

2003 Status & Trends Triennial Fish Monitoring

Update to RMP Fish Committee

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2003 Status & Trends Triennial Fish Monitoring

- Status and Trends
 - 7 species
 - Added PBDE analysis for S&T species
 - Looked at As in 5 individual leopard sharks & 3 smoothound sharks
 - Looked at MeHg in 9 individual leopard sharks and 9 individual smoothound sharks
 - We now have time series data from 1994-2003



Fish Tissue Analysis by Analyte

Fish Species	OC Analyses (PCBs, Pesticides)	PBDEs	Hg - total	MeHg	Se	As
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	# of composites	# of composites	# of composites	# of composites	# of composites	# of composites
White Croaker	11	11	11			
Leopard Shark	9	9	15	9		5
Striped Bass	7	7	24			
CA Halibut	2	2	6			
Shiner Surfperch	14	14	14			
Jacksmelt	4	4	4			
White Sturgeon	4	4	7		7	



2003 Results - Status & Trends

Some Good News

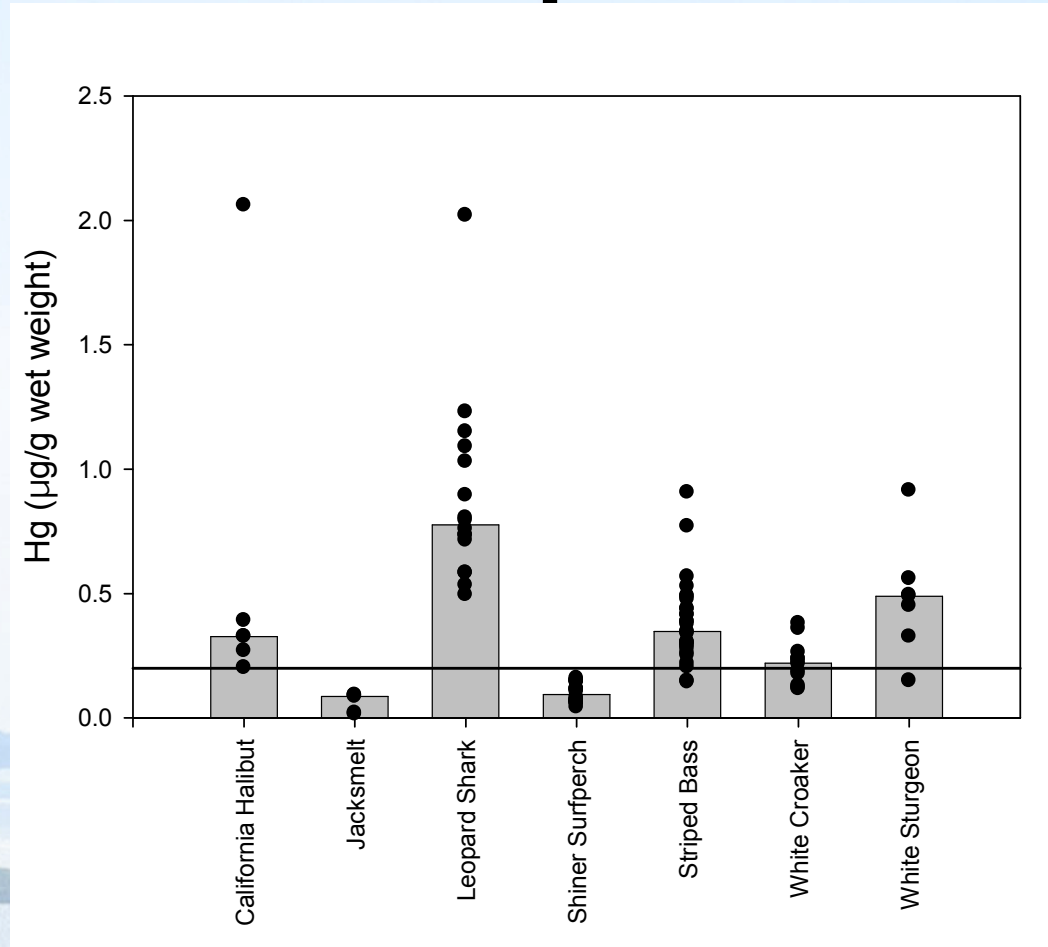
- All S&T fish below the Screening Value (SV) (30 ng/g ww) for chlordanes
- Only 1 sample (white sturgeon - South Bay exceeded DDT SV (100 ng/g ww)
- Dieldrin SV (2.0 ng/g ww) only exceeded for white croaker (45%) and white sturgeon (50%)
- Statistically significant declines in some species for DDT and Chlordane (lipid normalized)



Hg ($\mu\text{g/g ww}$) 2003

TMDL target=0.2 $\mu\text{g/g ww}$

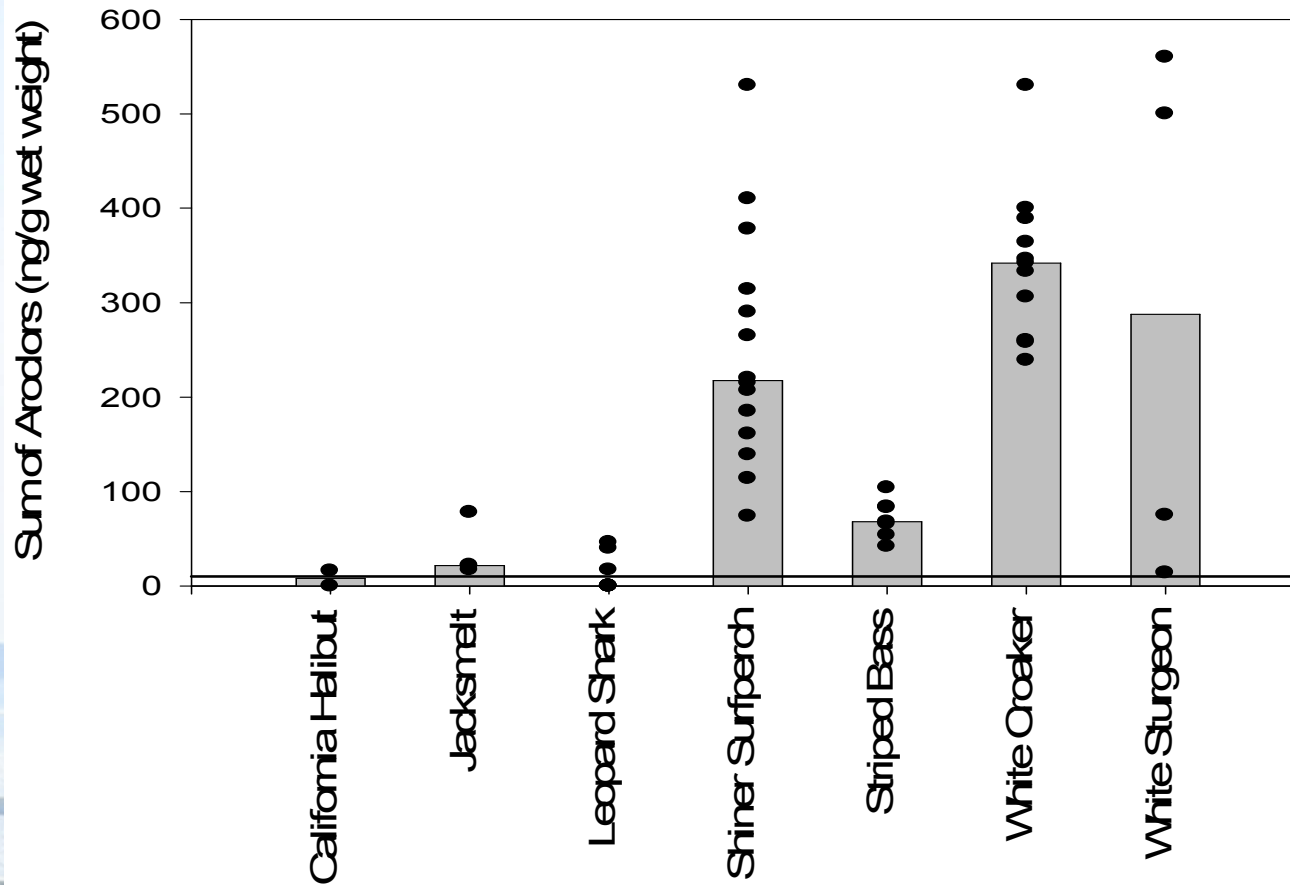
84% of samples exceeding



Aroclors (ng/g ww) 2003

TMDL target=10 ng/g ww

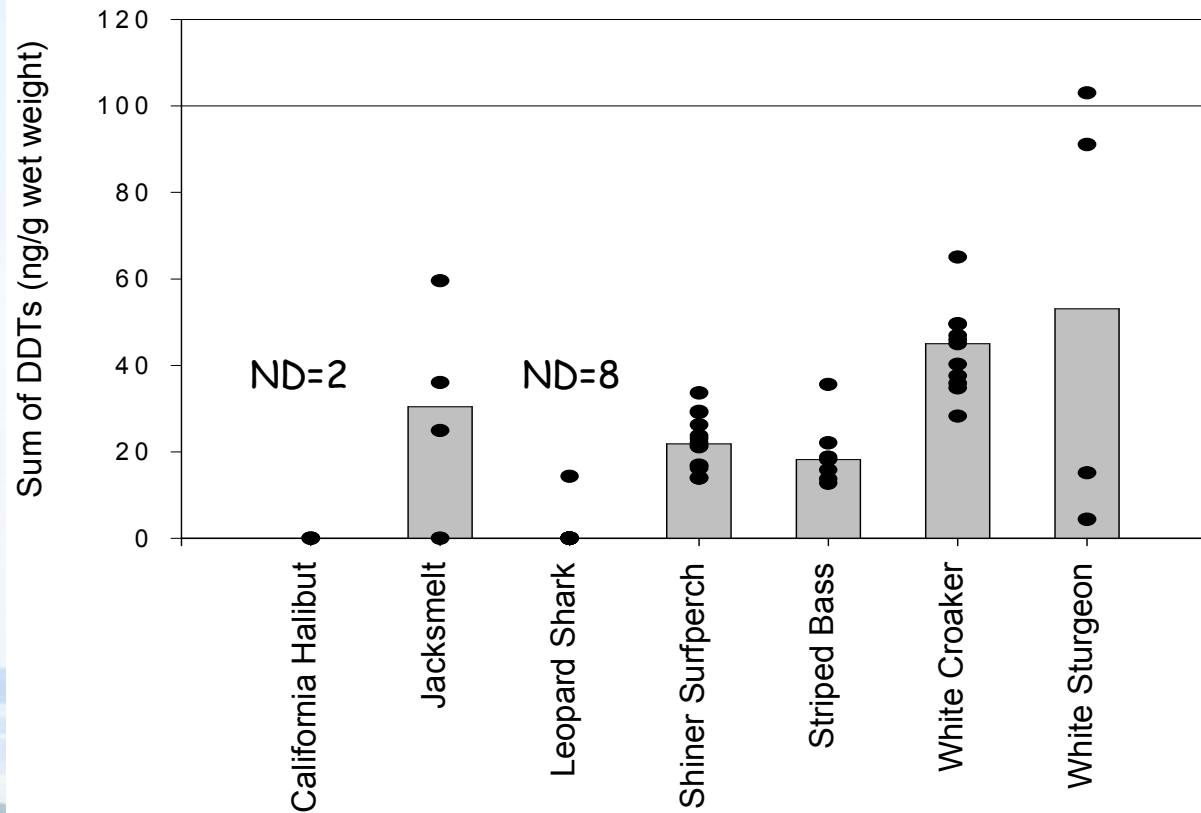
86% of samples exceeding



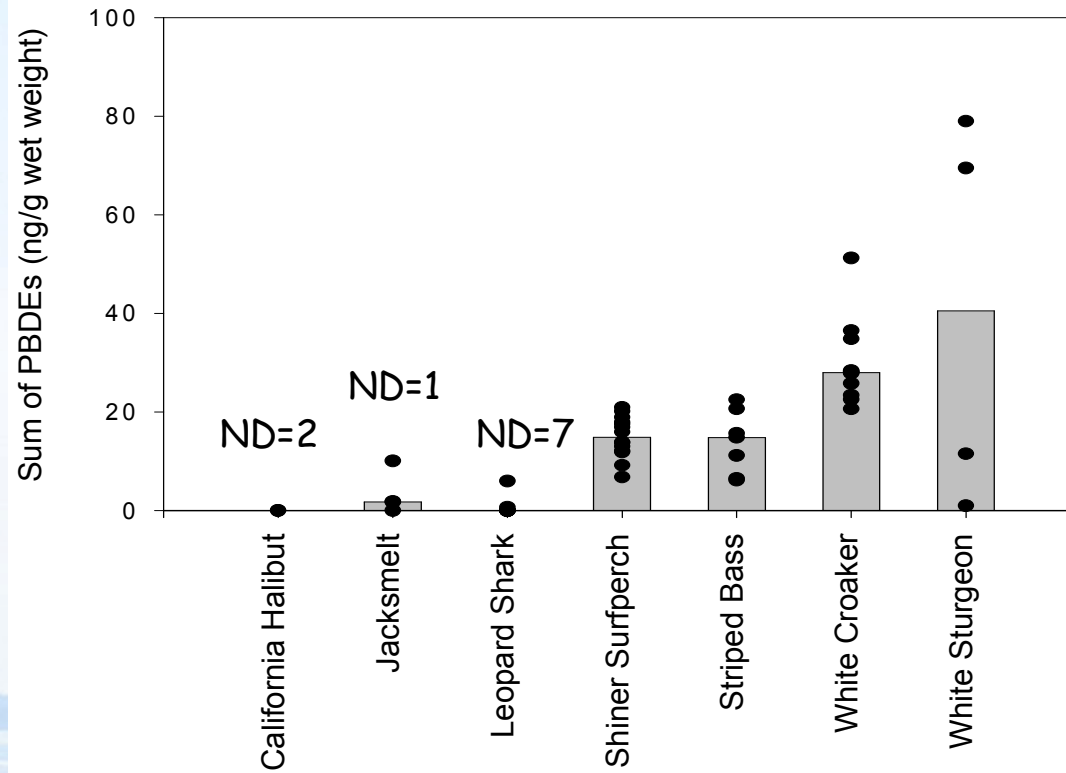
DDTs (ng/g ww) 2003

SV=100 ng/g ww

2% of samples exceeding



PBDEs (ng/g ww) 2003



PBDEs

- PBDE 47 was the dominant congener
- PBDE 47 > PBDE 100 > PBDE 99 > PBDE 153 > PBDE 154
- BDE-47, BDE-99, and BDE-100 are the most bioaccumulative congeners from the commercial Penta-BDE mixture (Oros 2005)
- Penta and octa mixtures banned in California effective 2006
- Concentrations in the same range found for North American freshwater fishes (Hites, 2004)



Pilot Study 2003

- Anchovy, brown smoothhound, Chinook Salmon, walleye surfperch, black surfperch, brown rockfish
- Analyzed for PCBs and Hg
- 2 small species (sardine and herring) and anchovy analyzed for PBDEs
- Anchovy composite from South Bay had the 3rd highest PBDE (total) concentration of all fish measured (64.5 ng/g ww, 9% lipid)



Fish Tissue Analysis by Analyte

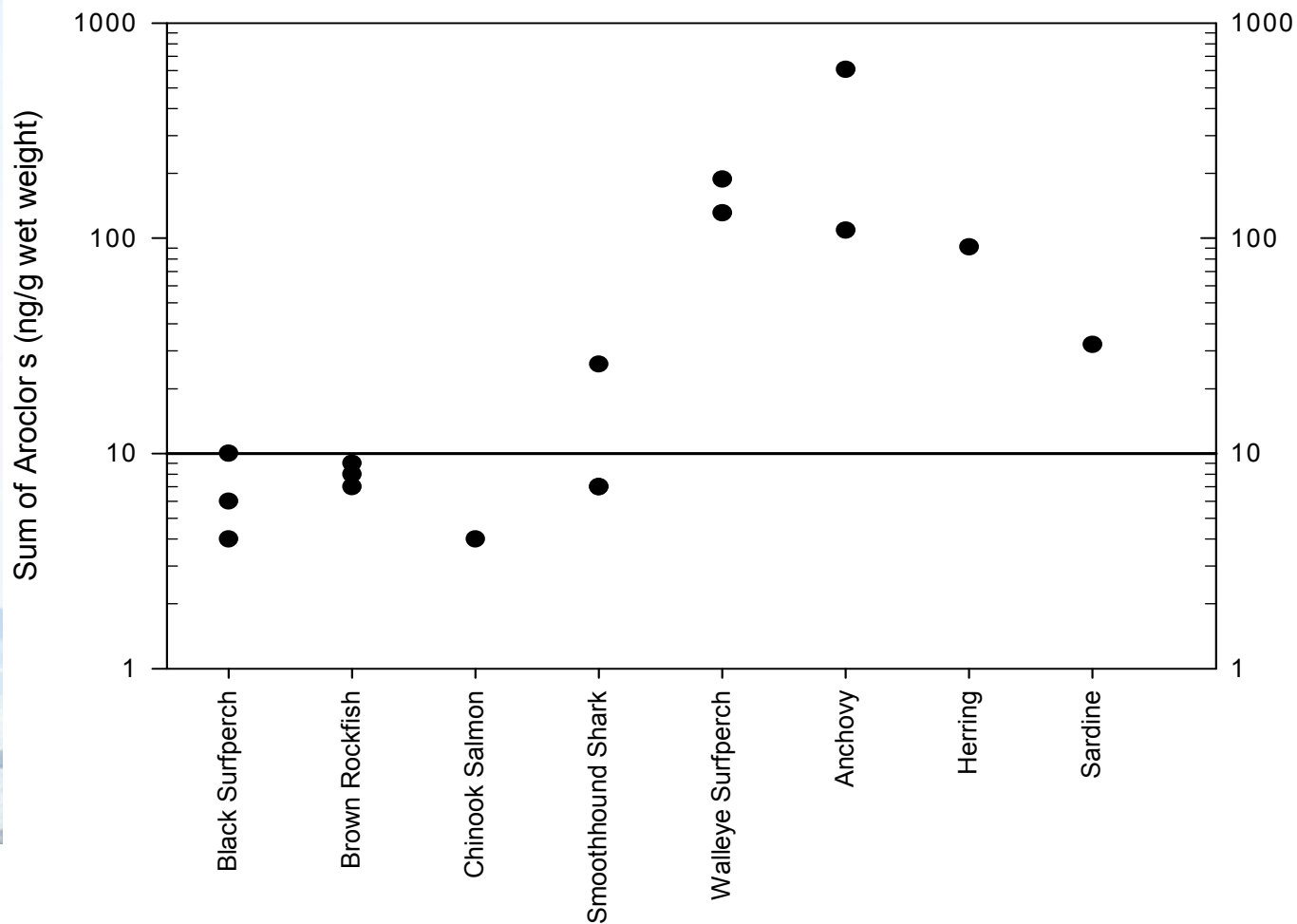
Fish Species	OC Analyses PCBs & Pesticide	PBDEs	PCBs only	Hg - total	MeHg	As
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	# of composites	# of composites	# of composites	# of composites	# of composites	# of composites
Brown Smoothhound			3	9	9	3
Chinook Salmon			2	2		
Walleye Surfperch			2	2		
Black Surfperch			3	3		
Brown Rockfish			3	3		
Anchovy		2	2	2		
Herring - bycatch		1	1	1		



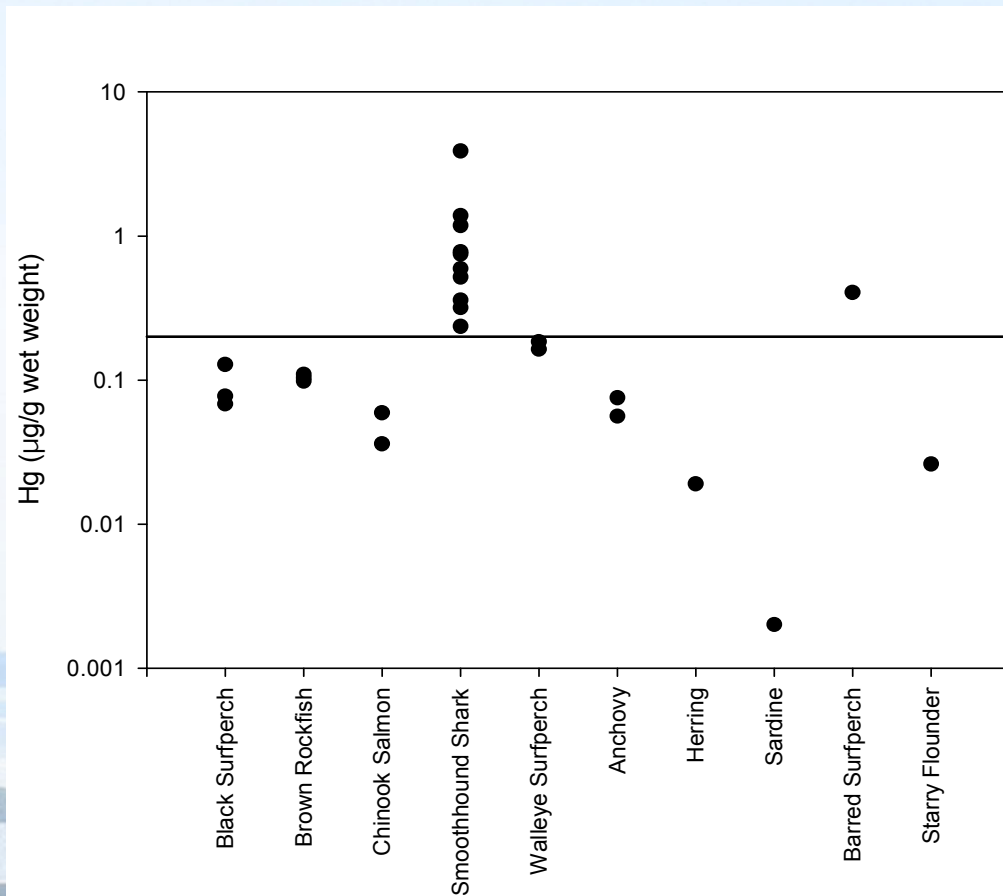
Aroclors (ng/g ww) 2003

TMDL target=10 ng/g ww
48% of samples exceeding



Hg ($\mu\text{g/g}$ ww) 2003

TMDL target = 0.2 $\mu\text{g/g}$ ww
41% of samples exceeded



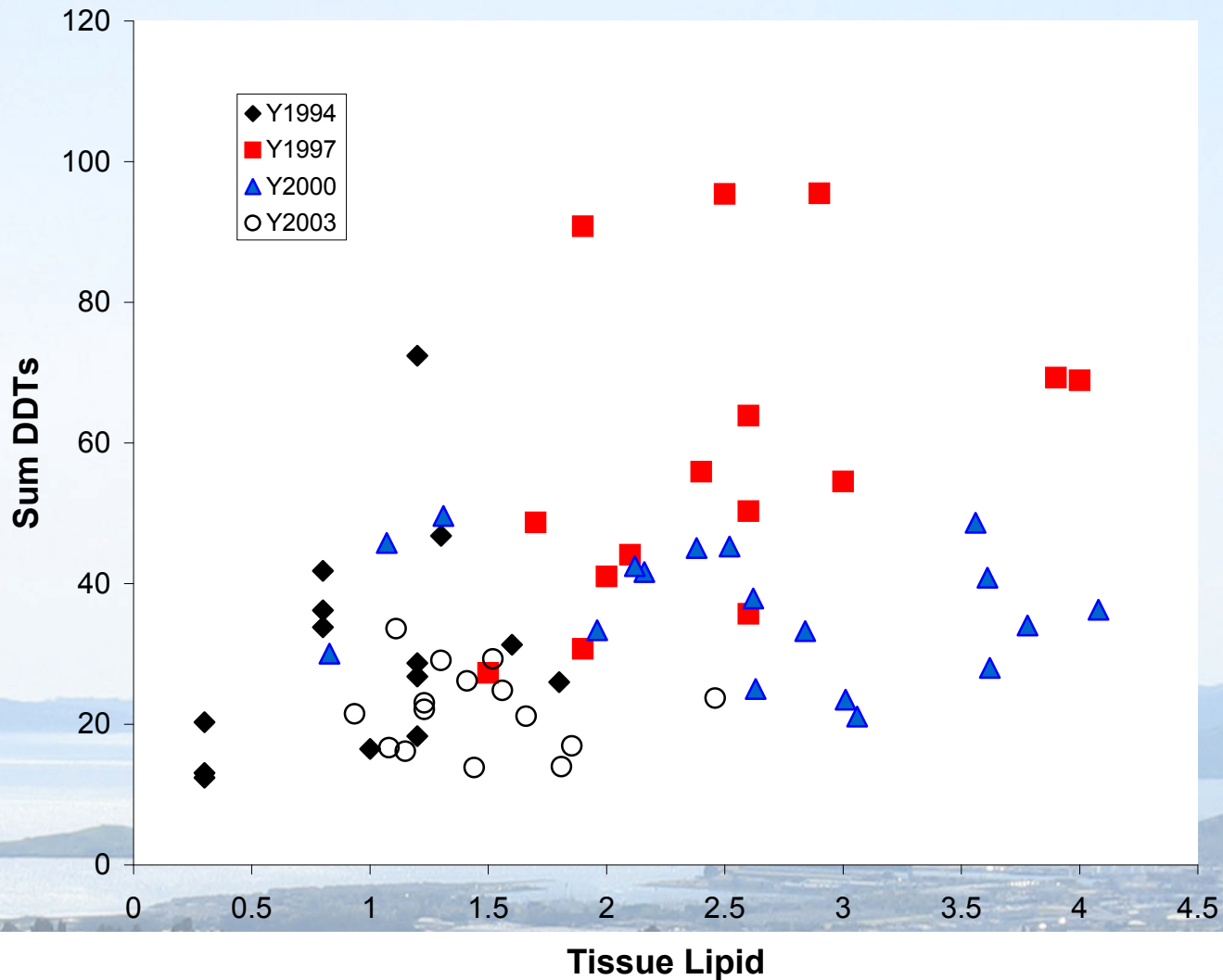
Trends

- RMP/BPTCP 4 sampling years
 - 1994, 1997, 2000, 2003
 - White croaker, shiner surfperch, leopard shark, striped bass
- RMP plus previous programs
 - Hg in striped bass: 1970-1972, 1994-2003
 - Selenium in sturgeon: 1986-2003
 - Organics in sturgeon: 1986-2003

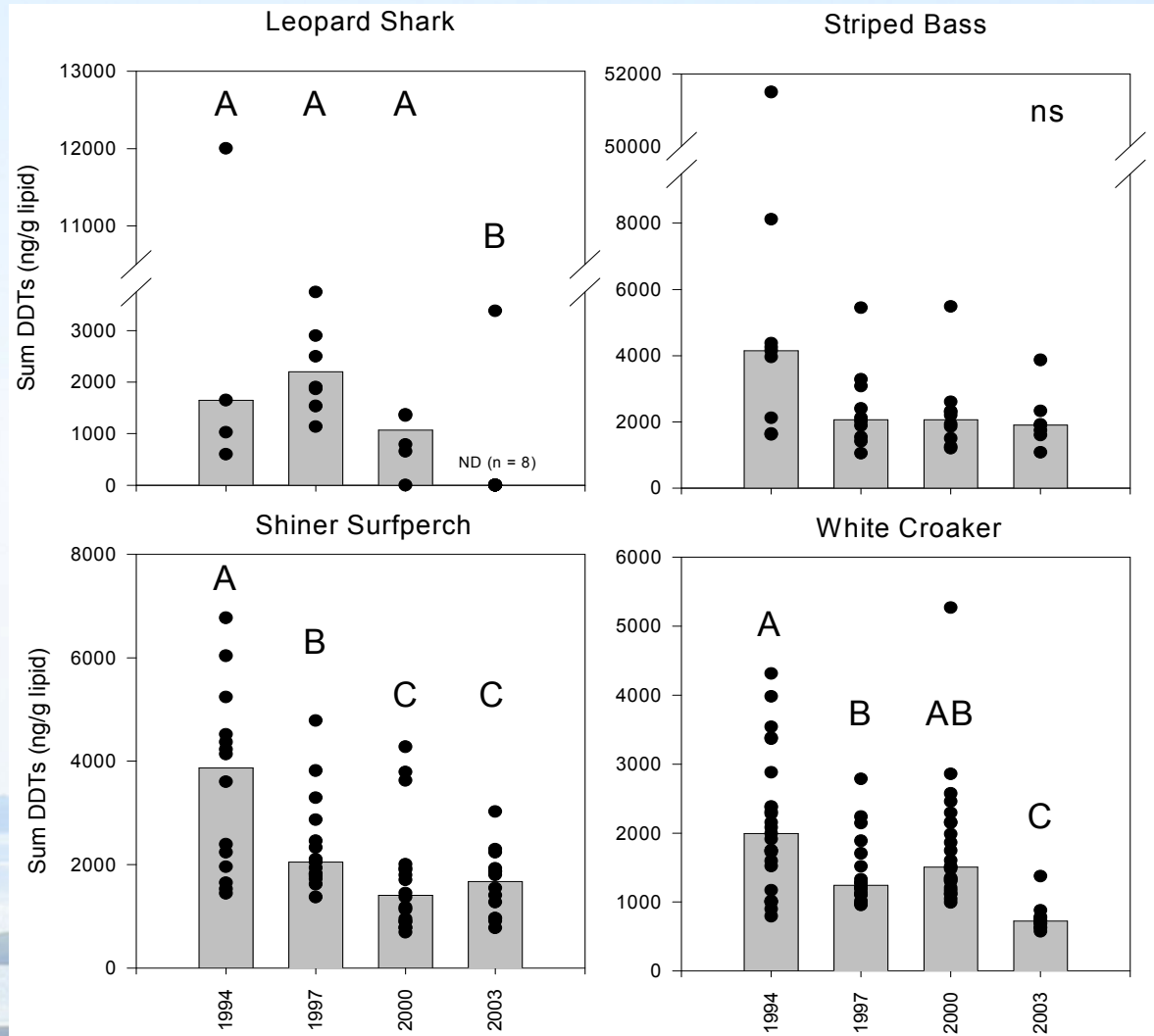


Lipid Content vs. Contaminants

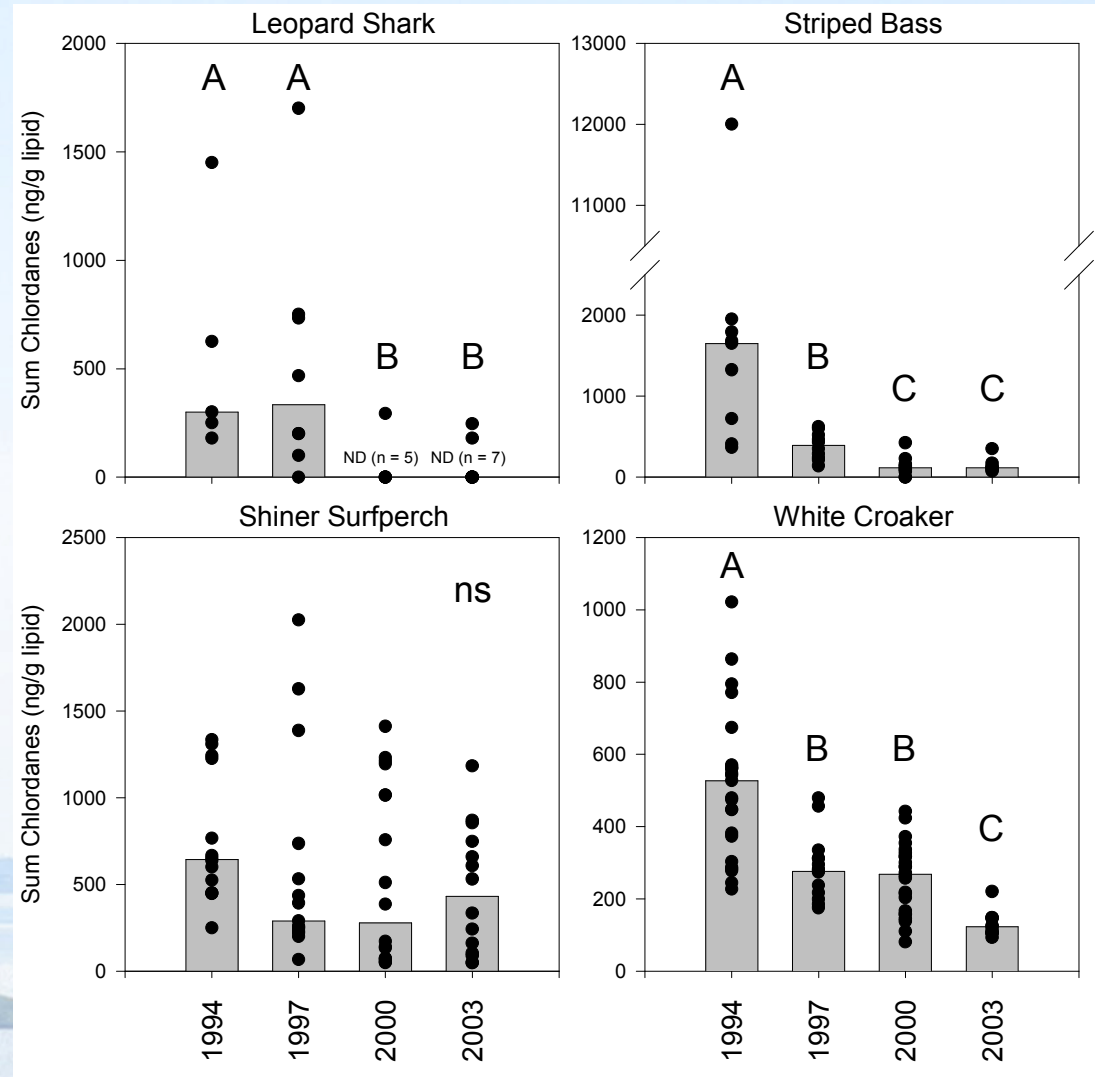
Shiner Surfperch Lipid vs. Sum DDTs



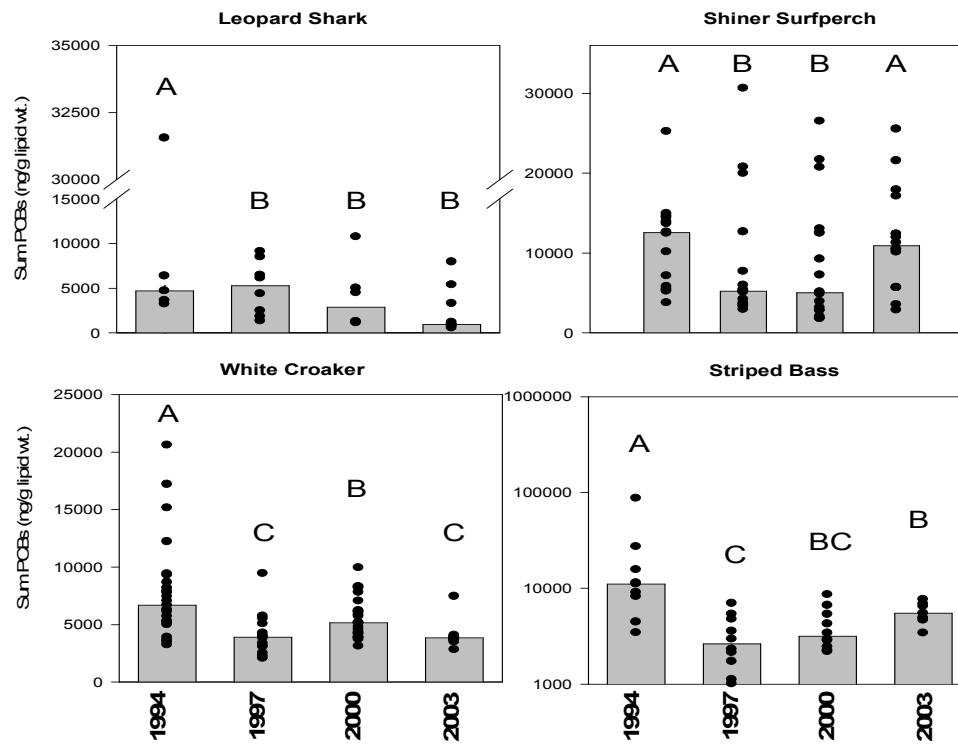
DDTs Lipid Weight



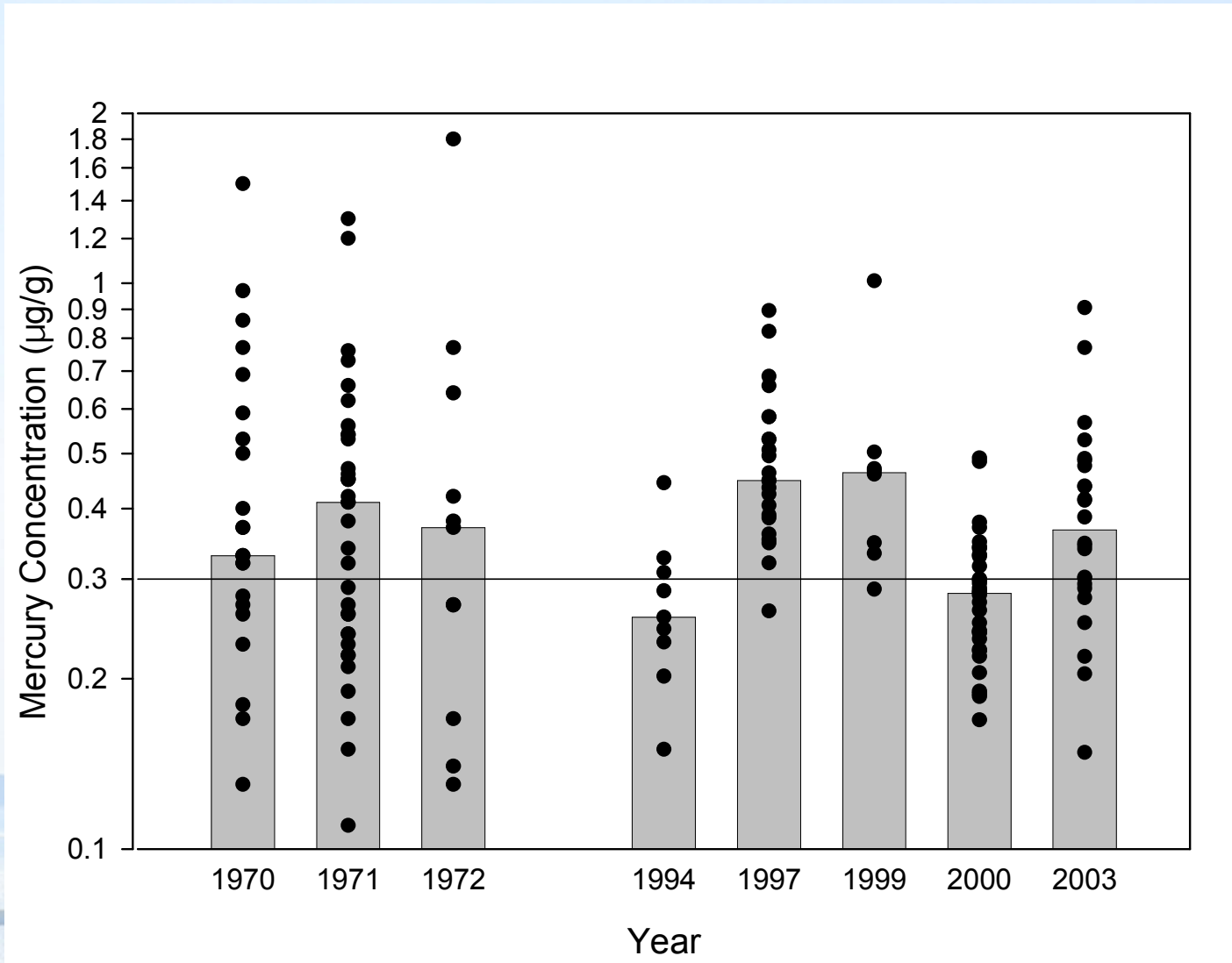
Chlordanes Lipid Weight



PCB Aroclors Lipid Wt.



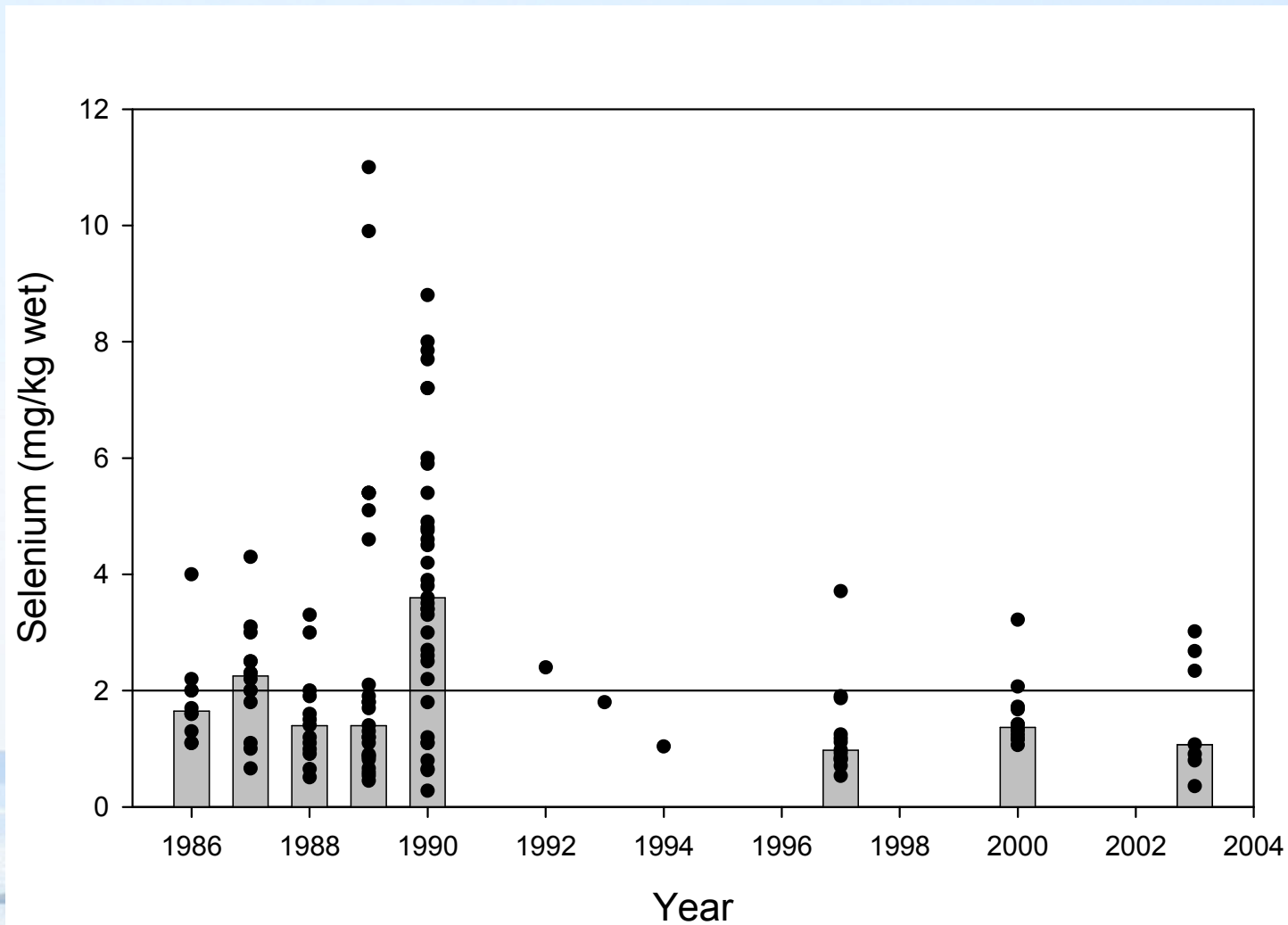
Hg in Striped Bass



Data are standardized to a 55 cm fish



Selenium in White Sturgeon



Trends Summary

- Evidence of decline in lipid weight concentrations for DDTs and Chlordanes in most fish species
- High variability in PCB data
- White sturgeon South Bay organics - unusually elevated samples in 2003
- No long-term trend in striped bass Hg
- No long-term trend in sturgeon Se



Trends Summary

	PCBs *	DDTs *	Chlordanes *	Selenium	Hg
Striped Bass	no	-	-		no
White Croaker	- ?	-	-		
Leopard Shark	-	- ?	-		
Shiner Surfperch	no	-	- ?		
Sturgeon	no	-	no	no	

* = Lipid wt. - = Negative trend



Study Participants

- Jen Hunt, Ben Greenfield, Jay Davis, SFEI
- Rusty Fairey, Cassandra Roberts, Marco Sigala and crew, MLML
- Dave Crane and crew, CDFG - MPSL
- Gary Ichikawa and crew, CDFG
- RMP Fish Work Group

