



**AGENDA**  
**RMP Technical Review Committee Meeting**  
**December 15<sup>th</sup>, 2010**  
**San Francisco Estuary Institute**  
**First Floor Conference Room**  
**7770 Pardee Lane, Oakland**  
**10:00 am - 4:00 pm**

<b>1.</b>	<b>Introductions and Approval of Agenda and Minutes</b> (Attachment) Review of Action Items	10:00 Bridgette DeShields
<b>2.</b>	<b>Information: Steering Committee Report</b> (Attachment) Update on the recent SC meeting.	10:10 Meg Sedlak
<b>3.</b>	<b>Action: 2011 Pulse</b> (Handout) The Steering Committee has decided to proceed with the theme of “Contaminant Effects on Wildlife” for the 2011 Pulse. A draft outline and timeline will be presented. <b>Desired Outcome:</b> Approval of the outline for the Pulse.	10:20 Jay Davis
<b>4.</b>	<b>Action: 2011 Joint meeting of CTAG and TRC</b> (Attachment) SCCWRP has tentatively proposed the date of our joint CTAG/TRC meeting for May 19th. We have prepared a tentative agenda for review <b>Desired Outcome:</b> Agreement on date and tentative agenda.	10:50 Bridgette DeShields, Meg Sedlak
<b>5.</b>	<b>2010 Highlights and 2011 Workplan</b> (Attachment) Highlights from 2010 and plans for 2011 will be summarized. <b>Desired Outcome:</b> Provide feedback and approval of the 2011 Draft Detailed Workplan.	11:10 Meg Sedlak
<b>5a.</b>	<ul style="list-style-type: none"> <li>• Sources, Pathways, and Loadings                             <ul style="list-style-type: none"> <li>○ Overview of strategy</li> <li>○ Update on 2010 activities</li> <li>○ Plans for 2010/2011 Watershed monitoring of 16 watersheds</li> <li>○ SPL Workgroup meeting in February</li> </ul> </li> </ul>	11:20 Lester McKee / Alicia Gilbreath/ Michelle Lent
	<b>Lunch Break</b>	<b>12:00</b>

<b>5b.</b>	<ul style="list-style-type: none"> <li>• Mercury and PCB Strategies, Synthesis, and Small Fish</li> </ul>	12:45 Rachel Allen, Jay Davis
<b>5c.</b>	<ul style="list-style-type: none"> <li>• Modeling <ul style="list-style-type: none"> <li>○ Overview of strategy</li> <li>○ Status</li> <li>○ Workgroup meeting in April</li> </ul> </li> </ul>	1:10 Ben Greenfield, Jay Davis
<b>5d.</b>	<ul style="list-style-type: none"> <li>• Effects Studies <ul style="list-style-type: none"> <li>○ Overview of strategy</li> <li>○ Update on 2010 activities</li> <li>○ Plans for 2011</li> <li>○ Workgroup meeting in February</li> </ul> </li> </ul>	1:40 Aroon Melwani, Meg Sedlak
<b>5e.</b>	<ul style="list-style-type: none"> <li>• Contaminants of Emerging Concern <ul style="list-style-type: none"> <li>○ Overview of strategy</li> <li>○ Update of 2010 activities</li> <li>○ Plans for 2011</li> <li>○ Workgroup meeting in March</li> </ul> </li> </ul>	2:10 Susan Klosterhaus
<b>5f.</b>	<ul style="list-style-type: none"> <li>• Dioxin <ul style="list-style-type: none"> <li>○ Overview of strategy</li> <li>○ Update of 2010 activities</li> <li>○ Plans for 2011</li> </ul> </li> </ul>	2:35 Don Yee
<b>5g.</b>	<ul style="list-style-type: none"> <li>• Status and Trends <ul style="list-style-type: none"> <li>○ Overview of strategy</li> <li>○ Sportfish</li> <li>○ Water and sediment</li> </ul> </li> </ul>	3:00 Meg Sedlak Jay Davis
<b>5h.</b>	<ul style="list-style-type: none"> <li>• Data Management (Handout) <ul style="list-style-type: none"> <li>○ Improvements to the web site design and reporting</li> <li>○ 2009 Annual Monitoring Results</li> </ul> </li> </ul>	3:20 Cristina Grosso
<b>6.</b>	<b>Action: Approve Detailed Workplan, set date for next meeting and Plus/Delta exercise on today's meeting</b>	3:45 Chair
	<b>Adjourn</b>	4:00

# Sources Pathways and Loadings Update

TRC Meeting

December 15, 2010

Lester McKee, Alicia Gilbreath, and Michelle Lent

# Loadings information development within the RMP

- SPLWG 1999 – present/ongoing
  - Regional scale estimates to support TMDLs and resulting policy (basin plan amendment, SSOs, MRP)
  - 5 main pathways
    - Atmospheric deposition (1999-2001)
    - Large rivers (2000-2006, 2010)
    - Small tributaries (incl. Guadalupe R.) (2001-2010)
    - Wastewater (Muni. and Ind.) (1999-2002)
    - In-Bay legacy erosion/re-suspension (2000, 2004, 2008)
- SPLWG will continue to meet once/twice annually

# Small Tributaries Loading Strategy (STLS)

- 2008- present/ongoing
- Focus on small tributaries to support improved management
- Premise
  - It is possible to identify small tributaries that exert a disproportionately large influence on loads and impacts
  - Control of Hg and PCBs will also help to control other particle bound POCs
- Bridge between RMP loads efforts and BASMAA effort in relation to provisions C8e, C11, and C12.
- Consistent with other RMP strategies
  - Mercury
  - Dioxins
  - Modeling
  - PCBs

# Overview of Strategy - Questions

- **Impairment:** Which are the “high-leverage” small tributaries that contribute or potentially contribute most to Bay impairment by pollutants of concern?
- **Loads:** What are the loads or concentrations of pollutants of concern from small tributaries to the Bay?
- **Trends:** How are loads or concentrations of pollutants of concern from small tributaries changing on a decadal scale?
- **Support for Management Actions:** What are the projected impacts of management actions on loads or concentrations of pollutants of concern from the high-leverage small tributaries and where should management actions be implemented in the region to have the greatest impact?

# Overview of Strategy – Deliverables



# 2010 Activities Update

## Meetings

- May SPLWG full meeting
- May Joint CTAG-TRC meeting (Ken and Lester presented)
- June STLS full meeting
- July STLS local meeting
- Multiple STLS local phone check-in meetings (thought the year)

## Projects

- Mallard Island loads
- Guadalupe River loads
- Zone 4 Line A loads
- Dioxin Loadings
- Spreadsheet Model
- Guadalupe R Model
- Watershed Categorization
- Sampling Optimization

## Products

- Watershed Categorization Report
- Sampling Optimization Report
- Guadalupe River Analysis and Hg Loads Report
- Mallard, Guadalupe, Zone 4 publications in progress

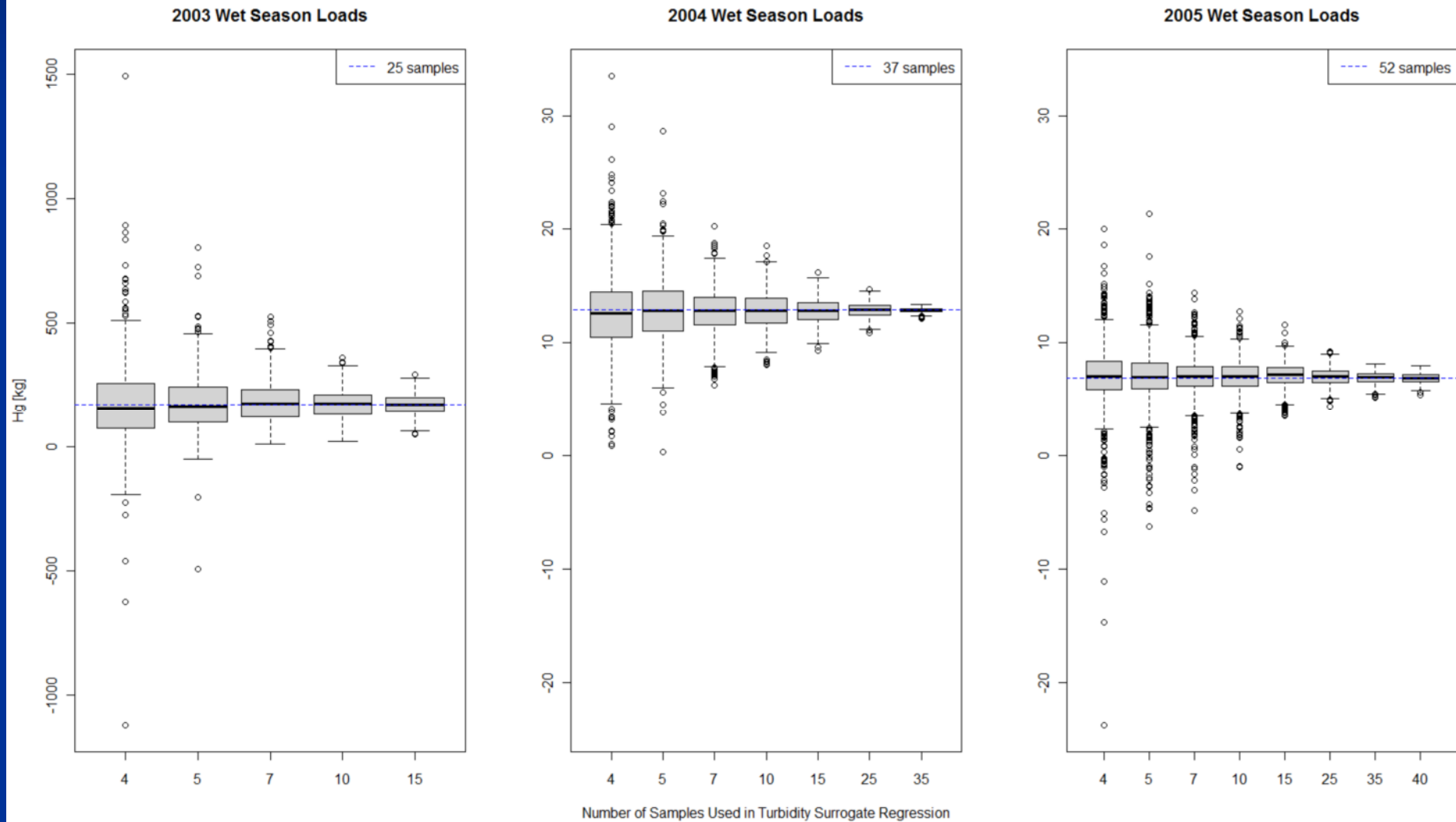


# Some highlights

# Watershed classification

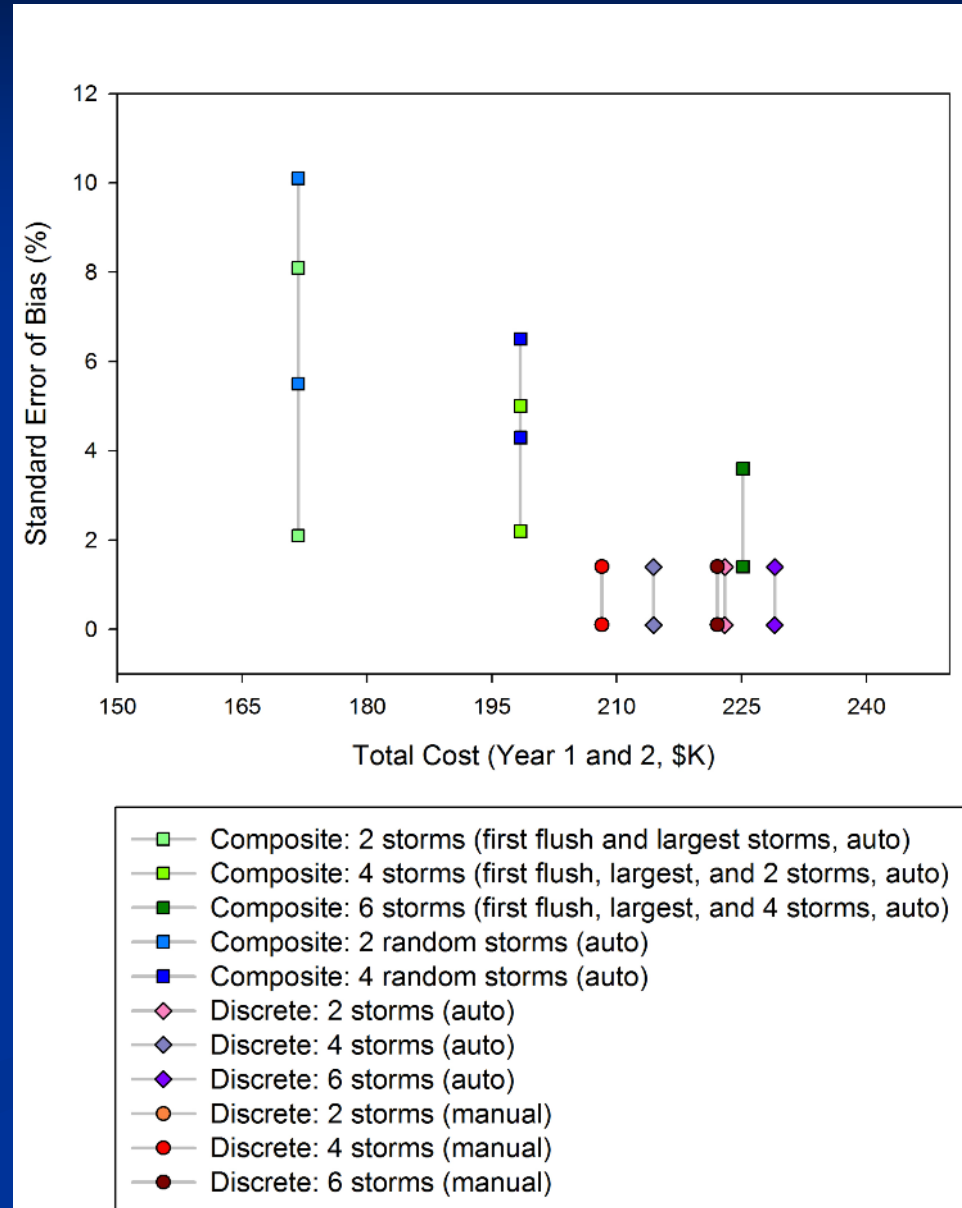
Task	Description	Question	2008	2009	2010	2011	2012	2013	2014	2015
1	Guadalupe River Model (2008 and 2009)	3,4	75	75						
3	Develop Multi-year Watershed Loading Sampling Plan			80						
3a	Develop Criteria and Rank Watersheds	1,4		25						
3b	Optimize Sampling Methods for Loading and Trends	1,2,3,4		45						
3c	Develop/Update Spreadsheet model for Regional Loadings Estimates	2	40		35	20	20	20	20	TBD
4	POC Load Monitoring in Representative Watersheds	1,2,3			87	300	300	300	300	TBD
4a	Guadalupe Small Tributaries Loading Study (WYs 2003, 2004, 2005, 2006, 2010)	1,2			43					
4b, 2	Z4LA Small Tributaries Loading Study (WYs 2007, 2008, 2009, 2010)	1,2	100	100	151					
4c	Watersheds to Be Named Later (reconnaissance)				12					
4d	Pollutants of Concern Monitoring at Representative Land Use sites – Rationale Development and Reconnaissance	2,3,4			30					
4e	Pollutants of Concern Monitoring at Representative Land Use sites	2,3,4				20	80	100	100	TBD
5	Additional Dynamic Modeling in Selected Representative Watersheds	2,3,4					150	75		
	Total		325	325	358	340	550	495	420	TBD

# Optimizing sampling for loads and trends



# Cost comparisons

- Carried out cost analysis of 40 scenarios
  - Only 12 fell within reasonable cost constraints set by BASMAA and Water Board
  - Discrete sampling using any estimator was found to be higher accuracy and precision
  - From a scientific perspective, turbidity surrogate method with 12-16 samples per year provided the best balance between cost and quality of data

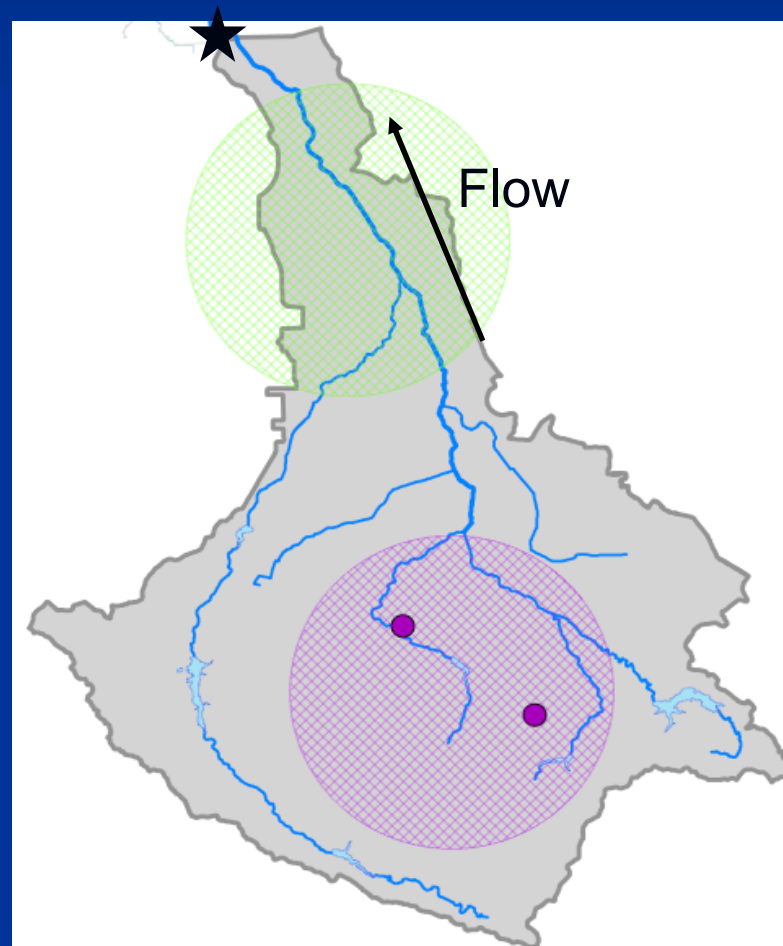
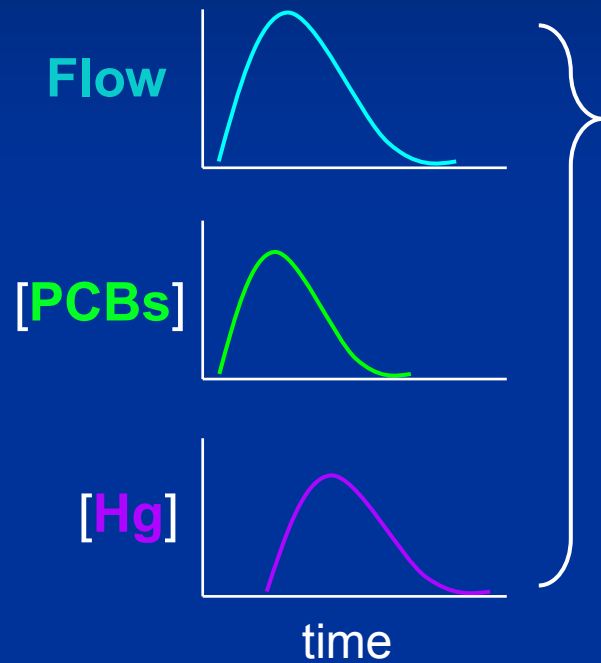


# Guadalupe Watershed Model

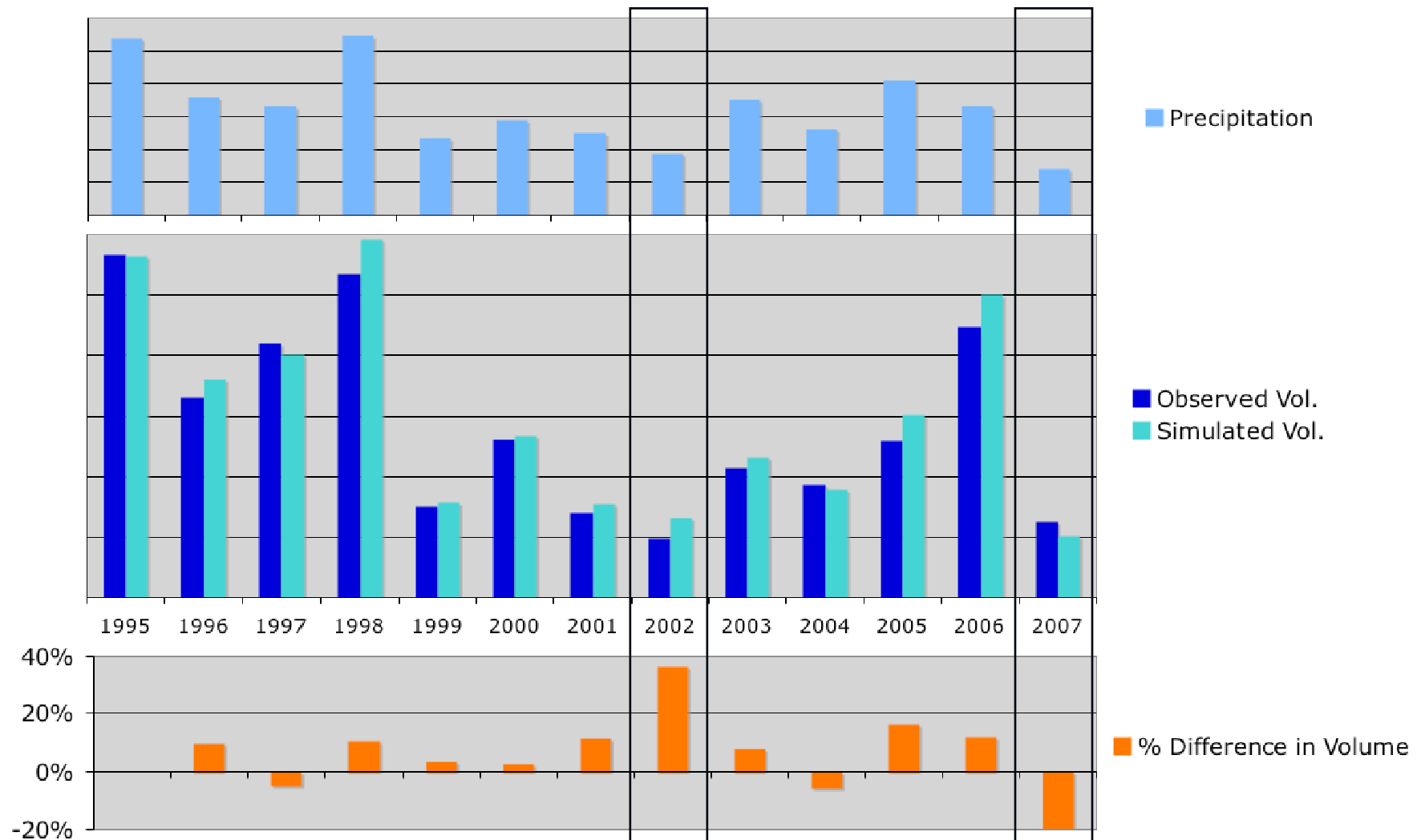
# Overview

Tasks	Time frame	Status
Develop hydrology model	2008	Completed
Calibrate & validate hydrology model	2008	Completed
Phase I Report	2008	Completed
Refine hydrology model	2009	Completed
Develop sediment model	2010	Completed
Develop mercury model	2010	In progress
Develop PCBs model	2010	In progress
Calibrate & validate sediment, Hg, and PCBs models	2010	In progress
Phase II Report	Dec. 31, 2010	In progress

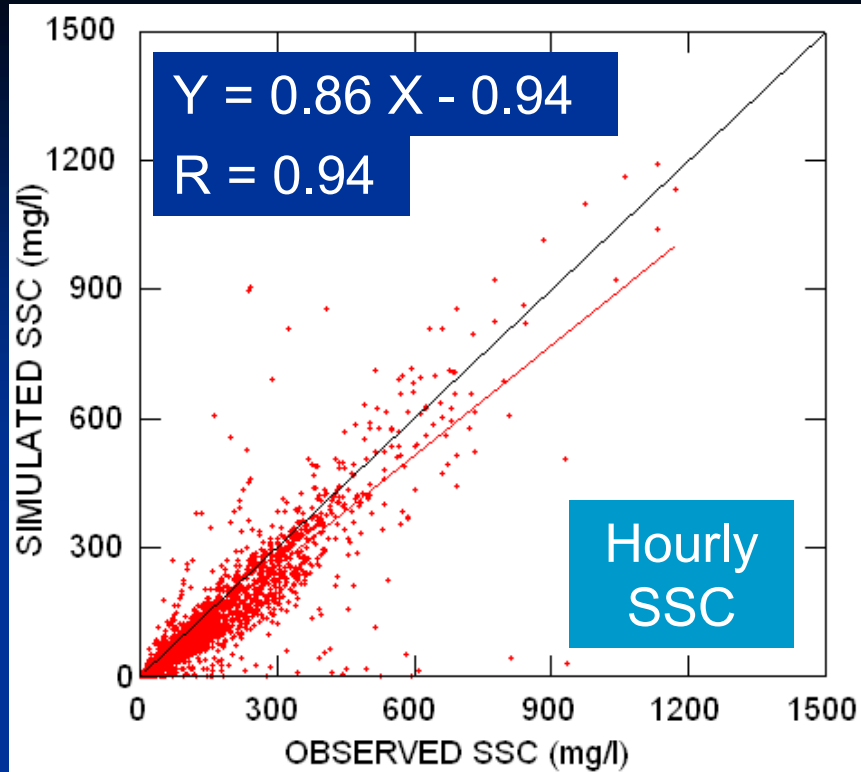
# Why study *source, release, and transport* of Hg and PCBs in Guadalupe Watershed?



# Hydrologic Model Performance: Annual Flow Volumes for Guadalupe River

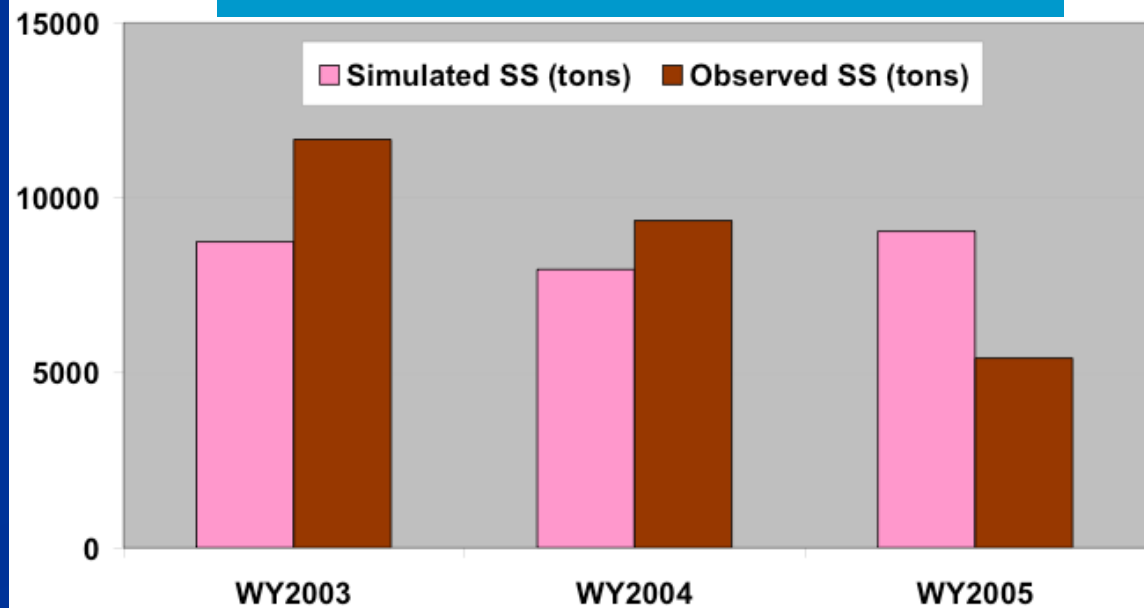




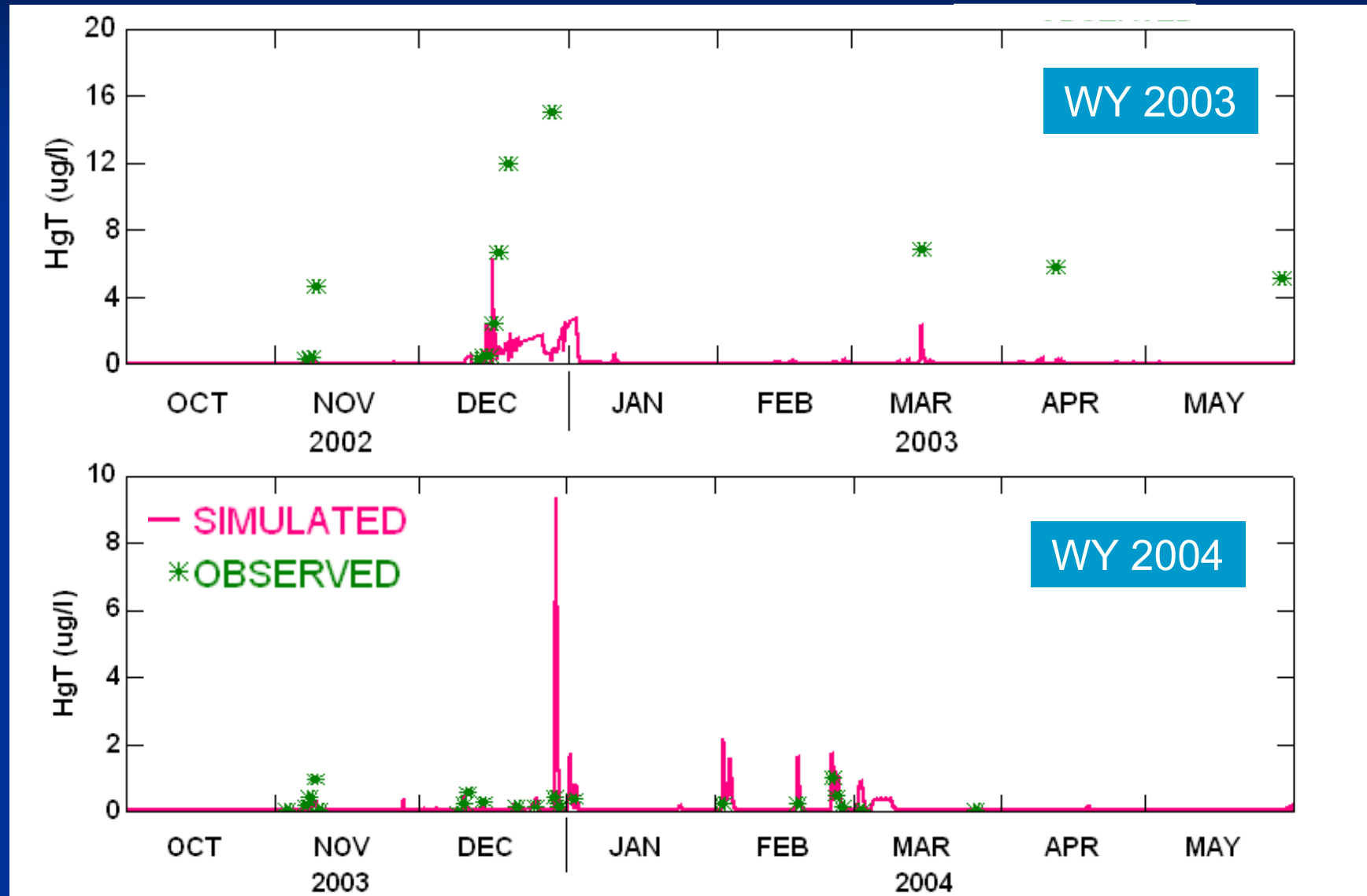


# Calibrated Sediment Results

## Wet Season Sediment loads



# Mercury initial calibration results



# Next steps

- Finish developing PCBs model
- Jointly calibrate PCBs and mercury models
- Complete report

# **Regional Spreadsheet Model & Land-Use Specific EMCs**

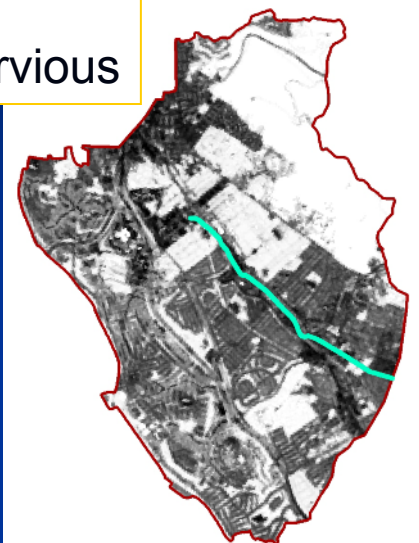
# Overview

Phase 1 Tasks	Time frame	Status
Compile GIS layers	Summer 2010	Completed
Develop base rainfall-runoff model	Fall 2010	Completed
Literature review on land-use specific EMCs & source characterization	Winter 2010-11	In progress
Add in initial POCs (SSC, Hg, PCBs)	Winter 2010-11	Upcoming
Report	February 2011	Upcoming

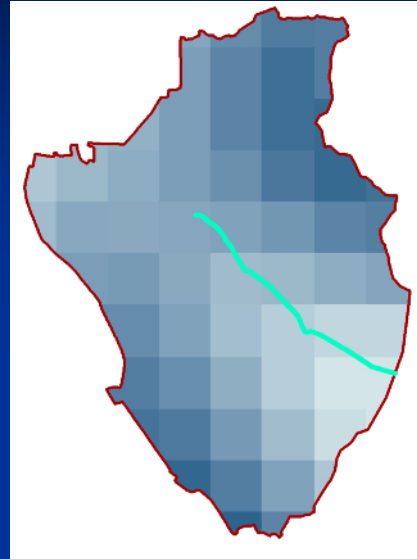
Phase 2 Tasks	Time frame	Status
Calibrate/optimize rainfall-runoff model	2011	Upcoming
Add in more POCs, as EMC data is available (rest of MRP POCs)	2011	Upcoming
Develop BMP modeling	2011	Upcoming
Internal documentation	2011	Upcoming

$$\text{Runoff Coefficient} \times \text{Rainfall} = \text{Runoff}$$

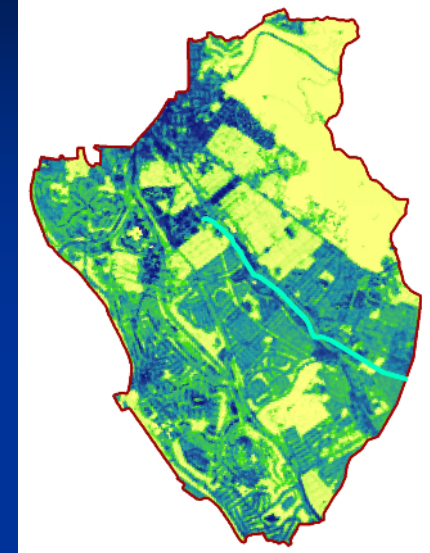
By %  
Impervious



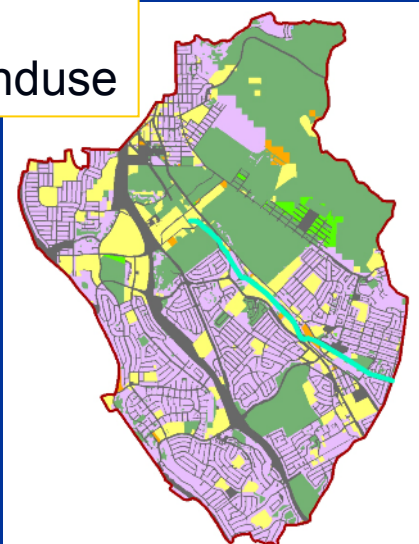
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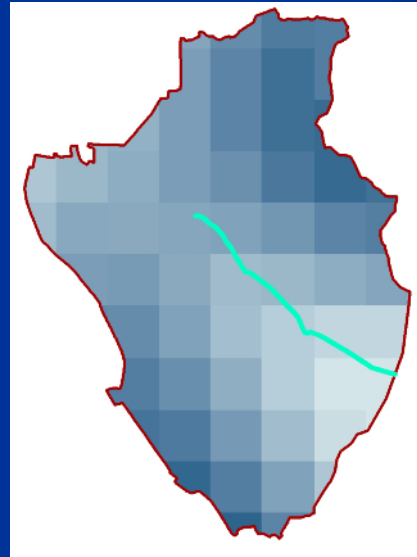
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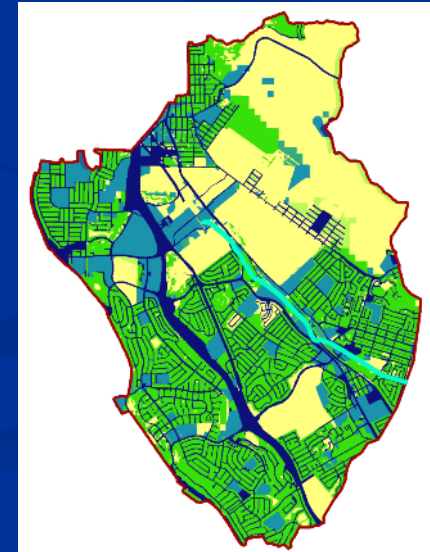
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Landuse



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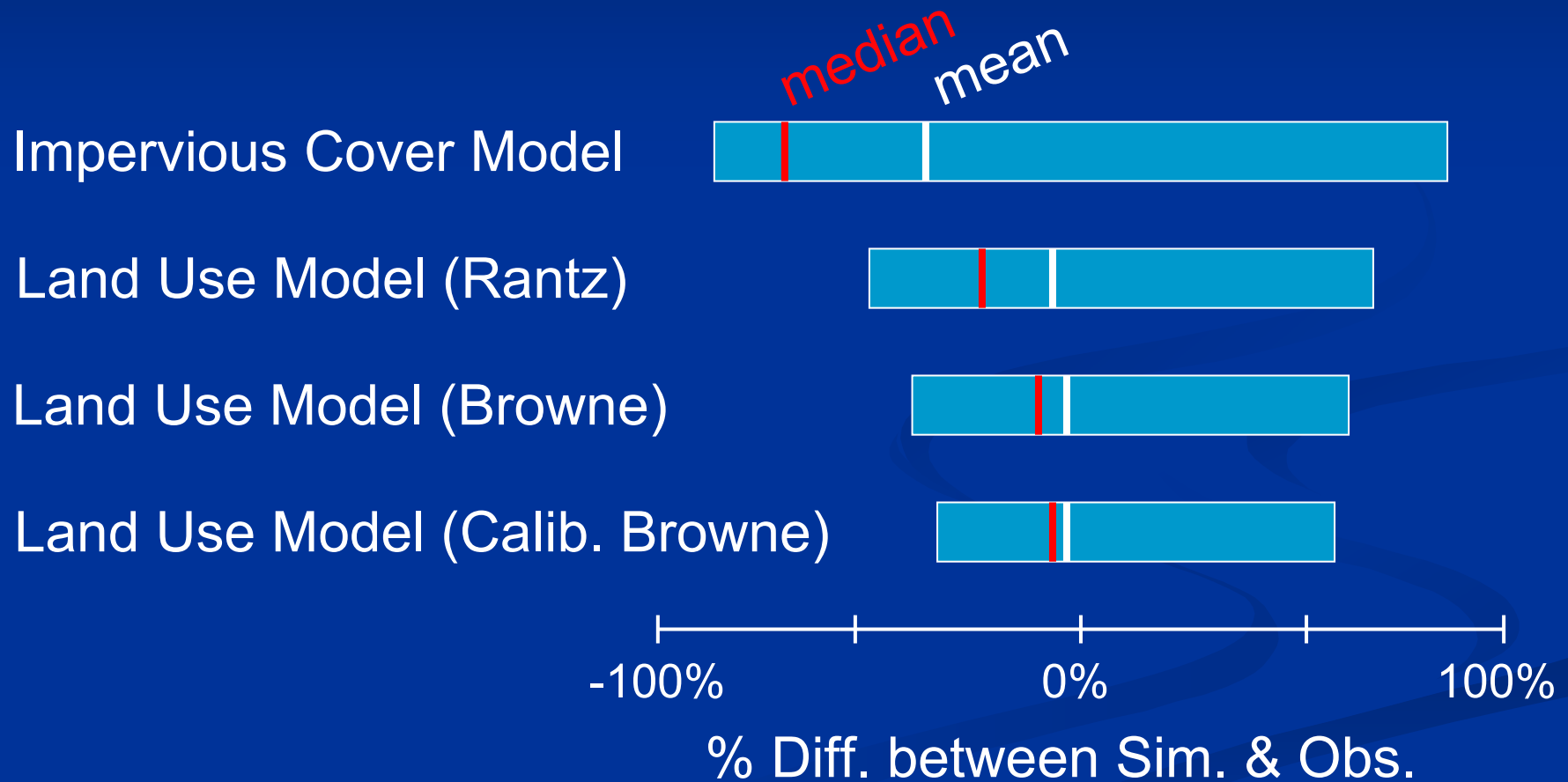


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# Initial Hydrologic Results

*Range of annual flow volume results shown for 18 watersheds*



# Next steps

- Further hydrologic calibration
  - Multi-variable regression optimization?
- Apply pollutant concentrations to generate loads:

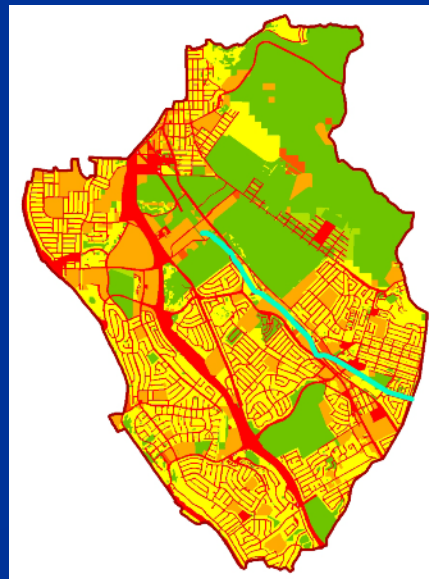
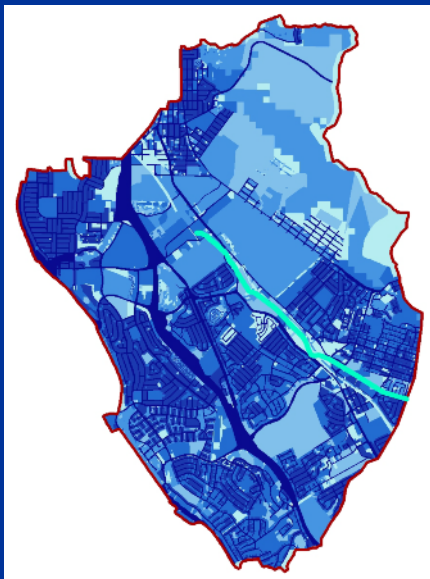
Runoff volume

x

EMC

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Load





# SPLWG/ STLS Products for 2011

- Regional loadings spreadsheet model (\$20k) (workplan Page 41)
  - Complete literature review of LU and source area based EMCs (with existing STLS budget)
  - Complete runoff optimization
  - Expand the model from runoff, SSC, Hg and PCBs to include other MRP Cat 1 (copper and nutrients) and Cat 2 analytes (Se, PBDE, PAH, pesticides) (based on the results of the literature review)
- Small tribs loads in representative watersheds - Wet season reconnaissance sampling to support watershed selection (\$300k) (Page 43)
  - STLS group review of all characterization data and make provisional final site selection by April (or sooner if lab results can be completed) BASMAA MYMP draft due Apr 29
- STLS management support (\$20k, \$4k to support expert review) (Page 47)
  - Cost scenario write-up including all assumptions (Due Jan 15)
  - STLS group firm up monitoring strategy (methods, general site selection criteria and approach)
  - Discussion and implications for outcomes of the spreadsheet model, LU and source areas lit. rev.
  - Initial site reconnaissance of LU sites

# WY 2011 Monitoring

- Started out with 30 potential watersheds
- Developed GIS and other attributes
- Completed reconnaissance
- Confirmed analyte list
- Developed cost estimates for several scenarios
- STLS team narrowed list to 16 watersheds based on answering loadings questions



# WY 2011 Monitoring

## Analytes

### ALL SITES

- HgT, MeHgT
- PCBs
- SSC
- TOC
- PFCs

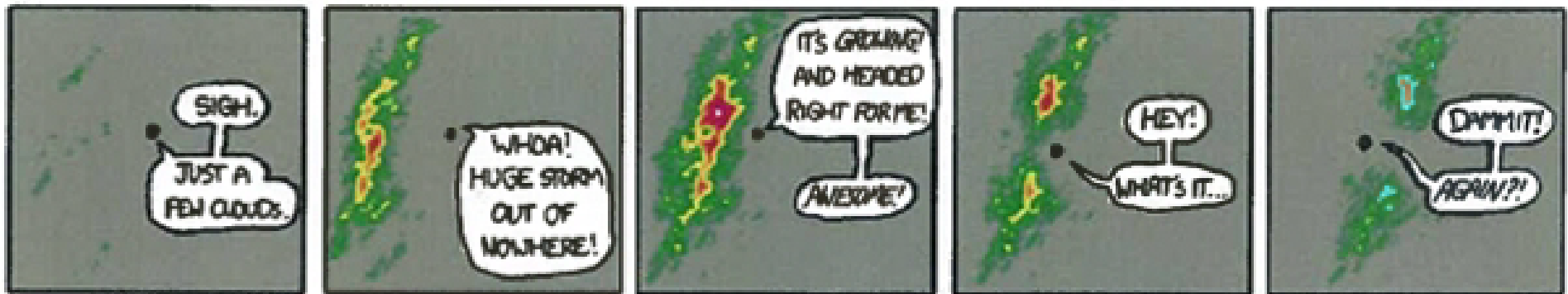
### SOME SITES

- PBDEs
- PAHs
- SeT, SeD



# WY 2011 Monitoring progress to-date

- Are we crazy?



- San Leandro Creek
- Santa Fe channel

# Overview of Special Studies



## RMP SPECIAL STUDIES: 2011-2015

	B	C	D	E	F	G	H
21		2011	2012	2013	2014	2015	2011-2015
22	<b>TOPIC</b>	\$713,000	\$977,000	\$615,000	\$540,000	\$150,000	
23	Mercury	\$95,000	TBD	TBD	TBD	TBD	\$95,000
24	PCBs	\$53,000	TBD	TBD	TBD	TBD	\$53,000
25	Dioxins	\$28,000	\$158,000	\$20,000	\$20,000	TBD	\$226,000
26	Emerging Contaminants	\$100,000	\$15,000	TBD	TBD	TBD	\$115,000
27	Small Tributaries	\$340,000	\$540,000	\$485,000	\$410,000	TBD	\$1,775,000
28	Other SPL	\$0	\$0	\$0	\$0	\$0	\$0
29	Exposure and Effects	\$97,000	\$80,000	TBD	TBD	TBD	\$177,000
30	Forecasting	\$0	\$155,000	\$105,000	\$105,000	\$145,000	\$510,000
31	Other	\$0	\$24,000	\$0	\$0	\$0	\$24,000
32	<b>TOTALS</b>	\$713,000	\$972,000	\$610,000	\$535,000	\$145,000	
33	<b>TOTAL AVAILABLE FOR SPECIAL STUDIES</b>	\$735,204	\$747,453	\$739,127	\$725,647	\$711,152	
34	<b>REMAINING FOR SPECIAL STUDIES</b>	\$22,204	-\$224,547	\$129,127	\$190,647	\$566,152	

# Mercury Strategy



General Area	Element	Mercury Questions Addressed	2008	2009	2010	2011	2012	2013	2014	2015
<b>Mercury-specific Studies</b>										
Mercury Strategy	Methylmercury Synthesis	1,2,3,4,5				75	TBD	TBD	TBD	TBD
	Food Web Uptake (Small Fish) (Status and Trends)	1,4	150	150	150	20	TBD	TBD	TBD	TBD
	High Leverage Pathways (DGTs)	2	58	58			TBD	TBD	TBD	TBD
	High Leverage Pathways (Isotopes)	2,5	40	40			TBD	TBD	TBD	TBD
	Methylmercury Fate Model	3,4		25			TBD	TBD	TBD	TBD
Effects	Effects on Birds		70	54						
<b>Multi-contaminant Studies That Include Mercury</b>										
Status and Trends	Sport Fish	1,4			96	87	90	92	95	98
	Avian Eggs	1,4			40	40	41	42	44	45
	Surface Sediments (THg, MeHg)	1			120	170	149	154	158	163
	Water (THg, MeHg)	1			120	180	154	159	164	169
Loads	Small Tributary Loading Strategy Studies: Synthesis	2			35	20	20	20	20	TBD
	Small Tributary Loading Strategy Studies: Monitoring	2			240	320	380	400	400	TBD
	Small Tributary Loading Strategy Studies: Dynamic Modeling	2					150	75	TBD	TBD
	River Loading (THg)				100				100?	TBD
	Atmospheric Deposition	2,3			10	TBD	TBD	TBD	TBD	TBD
Forecast	Modeling Strategy Studies	2,3,4			141		TBD	TBD	TBD	TBD

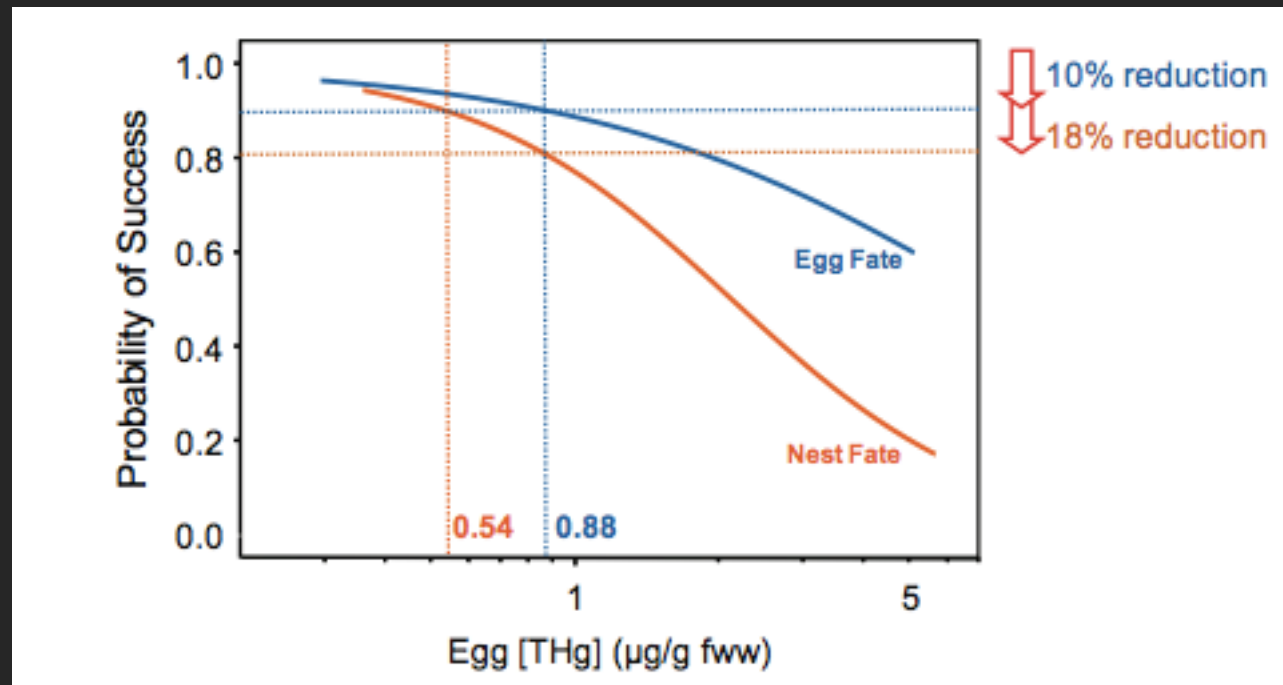
# Mercury Strategy: 2010



- Small fish monitoring – year 3
- Isotopes – manuscripts
- DGTs – report
- Methylmercury budget – A Regional Mass Balance of Methylmercury in San Francisco Bay, California, USA (Jan issue of ET&C)
- Effects on birds - report



# Effects on Terns





# Mercury Strategy: 2011



- Continued small fish monitoring
- Mercury Synthesis
  - Collaboration with CMERC
  - Workshop in September
  - Outline has been drafted
  - Draft report in spring
  - Presentation at Mercury Conference
  - Part of a journal special issue

# Reducing Methylmercury Accumulation in the Food Web of the San Francisco Estuary

**Jay Davis, Ben Greenfield, Letitia Grenier, Don Yee,  
Lester McKee, Aroon Melwani, Josh Collins**  
*San Francisco Estuary Institute*

**Mark Marvin-DiPasquale**  
*U.S. Geological Survey*

**Joel Blum**  
*University of Michigan*

**Richard Looker, Carrie Austin**  
*San Francisco Bay Regional Water Quality Control Board*

**Robert Brodberg**  
*California Office of Environmental Health Hazard Assessment*

## OUTLINE FOR REST OF THE PAPER: MAIN BODY



Primary Question: *Are there effective and practical management actions that can be taken to reduce methylmercury risk in the San Francisco Estuary food web?*

- Setting, Problem Definition, Management Status and Plans
- General conceptual models
- Potentially effective and practical actions (knobs) for each pathway (for each action consider potential benefits and costs relative to no action)
  - Internal net production of MeHg
  - Mercury mining sediment (Guadalupe River)
  - Urban runoff
  - Atmospheric deposition
    - Global
    - Local
  - Rivers/Delta outflow
  - Municipal wastewater
  - Industrial wastewater
  - Nonurban runoff
  - Dredging

# PCB Strategy



General Area	Element	PCB Questions Addressed	2010	2011	2012	2013	2014	2015
<b>PCB-specific Studies</b>								
PCB Strategy	Food Web Uptake (Small Fish)	1,7	50		TBD	TBD	TBD	TBD
	PCB Conceptual Model Update	1,2,3,4,5,6,7,8,9		53	TBD	TBD	TBD	TBD
<b>Multi-contaminant Studies That Include PCBs</b>								
Status and Trends	Sport Fish	1	96	87	90	92	95	98
	Avian Eggs	1,4	40	40	41	42	44	45
	Surface Sediments	2,3,4,6,7	120	170	149	154	158	163
	Water		120	180	154	159	164	169
Loads	Small Tributary Loading Strategy Studies: Synthesis	5,7,8	35	20	20	20	20	TBD
	Small Tributary Loading Strategy Studies: Monitoring	5,7,8	240	320	380	400	400	TBD
	Small Tributary Loading Strategy Studies: Dynamic Modeling	5,7,8			150	75	TBD	TBD
	River Loading (THg)	5	100				100?	TBD
	Atmospheric Deposition	5	10	TBD	TBD	TBD	TBD	TBD
Forecast	Modeling Strategy Studies	3,4,5,6,7,8	141		TBD	TBD	TBD	TBD

# PCB Strategy: 2011

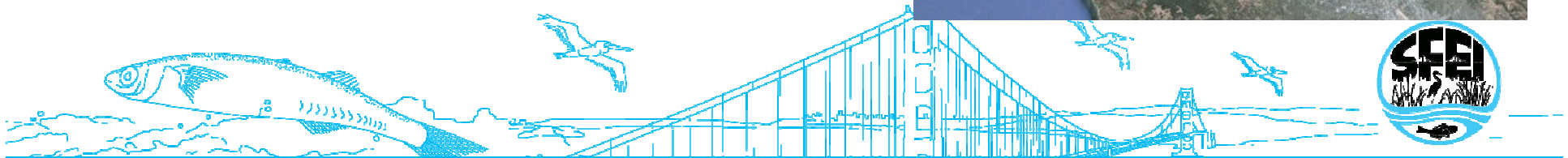
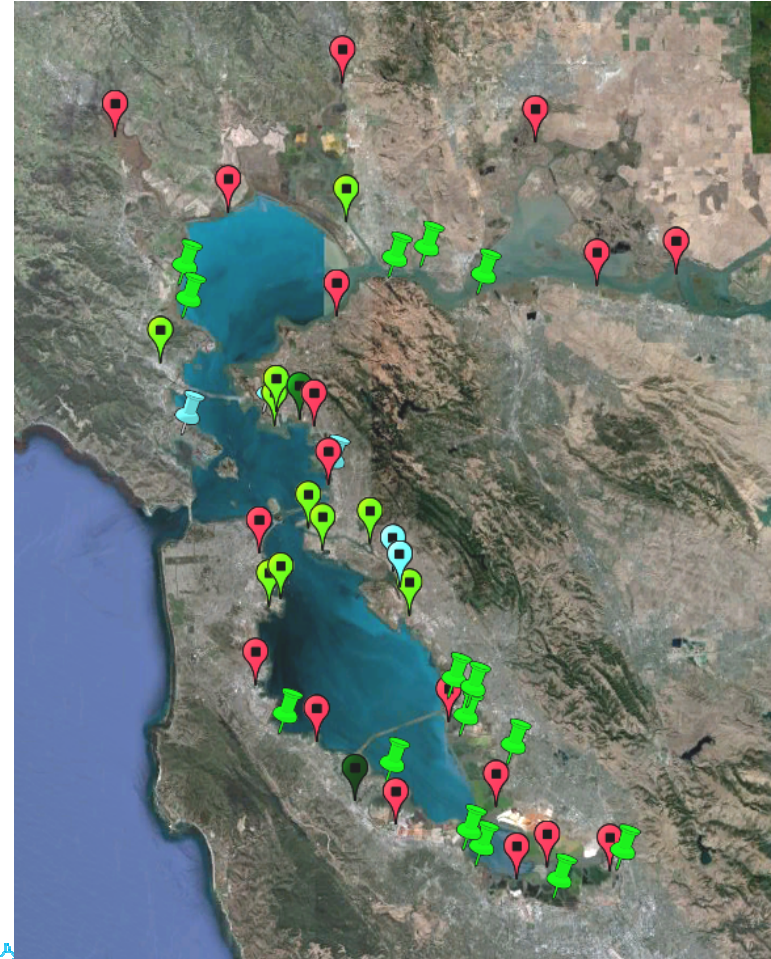


## PCB Synthesis

- Timing: Second half of 2011
- Topics
  - Recent RMP findings
  - Review of other TMDLs
  - PCB 11
  - Congener profiles and sources
  - Degradation
  - Attenuation
  - Linkage covered in Bioaccumulation Conceptual Model

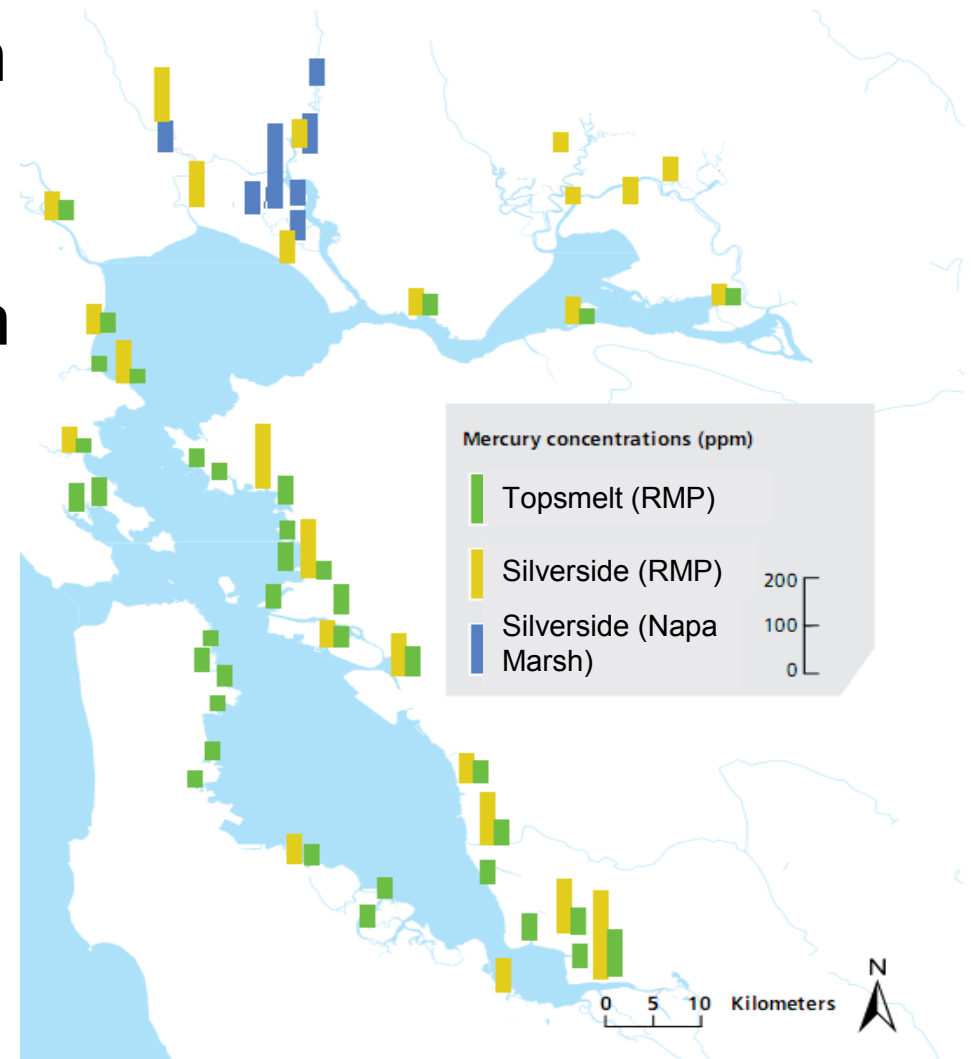
# Small Fish Update

- 2010
  - Bay wide sampling for Mercury and PCBs
  - DGT report (Trent University) on 2008 and 2009 being reviewed internally and by the CFWG
  - Hg isotopes in sediment and small fish report and publications (University of Michigan)
- 2011
  - Summary Report of Mercury in Small Fish
  - Seasonal Sampling



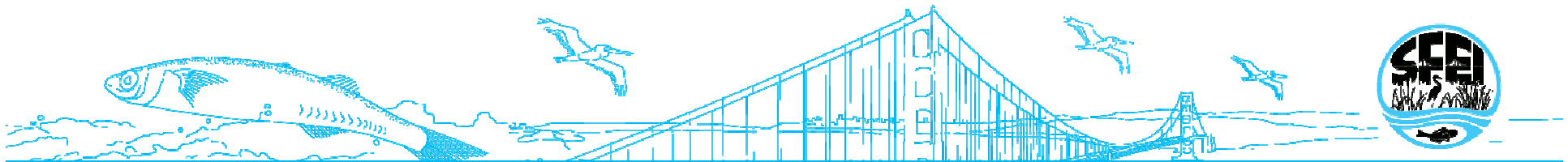
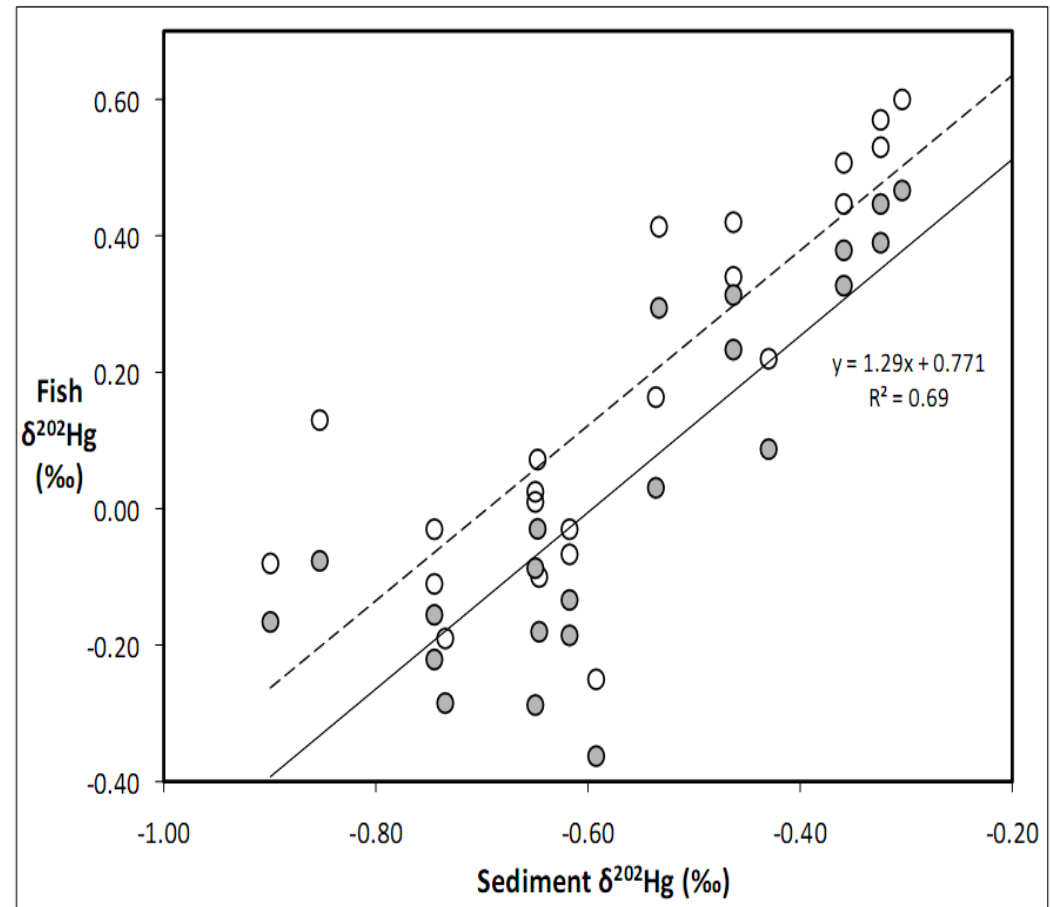
# Hg in Small Fish (2009)

- Concentrations continue to be higher in southern sites
  - Lower South Bay
- Napa Marsh restoration area comparison study
  - Similar to region
  - Exception is Pond 2
- Differences among site types not readily apparent



# Hg Isotopes in fish and sediment

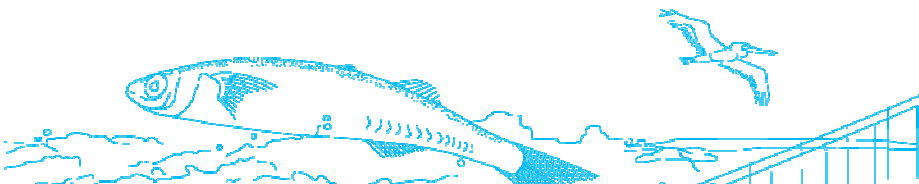
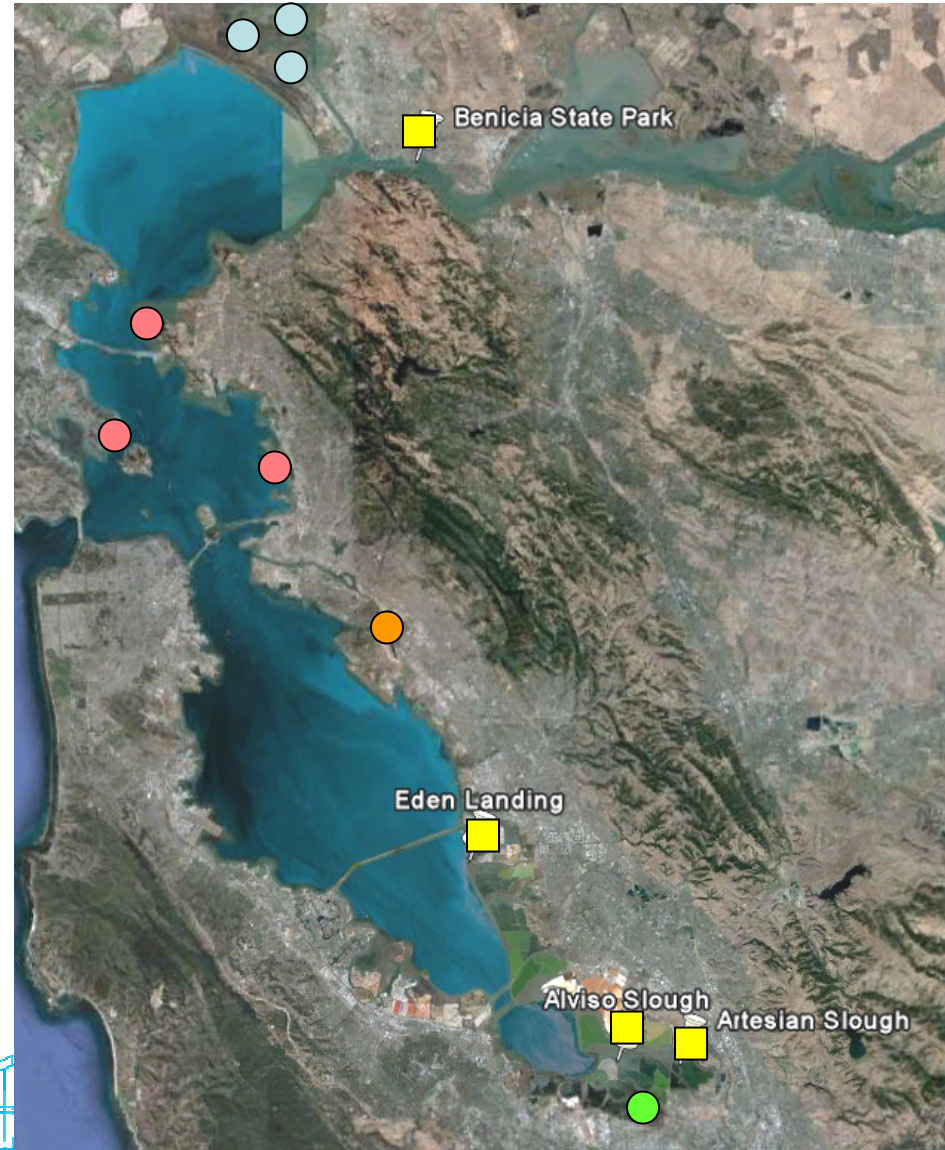
- Fish  $\delta^{202}\text{Hg}$  and sediment  $\delta^{202}\text{Hg}$  values well correlated
- Data indicate that sediment is an important source of Hg to fish





# 2011 Seasonal Survey

- Four sites
  - 3 long term sites
  - 1 South Bay Salt Ponds site
- Sample in Jan, May/June, and Sept/ Oct
- Determining seasonal patterns in MeHg uptake
  - Compare to MLK patterns from 2008-2010 and other locations
- Leveraging sampling by the South Bay Salt Ponds Project at Alviso and Artesian Sloughs
  - from April through September





# Forecasting: 2010

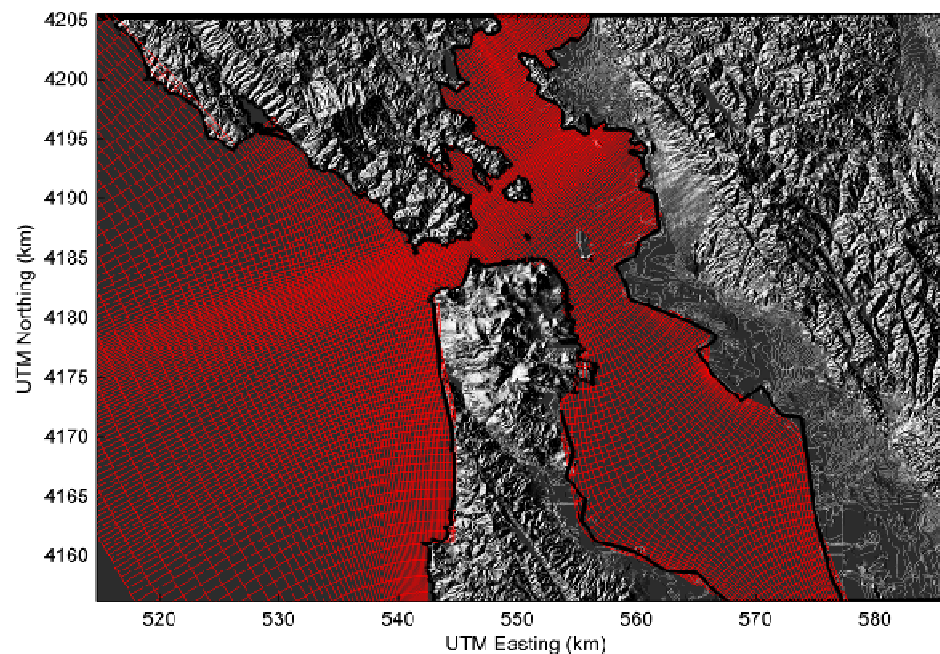


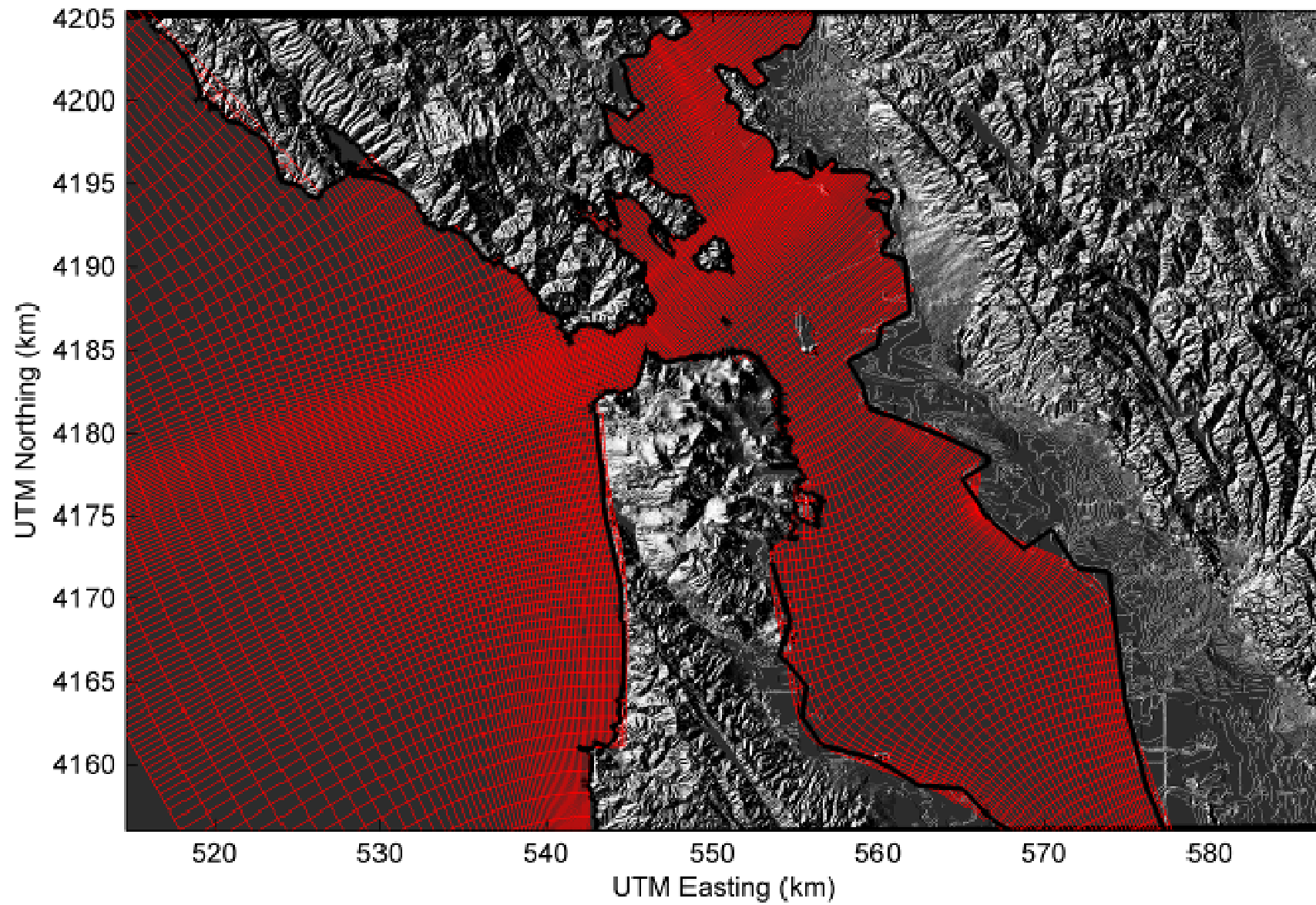
- Margins Conceptual Model – Draft in January
- SUNTANS Development – tasks are on track
- Bioaccumulation Conceptual Model – Draft in early March

# Forecasting: 2011



- Revised Forecasting Strategy by June
  - Likely focus on a lower resolution 3D model using DELFT or EFDC
- USGS Mud Provenance Study – Barnard et al.
  - Geochemical tracers to assess origins of fine sediment particles





# Highlights of Sediment Exposure and Effects Studies 2010/11

Aroon Melwani  
RMP Technical Review Committee  
December 15<sup>th</sup> 2010



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# Benthic Workgroup Meetings

2

- Workshops held April 22<sup>nd</sup> and October 20<sup>th</sup>, 2010
- April 22nd:
  - Role of the benthic workgroup
  - Completion of classification analysis
  - Best professional judgment exercise
  - Future plans
- October 20th:
  - Manuscripts on assemblage classification and BPJ
  - Mesohaline and limnetic assessment methods
  - Special studies

# Highlights of 2010 Progress

3

- Completed two manuscripts
  - Assemblage ms - in RMP review, submit to Estuaries
  - BPJ ms - submitted to Environmental Indicators
- Mesohaline Assessment Method (RMP)
  - Reference envelope methodology
  - Requires validation
- Limnetic Assessment Method (SQO)
  - Benthic response index
  - Results supported by AMBI (another index method from Europe)
  - Requires validation



# 2011- Gold Standard Workshop

4

- Gold standard developed in SQO Phase I as validation of polyhaline methodology
- Convene benthic experts to independently agree on a set of benthic samples
  - Results will be compared to assessment results
- Coordinating with SCCWRP on workshop
- Estimated cost around \$30K
- Timeframe - 2<sup>nd</sup> Quarter 2011

# 2010 - Causes of Sediment Tox

5

## Highlights of 2010 Project to-date

- Develop sediment and water LC50s
  - Test clean reference sediment - **complete**
  - Spike reference sediment - **40% done**
  - Range finding dose response tests - **complete**
  - Exposed amphipods sent to UCB - **complete**
- Next steps
  - Definitive dose-response tests and chemical analyses
  - Sediment TIE method development
  - Sediment TIE workgroup

# 2010 - Molecular TIEs

6

## Evaluation of Gene Expression for Sediment TIEs

- Task 1 - Calibration of molecular TIE - **in progress**

Deliverable: Gene expression profiles for contaminants

- Task 2 - Gene expression analysis of evaluation samples

Deliverable: Degree of match with known contaminant types

- Task 3 - Evaluation of molecular TIE

Deliverable: Journal article/report

# 2011 - Sediment Hotspot Study

7

- Oversight : Exposure and Effects Workgroup
- Estimated Cost: \$90K

## Proposed Tasks and Deliverables

- Task 1 - Convene focus group and develop work plan (May 2011)
- Task 2 - Sample collection and analysis (July/Aug 2011)
- Task 3 - Reporting (Draft - August 2012)

# 2011 - SF Bay NCCA (USEPA)

8

- Oversight : Exposure and Effects Workgroup
- Estimated Cost: \$50K from USEPA

## Tasks and Deliverables

- Assess the current condition of SF Bay using data from RMP and NCCA
- Assessment in concert with those performed on the national dataset, with exploratory enhancements utilizing longer term RMP data
- Report written in cooperation with EPA staff - final due in March 2012

# QUESTIONS?



# E&E Strategy

- Effects on Benthos
  - What are spatial/temporal trends of sediment contamination?
  - Which pollutants are responsible for observed impacts?
  - Are toxicity tests, benthic community assessment approaches, and the overall SQO assessment framework reliable indicators of impacts?

# Benthos update





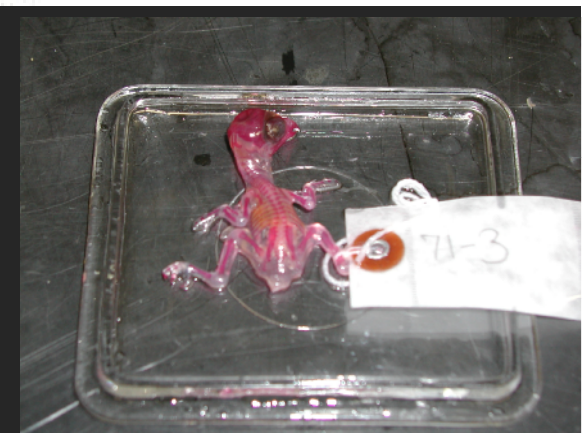
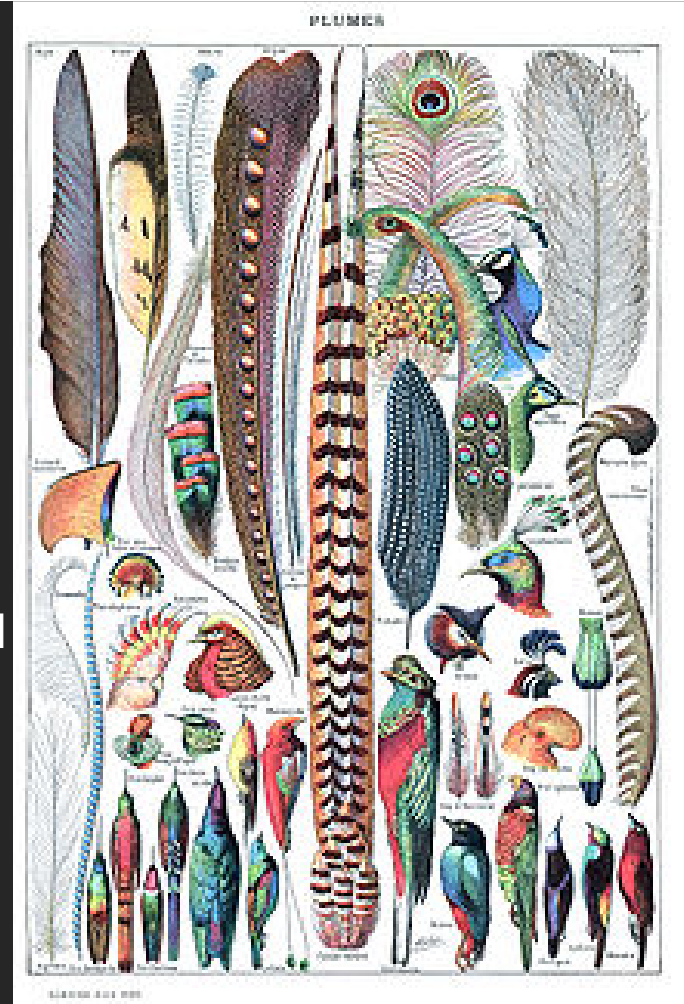
# E&E Strategy



- Effects on Birds
  - Is there clear evidence of pollutant effects on survival, reproduction and growth of individual birds
  - Are pollutants in the Bay adversely affecting bird populations?
  - What are appropriate guidelines for protecting bird populations that are at risk?
  - Do spatial patterns in accumulation indicate particular regions of concern?

# 2010 PBDEs in Terns

- Developing thresholds of effects
  - Pipping/hatching success
  - Sublethal effects
    - Deformities, growth, hepatic thyroid and immune organ histopathology, and bursal mass
- Penta mix (0.2, 2, 20 ug/g egg)
- Results to date
  - Significantly smaller rump length at 2 and 20 ug/g for terns
  - No difference for kestrels
- 2011
  - Continuing evaluation on histopathology and biochemical factors





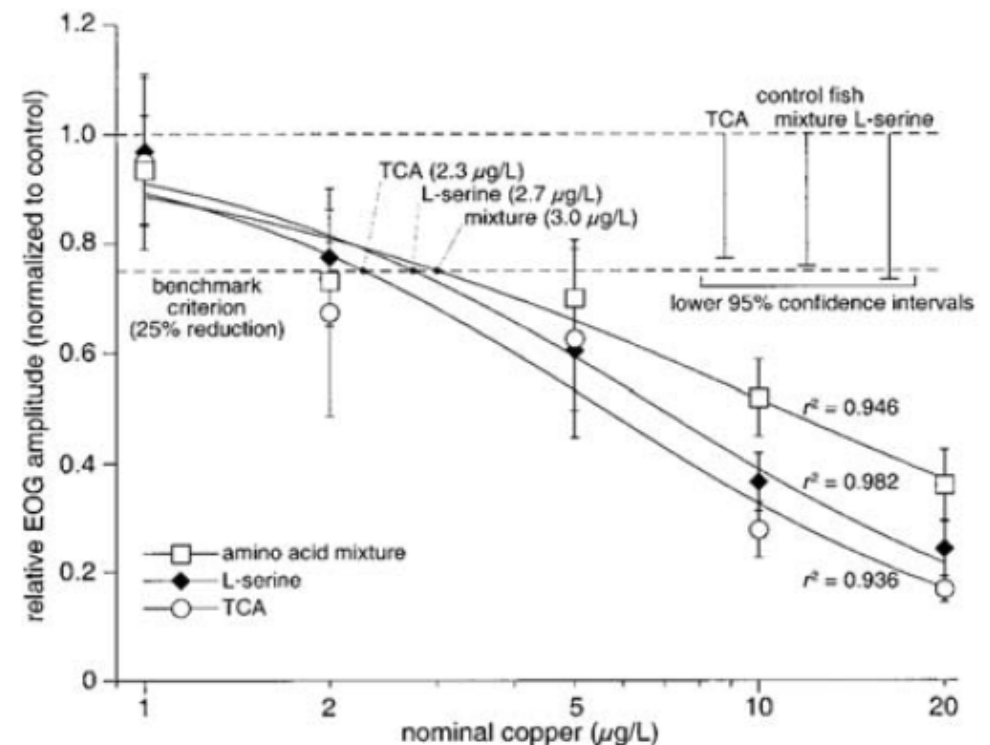
# Effects on Fish

- Are pollutants, individually, or in combination, reducing the reproductive ability, growth and health of sensitive fish populations?
- What are appropriate thresholds for Bay species?
- What are cost-effective indicators for monitoring effects of contaminants?

# 2011 SS: Copper and the Olfactory Nerve



- Goal: Assess impact of copper on seawater-phase juvenile salmon (Chinook)
- Vary DOC (2 to 6 mg/L)



**EXPOSURE AND EFFECTS**

Exposure and effects studies and monitoring in the RMP from 2008 to 2014. Numbers indicate budget allocations in \$1000s.

Exposure and Effects effort on Benthos and Fish in 2011 will focus on completion of studies from prior years and development of long-term plans for 2012 and beyond. For Birds, significant progress has been made in answering the priority questions, and further effects work is not needed at this time.

	Element	Effects Questions Addressed	2008	2009	2010	2011	2012	2013	2014	2015
<b>Benthos</b>	Spatial and Temporal Patterns of Benthic Impacts (Triad Monitoring)	1,2			231	280	263	271	279	287
	Understanding and Improving Benthic Assessment Tools	3	20	25	30					
	Causes of Sediment Toxicity: TIEs and LC50 Work	2	10	80						
	Causes of Sediment Toxicity: Molecular TIEs	2			60					
	USEPA Water Quality Synthesis	1,2,3				(50)				
	Hotspot Sediment Quality Followup Study	1,2				60	30			
	Synthesis on SQO Drivers	2					50			
<b>Fish</b>	Endocrine Disruption in San Francisco Bay Fish	4,6	35							
	Effects of PAHs on Flatfish	4,5,6	40	50						
	Effects of Copper on Salmon	4,5				37				
<b>Birds</b>	Mercury and Selenium Effects on Terns	1,2,3,4	74	54						
	PBDEs: Relative Sensitivity in Terns	1,3			48					
	Term and Cormorant Egg Triennial Monitoring (Status and Trends)	4			40	40	41	42	44	45

# **Contaminants of Emerging Concern: 2010 Highlights and 2011 Workplan**

**RMP TRC Meeting  
December 15, 2010**

# CEC Strategy

**What CECs have the potential to adversely impact beneficial uses in the Bay?**

**Chemical Screening**



**Pilot Study**



**Routine Monitoring**

# RMP Specimen Bank



- Signed MOU with NIST (Charleston, SC)
  - Covers sample collections until 2014
- Archive strategy document
  - Reviewed by ECWG, NIST, Environment Canada
  - TRC, SC approval
- Strategy implemented for 2009 sport fish, bird eggs; 2010 sediments, bivalves

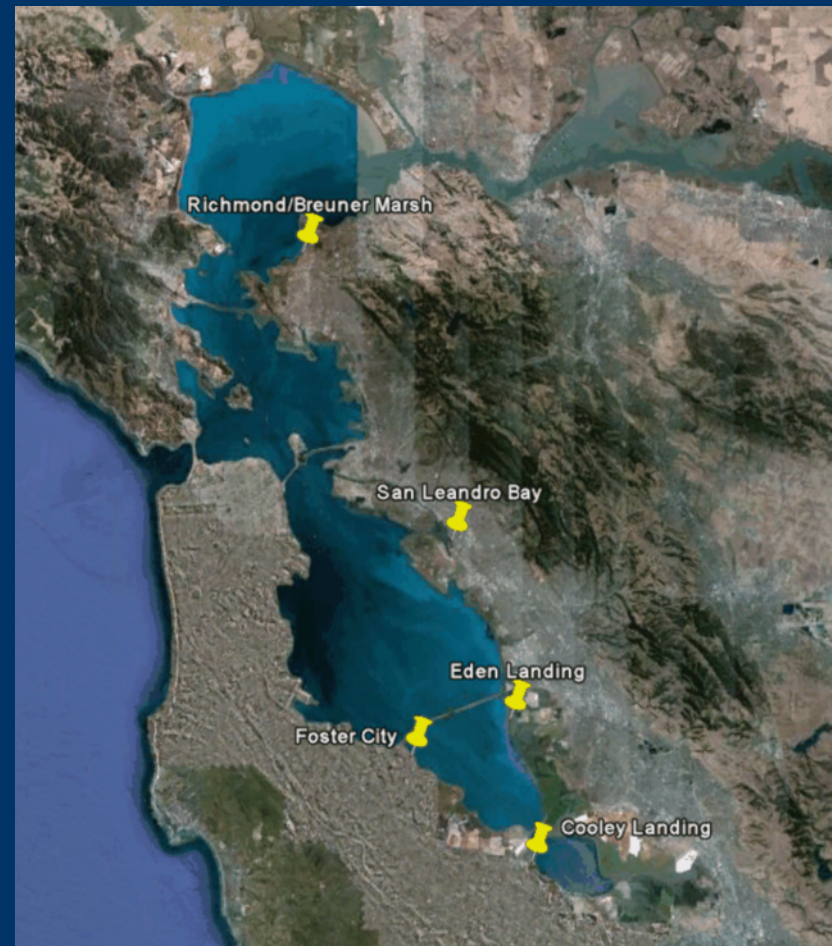


# CEC Profiles

- Provide information to water/air quality regulators, managers, public
- Completed three profiles to date:
  - antimicrobials (reviewed by ECWG)
  - alkylphenols
  - carbamazepine
- Fact sheets on website

# AXYS/CEC Mussel Pilot Study

- Water, sediment, benthic mussels @ 5 margin sites
- 104 PPCPs, alkylphenol ethoxylates, PFCs (pro bono)
- Support NOAA Mussel Watch  
CEC CA Pilot Study
- Data received
- SETAC presentation
- Manuscript in prep

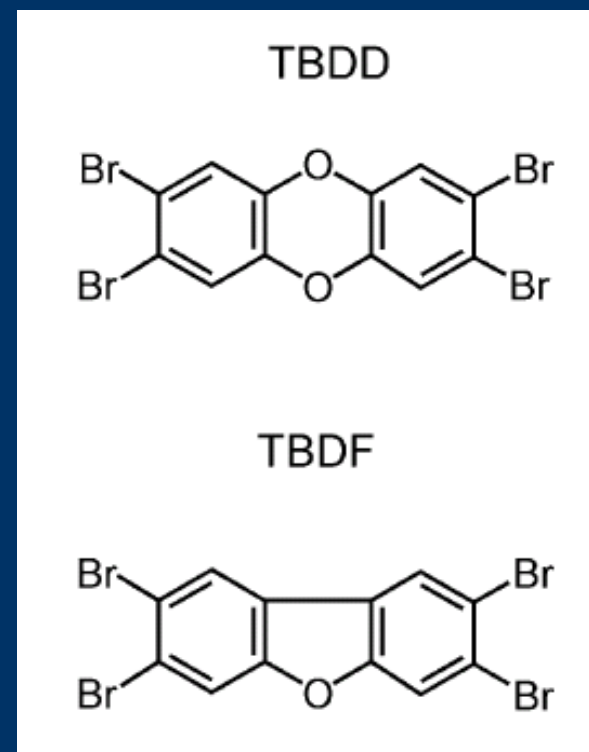


# Brominated Dioxins/Furans

- Pro bono analysis from AXYS Analytical
- Sediment, sport fish, seal blubber (n=6 of each matrix)
- Data received (July)
- Few detects at low concentrations
- RMP report/manuscript?

## Partnership with Univ of MN

- Formation/sources of Br dioxins
- Sediment cores, surface sediments from SF Bay

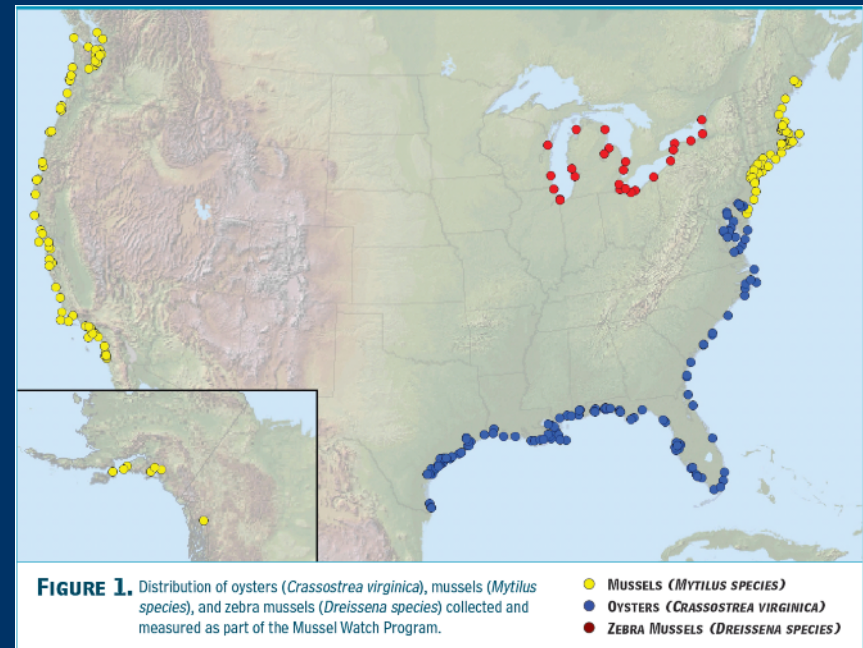


# NOAA Mussel Watch CEC California Pilot Study

- Increase focus on CECs
- 2010 effort as CA Pilot Study
- Multi-agency collaboration
  - Chemical analysis \$\$ from NOAA
  - Partners leveraged resources, provided field support

## Study Goals

- Develop list of high priority CECs for national program
- Investigate alternative methods (passive samplers)



# NOAA Mussel Watch CEC California Pilot Study

## Winter sampling at existing MW sites (n=69)

- Stratified by land use
- Resident mussels
- 4 sites in SF Bay
- Historic analyte list on subset

## Summer sampling, targeted new sites (n~10)

- Large POTWs, stormwater discharge, dry season ag runoff
- Caged bivalves, PSDs
- In SF Bay:
  - PSDs at 4 sites
  - PSDs, caged mussels at YBI
  - Caged mussels at 3 sites (Coyote Creek, Red Rock, SP Bay)



# NOAA Mussel Watch CEC California Pilot Study

## Target CECs

- PBDEs, polybrominated biphenyls (PBBs)
- 121 PPCPs
- PFCs
- Alkylphenols
- Current use pesticides
- Current use flame retardants
- Nanoparticles (single walled carbon nanotubes)

## Timeline

- Sample collection completed (Sept)
- Data by early 2011
- Report in Summer 2011 (authors TBD)

# Broadscan Screening of Bay Wildlife

- Collaboration with NIST, The Marine Mammal Center, SCCWRP, SDSU -

## Year 1 (2010)

- Harbor seal, mussel samples collected
- Method development; began analysis of seal samples

## Year 2 (2011)

- Continue seal sample analysis
- Modify methods for mussel analysis
- Analysis of mussel samples

## Outcomes:

- List of 'new' chemicals present in tissues
- Quantification where possible
- Methods and mass spec database development
- Final report March 2012

# CEC Synthesis Report (2011-2012)

## Report will include:

- Summary of CEC occurrence data in the Bay
  - RMP and other studies
- NOAA Mussel Watch CA CEC Pilot Study results
- Water Board/SCCWRP Advisory Panel recommendations
- Next steps/recommendations for monitoring CECs

## Timeline:

- Outline for review by ECWG (March/April 2011)
- Report prep beginning July 2011
- Final report spring 2012



# Surface Water Microplastics Survey

- Collaboration with SF Baykeeper
- Small pilot study in Central Bay (n=5)
- Target trash hotspots, industrialized areas
  - post rain event (within the next month)
- Baykeeper donating boat time
- SFPUC, SFSU/Tiburon loaning supplies
- Samples analyzed by UW at no cost
- Results: mass plastic/mass suspended particles (0.3-6 mm size range)



# RMP CEC Studies

- Screening of Bay Samples for Previously Unknown Organic Contaminants (2003)
- South Bay Pharmaceutical Study (2006-2007)
- Perfluorinated Compounds (2007-2010)
- Chlorinated Paraffins (2008)
- Triclosan (2008)
- Current Use Flame Retardants (2008-2009)
- Brominated Dioxins, Furans (2010)
- PPCPs, PFCs, Alkylphenol Ethoxylates (2010)
- NOAA Mussel Watch CEC California Pilot Study (2010)
- Broadscan Screening of Bay Wildlife (2010-2011)

# State CEC Advisory Panels

## Two Panels:

- Recycled Water
  - Coastal and Marine Ecosystems
- 
- Incorporate current knowledge into regulatory process
  - Recommend strategies for monitoring, managing CECs
  - Reports available to management community
    - Recycled Water: June 2010
    - Ecosystems: Summer 2011

# 12 PPCPs Detected in Water at All Sites

<b>Compound</b>	<b>Use</b>	<b>ng/L</b>	
		<b>Max</b>	<b>Mean</b>
<i>Valsartan</i>	<i>antihypertensive</i>	92	45
<i>Sulfamethoxazole</i>	<i>antibiotic</i>	67	26
<i>Carbamazepine</i>	<i>anticonvulsant</i>	44	18
<i>Caffeine</i>	<i>stimulant</i>	41	27
<i>Gemfibrozil</i>	<i>antilipidemic</i>	38	25
<i>Atenolol</i>	<i>beta blocker</i>	37	18
<i>Meprobamate</i>	<i>antianxiety</i>	36	20
<i>Diethyl-3-methyl-benzamide, N,N- (DEET)</i>	<i>insect repellent</i>	21	11
<i>Erythromycin-H2O</i>	<i>erythromycin metabolite</i>	12	4
<i>Triamterine</i>	<i>antihypertensive</i>	10	4
<i>Benzoylecgonine</i>	<i>cocaine metabolite; analgesic</i>	7	5
<i>Diltiazem</i>	<i>antianginal</i>	3	1

# 19 Other PPCPs Detected in Water

<b>Compound (# sites detected)</b>	<b>Use</b>	<b>ng/L</b>	
		<b>Max</b>	<b>Mean</b>
<i>Ibuprofen (1)</i>	<i>antiinflammatory</i>	38	8
<i>Metoprolol (3)</i>	<i>antianginal</i>	26	6
<i>Cotinine (4)</i>	<i>nicotine metabolite</i>	25	11
<i>Clarithromycin (2)</i>	<i>antibiotic</i>	18	5
<i>Sulphamethizole (1)</i>	<i>antibiotic</i>	16	3
<i>Amphetamine (2)</i>	<i>stimulant</i>	10	4
<i>Naproxen (1)</i>	<i>antiinflammatory</i>	8	2
<i>Hydrocodone (1)</i>	<i>analgesic</i>	7	1
<i>Trimethoprim (2)</i>	<i>antibiotic</i>	4	1
<i>Thiabendazole (1)</i>	<i>fungicide</i>	3	0.5
<i>Cocaine (4)</i>	<i>stimulant</i>	2	1
<i>Diphenhydramine (4)</i>	<i>antihistamine</i>	2	1
<i>Desmethyldiltiazem (2)</i>	<i>diltiazem metabolite</i>	2	0.4
<i>Dehydronifedipine (4)</i>	<i>antianginal</i>	1	0.7
<i>Albuterol (1)</i>	<i>antiasthmatic</i>	1	0.2
<i>Propoxyphene (2)</i>	<i>analgesic</i>	0.7	0.2
<i>Amitriptyline (2)</i>	<i>antidepressant</i>	0.6	0.2
<i>Diazepam (1)</i>	<i>antianxiety</i>	0.5	0.1
<i>10-hydroxy-amitriptyline (2)</i>	<i>amitriptyline metabolite</i>	0.3	0.1

# 11 PPCPs Detected in Sediment

<b>Compound (# sites detected)</b>	<b>Use</b>	<b>ng/g dry wt</b>	
		<b>Max</b>	<b>Mean</b>
<i>Ciprofloxacin (2)</i>	<i>antibiotic</i>	680	400
<i>Caffeine (3)</i>	<i>stimulant</i>	38	18
<i>Triclocarban (3)</i>	<i>antimicrobial</i>	33	8
<i>Trimethoprim (1)</i>	<i>antibiotic</i>	18	3
<i>Triamterene (5)</i>	<i>antihypertensive</i>	11	3
<i>Thiabendazole (2)</i>	<i>fungicide</i>	9	2
<i>Diethyl-3-methyl-benzamide, N,N- (DEET) (2)</i>	<i>insect repellent</i>	3	1
<i>Erythromycin-H2O (1)</i>	<i>erythromycin metabolite</i>	3	1
<i>Amphetamine (2)</i>	<i>stimulant</i>	3	1
<i>Sulphamethoxazole (1)</i>	<i>antibiotic</i>	1	0.1
<i>Cocaine (1)</i>	<i>stimulant</i>	0.2	0.1

- 33 compounds not reported by lab due to poor surrogate recoveries
- High MDLs for triclosan (60 ng/g), others

# 17 PPCPs Detected in Mussels

<b>Compound (# sites detected)</b>	<b>Use</b>	<b>ng/g wet wt</b>	
		<b>Max</b>	<b>Mean</b>
<i>Diethyl-3-methyl-benzamide, N,N- (DEET) (5)</i>	<i>insect repellent</i>	14	7
<i>Digoxigenin (3)</i>	<i>cardiac drug metabolite</i>	10	5
<i>Carbamazepine (5)</i>	<i>anticonvulsant</i>	5	3
<i>Amphetamine (3)</i>	<i>stimulant</i>	4	1
<i>Triclocarban (2)</i>	<i>antimicrobial</i>	2	0.5
<i>Sertraline (5)</i>	<i>antidepressant</i>	1	0.5
<i>Dehydronifedipine (5)</i>	<i>antianginal</i>	0.7	0.4
<i>Triamterine (3)</i>	<i>antihypertensive</i>	0.6	0.2
<i>Ranitidine (3)</i>	<i>antacid</i>	0.4	0.2
<i>Diphenhydramine (3)</i>	<i>antihistamine</i>	0.3	0.2
<i>Atenolol (1)</i>	<i>beta blocker</i>	0.3	0.1
<i>Cocaine (2)</i>	<i>stimulant</i>	0.3	0.1
<i>Amitryptiline (2)</i>	<i>antidepressant</i>	0.2	0.1
<i>Sulphamethizole (1)</i>	<i>antibiotic</i>	0.2	0.04
<i>Erythromycin-H2O (4)</i>	<i>erythromycin metabolite</i>	0.2	0.1
<i>Enalapril (2)</i>	<i>antihypertensive</i>	0.1	0.04
<i>Diltiazem (2)</i>	<i>antianginal</i>	0.1	0.04

# ***PPCPs in SF Bay***

## ***Comparison to 2006 South Bay Study***

- *Results comparable*
- *Higher frequency of detection in 2010 (30%)*

## ***Spatial Trend***

- *Highest in South Bay, lowest in Central Bay, but several exceptions*

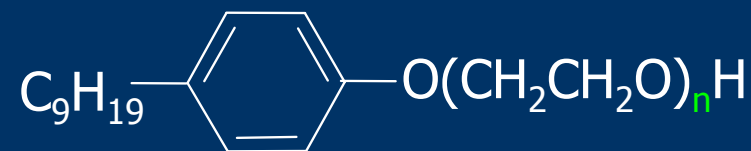
## ***Potential Impacts?***

- *Concentrations much lower than available toxicity thresholds*
- *Effects of long-term exposure to low concentrations unknown*



# Alkylphenol Ethoxylates

- *Nonionic surfactants in detergents, emulsifiers, pesticide formulations*
- *80% nonylphenol ethoxylates, 20% octylphenol ethoxylates*
- *Degrade to mono-, di-ethoxylates, nonylphenol, octylphenol*
- *Endocrine disrupting chemicals*
- *Phased out/restricted in Europe, Canada*
- *Monitored in RMP 2002 Pilot Study*



Nonylphenol  
**poly**ethoxylate

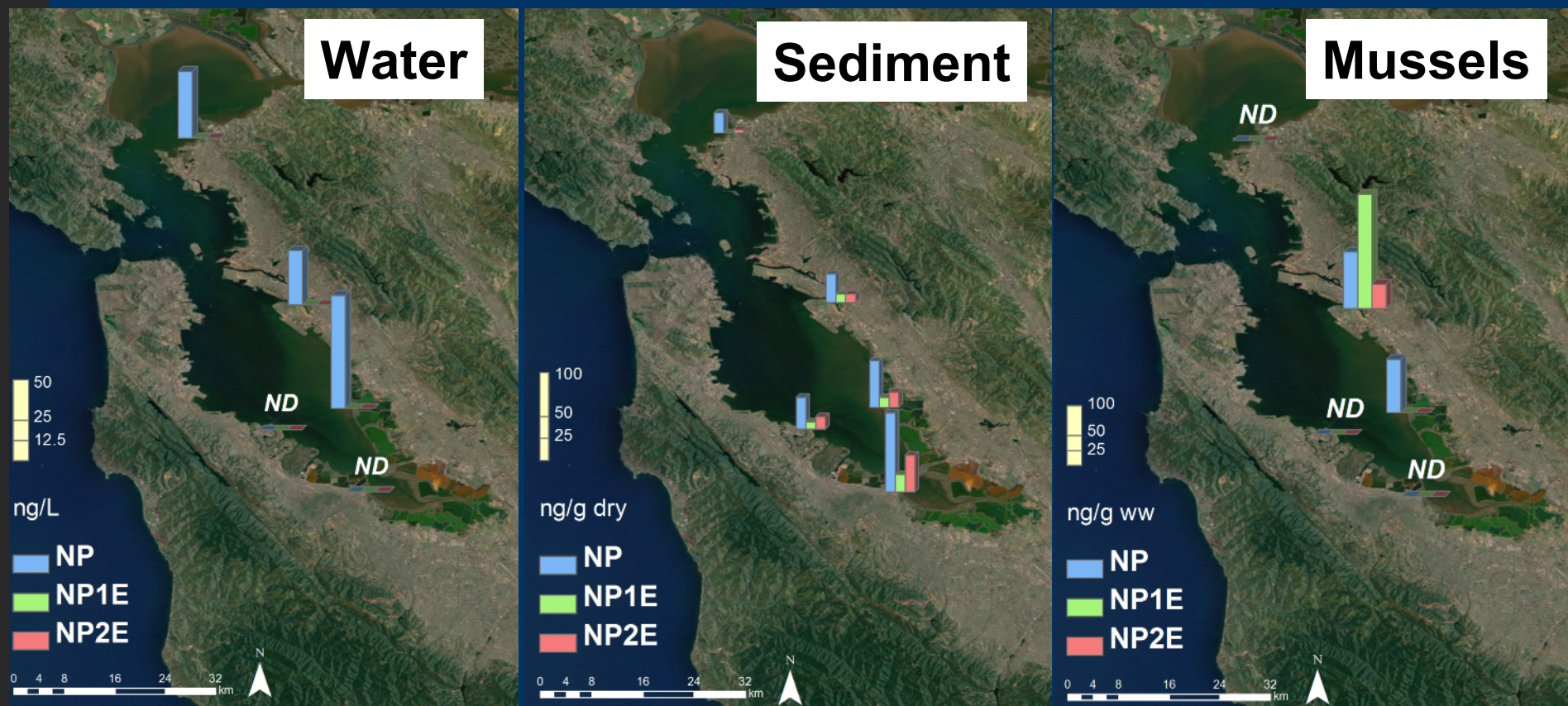


Nonylphenol  
**mono**ethoxylate



Nonylphenol

# Alkylphenol Ethoxylates



NP max 73 ng/L

NP max 86 ng/g

NP max 95 ng/g

# Dioxin Strategy Update

RMP TRC December 2010



# Dioxin Strategy Questions

- **1. Are the beneficial uses of San Francisco Bay impaired by dioxins?** (Sport fish, bird eggs)
- **2. What is the spatial pattern of dioxin impairment?** (RMP S&T sed & water)
- **3. What is the dioxin reservoir in Bay sediments and water?** (Bay sed cores)
- **4. Have dioxin loadings/concentrations changed over time?** (Wetland sed cores)
- **5. What is the relative contribution of each loading pathway as a source of dioxin impairment in the Bay?** (Trib studies, air dep estimate )
- **6. What future impairment is predicted for dioxins in the Bay?** (Mass balance)

# Master Plan

## DIOXINS

**Dioxin studies and monitoring in the RMP from 2008 to 2015.** Numbers indicate budget allocations in \$1000s. Unlike the other contaminants, dioxin costs have generally been itemized explicitly as add-ons to RMP studies.

Dioxin Strategy studies began in 2008, with a multi-year plan extending through 2012. Synthesis activities are planned for 2013 and 2014 after the data from the earlier studies are available.

General Area	Element	Dioxin Questions Addressed	2008	2009	2010	2011	2012	2013	2014	2015
<b>Dioxin-Specific Elements</b>										
Dioxin Strategy	QUALITY ASSURANCE	1,2,3,4,5,6		20						TBD
	Synthesis Report	1,2,3,4,5,6								TBD
Status and Trends	Sport Fish	1,2,4		22			22			TBD
	Avian Eggs	1,2,4					10			TBD
	Surface Sediments	2,3	57	57			57	TBD	TBD	TBD
	Water	2,3		20		28		TBD	TBD	TBD
Loads	Small Tributary Loading	4,5,6		34	34		68	TBD	TBD	TBD
	River Loading (THg)	4,5,6			34			TBD	TBD	TBD
Forecast	Sediment Cores	3,4,6			67			TBD	TBD	TBD
	Synthesis: One-Box Model	3,4,5,6						20	TBD	TBD
	Synthesis: Food Web Model	5,6							20	TBD
<b>Multi-contaminant Studies That Include Dioxins</b>										
Loads	Atmospheric Deposition	5,6		25	10	TBD	TBD	TBD	TBD	TBD

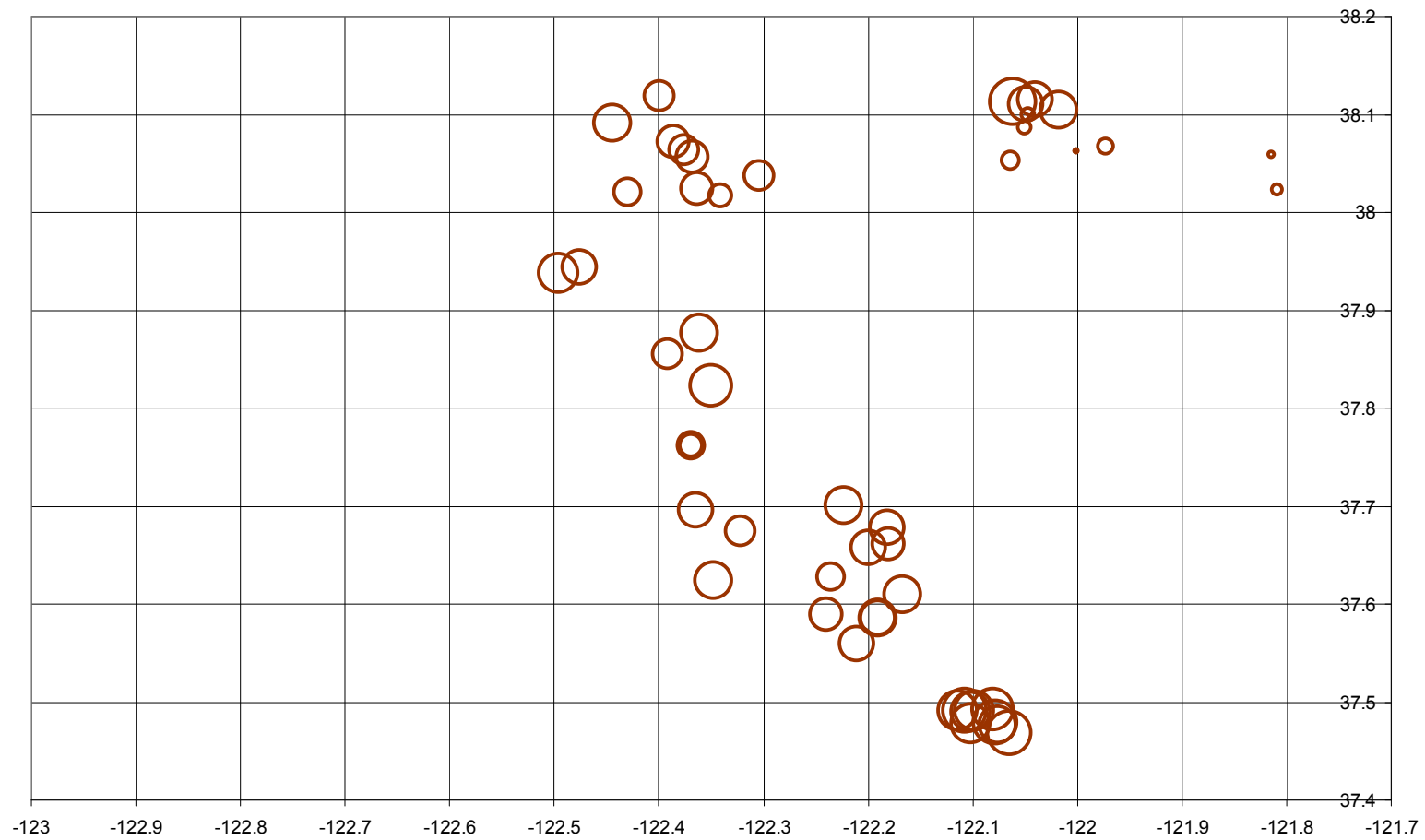
# Dioxin Strategy Timeline

Design Element	2008	2009	2010	2011	2012	2013	2014	Total by Element
Sport fish		22000 (data Fall 2010)			\$22,000			\$44,000
Bird eggs					\$10,000			\$10,000
Surface sediment	58000 (samples collected; not analyzed)	58000 (completed)	58000 (mix of 2008 & 2010 analyzed)		\$58,000	?	?	\$174,000
In-Bay surface water		26000 (completed)		\$26,000		?	?	\$52,000
Sediment cores	57000 (to lab Fall 2010)		57000 (to lab Fall 2010)			?	?	\$57,000
Trib loadings, Delta outflow			\$31,000 (Zone 4 Line A) \$34,000 (Delta) \$34,000 (Guadalupe)		\$68,000	?	?	\$167,000
Atmospheric deposition			\$20,000					\$20,000
One-box model						\$20,000		\$20,000
Foodweb model							\$20,000	\$20,000
QAPP		13500 (done)						\$13,500
Data synthesis						?	?	?
<b>Total by Year</b>	\$115,000	\$119,500	\$119,000	\$26,000	\$158,000	?	\$40,000	\$577,500

# 2009 Fish, Water, Sed

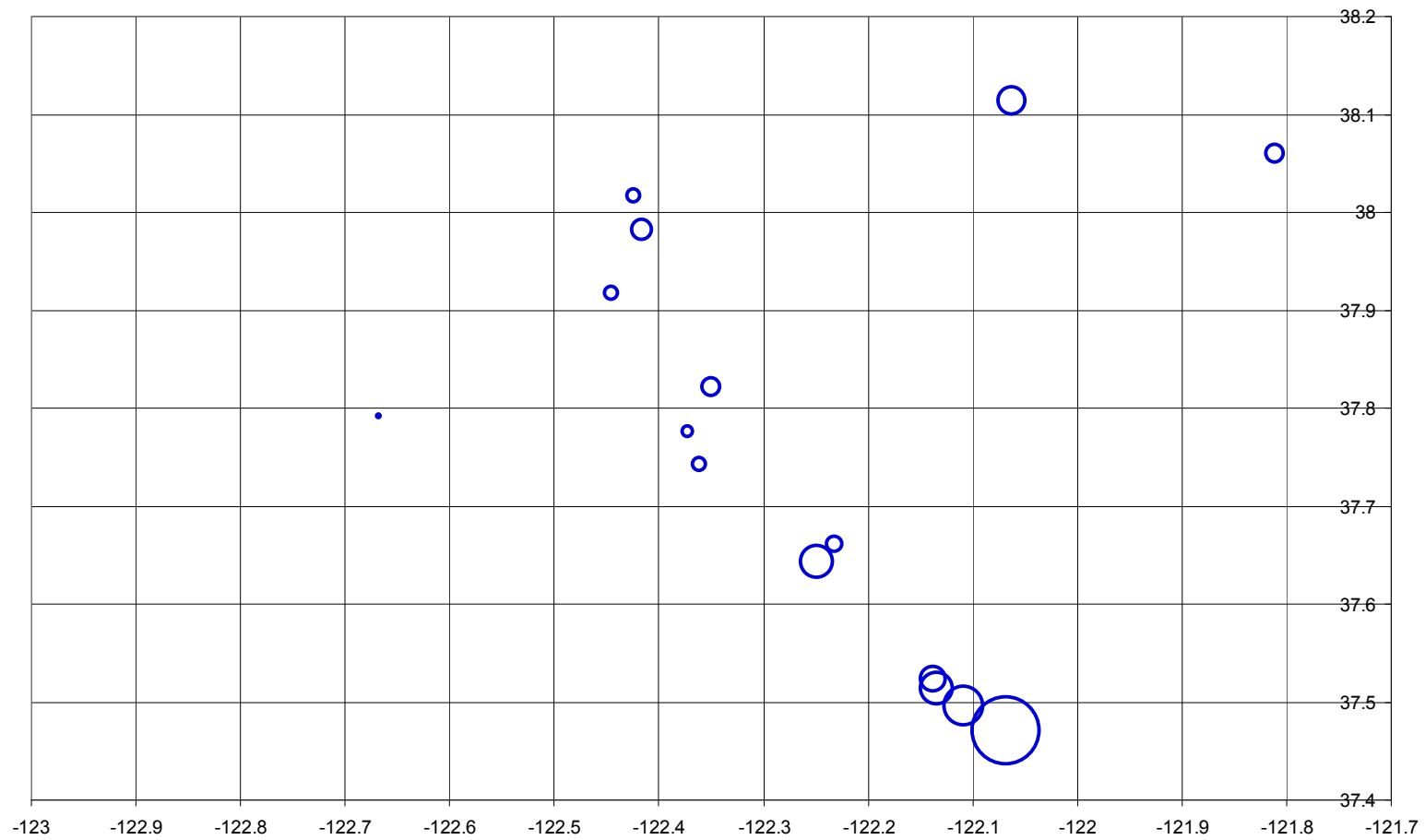
- Samples analyzed, QC reviewed, report on fish (other contaminant included) in progress
  - Data to be released to OEHHA Dec 2010
  - Reasonably quantitative data most isomers, esp. TCDD/F and PeCDD/F (<10% NDs)
- S&T Water & Sed Samples analyzed, QC'd
  - To be available via web query tool

# S&T Sediment





# S&T Water



# 2010 Sediments

- Surface sediments – hybrid of 2008 (dry) and 2010 (wet) samples sent for analysis
- Core sediments – hybrid of bay and wetland cores sent for analysis
- Results for both expected back from lab end of year, formatted and reviewed Q1 2011.

# 2010 Load Estimates

- Mallard, Guadalupe, Zone 4 samples
  - reported back by lab, QC reviewed, SPL team preparing reports / load estimates (on dioxins & other contaminants)
    - Lower conc isomers like TCDD, PeCDF, sometimes had blank contamination of similar magnitude to field conc.
- Air deposition
  - CARB released data from CADAMP sites, estimating air partitioning to model deposition rates (draft report end Dec 2010)

# Future Plans

- 2011
  - More RMP S&T water sites
- 2012
  - Fish, bird eggs, sediments, tribs
- 2013 +
  - Synthesis – e.g. via mass budget, foodweb model



# Status and Trends

- Strategy for S&T to be developed second quarter of 2011
  - Relevant management and policy decisions
  - Recent advances in our understanding
  - Priority questions for next five years
    - Level 1 MQs
      - Levels of concern and impacts
      - Concentrations and masses
      - Trends
  - Proposed plans 2011- 2014



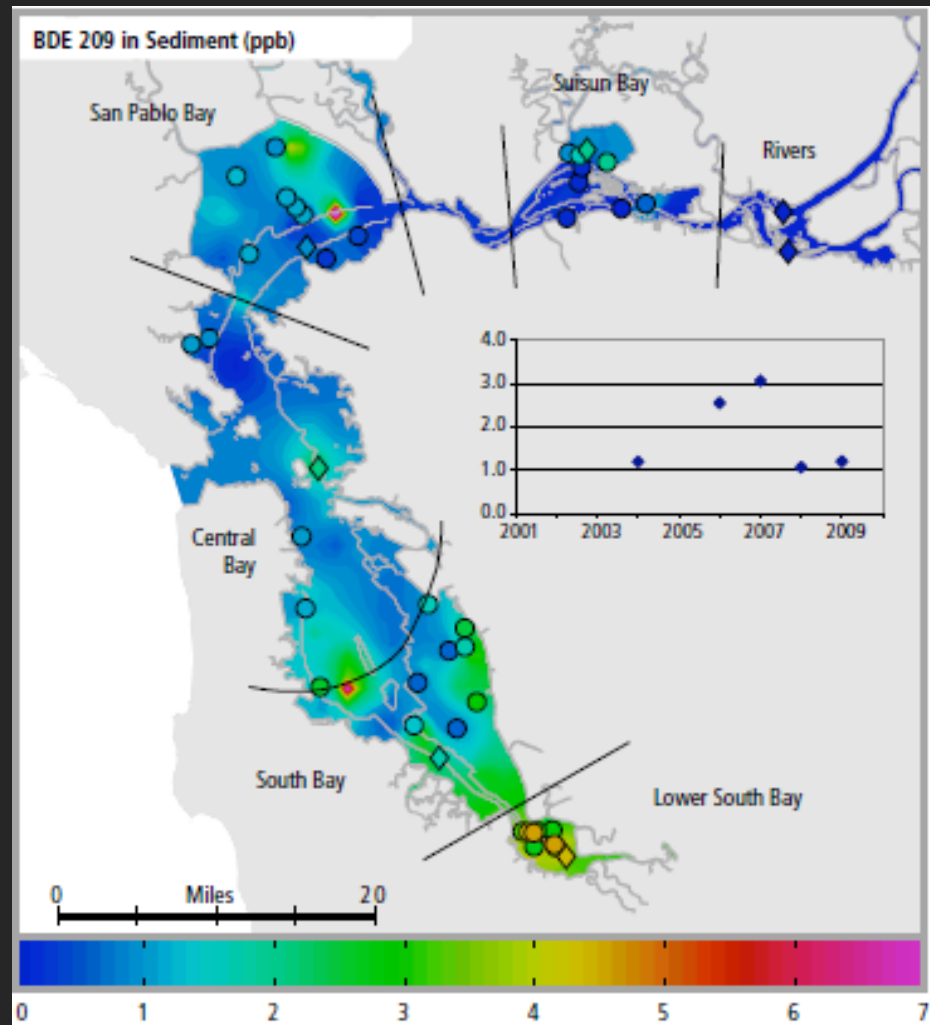
# Status and Trends

- Examples of relevant management policies and decisions
  - Revised Hg TMDL (2011-2013)
  - Revised PCB TMDL (2014-2015)
  - Cu SSO
    - Review of SSO (Triennial 2012)
  - Cyanide
    - Antidegradation policy
  - Legacy Pesticides
    - Development of simple TMDL (2012-2013)
  - Se
    - North Bay Se TMDL (2012-2014)
  - SQOs
  - Sport fish advisories
  - NPDES permitting needs –
    - 303 (d) list
    - RPA
  - Dredged Materials Management

# Advances in our understanding



- Highlighting new findings



# S&T Sediment

Feb 2010



- 27 sites
  - 20 random
    - 4 per segment
  - 7 historic RMP
    - Rivers (2 sites)
    - One per segment



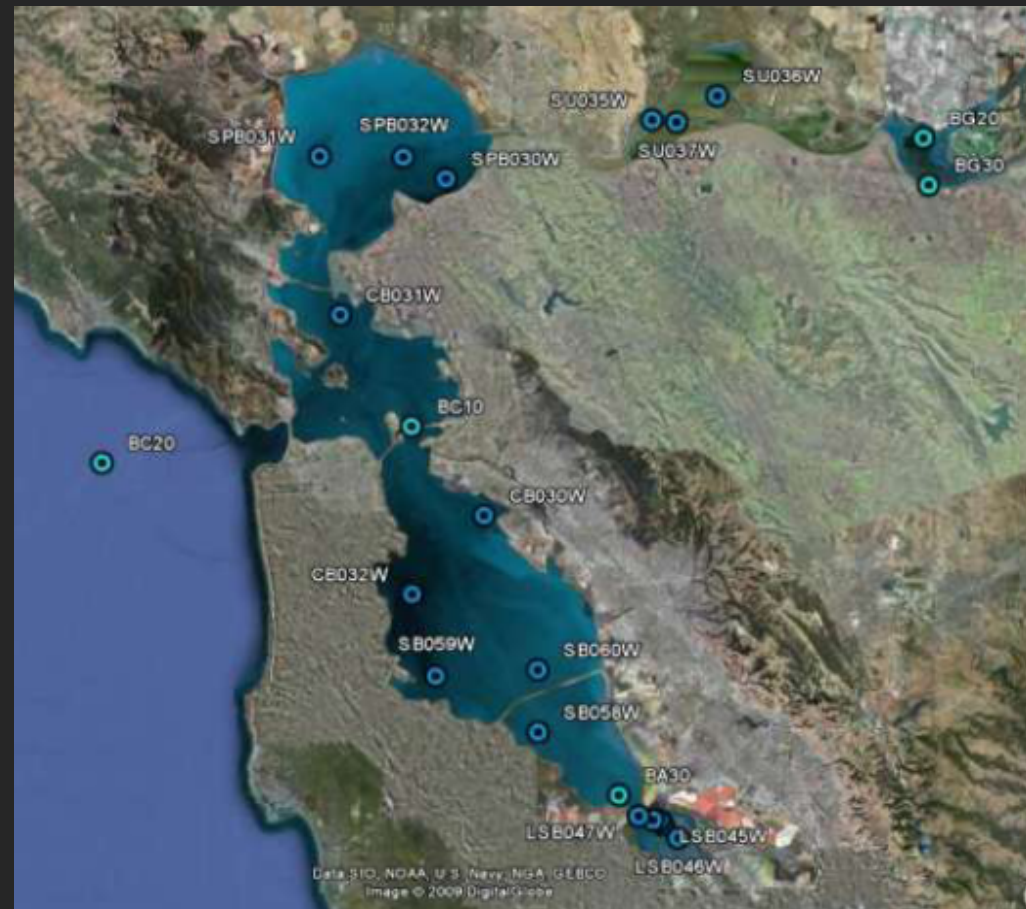


# S&T Water

## Aug 2010



- 22 sites
  - 17 random
    - 3 sites per segment except LSB (5 sites)
  - 5 historic RMP
    - Rivers (2 sites), GG, Yerba Buena, Dumbarton



# S&T Bivalve June – Sept 2010

- 11 fixed stations
  - Deployed *Mytilus* at 8 sites
    - Davis point site unable to place cage
  - Trawled for *Corbicula* at 2 river sites
    - Successful
- Organics

*Corbicula  
Fluminea*



*Mytilus Californianus*



# 2011 S&T Monitoring

## Water

- Summer – 22 sites
- Organics (e.g., PBDEs, PAHs, PCBs, and pesticides) and inorganics

## Sediment

- Summer – 47 sites
  - Organics/ inorganics
- Benthos and toxicity (27 sites)

# 2011 S&T / USGS Studies



## SSC (Dr. Schoellhamer)

- 6 sites (Alcatraz, Mallard, Benicia, Richmond Bridge, Hamilton ATF, and Dumbarton)

## Basic Water Quality (Dr. Cloern)

- Monthly monitoring along spine
- 39 sites – salinity, temp, DO, SS and phytoplankton



# 2012

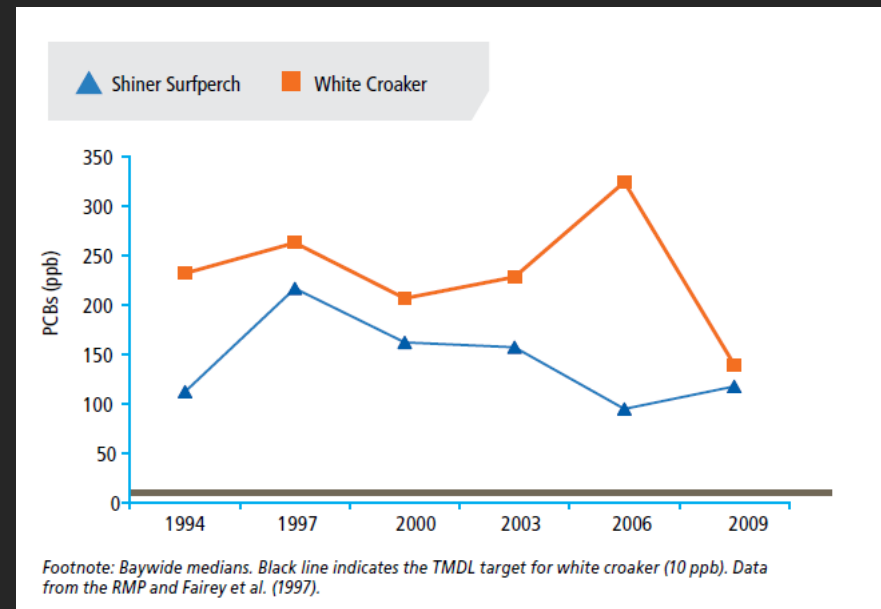


- Bivalves
- Bird egg monitoring

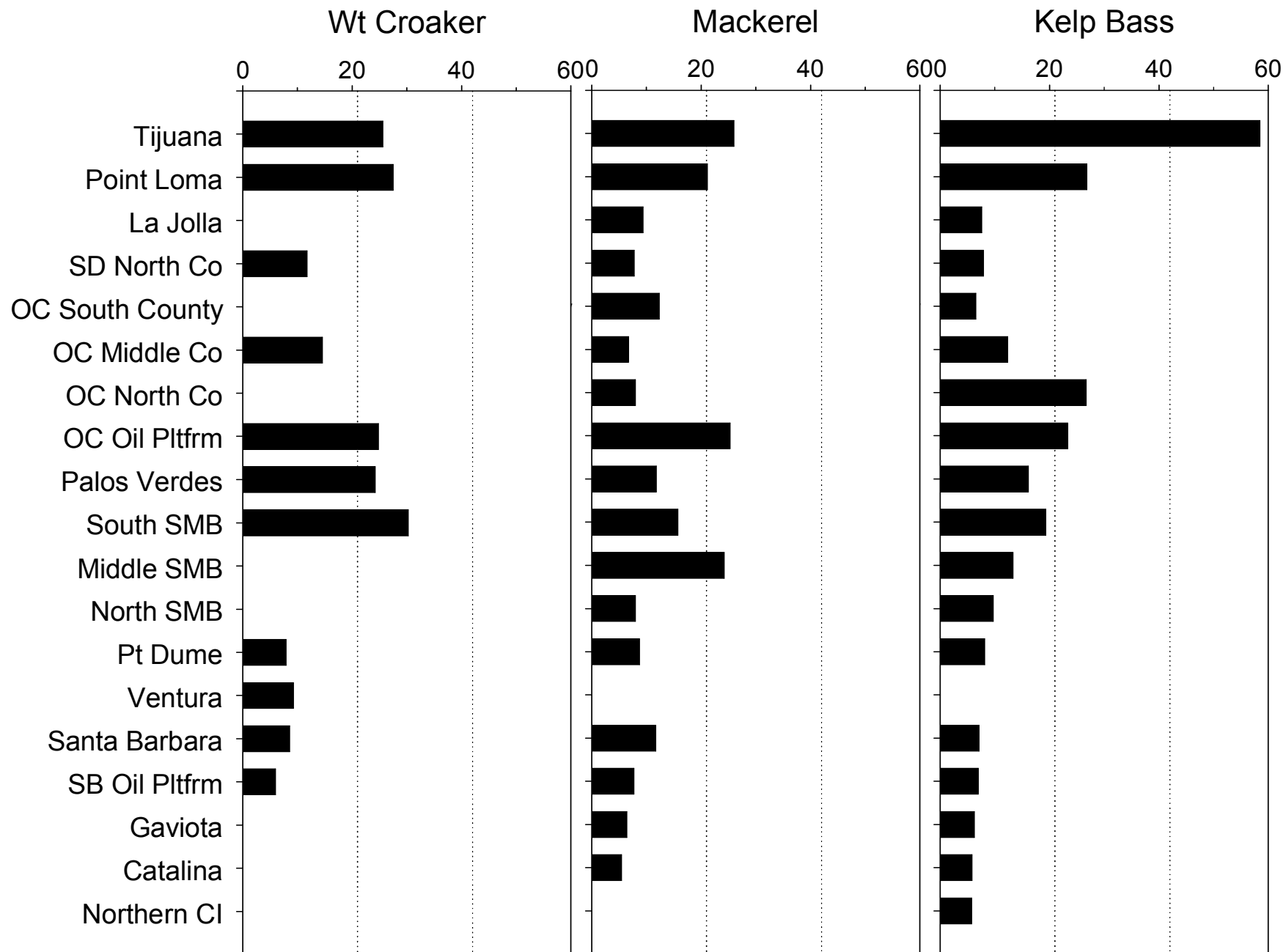
# Sport Fish



- Collaboration with SWAMP and Bight Program
- Integrated report
  - Regional and statewide context
- Draft in February
- Review Panel meeting at SCCWRP
- OEHHA updating advisory

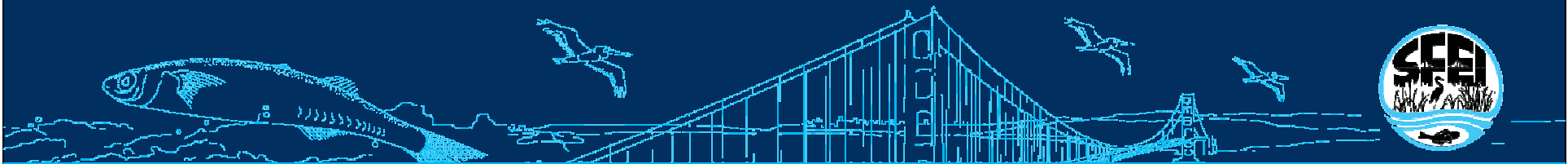


# TOTAL PCB (ug/wet kg)



# RMP Data Management: 2010 Highlights and 2011 Goals

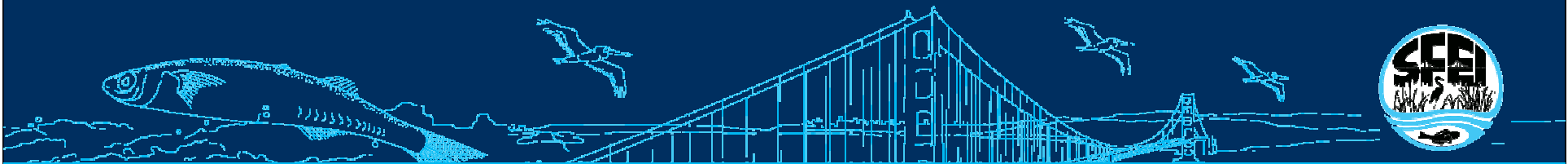
Cristina Grosso, John Ross, Amy Franz,  
Adam Wong, Donald Yee, Sarah Lowe,  
Todd Featherston, Jen Hunt,  
Shira Bezalel, Patty Frontiera





# 2010 Highlights

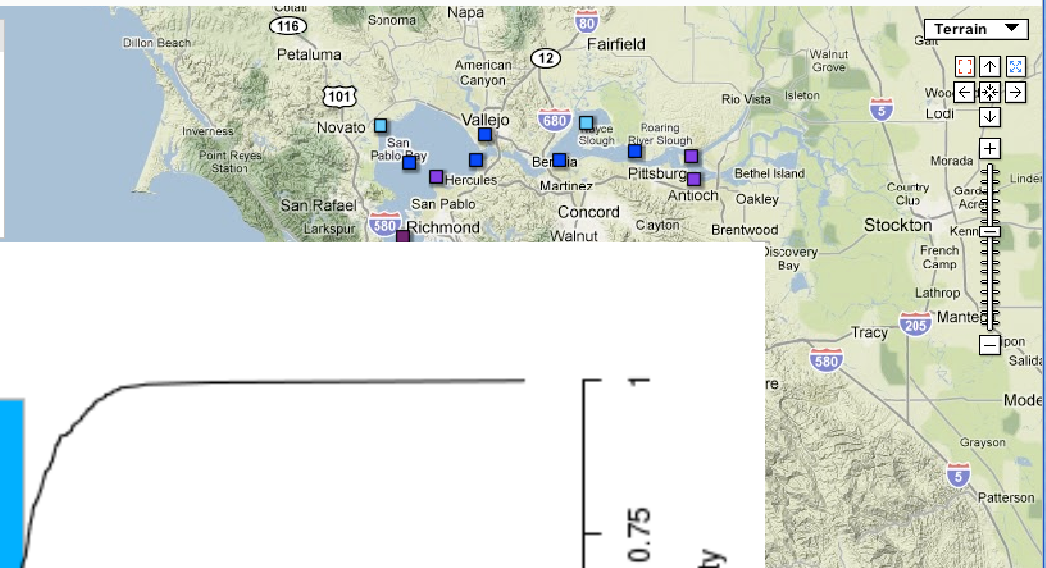
- **Uploaded 2009 data to database: S&T water, sediment, and sportfish; River Loading**
- **Provided online data access**



Region-wide Science for Ecosystem Management  
**SAN FRANCISCO ESTUARY INSTITUTE**

**Search Parameters:**

Test Material : Water  
 Program/Project : Regional Monitoring Program  
 Start Year : 1993  
 End Year : 1997  
 Matrix : Total  
 Parameter Type : Trace Elements  
 Parameter : Cu

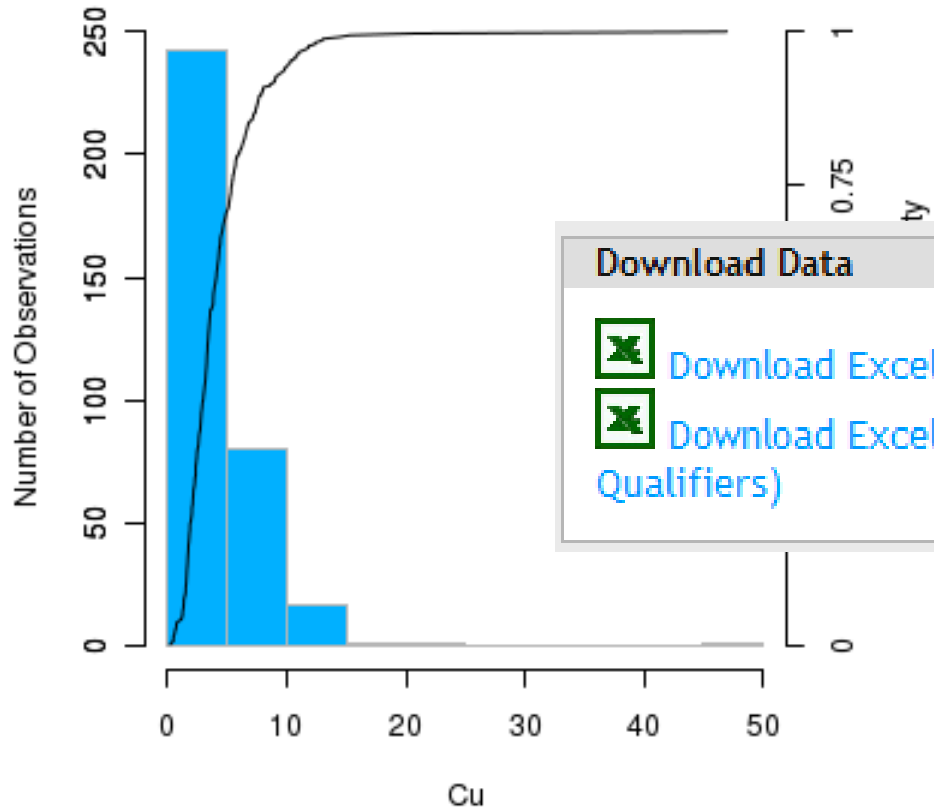


**Cu ( ug/L)**

Average of Multiple  
 Null / Not Repo

●	0.622 - 2.08
●	2.086 - 4.26
●	4.268 - 5.79
●	5.798 - 18.34

POWERED BY Google | 10 mi | 20 km



**Download Data**

- Download Excel (All Qualifiers)
- Download Excel (Primary Qualifiers)

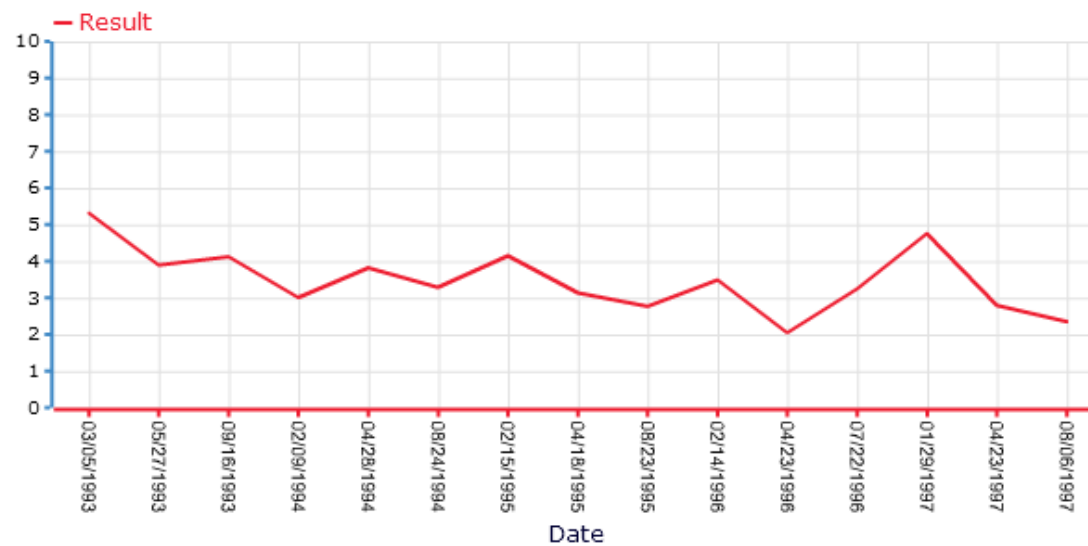


Individual Cu results for BG30

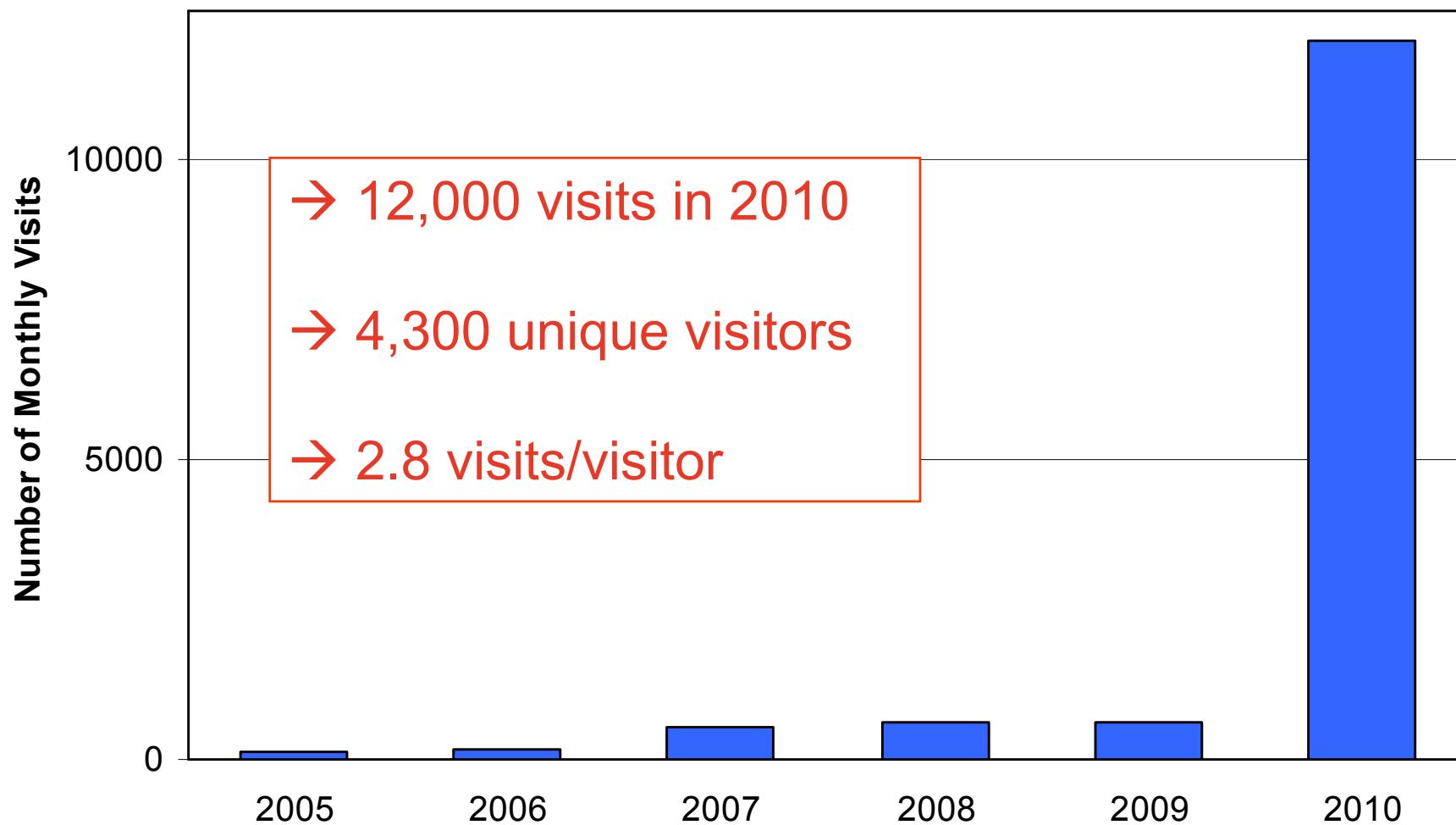
Close

 [Show/hide chart](#)  [Hide table](#)

Date	Result	MDL	Units	Qualifier	Compliance Code
03/05/1993	5.31	0.00393	ug/L		Com
05/27/1993	3.9	0.00393	ug/L		Com
09/16/1993	4.12	0.00393	ug/L		Com
02/09/1994	3.0131	0.00702	ug/L		Com
04/28/1994	3.822	0.018	ug/L		Com
08/24/1994	3.284	0.018	ug/L		Com
02/15/1995	4.1558	0.0098	ug/L		Com
04/18/1995	3.14	0.01	ug/L		Com
08/23/1995	2.77	0.005	ug/L		Com
02/14/1996	3.49	0.027	ug/L		Com
04/23/1996	2.05	0.008	ug/L		Com
07/22/1996	3.25	0.017	ug/L		Com
01/29/1997	4.756043	0.014284	ug/L		Com
04/23/1997	2.79395	0.010991	ug/L		Com
08/06/1997	2.358712	0.007141	ug/L		Com

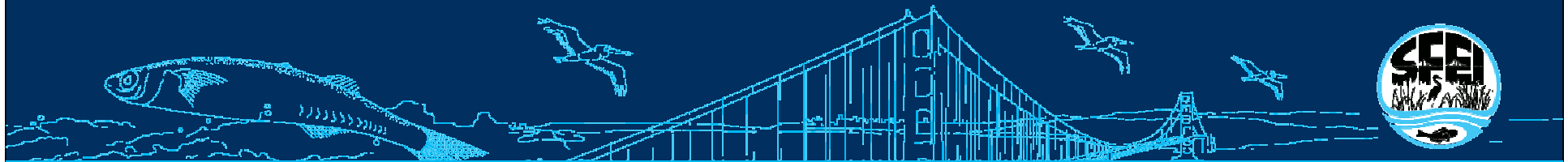


## External Use of RMP Data Web Query Tool



# 2010 Highlights

- Uploaded 2009 data to database
- **Maintained SWAMP/CEDEN comparability**





# CEDEN

CALIFORNIA ENVIRONMENTAL DATA EXCHANGE NETWORK

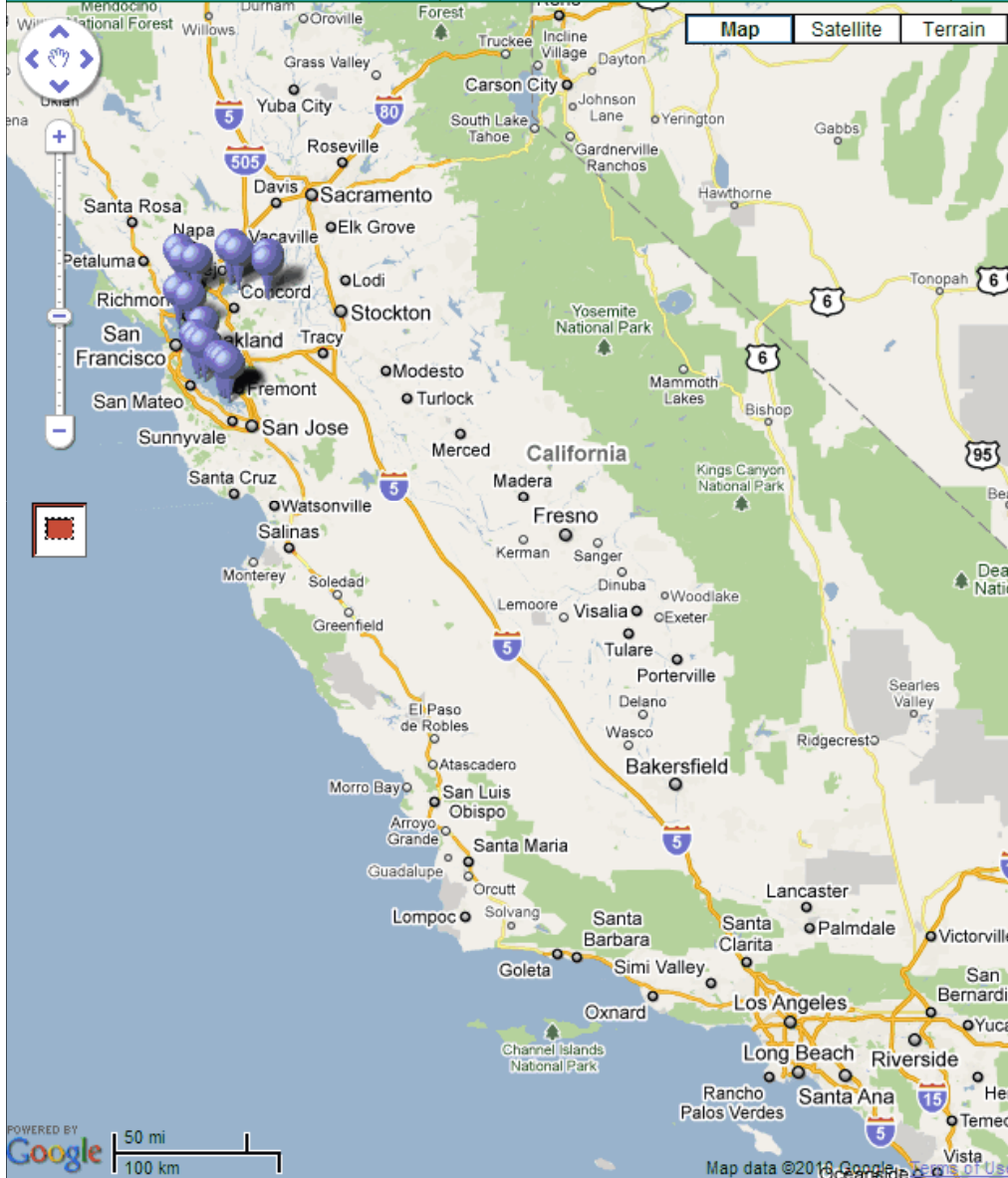


Home

About Us

Submit Data

Access Data



RESULT CATEGORY:  Water Quality  Toxicity  Field Data

Turn off automatic mapping of stations.

Click Map Stations at any time to show stations on the map

MAP STATIONS

MAP COUNTIES

MAP HUC-8

SHOW QA

SHOW STATIONLU

HELP

START OVER

Programs [Select] SFEI

Projects [Select] 2007 RMP Status & Trends

Parameter Groups [Select] pcbs

Parameters [Select] PCB 033, Total

Stations [Select]

- Central Bay (CB021W)
- Central Bay (CB022W)
- Central Bay (CB023W)
- Dumbarton Bridge (BA30)
- Lower South Bay (LSB027W)
- Lower South Bay (LSB028W)
- Lower South Bay (LSB029W)
- Lower South Bay (LSB030W)
- Lower South Bay (LSB032W)
- Sacramento River (BG20)

Include stations that are missing lat/lngs

Available date range: Aug-07-2007 to Aug-16-2007

From: [Month] [Day] [Year]

To: [Month] [Day] [Year]

RETRIEVE DATA

Non-QA Data Only

First 1000 Records Only

Record Count: [Input]

Download Format: excel

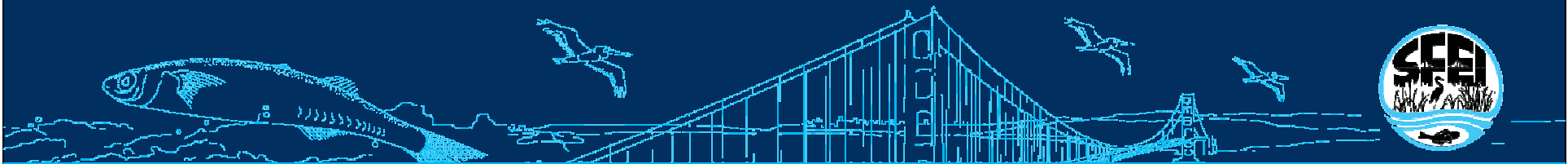
POWERED BY Google



Map data ©2010 Google

# 2010 Highlights

- Uploaded 2009 data to database
- Maintained SWAMP/CEDEN comparability
- Enhanced field entry & COC tools







# Field Data Entry Form: Water

today filter no filter previous next new save

## Sampling Event Info

Station Code:

Sample Date:   
(dd/mm/yyyy)

### People

Data Entry:

Field Measurements:

Samples:

Event Comments:

## Field Measurements

Analyte:	Units:	Result:	Comments:
<input type="text" value="Oxygen, Dissolved"/>	<input type="text" value="% saturation"/>	<input type="text" value="88.1"/>	<input type="text"/>
<input type="text" value="Temperature"/>	<input type="text" value="°C"/>	<input type="text" value="22.27"/>	<input type="text"/>
<input type="text" value="Conductivity"/>	<input type="text" value="mS/cm"/>	<input type="text" value="1.495"/>	<input type="text"/>
<input type="text" value="Salinity"/>	<input type="text" value="ppt"/>	<input type="text" value="0.77"/>	<input type="text"/>
<input type="text" value="pH"/>	<input type="text" value="pH"/>	<input type="text" value="8.43"/>	<input type="text"/>

Instrument:

## Samples

Analyte:	Container:	Container ID:	Vol. Filtered:	Vol. Filt. Unit:	Filter No.	# of Filters:	Comments:
<input type="text" value="POC (filtered)"/>	<input type="text" value="40 mL glass"/>	<input type="text" value="RMP 08WC-1093"/>	<input type="text" value="314"/>	<input type="text" value="ml"/>	<input type="text" value="3"/>	<input type="text" value="1"/>	<input type="text" value="Started with filter 12 but pump was put together wro"/>
<input type="text" value="Chlorophyll/Phae"/>	<input type="text" value="40 mL amber vials w"/>	<input type="text" value="RMP 08WC-1099"/>	<input type="text" value="1020"/>	<input type="text" value="ml"/>	<input type="text" value="NA"/>	<input type="text" value="3"/>	<input type="text" value="20 ml 90% methanol added"/>
<input type="text" value="DOC (dissolved)"/>	<input type="text" value="250 mL plastic"/>	<input type="text" value="RMP 08WC-1094"/>	<input type="text" value="314"/>	<input type="text" value="ml"/>	<input type="text" value="NA"/>	<input type="text" value="1"/>	<input type="text" value="250ml plastic bottle from CAS"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="ml"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

# SAMPLE COLLECTION



**DATA COLLECTION**

**LABELS**

**COCs**

**EDDs**

## DATA COLLECTION FOR GENERATING COCs



[MAIN MENU](#)

### SITE

Site Name:

Address:

Agency Jurisdiction:

Latitude:  Longitude:

Accuracy:  m.

Land Use of Site:

[NEW SITE](#)

Site Access:

Site Description:

### SAMPLERS

Sampler 1:

Sampler 2:

### SAMPLING

Sample Date:

Sample Time:

Solid / Liquid:

Sample Type:

BottleSize:  oz.

Sample Comments:

Post Field Processing:

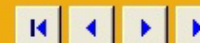
### Complete Sample Id

20080911SAG304

### Sample Photos

Shot Num:

Photo Description:



<b>San Francisco Estuary Institute</b> 7770 Pardee lane Oakland, CA, 94621-1424  Phone: 510-746-7334    Fax: 510-746-7300	Bill to: <b>San Francisco Estuary Institute</b> 7770 Pardee lane Oakland, CA, 94621-1424  Phone: 510-746-7334 - Fax: 510-746-7300	Shipped to: <b>East Bay MUD Laboratory</b>
---	---	--

Sampled by [Print Name(s)]/Affiliation <b>SFEI / Kat Ridolfi</b>						Analyses Requested						Project Name:												
Sampler(s) Signature(s)						<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width:5%; height: 20px;">HgT</td> <td style="width:5%; height: 20px;">PCBs</td> <td style="width:10%; height: 20px;">Grain size &lt; 63 µm</td> <td style="width:5%; height: 20px;"></td> <td style="width:5%; height: 20px;"></td> <td style="width:5%; height: 20px;"></td> <td style="width:5%; height: 20px;"></td> <td style="width:5%; height: 20px;"></td> <td style="width:5%; height: 20px;"></td> <td style="width:5%; height: 20px;"></td> <td style="width:5%; height: 20px;"></td> </tr> </table>						HgT	PCBs	Grain size < 63 µm									Prop. 13 - 5031	
HgT	PCBs	Grain size < 63 µm																						
Sample ID No.	Sampled Date      Time		Grab or Composite	Matrix (see codes)	Number/Size/Type of Containers							Remarks												
20080926SAG306 A	9/26/2008	10:45	G	SE	8																			
20080911SKR305 A	9/11/2008	13:30	G	SE	8																			
20080911SAG304 A	9/11/2008	13:45	G	SE	8																			
Shipment Method						3	← Total Number of Containers																	

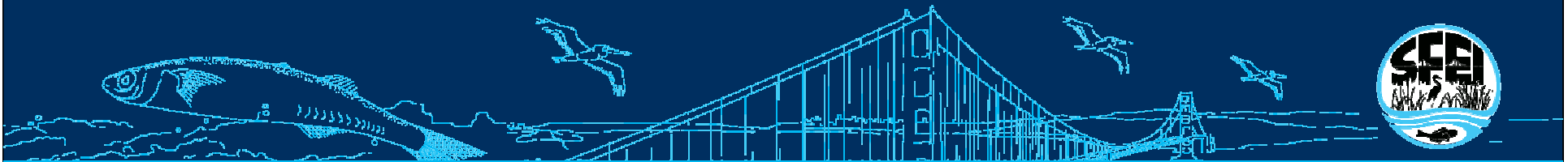
Out:    /    /	Via:	Relinquished by / Affiliation	Date	Time	Accepted by / Affiliation	Date	Time

MATRIX CODES: F = Freshwater    S = Saline    SE = Sediment    SW = Surface Water    PW = Porewater    B = Blanks    T = Toxicity    O = Other (spe

PRESERVATIVE CODES: H = Hydrochloric acid + ice    I = Ice only    N = Nitric acid + ice    S = Sulfuric acid + ice    O = Other (specify)

# 2010 Highlights

- Uploaded new data to database
- Maintained SWAMP/CEDEN comparability
- Enhanced field entry & COC tools
- Released beta version of data submittal tool



# SAN FRANCISCO ESTUARY INSTITUTE

Region-wide Science for Ecosystem Management



SFEI Data Checker - September 22, 2009

Instructions how to use this form: [Chemistry](#) [Tissue](#) [Toxicity](#)

Data Category:

Chemistry

Your Email Address:

cristina@sfei.org

Send me email with error results

Your Agency:

AMS-CA	Applied Marine Sciences, Inc. California
AXYS	Axys Analytical Services Ltd .
BR	Brooks Rand Labs
CCSF	City and County of San Francisco
CCSF-OBL	City and County of San Francisco - Oceanside Biology Lab
CCSF-ORG	City and County of San Francisco - Organics Lab
CSJ	City of San Jose Water Pollution Control Plant
CSUSM	California State University, San Marcos

File to Upload:

C:\Documents and Settings\Admin\Desktop\EDD CHECKER FILES\2008AXYS\_W\

[Troubleshooting & LookUp Lists](#)

 [Back to Main Page](#)

## Errors found in LabBatch Worksheet:

Error	Excel Row	Error Field	Erroneous Value	LabBatch	LabAgencyCode	LabBatchSubmissionCode	SubmittingAgencyCode	LabBatchComm
Unmatched LabBatch in LabBatch Worksheet	2	LabBatch	"WG25959"	"WG25959"	"AXYS"	"A"	"AXYS"	"{IS NULL}"
Unmatched LabBatch in LabBatch Worksheet	4	LabBatch	"WG26396"	"WG26396"	"AXYS"	"A"	"AXYS"	"{IS NULL}"
Unmatched LabBatch in LabBatch Worksheet	5	LabBatch	"WG26397"	"WG26397"	"AXYS"	"A"	"AXYS"	"{IS NULL}"
Unmatched LabBatch in LabBatch Worksheet	7	LabBatch	"WG26889"	"WG26889"	"AXYS"	"A"	"AXYS"	"{IS NULL}"

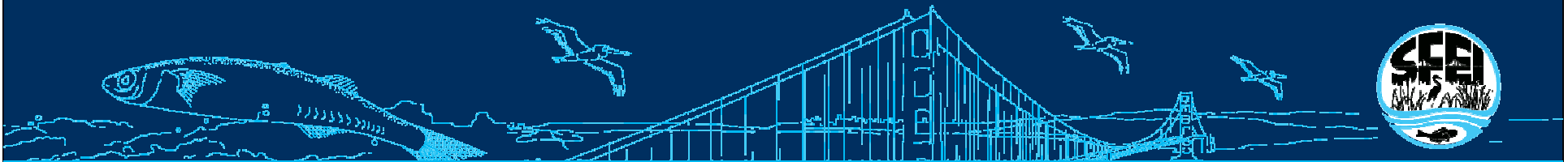
**Submit Data To SFEI if no errors in file**

[Troubleshooting & LookUp Lists](#)

 [Back to Main Page](#)

# 2010 Highlights

- Uploaded 2009 data to database
- Maintained SWAMP/CEDEN comparability
- Enhanced field entry & COC tools
- Released beta version of data submittal tool
- Improved web site reporting





[Home](#) :: [Programs](#) :: [Regional Monitoring Program](#) :: [Sampling Stations](#)

## Sampling Stations

Maps of RMP sampling stations are included as attachments below.

For more detailed information regarding sampling cruises from each year, visit [our Cruise Reports page](#).

Sampling Stations		
2011-2015 Sediment Target Sites	2011-2015 Water Target Sites	2011 - 2015 All Target Sites (.kml)
<a href="#">2011 (JPEG)</a>	<a href="#">2011 (JPEG)</a>	<a href="#">Files for Google Earth (ZIP)</a>
<a href="#">2012 (JPEG)</a>	<a href="#">2012 (JPEG)</a>	
<a href="#">2013 (JPEG)</a>	<a href="#">2013 (JPEG)</a>	
<a href="#">2014 (JPEG)</a>	<a href="#">2014 (JPEG)</a>	
<a href="#">2015 (JPEG)</a>	<a href="#">2015 (JPEG)</a>	
<a href="#">2011-2015 (DOC)</a>	<a href="#">2011-2015 (DOC)</a>	

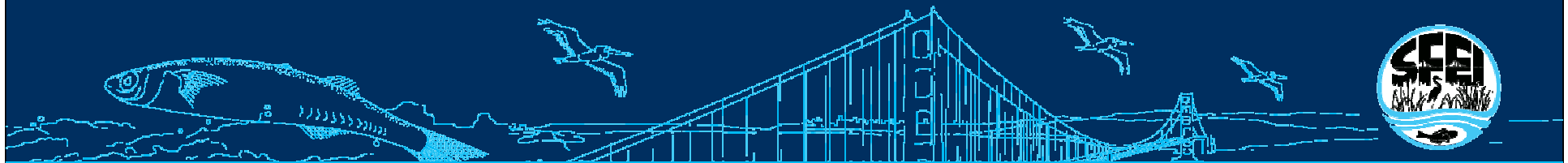
# Cruise Reports

Cruise reports contain the details of our sampling cruises for each year, organized by matrix. This includes schedules, sampling procedures and methodologies, details on each sample location, and further information regarding which parameters each sample is analyzed for. A graphical representation of sampling sites for each can be found at [our Sampling Stations page](#).

Cruise Reports		
		<b>2010</b>
		<a href="#">Bivalve Deployment</a>
		<a href="#">Bivalve Retrieval</a>
		<a href="#">Sediment</a>
		<a href="#">Water</a>
<b>2009</b>	<b>2008</b>	<b>2007</b>
<a href="#">Sediment</a>	<a href="#">Bivalve Deployment</a>	<a href="#">Sediment</a>
<a href="#">Water</a>	<a href="#">Bivalve Retrieval</a>	<a href="#">Water</a>
	<a href="#">Sediment</a>	
	<a href="#">Water</a>	
<b>2006</b>	<b>2005</b>	<b>2004</b>
<a href="#">Bivalve Deployment</a>	<a href="#">Bivalve Deployment</a>	<a href="#">Bivalve Deployment</a>

# 2011 Goals

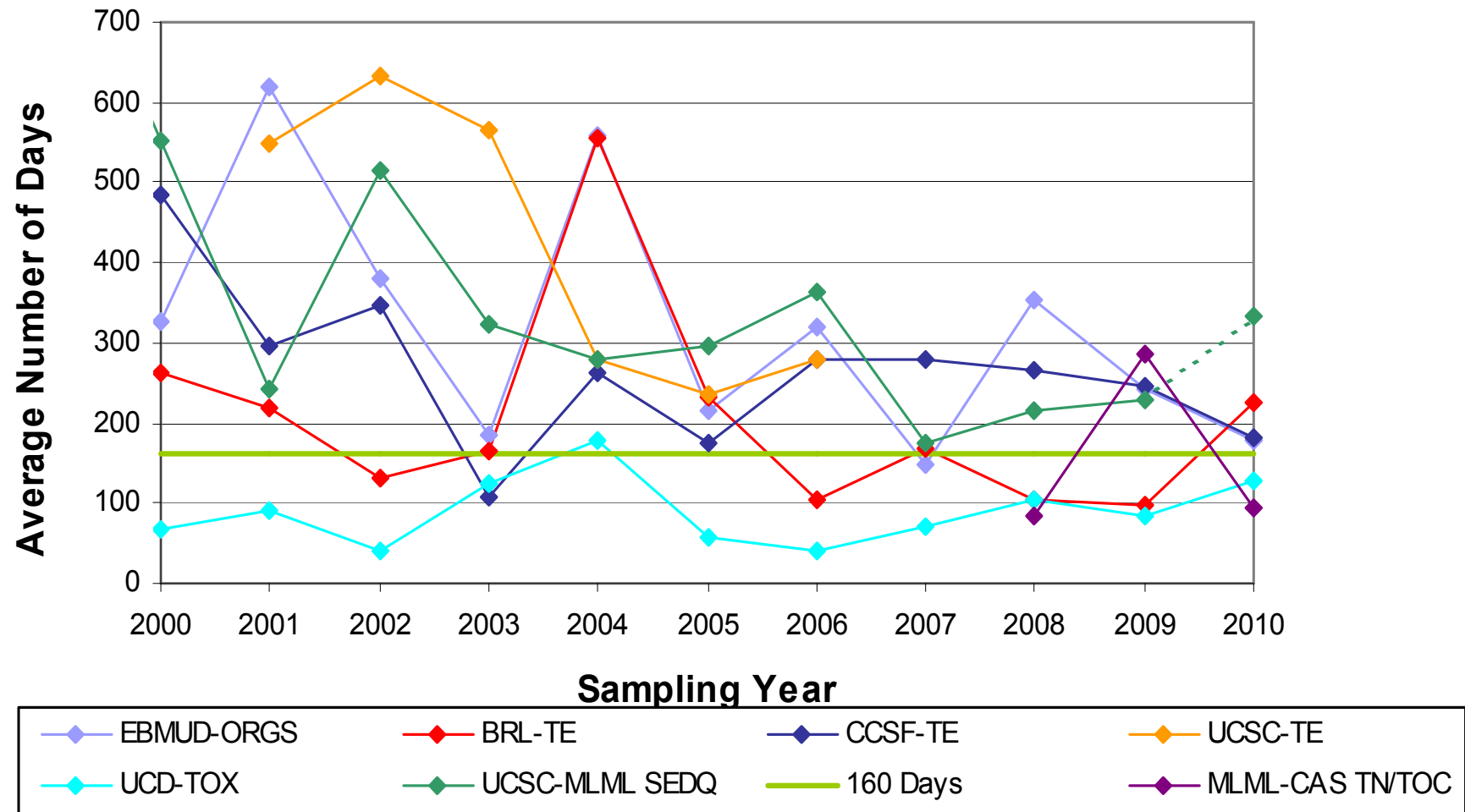
- Report data within one year



# Timeliness of Data: Sediment

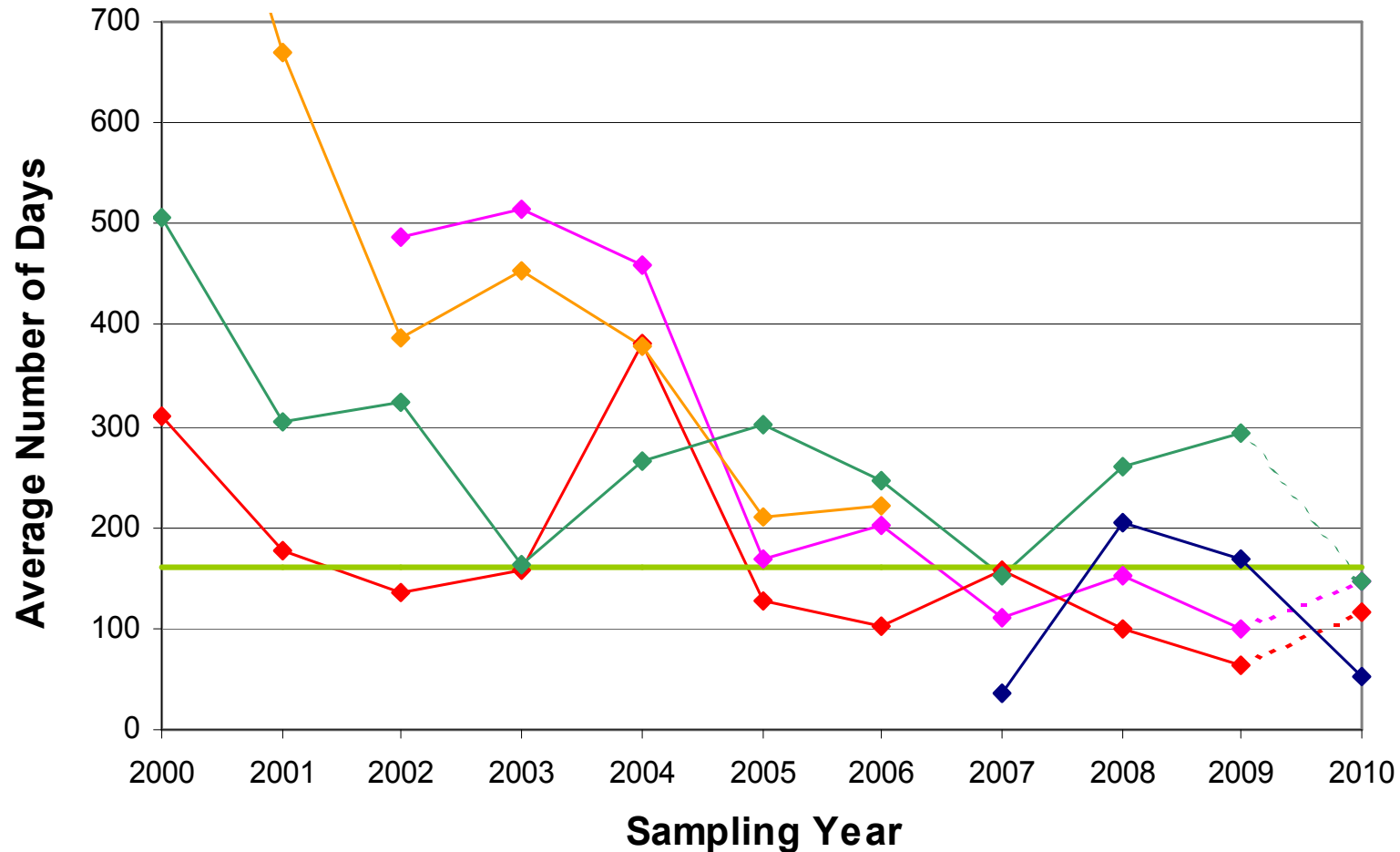
## Sediment Data from RMP Contract Labs

(average number of days data submitted after sample collection)



# Timeliness of Data: Water

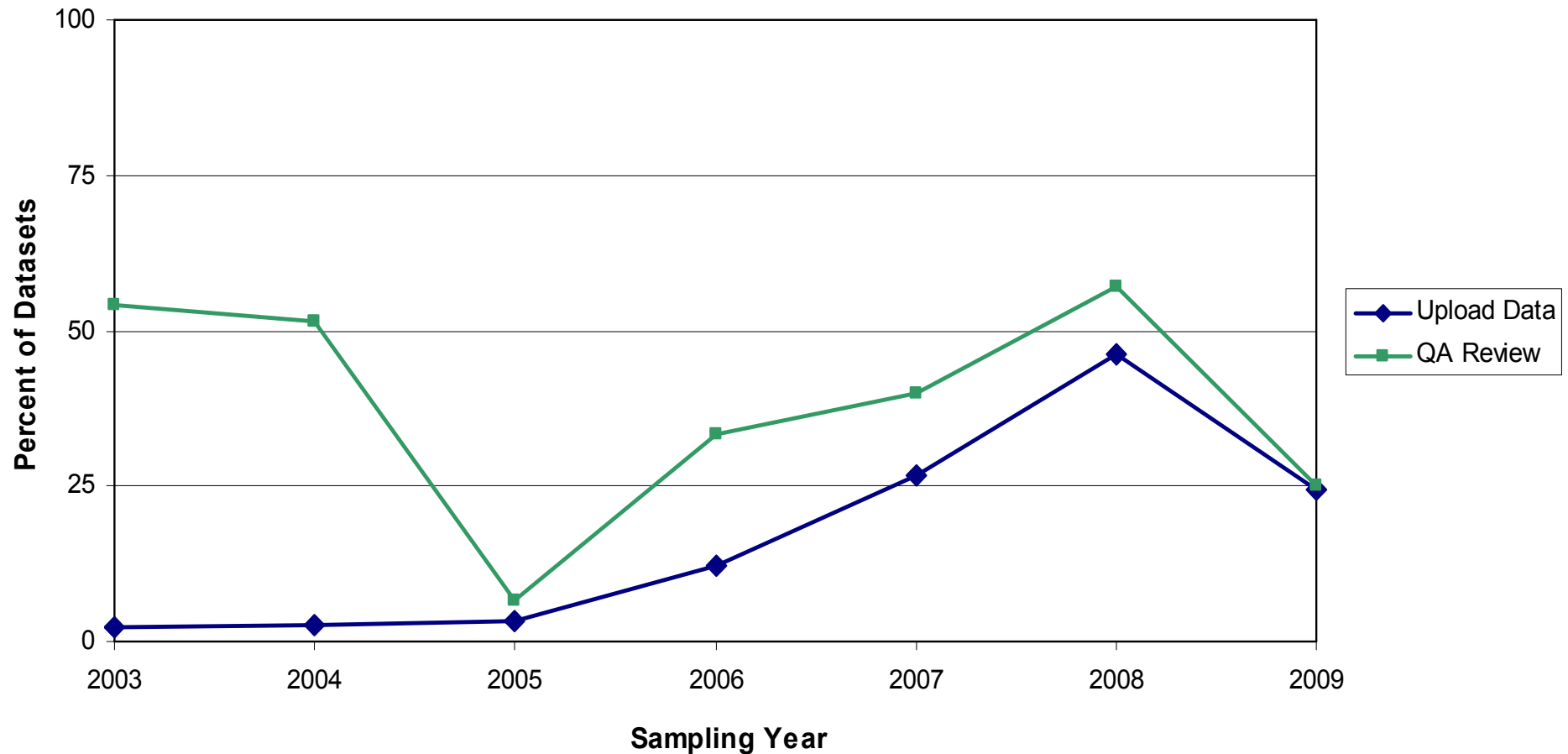
**Water Data from RMP Contract Labs**  
(average number of days data submitted after sample collection)



◆ AXYS-ORGS    ◆ BRL-TE    ◆ UCSC-TE    ◆ UCSC/EBMUD-WQ    — 160 Days    ◆ CAS-DOC/POC

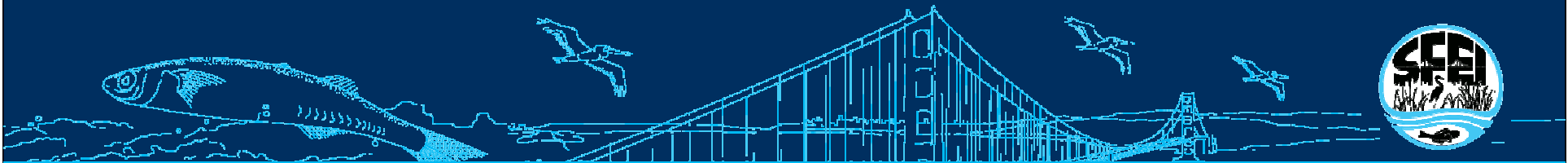
# Timeliness of Data: Uploading & QA Review

Timeliness of Reviewing Data  
Percent Taking >45 Days

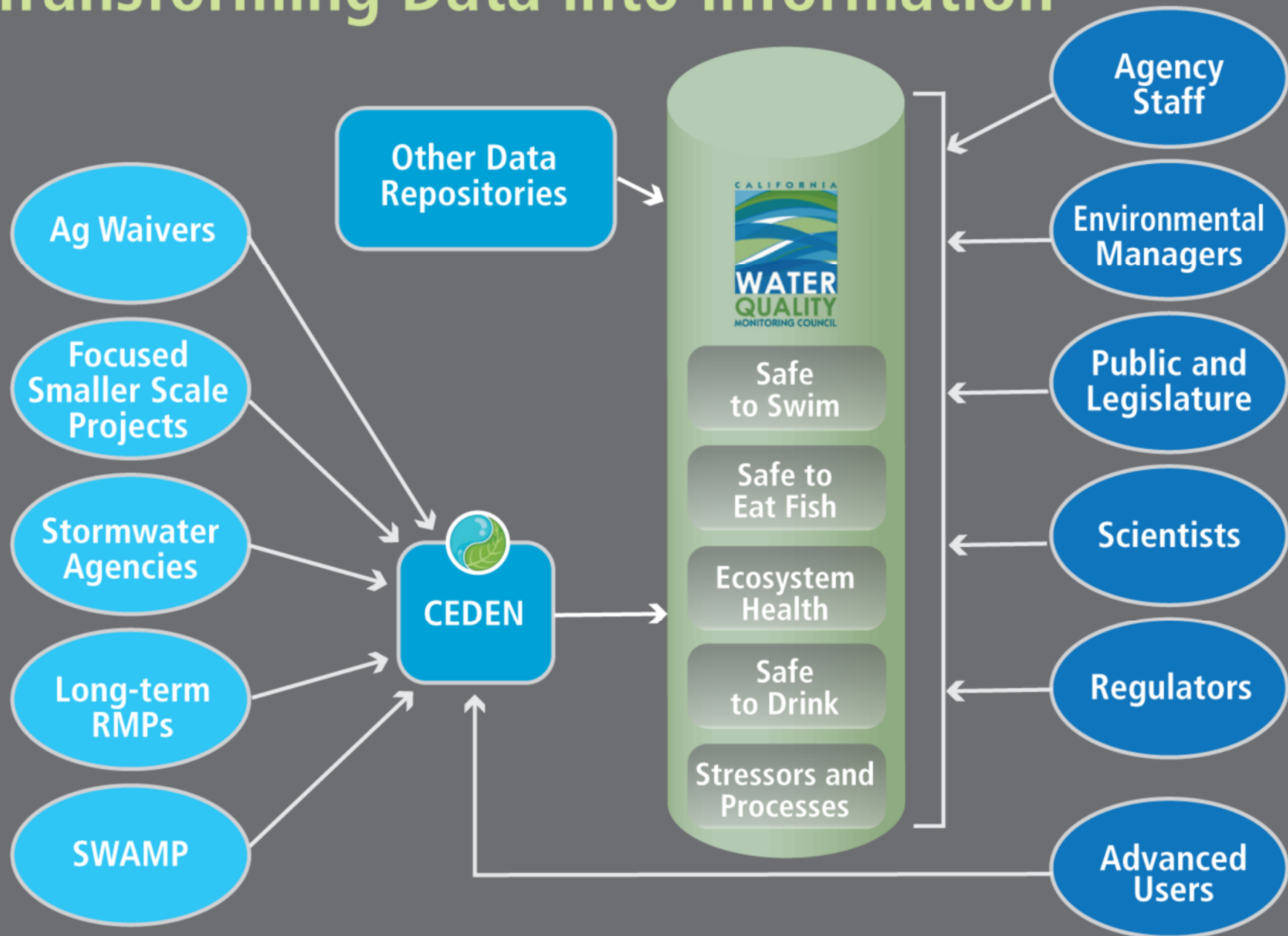


# 2011 Goals

- Report data within one year
- Upload data via web-based tool
- Enhance web query tools
- Coordinate San Francisco Bay's Regional Data Center



# Transforming Data into Information







Visit his Website

- > Cal/EPA
- > The Resources Agency
- > About the California Water Quality Monitoring Council
- > State & Regional Water Boards
  - >> Performance Report
- > Web Portal Partners
- > Monitoring & Assessment Programs, Data Sources & Reports
- > Water Quality Standards, Plans and Policies
- > Regulatory Activities

## Welcome to My Water Quality

This web portal, supported by a wide variety of public and private organizations, presents California water quality monitoring data and assessment information that may be viewed across space and time. Initial web portal development concentrates on four theme areas, with web portals to be released one at a time. Click the [Contact Us](#) tab for more information.

The Monitoring Council seeks to provide multiple perspectives on water quality information and to highlight existing data gaps and inconsistencies in data collection and interpretation, thereby identifying areas for needed improvement in order to better address the public's questions. Questions and comments should be addressed through the [Contact Us](#) tab.



### IS OUR WATER SAFE TO DRINK?

Safe drinking water depends on a variety of chemical and biological factors regulated by a number of local, state, and federal agencies. [More>>](#)

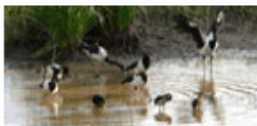


### IS IT SAFE TO SWIM IN OUR WATERS?



### IS IT SAFE TO EAT FISH AND SHELLFISH FROM OUR WATERS?

Aquatic organisms are able to accumulate certain pollutants from the water in which they live, sometimes r



### ARE OUR AQUATIC ECOSYSTEMS HEALTHY?

The health of fish and other aquatic organisms and communities depends on the chemical, physical, and biological quality of the waters in which they live.



### WHAT STRESSORS AND PROCESSES AFFECT OUR WATER QUALITY?

Beneficial uses of our waters are affected by emerging contaminants, invasive species, trash, global warming, acidification, pollutant loads, and flow. [More>>](#)