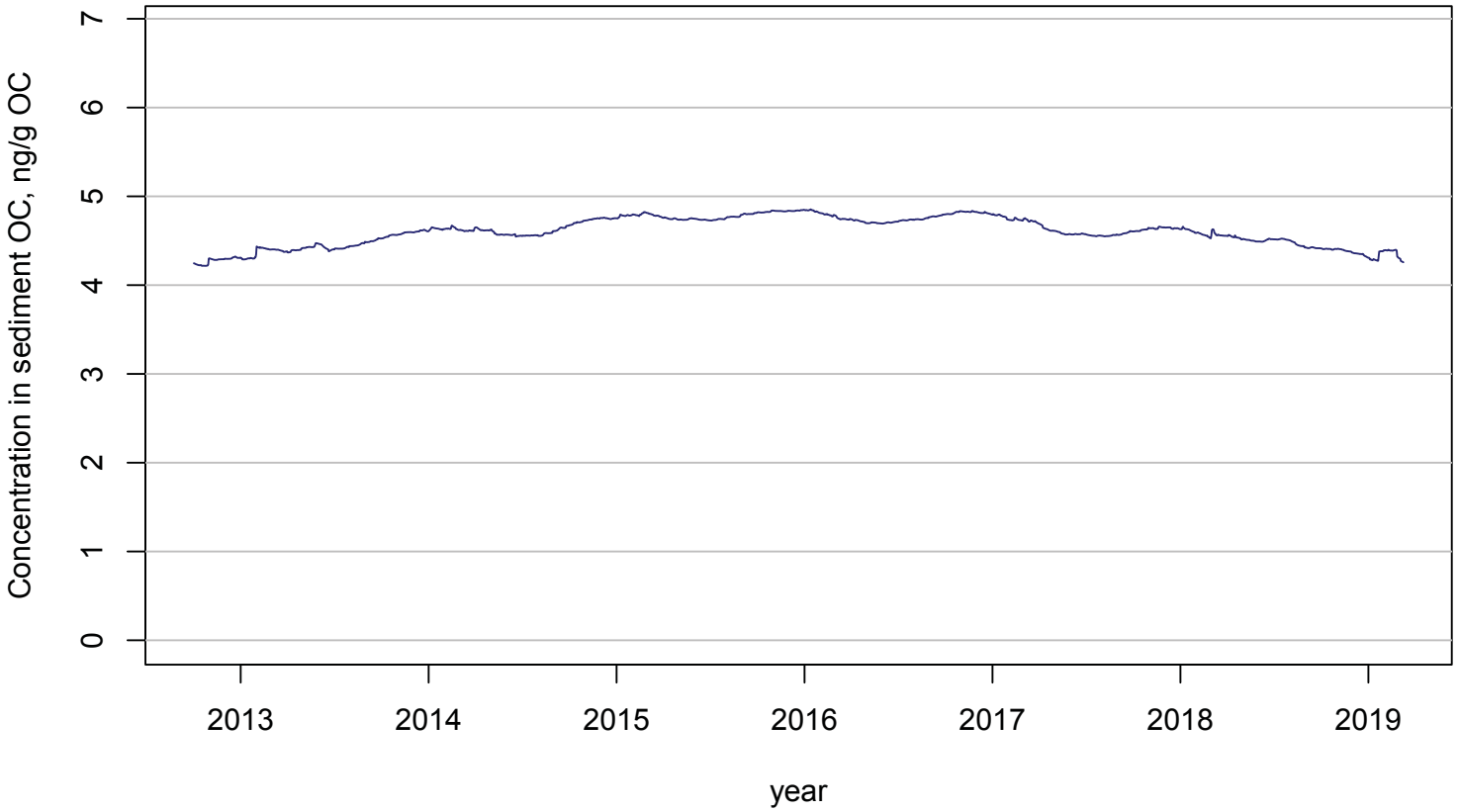
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized conc. in sediment) in Southwest



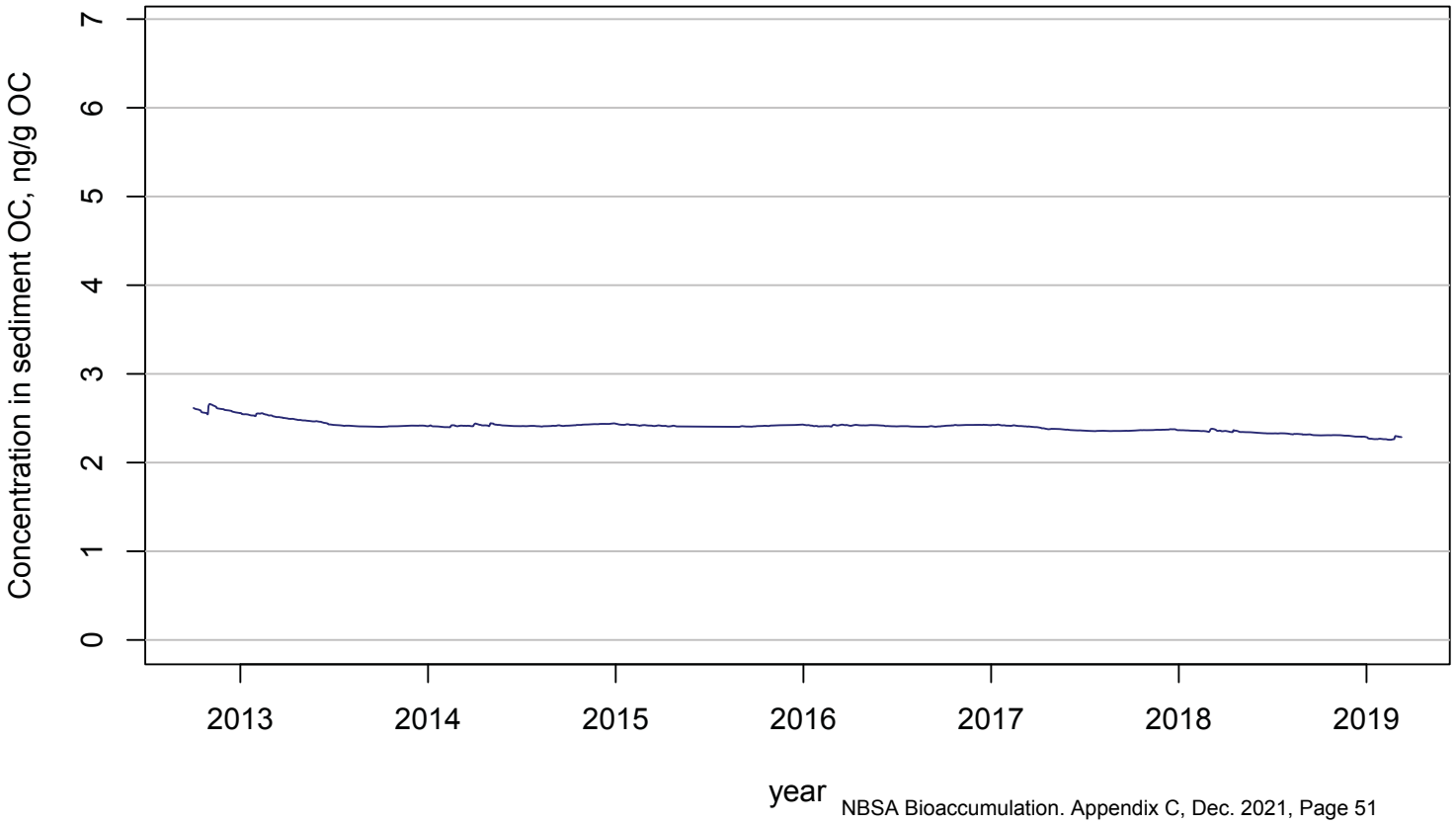
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized conc. in sediment) in Channel



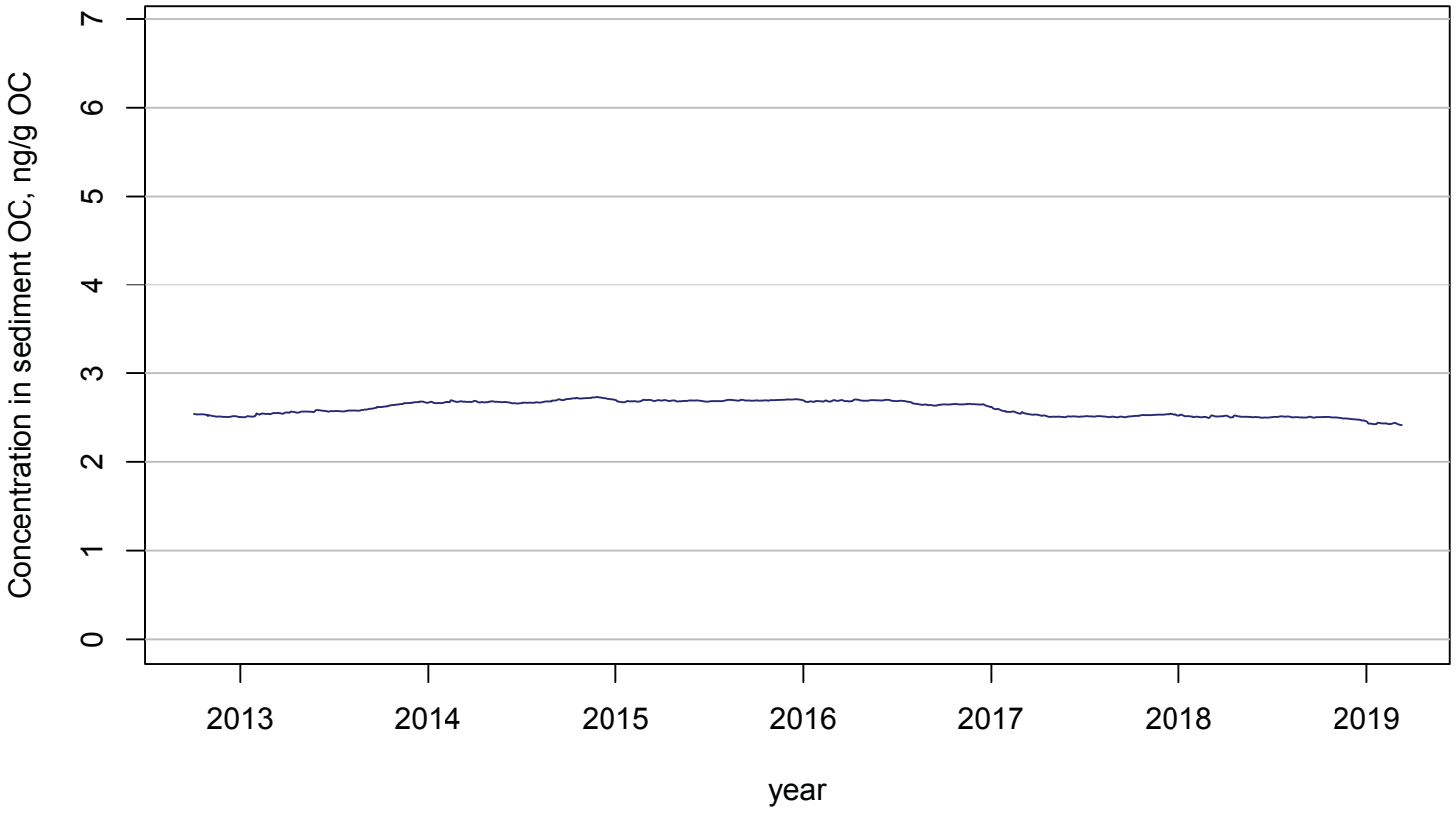
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized conc. in sediment) in North Mudflat

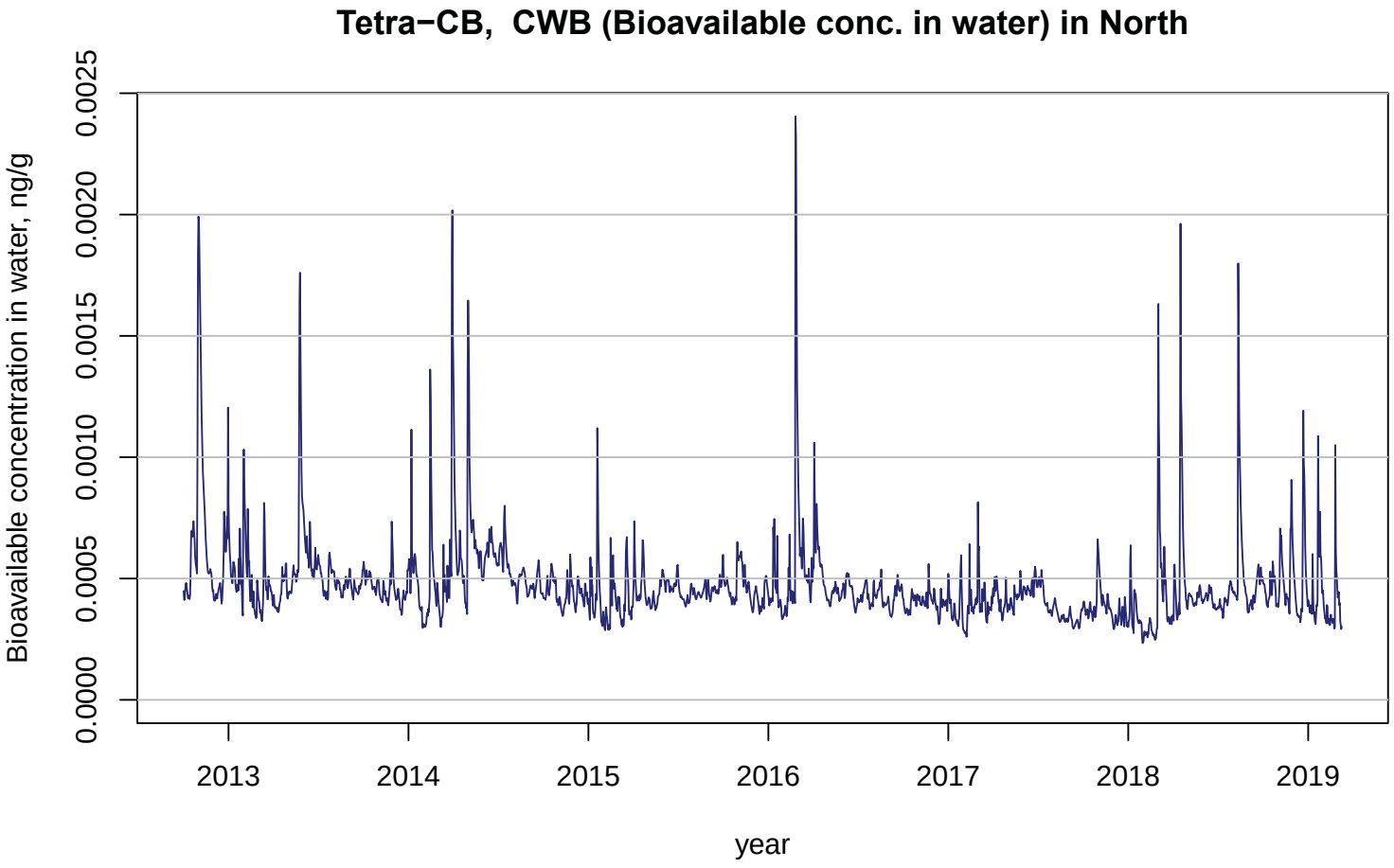


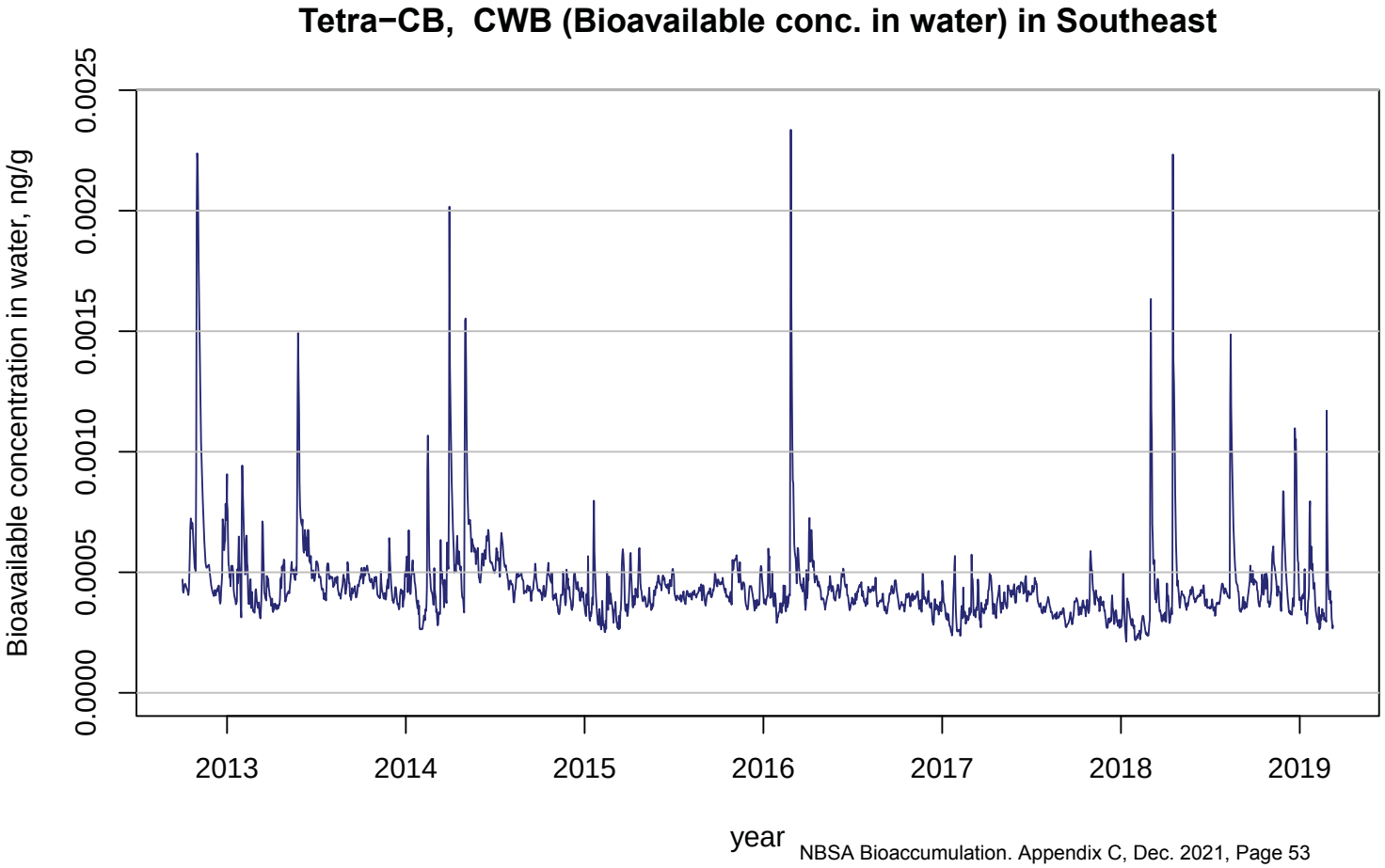
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized conc. in sediment) in Southeast Mudflat

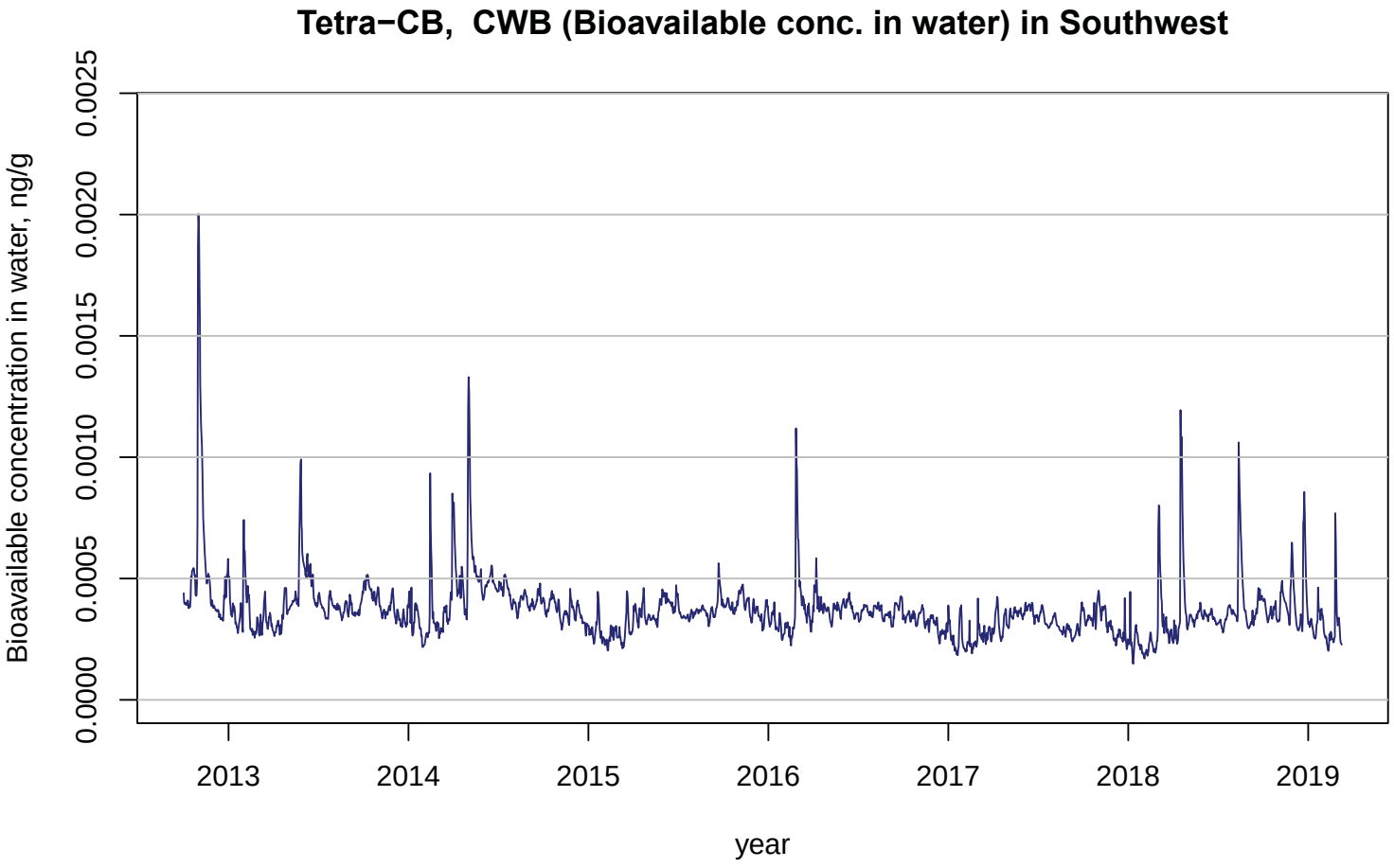


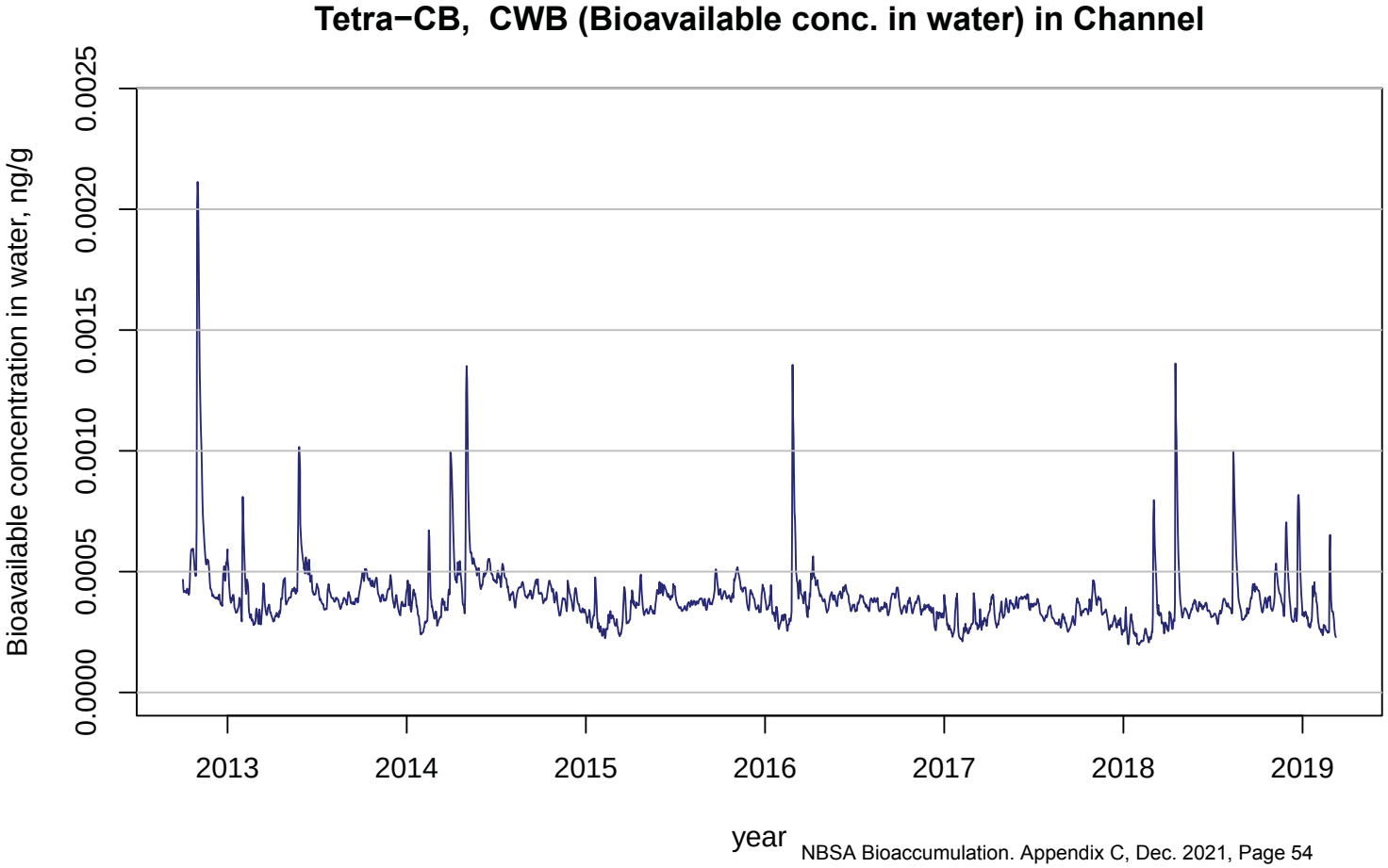
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized conc. in sediment) in Southwest Mudflat

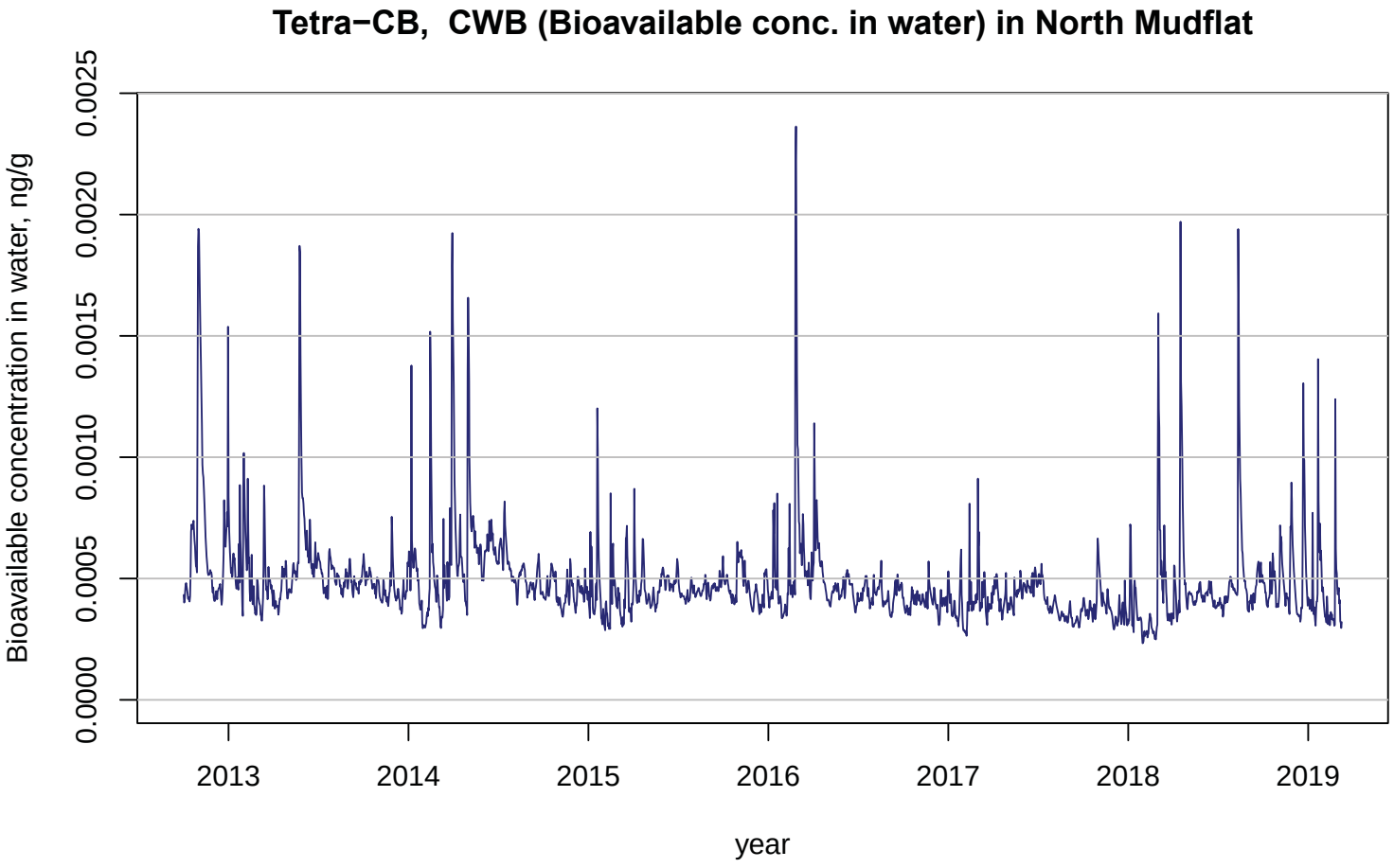


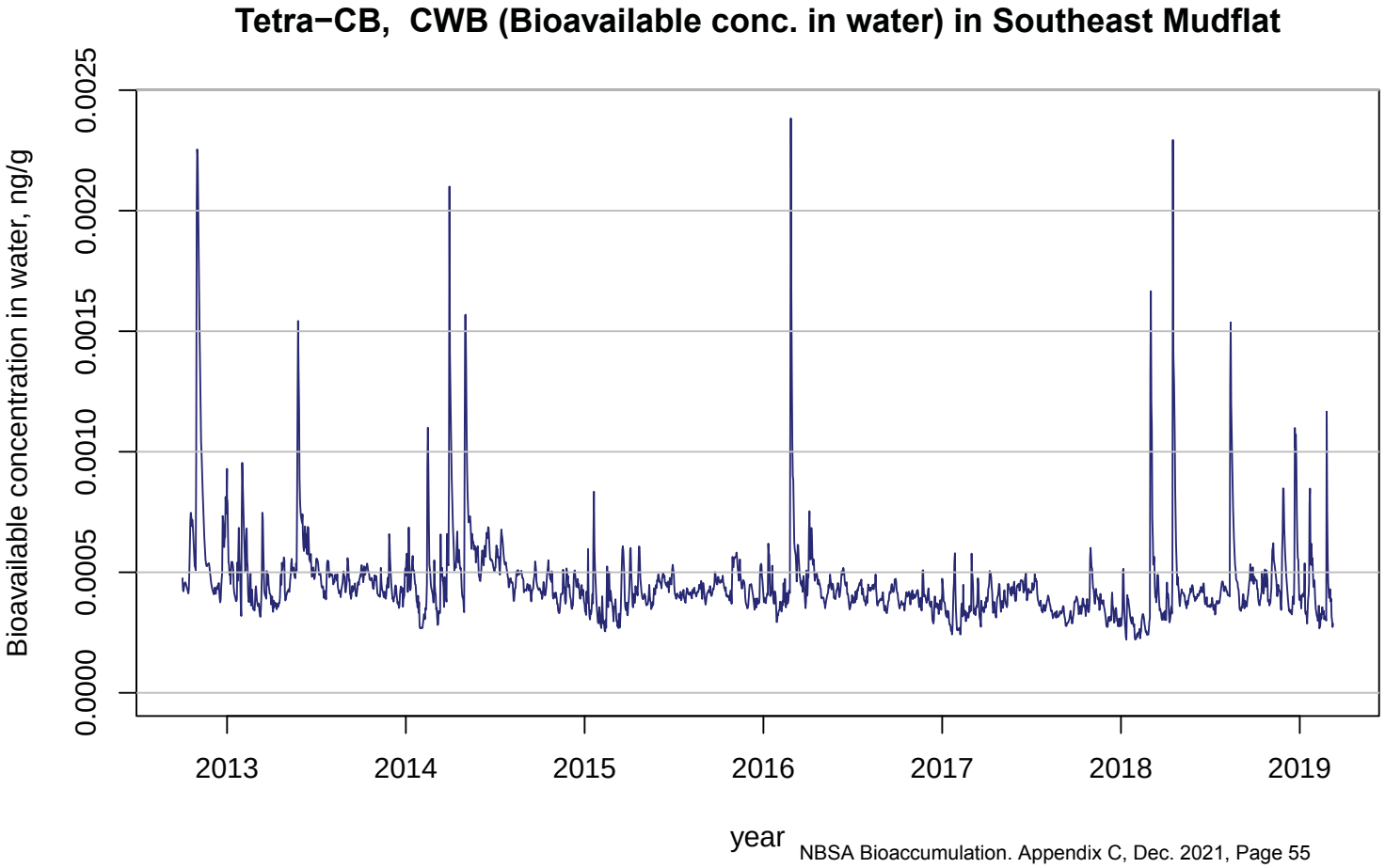

Tetra−CB, CWB (Bioavailable conc. in water) in North
Bioavailable concentration in water, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year

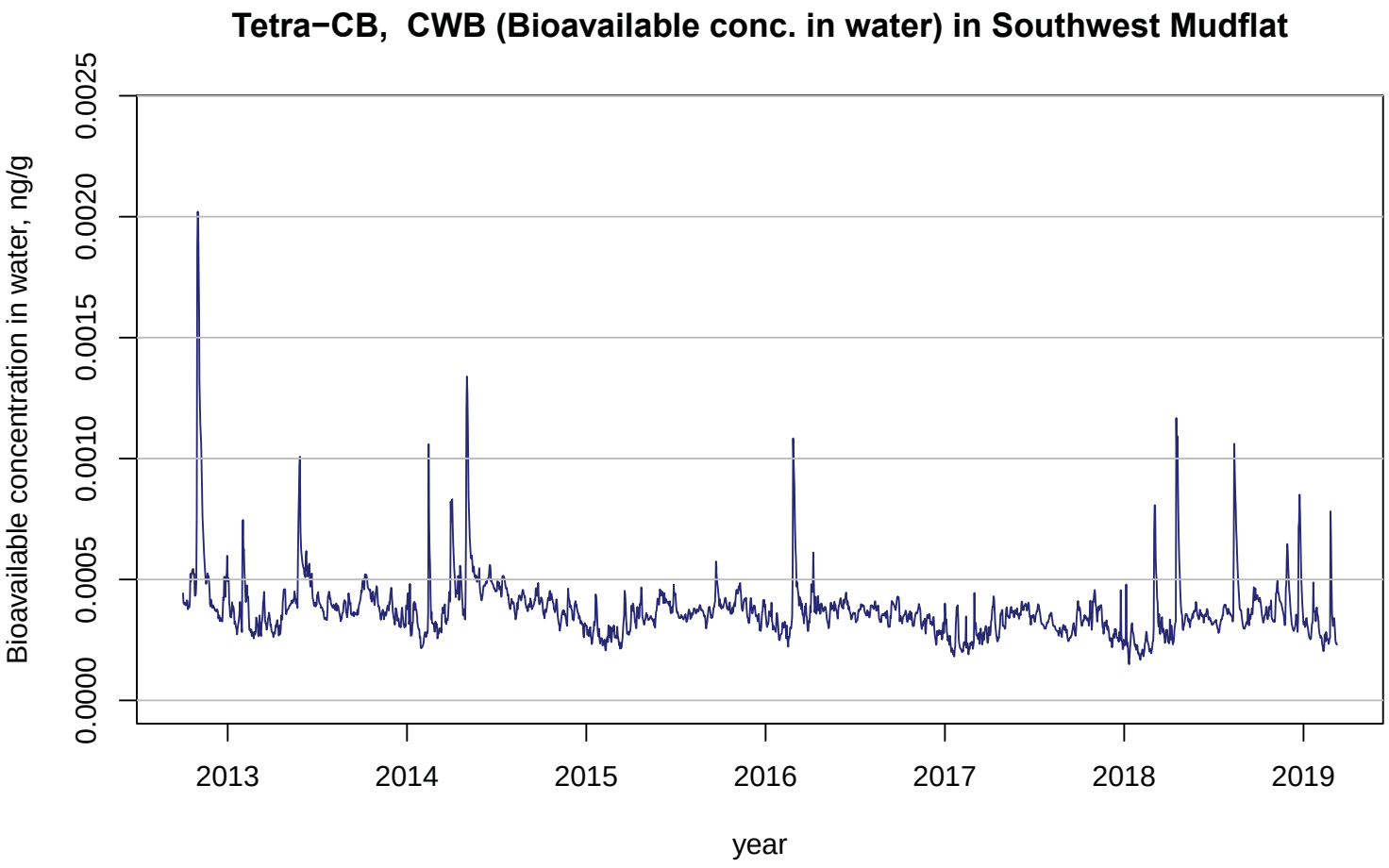

Tetra−CB, CWB (Bioavailable conc. in water) in Southeast
Bioavailable concentration in water, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CWB (Bioavailable conc. in water) in Southwest
Bioavailable concentration in water, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year

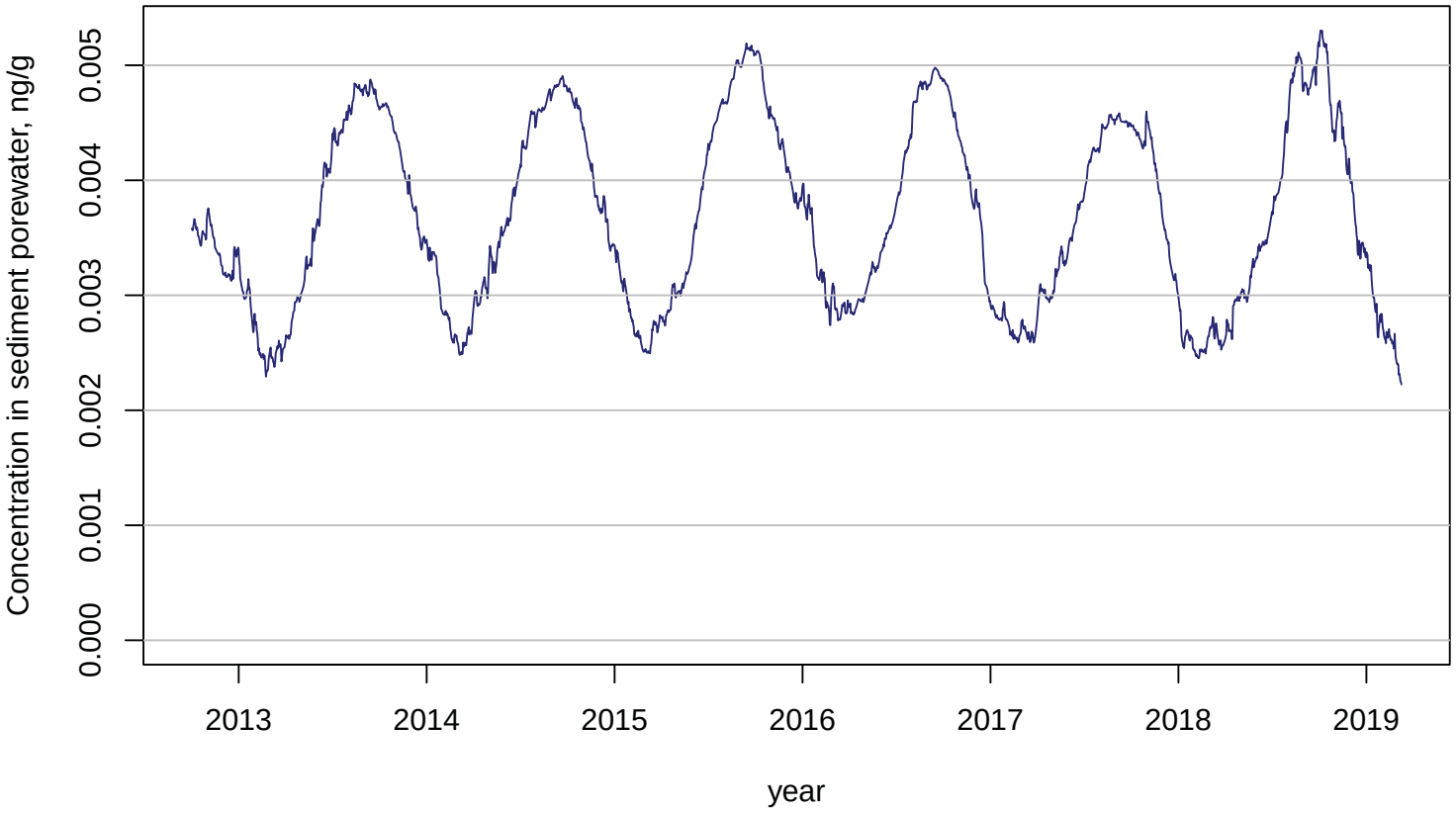

Tetra−CB, CWB (Bioavailable conc. in water) in Channel
Bioavailable concentration in water, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CWB (Bioavailable conc. in water) in North Mudflat
Bioavailable concentration in water, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year

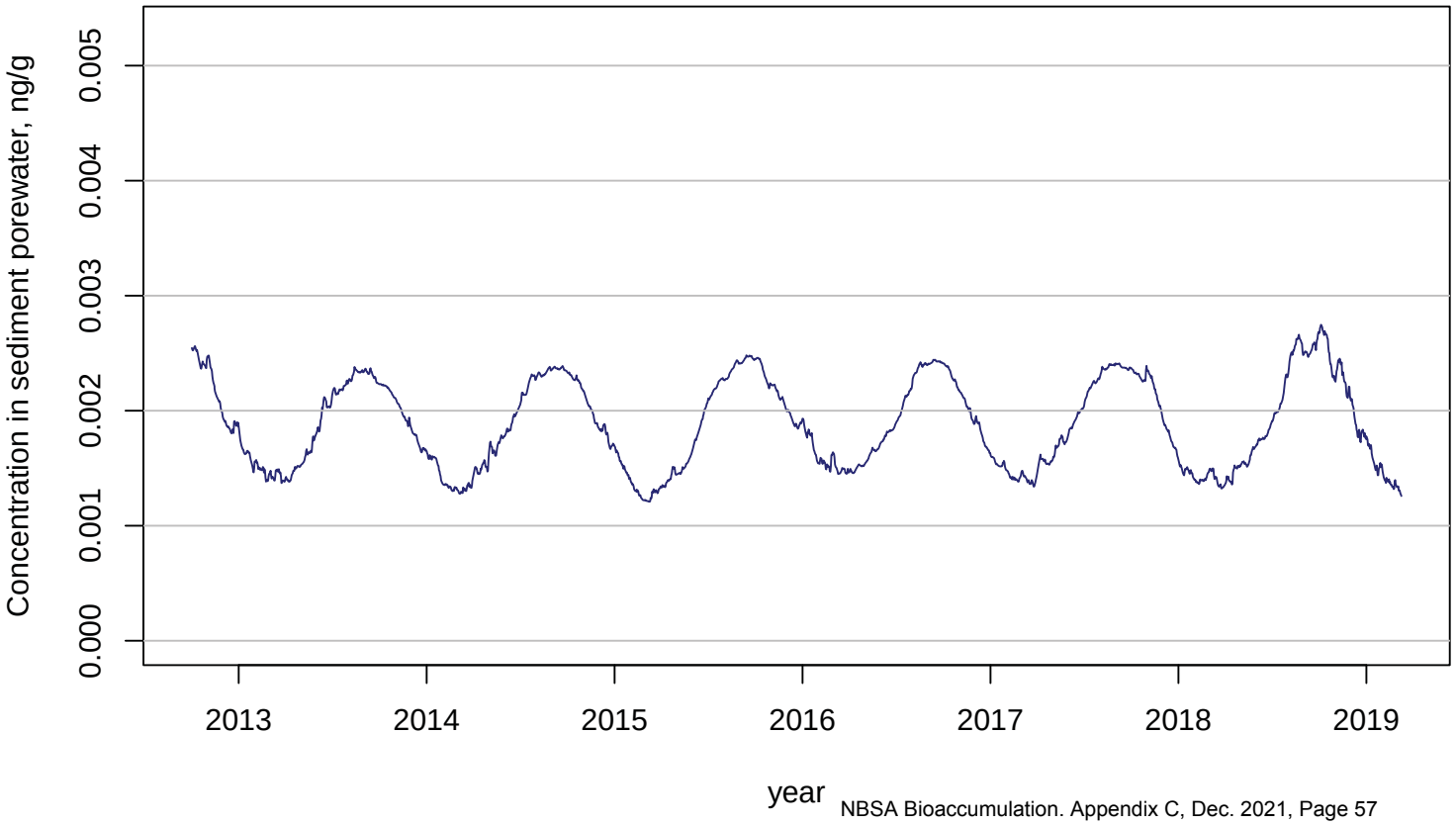

Tetra−CB, CWB (Bioavailable conc. in water) in Southeast Mudflat
Bioavailable concentration in water, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year

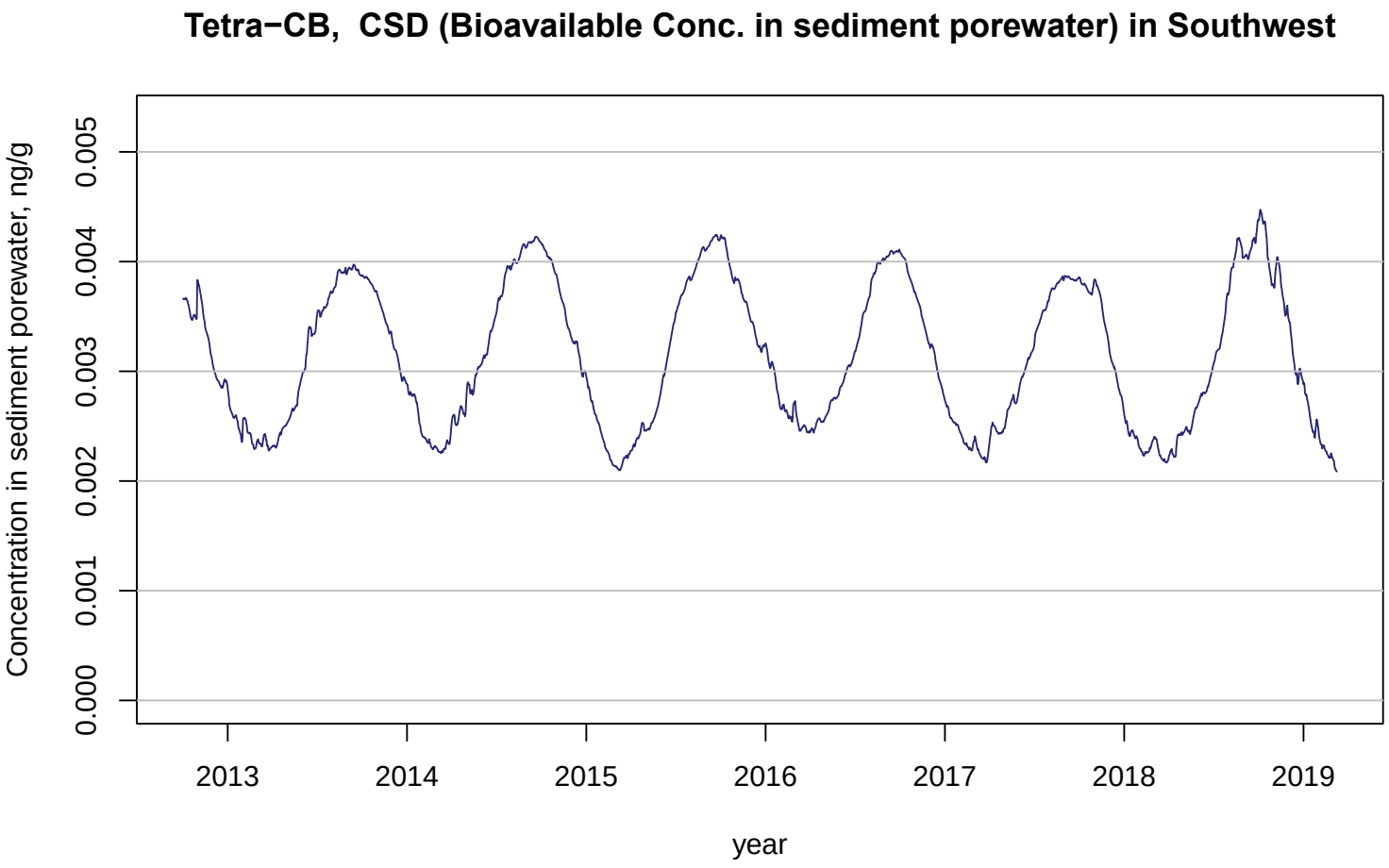

Tetra−CB, CWB (Bioavailable conc. in water) in Southwest Mudflat
Bioavailable concentration in water, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year

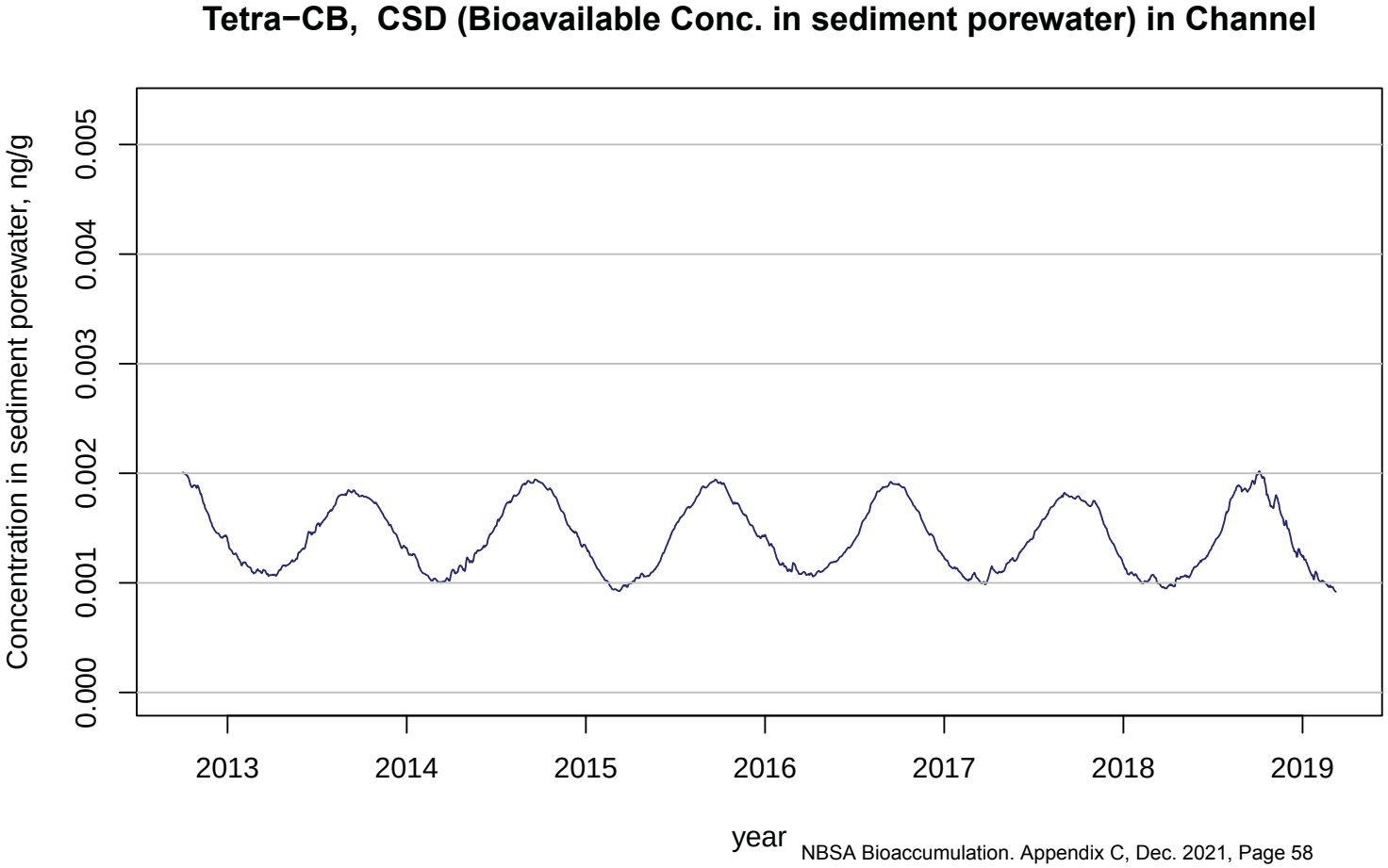
Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in North



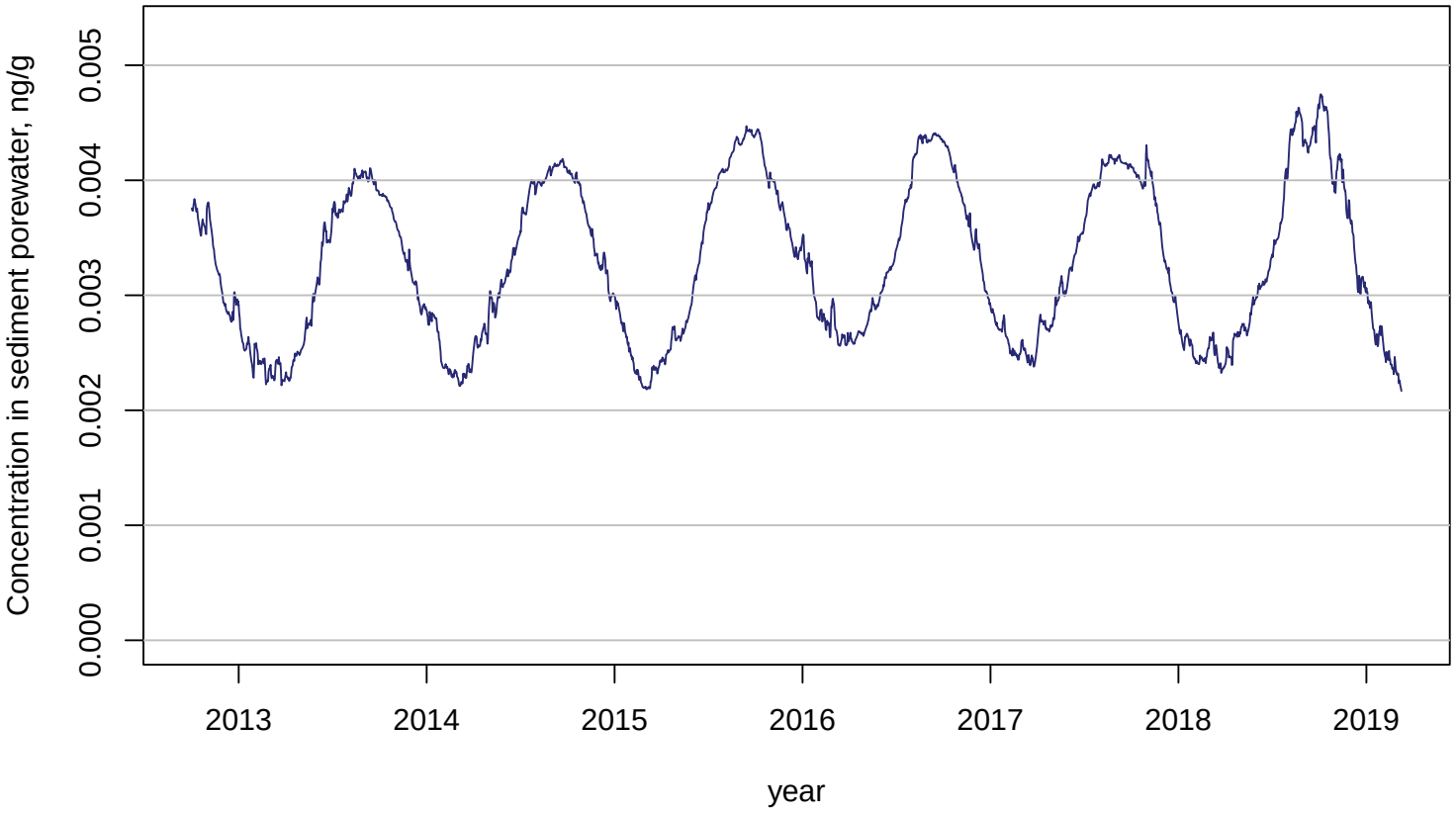
Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in Southeast



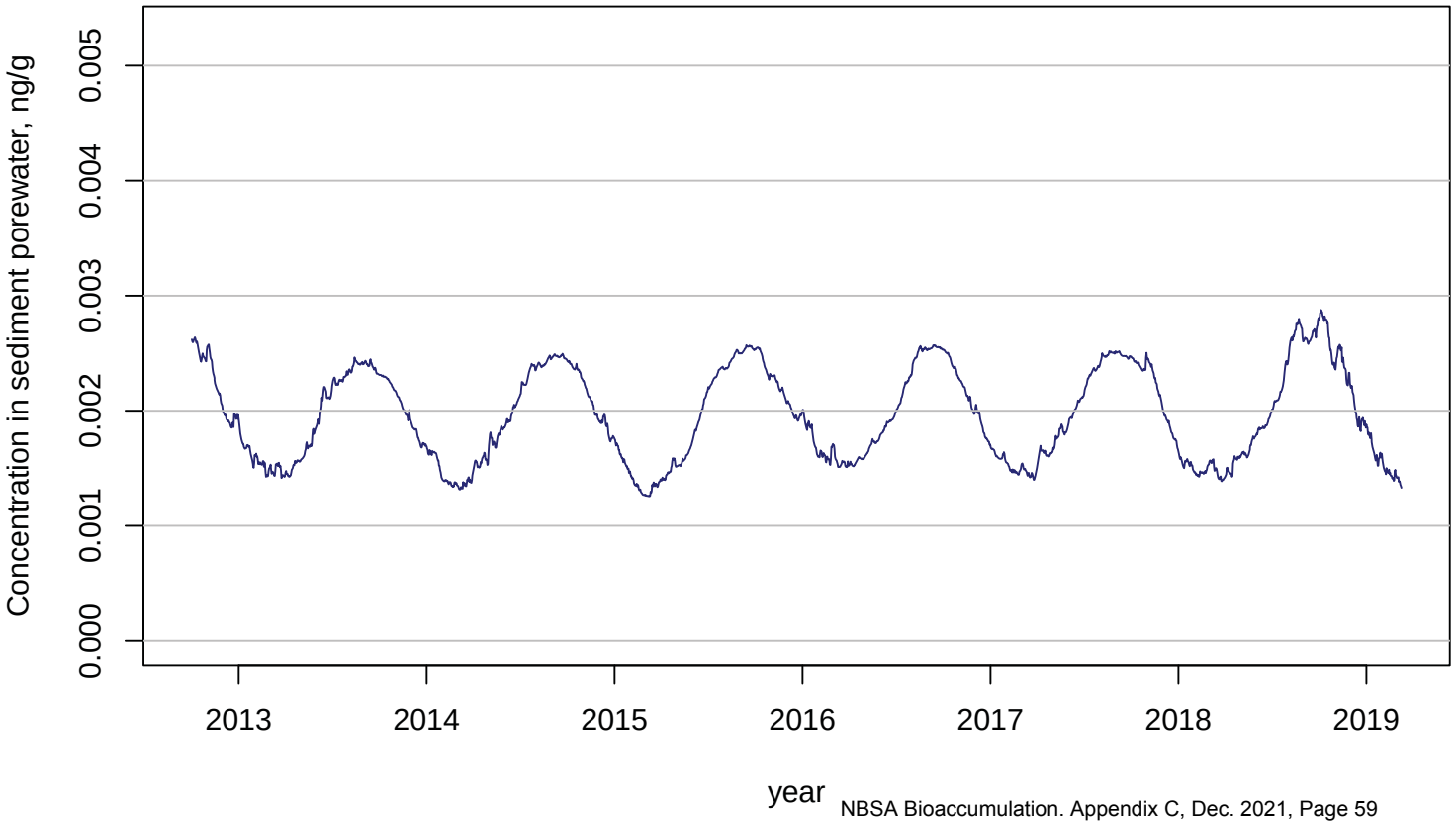

Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in Southwest
Concentration in sediment porewater, ng/g
0.000
0.001
0.002
0.003
0.004
0.005
2013
2014
2015
2016
2017
2018
2019
year

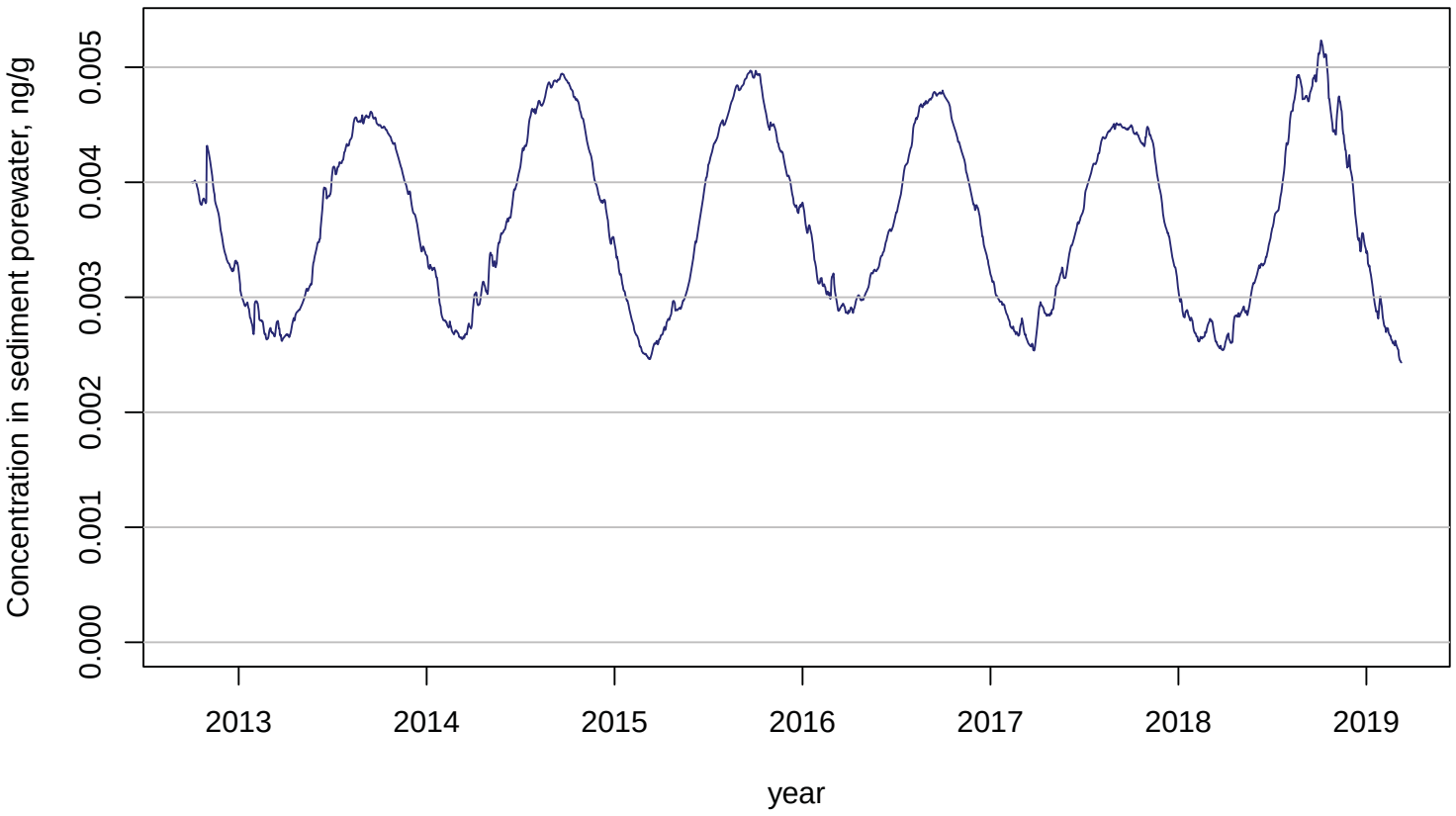

Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in Channel
Concentration in sediment porewater, ng/g
0.000
0.001
0.002
0.003
0.004
0.005
2013
2014
2015
2016
2017
2018
2019
year

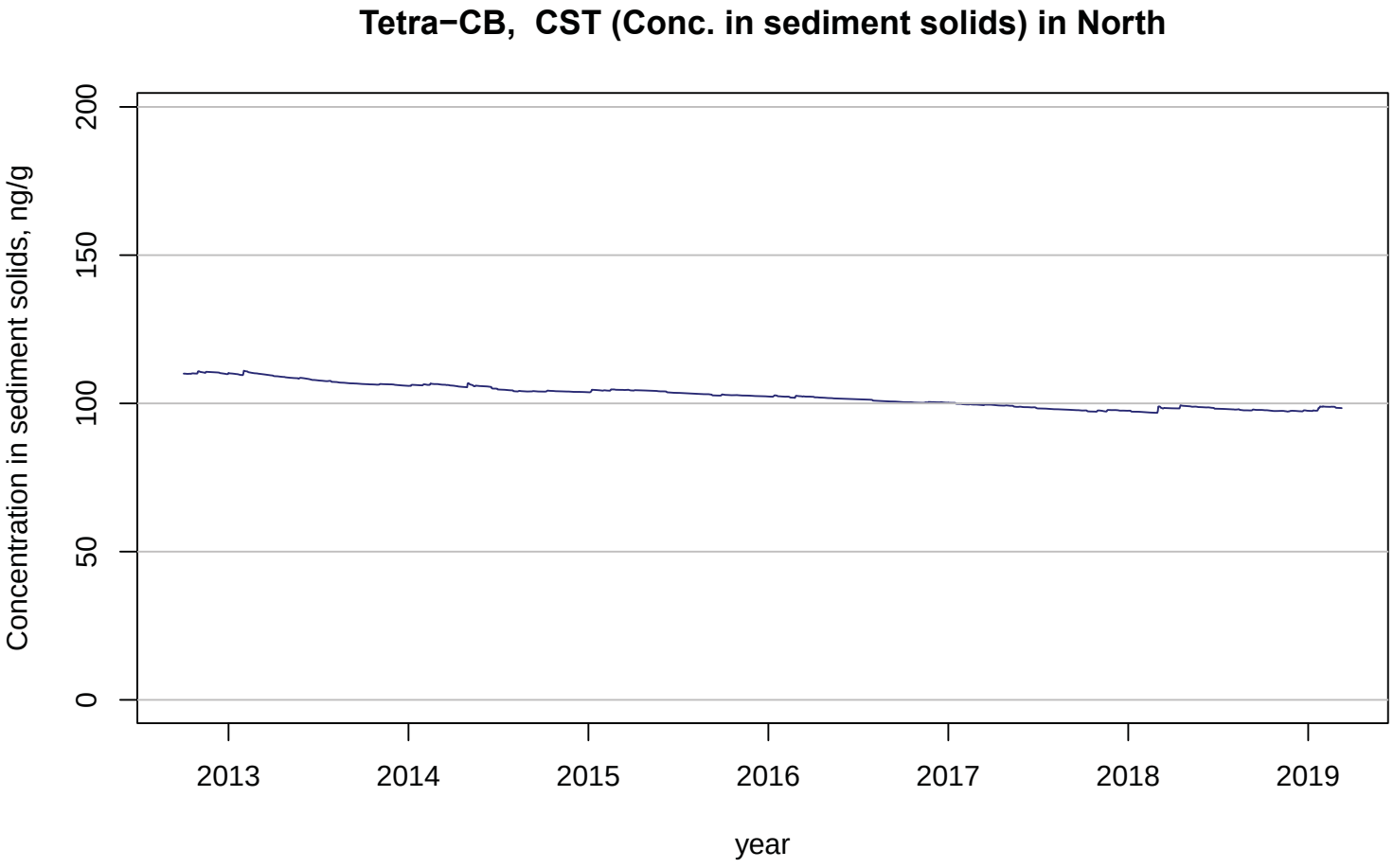
Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in North Mudflat

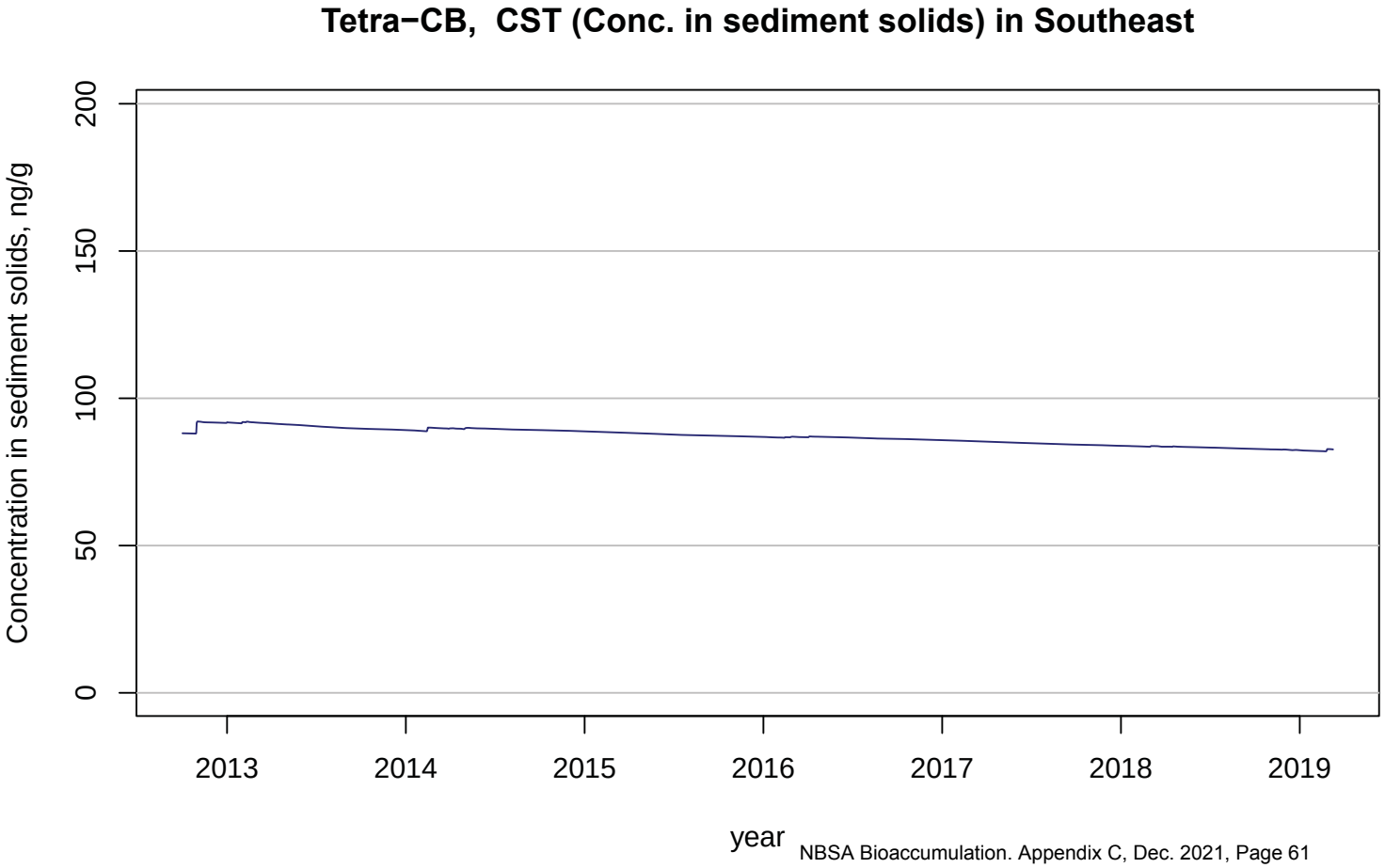


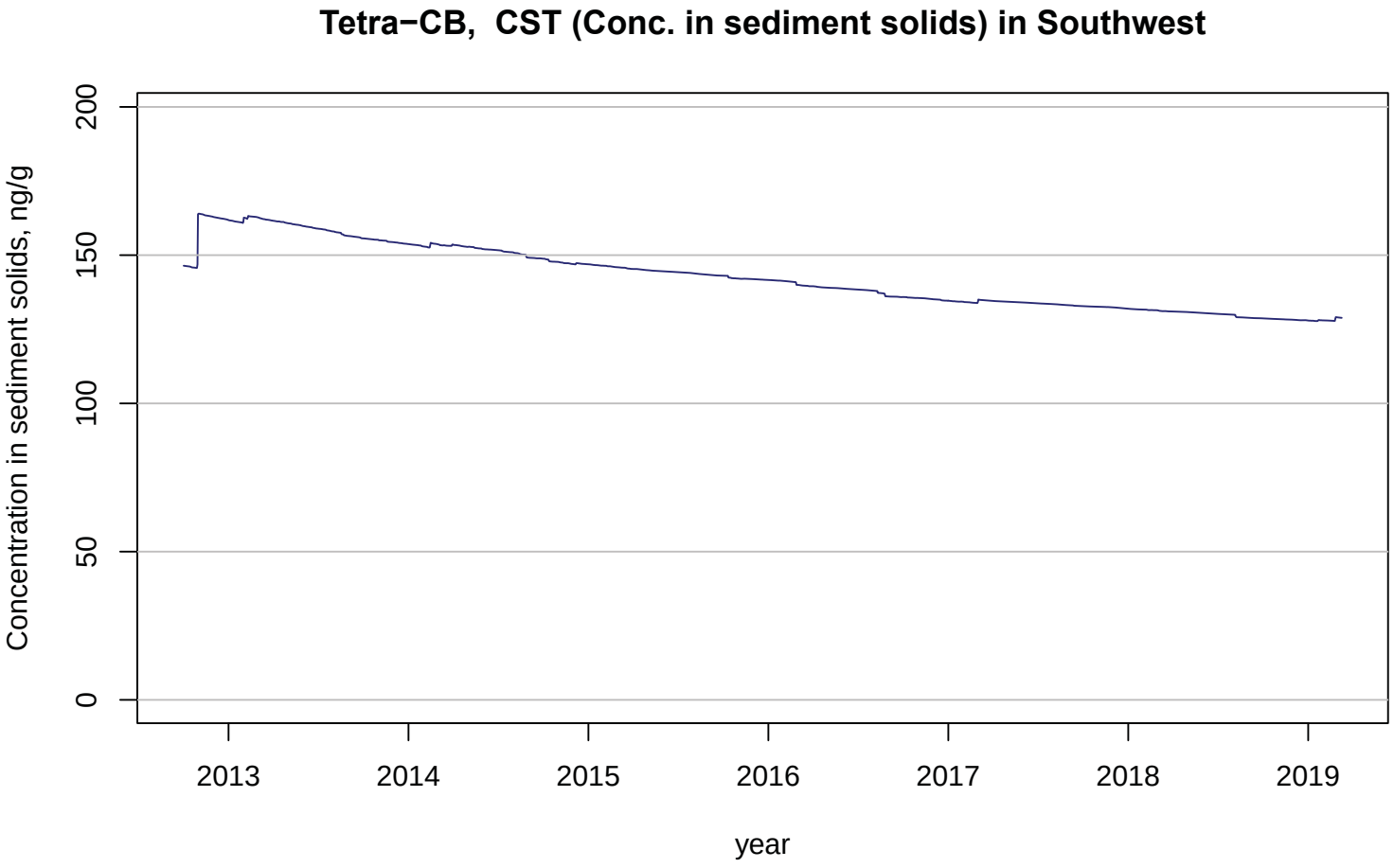
Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in Southeast Mudflat

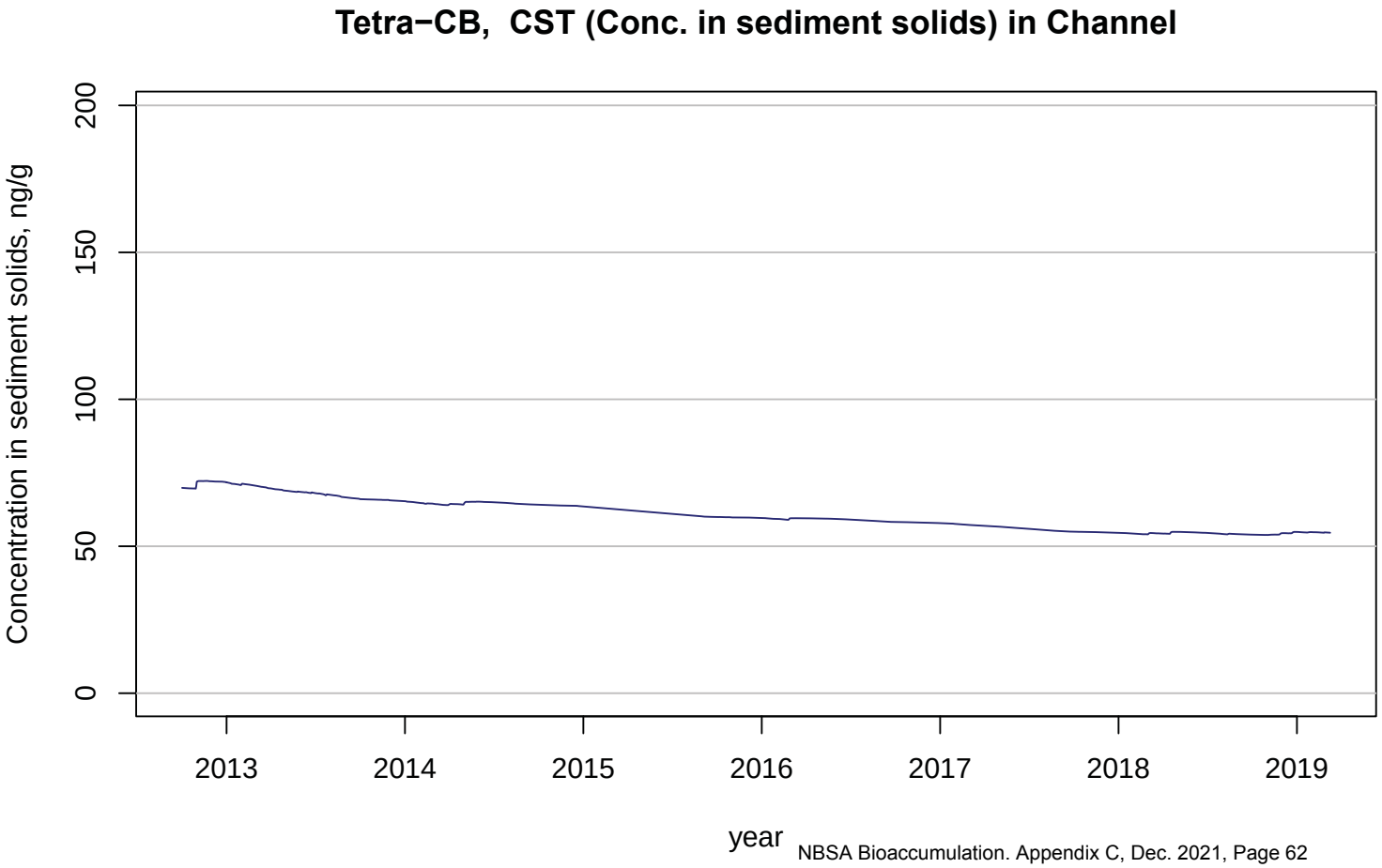


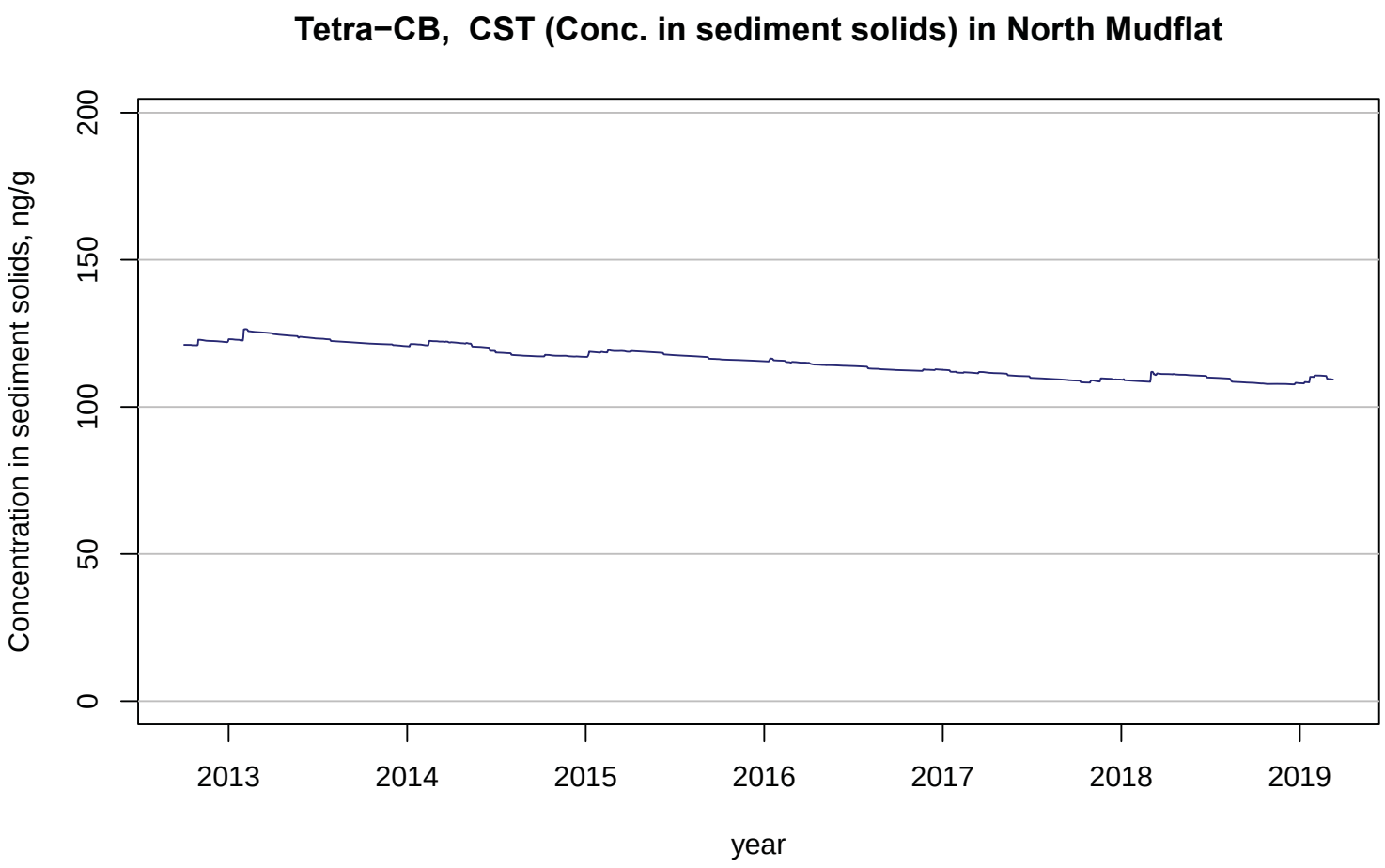

Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in Southwest Mudflat
Concentration in sediment porewater, ng/g
0.000
0.001
0.002
0.003
0.004
0.005
2013
2014
2015
2016
2017
2018
2019
year

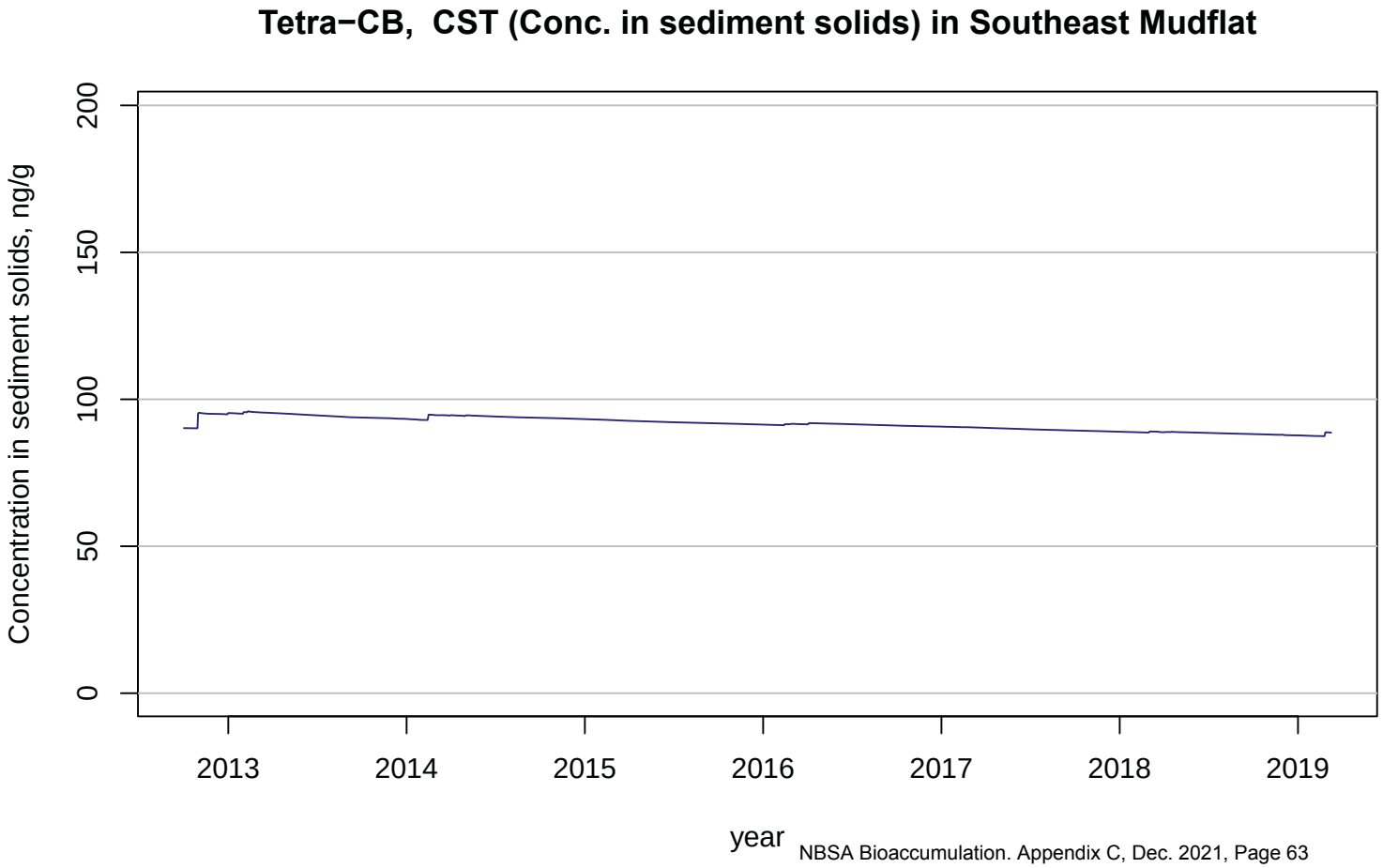

Tetra−CB, CST (Conc. in sediment solids) in North
Concentration in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

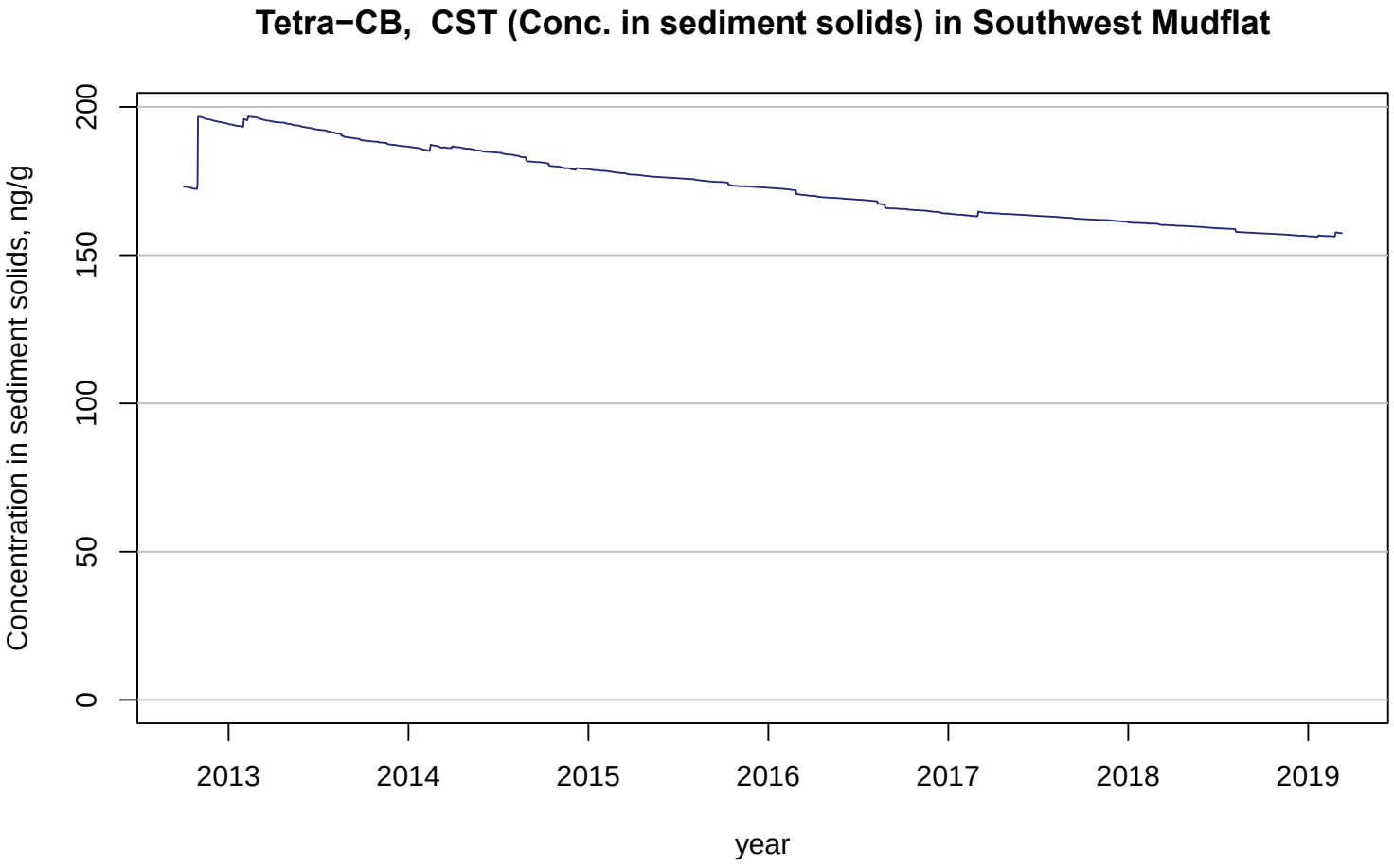

Tetra−CB, CST (Conc. in sediment solids) in Southeast
Concentration in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

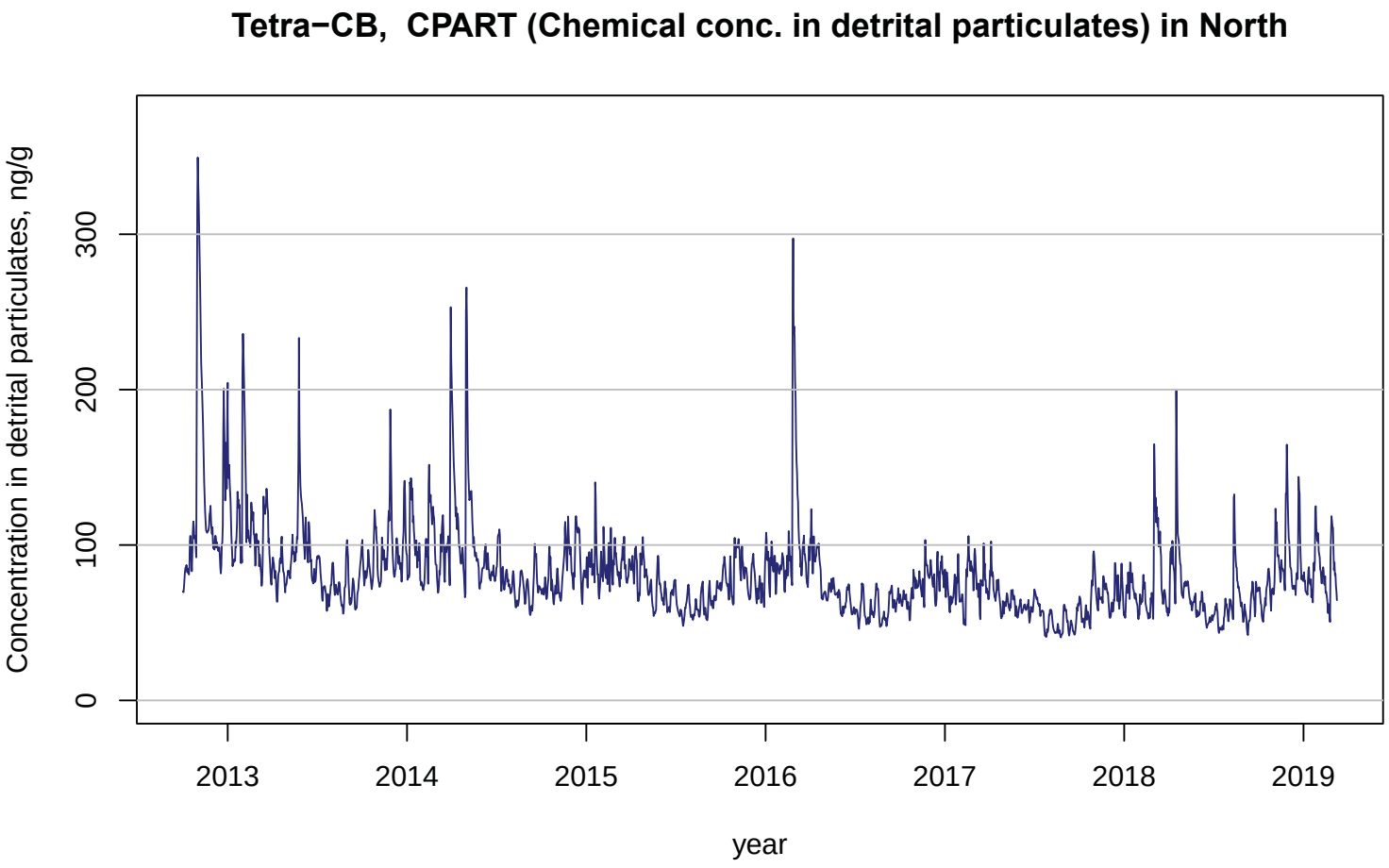

Tetra−CB, CST (Conc. in sediment solids) in Southwest
Concentration in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

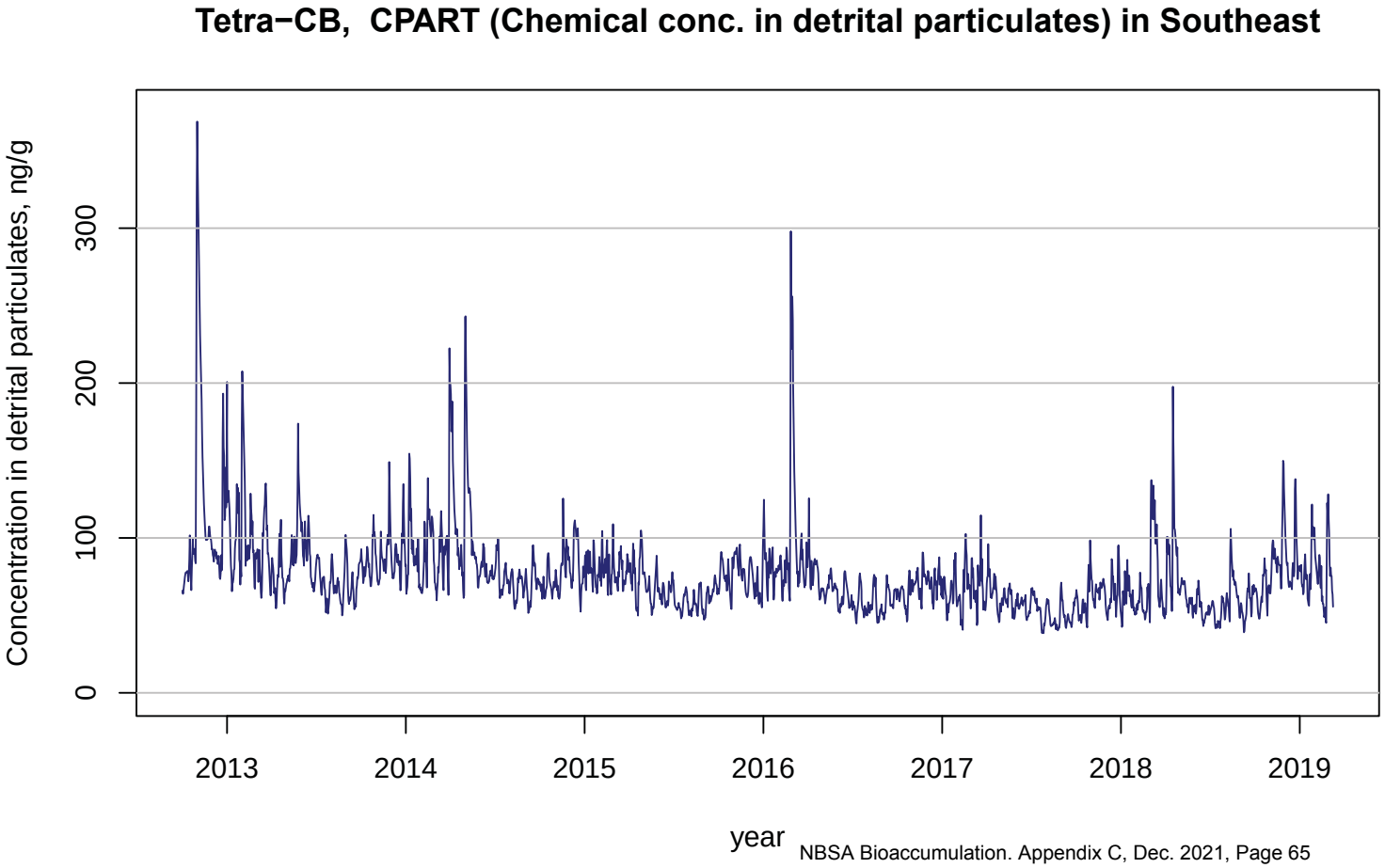

Tetra−CB, CST (Conc. in sediment solids) in Channel
Concentration in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

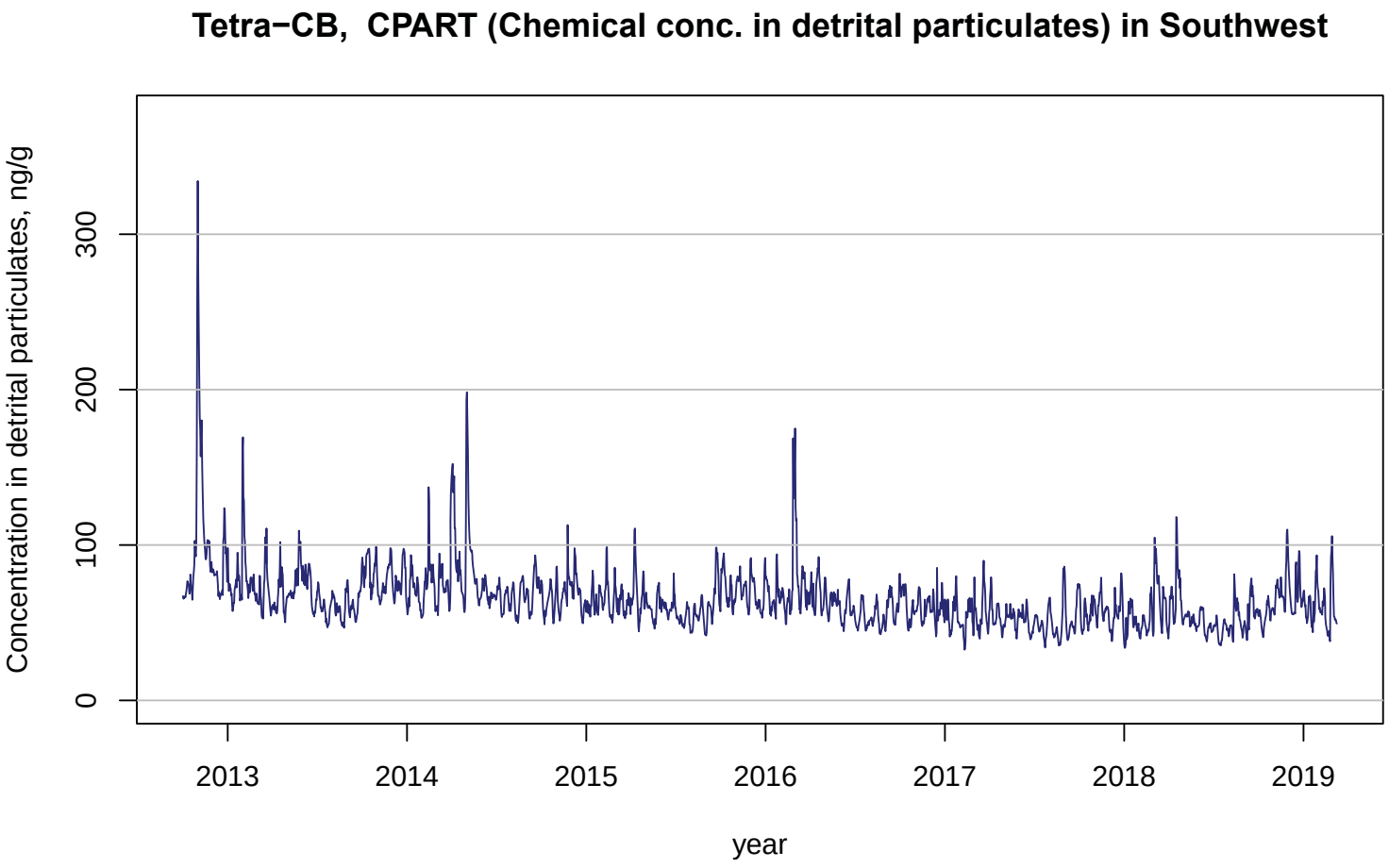

Tetra−CB, CST (Conc. in sediment solids) in North Mudflat
Concentration in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

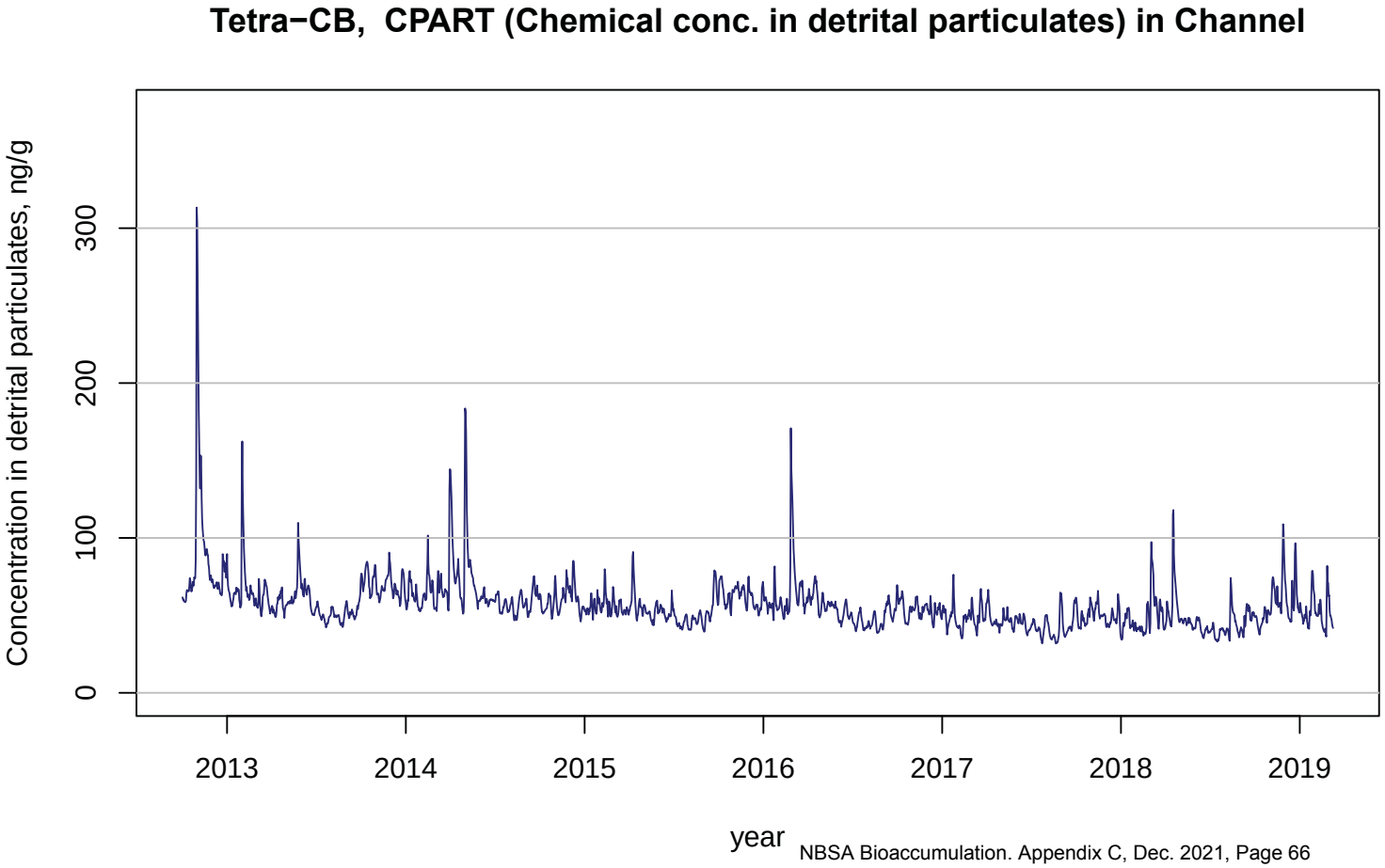

Tetra−CB, CST (Conc. in sediment solids) in Southeast Mudflat
Concentration in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

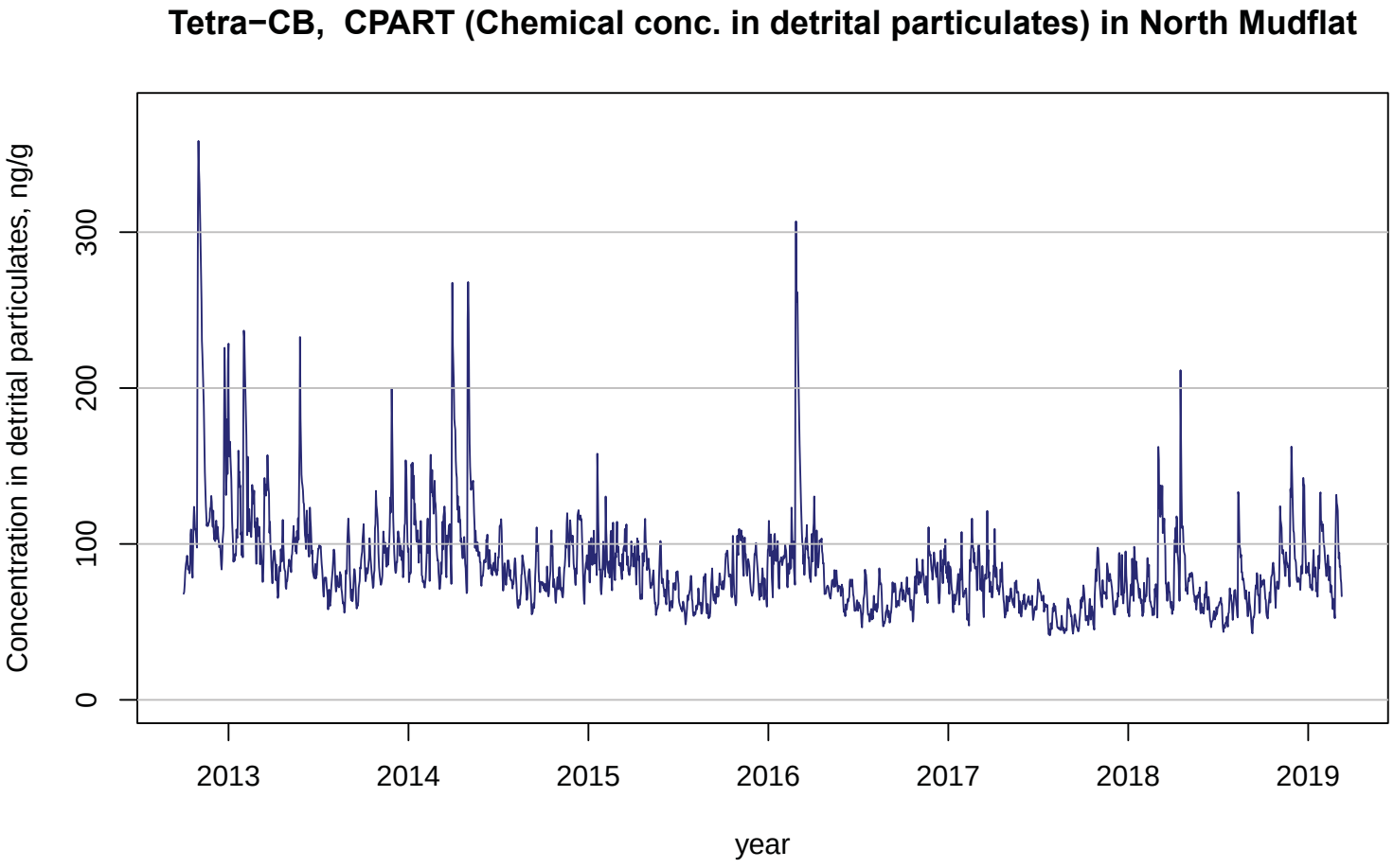

Tetra−CB, CST (Conc. in sediment solids) in Southwest Mudflat
Concentration in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

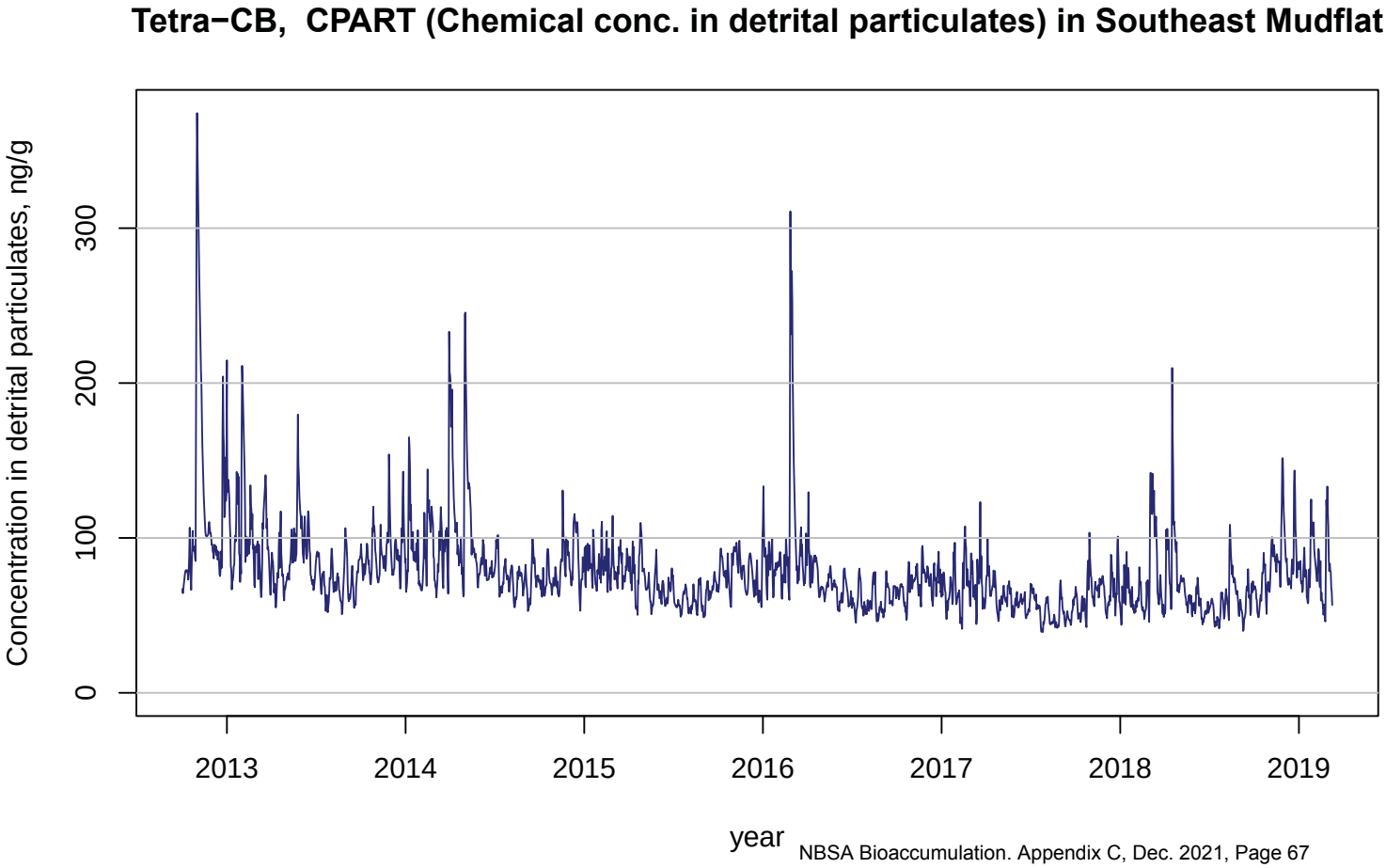

Tetra−CB, CPART (Chemical conc. in detrital particulates) in North
Concentration in detrital particulates, ng/g
0
100
200
300
2013
2014
2015
2016
2017
2018
2019
year

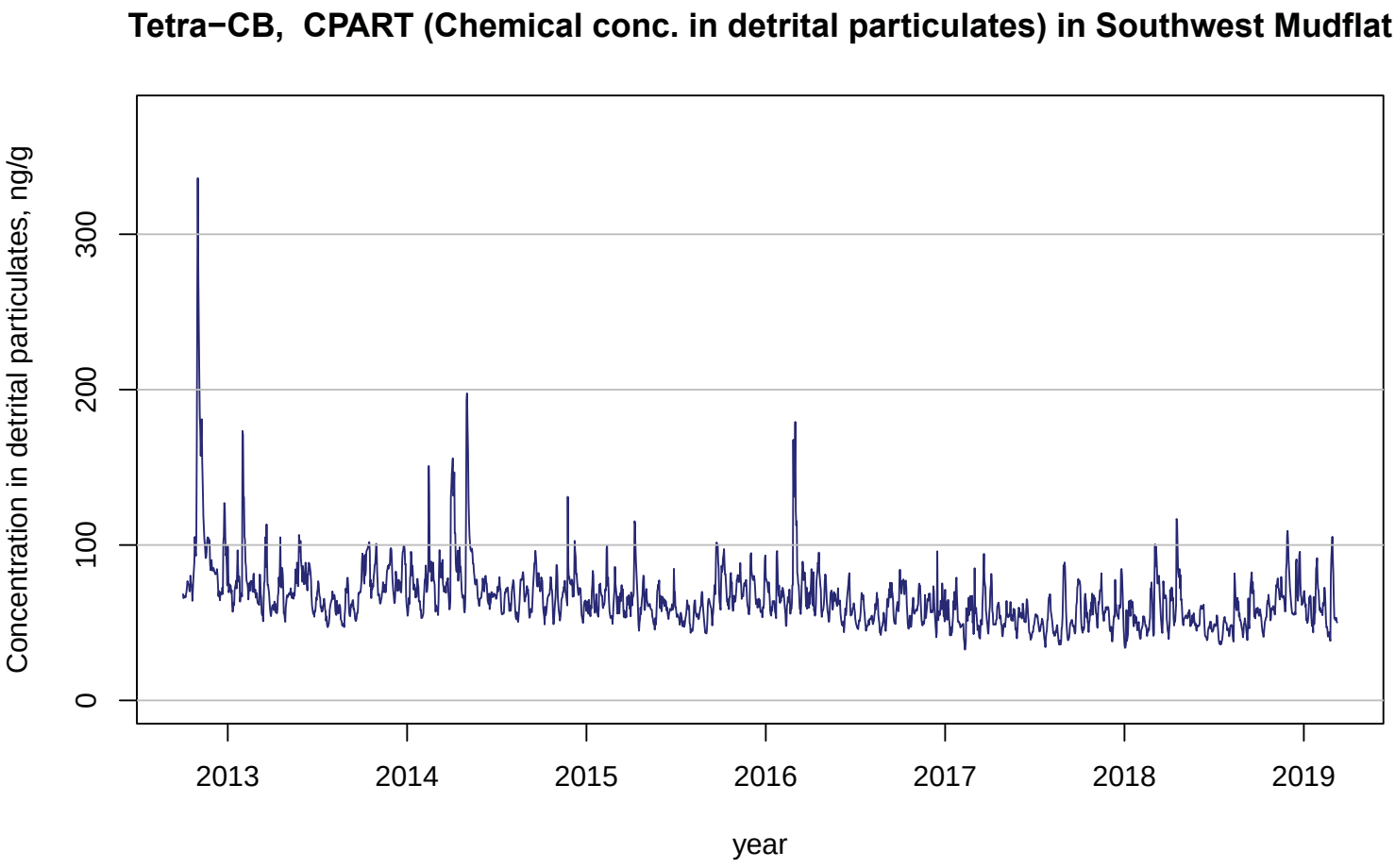

Tetra−CB, CPART (Chemical conc. in detrital particulates) in Southeast
Concentration in detrital particulates, ng/g
0
100
200
300
2013
2014
2015
2016
2017
2018
2019
year

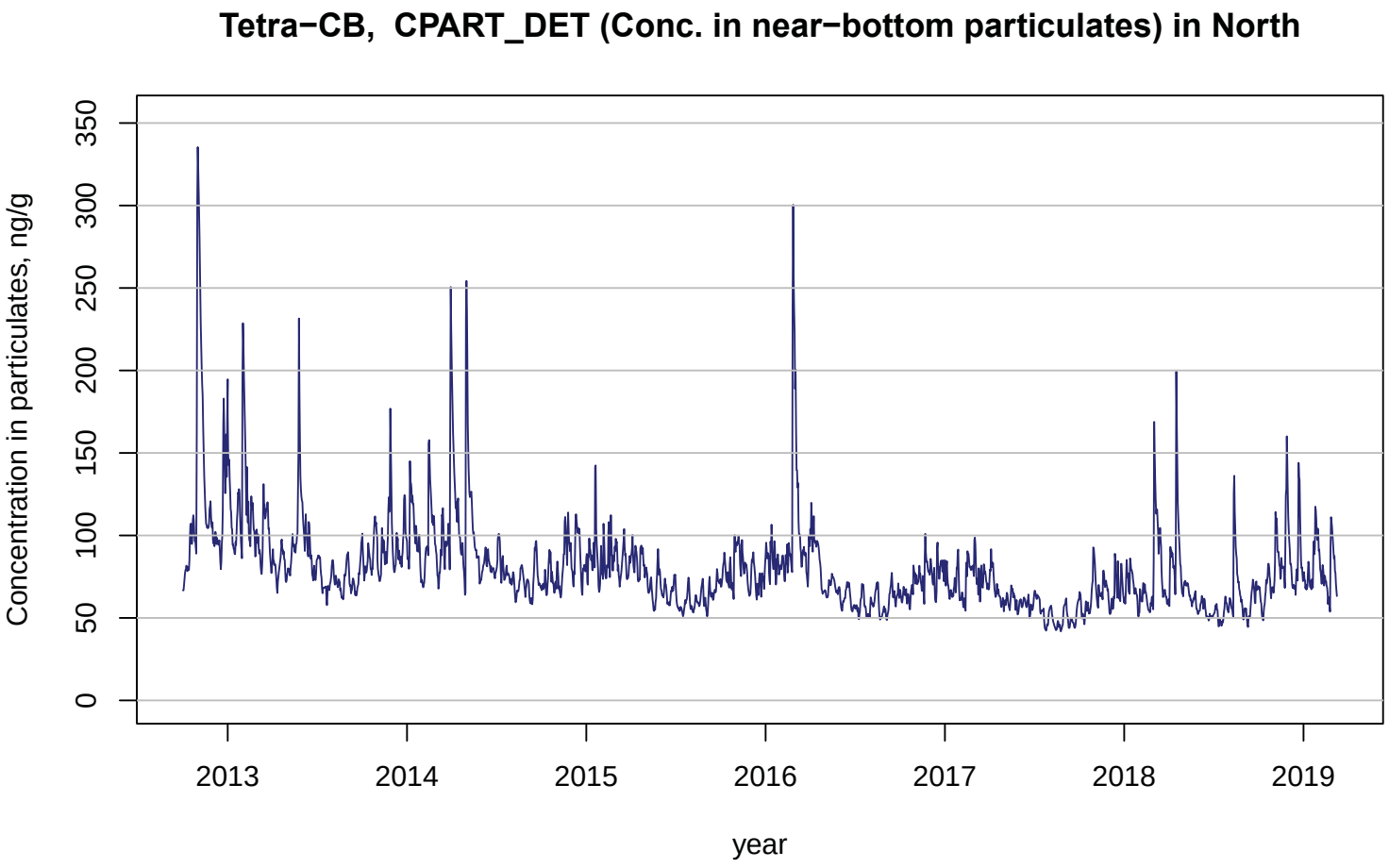

Tetra−CB, CPART (Chemical conc. in detrital particulates) in Southwest
Concentration in detrital particulates, ng/g
0
100
200
300
2013
2014
2015
2016
2017
2018
2019
year

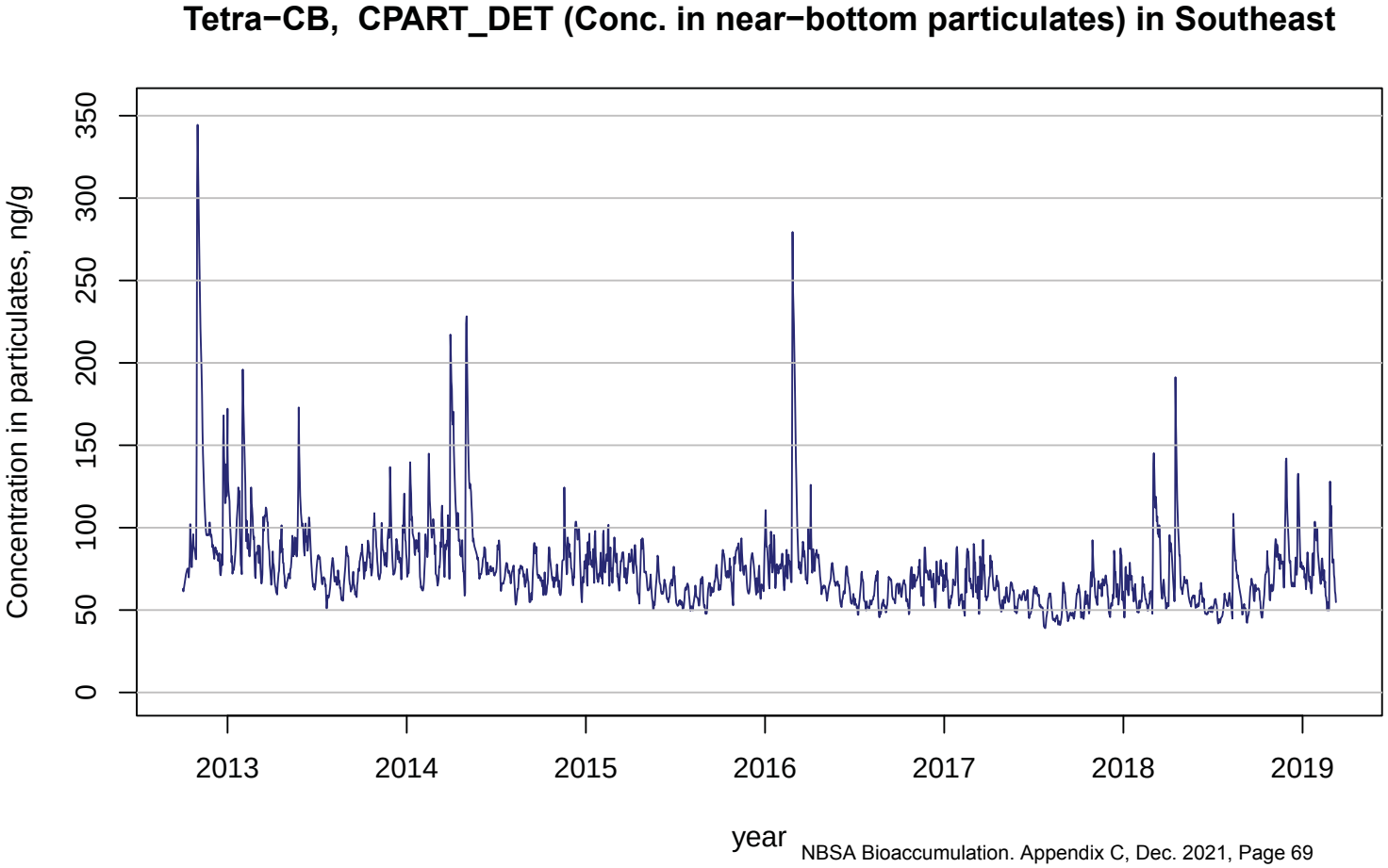

Tetra−CB, CPART (Chemical conc. in detrital particulates) in Channel
Concentration in detrital particulates, ng/g
0
100
200
300
2013
2014
2015
2016
2017
2018
2019
year

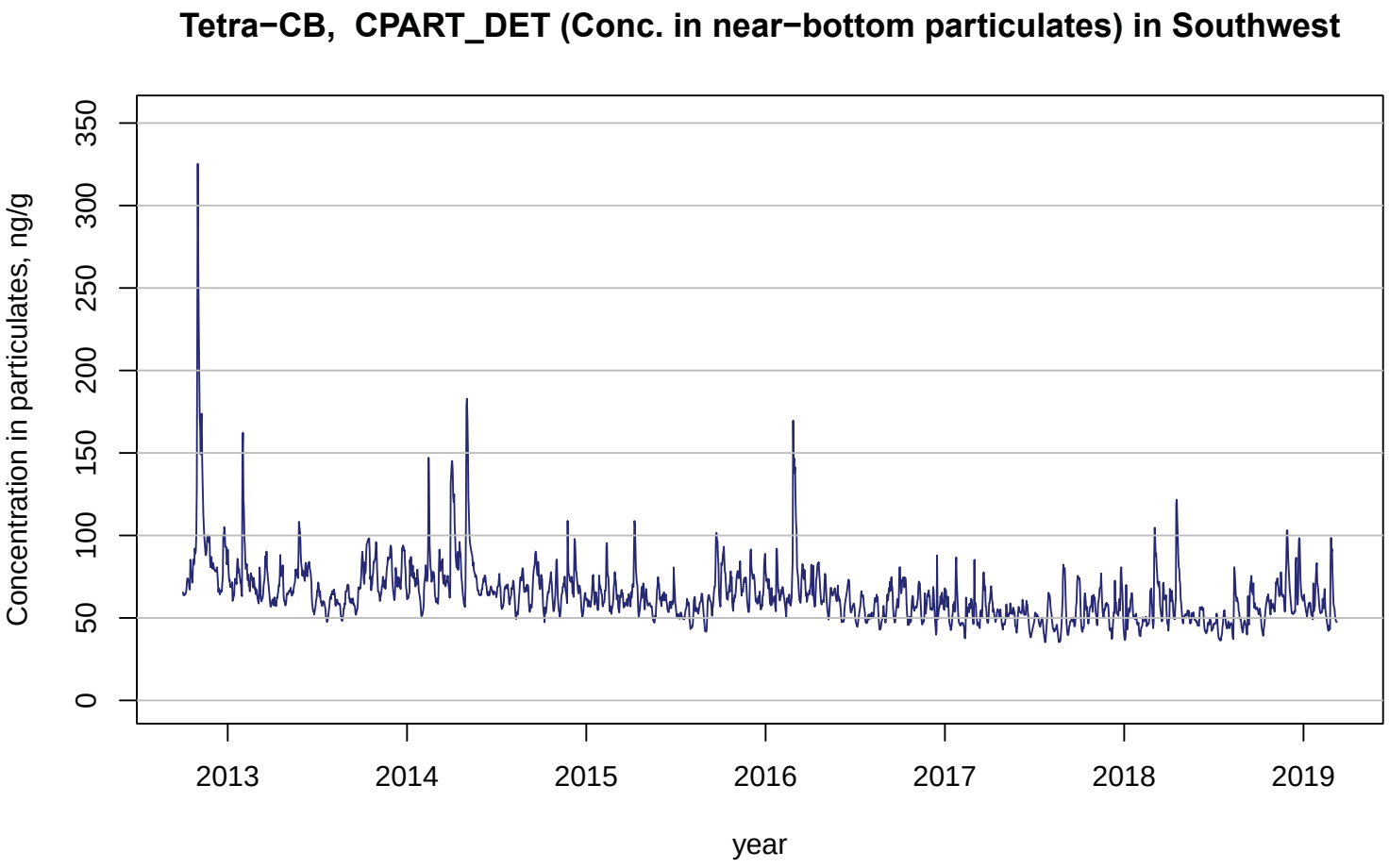

Tetra−CB, CPART (Chemical conc. in detrital particulates) in North Mudflat
Concentration in detrital particulates, ng/g
0
100
200
300
2013
2014
2015
2016
2017
2018
2019
year

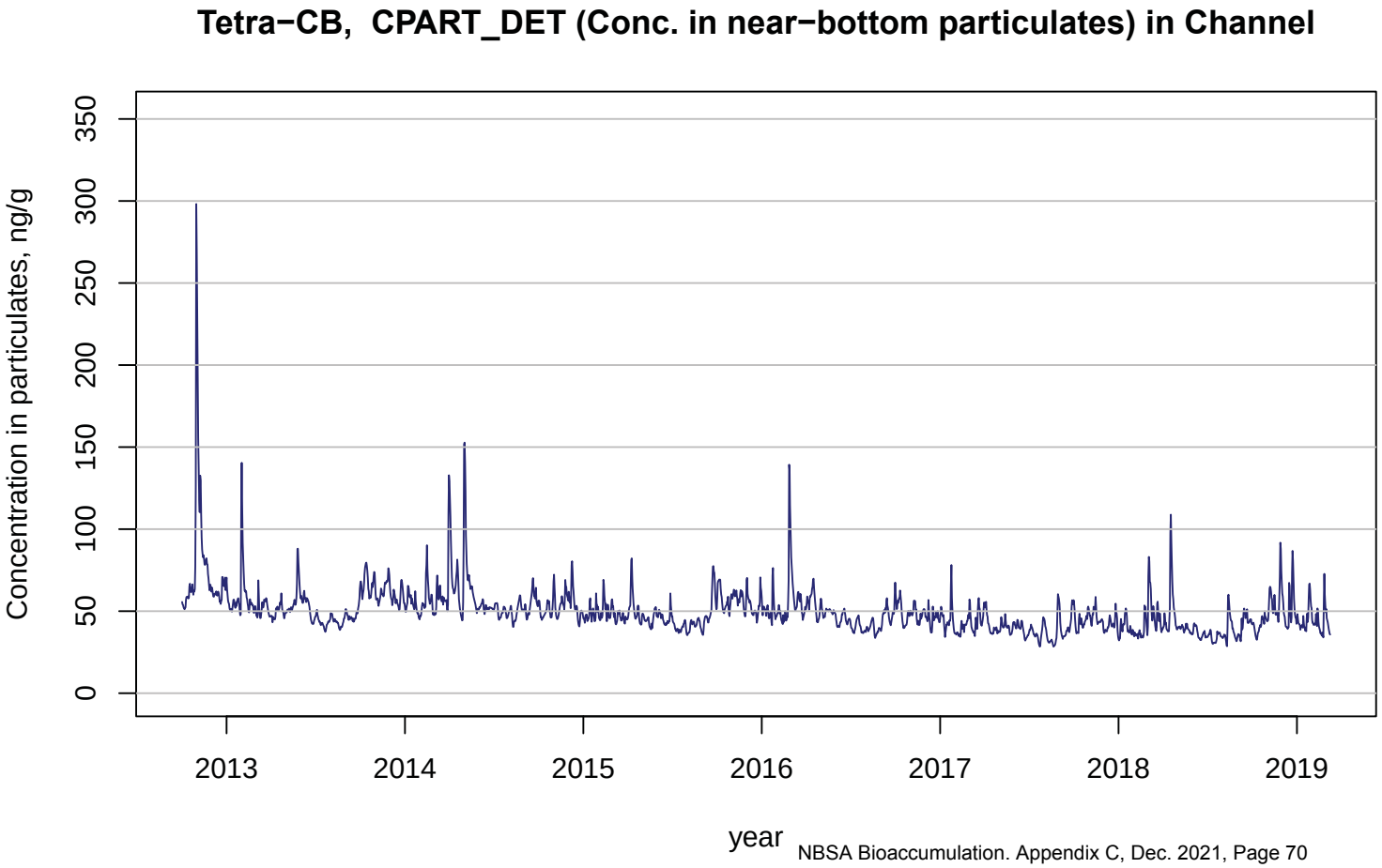

Tetra−CB, CPART (Chemical conc. in detrital particulates) in Southeast Mudflat
Concentration in detrital particulates, ng/g
0
100
200
300
2013
2014
2015
2016
2017
2018
2019
year

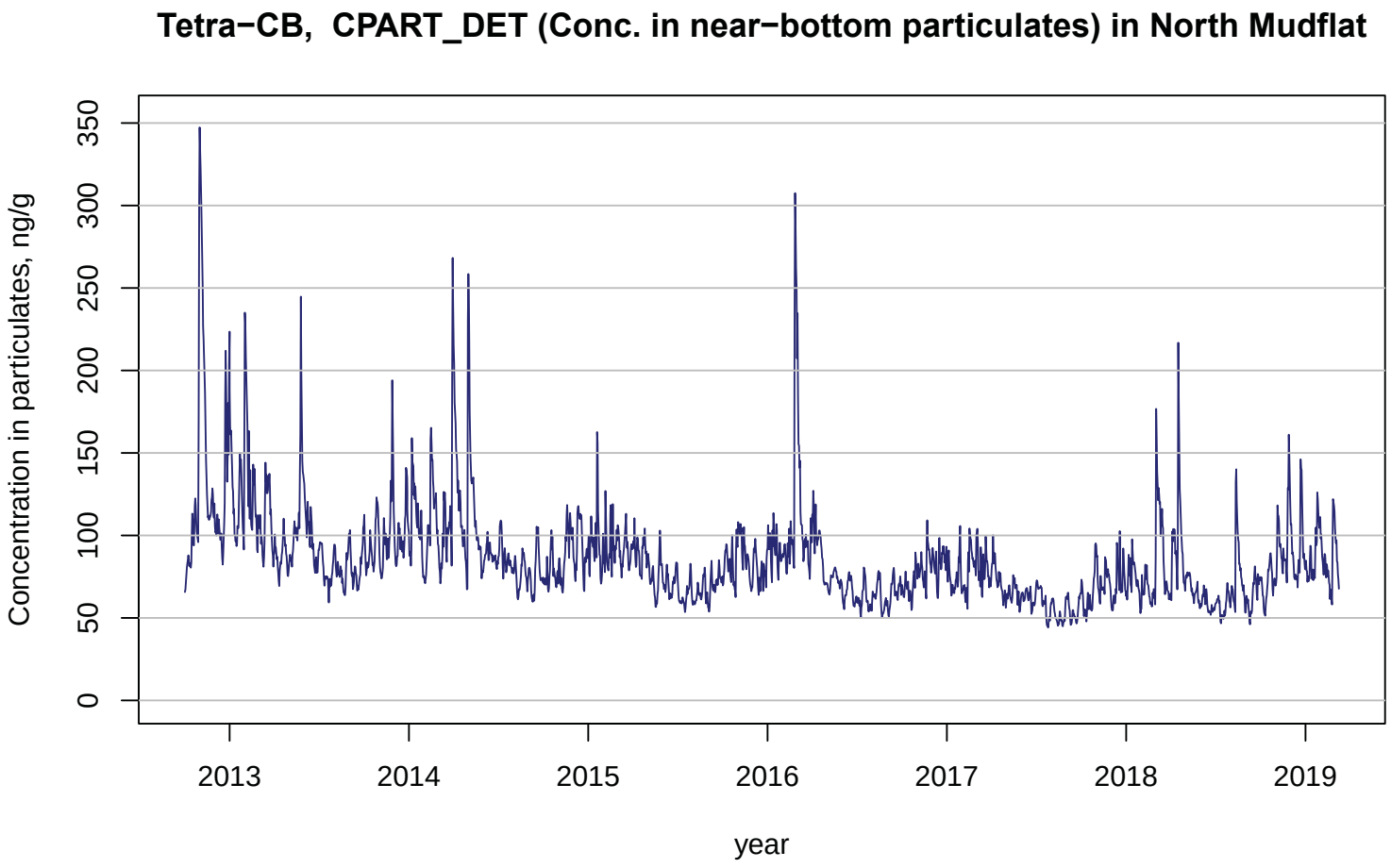

Tetra−CB, CPART (Chemical conc. in detrital particulates) in Southwest Mudflat
Concentration in detrital particulates, ng/g
0
100
200
300
2013
2014
2015
2016
2017
2018
2019
year

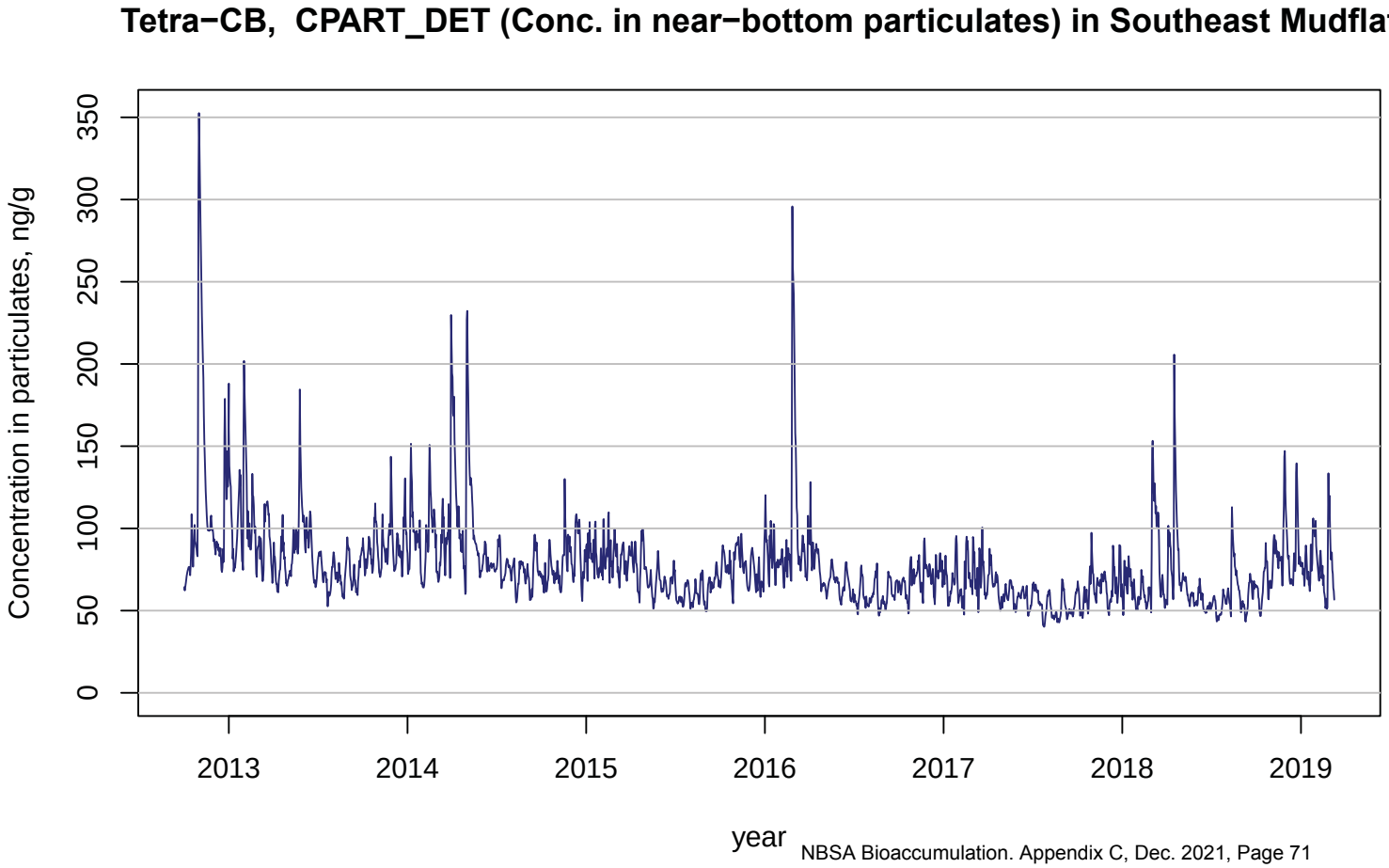

Tetra−CB, CPART_DET (Conc. in near−bottom particulates) in North
Concentration in particulates, ng/g
0
50
100
150
200
250
300
350
2013
2014
2015
2016
2017
2018
2019
year

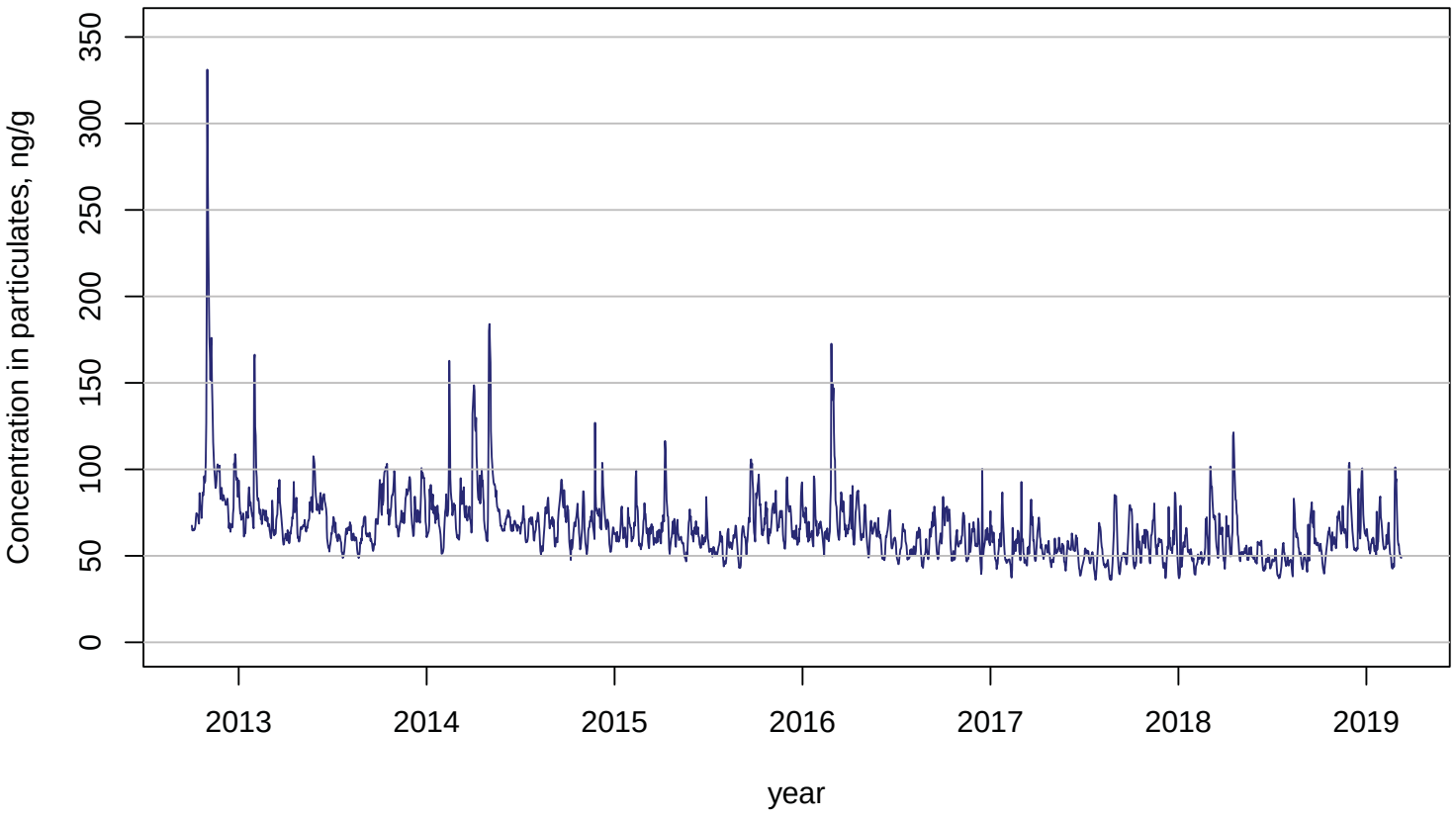

Tetra−CB, CPART_DET (Conc. in near−bottom particulates) in Southeast
Concentration in particulates, ng/g
0
50
100
150
200
250
300
350
2013
2014
2015
2016
2017
2018
2019
year

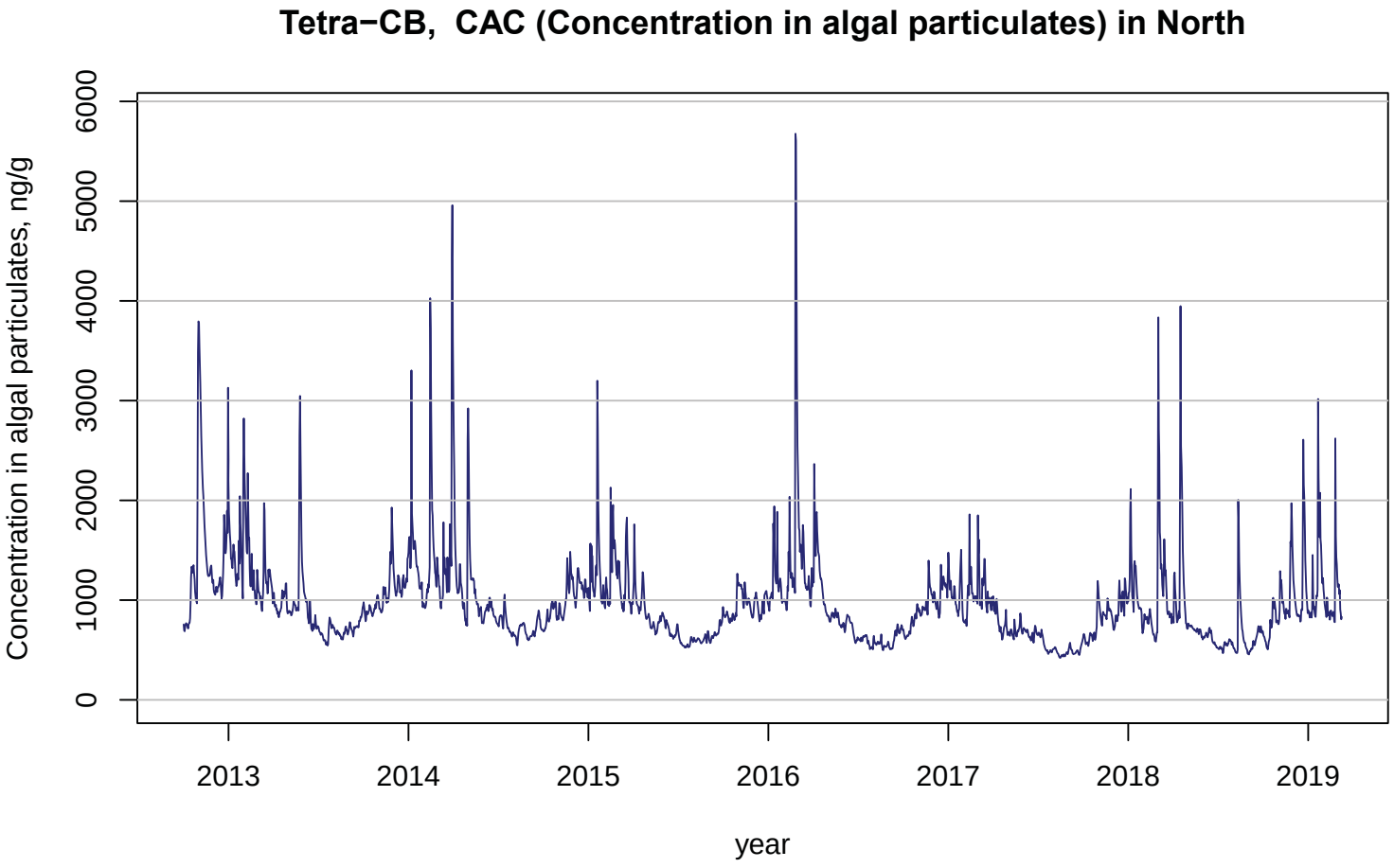

Tetra−CB, CPART_DET (Conc. in near−bottom particulates) in Southwest
Concentration in particulates, ng/g
0
50
100
150
200
250
300
350
2013
2014
2015
2016
2017
2018
2019
year

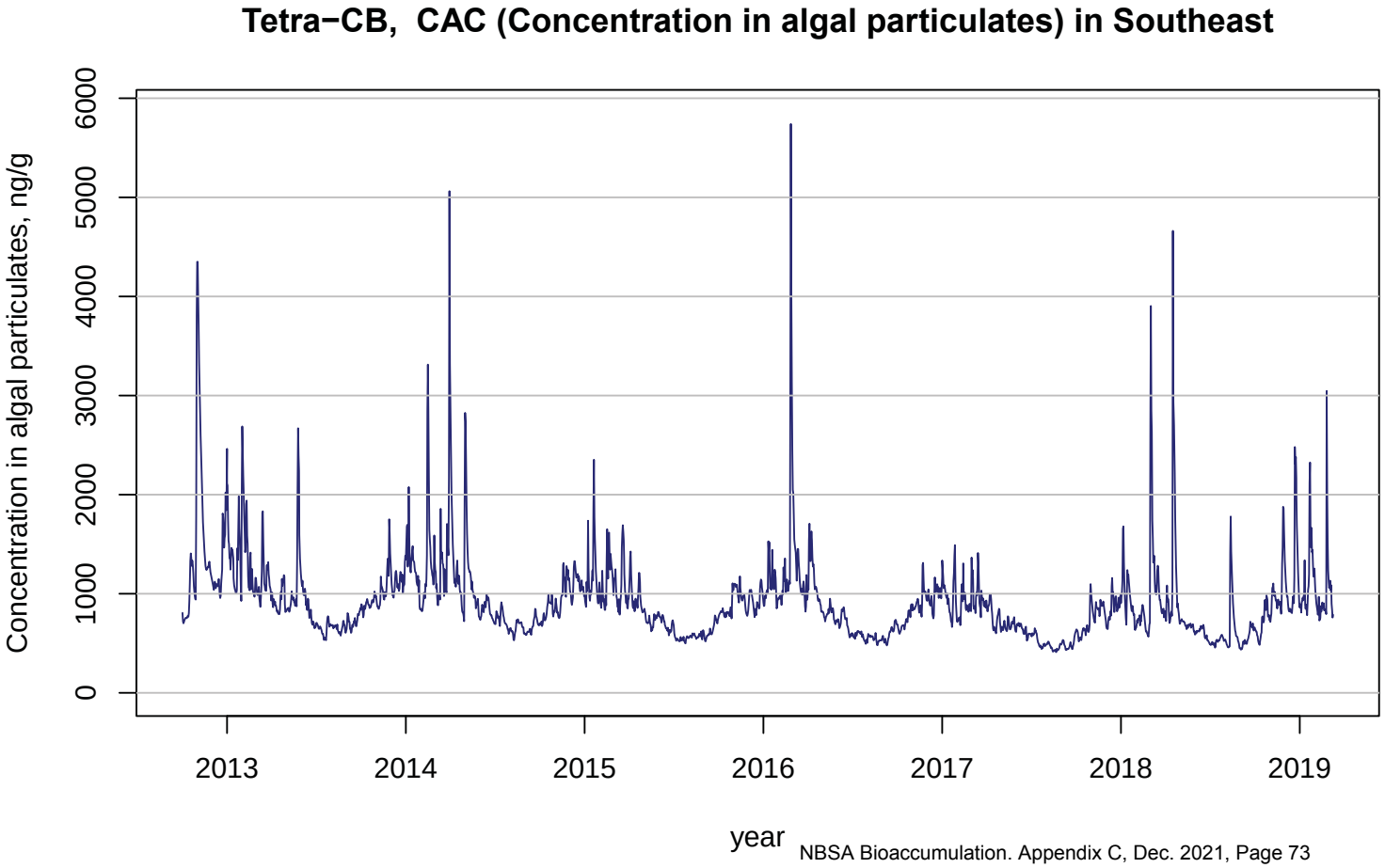

Tetra−CB, CPART_DET (Conc. in near−bottom particulates) in Channel
Concentration in particulates, ng/g
0
50
100
150
200
250
300
350
2013
2014
2015
2016
2017
2018
2019
year

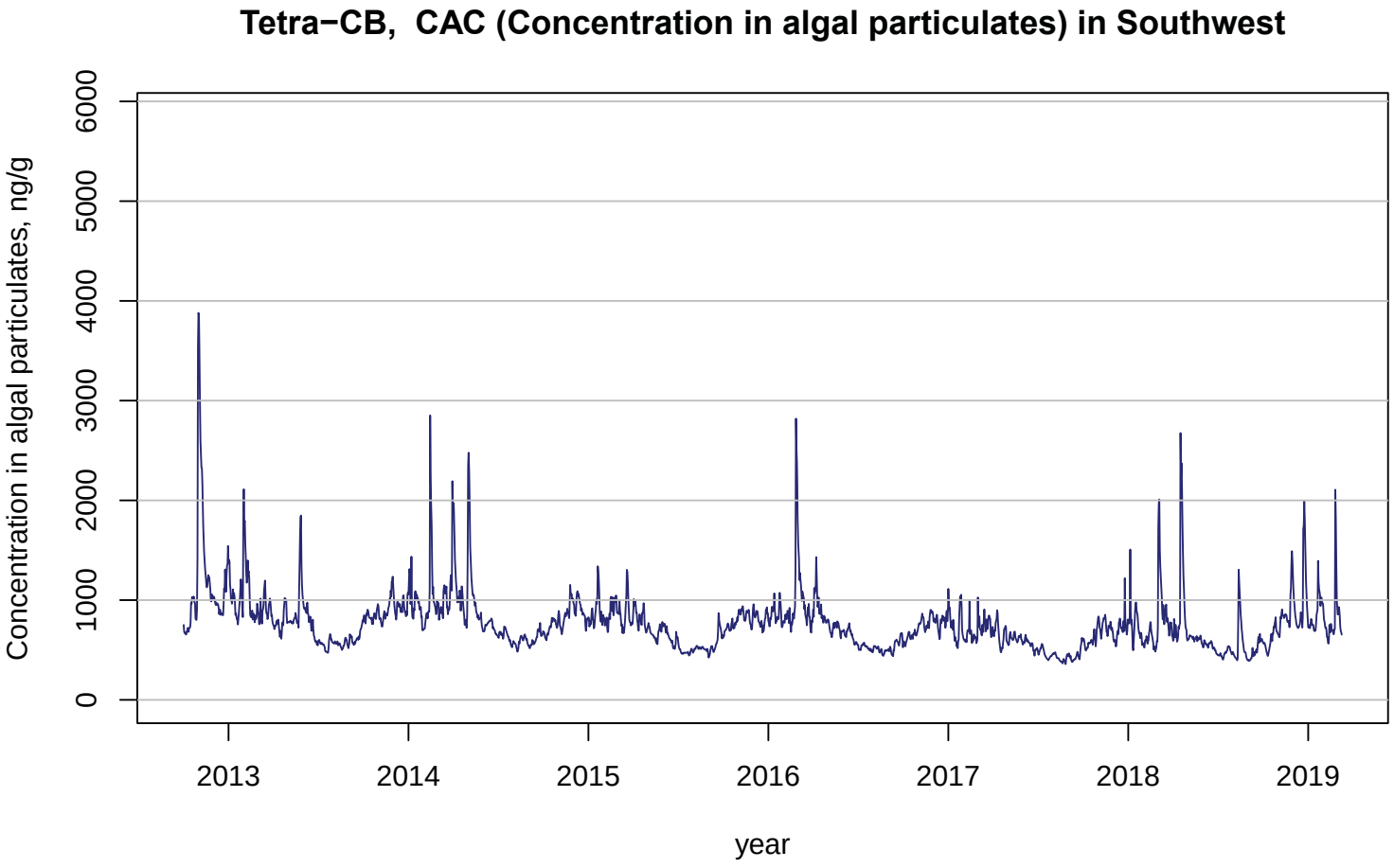

Tetra−CB, CPART_DET (Conc. in near−bottom particulates) in North Mudflat
Concentration in particulates, ng/g
0
50
100
150
200
250
300
350
2013
2014
2015
2016
2017
2018
2019
year

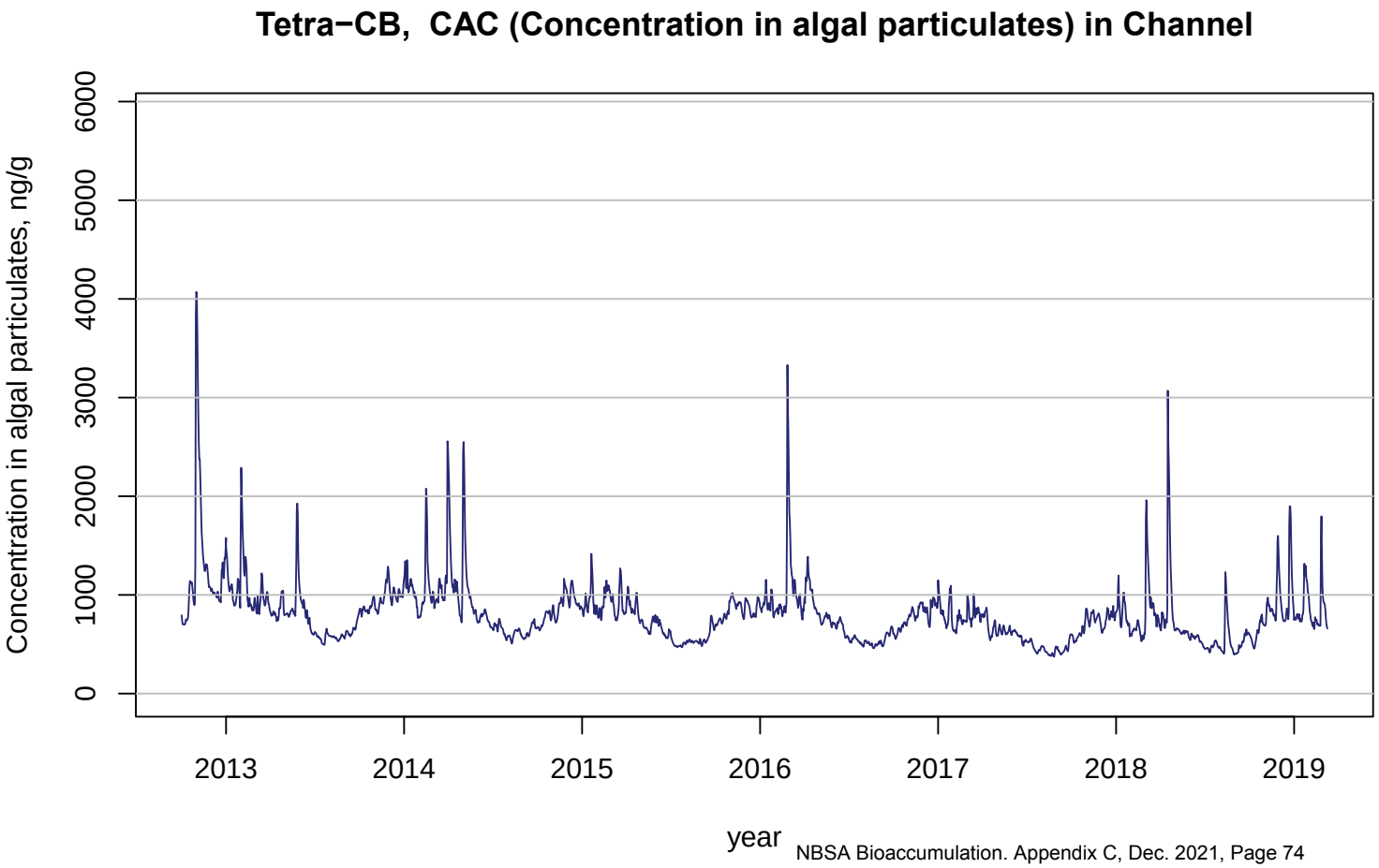

Tetra−CB, CPART_DET (Conc. in near−bottom particulates) in Southeast Mudflat
Concentration in particulates, ng/g
0
50
100
150
200
250
300
350
2013
2014
2015
2016
2017
2018
2019
year

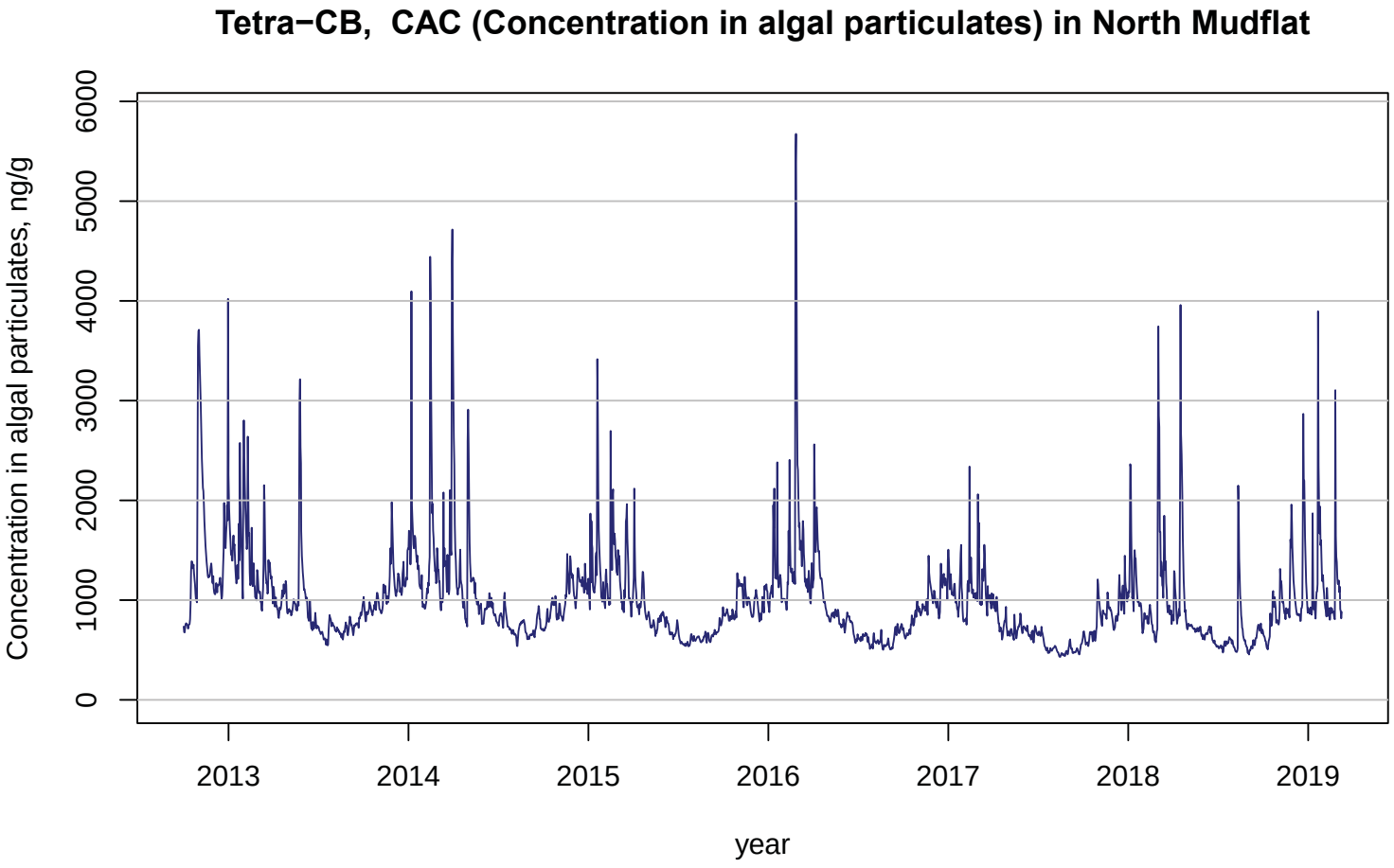

Tetra−CB, CPART_DET (Conc. in near−bottom particulates) in Southwest Mudflat
Concentration in particulates, ng/g
0
50
100
150
200
250
300
350
2013
2014
2015
2016
2017
2018
2019
year

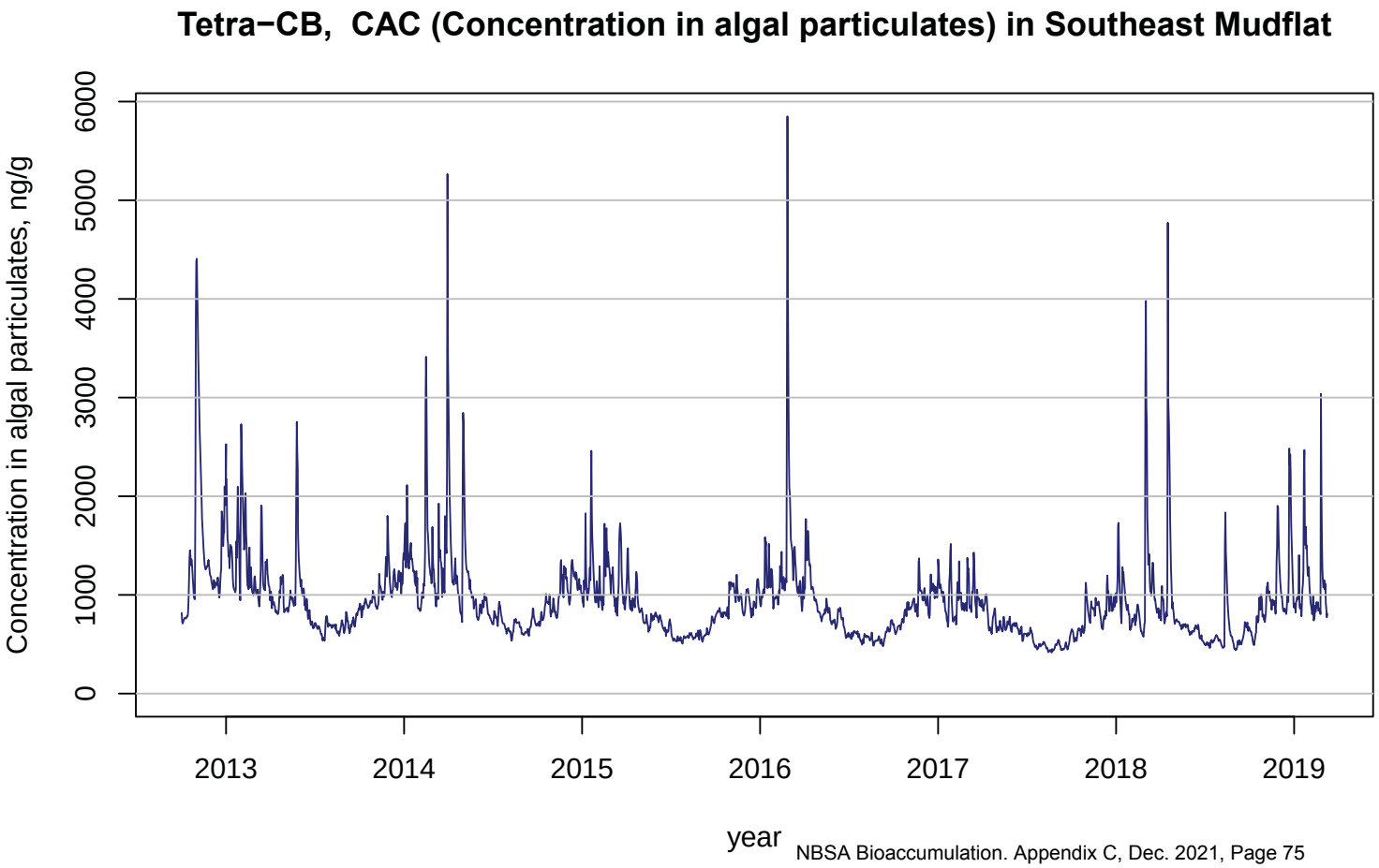

Tetra−CB, CAC (Concentration in algal particulates) in North
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

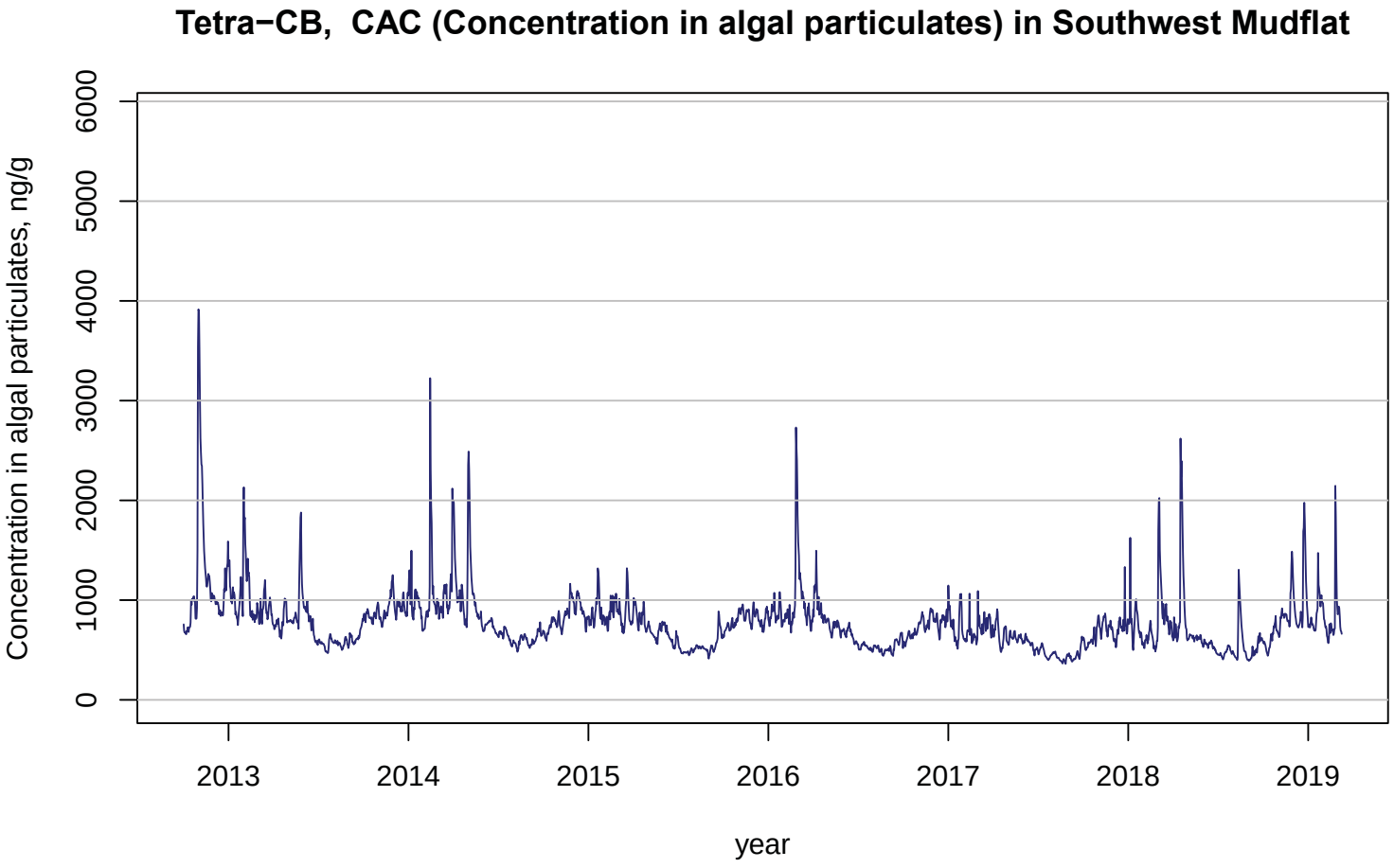

Tetra−CB, CAC (Concentration in algal particulates) in Southeast
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

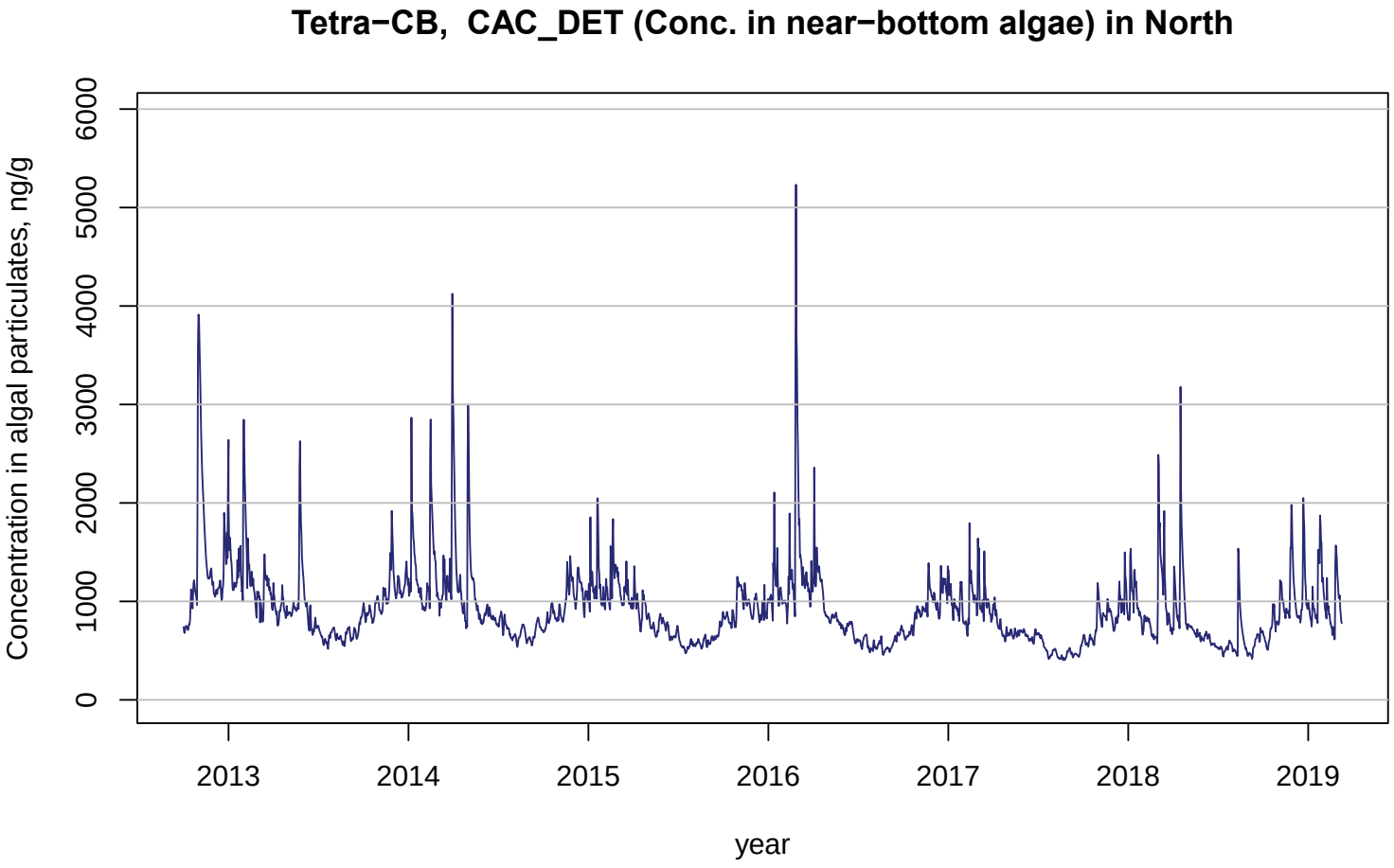

Tetra−CB, CAC (Concentration in algal particulates) in Southwest
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

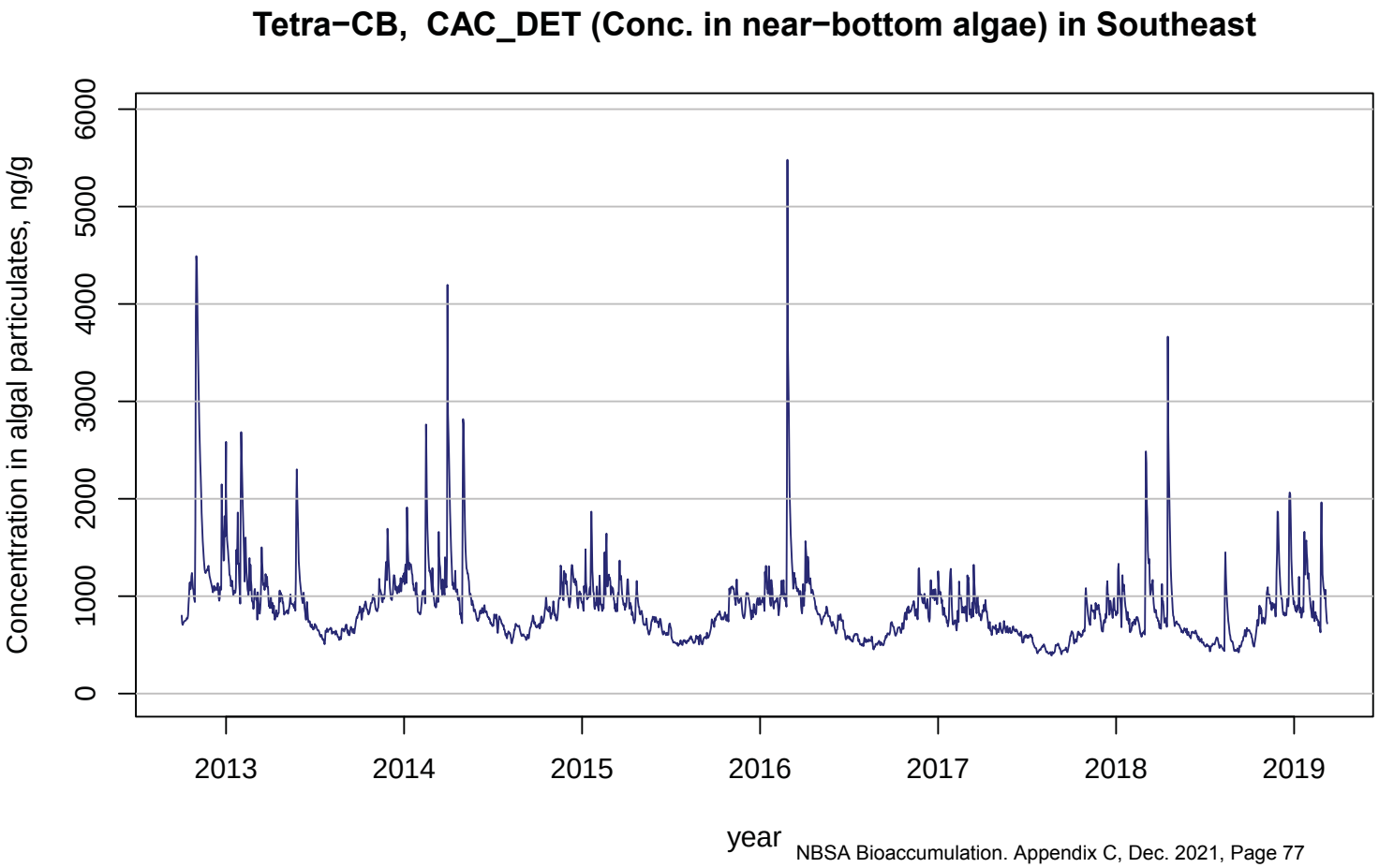

Tetra−CB, CAC (Concentration in algal particulates) in Channel
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

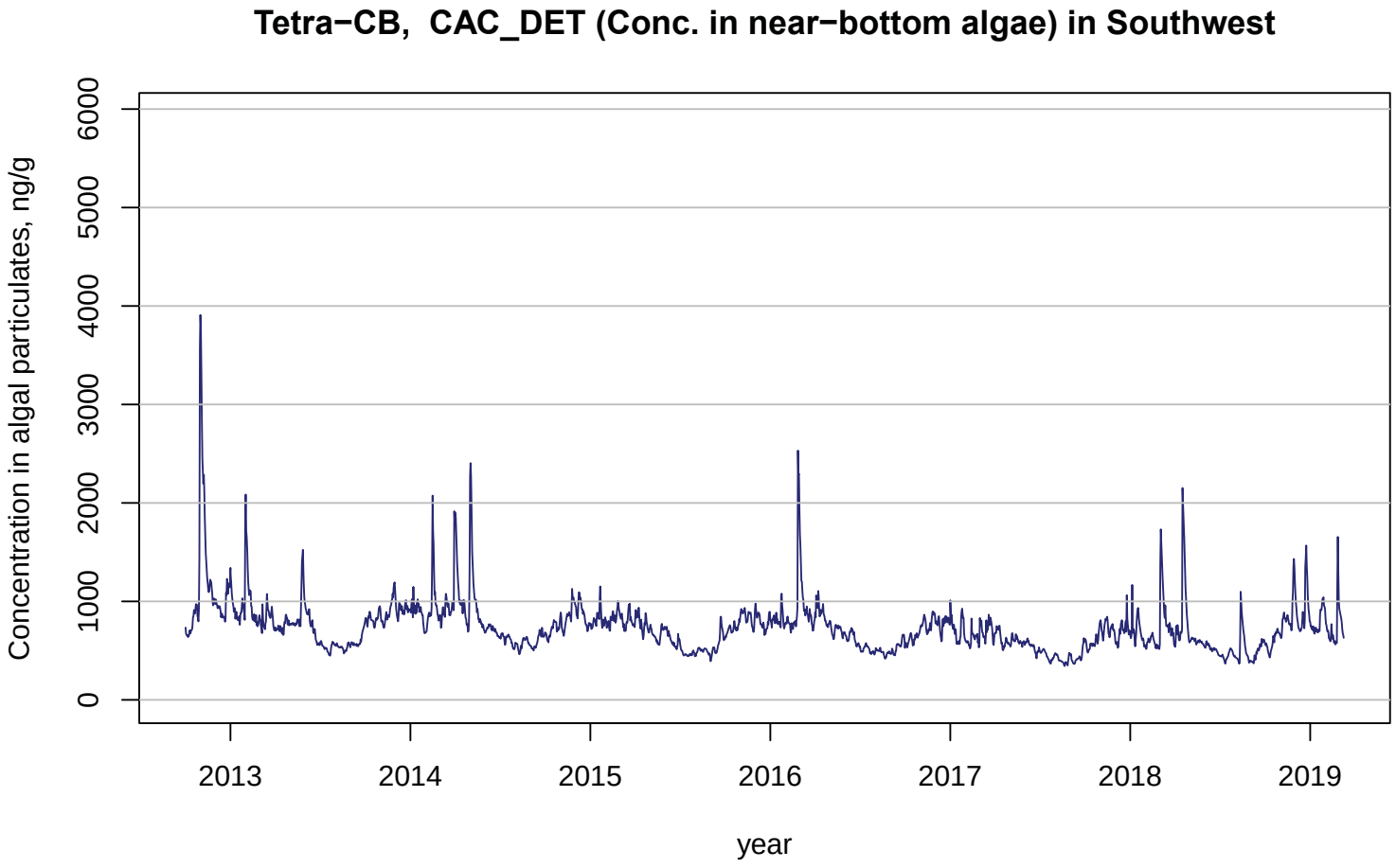

Tetra−CB, CAC (Concentration in algal particulates) in North Mudflat
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

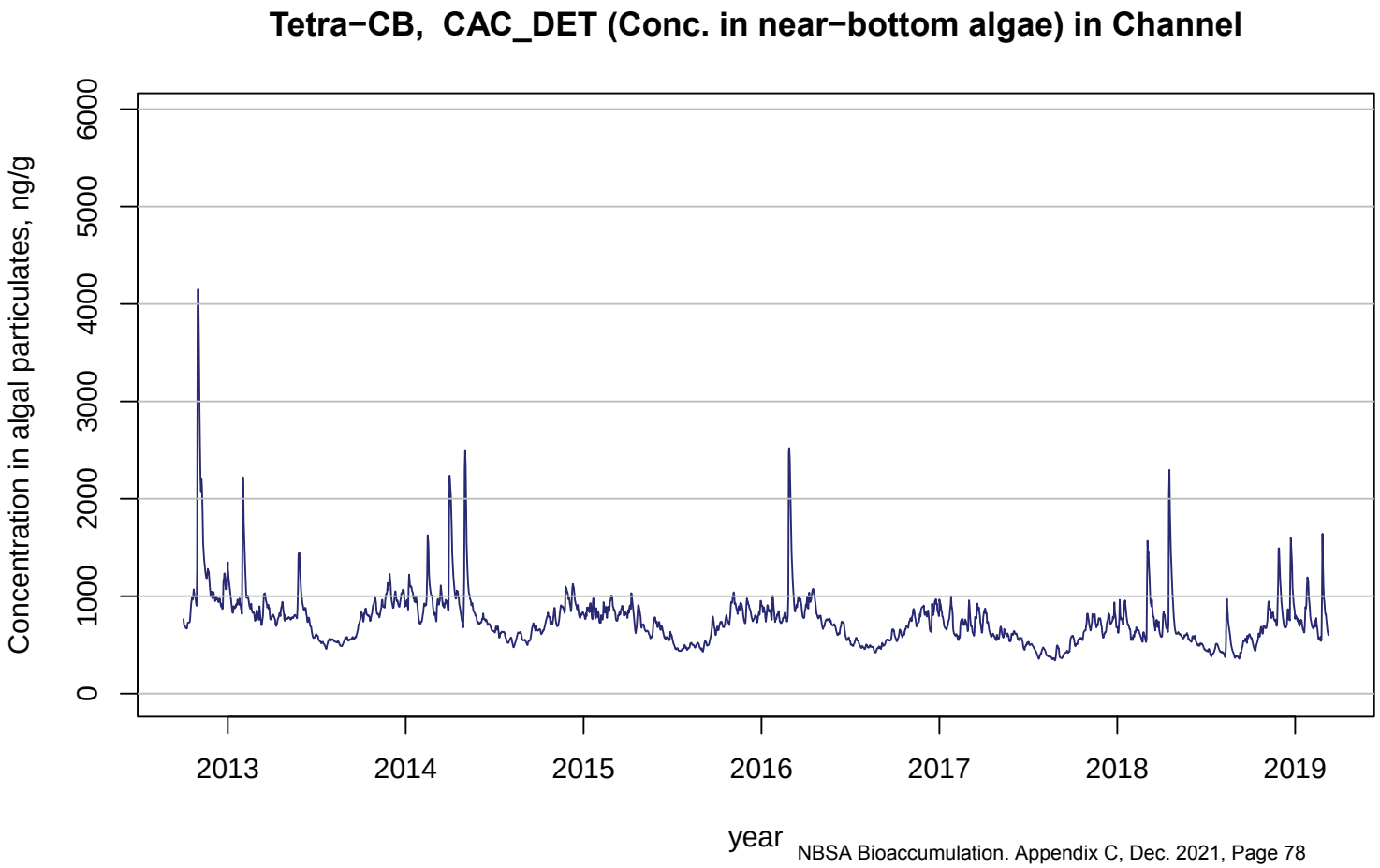

Tetra−CB, CAC (Concentration in algal particulates) in Southeast Mudflat
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

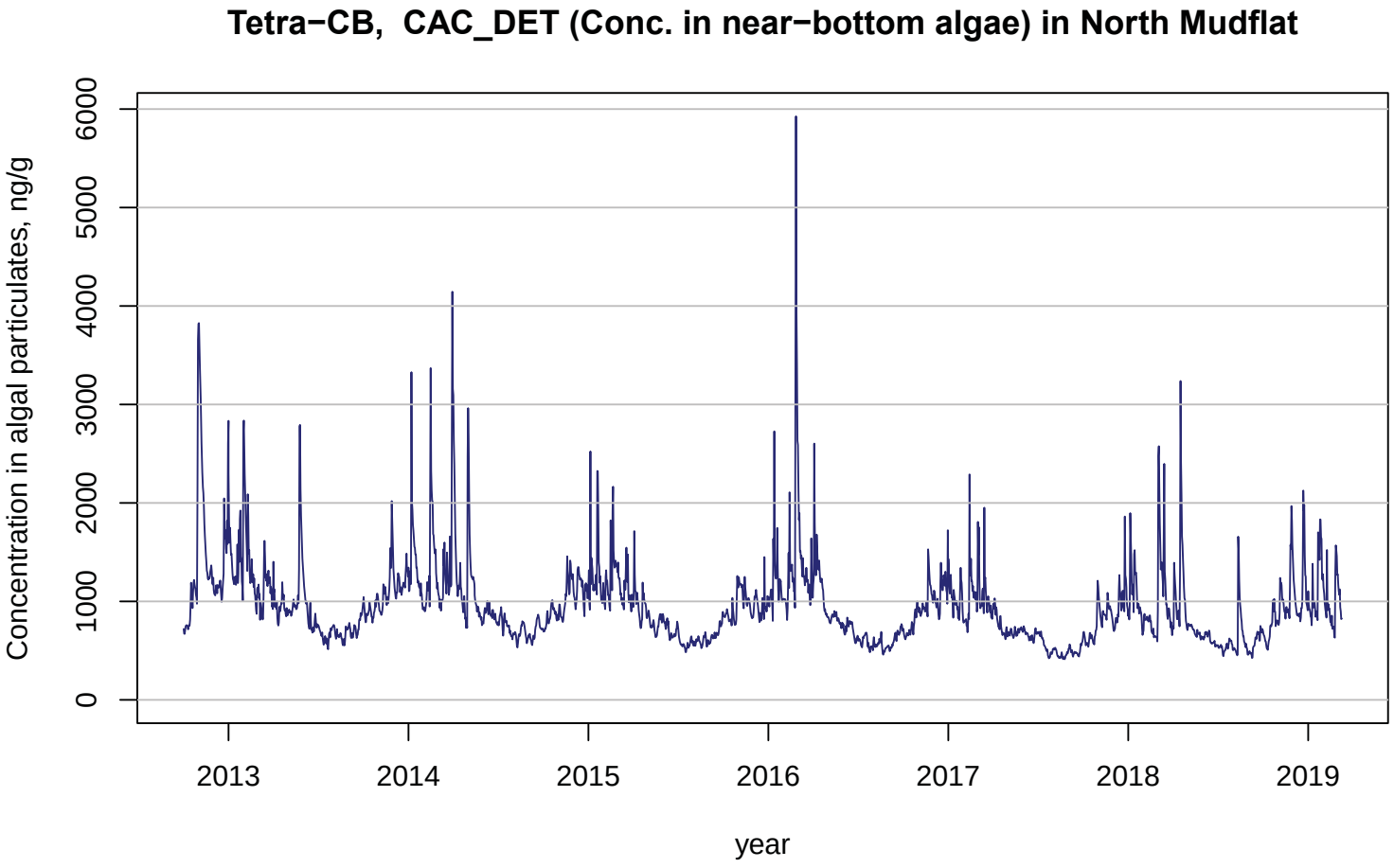

Tetra−CB, CAC (Concentration in algal particulates) in Southwest Mudflat
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

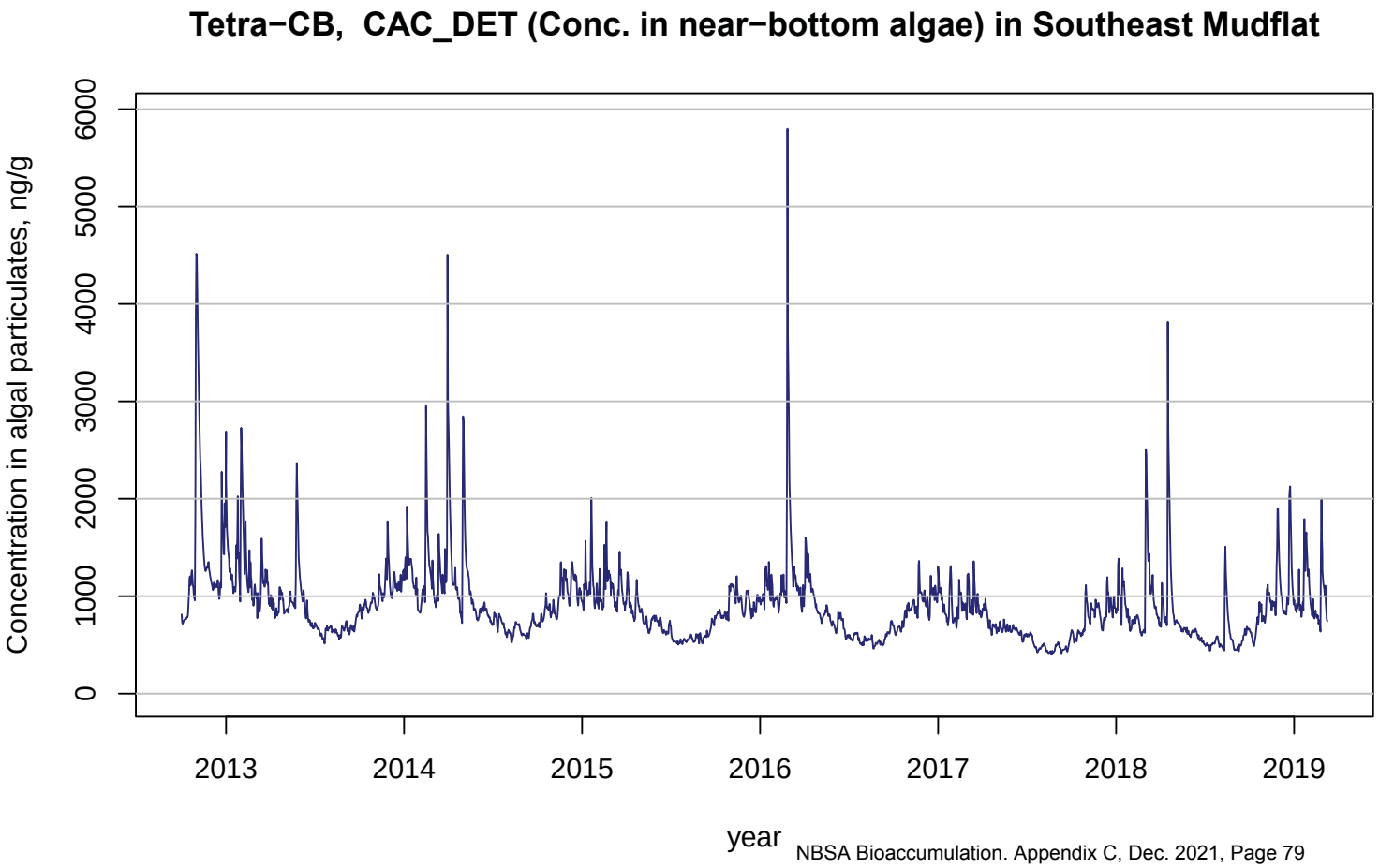

Tetra−CB, CAC_DET (Conc. in near−bottom algae) in North
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

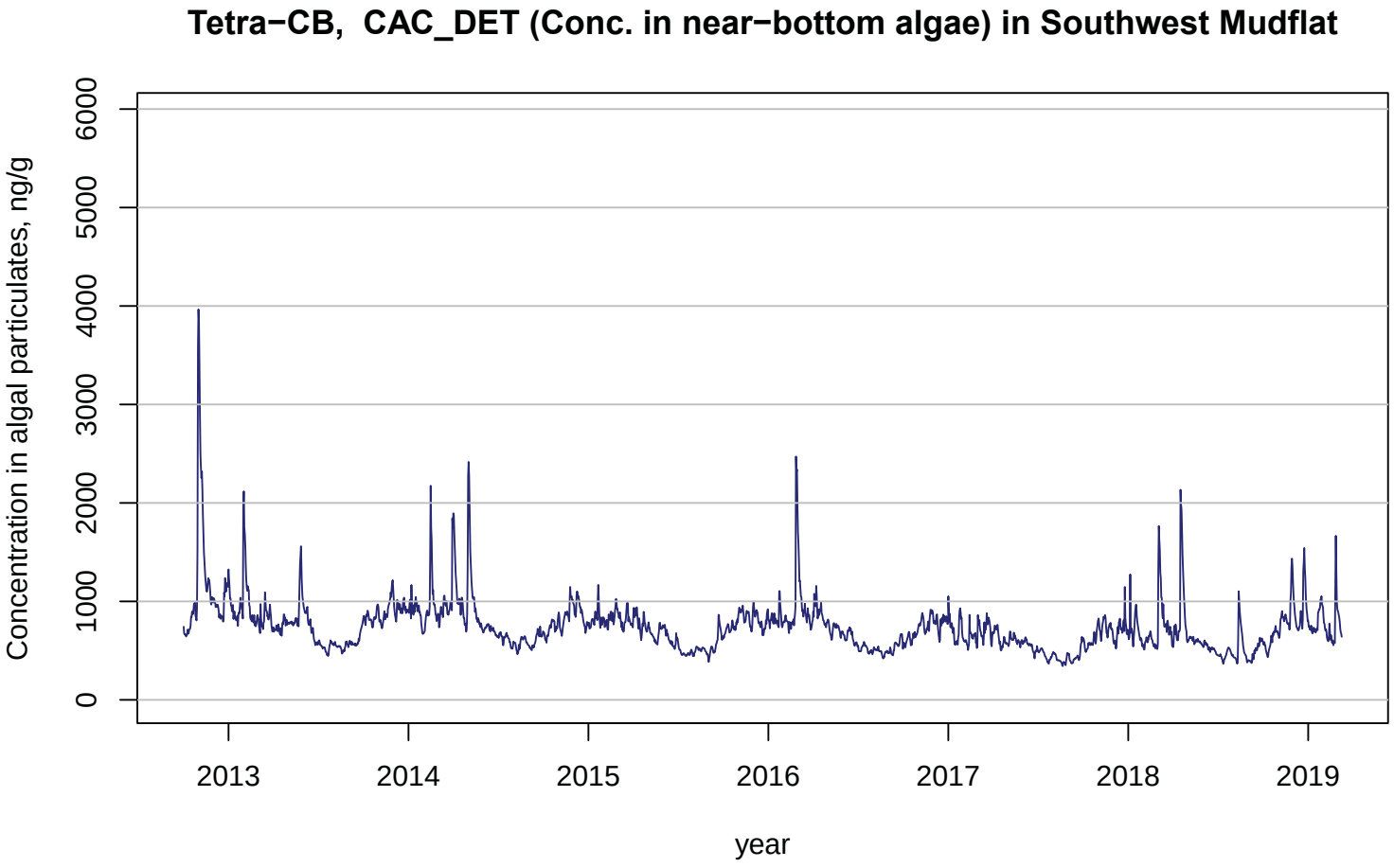

Tetra−CB, CAC_DET (Conc. in near−bottom algae) in Southeast
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

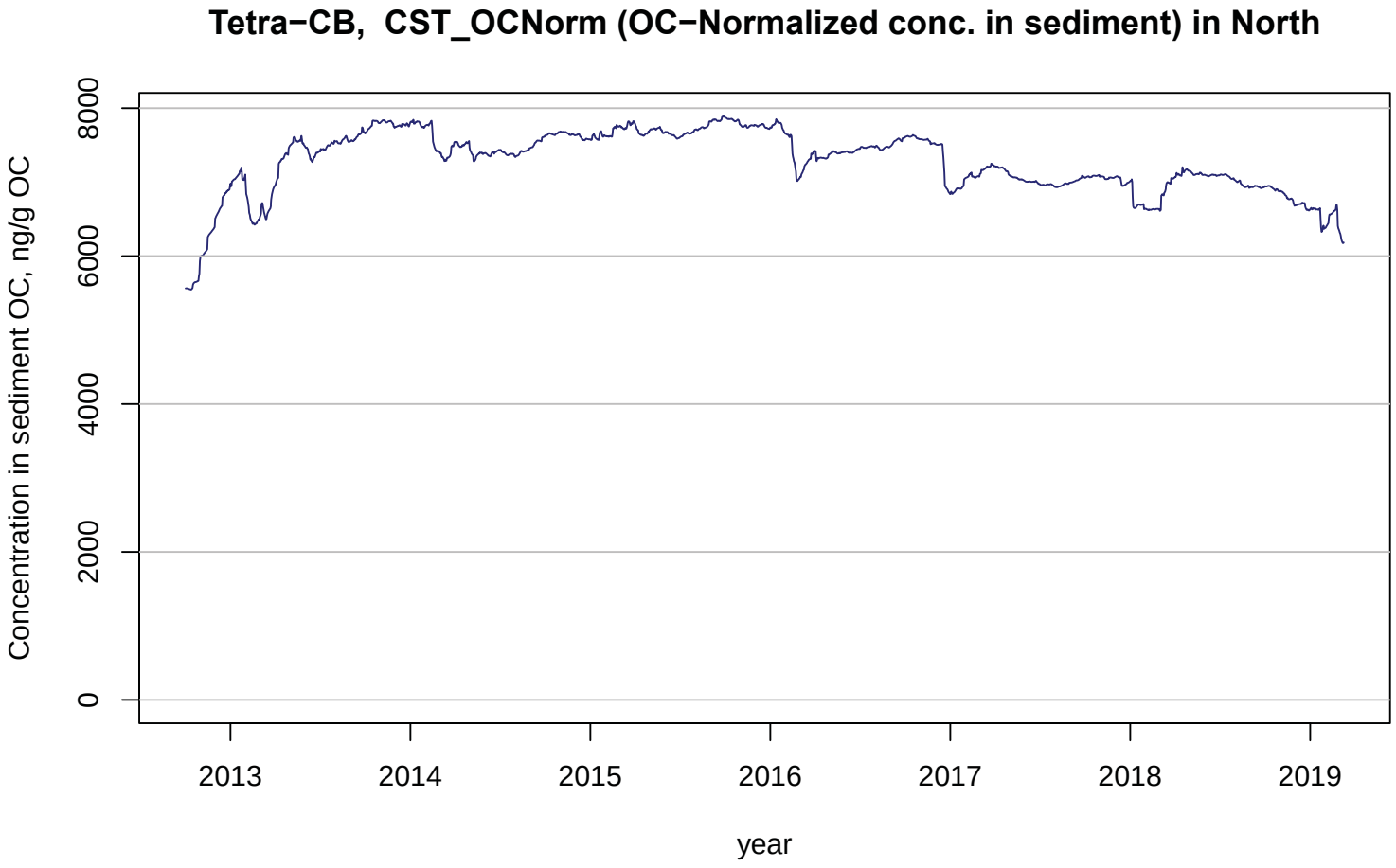

Tetra−CB, CAC_DET (Conc. in near−bottom algae) in Southwest
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

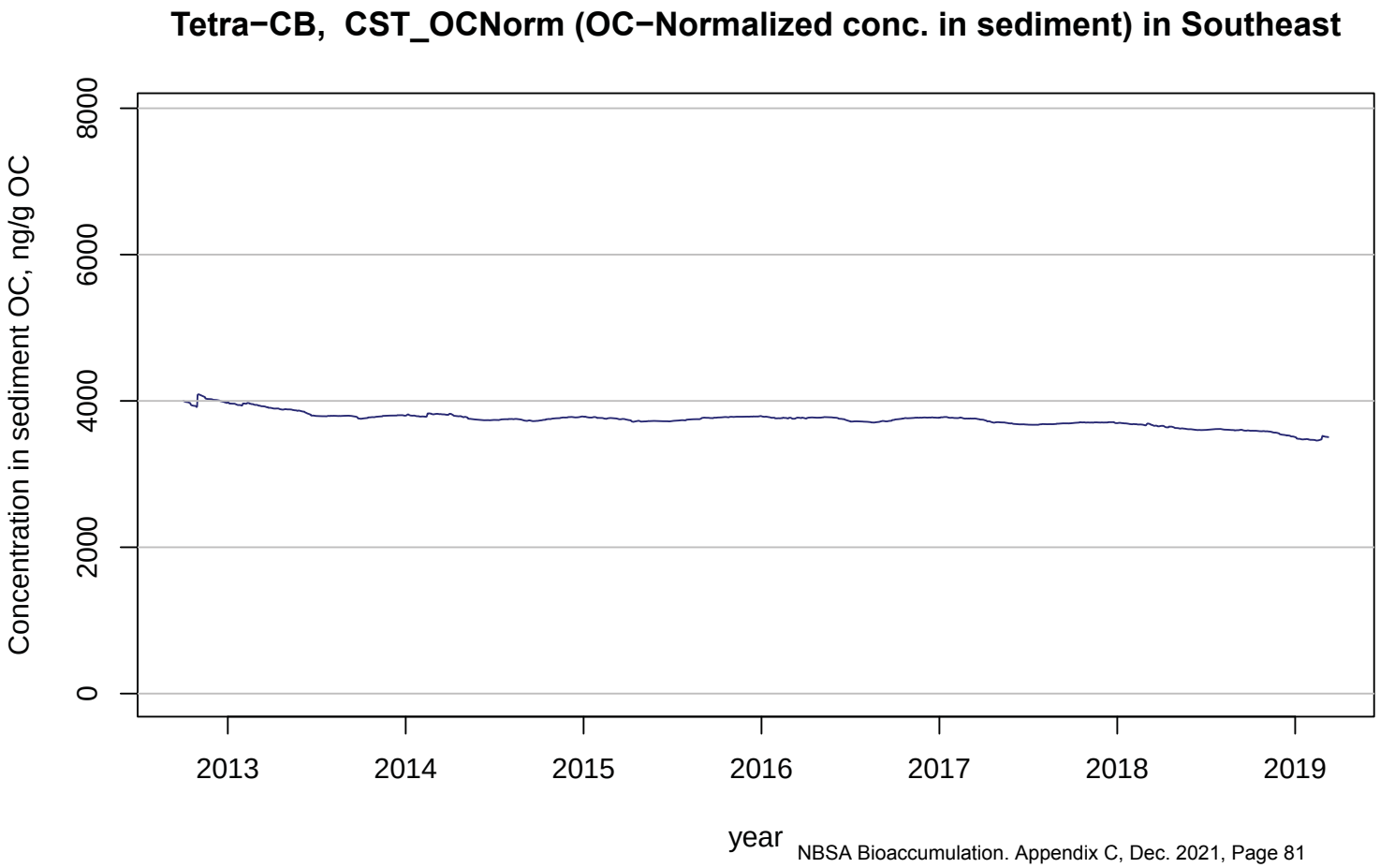

Tetra−CB, CAC_DET (Conc. in near−bottom algae) in Channel
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

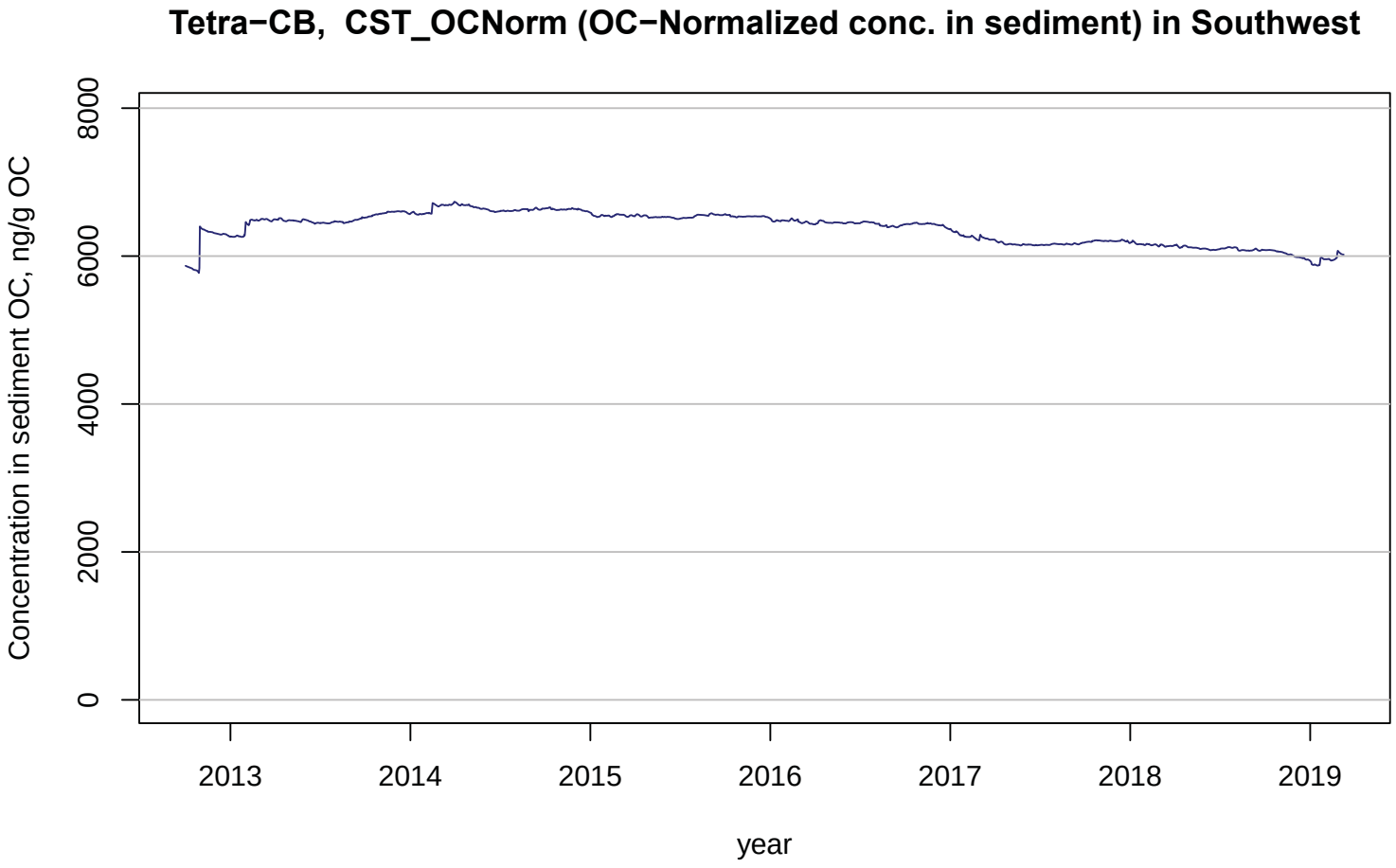

Tetra−CB, CAC_DET (Conc. in near−bottom algae) in North Mudflat
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

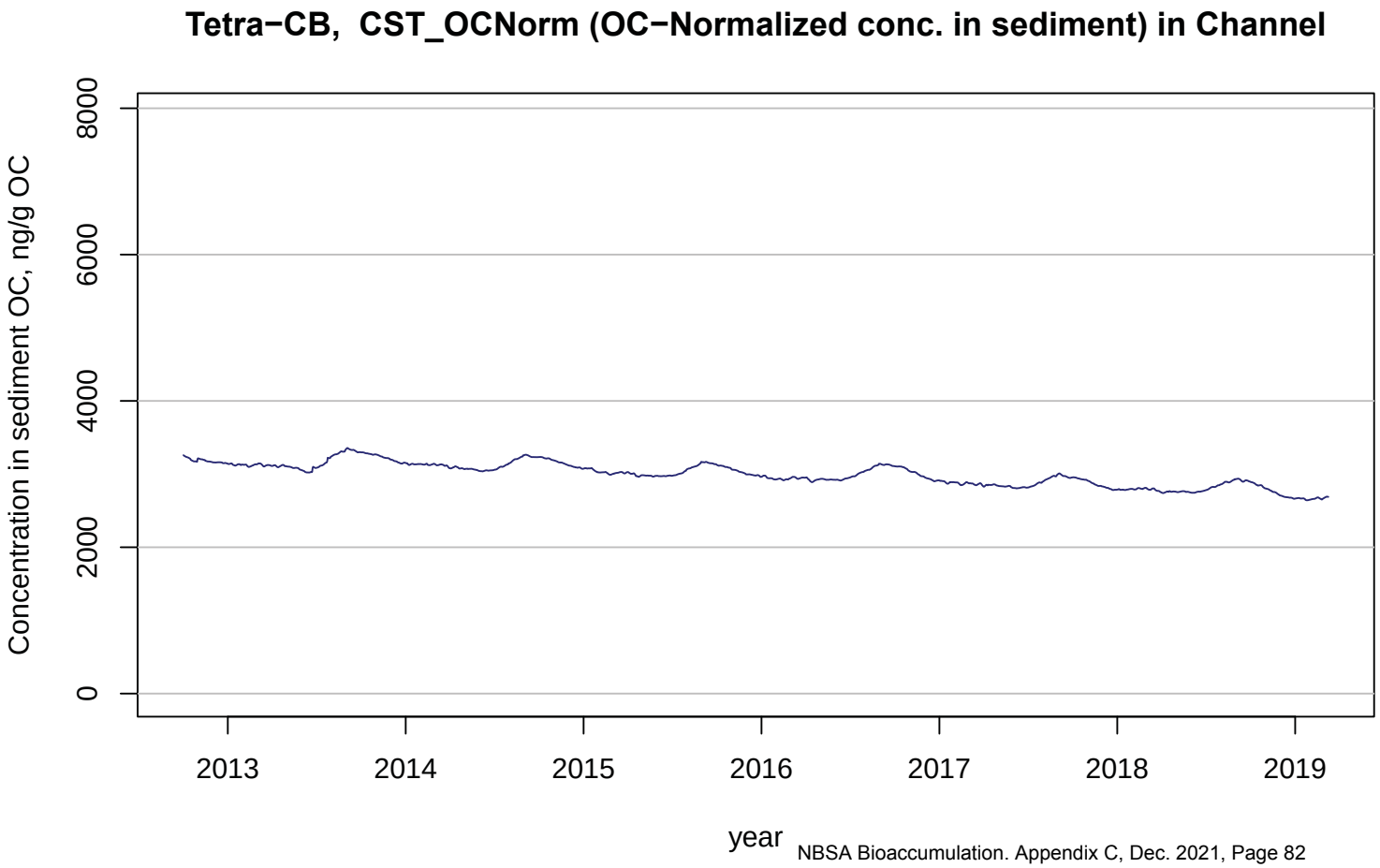

Tetra−CB, CAC_DET (Conc. in near−bottom algae) in Southeast Mudflat
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

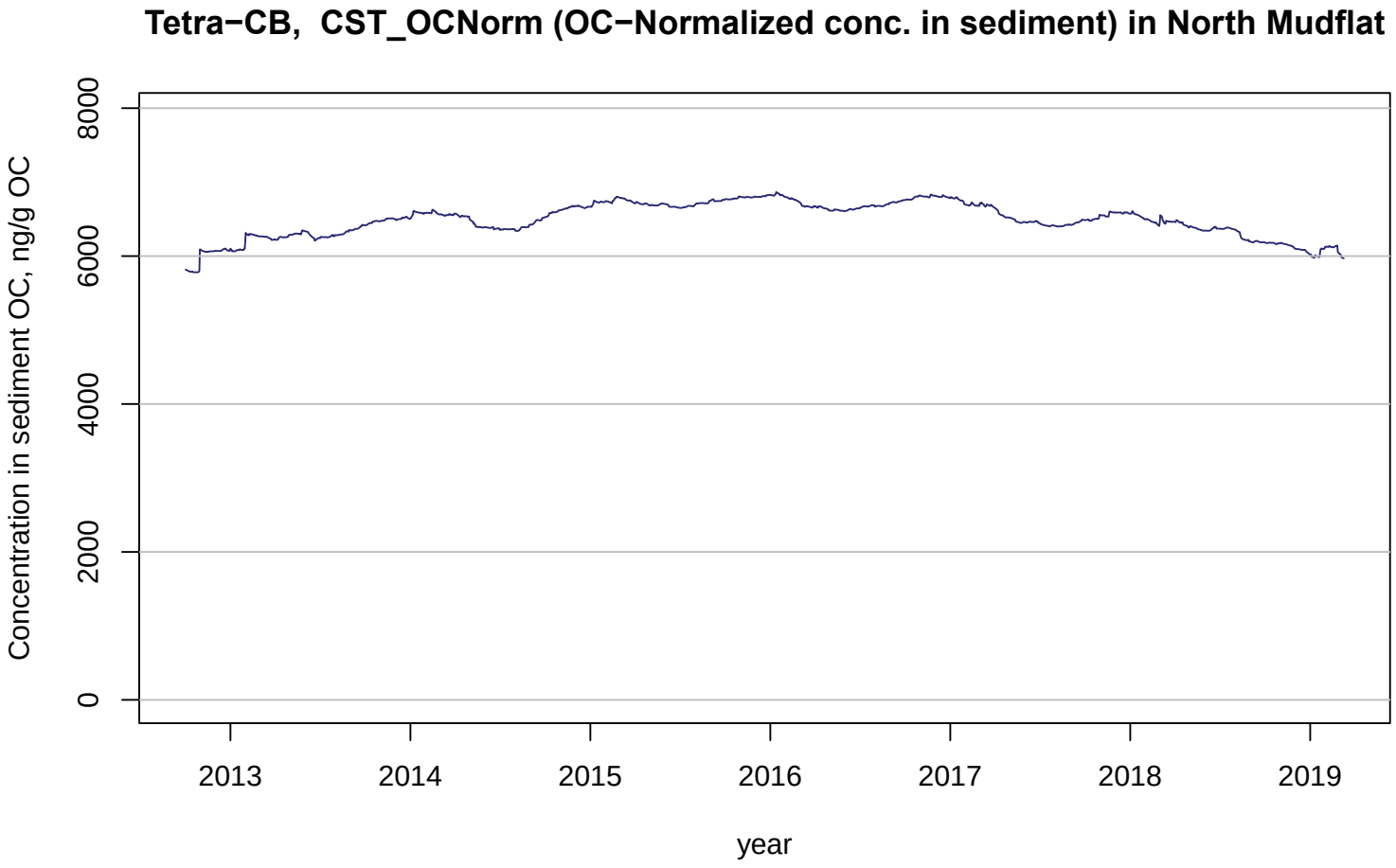

Tetra−CB, CAC_DET (Conc. in near−bottom algae) in Southwest Mudflat
Concentration in algal particulates, ng/g
0
1000
2000
3000
4000
5000
6000
2013
2014
2015
2016
2017
2018
2019
year

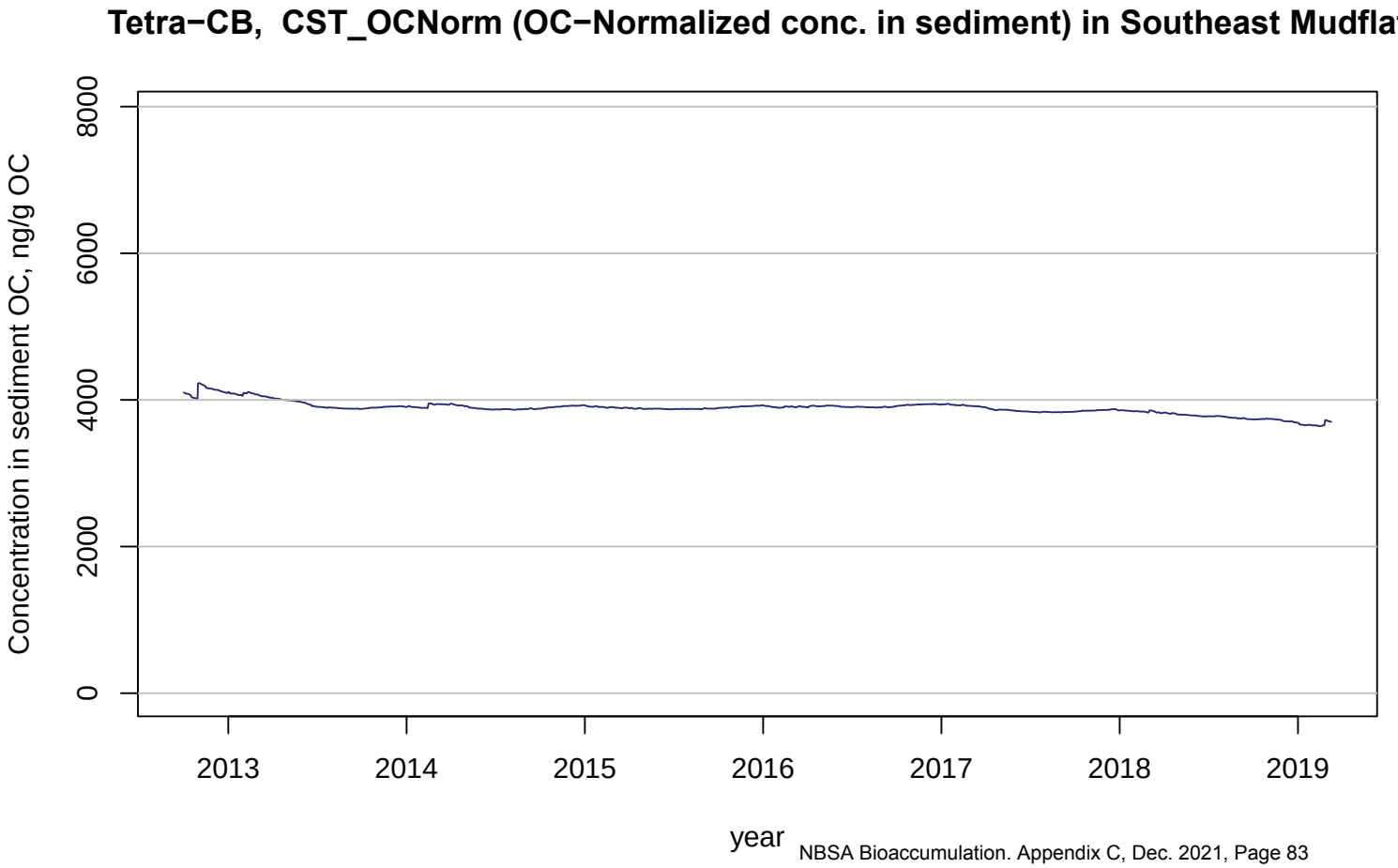

Tetra−CB, CST_OCNorm (OC−Normalized conc. in sediment) in North
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

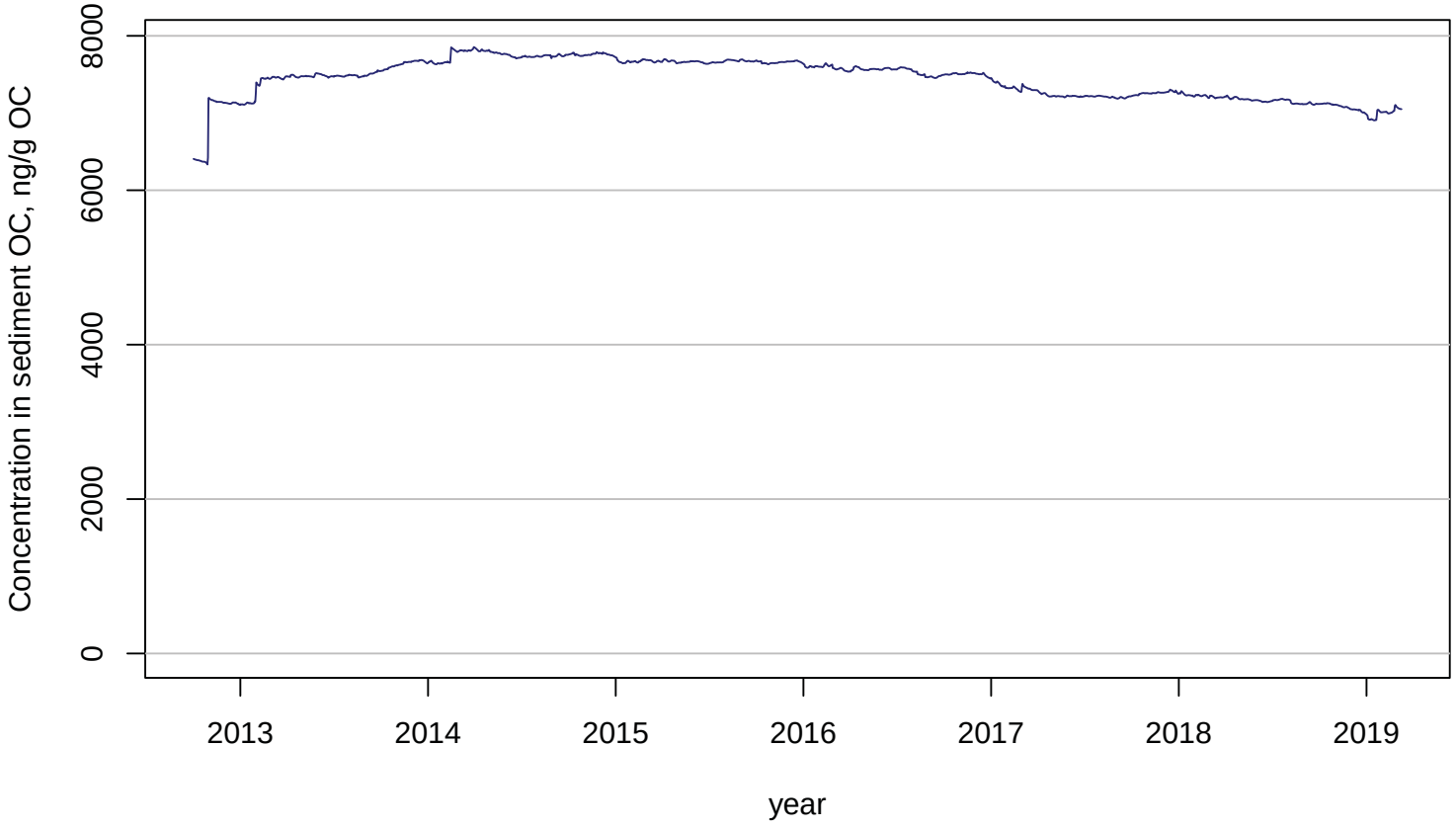

Tetra−CB, CST_OCNorm (OC−Normalized conc. in sediment) in Southeast
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CST_OCNorm (OC−Normalized conc. in sediment) in Southwest
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

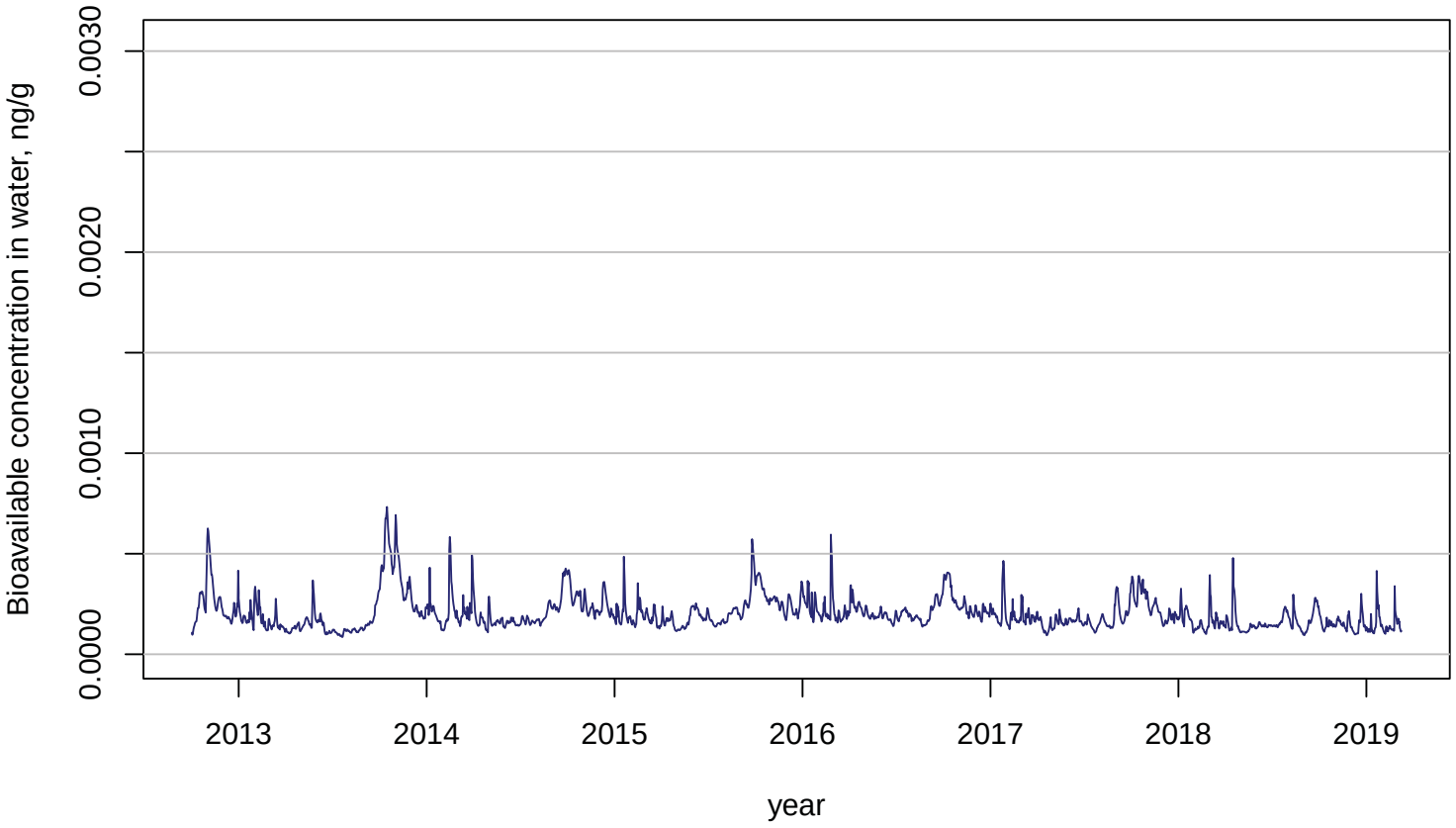

Tetra−CB, CST_OCNorm (OC−Normalized conc. in sediment) in Channel
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CST_OCNorm (OC−Normalized conc. in sediment) in North Mudflat
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

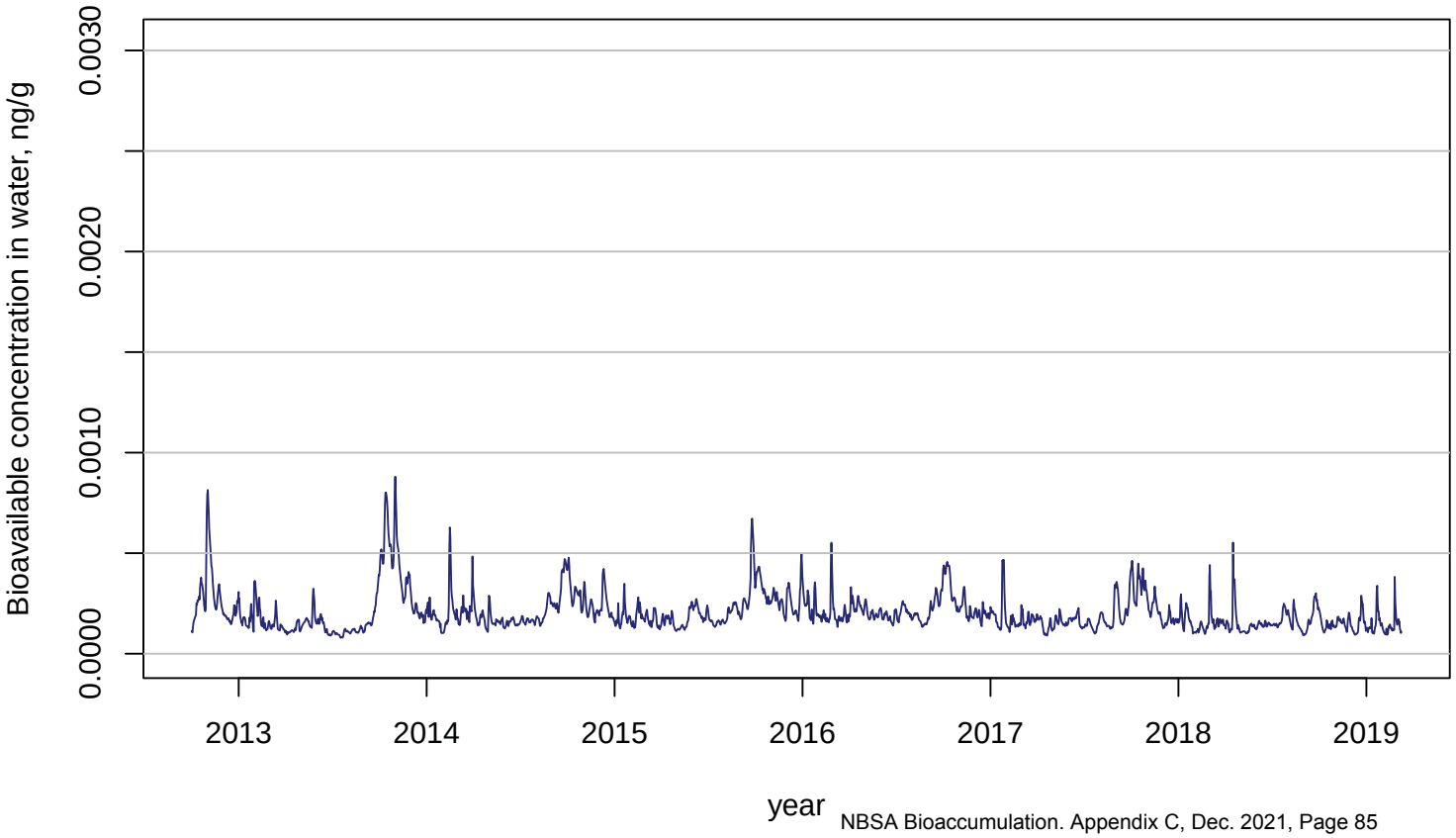

Tetra−CB, CST_OCNorm (OC−Normalized conc. in sediment) in Southeast Mudflat
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

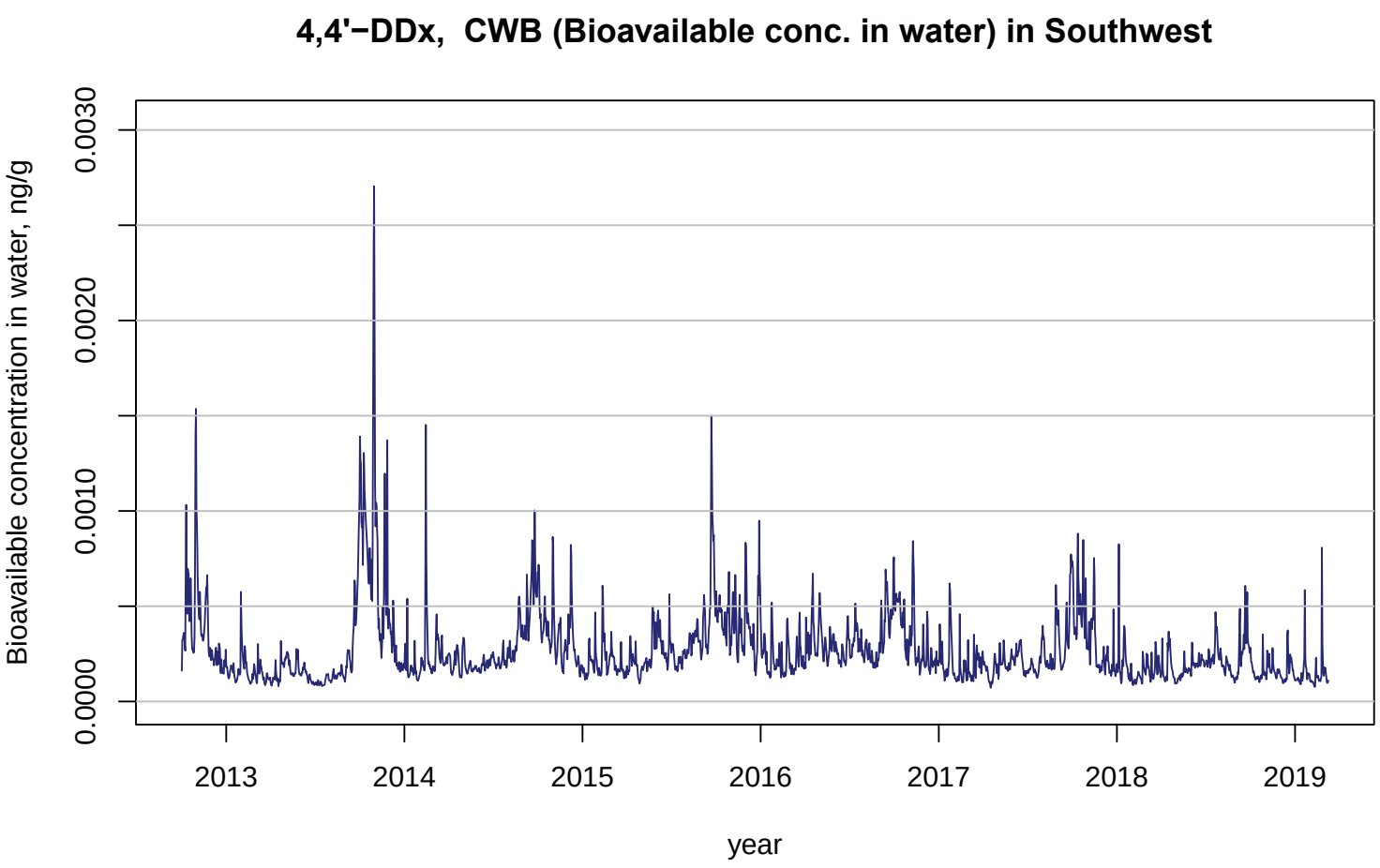

Tetra−CB, CST_OCNorm (OC−Normalized conc. in sediment) in Southwest Mudflat
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

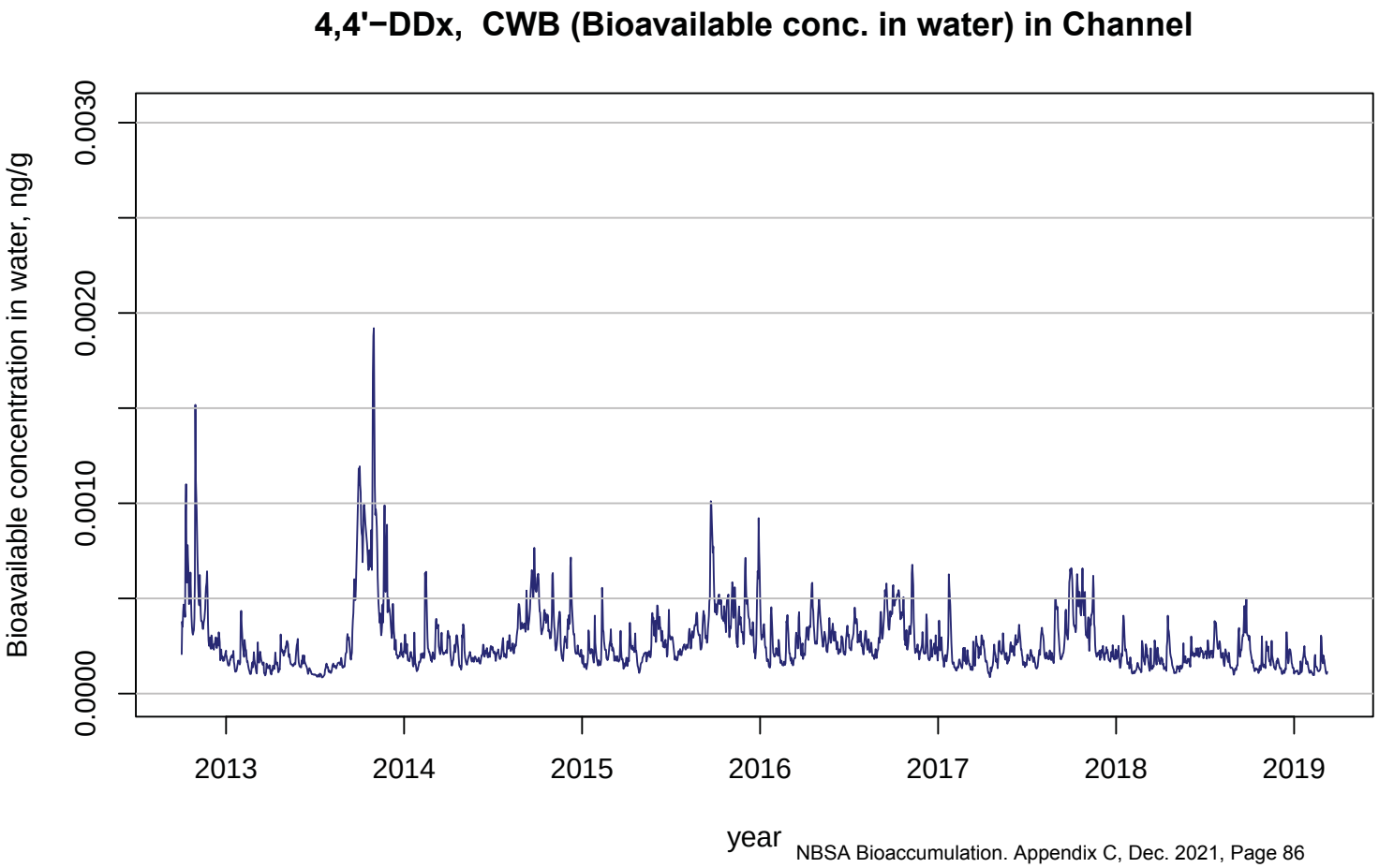
4,4'−DDx, CWB (Bioavailable conc. in water) in North



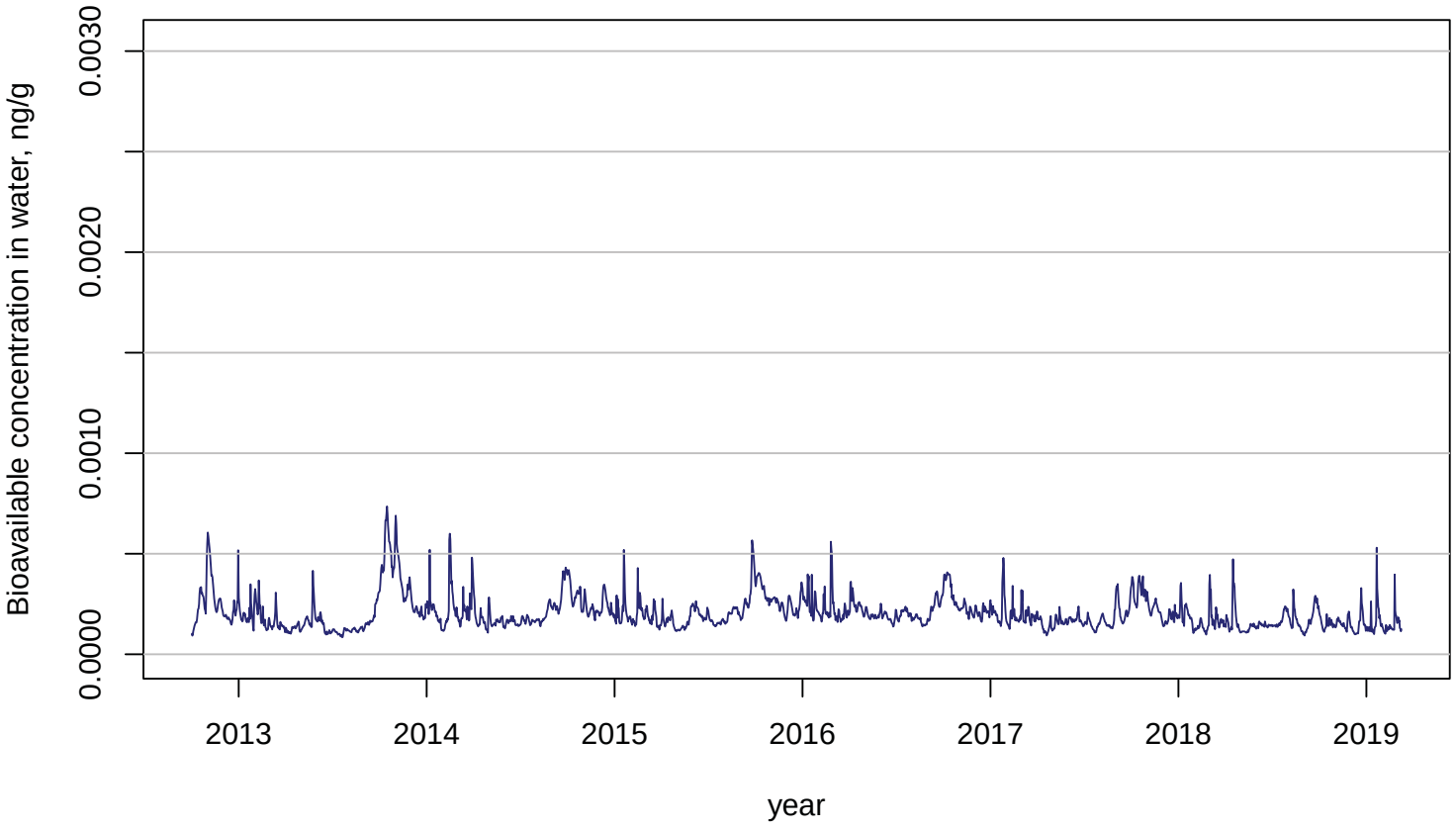
4,4'−DDx, CWB (Bioavailable conc. in water) in Southeast



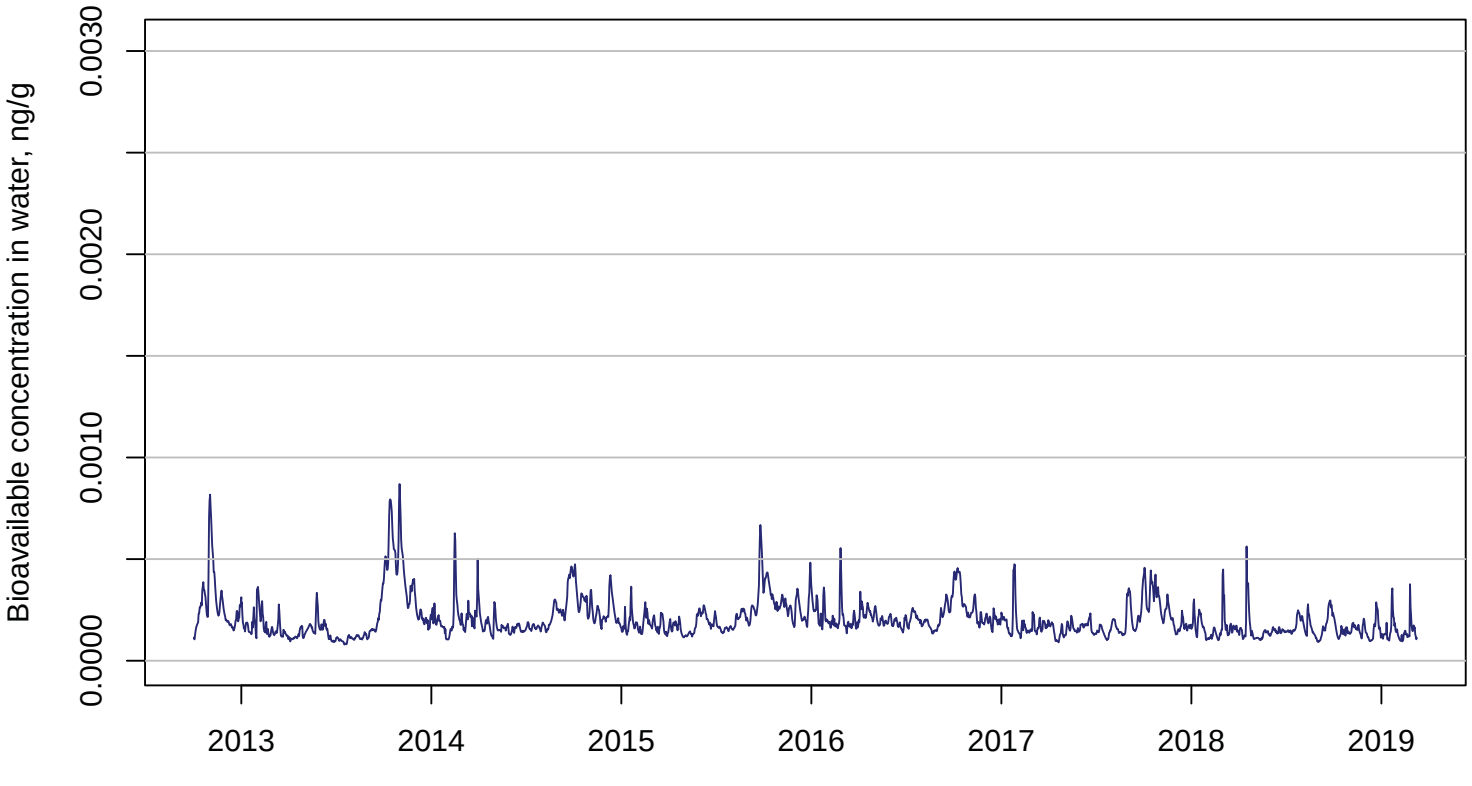

4,4'−DDx, CWB (Bioavailable conc. in water) in Southwest
Bioavailable concentration in water, ng/g
0.0000
0.0010
0.0020
0.0030
2013
2014
2015
2016
2017
2018
2019
year

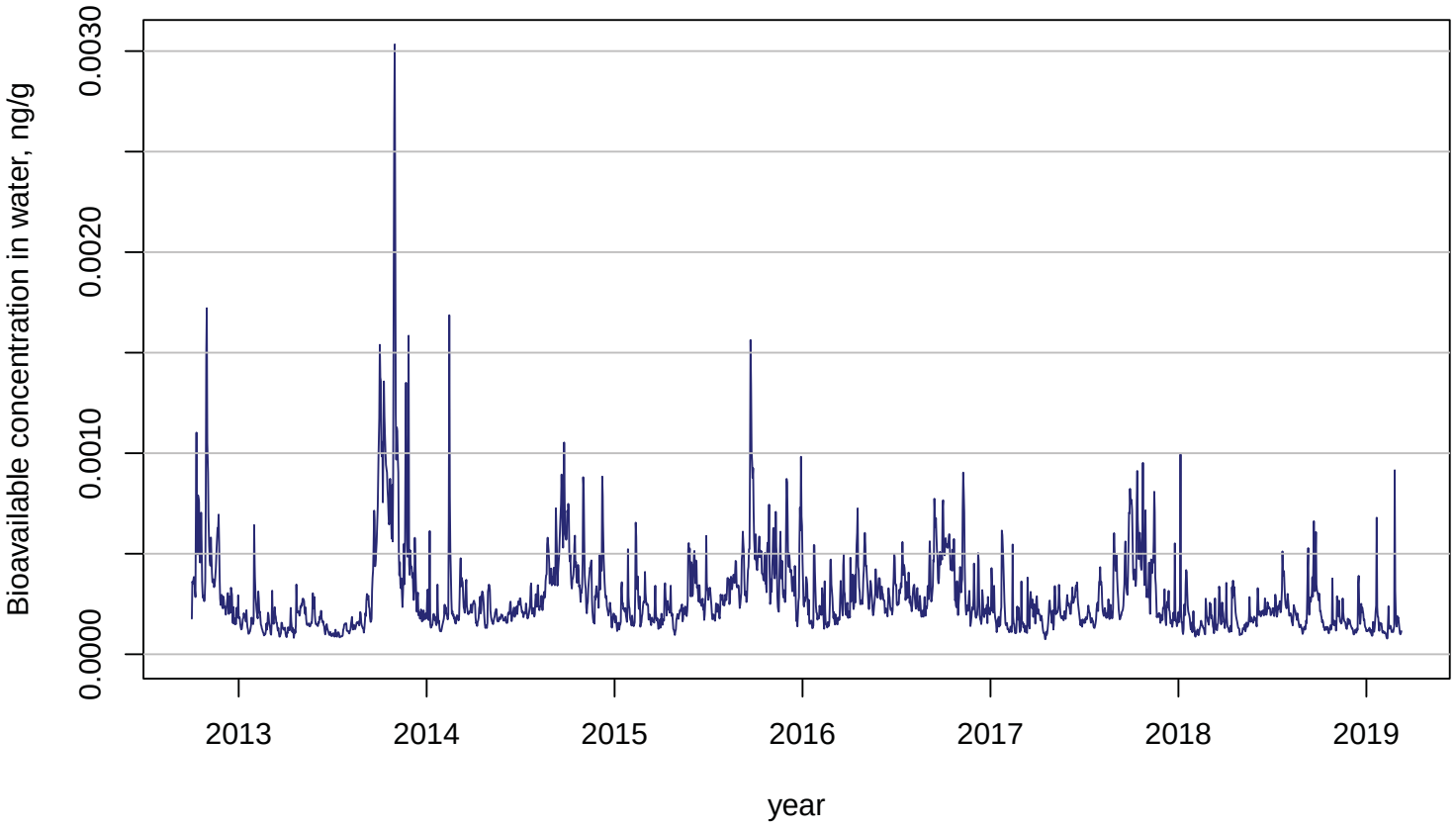

4,4'−DDx, CWB (Bioavailable conc. in water) in Channel
Bioavailable concentration in water, ng/g
0.0000
0.0010
0.0020
0.0030
2013
2014
2015
2016
2017
2018
2019
year

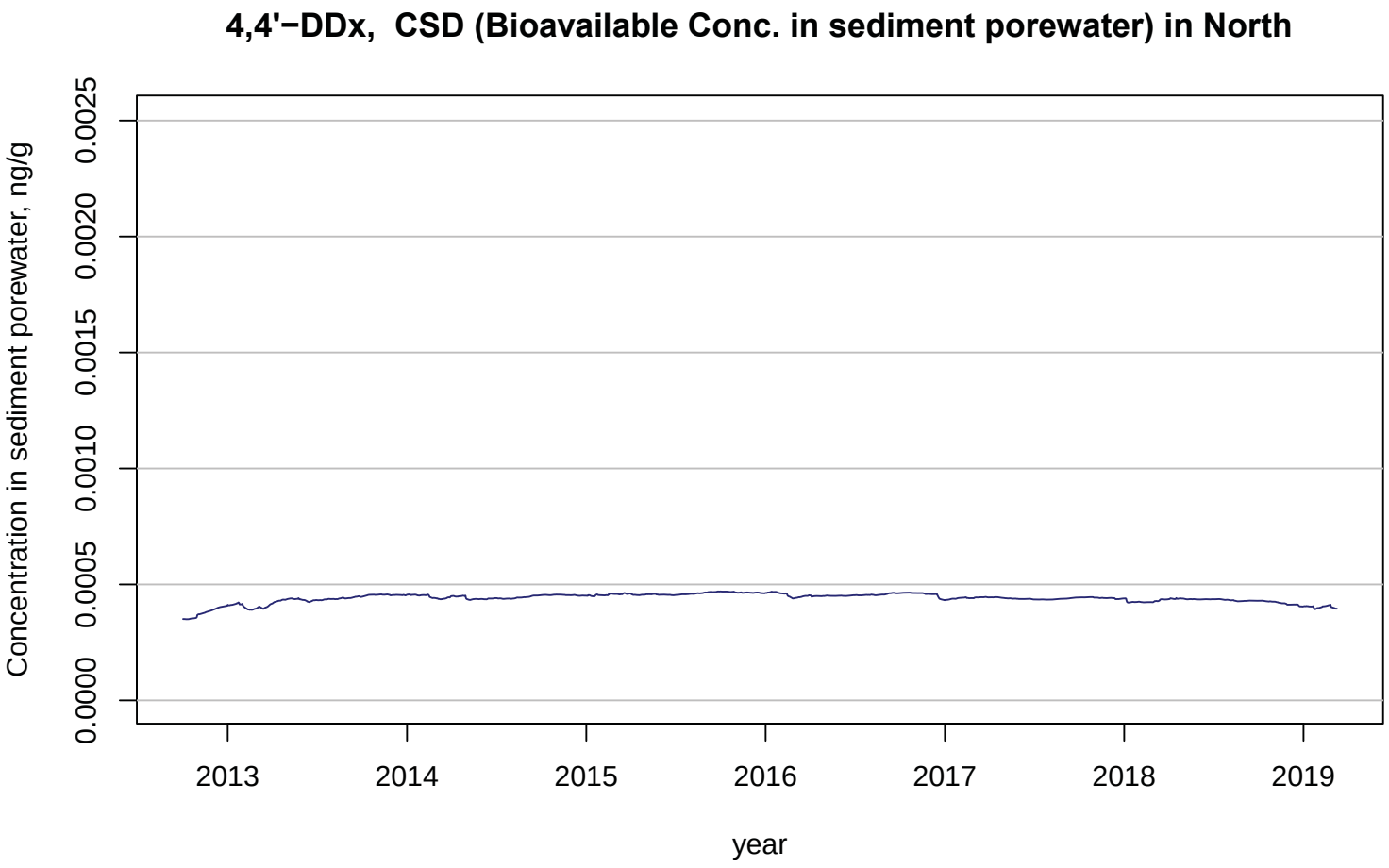
4,4'−DDx, CWB (Bioavailable conc. in water) in North Mudflat

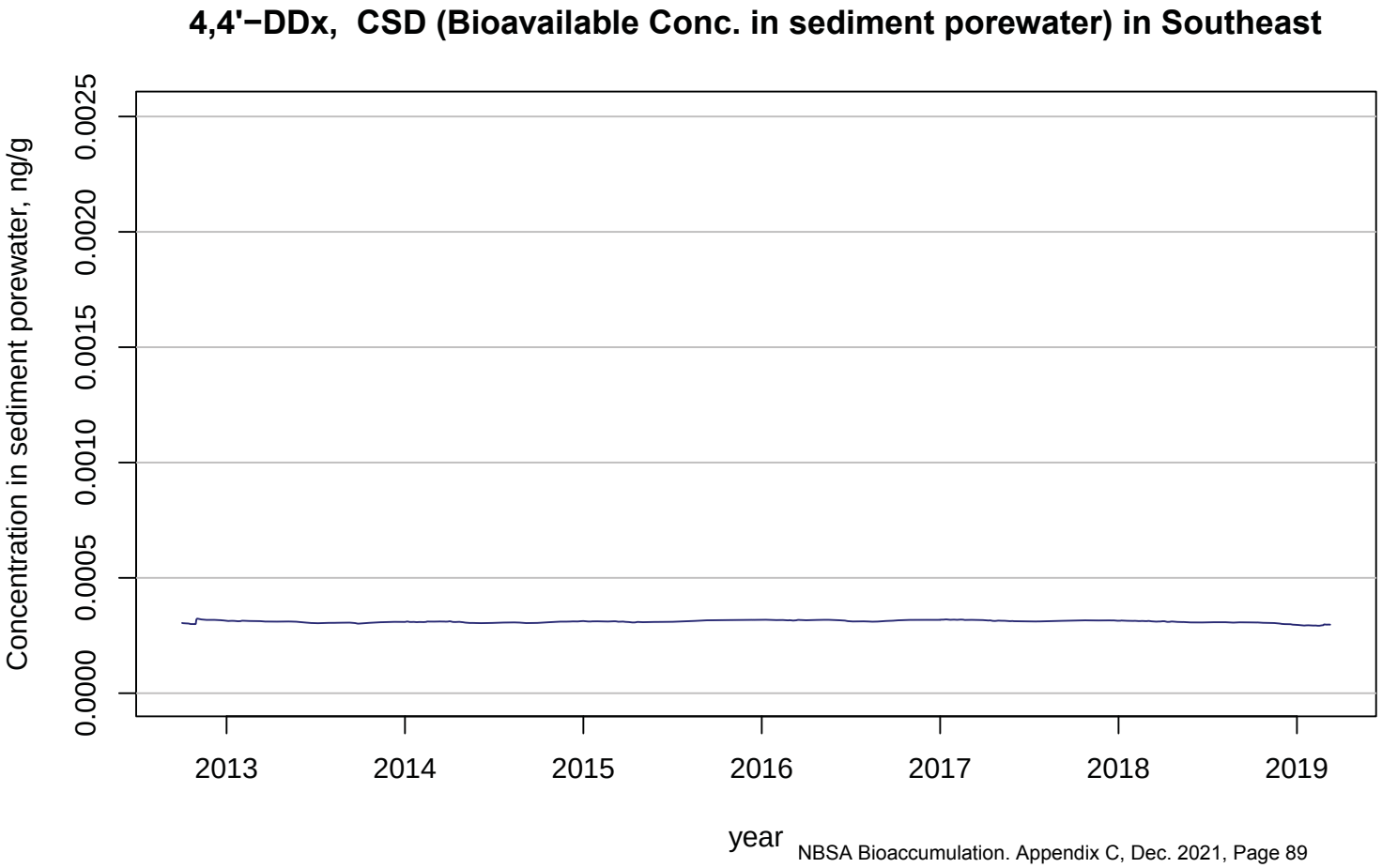


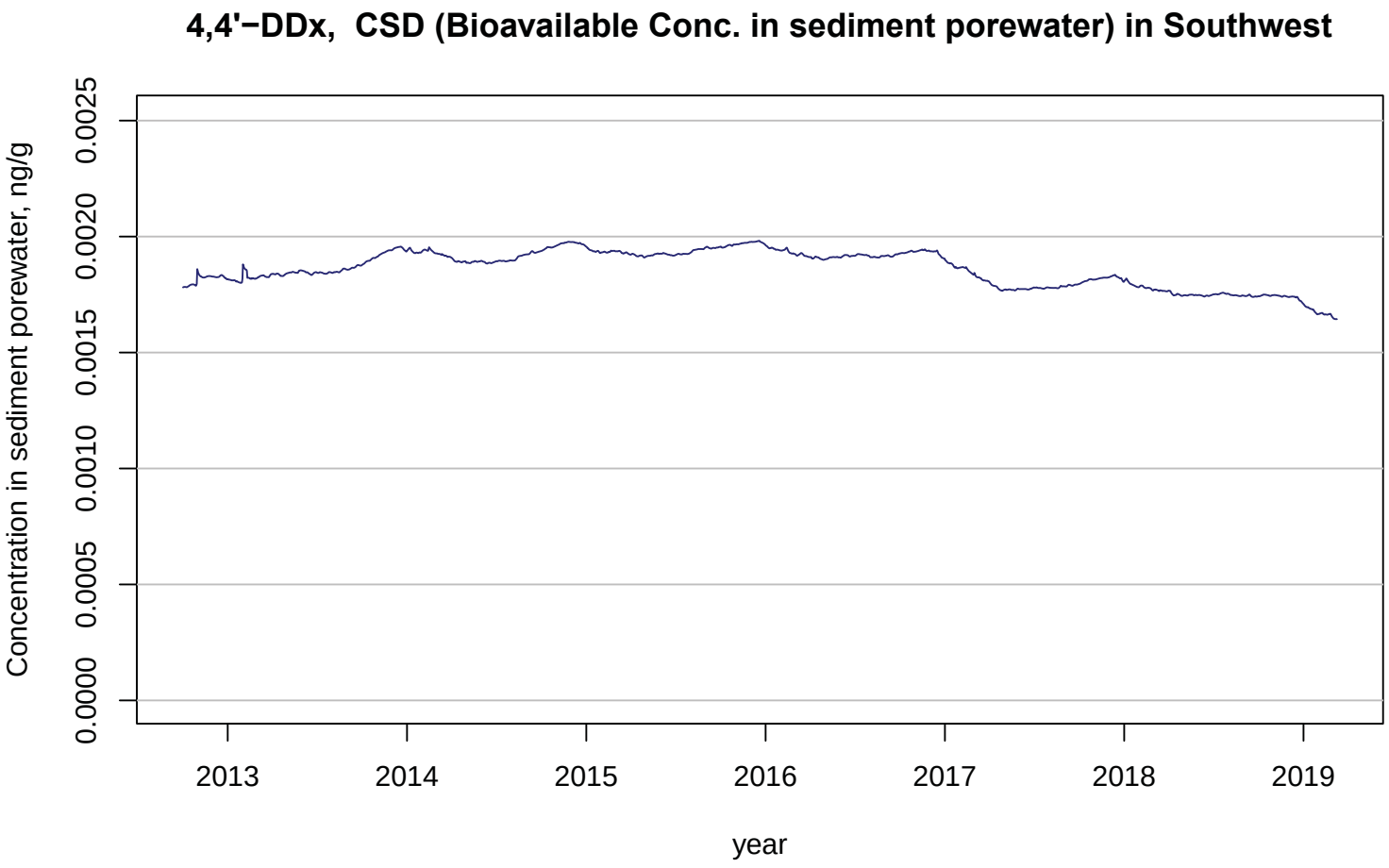
4,4'−DDx, CWB (Bioavailable conc. in water) in Southeast Mudflat

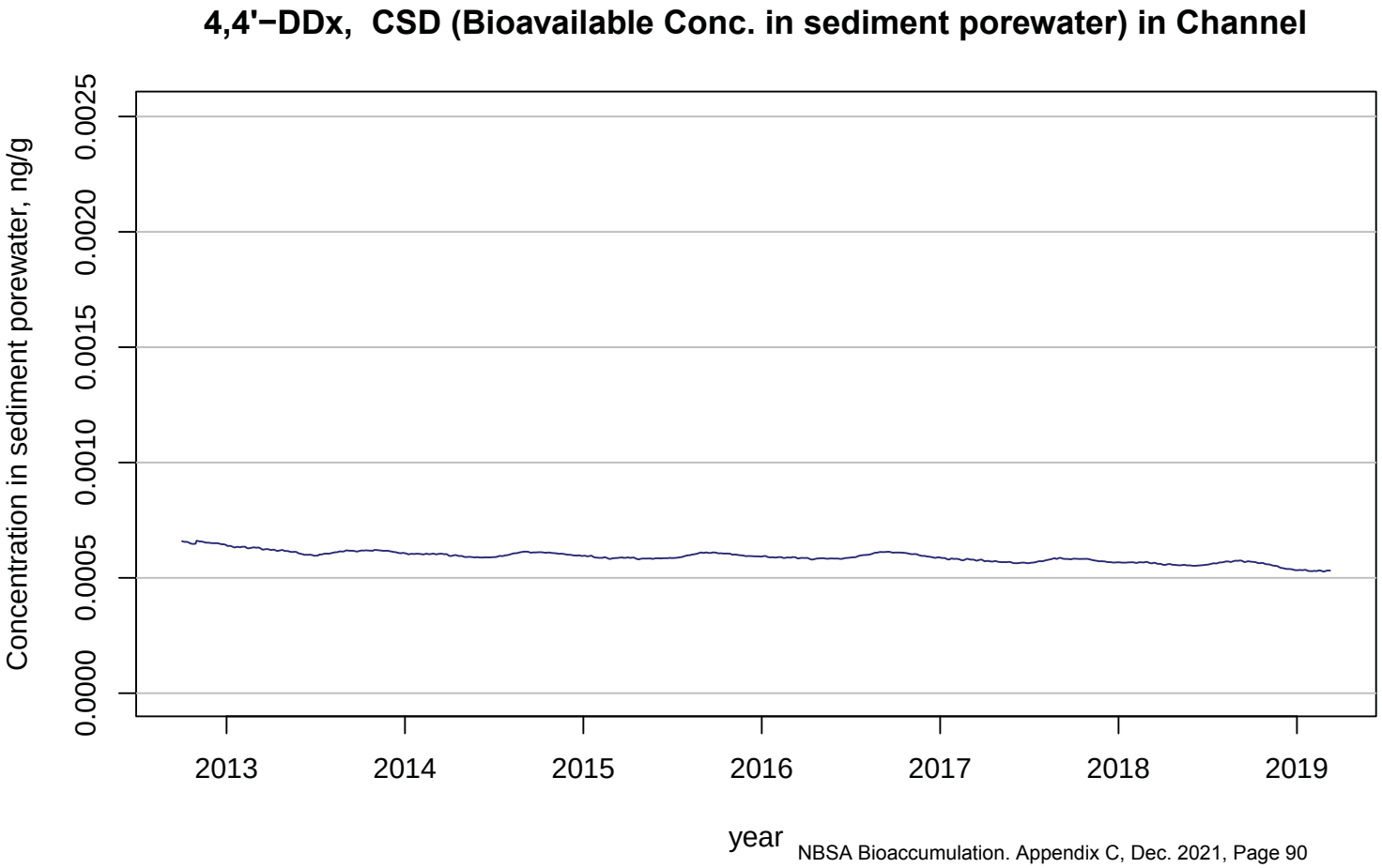



4,4'−DDx, CWB (Bioavailable conc. in water) in Southwest Mudflat
Bioavailable concentration in water, ng/g
0.0000
0.0010
0.0020
0.0030
2013
2014
2015
2016
2017
2018
2019
year

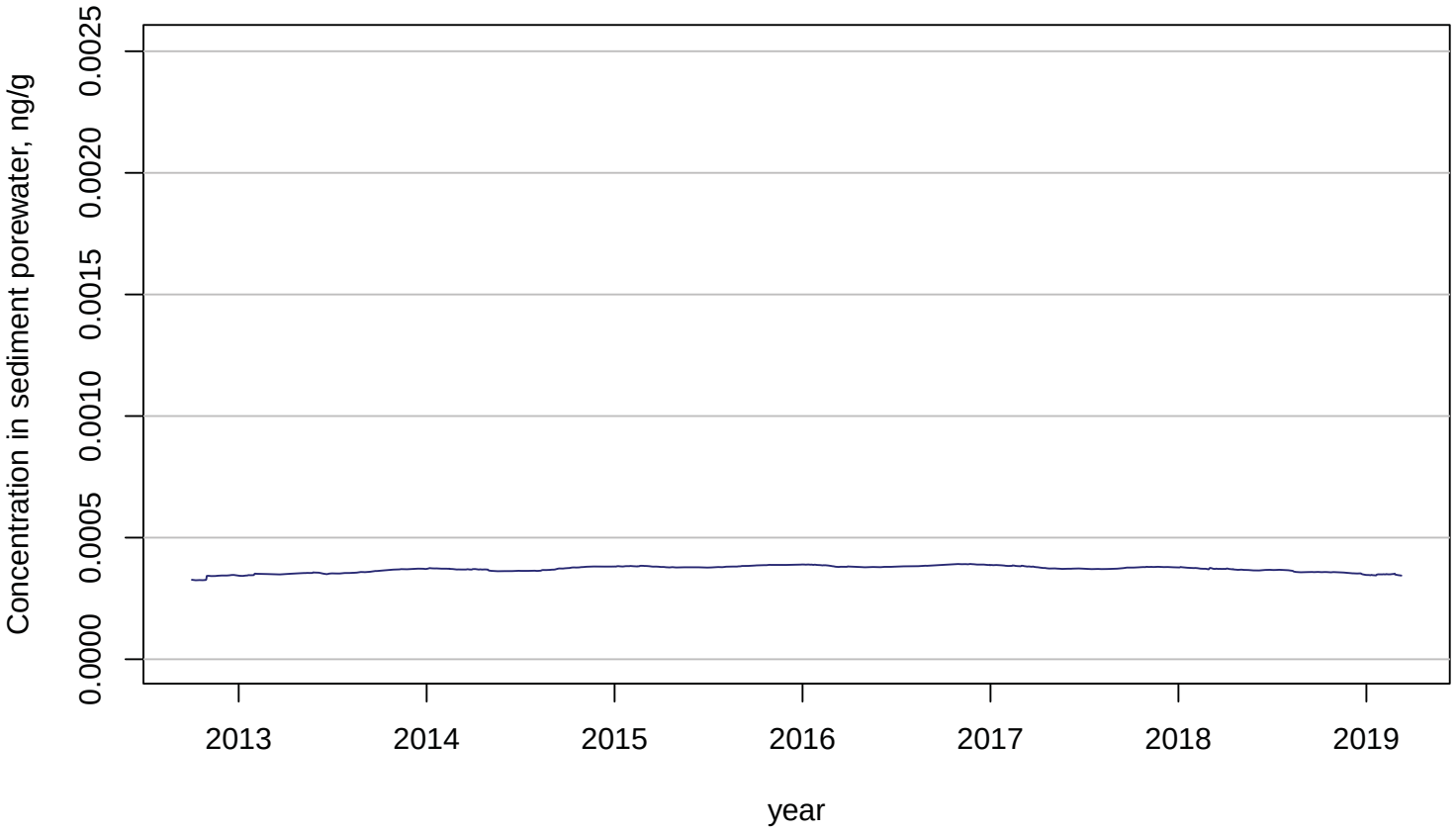

4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in North
Concentration in sediment porewater, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in Southeast
Concentration in sediment porewater, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year

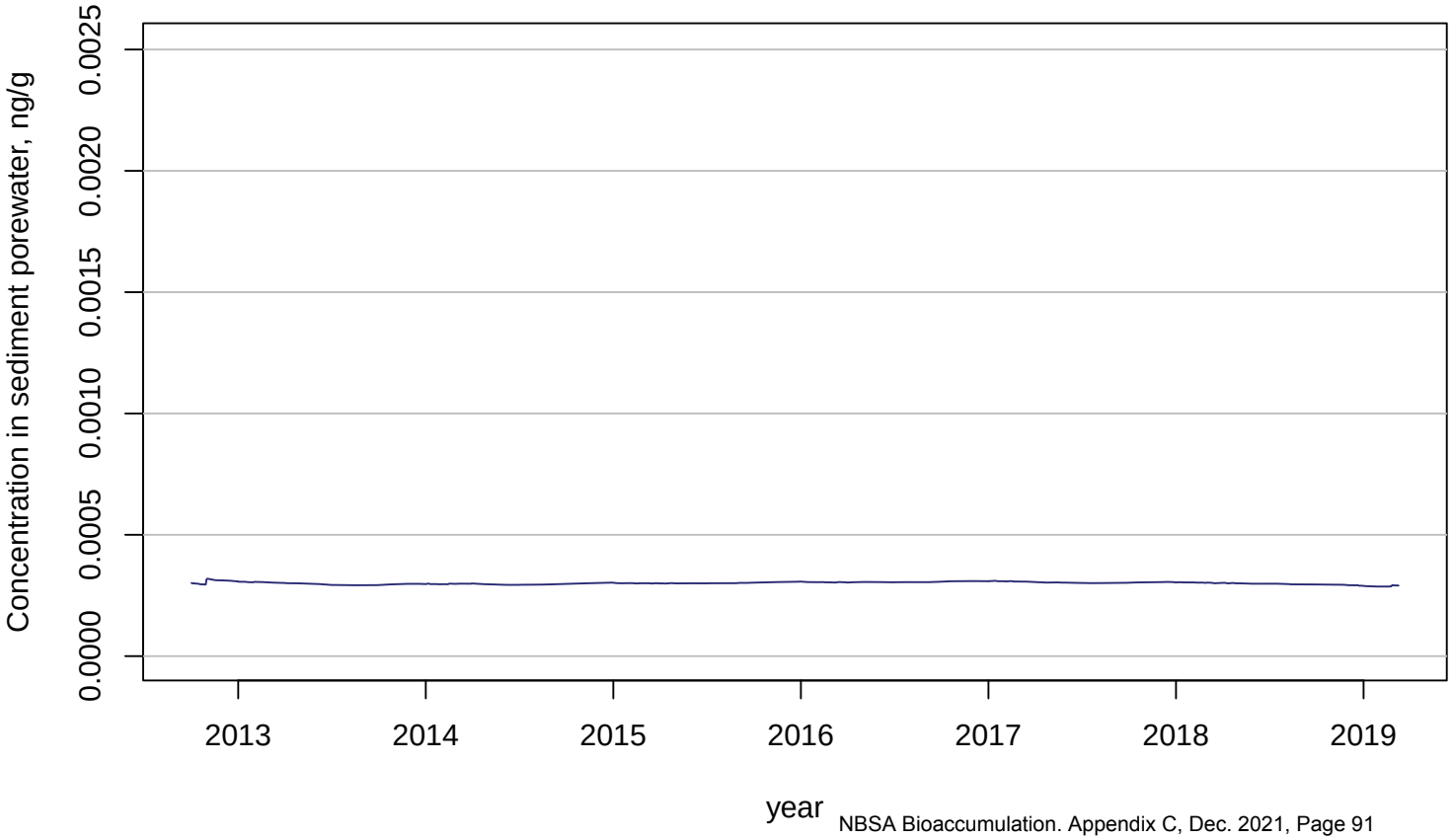

4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in Southwest
Concentration in sediment porewater, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year

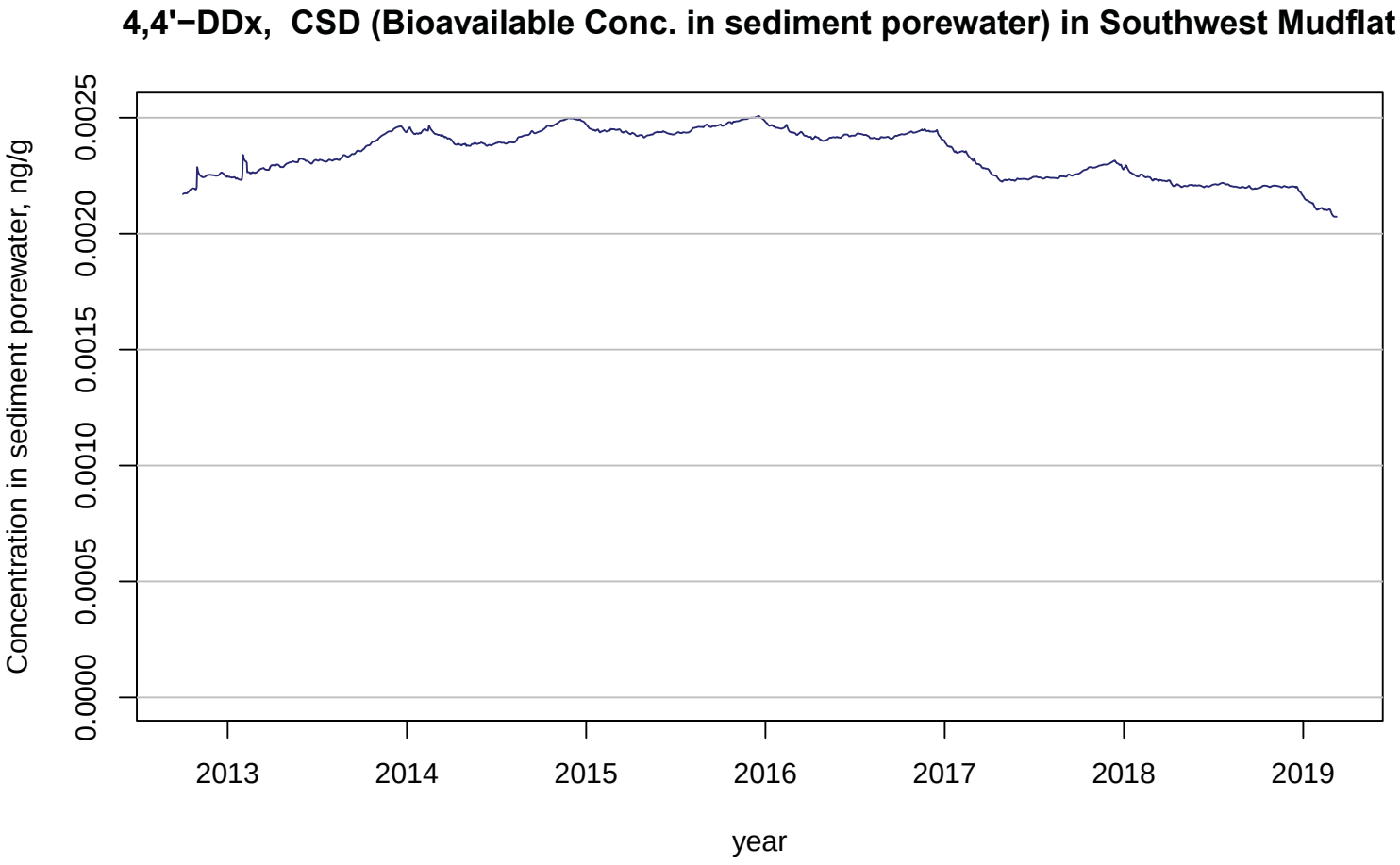

4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in Channel
Concentration in sediment porewater, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year

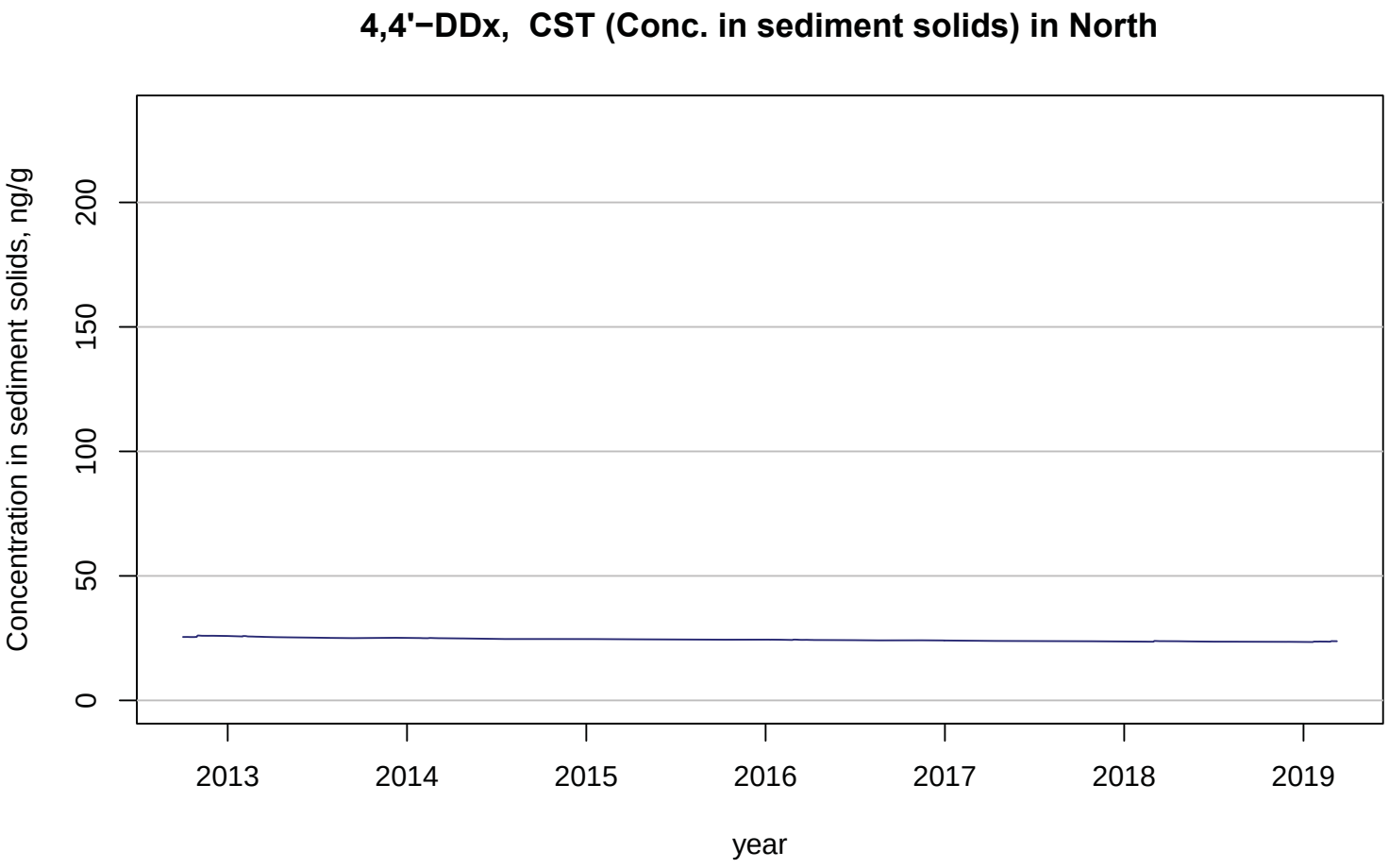
4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in North Mudflat

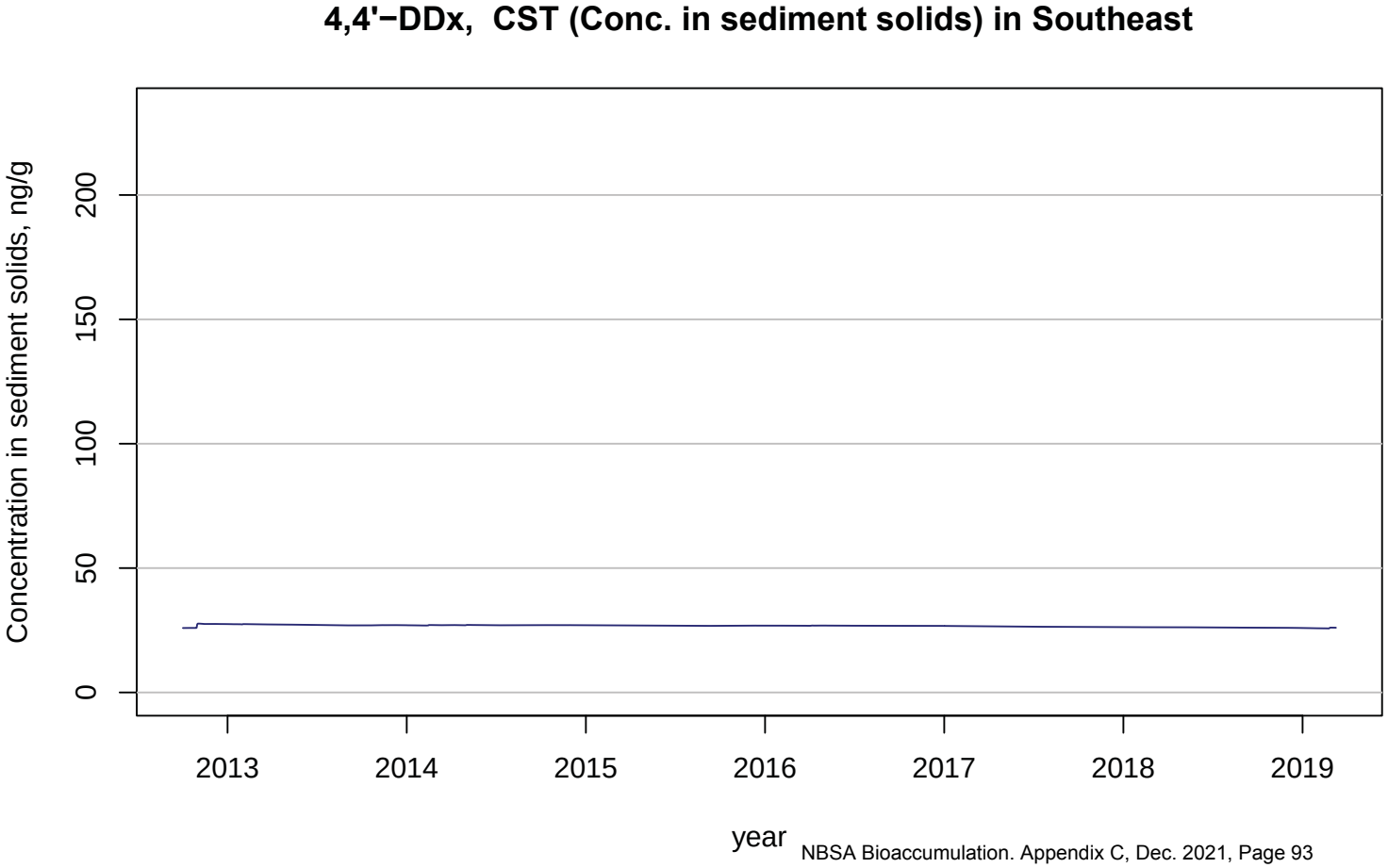


4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in Southeast Mudflat

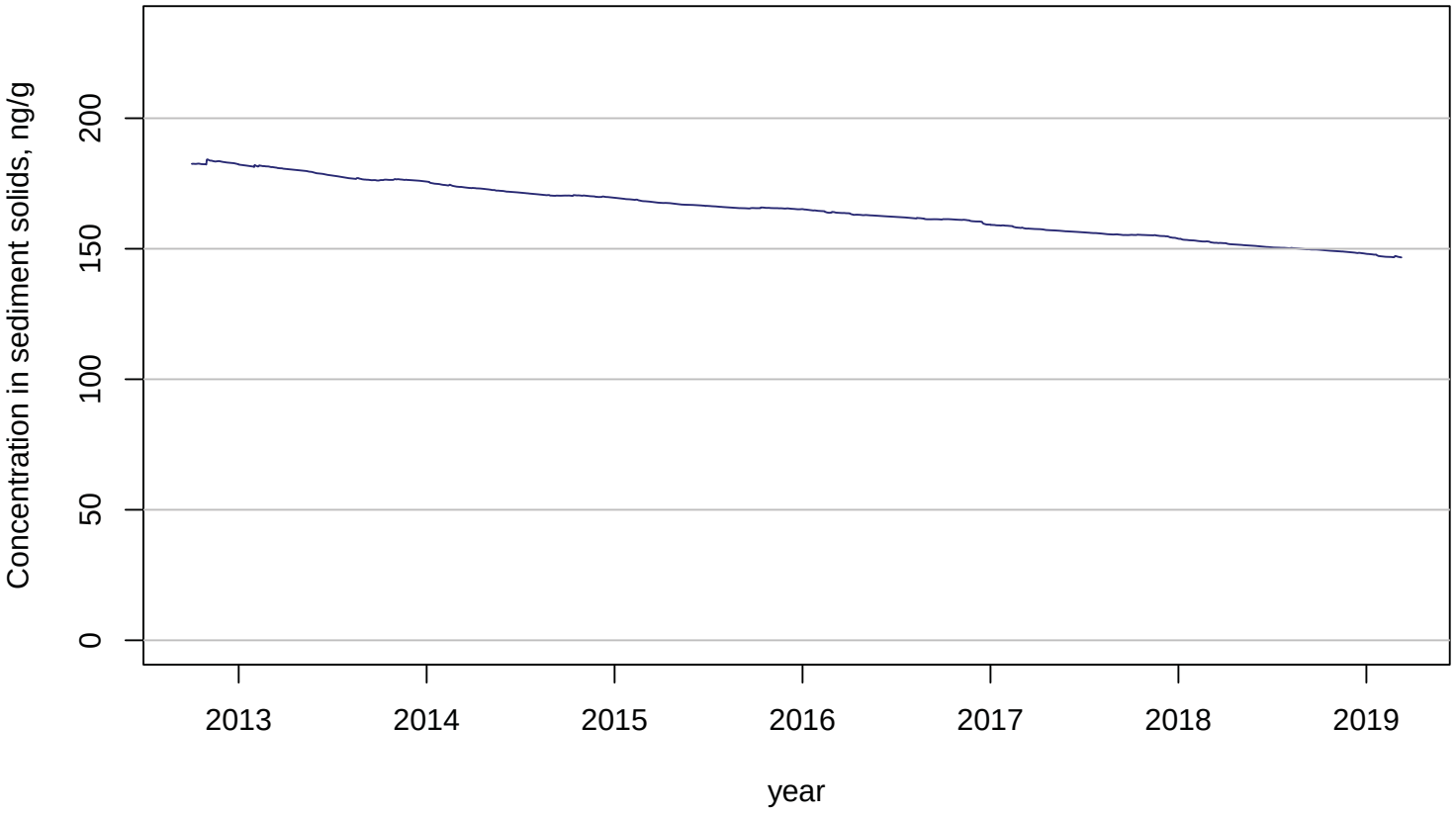



4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in Southwest Mudflat
Concentration in sediment porewater, ng/g
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
2013
2014
2015
2016
2017
2018
2019
year

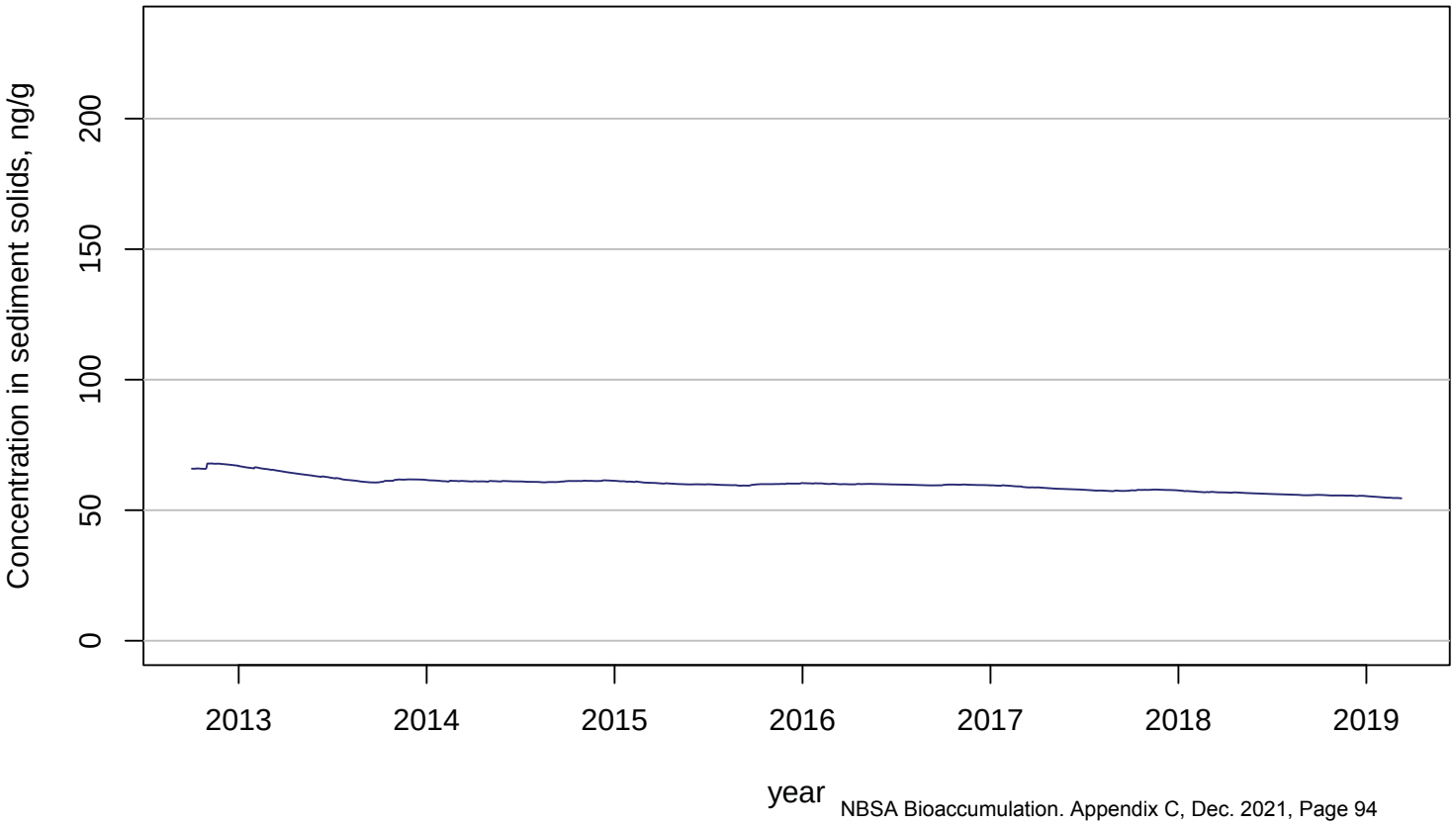

4,4'−DDx, CST (Conc. in sediment solids) in North
Concentration in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CST (Conc. in sediment solids) in Southeast
Concentration in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

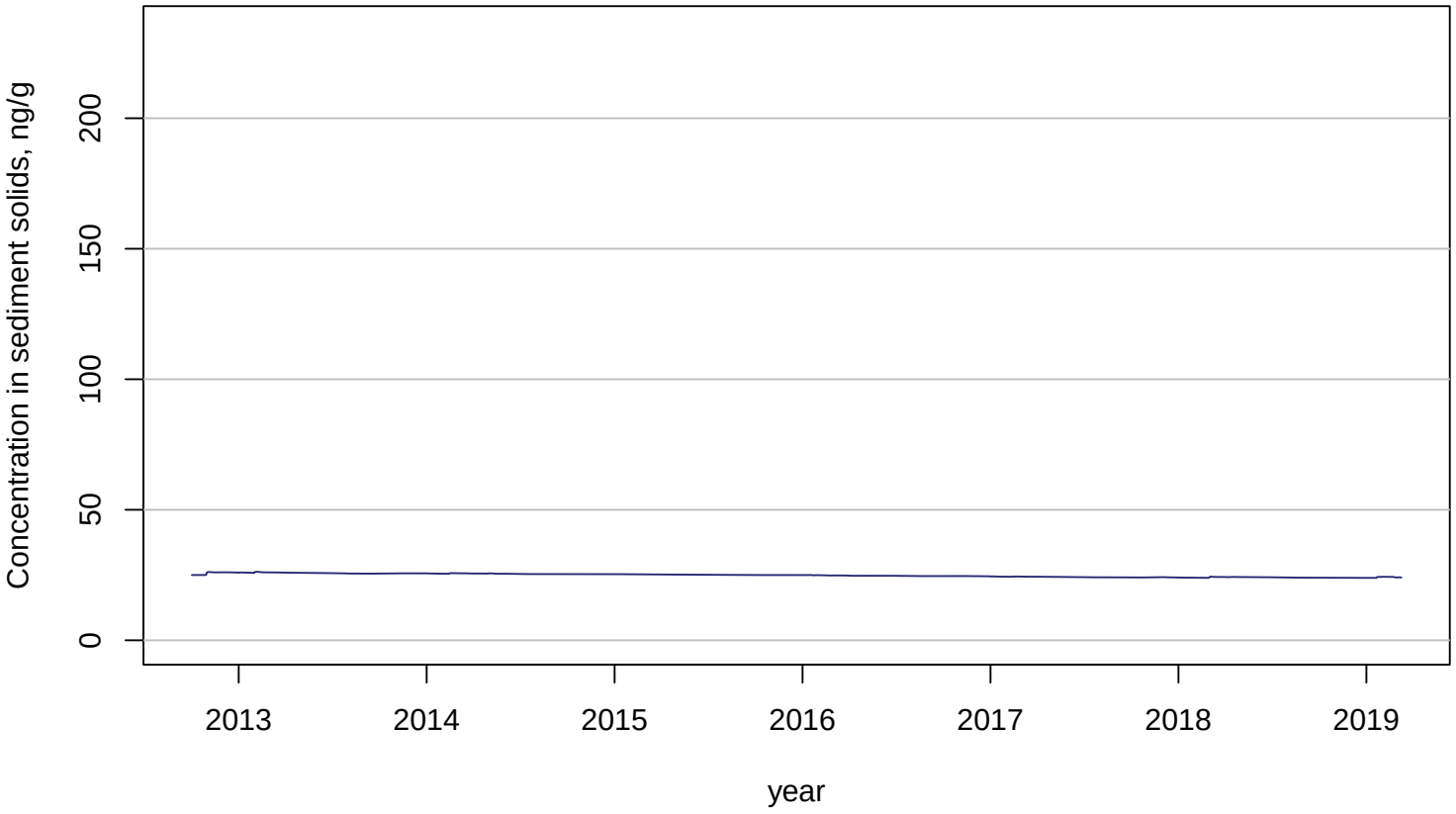
4,4'−DDx, CST (Conc. in sediment solids) in Southwest



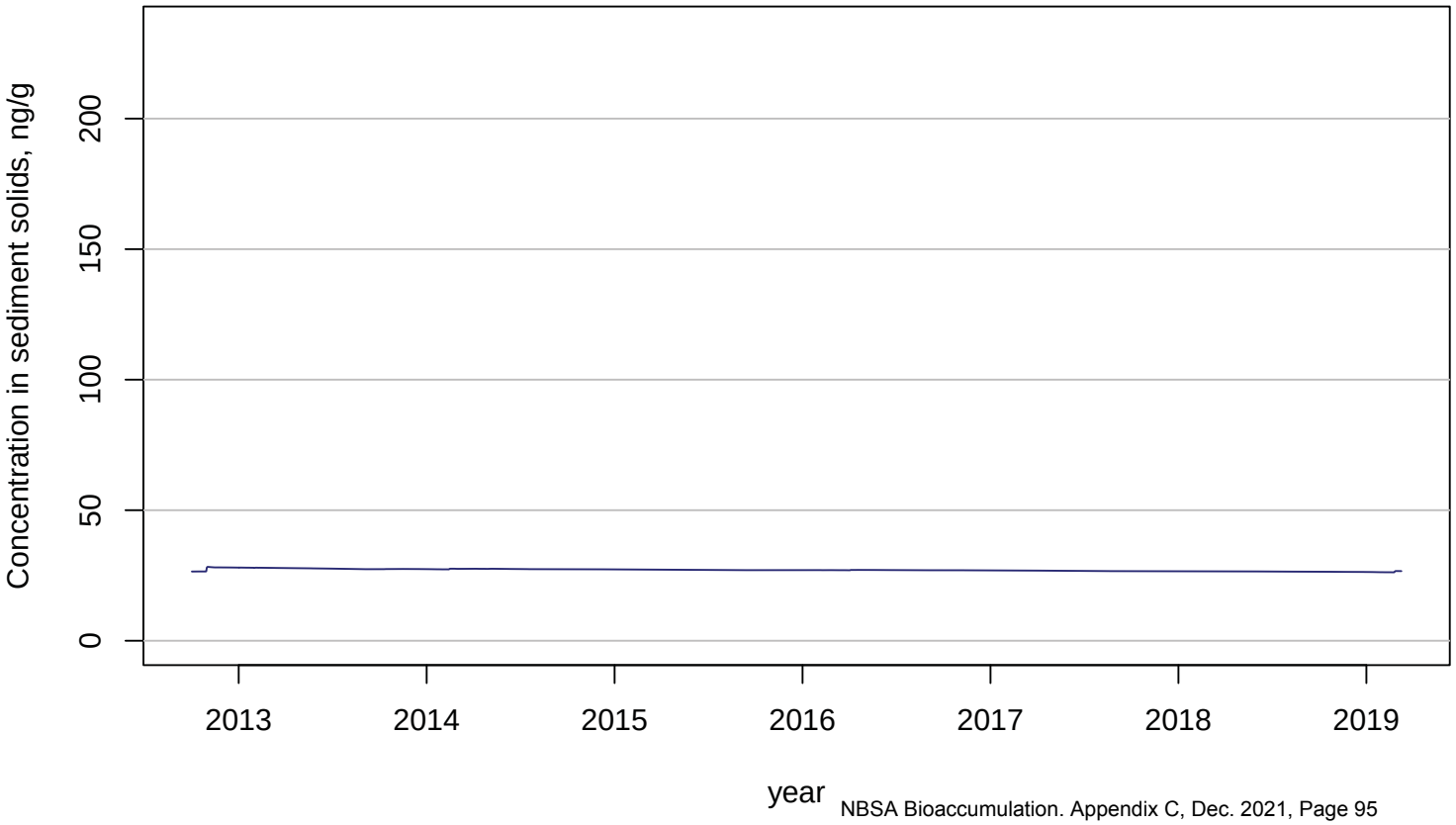
4,4'−DDx, CST (Conc. in sediment solids) in Channel

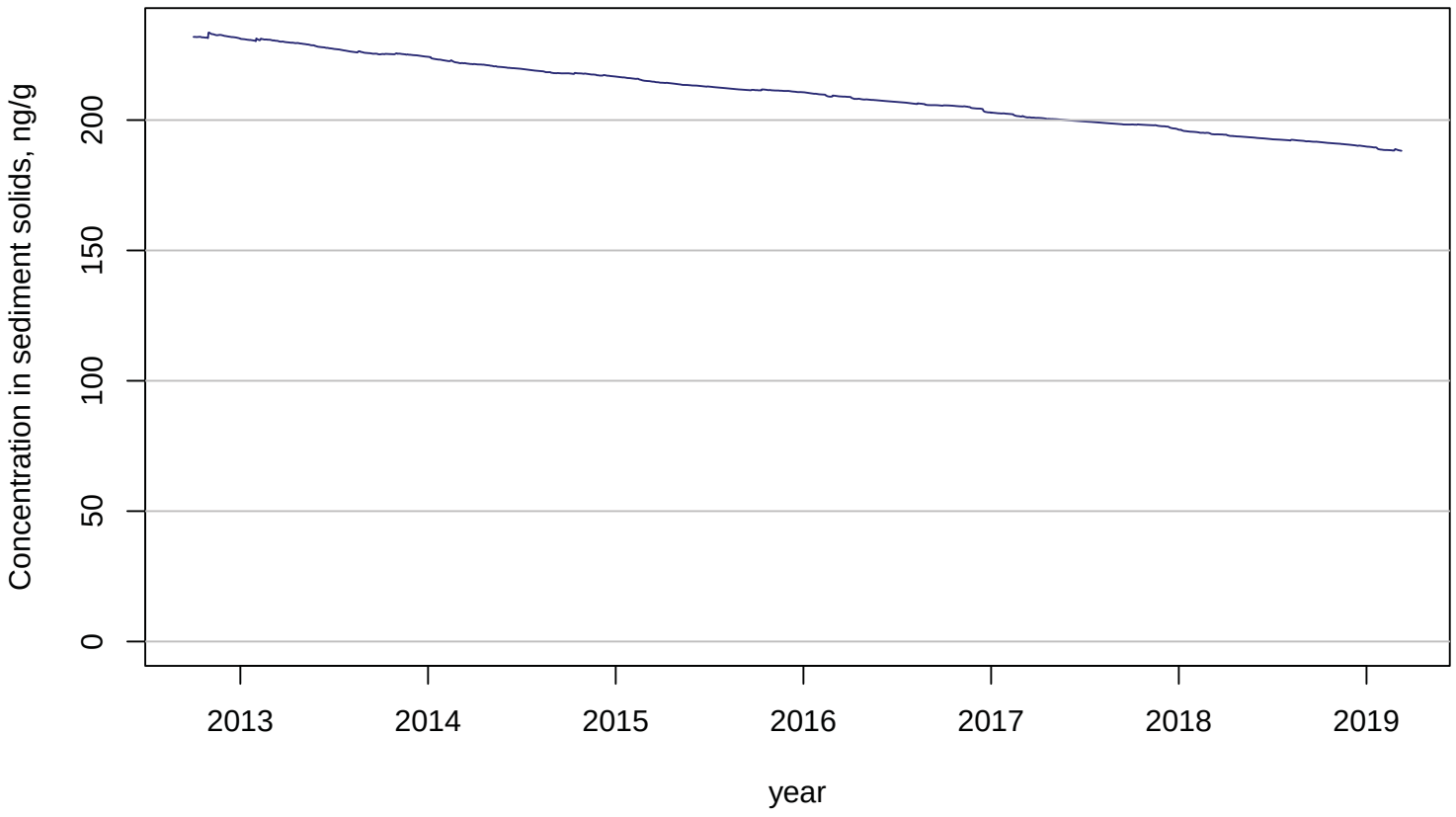


4,4'−DDx, CST (Conc. in sediment solids) in North Mudflat

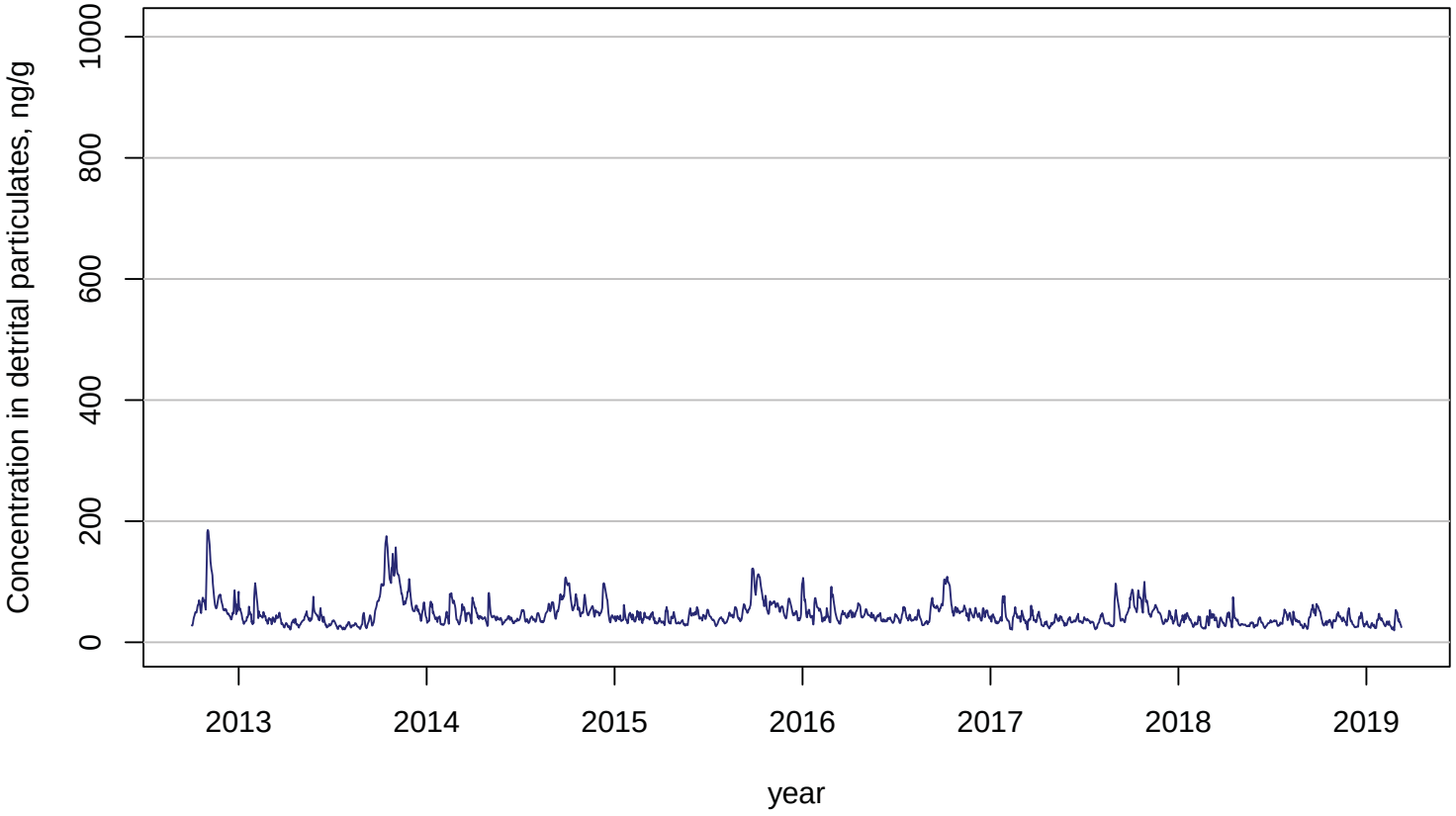


4,4'−DDx, CST (Conc. in sediment solids) in Southeast Mudflat

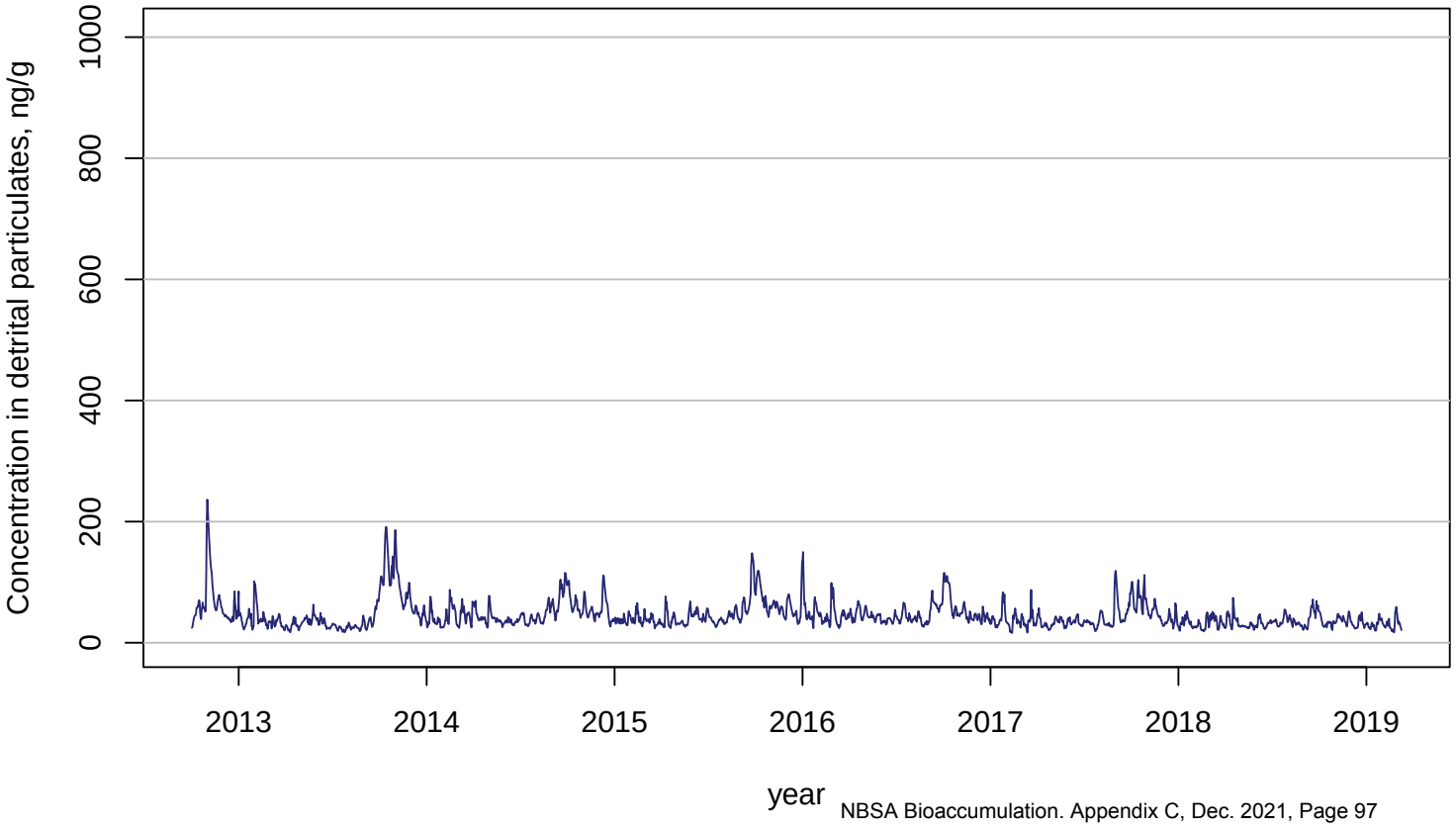



4,4'−DDx, CST (Conc. in sediment solids) in Southwest Mudflat
Concentration in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

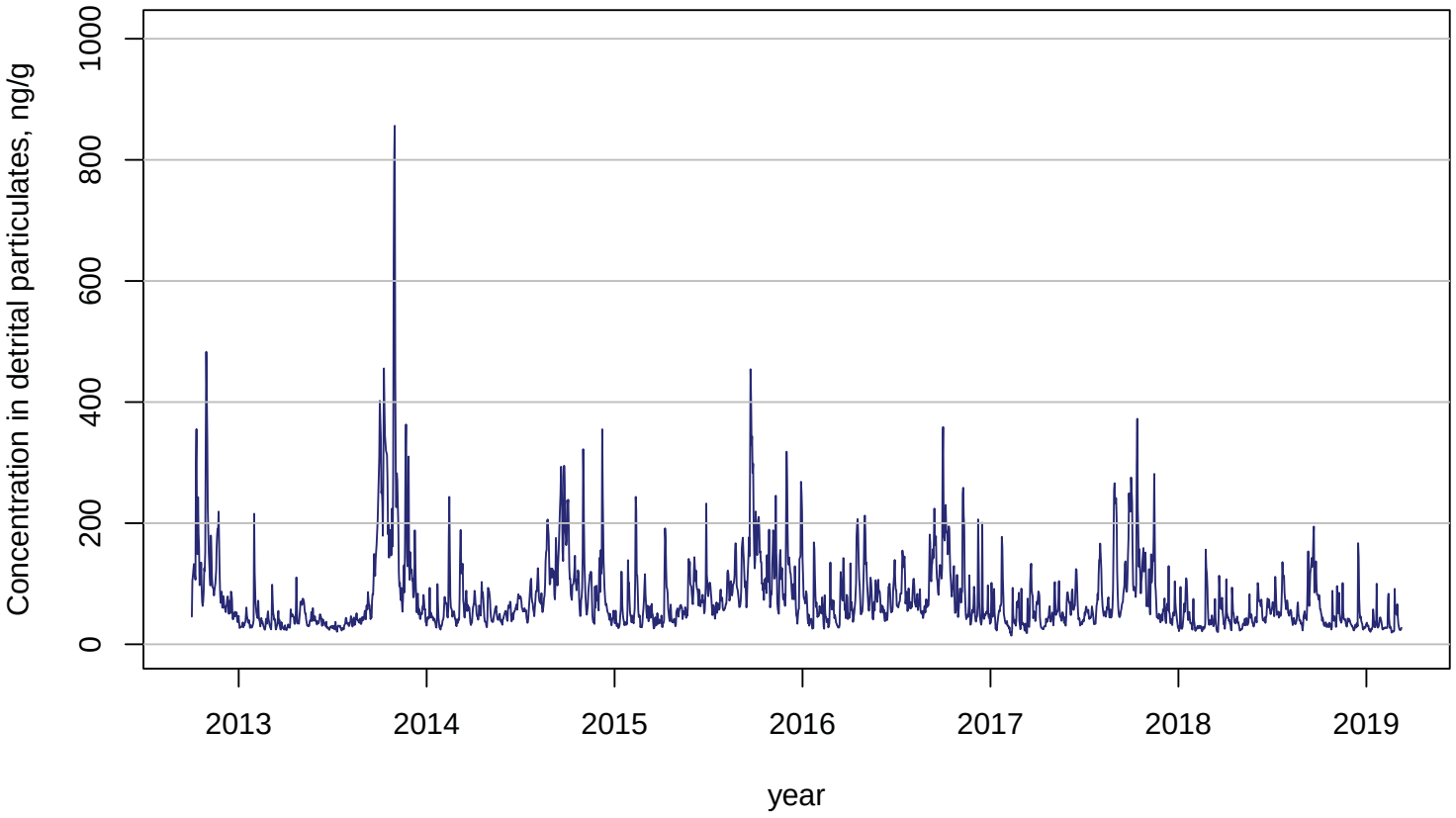
4,4'−DDx, CPART (Chemical conc. in detrital particulates) in North



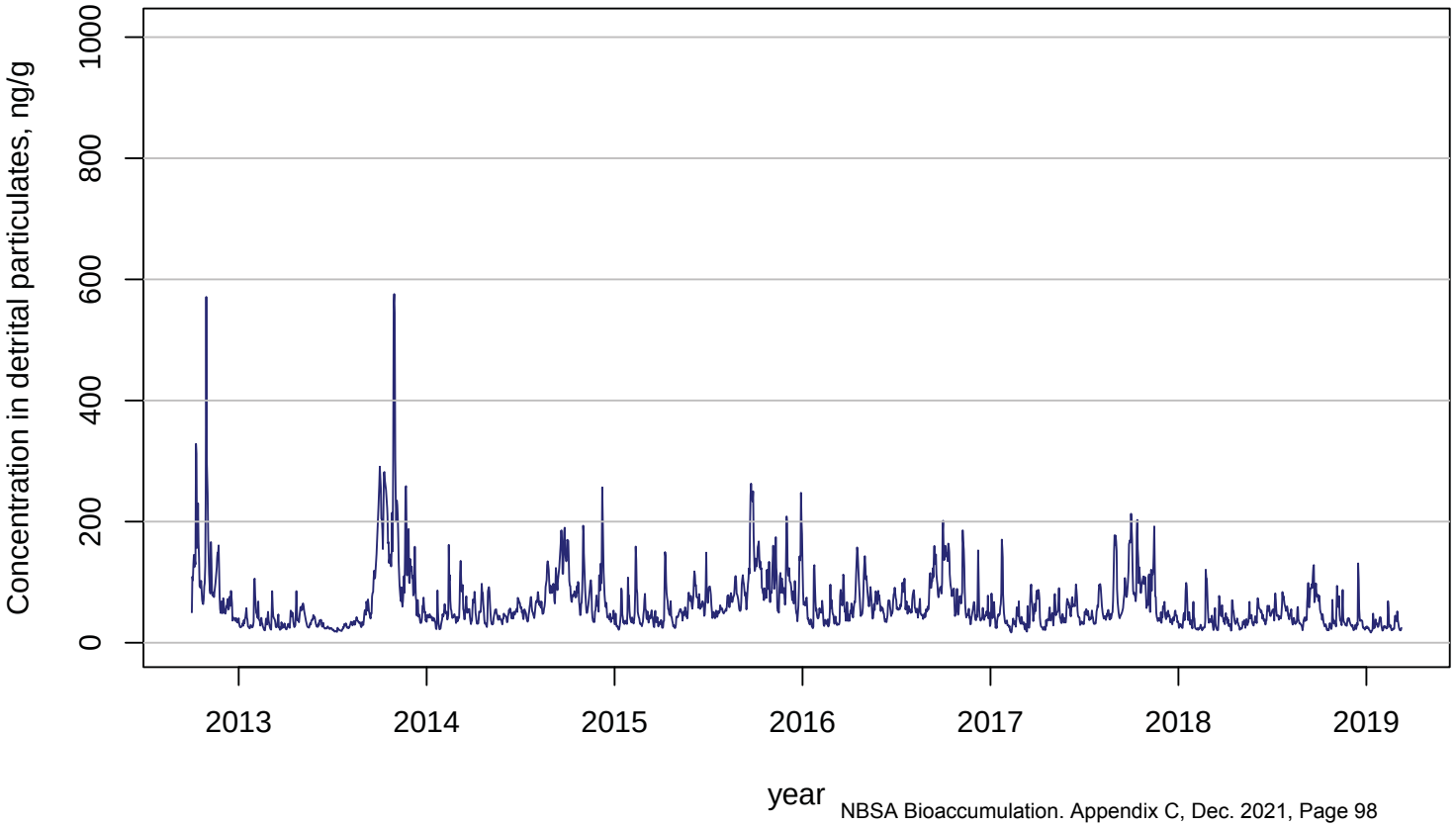
4,4'−DDx, CPART (Chemical conc. in detrital particulates) in Southeast



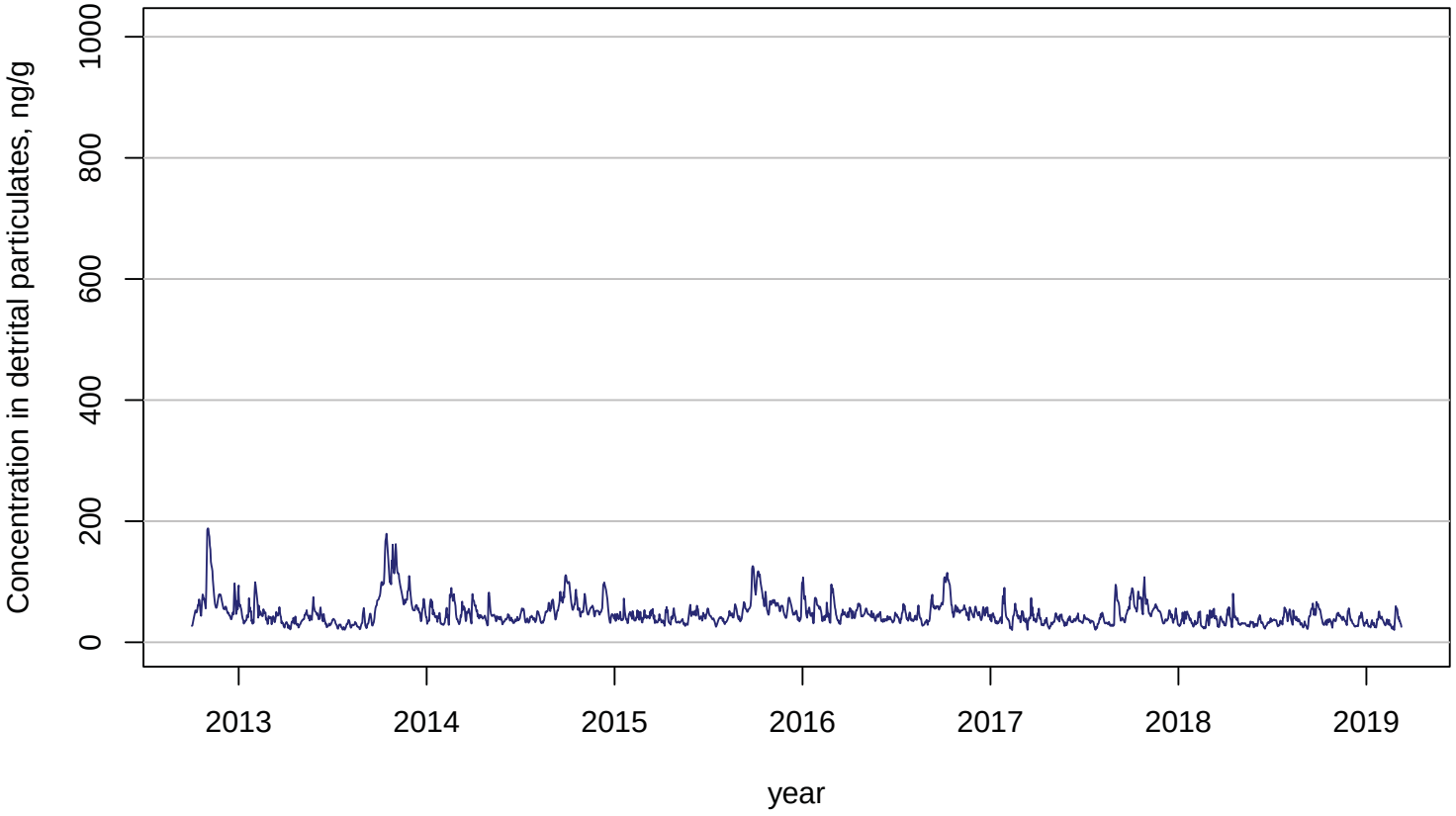
4,4'−DDx, CPART (Chemical conc. in detrital particulates) in Southwest



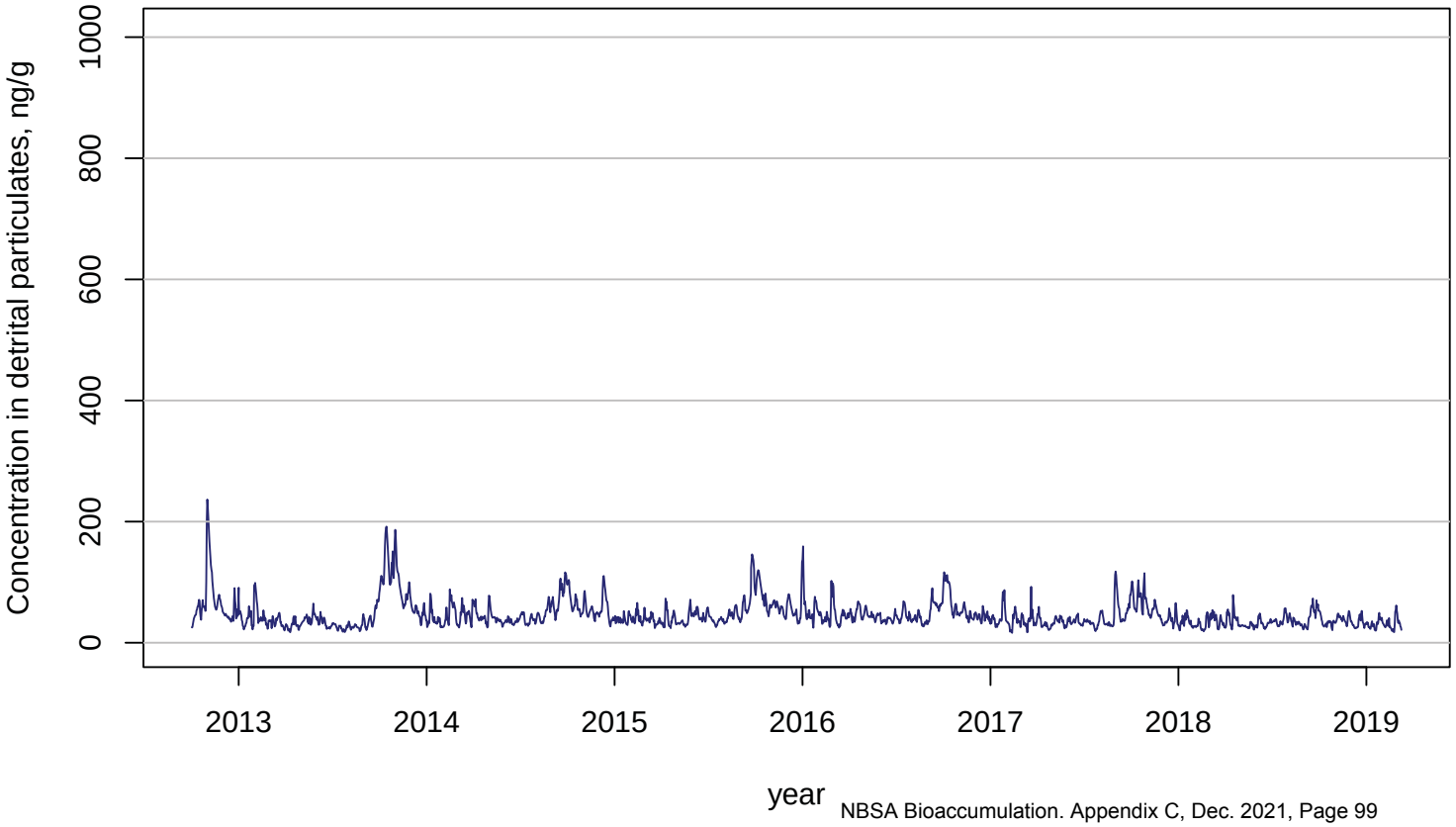
4,4'−DDx, CPART (Chemical conc. in detrital particulates) in Channel

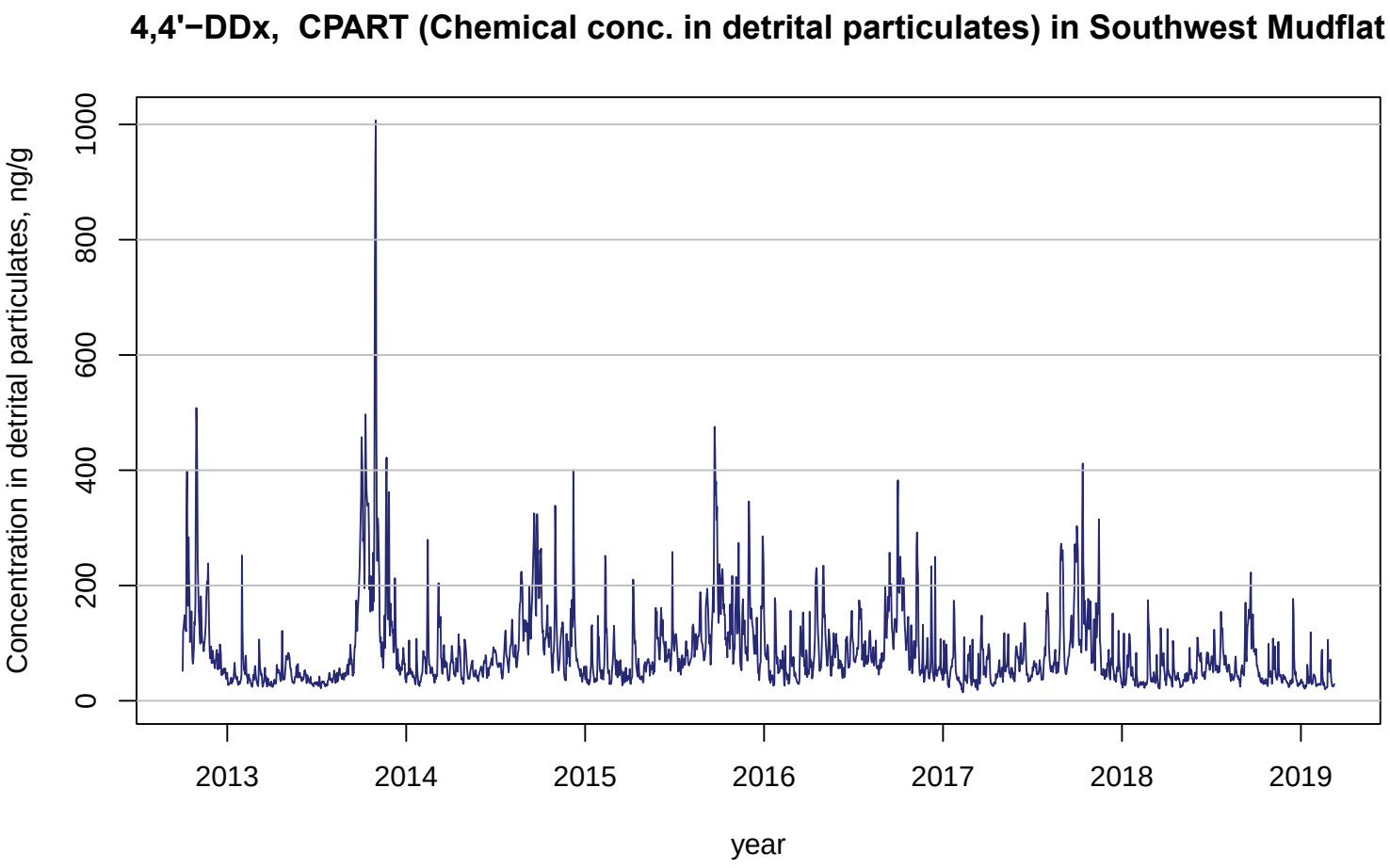


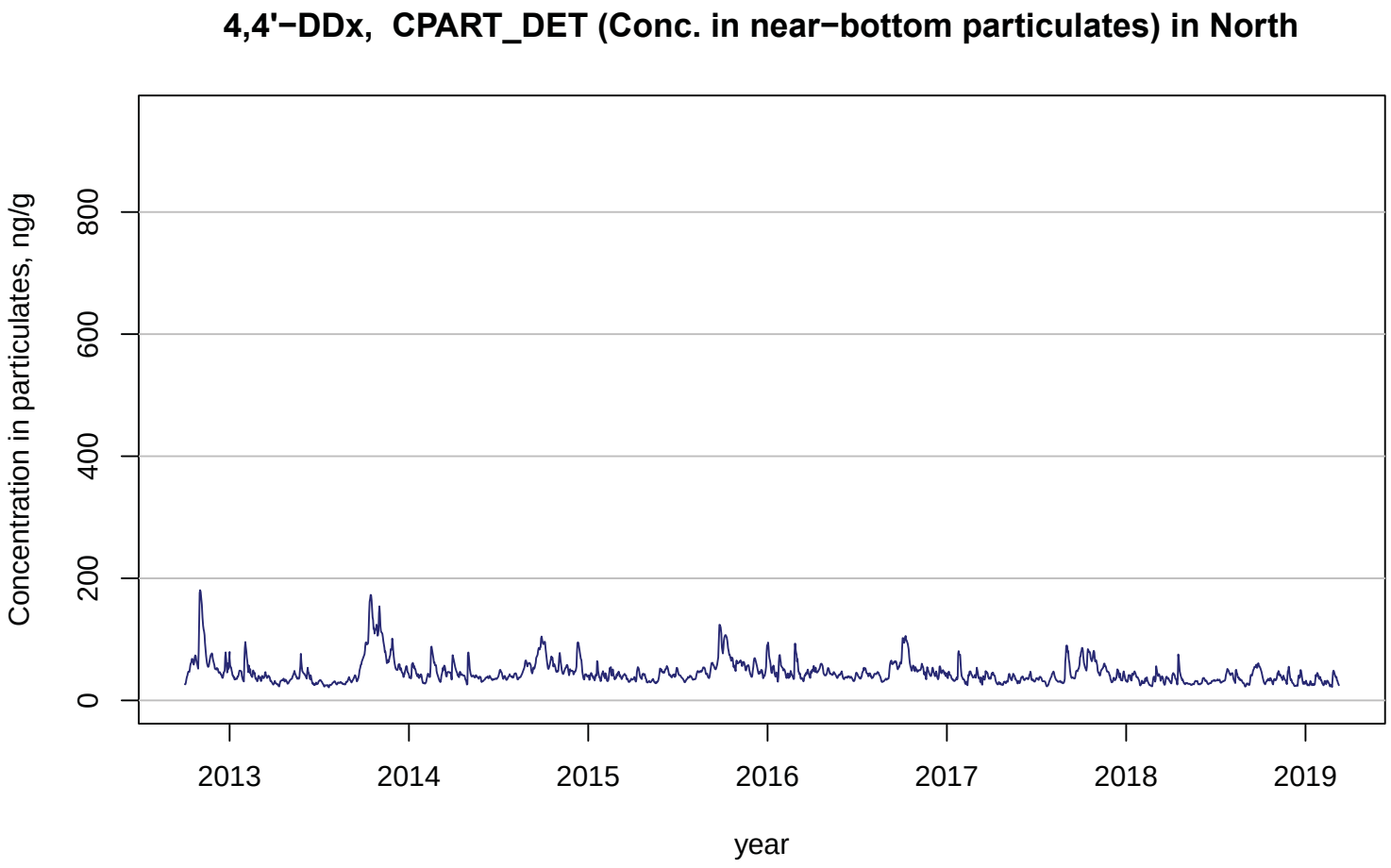
4,4'−DDx, CPART (Chemical conc. in detrital particulates) in North Mudflat

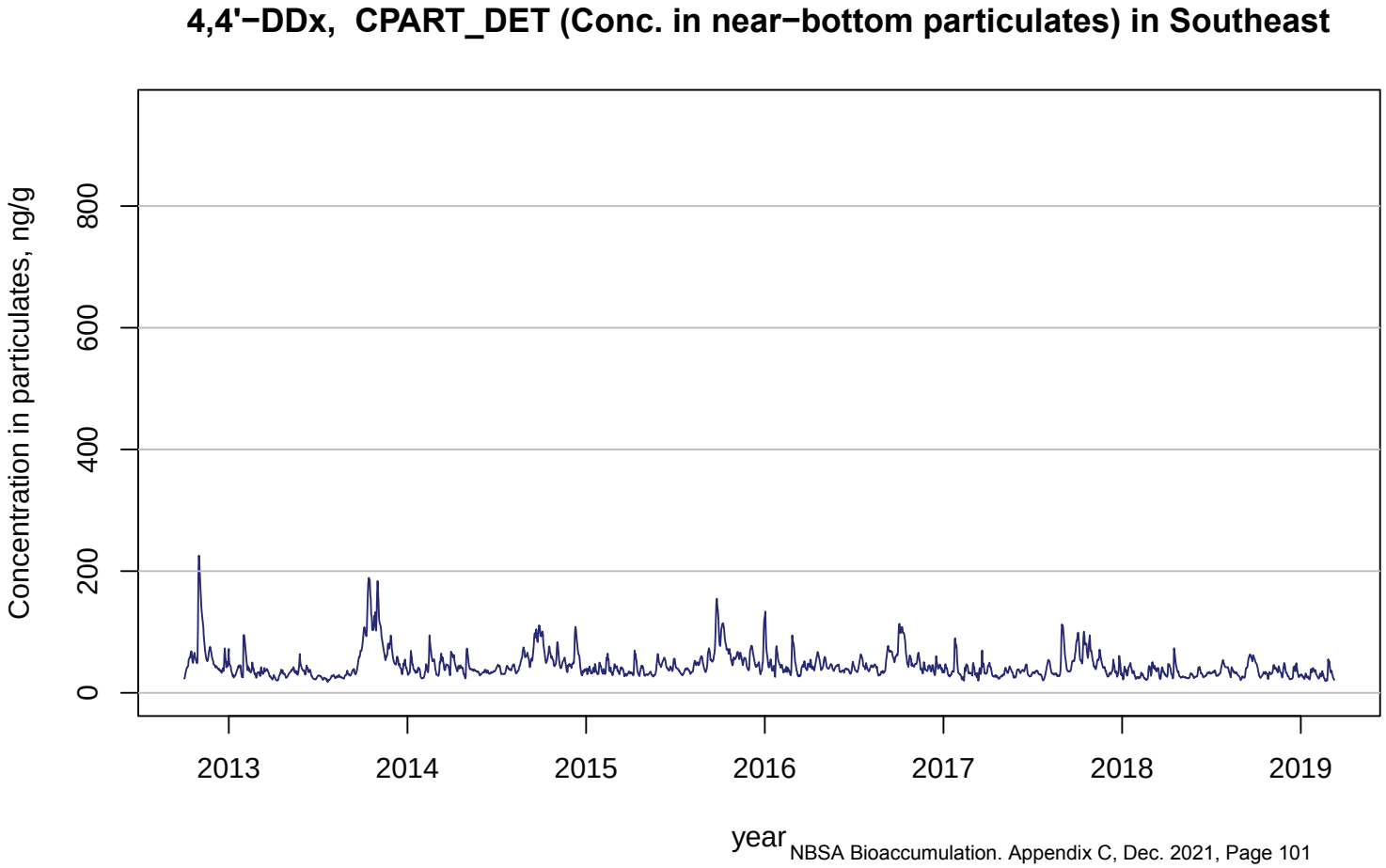


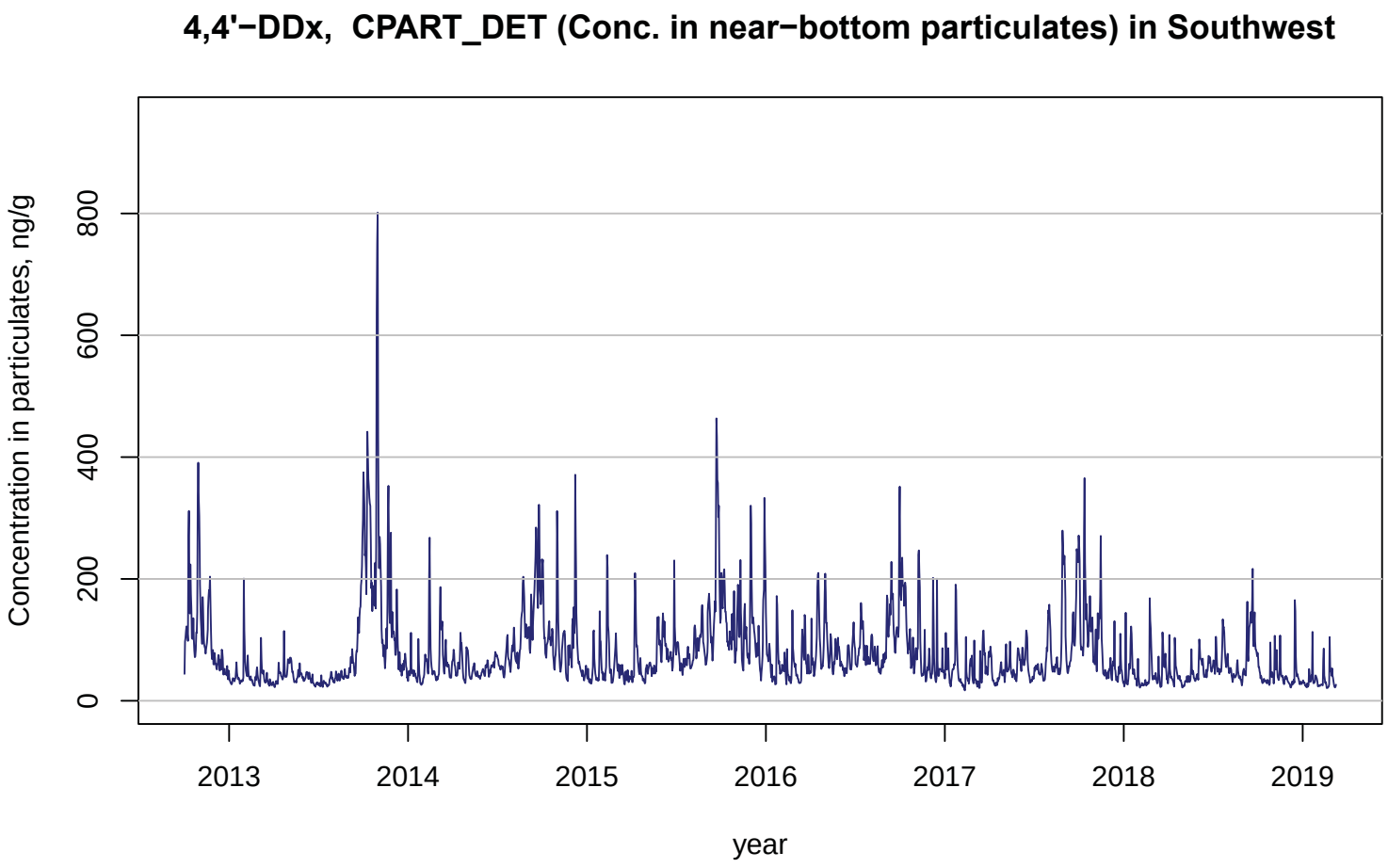
4,4'−DDx, CPART (Chemical conc. in detrital particulates) in Southeast Mudflat

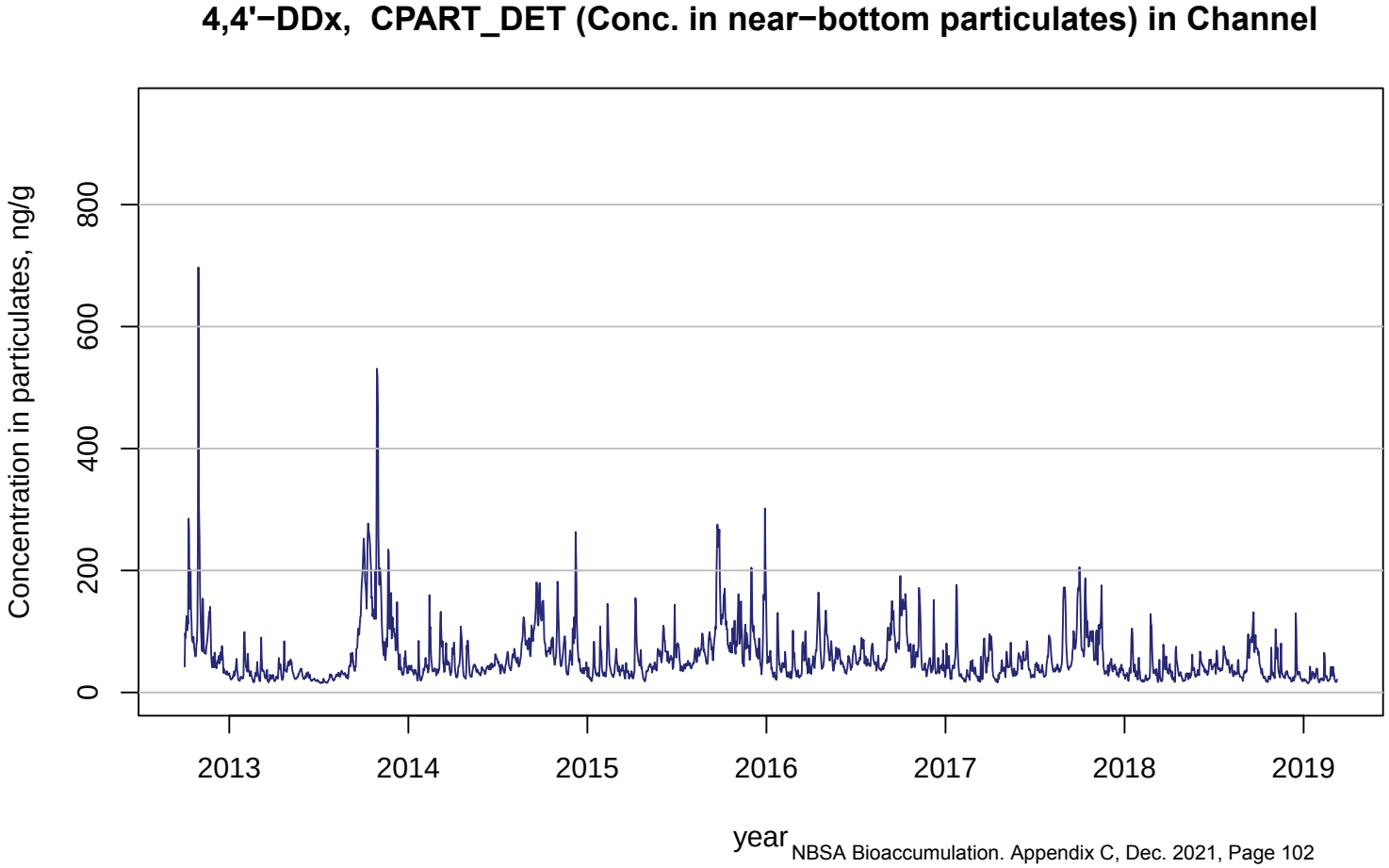



4,4'−DDx, CPART (Chemical conc. in detrital particulates) in Southwest Mudflat
Concentration in detrital particulates, ng/g
0
200
400
600
800
1000
2013
2014
2015
2016
2017
2018
2019
year

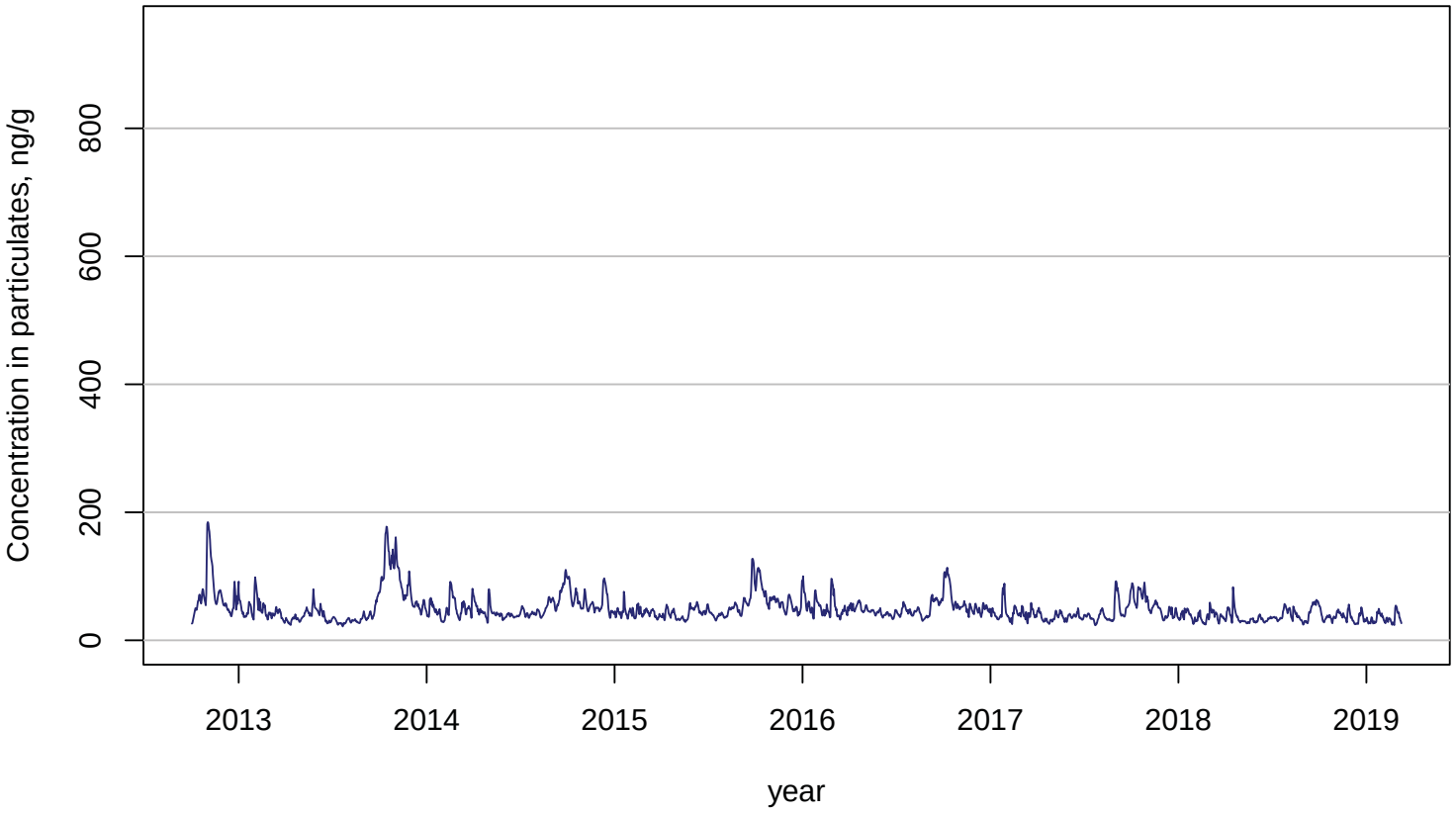

4,4'−DDx, CPART_DET (Conc. in near−bottom particulates) in North
Concentration in particulates, ng/g
0
200
400
600
800
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CPART_DET (Conc. in near−bottom particulates) in Southeast
Concentration in particulates, ng/g
0
200
400
600
800
2013
2014
2015
2016
2017
2018
2019
year

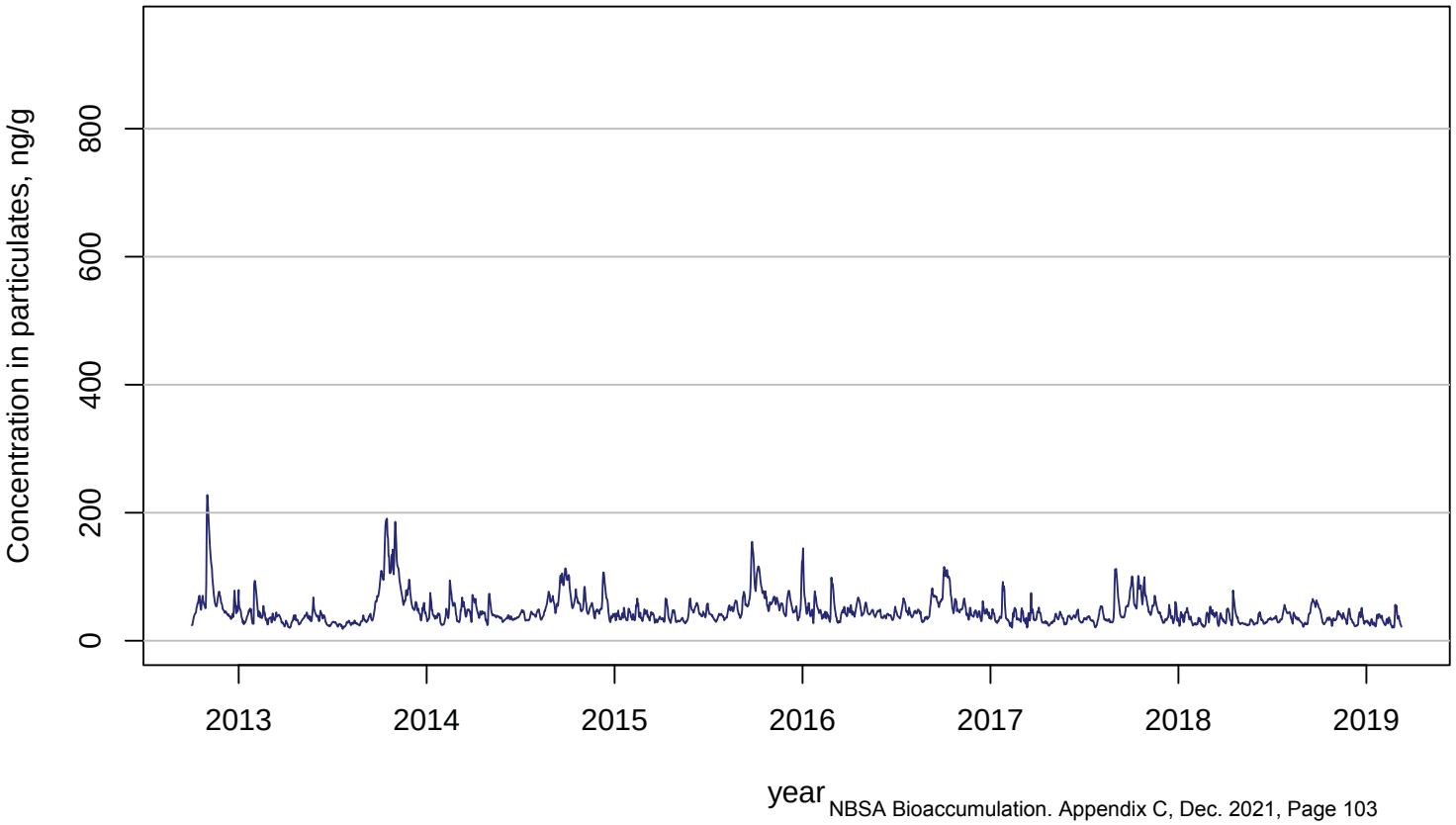

4,4'−DDx, CPART_DET (Conc. in near−bottom particulates) in Southwest
Concentration in particulates, ng/g
0
200
400
600
800
2013
2014
2015
2016
2017
2018
2019
year

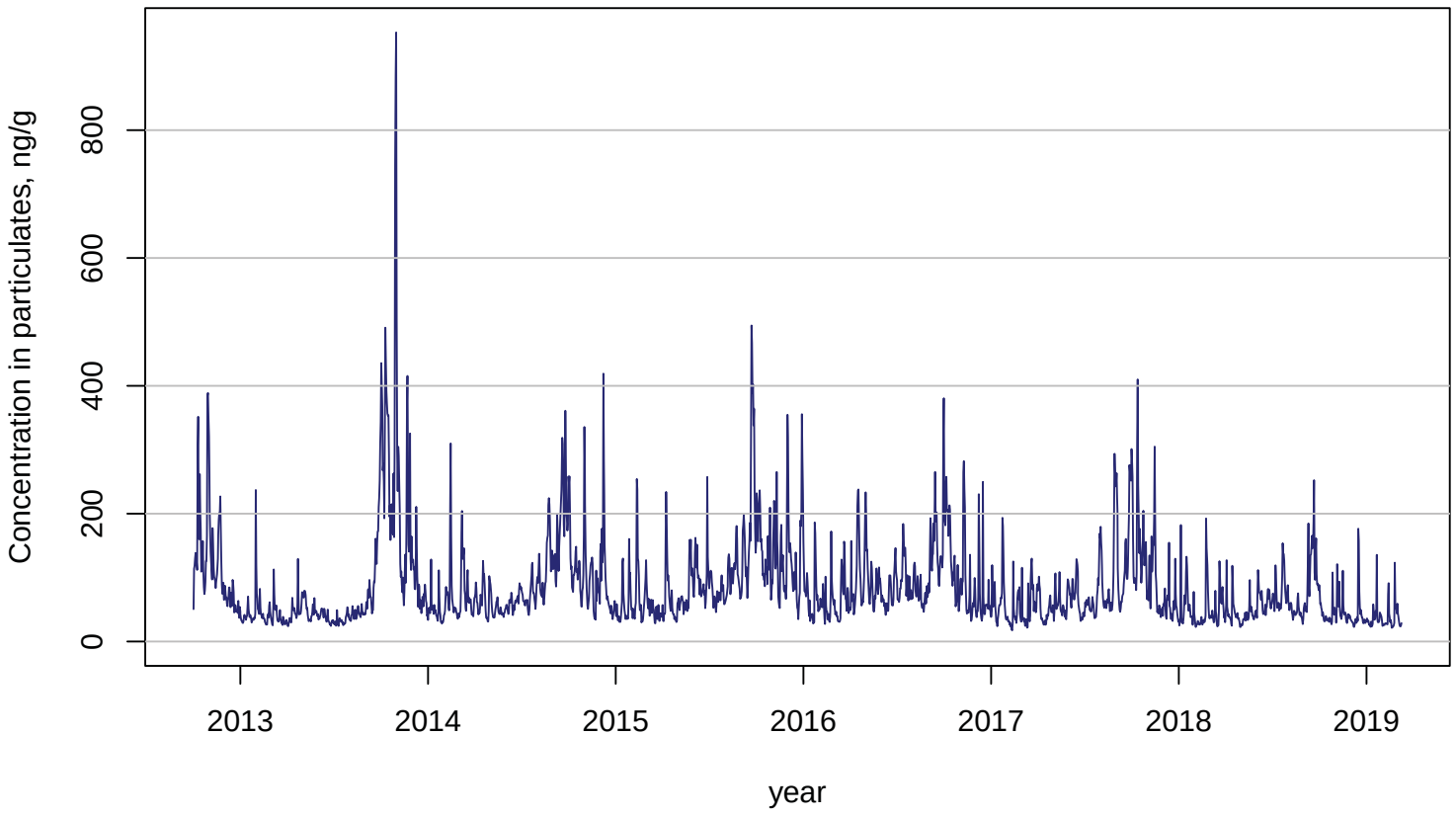

4,4'−DDx, CPART_DET (Conc. in near−bottom particulates) in Channel
Concentration in particulates, ng/g
0
200
400
600
800
2013
2014
2015
2016
2017
2018
2019
year

4,4'−DDx, CPART_DET (Conc. in near−bottom particulates) in North Mudflat

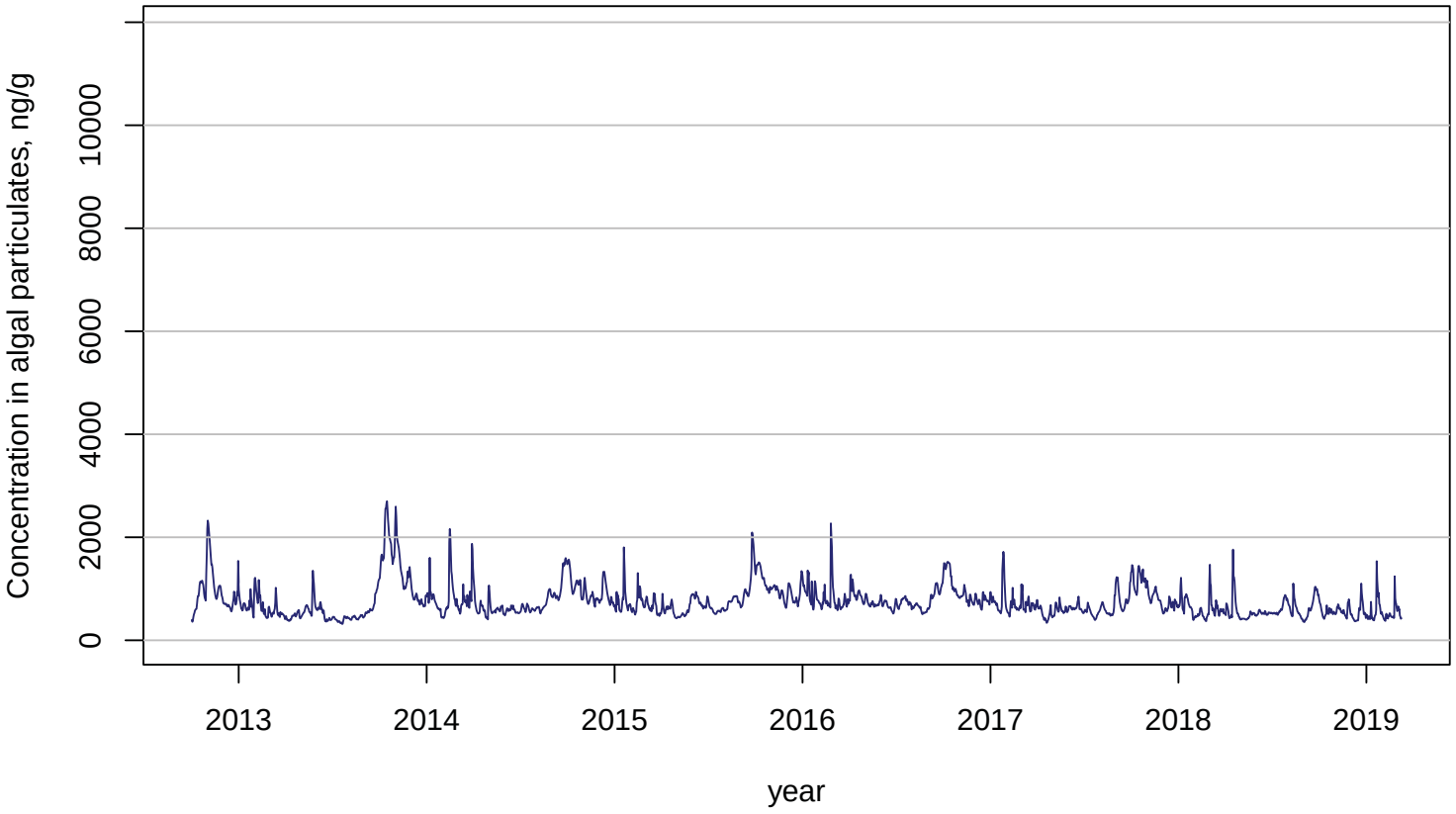


4,4'−DDx, CPART_DET (Conc. in near−bottom particulates) in Southeast Mudflat

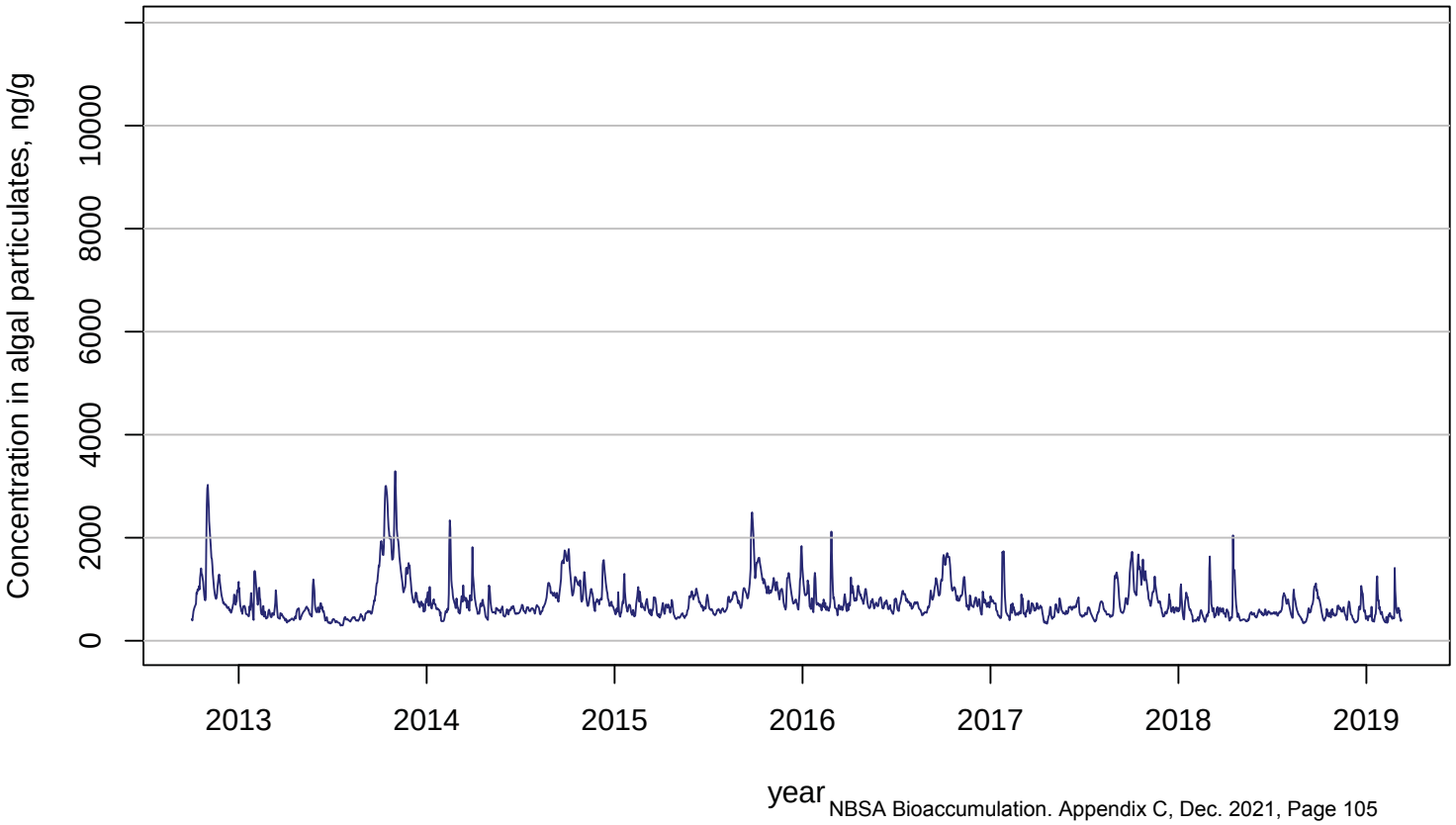



4,4'−DDx, CPART_DET (Conc. in near−bottom particulates) in Southwest Mudflat
Concentration in particulates, ng/g
0
200
400
600
800
2013
2014
2015
2016
2017
2018
2019
year

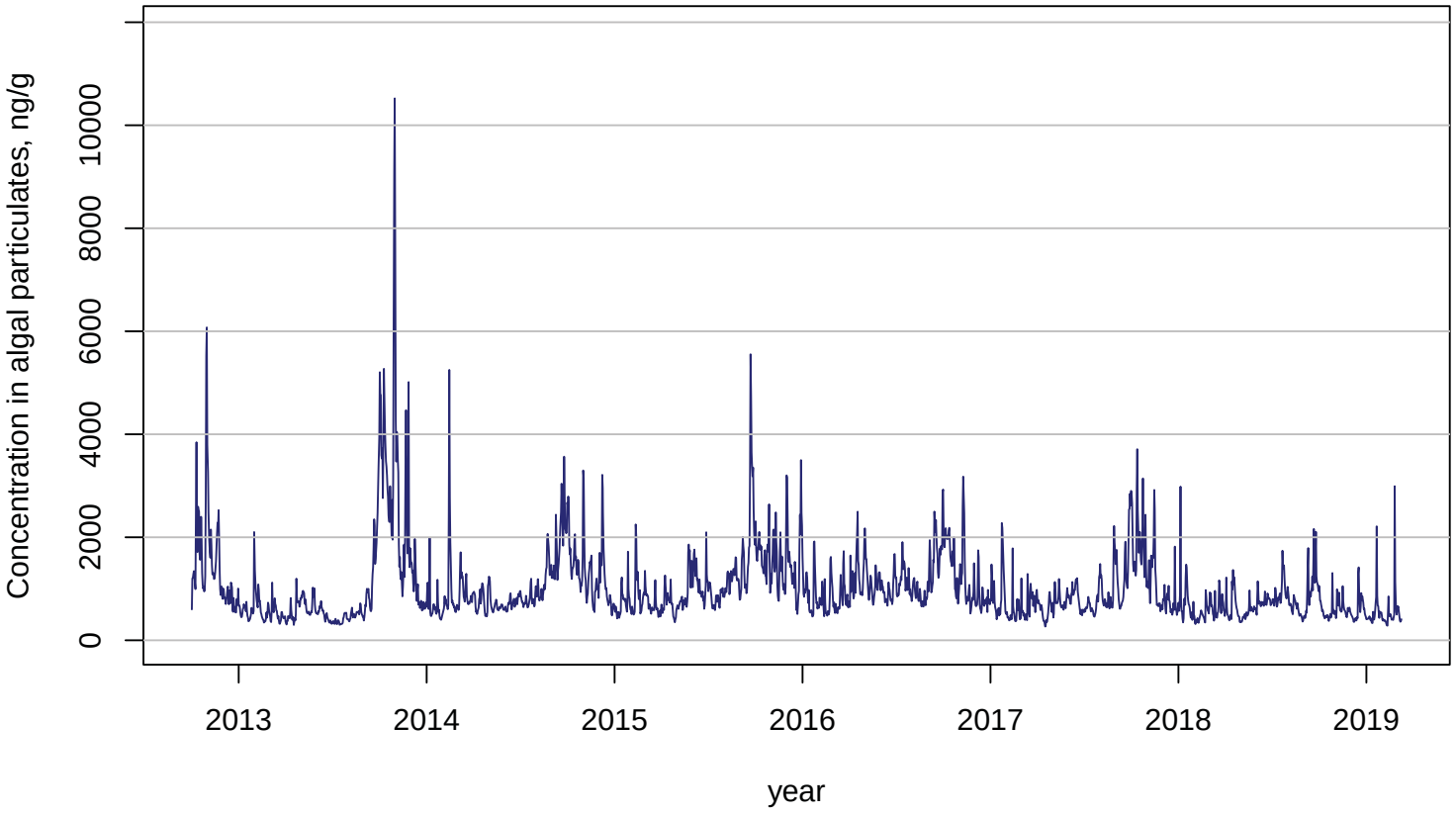
4,4'−DDx, CAC (Concentration in algal particulates) in North



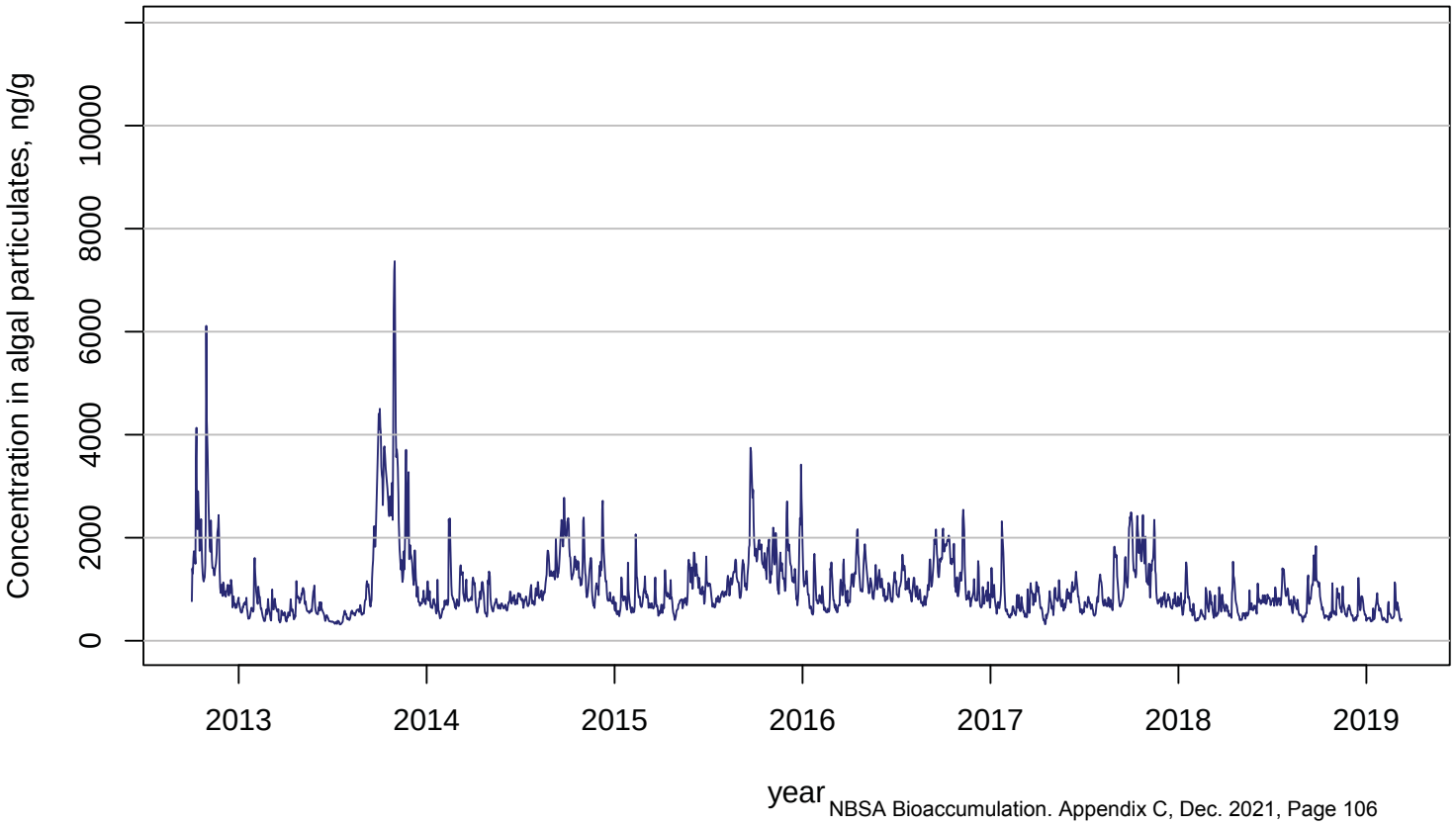
4,4'−DDx, CAC (Concentration in algal particulates) in Southeast



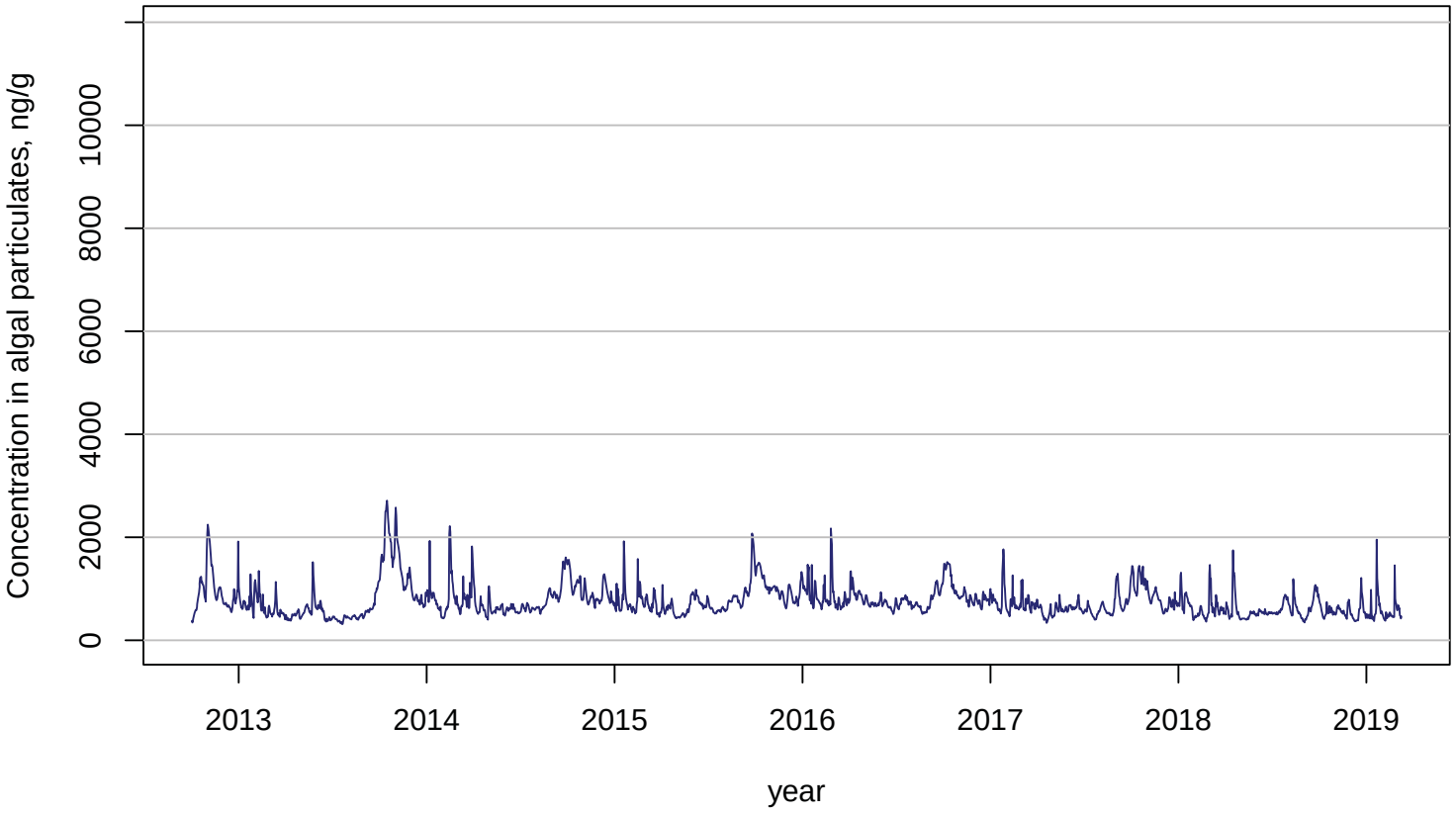
4,4'−DDx, CAC (Concentration in algal particulates) in Southwest



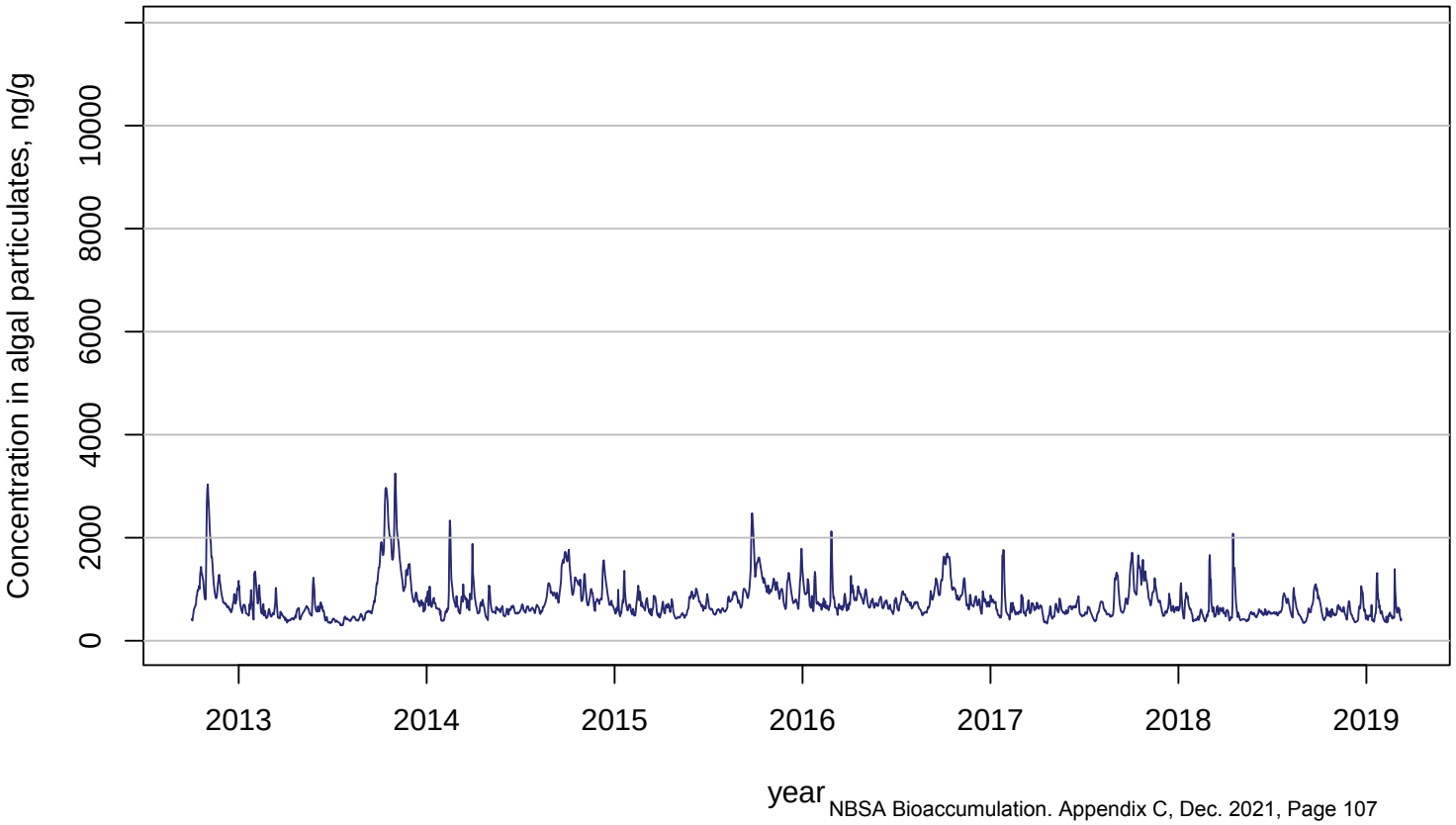
4,4'−DDx, CAC (Concentration in algal particulates) in Channel

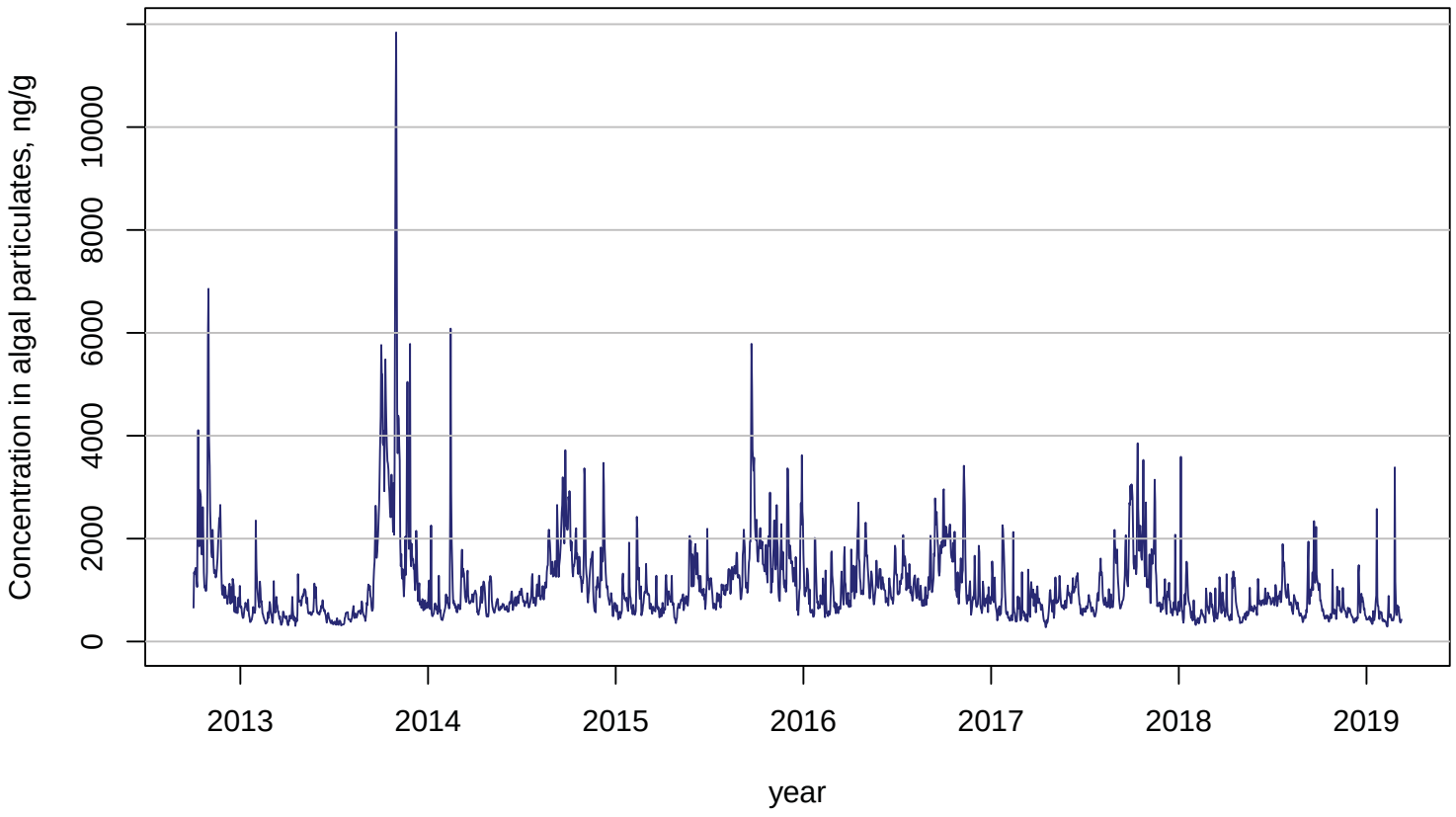


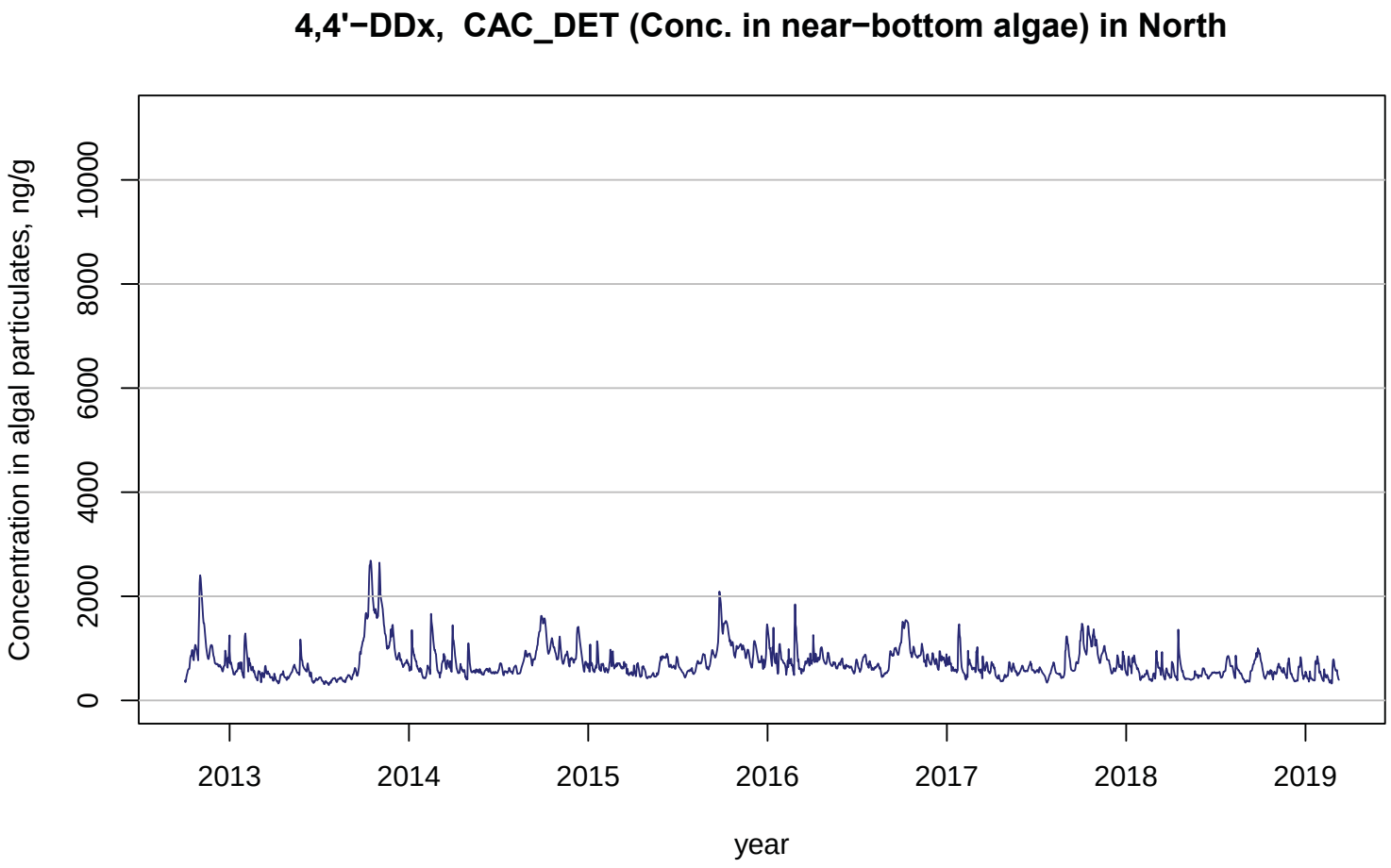
4,4'−DDx, CAC (Concentration in algal particulates) in North Mudflat

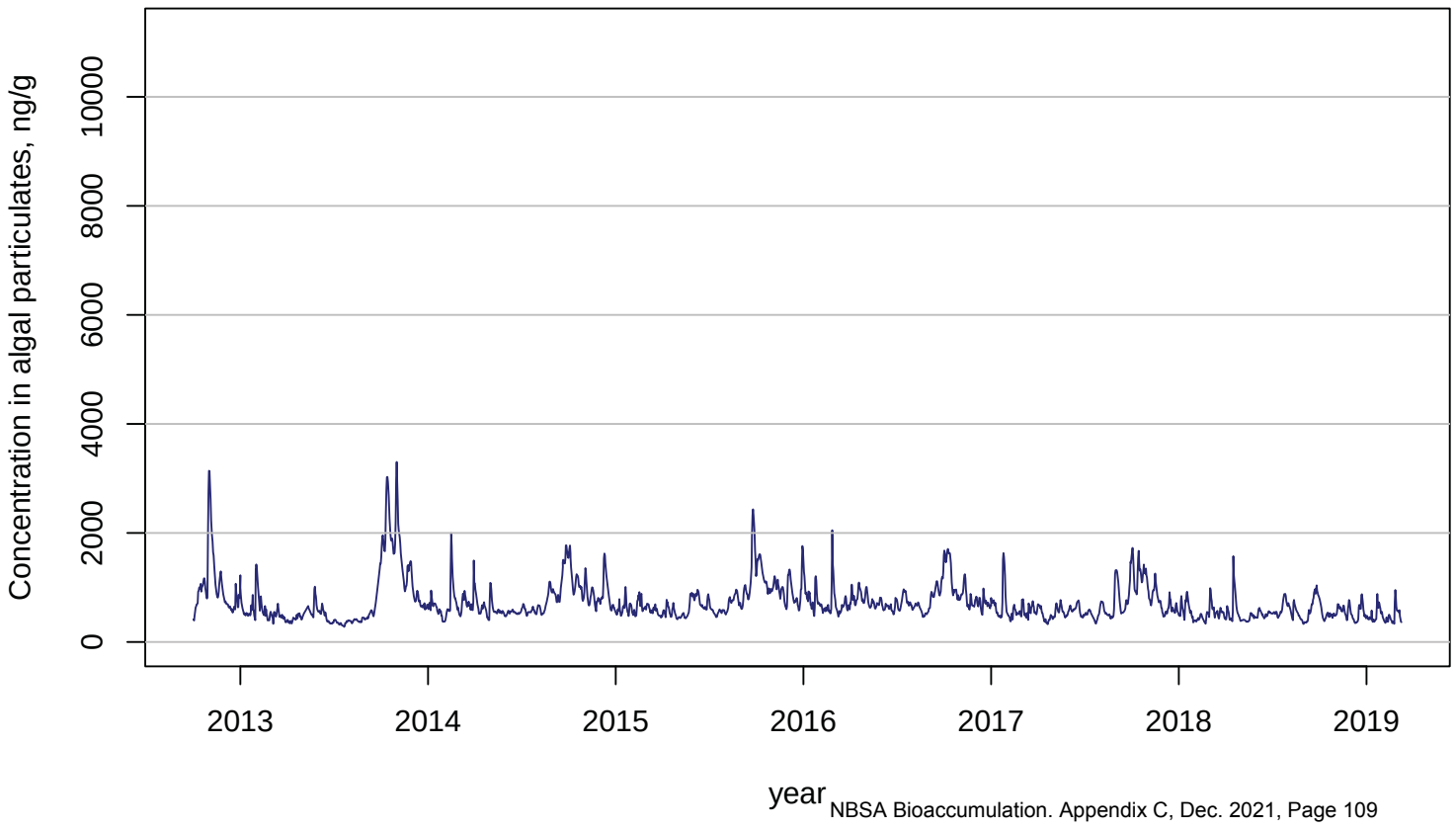


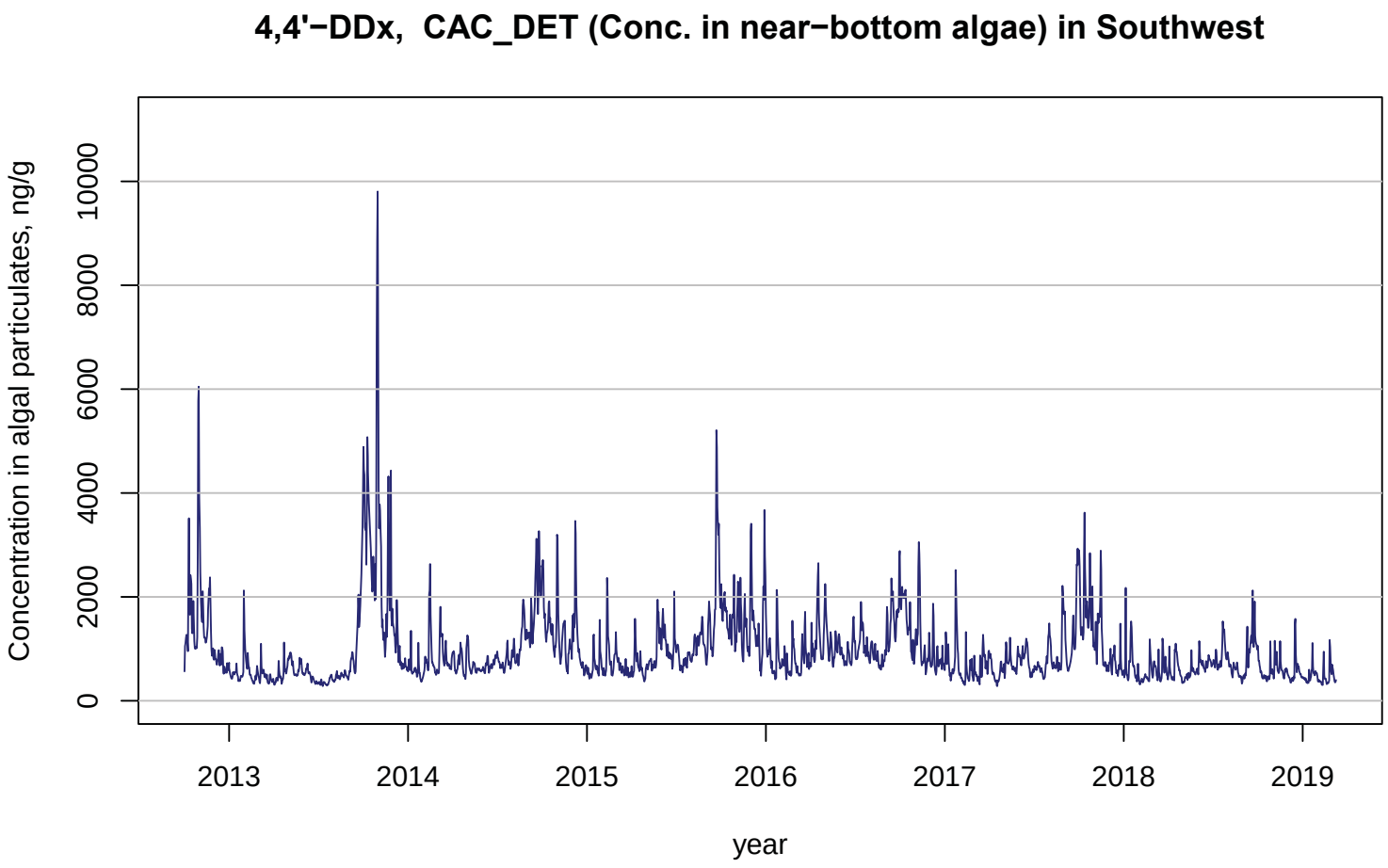
4,4'−DDx, CAC (Concentration in algal particulates) in Southeast Mudflat

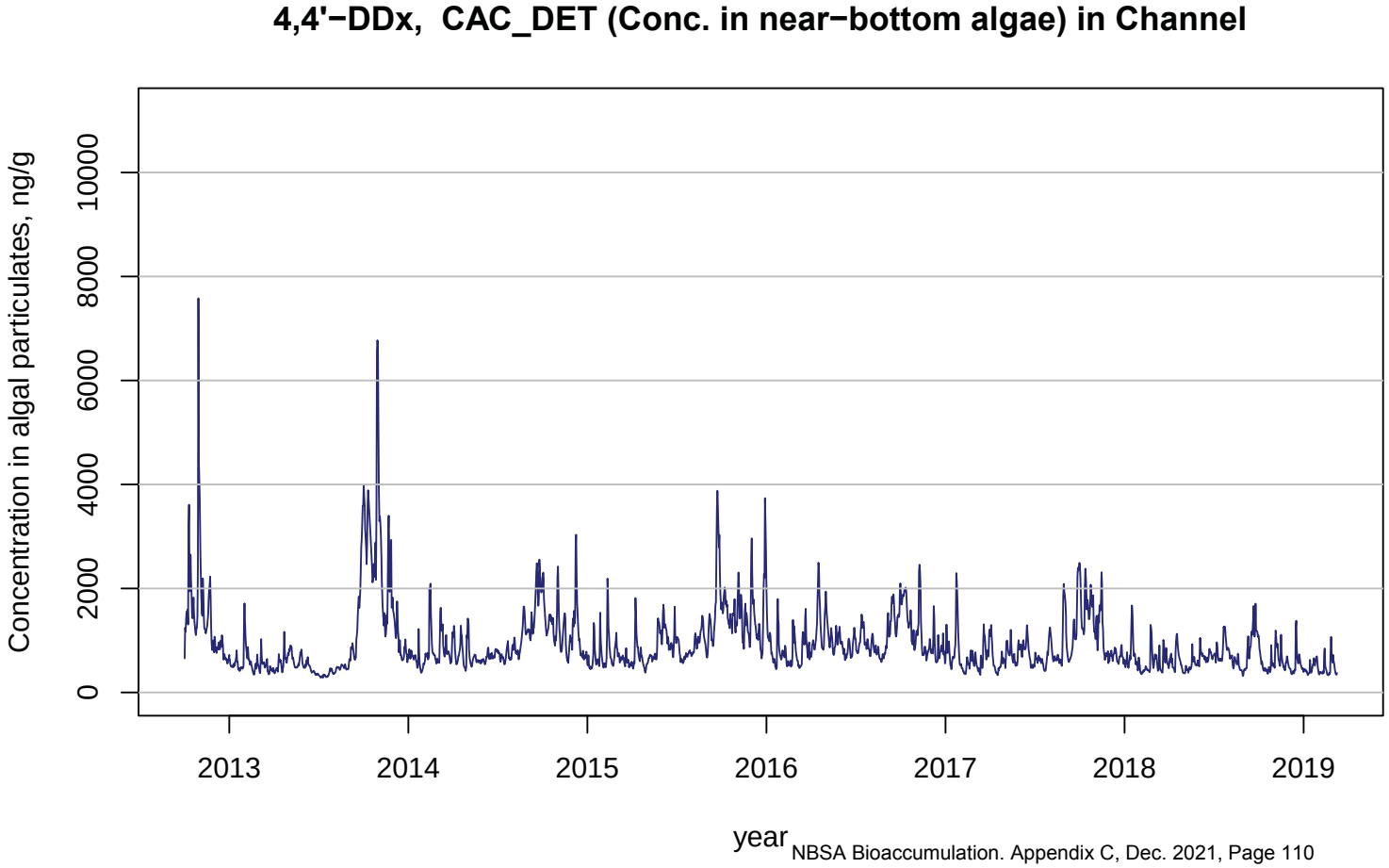


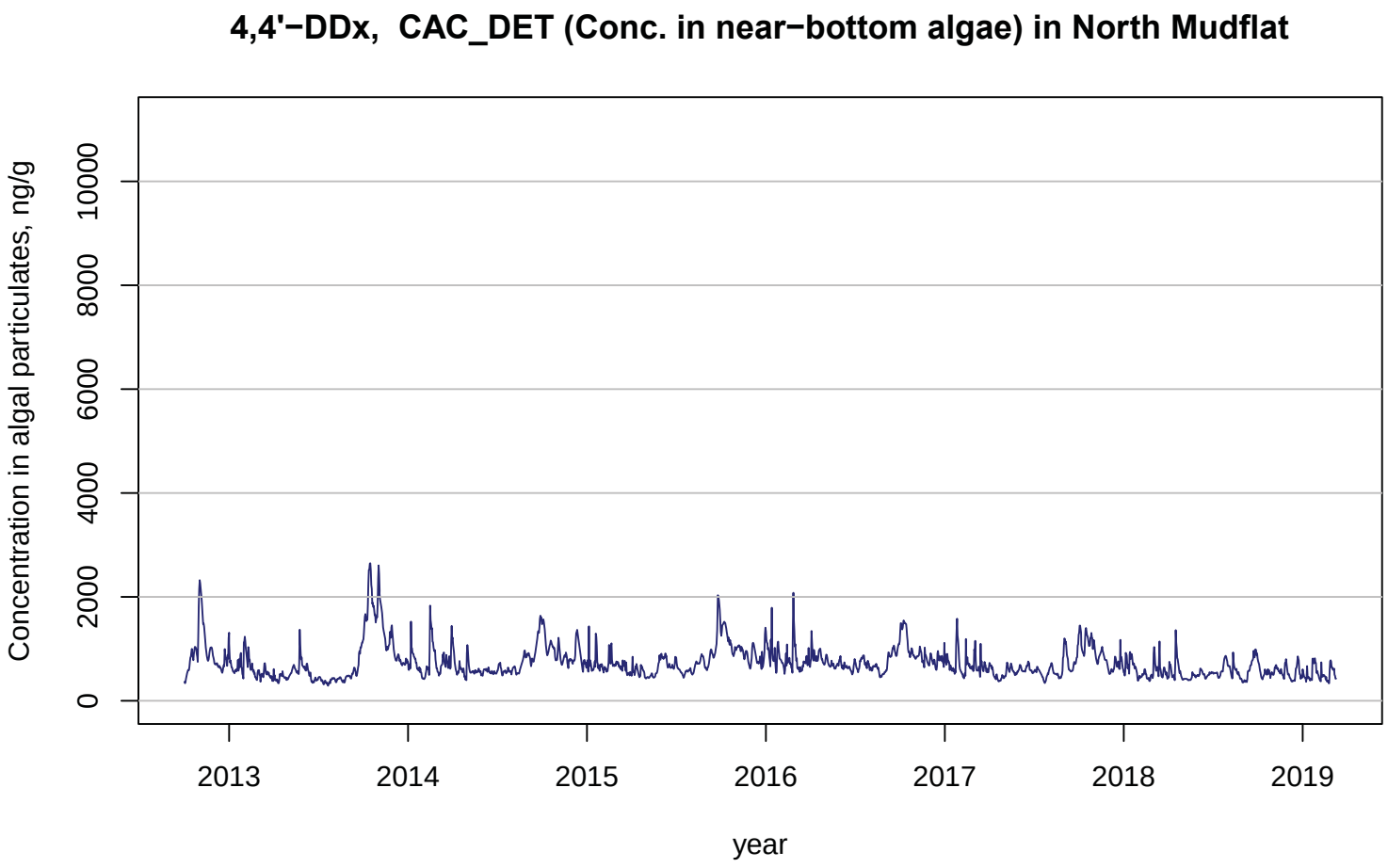

4,4'−DDx, CAC (Concentration in algal particulates) in Southwest Mudflat
Concentration in algal particulates, ng/g
0
2000
4000
6000
8000
10000
2013
2014
2015
2016
2017
2018
2019
year

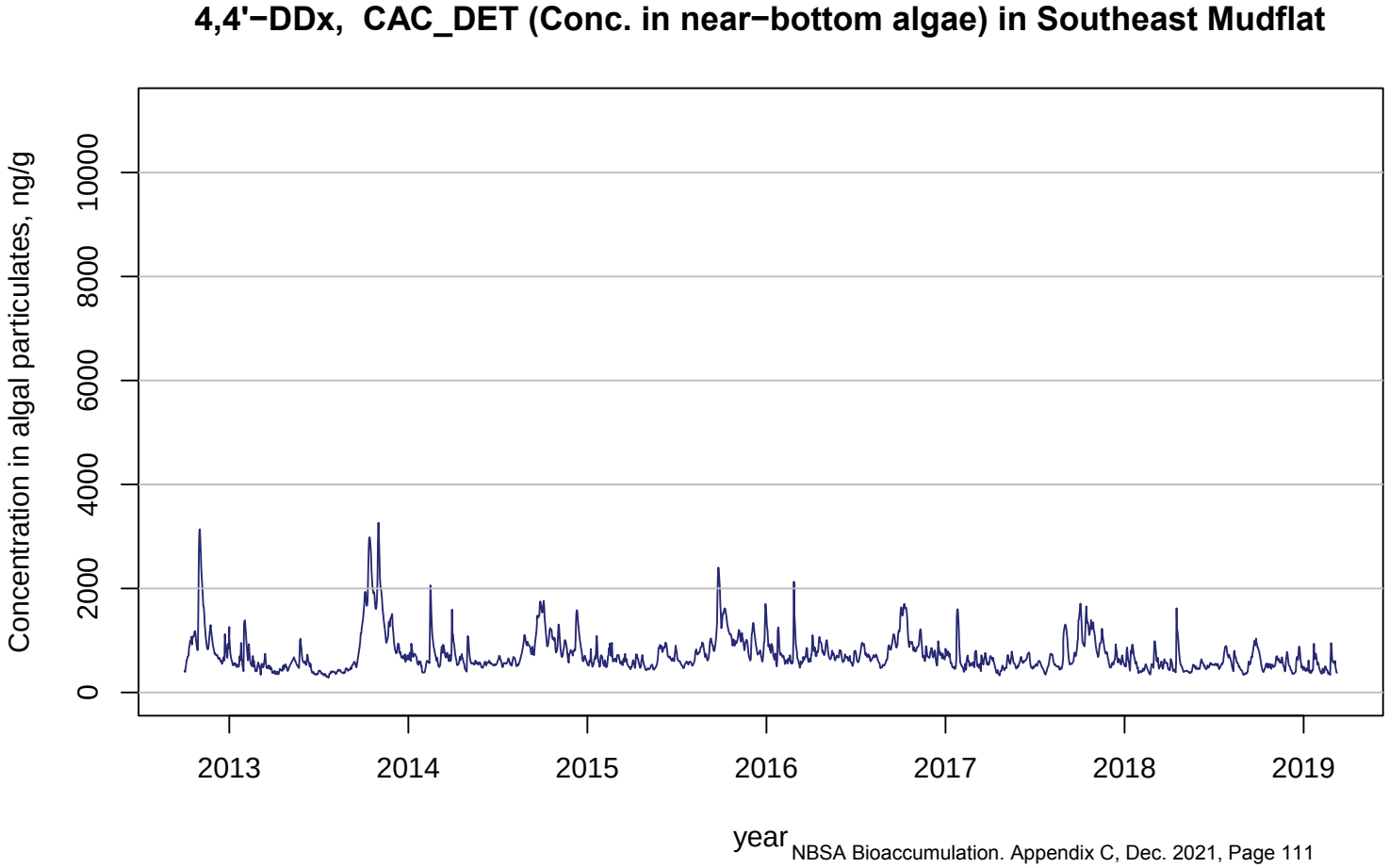

4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in North
Concentration in algal particulates, ng/g
0
2000
4000
6000
8000
10000
2013
2014
2015
2016
2017
2018
2019
year

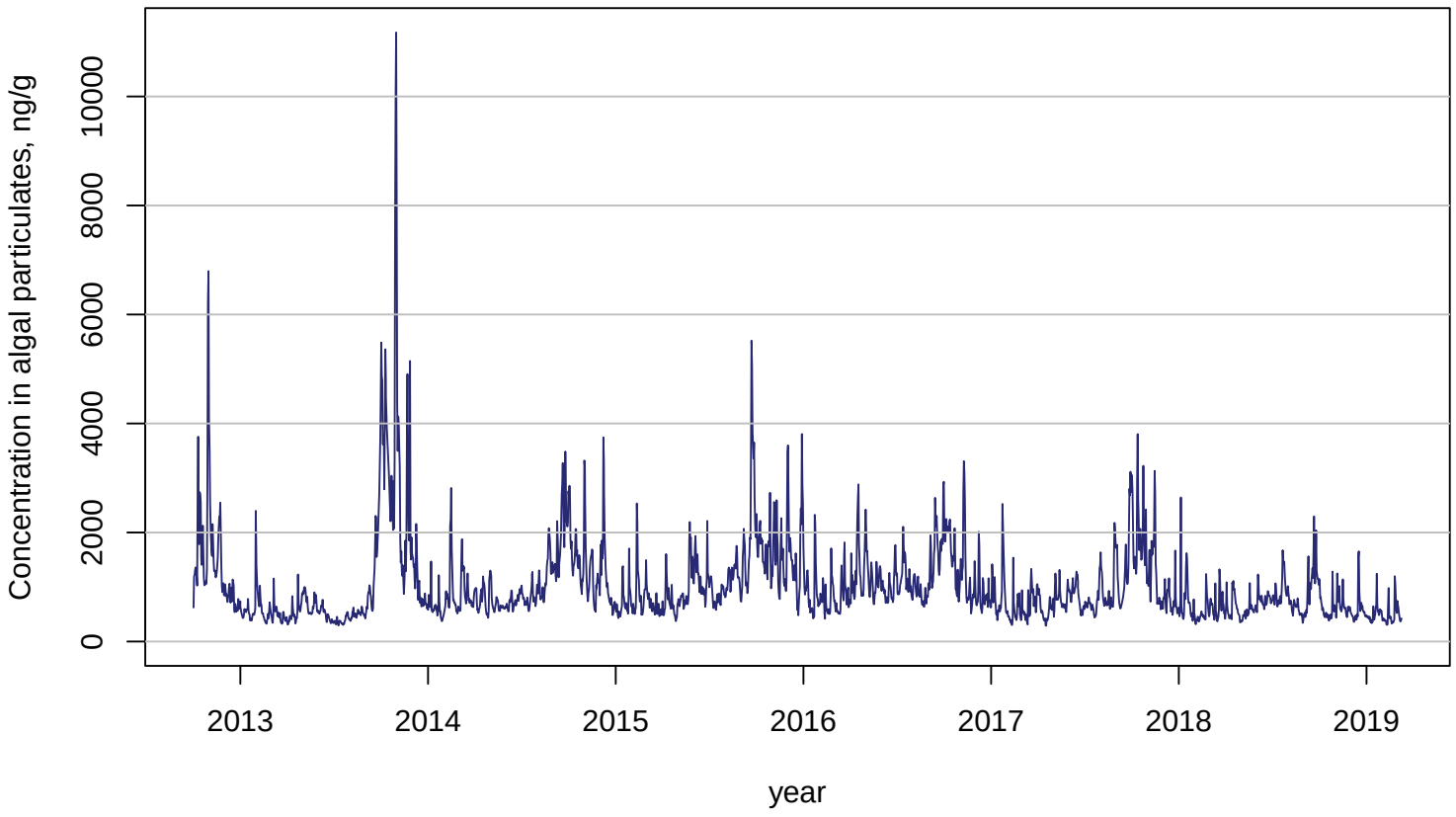

4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in Southeast
Concentration in algal particulates, ng/g
0
2000
4000
6000
8000
10000
2013
2014
2015
2016
2017
2018
2019
year

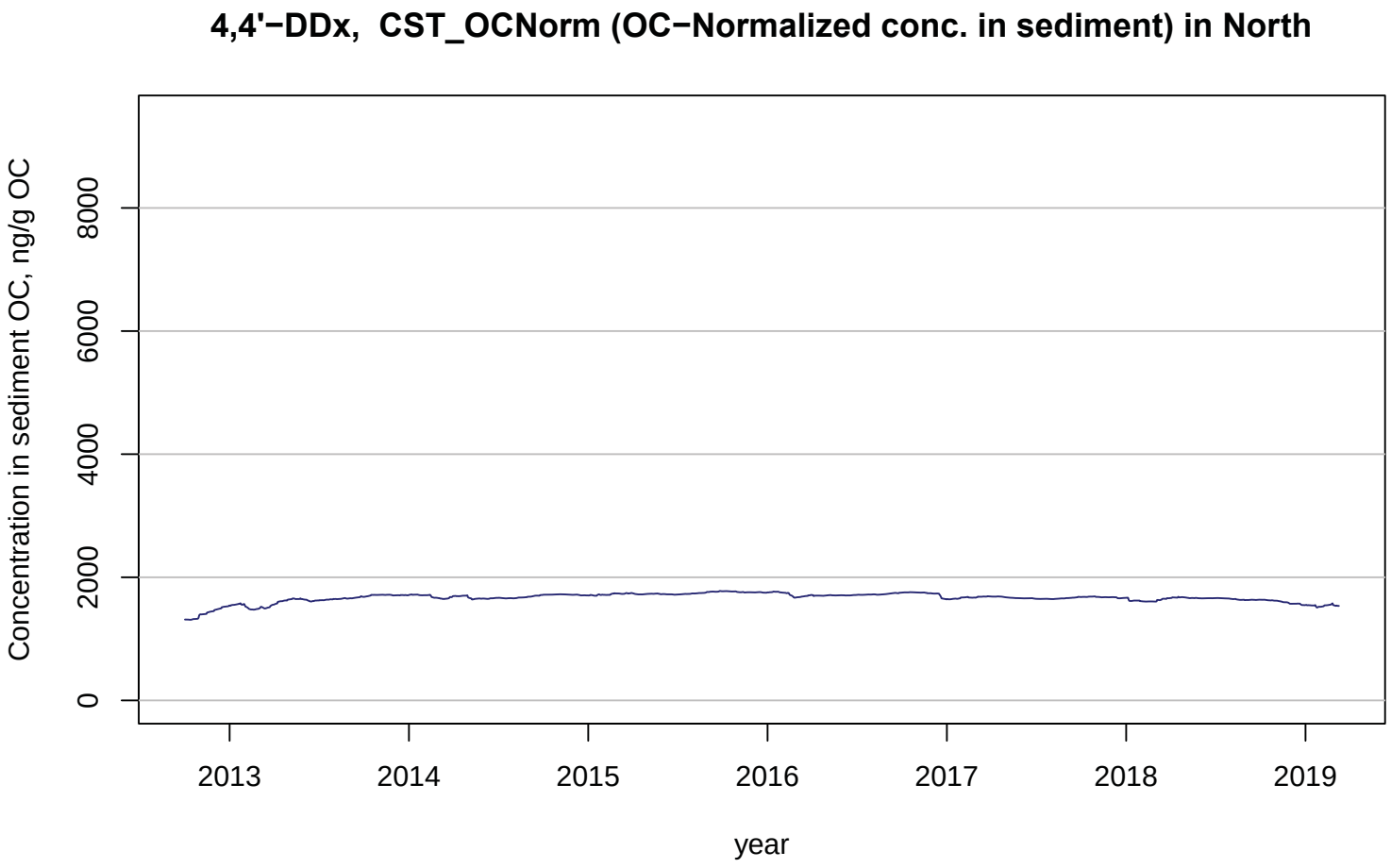

4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in Southwest
Concentration in algal particulates, ng/g
0
2000
4000
6000
8000
10000
2013
2014
2015
2016
2017
2018
2019
year

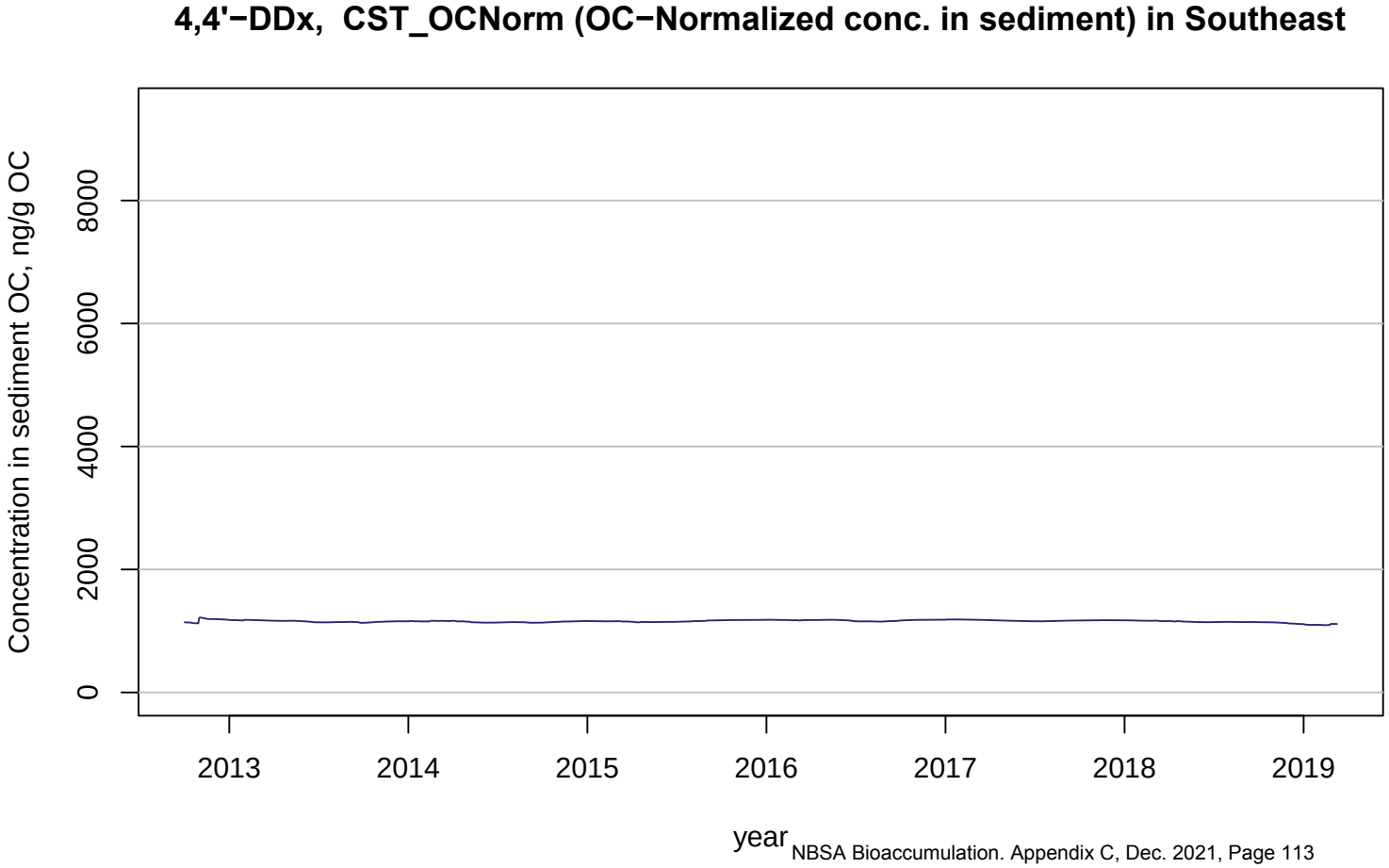

4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in Channel
Concentration in algal particulates, ng/g
0
2000
4000
6000
8000
10000
2013
2014
2015
2016
2017
2018
2019
year

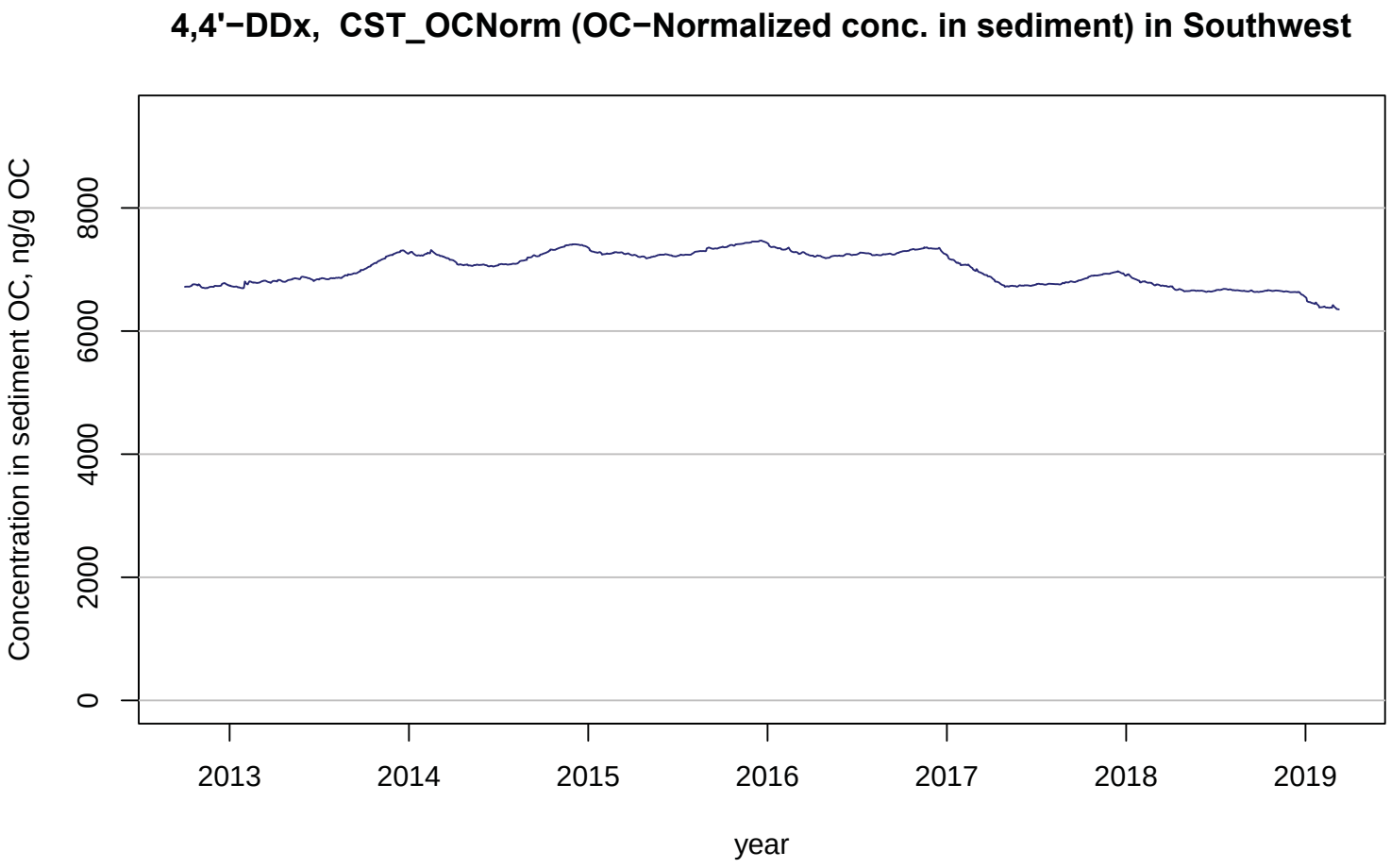

4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in North Mudflat
Concentration in algal particulates, ng/g
0
2000
4000
6000
8000
10000
2013
2014
2015
2016
2017
2018
2019
year

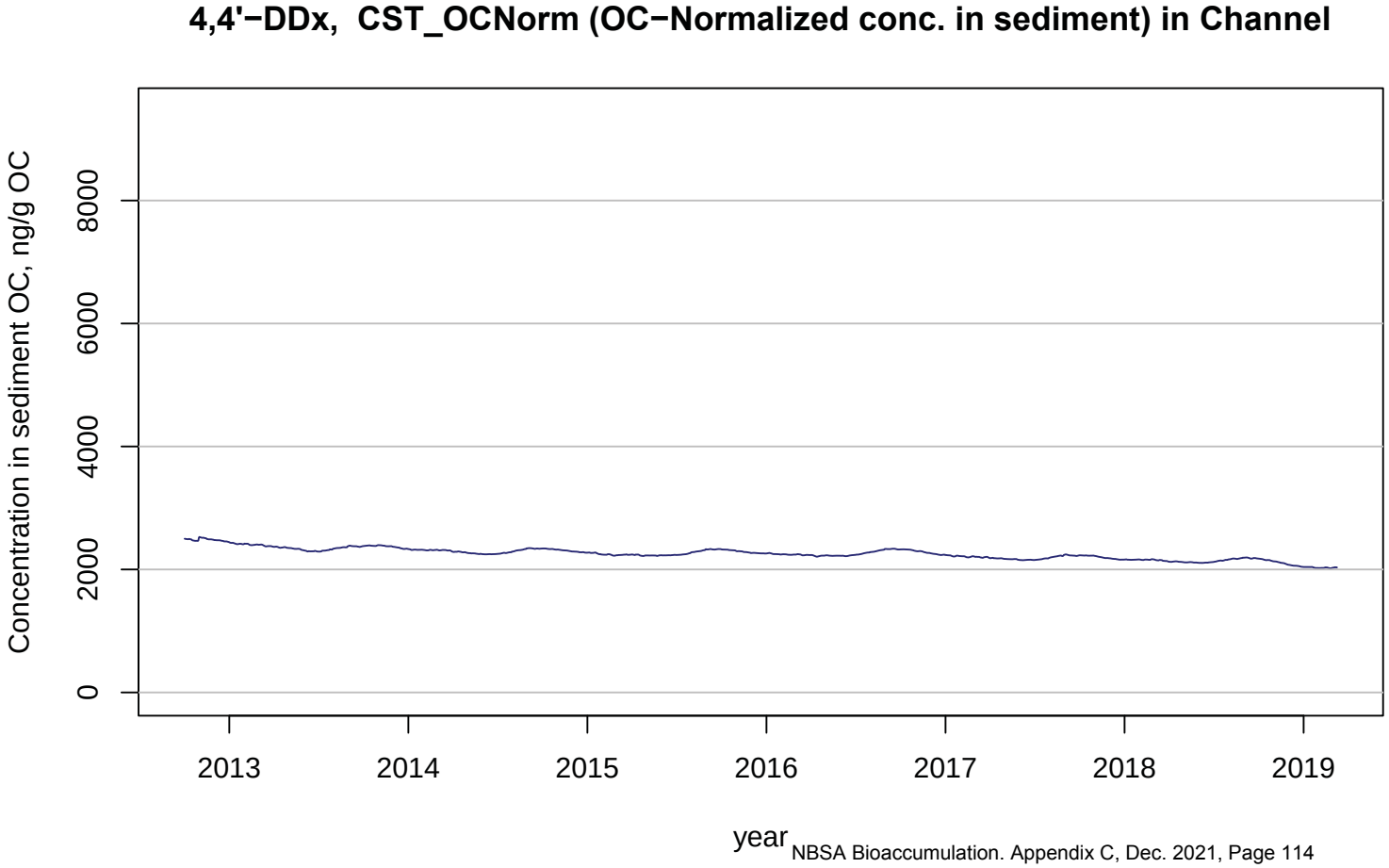

4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in Southeast Mudflat
Concentration in algal particulates, ng/g
0
2000
4000
6000
8000
10000
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in Southwest Mudflat
Concentration in algal particulates, ng/g
0
2000
4000
6000
8000
10000
2013
2014
2015
2016
2017
2018
2019
year

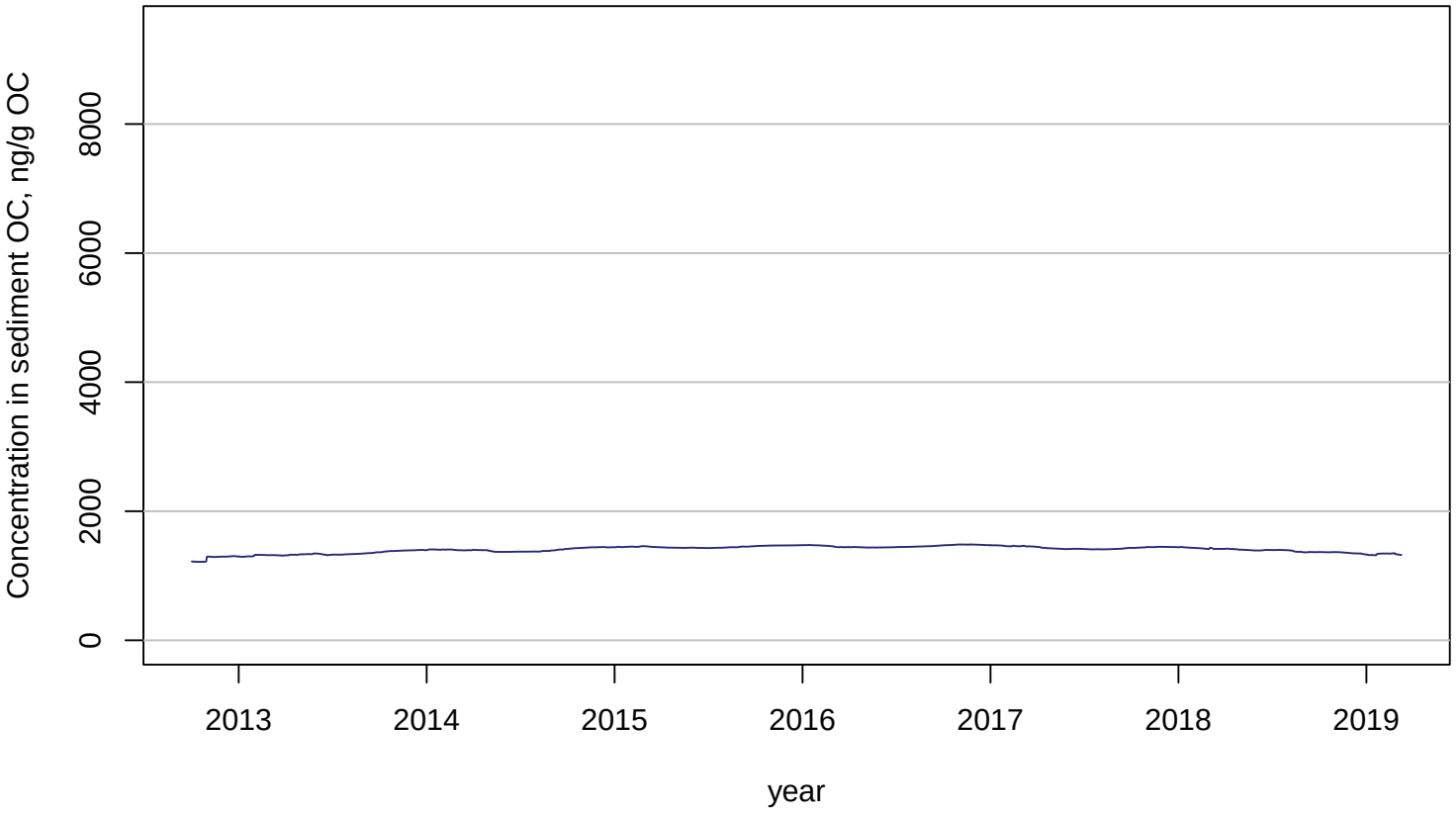

4,4'−DDx, CST_OCNorm (OC−Normalized conc. in sediment) in North
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CST_OCNorm (OC−Normalized conc. in sediment) in Southeast
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

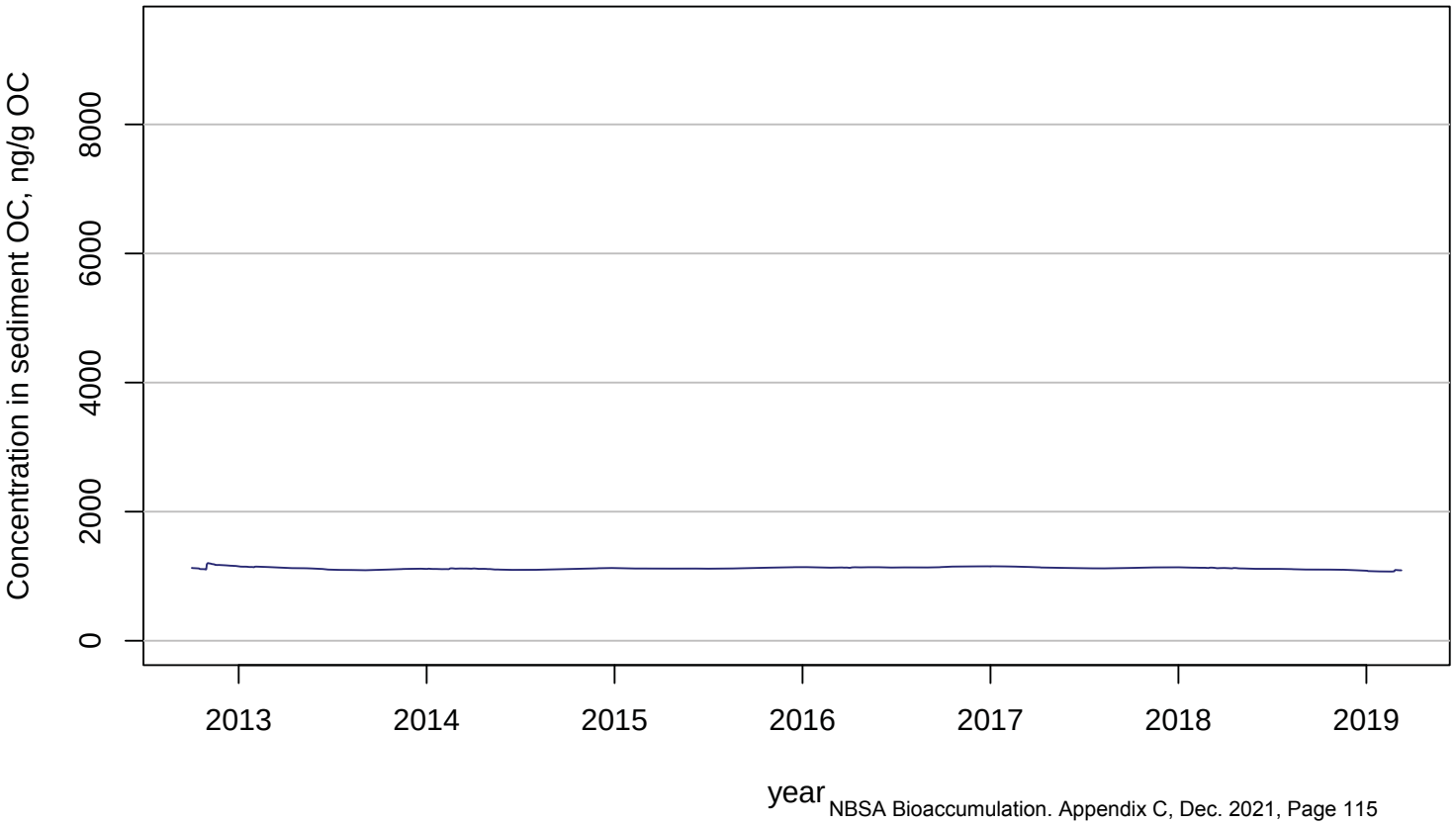

4,4'−DDx, CST_OCNorm (OC−Normalized conc. in sediment) in Southwest
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

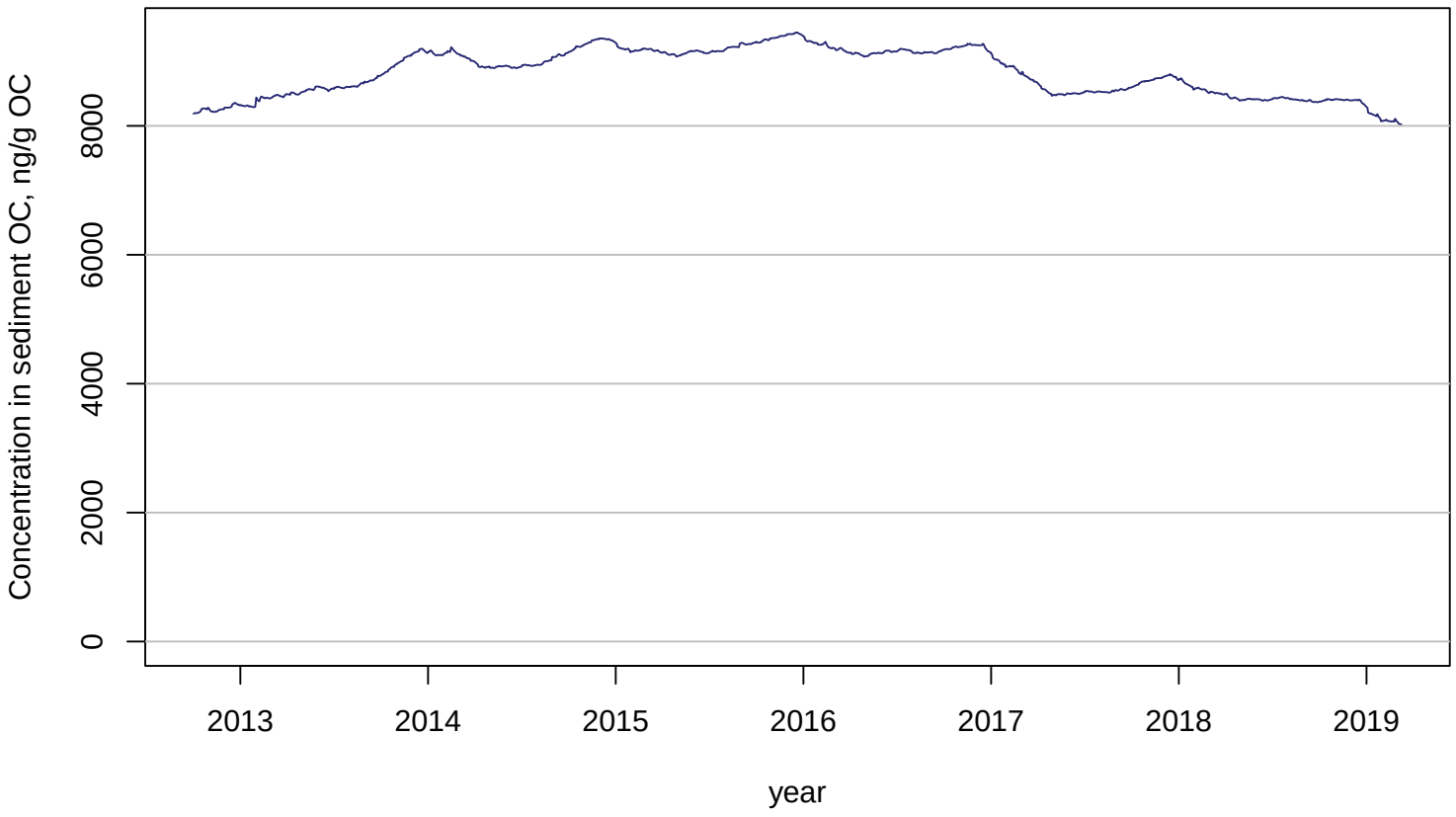

4,4'−DDx, CST_OCNorm (OC−Normalized conc. in sediment) in Channel
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

4,4'−DDx, CST_OCNorm (OC−Normalized conc. in sediment) in North Mudflat



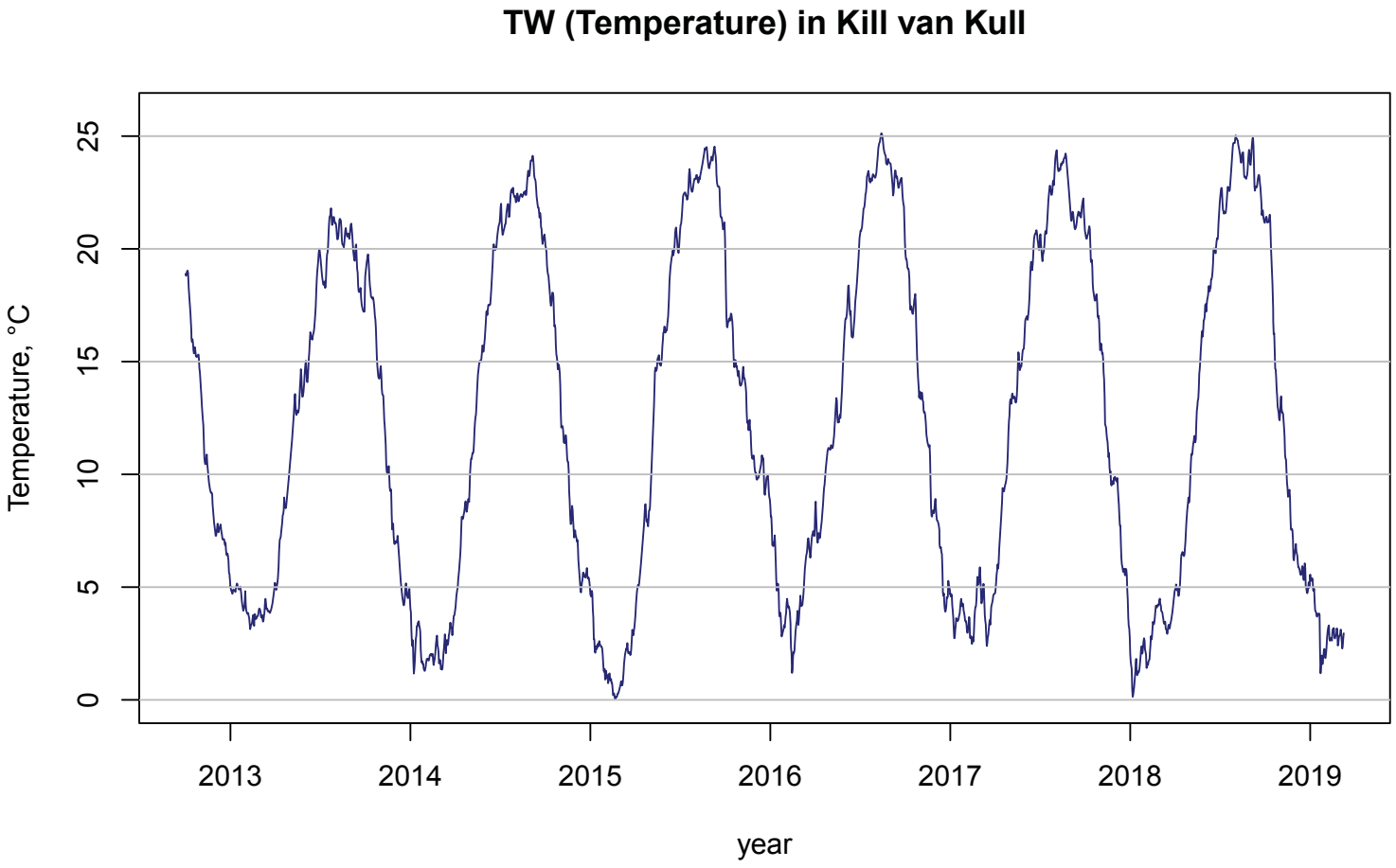
4,4'−DDx, CST_OCNorm (OC−Normalized conc. in sediment) in Southeast Mudflat

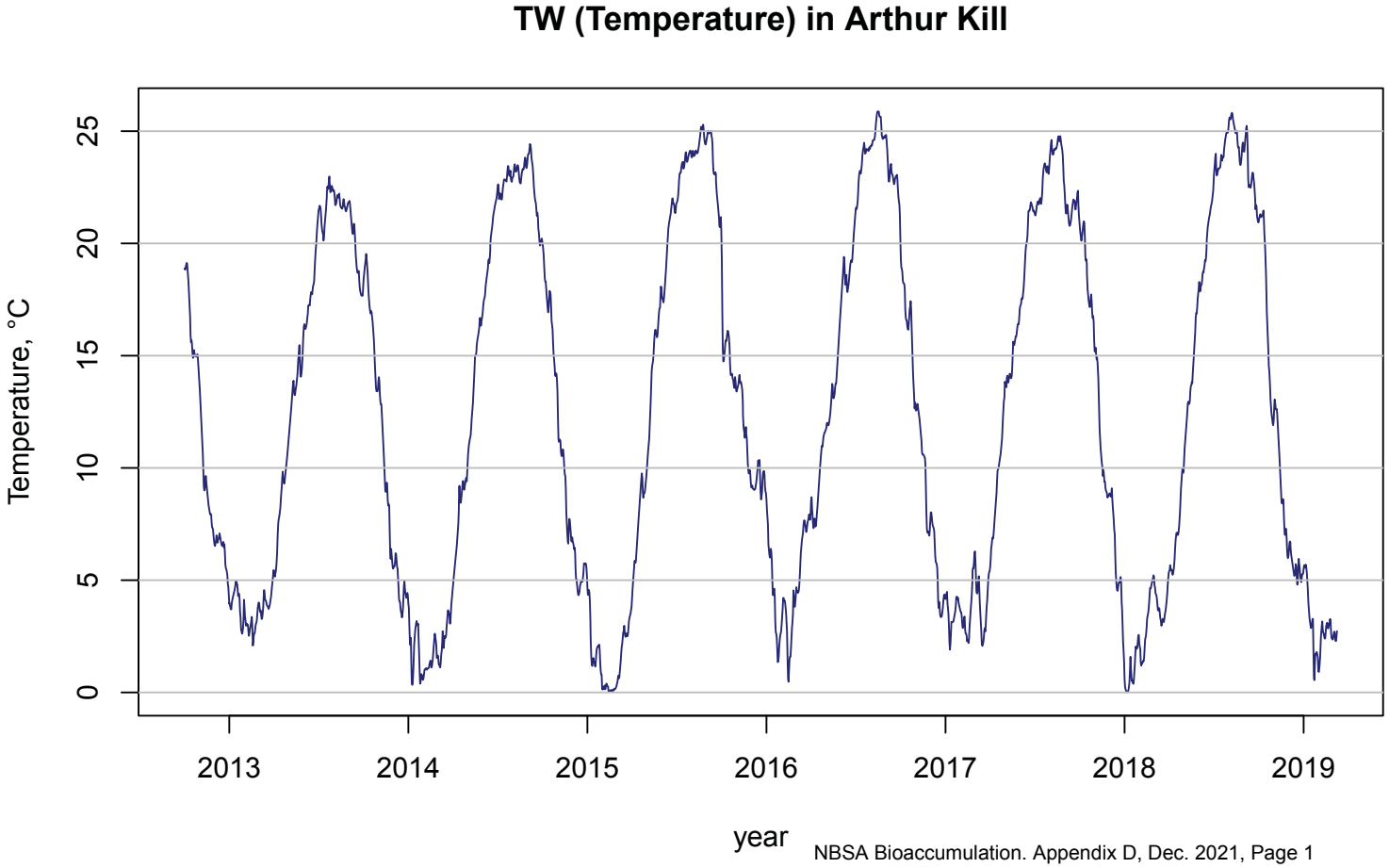


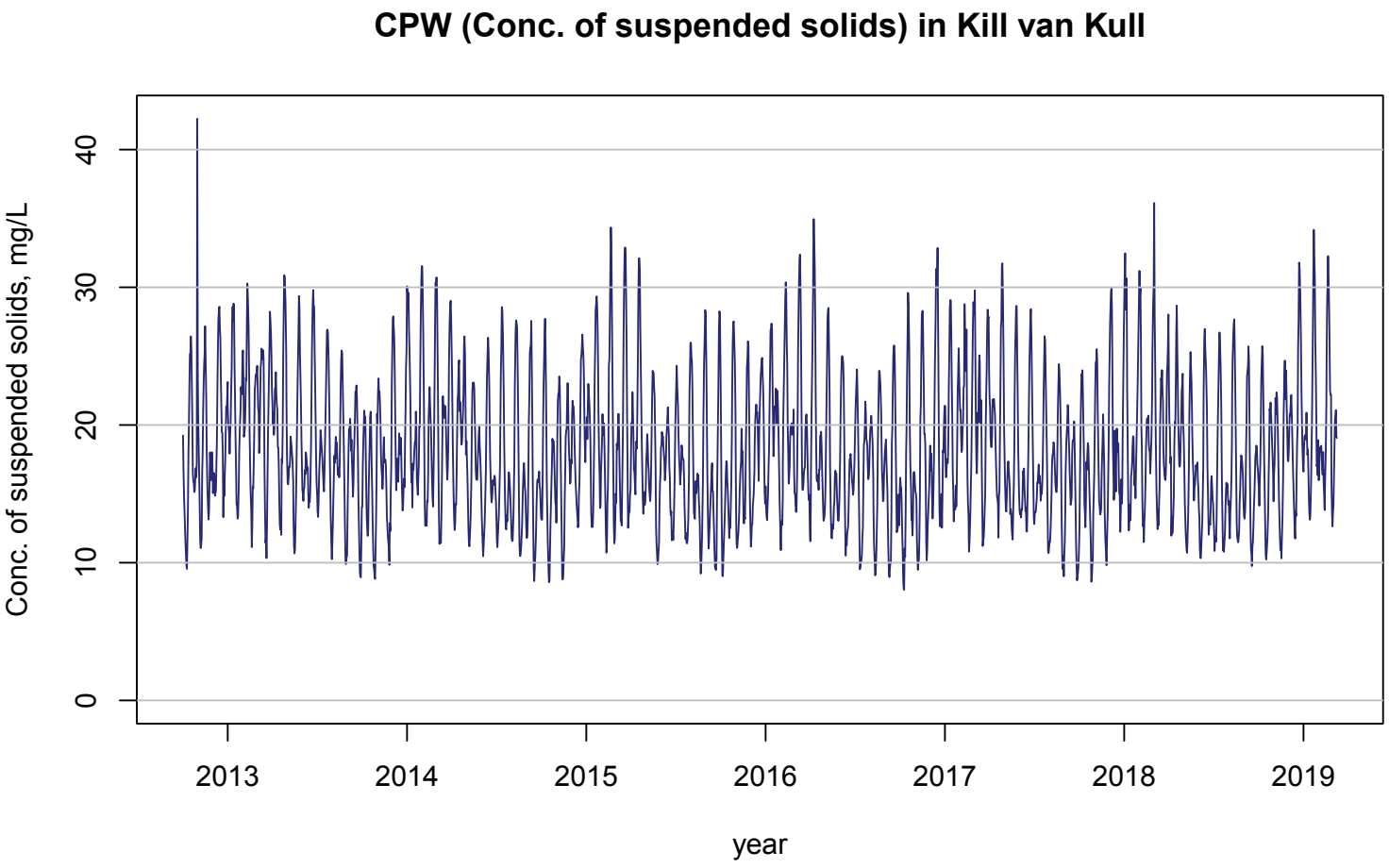

4,4'−DDx, CST_OCNorm (OC−Normalized conc. in sediment) in Southwest Mudflat
Concentration in sediment OC, ng/g OC
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

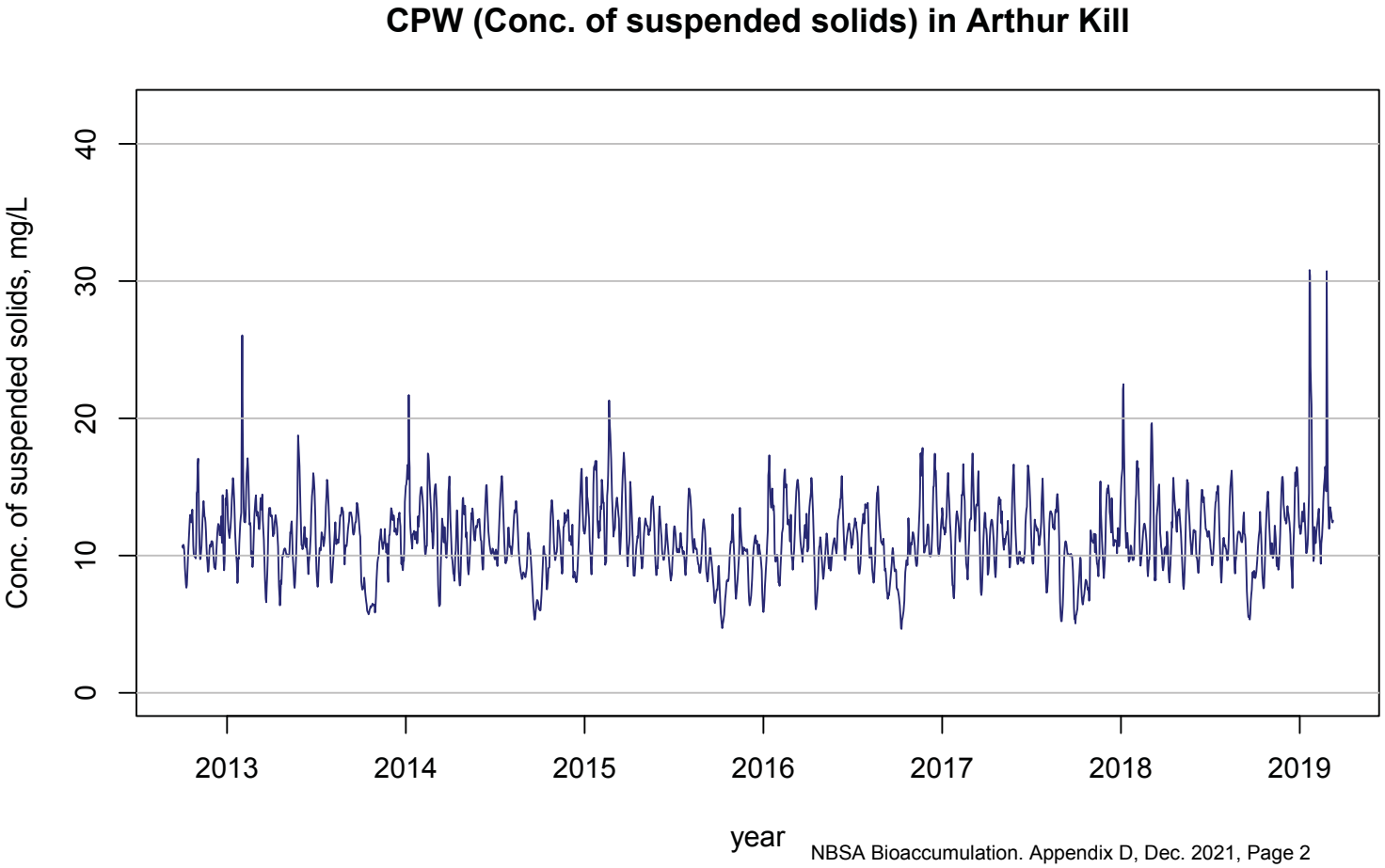
APPENDIX D: MODEL LINKAGE INPUTS—OFF-SITE LOCATIONS

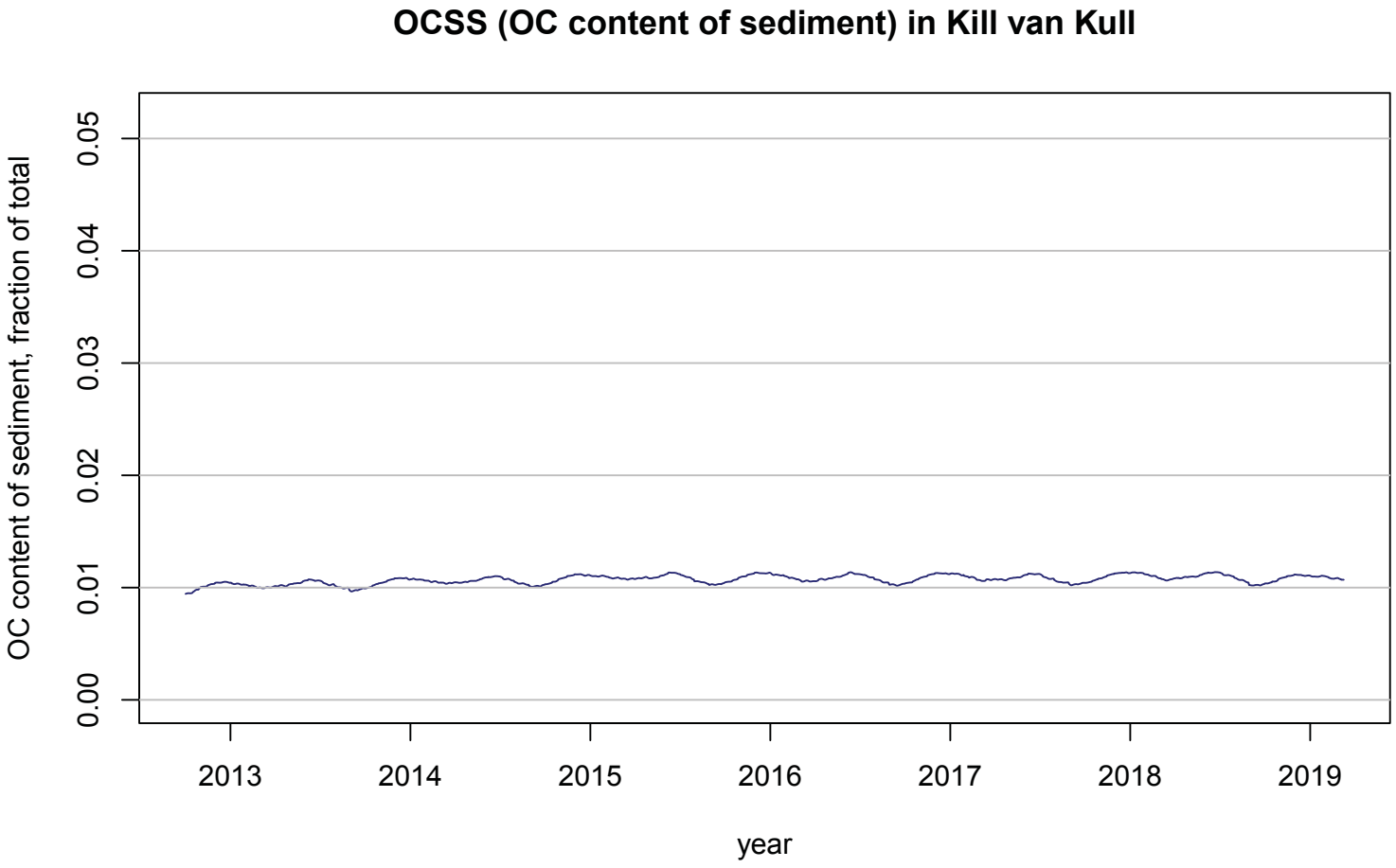
CFT Model linkage data for representative off-site locations represented in the CFT model are presented, first for Kill Van Kull and Arthur Kill and then for the two Lower Passaic River segments included:

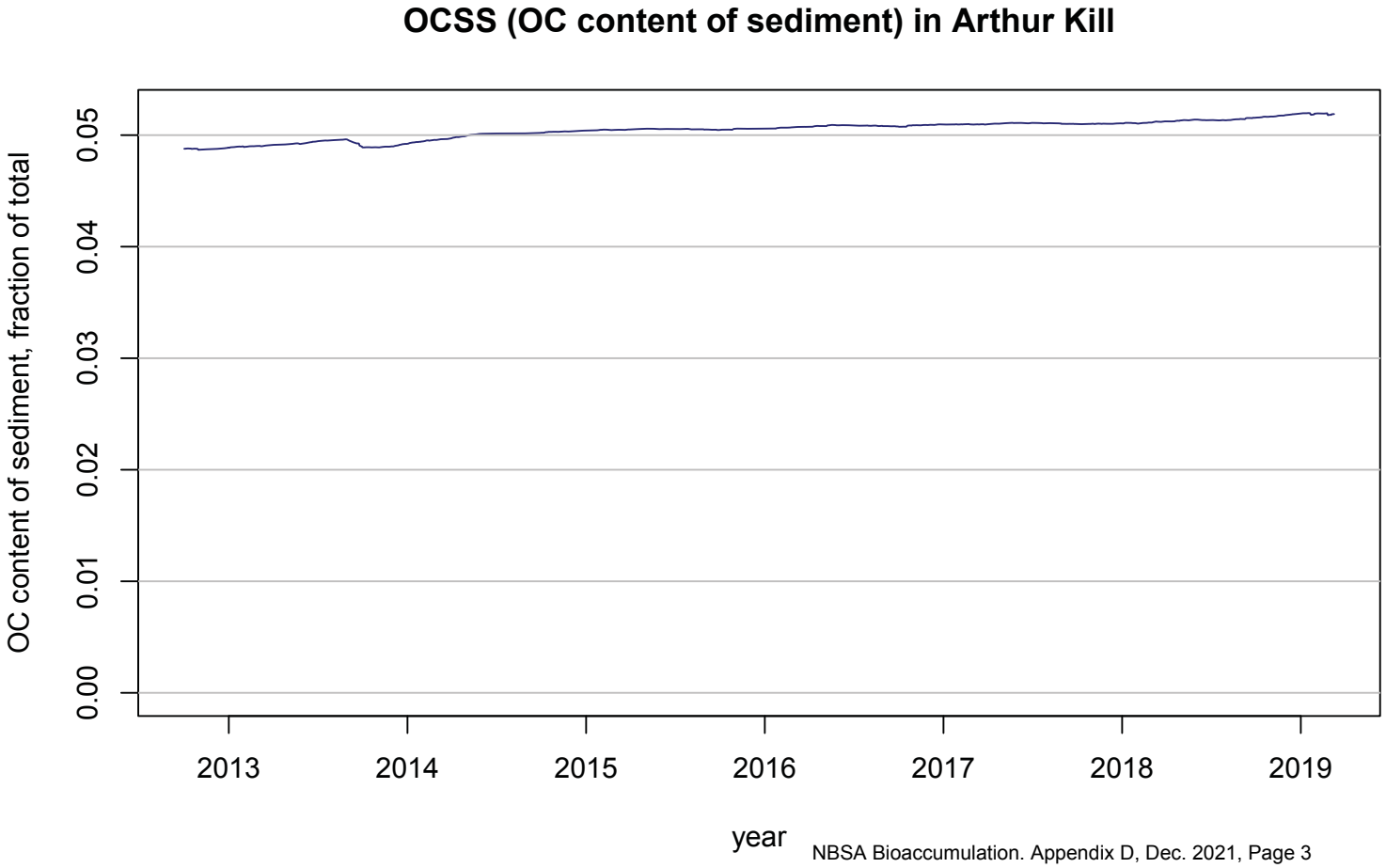

TW (Temperature) in Kill van Kull
Temperature, °C
0
5
10
15
20
25
2013
2014
2015
2016
2017
2018
2019
year


TW (Temperature) in Arthur Kill
Temperature, °C
0
5
10
15
20
25
2013
2014
2015
2016
2017
2018
2019
year

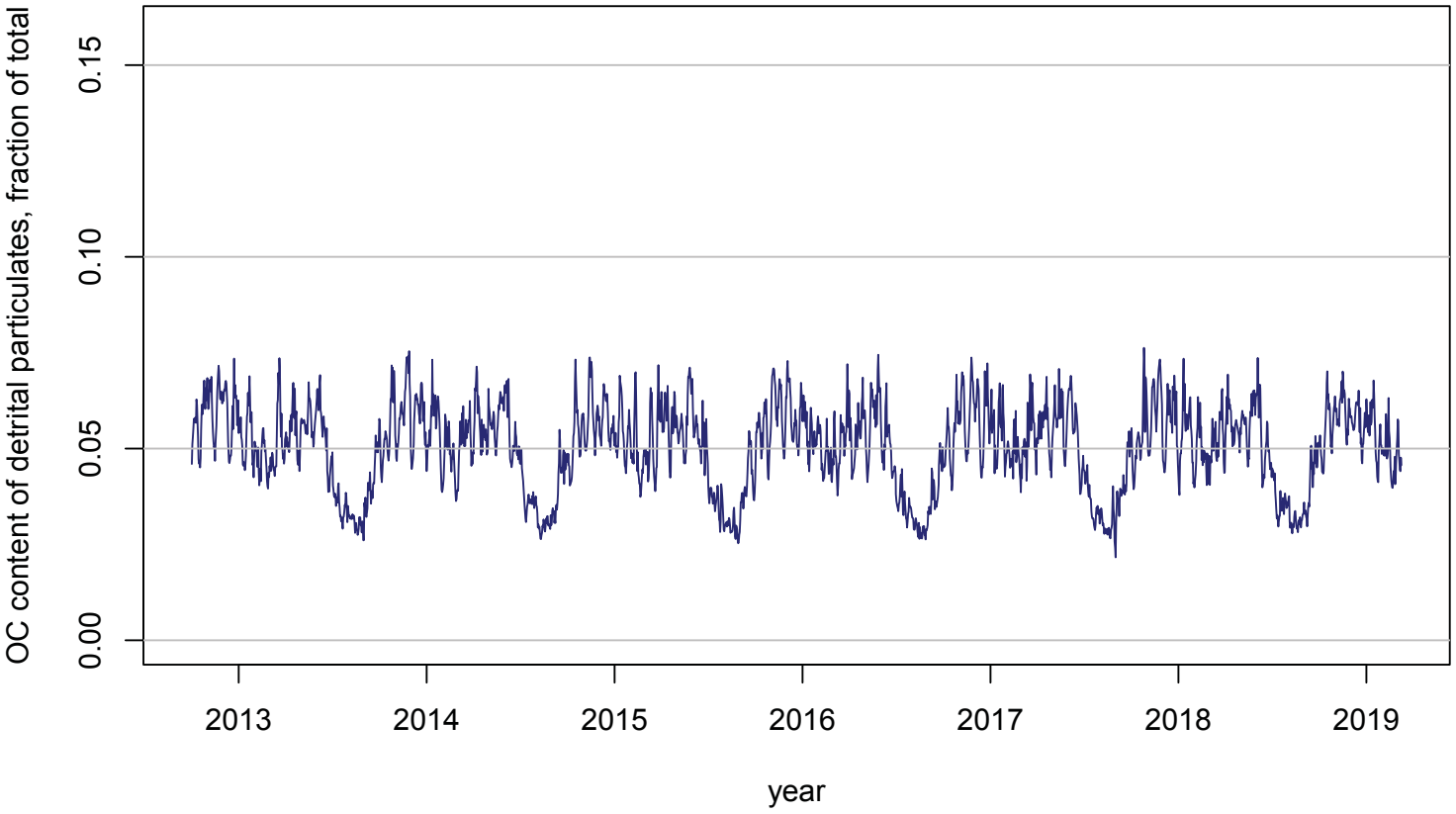

CPW (Conc. of suspended solids) in Kill van Kull
Conc. of suspended solids, mg/L
0
10
20
30
40
2013
2014
2015
2016
2017
2018
2019
year


CPW (Conc. of suspended solids) in Arthur Kill
Conc. of suspended solids, mg/L
0
10
20
30
40
2013
2014
2015
2016
2017
2018
2019
year

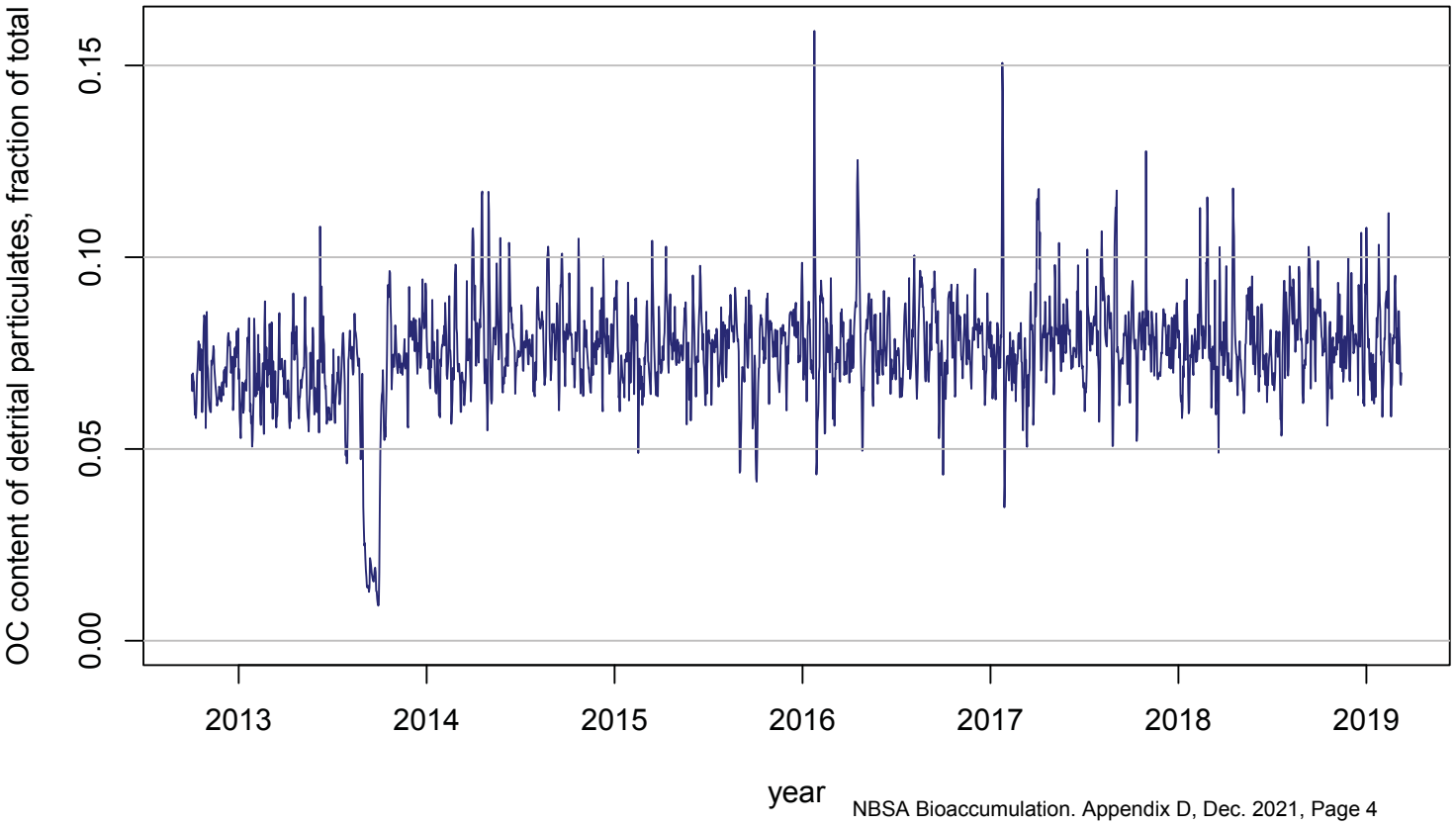

OCSS (OC content of sediment) in Kill van Kull
OC content of sediment, fraction of total
0.00
0.01
0.02
0.03
0.04
0.05
2013
2014
2015
2016
2017
2018
2019
year

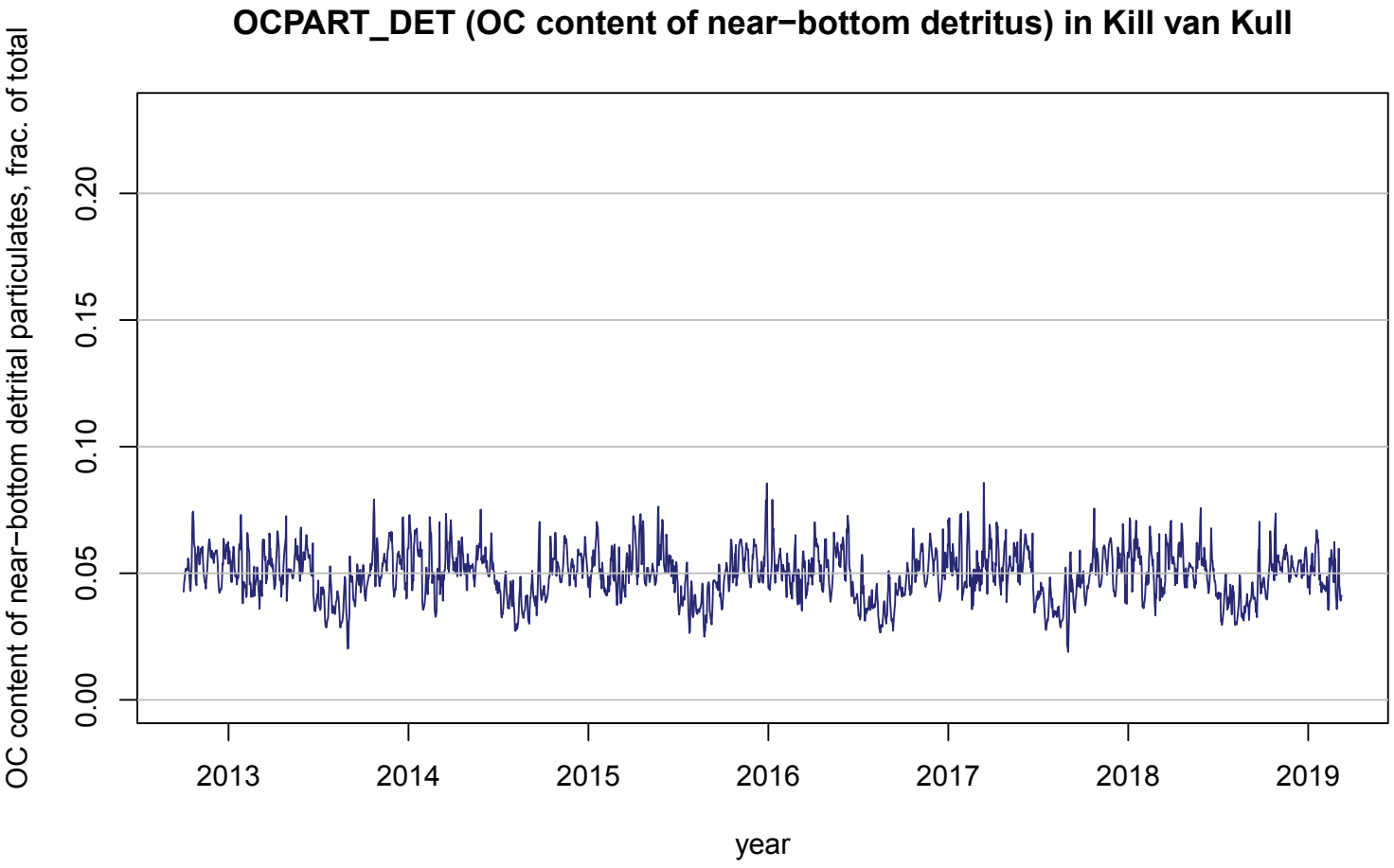

OCSS (OC content of sediment) in Arthur Kill
OC content of sediment, fraction of total
0.00
0.01
0.02
0.03
0.04
0.05
2013
2014
2015
2016
2017
2018
2019
year

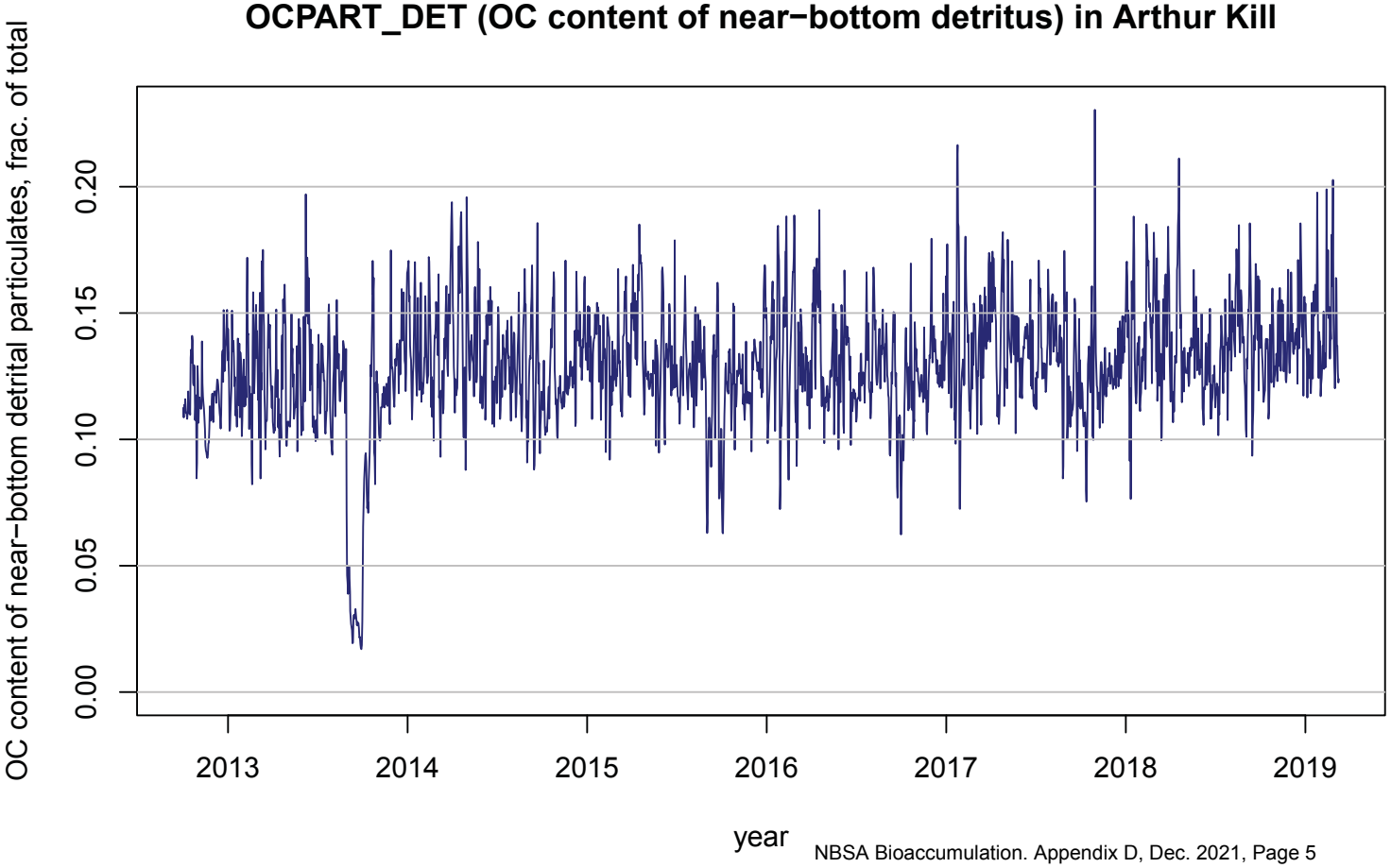
OCPART (OC content of detrital particulates) in Kill van Kull



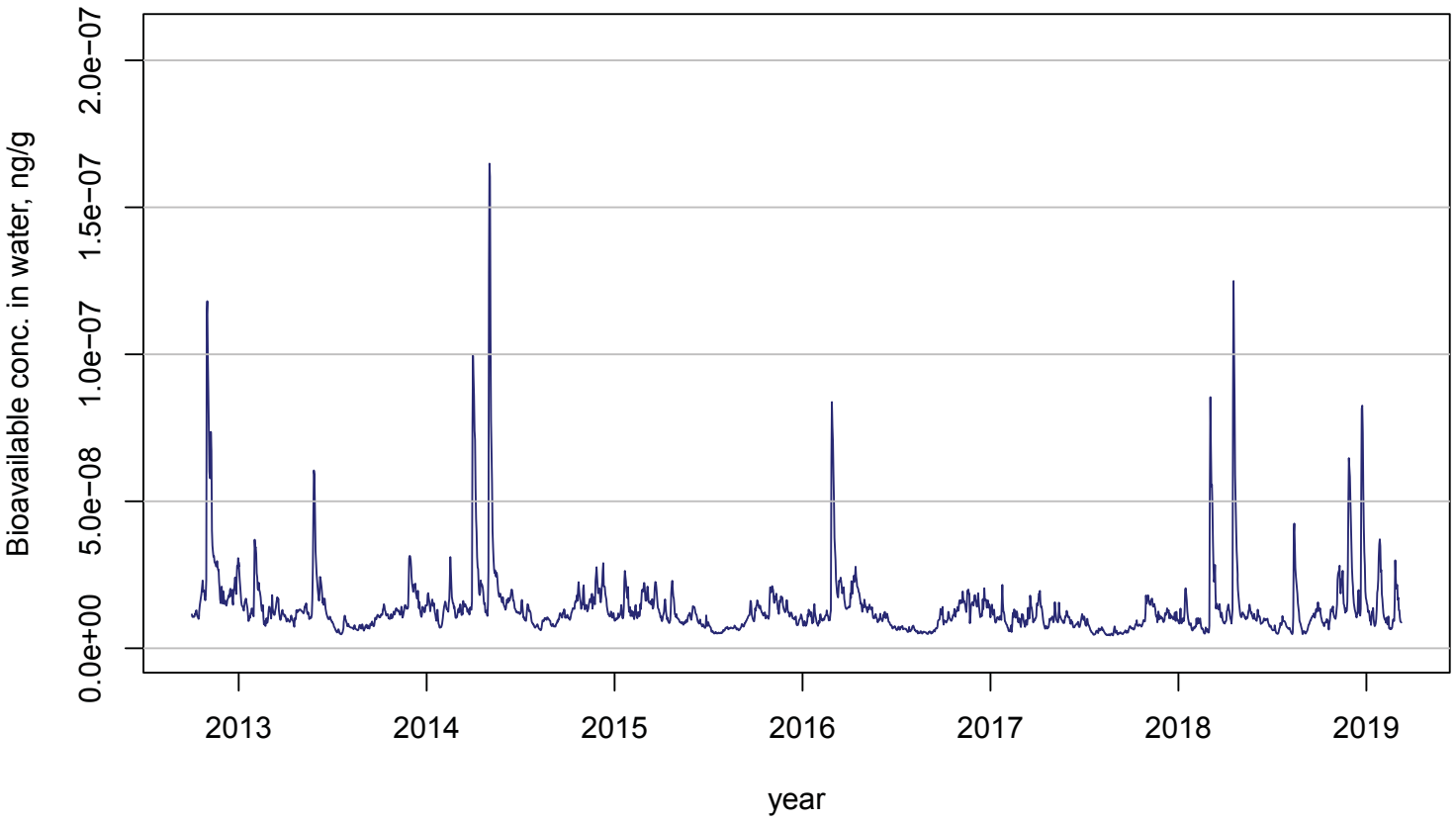
OCPART (OC content of detrital particulates) in Arthur Kill



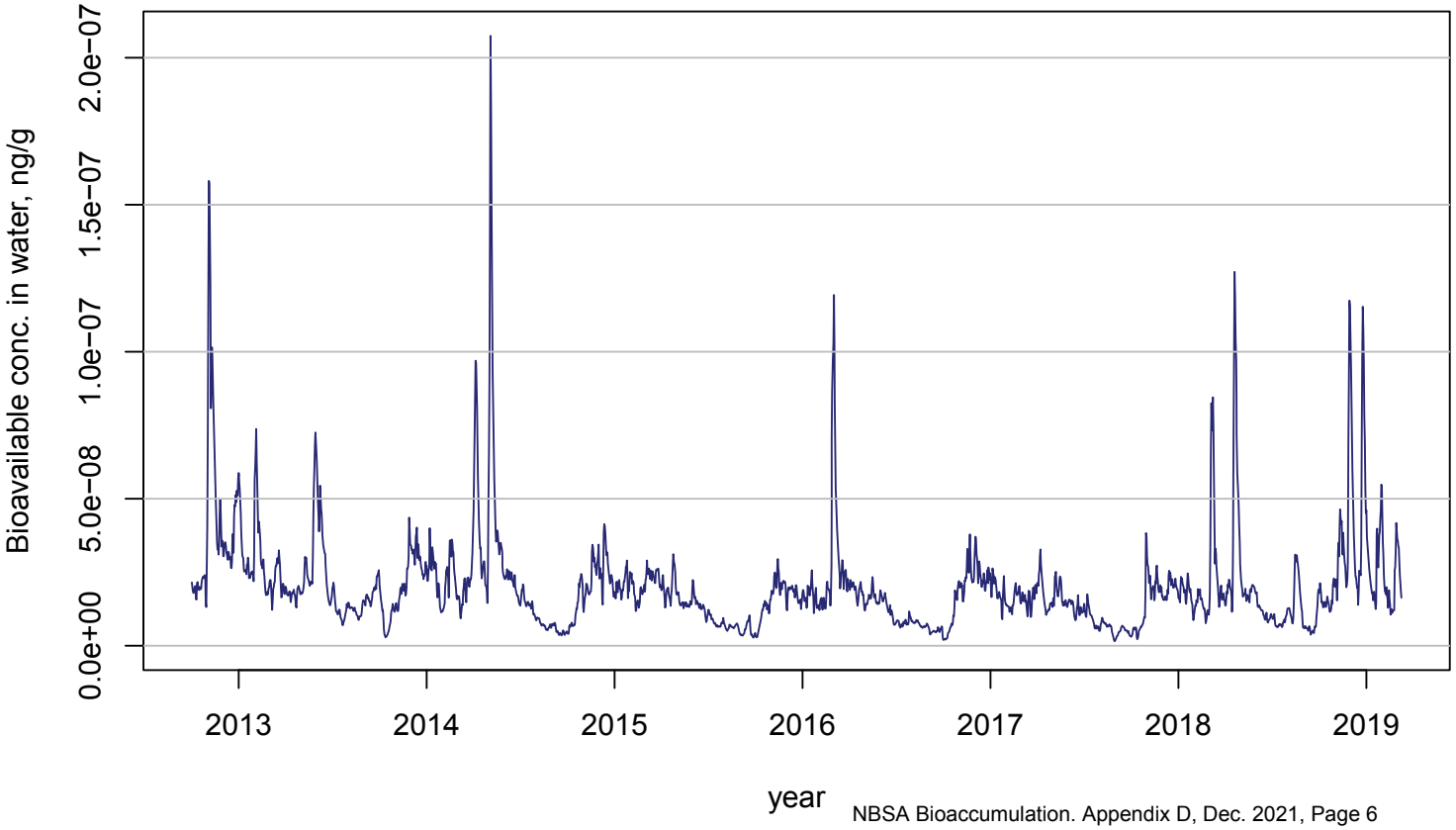

OCPART_DET (OC content of near−bottom detritus) in Kill van Kull
OC content of near−bottom detrital particulates, frac. of total
0.00
0.05
0.10
0.15
0.20
2013
2014
2015
2016
2017
2018
2019
year


OCPART_DET (OC content of near−bottom detritus) in Arthur Kill
OC content of near−bottom detrital particulates, frac. of total
0.00
0.05
0.10
0.15
0.20
2013
2014
2015
2016
2017
2018
2019
year

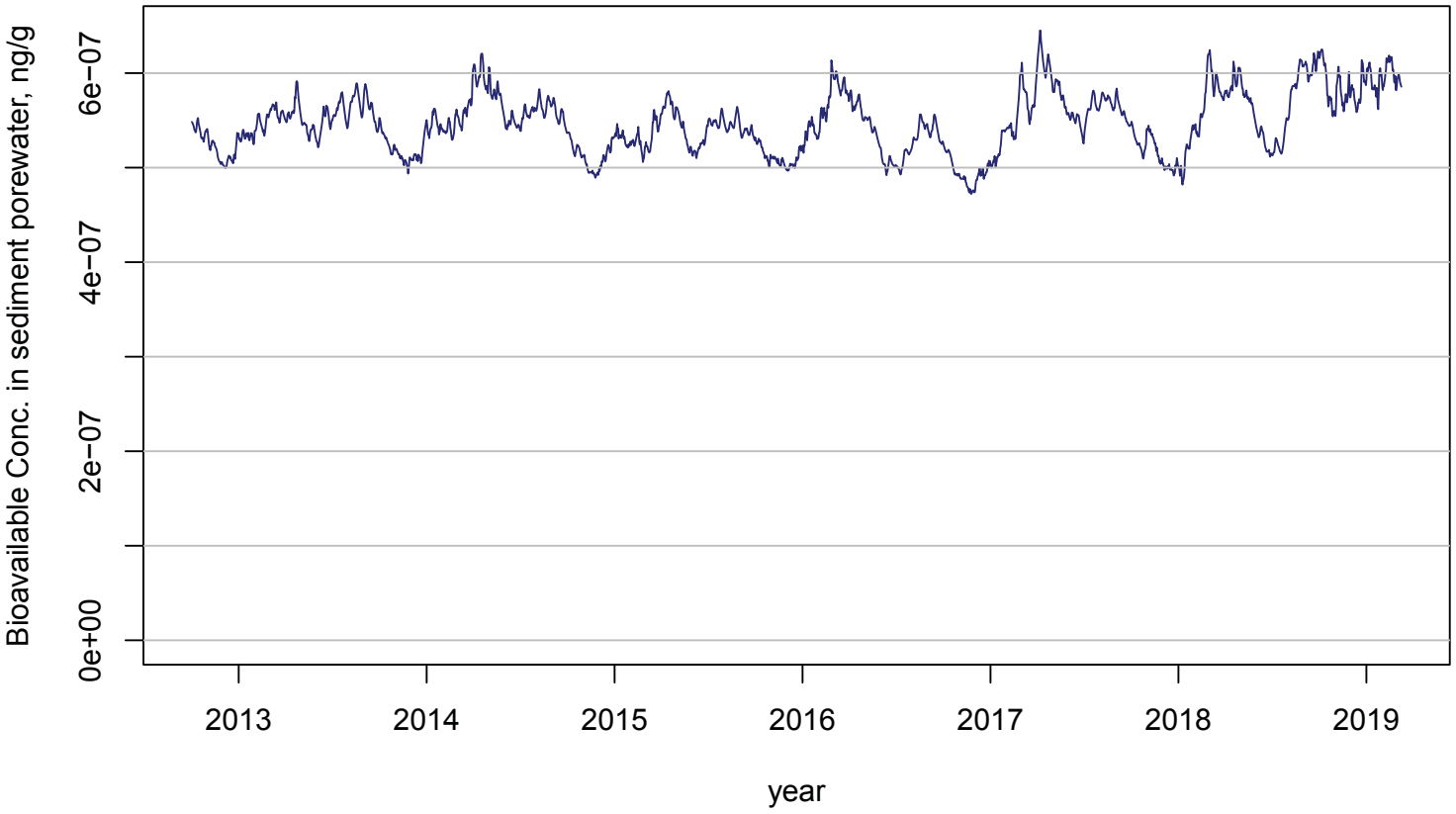
2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in Kill van Kull



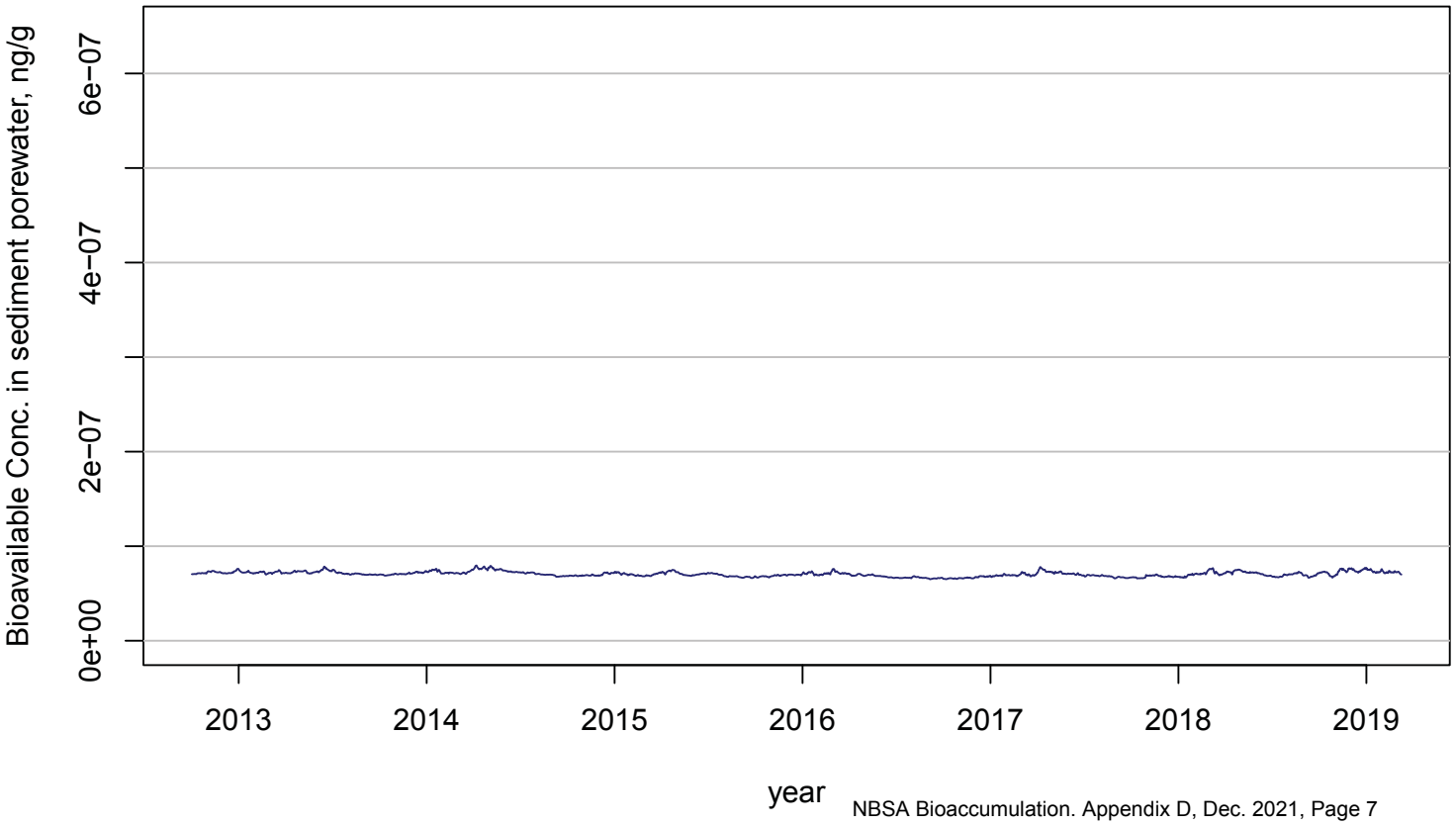
2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in Arthur Kill



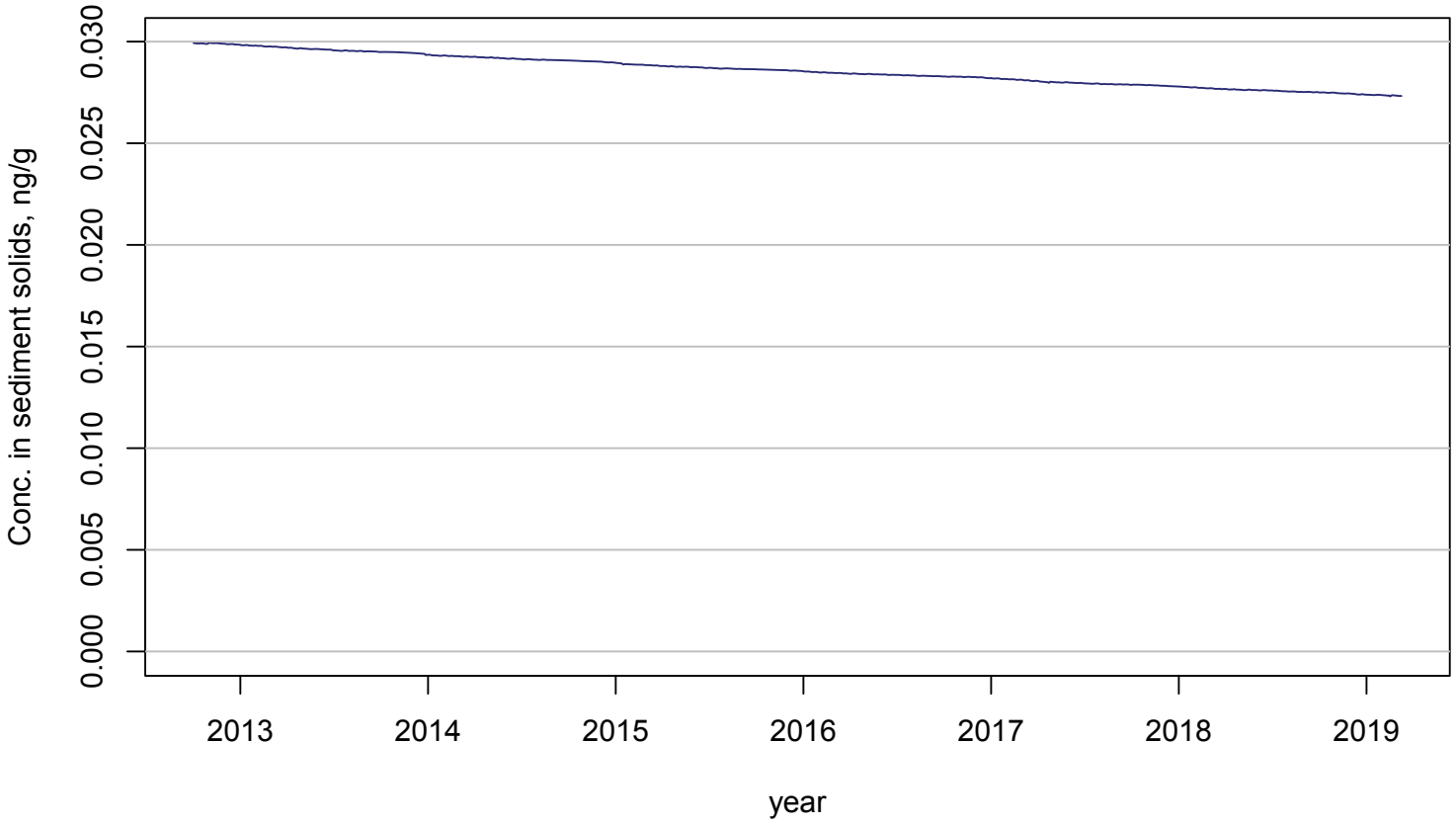
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in Kill van Kull



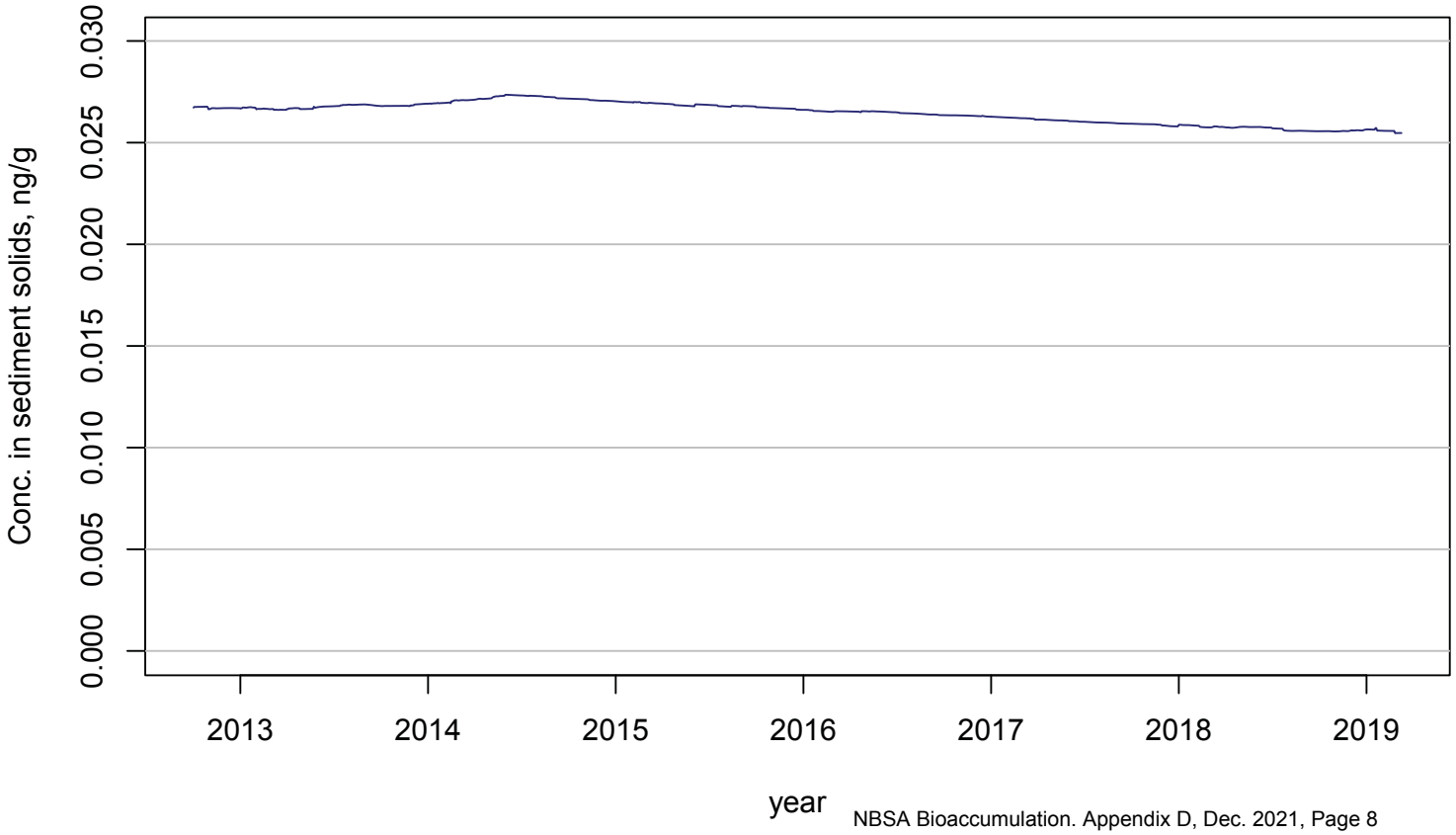
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in Arthur Kill



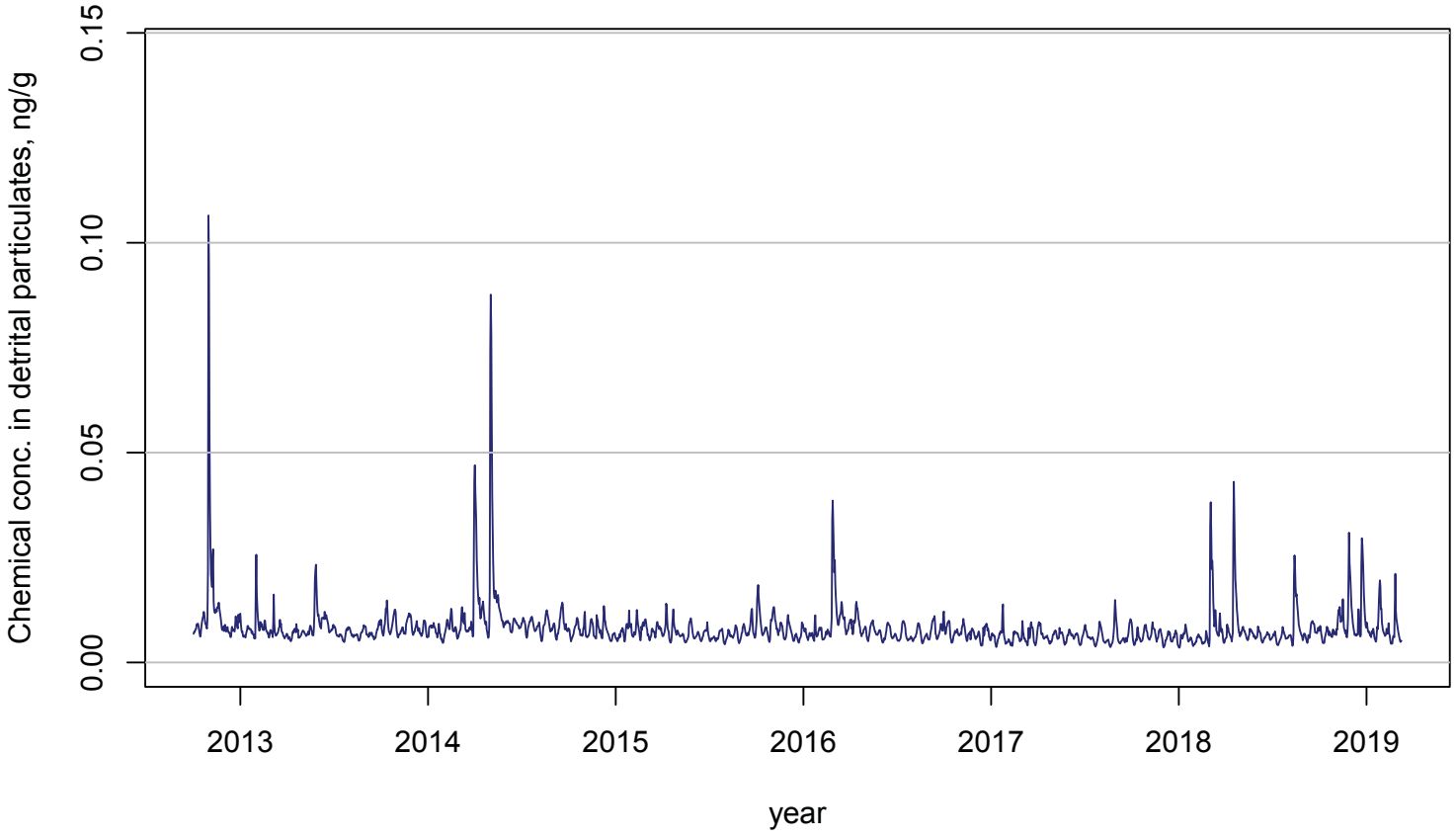
2,3,7,8−TCDD, CST (Conc. in sediment solids) in Kill van Kull



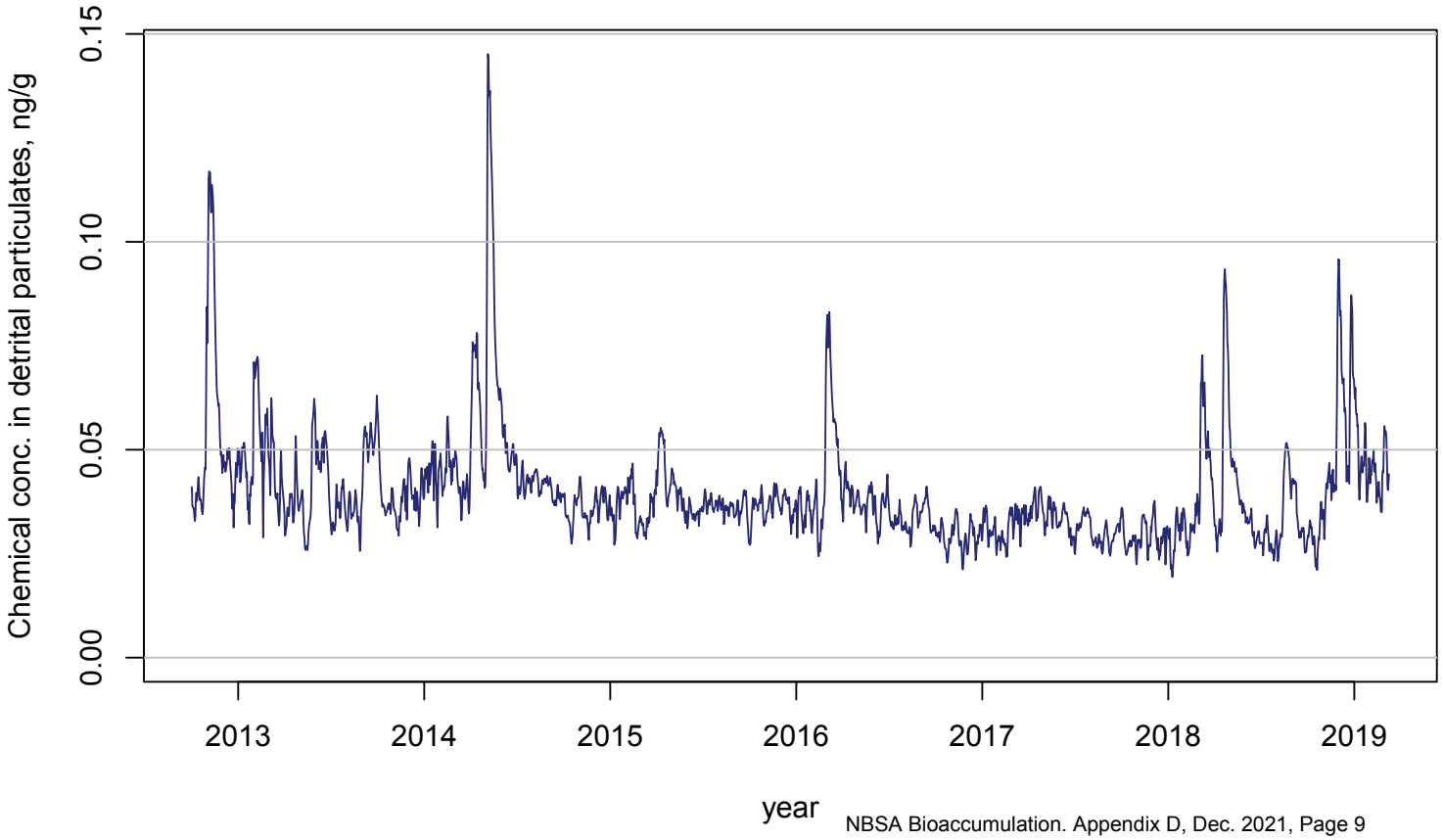
2,3,7,8−TCDD, CST (Conc. in sediment solids) in Arthur Kill



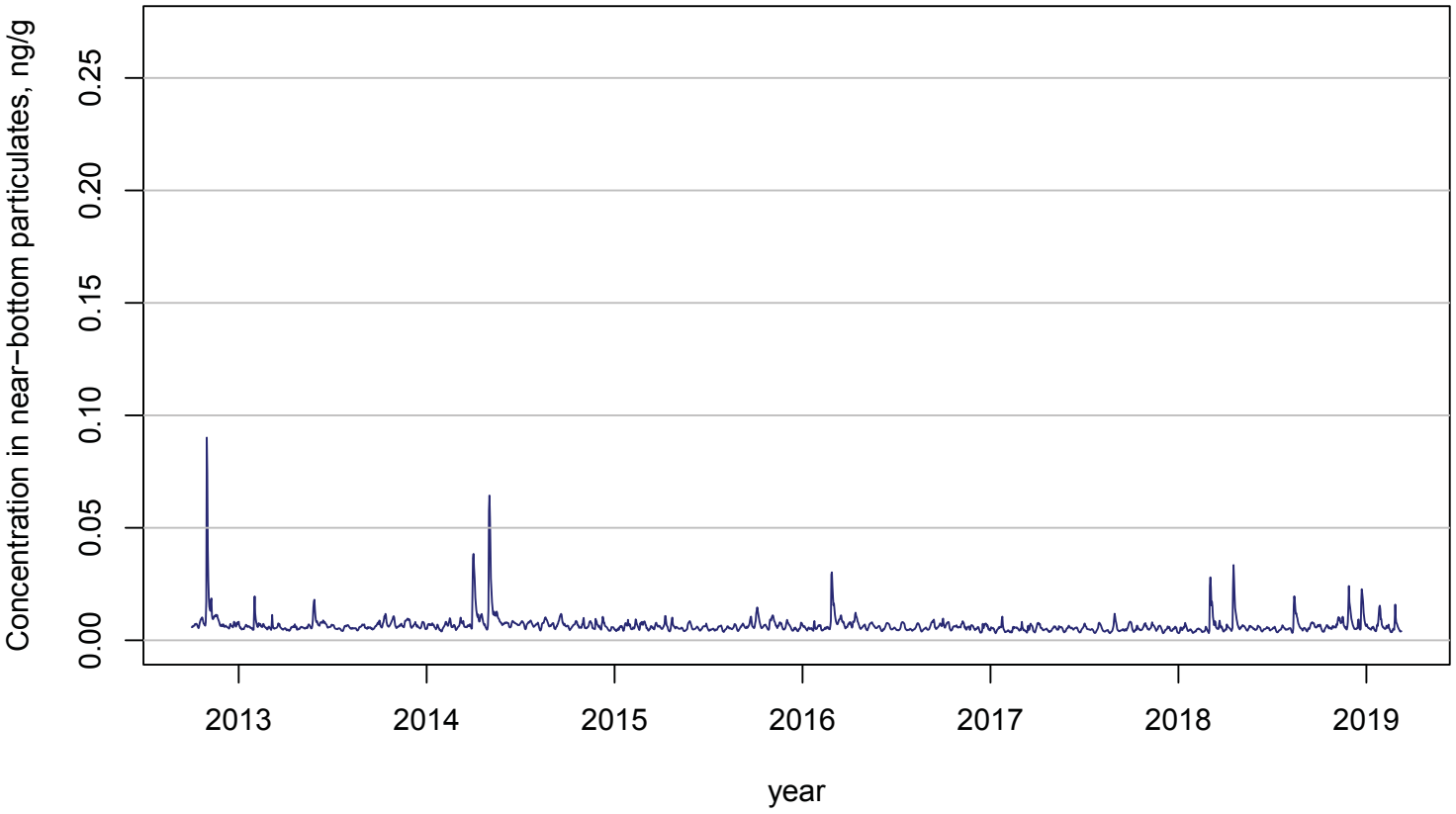
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in Kill van Kull



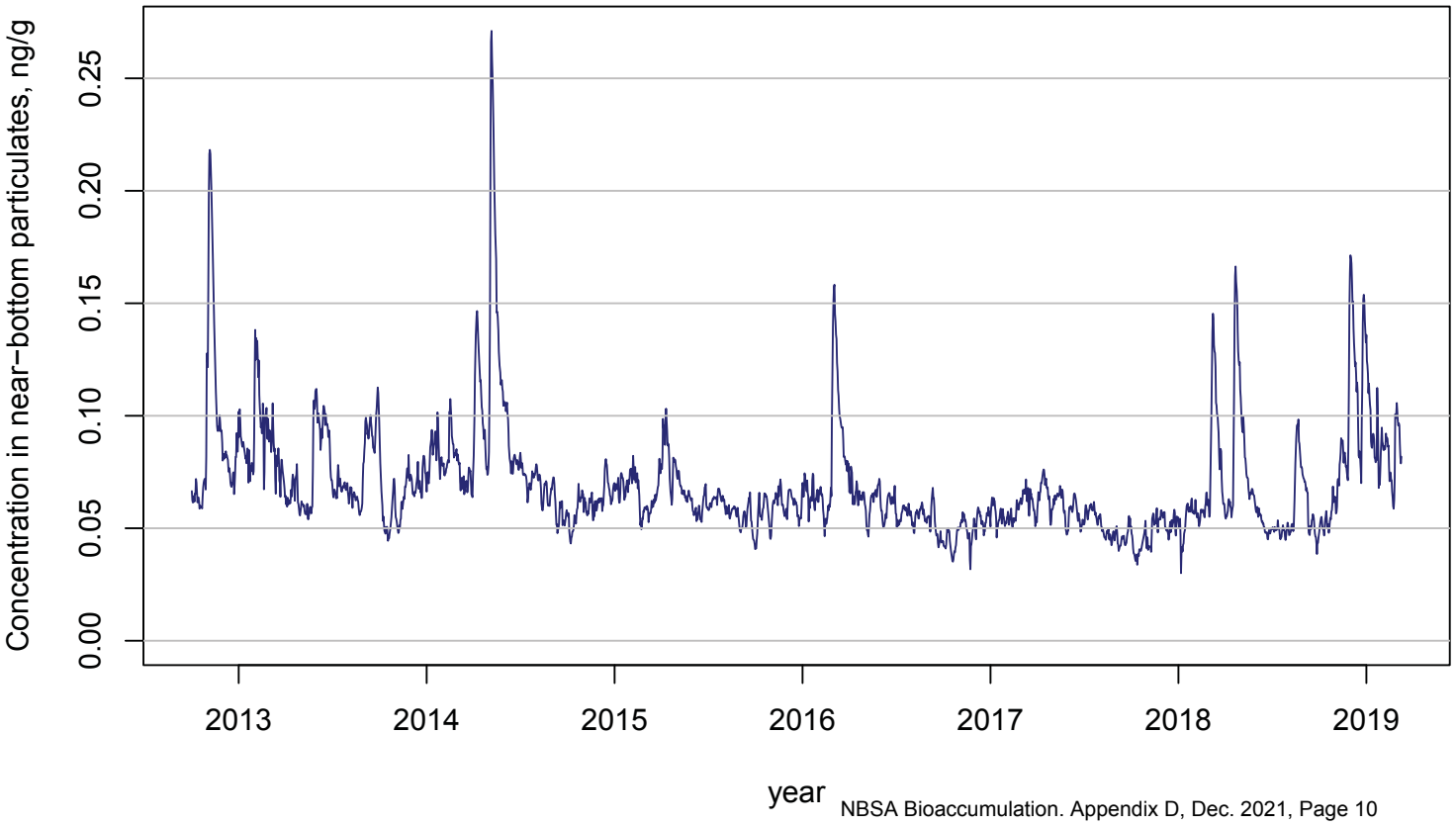
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in Arthur Kill



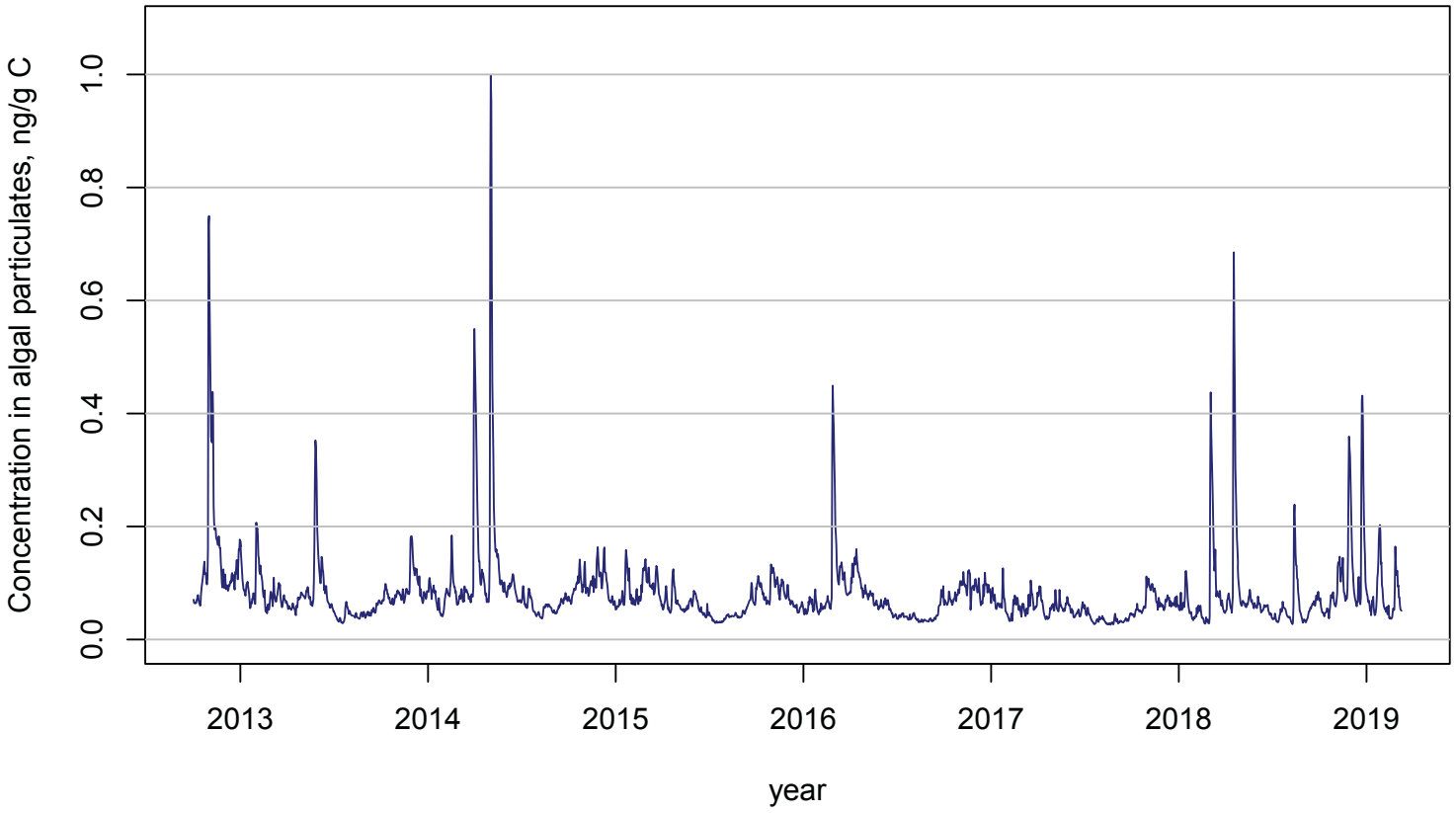
2,3,7,8−TCDD, CPART_DET (Concentration in near−bottom particulates) in Kill van Kull



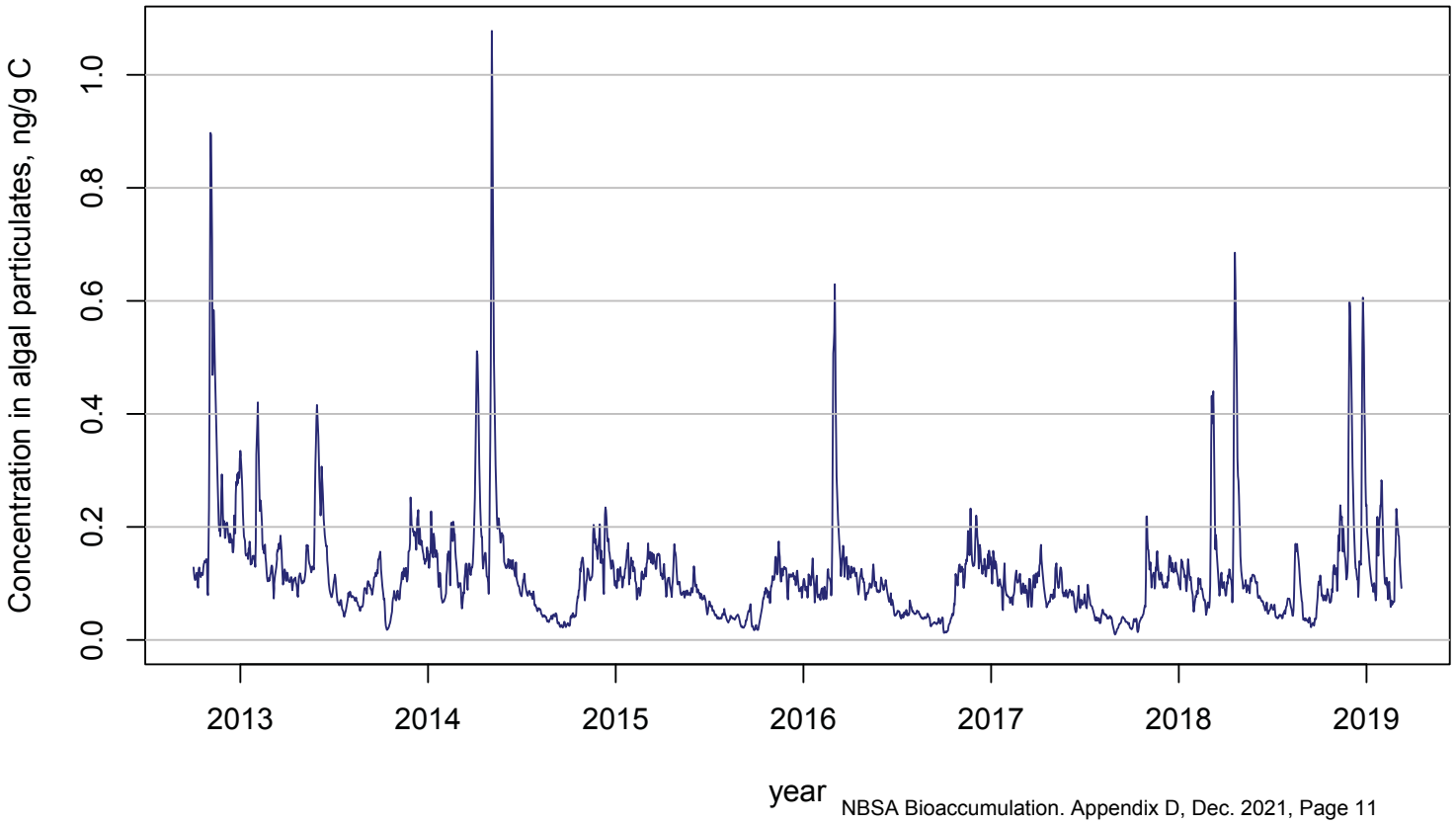
2,3,7,8−TCDD, CPART_DET (Concentration in near−bottom particulates) in Arthur Kill

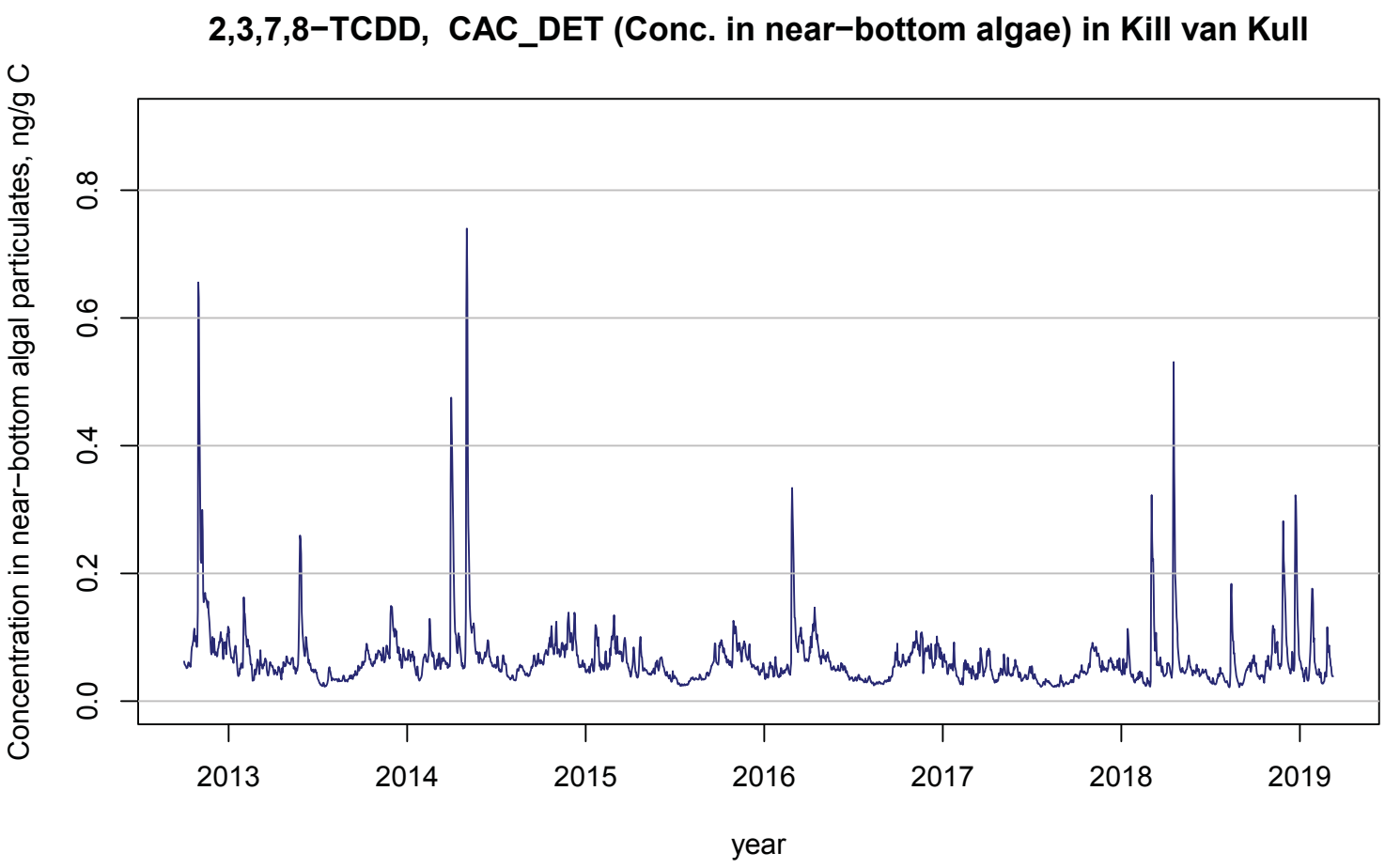


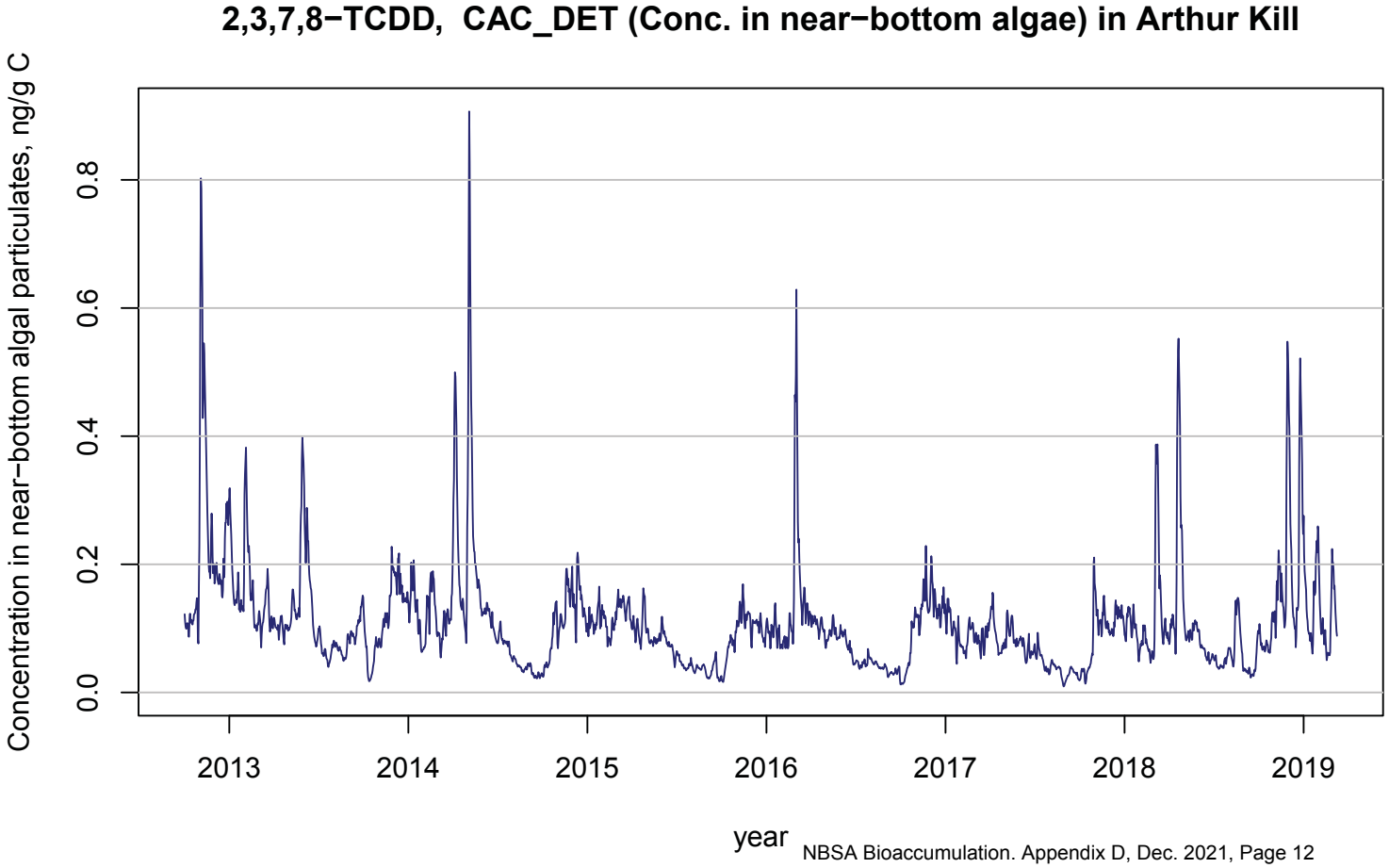
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in Kill van Kull



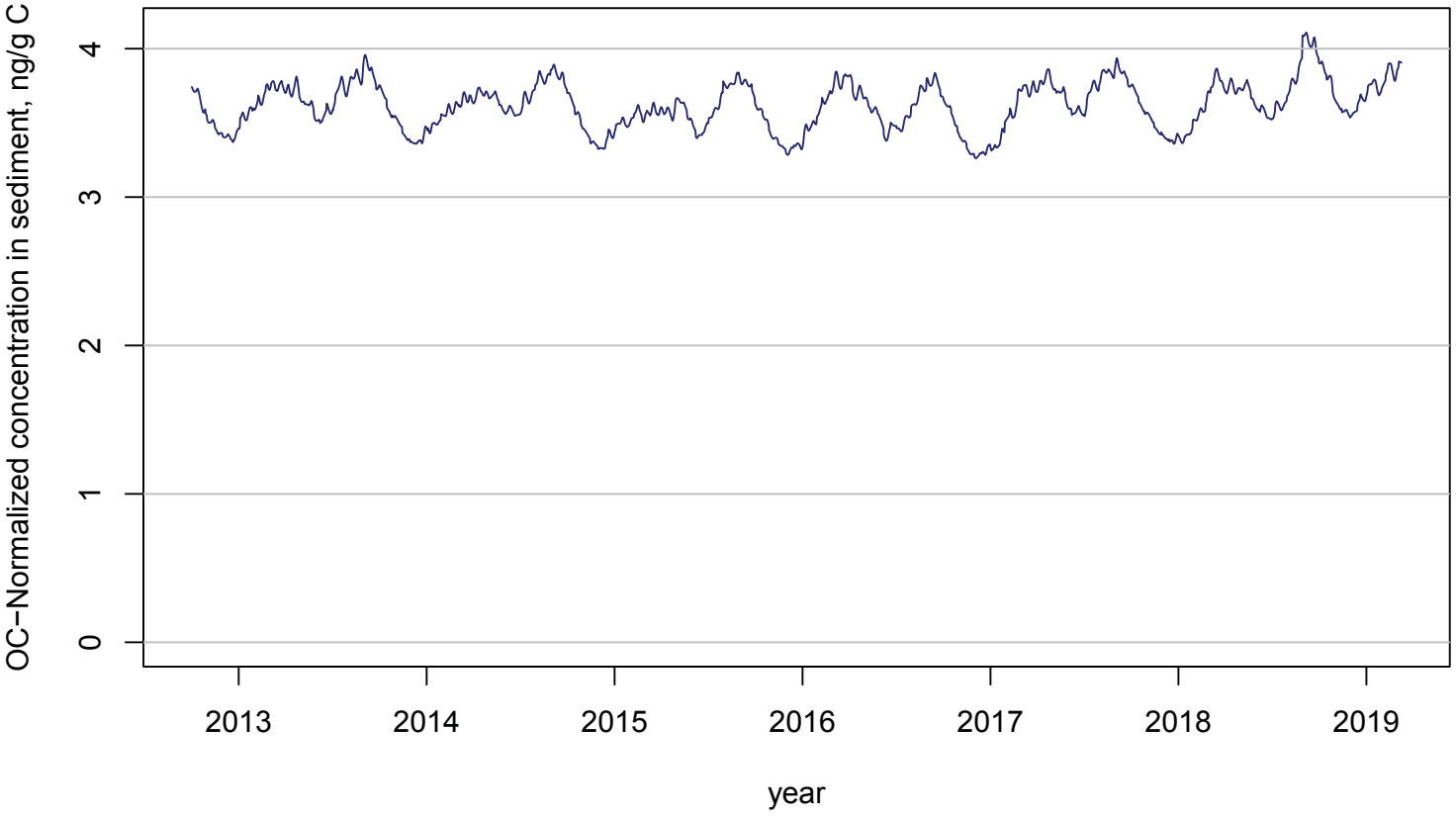
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in Arthur Kill



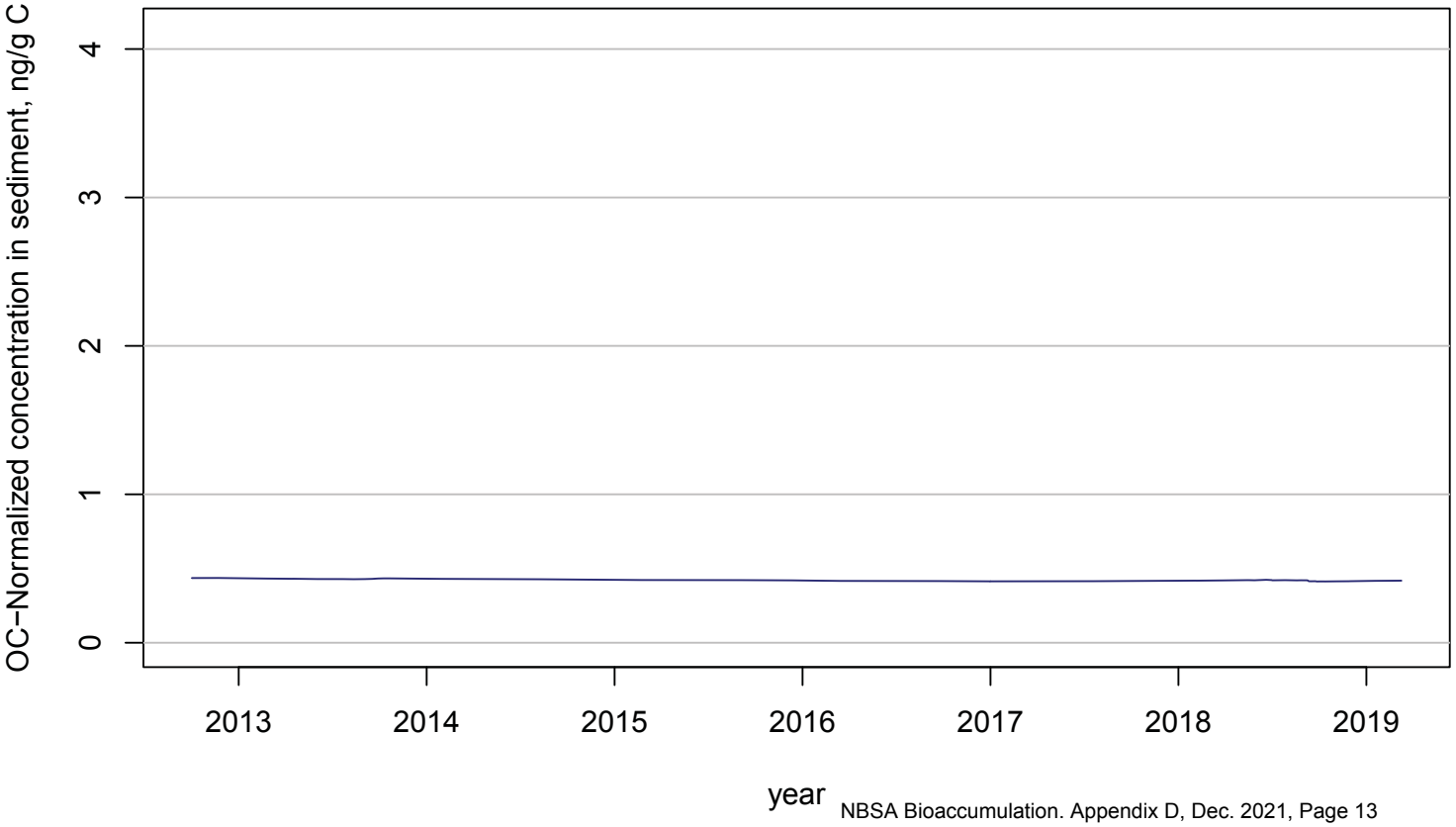

2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in Kill van Kull
Concentration in near−bottom algal particulates, ng/g C
0.0
0.2
0.4
0.6
0.8
2013
2014
2015
2016
2017
2018
2019
year

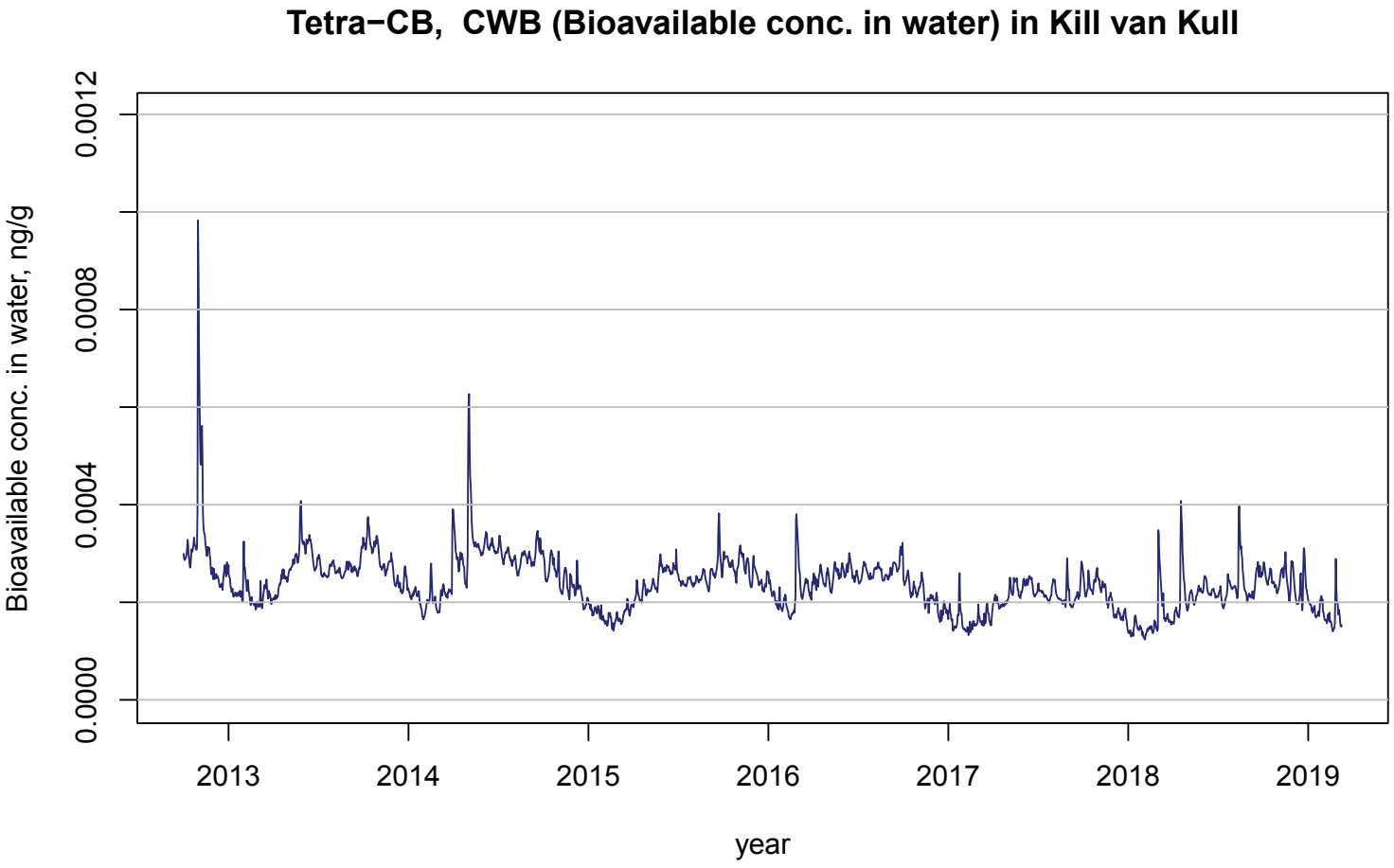

2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in Arthur Kill
Concentration in near−bottom algal particulates, ng/g C
0.0
0.2
0.4
0.6
0.8
2013
2014
2015
2016
2017
2018
2019
year

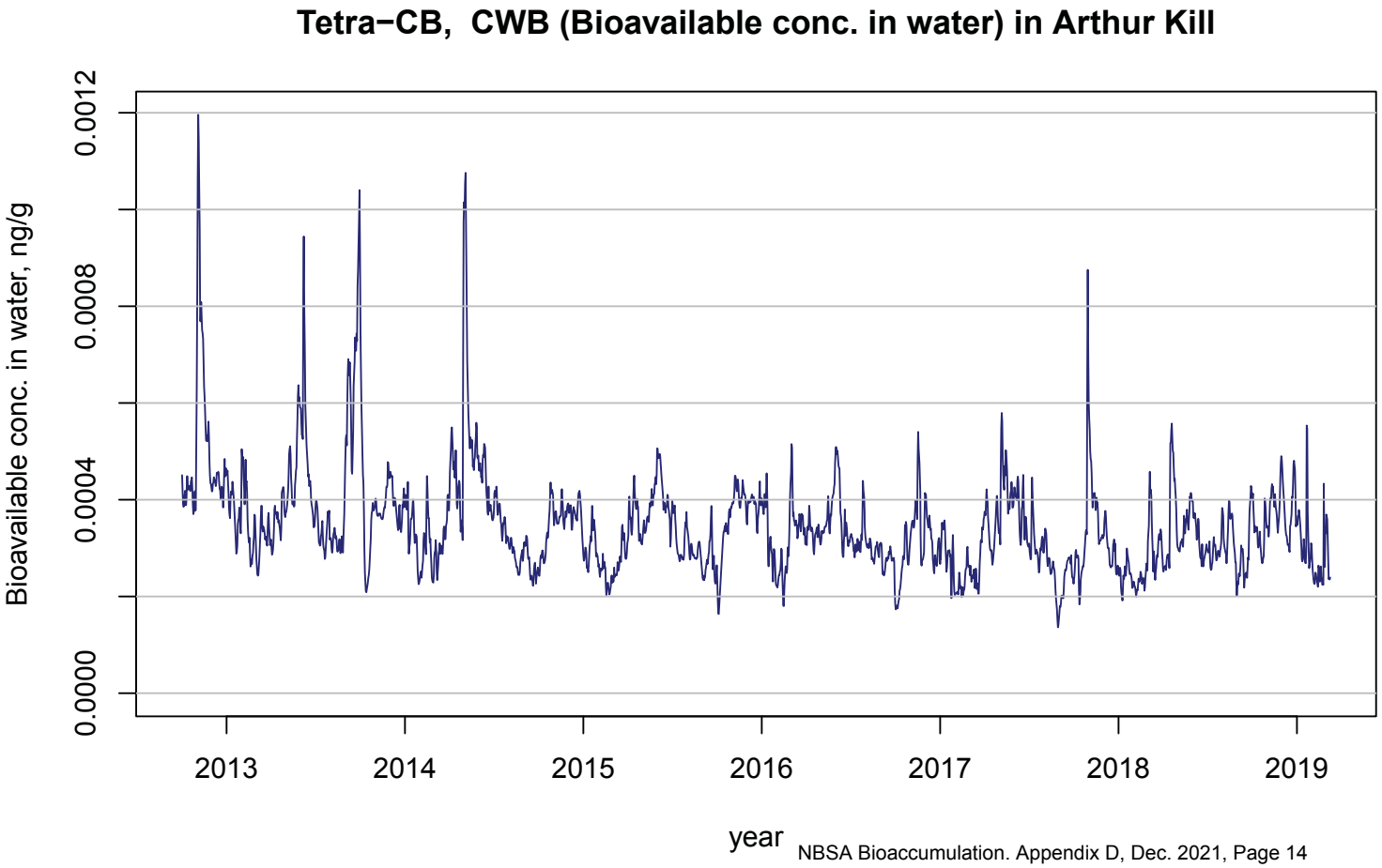
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized concentration in sediment) in Kill van Kul

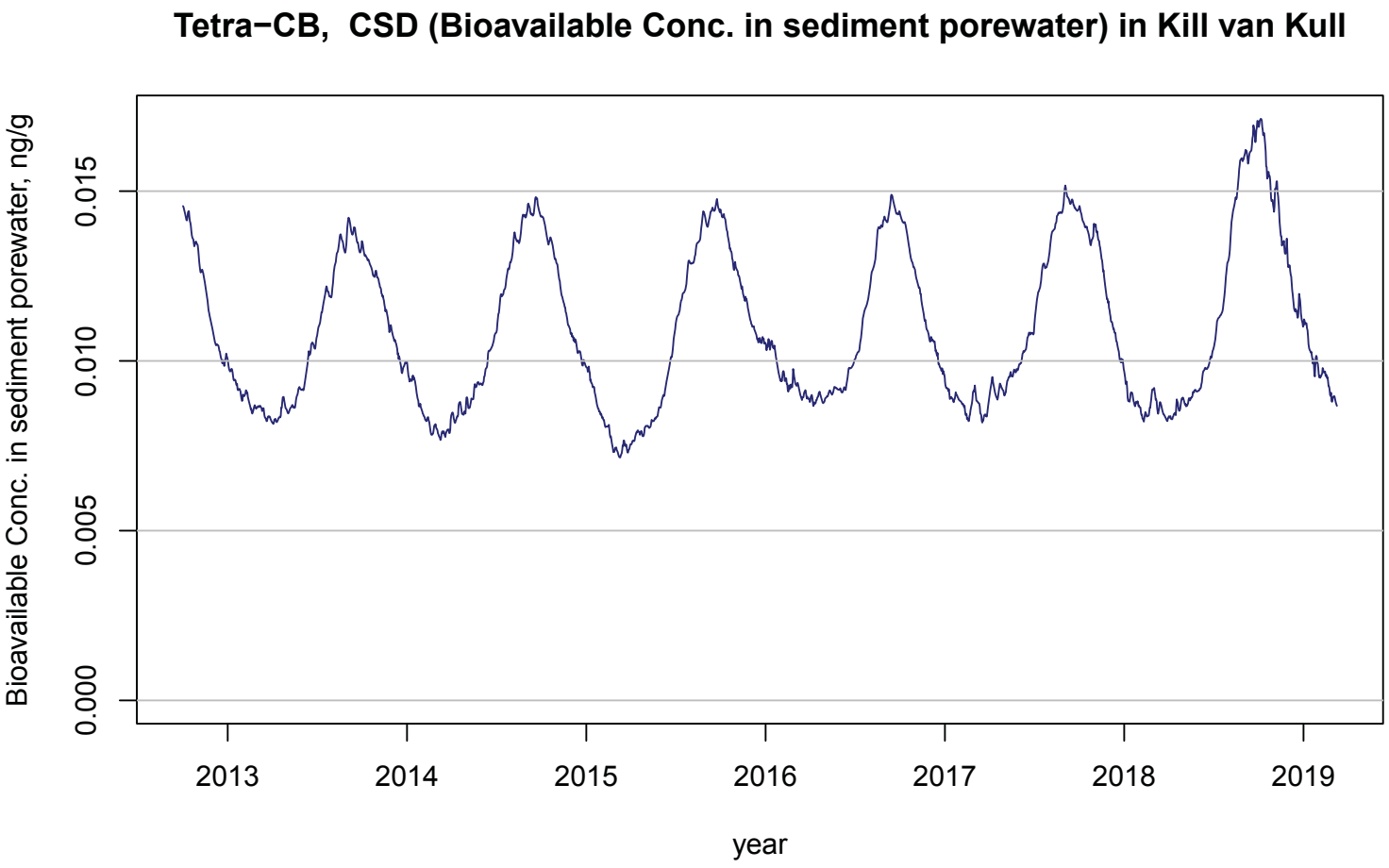


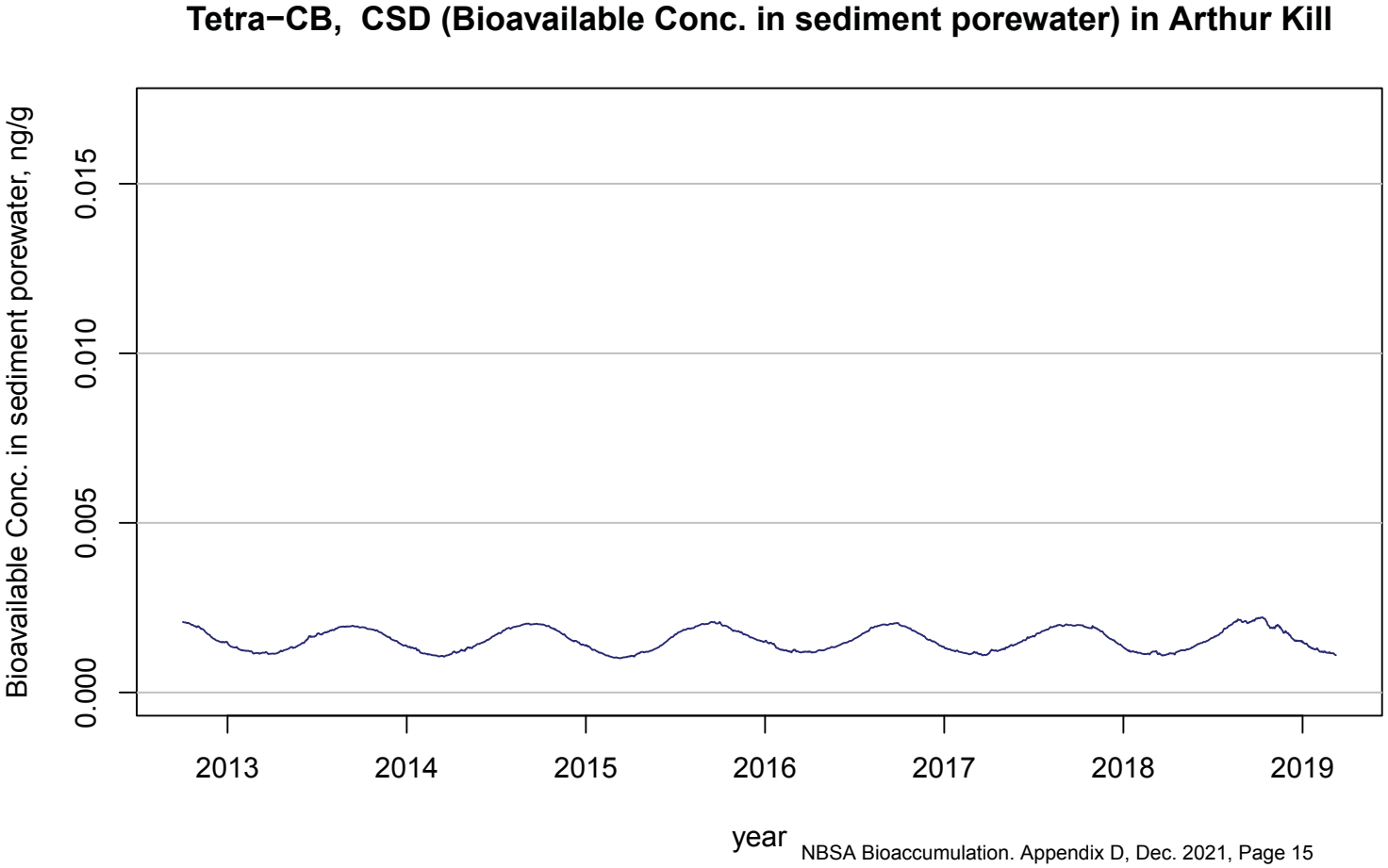
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized concentration in sediment) in Arthur Kill

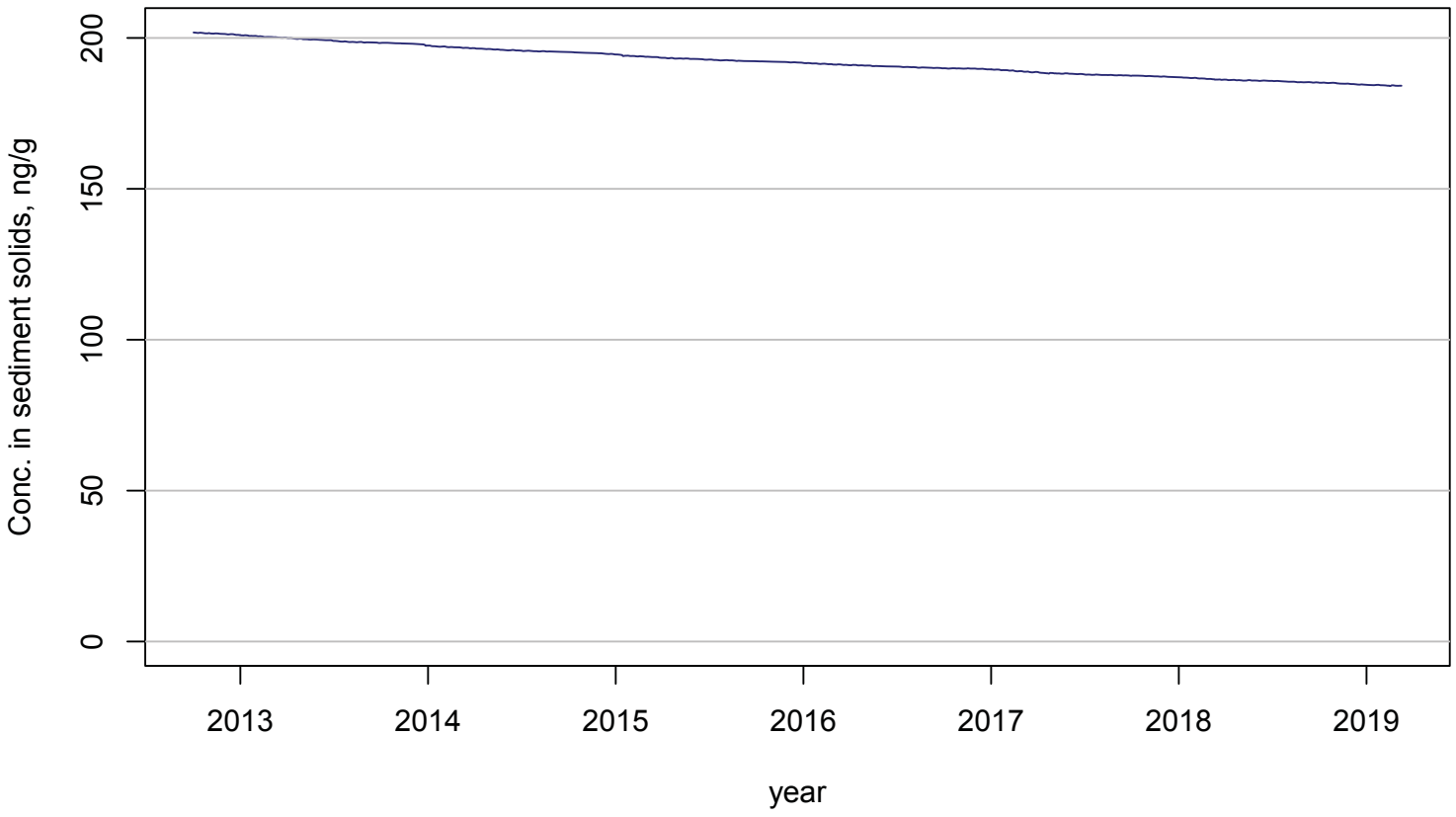


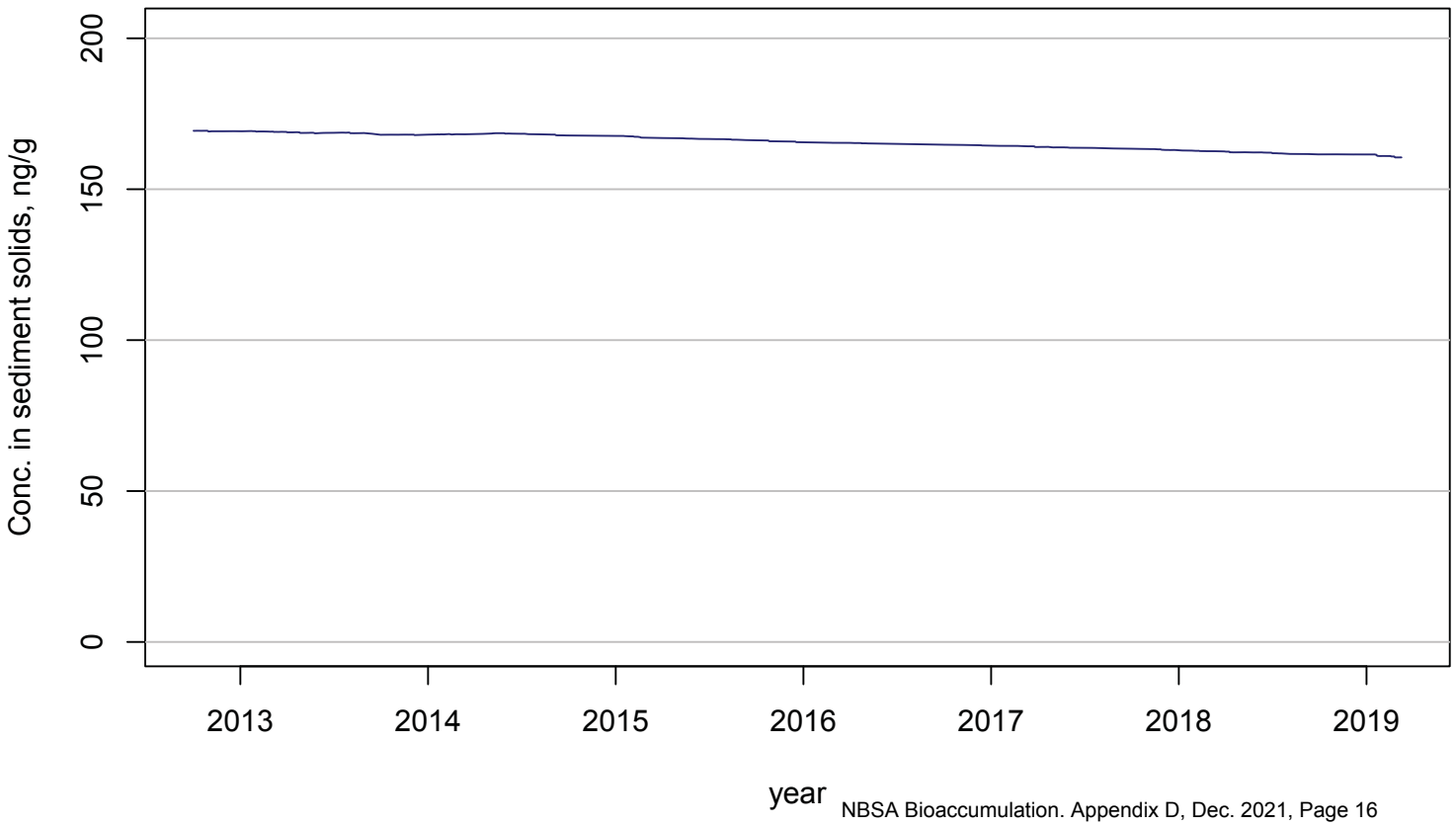

Tetra−CB, CWB (Bioavailable conc. in water) in Kill van Kull
Bioavailable conc. in water, ng/g
0.0000
0.0004
0.0008
0.0012
2013
2014
2015
2016
2017
2018
2019
year

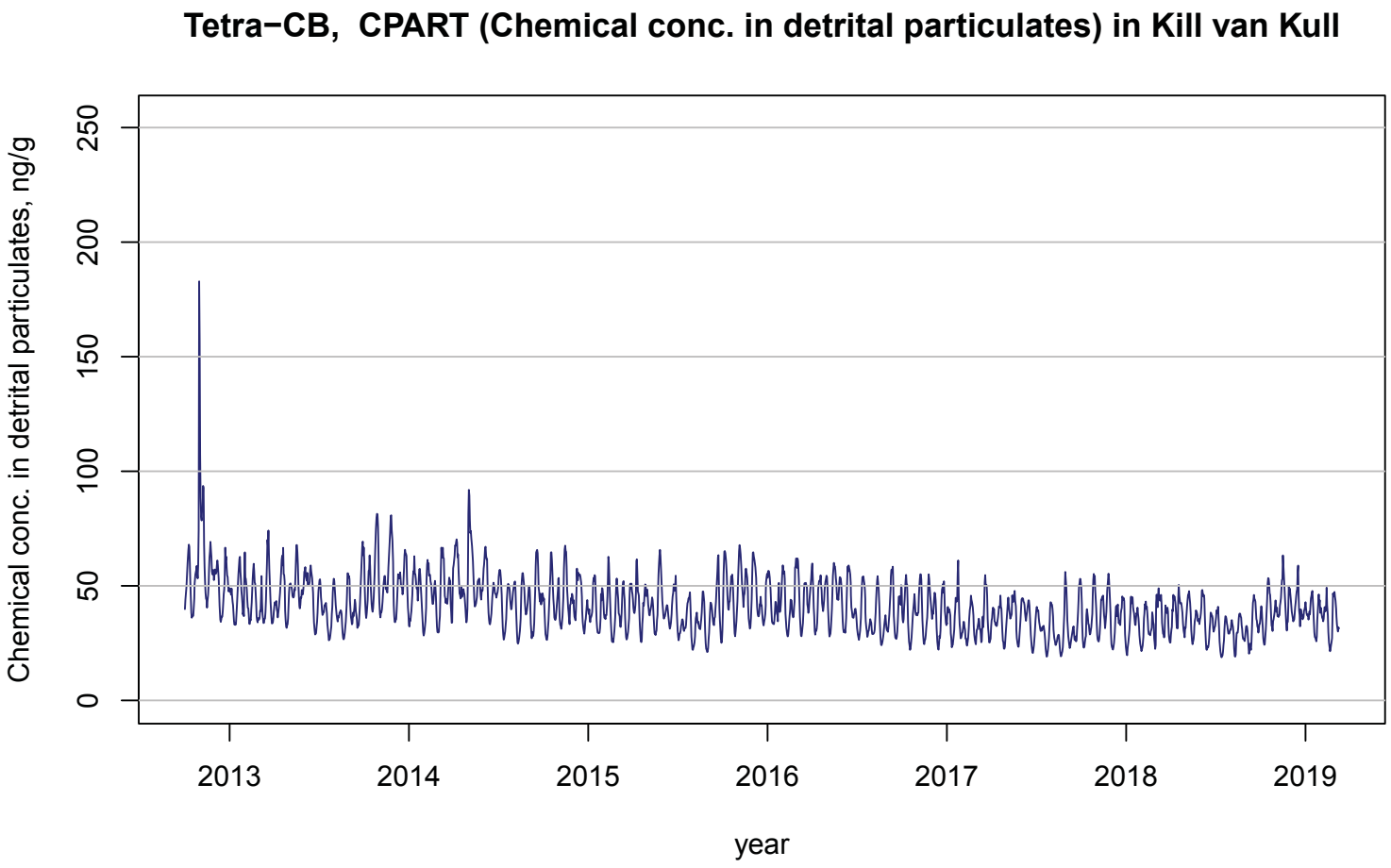

Tetra−CB, CWB (Bioavailable conc. in water) in Arthur Kill
Bioavailable conc. in water, ng/g
0.0000
0.0004
0.0008
0.0012
2013
2014
2015
2016
2017
2018
2019
year

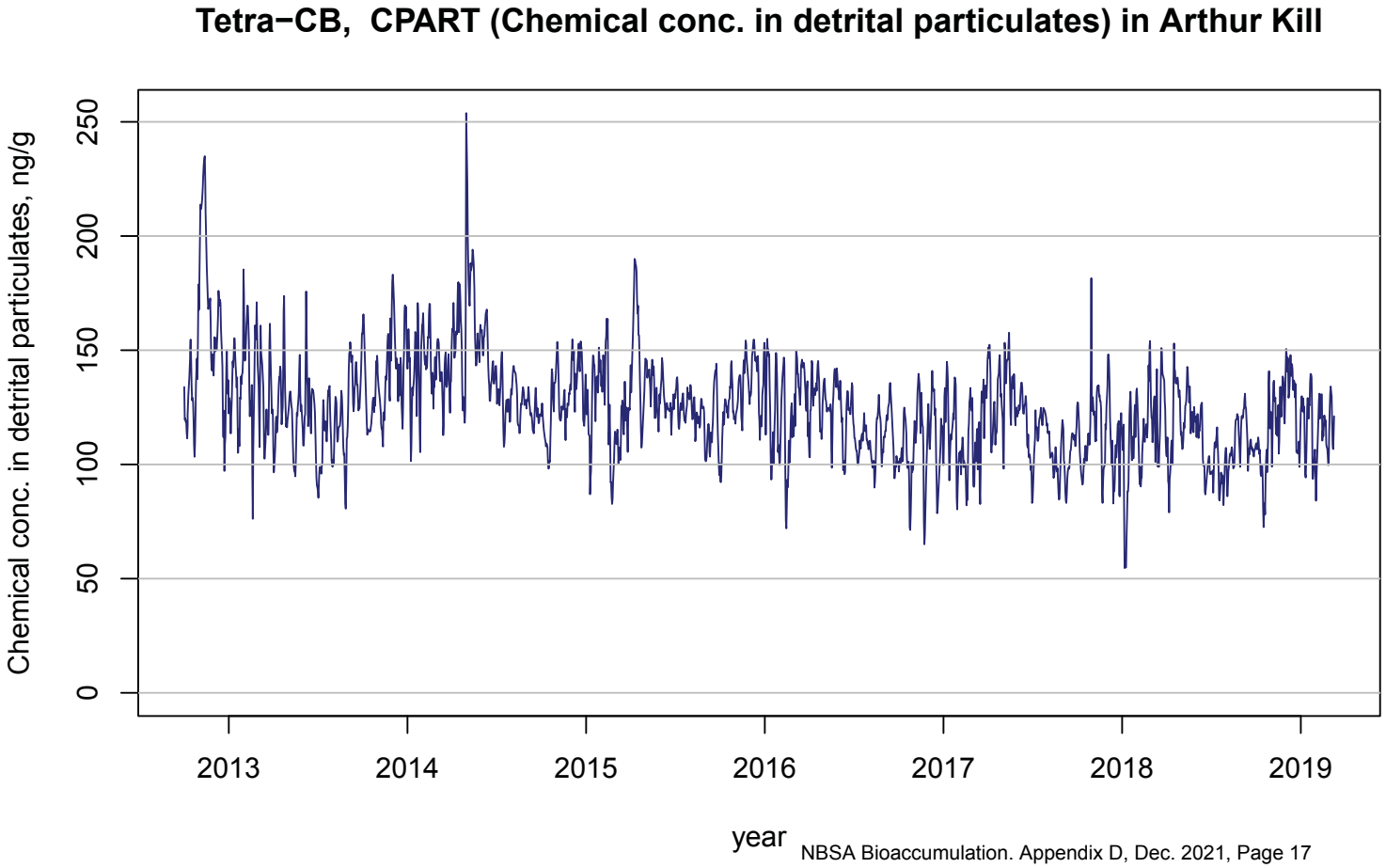

Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in Kill van Kull
Bioavailable Conc. in sediment porewater, ng/g
0.000
0.005
0.010
0.015
2013
2014
2015
2016
2017
2018
2019
year

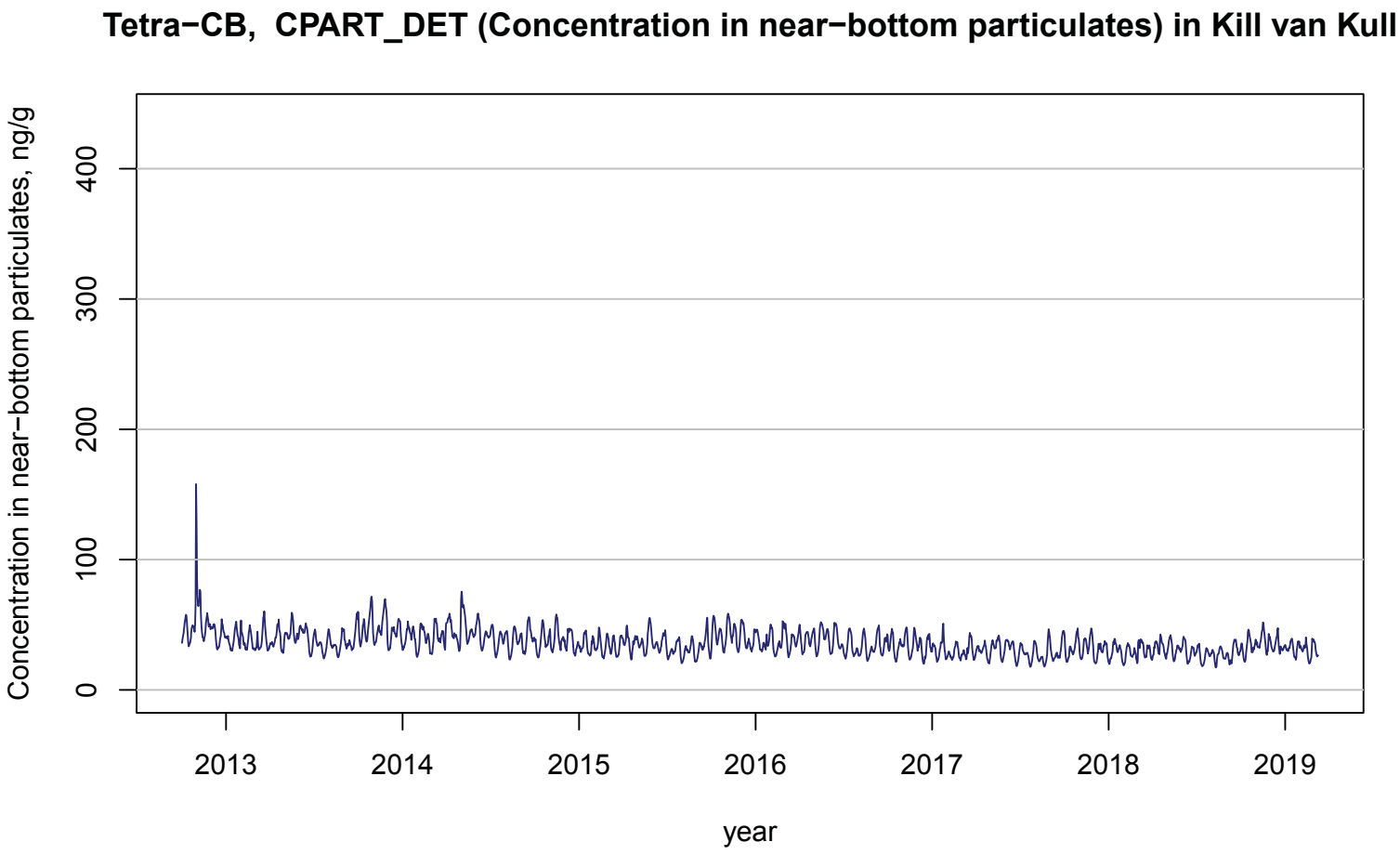

Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in Arthur Kill
Bioavailable Conc. in sediment porewater, ng/g
0.000
0.005
0.010
0.015
2013
2014
2015
2016
2017
2018
2019
year

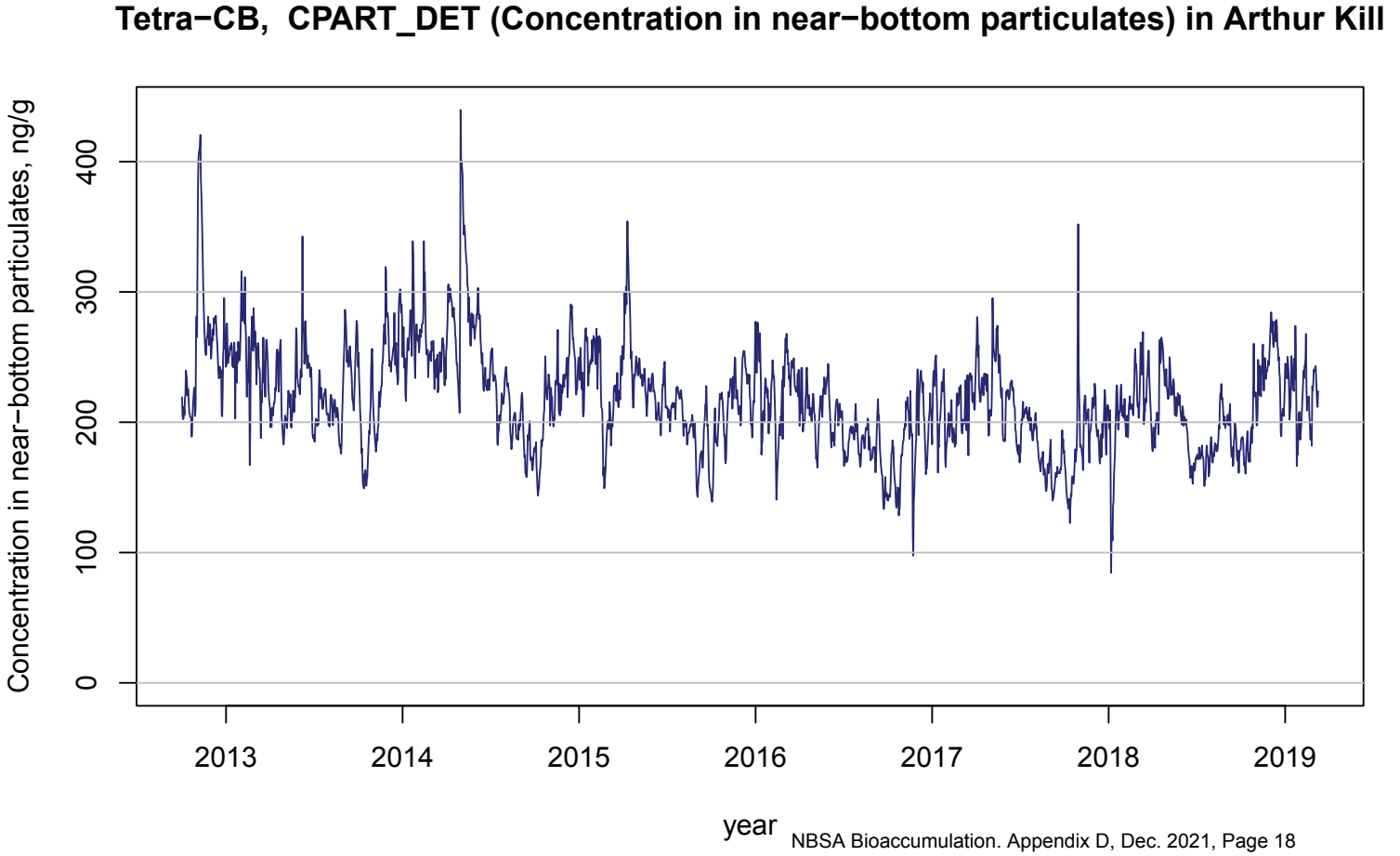

Tetra−CB, CST (Conc. in sediment solids) in Kill van Kull
Conc. in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

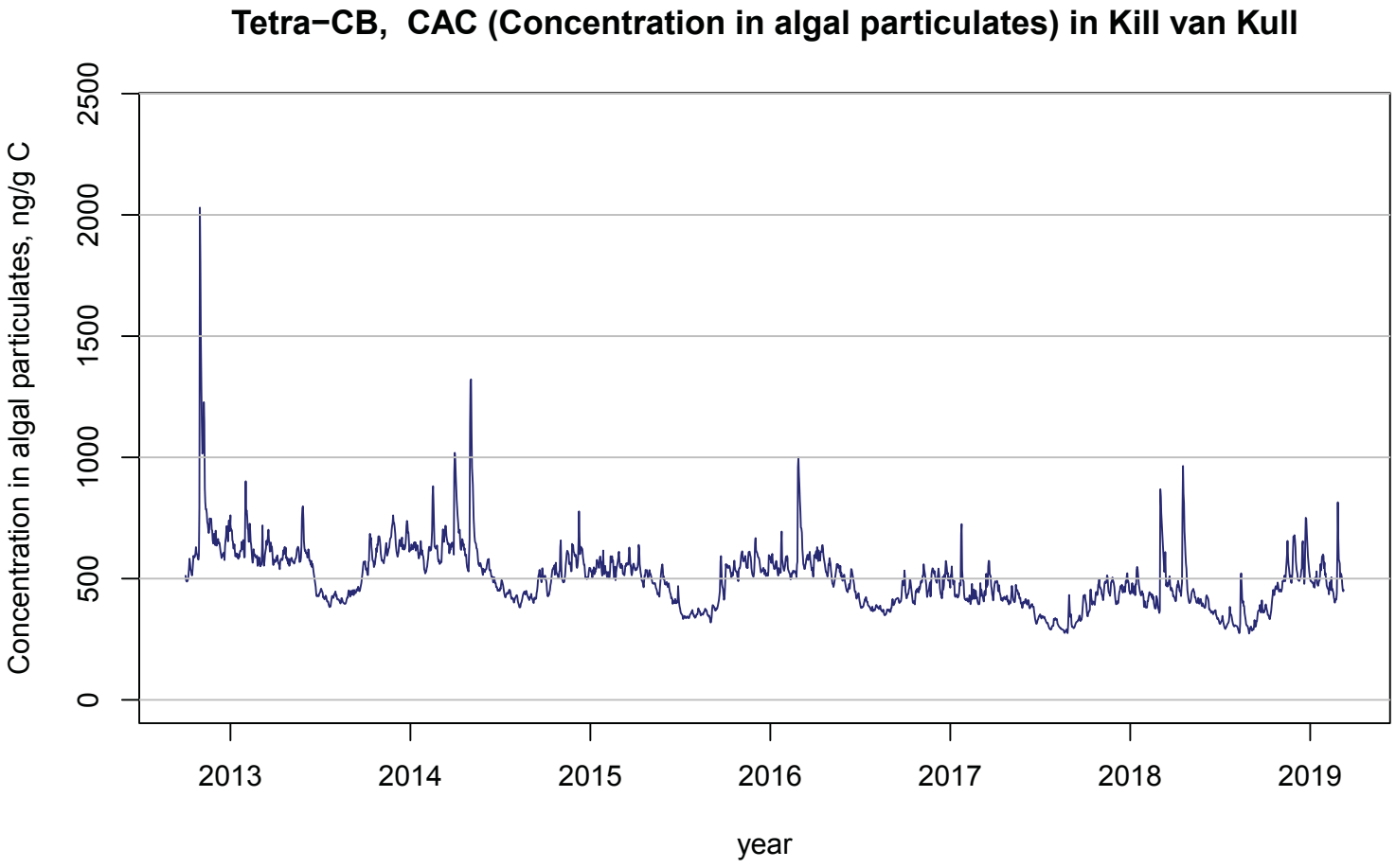

Tetra−CB, CST (Conc. in sediment solids) in Arthur Kill
Conc. in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

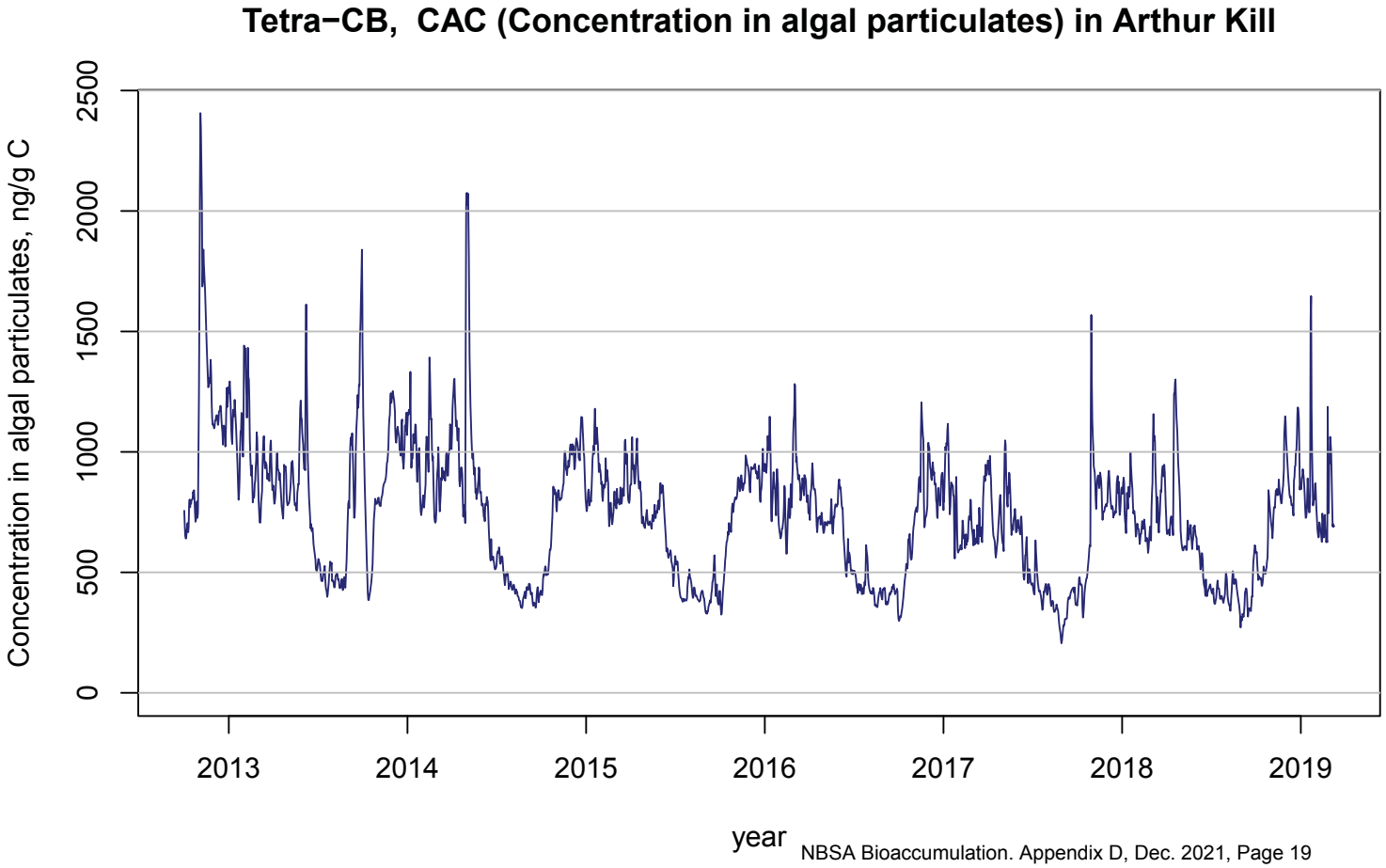

Tetra−CB, CPART (Chemical conc. in detrital particulates) in Kill van Kull
Chemical conc. in detrital particulates, ng/g
0
50
100
150
200
250
2013
2014
2015
2016
2017
2018
2019
year

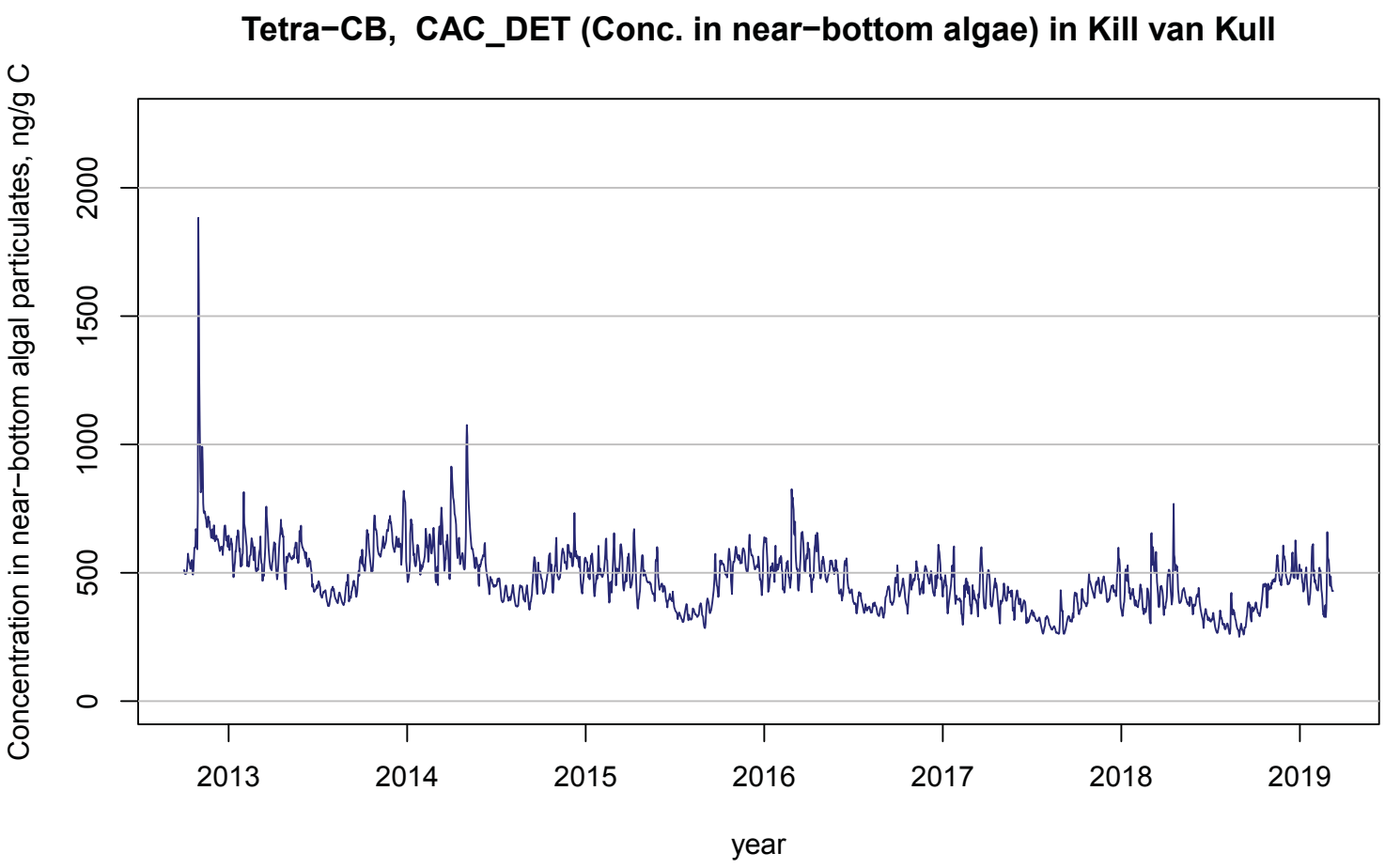

Tetra−CB, CPART (Chemical conc. in detrital particulates) in Arthur Kill
Chemical conc. in detrital particulates, ng/g
0
50
100
150
200
250
2013
2014
2015
2016
2017
2018
2019
year

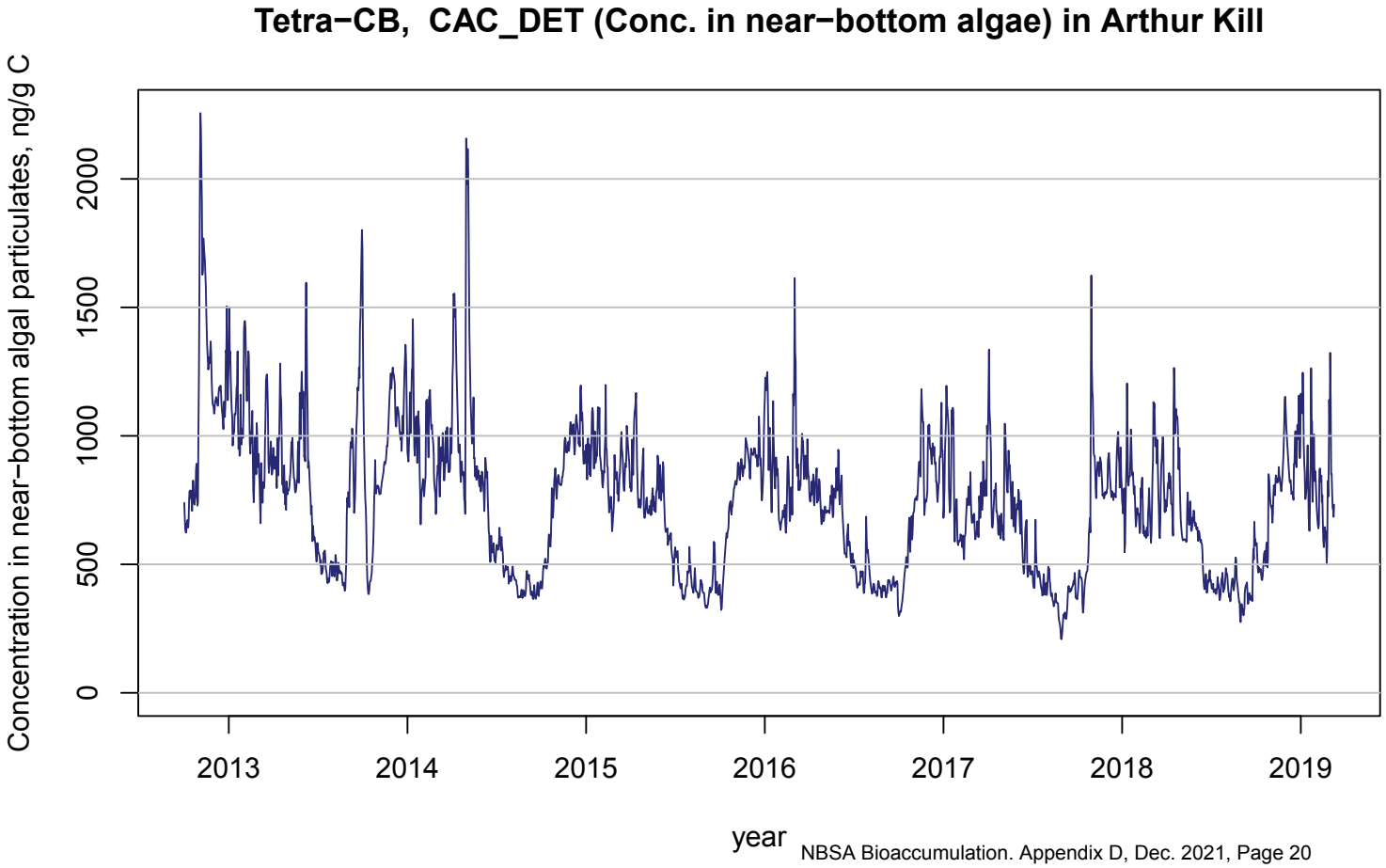

Tetra−CB, CPART_DET (Concentration in near−bottom particulates) in Kill van Kull
Concentration in near−bottom particulates, ng/g
0
100
200
300
400
2013
2014
2015
2016
2017
2018
2019
year

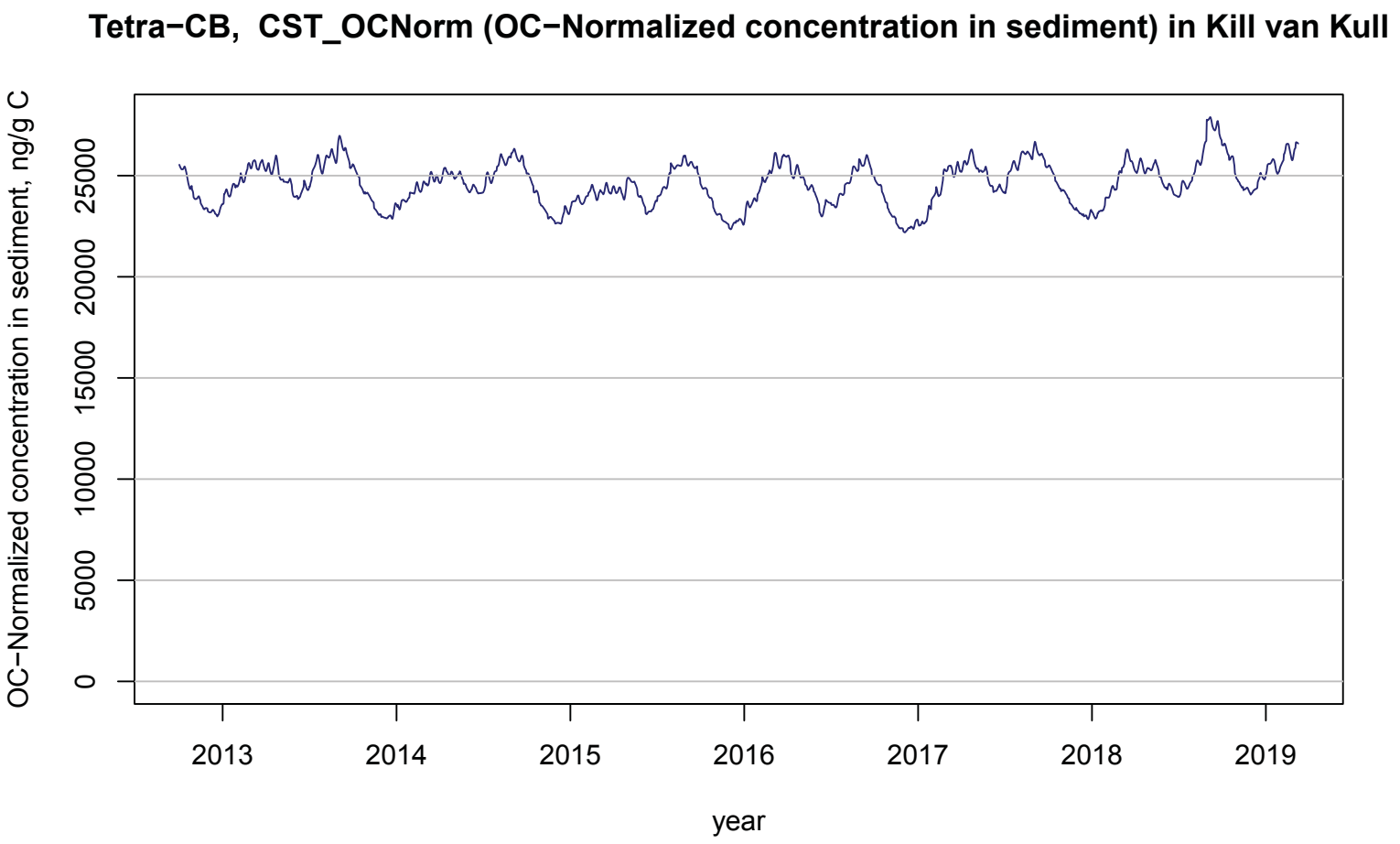

Tetra−CB, CPART_DET (Concentration in near−bottom particulates) in Arthur Kill
Concentration in near−bottom particulates, ng/g
0
100
200
300
400
2013
2014
2015
2016
2017
2018
2019
year

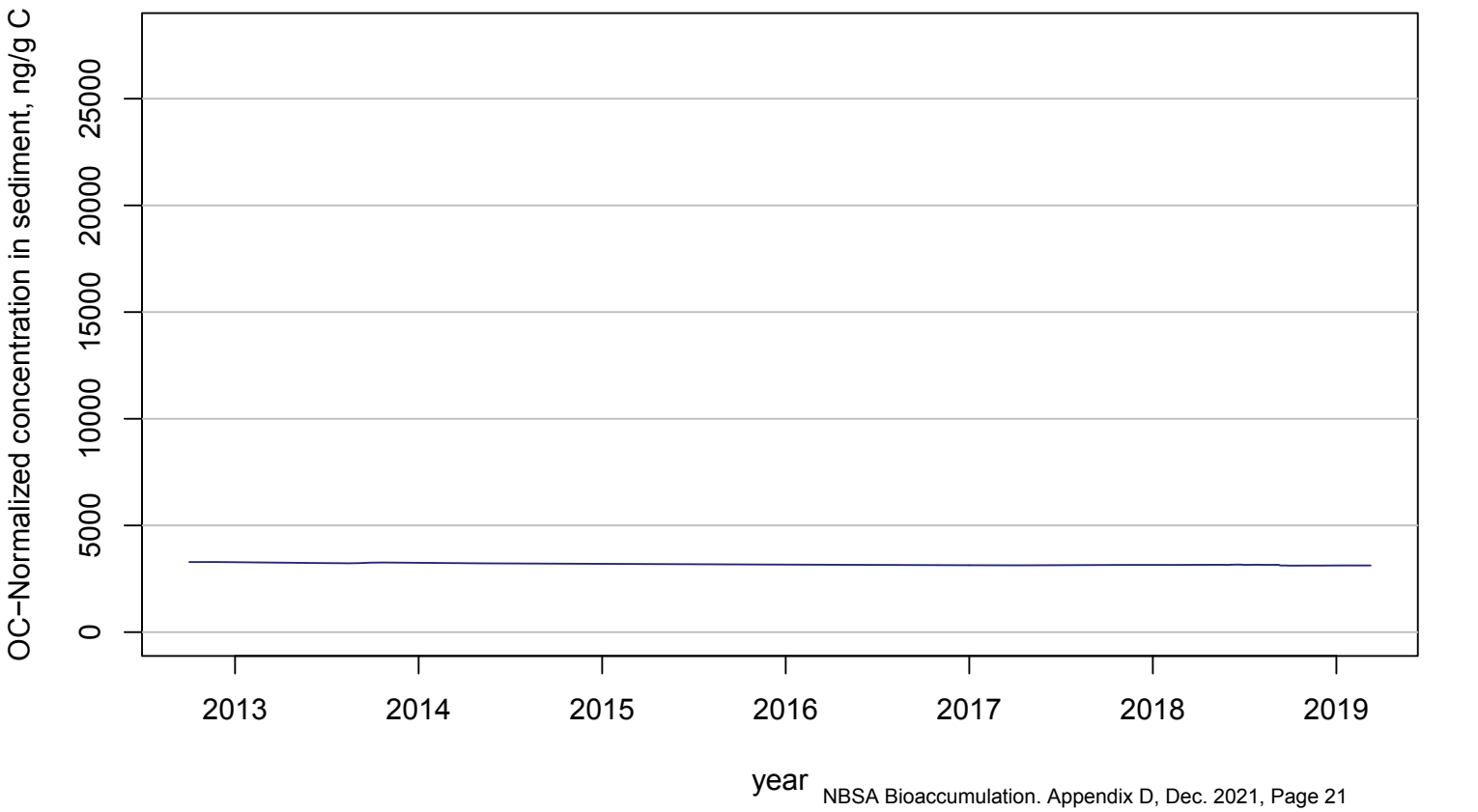

Tetra−CB, CAC (Concentration in algal particulates) in Kill van Kull
Concentration in algal particulates, ng/g C
0
500
1000
1500
2000
2500
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CAC (Concentration in algal particulates) in Arthur Kill
Concentration in algal particulates, ng/g C
0
500
1000
1500
2000
2500
2013
2014
2015
2016
2017
2018
2019
year

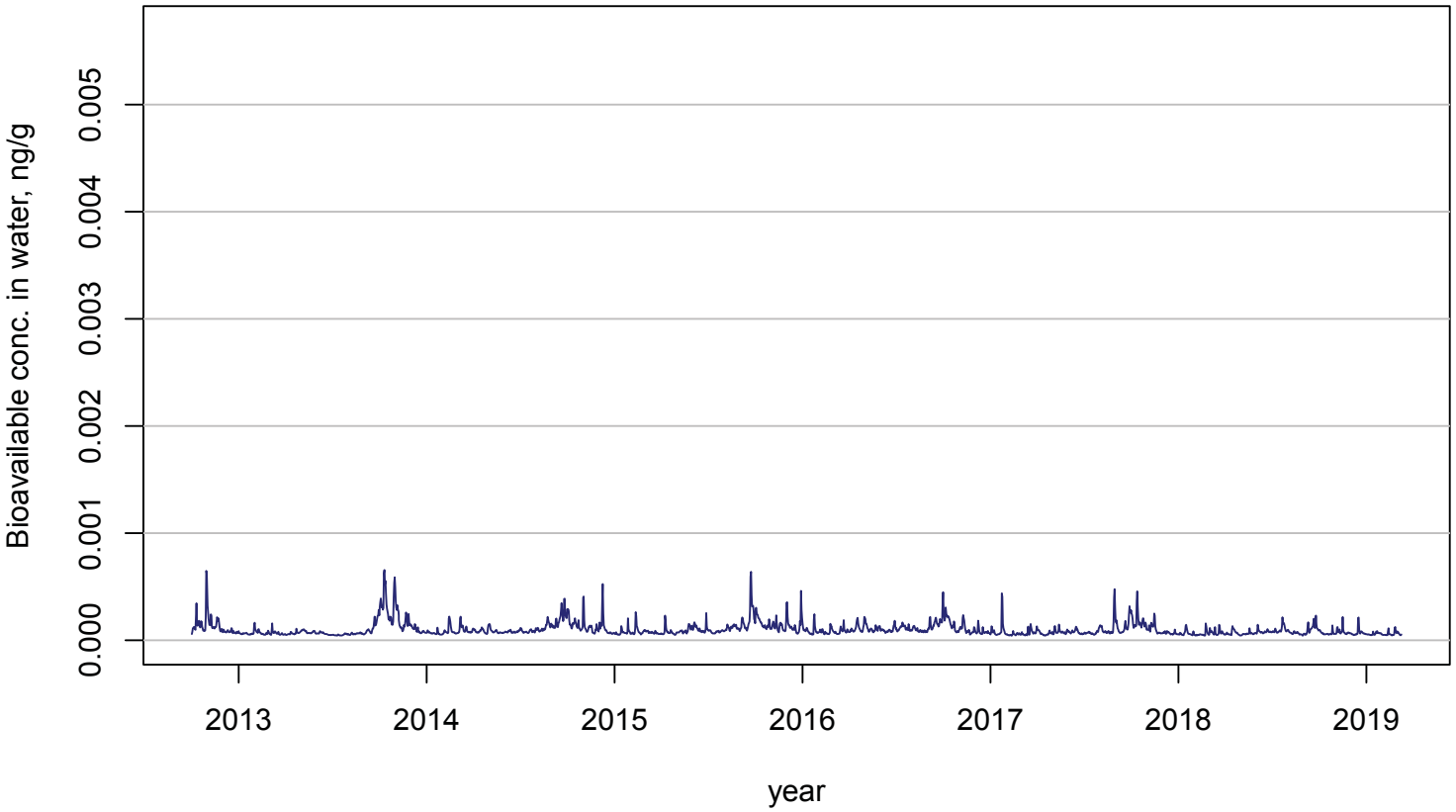

Tetra−CB, CAC_DET (Conc. in near−bottom algae) in Kill van Kull
Concentration in near−bottom algal particulates, ng/g C
0
500
1000
1500
2000
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CAC_DET (Conc. in near−bottom algae) in Arthur Kill
Concentration in near−bottom algal particulates, ng/g C
0
500
1000
1500
2000
2013
2014
2015
2016
2017
2018
2019
year

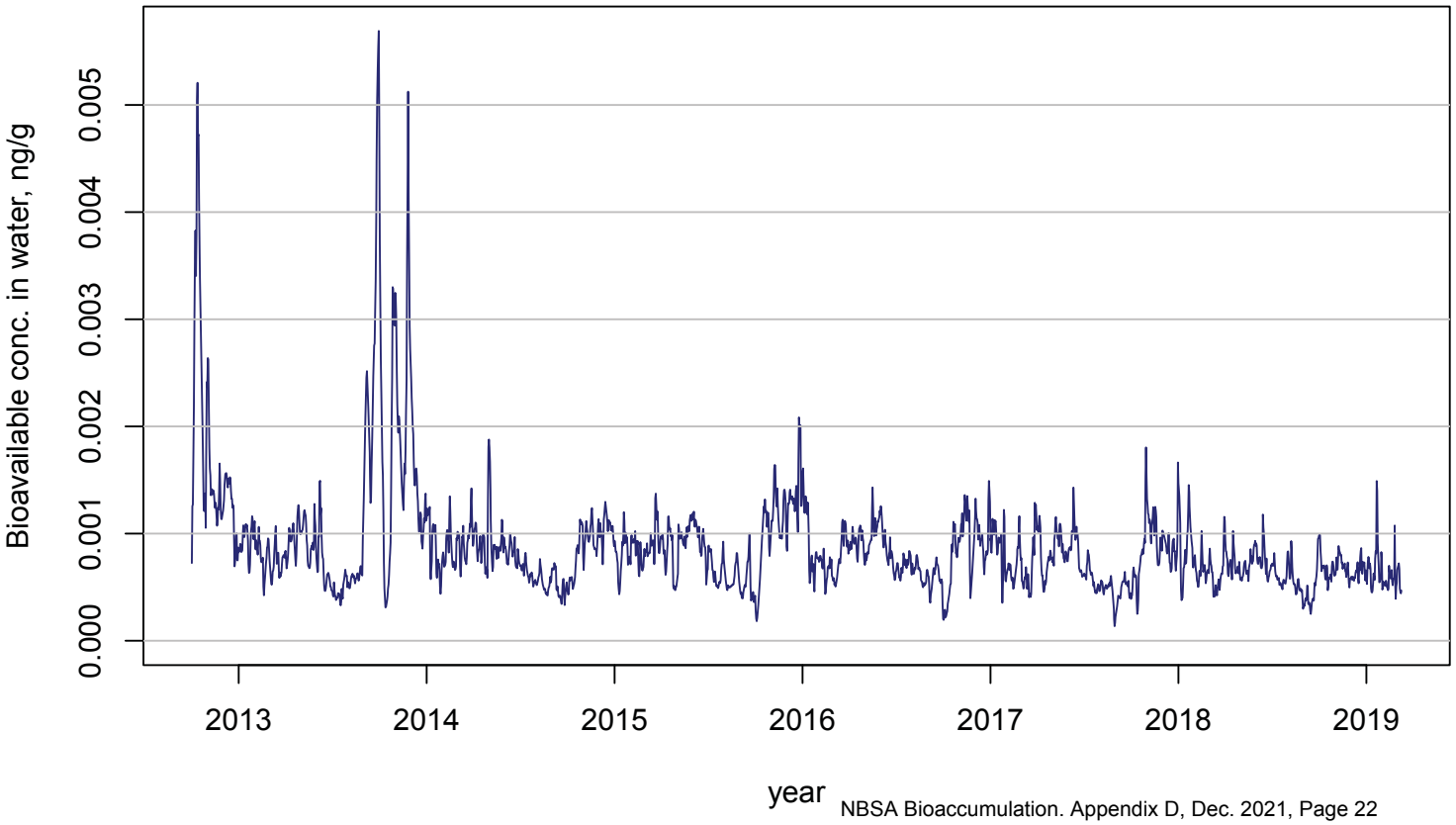

Tetra−CB, CST_OCNorm (OC−Normalized concentration in sediment) in Kill van Kull
OC−Normalized concentration in sediment, ng/g C
0
5000
10000
15000
20000
25000
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CST_OCNorm (OC−Normalized concentration in sediment) in Arthur Kill
OC−Normalized concentration in sediment, ng/g C
0
5000
10000
15000
20000
25000
2013
2014
2015
2016
2017
2018
2019
year

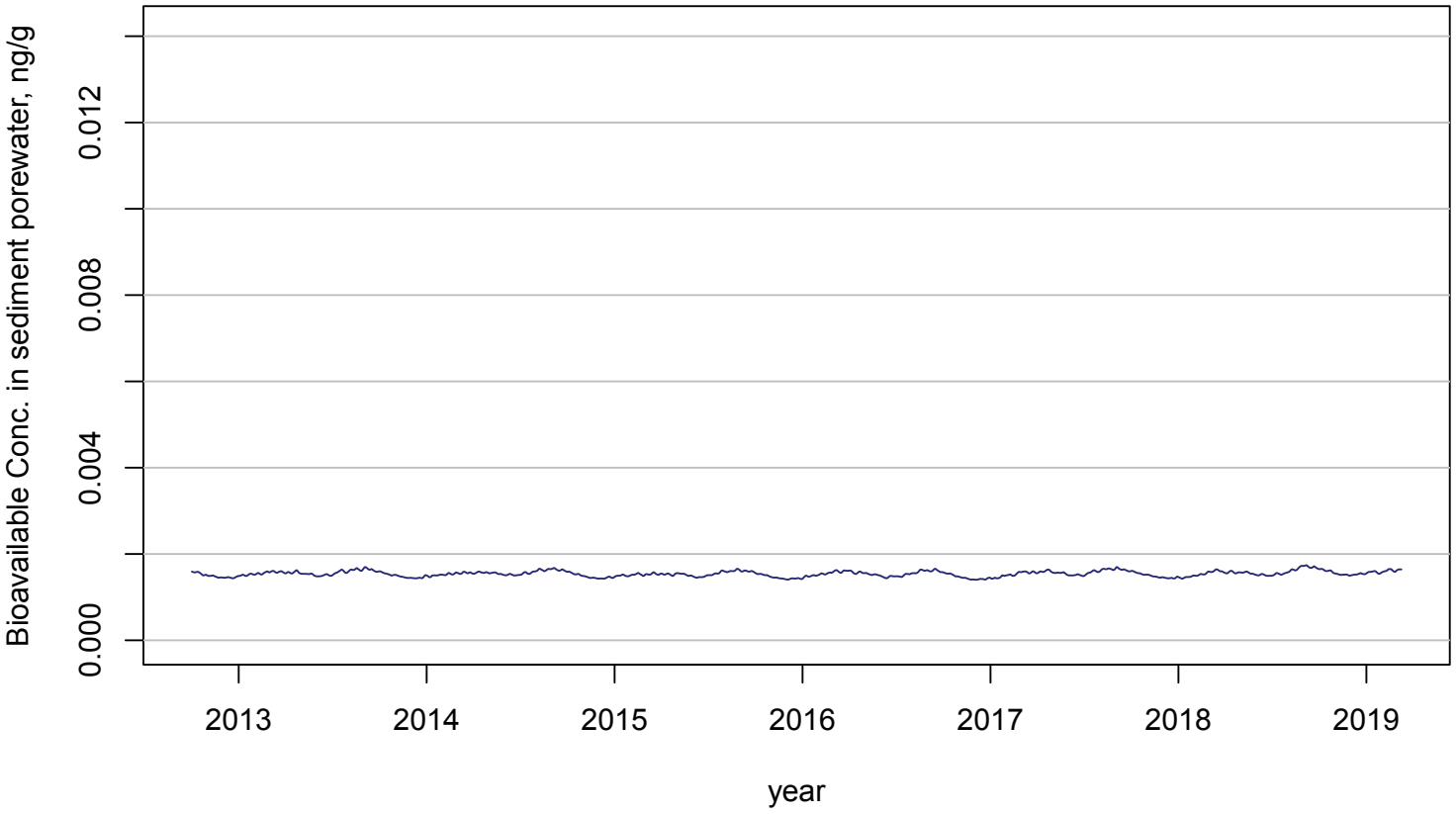
4,4'−DDx, CWB (Bioavailable conc. in water) in Kill van Kull



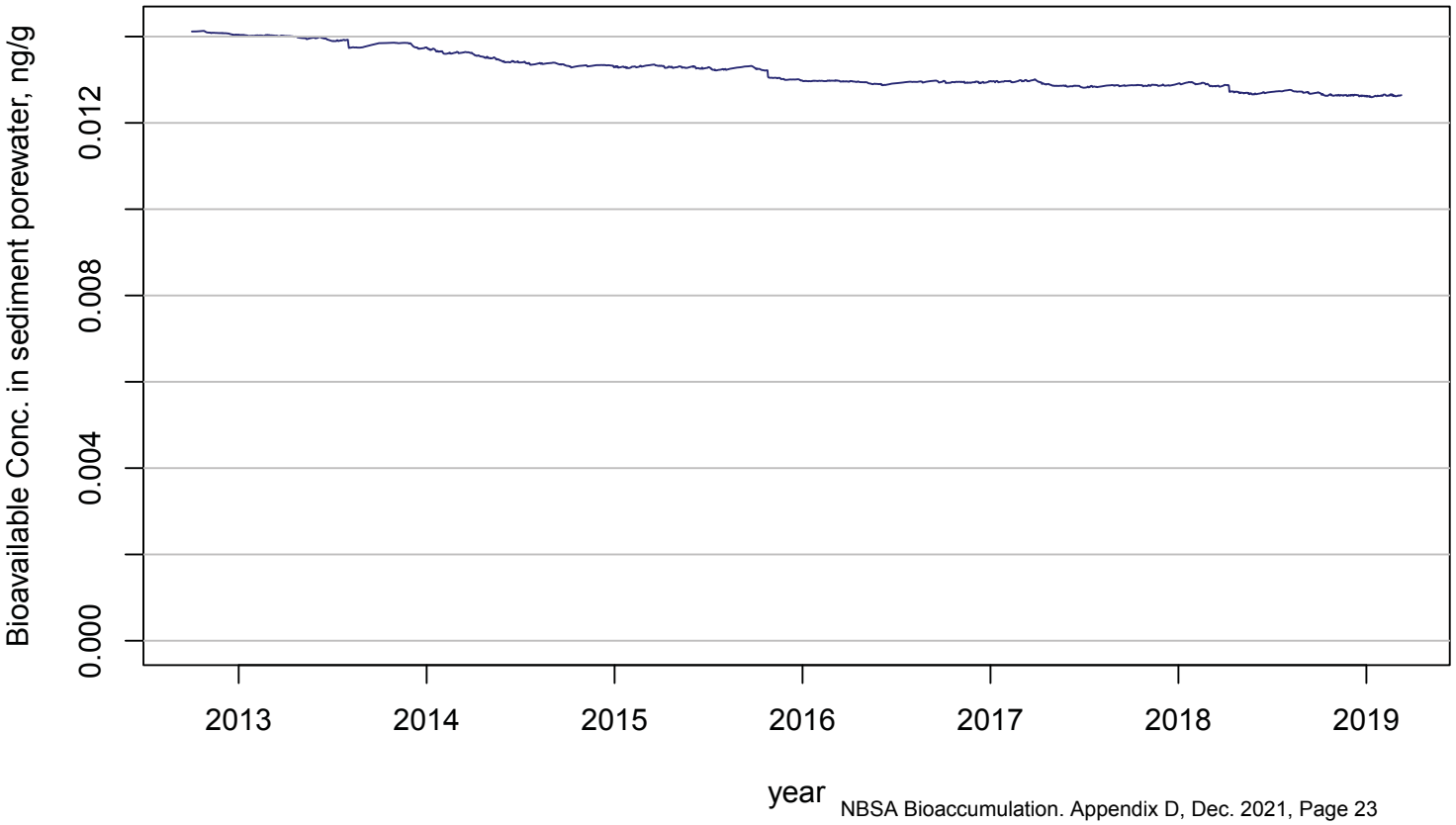
4,4'−DDx, CWB (Bioavailable conc. in water) in Arthur Kill



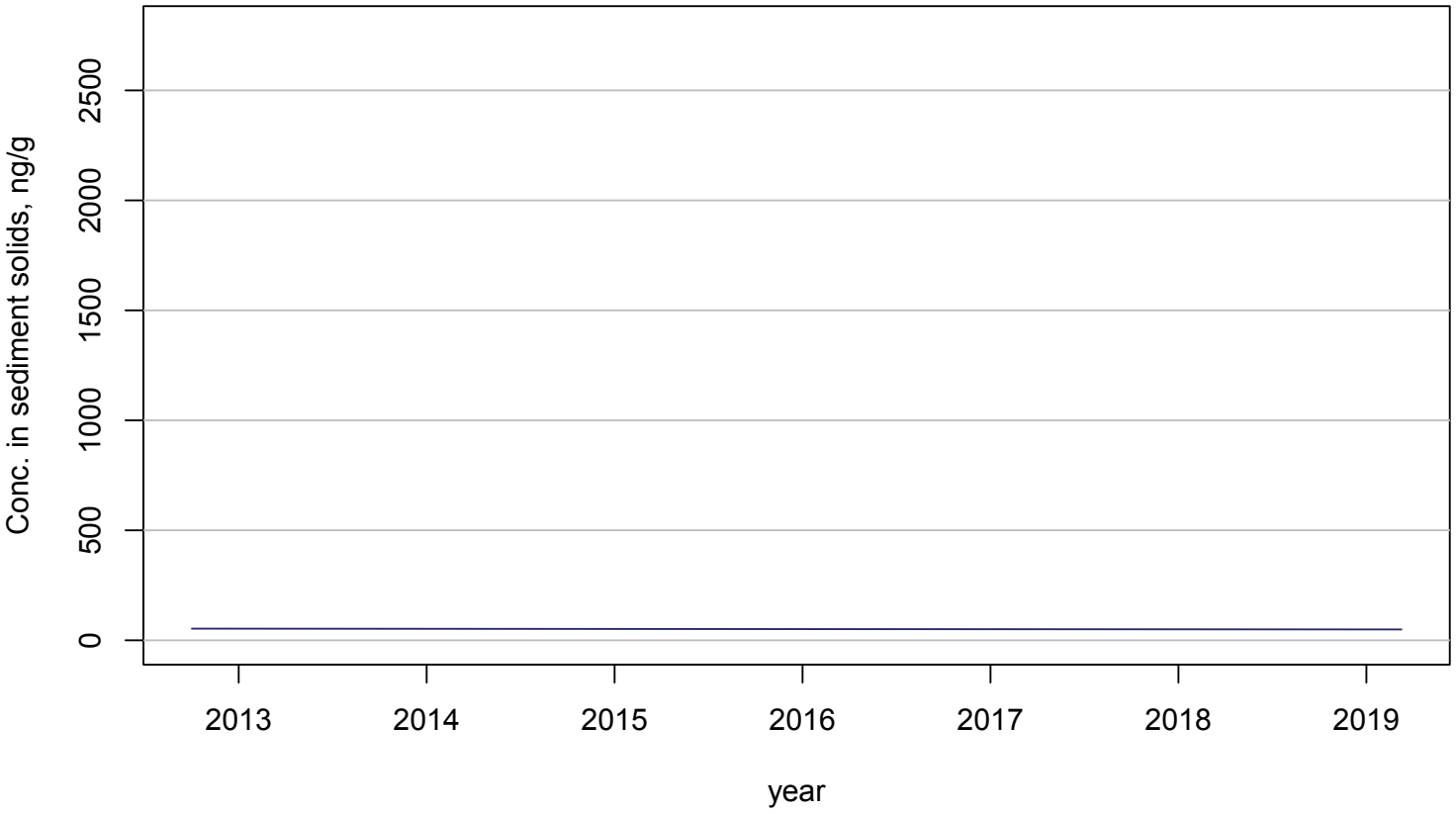
4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in Kill van Kull



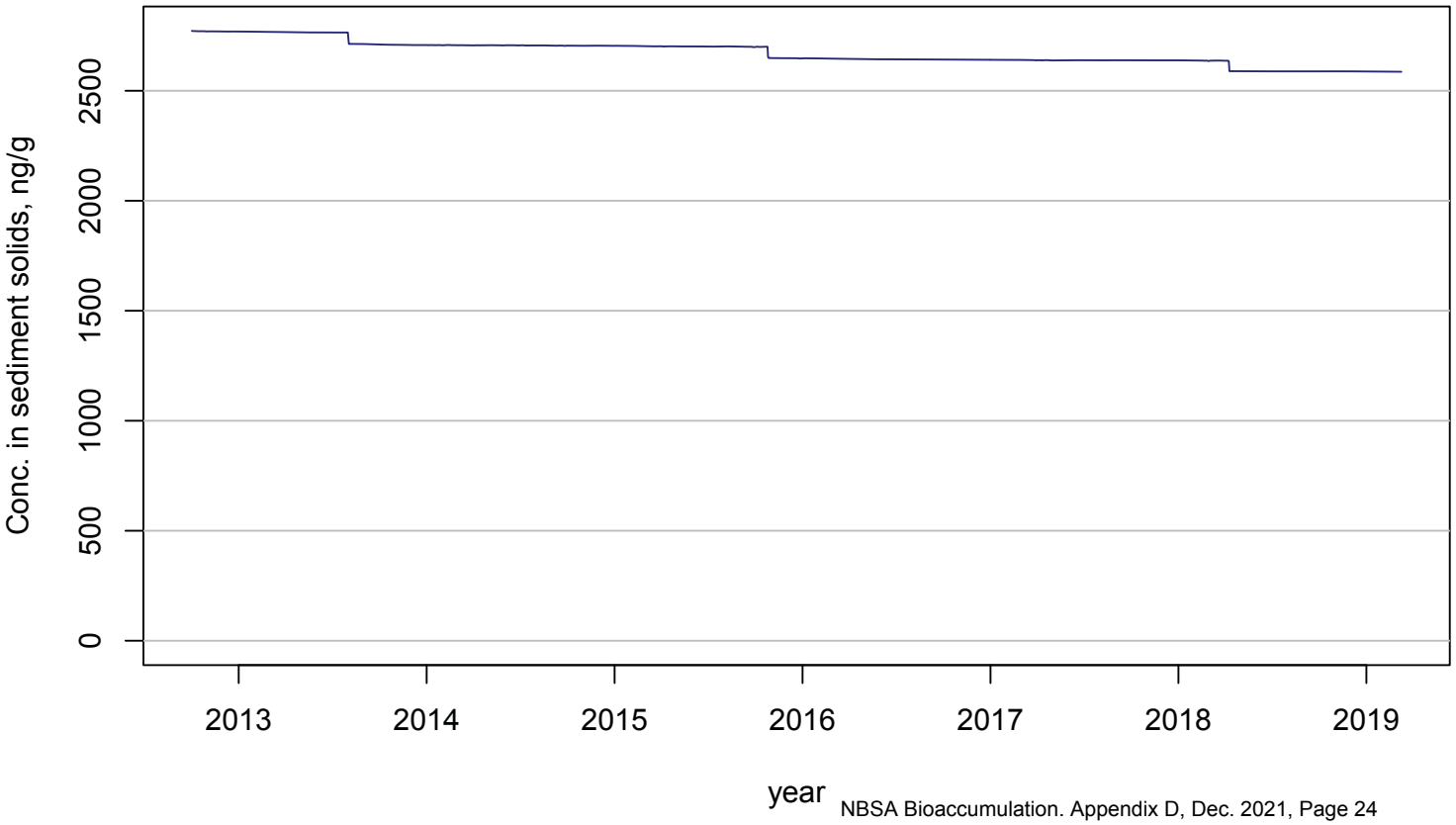
4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in Arthur Kill

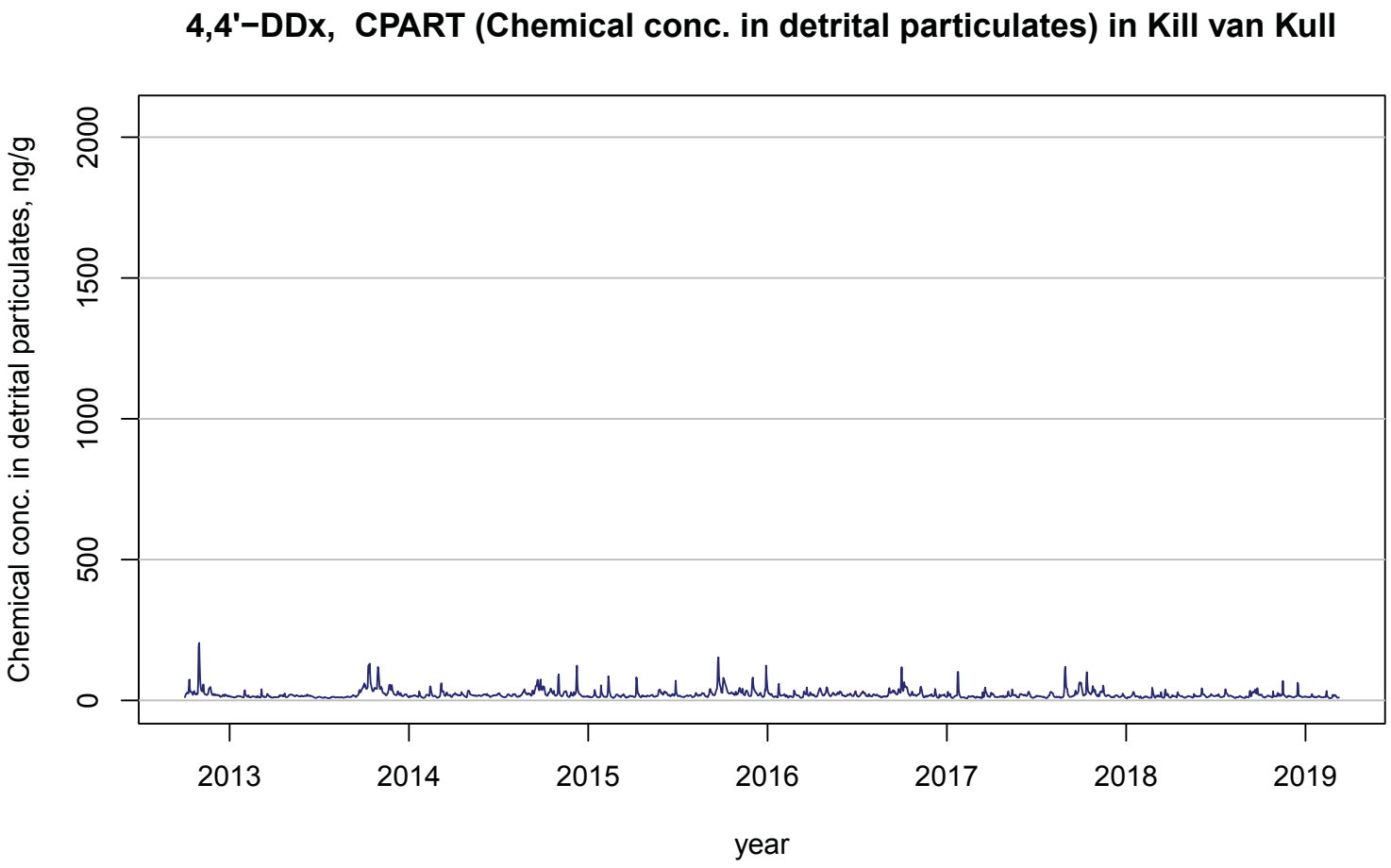


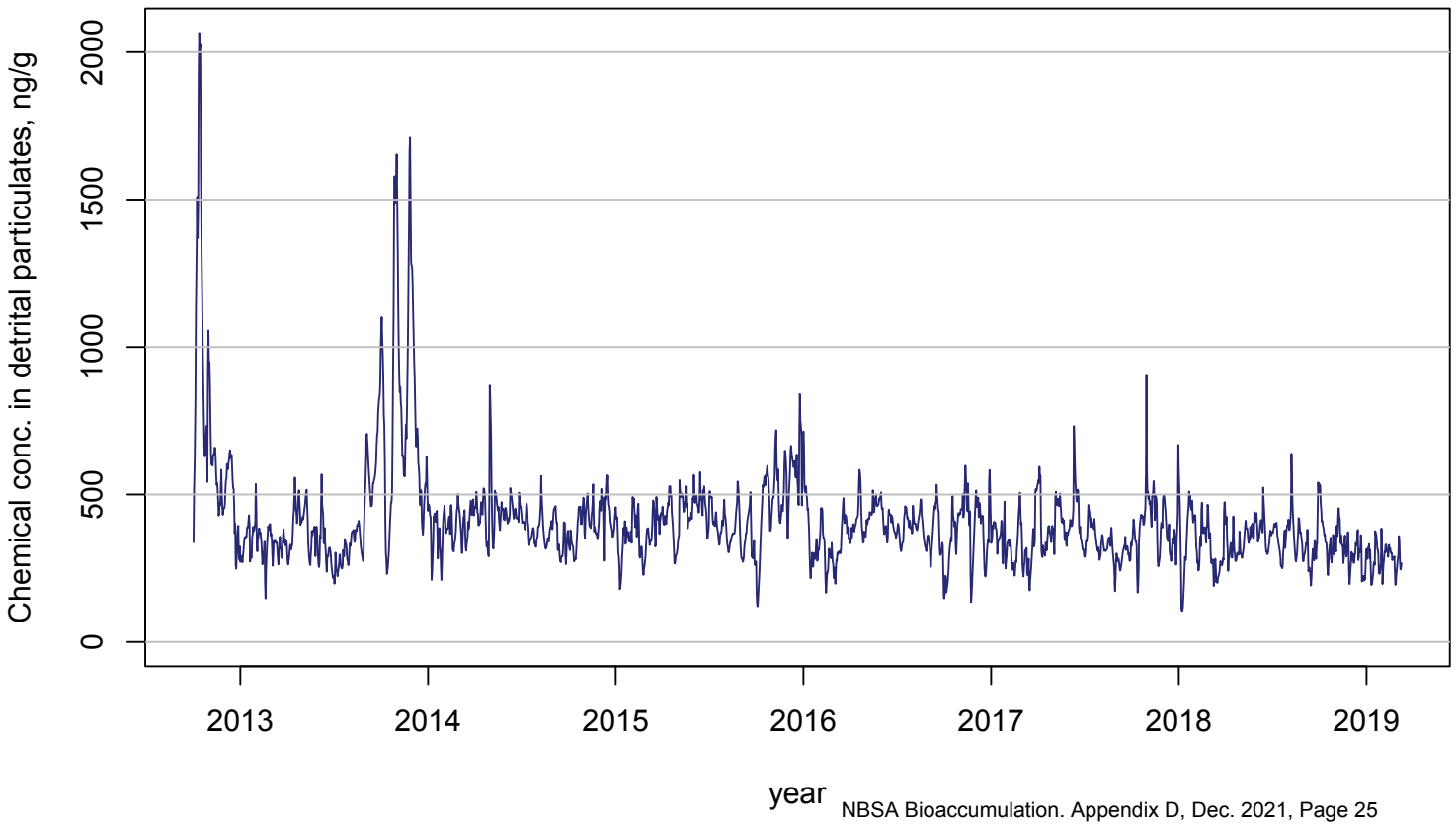
4,4'−DDx, CST (Conc. in sediment solids) in Kill van Kull



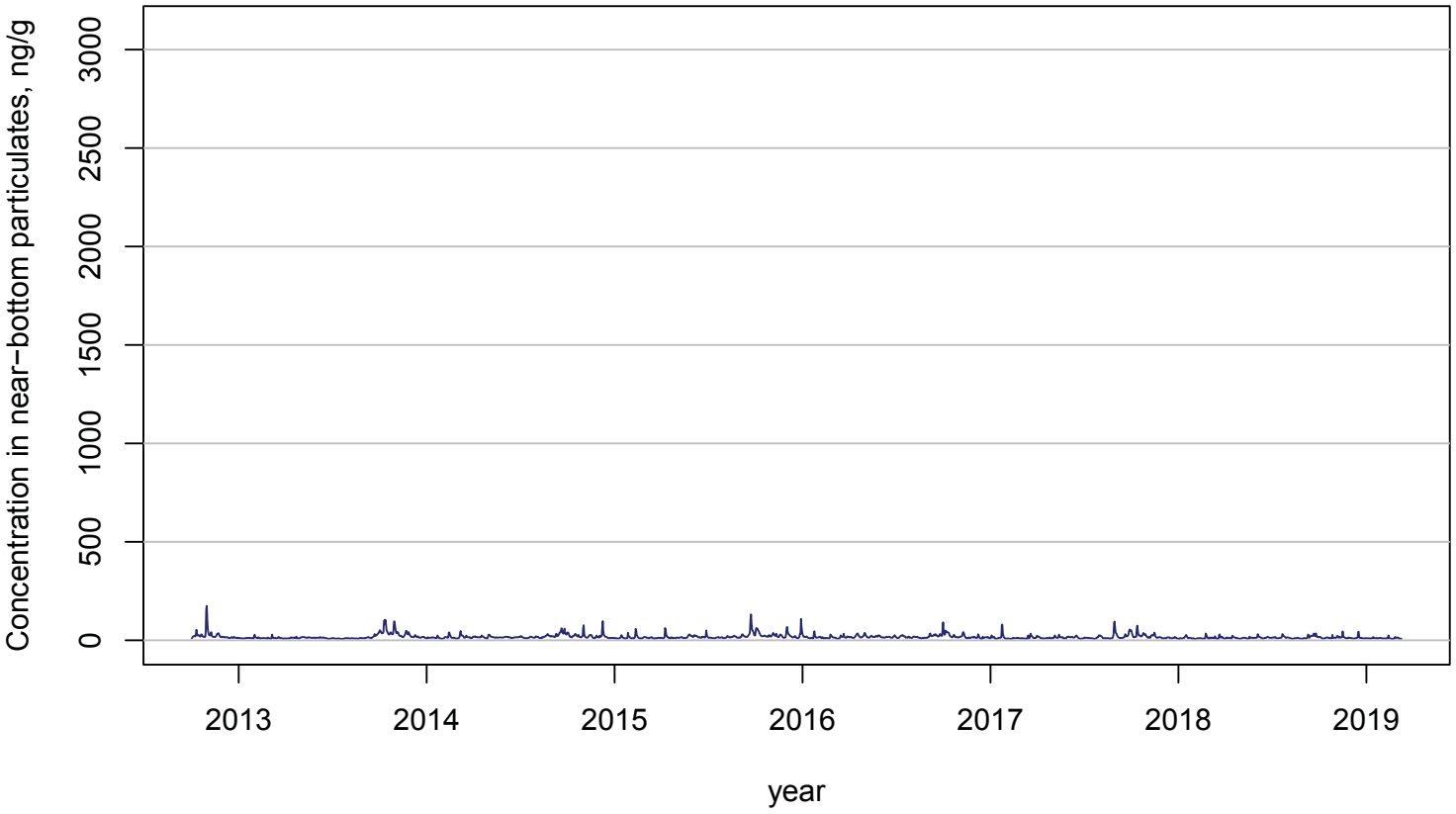
4,4'−DDx, CST (Conc. in sediment solids) in Arthur Kill



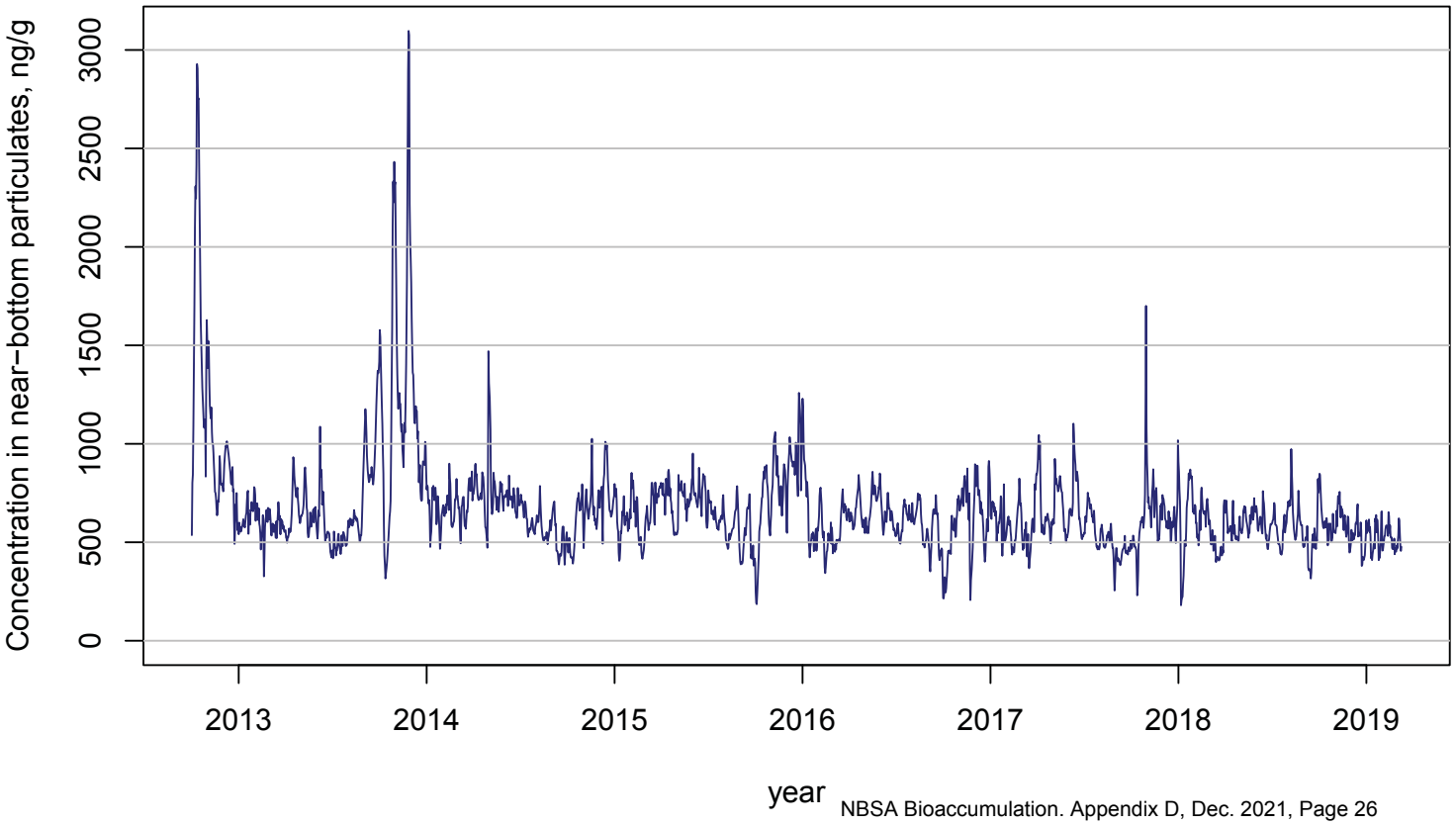

4,4'−DDx, CPART (Chemical conc. in detrital particulates) in Kill van Kull
Chemical conc. in detrital particulates, ng/g
0
500
1000
1500
2000
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CPART (Chemical conc. in detrital particulates) in Arthur Kill
Chemical conc. in detrital particulates, ng/g
0
500
1000
1500
2000
2013
2014
2015
2016
2017
2018
2019
year

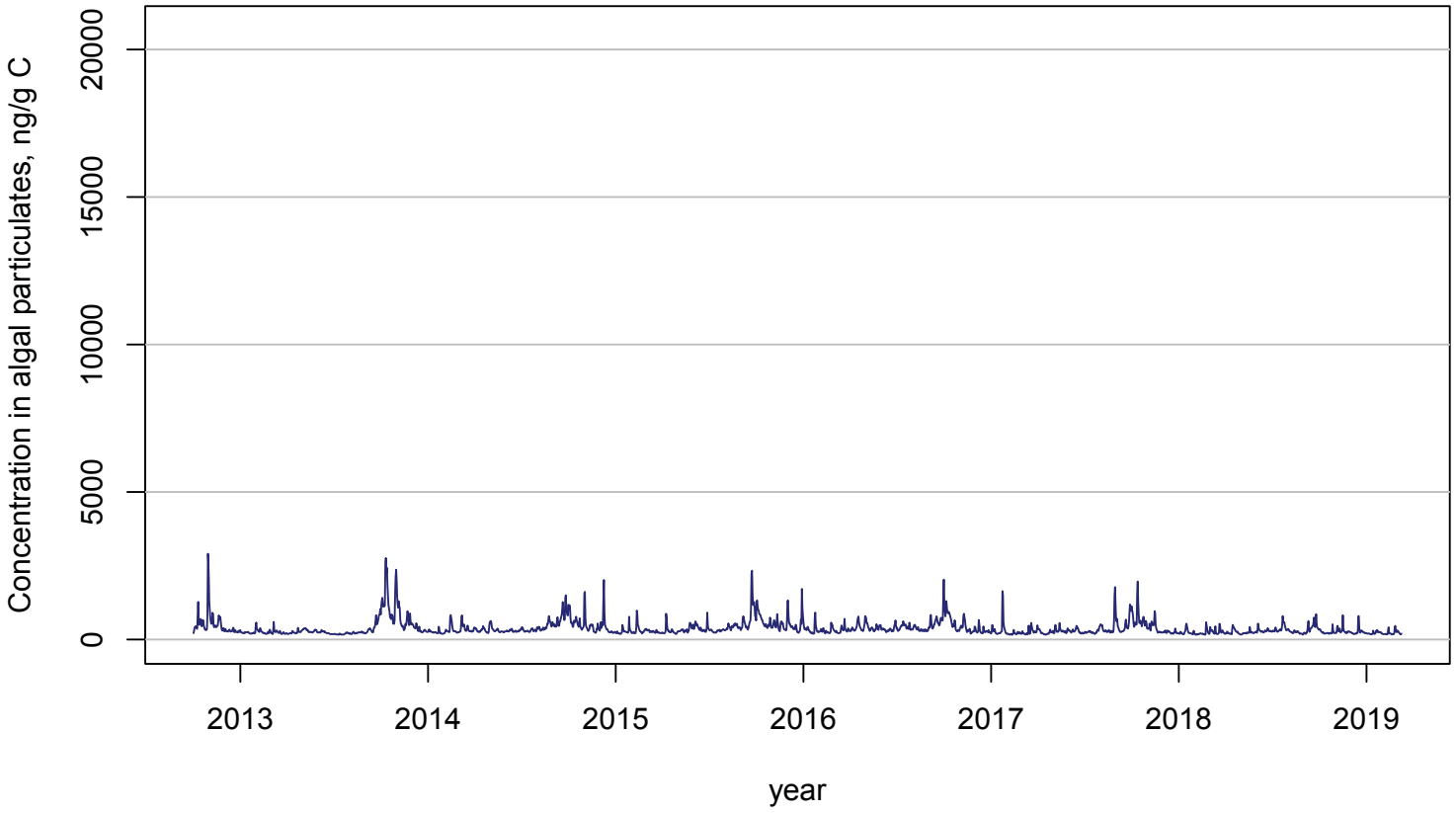
4,4'−DDx, CPART_DET (Concentration in near−bottom particulates) in Kill van Kull



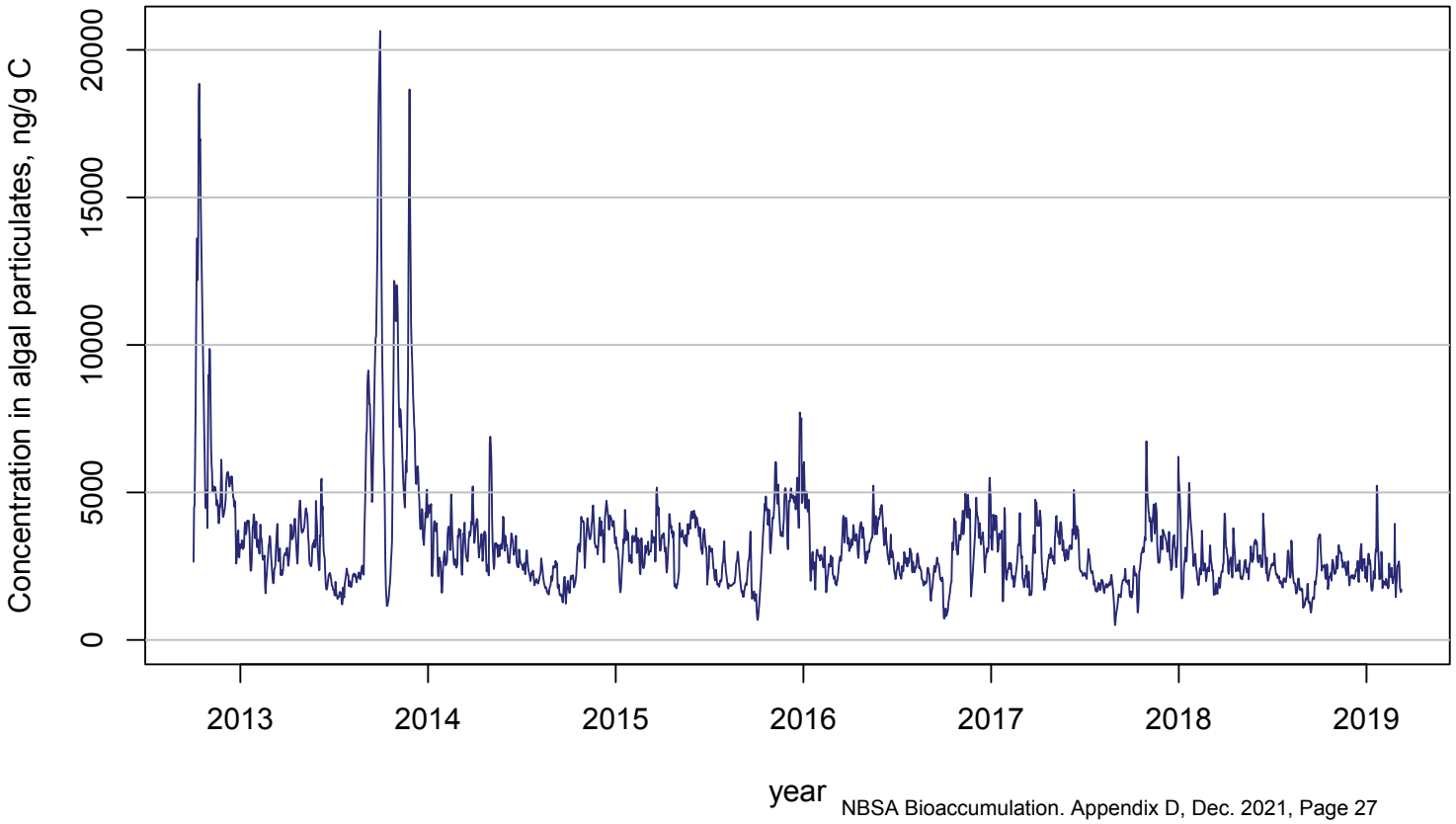
4,4'−DDx, CPART_DET (Concentration in near−bottom particulates) in Arthur Kill

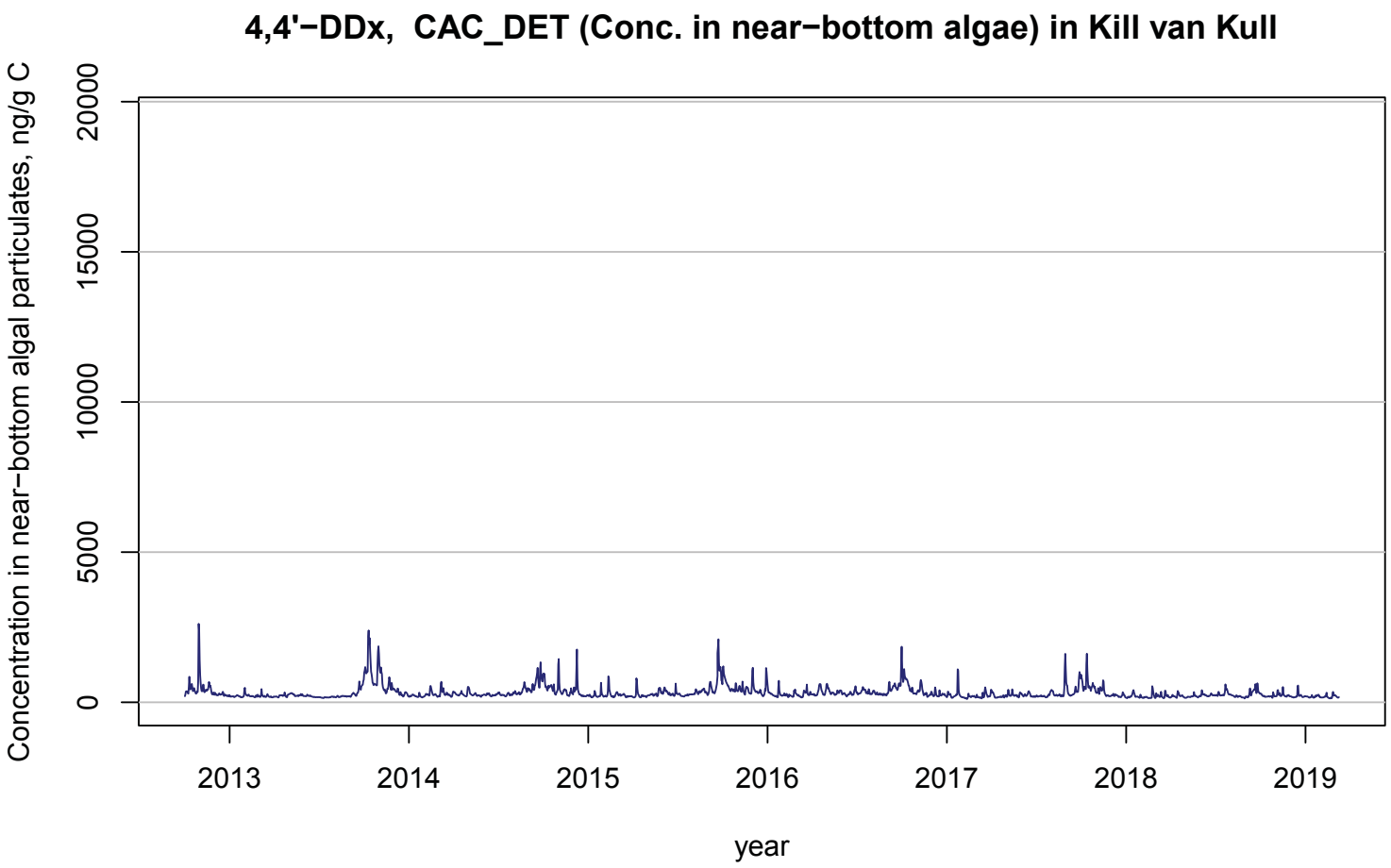


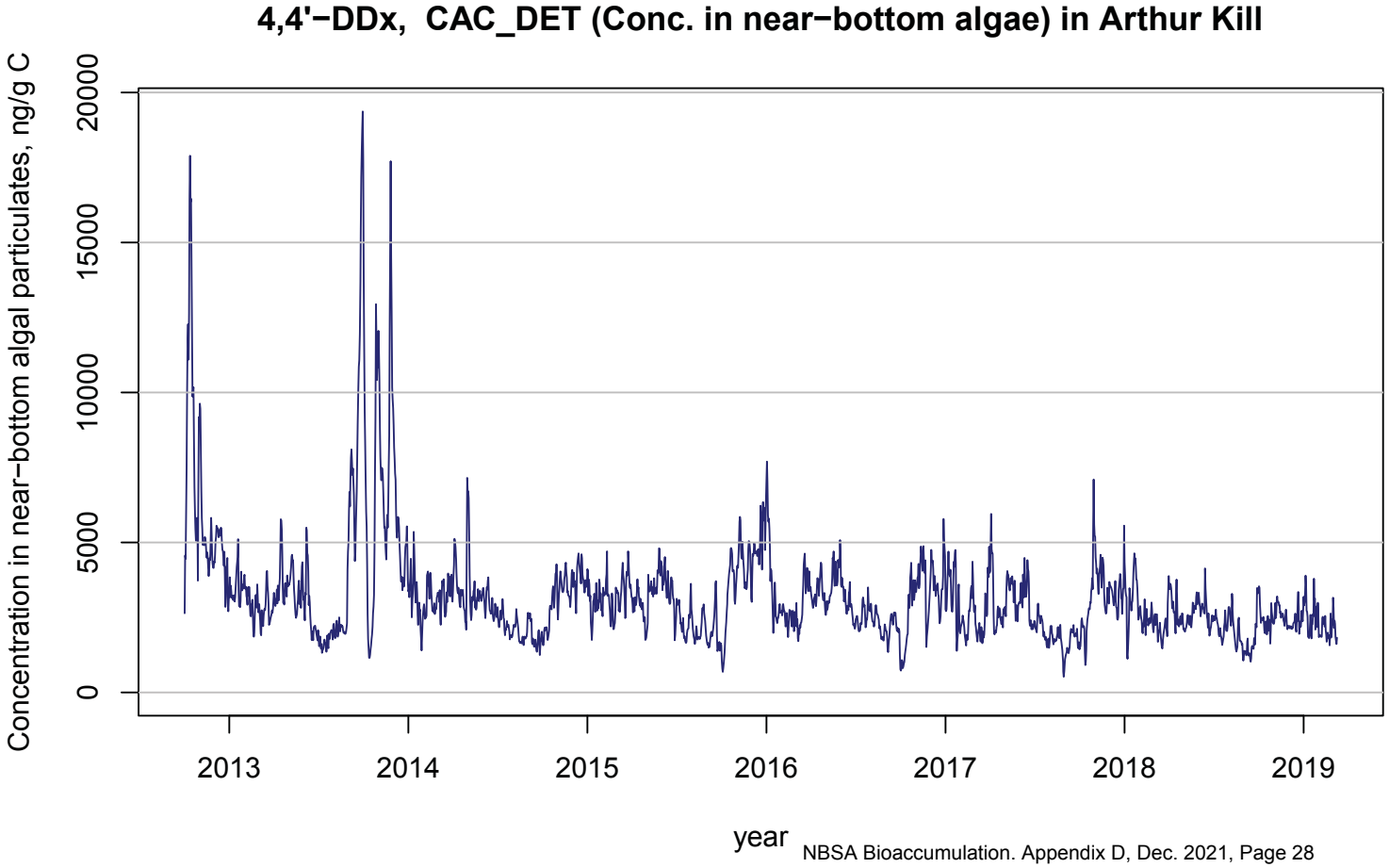
4,4'−DDx, CAC (Concentration in algal particulates) in Kill van Kull



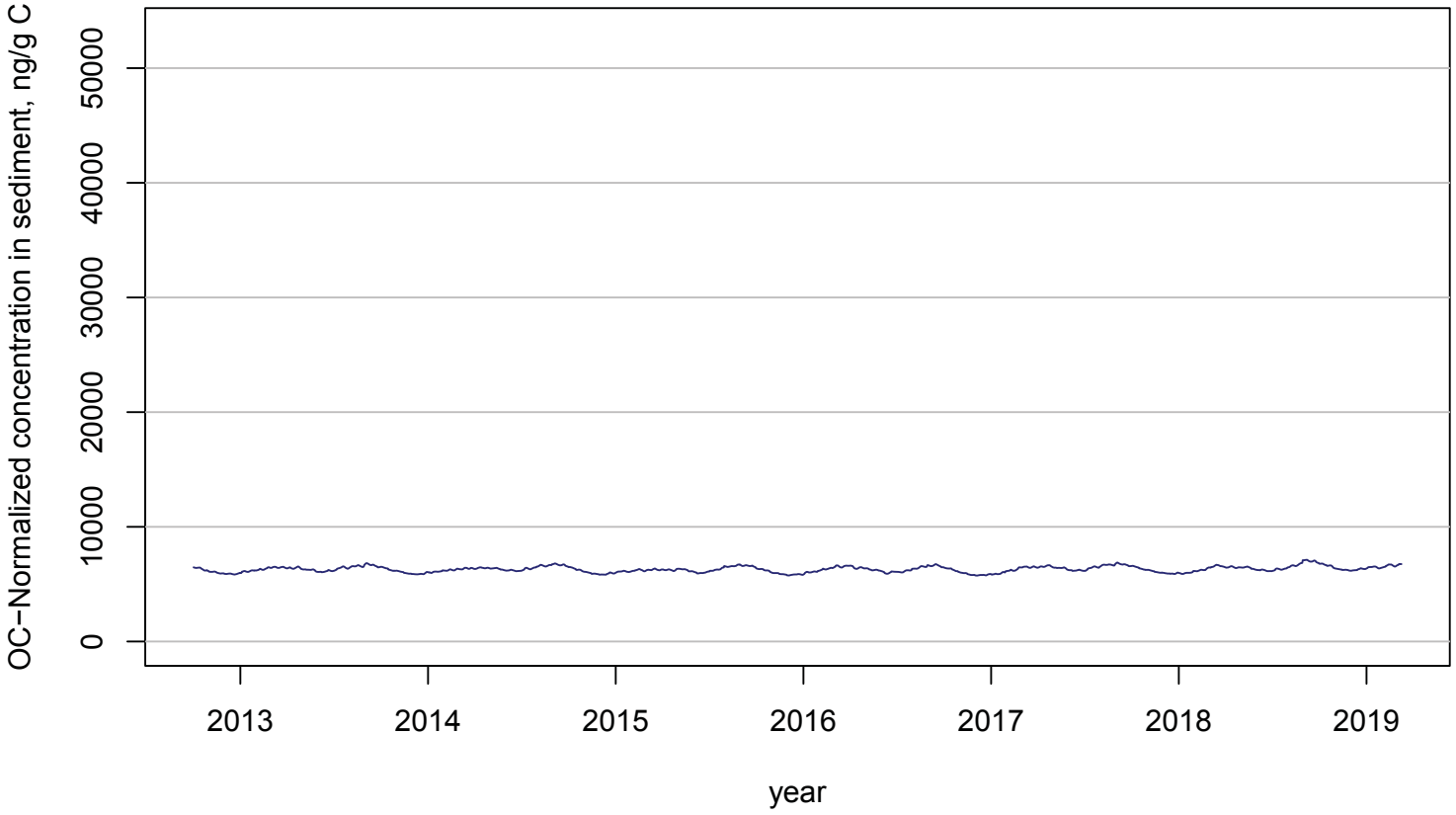
4,4'−DDx, CAC (Concentration in algal particulates) in Arthur Kill



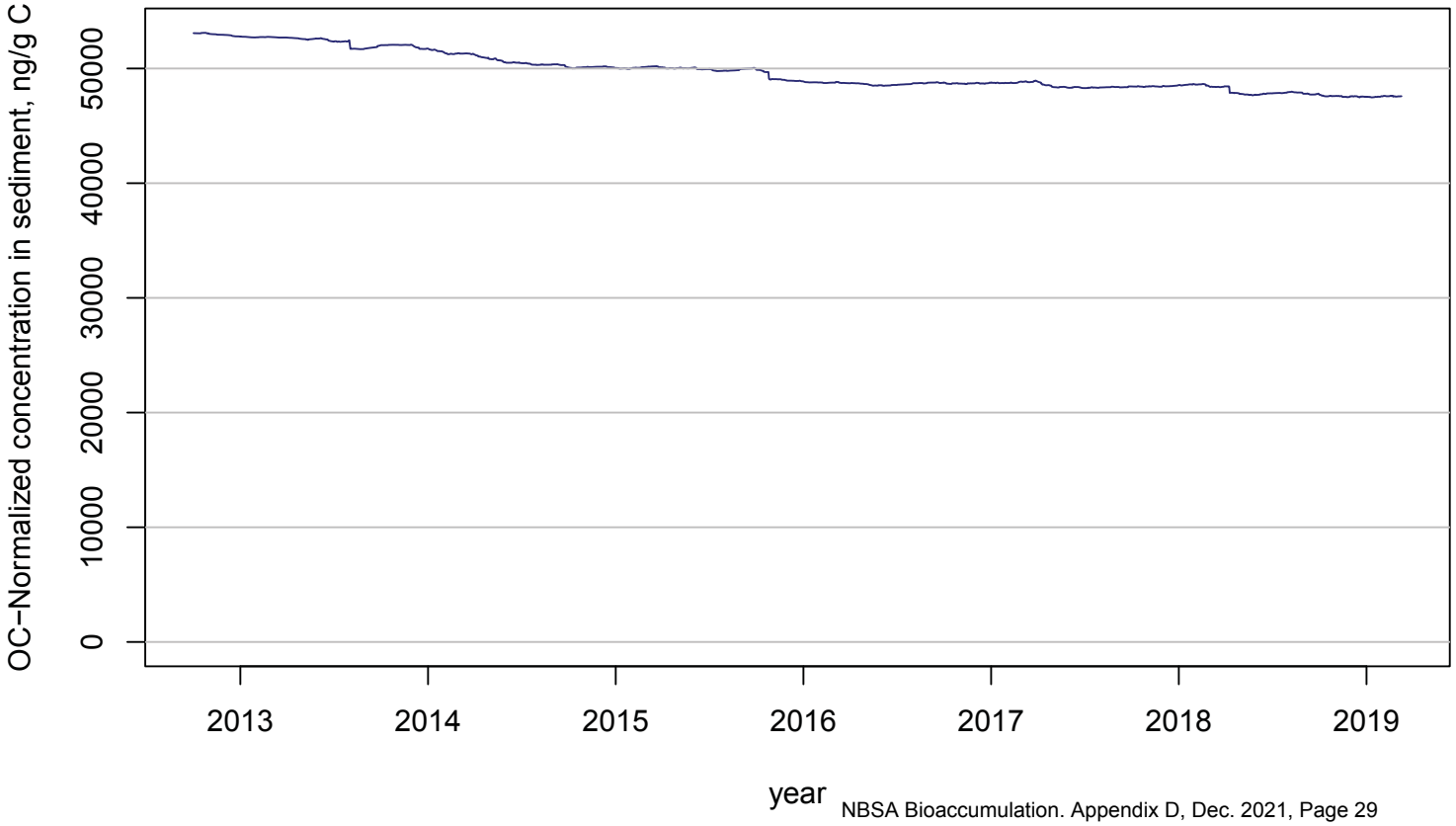

4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in Kill van Kull
Concentration in near−bottom algal particulates, ng/g C
0
5000
10000
15000
20000
2013
2014
2015
2016
2017
2018
2019
year

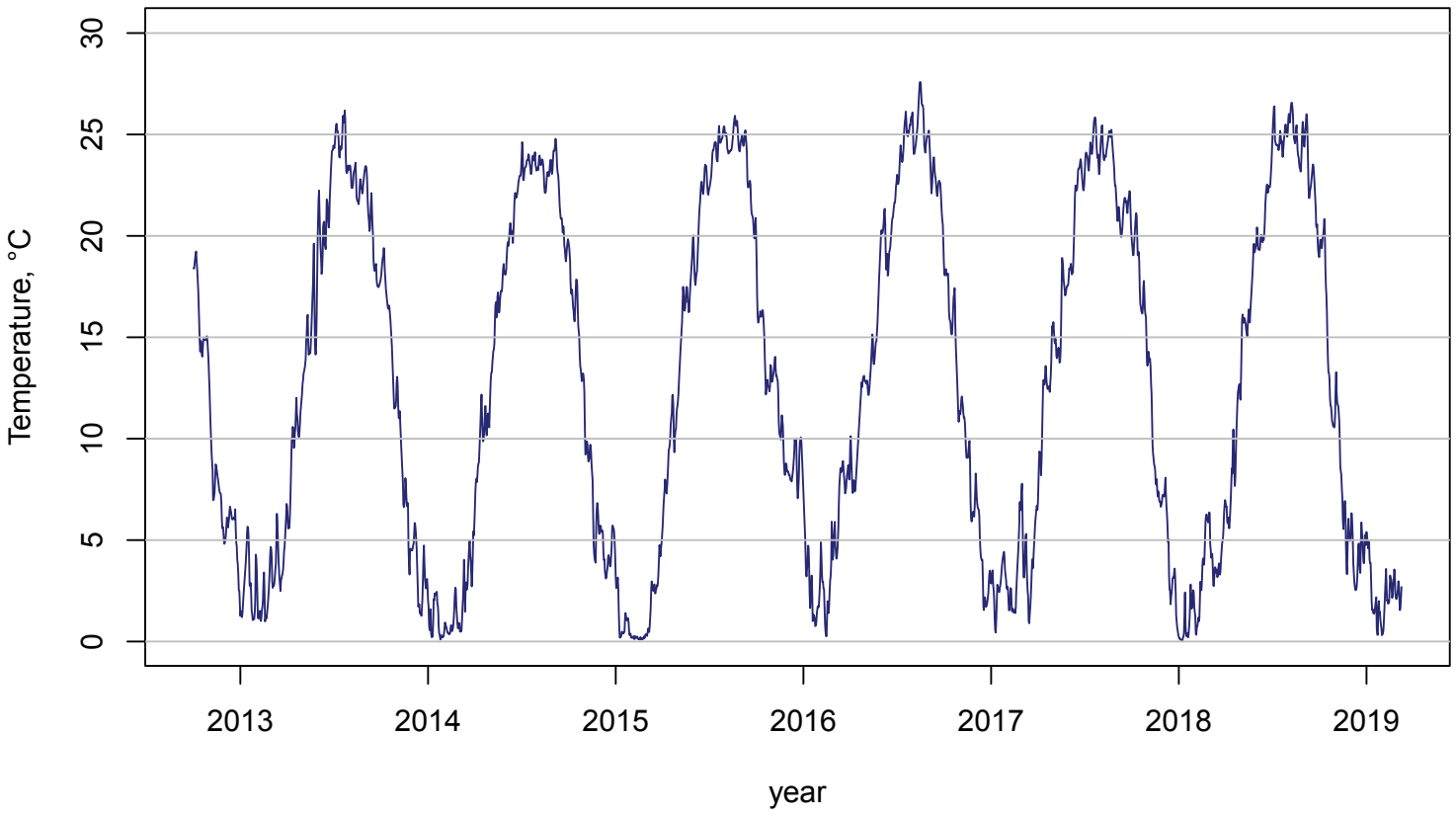

4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in Arthur Kill
Concentration in near−bottom algal particulates, ng/g C
0
5000
10000
15000
20000
2013
2014
2015
2016
2017
2018
2019
year

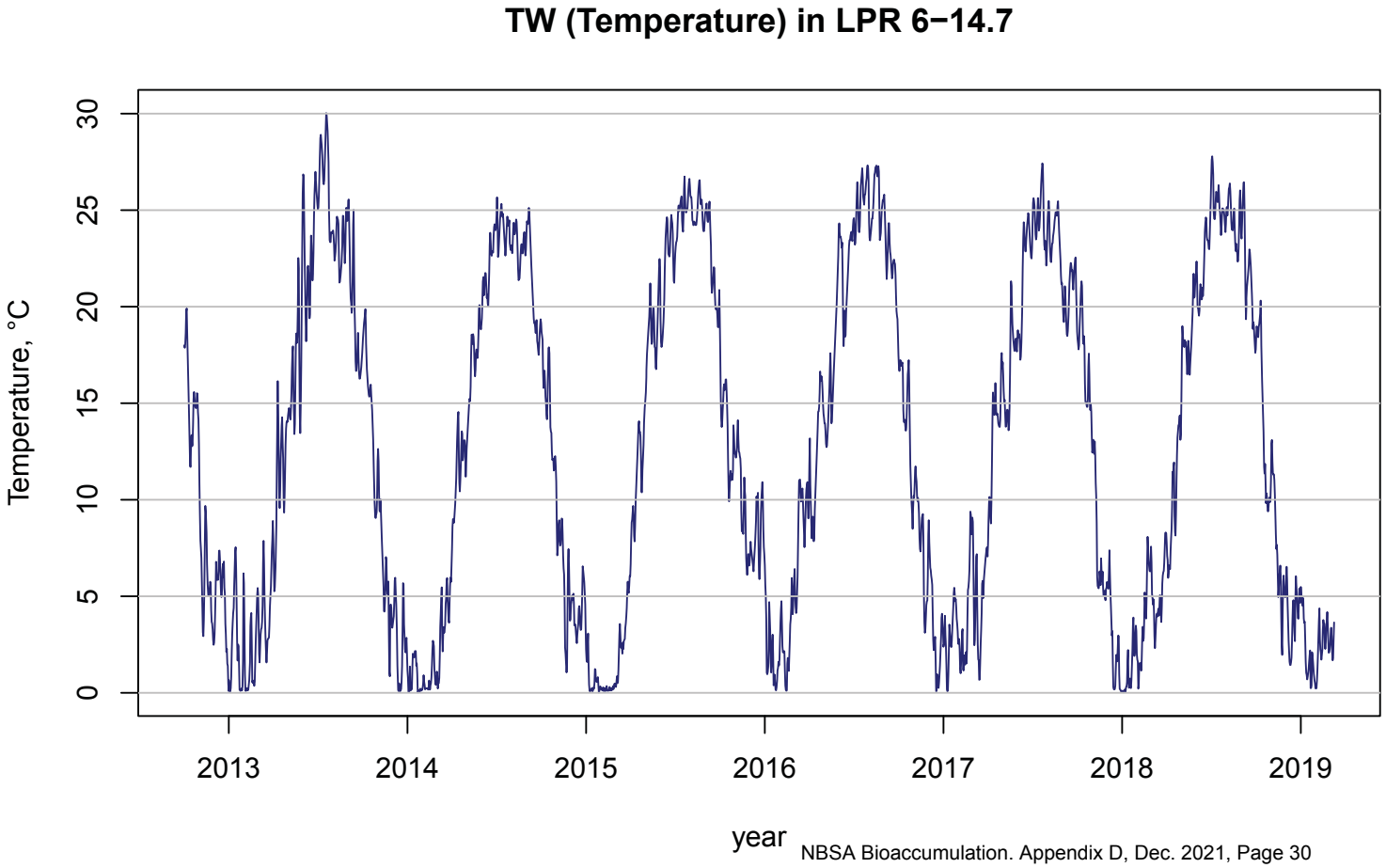
4,4'−DDx, CST_OCNorm (OC−Normalized concentration in sediment) in Kill van Kull

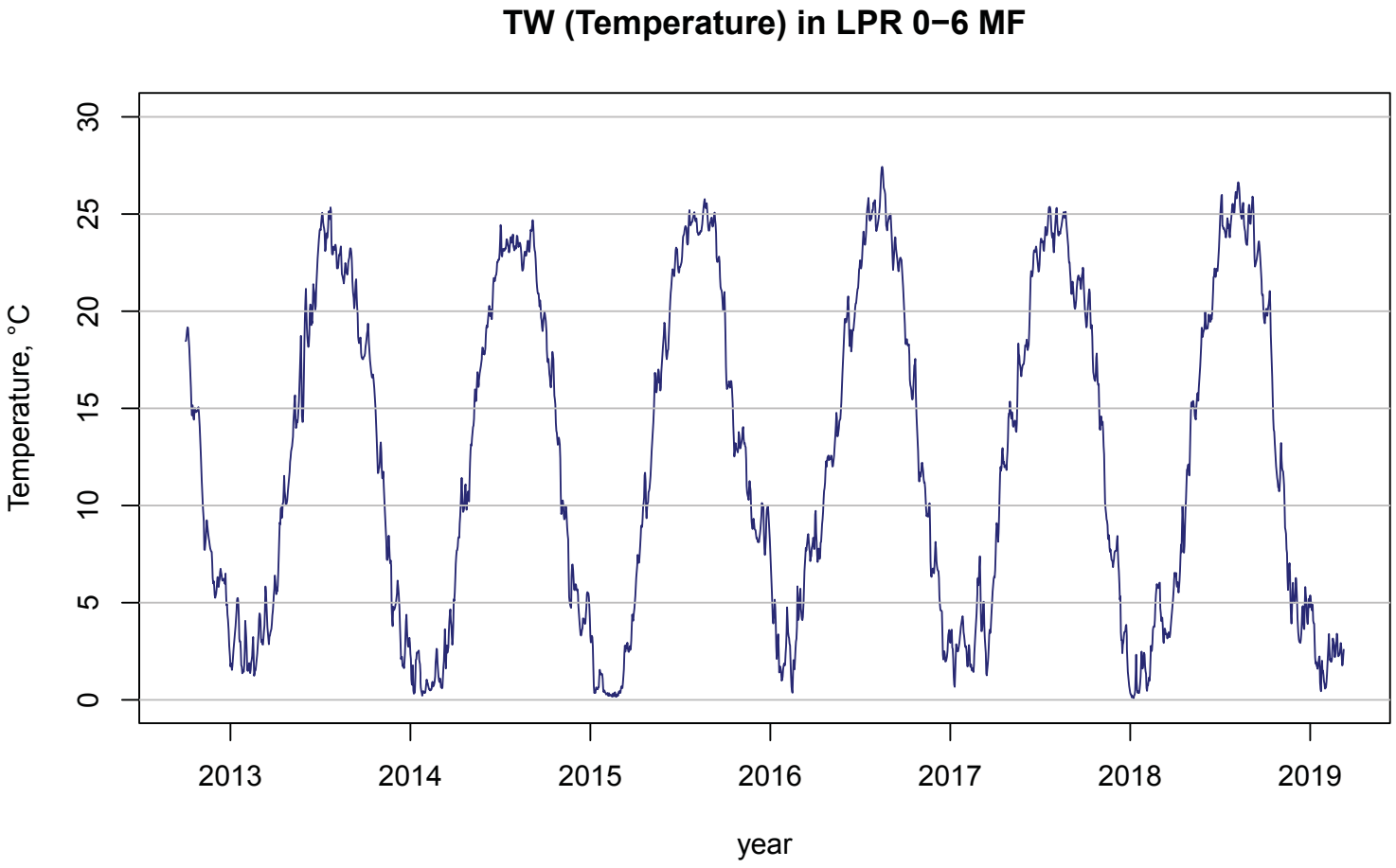


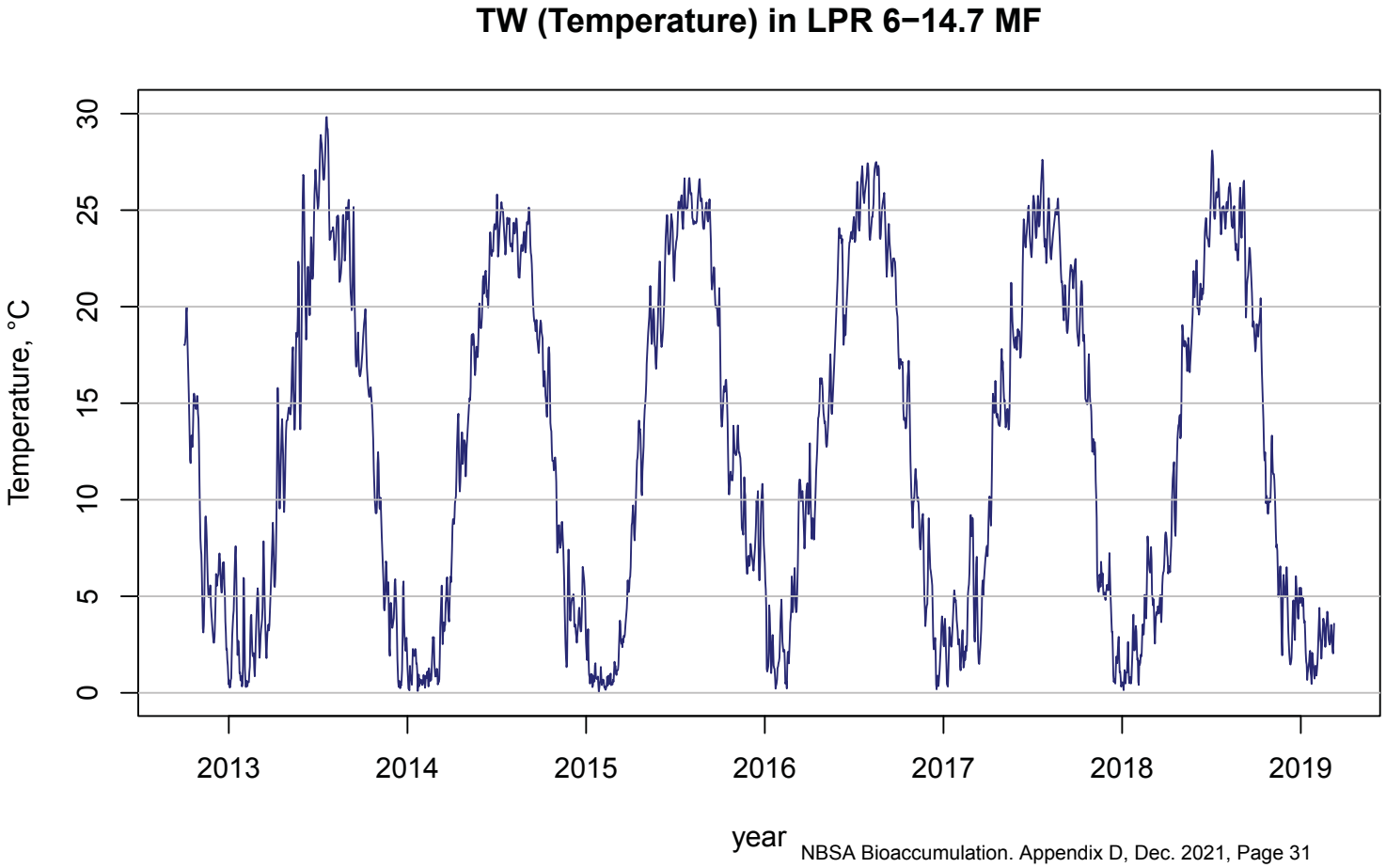
4,4'−DDx, CST_OCNorm (OC−Normalized concentration in sediment) in Arthur Kill

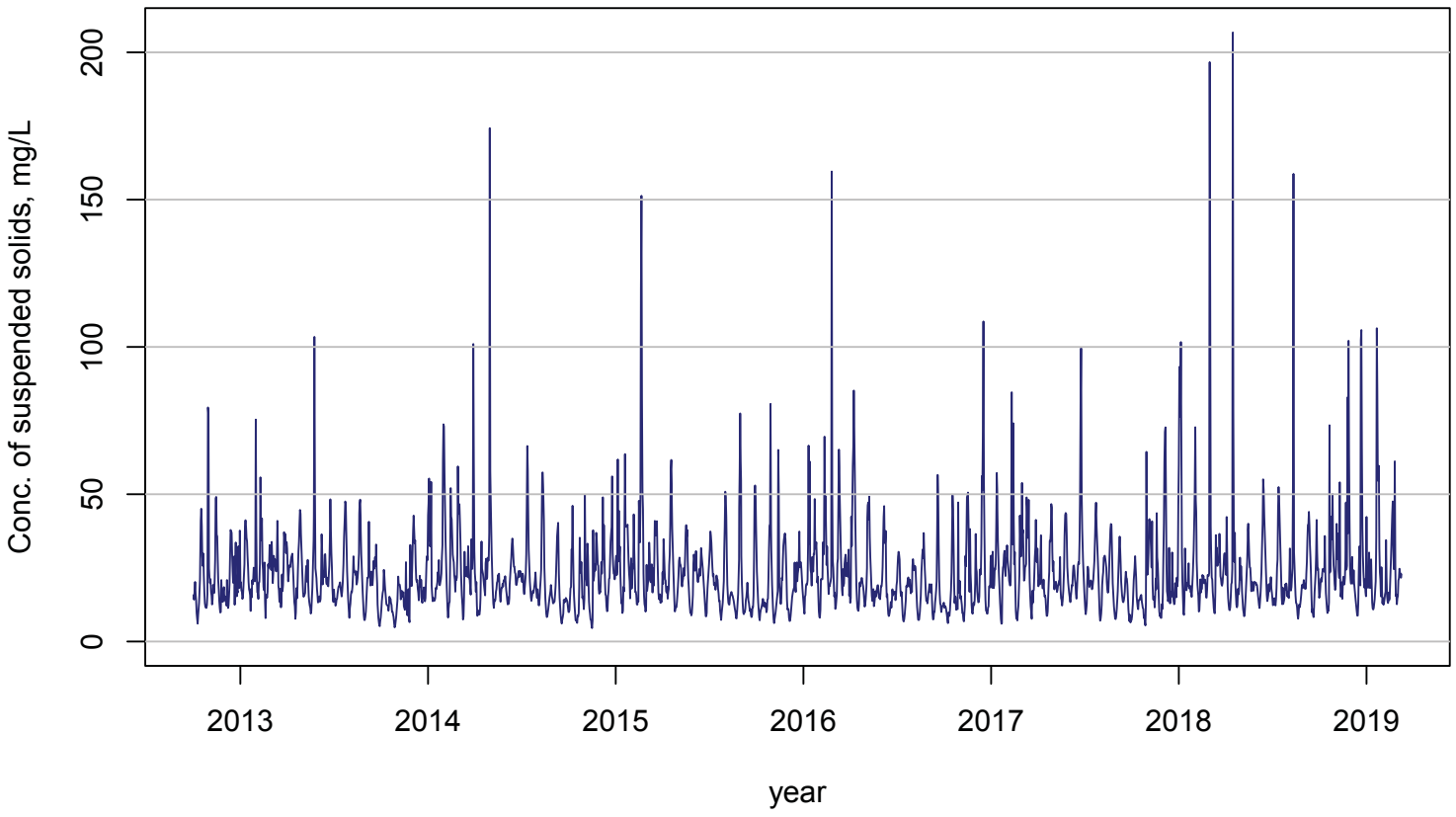


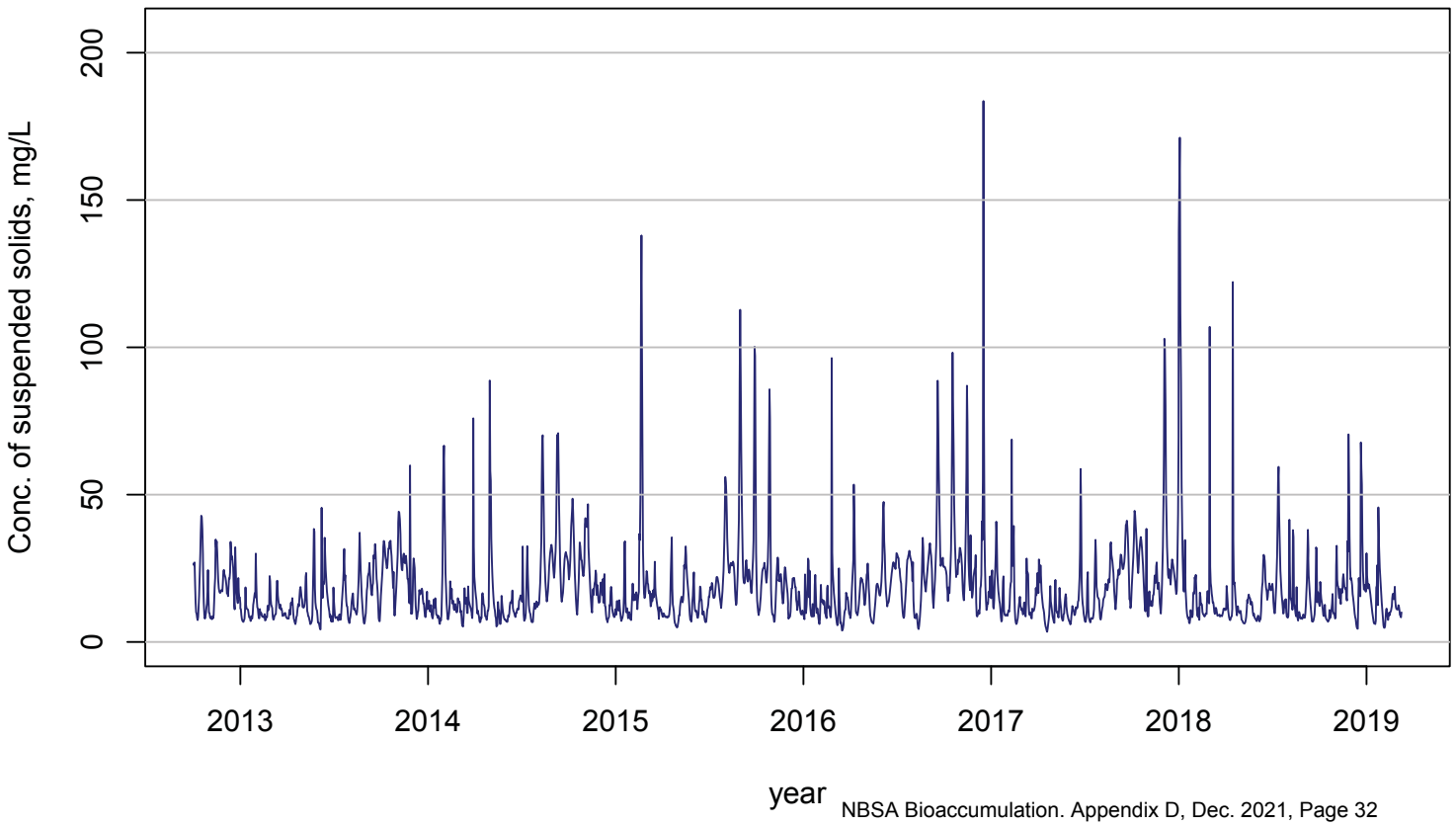

TW (Temperature) in LPR 0−6
Temperature, °C
0
5
10
15
20
25
30
2013
2014
2015
2016
2017
2018
2019
year

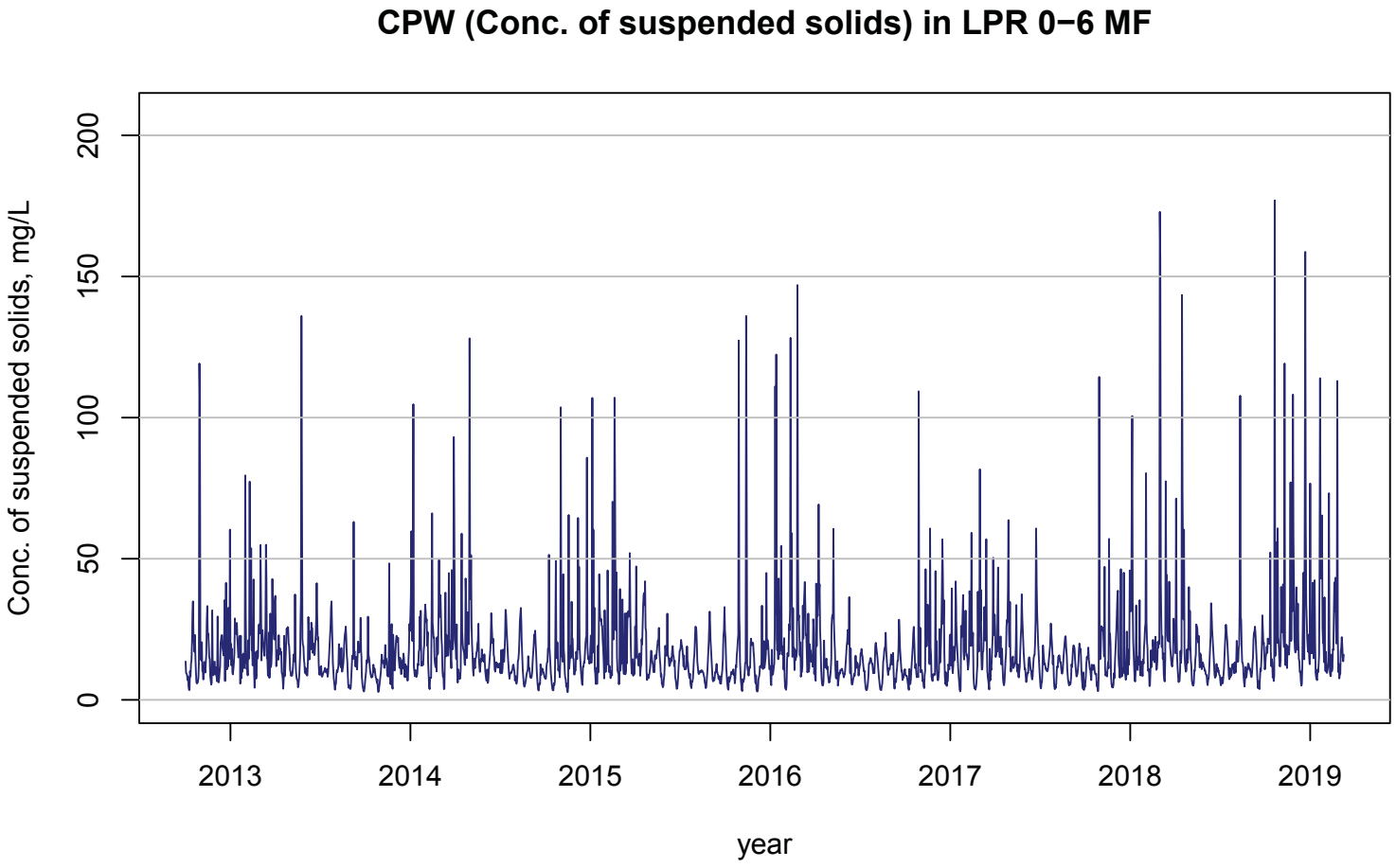

TW (Temperature) in LPR 6−14.7
Temperature, °C
0
5
10
15
20
25
30
2013
2014
2015
2016
2017
2018
2019
year

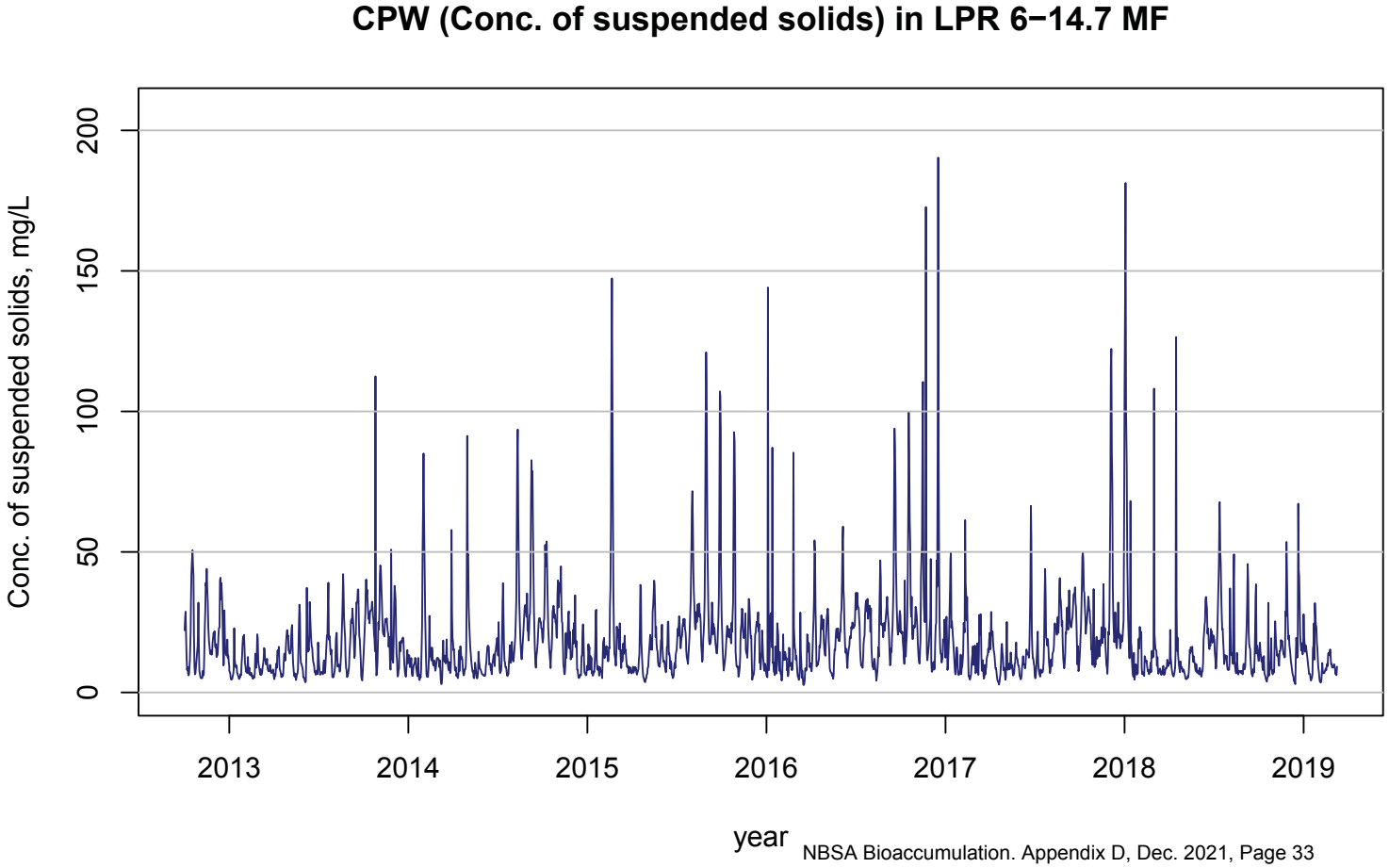

TW (Temperature) in LPR 0−6 MF
Temperature, °C
0
5
10
15
20
25
30
2013
2014
2015
2016
2017
2018
2019
year

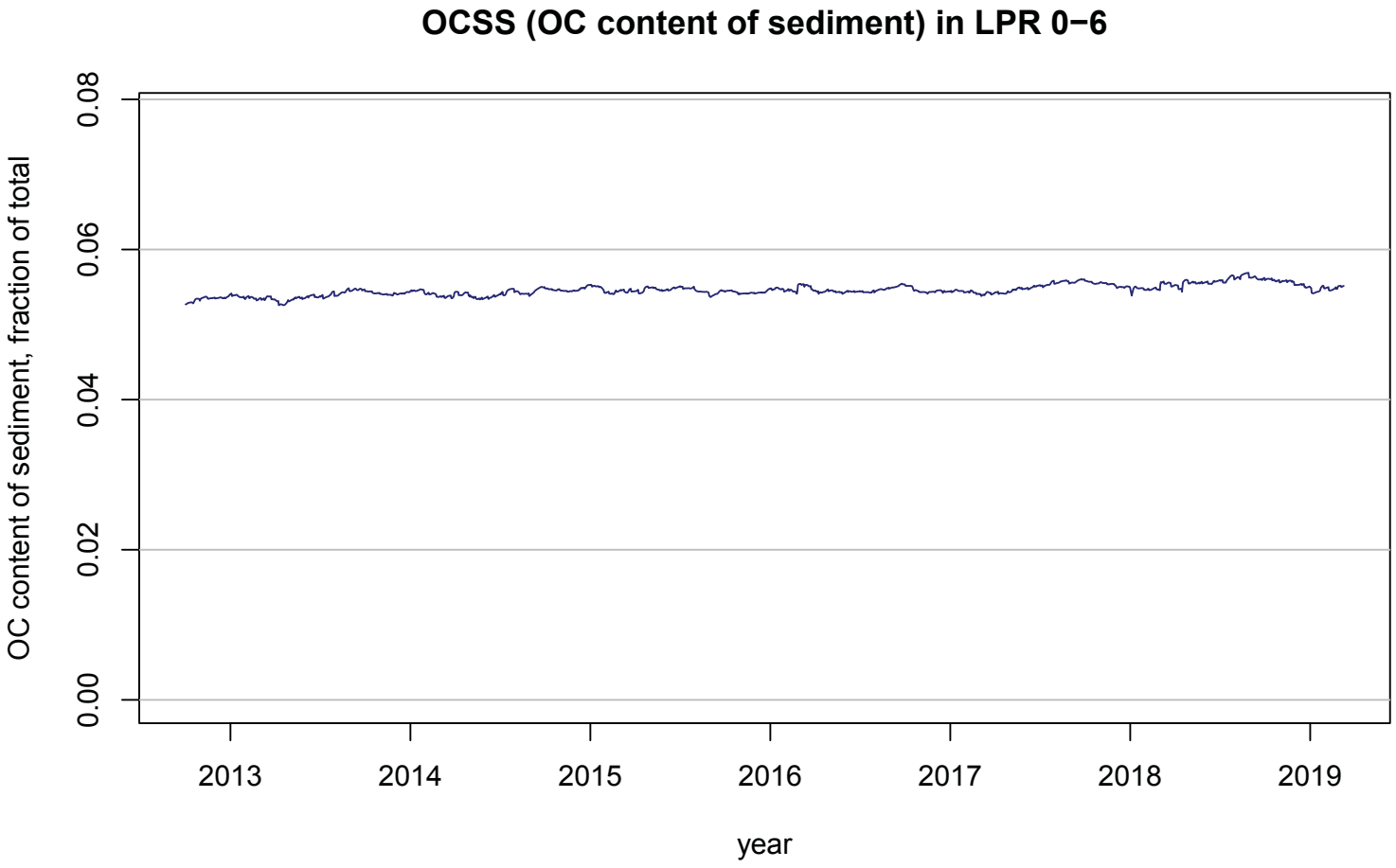

TW (Temperature) in LPR 6−14.7 MF
Temperature, °C
0
5
10
15
20
25
30
2013
2014
2015
2016
2017
2018
2019
year

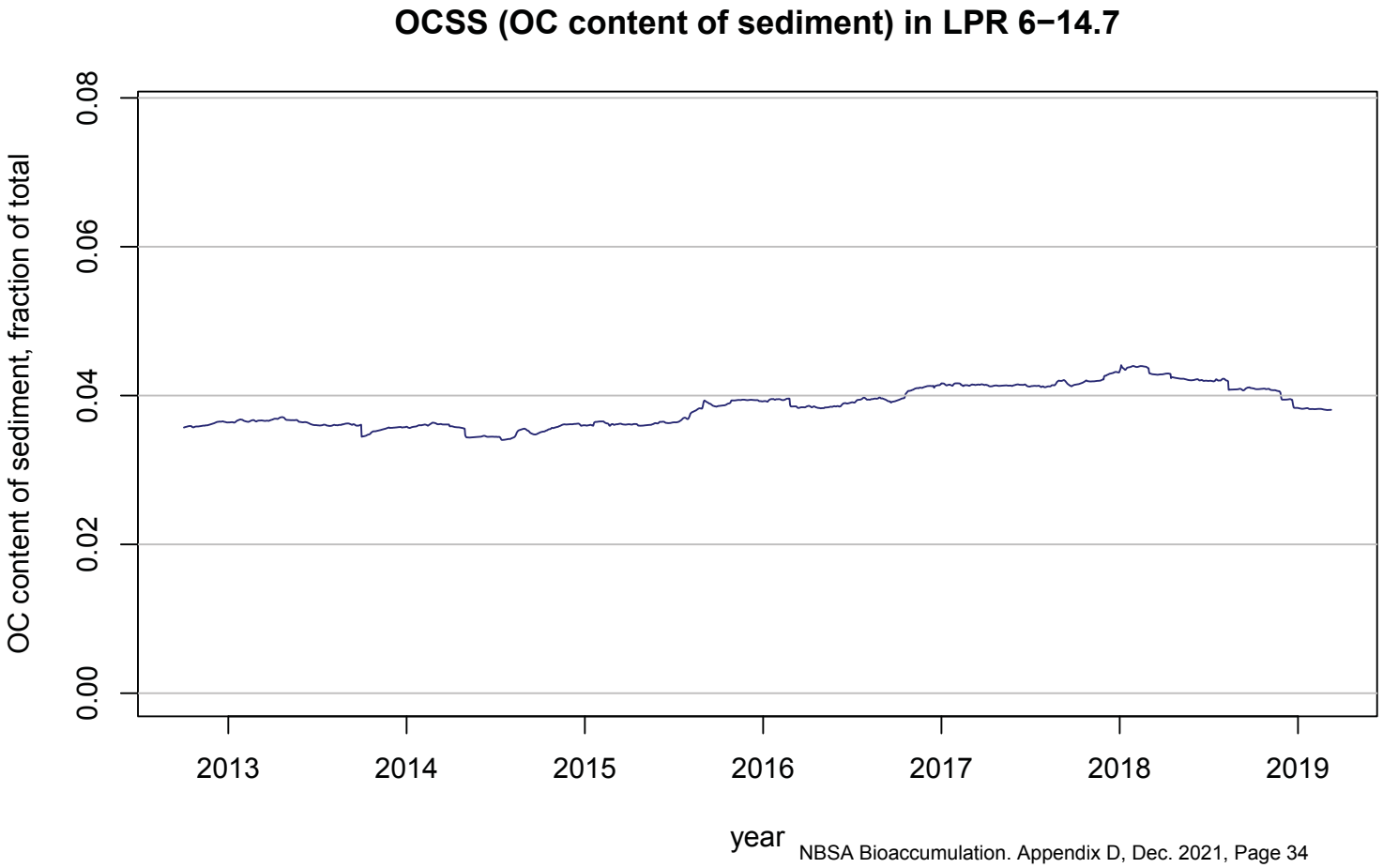

CPW (Conc. of suspended solids) in LPR 0−6
Conc. of suspended solids, mg/L
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

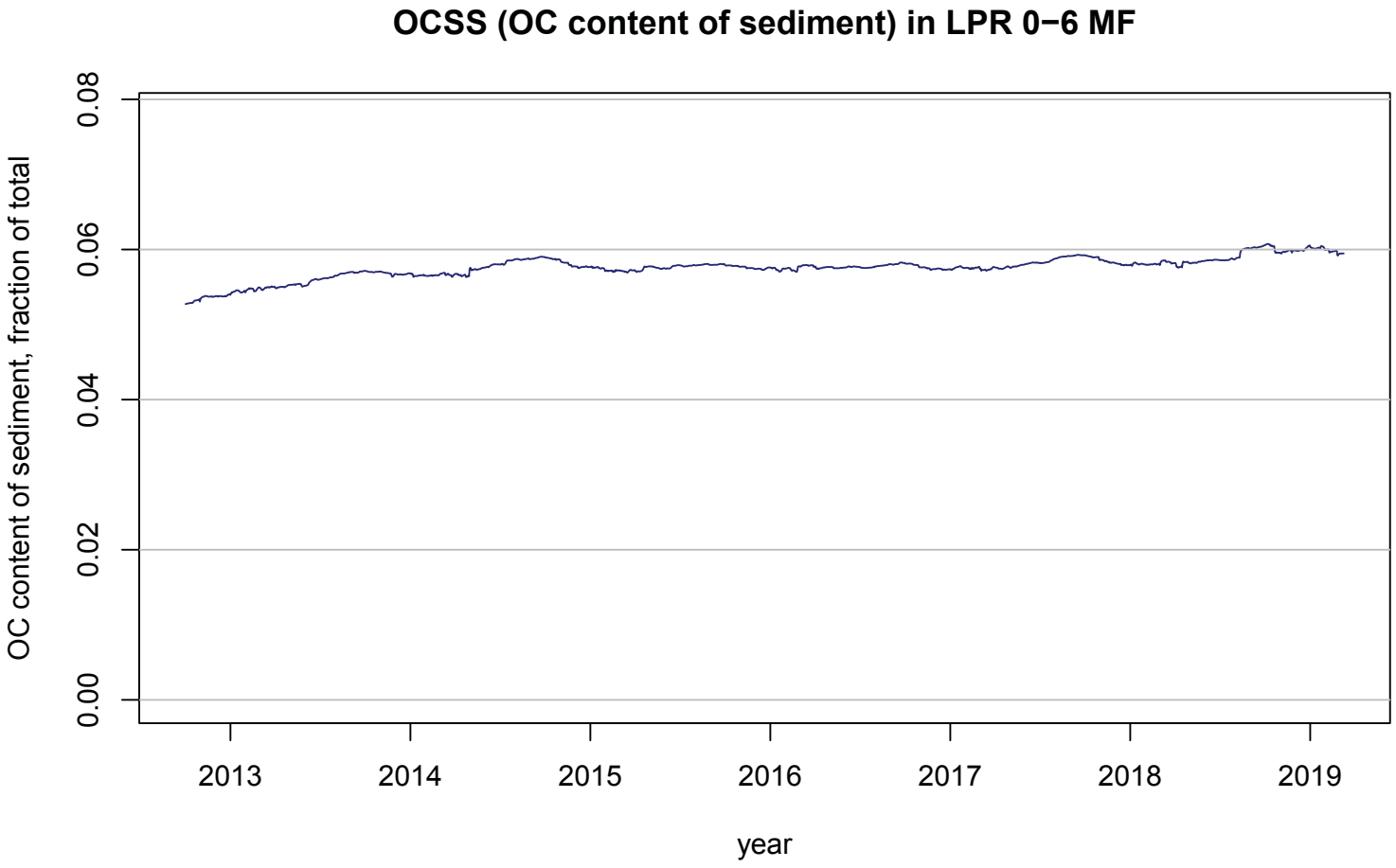

CPW (Conc. of suspended solids) in LPR 6−14.7
Conc. of suspended solids, mg/L
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

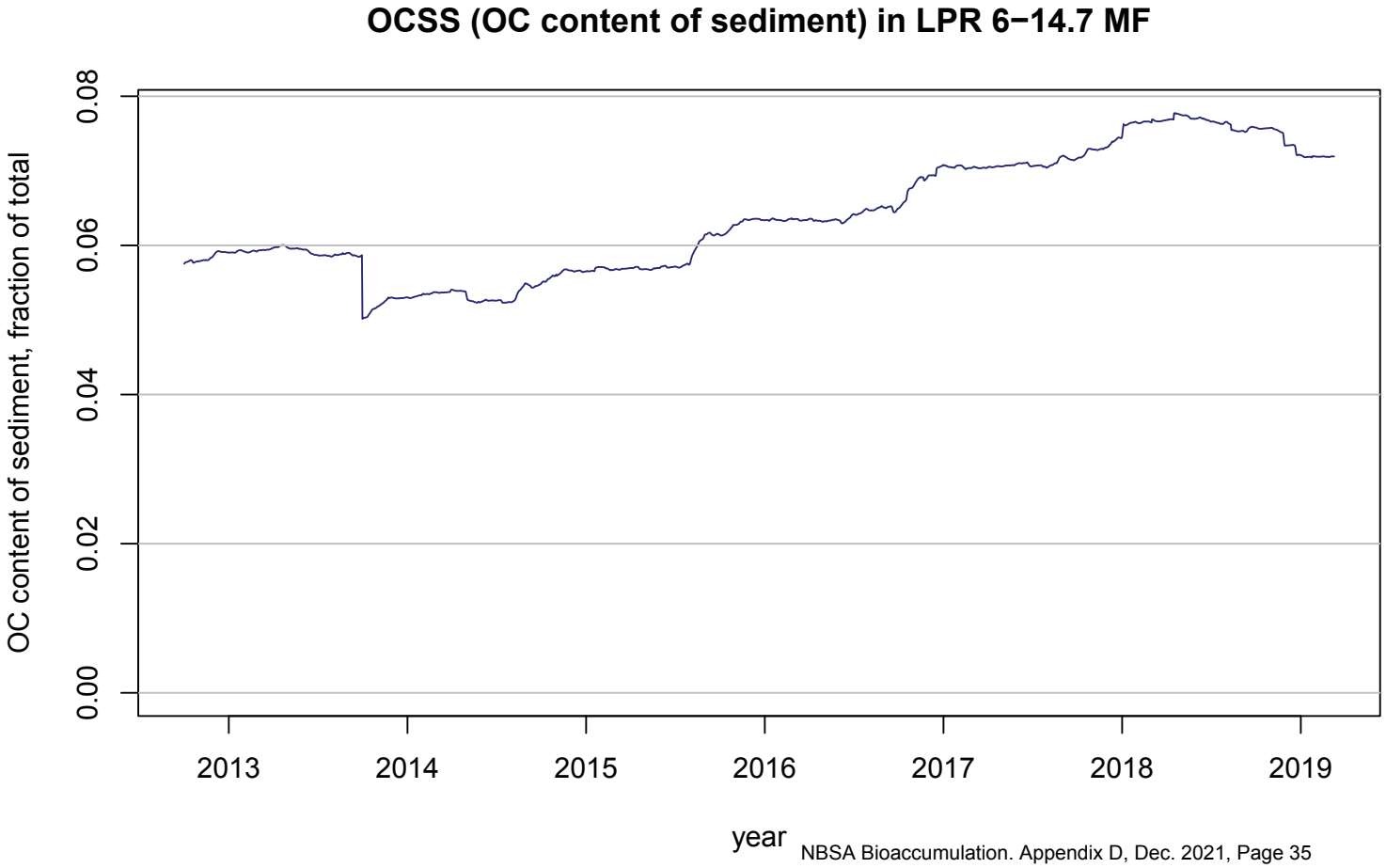

CPW (Conc. of suspended solids) in LPR 0−6 MF
Conc. of suspended solids, mg/L
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

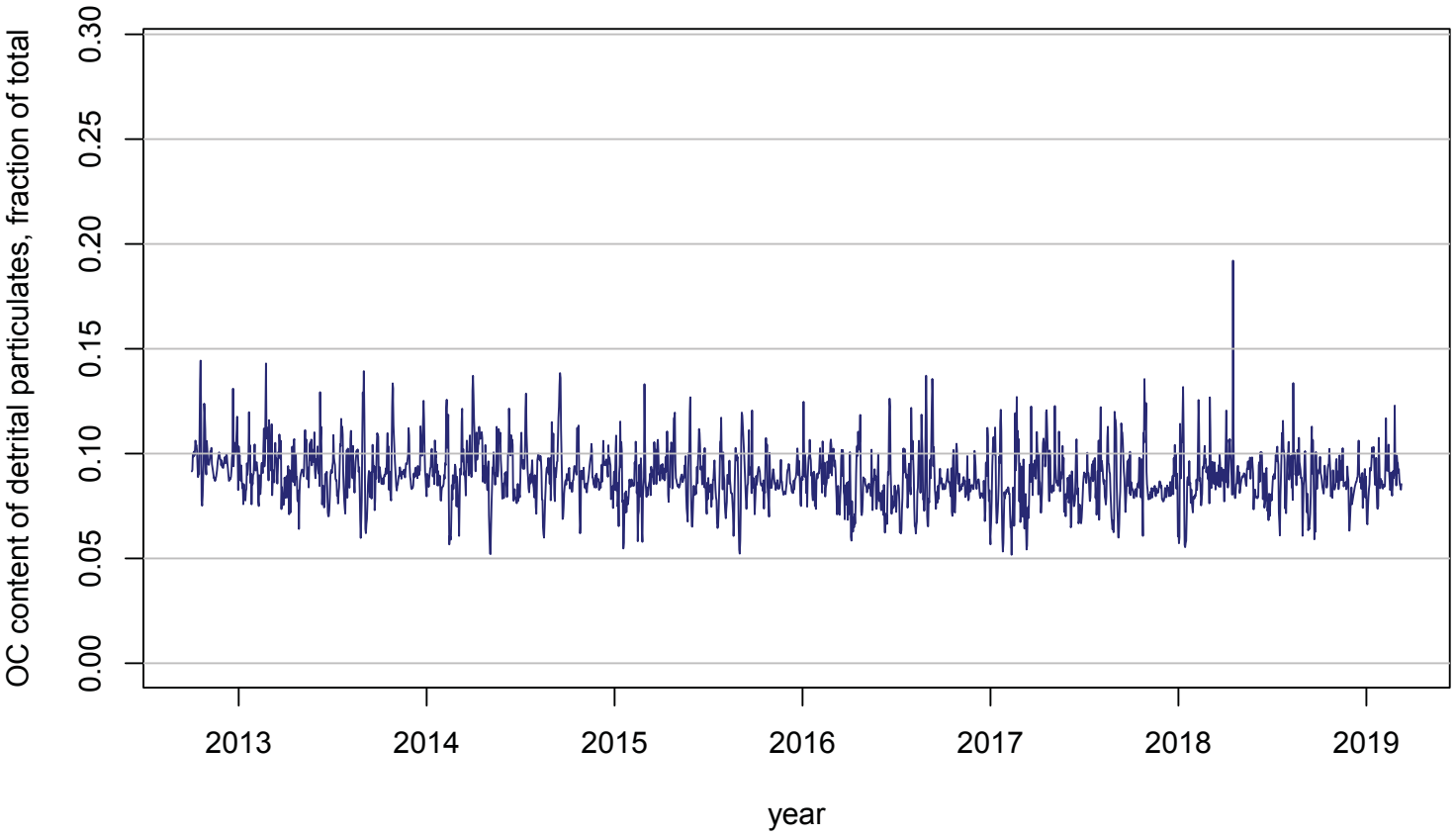

CPW (Conc. of suspended solids) in LPR 6−14.7 MF
Conc. of suspended solids, mg/L
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

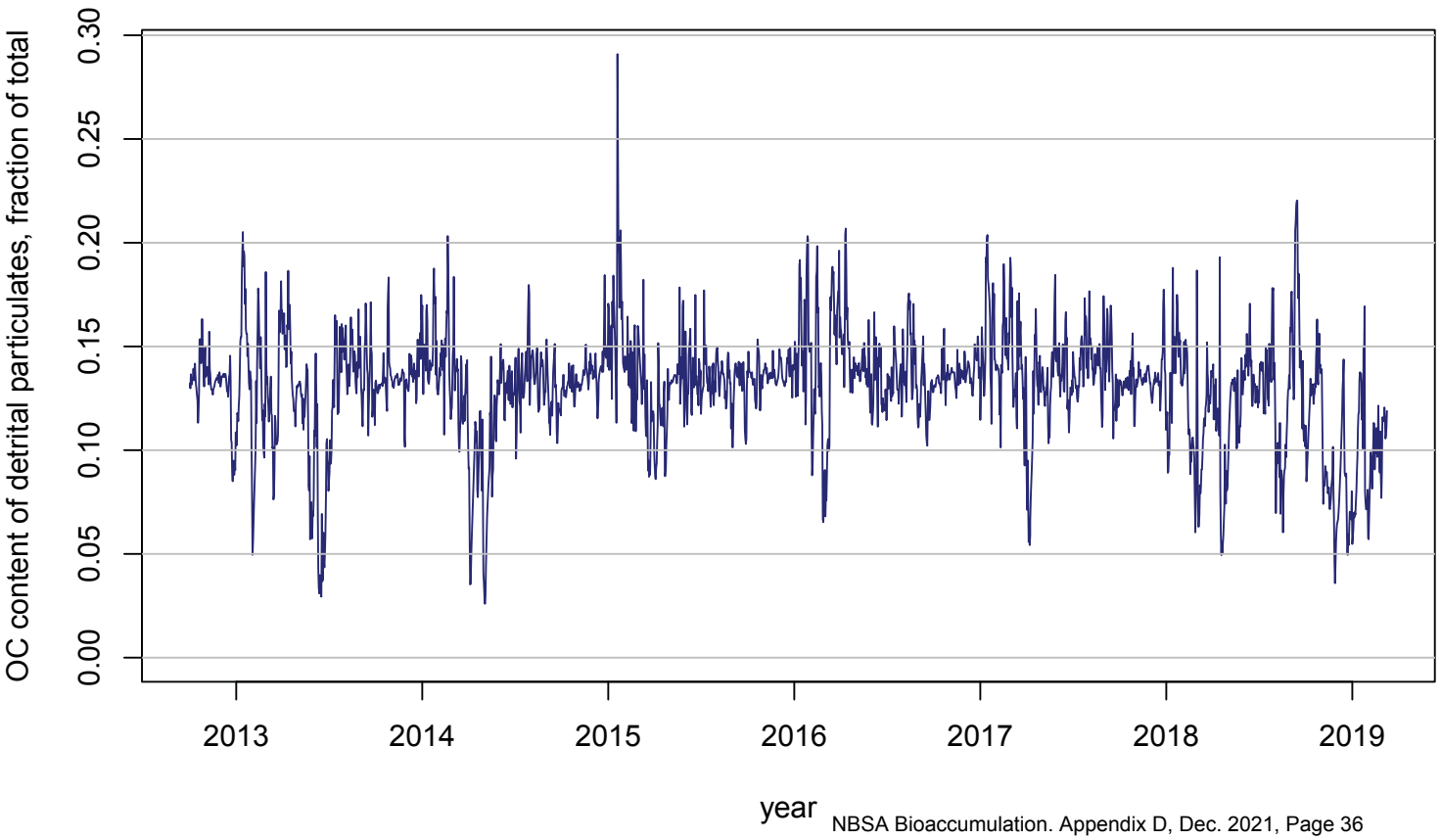

OCSS (OC content of sediment) in LPR 0−6
OC content of sediment, fraction of total
0.00
0.02
0.04
0.06
0.08
2013
2014
2015
2016
2017
2018
2019
year

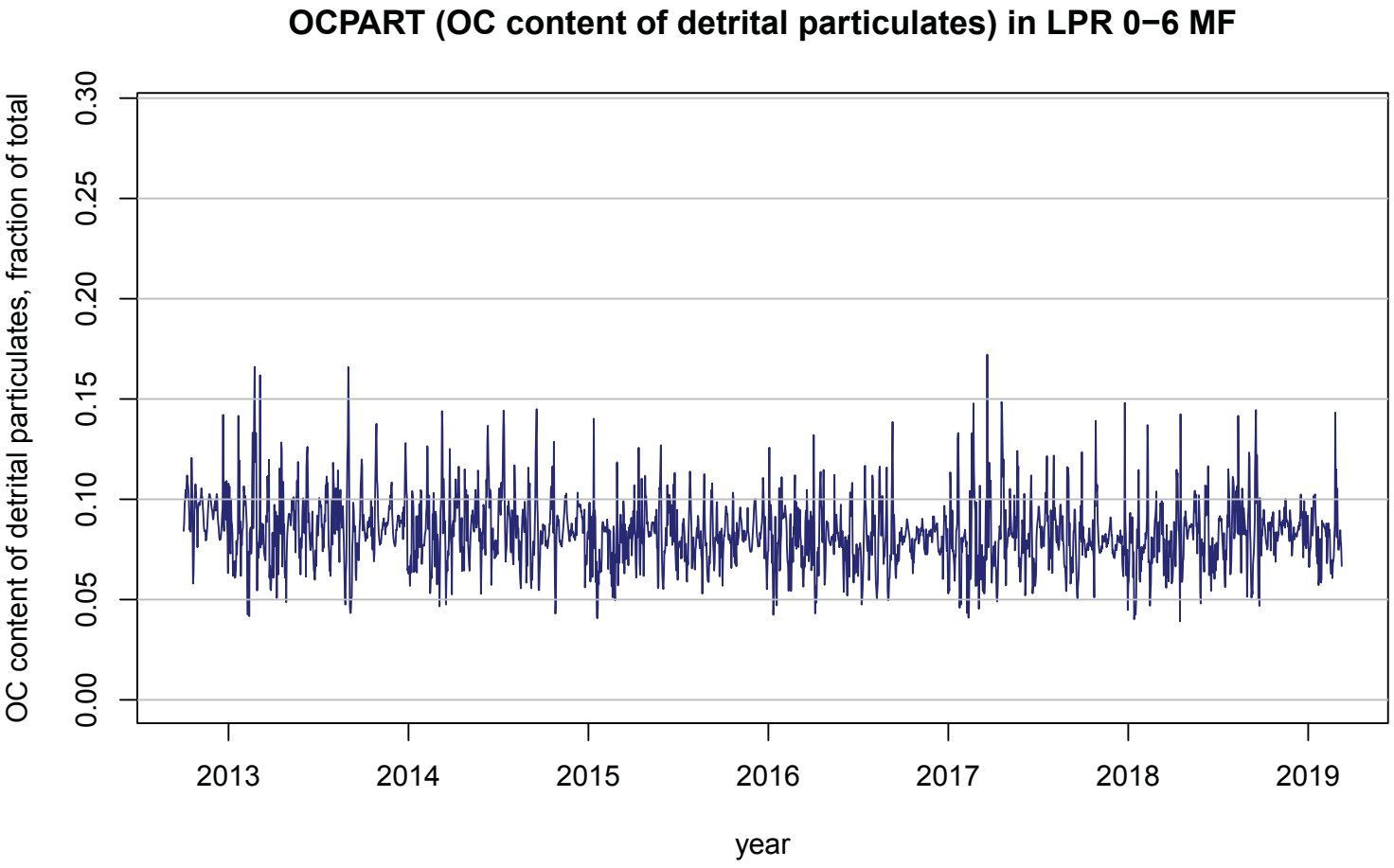

OCSS (OC content of sediment) in LPR 6−14.7
OC content of sediment, fraction of total
0.00
0.02
0.04
0.06
0.08
2013
2014
2015
2016
2017
2018
2019
year

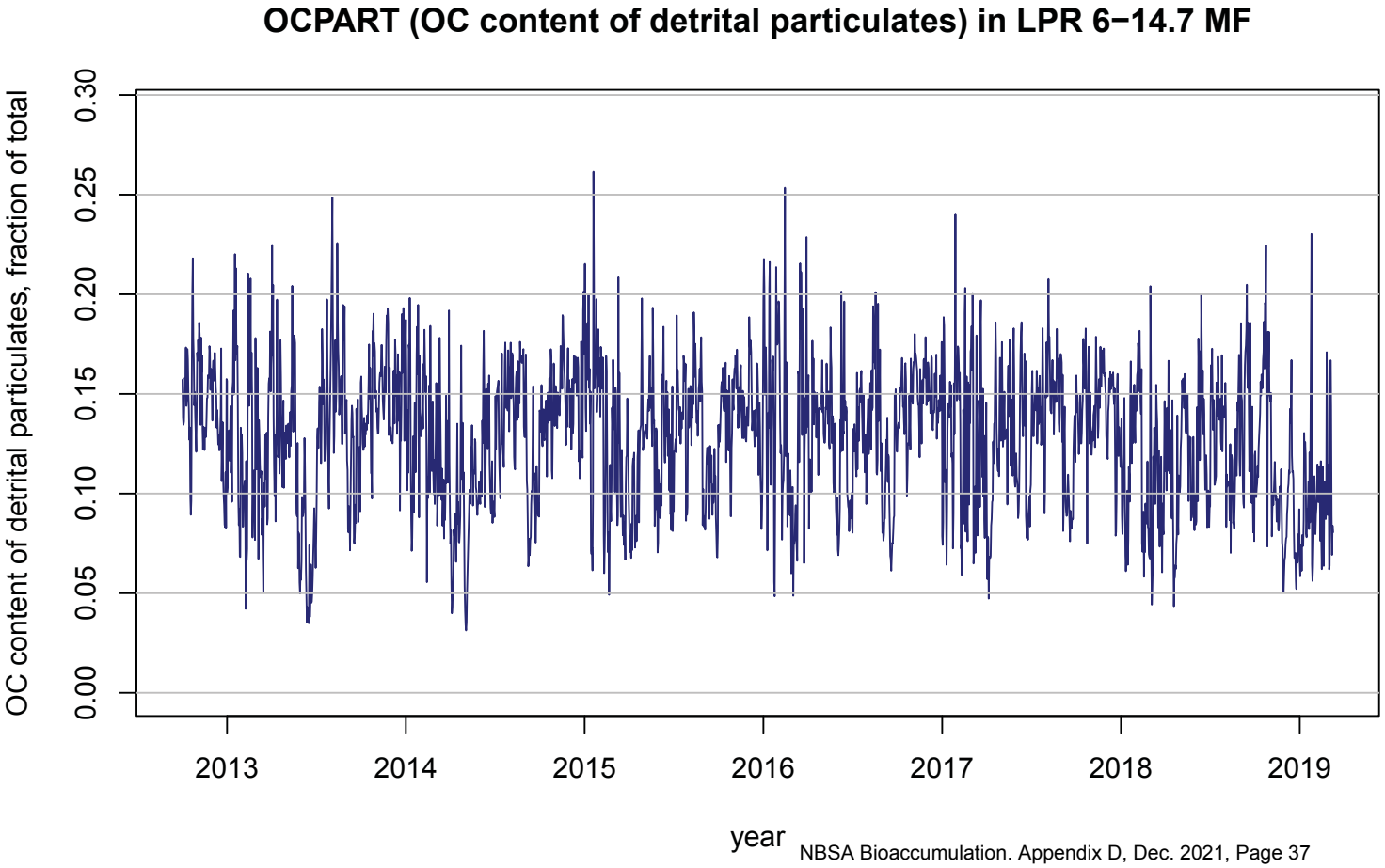

OCSS (OC content of sediment) in LPR 0−6 MF
OC content of sediment, fraction of total
0.00
0.02
0.04
0.06
0.08
2013
2014
2015
2016
2017
2018
2019
year

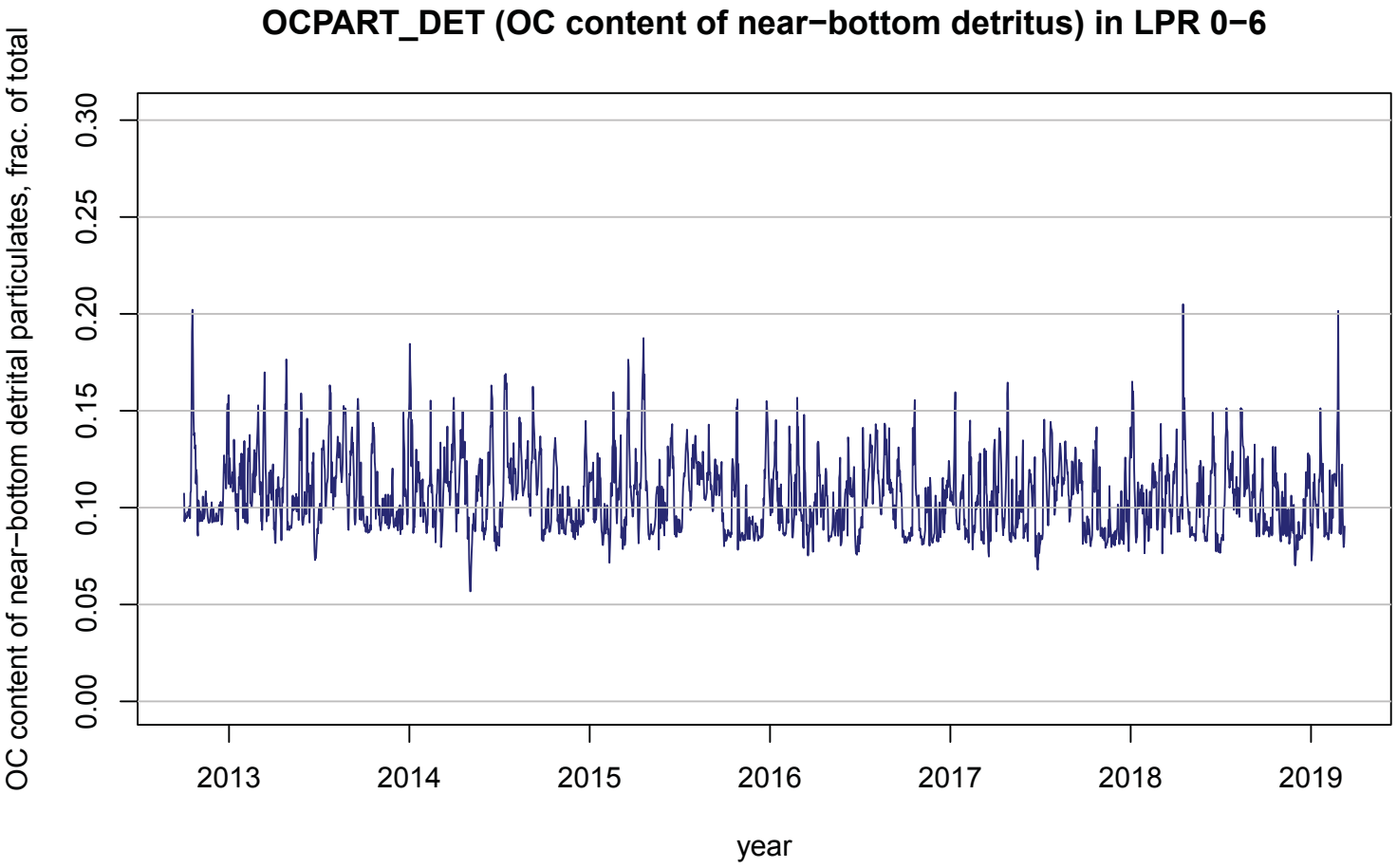

OCSS (OC content of sediment) in LPR 6−14.7 MF
OC content of sediment, fraction of total
0.00
0.02
0.04
0.06
0.08
2013
2014
2015
2016
2017
2018
2019
year

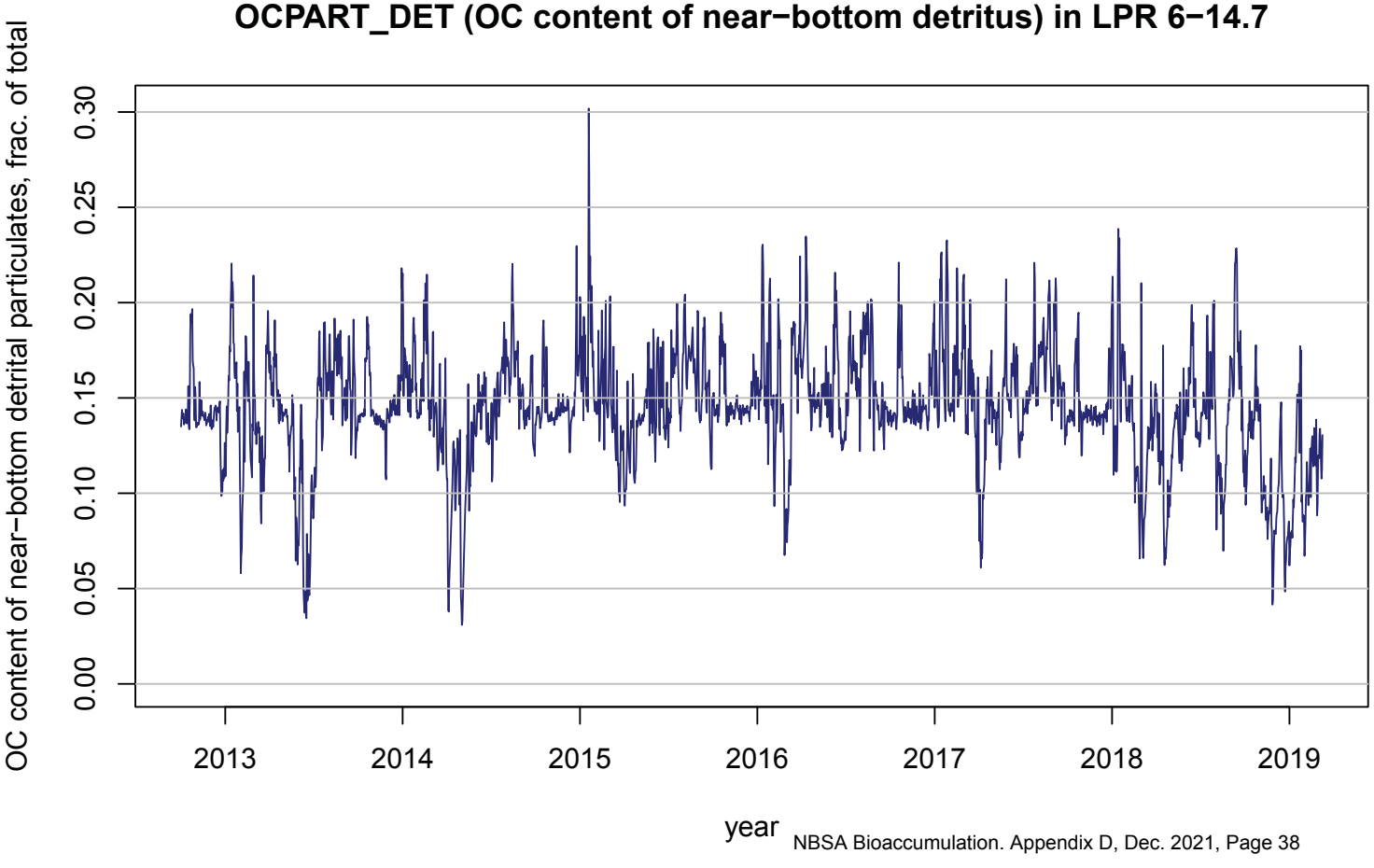

OCPART (OC content of detrital particulates) in LPR 0−6
OC content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
0.20
0.25
0.30
2013
2014
2015
2016
2017
2018
2019
year

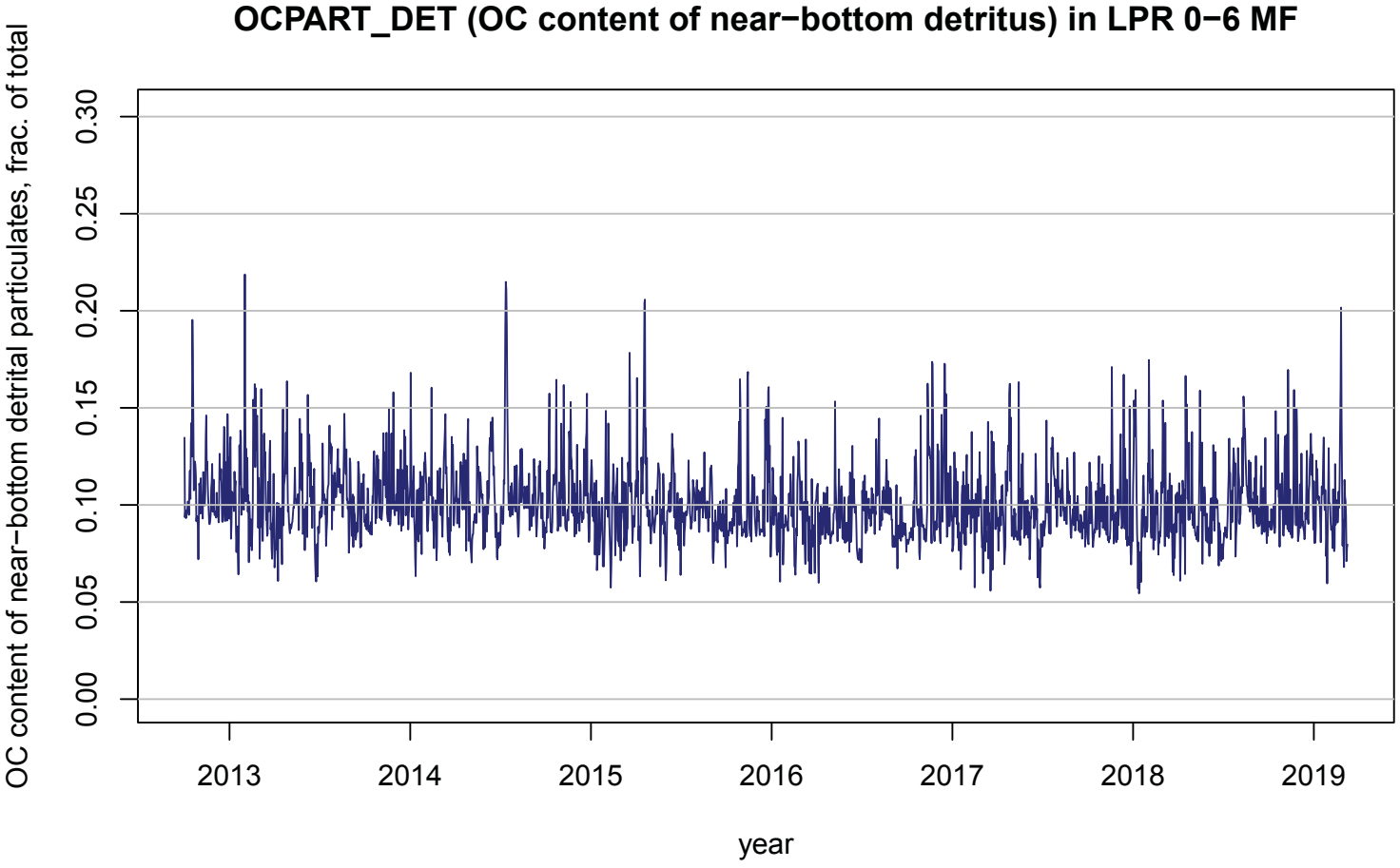

OCPART (OC content of detrital particulates) in LPR 6−14.7
OC content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
0.20
0.25
0.30
2013
2014
2015
2016
2017
2018
2019
year

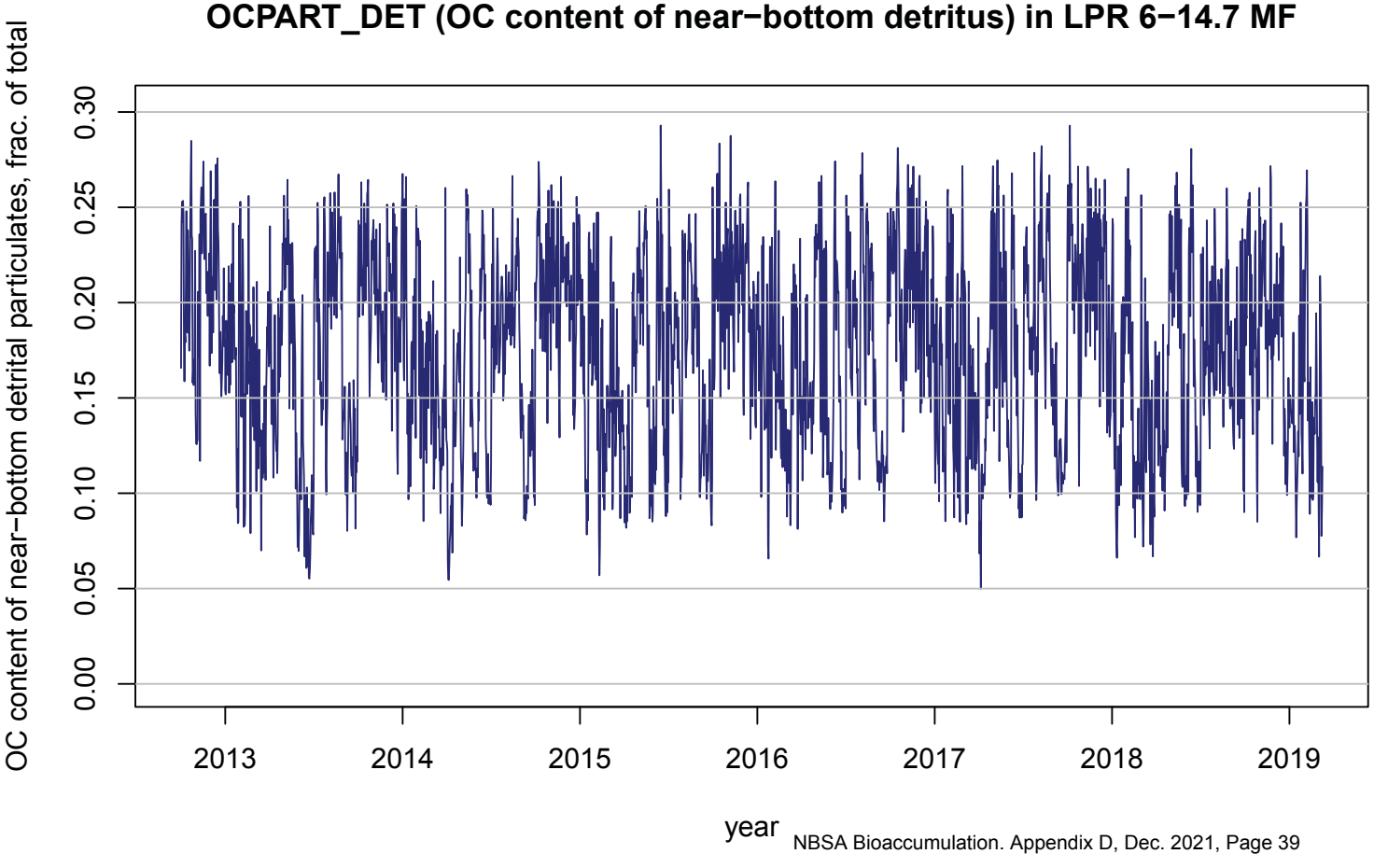

OCPART (OC content of detrital particulates) in LPR 0−6 MF
OC content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
0.20
0.25
0.30
2013
2014
2015
2016
2017
2018
2019
year


OCPART (OC content of detrital particulates) in LPR 6−14.7 MF
OC content of detrital particulates, fraction of total
0.00
0.05
0.10
0.15
0.20
0.25
0.30
2013
2014
2015
2016
2017
2018
2019
year

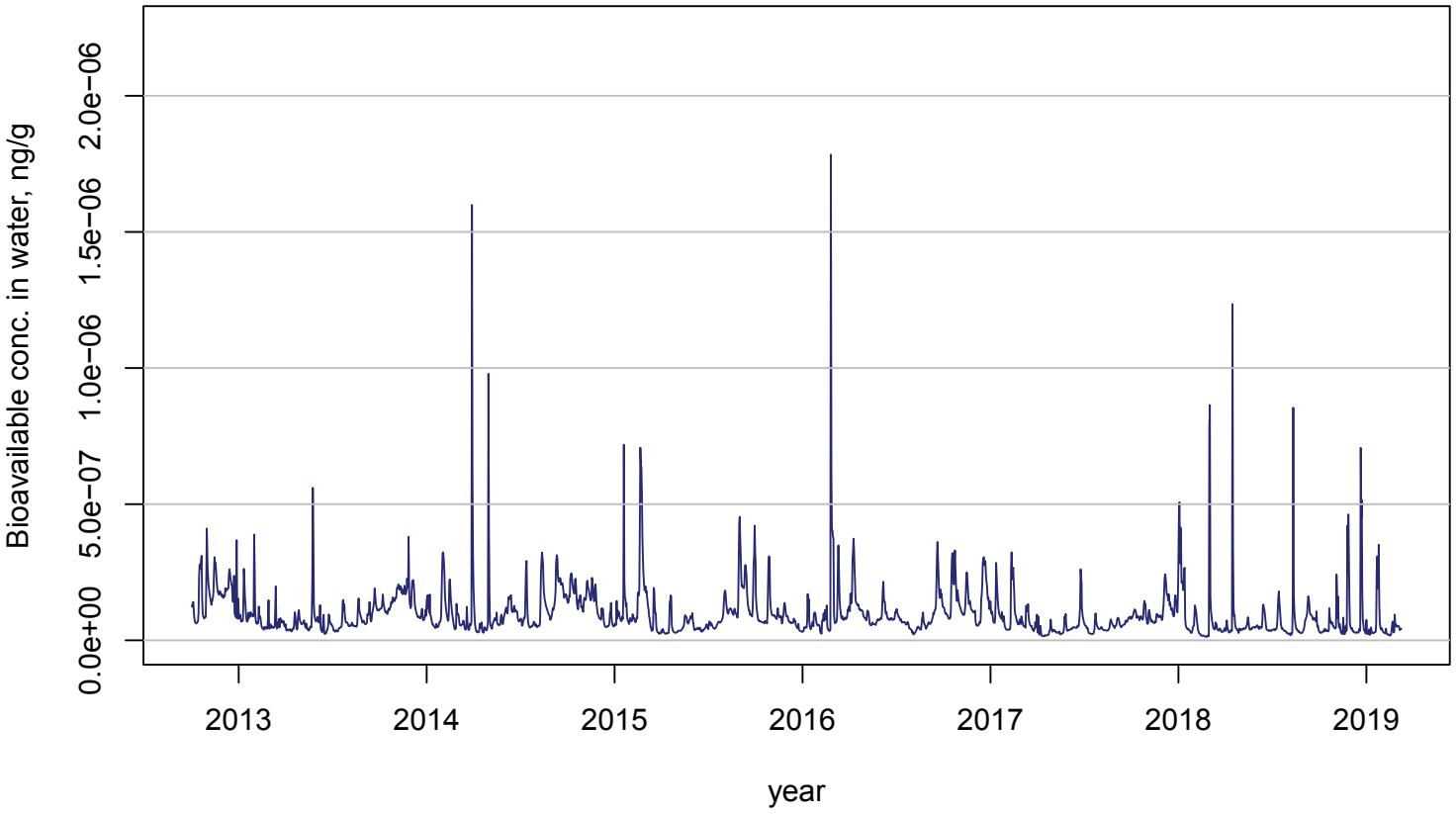

OCPART_DET (OC content of near−bottom detritus) in LPR 0−6
OC content of near−bottom detrital particulates, frac. of total
0.00
0.05
0.10
0.15
0.20
0.25
0.30
2013
2014
2015
2016
2017
2018
2019
year


OCPART_DET (OC content of near−bottom detritus) in LPR 6−14.7
OC content of near−bottom detrital particulates, frac. of total
0.00
0.05
0.10
0.15
0.20
0.25
0.30
2013
2014
2015
2016
2017
2018
2019
year

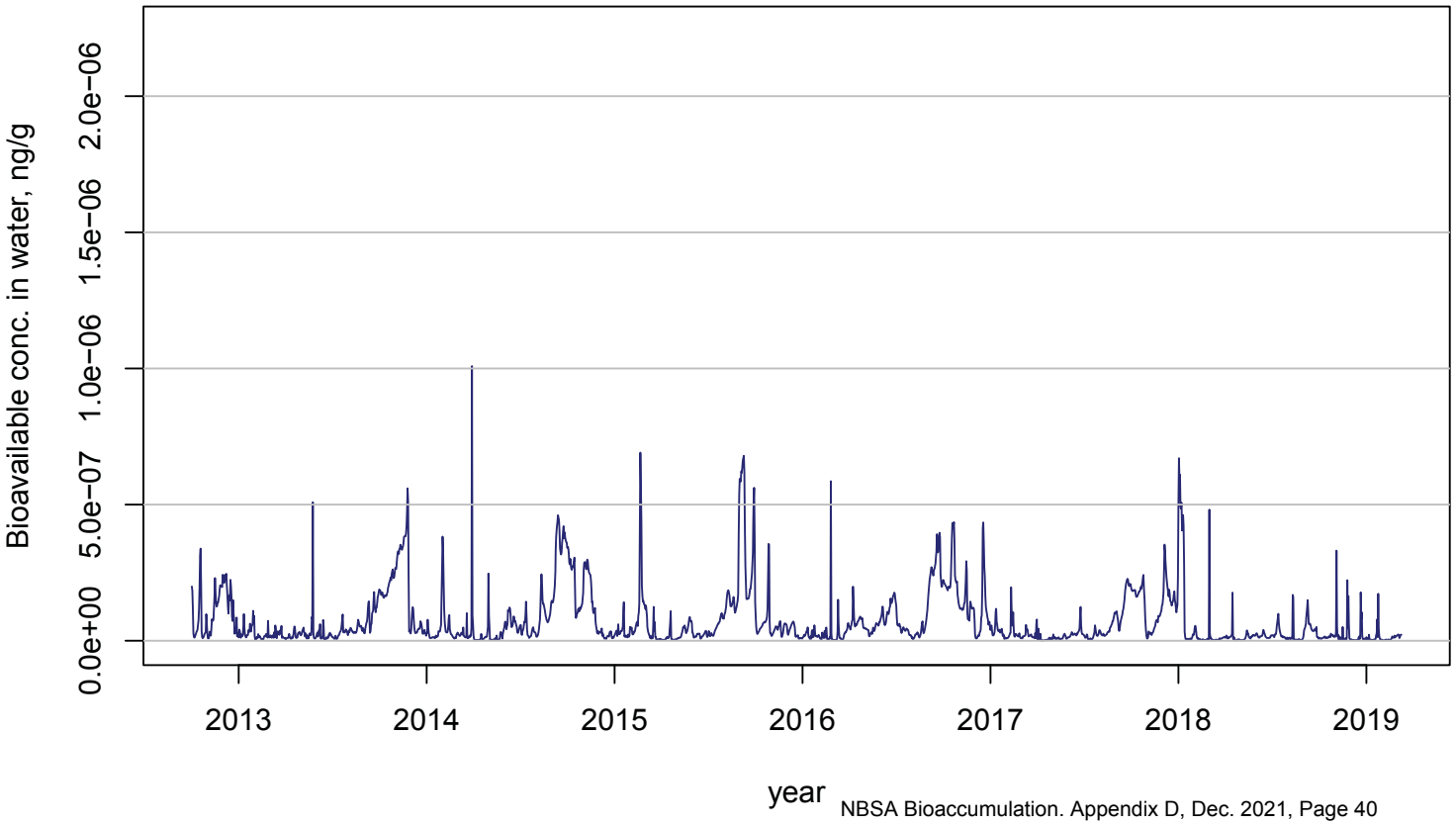

OCPART_DET (OC content of near−bottom detritus) in LPR 0−6 MF
OC content of near−bottom detrital particulates, frac. of total
0.00
0.05
0.10
0.15
0.20
0.25
0.30
2013
2014
2015
2016
2017
2018
2019
year


OCPART_DET (OC content of near−bottom detritus) in LPR 6−14.7 MF
OC content of near−bottom detrital particulates, frac. of total
0.00
0.05
0.10
0.15
0.20
0.25
0.30
2013
2014
2015
2016
2017
2018
2019
year

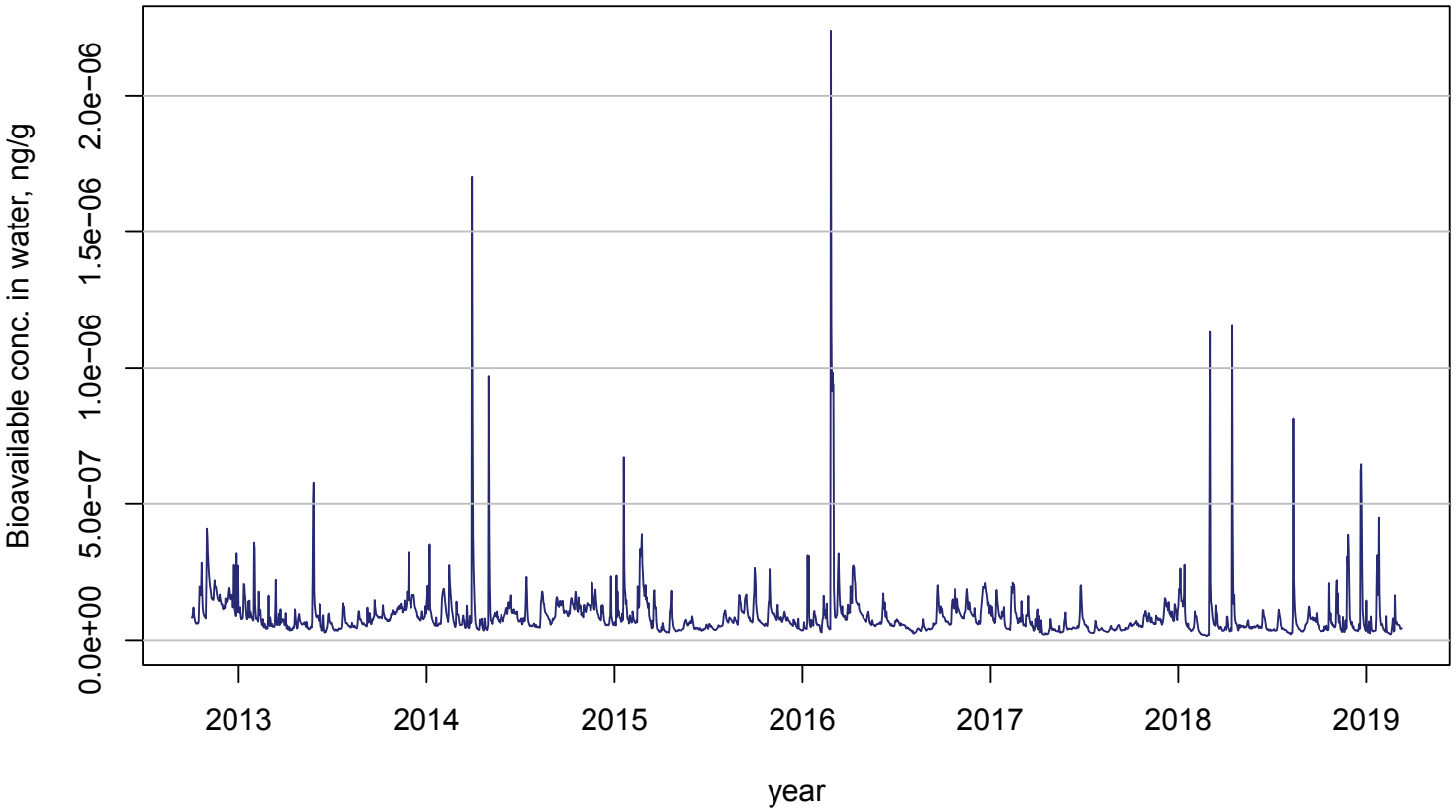
2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in LPR 0−6



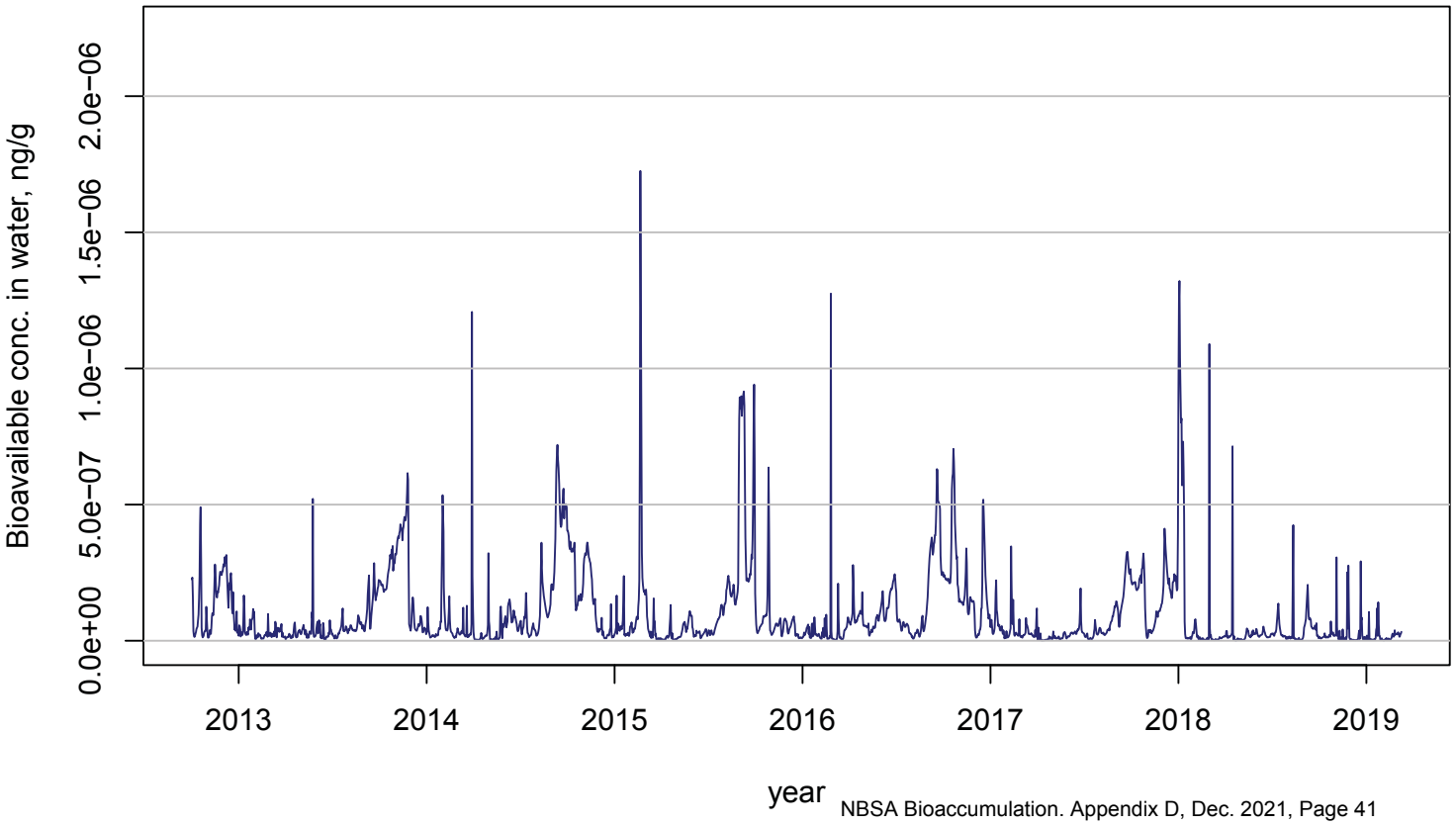
2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in LPR 6−14.7



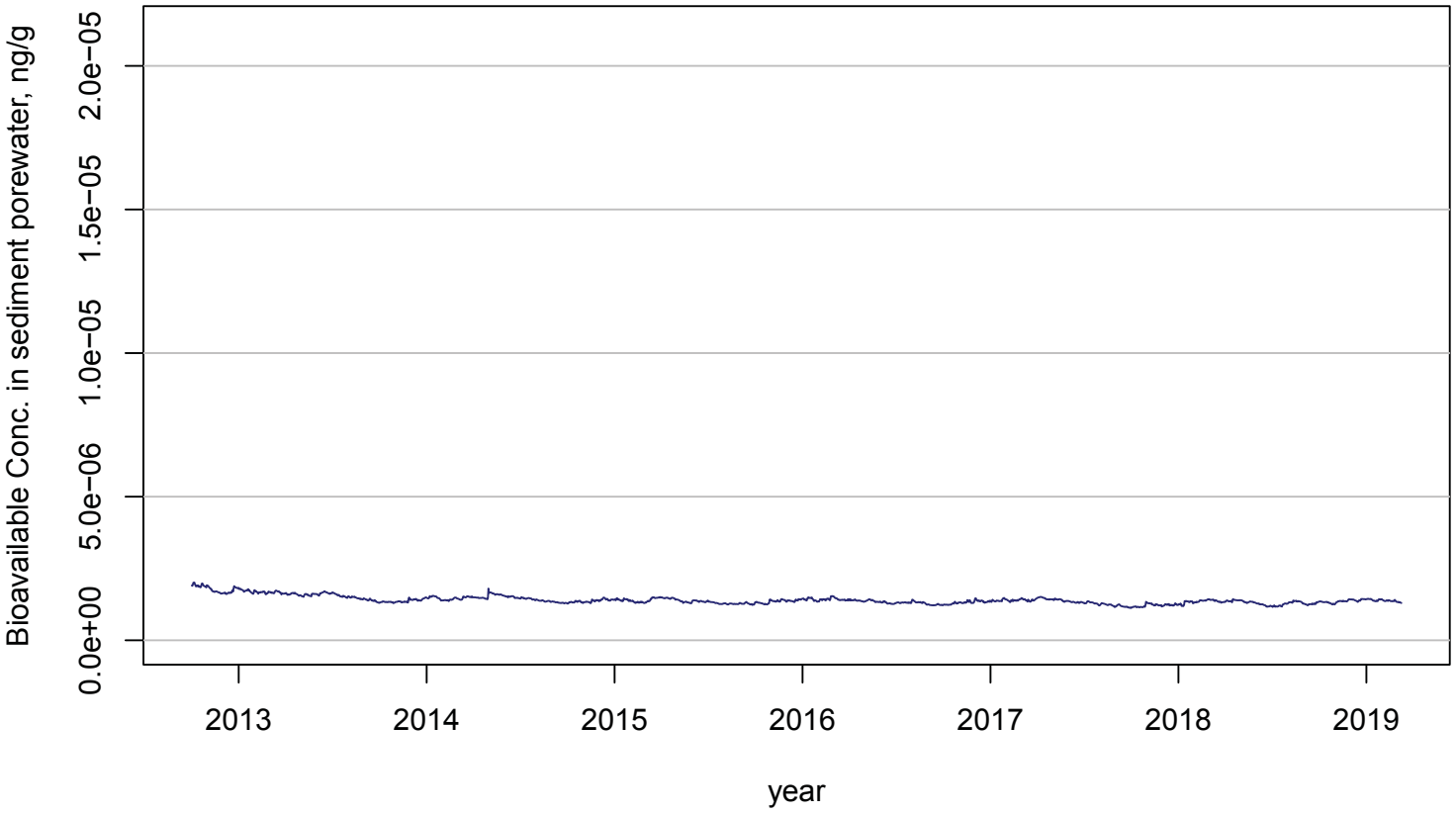
2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in LPR 0−6 MF



2,3,7,8−TCDD, CWB (Bioavailable conc. in water) in LPR 6−14.7 MF



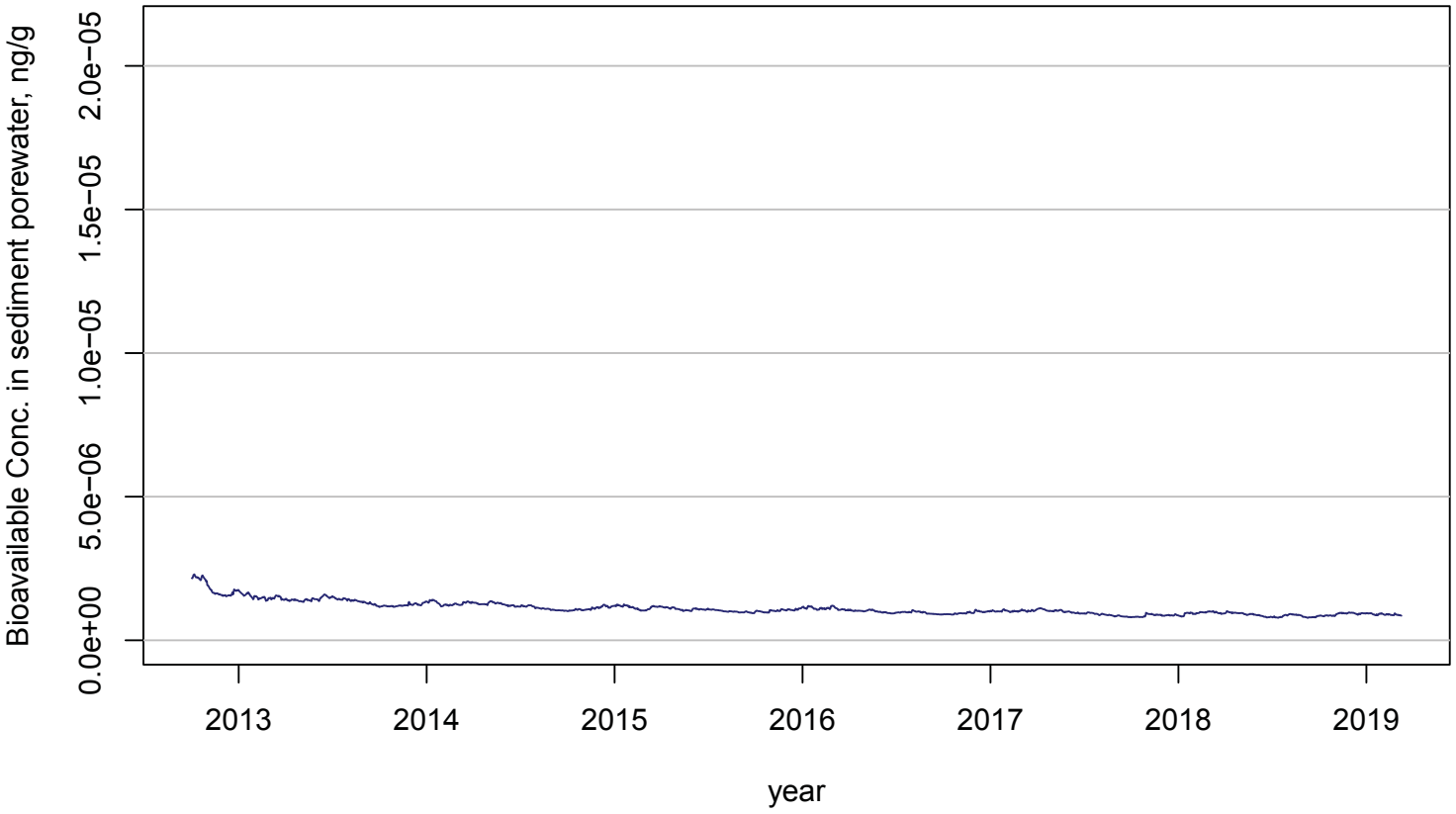
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in LPR 0−6



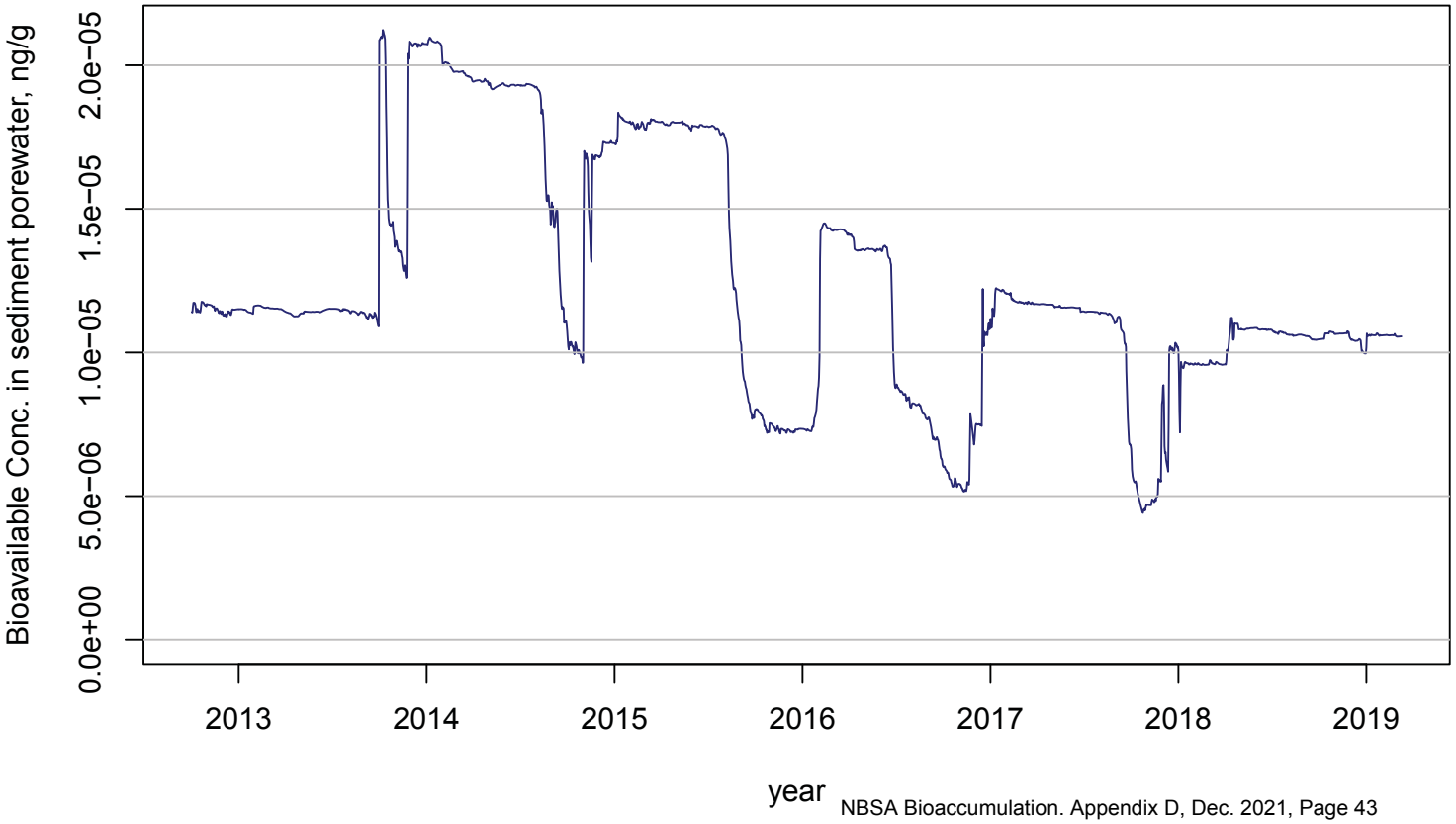
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in LPR 6−14.7



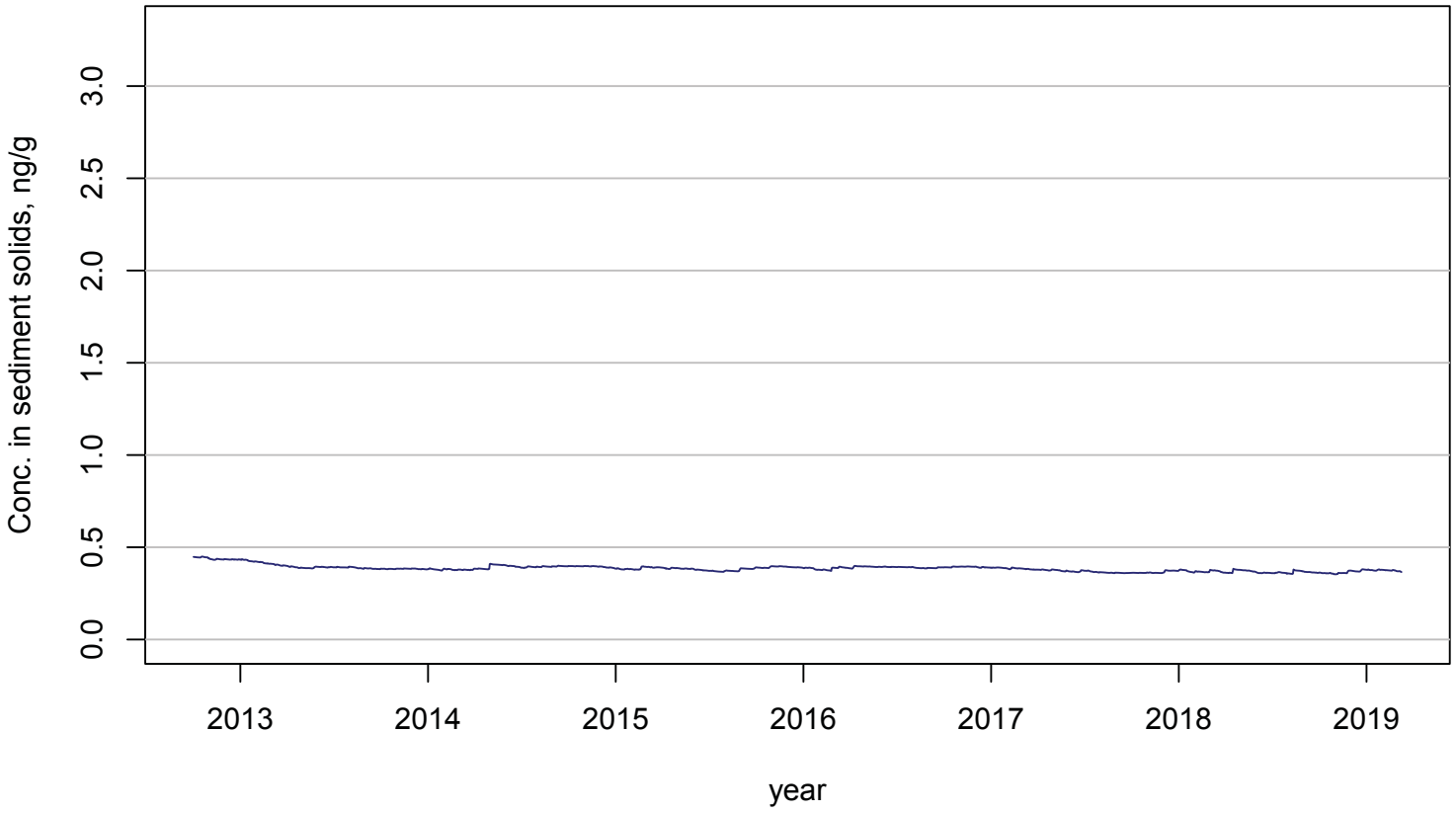
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in LPR 0−6 MF



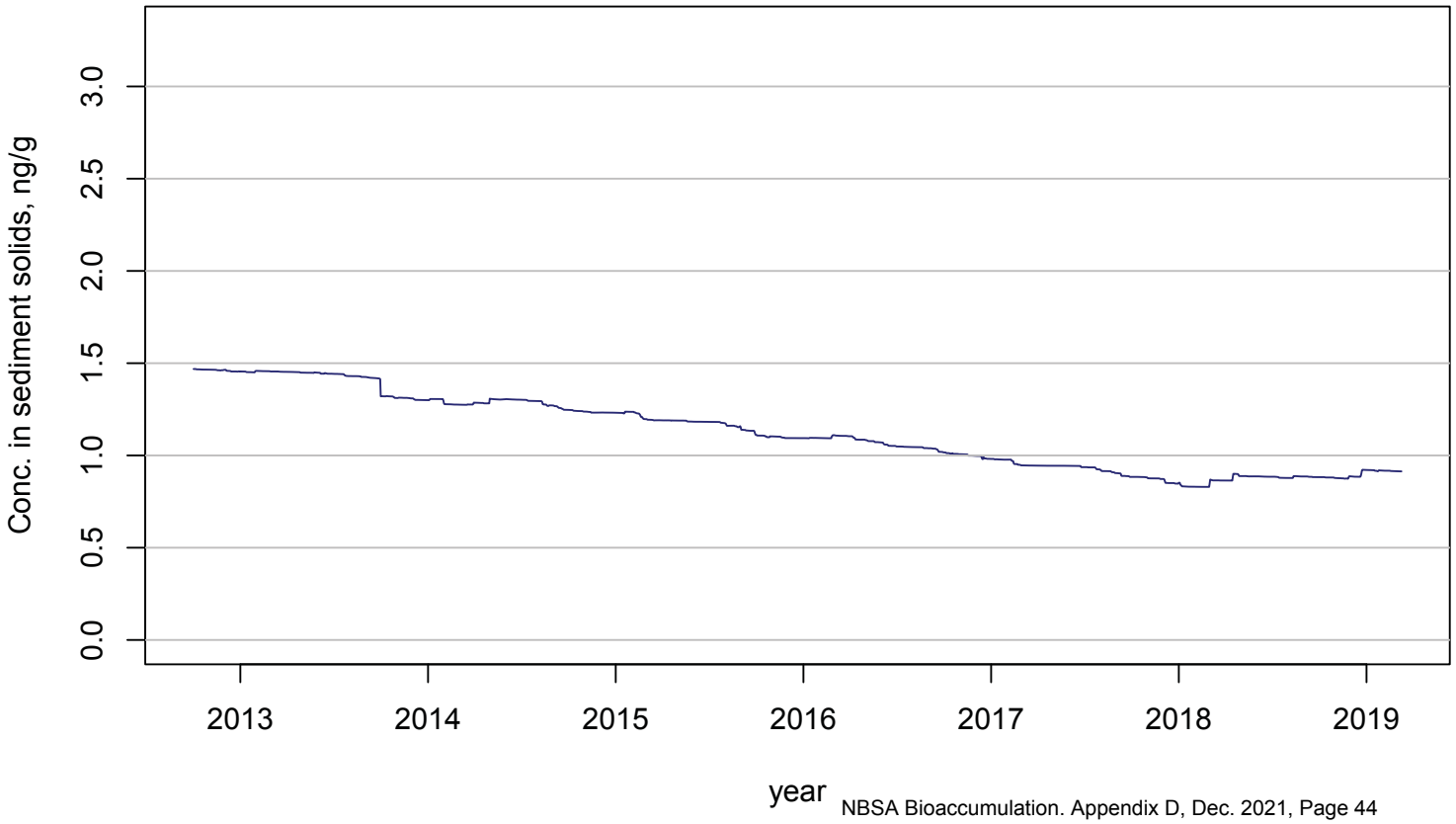
2,3,7,8−TCDD, CSD (Bioavailable Conc. in sediment porewater) in LPR 6−14.7 MF



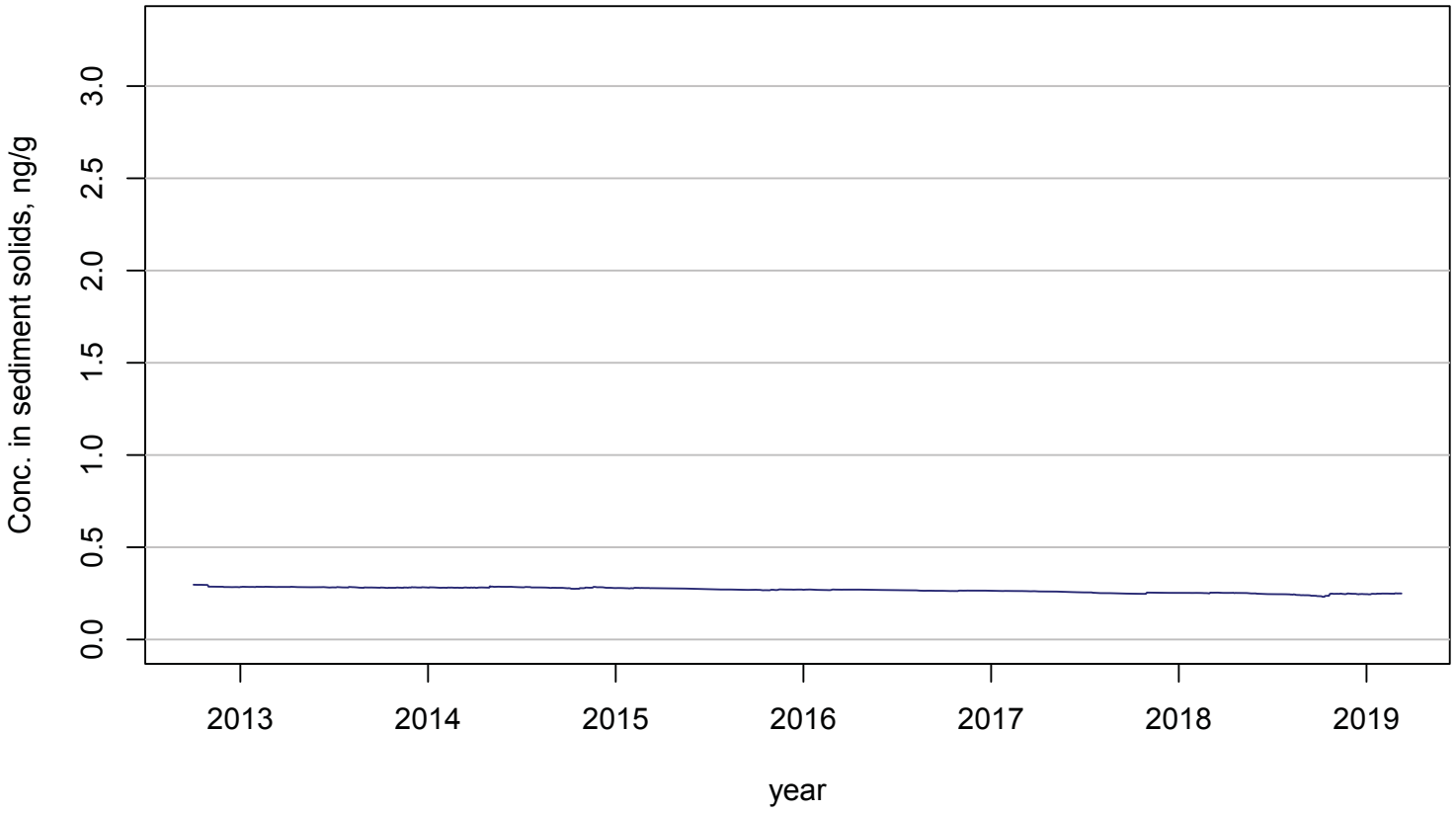
2,3,7,8−TCDD, CST (Conc. in sediment solids) in LPR 0−6



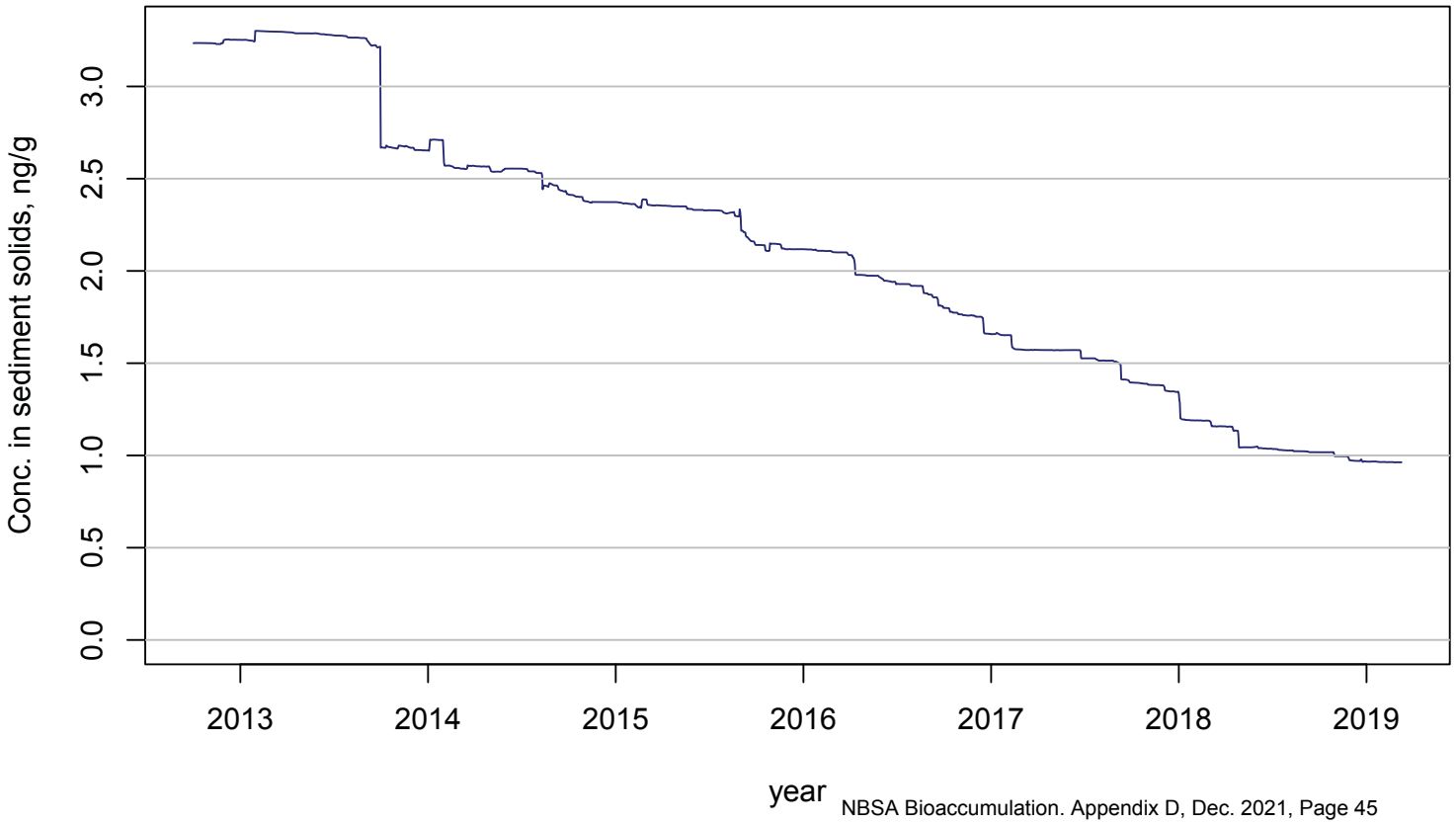
2,3,7,8−TCDD, CST (Conc. in sediment solids) in LPR 6−14.7



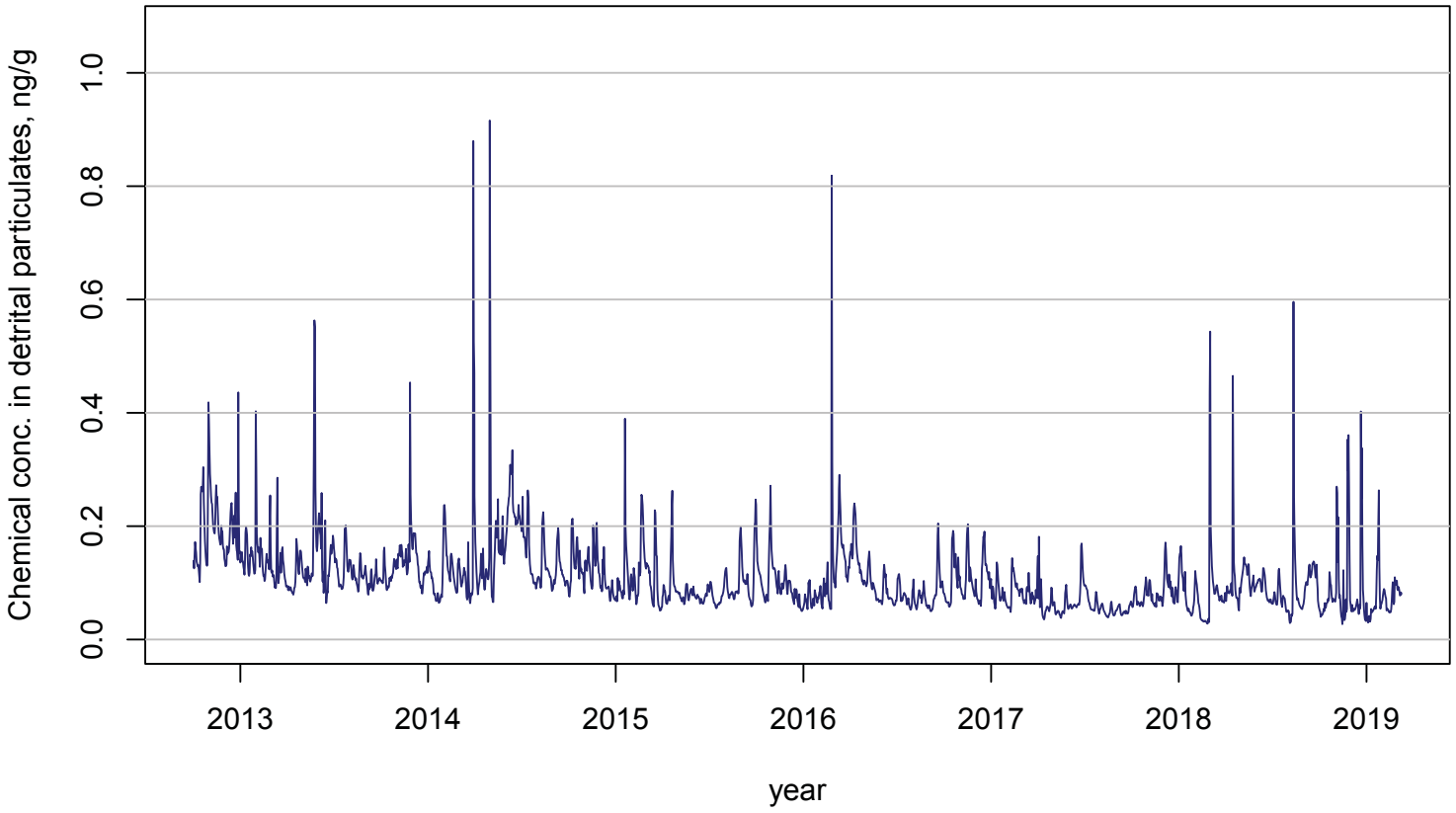
2,3,7,8−TCDD, CST (Conc. in sediment solids) in LPR 0−6 MF



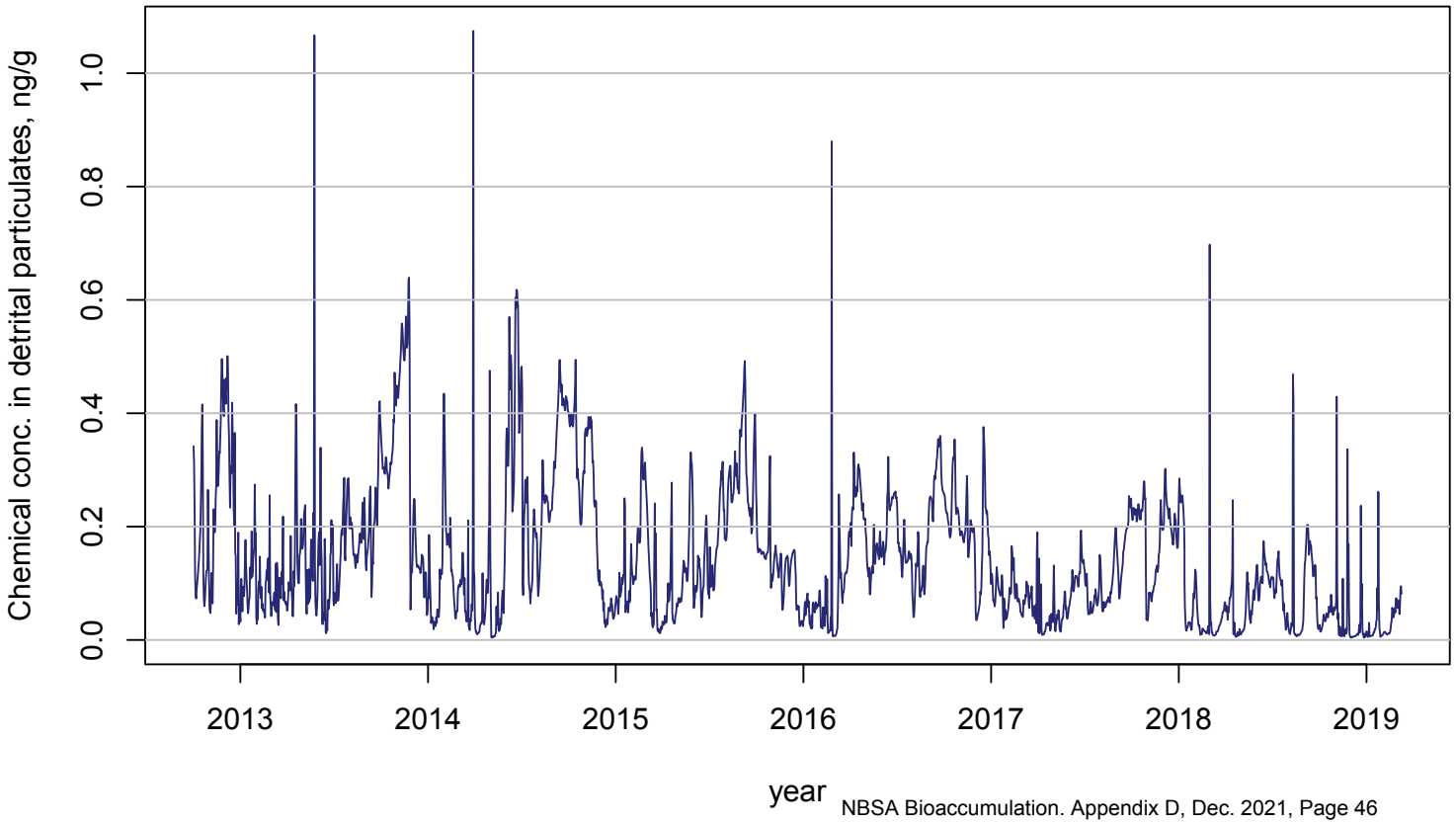
2,3,7,8−TCDD, CST (Conc. in sediment solids) in LPR 6−14.7 MF



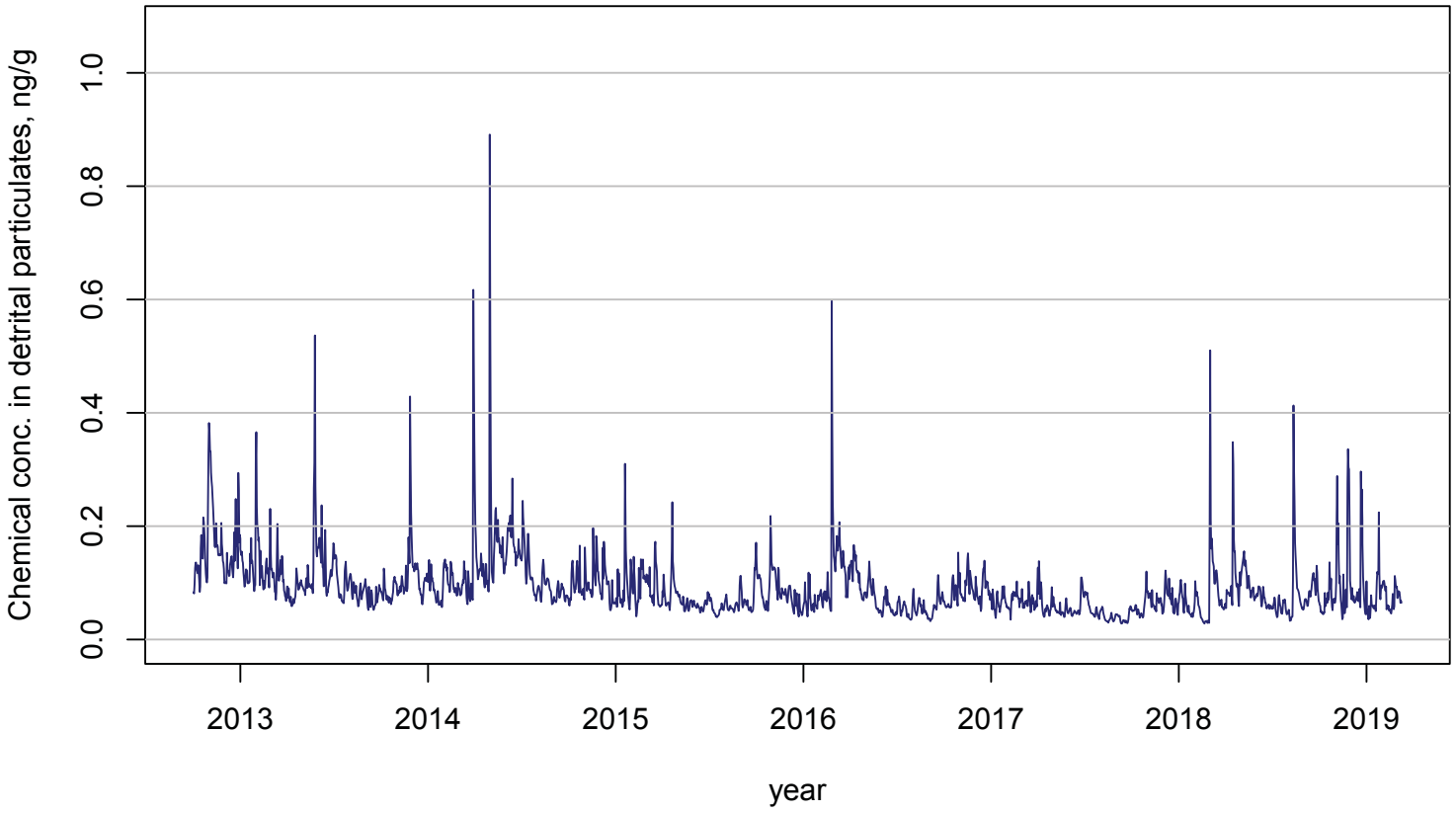
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in LPR 0−6



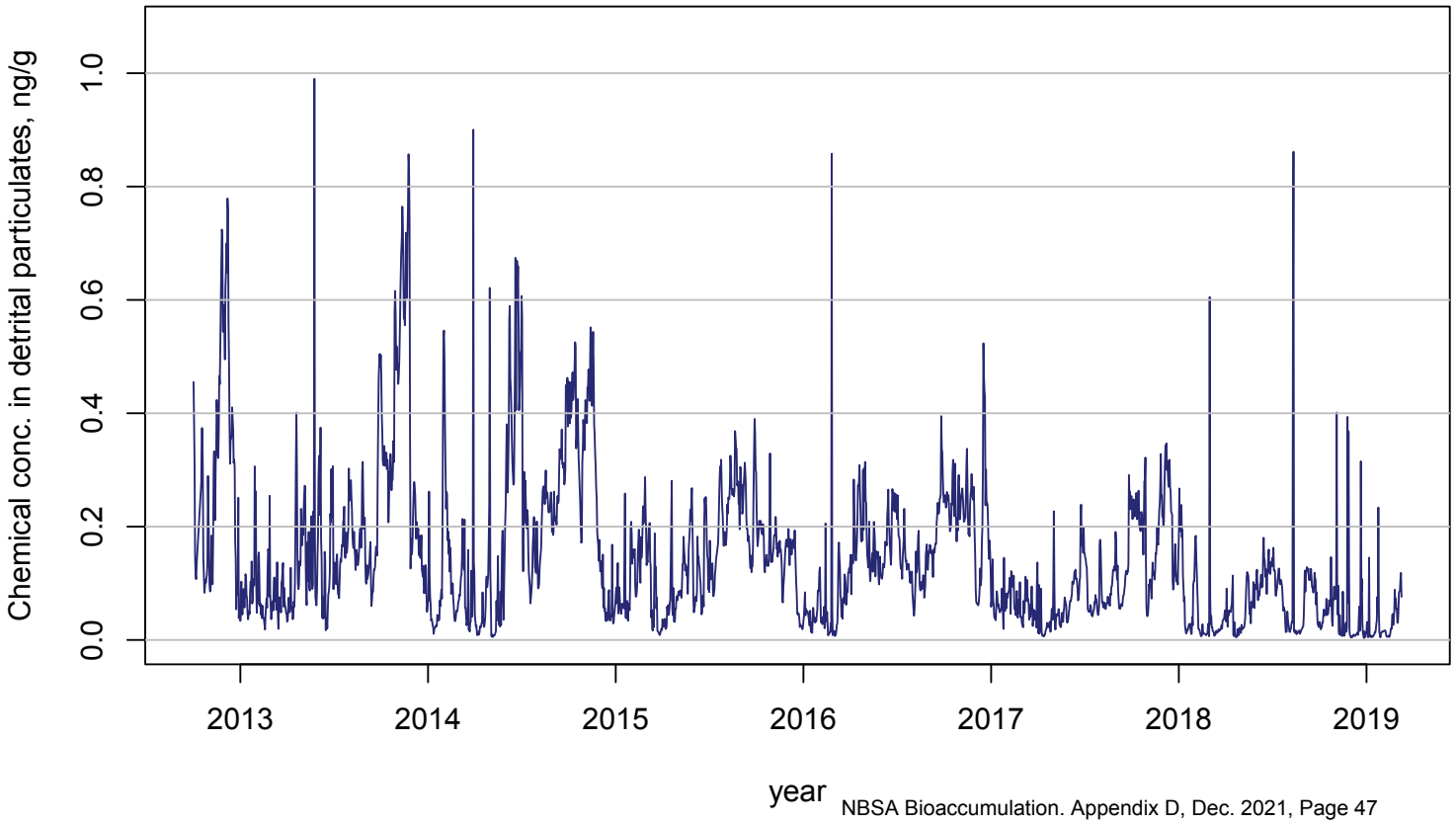
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in LPR 6−14.7



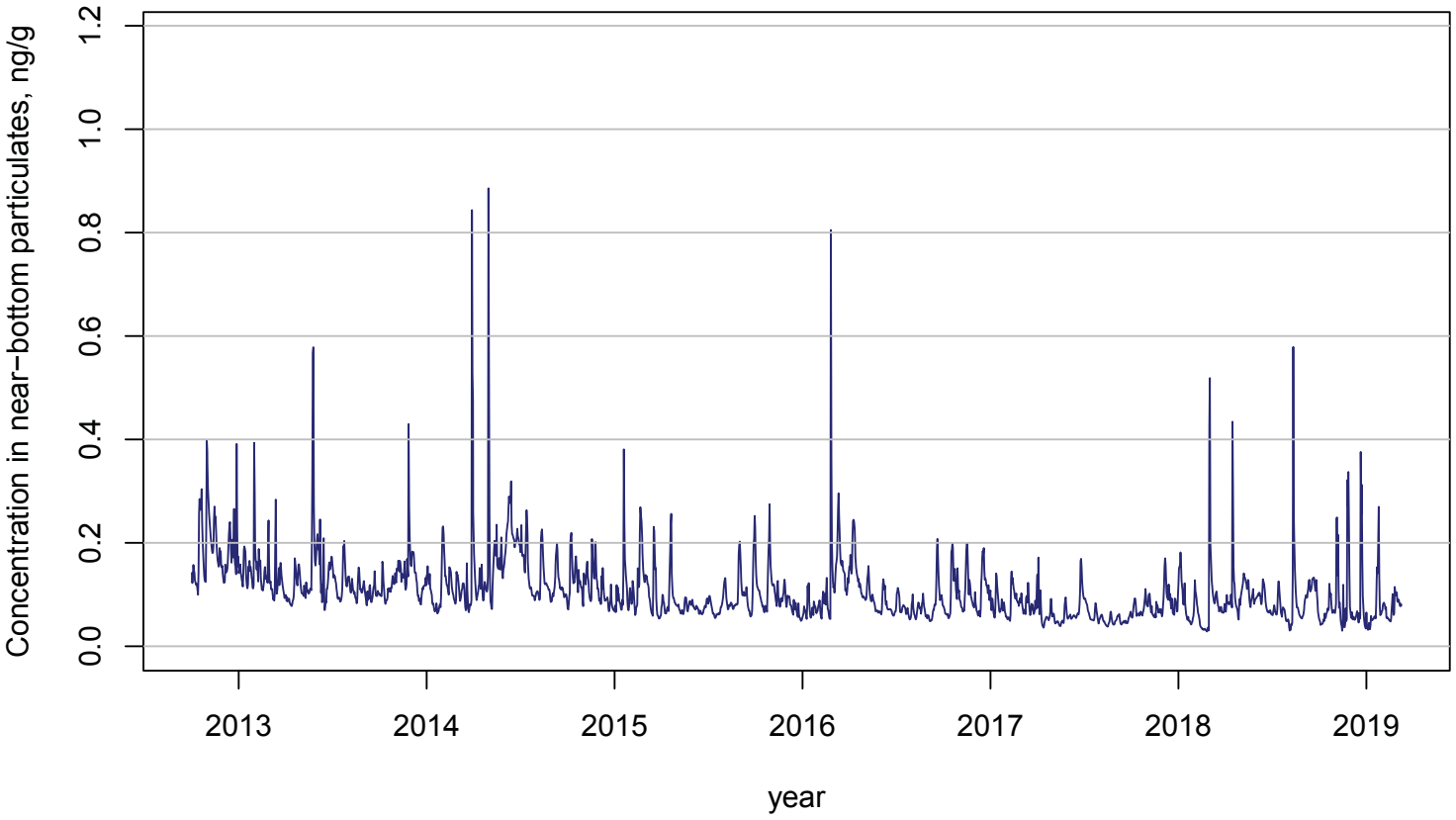
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in LPR 0−6 MF



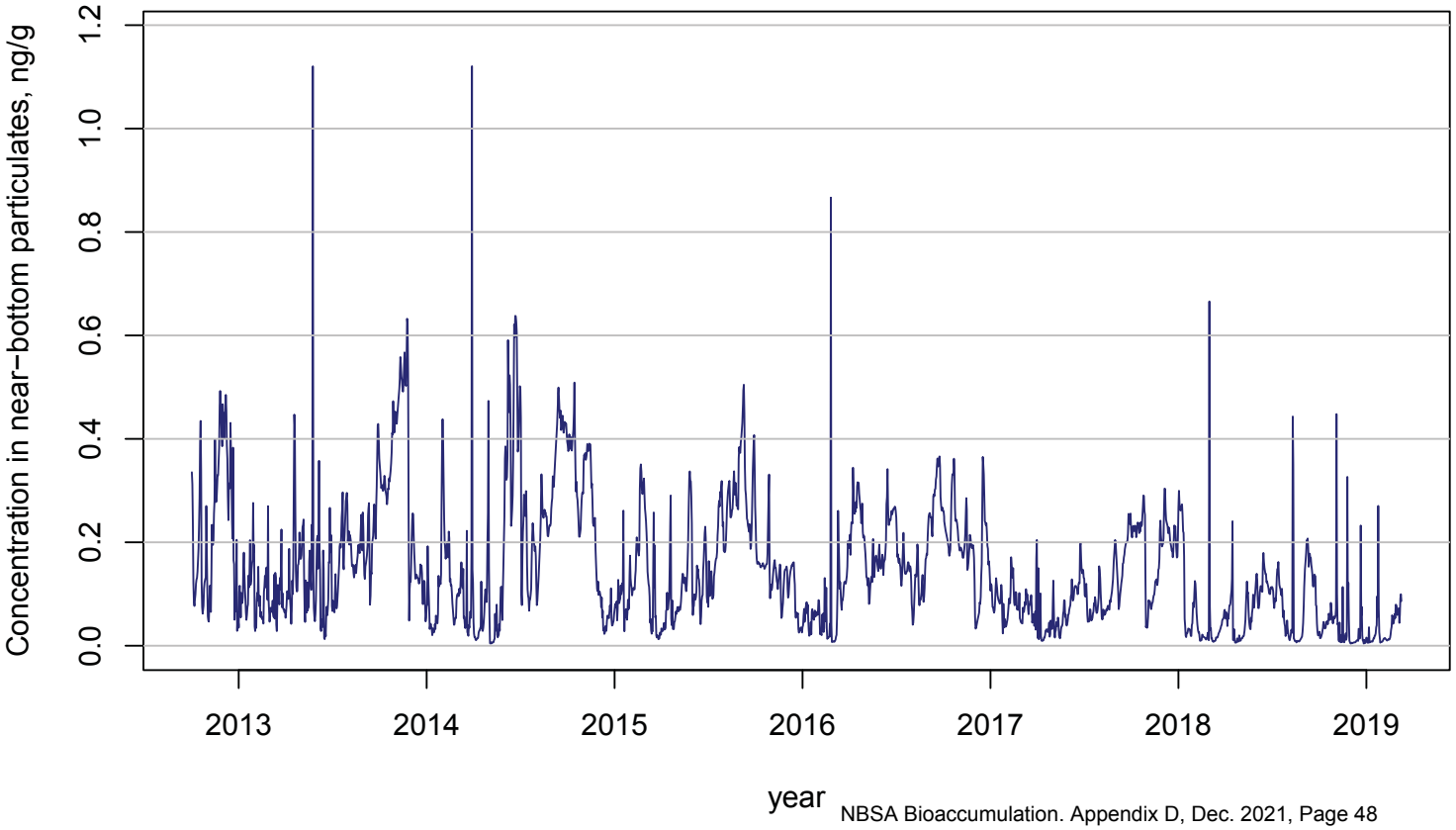
2,3,7,8−TCDD, CPART (Chemical conc. in detrital particulates) in LPR 6−14.7 MF



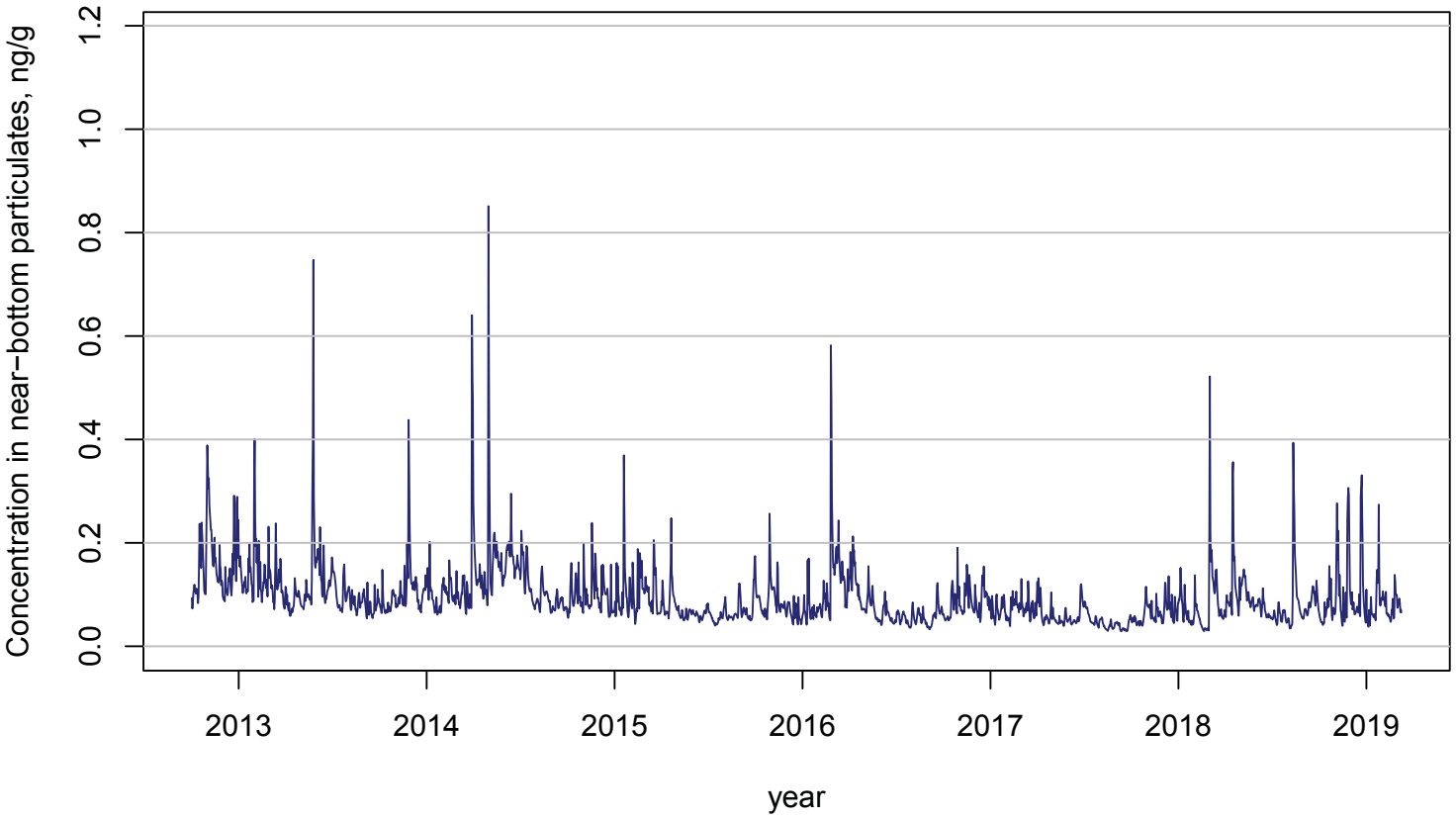
2,3,7,8−TCDD, CPART_DET (Concentration in near−bottom particulates) in LPR 0−6



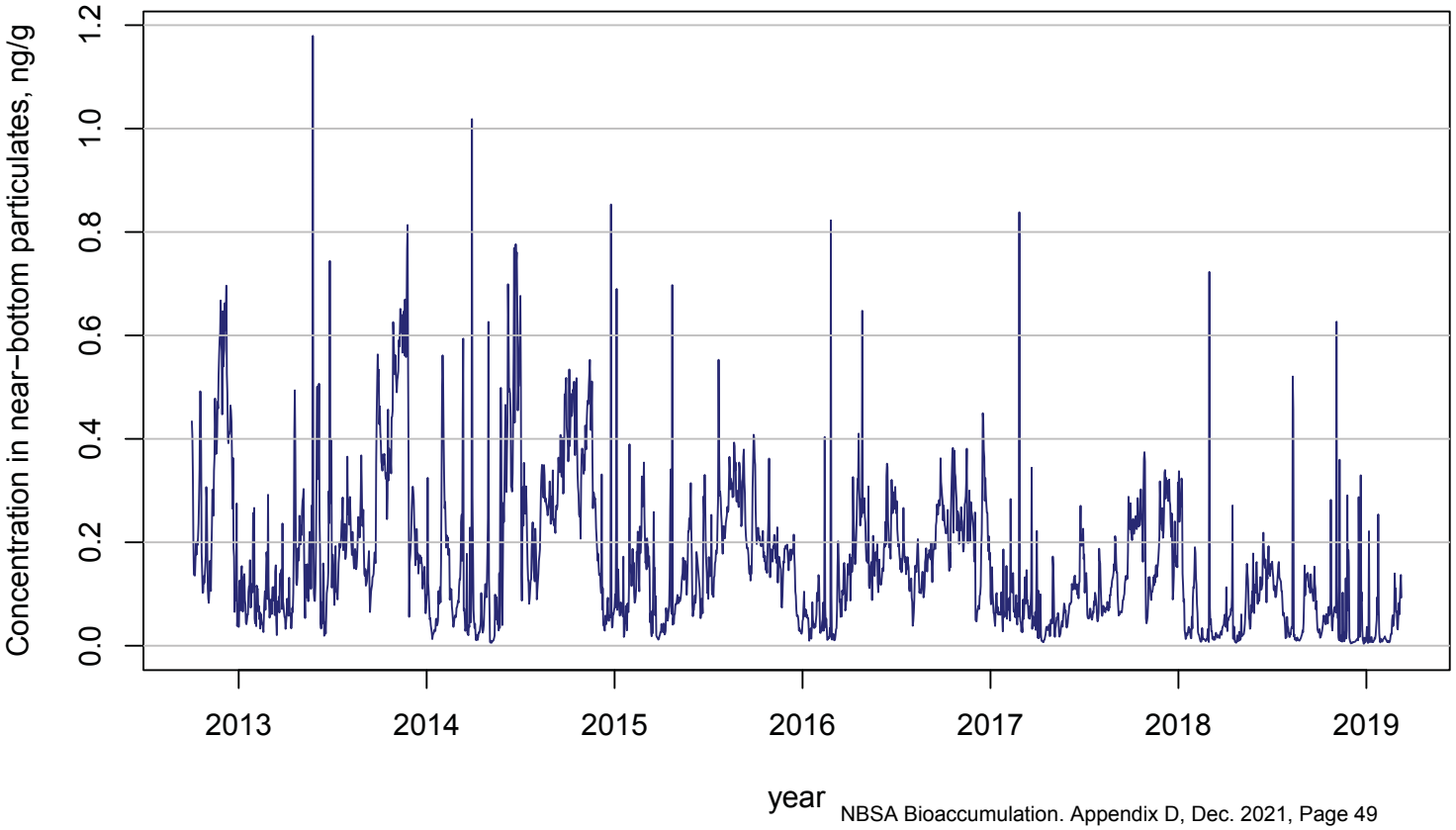
2,3,7,8−TCDD, CPART_DET (Concentration in near−bottom particulates) in LPR 6−14.7



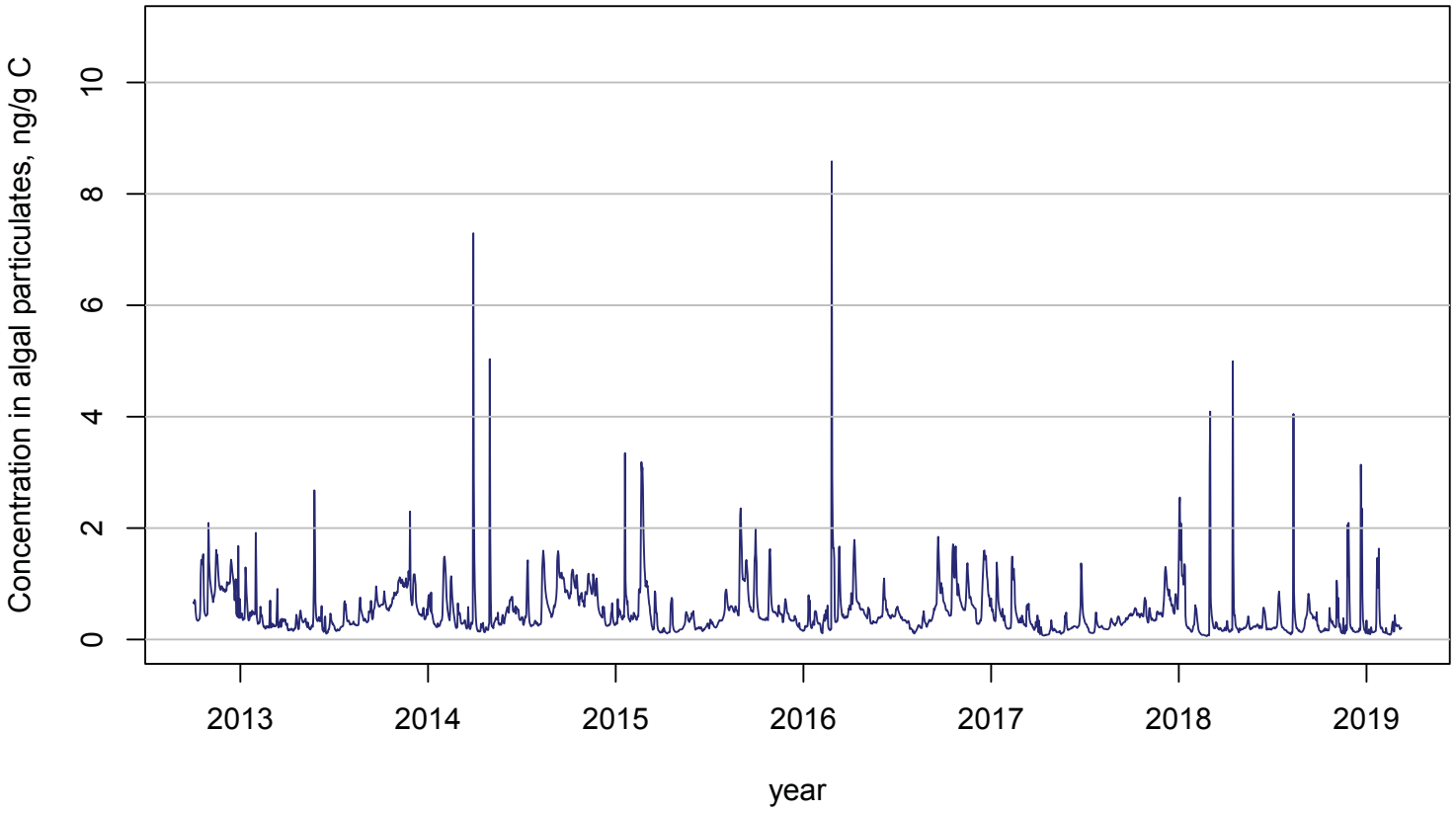
2,3,7,8−TCDD, CPART_DET (Concentration in near−bottom particulates) in LPR 0−6 MF



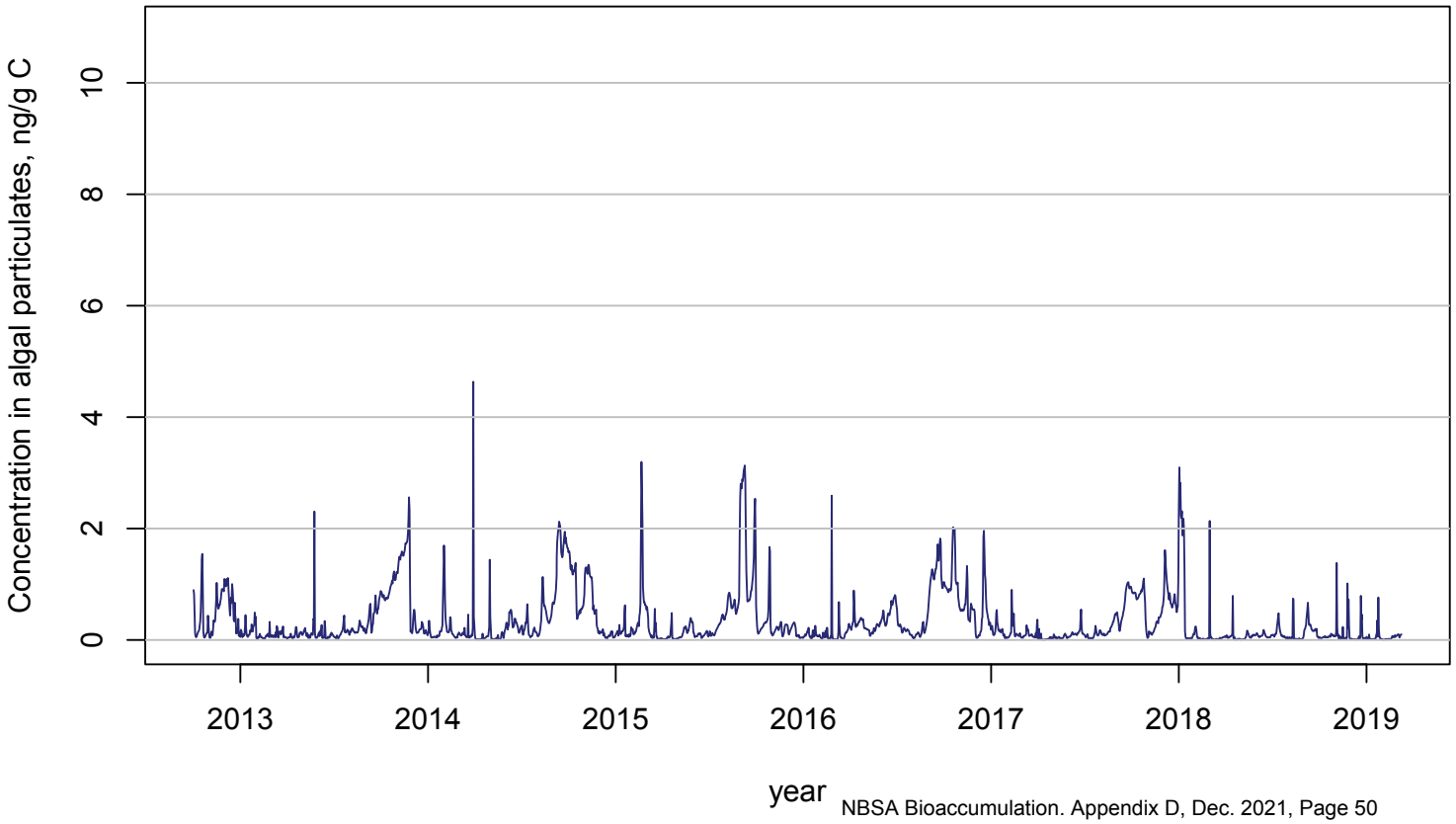
2,3,7,8−TCDD, CPART_DET (Concentration in near−bottom particulates) in LPR 6−14.7 M



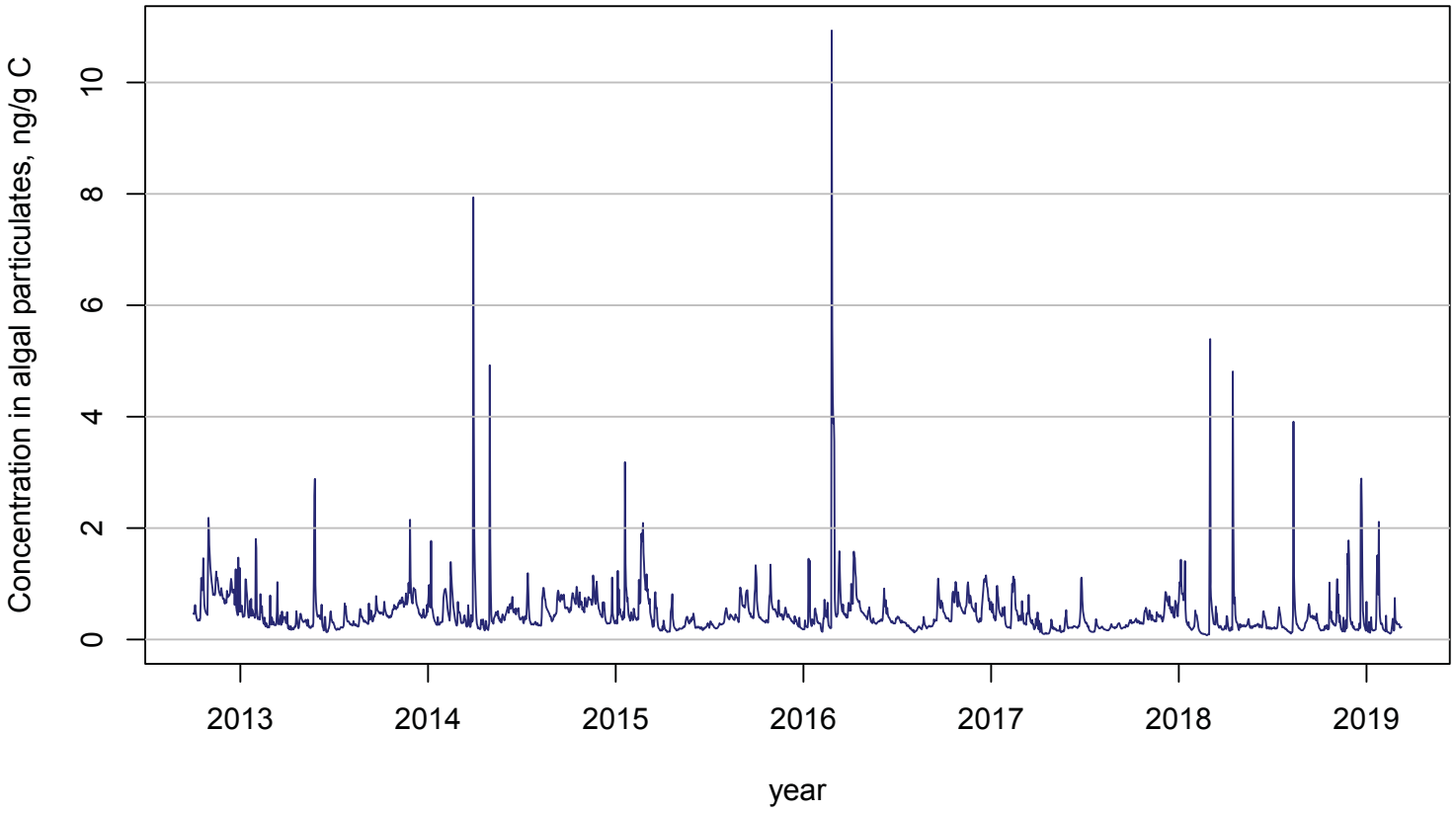
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in LPR 0−6



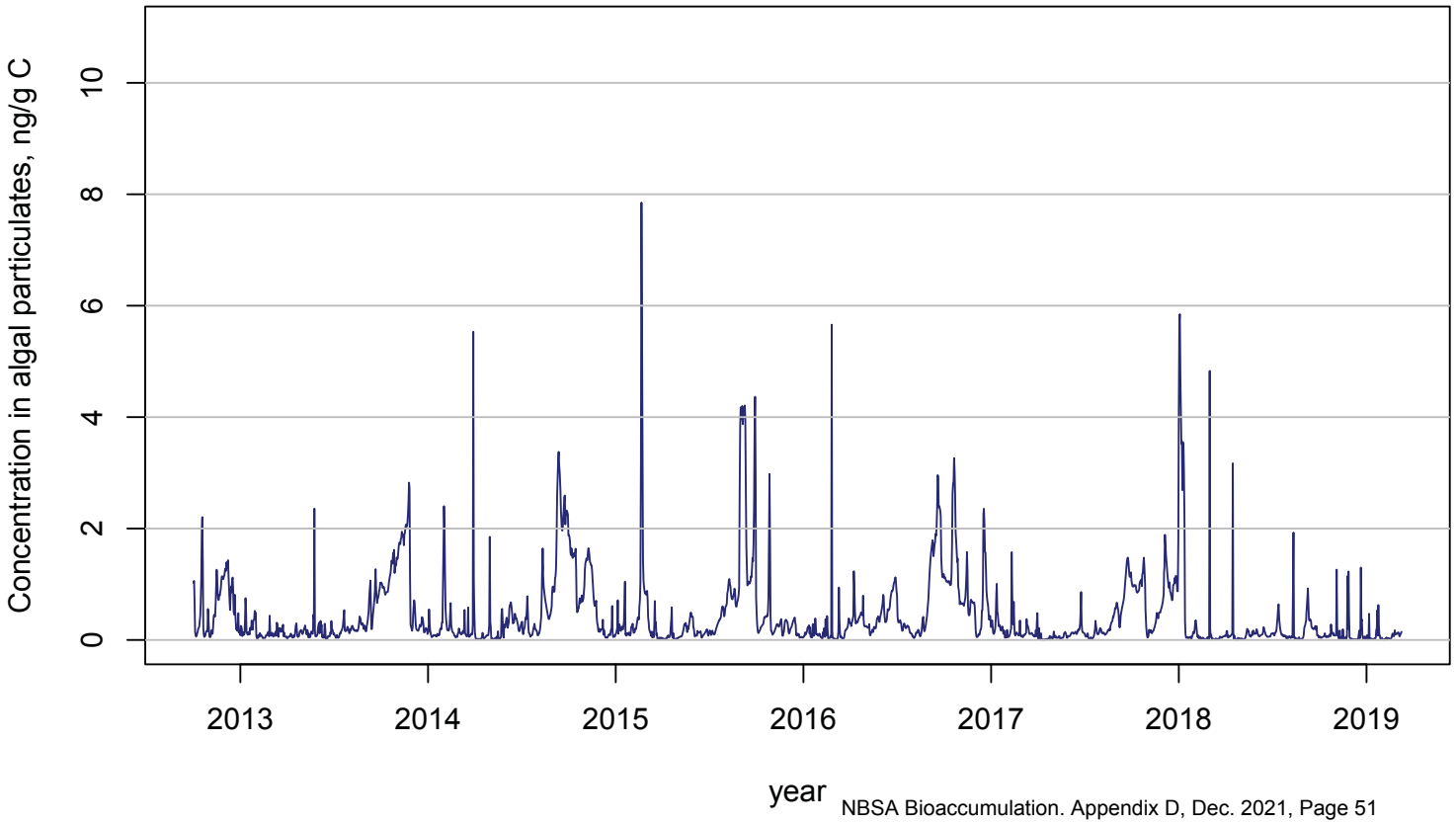
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in LPR 6−14.7



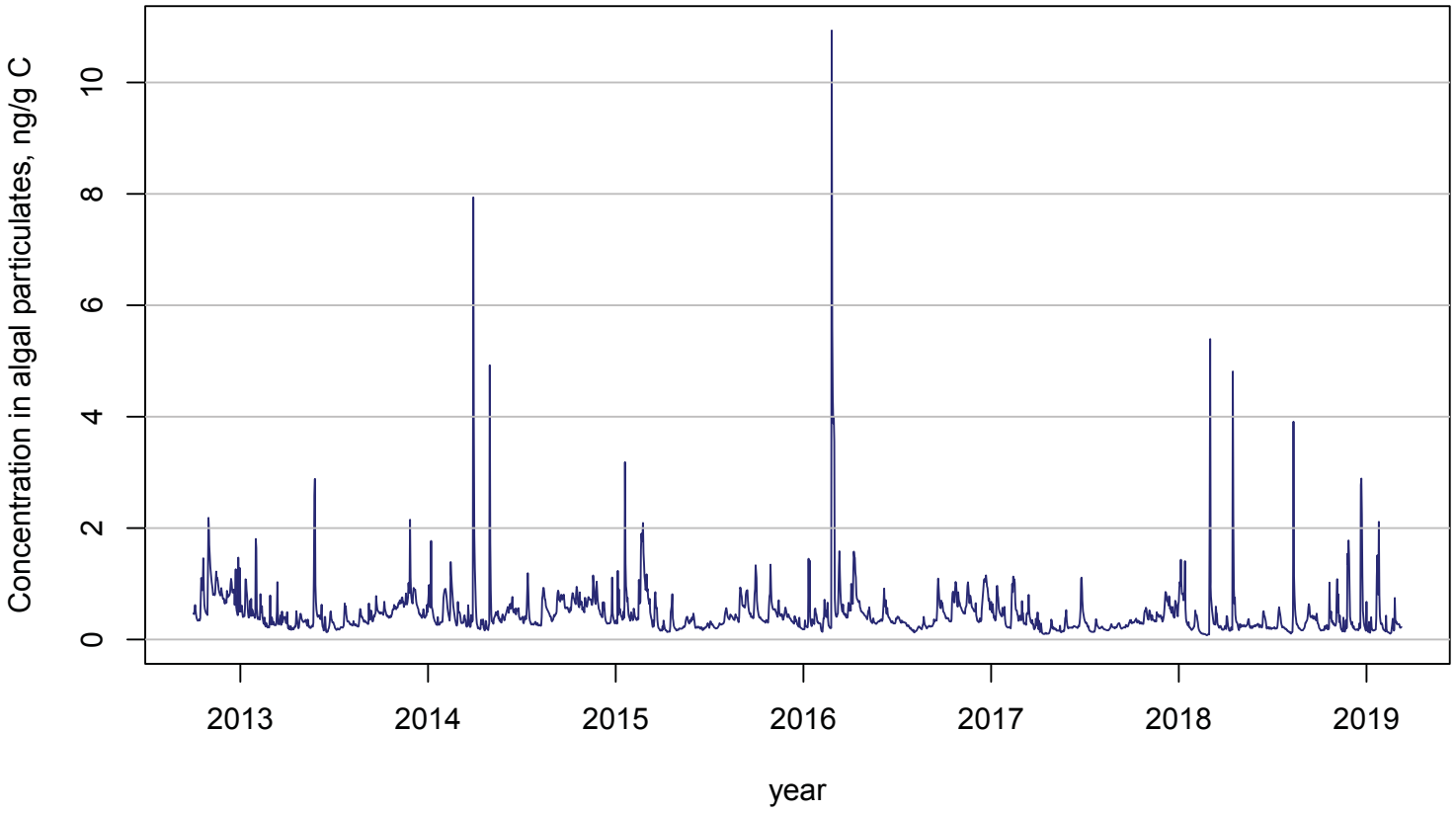
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in LPR 0−6 MF



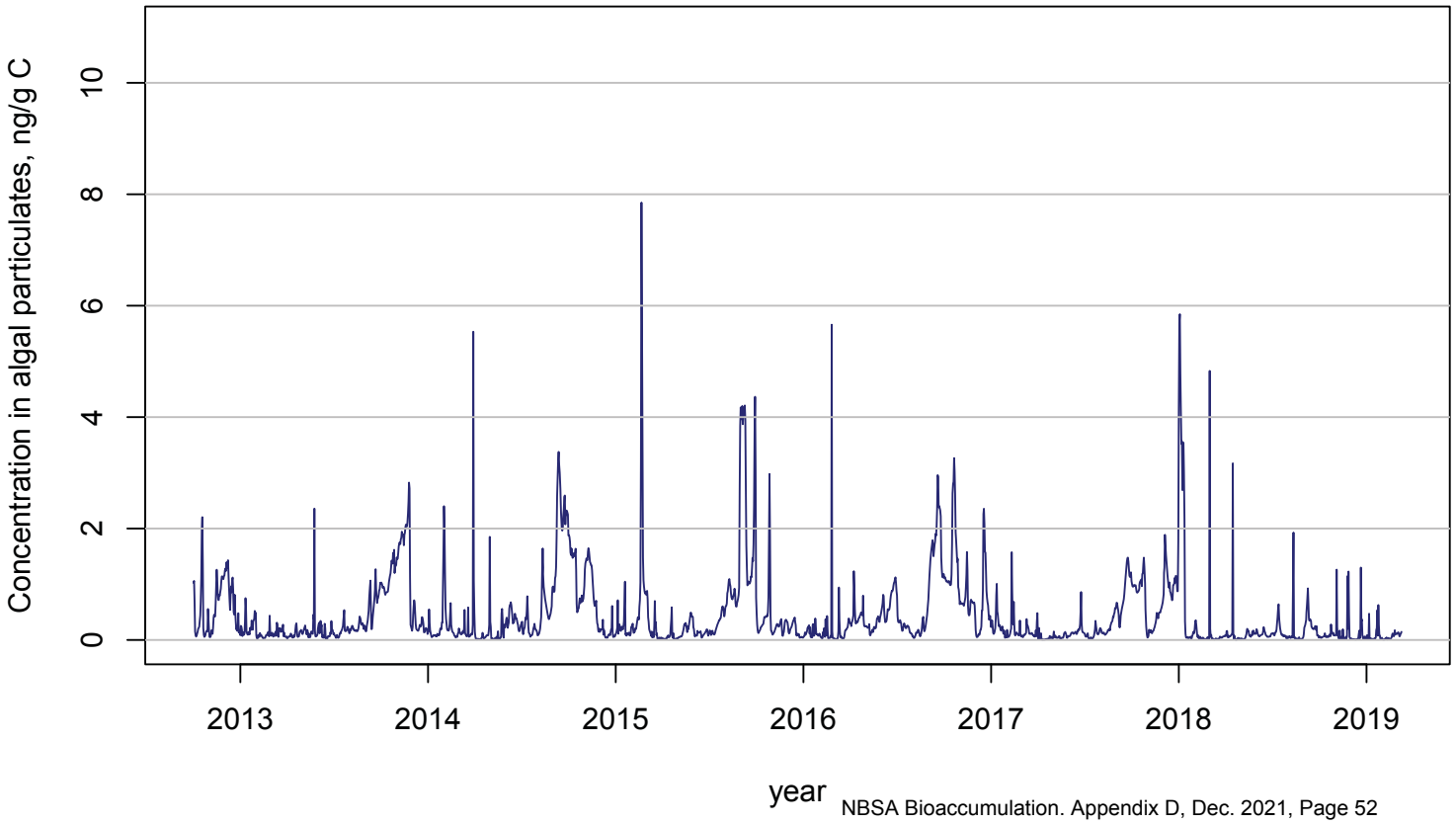
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in LPR 6−14.7 MF

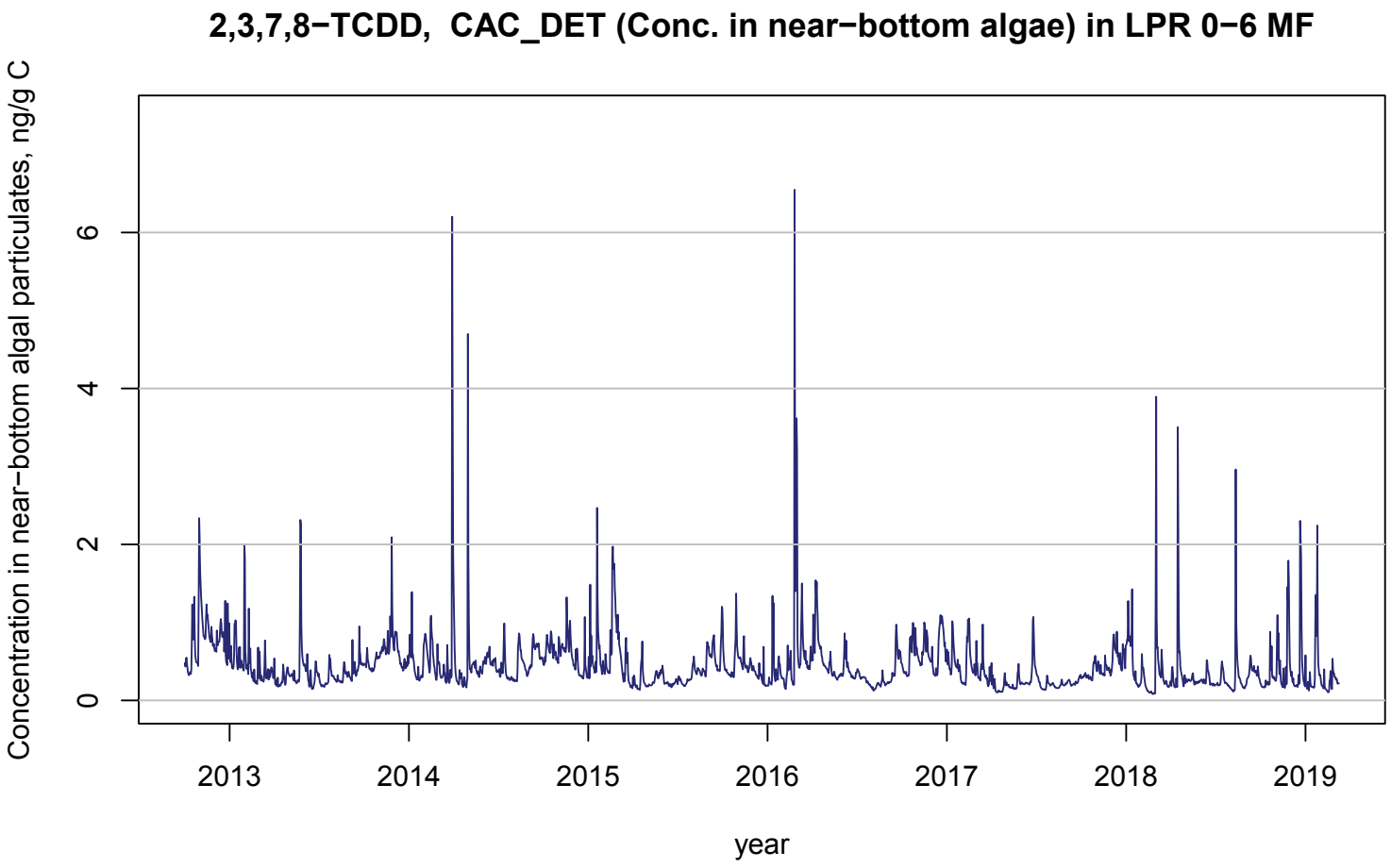


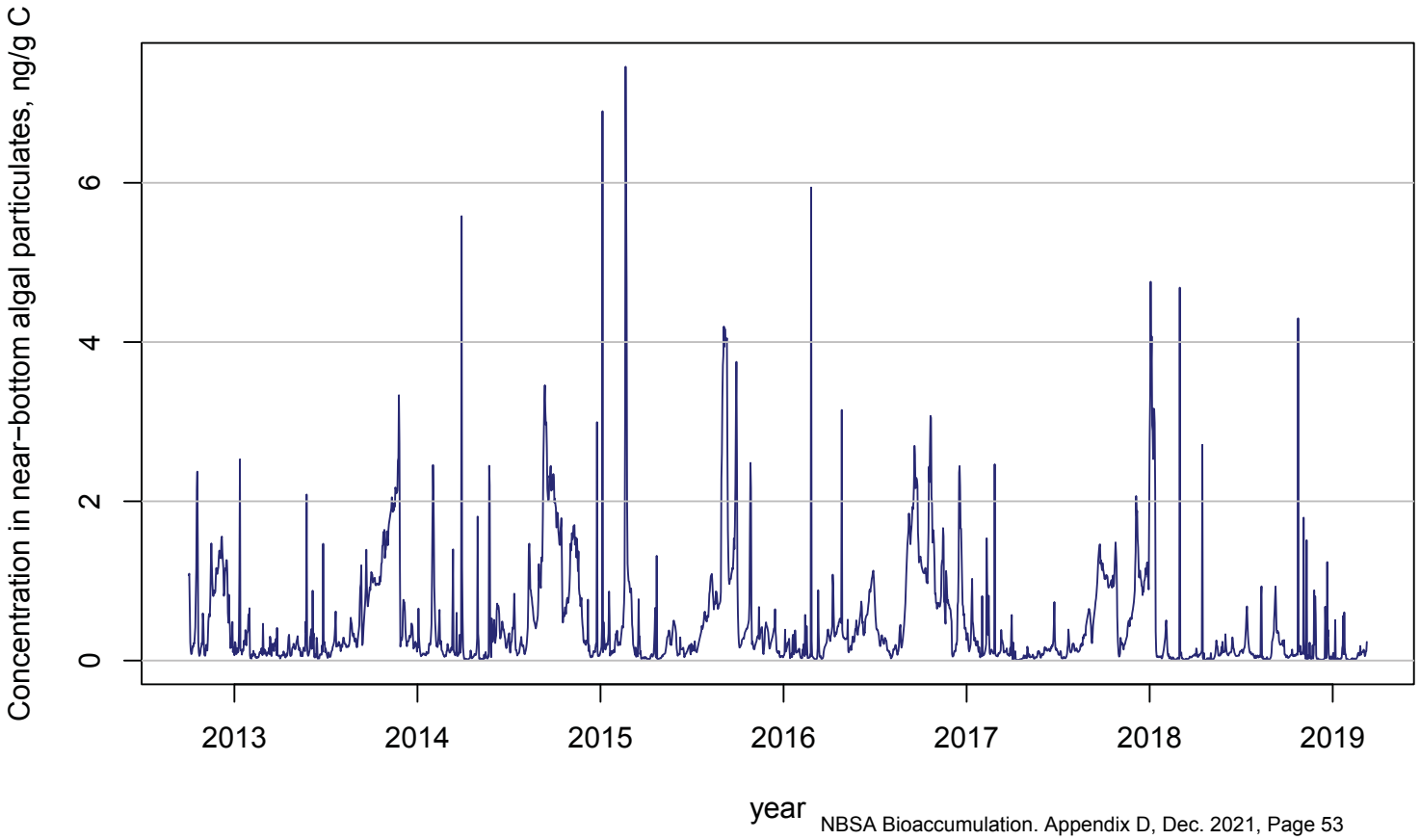
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in LPR 0−6 MF

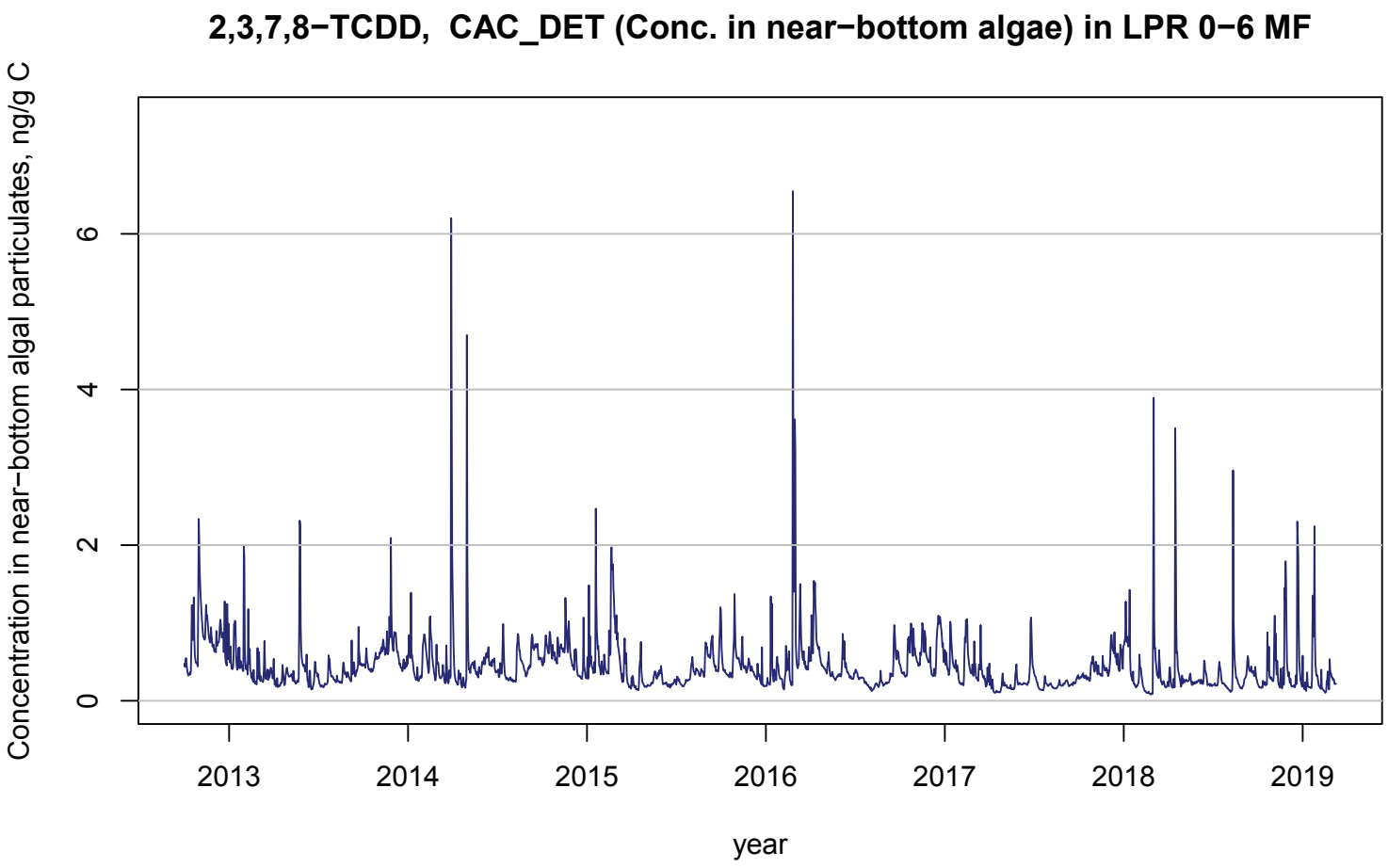


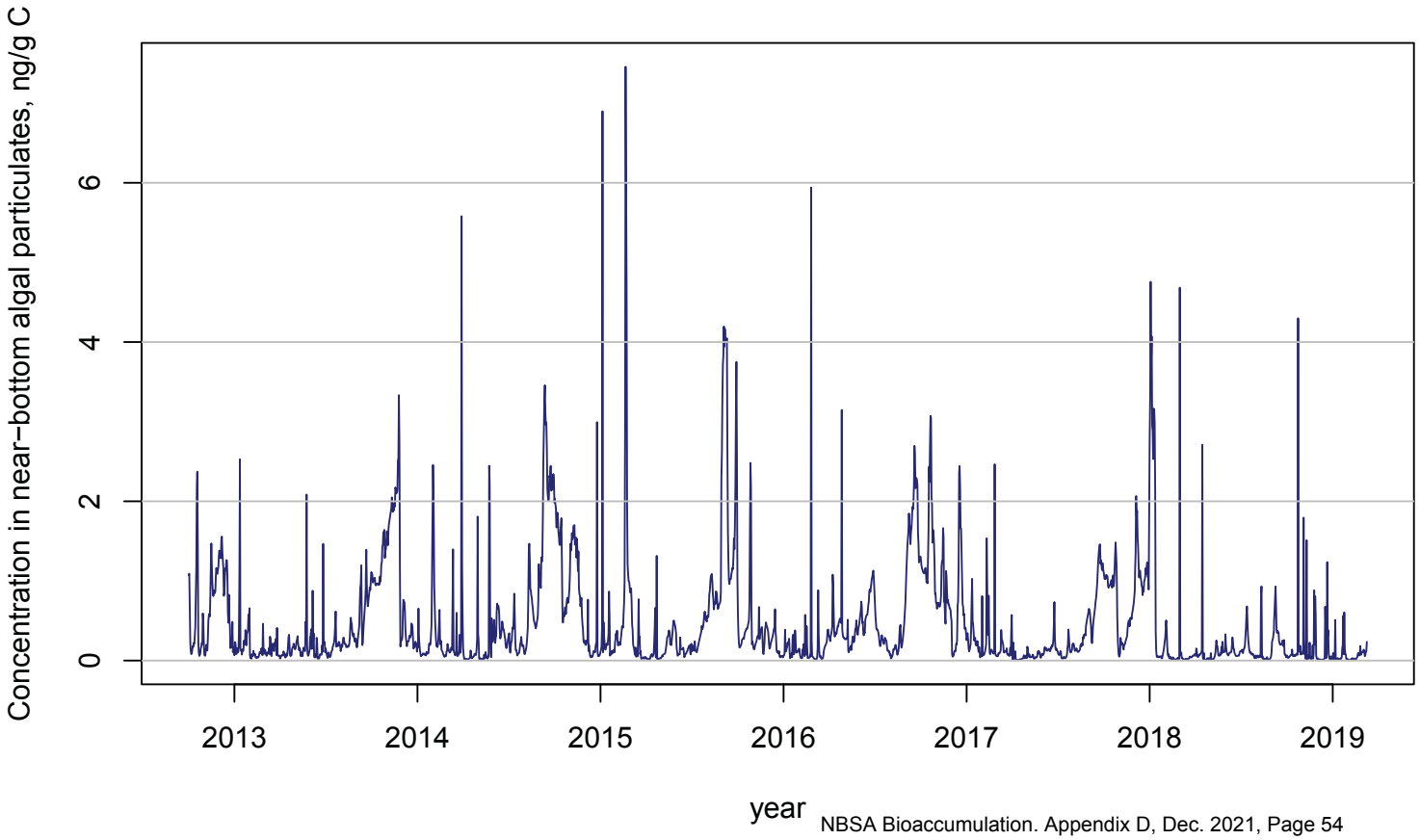
2,3,7,8−TCDD, CAC (Concentration in algal particulates) in LPR 6−14.7 MF



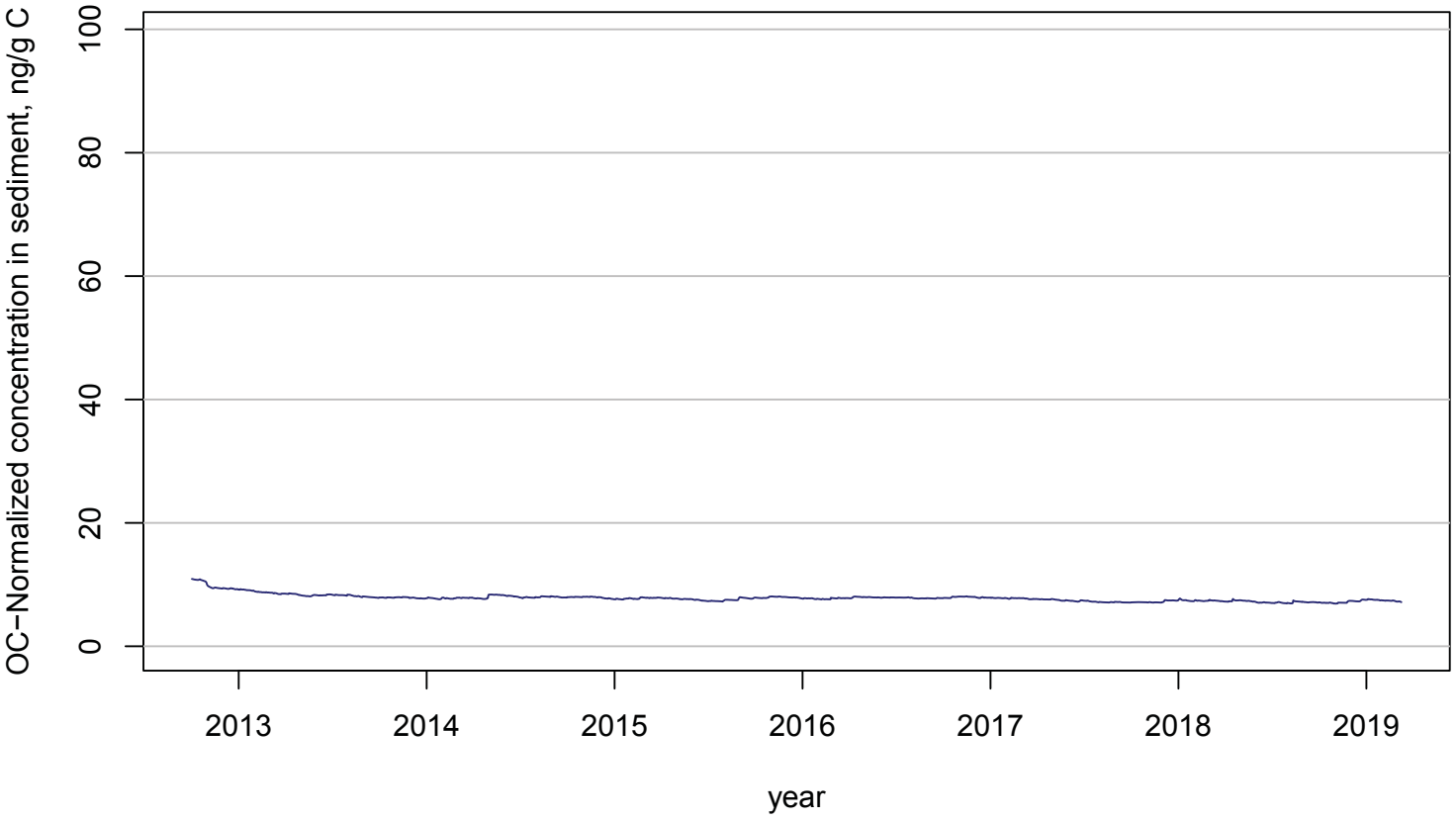

2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in LPR 0−6 MF
Concentration in near−bottom algal particulates, ng/g C
0
2
4
6
2013
2014
2015
2016
2017
2018
2019
year


2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in LPR 6−14.7 MF
Concentration in near−bottom algal particulates, ng/g C
0
2
4
6
2013
2014
2015
2016
2017
2018
2019
year


2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in LPR 0−6 MF
Concentration in near−bottom algal particulates, ng/g C
0
2
4
6
2013
2014
2015
2016
2017
2018
2019
year

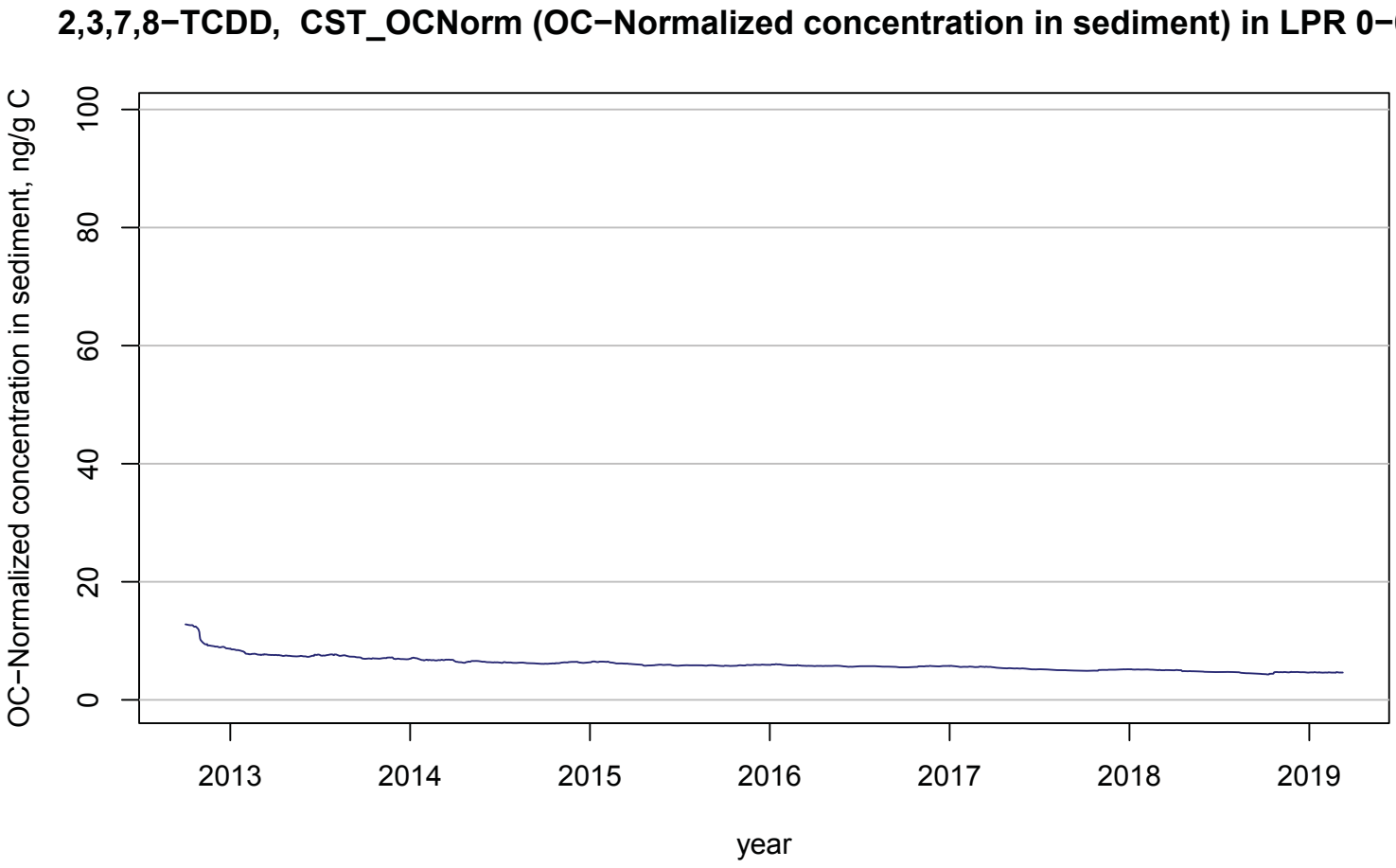

2,3,7,8−TCDD, CAC_DET (Conc. in near−bottom algae) in LPR 6−14.7 MF
Concentration in near−bottom algal particulates, ng/g C
0
2
4
6
2013
2014
2015
2016
2017
2018
2019
year

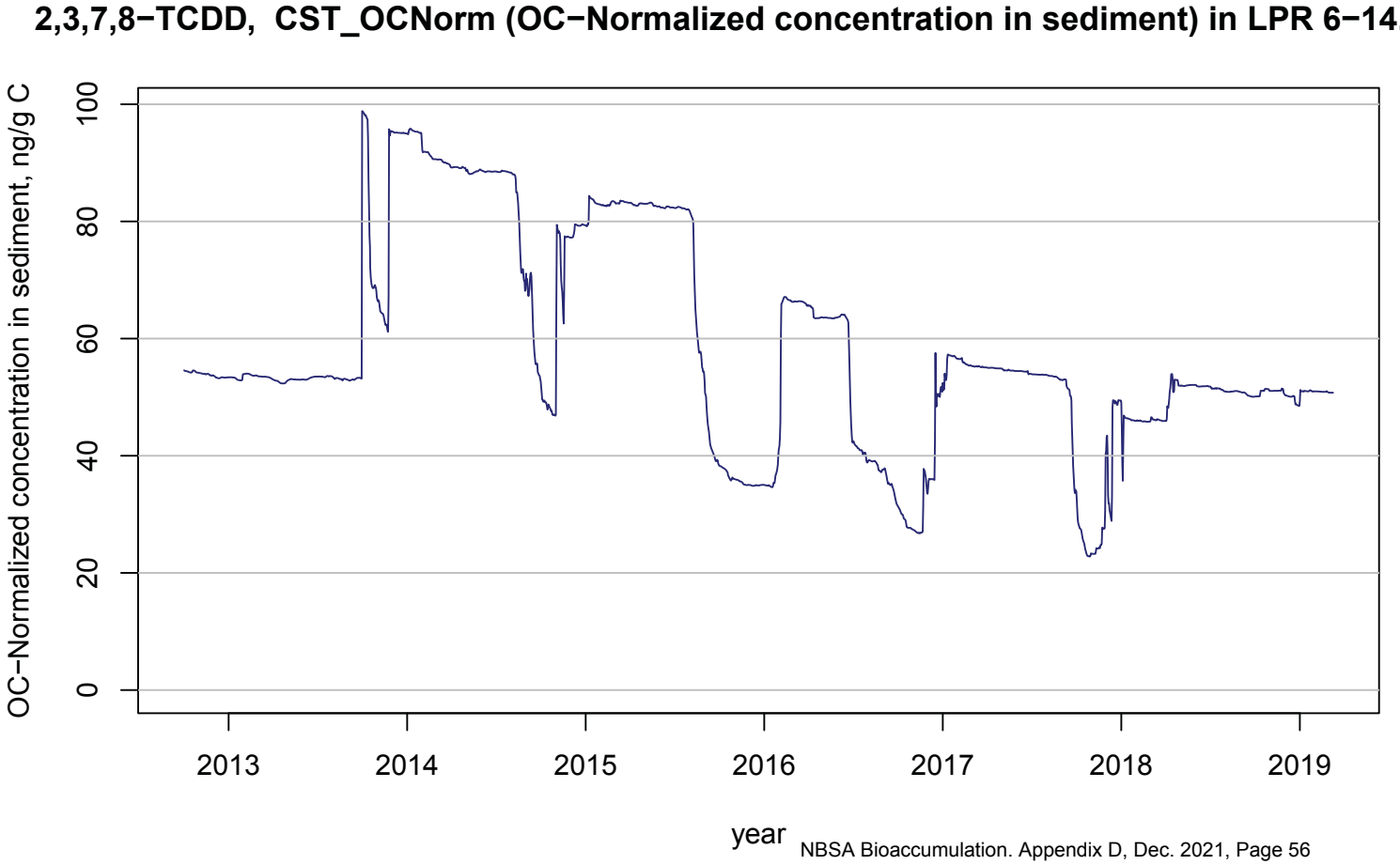
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 0−6

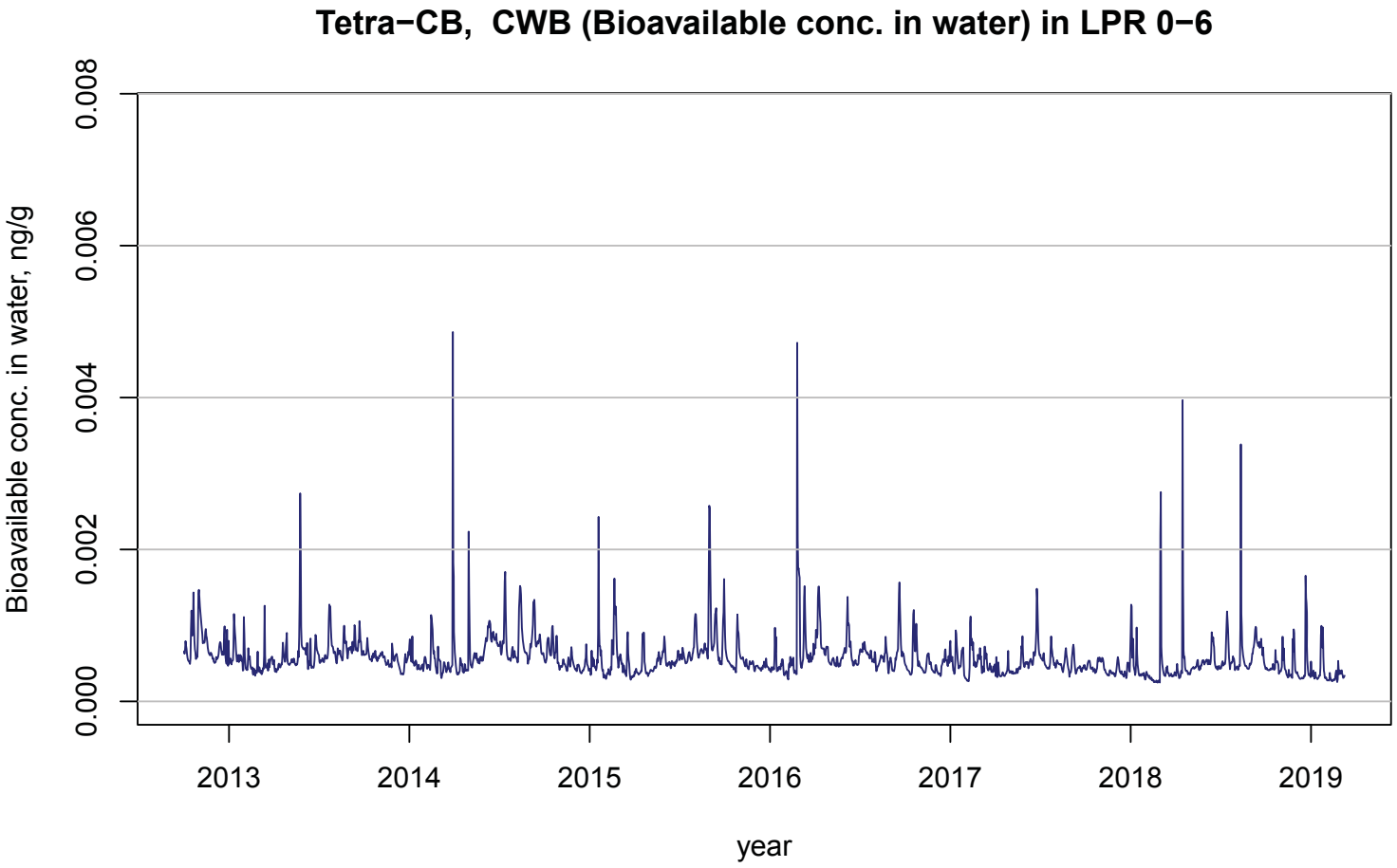


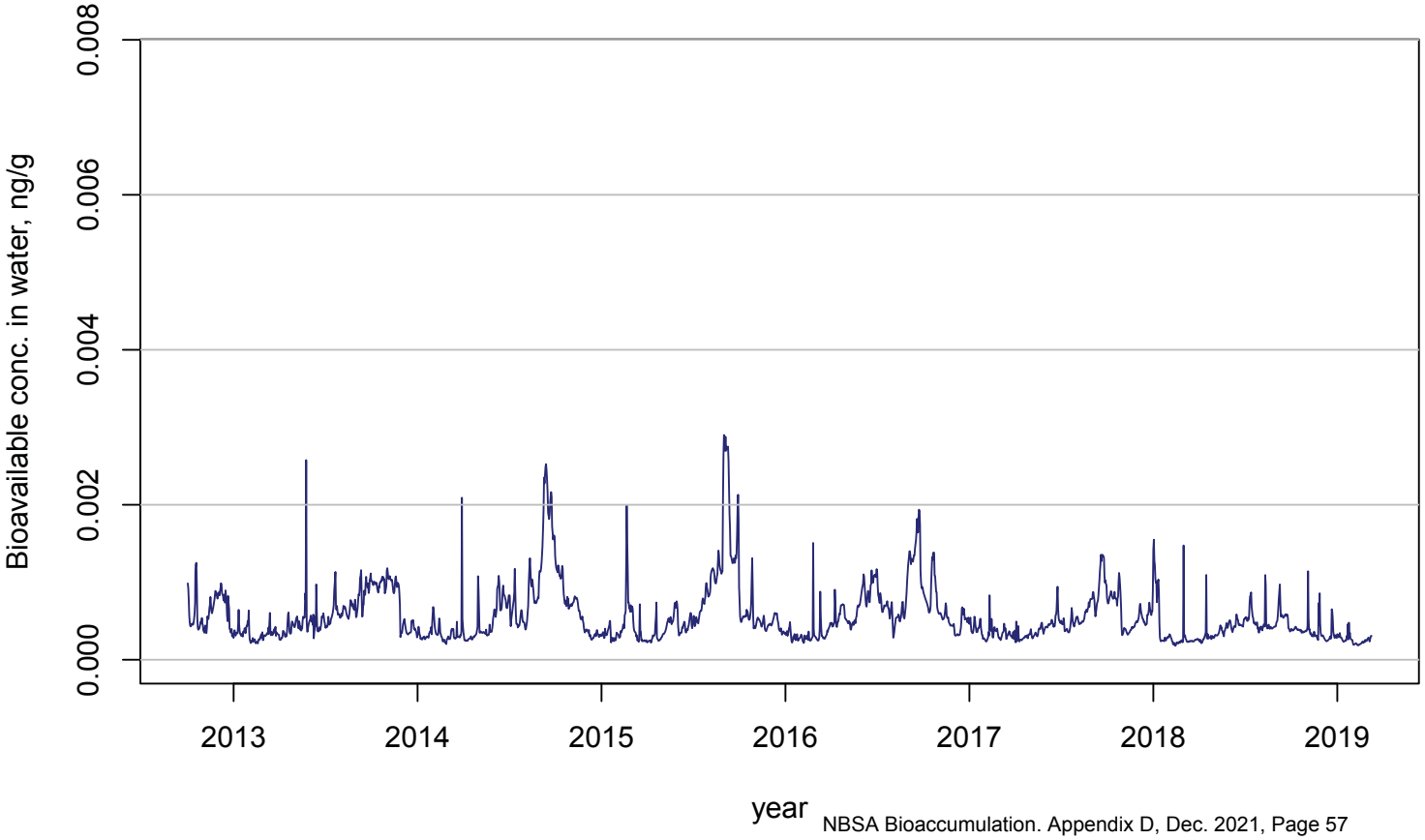
2,3,7,8−TCDD, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 6−14.7

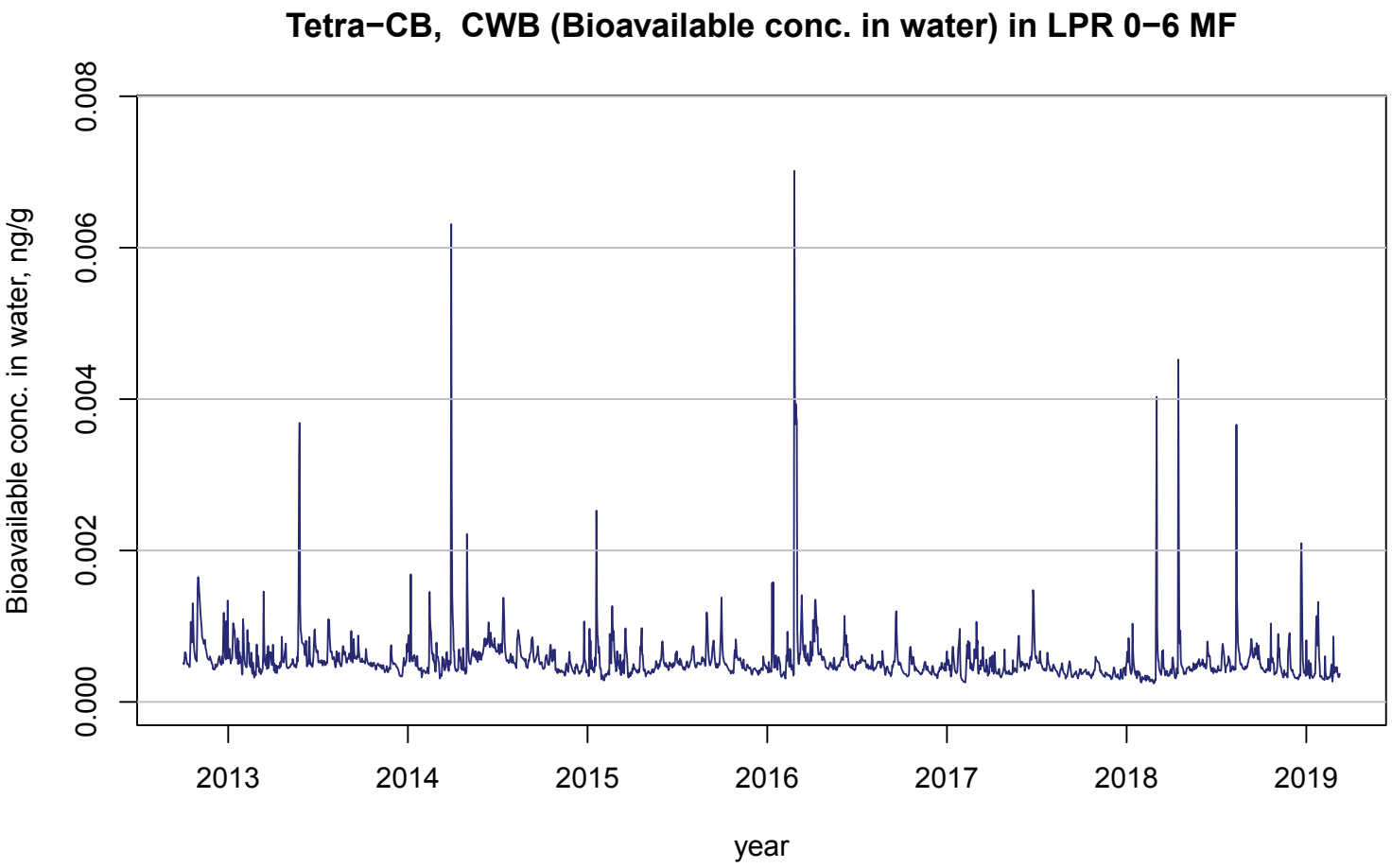


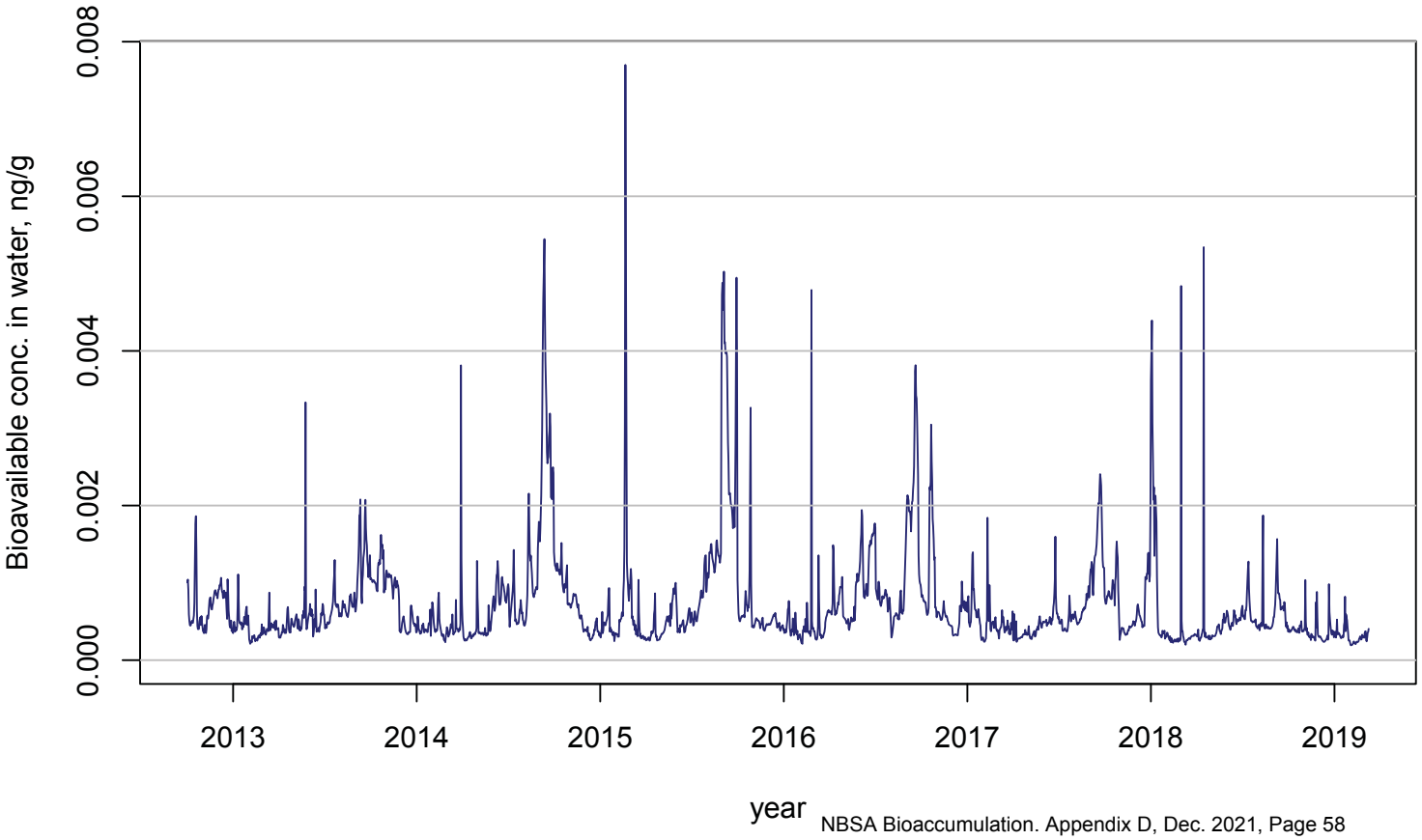

2,3,7,8−TCDD, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 0−6 MF
OC−Normalized concentration in sediment, ng/g C
0
20
40
60
80
100
2013
2014
2015
2016
2017
2018
2019
year

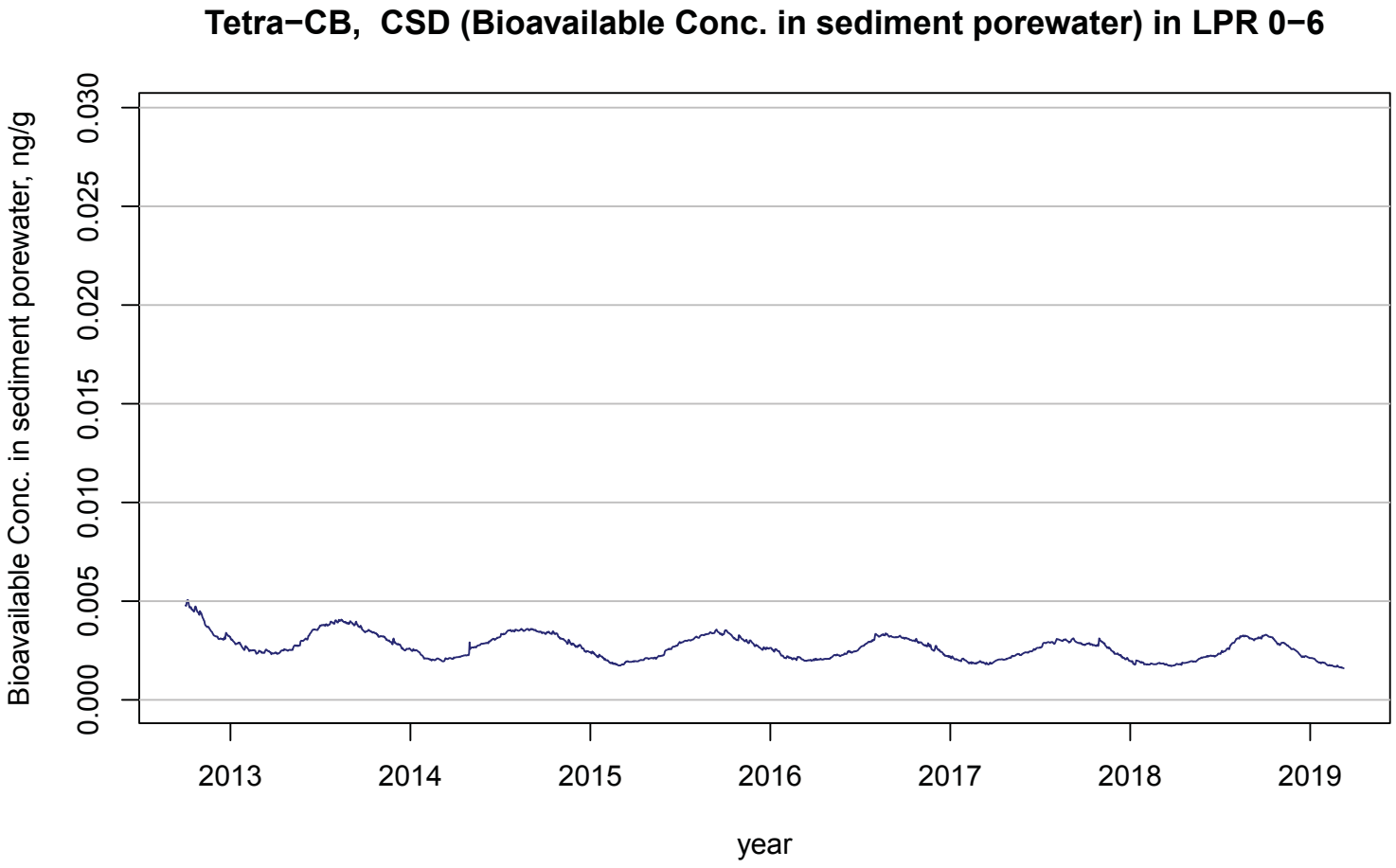

2,3,7,8−TCDD, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 6−14.7 M
OC−Normalized concentration in sediment, ng/g C
0
20
40
60
80
100
2013
2014
2015
2016
2017
2018
2019
year

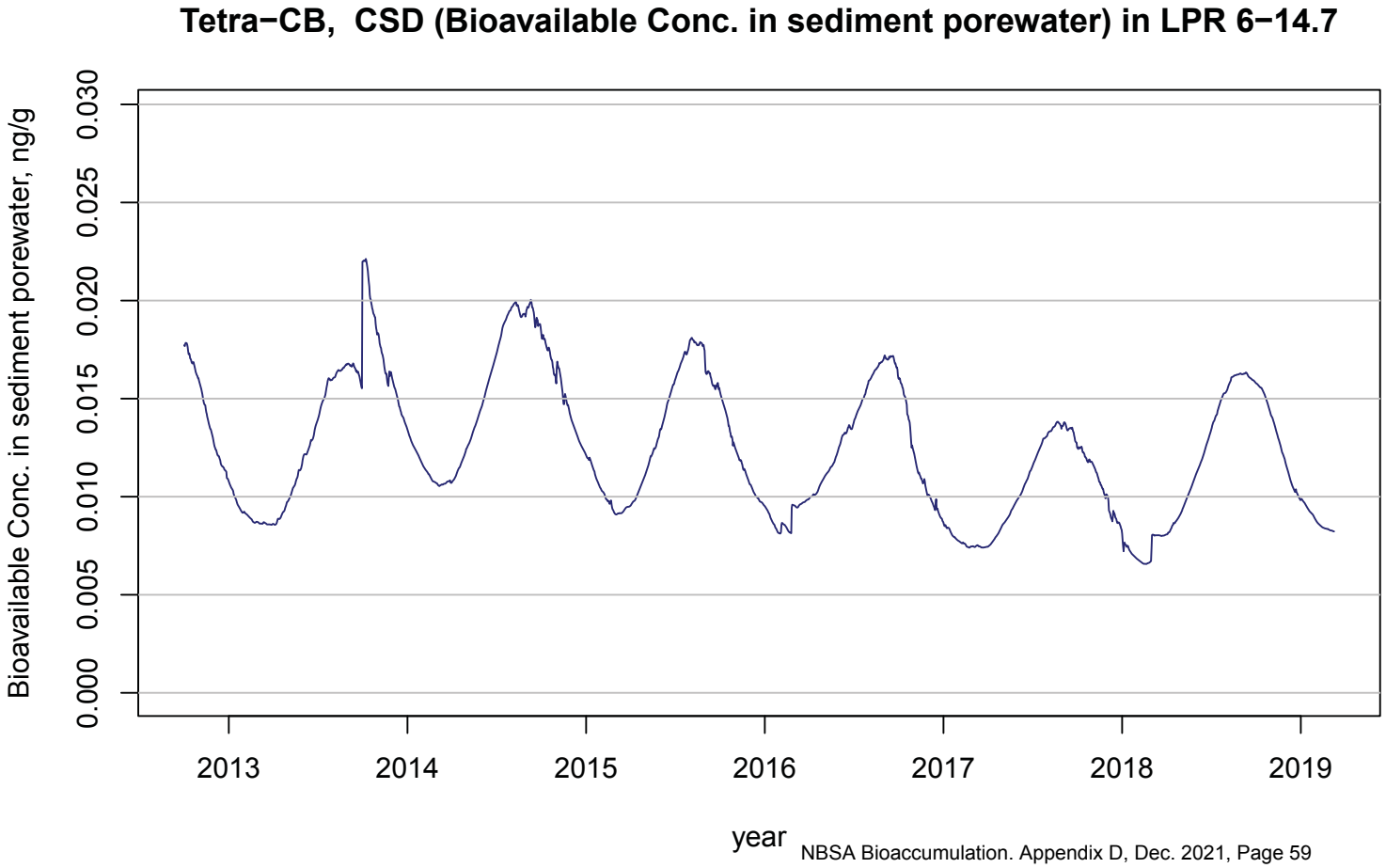

Tetra−CB, CWB (Bioavailable conc. in water) in LPR 0−6
Bioavailable conc. in water, ng/g
0.000
0.002
0.004
0.006
0.008
2013
2014
2015
2016
2017
2018
2019
year

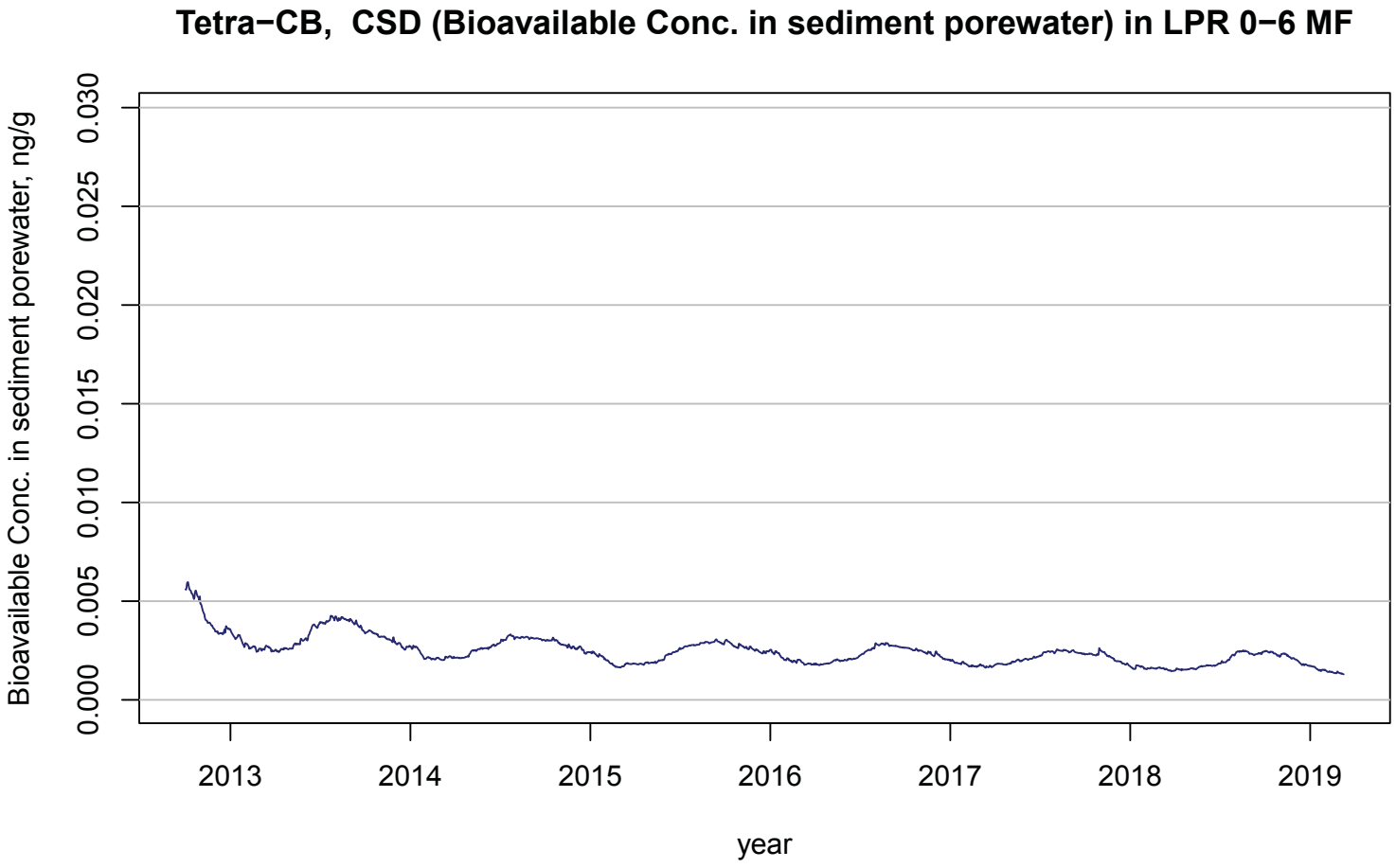

Tetra−CB, CWB (Bioavailable conc. in water) in LPR 6−14.7
Bioavailable conc. in water, ng/g
0.000
0.002
0.004
0.006
0.008
2013
2014
2015
2016
2017
2018
2019
year

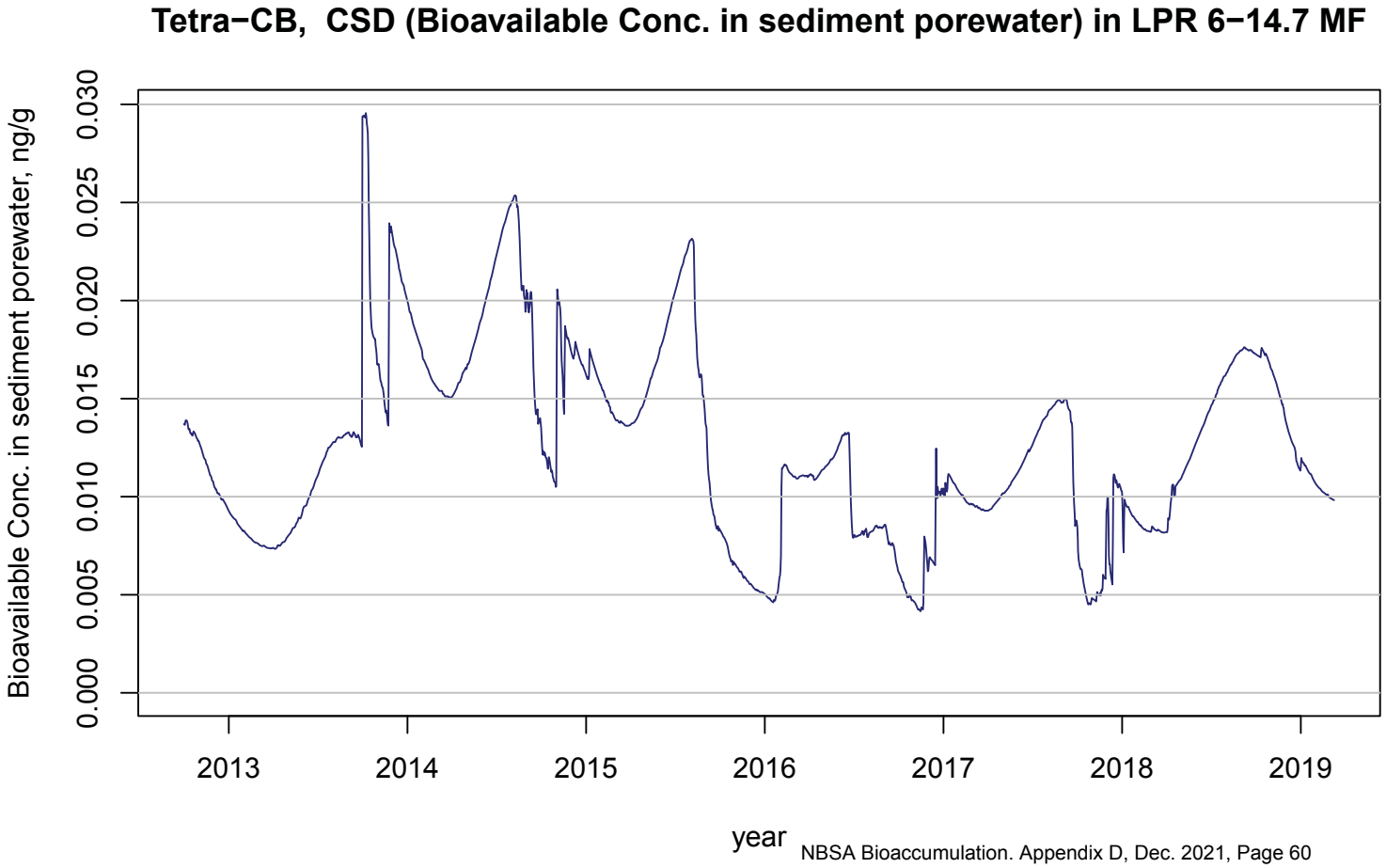

Tetra−CB, CWB (Bioavailable conc. in water) in LPR 0−6 MF
Bioavailable conc. in water, ng/g
0.000
0.002
0.004
0.006
0.008
2013
2014
2015
2016
2017
2018
2019
year

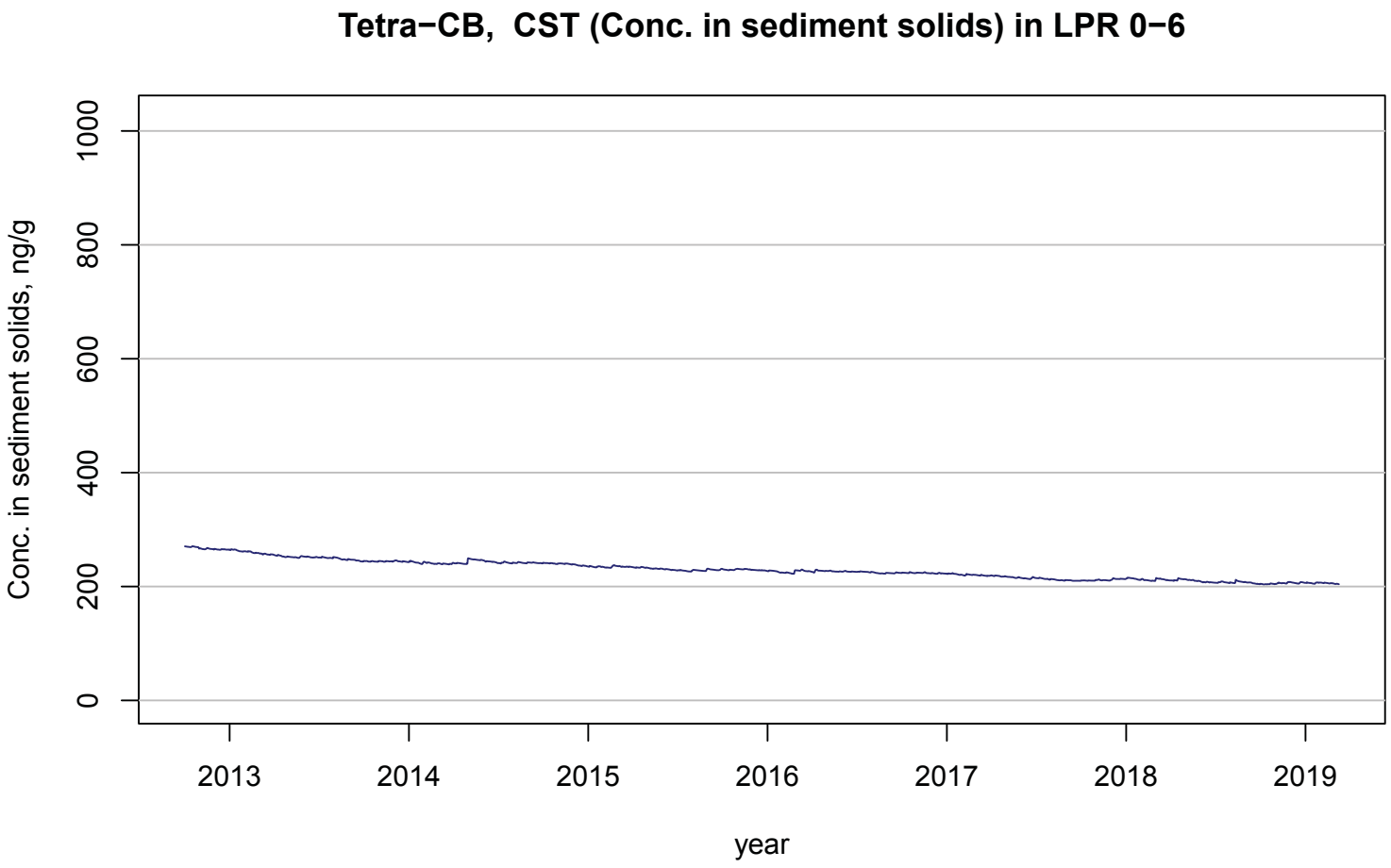

Tetra−CB, CWB (Bioavailable conc. in water) in LPR 6−14.7 MF
Bioavailable conc. in water, ng/g
0.000
0.002
0.004
0.006
0.008
2013
2014
2015
2016
2017
2018
2019
year

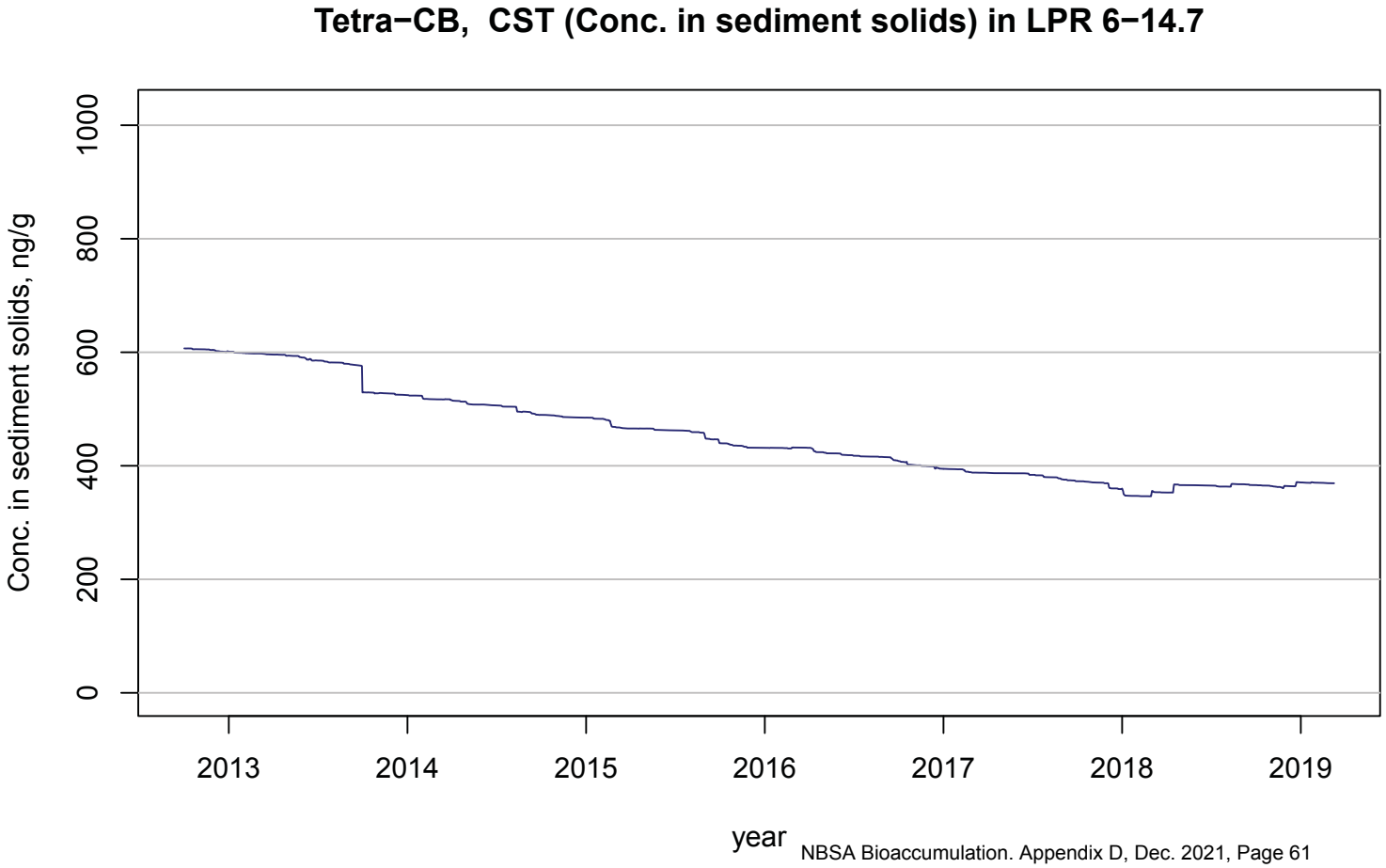

Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in LPR 0−6
Bioavailable Conc. in sediment porewater, ng/g
0.000
0.005
0.010
0.015
0.020
0.025
0.030
2013
2014
2015
2016
2017
2018
2019
year

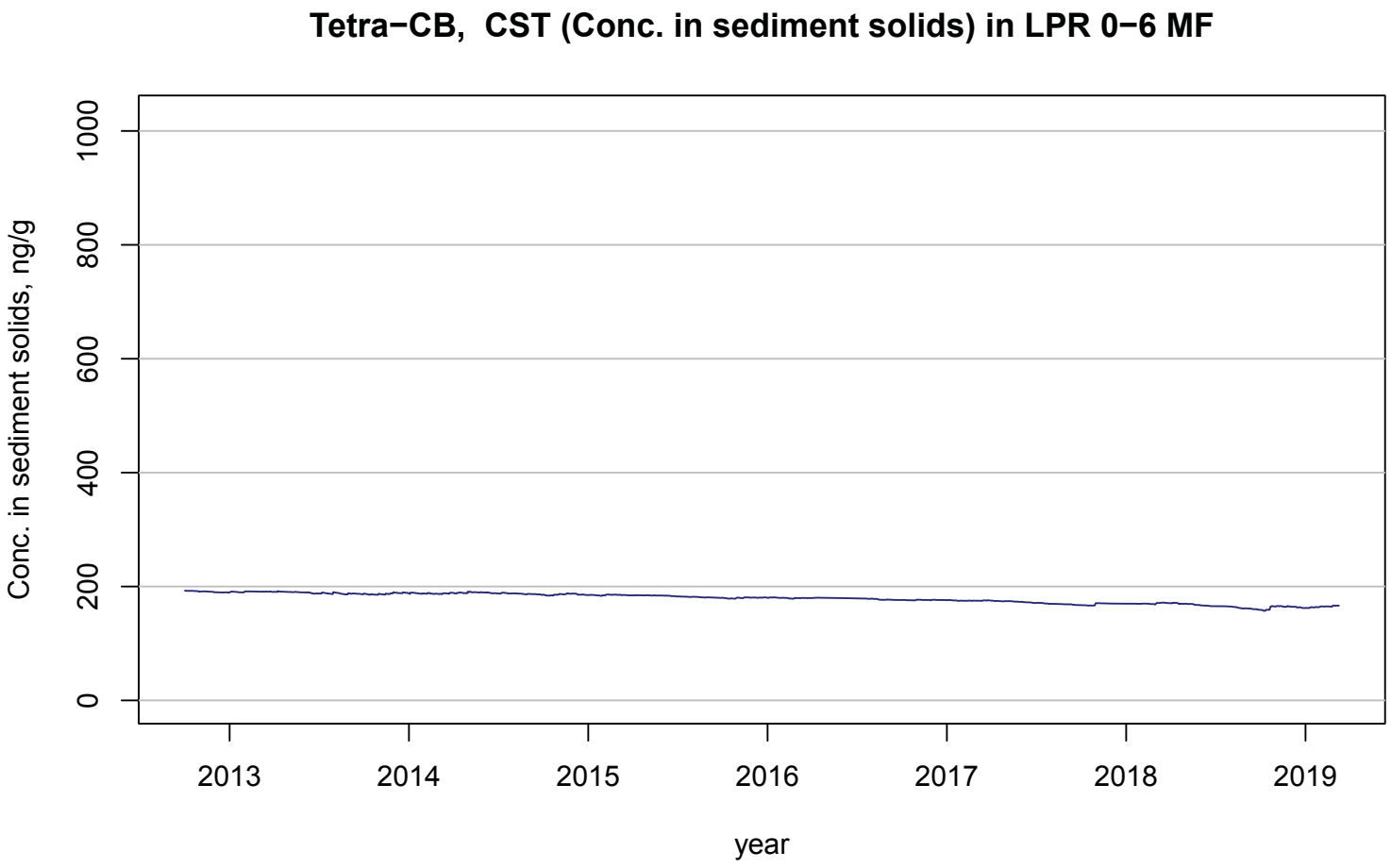

Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in LPR 6−14.7
Bioavailable Conc. in sediment porewater, ng/g
0.000
0.005
0.010
0.015
0.020
0.025
0.030
2013
2014
2015
2016
2017
2018
2019
year

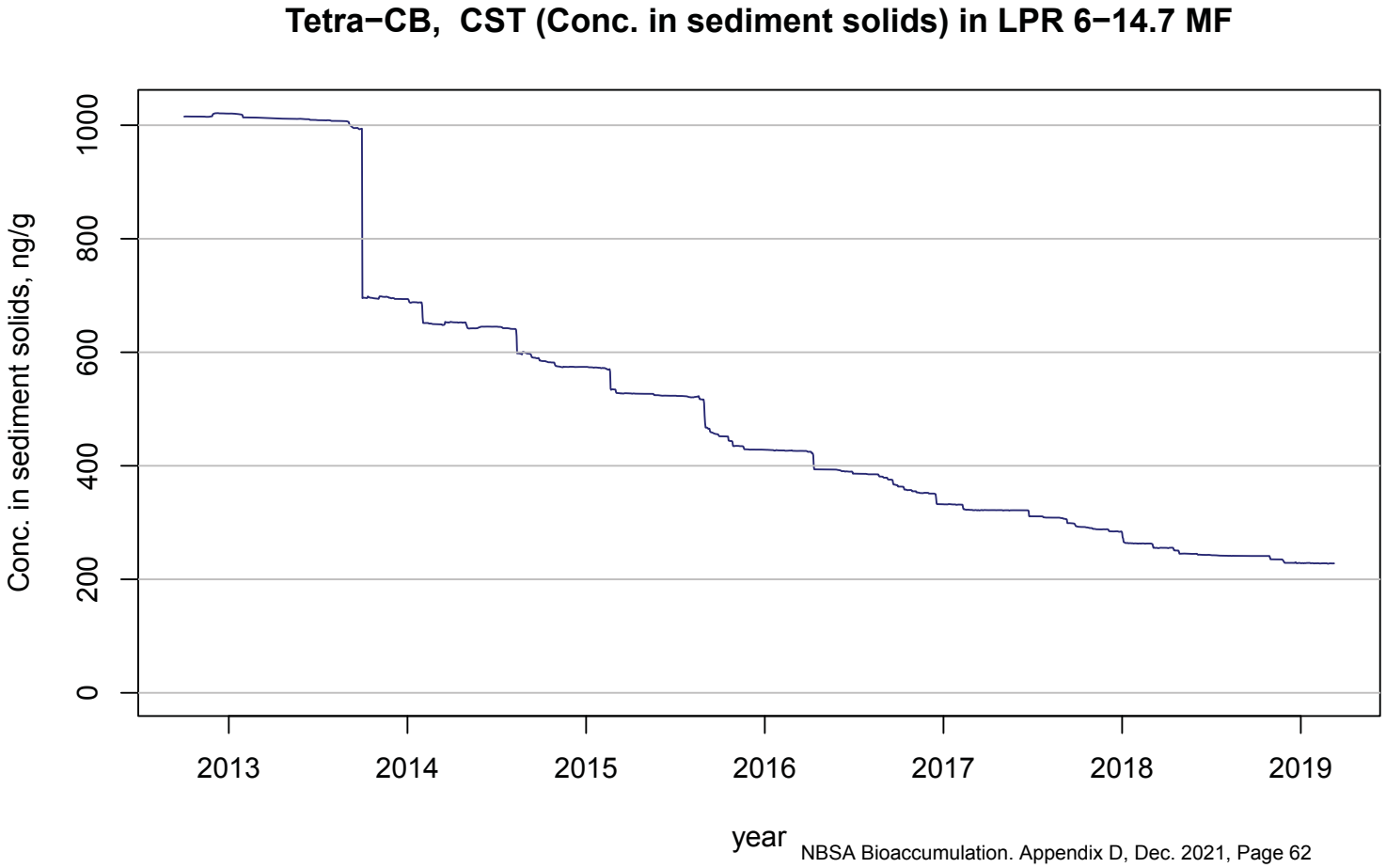

Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in LPR 0−6 MF
Bioavailable Conc. in sediment porewater, ng/g
0.000
0.005
0.010
0.015
0.020
0.025
0.030
2013
2014
2015
2016
2017
2018
2019
year

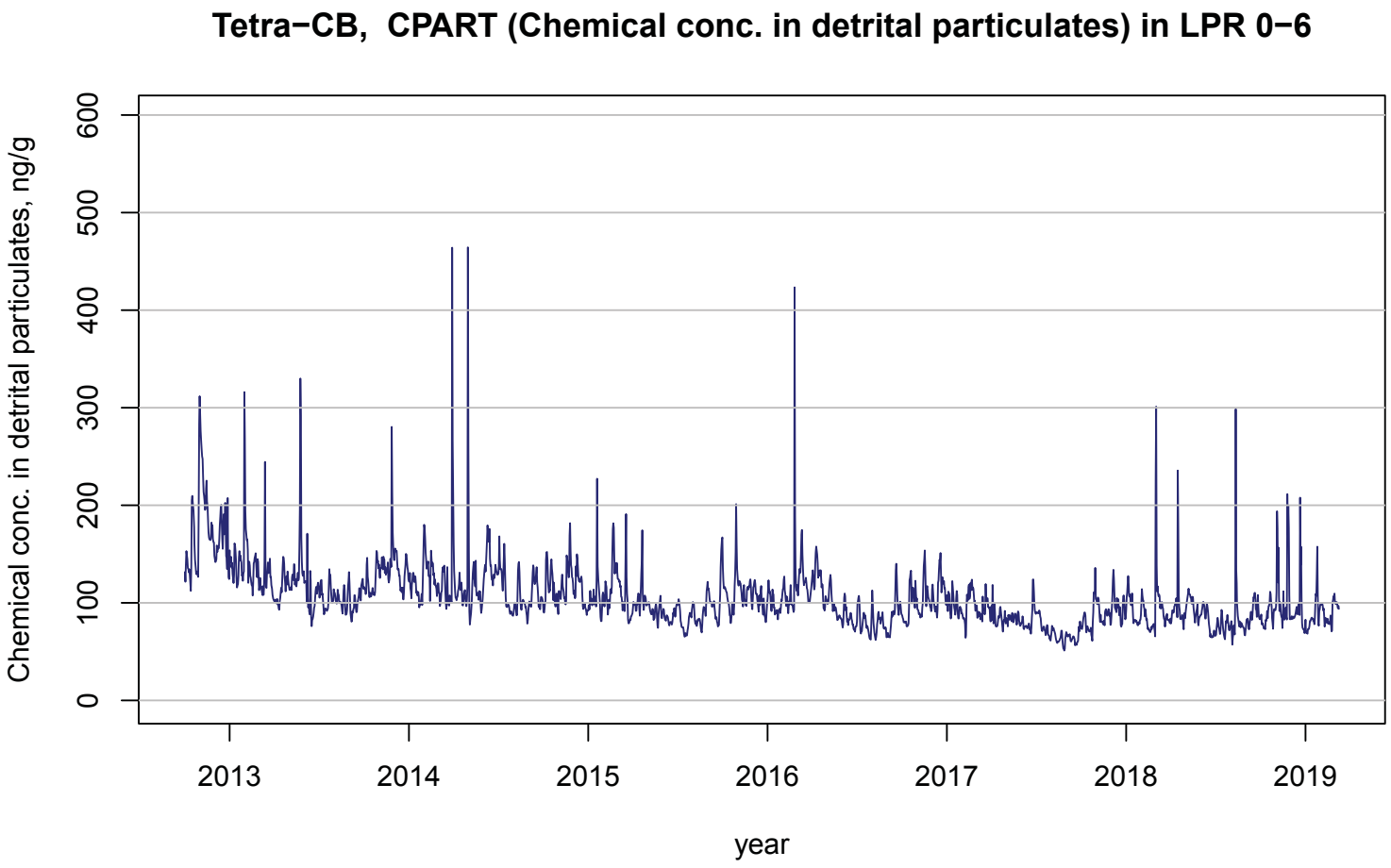

Tetra−CB, CSD (Bioavailable Conc. in sediment porewater) in LPR 6−14.7 MF
Bioavailable Conc. in sediment porewater, ng/g
0.000
0.005
0.010
0.015
0.020
0.025
0.030
2013
2014
2015
2016
2017
2018
2019
year

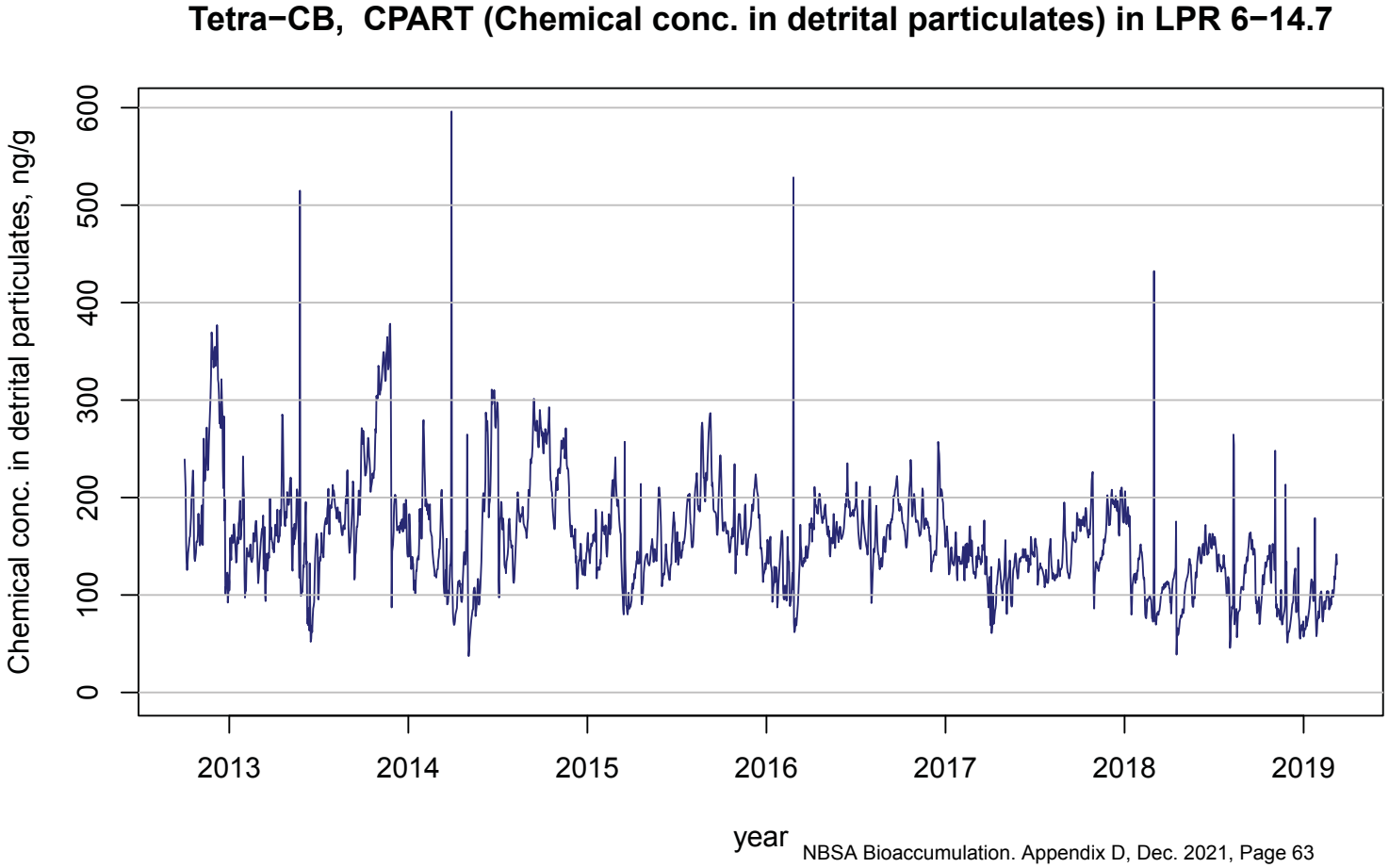

Tetra−CB, CST (Conc. in sediment solids) in LPR 0−6
Conc. in sediment solids, ng/g
0
200
400
600
800
1000
2013
2014
2015
2016
2017
2018
2019
year

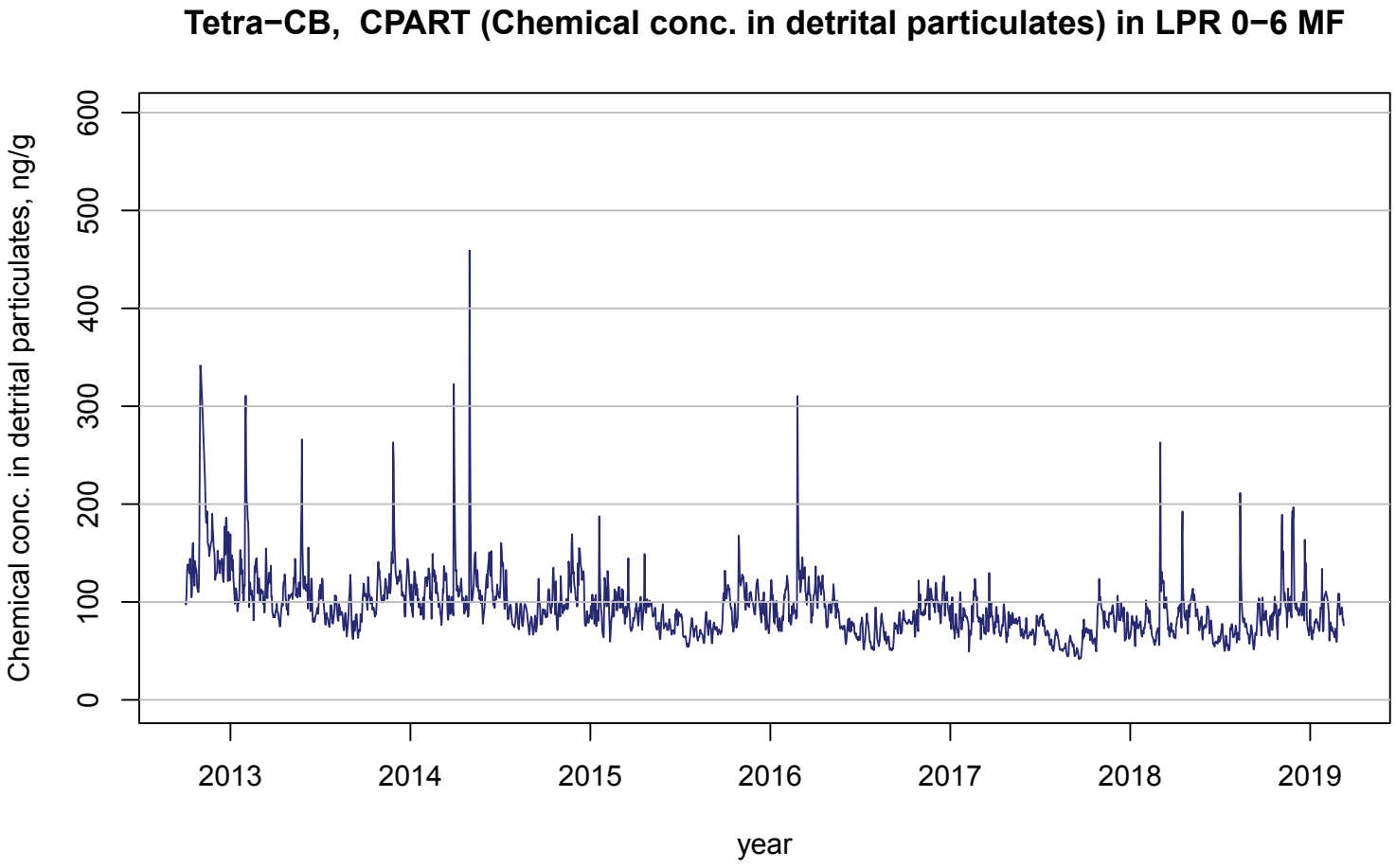

Tetra−CB, CST (Conc. in sediment solids) in LPR 6−14.7
Conc. in sediment solids, ng/g
0
200
400
600
800
1000
2013
2014
2015
2016
2017
2018
2019
year

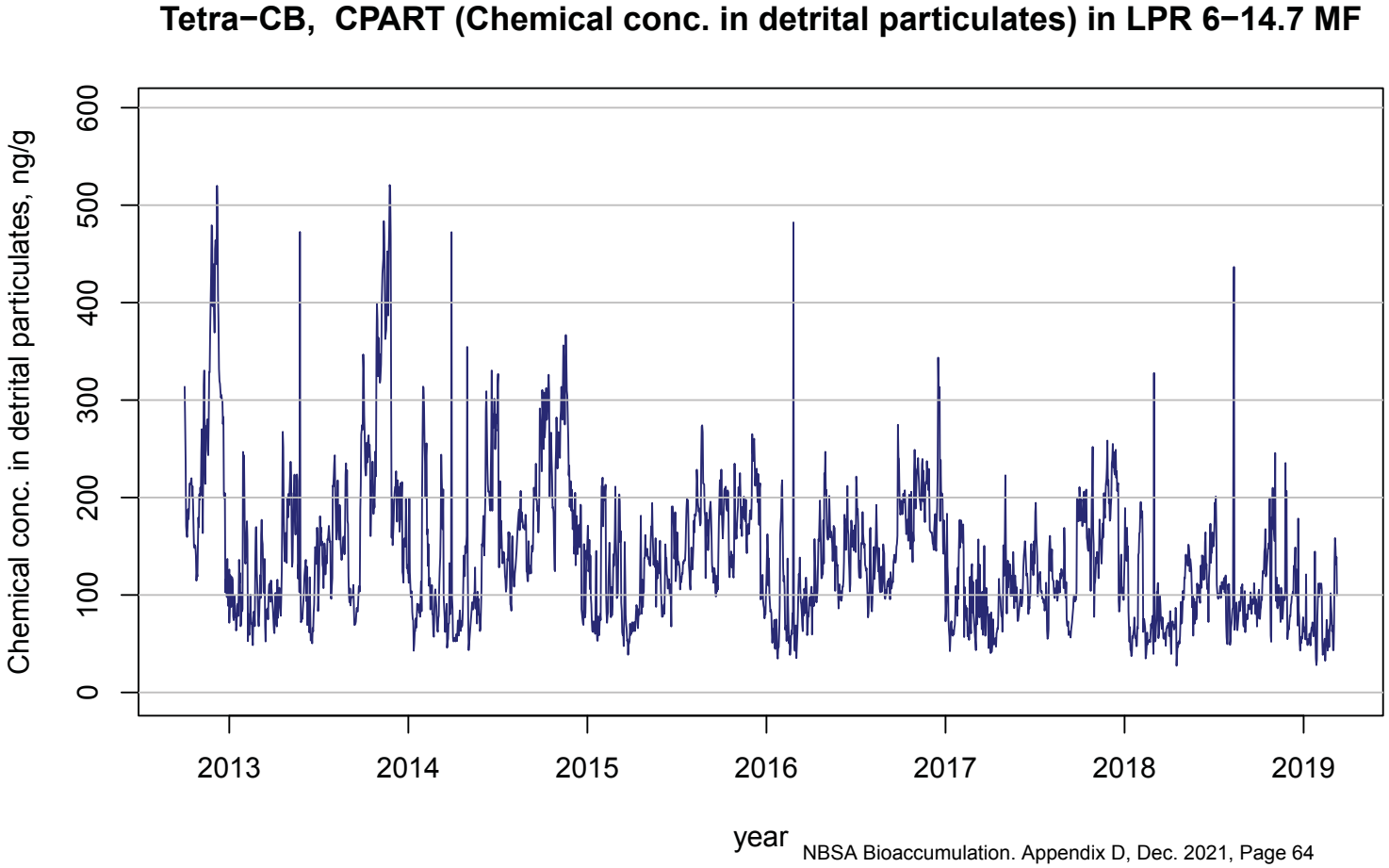

Tetra−CB, CST (Conc. in sediment solids) in LPR 0−6 MF
Conc. in sediment solids, ng/g
0
200
400
600
800
1000
2013
2014
2015
2016
2017
2018
2019
year

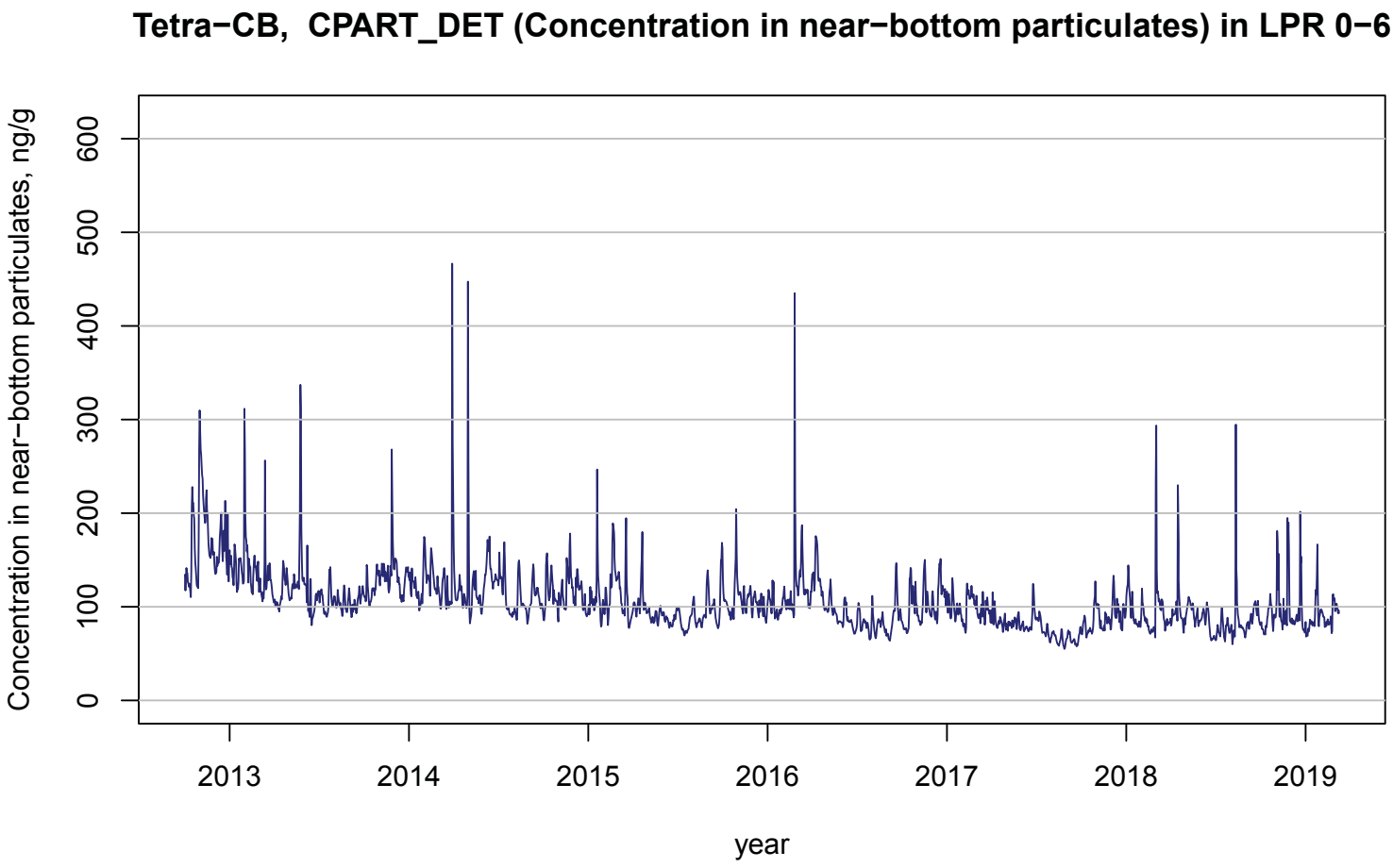

Tetra−CB, CST (Conc. in sediment solids) in LPR 6−14.7 MF
Conc. in sediment solids, ng/g
0
200
400
600
800
1000
2013
2014
2015
2016
2017
2018
2019
year

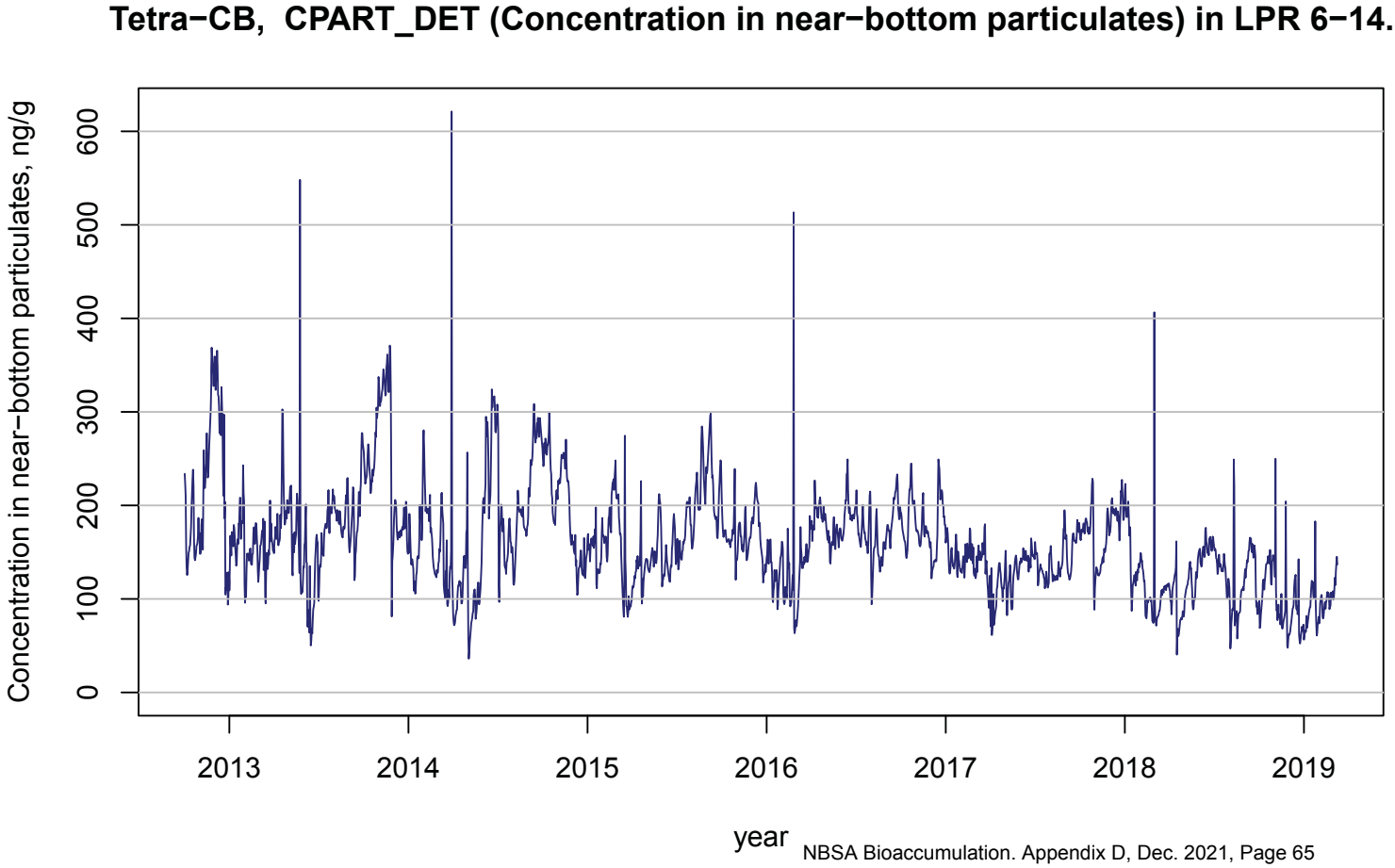

Tetra−CB, CPART (Chemical conc. in detrital particulates) in LPR 0−6
Chemical conc. in detrital particulates, ng/g
0
100
200
300
400
500
600
2013
2014
2015
2016
2017
2018
2019
year

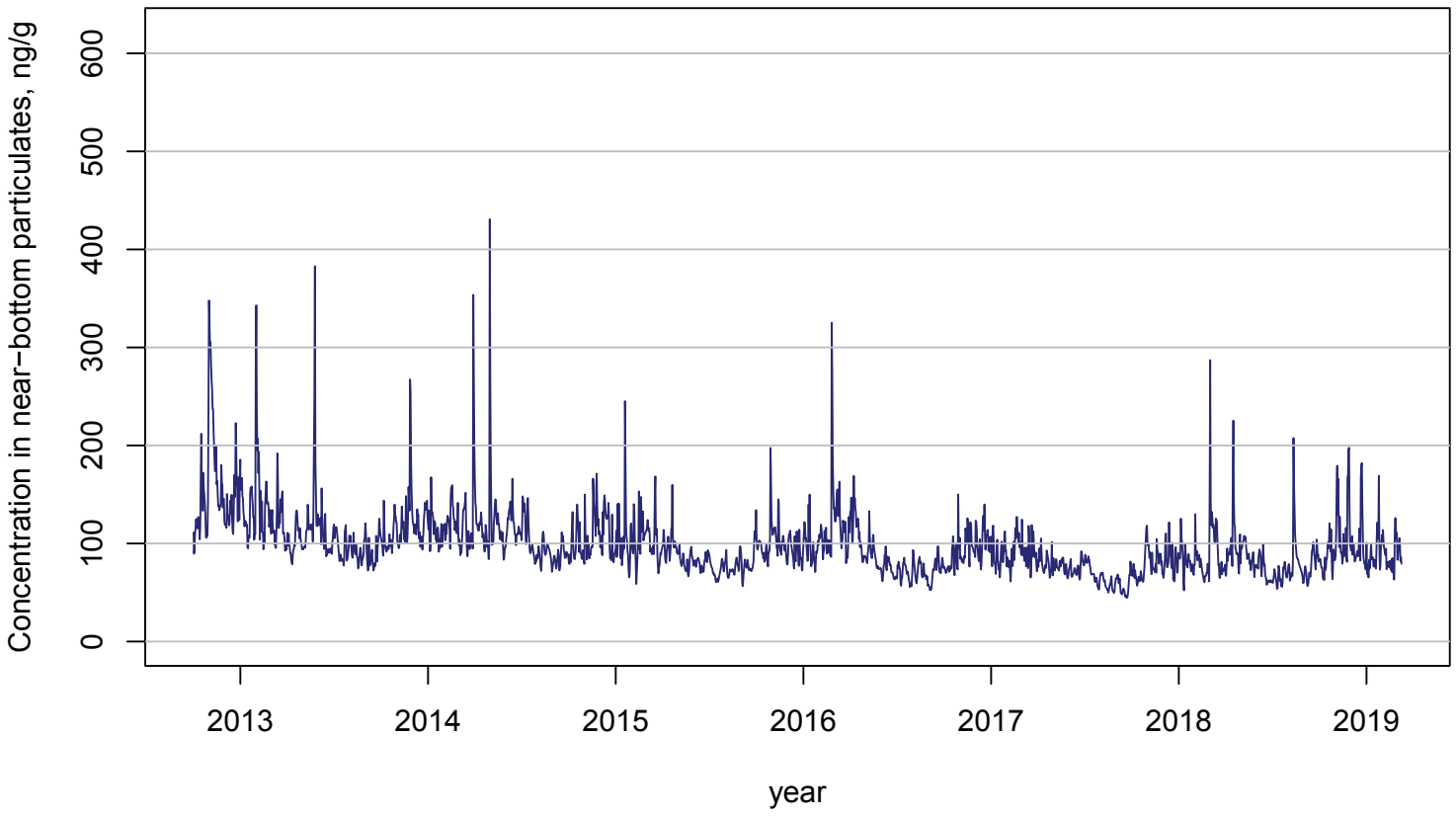

Tetra−CB, CPART (Chemical conc. in detrital particulates) in LPR 6−14.7
Chemical conc. in detrital particulates, ng/g
0
100
200
300
400
500
600
2013
2014
2015
2016
2017
2018
2019
year

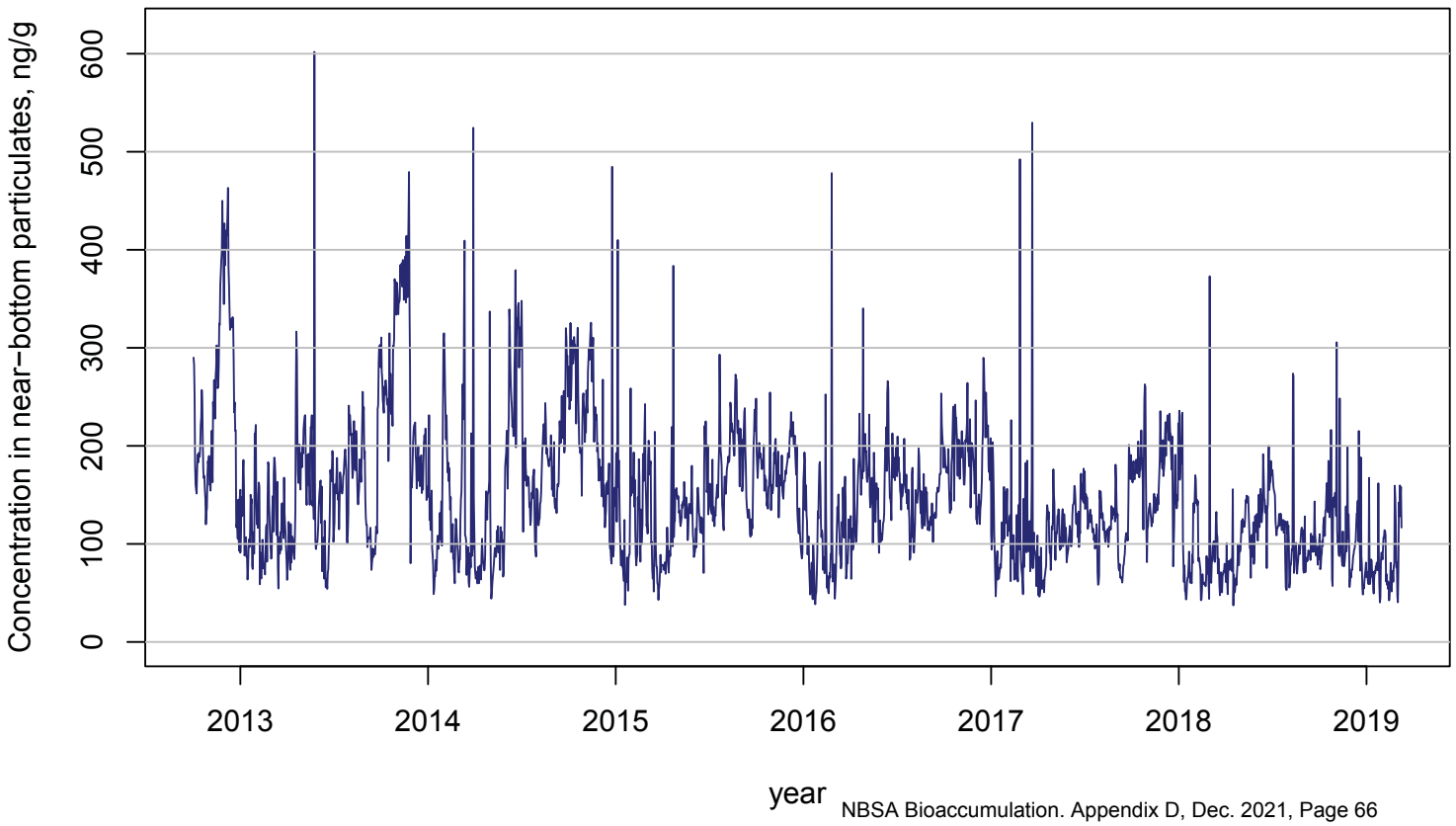

Tetra−CB, CPART (Chemical conc. in detrital particulates) in LPR 0−6 MF
Chemical conc. in detrital particulates, ng/g
0
100
200
300
400
500
600
2013
2014
2015
2016
2017
2018
2019
year

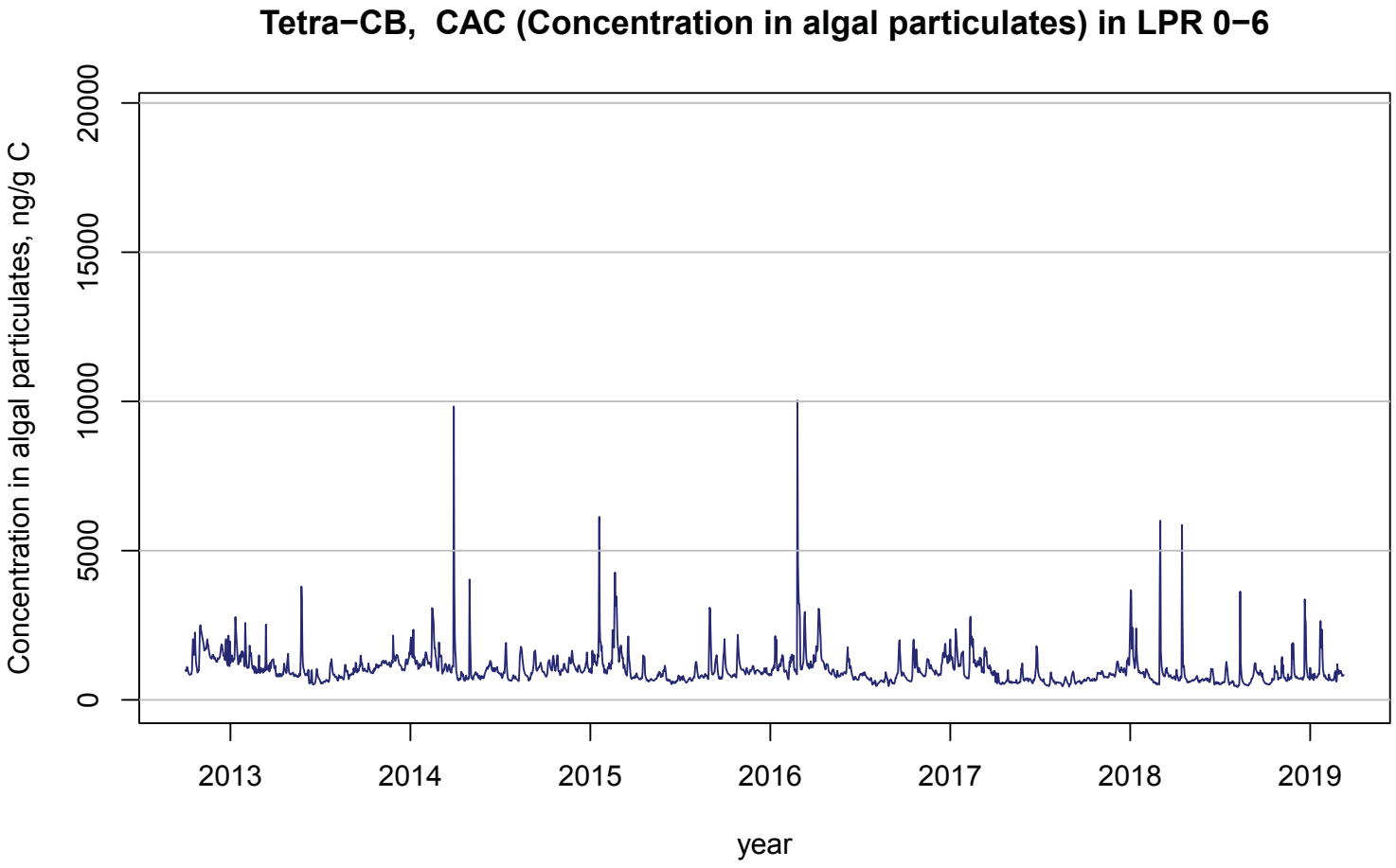

Tetra−CB, CPART (Chemical conc. in detrital particulates) in LPR 6−14.7 MF
Chemical conc. in detrital particulates, ng/g
0
100
200
300
400
500
600
2013
2014
2015
2016
2017
2018
2019
year

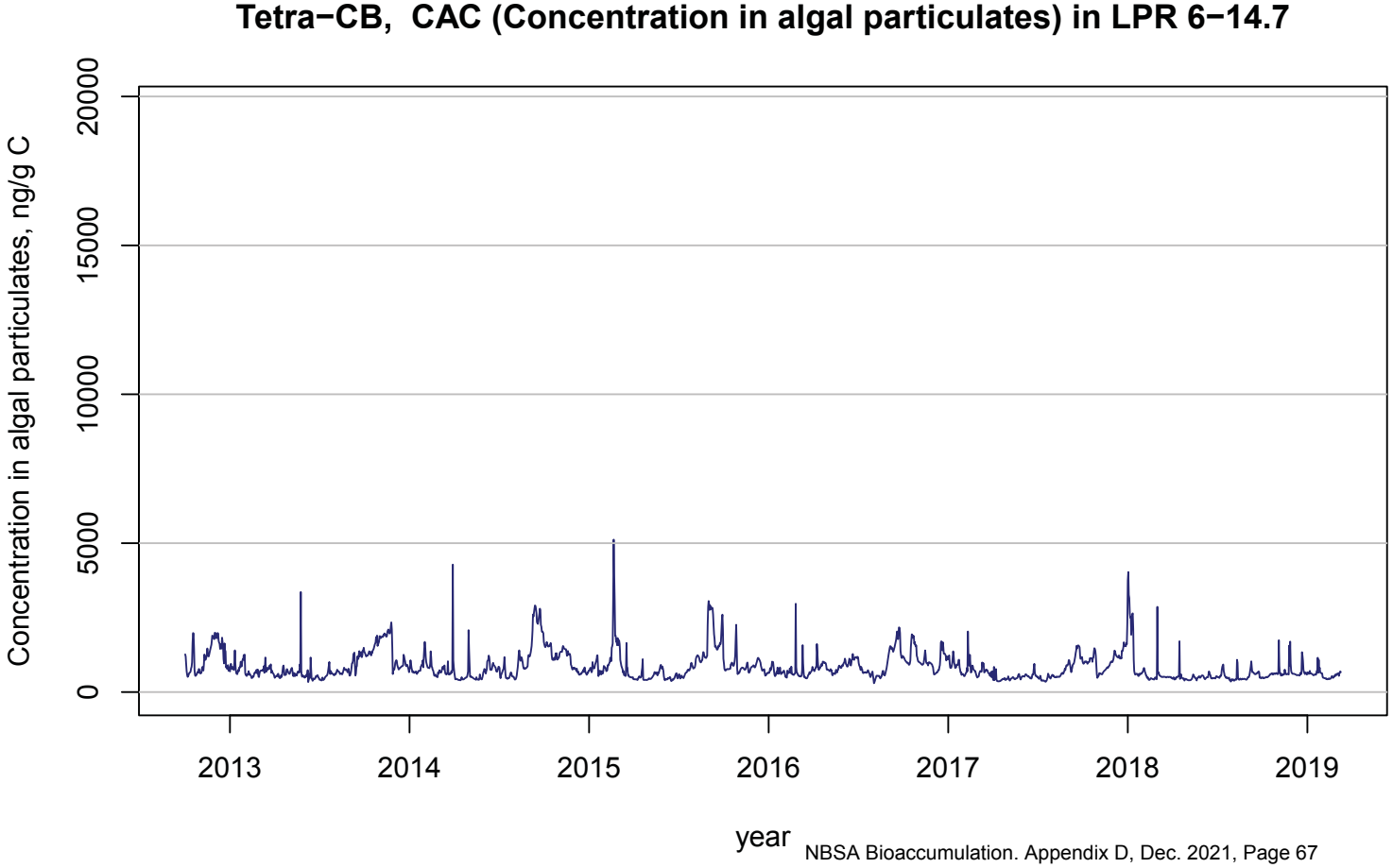

Tetra−CB, CPART_DET (Concentration in near−bottom particulates) in LPR 0−6
Concentration in near−bottom particulates, ng/g
0
100
200
300
400
500
600
2013
2014
2015
2016
2017
2018
2019
year

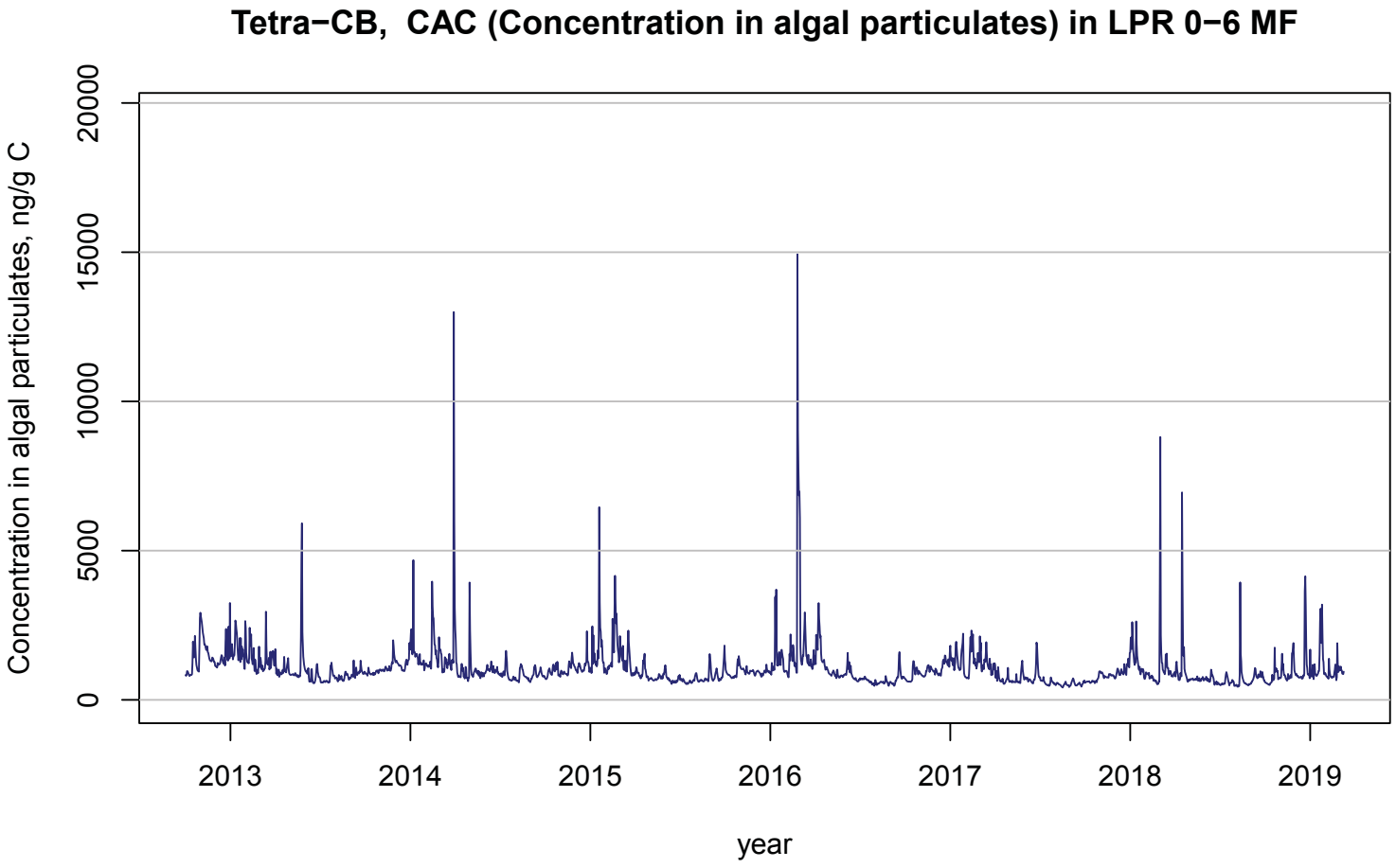

Tetra−CB, CPART_DET (Concentration in near−bottom particulates) in LPR 6−14.7
Concentration in near−bottom particulates, ng/g
0
100
200
300
400
500
600
2013
2014
2015
2016
2017
2018
2019
year

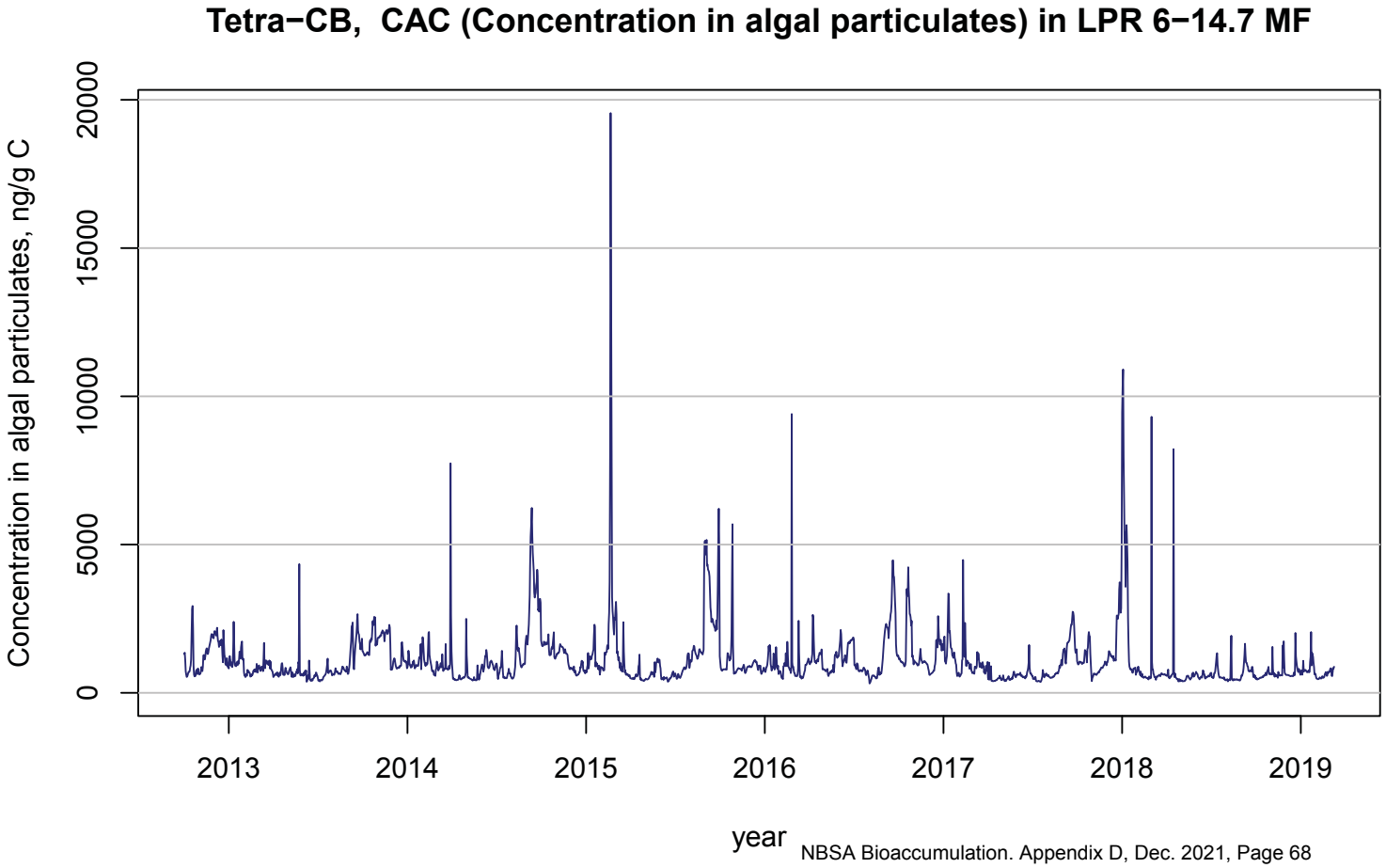

Tetra−CB, CPART_DET (Concentration in near−bottom particulates) in LPR 0−6 MF
Concentration in near−bottom particulates, ng/g
0
100
200
300
400
500
600
2013
2014
2015
2016
2017
2018
2019
year

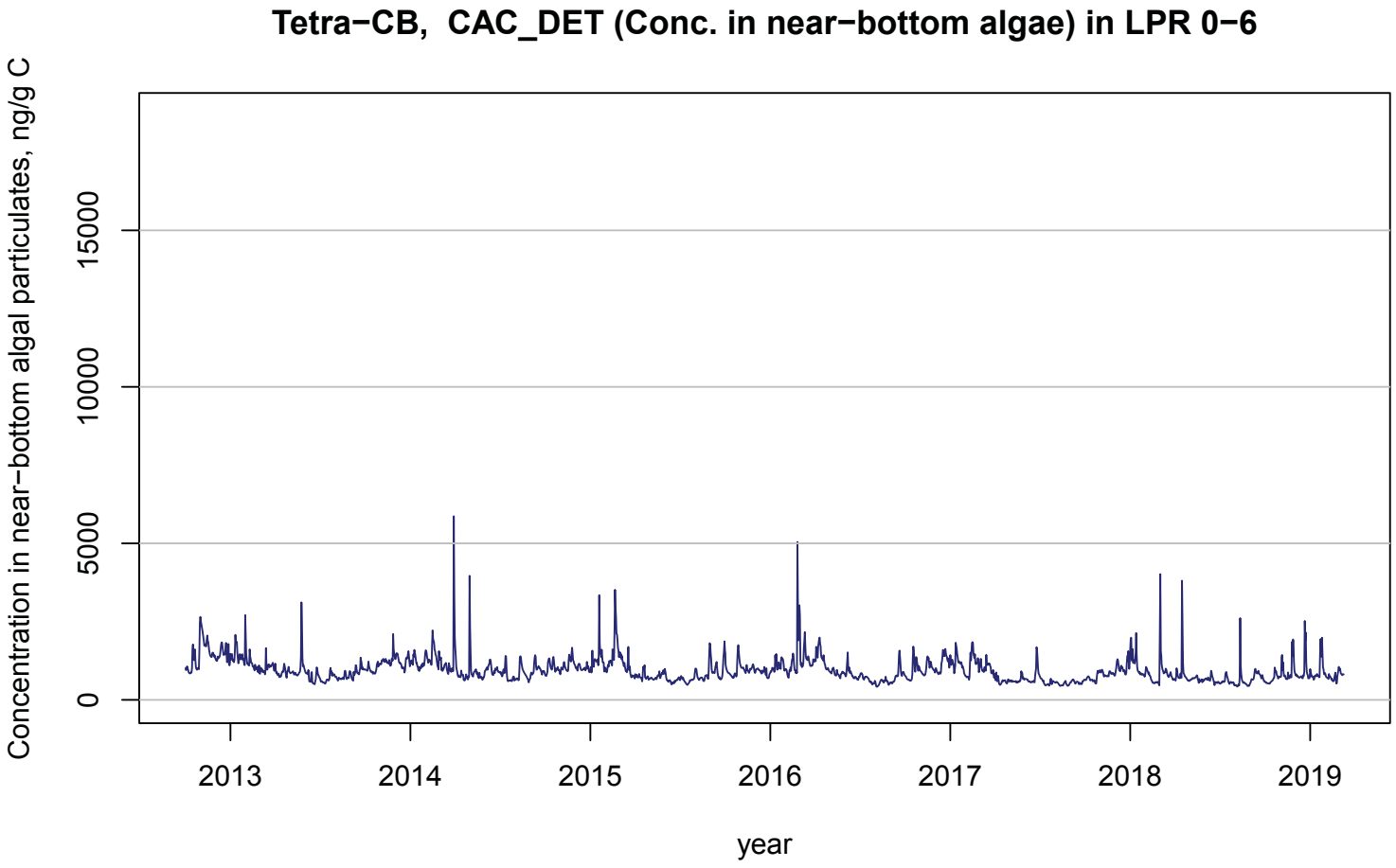

Tetra−CB, CPART_DET (Concentration in near−bottom particulates) in LPR 6−14.7 MF
Concentration in near−bottom particulates, ng/g
0
100
200
300
400
500
600
2013
2014
2015
2016
2017
2018
2019
year

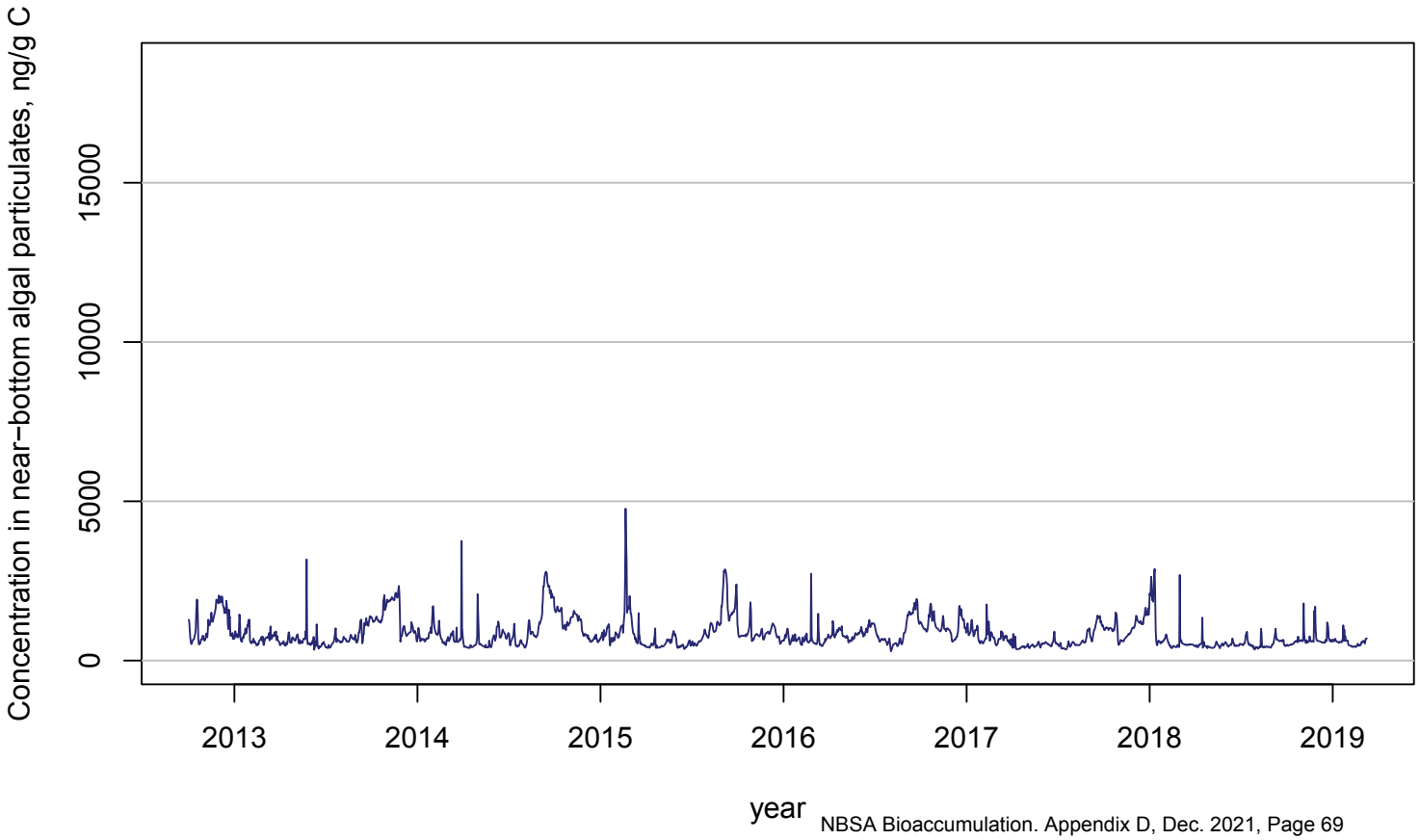

Tetra−CB, CAC (Concentration in algal particulates) in LPR 0−6
Concentration in algal particulates, ng/g C
0
5000
10000
15000
20000
2013
2014
2015
2016
2017
2018
2019
year

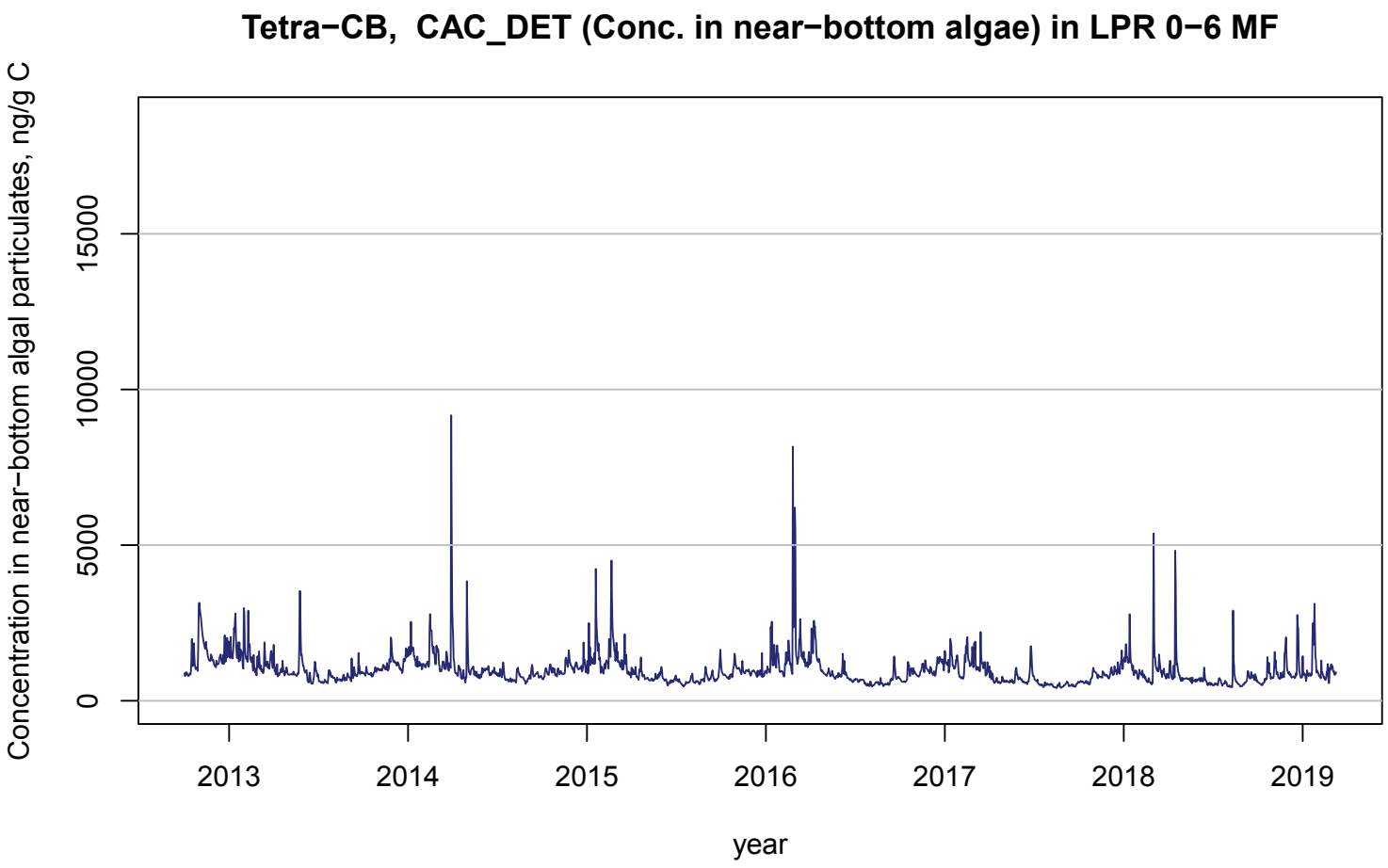

Tetra−CB, CAC (Concentration in algal particulates) in LPR 6−14.7
Concentration in algal particulates, ng/g C
0
5000
10000
15000
20000
2013
2014
2015
2016
2017
2018
2019
year

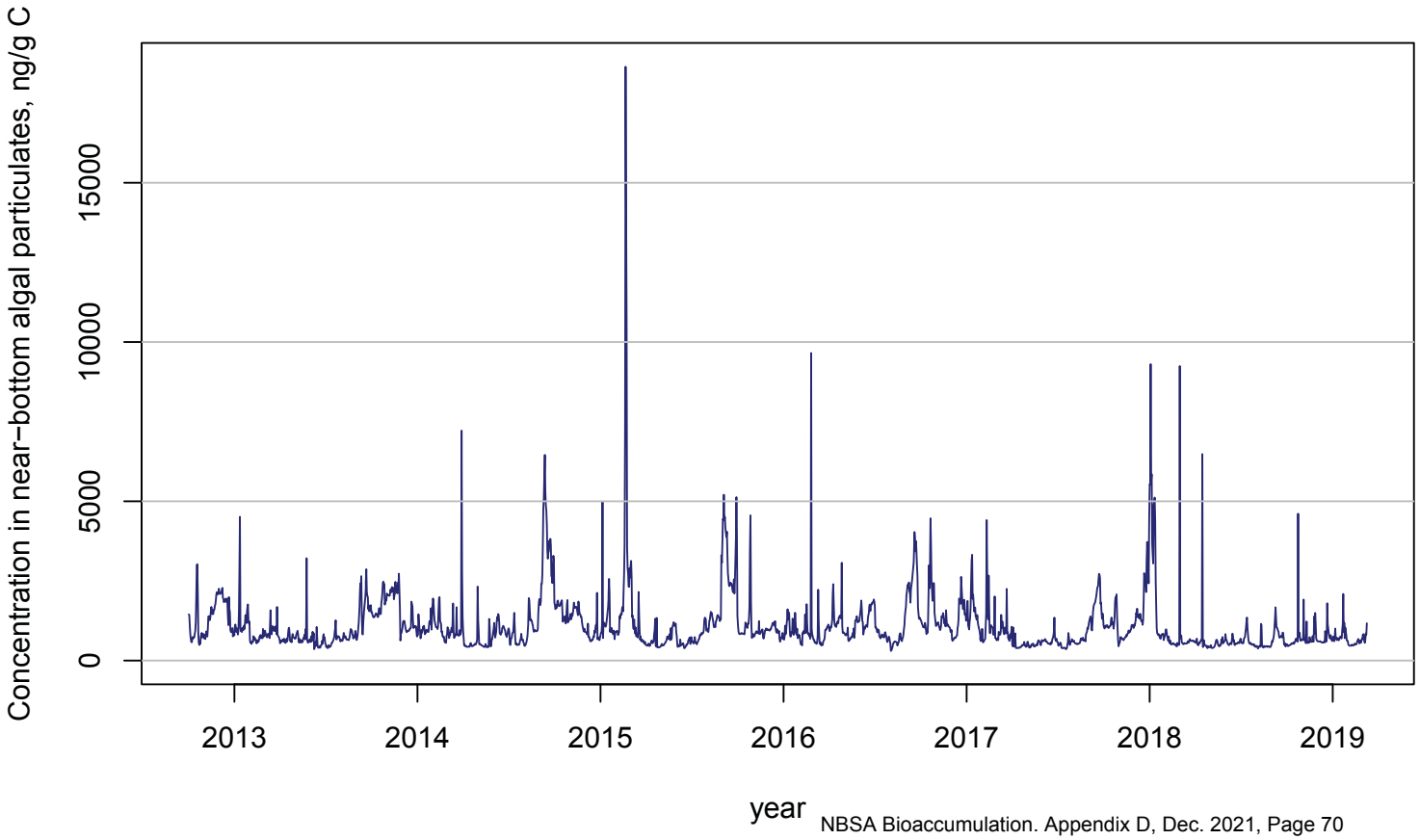

Tetra−CB, CAC (Concentration in algal particulates) in LPR 0−6 MF
Concentration in algal particulates, ng/g C
0
5000
10000
15000
20000
2013
2014
2015
2016
2017
2018
2019
year

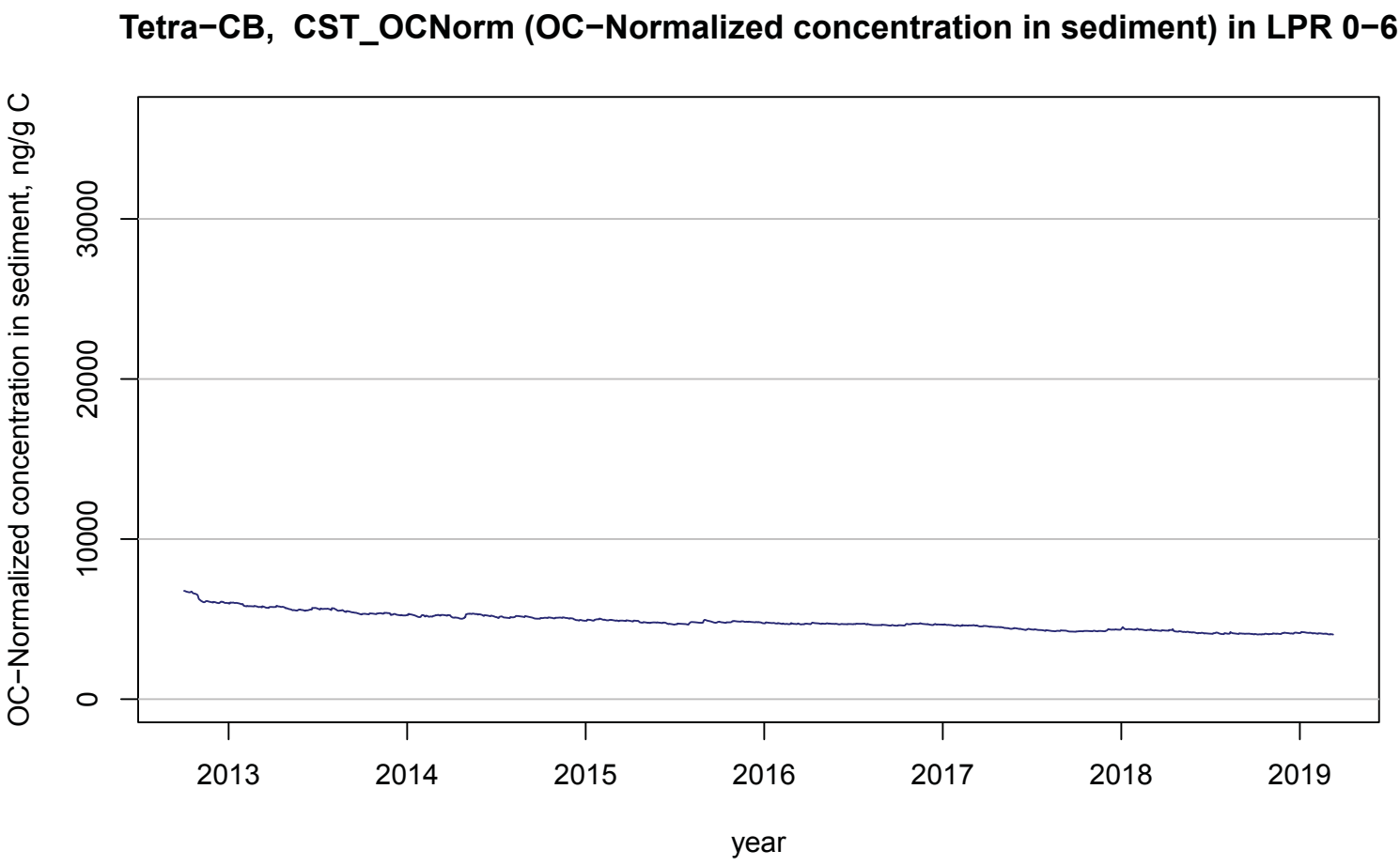

Tetra−CB, CAC (Concentration in algal particulates) in LPR 6−14.7 MF
Concentration in algal particulates, ng/g C
0
5000
10000
15000
20000
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CAC_DET (Conc. in near−bottom algae) in LPR 0−6
Concentration in near−bottom algal particulates, ng/g C
0
5000
10000
15000
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CAC_DET (Conc. in near−bottom algae) in LPR 6−14.7
Concentration in near−bottom algal particulates, ng/g C
0
5000
10000
15000
2013
2014
2015
2016
2017
2018
2019
year

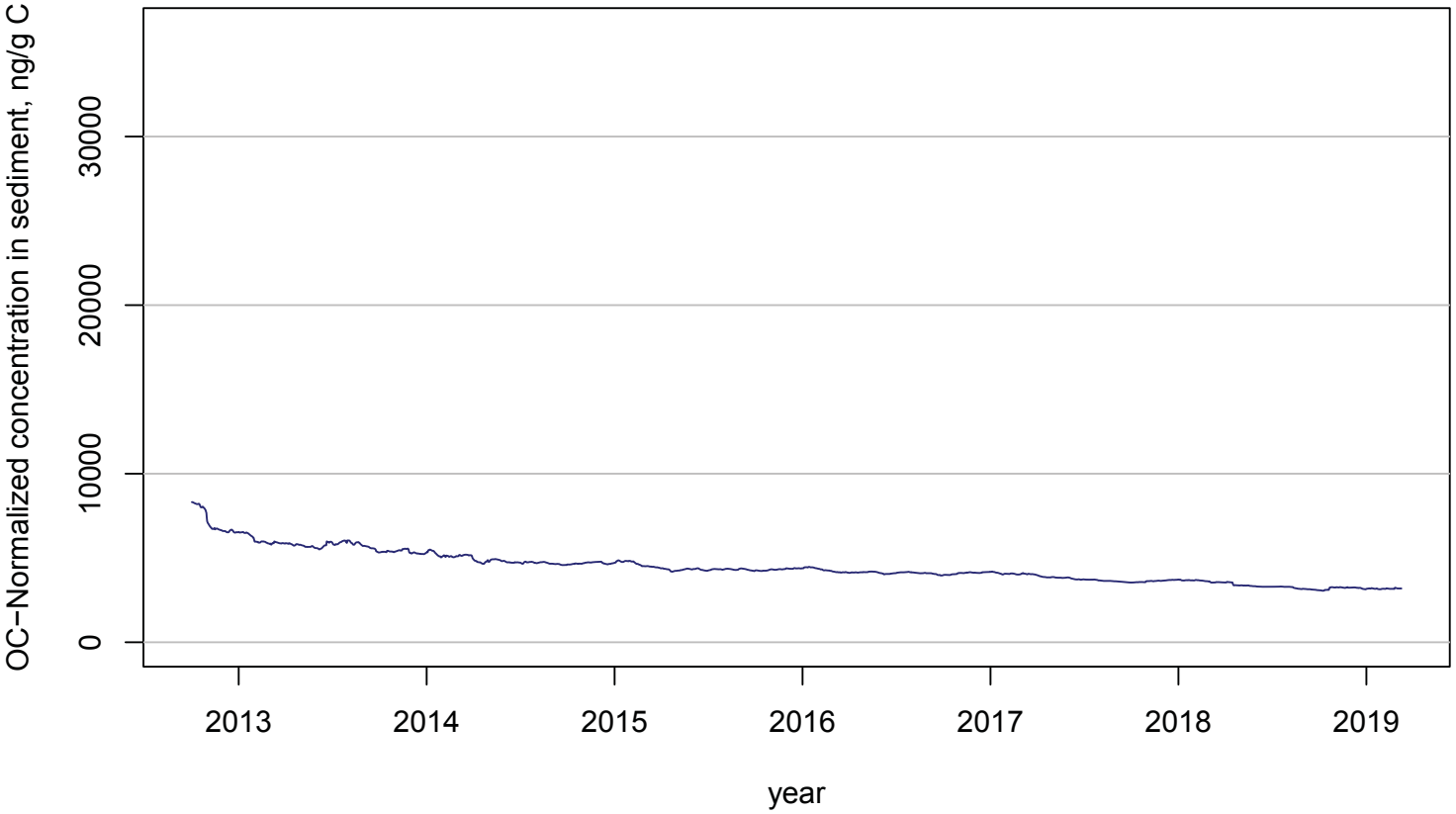

Tetra−CB, CAC_DET (Conc. in near−bottom algae) in LPR 0−6 MF
Concentration in near−bottom algal particulates, ng/g C
0
5000
10000
15000
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CAC_DET (Conc. in near−bottom algae) in LPR 6−14.7 MF
Concentration in near−bottom algal particulates, ng/g C
0
5000
10000
15000
2013
2014
2015
2016
2017
2018
2019
year

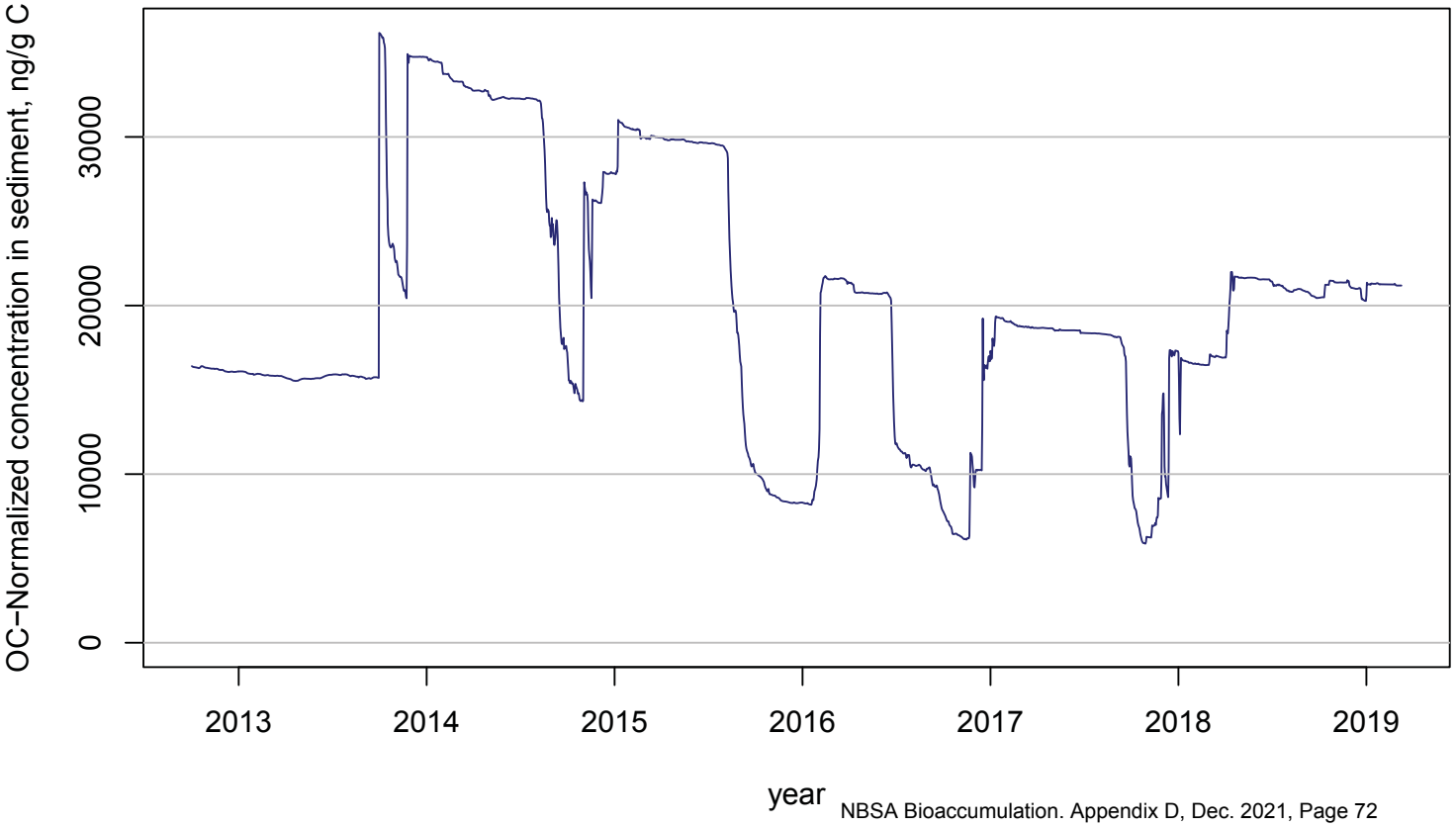

Tetra−CB, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 0−6
OC−Normalized concentration in sediment, ng/g C
0
10000
20000
30000
2013
2014
2015
2016
2017
2018
2019
year


Tetra−CB, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 6−14.7
OC−Normalized concentration in sediment, ng/g C
0
10000
20000
30000
2013
2014
2015
2016
2017
2018
2019
year

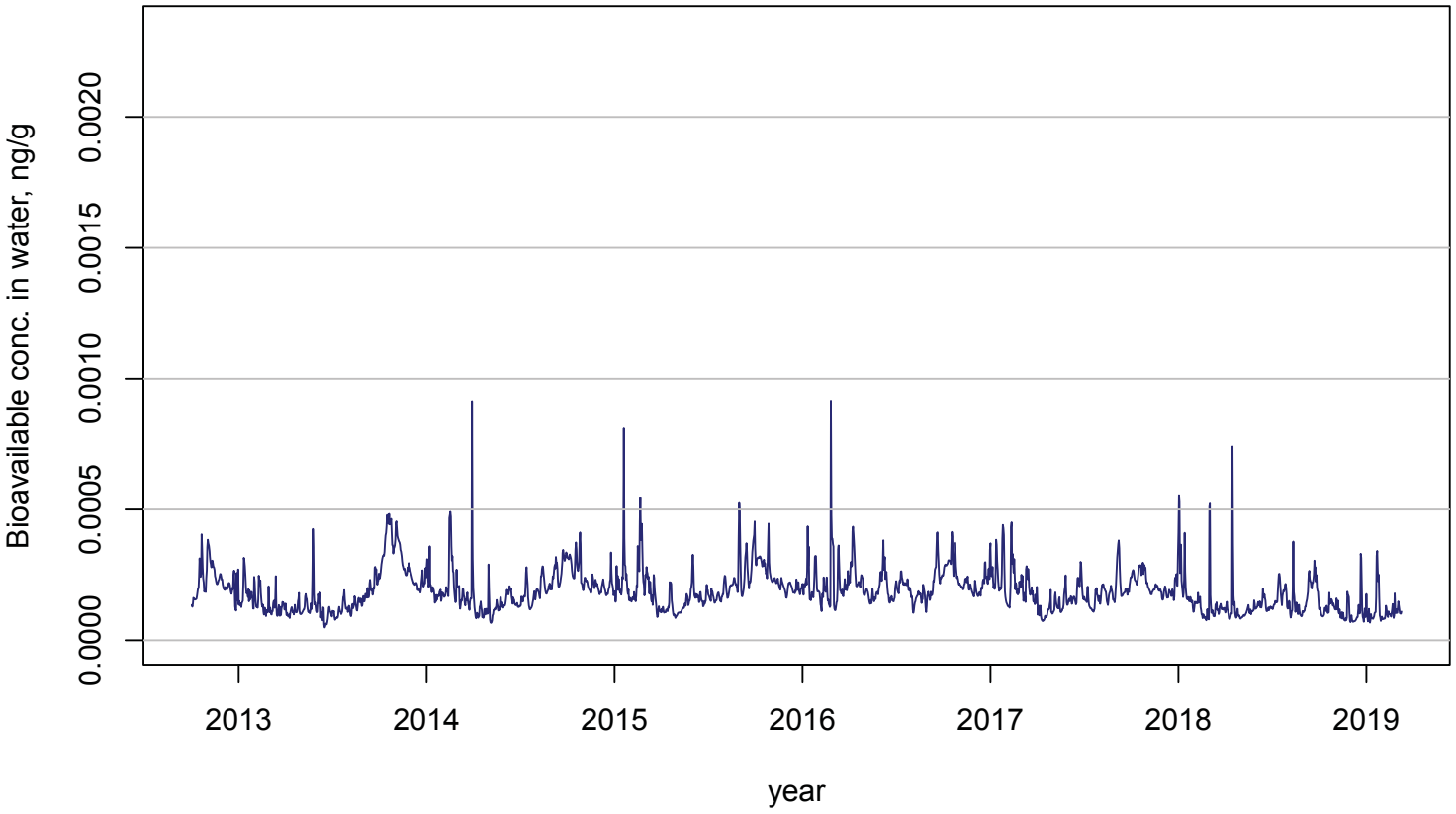
Tetra−CB, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 0−6 MF



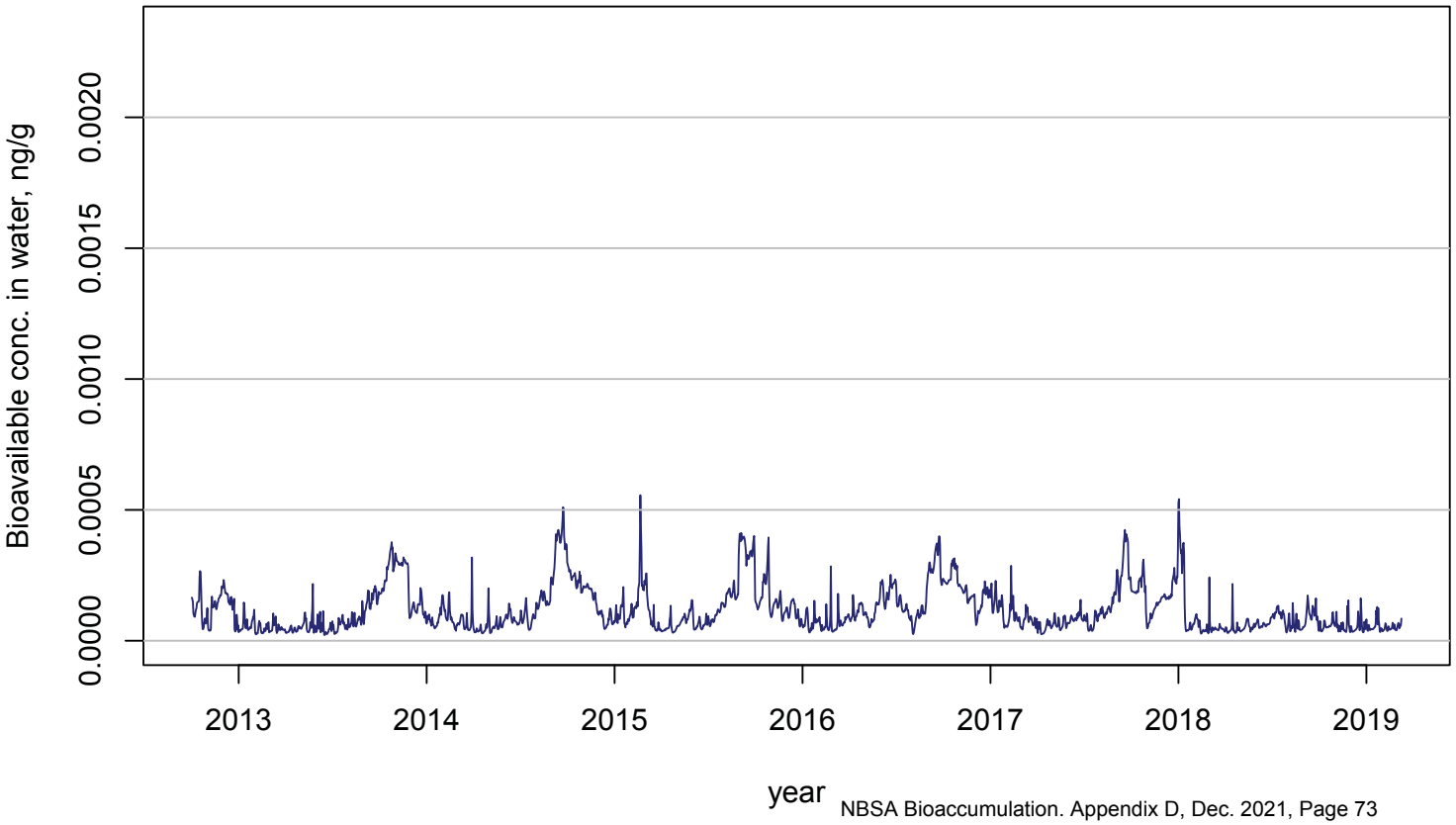
Tetra−CB, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 6−14.7 MF



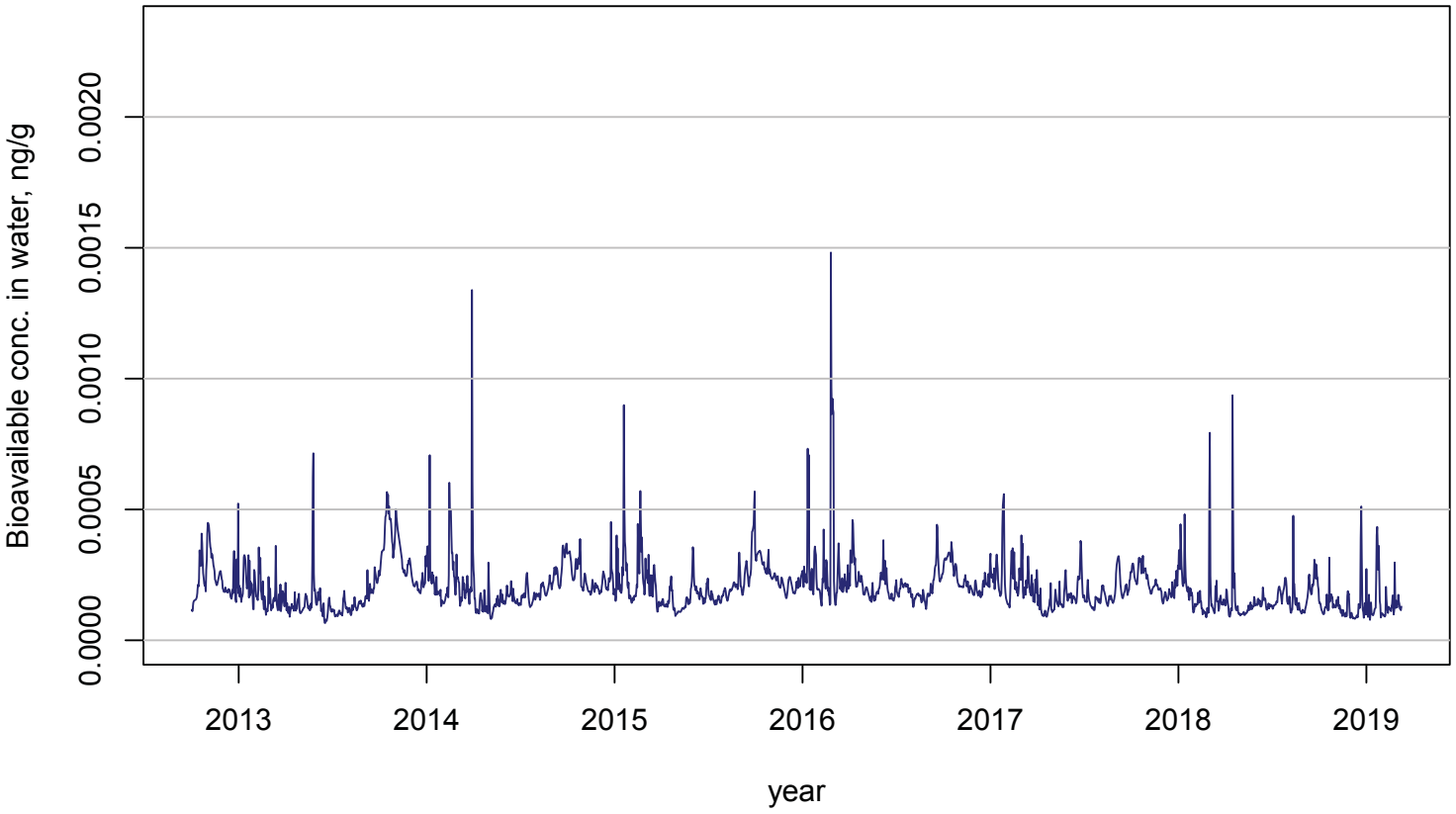
4,4'−DDx, CWB (Bioavailable conc. in water) in LPR 0−6



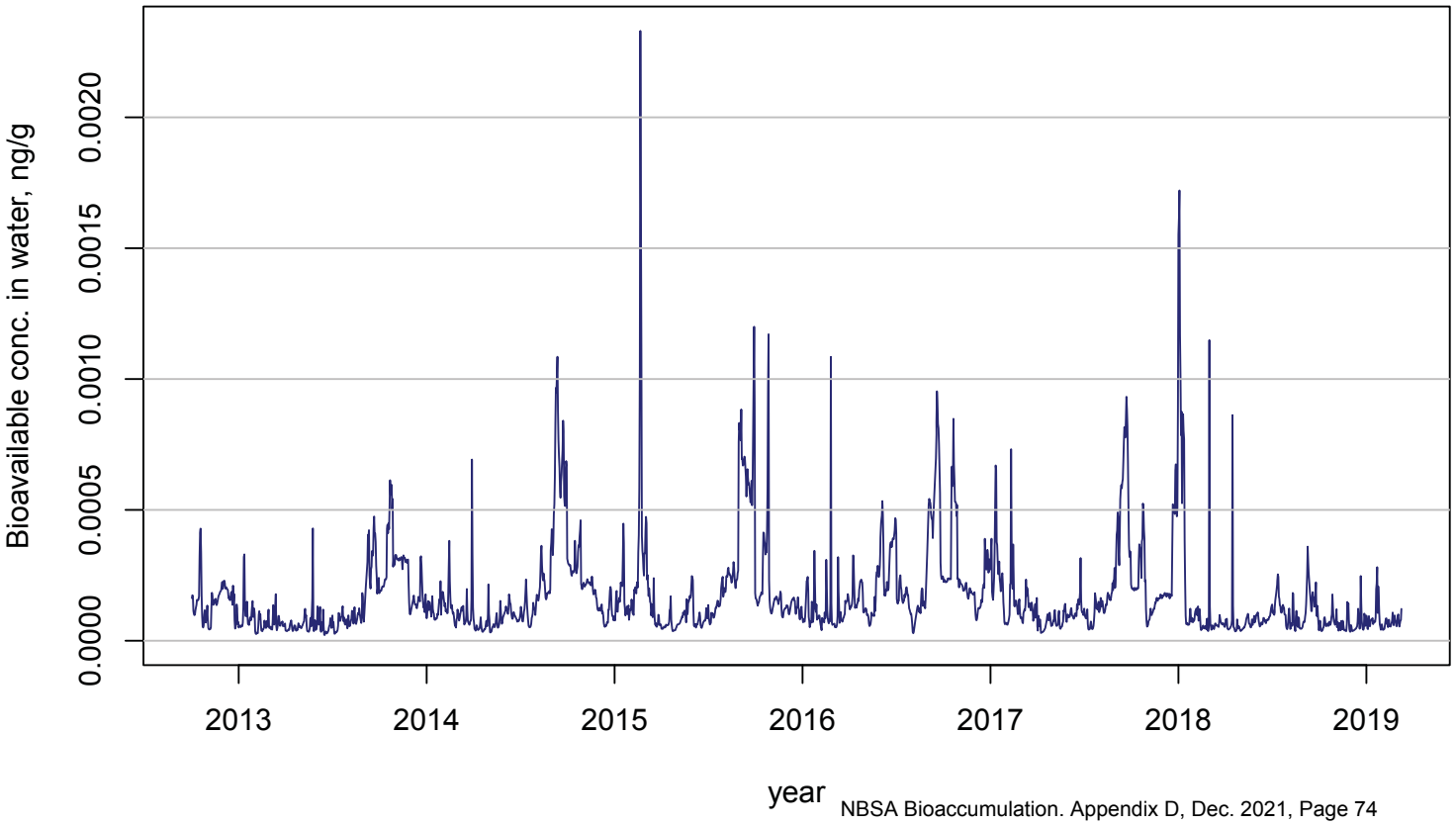
4,4'−DDx, CWB (Bioavailable conc. in water) in LPR 6−14.7



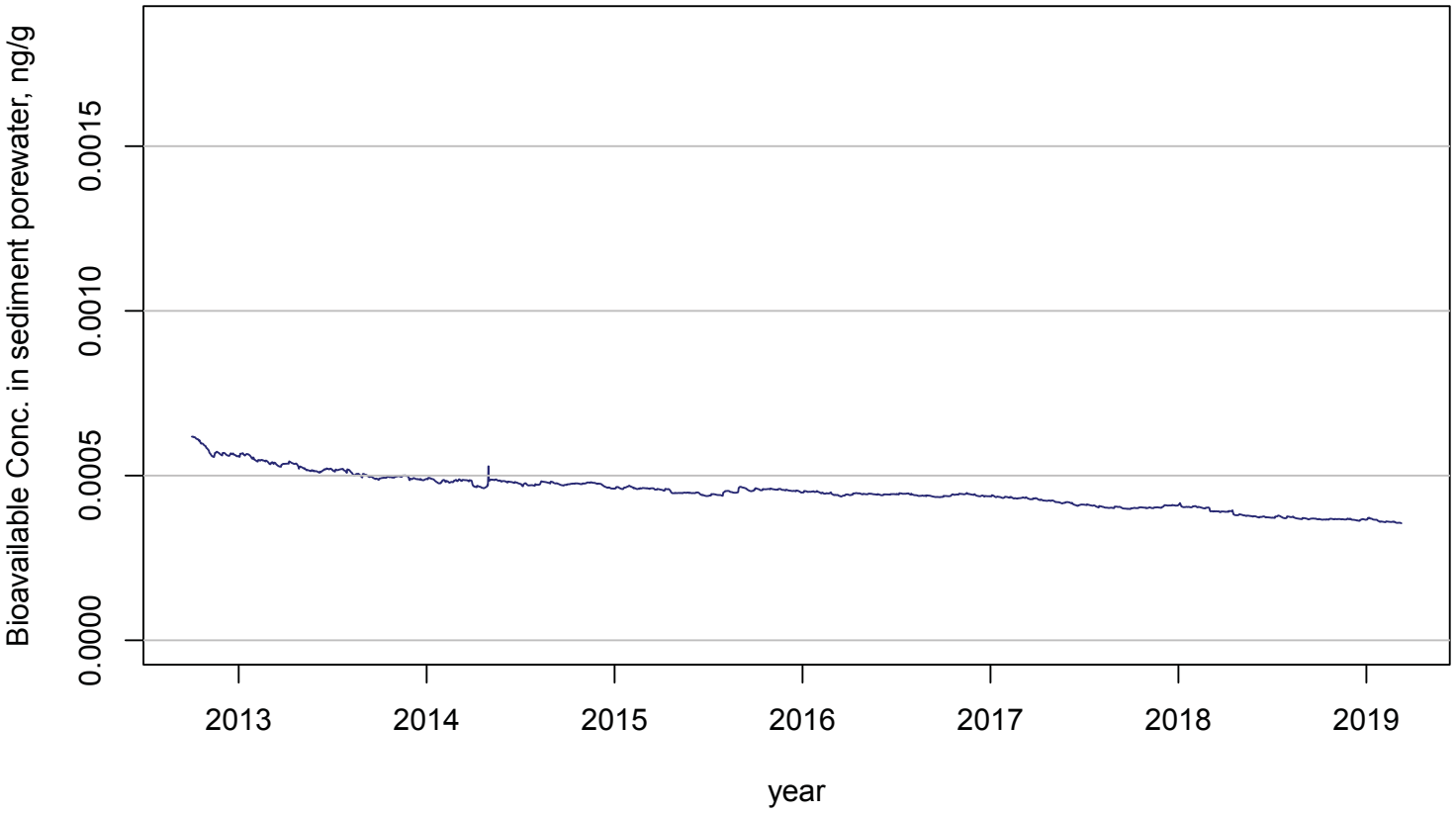
4,4'−DDx, CWB (Bioavailable conc. in water) in LPR 0−6 MF



4,4'−DDx, CWB (Bioavailable conc. in water) in LPR 6−14.7 MF



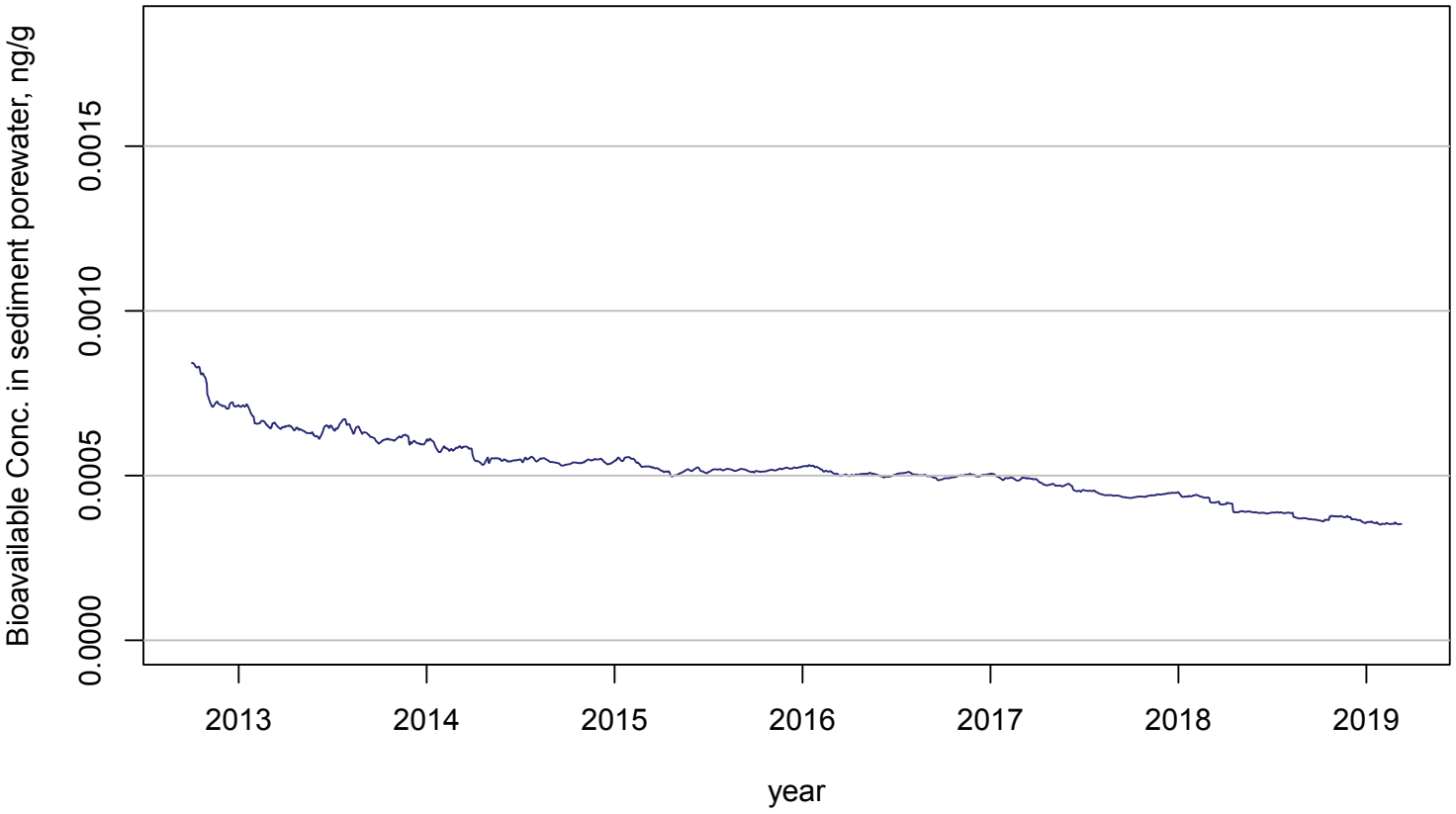
4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in LPR 0−6



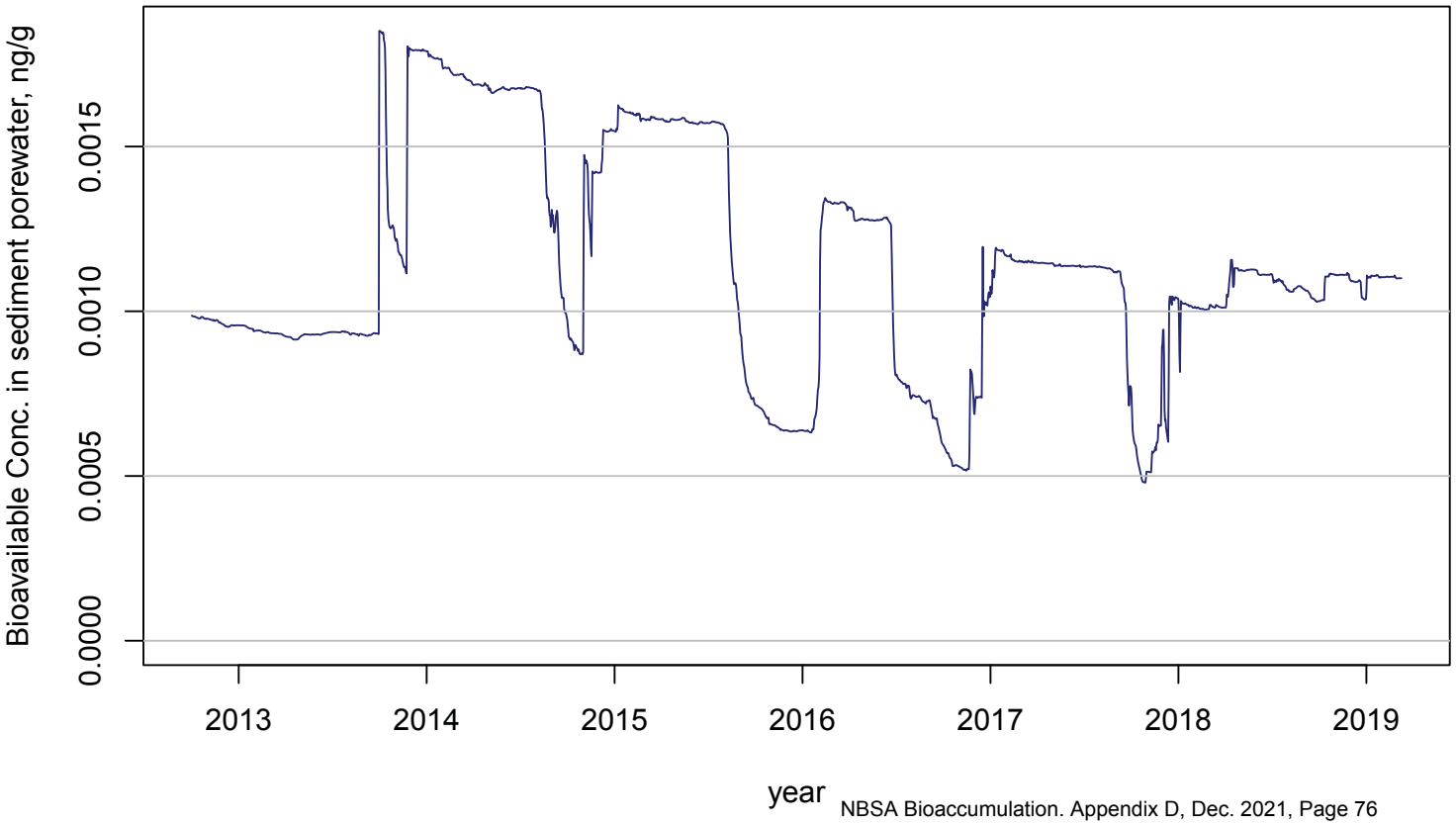
4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in LPR 6−14.7

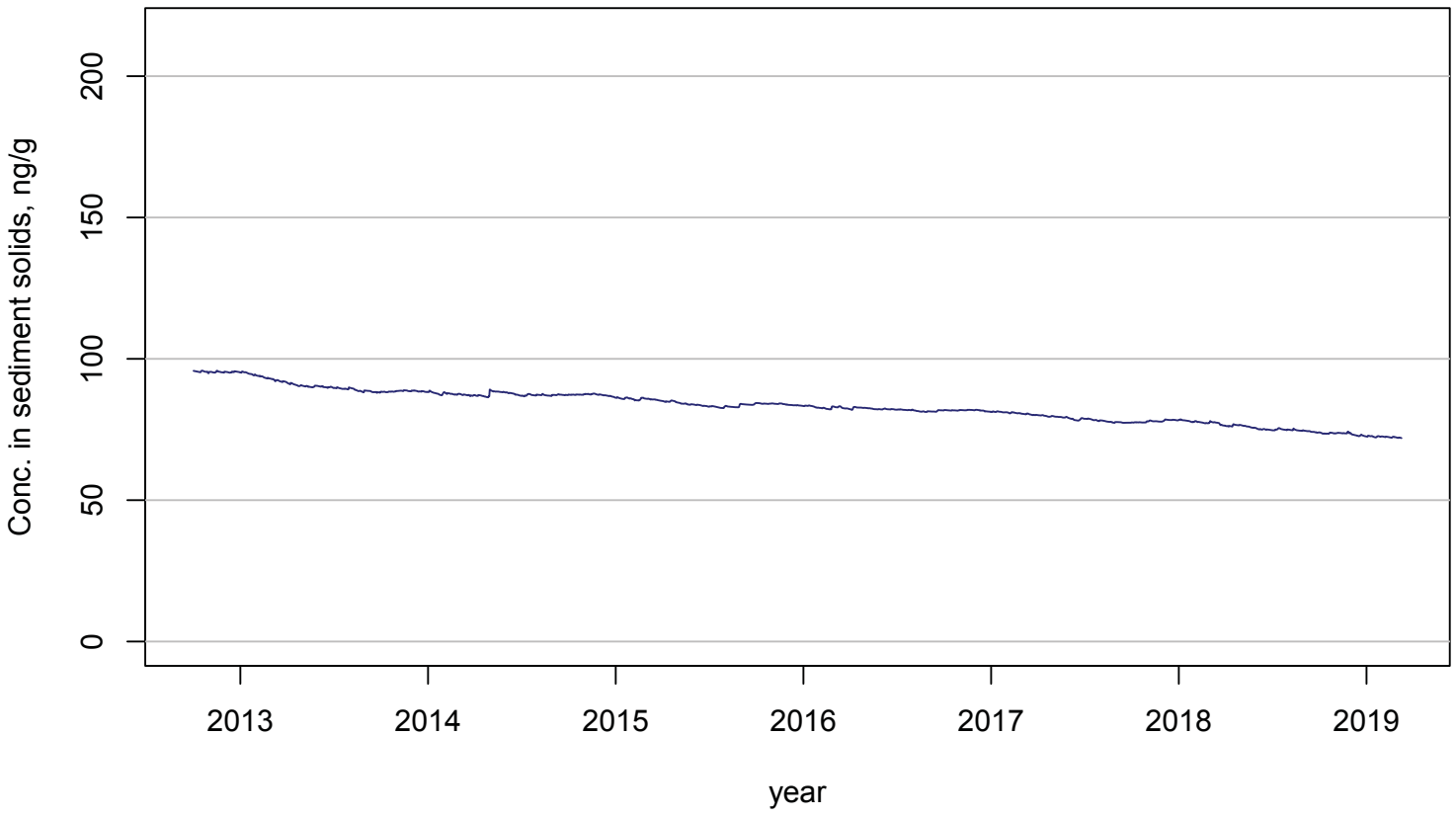


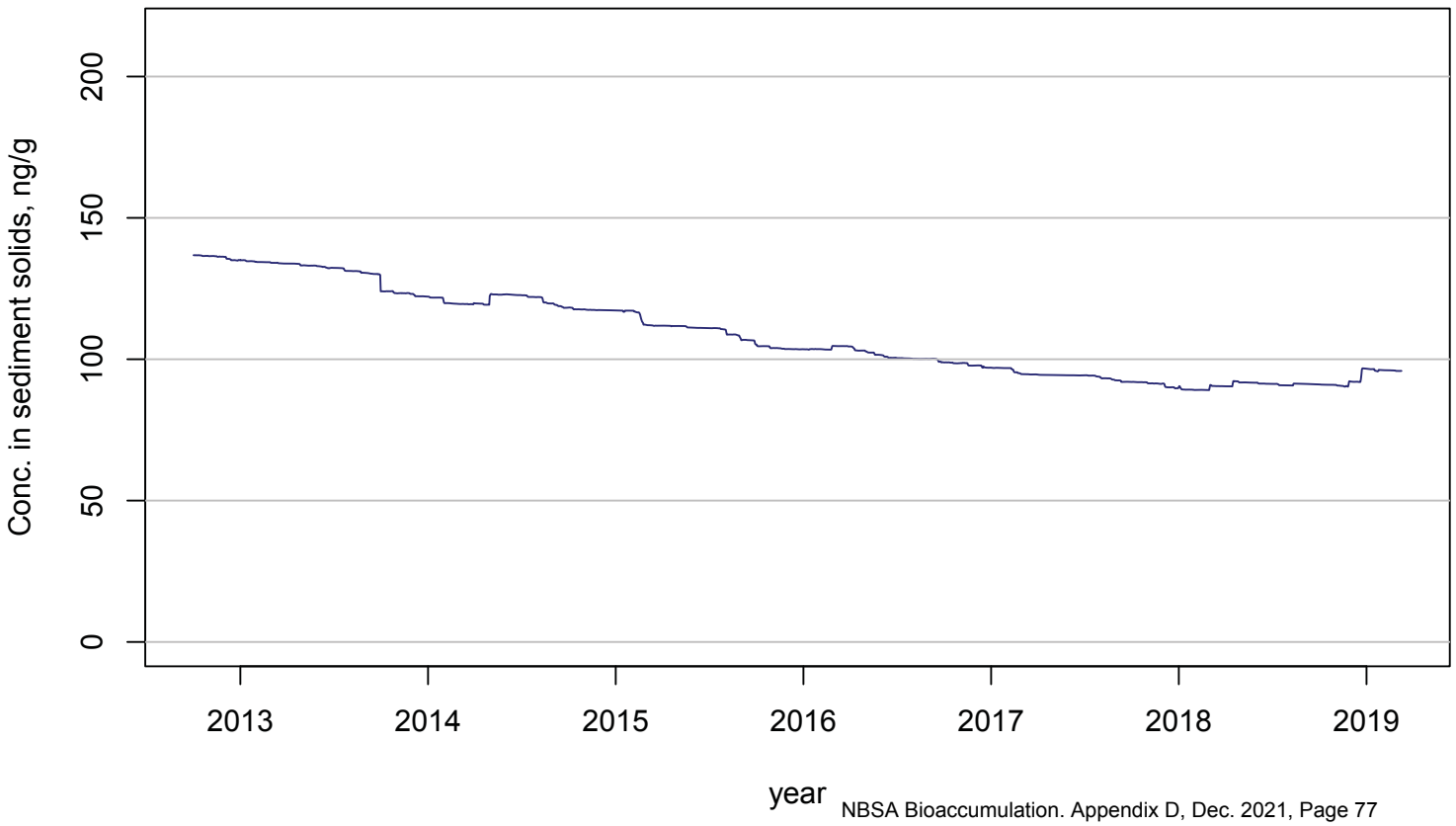
4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in LPR 0−6 MF

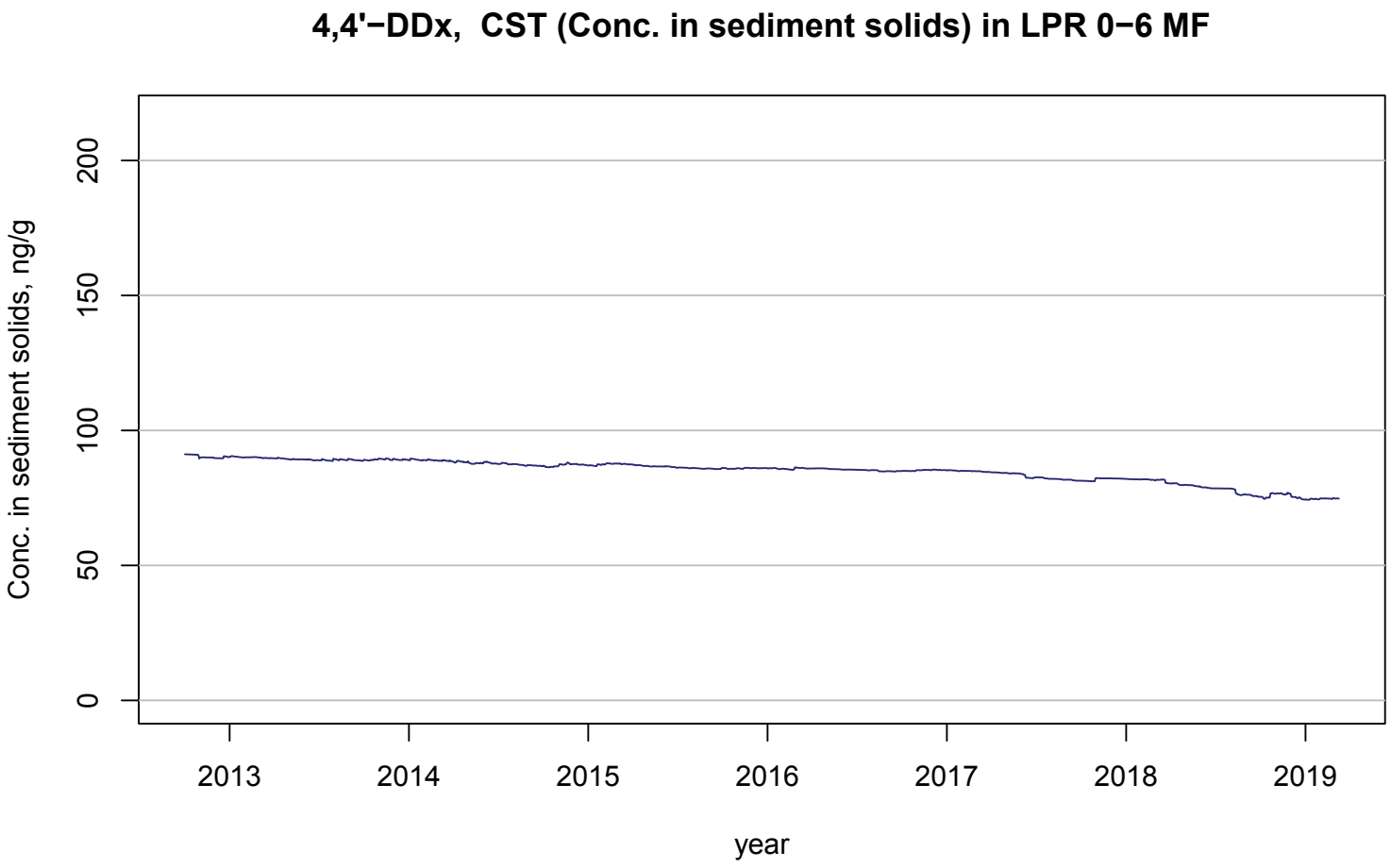


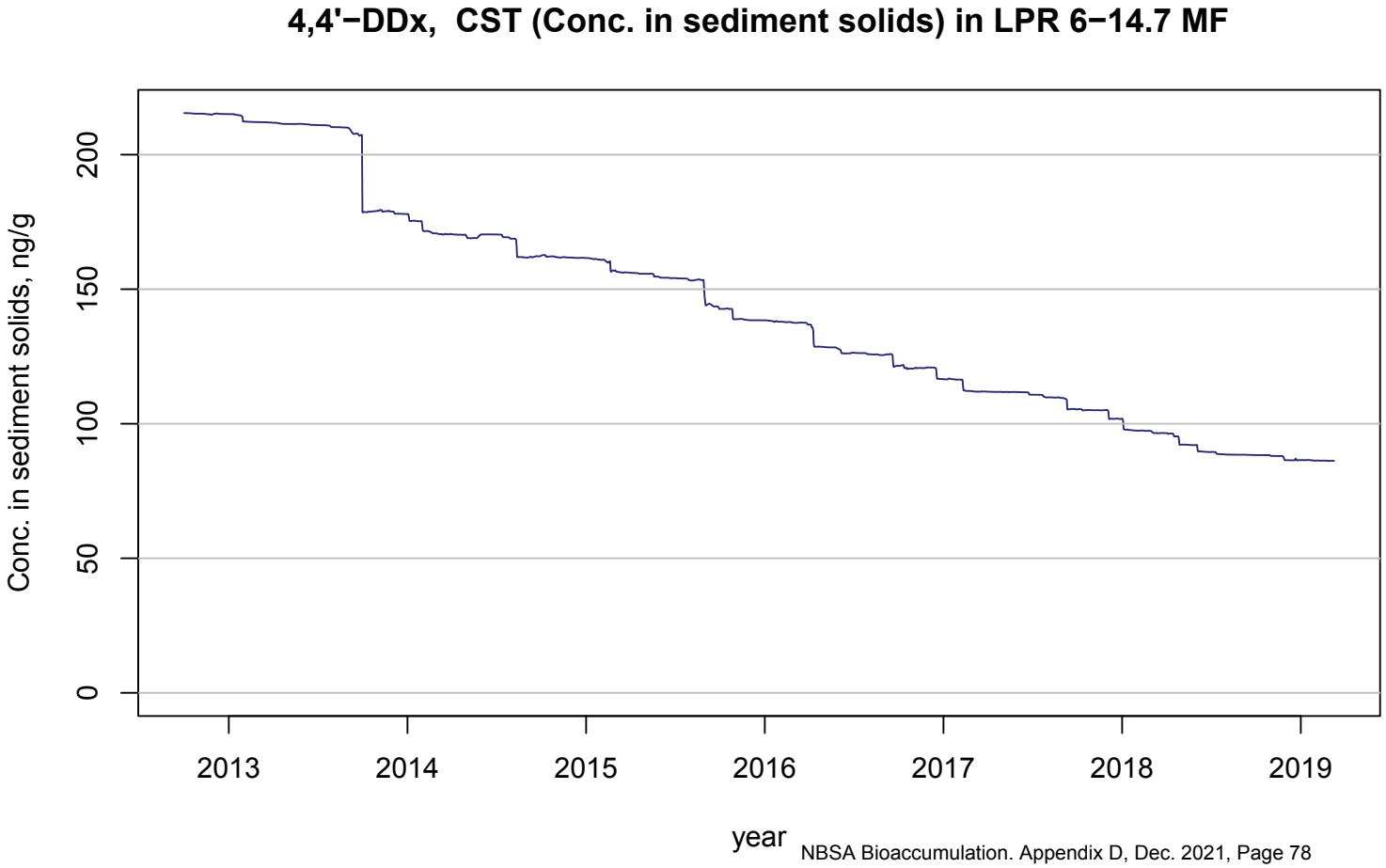
4,4'−DDx, CSD (Bioavailable Conc. in sediment porewater) in LPR 6−14.7 MF



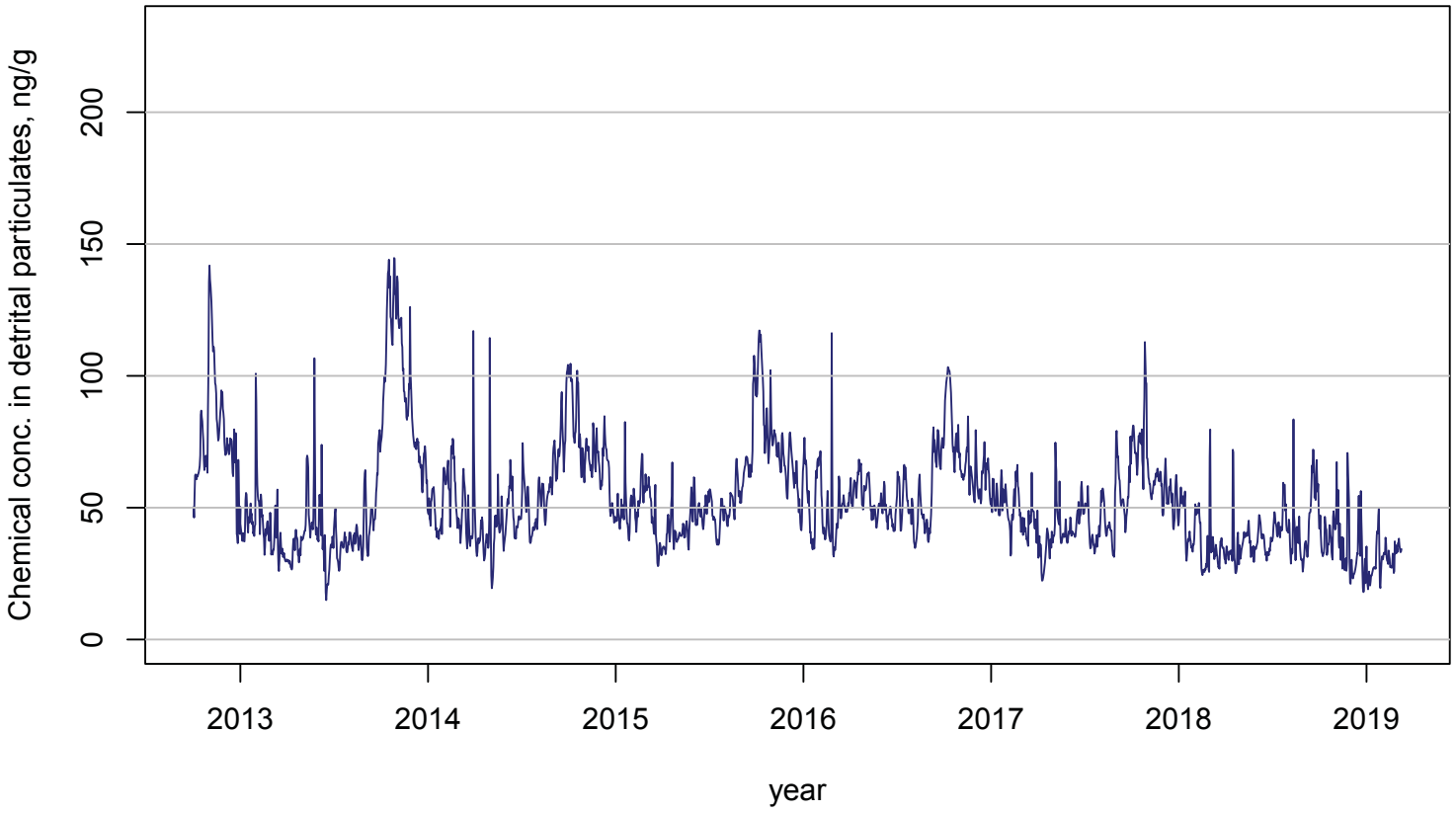

4,4'−DDx, CST (Conc. in sediment solids) in LPR 0−6
Conc. in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CST (Conc. in sediment solids) in LPR 6−14.7
Conc. in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

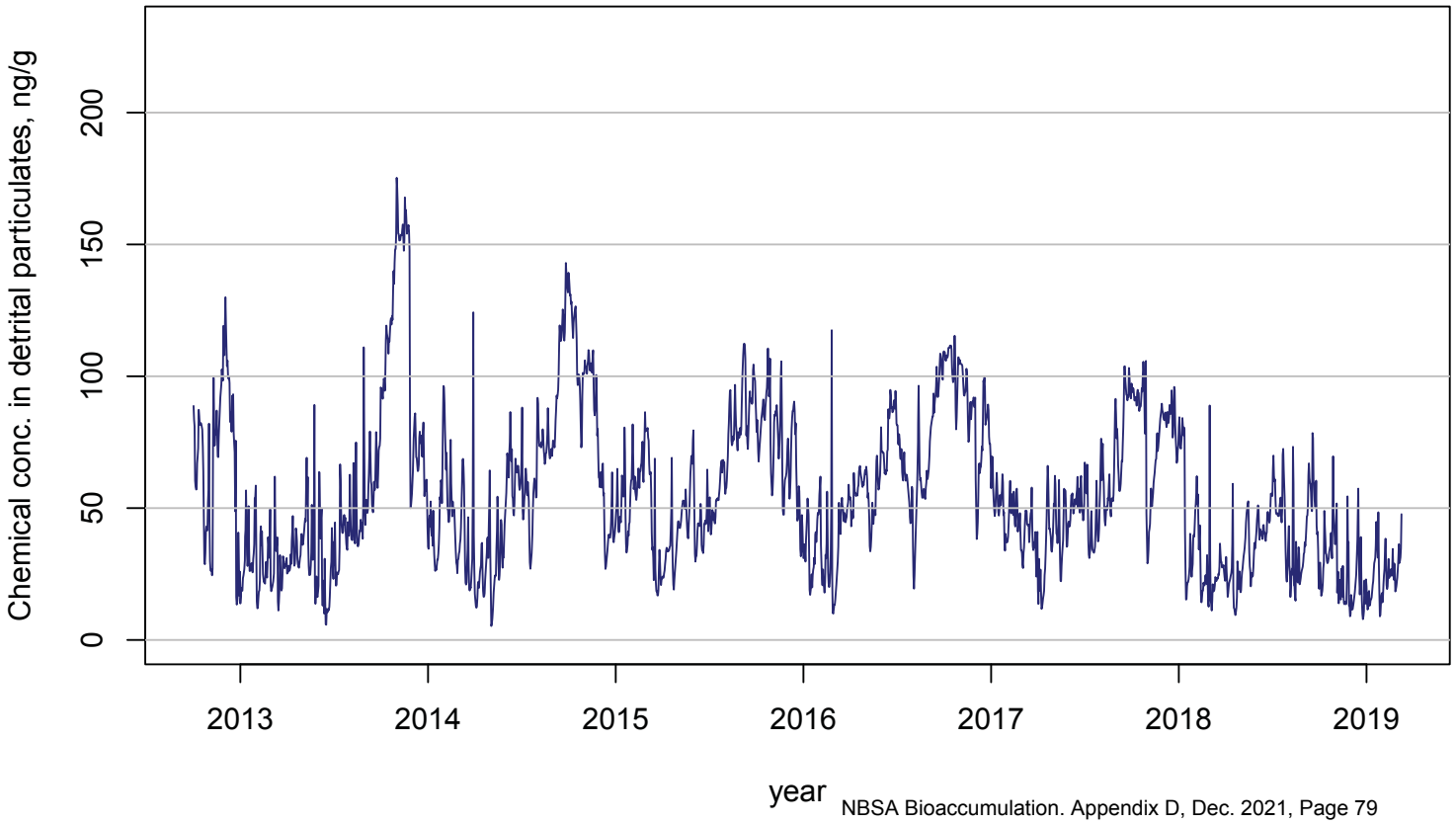

4,4'−DDx, CST (Conc. in sediment solids) in LPR 0−6 MF
Conc. in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CST (Conc. in sediment solids) in LPR 6−14.7 MF
Conc. in sediment solids, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

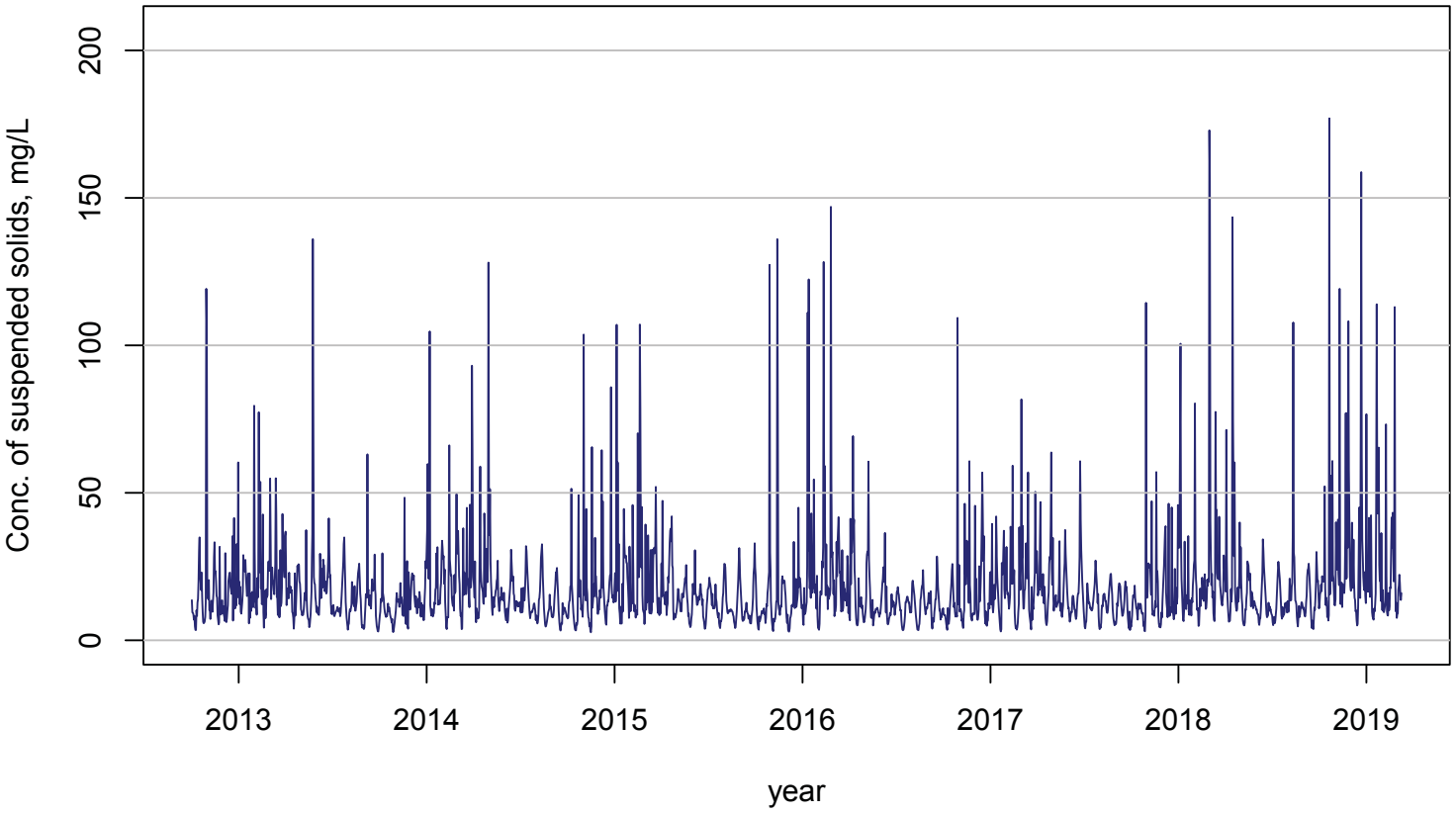
4,4'−DDx, CPART (Chemical conc. in detrital particulates) in LPR 0−6



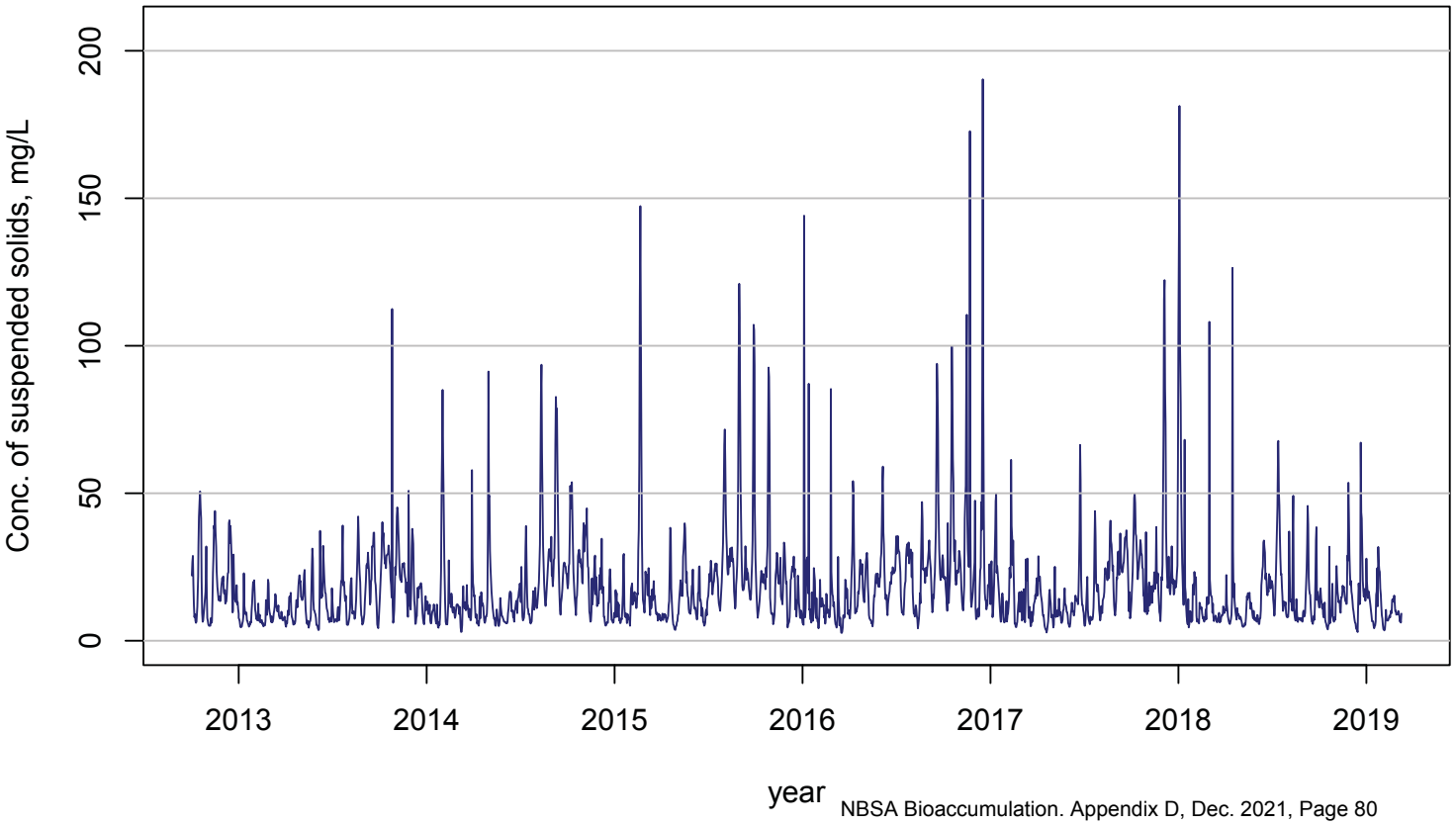
4,4'−DDx, CPART (Chemical conc. in detrital particulates) in LPR 6−14.7

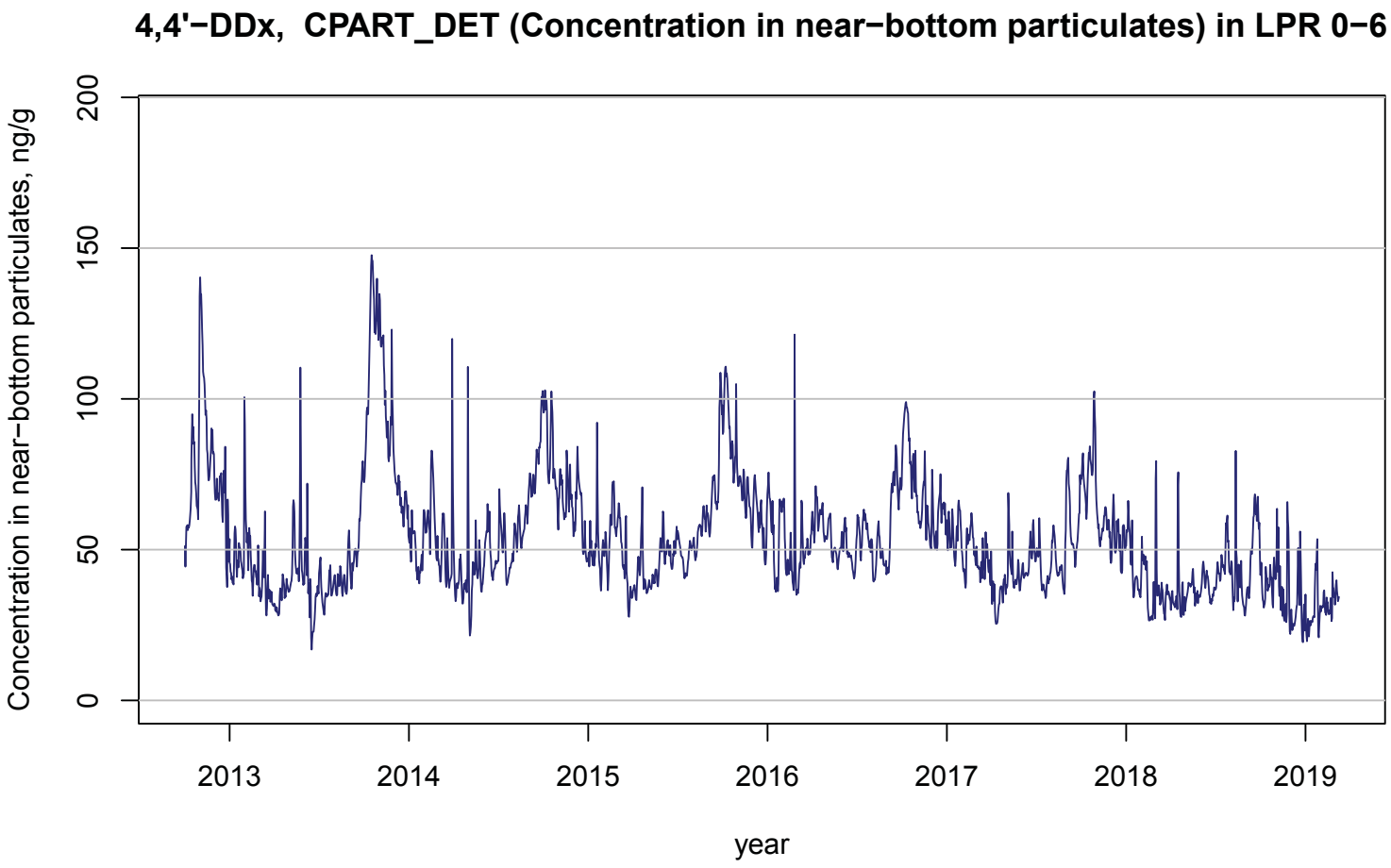


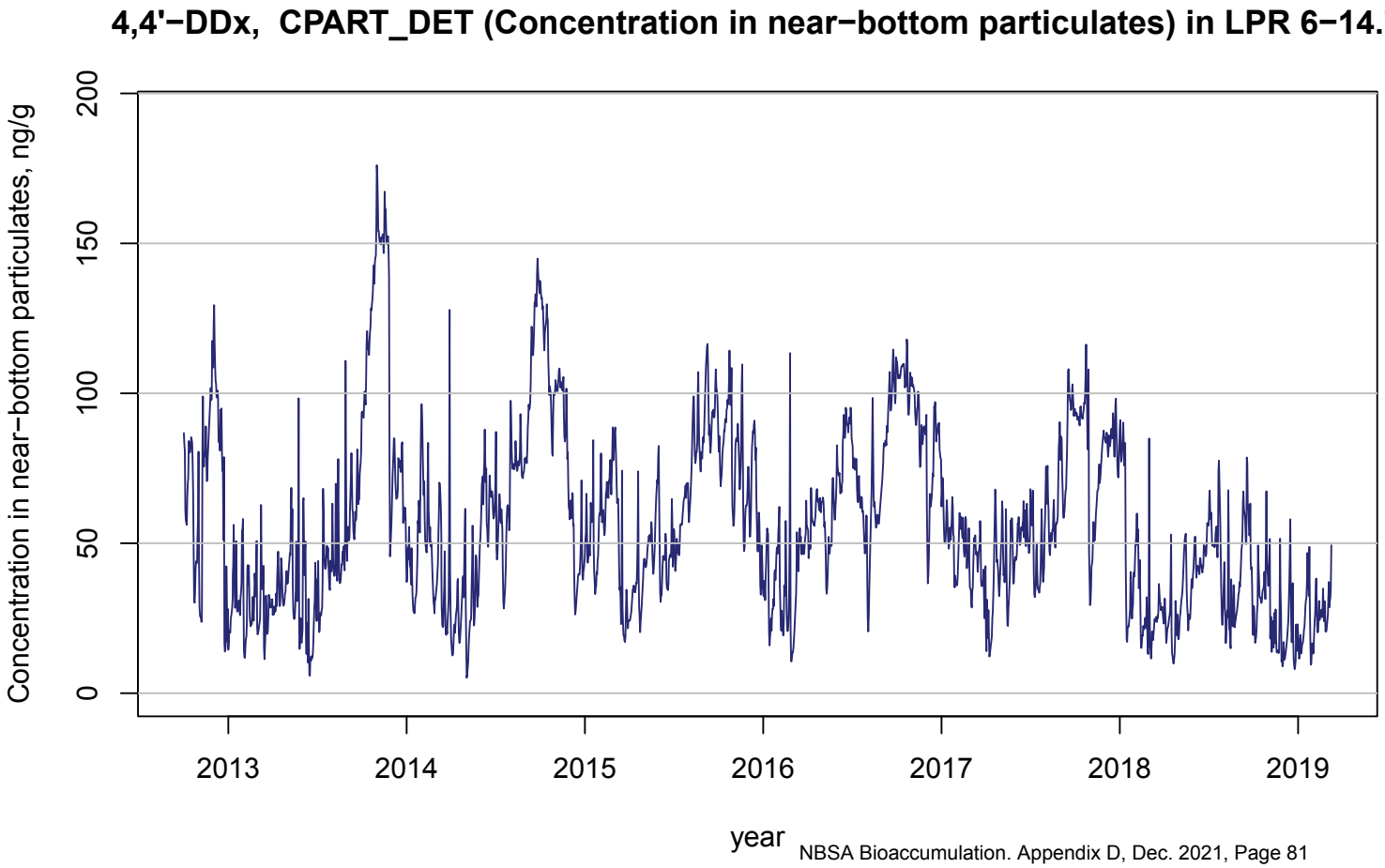
4,4'−DDx, CPW (Conc. of suspended solids) in LPR 0−6 MF

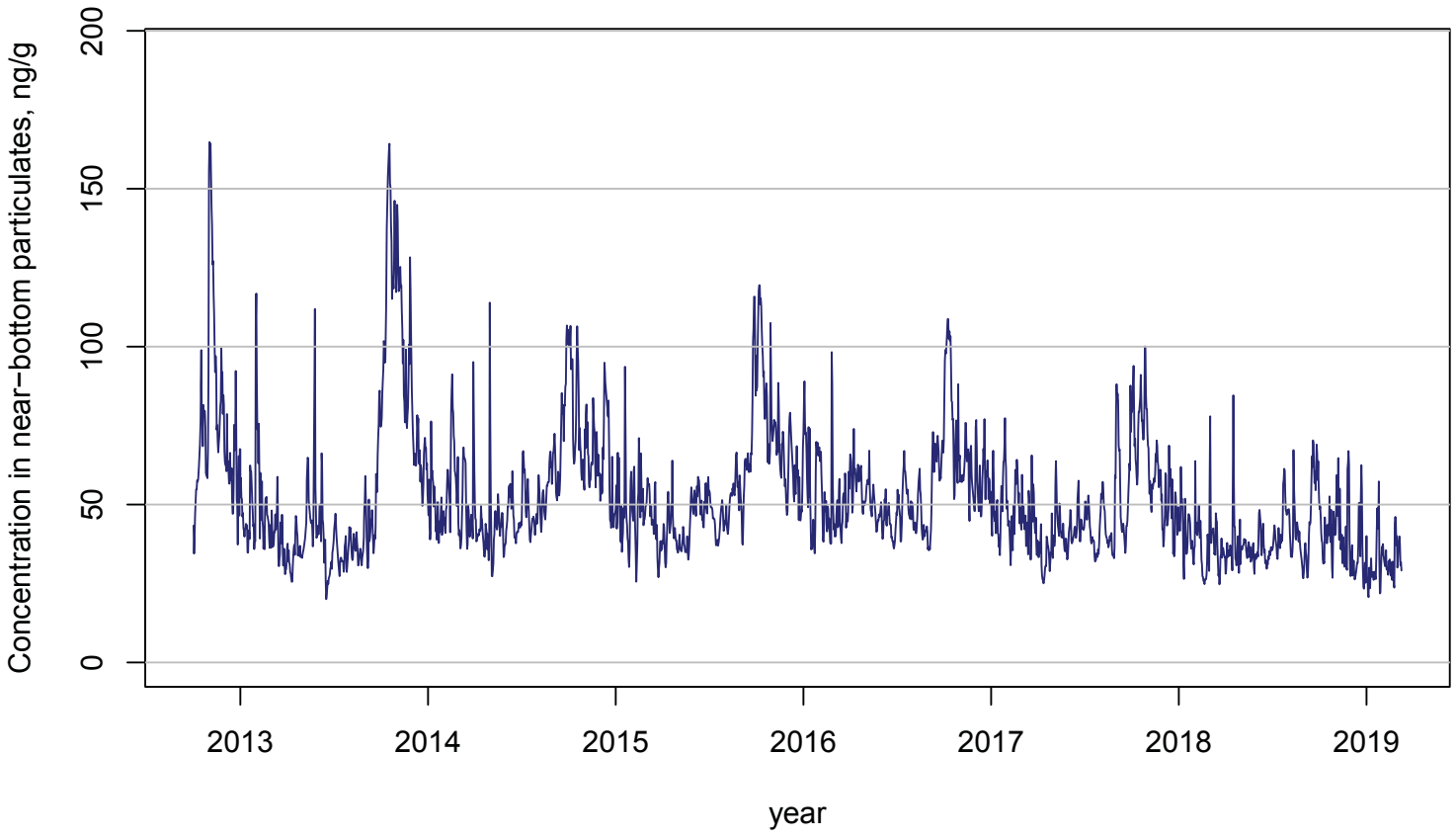


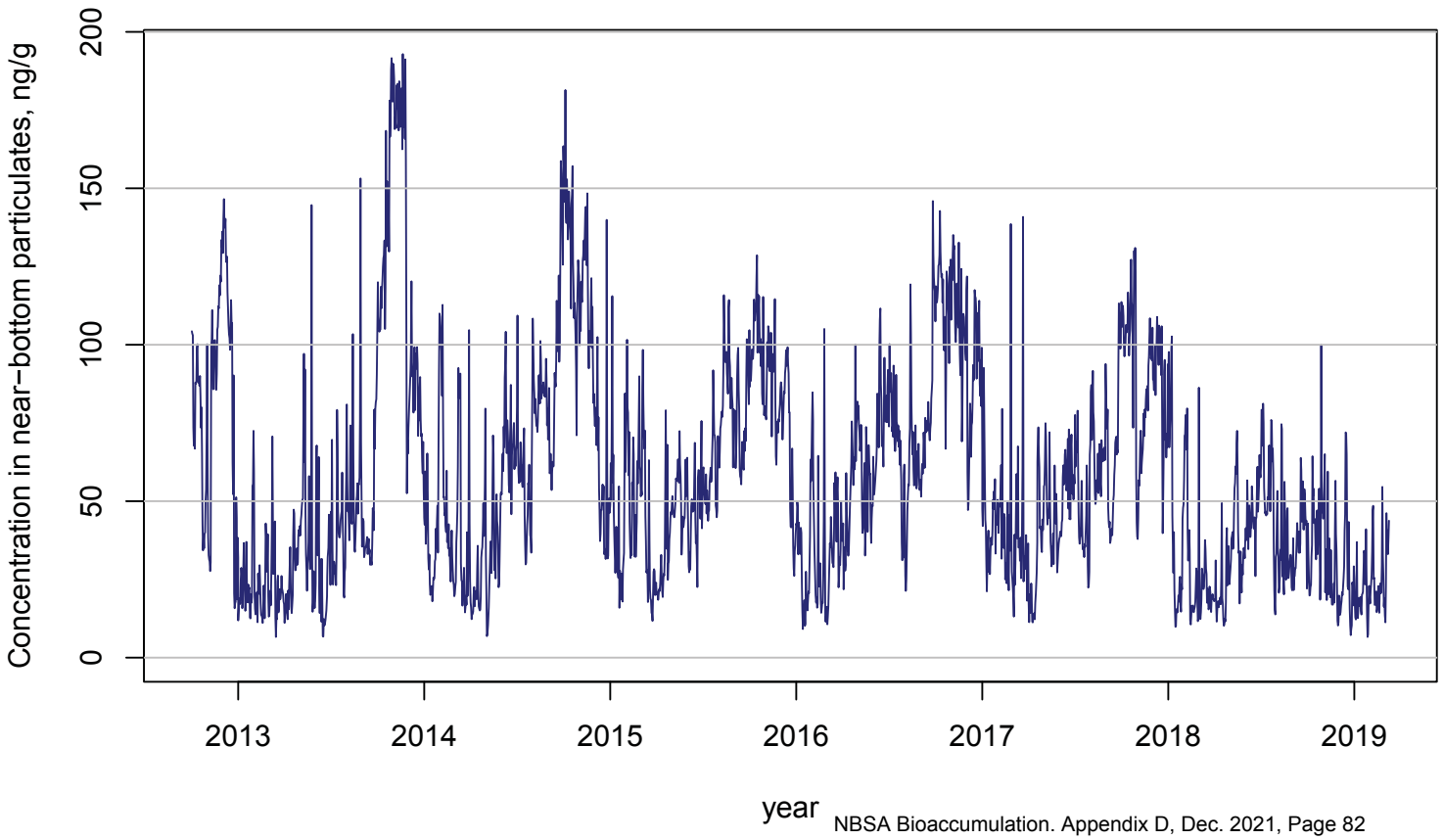
4,4'−DDx, CPW (Conc. of suspended solids) in LPR 6−14.7 MF



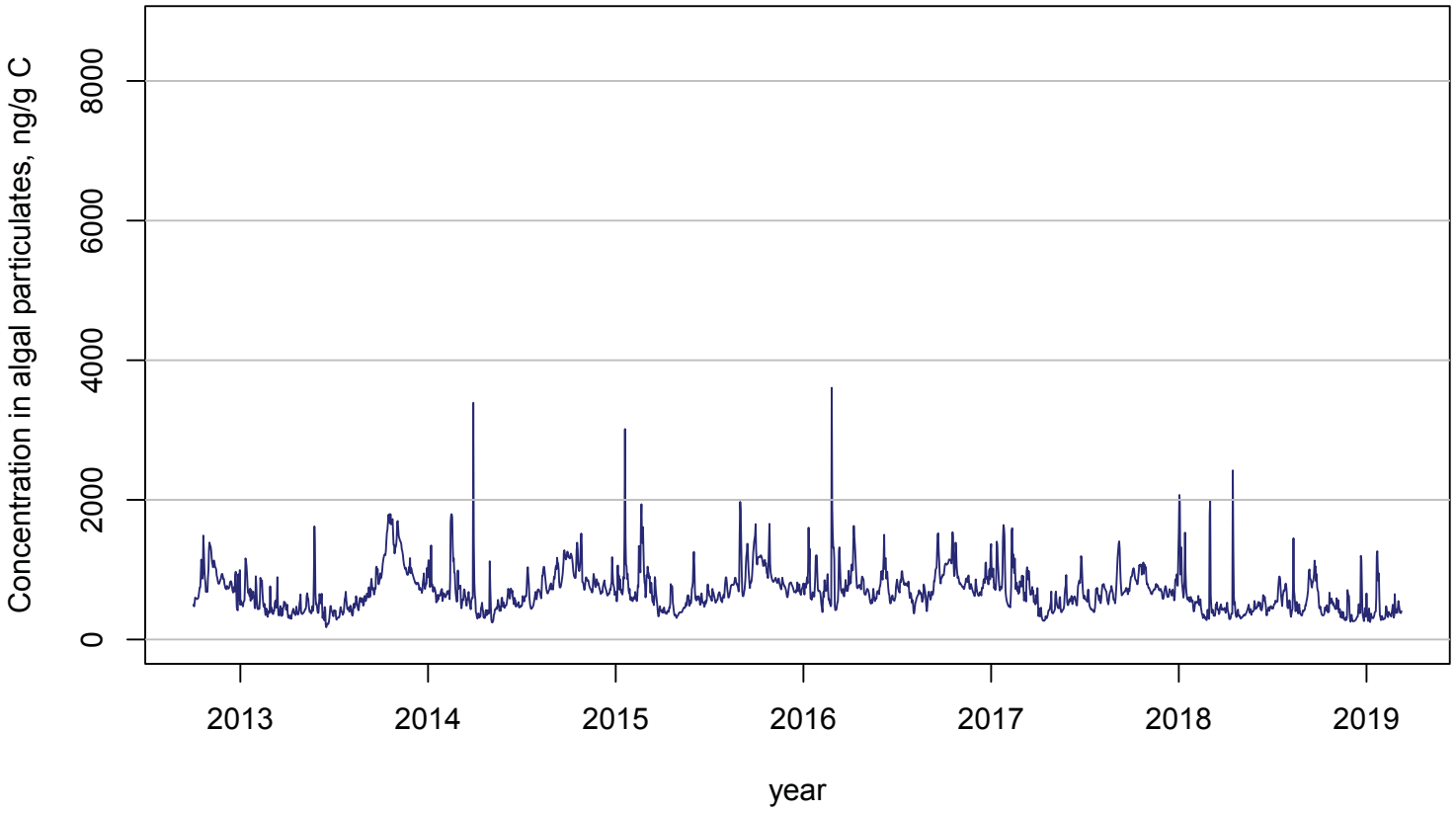

4,4'−DDx, CPART_DET (Concentration in near−bottom particulates) in LPR 0−6
Concentration in near−bottom particulates, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CPART_DET (Concentration in near−bottom particulates) in LPR 6−14.7
Concentration in near−bottom particulates, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

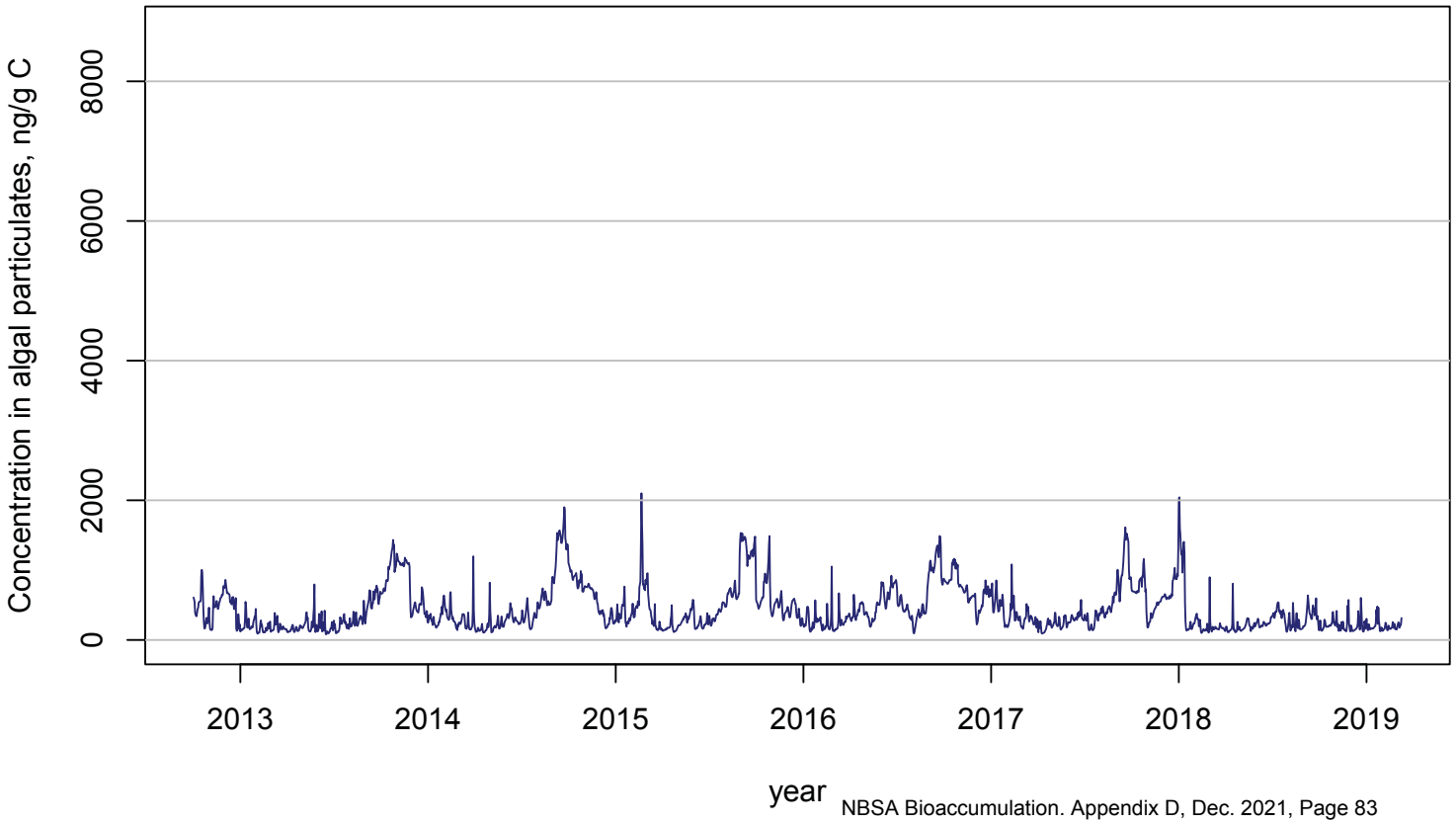

4,4'−DDx, CPART_DET (Concentration in near−bottom particulates) in LPR 0−6 MF
Concentration in near−bottom particulates, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CPART_DET (Concentration in near−bottom particulates) in LPR 6−14.7 MF
Concentration in near−bottom particulates, ng/g
0
50
100
150
200
2013
2014
2015
2016
2017
2018
2019
year

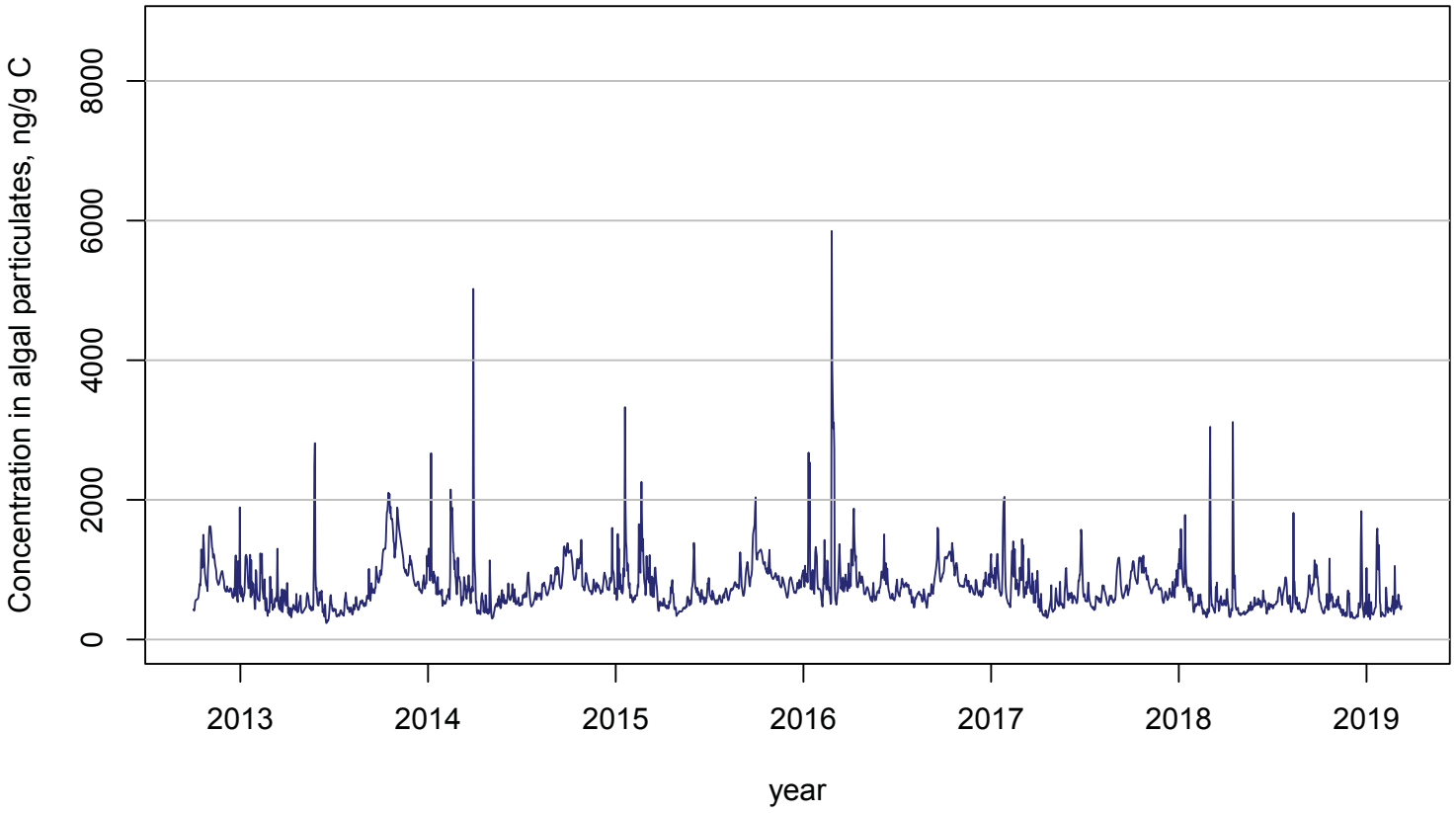
4,4'−DDx, CAC (Concentration in algal particulates) in LPR 0−6



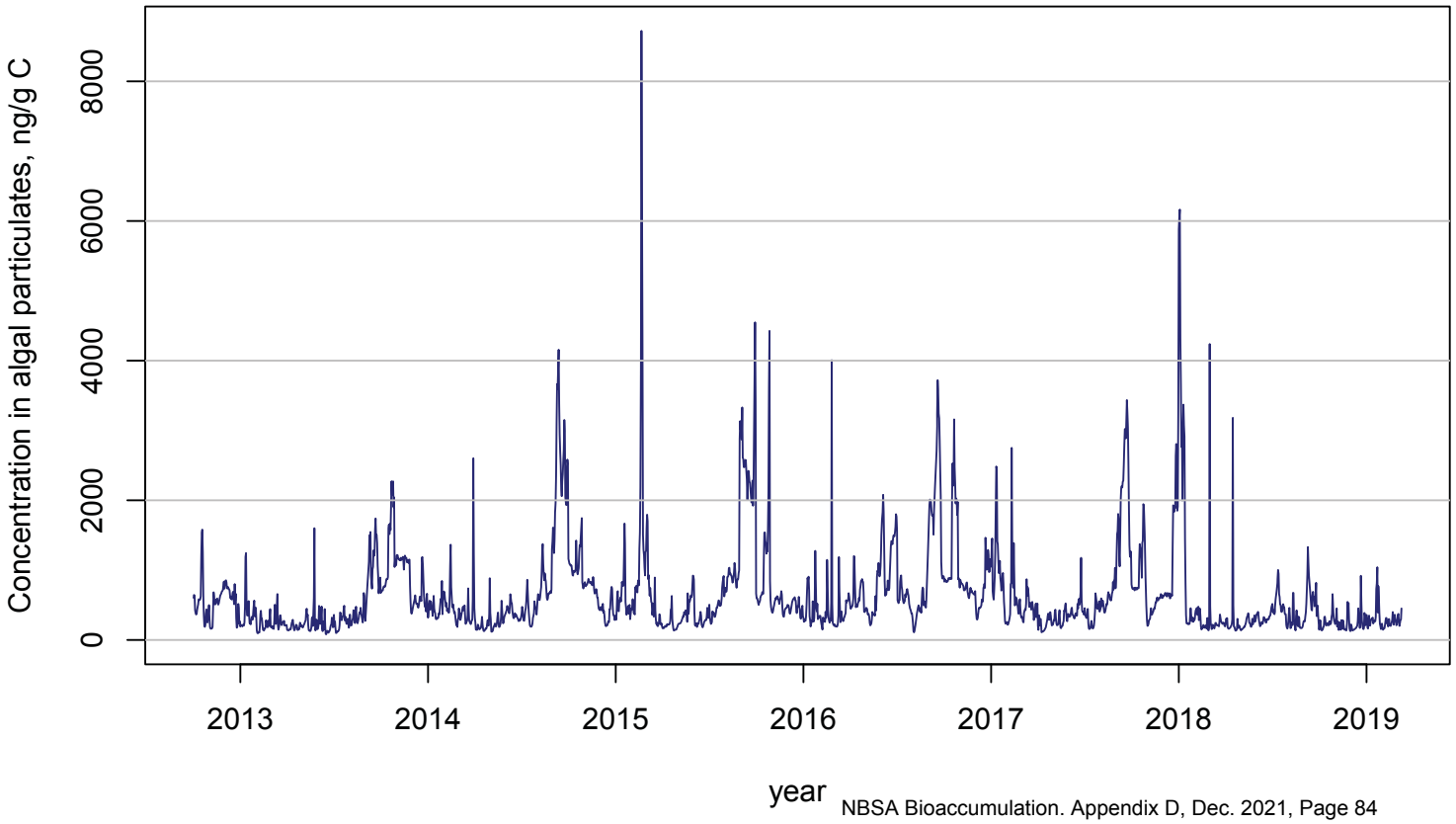
4,4'−DDx, CAC (Concentration in algal particulates) in LPR 6−14.7

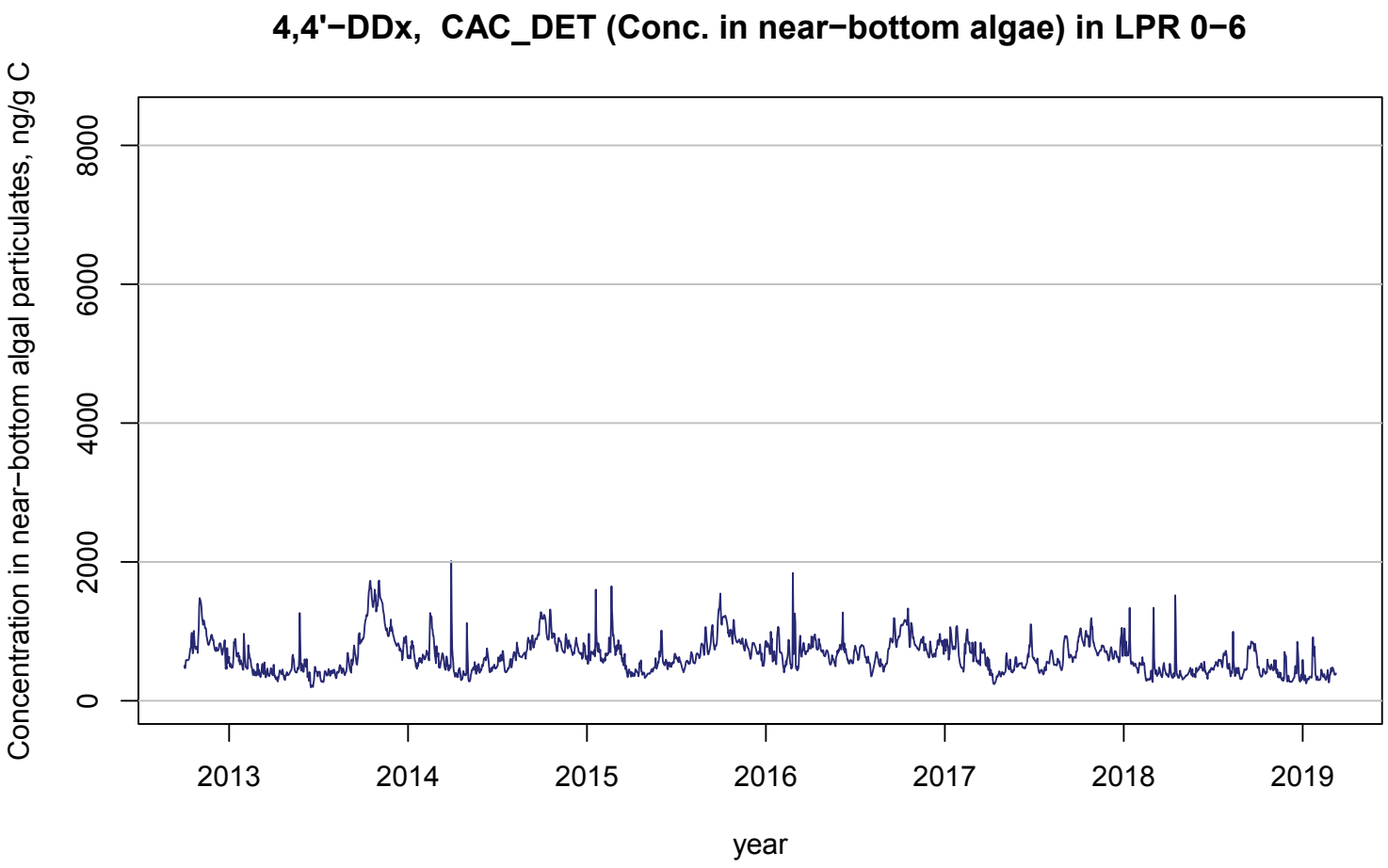


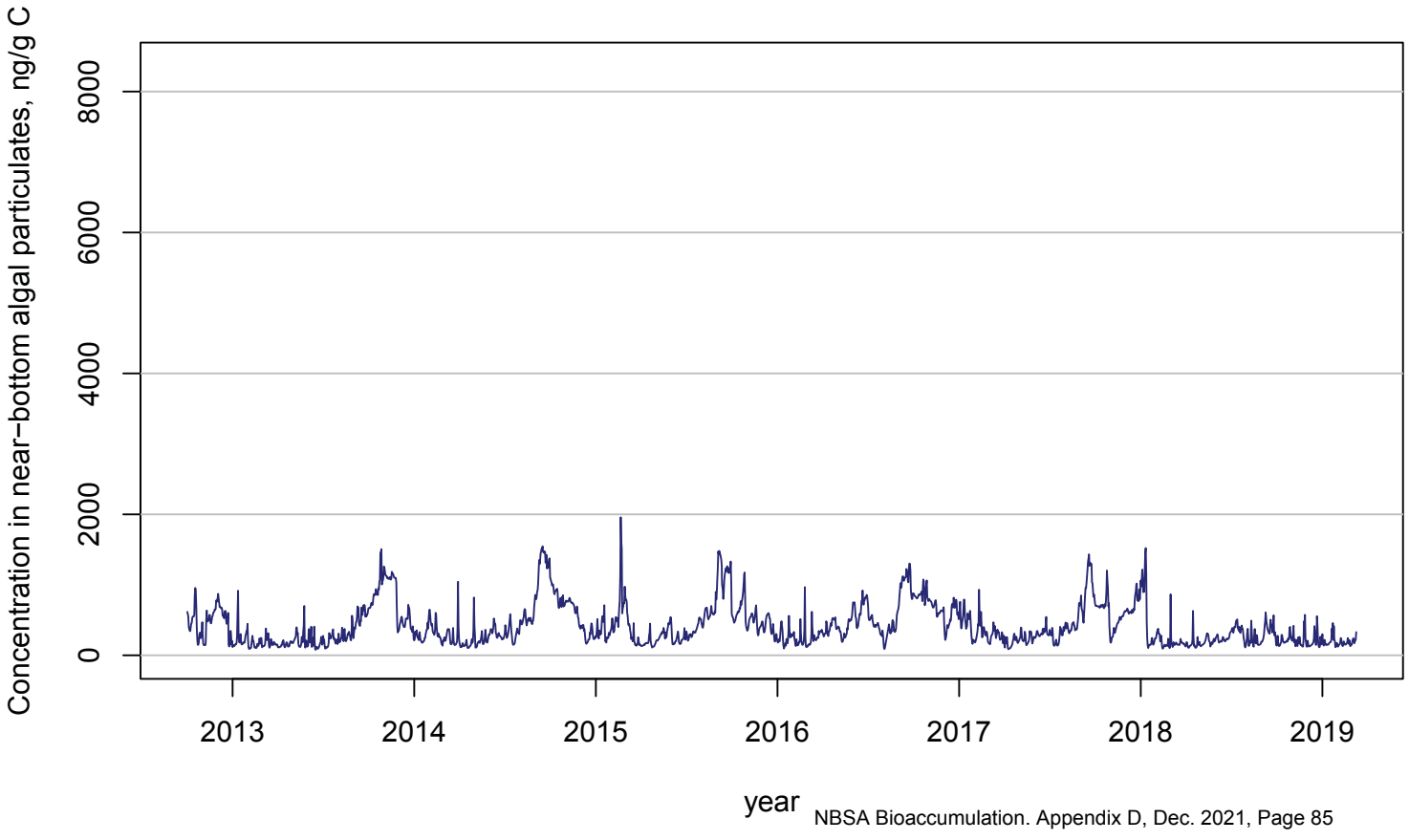
4,4'−DDx, CAC (Concentration in algal particulates) in LPR 0−6 MF

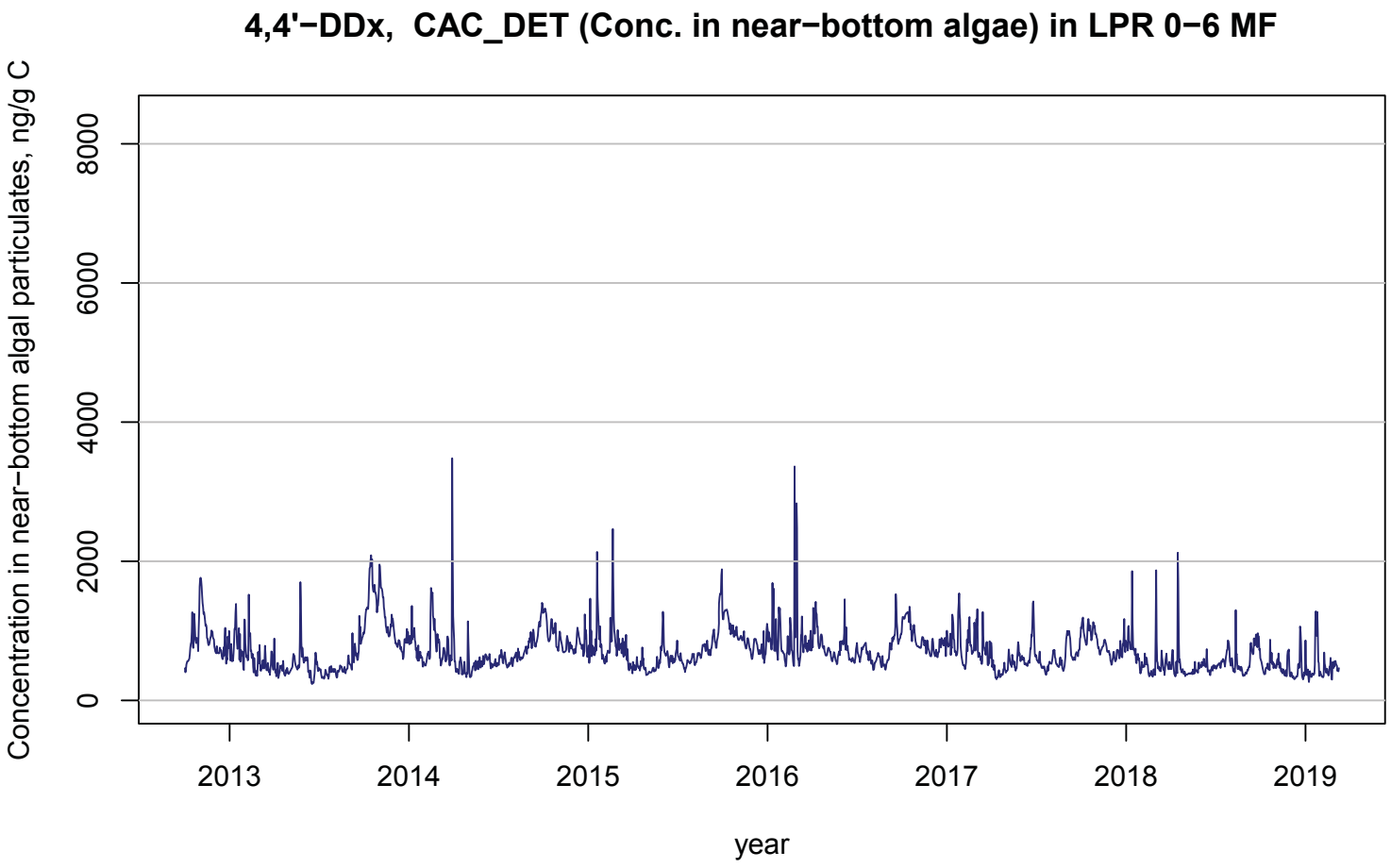


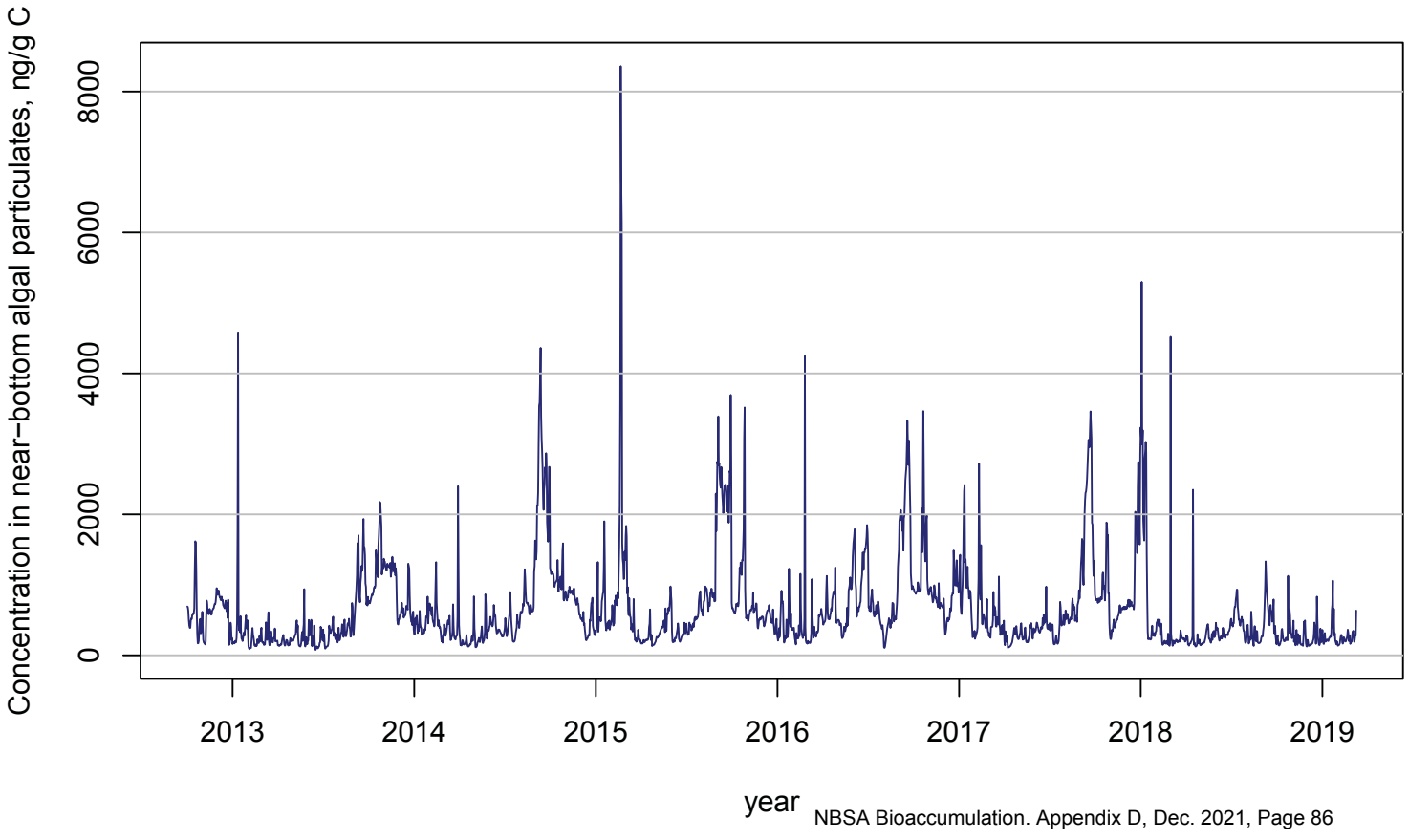
4,4'−DDx, CAC (Concentration in algal particulates) in LPR 6−14.7 MF

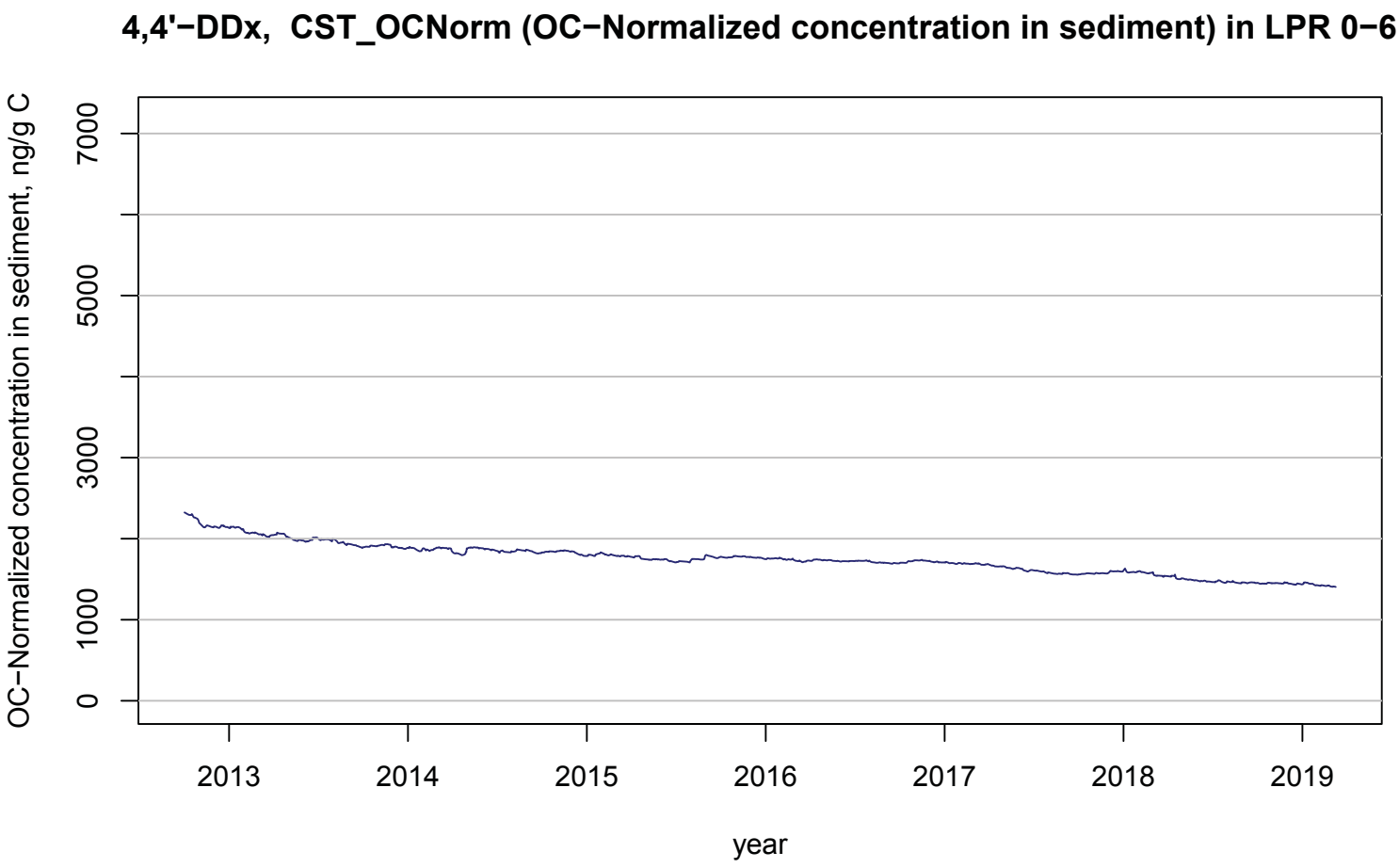



4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in LPR 0−6
Concentration in near−bottom algal particulates, ng/g C
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in LPR 6−14.7
Concentration in near−bottom algal particulates, ng/g C
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

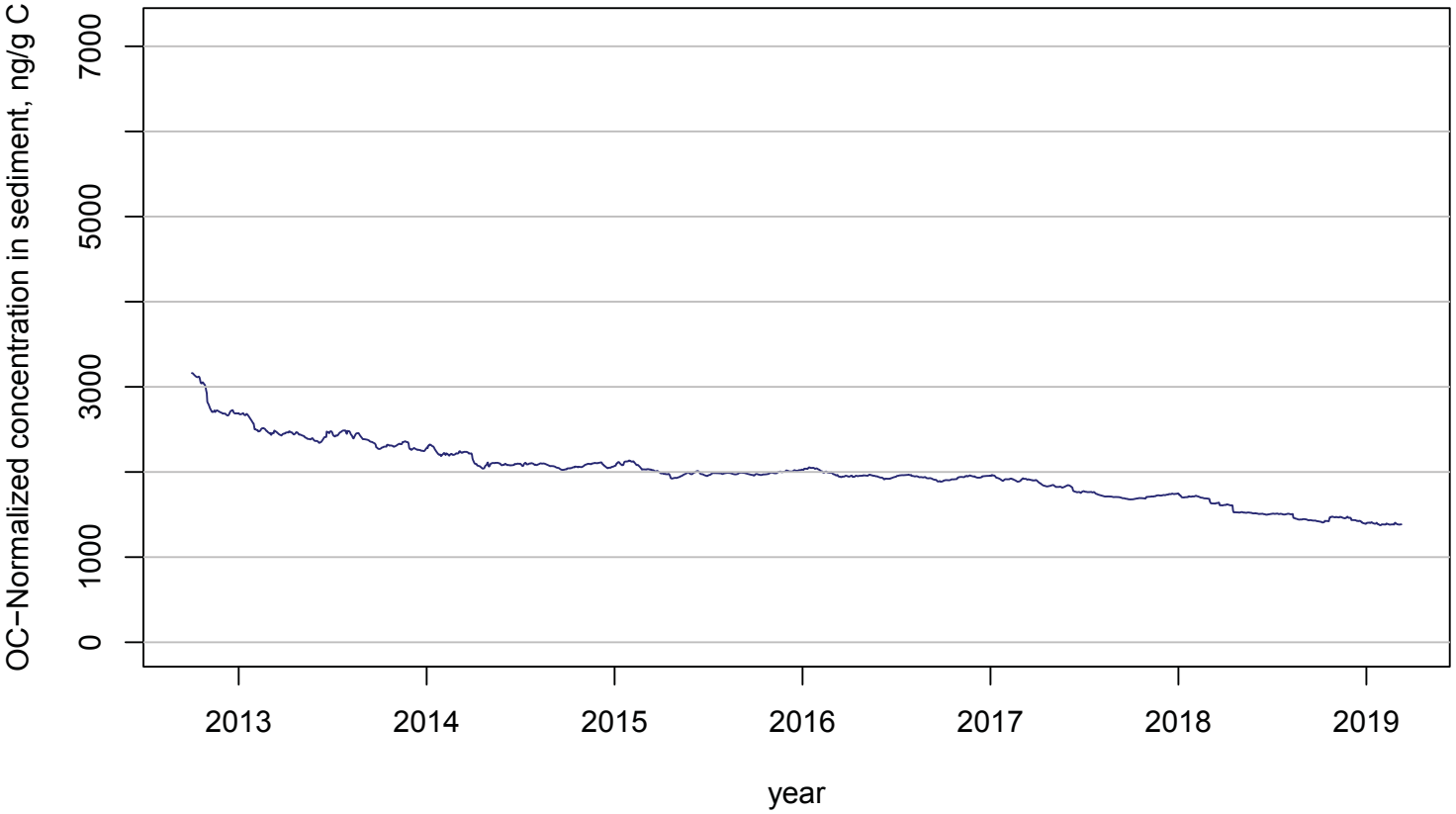

4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in LPR 0−6 MF
Concentration in near−bottom algal particulates, ng/g C
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CAC_DET (Conc. in near−bottom algae) in LPR 6−14.7 MF
Concentration in near−bottom algal particulates, ng/g C
0
2000
4000
6000
8000
2013
2014
2015
2016
2017
2018
2019
year

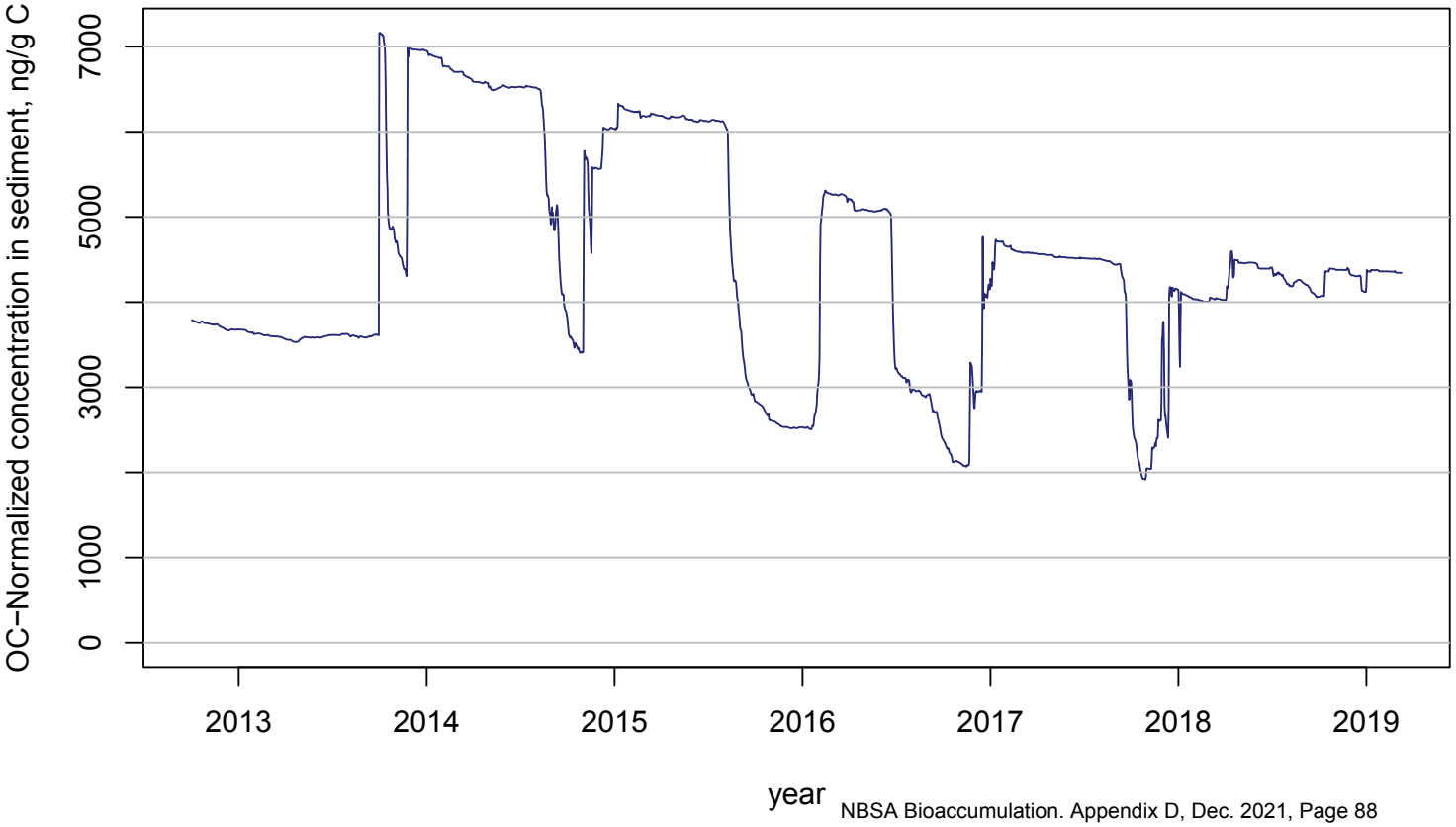

4,4'−DDx, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 0−6
OC−Normalized concentration in sediment, ng/g C
0
1000
3000
5000
7000
2013
2014
2015
2016
2017
2018
2019
year


4,4'−DDx, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 6−14.7
OC−Normalized concentration in sediment, ng/g C
0
1000
3000
5000
7000
2013
2014
2015
2016
2017
2018
2019
year

4,4'−DDx, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 0−6 MF



4,4'−DDx, CST_OCNorm (OC−Normalized concentration in sediment) in LPR 6−14.7 MF



APPENDIX E: HDR LIFE HISTORY MEMORANDUM

Attach Memorandum here:

Newark Bay_Fish Life Histories_Bioaccumulation.docx

Date: Thursday, June 14, 2018
From: HDR Engineering, Inc.

Subject: Newark Bay Fish Life Histories for Bioaccumulation Modeling

Memo

Date: Thursday, June 14, 2018

From: HDR Engineering, Inc.

Subject: Newark Bay Fish Life Histories for Bioaccumulation Modeling

Striped Bass (*Morone saxatilis*)

Striped bass occur along the Atlantic coast of North America from the St. Lawrence River in Canada to the St. Johns River in Florida. They are long-lived (up to 30 years) and typically undergo complex and sometimes divergent or partial coastal migrations (Able & Fahay 2010 and Gahagan et al. 2015). Striped bass are anadromous, inhabiting estuarine and marine waters for the majority of their lives, and migrate to freshwater areas to spawn. In the Hudson River estuary, spawning typically begins in the spring (April-May) when water temperatures reach 11°C and occurs in freshwater areas between West Point and Kingston. After spawning and larval development, young-of-the-year disperse downstream and spend their first summer and winter in the lower Hudson River estuary. Juvenile striped bass typically remain in their native coastal estuaries for two to three years until becoming adults when they begin migrating to the ocean in the fall and return to the estuaries and freshwater to spawn in the spring. According to Able & Fahay (2010), males typically mature at 2 years of age and at a size of 17 cm in total length (TL) compared to females which mature at 4 to 6 years and 45 to 55 cm TL.

Within the deep water channels of Newark Bay, striped bass were the most commonly collected fish species during bottom trawl sampling conducted by National Marine Fisheries Service (NMFS) in 1993-1994 (**Table 1**). They were collected in all months except for September but were most commonly collected from November to April which corresponds to the period for over-wintering young-of-the-year and juveniles. By comparison, striped bass were present but less common in the non-channel areas of Newark Bay during both bottom trawl sampling (**Table 2**) and experimental gill net surveys (**Table 3**) conducted by NMFS. They were primarily collected from May to December in the shallow water areas. During USACE-NYD bottom trawls conducted from January to June in 2002-2010, striped bass were the second most common species collected in Newark Bay/Arthur Kill (after white perch) during winter, accounting for 19% of the total collection (**Table 4**), and were primarily collected in channel areas of the bay (USACE-NYD 2015a). Based on the total length data, the striped bass collected during the NMFS study were primarily yearlings and juveniles from November to April with a mix of adults and larger sized juveniles (> 20 cm) collected between May and October.

Expected Residence Time in Newark Bay for Striped Bass by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Young-of-the-Year (<10 cm)	November - April of First Year	6 months
Juveniles (10 – 25 cm)	Year round	2 years
Adults (> 25cm)	May – August, October (Fall Migration)	4 -6 months per year

According to Able & Fahay (2010), adult striped bass feed mostly on fishes and crustaceans while juveniles concentrate on crustaceans. Of note, Atlantic menhaden (or bunker) is often cited as the most important prey fish for adult striped bass although a variety of herring, shad and drum species are also common targets. Prey items for young-of-the-year include a variety of smaller invertebrates (polychaetes, insects, mysids, decapod shrimp, and copepods) before shifting to larger invertebrates (decapod shrimp and crabs) as the juveniles grow out.

Striped bass are a popular recreational sport fish. The legal size limit in New Jersey is 28 inches from March 1 - December 31. Within the Newark Bay complex, there is a consumption advisory for the general population that recommends eating no more than 4 striped bass fish meals per year and a do NOT eat advisory for high risk individuals (**Table 5**; NJDEP 2017).

Blue Crab (*Callinectes sapidus*)

Blue crab is a large, estuarine dependent crustacean that is widely distributed along the Atlantic and Gulf coasts of North America. Their biology is widely studied in the Chesapeake Bay system but is less well known and may be slightly divergent in other systems including in the Hudson-Raritan Estuary (Wilson & Able 1992 and NYSDEC 2004). Blue crab larvae (or "zoea") develop offshore during the summer and are transported into the estuary as megalopae where they settle into shallow water habitats and molt into a first crab stage at 2-3 mm in carapace width (CW) (Wilson & Able 1992). Newly settled blue crabs require approximately 14 - 18 to months to reach maturity, typically achieving adult size during the late summer or fall of their second year (Van Heukelem 1991). After mating, mature females migrate offshore to higher salinity waters to spawn in the late summer and fall; overwinter offshore and sometimes spawn again in the spring. Males remain in the estuary, preferring shallow water habitats during warmer months and deep water during winter. The typical lifespan for blue crab is 3 years.

In the Hudson River, blue crab occur from New York Harbor to the Troy Dam. Recreational crabbing occurs throughout much of the lower Hudson River Estuary and overwintering blue crab support a small commercial fishery off Brooklyn from Lower Bay and Gravesend through Rockaway Inlet (NYSDEC 2004). As water temperatures cool to below 10°C in the fall, blue crab become lethargic, moving into deeper water to burrow into the sediment before entering a period of dormancy for the winter. Within the deep water channels of Newark Bay, blue crab were collected in every month but were more common in warmer months from May through October during the bottom trawl sampling conducted by NMFS (**Table 1**). They were less commonly collected in non-channel areas of Newark Bay during both bottom trawl sampling (**Table 2**) and experimental gill net surveys (**Table 3**) conducted by NMFS.

Expected Residence Time in Newark Bay for Blue Crab by Life Stage.

Life Stage (approx. size in CW)	Months	Approx. Duration
Young-of-the-Year	October - June of First Year	9 months
Juveniles (<12 cm CW)	June - October of 2nd year	5 months
Adult – male* (>12 cm CW)	May – October of 3rd Year	6 months

* Adult females expected to remain offshore after breeding during Year 2.

Adult blue crab are voracious predators that feed on mollusks, bivalves and other crabs as well as carrion or living fish that come close enough to be captured (NYSDEC 2018). Blue crab supports a popular recreational and commercial fishery in coastal New Jersey. However, within the Newark Bay complex, there is a do NOT eat or harvest advisory (**Table 5**; NJDEP 2017).

Atlantic Menhaden (*Brevoortia tyrannus*)

Atlantic menhaden is a migratory species that occurs along the Atlantic coast of North America from the Gulf of St. Lawrence to northern Florida. Spawning typically occurs offshore over the inner continental shelf and occurs over two prolonged periods: one during the late winter to early summer and another in the fall (Able & Fahay 2010). Adults occur in large schools in coastal areas adjacent to major estuaries and bays. The pelagic larvae are transported into estuaries where young-of-the-year and juveniles reside until the fall before migrating into deeper coastal waters as water temperatures decline. Larger and older adults may also use estuaries outside of the primary spawning season (Able & Fahay 2010).

Within the deep water channels of Newark Bay, Atlantic menhaden were collected from May to November but were most abundant in June through August during bottom trawl sampling conducted by NMFS (**Table 1**). Atlantic menhaden were also collected from May to November in shallow non-channel areas of Newark Bay during experimental gill net surveys conducted by NMFS but were most abundant in May where they were the most commonly collected species (**Table 3**). During USACE-NYD bottom trawls conducted from January to June in 2002-2010, Atlantic menhaden were uncommon in Newark Bay/Arthur Kill compared to the Lower Bay (**Table 4**) and were primarily collected as juveniles (82% of the collection in Newark Bay/Arthur Kill stations) (USACE-NYD 2015a). Atlantic menhaden accounted for between 1% (spring and summer) and 4% (fall) of the total catch during pelagic mid-water trawl sampling conducted by USACE-NYD in Newark Bay from March through December (**Figure 1**).

Expected Residence Time in Newark Bay for Atlantic Menhaden by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Young-of-the-Year (<8 cm)	May - November of first year	6 months
Juveniles (8 – 23 cm)	May - November of 2nd year	6 months
Adults (>23 cm)	June - September (but more sporadically than juveniles)	2-4 months per year

Atlantic menhaden are planktonic filter feeders. Important prey items include a variety of small invertebrates including copepods and mysids as well as phytoplankton such as diatoms, flagellates, and

algae (Able & Fahay 2010). They are in turn important prey themselves for large piscivorous estuarine fish including striped bass and bluefish (*Pomatomus saltatrix*).

White Perch (*Morone americana*)

White perch is predominantly an estuarine species that occurs from New Brunswick, Canada to South Carolina. Most spawning takes place in brackish water (< 4 ppt) and freshwater areas during spring, beginning in late April in the Hudson River estuary when water temperatures are between 10 and 12 °C and peaking in May when temperatures are between 16 and 20 °C (Able & Fahay 2010). White perch are considered semi-anadromous with seasonal migrations occurring between deeper, more saline areas of estuaries during winter to shallow, brackish, or freshwater areas from early spring through summer. Young-of-the-year tend to remain in shallow, brackish water during their first summer, preferring compact bottoms of silt, sand or clay with limited cover, before leaving their shallow nursery areas during the fall and spending their first winter in deeper parts of the lower estuary (Able & Fahay 2010).

Within the deep water channels of Newark Bay, white perch were collected in high abundance from November to April during bottom trawl sampling conducted by NMFS (**Table 1**). They were much less common in shallow non-channel areas of Newark Bay during bottom trawling (**Table 2**) and experimental gill net surveys (**Table 3**) conducted by NMFS. During USACE-NYD bottom trawls conducted from January to June in 2002-2010, white perch were overwhelmingly the most common species collected in Newark Bay/Arthur Kill during winter (CPUE = 80.15) and were much less common (CPUE = 2.31) during spring (**Table 4**). Based on the total length data, the white perch collected during the NMFS study were primarily young-of-the-year and juveniles (<15 cm TL) with a mix of adults. Adults reach ages of 7 to 10 years and sizes of 200 to 270 cm TL (Able & Fahay 2010).

Expected Residence Time in Newark Bay for White Perch by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Young-of-the-Year (<8 cm)	November – April of first year	6 months
Juveniles (8 – 15 cm)	November - April of 2nd year	6 months
Adults (>15 cm)	November - April (but more sporadically than juveniles)	4-6 months per year

Adult white perch are carnivorous predators, feeding on crabs, shrimp and small fishes. Young-of-the-Year diets include a variety of invertebrates such as polychaetes, insect larvae, mysids, amphipods, decapod shrimp, and copepods. As white perch grow their diets shift from plankton (copepods and amphipods) to more benthic oriented organisms including oligochaetes and polychaetes (Able & Fahay 2010). White perch are frequent prey for large, piscivorous estuarine fish including bluefish. Within the Newark Bay complex, there is a do NOT eat advisory for white perch (**Table 5**; NJDEP 2017).

Summer Flounder (*Paralicthhys dentatus*)

Summer flounder (or “fluke”) occur along the Atlantic Coast of North America from Nova Scotia to Florida but are most abundant in coastal waters from Cape Cod to North Carolina. Spawning occurs on the continental shelf from September through January with a peak in October and November (Able & Fahey 2010). Planktonic larvae are most abundant offshore and at water depths >30 feet while post-settlement young-of-the-year and juveniles move inshore and are widely distributed in high salinity (> 23 ppt) habitats including sub-tidal marsh creeks, coves and large bays, including both vegetated and

unvegetated areas (NMFS 1999a and Able & Fahey 2010). Adult and juvenile summer flounder are demersal, typically inhabiting shallow coastal and estuarine waters from May through October, before migrating off shore during colder months (NMFS 1999a).
Within the deep water channels of Newark Bay, summer flounder were collected from April to October but were most abundant in June through August during bottom trawl sampling conducted by NMFS (**Table 1**). They were less common but occurred over the same seasonal period in shallow non-channel areas of Newark Bay during bottom trawling (**Table 2**) and experimental gill net surveys (**Table 3**) conducted by NMFS. As would be expected based on their life history, summer flounder were rarely collected in Newark Bay during USACE-NYD bottom trawl sampling conducted from January to June (USACE 2015a). Based on the total length data, the summer flounder collected during the NMFS study were a mix of juveniles (>15 cm TL) and adults (>25 cm TL).

Expected Residence Time in Newark Bay for Summer Flounder by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Juveniles (15 – 30 cm)	May - September	4 months
Adults (>30 cm)	May - September	4 months per year

Adult summer flounder feed in estuaries and shelf waters in the warmer months and are active during daylight hours as they are primarily visual feeders. Summer flounder larvae and juveniles forage opportunistically but primarily feed on crustaceans and polychaetes (NMFS 1999a). Adult prey includes shrimp, mysids, Anchoa sp. (anchovy), Menidia sp. (silverside), Ammodytes sp. (sand lance), and other flatfishes (NMFS 1999a and Able & Fahey 2010).

Winter Flounder (*Pseudopleuronectes americanus*)
Winter flounder occur along the Atlantic Coast of North America from Labrador to Georgia but are most abundant in the northern portion of this range south to New Jersey (Able & Fahey 2010). Winter flounder occurrence has been extensively studied in NY/NJ Harbor by USACE-NYD and is well documented. Spawning typically occurs in shallow water estuaries (< 18 feet) from late winter to early spring with a concentration from late January to early April in NY/NJ Harbor (USACE 2010 and USACE 2012). Young-of-the-year spend the majority of the first year in shallow inshore waters, across a variety of habitat types, tolerating higher water temperatures and lower salinities than yearlings or adults (NMFS 1999b). As winter flounder mature, they begin outward migrations to cooler, deeper waters during warm weather months and are less tolerant to low salinity. Adult winter flounder (>25 cm) return to the estuary beginning in the late fall and often remain in spawning areas until water temperatures reach about 15°C (NMFS 1999b).

Within the deep water channels of Newark Bay, winter flounder were collected in every month but were most common from June through December with peaks in August and November during bottom trawl sampling conducted by NMFS in 1993-1994 (**Table 1**). By comparison, they were less common but present in most months except for February and March in the non-channel areas of Newark Bay during NMFS bottom trawl sampling (**Table 2**) and were absent from experimental gill net surveys (**Table 3**) which is not surprising since they are demersal species. Of note, older winter flounder are reported to bury in the mud during winter (Able & Fahey 2010) which may explain some of the low occurrence observed during NMFS bottom trawl sampling during the coldest months of the year. According to NMFS (1997), based on the length frequency data, the winter flounder collected during these surveys

were primarily a mix of Year-1 and Year-2 juveniles with a few older adults. During USACE-NYD bottom trawls conducted from January to June in 2002-2010, adult and juvenile winter flounder were common in the Newark Bay/Arthur Kill collections during winter both winter and spring (**Table 4**), and were collected primarily in channel areas of the bay as young-of-the-year and Year-1 juveniles (USACE-NYD 2012).

Expected Residence Time in Newark Bay for Winter Flounder by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Young-of-the-Year (<8 cm)	April – April	1 Year
Year-1 Juveniles (8 -15 cm)	April - December	8 months
Year-2 Juveniles (15 – 25 cm)	November - June	8 months
Adults (>25 cm)	November - April	6 months per year

Winter flounder are omnivorous, opportunistic feeders, consuming a wide variety of prey based upon seasonal availability and changes in life history with polychaetes and crustaceans (mostly amphipods) constituting the bulk of the diet (NMFS 1999b). Stehlik and Meise (2000) studied the stomach contents of juvenile and adult winter flounder collected from the Navesink River and Sandy Hook Bay, New Jersey, and found differences between size groups with young-of-the-year preferring polychaetes, copepods and amphipods. They noted the disappearance of copepods from the diets of the larger fish collected and an increase in the number of taxa consumed including siphons of the bivalve *Mya arenaria* as well as an increase in consumption of sand shrimp (Crangonidade) during the summer and fall.

American Eel (*Anguilla rostrata*)

American eel is a catadromous species, spawning in the ocean but living most of its life in freshwater or estuarine habitats, ranging from Greenland to the West Indies (Able & Fahay 2010). Spawning takes place in the southwestern Sargasso Sea (between Bermuda and the Bahamas) from January to April. Depending on age/body size a female eel may produce up to 30,000,000 eggs which float to the surface (Shepard 2015). After hatching, migration of developing larvae (“leptocephali”) occurs via passive entrainment in ocean currents but newly metamorphosed larvae (“glass eels”) are believed to actively swim to cross the continental shelf and start to move up into coastal bays and estuaries (Shepard 2015). As juvenile eels grow and become more pigmented in lower salinity habitats, they are termed “elvers.” When eels become larger and fully pigmented they begin to turn yellowish on their bellies; at this stage they are called “yellow eels.” The majority of growth, as well as sexual differentiation, take place during this stage. Yellow eels are primarily bottom dwellers, and often hide in burrows, shelters, or submerged vegetation. During winter eels often burrow in mud and remain inactive at temperatures below 8 °C (Facey & Van Den Avyle 1987, Able & Fahay 1998, Shepard 2015).

Within larger watersheds, eels that migrate to headwater habitats are mostly females, while those that remain in downstream estuarine habitats are more likely to be male (Able & Fahay 1998, Shepard 2015). Eels that do not migrate far upstream and remain in estuaries and coastal waters complete their life cycle much more quickly (Shepard 2015). Following an estuarine/freshwater residency period of 2-30 years, reproductively mature “silver” eels migrate back to their oceanic spawning grounds. During outmigration, which takes place in late summer/early fall, eels move rapidly downstream, with the most active periods of migration taking place at night and following rain events (Shepard 2015). When not

undertaking seasonal migrations, eels are generally sedentary and remain within a restricted home territory (Able & Fahay 1998).

American eel are very abundant in the lower Hudson River and are commonly encountered by recreational anglers throughout the Hudson-Raritan Estuary (Smith 1985, NYSDEC 2017). However, eels were not collected in Newark Bay bottom trawl or gill net sampling conducted by NMFS or USACE (**Tables 1-4**). Their cryptic life history and elongated body form likely explains their absence in surveys, rather than a lack of abundance in Newark Bay. Typically, eel surveys employ baited or un-baited traps deployed in quiescent shallow waters. A survey of fish use in the vicinity of piers and other man-made water structures in NY/NJ Harbor by Able and Duffy-Anderson (2006) documented American eel as one of the most abundant species in shaded areas, under piers and in inter-pier basins.

Expected Residence Time in Newark Bay for American Eel by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Glass eels (5 - 6.5 cm)	February – June of first year	4 months
Pigmented elvers (>5 - 10 cm)	February - June of first year	4 months
Yellow eel phase (10 - 60 cm)	Year-round residence in estuaries	12 months
Silver eel phase (40 - 120 cm)	August - December (during out-migration)	2-4 months per year

Eels prefer live food and generally feed at night on aquatic invertebrates and fish (including other eels). However, they also scavenge on carcasses of fish and other aquatic organisms (Facey & Van Den Avyle 1987, Shepard 2015). Within the Newark Bay complex, there is a do NOT eat advisory for American eel (**Table 5**; NJDEP 2017).

Atlantic Silverside (*Menidia menidi*a)

Silversides are small schooling fish that frequent tidal marshes, seagrass bed and shallow shore areas. Silversides typically occur in dense schools and represent an important prey resource for larger predatory fishes. The geographic range of the Atlantic silverside is from Nova Scotia to central Florida, including all coastal waters and tributaries. They remain in estuaries areas or the coastal surf zone throughout most of the year (Conover & Murawski 1982). The Atlantic silverside is the most abundant silverside in mid-Atlantic estuaries, including the Hudson-Raritan Estuary; however, a similar species (inland silverside, *M. beryllina*) often co-occurs with *M. menidia*, especially in brackish waters. Habitat preferences for Atlantic silversides include sand and gravel substrates, tidal marsh creeks and eelgrass beds (Able & Fahay 1998).

Atlantic silversides tolerate a wide range of temperature and salinity conditions, but are considered sensitive to low dissolved oxygen concentrations, in comparison to other small resident fish species occupying coastal marsh habitats (Able & Fahay 1998). Spawning is lunar-related and occurs from late March through June in shallow coastal habitats coincident with new or full moon daytime high tides. Eggs are deposited in the intertidal zone above the mean low water mark on stems or roots of saltmarsh cordgrass (*Spartina alterniflora*) or on mats of detritus (Conover & Kynard 1984). Juveniles grow rapidly and are abundant in shallow nearshore habitats throughout the summer and fall. During winter months, Atlantic silversides migrate out of estuaries and school in deeper coastal waters (Conover & Murawski 1982).

Atlantic silversides were not collected in the deep water channels of Newark Bay, during bottom trawl sampling conducted by NMFS (**Table 1**). However, they were collected from October through March during trawl surveys in shallow non-channel areas of Newark Bay (**Table 2**). Silversides were not collected during experimental gill net surveys conducted by NMFS, which is not unexpected given their relatively small body size (**Table 3**). During USACE-NYD bottom trawls conducted from January to June in 2002-2010, Atlantic silversides were most abundant in the Lower Bay in comparison to the Upper Bay and Newark Bay/Arthur Kill complex during winter, but were not collected during spring surveys of these same areas (**Table 4**) (USACE-NYD 2015a). Atlantic silversides represented <1% (spring and fall) of the total catch during pelagic mid-water trawl sampling conducted by USACE-NYD in Newark Bay from March through December. Silversides were not collected during summer mid-water trawl surveys (**Figure 1**). It is likely that silversides were underrepresented in the various NMFS/USACE surveys because of their small body size relative to gear mesh apertures and affinity for very shallow near-shore habitats, especially during warmer months.

Expected Residence Time in Newark Bay for Atlantic Silverside by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Young-of-the-Year (<4 cm)	April - December	8 months
Juveniles (4-9 cm)	April - December	8 months
Adults (9-13 cm)	April - December	8 months per year

Atlantic silversides are omnivores, feeding opportunistically on a variety of available organisms including zooplankton, benthic crustaceans, small mollusks, worms, and insects. Plant food may include algae, diatoms, and detritus (Warkentine & Rachlin 1989).

Bluefish (*Pomatomus saltatrix*)

Bluefish is a pelagic species commonly occurring from Nova Scotia and Bermuda to the Gulf of Mexico. Spawning typically begins on the outer continental shelf in March and April (spring spawned cohort) but may continue through the summer (summer spawned cohort) in the Middle Atlantic and New York Bights; adult and juvenile bluefish can be expected to be seasonally present in New York Harbor from late spring to early fall (Able & Fahey 2010, NMFS 2006).

Within Newark Bay, bluefish were collected from May to October in relatively low abundances within the deep water channels (**Table 1**) and in shallow non-channel areas during bottom trawling (**Table 2**) and experimental gill net surveys (**Table 3**) conducted by NMFS. Bluefish accounted for <1% of the total seasonal collections in spring through fall during USACE-NYD mid-water trawling (**Figure 1**).

Expected Residence Time in Newark Bay for Bluefish by Life Stage.

Life Stage (approx. size in TL)	Months	Approx. Duration
Juveniles (< 30 cm)	May - September	4 months
Adults (≥ 30 cm)	May - September	4 months per year

Adult bluefish are voracious carnivores, feeding on a wide variety of fish including bay anchovy and other clupeids, menhaden, silverside, and young-of-the-year striped bass while juvenile bluefish prey upon crustaceans and polychaetes (Able & Fahay 2006).

Bluefish are a popular recreational sport fish. There is no legal size limit in New Jersey. Within the coastal waters of New Jersey, there is a consumption advisory for the general population that recommends eating no more than 6 bluefish fish meals per year of fish greater than 6 pounds/24 inches and no more than one meal per month of fish less than 6 pounds/24 inches as well as a do NOT eat advisory for high risk individuals (**Table 5**; NJDEP 2017).

Table 1. Monthly catch in number of fish and mega-invertebrates collected with an 8.5-m otter trawl within channel areas of Newark Bay between May 1993 and April 1994 (from NMFS 1997).

Common Name	Scientific Name	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Little Skate	*Raja erinacea*	-	-	-	-	-	-	1	-	-	-	-	1
Atlantic Sturgeon	*Acipenser oxyrhynchus*	-	1	-	-	-	-	-	-	-	-	-	-
American Eel	*Anguilla rostrata*	1	1	-	1	-	-	2	1	2	1	-	1
Conger Eel	*Congridae sp.*	-	-	-	-	-	-	-	-	1	-	-	-
Blueback Herring	*Alosa aestivalis*	-	-	-	-	-	-	-	1	-	-	-	1
Alewife	*Alosa pseudoharengus*	1	2	31	3	3	31	161	2	9	-	-	9
American Shad	*Alosa sapidissima*	-	1	-	-	-	-	5	-	-	-	-	2
Atlantic Menhaden	*Brevoortia tyrannus*	2	8	68	7	2	2	2	-	-	-	-	-
Atlantic Herring	*Clupea harengus*	-	3	-	-	-	-	2	-	-	-	1	1
Gizzard Shad	*Dorosoma cepedianum*	-	-	-	2	-	13	196	18	47	1	-	-
Bay Anchovy	*Anchoa mitchilli*	-	16	282	11	8	2	5	1	-	-	-	-
Rainbow Smelt	*Osmerus mordax*	1	-	-	-	-	-	-	5	313	25	27	2
Atlantic Tomcod	*Microgadus tomcod*	167	852	1226	684	15	91	276	110	9	8	7	102
Red Hake	*Urophycis chuss*	45	33	1	-	-	-	-	13	3	-	1	3
Spotted Hake	*Urophycis regia*	288	450	31	-	-	17	20	15	-	-	-	26
Striped Killifish	*Fundulus majalis*	-	-	-	-	-	-	-	-	1	1	-	-
Threespine Stickleback	*Gasterosteus aculeatus*	-	-	-	-	-	-	-	-	1	6	11	-
Northern Pipefish	*Syngnathus fuscus*	-	-	-	-	1	-	-	-	-	-	-	1
Northern Searobin	*Prionotus carolinus*	-	9	7	10	-	2	-	-	-	-	-	-
Striped Searobin	*Prionotus evolans*	2	5	3	7	44	25	7	-	-	-	-	-
Grubby	*Myoxocephalus aenaeus*	13	28	13	8	-	4	5	23	66	44	54	13
White Perch	*Morone americana*	3	1	-	-	-	1	507	264	244	737	666	354
Striped Bass	*Morone saxatilis*	22	22	323	23	-	41	1742	181	215	1021	1844	1006
Bluefish	*Pomatomus saltatrix*	-	-	-	1	2	2	-	-	-	-	-	-
Crevalle Jack	*Caranx hippos*	-	-	-	-	1	-	-	-	-	-	-	-

Common Name	Scientific Name	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Scup	*Stenotomus chrysops*	1	1	-	-	-	1	-	-	-	-	-	-
Silver Perch	*Bairdiella chrysoura*	-	-	-	-	-	8	13	-	-	-	-	-
Weakfish	*Cynoscion regalis*	5	14	9	804	1128	735	104	4	-	-	-	-
Spot	*Leiostomus xanthurus*	-	-	-	2	2	1	-	-	-	-	-	-
Northern Kingfish	*Menticirrhus saxatilis*	-	-	-	1	-	-	-	-	-	-	-	-
Atlantic Croaker	*Micropogonias undulatus*	-	-	-	7	3	4	5	3	-	-	-	-
Tautog	*Tautoga onitis*	-	-	-	1	-	-	3	1	-	-	-	1
Cunner	*Tautogolabrus adspersus*	-	1	-	-	-	-	-	-	1	-	2	2
Rock Gunnel	*Pholis gunnellus*	-	-	-	-	-	-	-	-	-	-	-	1
Butterfish	*Peprilus triacanthus*	-	-	-	42	18	19	1	-	-	-	-	-
Smallmouth Flounder	*Etropus microstomus*	-	-	-	-	-	-	2	2	-	-	-	1
Summer Flounder	*Paralichthys dentatus*	28	52	80	40	10	1	-	-	-	-	-	8
Fourspot Flounder	*Paralichthys oblongus*	-	1	-	-	-	-	-	-	-	-	-	-
Windowpane	*Scophthalmus aquosus*	1	2	9	4	2	19	19	5	1	2	4	10
Winter Flounder	*Pleuronectes americanus*	17	59	161	271	53	108	365	164	51	33	57	69
Hogchoker	*Trinectes maculatus*	1	2	1	2	7	-	-	2	-	-	1	1
Planehead Filefish	*Monacanthus hispidus*	-	-	-	-	-	1	-	-	-	-	-	-
Northern Puffer	*Sphoeroides maculatus*	-	-	-	1	-	-	-	-	-	-	-	-
Soft Clam	*Mya arenaria*	-	-	-	-	-	-	4	-	2	5	5	29
Longfin Squid	*Loligo pealei*	-	-	1	-	-	-	-	-	-	-	-	-
Horseshoe Crab (U)	*Limulus polyphemus*	1	1	-	1	-	1	-	-	2	1	-	1
Mantis Shrimp	*Squilla empusa*	-	-	-	-	2	11	2	-	6	-	-	-
Spider Crab (U)	*Libinia emarginata*	-	-	-	-	-	-	-	-	-	1	1	-
Atlantic Rock Crab (U)	*Cancer irroratus*	-	-	-	-	-	-	-	1	-	-	-	-
Atlantic Rock Crab (M)	*Cancer irroratus*	-	1	-	-	-	-	-	-	3	-	1	-
Lady Crab (F)	*Ovalipes ocellatus*	-	-	-	-	-	-	-	1	-	-	-	-
Blue Crab (M)	*Callinectes sapidus*	336	876	894	163	171	368	100	69	30	54	75	23
Blue Crab (F)	*Callinectes sapidus*	228	647	1093	147	199	62	64	32	13	9	17	16

Table 2. Monthly catch in number of fish and mega-invertebrates collected with a 4.9-m otter trawl within non-channel areas of Newark Bay between May 1993 and April 1994 (from NMFS 1997).

Common Name	Scientific Name	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Blueback Herring	*Alosa aestivalis*	-	-	-	-	-	-	2	7	-	-	-	-
Alewife	*Alosa pseudoharengus*	2	-	-	1	-	-	-	2	-	-	-	-
American Shad	*Alosa sapidissima*	1	-	-	3	2	-	-	2	-	-	-	-
Atlantic Herring	*Clupea harengus*	50	616	-	-	-	-	-	-	-	-	-	-
Bay Anchovy	*Anchoa mitchilli*	1	79	171	398	750	-	-	8	-	-	-	1
Rainbow Smelt	*Osmerus mordax*	-	-	-	-	-	-	-	-	-	-	1	-
Atlantic Tomcod	*Microgadus tomcod*	48	246	-	-	-	-	-	-	-	-	-	-
Spotted Hake	*Urophycis regia*	-	2	-	-	-	-	-	-	-	-	-	-
Atlantic Silverside	*Menidia menidia*	-	-	-	-	-	30	3	8	1	-	2	-
Threespine Stickleback	*Gasterosteus aculeatus*	-	-	-	-	-	-	-	-	-	-	2	-
Lined Seahorse	*Hippocampus erectus*	-	1	-	-	-	-	-	-	-	-	-	-
Northern Pipefish	*Syngnathus fuscus*	1	3	4	1	1	-	-	-	-	-	-	-
Northern Searobin	*Prionotus carolinus*	1	-	-	-	-	-	-	-	-	-	-	-
Striped Searobin	*Prionotus evolans*	-	-	-	2	1	-	-	-	-	-	-	-
Grubby	*Myoxocephalus aenaeus*	-	-	-	-	-	-	1	-	-	-	-	-
White Perch	*Morone americana*	-	-	-	-	-	-	-	8	-	-	2	-
Striped Bass	*Morone saxatilis*	6	1	8	23	33	37	1	23	-	-	-	-
Bluefish	*Pomatomus saltatrix*	-	-	2	4	9	-	-	-	-	-	-	-
Weakfish	*Cynoscion regalis*	-	-	-	3	-	3	-	-	-	-	-	-
Spot	*Leiostomus xanthurus*	-	-	-	1	-	-	-	-	-	-	-	-
Northern Kingfish	*Menticirrhus saxatilis*	-	-	-	2	-	-	-	-	-	-	-	-
Goby	*Gobiidae* sp.	-	1	-	-	-	-	-	-	-	-	-	-
Butterfish	*Peprilus triacanthus*	-	-	-	-	-	1	-	-	-	-	-	-
Smallmouth Flounder	*Etropus microstomus*	-	-	-	-	2	-	1	-	-	-	-	-
Summer Flounder	*Paralichthys dentatus*	1	5	9	6	-	-	-	-	-	-	-	-
Windowpane	*Scophthalmus aquosus*	-	-	4	-	-	-	-	-	-	-	-	-

Common Name	Scientific Name	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Winter Flounder	*Pleuronectes americanus*	25	53	21	14	1	8	6	5	1	-	-	3
Northern Puffer	*Sphoeroides maculatus*	-	-	-	-	1	-	-	-	-	-	-	-
Eastern Oyster	*Crassostrea virginica*	-	1	-	-	-	-	-	-	-	-	-	-
Blue Crab (M)	*Callinectes sapidus*	2	13	51	27	13	17	-	-	-	3	11	-
Blue Crab (F)	*Callinectes sapidus*	-	4	41	6	5	8	1	1	-	-	1	1
Blue Crab (U)	*Callinectes sapidus*	-	1	-	-	-	-	-	-	-	-	-	-

Table 3. Monthly catch in number of fish and mega-invertebrates collected with experimental gill nets set within non-channel areas of Newark Bay between May 1993 and April 1994 (from NMFS 1997).

Common Name	Scientific Name	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Blueback Herring	*Alosa aestivalis*	44	8	-	-	-	2	-	-	-	-	-	-
Alewife	*Alosa pseudoharengus*	14	-	-	-	-	-	-	-	-	-	-	-
American Shad	*Alosa sapidissima*	3	-	-	-	-	-	-	-	-	-	-	1
Atlantic Herring	*Clupea harengus*	-	-	-	-	-	1	15	-	-	-	-	6
Atlantic Menhaden	*Brevoortia tyrannus*	250	17	15	15	-	28	2	-	-	-	-	2
Atlantic Tomcod	*Microgadus tomcod*	-	-	-	-	-	-	1	-	-	-	-	-
Northern Pipefish	*Syngnathus fuscus*	-	-	-	-	-	-	-	-	-	-	-	1
White Perch	*Morone americana*	1	1	-	-	-	-	-	-	-	1	1	1
Striped Bass	*Morone saxatilis*	36	59	17	1	3	2	5	1	-	-	-	3
Bluefish	*Pomatomus saltatrix*	8	16	1	2	7	1	-	-	-	-	-	-
Crevalle Jack	*Caranx hippos*	-	-	-	-	1	1	-	-	-	-	-	-
Weakfish	*Cynoscion regalis*	6	6	-	1	1	2	-	-	-	-	-	-
Chub Mackerel	*Scomber japonicus*	-	1	-	-	-	-	-	-	-	-	-	-
Butterfish	*Peprilus triacanthus*	-	-	-	-	-	3	-	-	-	-	-	-
Summer Flounder	*Paralichthys dentatus*	-	1	-	-	-	-	-	-	-	-	-	-
Blue Crab (M)	*Callinectes sapidus*	-	22	25	10	7	3	2	-	-	-	2	2
Blue Crab (F)	*Callinectes sapidus*	-	8	10	5	-	1	-	-	-	-	-	1

Table 4. Overall mean Catch Per Unit Effort (CPUE) for Arthur Kill/Newark Bay (AKNB), Lower Bay (LB) and Upper Bay (UB) regions during USACE-NYD bottom trawl sampling conducted January through June from 2002-2010 (from USACE 2015a).

Winter				Spring			
Species	**AKNB**	LB	UB	Species	**AKNB**	LB	UB
White perch	**80.15**	0.01	0.80	Bay anchovy	**28.93**	43.63	79.66
Alewife**	**1.51**	16.17	3.73	Spotted hake	**23.46**	6.78	17.50
Striped bass**	**19.48**	0.11	5.07	Atlantic herring*	**23.07**	2.67	14.09
Blueback herring**	**1.45**	7.17	4.23	Alewife**	**3.84**	2.55	1.68
American sandlance	**0.01**	10.97	0.08	Winter flounder*	**2.52**	1.97	3.10
Spotted hake	**1.48**	5.24	3.57	Striped bass**	**4.26**	0.13	2.84
Winter flounder*	**4.12**	1.55	2.98	Atlantic tomcod**	**1.07**	0.02	5.50
Atlantic silverside	**0.71**	6.52	0.64	Blueback herring**	**2.26**	0.88	2.65
Red hake*	**2.11**	1.23	2.91	Red hake*	**2.12**	0.47	2.75
Silver hake*	**0.11**	1.56	0.24	White perch	**2.31**	0.00	0.28
American shad**	**0.25**	0.47	1.15	Windowpane*	**0.56**	0.56	1.37
Windowpane*	**0.26**	0.50	1.00	Scup*	**0.01**	1.22	1.20
Atlantic menhaden**	**0.05**	1.47	0.17	Atlantic butterfish*		0.85	
Bay anchovy	**0.42**	0.79	0.51	Striped searobin		0.65	
Smallmouth flounder	**0.05**	1.17	0.34	American sandlance		0.06	1.51
Grubby			0.21				
Atlantic croaker			0.60				
Atlantic herring*		0.76	0.44				
Spot			0.51				

*Federally managed (EFH) species
**State managed species (listed on http://www.asmfc.org/fisheries-management/program-overview)

Table 5. Current fish consumption advisories for New Jersey estuarine and marine waters posted at http://www.nj.gov/dep/dsr/fishadvisories/marine.htm

2017 Statewide Estuarine & Marine Waters (All coastal waterbodies except those under Waterbody Specific Advisories)			
SPECIES		**GENERAL POPULATION EAT NO MORE THAN: (2, 3)**	**HIGH-RISK INDIVIDUAL (1)EAT NO MORE THAN: (2, 3)**
	STRIPED BASS	One meal per month	Do Not Eat
	BLUEFISH (greater than 6 lbs/24 inches)	Six meals per year	
	BLUEFISH (less than 6lbs/24 inches)	One meal per month	
	AMERICAN EEL	Four meals per year	
	AMERICAN LOBSTER	Do Not Eat the Green Gland (a.k.a., Tomalley or Hepatopancreas)	
ESTUARINE & MARINE WATERS			
NEWARK BAY COMPLEX Including Newark Bay, tidal Hackensack River, Arthur Kill, Kill Van Kull and tidal tributaries			
SPECIES		**GENERAL POPULATION EAT NO MORE THAN**	**HIGH-RISK INDIVIDUAL EAT NO MORE THAN**
	Blue Crab*	Do not eat or harvest (5)	
	Striped Bass*	Four meals per year	Do not eat
	American Eel*	Do not eat	
	White Perch		
	White Catfish	One meal per year	
TIDAL PASSAIC RIVER From the head of tide at Garfield to Newark Bay and all tidal tributaries			
SPECIES		**GENERAL POPULATION EAT NO MORE THAN**	**HIGH-RISK INDIVIDUAL EAT NO MORE THAN**
All Fish & Shellfish*		Do not eat	
	Blue Crab*	Do not eat or harvest (5)	

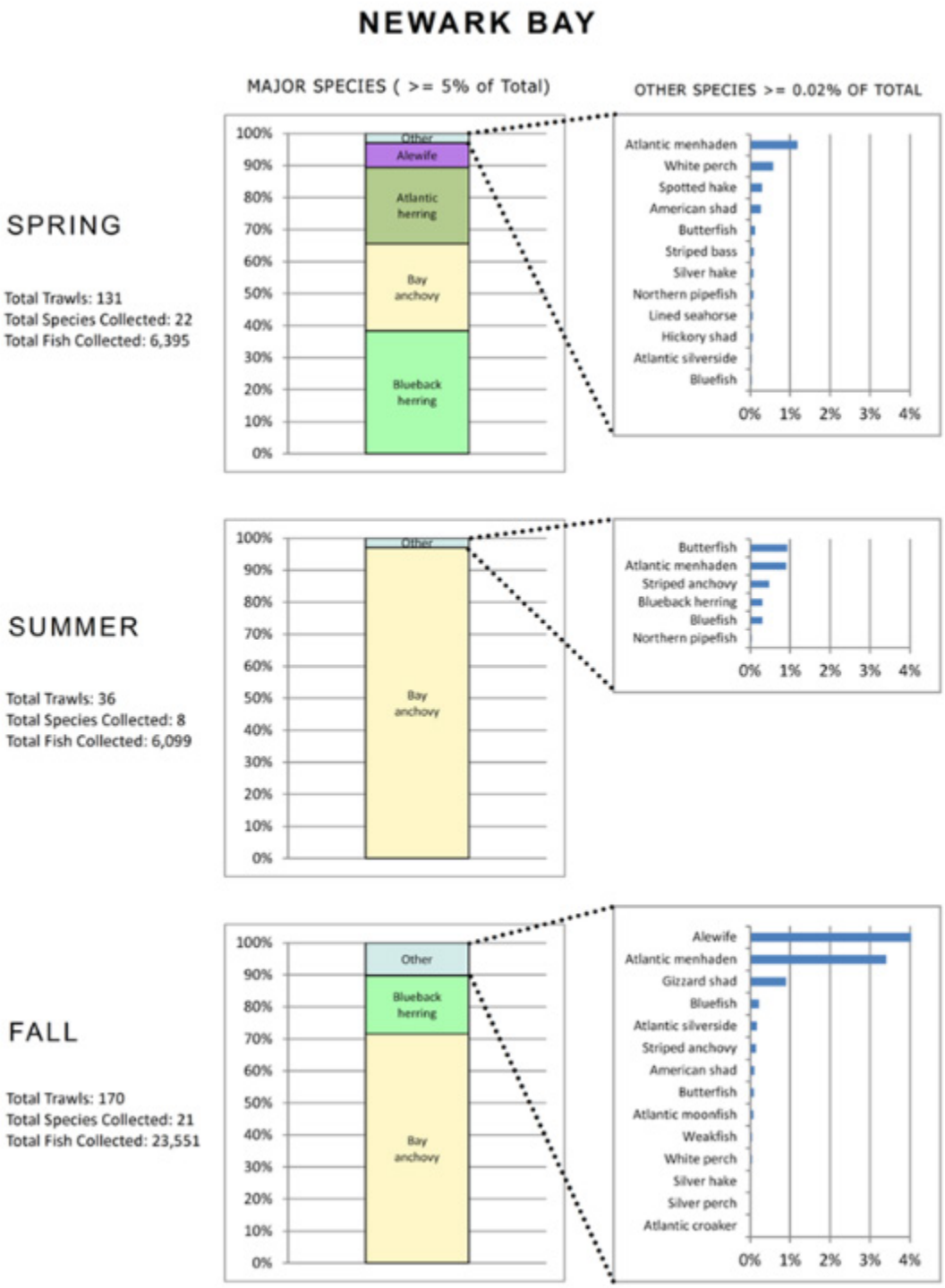


Figure 1. Seasonal occurrence of common pelagic species collected in Newark Bay during USACE-NYD mid-water trawl sampling during spring (March – May), summer (June – August), and fall (September – December) in 2006 and 2011 to 2013 (from USACE-NYD 2015b).

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