

*Community Advisory Group (CAG) Meeting  
Hudson River PCBs Superfund Site  
Fort Edward, NY, 28 June 2012*

# Update on Hudson River Fish Monitoring Program

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The logo for the Hudson River PCBs Superfund Site. It features a stylized blue wave above the text "Hudson River" in a blue serif font. Below "Hudson River" is the text "PCBs SUPERFUND SITE" in a smaller, blue, all-caps sans-serif font.

**Hudson River**  
PCBs SUPERFUND SITE

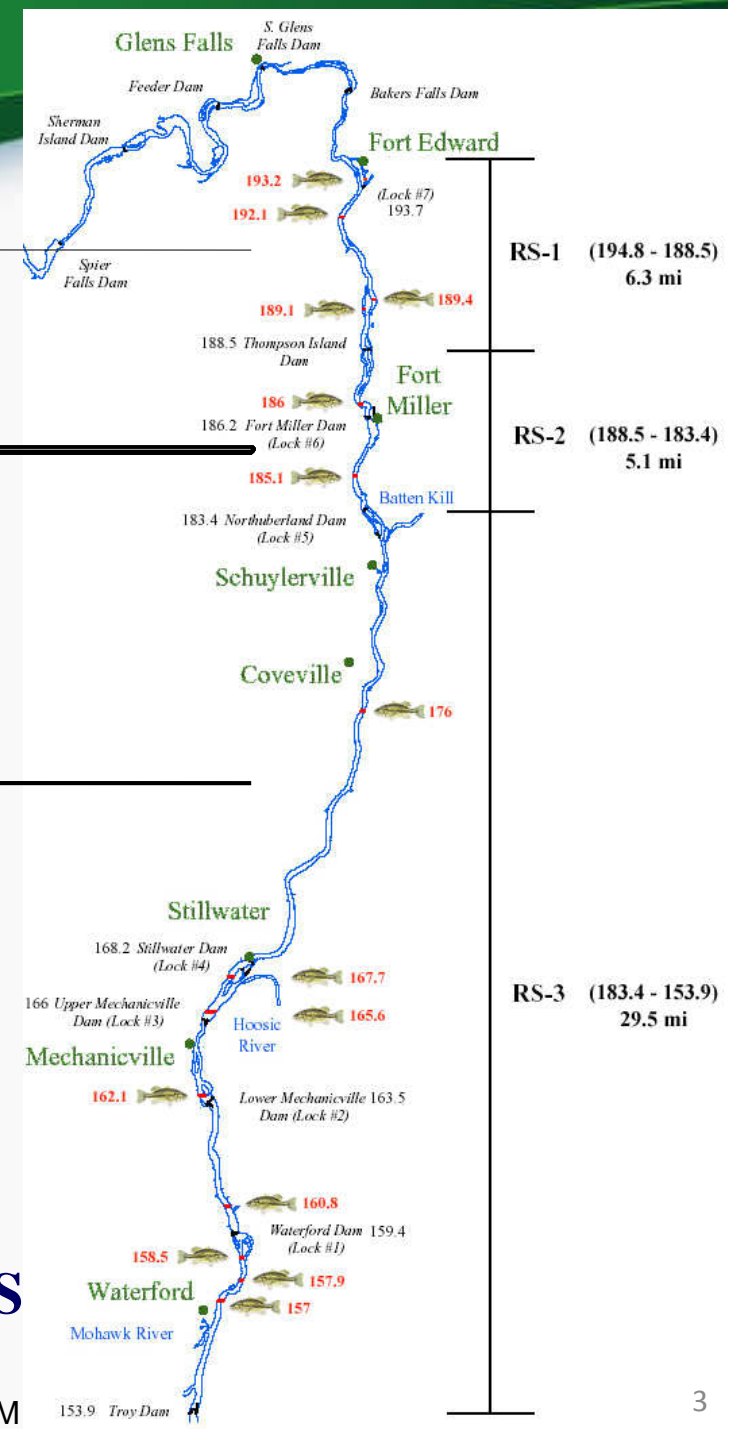
# Background and Objectives



- Risk from fish consumption by humans and wildlife was the key driver for remediation
- Fish monitoring in the river since 1970s and will continue
- Since 2003 we designed structured baseline, remedial action, and post-remedy monitoring programs to provide statistical power to address both short- and long-term needs
  - Allows us to evaluate annual (short term) changes *and* establish long-term trends
  - Allows us to document interim risk reduction following the remedial action
  - We need to demonstrate that the remedy is moving toward, or achieving RAOs (remedy effectiveness)

# Baseline, Remedial Action & Long Term\* Fish Monitoring Plans for UHR

River Area	No. Spp. Groups	No. Individ/Spp Groups	Total Samples
<b>Feeder Dam</b>	<b>4</b>	<b>20</b>	<b>80</b>
<b>RS-1</b>	<b>4</b>	<b>30</b>	<b>120</b>
<b>RS-2</b>	<b>4</b>	<b>25</b>	<b>100</b>
<b>RS-3</b>	<b>4</b>	<b>30</b>	<b>120</b>
<b>Albany/Troy</b>	<b>4</b>	<b>20</b>	<b>80</b>



## Four species/groups sampled ANNUALLY:

- Top-level pred: Blk Bass (LMB, SMB) SF
- Water col feeder: Perch (YP) SF
- Bottom-feeder: Bullhead (YB, BB) SF
- Yearling: Pumpkinseed WH

## Annual composites of Forage Fish; n=10 per RS

\* The LTMP may be modified after 3 years of OM&M

# Review of EPA Phase 1 Evaluation Report

*(data 2009; report issued March 2010)*



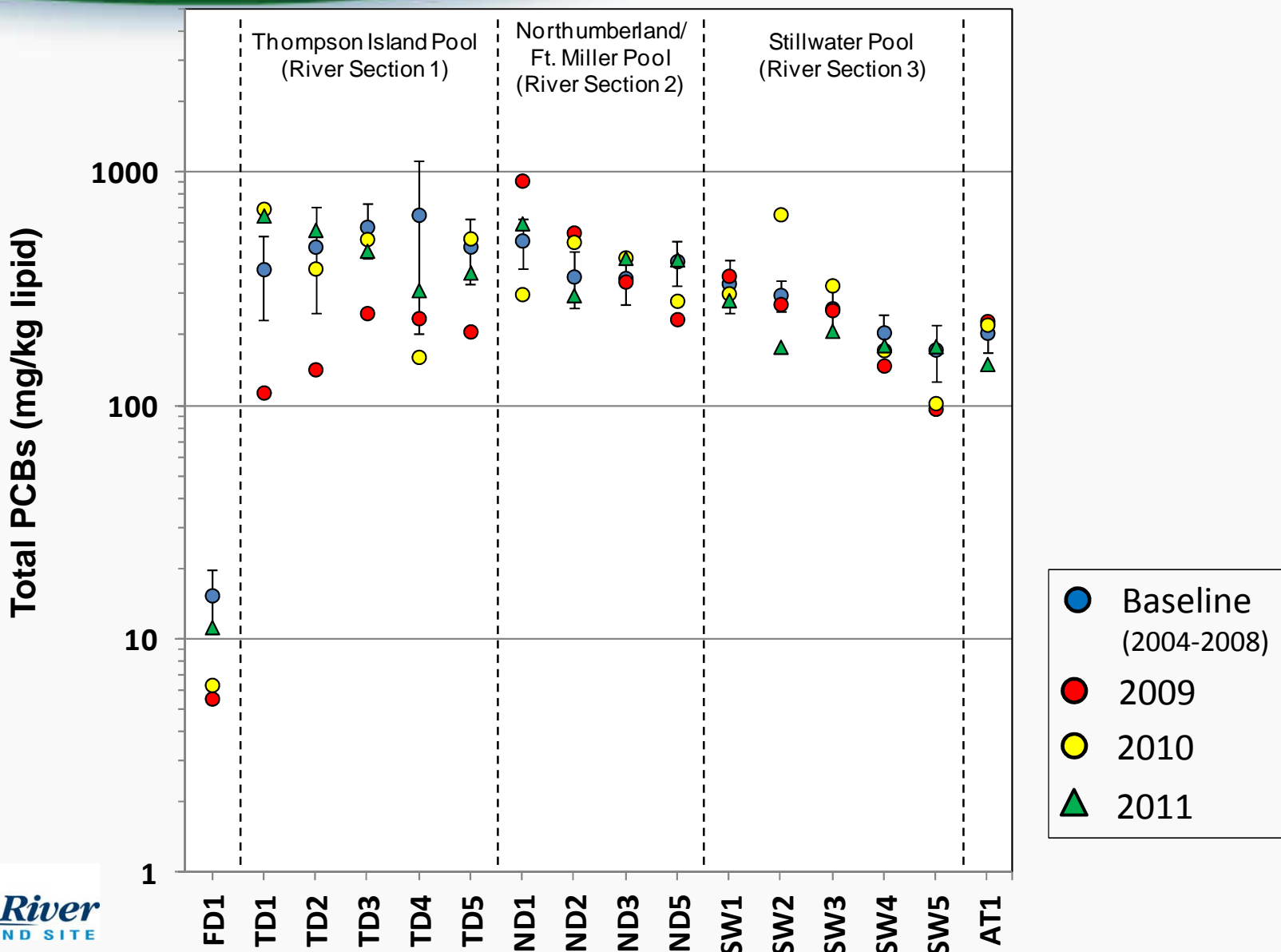
- Increases in fall 2009 whole body pumpkinseed and forage fish tissue PCB levels in the UHR compared to baseline
- No statistically significant increases in fish tissue PCBs at the Albany/Troy lower river monitoring station below the Federal Dam
- We concluded that:
  - Resuspension of PCBs from sediments during dredging affected fish locally, with greatest impact in immediate vicinity of dredging activity;
  - Data did not support idea that dredging had an effect on PCB levels in fish more than 2-3 miles downstream of the Thompson Island Pool.
- Expected that any dredging-related increases in PCB concentrations in adult sport fish would be observed in fish collected during spring 2010

# Summary of 2010 Data

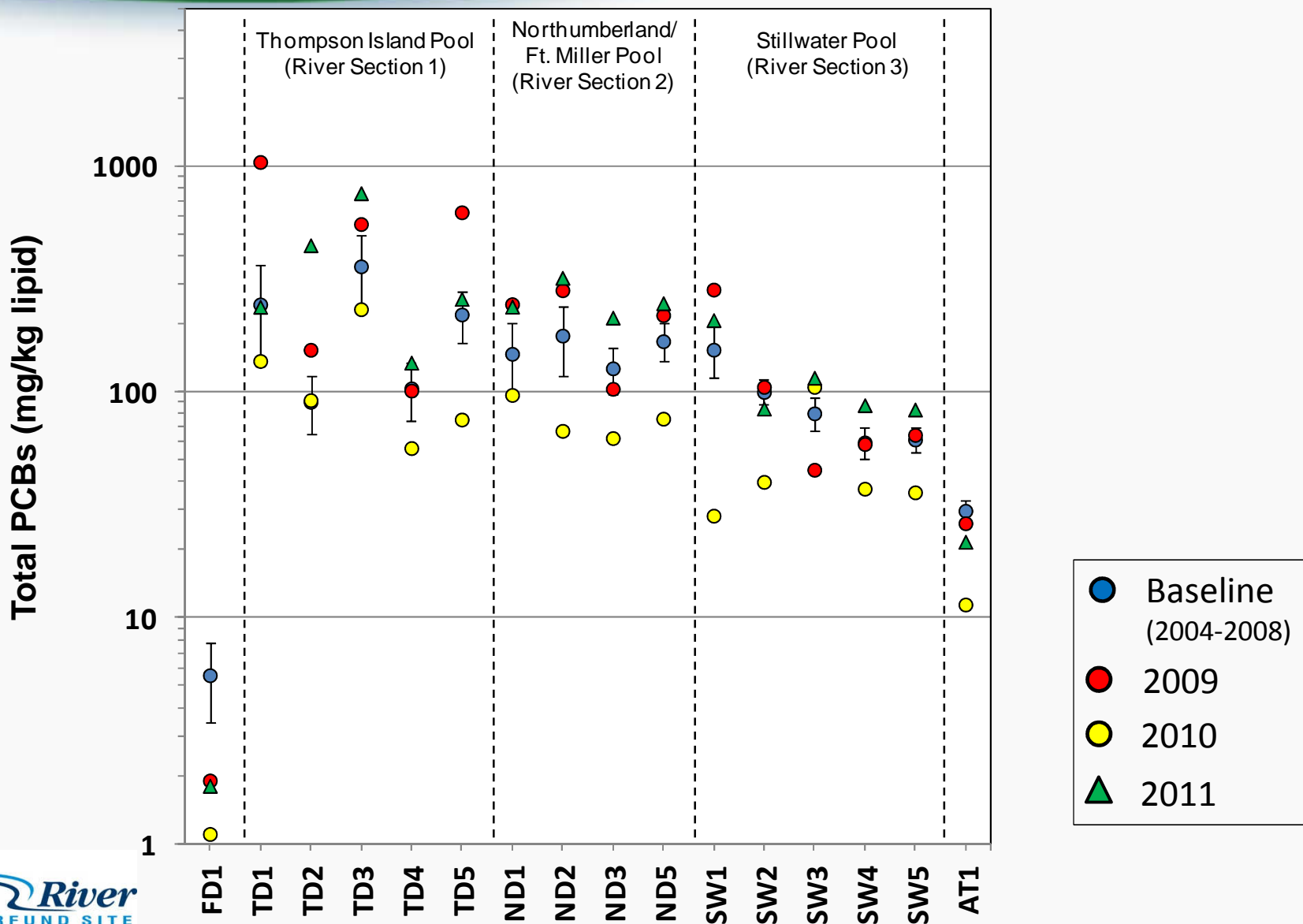


- Spring 2010 Adult Sport Fish
  - Black bass, bullhead, yellow perch
  - No appreciable increases in tissue concentrations of PCBs relative to the five-year baseline period (2004-2008)
- Fall 2010 Pumpkinseed
  - Tissue concentrations appeared to have nearly recovered from the localized dredging impacts reported in 2009
- Annual monitoring continues

# Comparison of Baseline to 2009, 2010 & 2011: Black Bass



# Comparison of Baseline to 2009, 2010 & 2011: Pumpkinseed



# Total PCBs in Fish Tissues: Baseline vs. 2009



SECTION	STATION	Approx. River Mile	Black Bass	Bullhead	Yellow Perch	Pumpkin-seed	Forage Fish
1	ALL	188.5-195	-		-	+	+
2	ALL	183.4-188.5	(-)		-	+	
3	ALL	168.2-183.2		-	-		
SECTION	STATION						
--	FD1	201.1			+		(+)
1	TD1	194			+	+	
1	TD2	193	-			+	
1	TD3	192	-		(-)		
1	TD4	190-191			-		(+)
1	TD5	189.3	-		-	+	
2	ND1	187		(-)		(+)	
2	ND2	186.4			-		-
2	ND3	185.5					
2	ND5	183.5	-		-		
3	SW1	181.2					+
3	SW2	178.2					
3	SW3	177.3		-	-		
3	SW4	172.1					
3	SW5	167.8					
--	AT1	153.2 & 142		NA	-		

	Neutral p > 0.10
-	Decrease between 2004-8 and 2009; p<0.05
+	Increase between 2004-8 and 2009; p<0.05
( )	p<0.10



# Total PCBs in Fish Tissues: 2009 vs. 2010



Section	Station	Approx River Mile	Black Bass	Bullhead	Yellow Perch	Pumpkin-seed
1	All	188.5-195	+		+	-
2	All	183.4-188.5	(+)		(+)	-
3	All	168.2-183.2	(+)	(-)		-
Section	Station					
---	FD1	201.1	+		+	
1	TD1	194	+	(+)		(-)
1	TD2	193	+			-
1	TD3	192			+	
1	TD4	190-191				-
1	TD5	189.3	(+)	-	+	-
2	ND1	187		(-)		-
2	ND2	186.4			NA	-
2	ND3	185.5		-	-	
2	ND5	183.5	+			-
3	SW1	181.2				-
3	SW2	178.2			+	-
3	SW3	177.3	(+)			(+)
3	SW4	172.1				-
3	SW5	167.8				-
---	AT1	153.2 & 142		NA	NA	-

	Neutral $p > 0.10$
-	Decrease btwn 2009 and 2010; $p < 0.05$
+	Increase btwn 2009 and 2010; $p < 0.05$
()	$0.05 < p < 0.10$

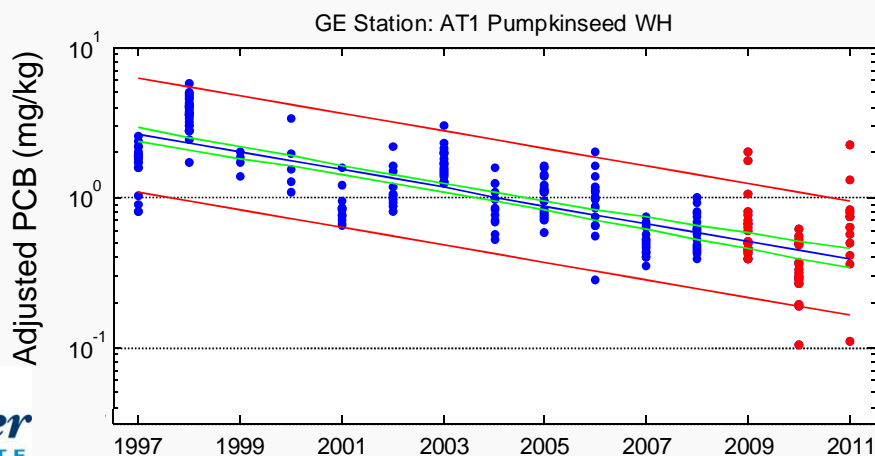
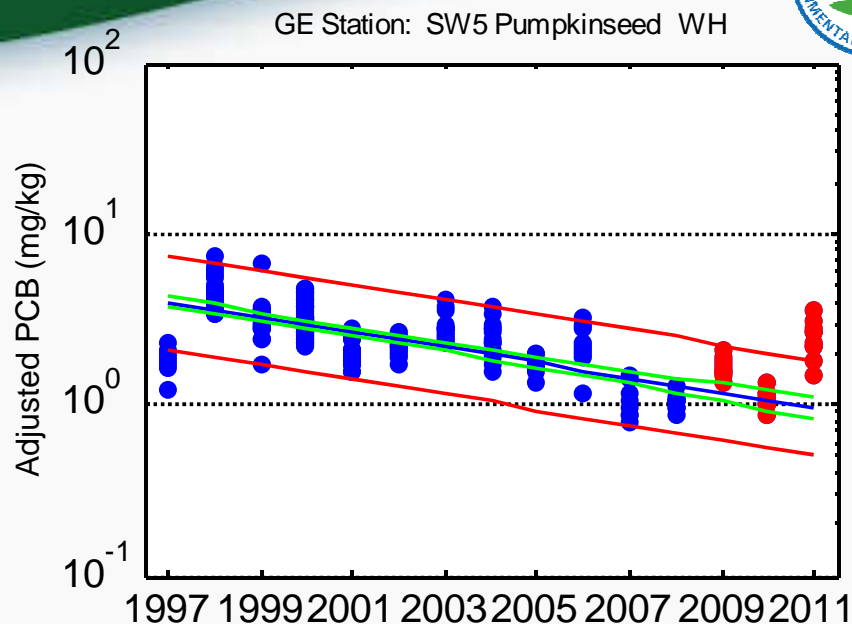
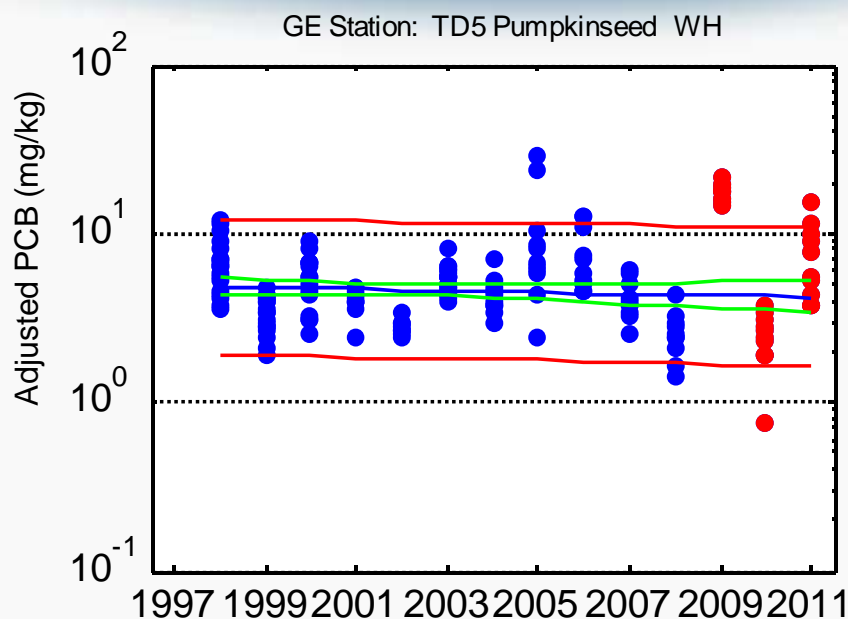
# Total PCBs in Fish Tissues: Baseline vs. 2011



Section	Station	Approx River Mile	Black Bass	Bullhead	Yellow Perch	Pumpkinseed
1	All	188.5-195			+	+
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---	FD1	201.1			+	
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3	SW4	172.1				+
3	SW5	167.8				+
---	AT1	153.2 & 142		NA		-

	Neutral $p > 0.10$	+	Increase Post Dredging; $p < 0.05$
-	Decrease Post Dredging; $p < 0.05$	()	$0.05 < p < 0.10$

# Annual & spatial patterns can be important



## Variability:

Approx. one order of magnitude range of conc.

- Within each yr;
- Within & among stations
- Within reach or section

# Perspective



- We have expected that short-term, localized increases in fish PCB levels would occur during dredging
  - These apparent dredging impacts were observed within or immediately below the Phase 1 dredging areas
  - Recovery observed in 2010 with rapid integrators (pumpkinseed)
  - Pattern of increase observed in 2011 fish (Phase 2)
  - These increases have fluctuated around the baseline concentrations

# Perspective



- We anticipate that short-term, dredging related, localized body burden increases of PCBs in fish will rapidly return to baseline levels, and continue to decline thereafter following remediation
  - Exposures related to dredging are expected to be brief
    - Dredging only occurs in a given area for single dredging season, or a portion thereof (weeks to months)
    - Tissue concentrations of PCBs in fish have been shown to decrease rapidly following spikes related to exposure events and environmental dredging.

# Spikes in tissue concentrations linked to dredging events have been observed to recover

## Cumberland Bay Site, Plattsburgh, NY – Yellow Perch, Wilcox Dock

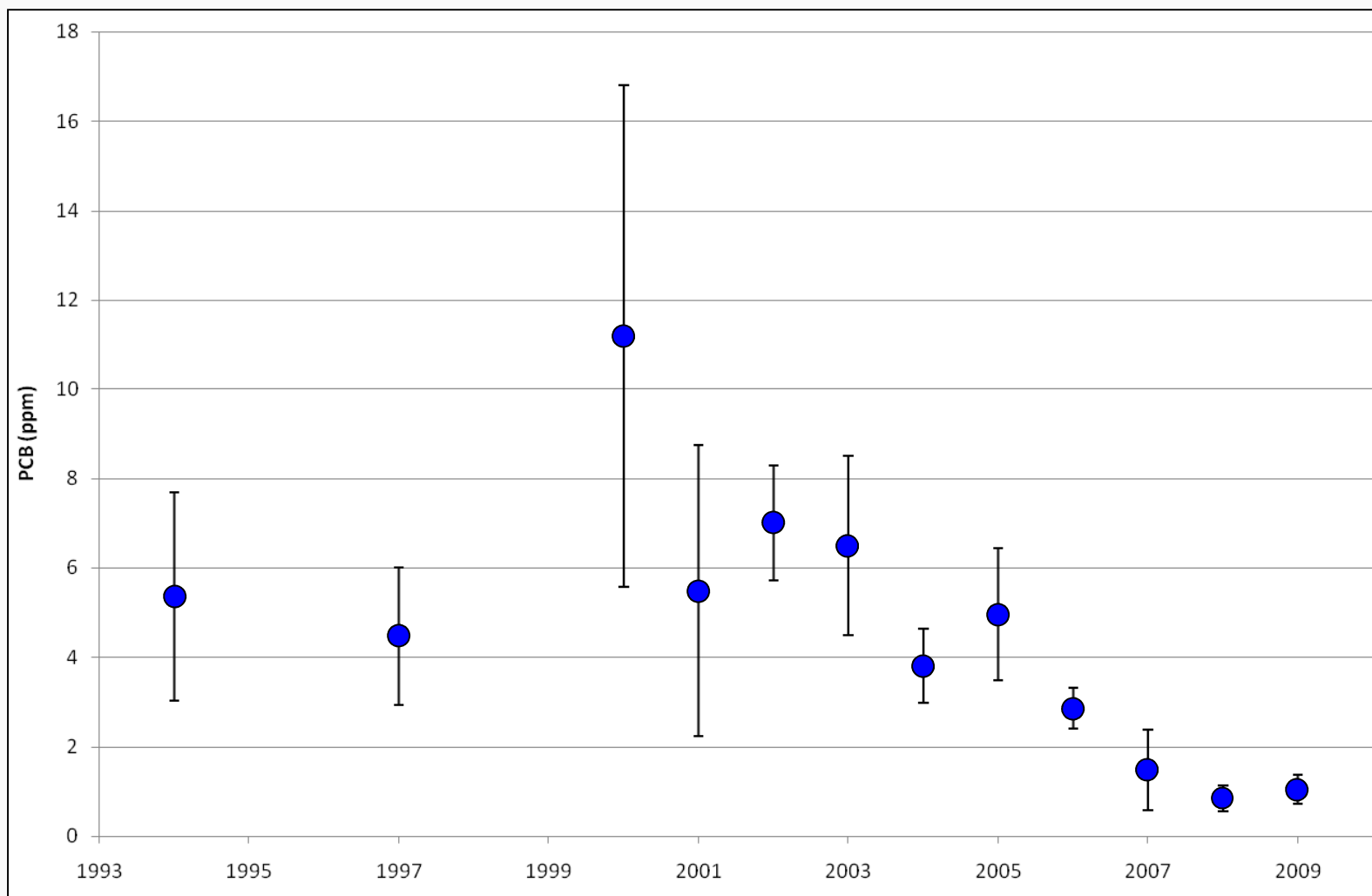


Figure courtesy of NYSDEC (2009)