Bight '08 Regional Marine Monitoring
Key Findings:
Tissue Contamination

So Cal Lacks a Comprehensive Fish Tissue Monitoring Program

- **Recreational anglers landed 8 million fish in 2009**
  - Industry generates approximately $2B/yr
- **Less than $3M spent on bioaccumulation monitoring in 1997**
  - Only LA margin has been assessed for risk of seafood consumption
- **Unable to combine NPDES monitoring data from San Diego to Santa Barbara**
  - Different species, tissues, analytes, etc.

Study Questions

- **What percentage of popular fishing areas have low enough concentrations of contaminants that fish can be safely consumed?**
  - Support future Fish Advisories by the Office of Environmental Health and Hazard Assessment (OEHHA)

- **What is the regional distribution of fish concentrations?**
  - Comparison to regulatory monitoring for National Pollutant Discharge Elimination System monitoring (NPDES)

Study Design

- **Select multiple species that anglers catch/consume**
  - At least one bottom and one water column species
  - Greatest overlap in species between NPDES programs
- **Use a zone approach scaled to fishing effort**
  - Consistent with OEHHA's new advisory strategy
  - 27 zones from Pt Conception and Mexico
  - Replication within each zone
- **Focus on constituents/tissues with greatest potential health risk**
  - PCBs, DDTs, Mercury
  - Composites of skin off filets


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19
18
16
15
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12
14
11
9
10
8
7
6
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4
3
2
23
17
San Miguel Island
Santa Cruz Island
Anacapa Island
Santa Rosa Island
Santa Catalina Island
San Nicolas Island
San Clemente Island
Los Angeles
Riverside
San Diego
61 mi
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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33°24'35.61" N 118°38'41.79" W elev -2184 ft
Eye alt 204.32 mi
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Fish Advisory Tissue Levels (ATL)
OEHHA, 2008

Contaminant (ng/wet g)	Number 8 oz Meals Per Week		
	<Three	<Two	<One
DDTs	520	1000	2100
methylMercury (women 18-45, kid 1-17)	70	150	440
methylMercury (women >45, men)	220	440	1310
PCBs	21	42	120

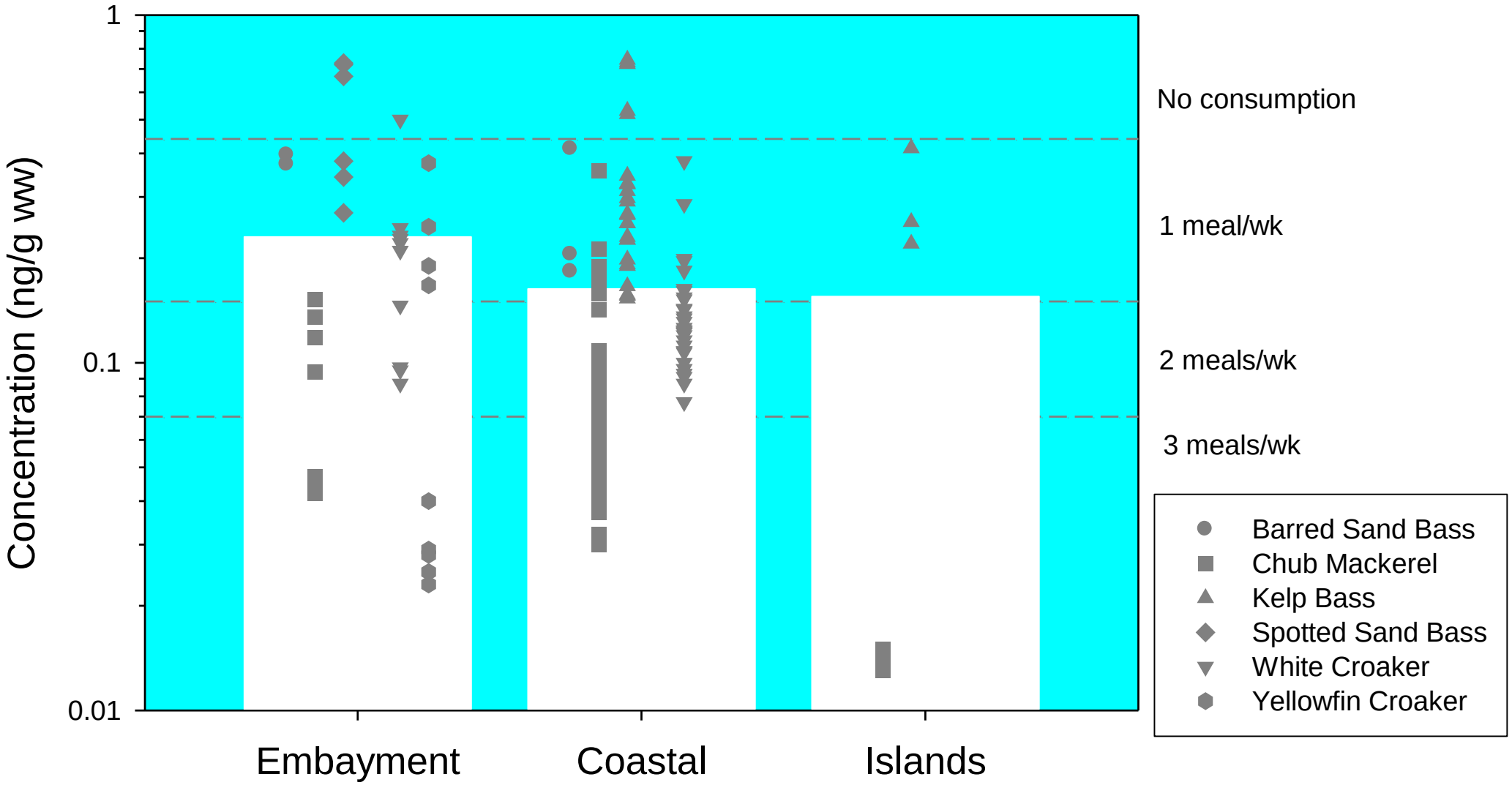
Sampling Summary

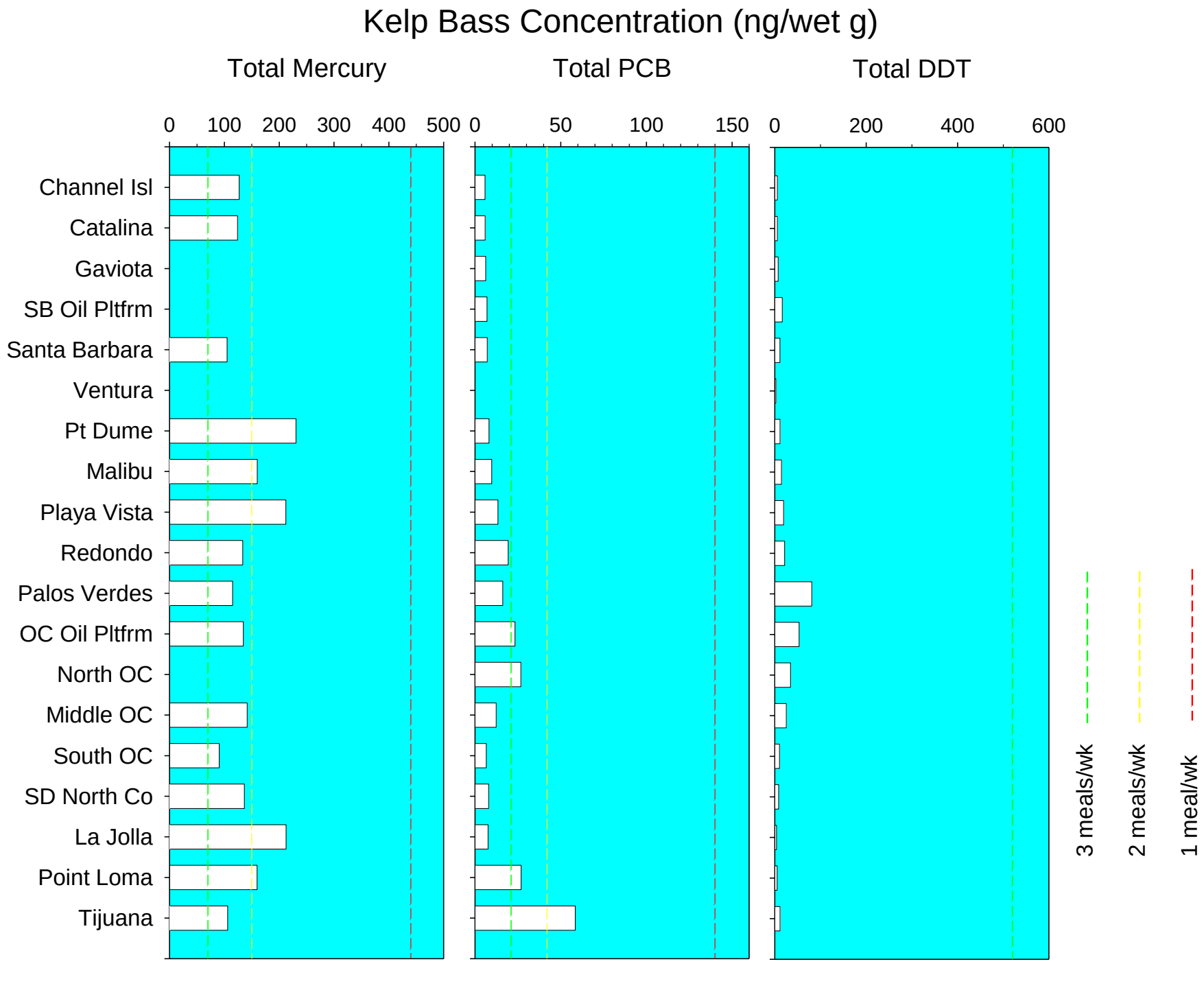
Species	Number of Fish Caught	Number Zones Offshore (N=19)	Percent of Offshore Zones Sampled	Number Embayment Zones (N=8)	Percent of Embayment Zones Sampled
Chub Mackerel	290	17	89	3	38
Kelp Bass	399	18	95	0	-
White Croaker	233	11	58	5	63
Yellowfin Croaker	50	0	-	4	50
Spotted Sand Bass	95	0	-	4	50
Any Species	**1,057**	**19**	**100**	**7**	**88**

Average Concentration By Species (ng/wet g)

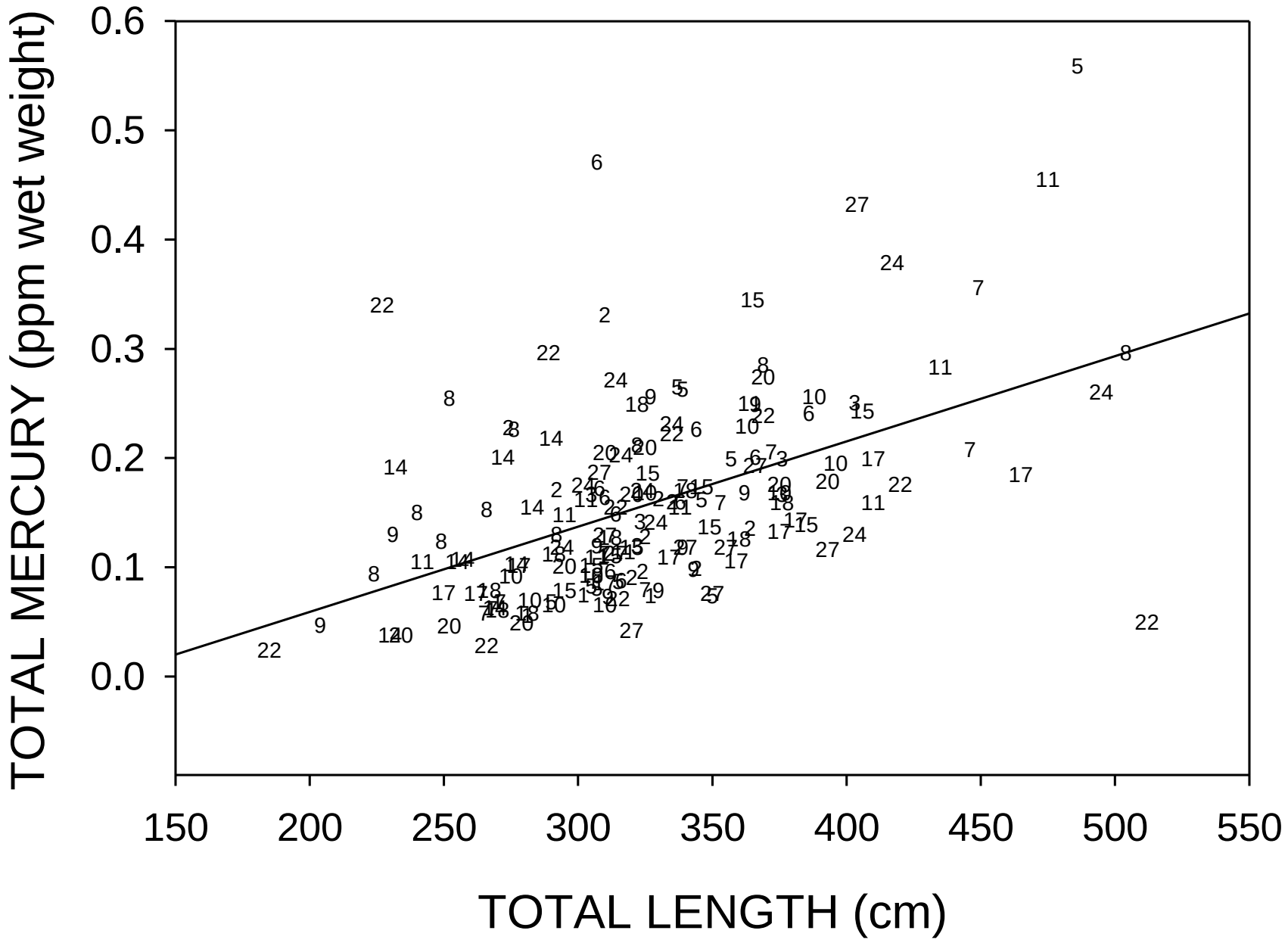
Species	Total Mercury	Total DDT	Total PCB
Chub Mackerel	61	28	19
Kelp Bass	146	19	15
White Croaker	125	42	21
Yellowfin Croaker	96	10	31
Spotted Sand Bass	164	10	35

Total Mercury In Edible Tissues of Southern California Sportfish




Kelp Bass Concentration (ng/wet g)
Total Mercury
Total PCB
Total DDT
0
100
200
300
400
500
0
50
100
150
0
200
400
600
Channel Isl
Catalina
Gaviota
SB Oil Pltfrm
Santa Barbara
Ventura
Pt Dume
Malibu
Playa Vista
Redondo
Palos Verdes
OC Oil Pltfrm
North OC
Middle OC
South OC
SD North Co
La Jolla
Point Loma
Tijuana
3 meals/wk
2 meals/wk
1 meal/wk

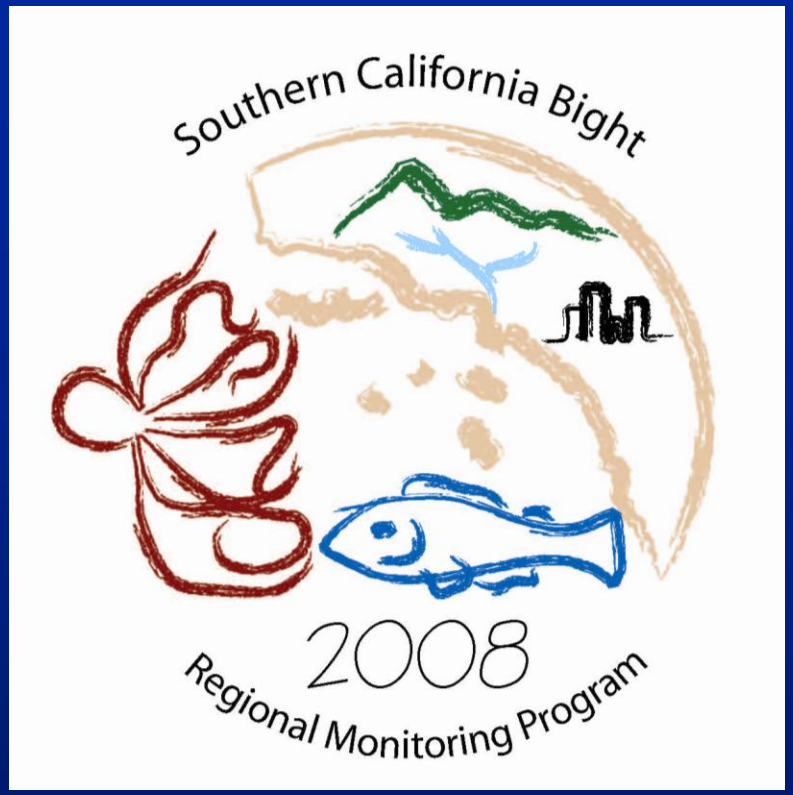
KELP BASS


TOTAL MERCURY (ppm wet weight)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
150
200
250
300
350
400
450
500
550
TOTAL LENGTH (cm)

Answering Our Two Questions

- **No species sampled had average concentrations that exceeded OEHHA's no consumption guidelines**
  - Most samples of Kelp Bass exceeded lowest advisory tissue level for mercury

- **Spatial patterns in tissue concentration were consistent with known sources of DDTs and PCBs**
  - Spatial pattern for mercury correlated with fish age



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