

Tables

Table 10-1**Acreages and 2,3,7,8-TCDD Surface Sediment Data Counts by 1995 to 2010 Bathymetric Category for RM 1 to RM 7**

1995 to 2010 Bathymetric Category	Area Sub-Category	Acreage	Percentage of RM 1-7 Area	2,3,7,8-TCDD Count	
				1995–1999 Dataset	2005–2011 (Pre-Irene Dataset)
Depositional Areas	All Areas	117.3	31.7%	27	18
	Cyclical 2007-2010	11.6	3.1%	3	0
	Not-Cyclical 2007-2010 ¹	102.9	27.8%	24	18
	No Data on Cyclical Behavior ²	2.8	0.8%	0	0
Erosional Areas	All Areas	58.2	15.7%	17	11
	Cyclical 2007-2010	3.4	0.9%	0	0
	Not-Cyclical 2007-2010 ³	53.7	14.5%	17	11
	No Data on Cyclical Behavior ²	1.1	0.3%	0	0
Areas with ≤ 6 inches Bathymetric Change	All Areas	86.5	23.3%	31	19
	Cyclical 2007-2010	3.3	0.9%	0	0
	Not-Cyclical 2007-2010 ⁴	80.8	21.8%	30	18
	No Data on Cyclical Behavior ²	2.4	0.7%	1	1
Areas Not Covered by Both the 1995 and 2010 Bathymetry Surveys	All Areas	108.5	29.3%	76	45
	Cyclical 2007-2010	0.4	0.1%	0	0
	Not-Cyclical 2007-2010 ⁵	3.8	1.0%	1	2
	No Data on Cyclical Behavior ²	104.3	28.1%	75	43

Notes:

¹Less than or equal to 6 inches of change in both time periods: 69.9 acres. Erosion dominant: 13.7 acres. Deposition dominant: 19.3 acres.²Areas not covered by the 2007, 2008, and 2010 multibeam surveys³Less than or equal to 6 inches of change in both time periods: 46.3 acres. Erosion dominant: 6.6 acres. Deposition dominant: 0.8 acres.⁴Less than or equal to 6 inches of change in both time periods: 69.9 acres. Erosion dominant: 8.5 acres. Deposition dominant: 2.4 acres.⁵Less than or equal to 6 inches of change in both time periods: 2.7 acres. Erosion dominant: 0.7 acres. Deposition dominant: 0.4 acres.

Deposition and erosion are defined by bathymetry differences greater than 6 inches between 1995 and 2010. Cyclical areas are based on sequential bathymetric survey differences of between the 2007, 2008, and 2010 surveys and represent the minimum area likely to be cyclical. The multi-beam bathymetry data evaluated at the 5-foot by 5-foot resolution shown here in the cyclical areas can distinguish differences greater than 6 inches between surveys. See Appendix A for a discussion of bathymetric uncertainty.

For acreages in the footnotes of not-cyclical 2007-2010 areas: "Erosion dominant" means greater than 6 inches of erosion in at least one time period. "Deposition dominant" means greater than 6 inches of deposition in at least one time period. Areas with greater than 6 inches of erosion followed by greater than 6 inches of deposition, or vice-versa would be counted under cyclical areas rather than non-cyclical areas.

2,3,7,8-TCDD: 2,3,7,8-tetrachlorodibenzo-p-dioxin

Table 10-2
Comparison of Pre-Irene and Post-Irene Surface Sediment Contaminant Concentrations

COPC (Concentration Units)	RM Range	Dataset	Number of Samples	Concentration Distribution Statistics					Ratio of Post-Irene to Pre-Irene Mean Concentration		
				Mean	Median	25%	75%	Interquartile Range	Ratio of Data Means	Bootstrap 95% Confidence Interval on Ratio	Bootstrap Probability of Ratio > 1
2,3,7,8-TCDD (ng/kg)	2 - 8	Pre-Irene	95	663	290	195	414	219	4.9	2.0-9.3	>99.9%
		Post-Irene	63	3080	277	111	800	689			
	8 - 12	Pre-Irene	71	1029	309	119	596	477	3.4	1.6-6.4	>99.9%
		Post-Irene	139	3201	369	66	1965	1899			
Total PCBs (mg/kg)	2 - 8	Pre-Irene	90	1.5	1.0	0.7	1.2	0.53	2.4	1.3-4.0	99.8%
		Post-Irene	62	3.4	1.1	0.6	2.4	1.8			
	8 - 12	Pre-Irene	60	2.1	0.91	0.49	1.62	1.1	2.3	1.2-4.0	99.3%
		Post-Irene	132	4.1	1.0	0.2	4.5	4.2			
Total 4,4'-DDX (mg/kg)	2 - 8	Pre-Irene	97	0.17	0.080	0.057	0.155	0.10	1.2	0.7-2.0	71.6%
		Post-Irene	62	0.21	0.10	0.05	0.16	0.11			
	8 - 12	Pre-Irene	71	0.13	0.093	0.050	0.130	0.079	1.1	0.8-1.6	71.8%
		Post-Irene	134	0.15	0.072	0.021	0.176	0.16			
Mercury (mg/kg)	2 - 8	Pre-Irene	102	2.1	1.9	1.4	2.4	1.0	2.0	1.4-2.6	>99.9%
		Post-Irene	62	4.1	2.1	1.5	4.1	2.5			
	8 - 12	Pre-Irene	78	2.3	1.8	1.0	2.5	1.6	1.7	1.2-2.4	99.8%
		Post-Irene	132	3.9	1.9	0.5	5.0	4.5			
HMW PAHs (mg/kg)	2 - 8	Pre-Irene	96	32	27	21	35	14	1.3	0.9-1.8	93.7%
		Post-Irene	62	42	29	23	37	14			
	8 - 12	Pre-Irene	72	29	29	21	35	14	1.0	0.8-1.3	57.7%
		Post-Irene	134	30	24	14	34	20			
LMW PAHs (mg/kg)	2 - 8	Pre-Irene	96	9.0	4.0	3.0	6.1	3.1	2.4	0.6-6.4	80.6%
		Post-Irene	62	20	4.6	3.5	6.9	3.4			
	8 - 12	Pre-Irene	72	5.0	4.6	3.2	6.3	3.0	1.3	0.9-1.8	94.2%
		Post-Irene	134	6.5	4.2	2.4	6.8	4.3			

Notes:

2,3,7,8-TCDD: 2,3,7,8-tetrachlorodibenzo-p-dioxin

COPC: chemical of potential concern

HMW: high molecular weight

LMW: low molecular weight

mg/kg: milligrams per kilogram

ng/kg: nanograms per kilogram

PAH: polycyclic aromatic hydrocarbon

PCB: polychlorinated biphenyl

RM: river mile

Table 10-3
Summary of Historical and Recent Data for Fish and Crab from the LPRSA

Species and Tissue Type	Historical Data (1995–2004)				Recent Data (2009–2010)		
	Sampling Event and Timing	Available Samples	Total Samples	Lipid Fraction	Available Samples	Sample Timing	Lipid Fraction
American eel – fillet	August 2001 Supplemental RI-ESP Biota Sampling Program	7 samples, skin-on fillet (all from RM 6-7)	7 samples; RM 6-7	8.1%	6 samples, skinless fillets (RM 6–8)	August–September 2009	4.7%
Carp – fillet	Late summer/fall 2004 NJDEP Task II Sampling Program	10 samples, skinless fillet (3 for TCDD; no Hg/PAHs)	10 samples (3 for TCDD, 9 for DDTs, no Hg/PAHs)	4.4%	4 samples, skin-on fillet (RM 8–10 and 14–17.4)	September 2009	5.0%
Mummichog – whole body	September 1995 Biological Sampling Program	5 samples (no PCB data)	59 samples (58 for DDTs, 53 for PCBs; RM 0.5-6.5)	3.2%	15 samples; RM 0–8	June–August 2010	1.9%
	Late summer/early fall 1999 RI-ESP Sampling Program	47 samples					
	Fall 1999 Harbor Fish Collection	1 sample					
	Winter 2000 Harbor Fish Collection	1 sample					
	Spring 2000 Harbor Fish Collection	1 sample (no PCB/DDT data)					
	Spring 2000 Spring RI-ESP Sampling Program	4 samples					
White perch – fillet	Spring 2000 RI-ESP Sampling Program	6 samples, skinless fillet	6 samples; RM 1–6	2.9%	11 samples, skin-on fillet; RM 0–8	September 2009	2.3%
Blue crab – muscle	September 1995 Biological Sampling Program	4 samples (no total PCBs)	37 samples (23 for PCBs, 26 for PAHs; RM 0.5–7)	0.6%	11 samples; RM 0–8	August–September 2009	0.5%
	Summer 1999 Harbor Crustacean Collection	3 samples					
	Late summer/early fall 1999 RI-ESP Sampling Program	17 samples (16 for PAHs)					
	Spring 2000 RI-ESP Sampling Program	3 samples					
	Late summer/fall 2004 NJDEP Task II Sampling Program	10 samples (no PCB/PAH data)					

Table 10-3
Summary of Historical and Recent Data for Fish and Crab from the LPRSA

Species and Tissue Type	Historical Data (1995–2004)				Recent Data (2009–2010)		
	Sampling Event and Timing	Available Samples	Total Samples	Lipid Fraction	Available Samples	Sample Timing	Lipid Fraction
Blue crab – muscle/ hepato-pancreas	Summer 1999 Harbor Crustacean Collection	8 samples (5 for 2,3,7,8-TCDD/PAHs)	28 samples (25 for TCDD/PAHs); RM 1–6.5	2.3%	22 samples; RM 0–8	August–September 2009	1.5%
	Late summer/early fall 1999 RI-ESP Sampling Program	16 samples					
	Spring 2000 RI-ESP Sampling Program	4 samples					
Blue crab – hepato-pancreas	September 1995 Biological Sampling Program	2 samples (no PCB data)	30 samples (18 for PCBs, 19 for PAHs); RM 0.5–7	13%	5 samples; RM 0–8	August–September 2009	7.3%
	Summer 1999 Harbor Crustacean Collection	3 samples (2 for PAHs)					
	Late summer/early fall 1999 RI-ESP Sampling Program	15 samples					
	Late summer/fall 2004 NJDEP Task II Sampling Program	10 samples (no PCB/PAH data)					

Notes:

Additional details of the data in this table can be found in Section 2, Section 5, Appendix B, and Appendix D.

Hg: mercury

ESP: Ecological Sampling Program

LPRSA: Lower Passaic River Study Area

NJDEP: New Jersey Department of Environmental Protection

PAH: polycyclic aromatic hydrocarbon

PCB: polychlorinated biphenyl

RI: Remedial Investigation

RM: river mile

TCDD: tetrachlorodibenzo-p-dioxin

Table 10-4

Comparison of Percent Change in Mean Tissue Concentrations Between Historical and Recent Data

Species	Tissue Type	Area	Percent Change of Mean Concentrations					
			2,3,7,8-TCDD	Total PCBs	Sum of 4,4'-DDx	Mercury	HMW PAHs	LMW PAHs
Lipid-Normalized Concentrations								
American eel	Fillet	RM 6–8	46%	3%	29%	87%	46%	39%
Carp	Fillet	RM 8–10 and 14–17.4	no data	495%	235%	no data	no data	no data
Mummichog	Whole body	RM 0–8	33%	30%	23%	136%	489%	35%
White perch	Fillet	RM 0–8	3%	60%	27%	3%	5%	105%
Blue crab	Muscle	RM 0–8	33%	61%	71%	78%	56%	28%
	Muscle/hep	RM 0– 8	26%	30%	1%	297%	5%	100%
	Hep	RM 0–8	33%	85%	50%	35%	78%	33%
Wet-Weight Concentrations								
American eel	Fillet	RM 6–8	5%	43%	32%	6%	17%	27%
Carp	Fillet	RM 8–10 and 14–17.4	no data	696%	337%	no data	no data	no data
Mummichog	Whole body	RM 0–8	56%	56%	19%	49%	341%	16%
White perch	Fillet	RM 0–8	25%	69%	46%	28%	20%	52%
Blue crab	Muscle	RM 0–8	21%	52%	75%	63%	45%	11%
	Muscle/hep	RM 0–8	13%	52%	31%	166%	37%	45%
	Hep	RM 0–8	41%	85%	52%	11%	112%	57%

Notes:

Green shading indicates a decrease in the mean value; yellow shading indicates an increase in the mean value.

Values in **bold** indicate that the recent and historical populations are statistically different (using 2-sided Mann-Whitney U Test, $\alpha = 0.05$).

Percentage changes in concentration are presented without the exclusion of potential outliers.

HMW: high molecular weight

LMW: low molecular weight

PAH: polycyclic aromatic hydrocarbon

PCB: polychlorinated biphenyl

RM: river mile

TCDD: tetrachlorodibenzo-p-dioxin

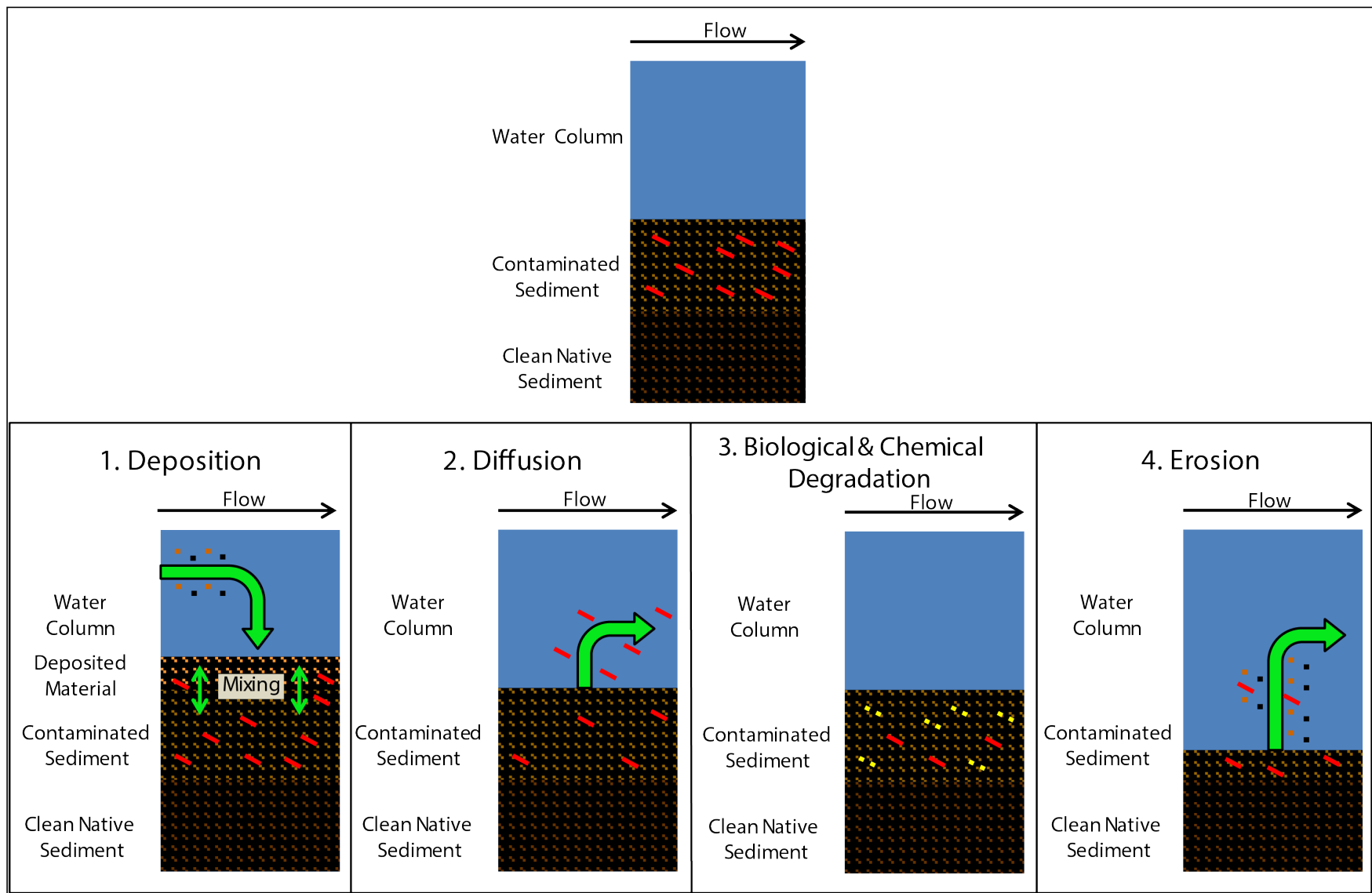
Table 10-5
Outlier Comparison of Historical and Recent Data

Species and Tissue Type	Historical Data													Recent Data													
	No. of Samples	No. of Outliers ^a						Average ^{b,c}						No. of Samples	No. of Outliers ^a						Average ^{b,c}						
		2,3,7,8-TCDD	Total PCBs	Sum of 4,4'-DDx	Mercury	HPAHs	LPAHs	2,3,7,8-TCDDd	Total PCBs	Sum of 4,4'-DDx	Mercury	HMW PAHs	LMW PAHs		2,3,7,8-TCDD	Total PCBs	Sum of 4,4'-DDx	Mercury	HPAHs	LPAHs	2,3,7,8-TCDDd	Total PCBs	Sum of 4,4'-DDx	Mercury	HMW PAHs	LMW PAHs	
Lipid-Normalized Data (mg/kg lipid)																											
American eel – fillet	7	0	0	1	0	0	0	0.00029	43	3.8 (2.8)	5.2	0.26	0.52	6	0	1	0	0	0	0	0.00042	44 (29)	5.0	9.8	0.37	0.72	
Carp – fillet	9	-	0	0	-	-	-	no data	20	3.2	no data	no data	no data	4	-	0	0	-	-	-	no data	117	11	no data	no data	no data	
Mummichog – whole body	58	3	0	4	3	2	1	0.0025 (0.0017)	37	2.2 (1.7)	1.5 (1.1)	0.94 (0.72)	1.8 (1.7)	15	0	0	0	0	1	0	0.0017	26	2.7	3.4	5.6 (4.3)	2.4	
White perch – fillet	6	0	0	0	0	0	0	0.0023	82	3.2	13	1.4	2.1	11	0	0	0	0	0	1	0.0022	33	2.3	13	1.5	4.2 (3.2)	
Blue crab – muscle	37	0	0	0	1	0	3	0.0032	29	2.6	24 (23)	3.7	3.5 (1.9)	11	0	0	1	0	0	0	0.0022	11	4.5 (4.2)	44	1.6	2.5	
Blue crab – muscle/hepatopancreas	25	1	0	0	0	0	0	0.0032 (0.0031)	36	4.9	3.3	4.0	1.5 (1.5)	22	0	0	0	0	0	1	0.0041	25	5.0	13	3.8	3.0 (2.2)	
Blue crab – hepatopancreas	30	0	1	0	0	0	1	0.0037	100 (47)	9.9	0.68	2.2	1.7 (1.5)	5	0	0	0	0	0	1	0.0025	15	5.0	0.92	3.9	2.3 (1.3)	
Wet-Weight Data (µg/kg)																											
American eel – fillet	7	0	0	1	0	0	1	22	3,244	331 (220)	396	20	41 (37)	6	0	1	0	0	0	1	21	1,838 (1,346)	227	420	16	30 (26)	
Carp – fillet	9	-	0	0	-	-	-	no data	830	138	no data	no data	no data	4	-	0	0	-	-	-	no data	6,600	605	no data	no data	no data	
Mummichog – whole body	59	3	0	4	5	1	0	77 (51)	1,175	66 (52)	40 (34)	26 (22)	57	15	0	0	0	0	1	0	34	512	53	60	116 (86)	48	
White perch – fillet	6	0	0	0	1	0	0	65	2,359	92	363 (350)	41	59	11	1	0	0	1	0	0	49 (44)	724	49	262 (218)	32	90	
Blue crab – muscle	37	0	0	1	0	1	1	14	121	13 (12)	133	16	15	11	0	0	0	0	1	0	11	58	22	216	8.9 (7.0)	13	
Blue crab – muscle/hepatopancreas	25	0	0	0	0	0	0	71	787	107	66	85	32	22	0	0	0	0	0	2	62	377	73	177	53	46 (29)	
Blue crab – hepatopancreas	30	0	2	0	0	1	1	296	7,719 (2,613)	767	73	148 (120)	124 (89)	5	0	0	0	0	0	1	176	1,128	366	64	314	195 (88)	

Notes:
Bold values indicate significance using 2-sided Mann-Whitney U Test, α = 0.05
a Outlier determination based on 3 x interquartile range (IQR)
b Average including outliers presented
c Values provided in parentheses are the average value of all data, excluding 3 x IQR outliers
d Wet-weight units for 2,3,7,8-TCDD are in nanograms per kilogram
µg/kg: microgram per kilogram
HMW: high molecular weight
LMW: low molecular weight
mg/kg: milligram per kilogram

PAH: polycyclic aromatic hydrocarbon
PCB: polychlorinated biphenyl
RM: river mile
TCDD: tetrachlorodibenzo-p-dioxin

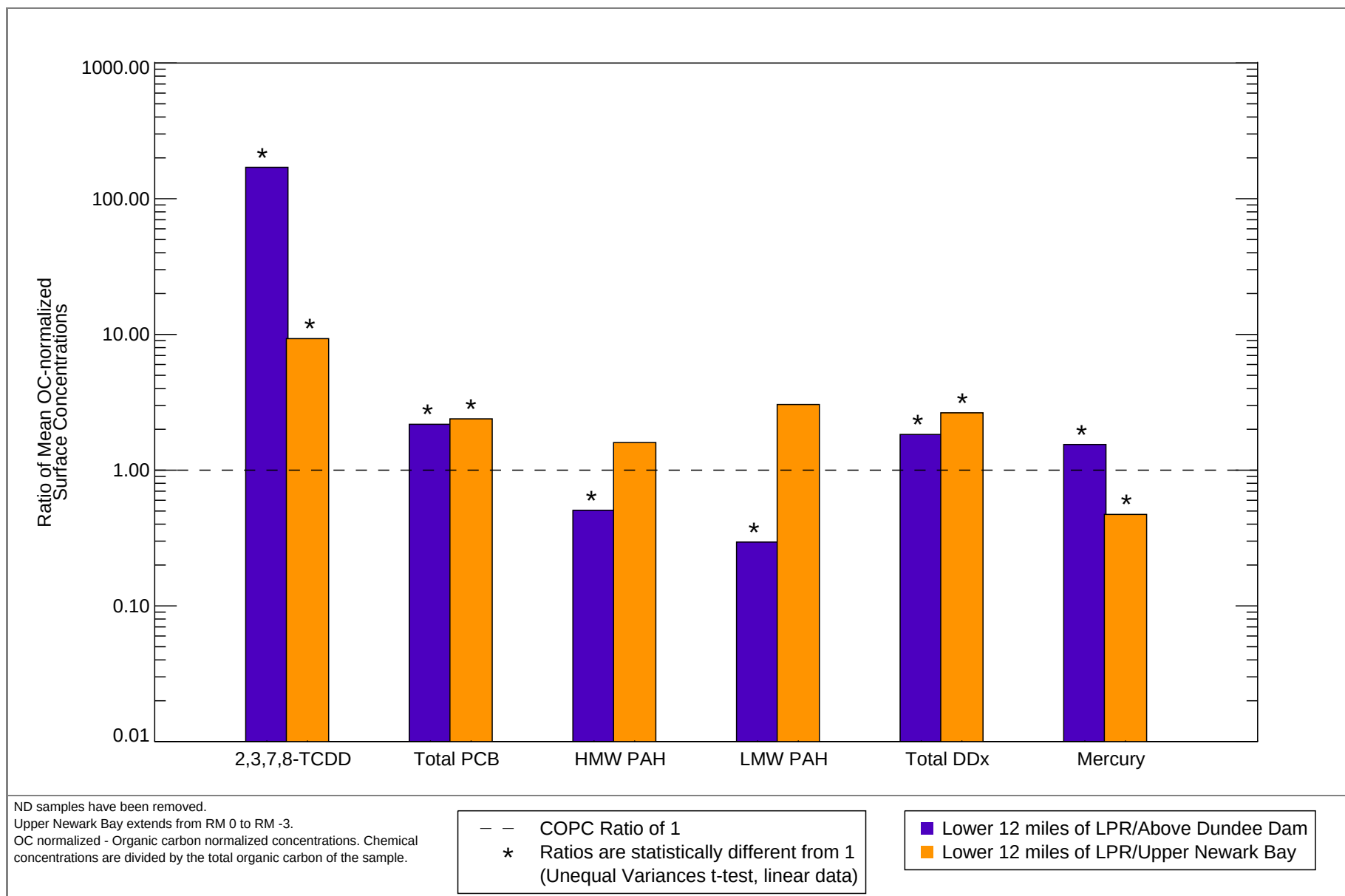
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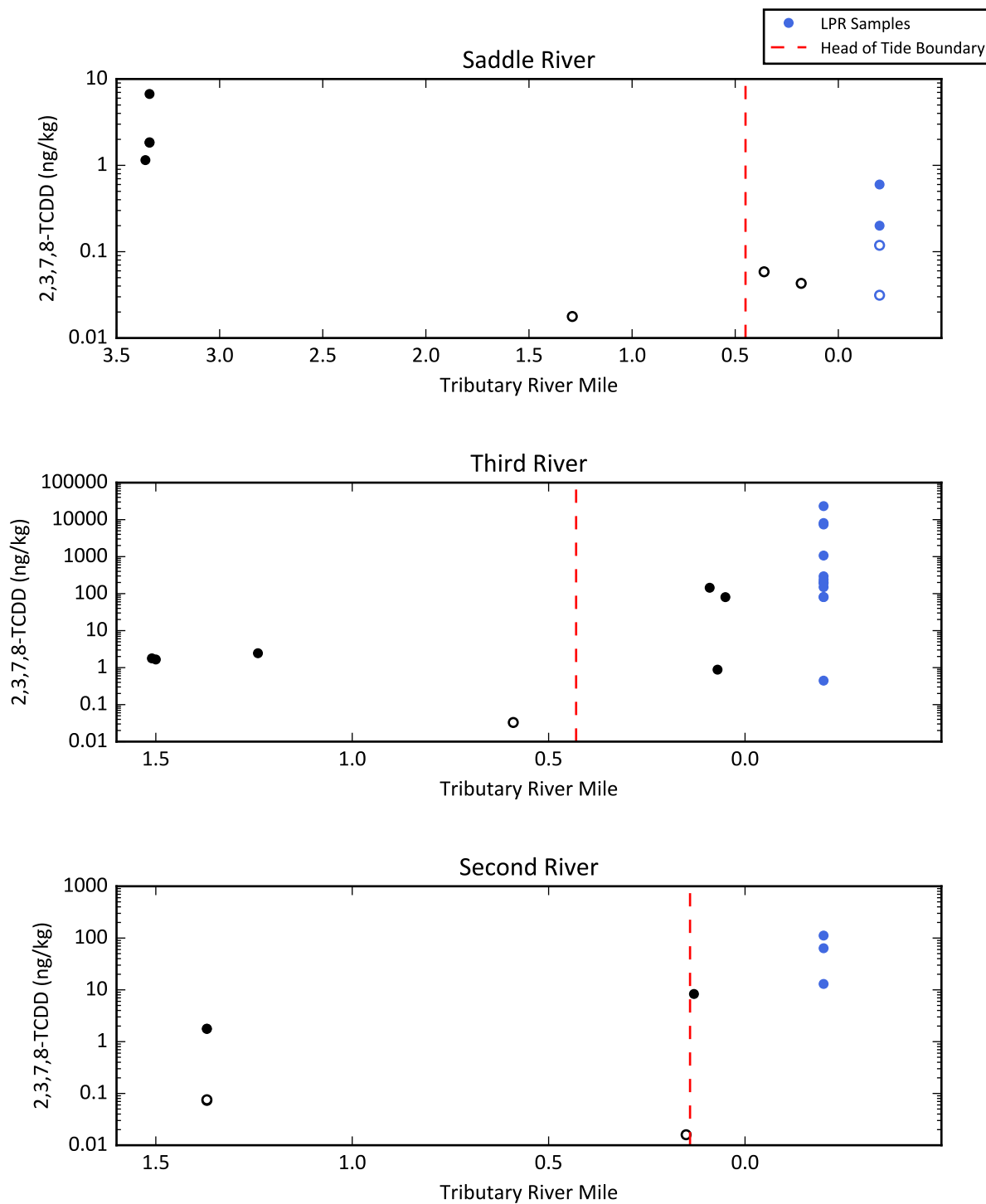
Figure 10-1
Methods of Natural Recovery

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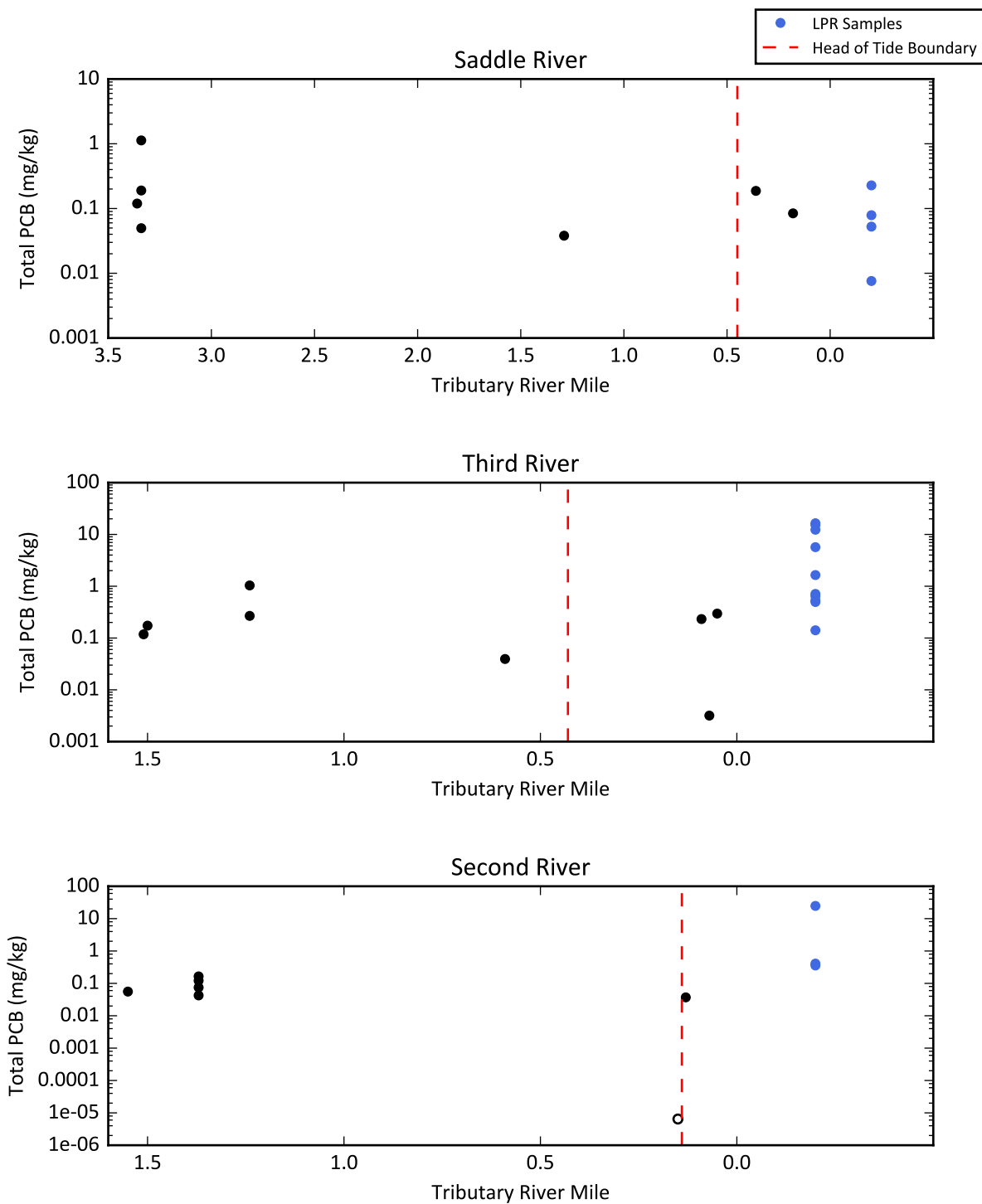
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Figure 10-2
Ratios of Mean Contaminant Levels in Surface Sediments in LPR and Nearby Regions



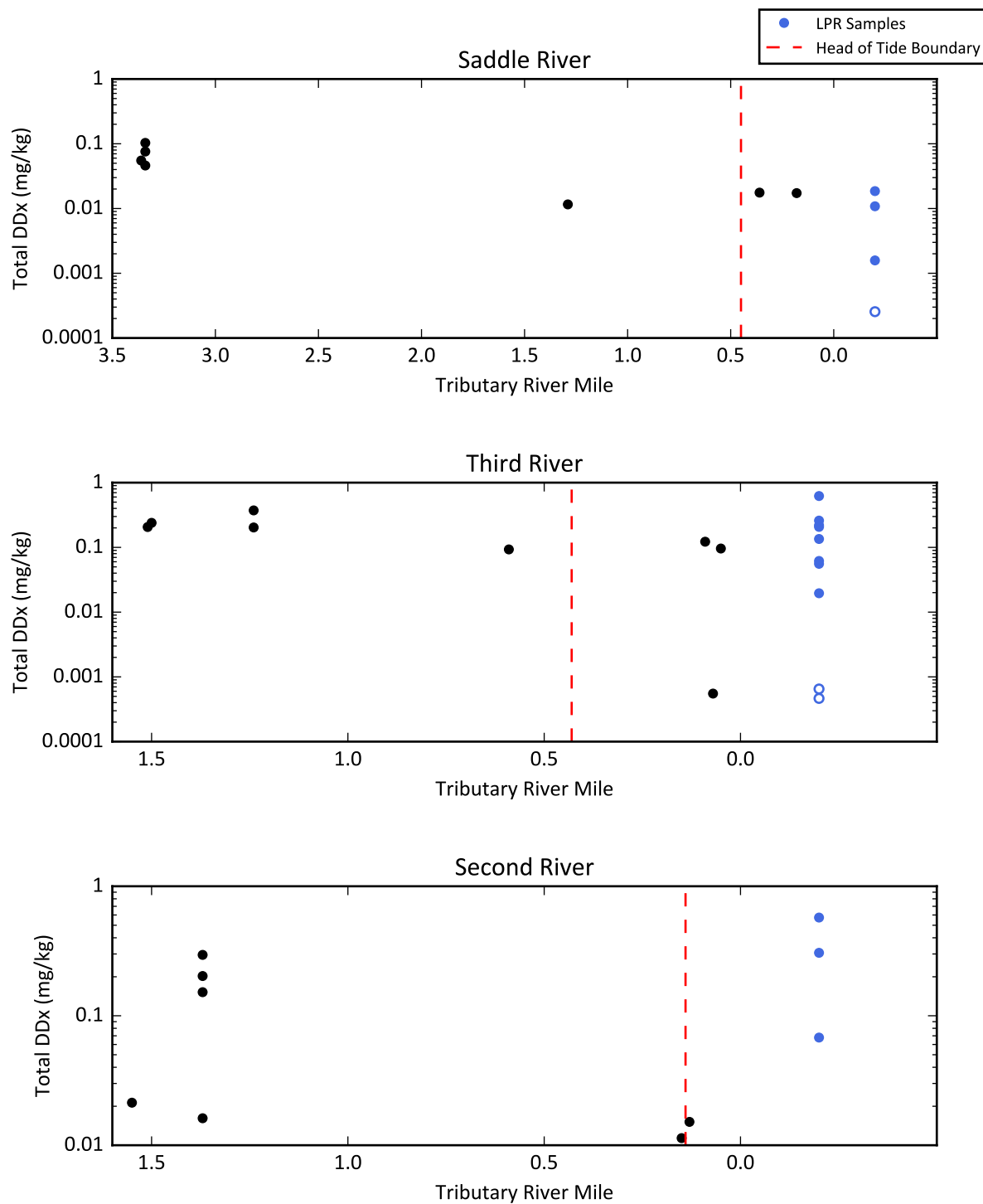
Plots include all post 2005 data with bottom depths less than 6 inches.
Blue circles are LPR data within a 500 ft radius of the confluence between the tributary and the LPR. Blue circles are plotted at -0.2 on the x-axis for visualization purposes.
Non detects plotted with unfilled symbols at 1/2 the detection limit. River Mile 0 is at the tributary mouth along the Passaic River.

Figure 10-3a
Concentrations in Tributary Surface Sediments for 2,3,7,8-TCDD
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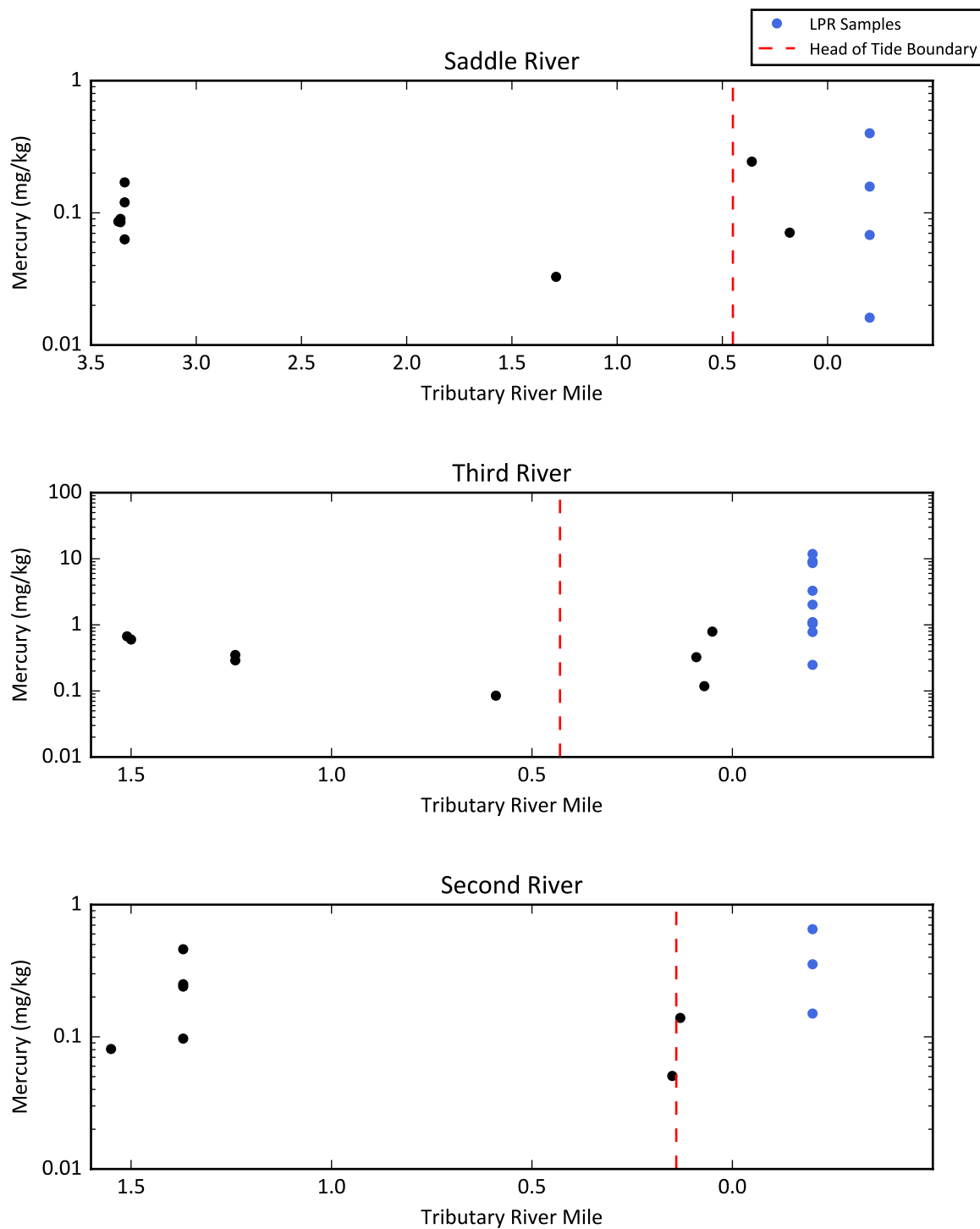
Plots include all post 2005 data with bottom depths less than 6 inches.
 Blue circles are LPR data within a 500 ft radius of the confluence between the tributary and the LPR. Blue circles are plotted at -0.2 on the x-axis for visualization purposes.
 Non detects plotted with unfilled symbols at 1/2 the detection limit. River Mile 0 is at the tributary mouth along the Passaic River.

Figure 10-3b
Concentrations in Tributary Surface Sediments for Total PCB
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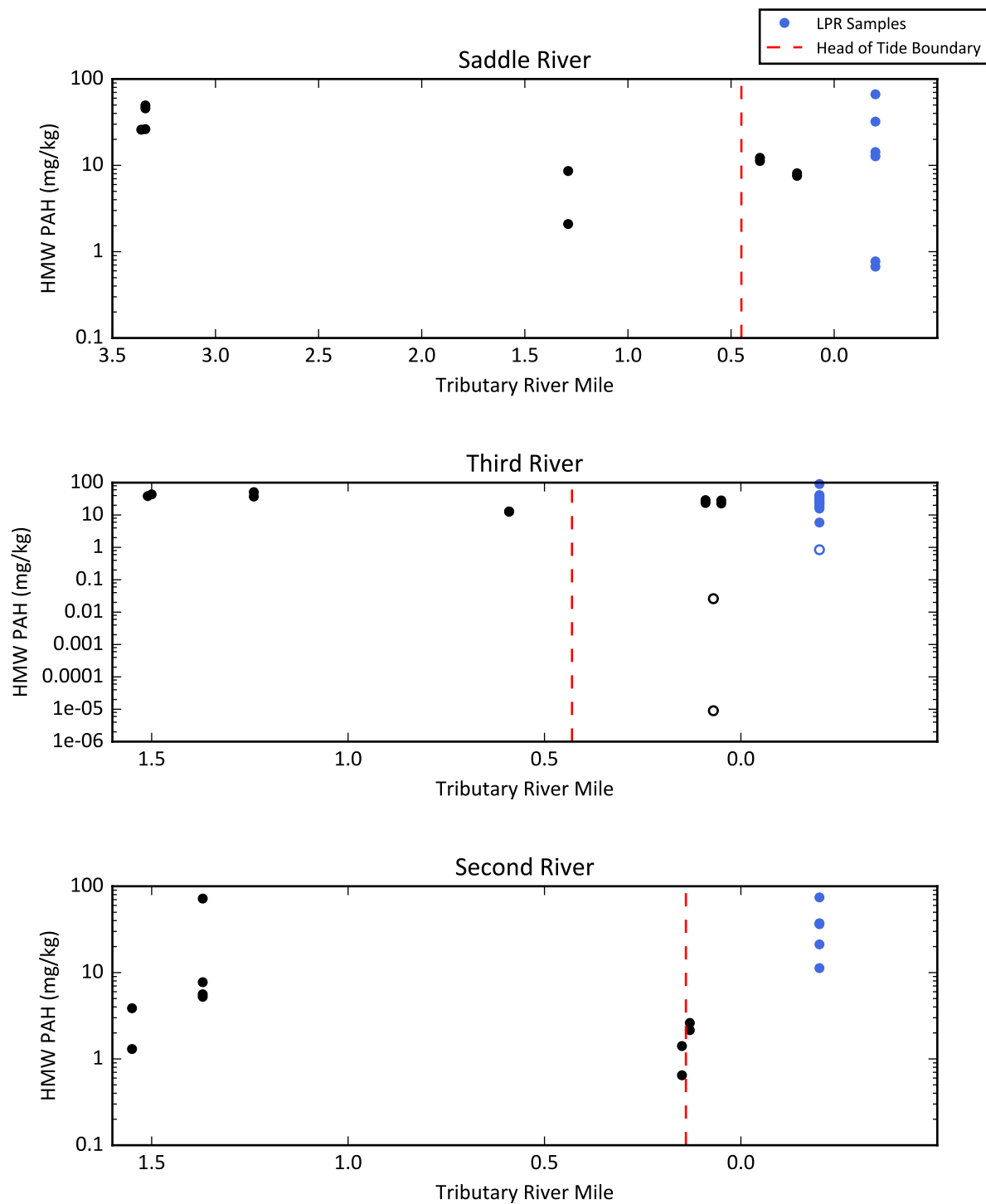
Plots include all post 2005 data with bottom depths less than 6 inches.
 Blue circles are LPR data within a 500 ft radius of the confluence between the tributary and the LPR. Blue circles are plotted at -0.2 on the x-axis for visualization purposes.
 Non detects plotted with unfilled symbols at 1/2 the detection limit. River Mile 0 is at the tributary mouth along the Passaic River.
 Total DDx is the sum of 6 congeners for concentrations.

Figure 10-3c
Concentrations in Tributary Surface Sediments for Total DDx
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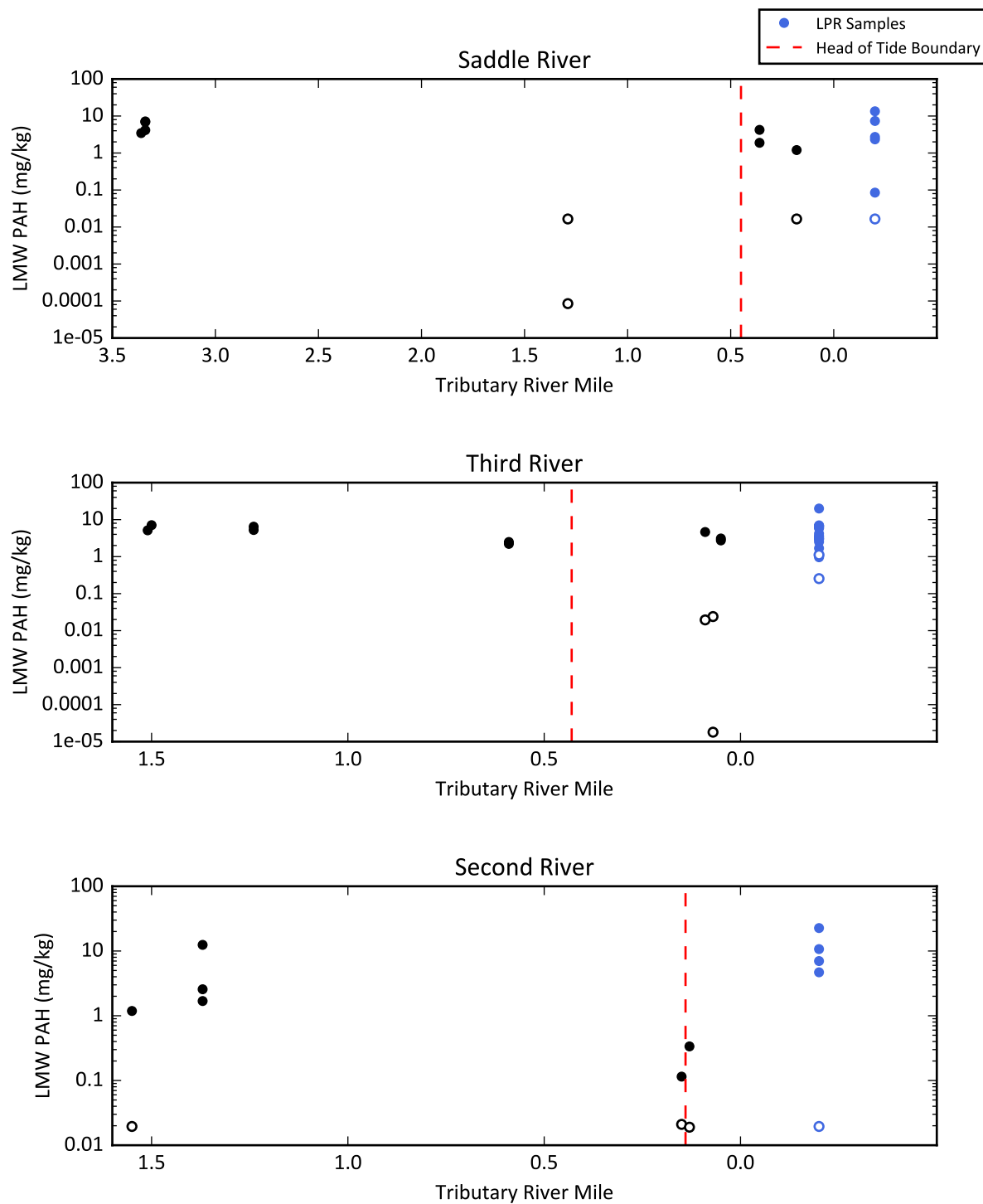
Plots include all post 2005 data with bottom depths less than 6 inches.
 Blue circles are LPR data within a 500 ft radius of the confluence between the tributary and the LPR. Blue circles are plotted at -0.2 on the x-axis for visualization purposes.
 Non detects plotted with unfilled symbols at 1/2 the detection limit. River Mile 0 is at the tributary mouth along the Passaic River.

Figure 10-3d
Concentrations in Tributary Surface Sediments for Mercury
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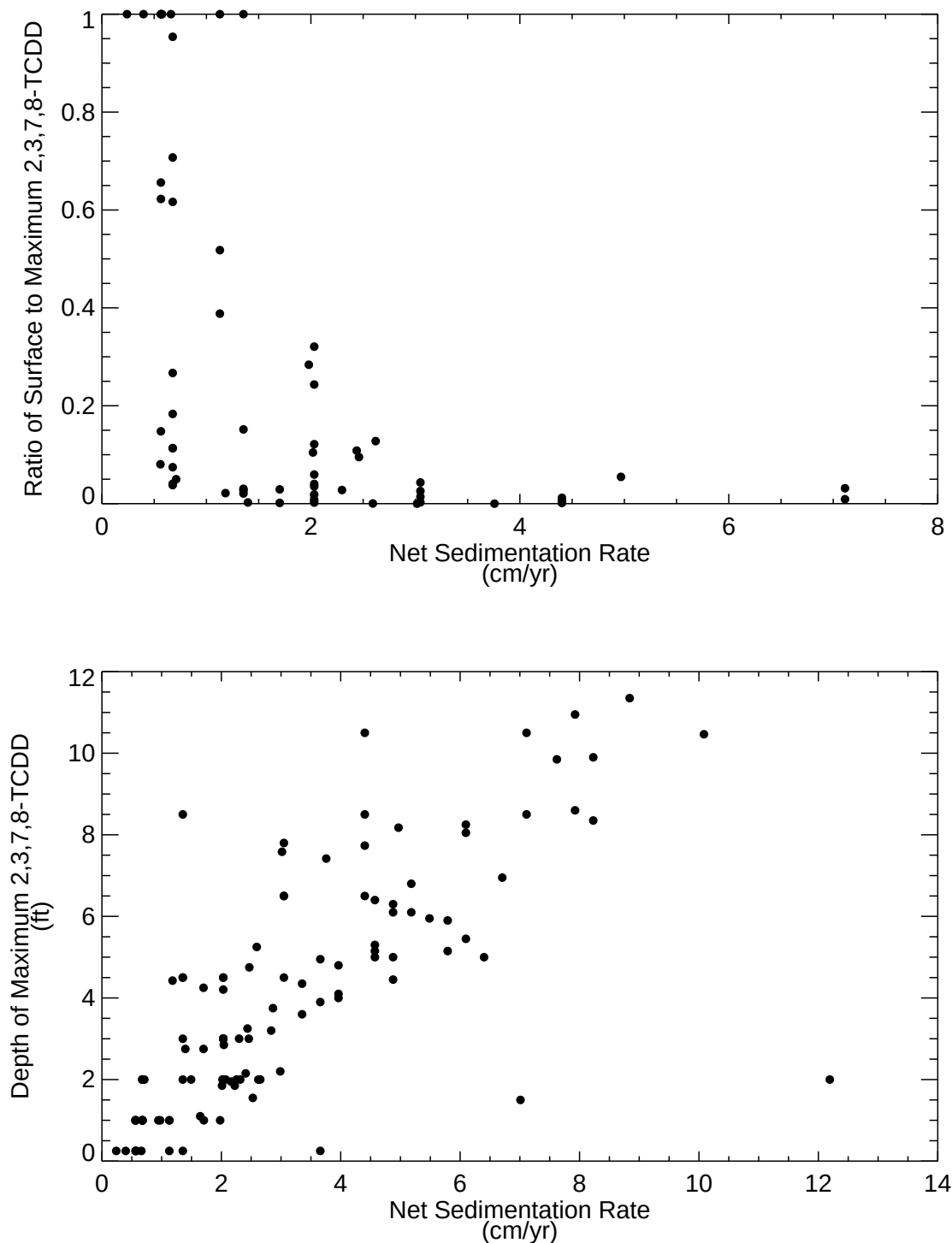
Plots include all post 2005 data with bottom depths less than 6 inches.
 Blue circles are LPR data within a 500 ft radius of the confluence between the tributary and the LPR. Blue circles are plotted at -0.2 on the x-axis for visualization purposes.
 Non detects plotted with unfilled symbols at 1/2 the detection limit. River Mile 0 is at the tributary mouth along the Passaic River.

Figure 10-3e
Concentrations in Tributary Surface Sediments for HMW PAH
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Plots include all post 2005 data with bottom depths less than 6 inches.
 Blue circles are LPR data within a 500 ft radius of the confluence between the tributary and the LPR. Blue circles are plotted at -0.2 on the x-axis for visualization purposes.
 Non detects plotted with unfilled symbols at 1/2 the detection limit. River Mile 0 is at the tributary mouth along the Passaic River.

Figure 10-3f
Concentrations in Tributary Surface Sediments for LMW PAH
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Only detected samples plotted.

Surface data use post 2005 data with bottom depths less than 6 inches.

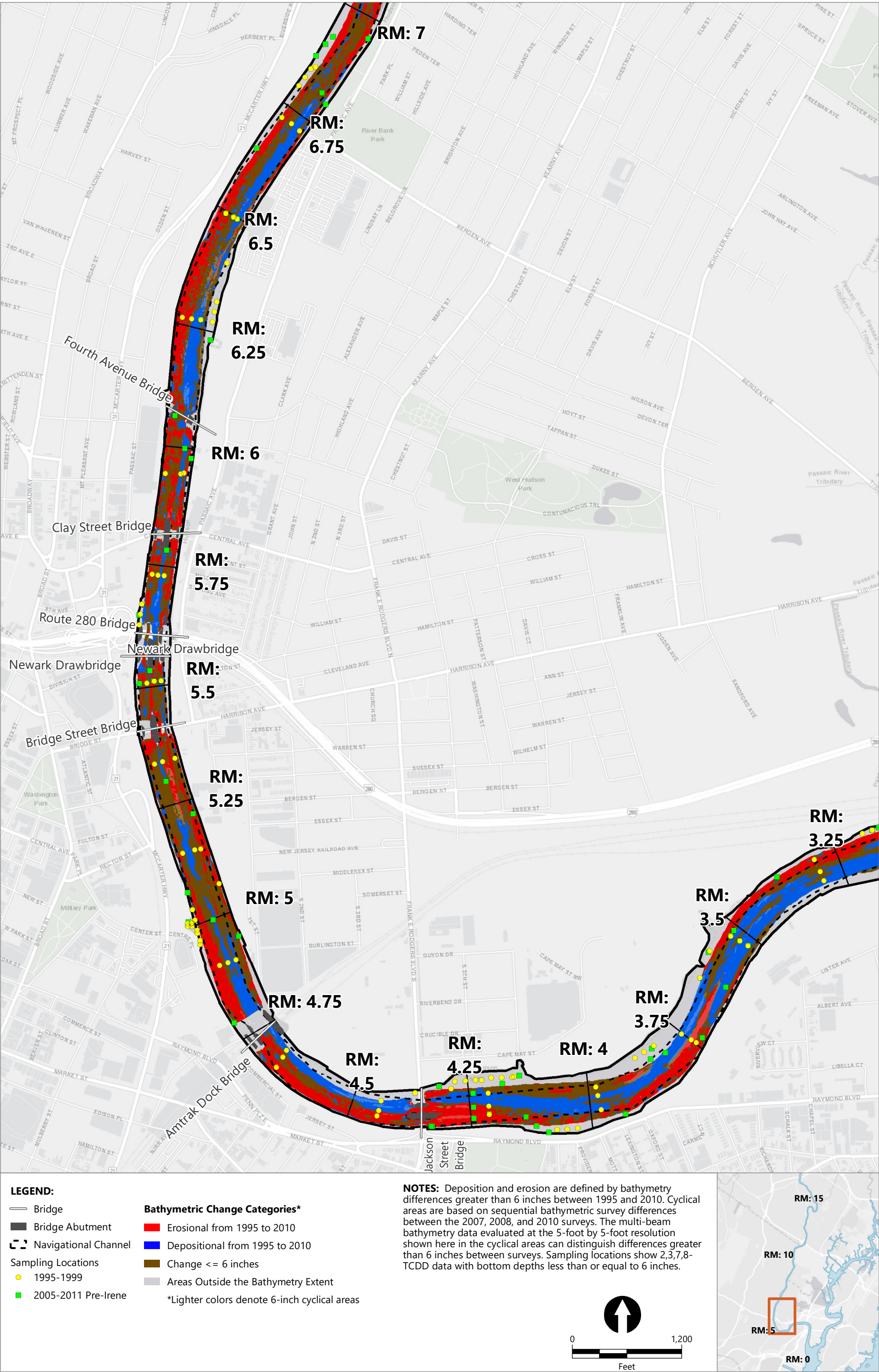
Data between RM 1.9 and RM 17.4 used in analysis. Data below RM 1.9 not included because of potential impacts of navigational dredging.

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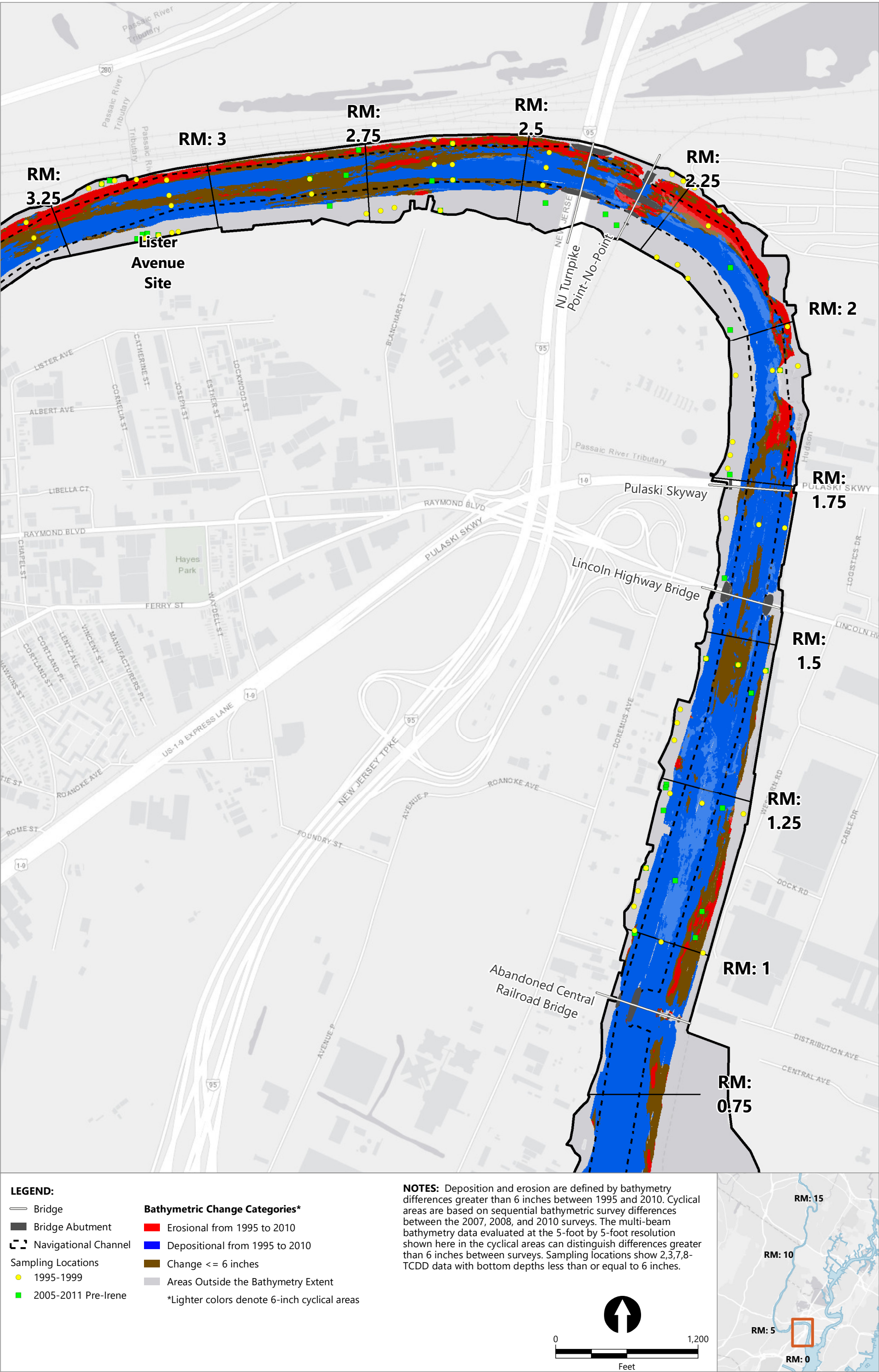
Figure 10-4
2,3,7,8-TCDD: Recovery in the LPR

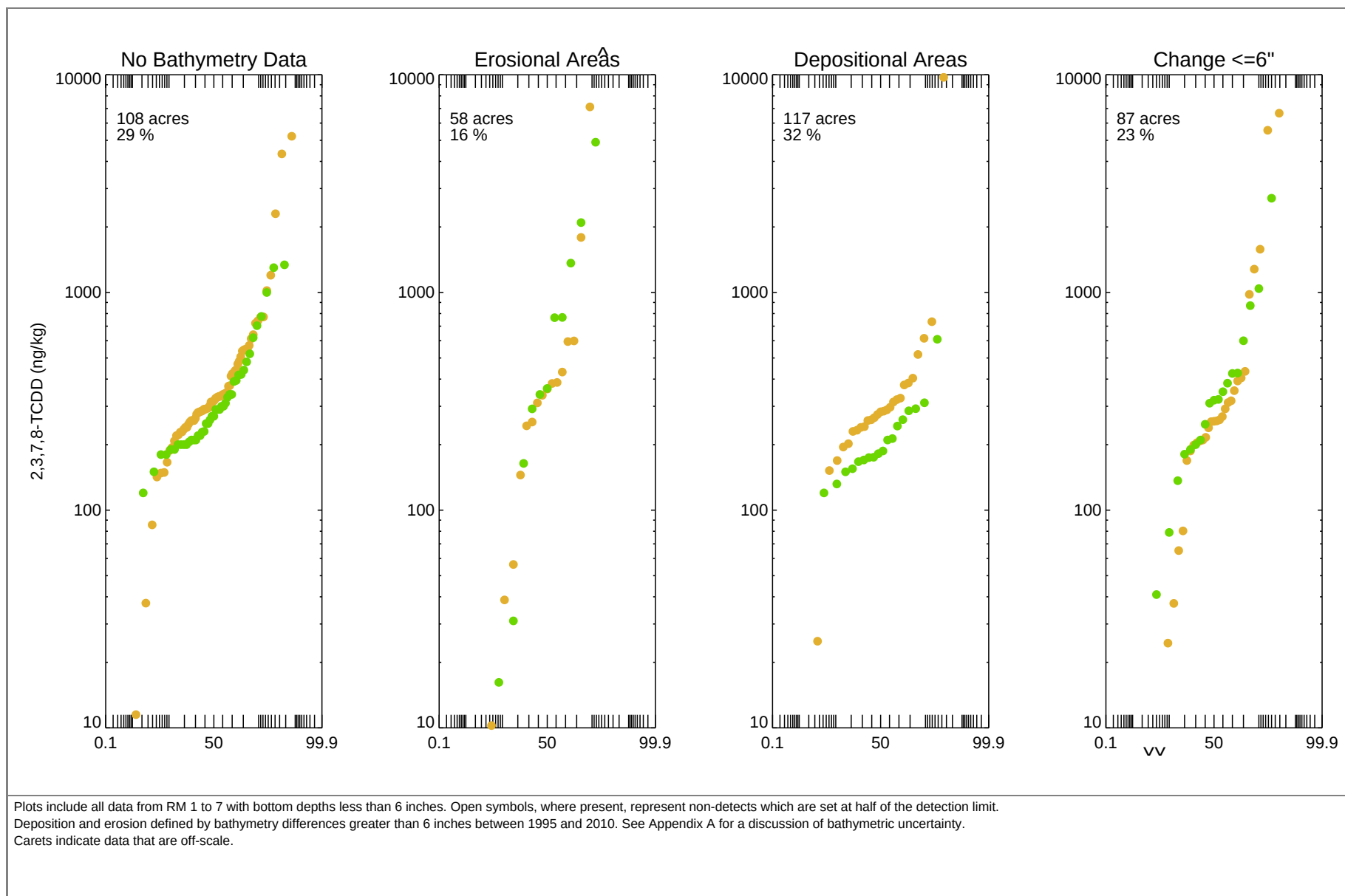
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Figure 10-5a
Bathymetric Change Greater than 6 Inches Between 1995 and 2010 in RM 1-7
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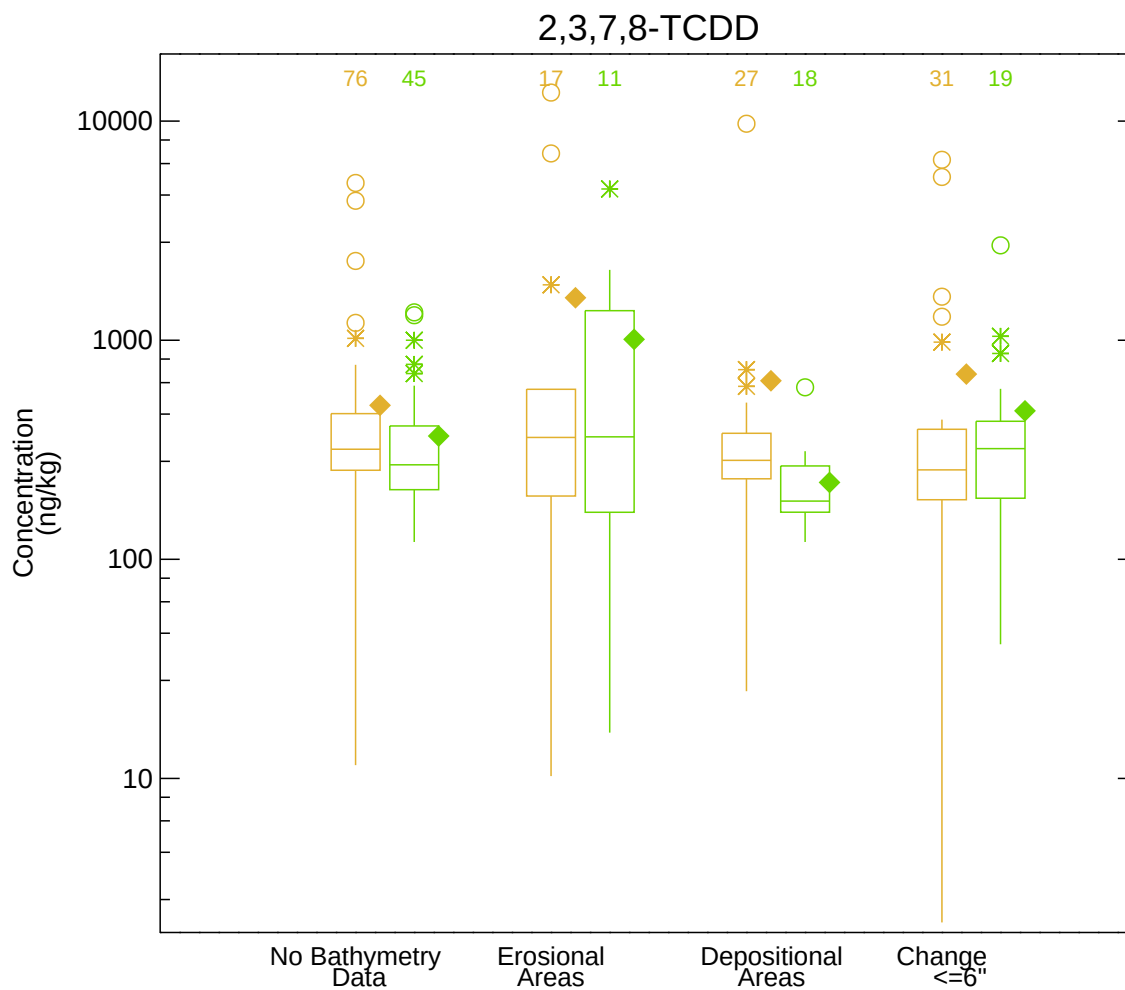


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- 1995-1999
- 2005-2011 Pre-Irene

Figure 10-6

Comparison of 1995 and 2011 Pre-Irene Surface Sediment Concentrations for 2,3,7,8-TCDD: RM 1-7, 6" Cyclical Remedial Investigation Report
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Plots include all data from RM 1 to 7 with bottom depths less than 6 inches.
 Deposition and erosion defined by bathymetry differences greater than 6 inches between 1995 and 2010.
 See Appendix A for a discussion of bathymetric uncertainty.
 Filled diamonds indicate the mean of the data. Medians denoted as lines bisecting the box.
 Outer outliers are plotted as unfilled circles. Inner outliers are plotted as asterisks.
 See Section 4, Figure 4.1-5 for more information on Tukey box plots.
 A * after the bathymetric category indicates that means are significantly different between 1995 and 2010 based on a t-test on log-transformed data.

● 1995-1999
 ● 2005-2011 Pre-Irene

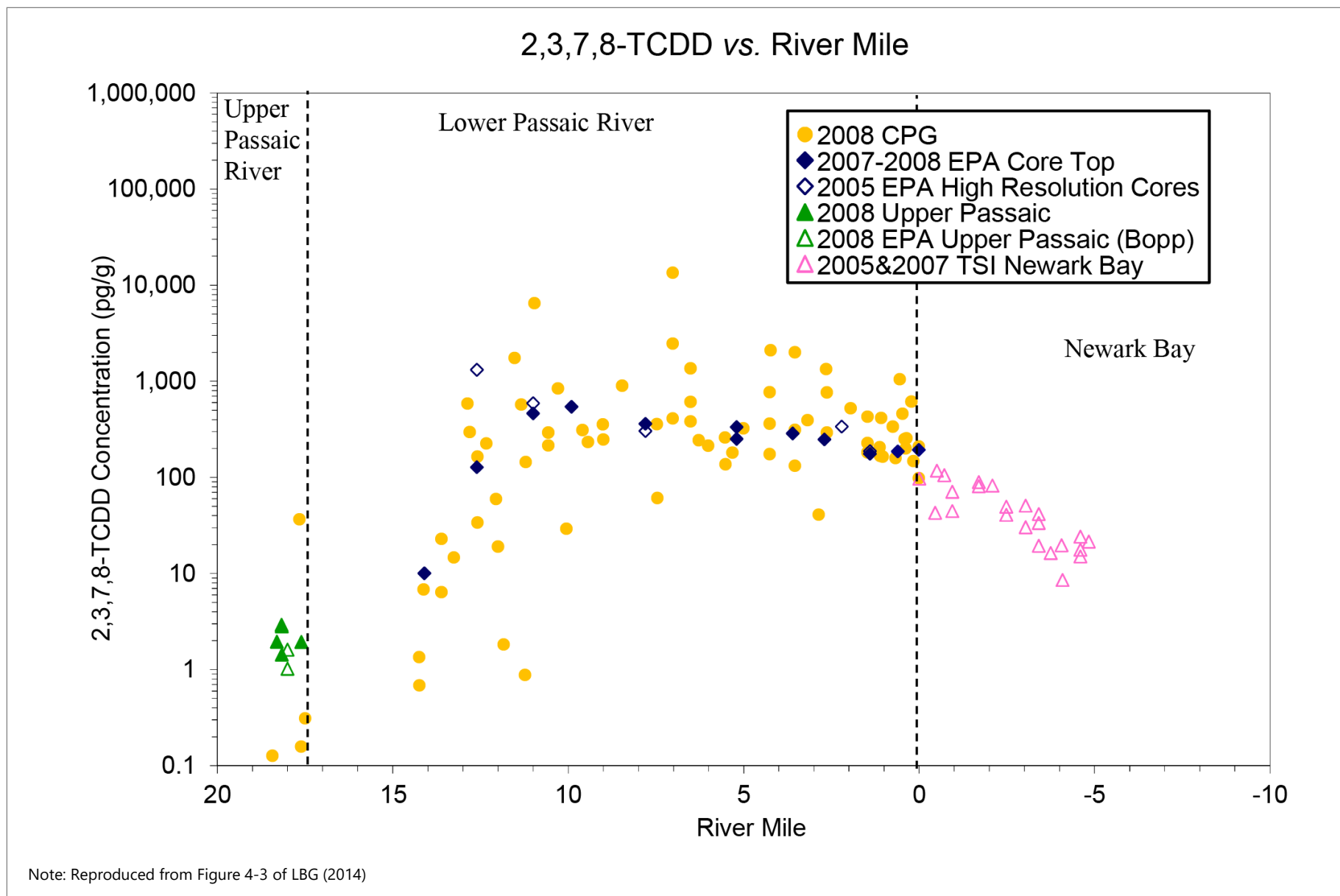
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Figure 10-7

2,3,7,8-TCDD Concentrations by Bathymetric Category in Surface Sediments: RM 1-7

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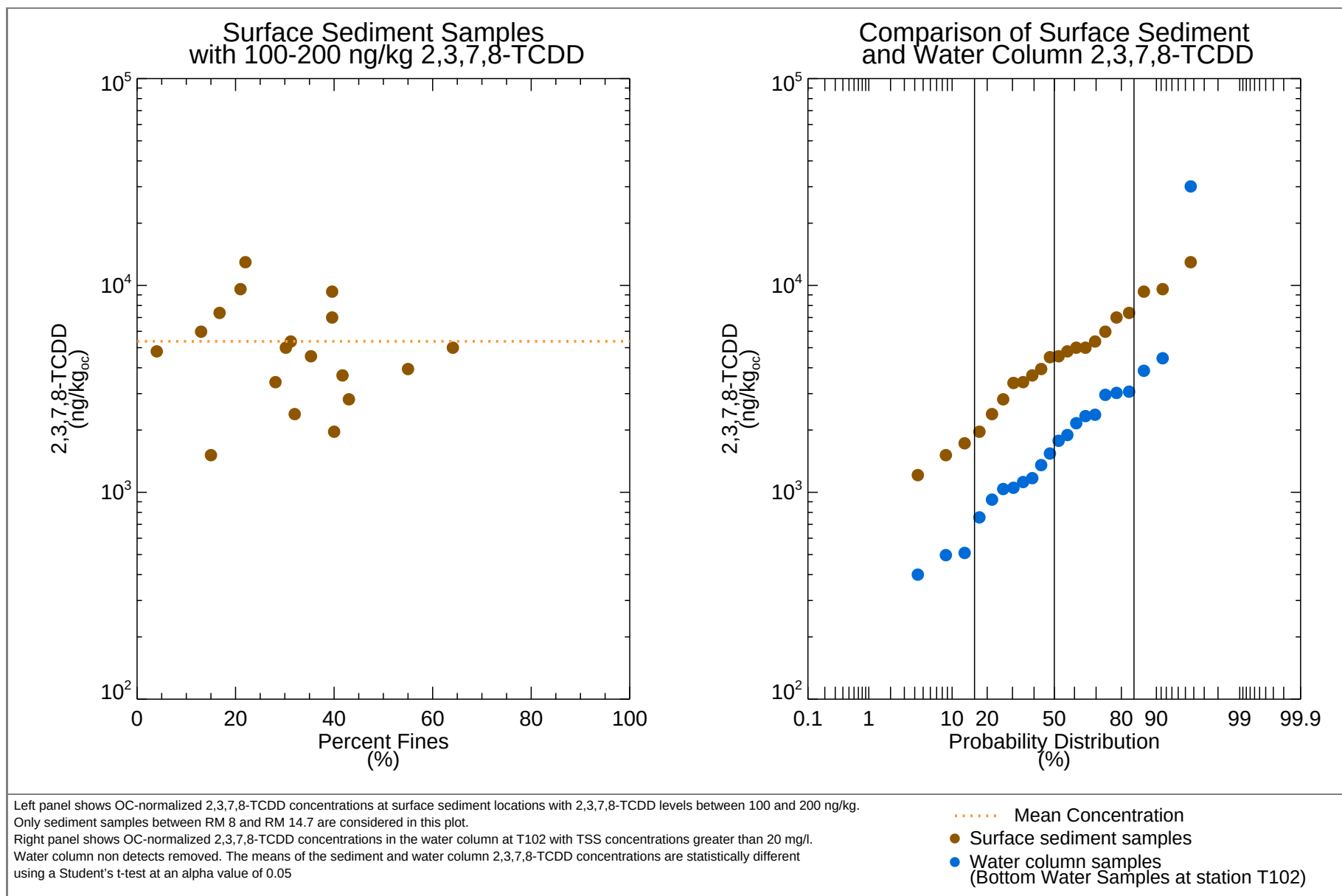


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Figure 10-8

2,3,7,8-TCDD in Recently Deposited Sediments in the Lower Passaic River, Newark Bay, and the Upper Passaic River

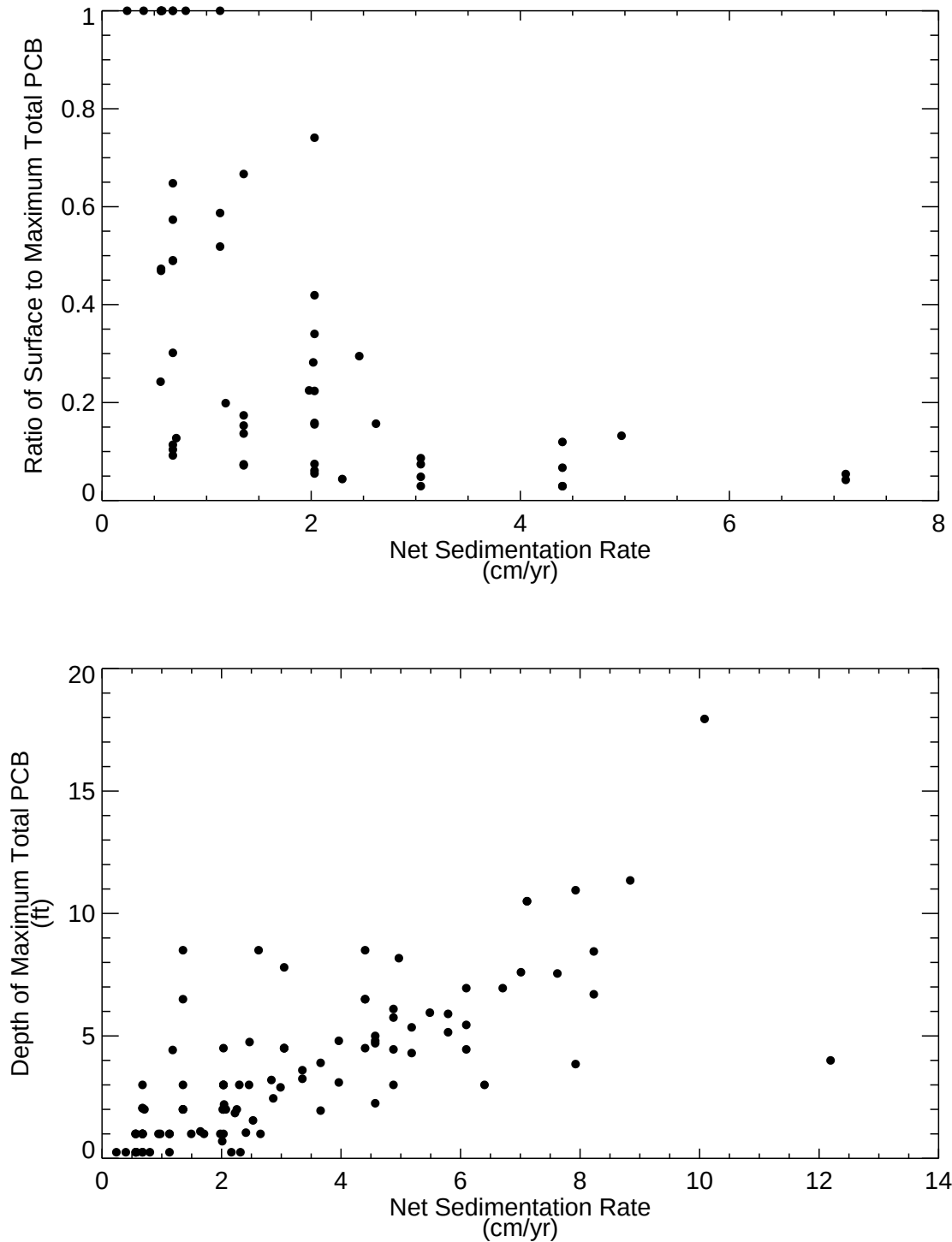
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Figure 10-9
OC-Normalized 2,3,7,8-TCDD Concentrations

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Only detected samples plotted.

Surface data use post 2005 data with bottom depths less than 6 inches.

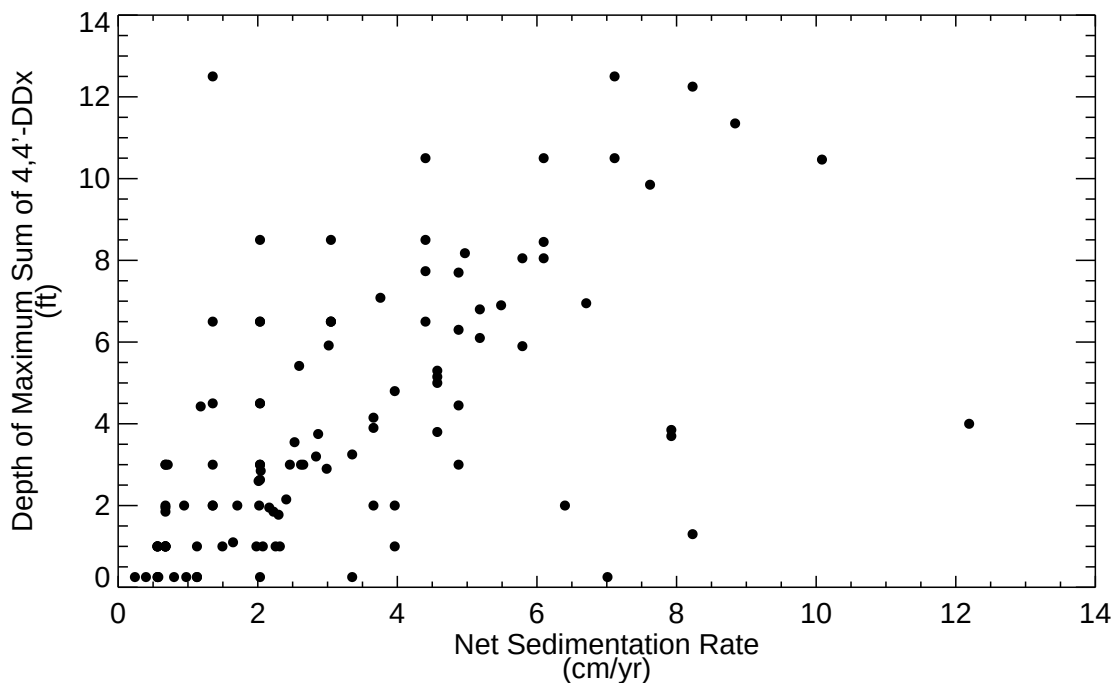
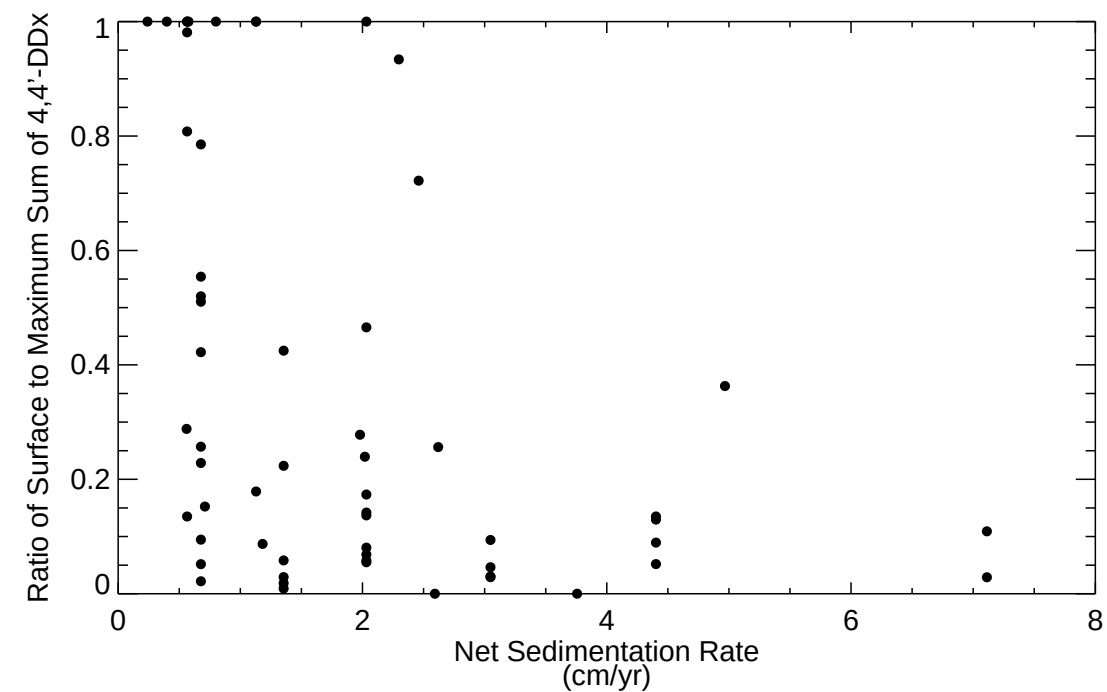
Data between RM 1.9 and RM 17.4 used in analysis. Data below RM 1.9 not included because of potential impacts of navigational dredging.

Publish Date: 06/10/2019 17:10 | User: SM/EP

File Path: H:\Passaic_CPG\DOCUMENTS\2019\RI_Report\source\5\10\twopanel_recovery_plots_noaqdeprates.pro

Figure 10-10
Total PCB: Recovery in the LPR

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Only detected samples plotted.

Surface data use post 2005 data with bottom depths less than 6 inches.

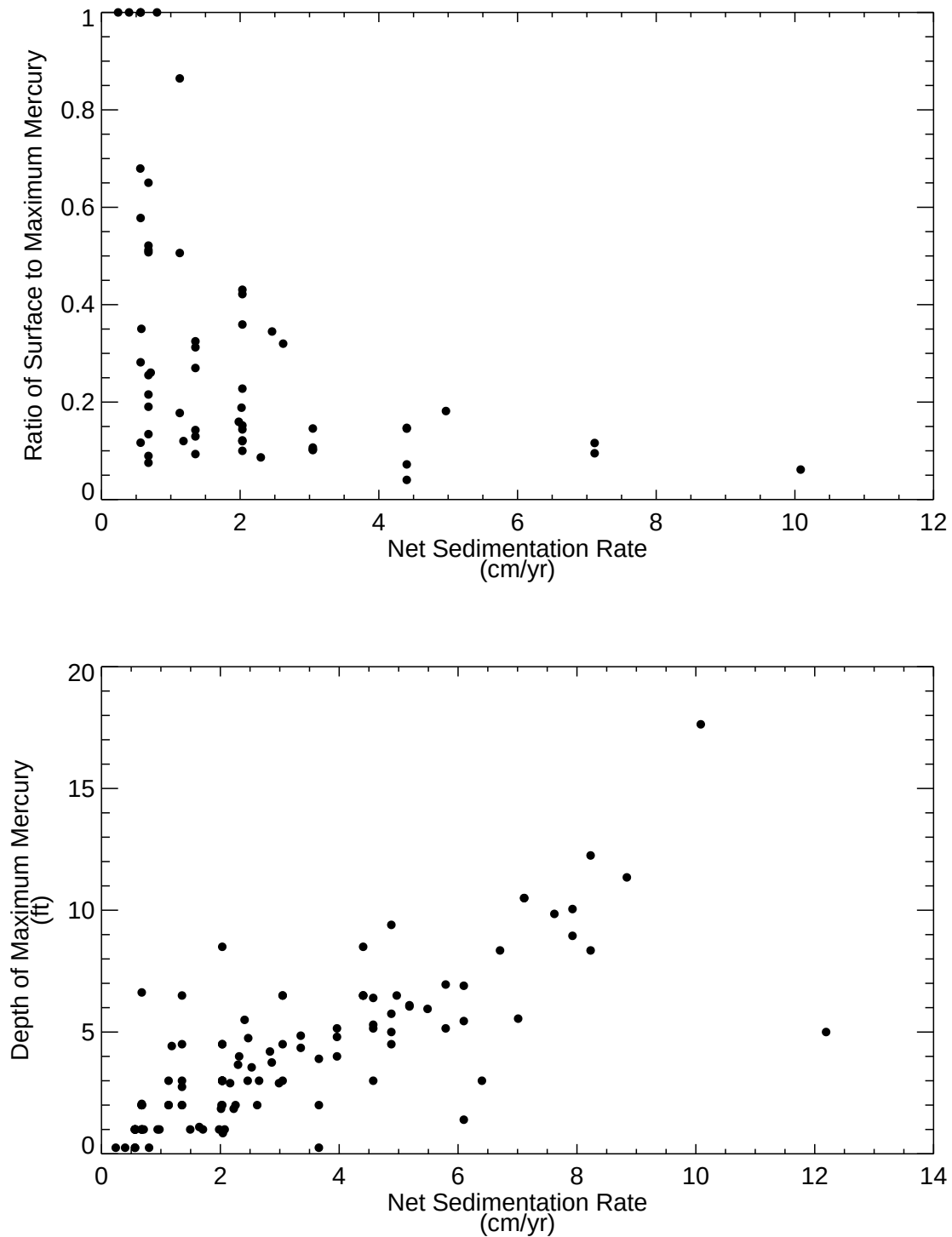
Data between RM 1.9 and RM 17.4 used in analysis. Data below RM 1.9 not included because of potential impacts of navigational dredging.

Publish Date: 06/10/2019 17:10 | User: SM/EP

File Path: H:\Passaic_CPG\DOCUMENTS\2019\RI_Report\source\5\10\twopanel_recovery_plots_noaqdeprates.pro

Figure 10-11
Sum of 4,4'-DDx: Recovery in the LPR

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Only detected samples plotted.

Surface data use post 2005 data with bottom depths less than 6 inches.

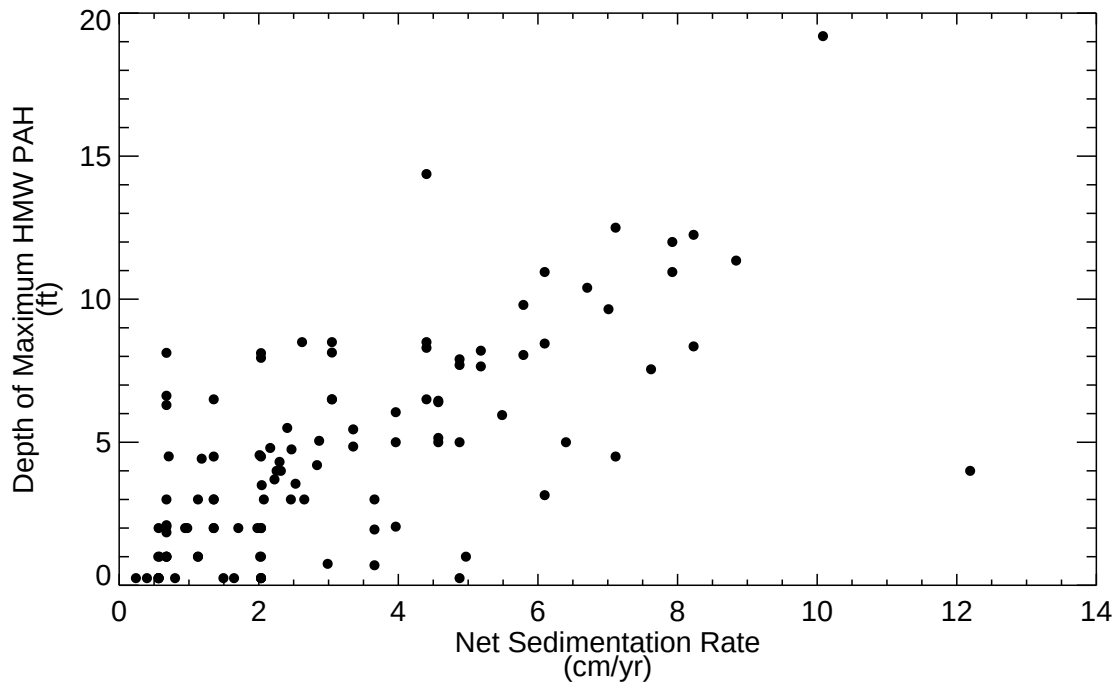
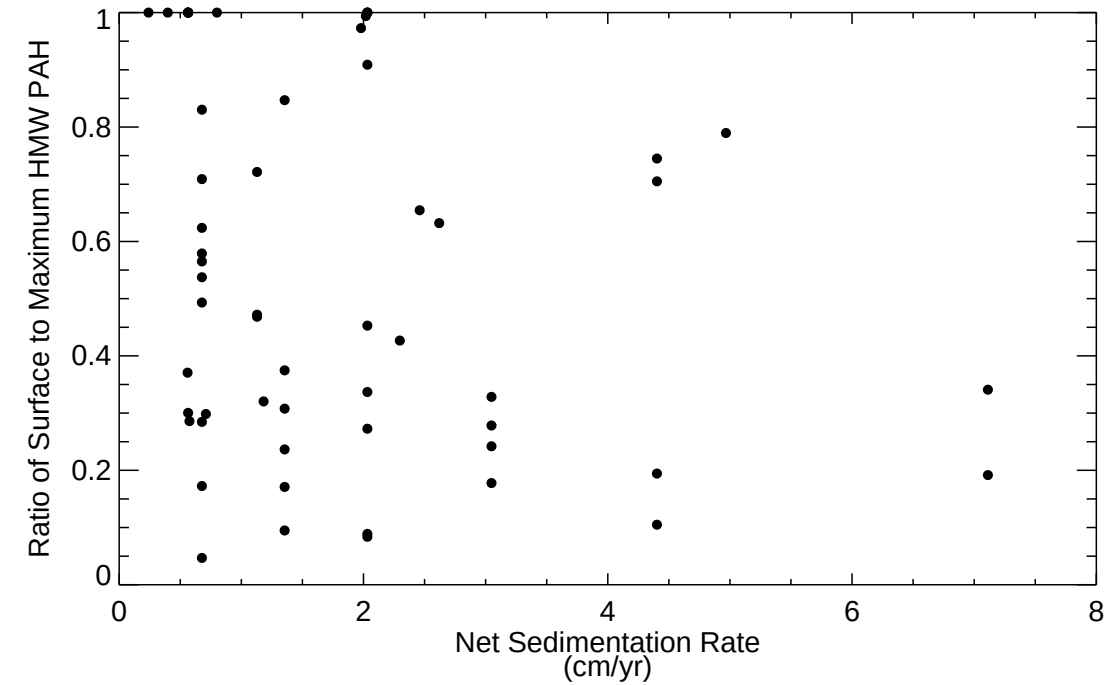
Data between RM 1.9 and RM 17.4 used in analysis. Data below RM 1.9 not included because of potential impacts of navigational dredging.

Publish Date: 06/10/2019 17:10 | User: SM/EP

File Path: H:\Passaic_CPG\DOCUMENTS\2019\RI_Report\source\5\10\twopanel_recovery_plots_noaqdeprates.pro

Figure 10-12
Mercury: Recovery in the LPR

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Only detected samples plotted.

Surface data use post 2005 data with bottom depths less than 6 inches.

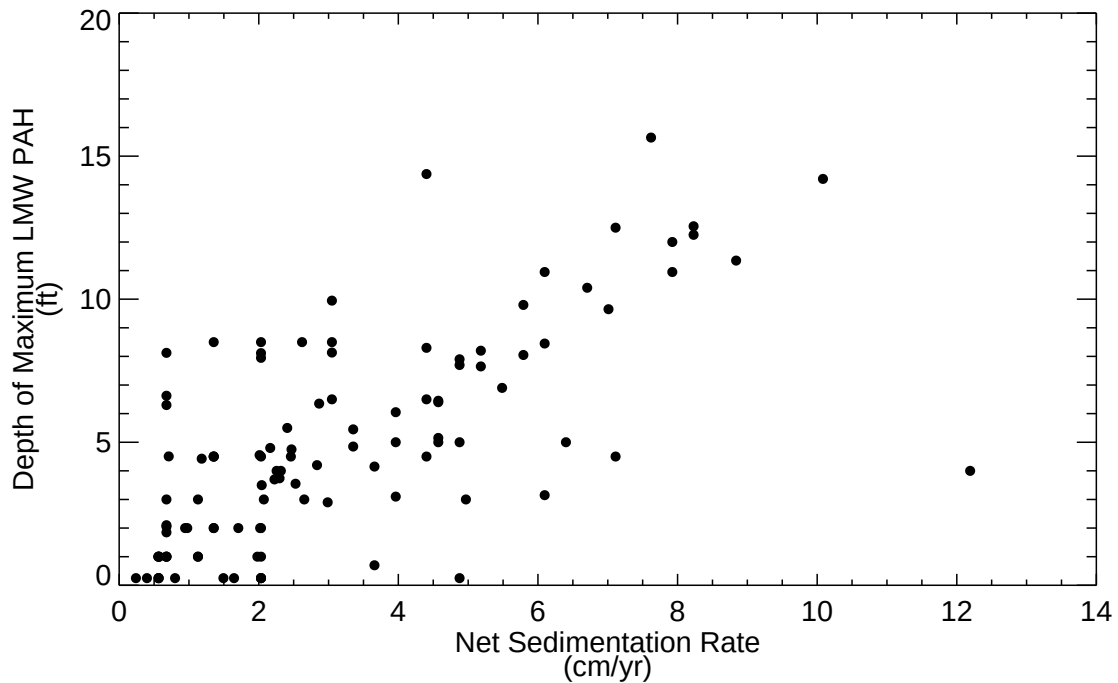
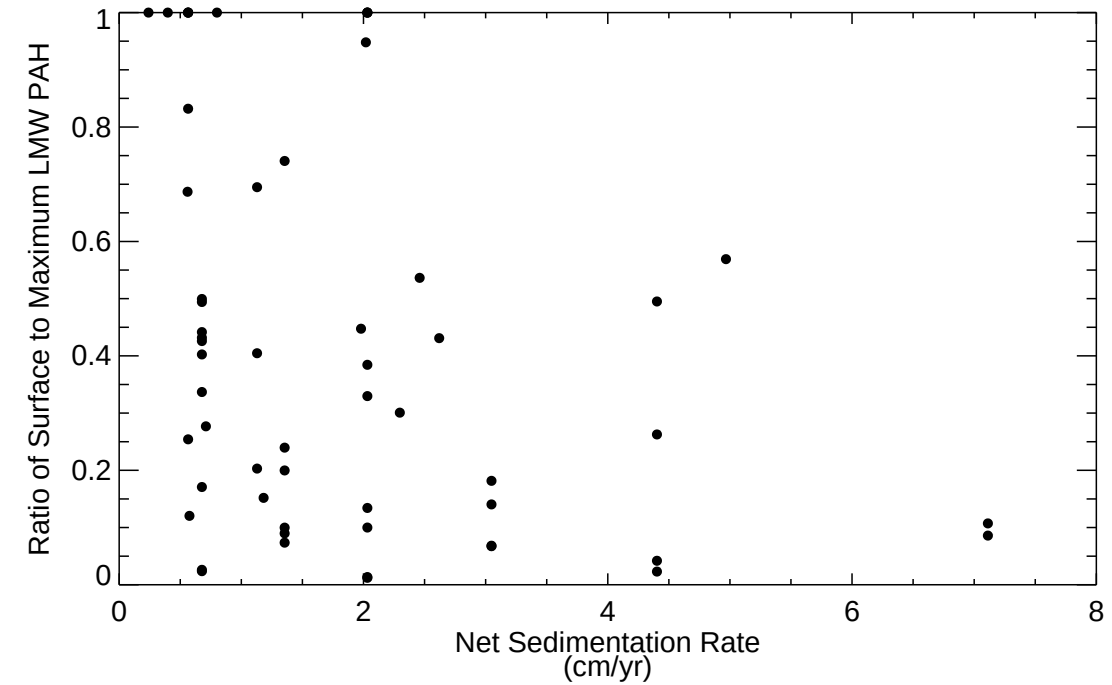
Data between RM 1.9 and RM 17.4 used in analysis. Data below RM 1.9 not included because of potential impacts of navigational dredging.

Publish Date: 06/10/2019 17:10 | User: SM/EP

File Path: H:\Passaic_CPG\DOCUMENTS\2019\RI_Report\source\v5\s10\twopanel_recovery_plots_noaqdeprates.pro

Figure 10-13
HMW PAH: Recovery in the LPR

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Only detected samples plotted.

Surface data use post 2005 data with bottom depths less than 6 inches.

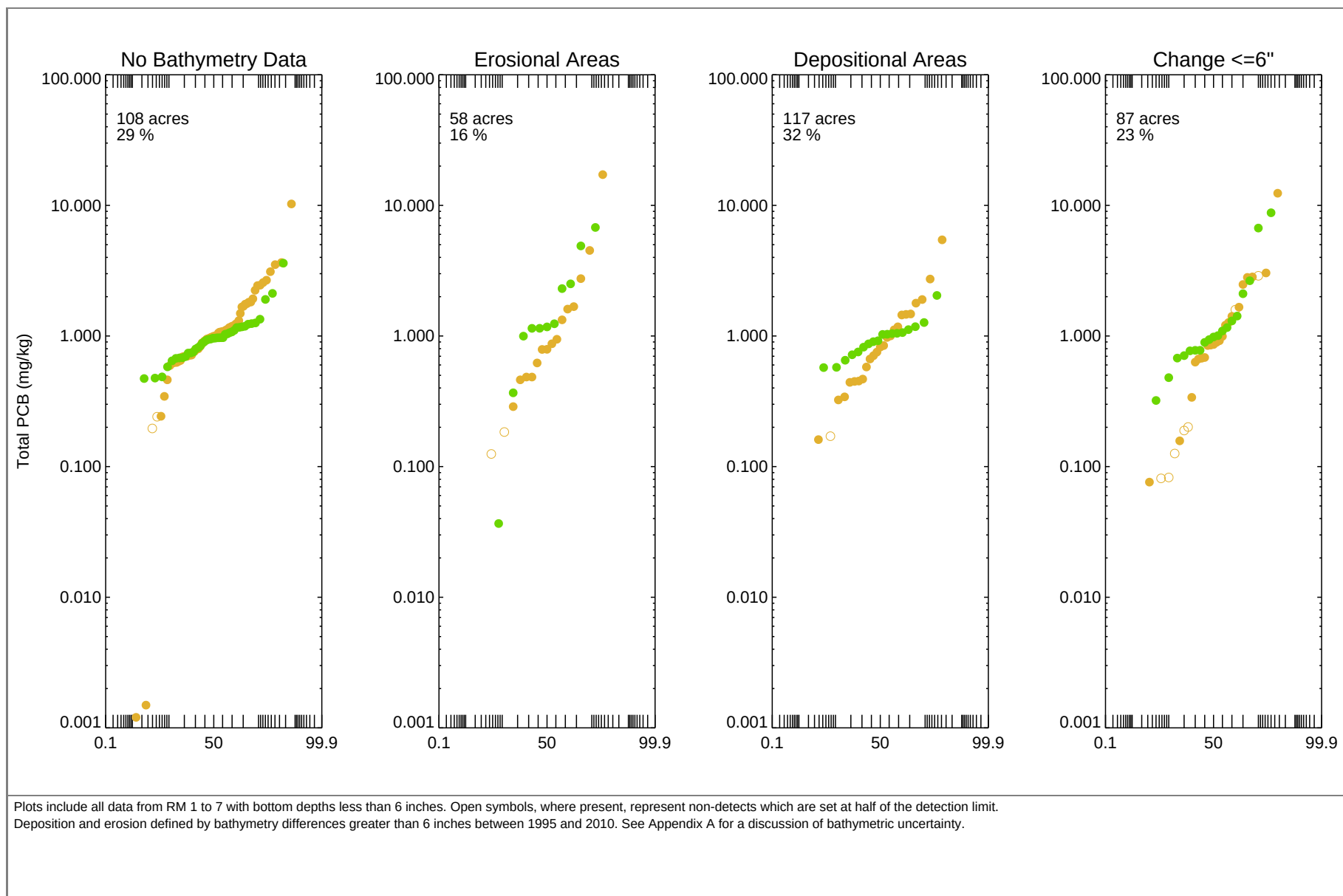
Data between RM 1.9 and RM 17.4 used in analysis. Data below RM 1.9 not included because of potential impacts of navigational dredging.

Publish Date: 06/10/2019 17:10 | User: SM/EP

File Path: H:\Passaic_CPG\DOCUMENTS\2019\RI_Report\source\5\10\twopanel_recovery_plots_noaqdeprates.pro

Figure 10-14
LMW PAH: Recovery in the LPR

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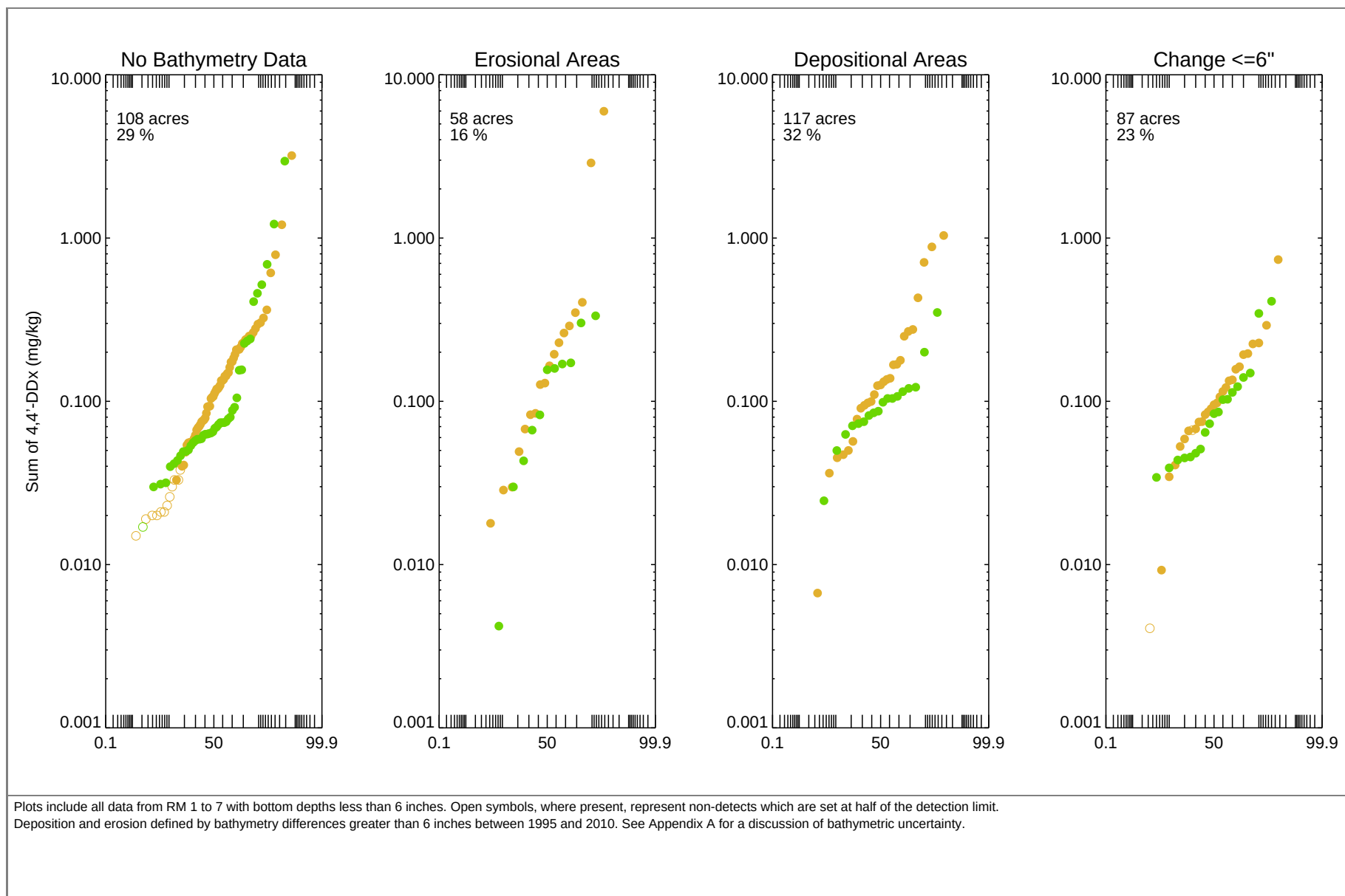


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- 1995-1999
- 2005-2011 Pre-Irene

Figure 10-15

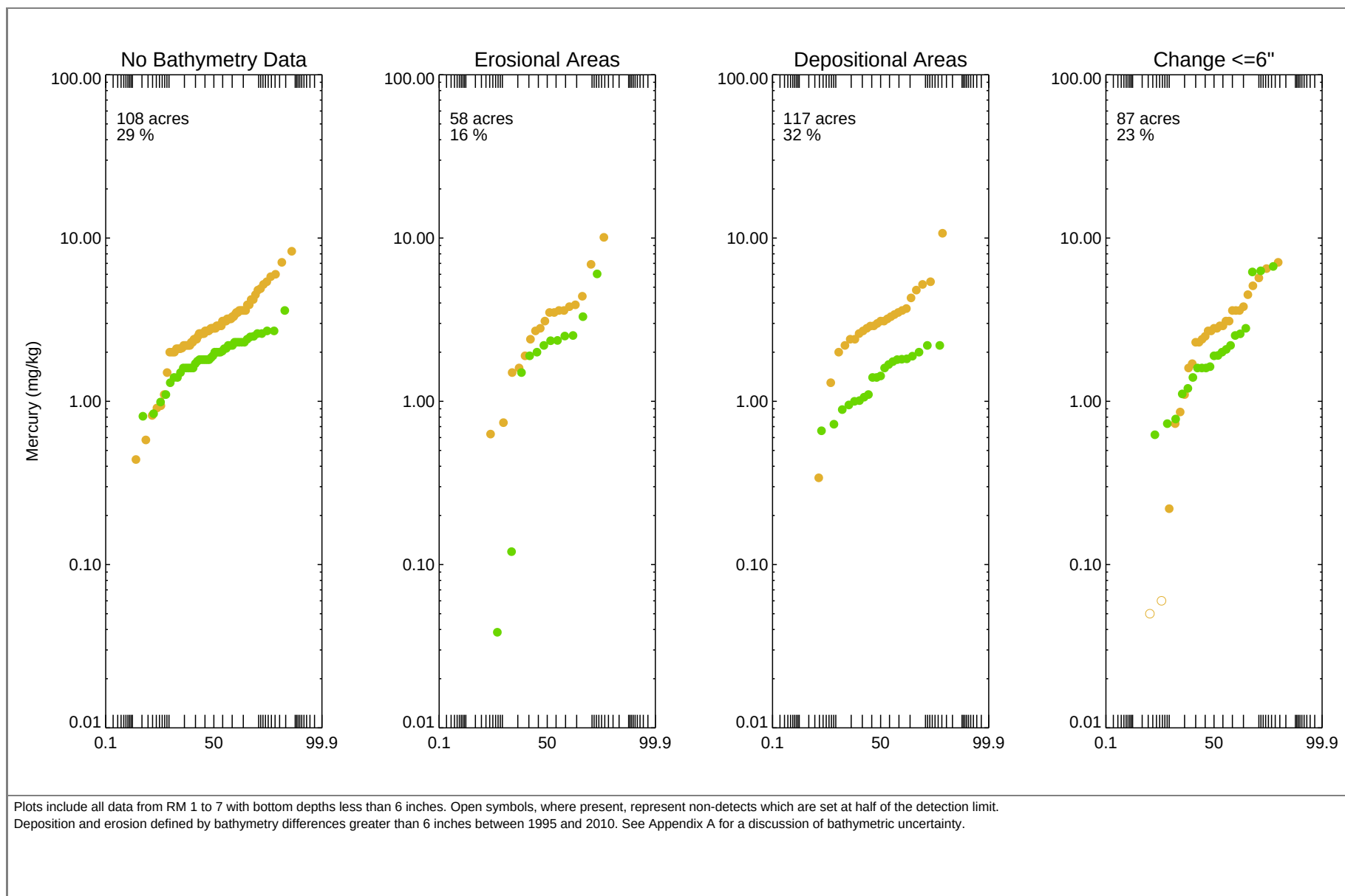
**Comparison of 1995 and 2011 Pre-Irene Surface Sediment Concentrations for Total PCB: RM 1-7, 6" Cyclical
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Publish Date: 06/17/2019 12:45 | User: DB/GD/EP
File Path: \\Boston1\jobs\Passaic_CPG\DOCUMENTS\2019\RI_Report\source\5s10\paspcg_copc_bdiff_milebin_plotter_4panelwCyclical.pro

- 1995-1999
- 2005-2011 Pre-Irene

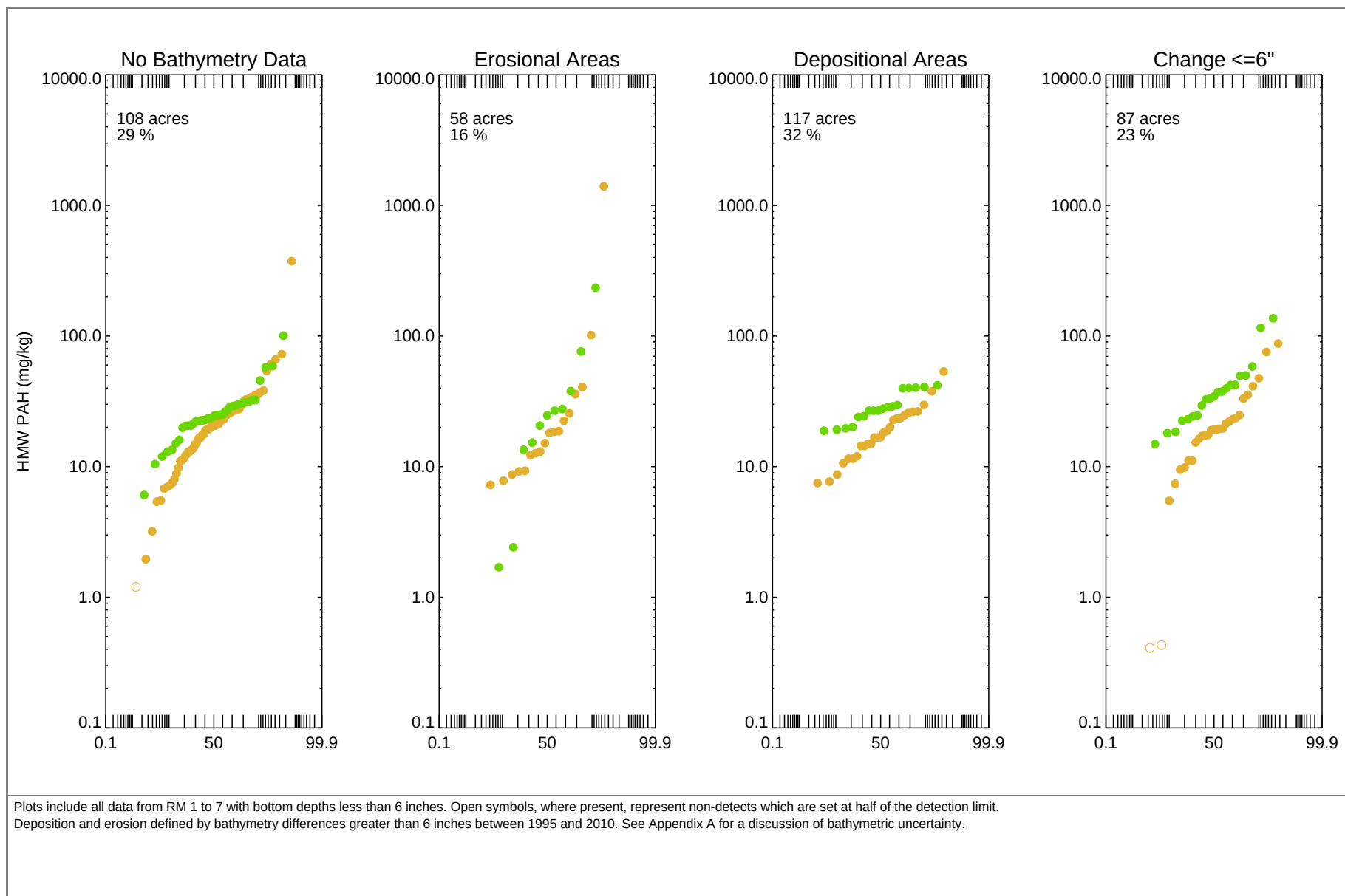
Figure 10-16
Comparison of 1995 and 2011 Pre-Irene Surface Sediment Concentrations for Sum of 4,4'-DDx: RM 1-7, 6" Cyclical
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 File Path: \\Boston1\jobs\Passaic_CPG\DOCUMENTS\2019\RI_Report\source\5s10\paspcg_copc_bdiff_milebin_plotter_4panelwCyclical.pro

- 1995-1999
- 2005-2011 Pre-Irene

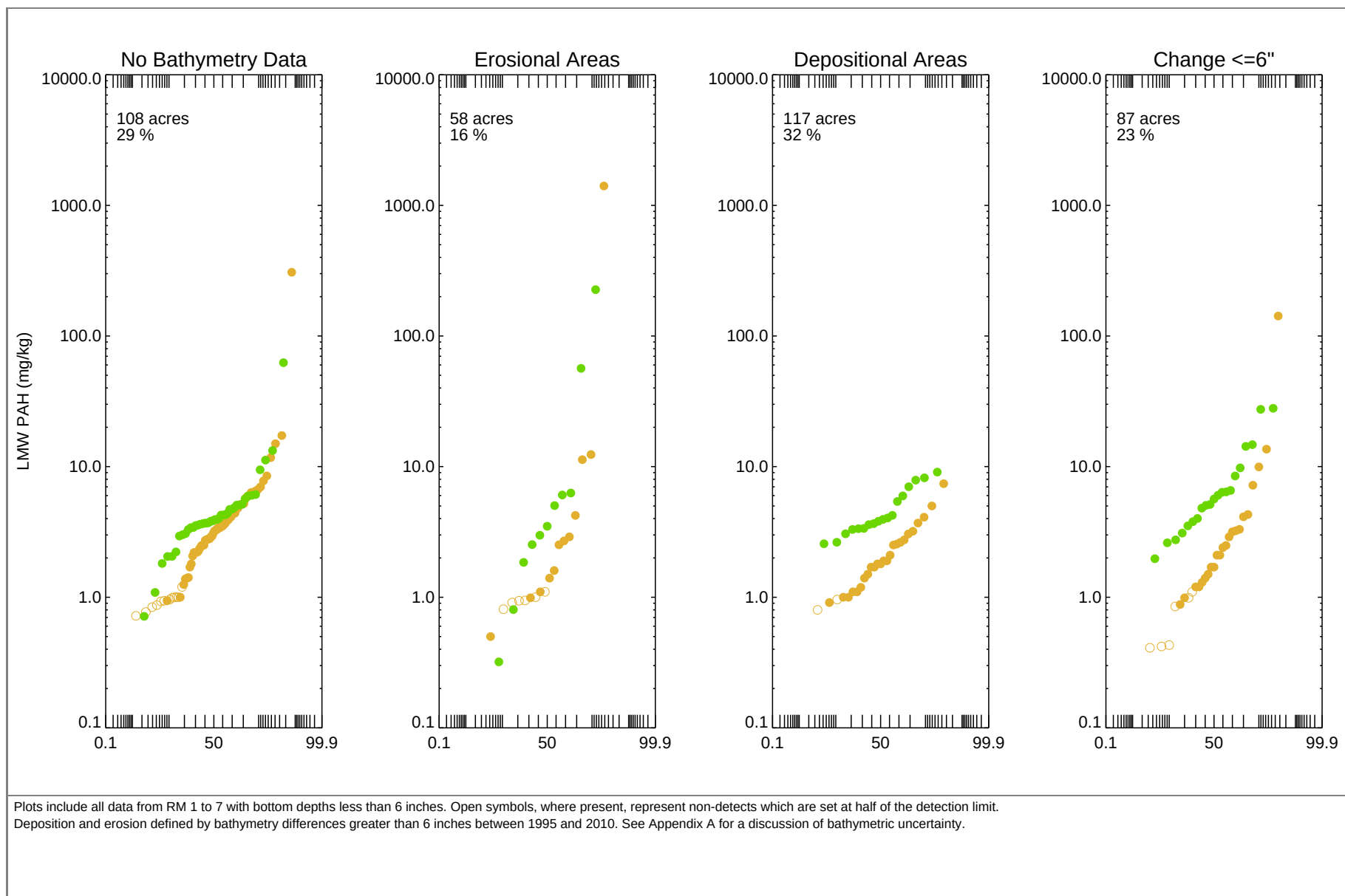
Figure 10-17
Comparison of 1995 and 2011 Pre-Irene Surface Sediment Concentrations for Mercury: RM 1-7, 6" Cyclical
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- 1995-1999
- 2005-2011 Pre-Irene

Figure 10-18
Comparison of 1995 and 2011 Pre-Irene Surface Sediment Concentrations for HMW PAH: RM 1-7, 6" Cyclical
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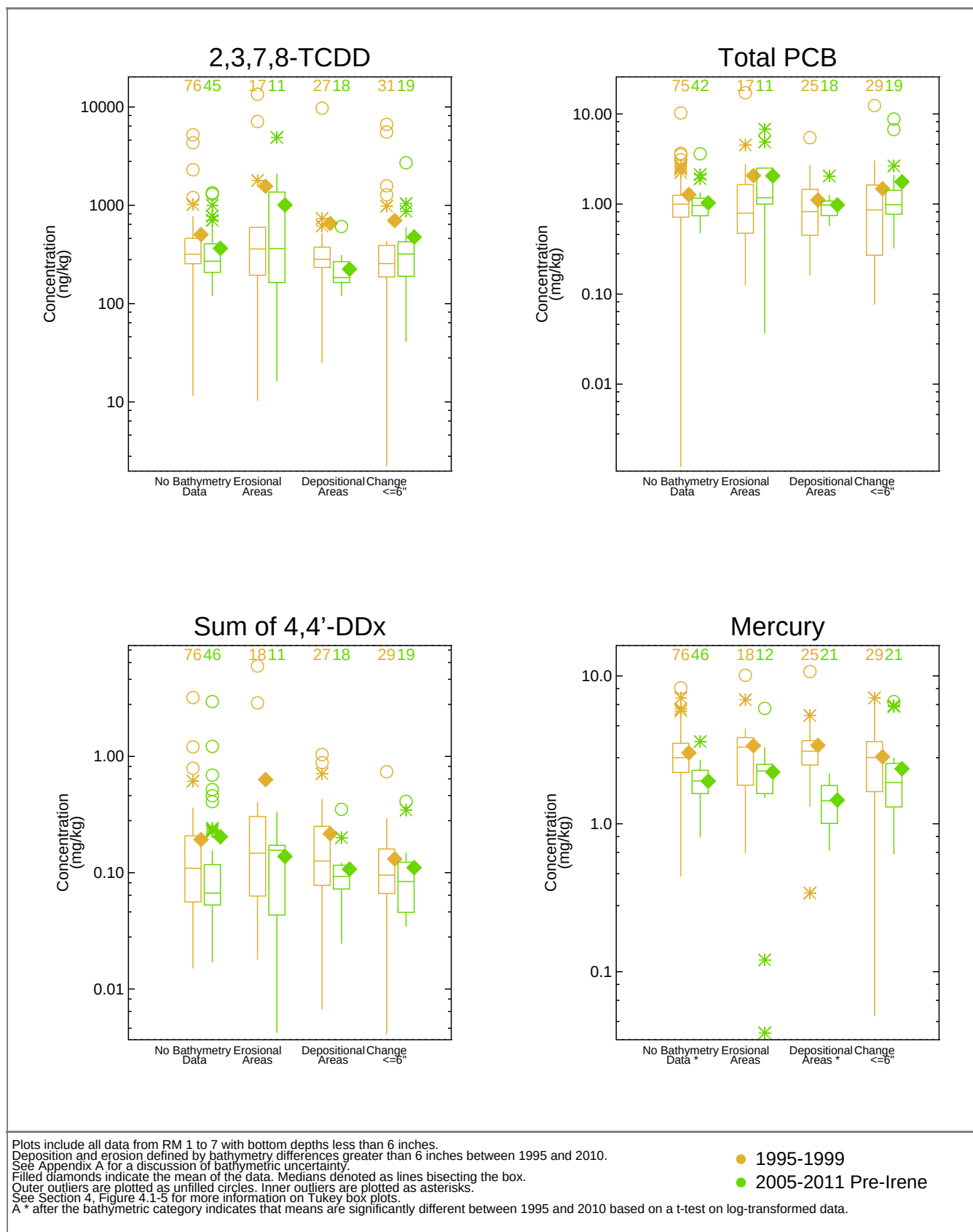


Publish Date: 06/17/2019 12:46 | User: DB/GD/EP
File Path: \\Boston1\jobs\Passaic_CPG\DOCUMENTS\2019\RI_Report\source\v5\s10\paspcg_copc_bdiff_milebin_plotter_4panelwCyclical.pro

- 1995-1999
- 2005-2011 Pre-Irene

Figure 10-19

Comparison of 1995 and 2011 Pre-Irene Surface Sediment Concentrations for LMW PAH: RM 1-7, 6" Cyclical
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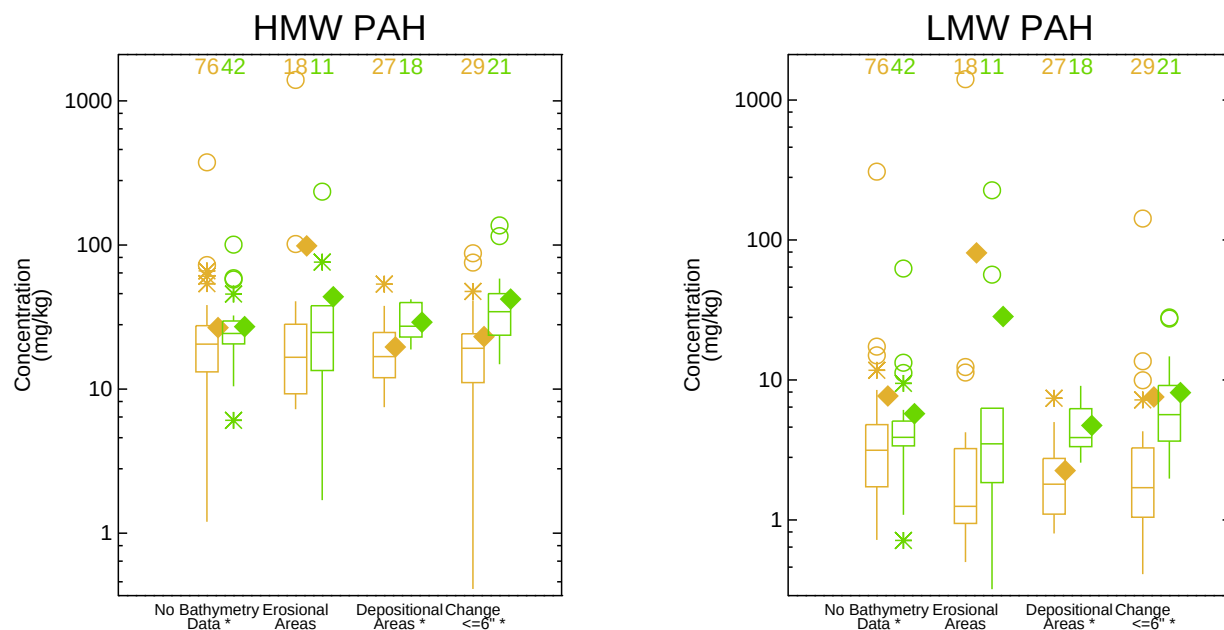


Publish Date: 06/12/2019 09:57 | User: DB/GD/EP

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Figure 10-20a
Contaminant Concentrations by Bathymetric Category in Surface Sediments: RM 1-7

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Plots include all data from RM 1 to 7 with bottom depths less than 6 inches.
 Deposition and erosion defined by bathymetry differences greater than 6 inches between 1995 and 2010.
 See Appendix A for a discussion of bathymetric uncertainty.
 Filled diamonds indicate the mean of the data. Medians denoted as lines bisecting the box.
 Outer outliers are plotted as unfilled circles. Inner outliers are plotted as asterisks.
 See Section 4, Figure 4.1-5 for more information on Tukey box plots.
 A * after the bathymetric category indicates that means are significantly different between 1995 and 2010 based on a t-test on log-transformed data.

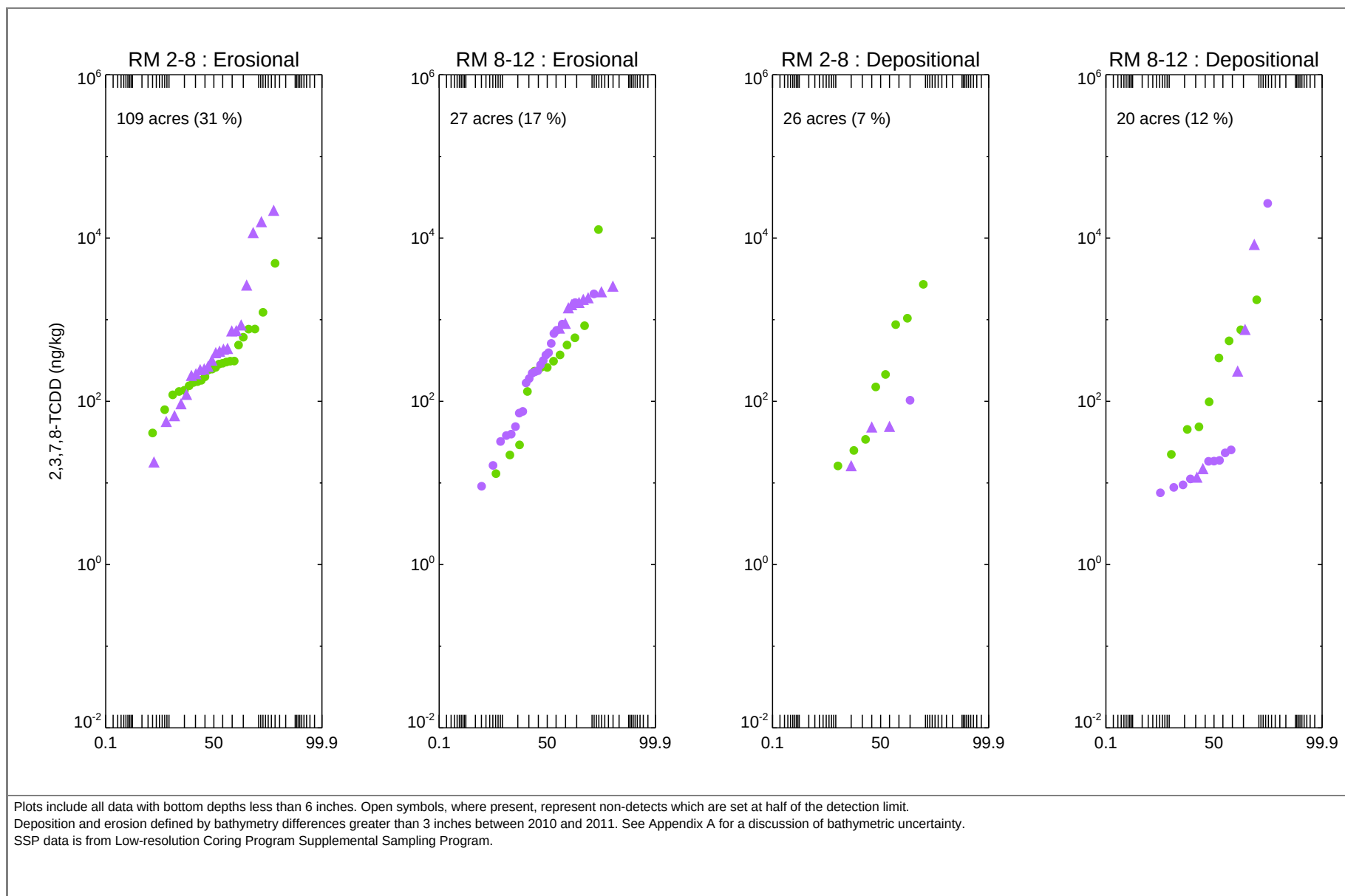
● 1995-1999
 ● 2005-2011 Pre-Irene

Publish Date: 06/12/2019 09:57 | User: DB/GD/EP

File Path: \\Boston1\jobs\Passaic_CPG\DOCUMENTS\2019\RI_Report\source\5\510\pascpg_copc_bdiff_plotter_barplot_boxplot.pro

Figure 10-20b
Contaminant Concentrations by Bathymetric Category in Surface Sediments: RM 1-7

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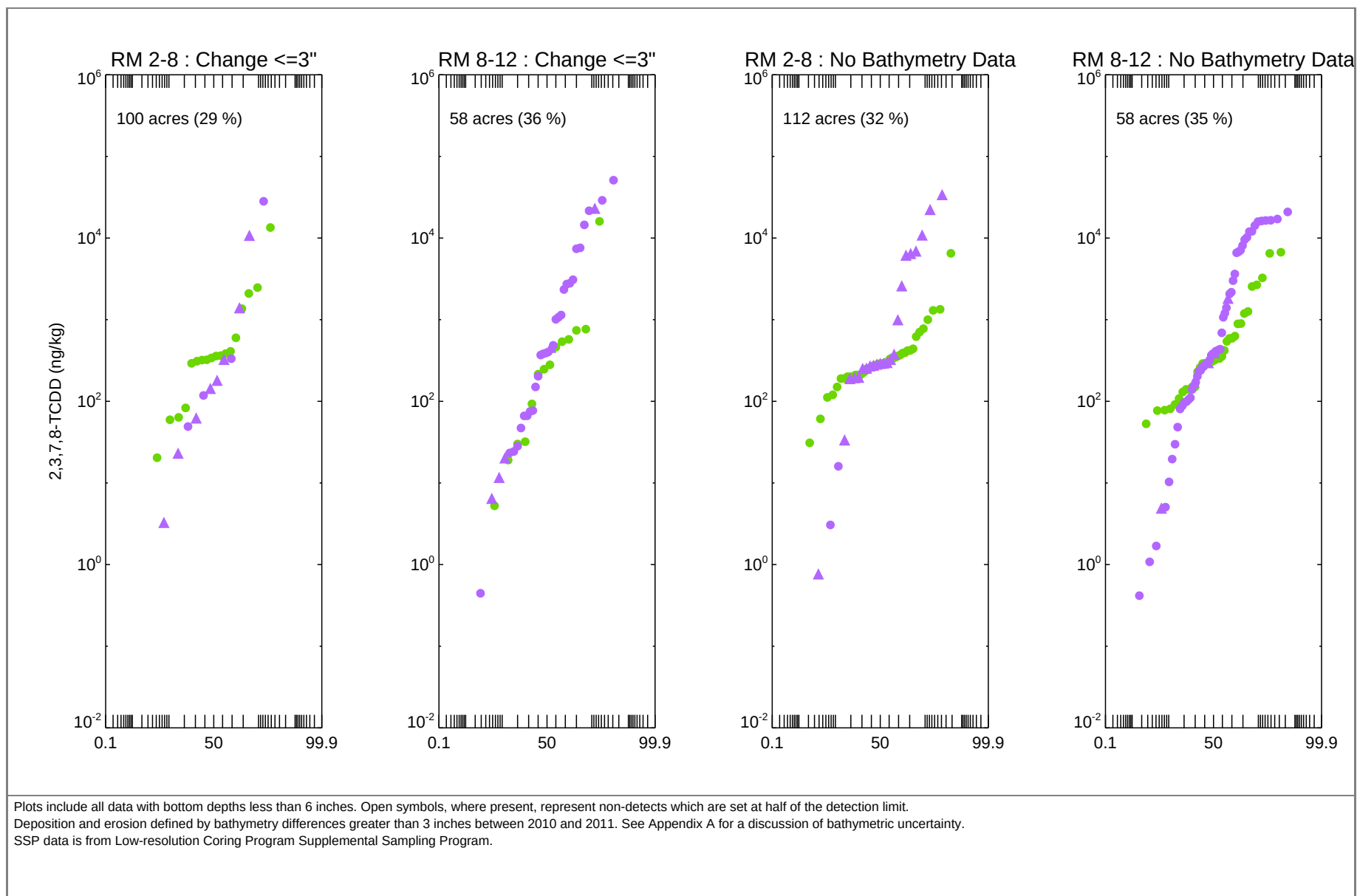


Publish Date: 06/12/2019 10:05 | User: DB/GD/EP
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- Pre-Irene (2005-2011)
- Post-Irene (2011-2013)
- ▲ Post-Irene SSP data (2012)

Figure 10-21

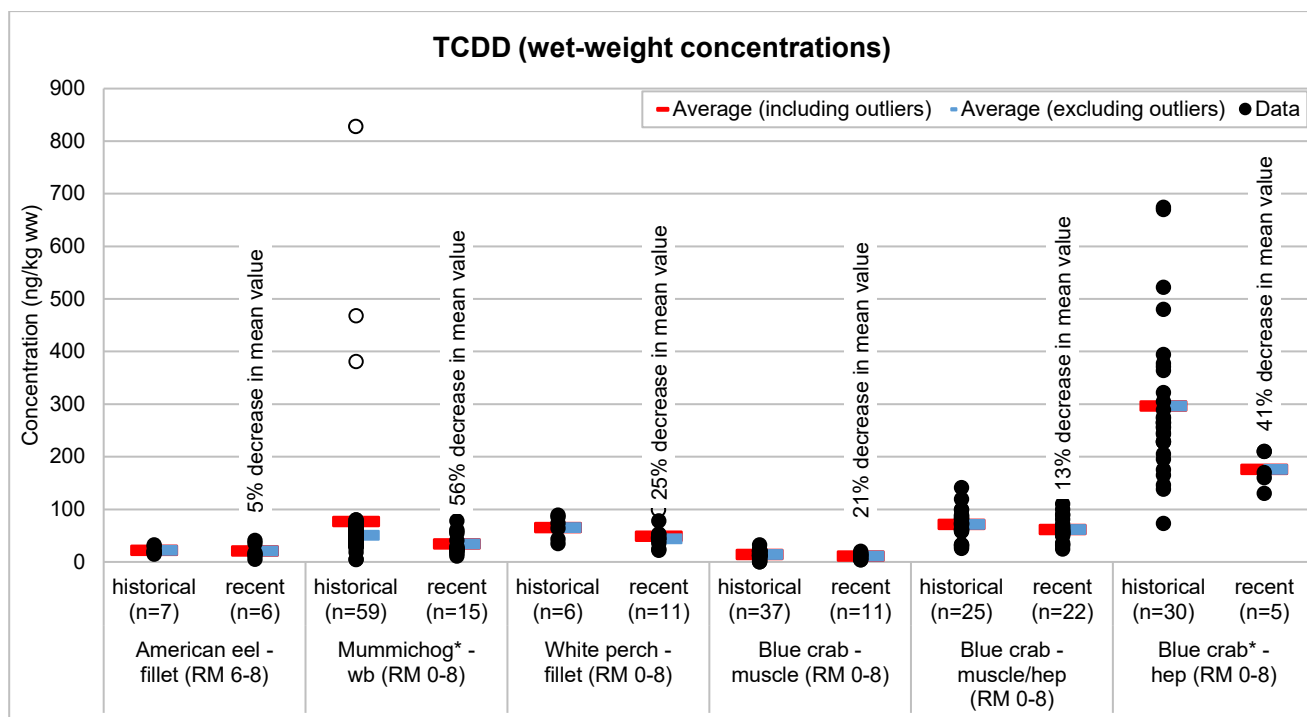
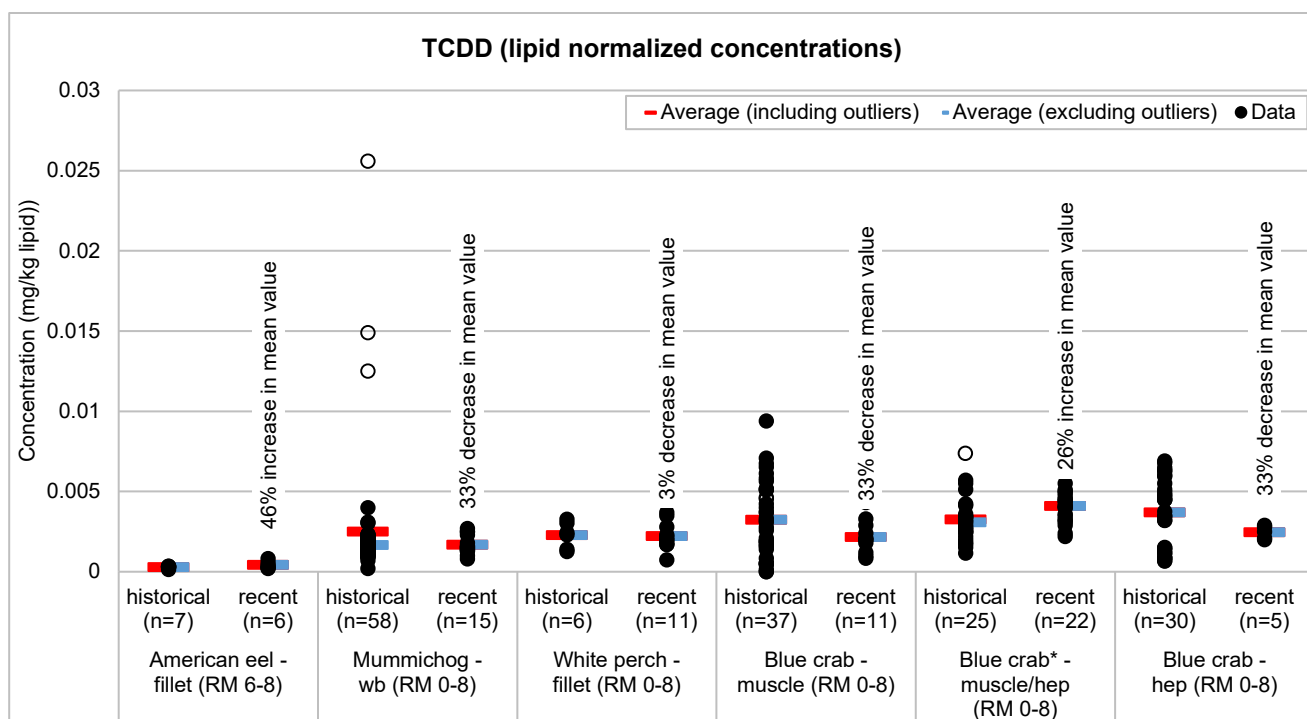
Comparison of Pre- and Post-Irene Surface Sediment Concentrations for 2,3,7,8-TCDD
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Publish Date: 06/12/2019 10:05 | User: DB/GD/EP
File Path: \\Boston1\jobs\Passaic_CPG\DOCUMENTS\2019\RI_Report\source\v5\s10\pascpg_copc_bdiff_milebin_plotter_4panelwCyclical_V3.pro

- Pre-Irene (2005-2011)
- Post-Irene (2011-2013)
- ▲ Post-Irene SSP data (2012)

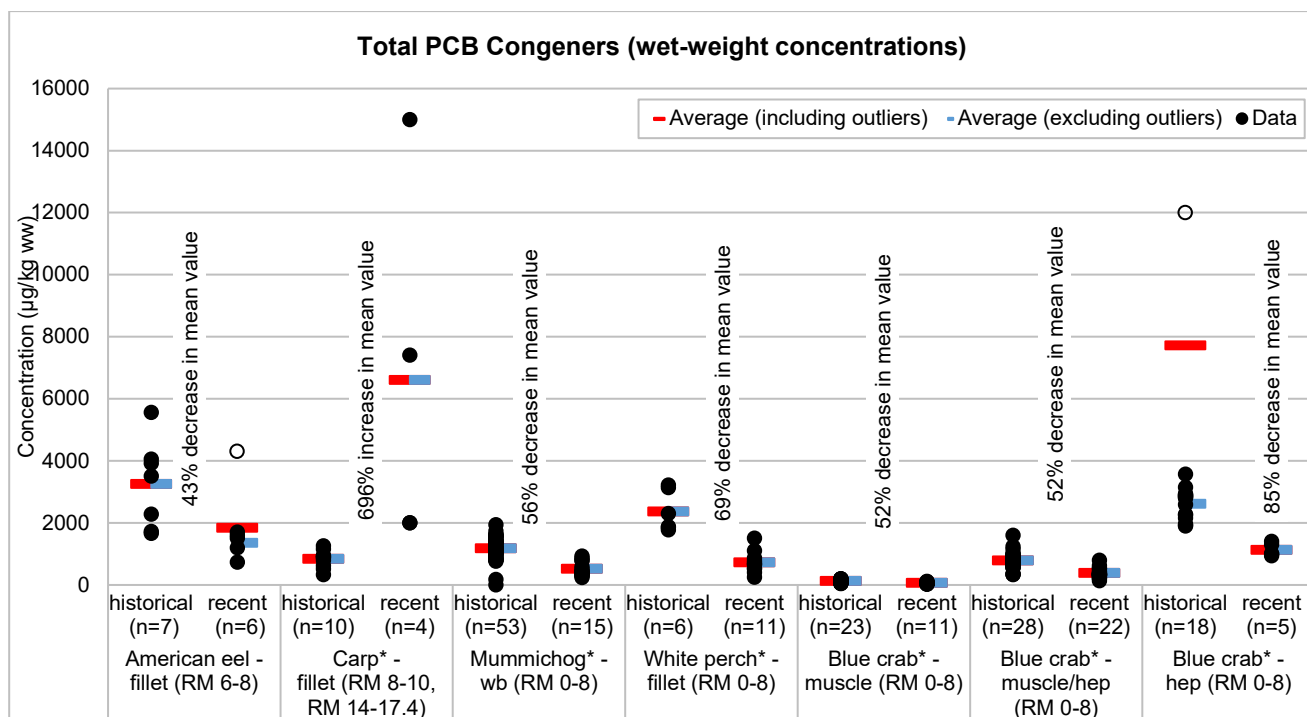
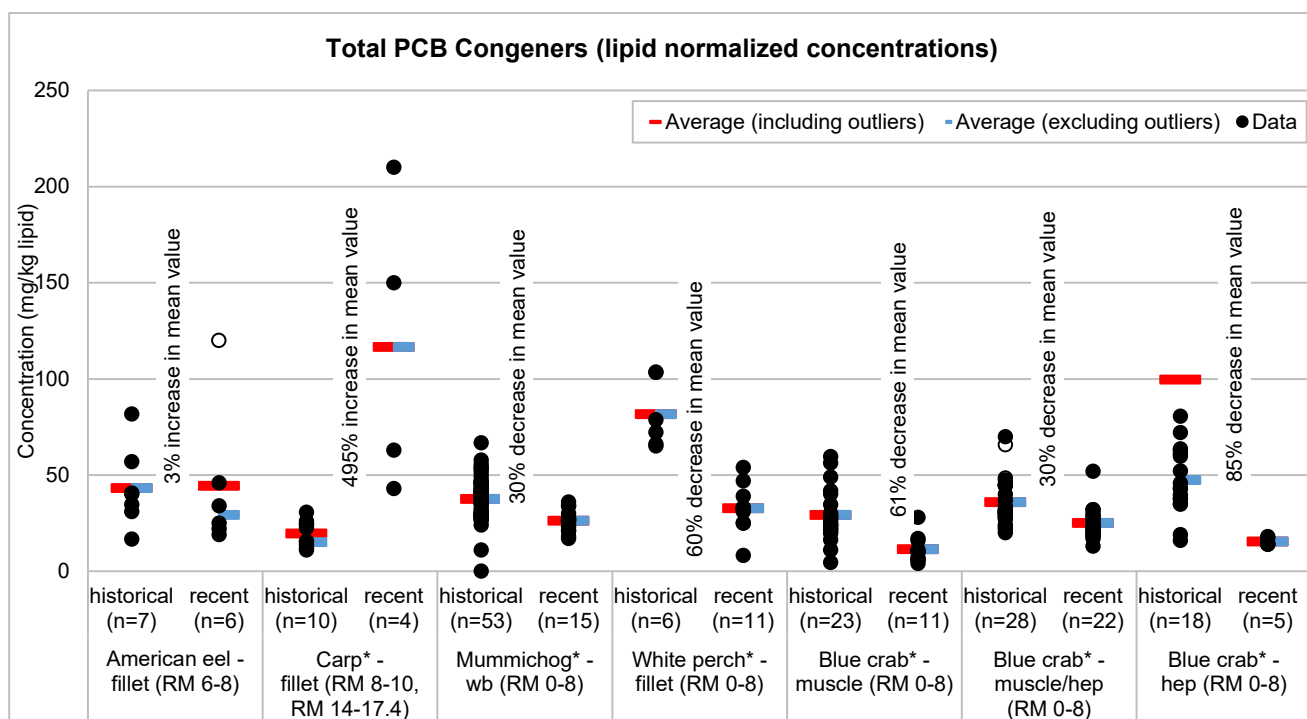
Figure 10-22
Comparison of Pre- and Post-Irene Surface Sediment Concentrations for 2,3,7,8-TCDD
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Note: Open circles represent 3xIQR determined outliers. Statistically significant difference between recent and historical populations (with outliers included) noted by asterisk.

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Figure 10-23
Comparison of Mean 2,3,7,8-TCDD Concentrations in Historical and Recent Biota Tissue Samples

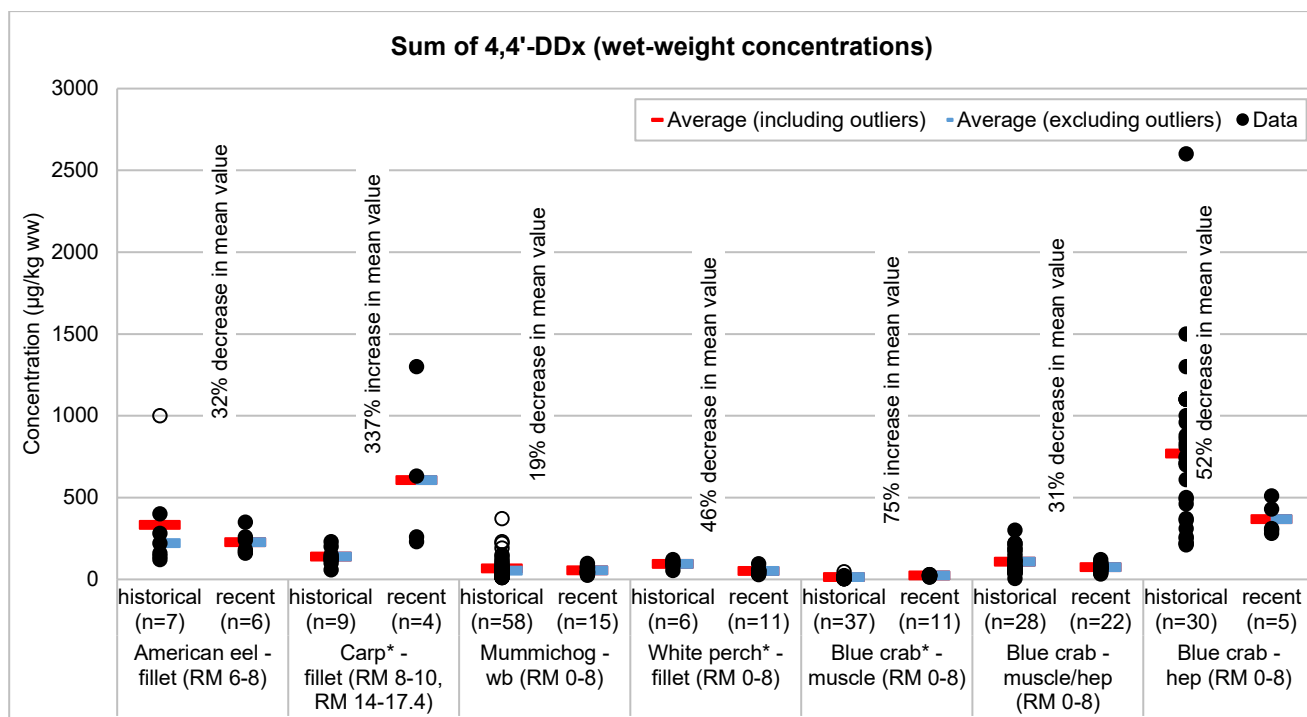
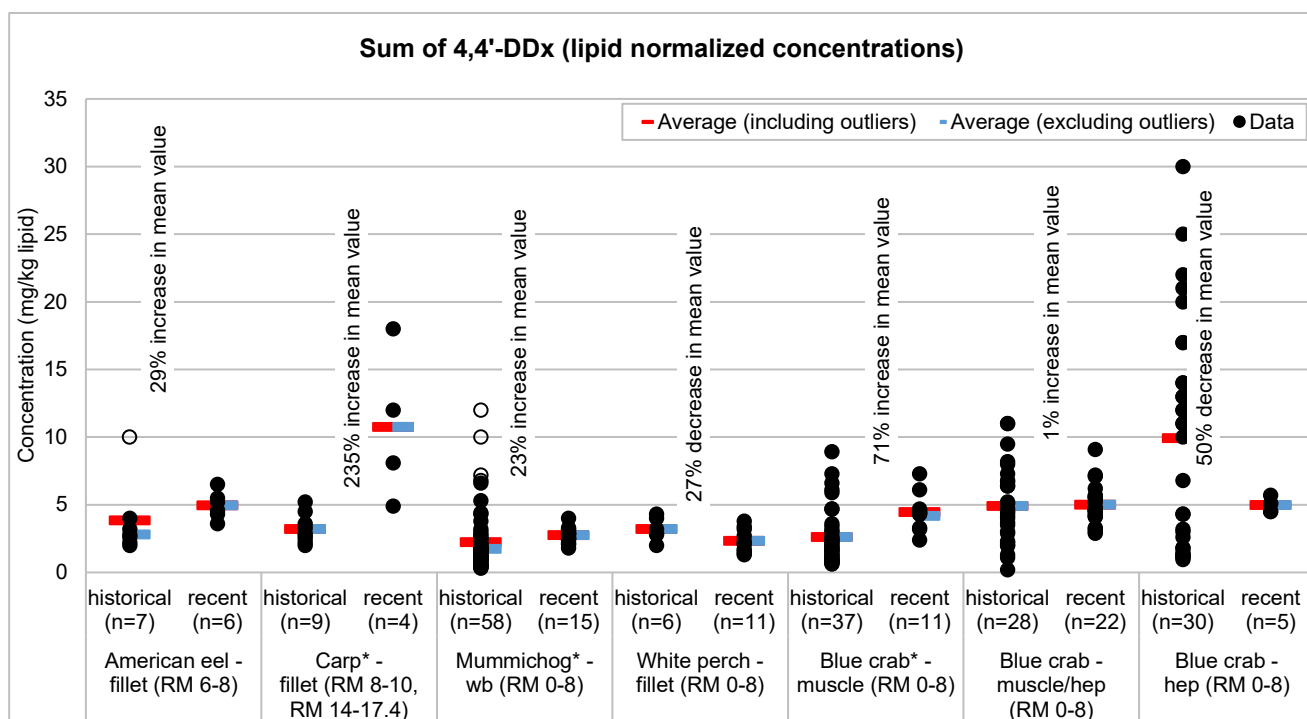


Note: Open circles represent 3xIQR determined outliers. Statistically significant difference between recent and historical populations (with outliers included) noted by asterisk.

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Figure 10-24
Comparison of Mean Total PCB Concentrations in Historical and Recent Biota Tissue Samples

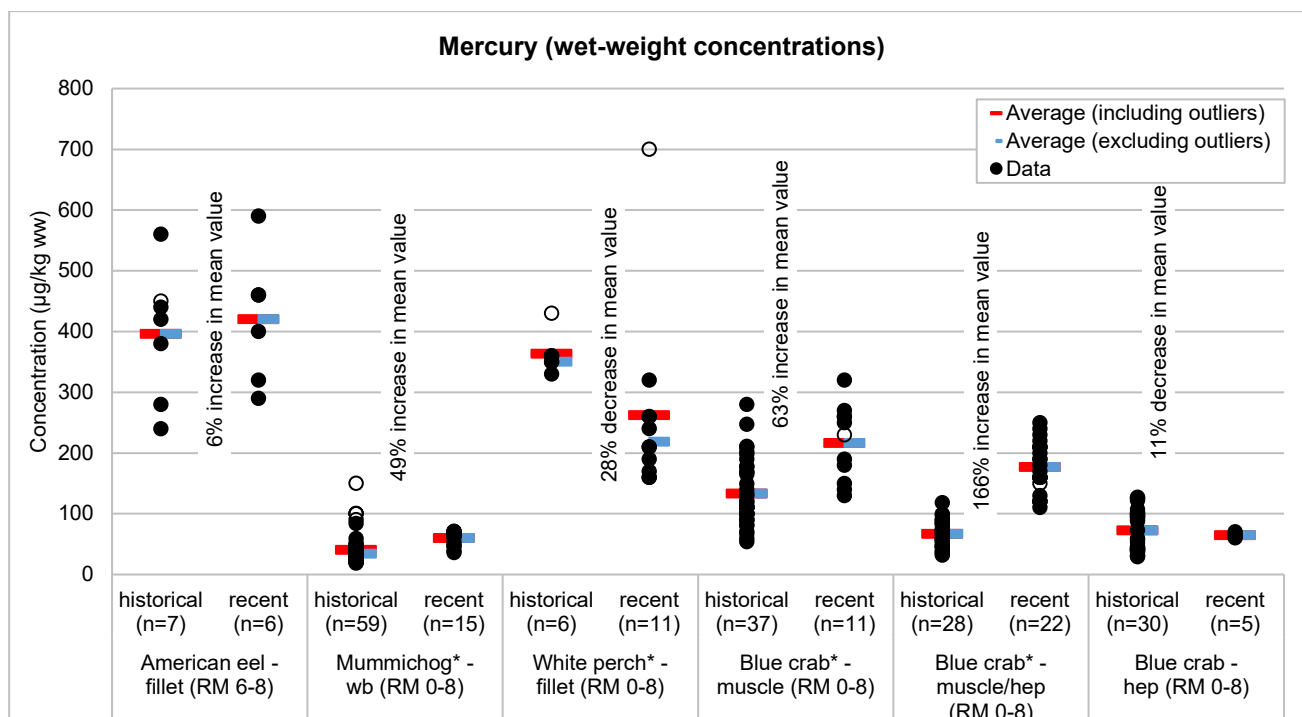
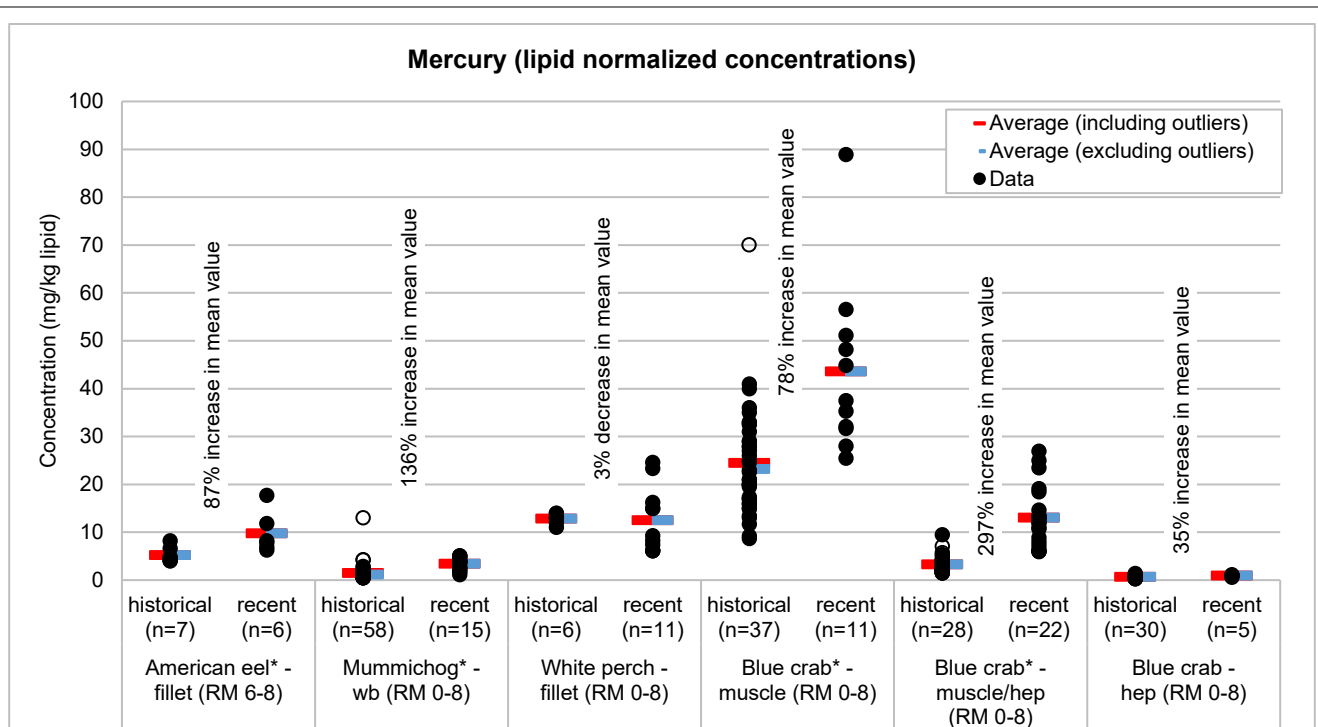
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Note: Open circles represent 3xIQR determined outliers. Statistically significant difference between recent and historical populations (with outliers included) noted by asterisk.

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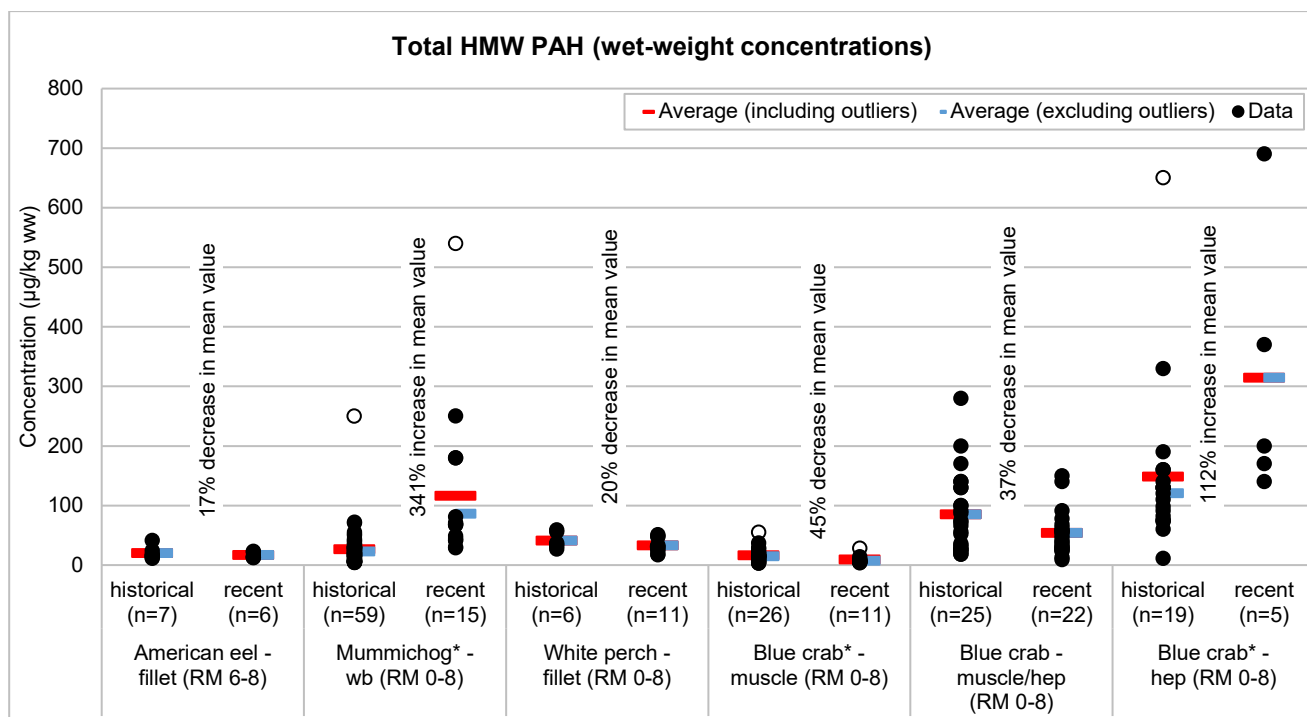
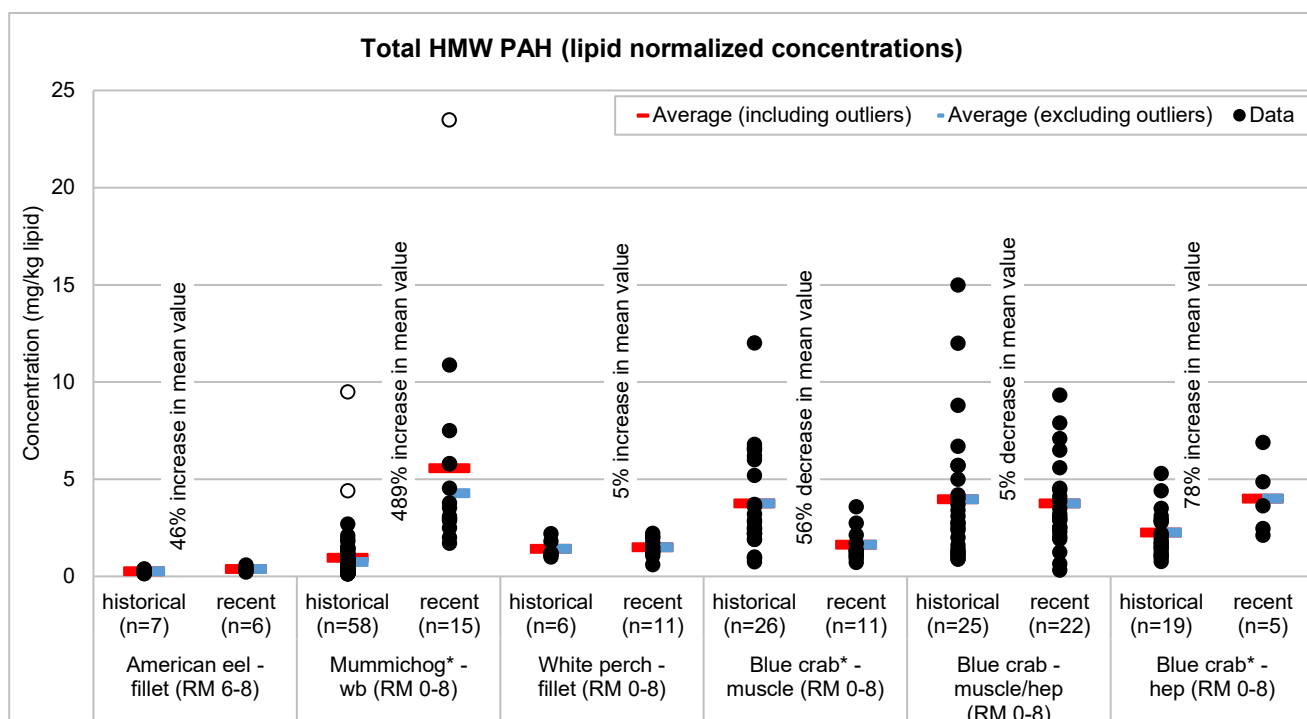
Figure 10-25
Comparison of the Mean Sum of 4,4'-DDx Concentrations in Historical and Recent Biota Tissue Samples



Note: Open circles represent 3xIQR determined outliers. Statistically significant difference between recent and historical populations (with outliers included) noted by asterisk.

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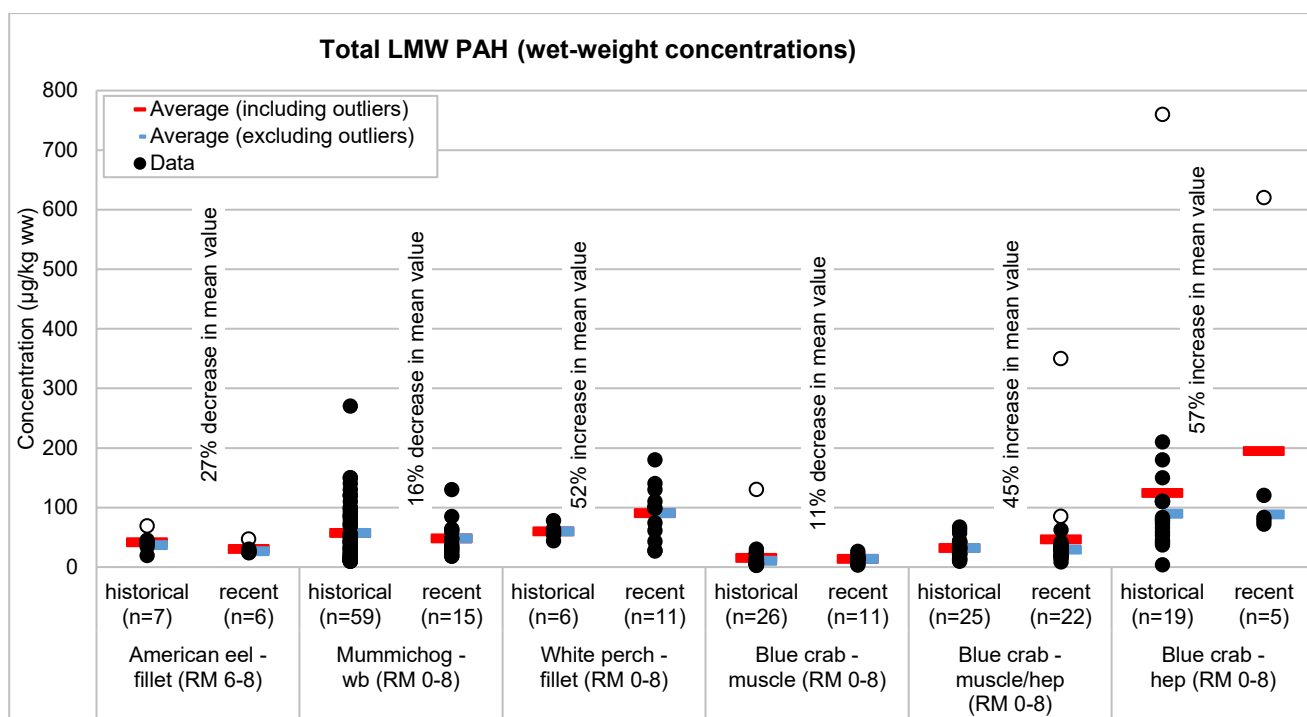
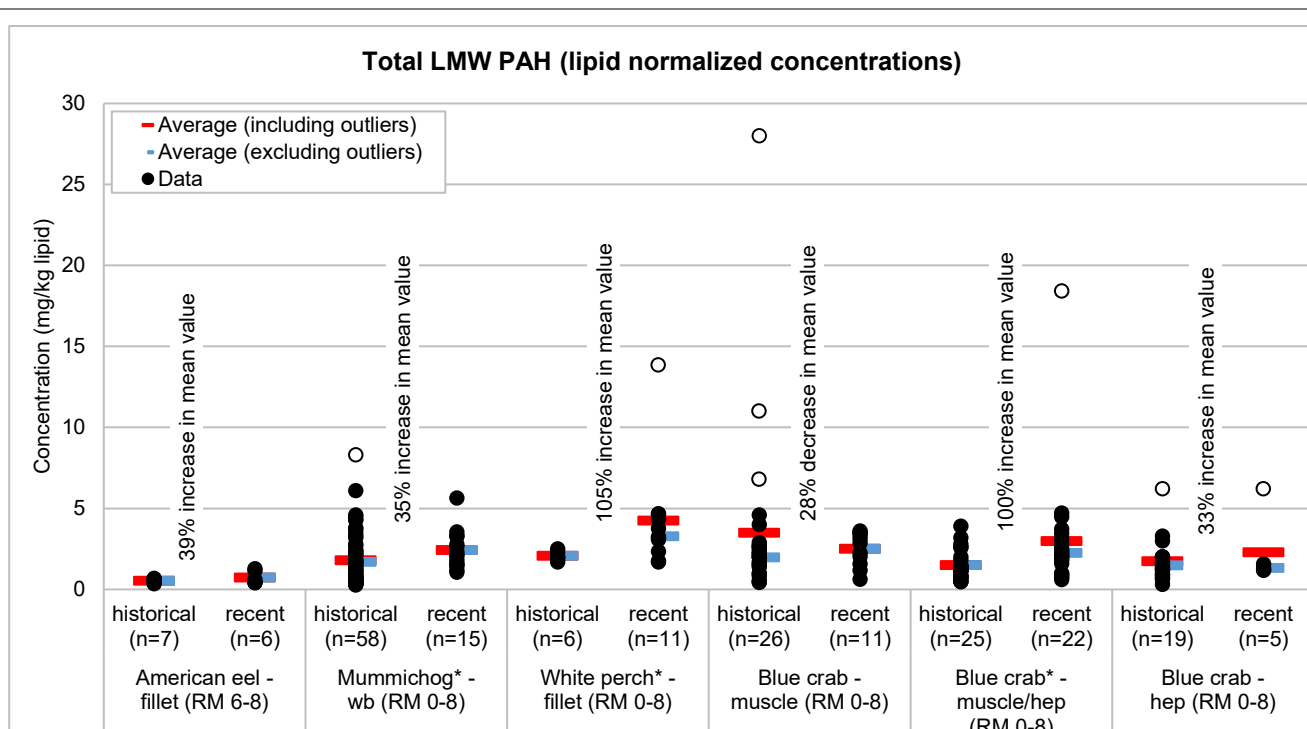
Figure 10-26
Comparison of Mean Mercury Concentrations in Historical and Recent Biota Tissue Samples



Note: Open circles represent 3xIQR determined outliers. Statistically significant difference between recent and historical populations (with outliers included) noted by asterisk.

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Figure 10-27
Comparison of Mean HMW PAH Concentrations in Historical and Recent Biota Tissue Samples



Note: Open circles represent 3xIQR determined outliers. Statistically significant difference between recent and historical populations (with outliers included) noted by asterisk.

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Figure 10-28
Comparison of Mean LMW PAH Concentrations in Historical and Recent Biota Tissue Samples