

**CA Regional Water Quality Control Board
San Diego Region**

San Diego Bay Studies

October 18, 2016

Bioaccumulation Study in San Diego Bay

SD Water Board Contact:

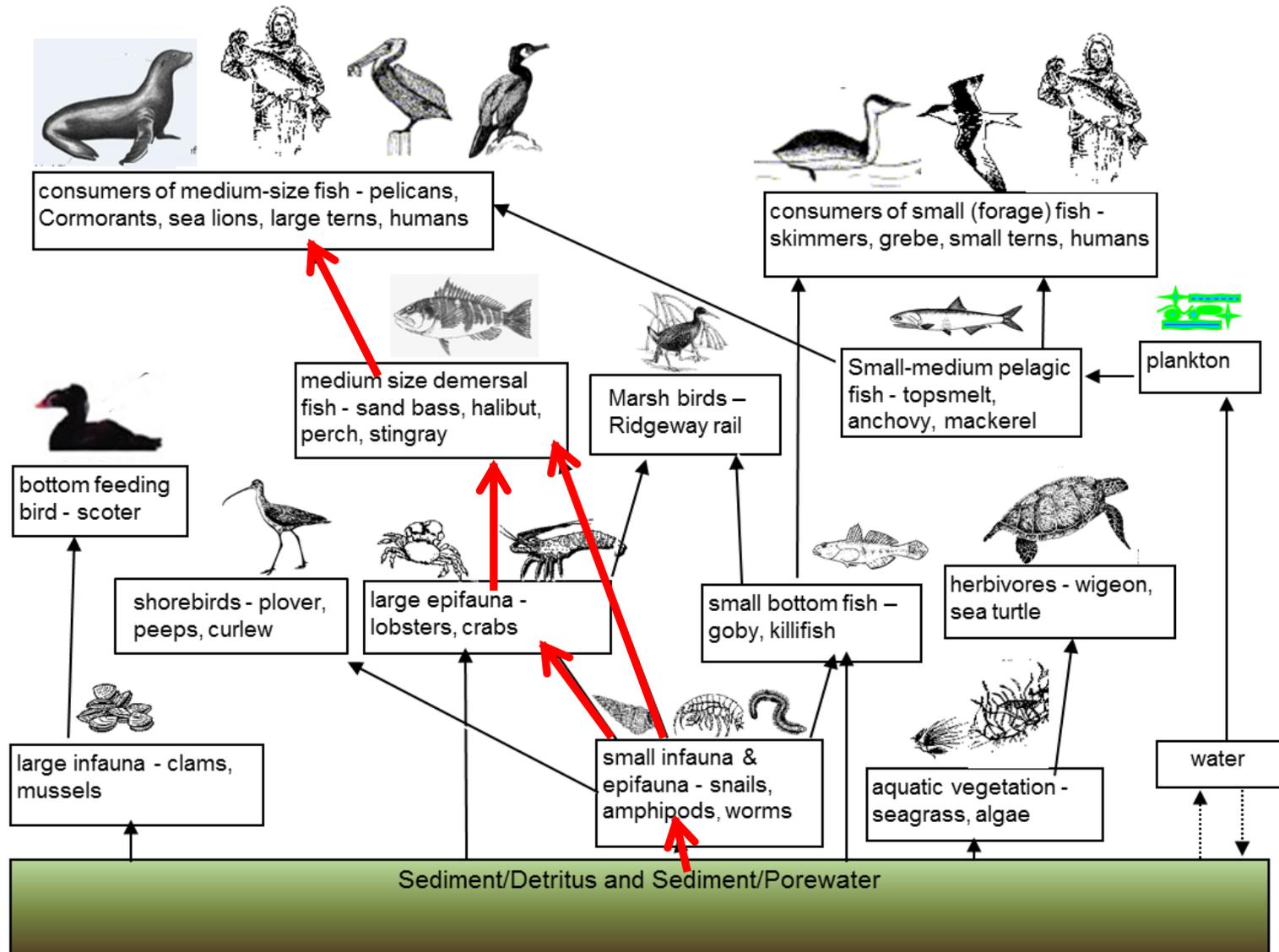
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***Slides provided by Steve Bay, SCCWRP*

San Diego Bay Bioaccumulation Study

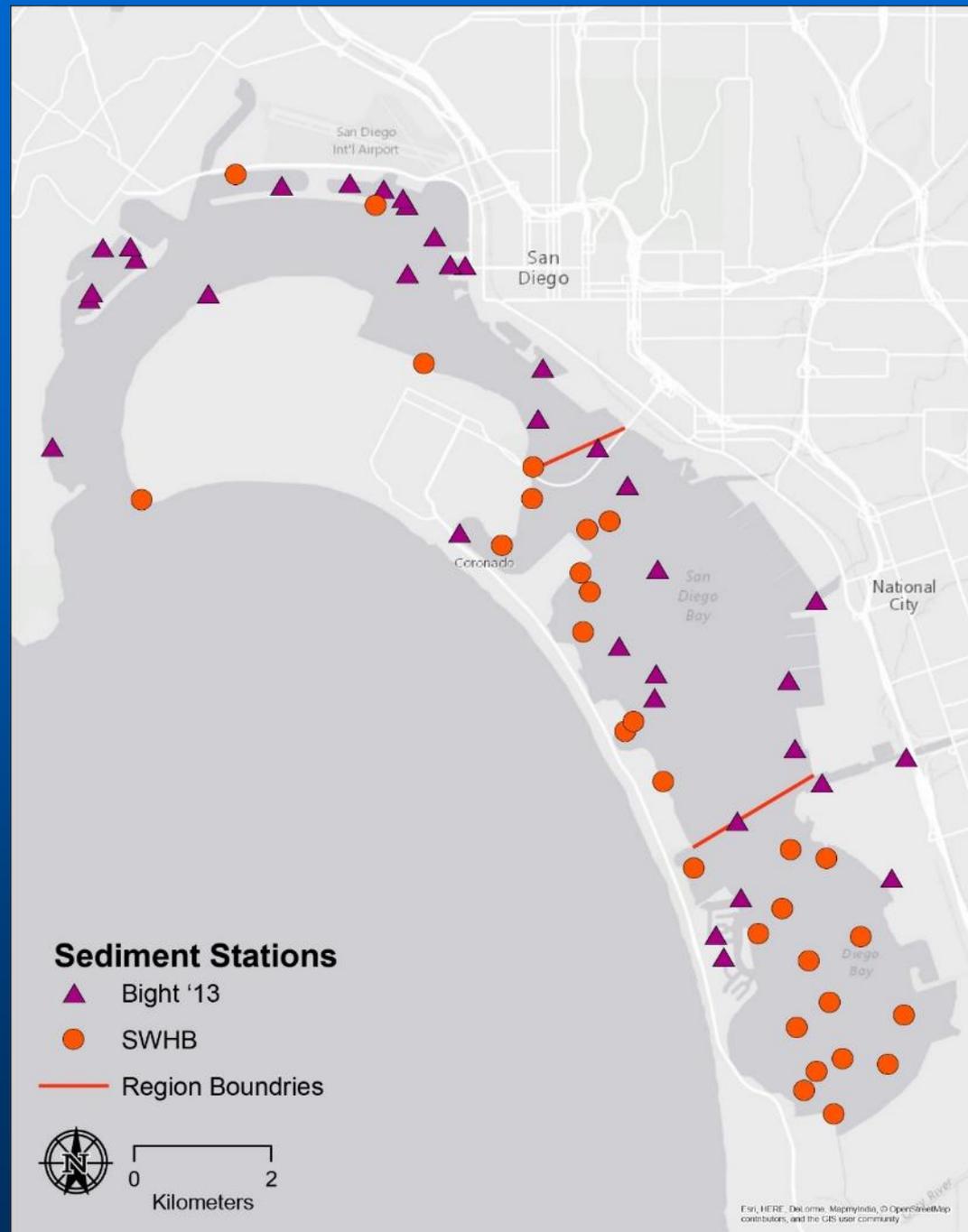
- **Partners:**
 1. **Principal Researchers: SCCWRP, USFWS**
 2. **Funding: SWRCB, Port, and City of SD**
- **Three major study elements:**
 1. **Better understand transfer of chemical contaminants through the food web**
 2. **Potential risks to wildlife**
 3. **Potential risks to human health**
- **Data collected from three programs will supplement the SD Bay Bioaccumulation Study**

Bioaccumulation Pathways

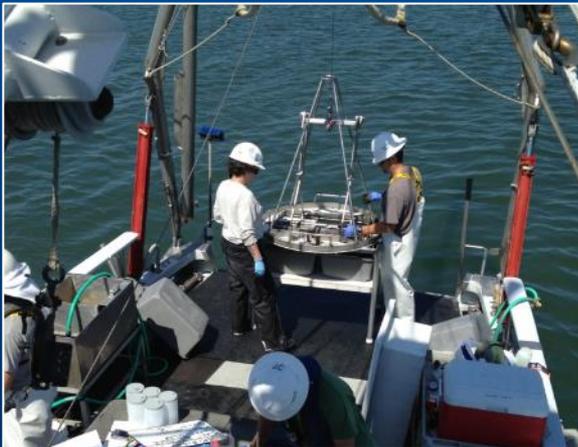


Sediment

- Three bay subregions
 - North, Central, South
 - Surface sediment
- Different habitats and uses
 - Marina, Port
 - Open bay, shallow



Sediment Sampling



Biota

- Multiple food web elements
- Matched sediment and biota samples from each region
- Includes shallow and deep areas



Fish Sampling

- Collected fish from boats and piers
- Multiple sampling events
 - Guided boat fishing
 - Fishing derby



San Diego Bay
Donate your fish to support a human health risk assessment of San Diego Bay
Free!
Fishing for Science Derby
Saturday, June 6th

LOCATION:
FOUR CHECK-IN TENTS AROUND SD BAY:
ORIENTATION REQUIRED TO PARTICIPATE

- SHELTER ISLAND PIER
- EMBARCADERO S. PIER
- PEPPER PARK
- SILVER STRAND (CROWN COVE)

FOR MORE INFO:
CALL: 858-775-5547
VISIT: <http://tinyurl.com/SDBFishStudy>

LAUNCH TIME:
CHECK-IN & ORIENTATION 6:30AM
FISHING 7:00AM—2:30PM
AWARDS/RAFFLE 2:30PM

PRIZES:
BIGGEST TARGET FISH & RAFFLE DRAW

Presented by,
San Diego Regional Water Board & Partners
amec foster wheeler

100% FREE! EMAIL corey.sheredy@amecfw.com OR CHECK-IN DAY OF REGISTER EARLY TO SECURE YOUR FREE SWAG BAG & RAFFLE TICKETS! SPACES ARE LIMITED

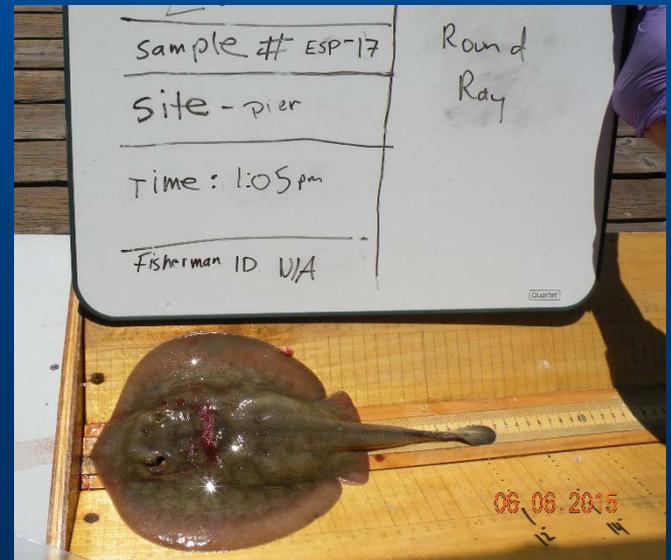
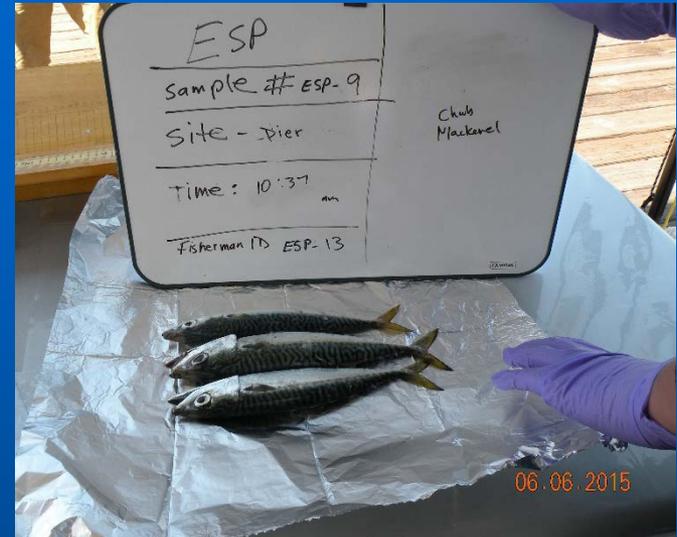


Guided Boat Fishing



Photos courtesy of Amec Foster Wheeler

Fishing Derby



Species Summary

Pelagic Fish and Invertebrates

- Anchovy
- Topsmelt
- Mackerel
- Zooplankton

Sediment-Dwelling Invertebrates

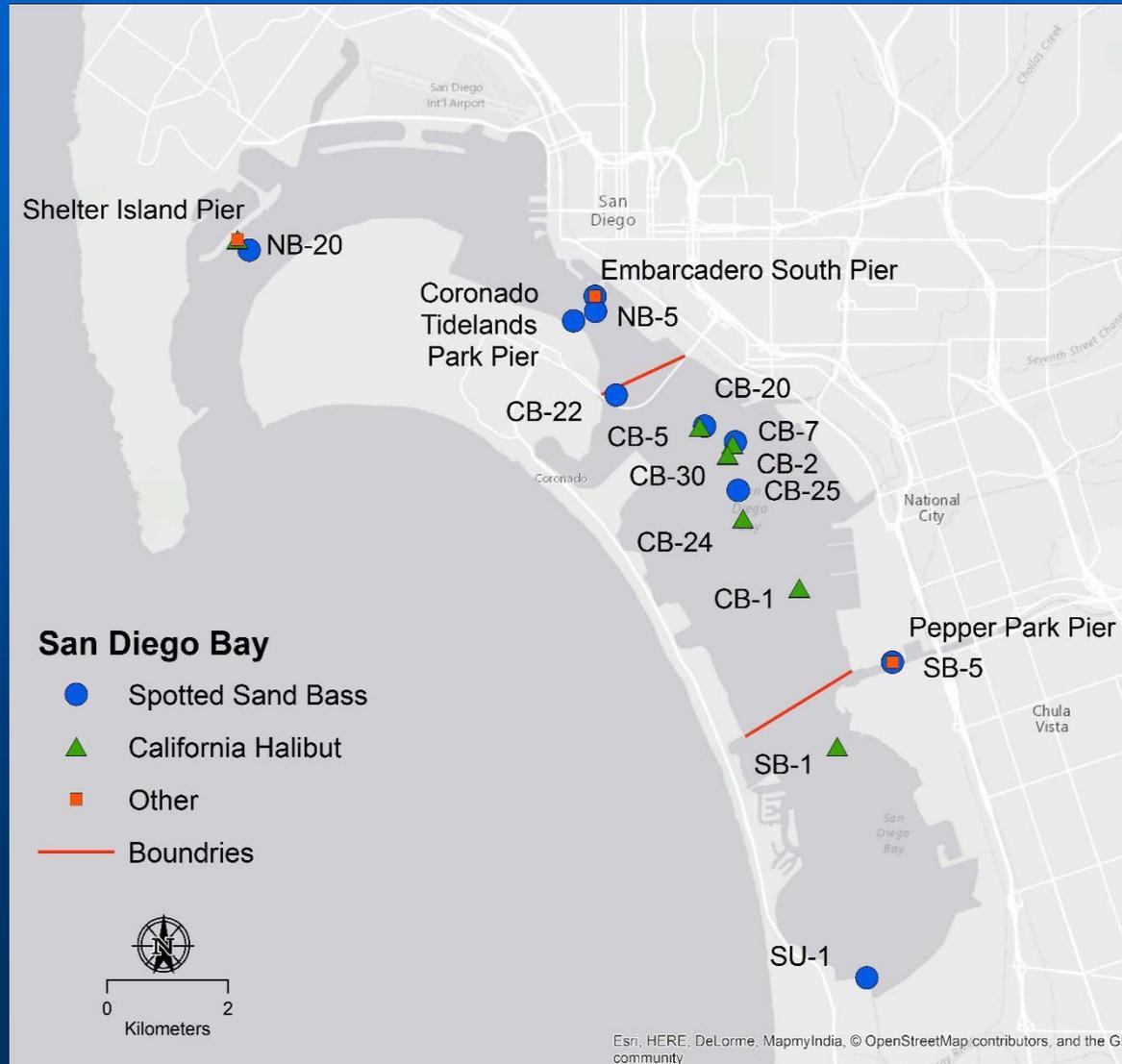
- Polychaetes
- Mollusks
- Crustaceans

Bottom Fish

- Barred Sand Bass
- Spotted Sand Bass
- California Halibut
- Perch
- Stingray
- Gobies
- Killifish

Sport Fish Sample Locations

- Chemical analysis for PCBs, DDTs, mercury, Chlordanes, and dieldrin
- Composites of 5 fish
 - Individual halibut
 - Fillet or whole body (depending on size)



Health Risk Assessment Methods

- **OEHHA threshold comparison**
 - Basis for seafood consumption advisories
 - Balance health risk and benefits of seafood consumption
 - Does not consider source of contamination
- **Sediment Quality Objectives draft assessment framework**

“Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health”

Target Species

Pelagic forager: Caspian Tern



Benthic forager: Cormorant



Mixed forager: Western Gull



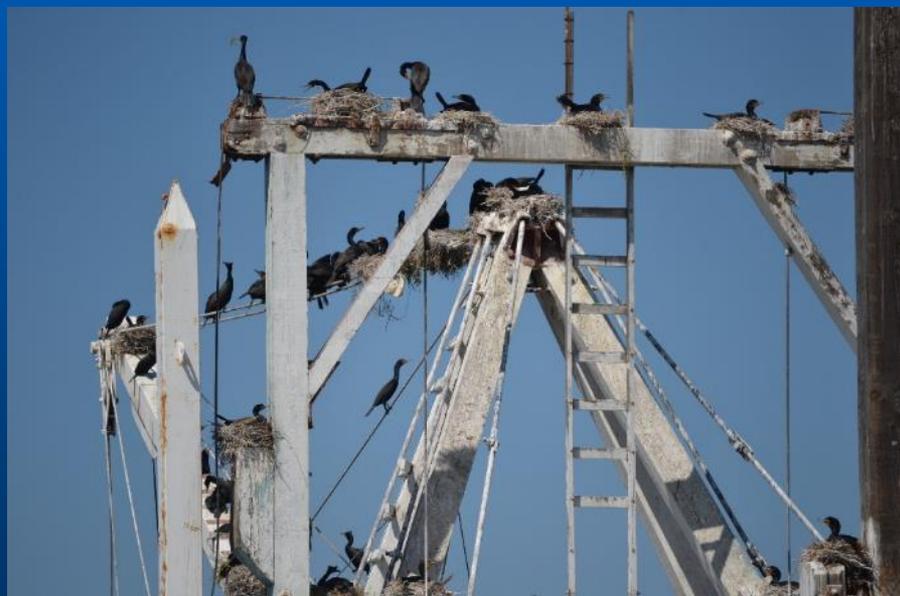
**Species of special concern:
CA Least Tern**



San Diego Bay Nest Sites



Lea Squires



Brian Collins/USFWS

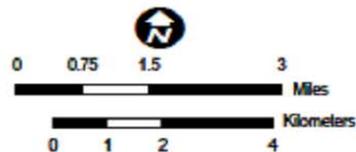


2013 Bird Egg Sampling Locations



PRODUCED BY GIS SERVICES
CARLSBAD FIELD OFFICE
GIS CONTACT: ED TURNER
BIOLOGY CONTACT: KATIE ZEEMAN

MAP DATE: 10/23/13
DATA SOURCE: USFWS
IMAGE SOURCE: Esri On-Line Imagery
Style: c:\temp\new\dm\apr\Bight_3esB142.mxd



Legend

Bight Seabird Egg Sample Locations

Wildlife Risk Assessment Methods

- **Literature-Based Screening Values**
 - No Observed Adverse Effect Concentrations (NOAECs)
 - Lowest Observed Adverse Effect Concentrations (LOAECs)
- **Hazard Quotient Approach**
 - $HQ < 1.0$
 - $HQ > 1.0$

Study Products

- **Final report**
 - Draft report available on Water Board website
 - Final report by end of 2016



SAN DIEGO BAY FISH CONSUMPTION STUDY



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**Slides provided by Steve Steinberg, SCCWRP

TECHNICAL ADVISORY GROUP



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PROJECT OVERVIEW



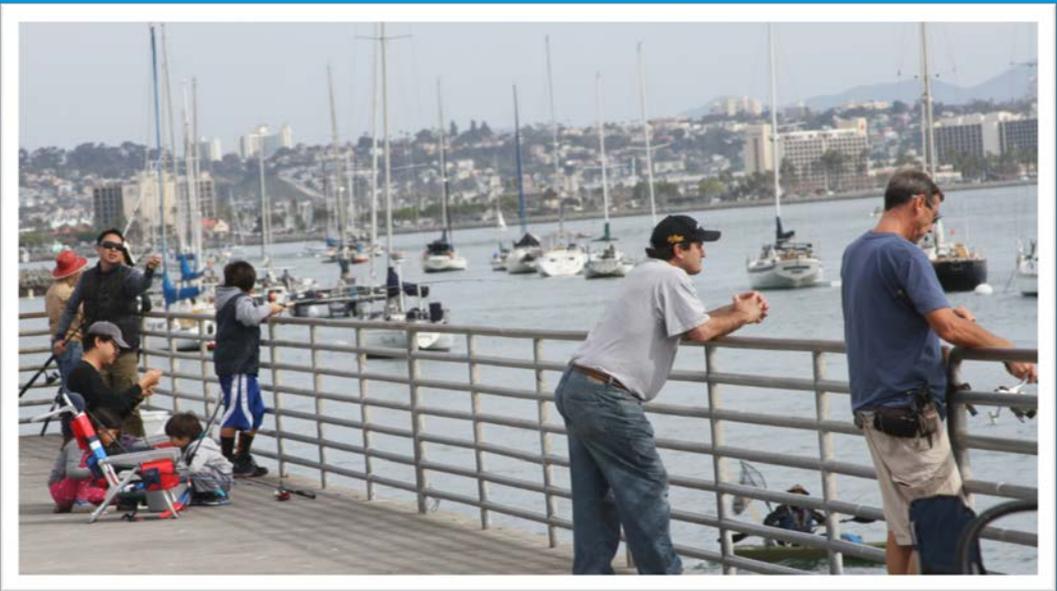
- Goal: Improve current understanding of risk to humans from consuming contaminated fish from the Bay.
- Last such study in San Diego Bay was completed by the Environmental Health Coalition in 2005. (pier focused)
- SD County Dept. Health Services completed a study in 1990.



PROJECT VALUE



- Study findings will provide valuable information regarding **actual** consumption rates for San Diego Bay
- Useful to inform decision-making and policy that is appropriate to the local context.



STUDY PLAN AND SURVEY



- Capture representative sociodemographic, spatial and temporal coverage.

North Bay

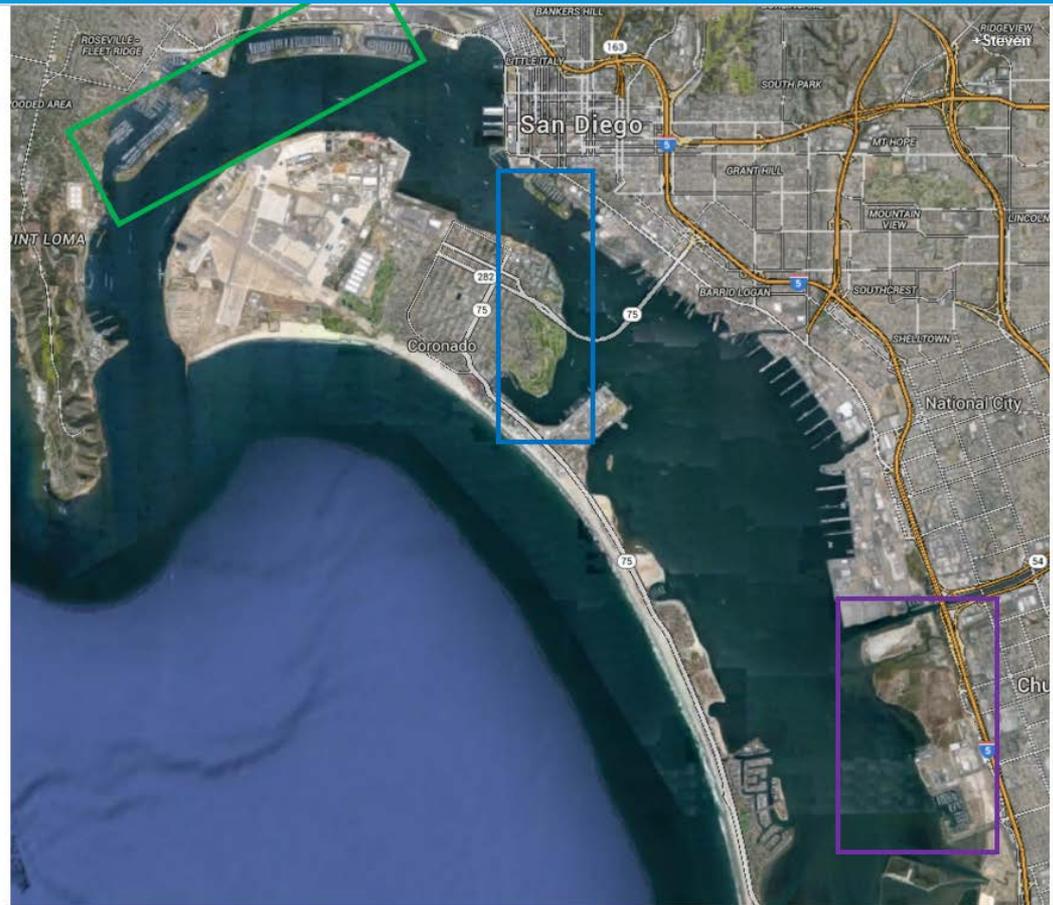
Includes one pier, shoreline sites & one boat ramp (Shoreline Park). Shoreline sites (Harbor Island Park).

Mid Bay

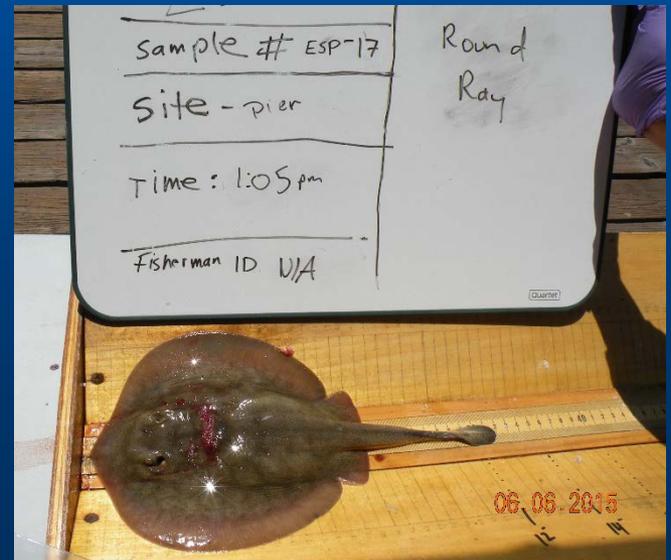
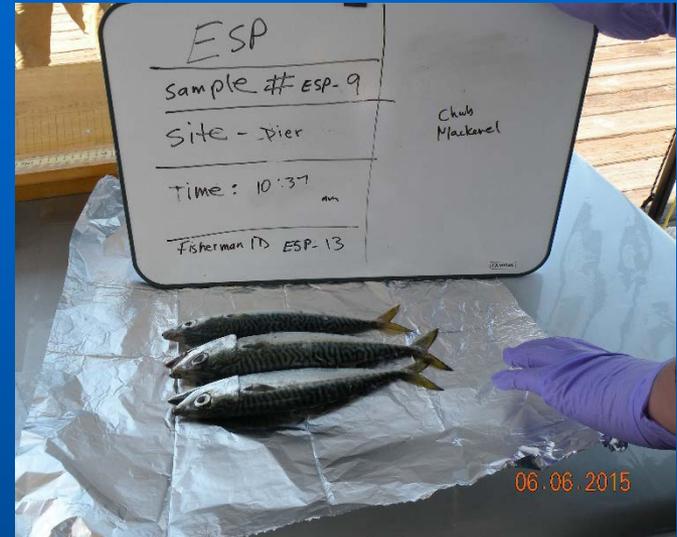
Includes two piers (Coronado Ferry Landing, Embarcadero Marina Park), shoreline sites (Tidelands Park, Glorietta Bay Park & Embarcadero Marina Park), one boat ramp and rental boats (Glorietta Bay).

South Bay

Includes one pier, shoreline sites & two boat ramps (Bayside Park and Pepper Park).



Fishing Derby



SURVEY STATUS

AS OF FEBRUARY 29, 2016



- 1512 anglers approached
 - All fishing activity observed is recorded for date, time and location of survey
- 1005 full surveys
 - 643 pier
 - 203 shoreline
 - 159 boat
- Draft report by Dec 30, 2016
- Final Report by Mar 31, 2017

Passive Sampling Study in San Diego Bay

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San Diego Bay Passive Sampling Study

- **Partners:**
 1. Principal Researcher: SCCWRP
 2. Funding: SWRCB
- **Purpose of Study: develop passive sampling protocols for potential use in SD Bay**
- **Lab-Based Screening**
 1. Polyethylene (PE) Passive Samplers
 2. Polymethylmethacrylate (PMMA) Passive Samplers

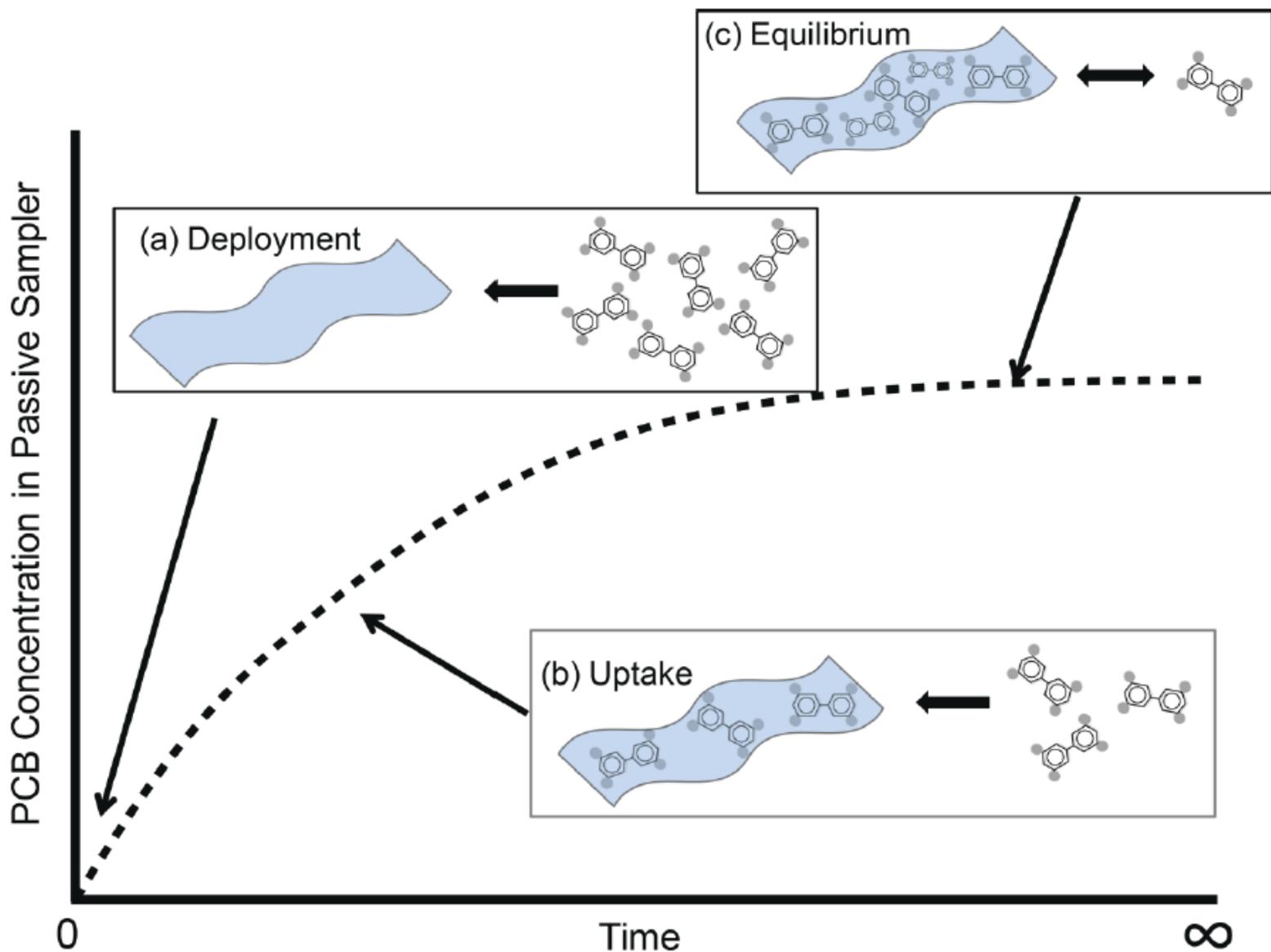
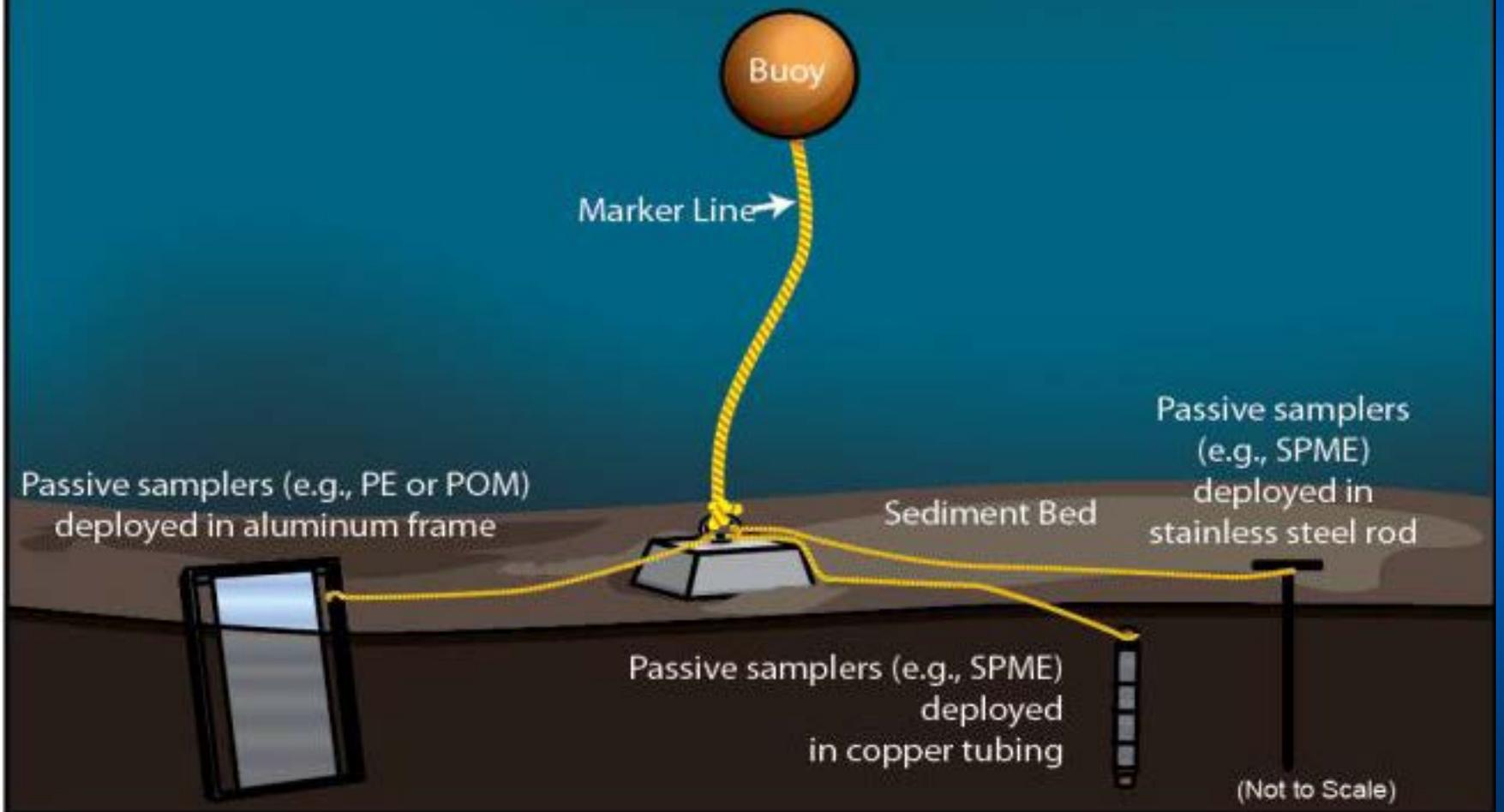


Figure 5. Conceptual schematic of PCB (c1ccc(Cl)cc1) uptake by a passive sampler () from (a) initial deployment, (b) through uptake, and (c) achieving equilibrium. The number of PCB molecules is not intended to be quantitative but rather demonstrate relative changes in the concentrations of PCBs over the deployment period.

(d)



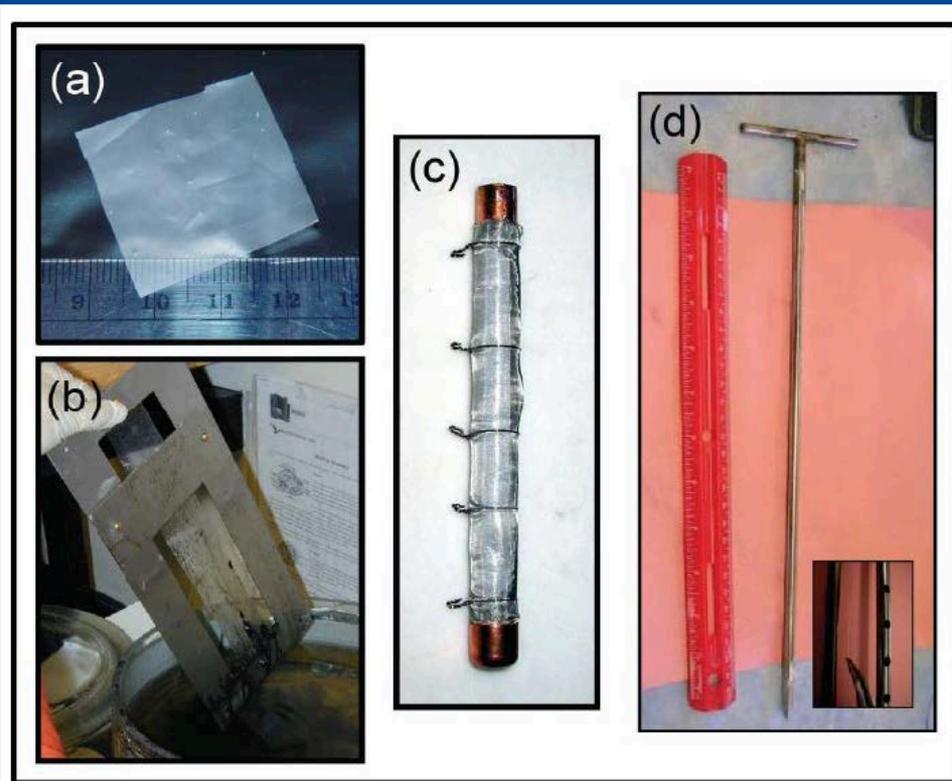


Figure 7. Passive samplers designed for whole sediment deployments: (a) small piece of polyethylene, (b) polyethylene arrayed in a metal frame, (c) copper tubing holding SPME fibers, and (d) stainless steel tubing containing SPME fibers.

Study Products

- **Final report**
 - Draft report by January 31, 2018
 - Final report by March 30, 2018

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