RMP SPECIAL STUDIES 2014

OTHER FUNDING DECISIONS ON THE HORIZON

- **To be Discussed at September TRC Meeting**
- **Margins Sampling**
  - ~$100Ks??
- **PCB Synthesis**
  - ~$100Ks??
- **Placing 2014 S&T Sediment Benthos and Toxicity on hold**
  - Potentially ~$110K additional funds if this element is put on hold for 2014

BUDGET IN MYP

	2013	2014
Total Available for Special Studies	$1,287,280	$1,266,393
Unencumbered/Overencumbered	$59,280	$166,393

SPECIAL STUDY AREAS	2013	2014
SPECIAL STUDIES TOTAL	$1,228,000	$1,100,000
Mercury	$0	$0
PCBs	$0	$0
Dioxins	$0	$24,000
Emerging Contaminants	$141,000	$76,000
Small Tributaries	$468,000	$430,000
Other SPL	$0	$0
Exposure and Effects	$114,000	$50,000
Forecasting	$100,000	$200,000
Nutrients	$405,000	$320,000

SUBMITTED PROPOSALS*

2014 SPECIAL STUDIES

	Proposal Name	Primary Authors	Estimated Cost	TRC Recom-mendation	TRC Comments
1	Alternative Flame Retardants	Sutton	$137,000	$83,000	Option 2 - $83K (no archives, no AXYS)
2	Updating RMP Emerging Contaminants Strategy	Sutton	$20,000		
3	Bioanalytical Tools: Linkage of In Vitro Assay Results With In Vivo End Points	Denslow	$56,000		
4	Impacts of Dredging on Benthic Habitats	Goeden and Schaffer	$50,000		Contingent on America's Cup funding, finding acceptable lead scientist, EEWG review acceptance of study design
5	Developing a Reference Site for Dredge Materials	Ross and Christian	$27,000		Consider for 2015; however, should Study 4 fall through, fund this study
6	The effects of particle size and shape and animal health on toxicity test results	Bay and Anderson	$119,140	$30,000	Fund summer only (RMP $30K, $50K from State [Beegan]) - contingent on new particle size method
7	Stormwater Loads Monitoring in Representative Watersheds	McKee	$352,000		
8	Develop and Update Spreadsheet Model- Year 5	McKee and Hunt	$30,000		
9	POC Loads Monitoring – Landuse/Source Area Specific EMC Development	McKee	$80,000		
10	Management Support for Spreadsheet Model Outreach and "Land Use" Based Monitoring	McKee	$25,000		
11	Hydrodynamic and Water Quality Modeling	Senn and Yee	$150,000		
12	Combined Nutrients Proposals: Monitoring and Program Management	Senn and Novick	$320,000		
13	Stormwater Modeling	Senn and Novick	$50,000		
14	Analysis of Dioxin in Sportfish	Yee	$24,000		
	Total Amount		**$1,440,140**	**$1,270,000**	
	the MYP)		**$1,266,393**	**$1,266,393**	
			($173,747)	($3,607)	

*

- $3,607

#1 ALT. FLAME RETARDANTS

- **$137-$83K (TRC recommendation)**
- **ECWG approved**
- **TRC fund @ $83K (no archive, no AXYS)**
- **Objective:**
  - Evaluate alternative flame retardants in water, sediment, mussels and seals

Alternative Flame Retardants	Water	Sediment	Mussels	Seals (2014)	Seals (archive)
HBCD	not prioritized for testing; Tier II (Low Concern)				
Dechlorane Plus (DP)		✓		✓	✓
PBEB		✓		✓	✓
DBDPE		✓	✓	✓	✓
BTBPE		✓		✓	✓
HBB		✓		✓	✓
BEH-TBP**		✓	✓	✓	
EH-TBB**		✓	✓	✓	
TDCPP or Chlorinated Tris	✓	✓			
TCPP	✓	✓			
TPhP	✓	✓	✓		
TCEP	✓				
TBP					
TBEP	✓				
TEHP					
TPrP	✓	✓			
Tris(2,3-dibromopropyl) phosphat Tricresyl phosphate, 2-Ethylhexyl-diphenyl phosphate, Tris(2-bromo-4-methylphenyl) phosphate					
V6	✓	✓	✓		
EBTEBPI		✓	✓		
DBE-DBCH or TBECH		✓		✓	
Dechlorane 602		✓		✓	
Organophosphate metabolites			✓	✓	

#2 UPDATING EC STRATEGY

- **$20,000**
- **Workgroup: ECWG approved**
- **Objective:**
  - Track new EC information and revise/ update EC strategy
    - Evaluating pharmaceuticals
  - Strategy based on existing information, effects (bioassays) and occurrence (NIST work, fate modeling)
  - Gray literature (Env. Canada, Great Lakes, Baltic, etc.)
  - Journals (ES&T, SETAC, etc.)

#3 BIOANALYTICAL TOOLS (YR 2)

- **$56,000**
- **Workgroup: EEWG approved**
- **Objective: to develop a tool to identify CECs through common modes of action**
  - Recommendation of State CEC Panel report
  - Linking in vitro (cellular) to in vivo response (organism)
  - No research to date on estuarine organisms
    - Will evaluate Silversides
    - Evaluate endocrine disruptors (estrone, BPA, 4NP, and galaxolide)
  - Year 1 underway; Year 2 is a field study

#4 ASSESSING DREDGING IMPACTS ON BENTHOS

- **$50,000 (RMP) plus $100,000 external funding**
- **Workgroup: EEWG reviewed - concerns about lack of lead**
- **TRC: Contingent on ext. funding, identifying an acceptable lead, and approval of study design by EEWG**
- **Objective:**
  - Assessing impacts of periodic dredging on benthic assemblages
    - Focus on effects to fish foraging
    - Evaluating shallows (<12 ft MLLW)
  - High priority for NMFS and LTMS
- **Approach**
  - Literature review
  - Design of a statistical study
  - Field program

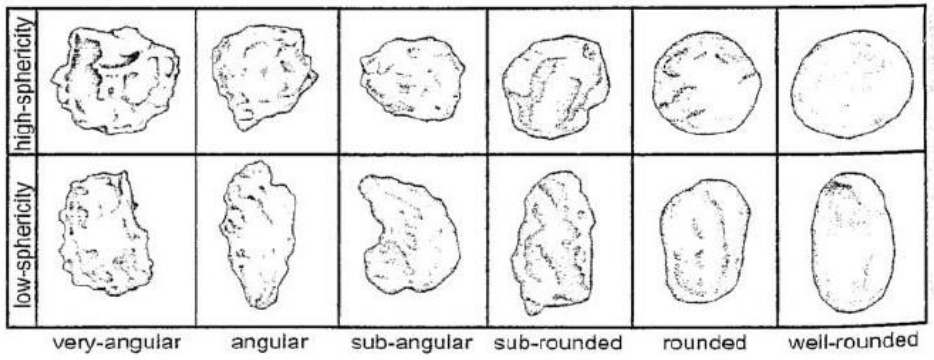
#5 REFERENCE SITE FOR BIOASSAYS

- **$27,000**
- **Workgroup: EEWG approved**
- **TRC recommend to fund if study #4 is not approved**
- **Objective:**
  - Identify a sediment reference site fo comparison of SFB dredge material
  - Incorporate site into RMP 2014 S&T sediment cruise
  - Lower priority than the dredging impacts study (Study #4)
  - Evaluate 2 sites

Figure 1: Previously sampled RMP S&T sites with fine-grained sediment, low PCB, PAH, and Hg concentrations, and greater than 85 percent *Eohaustorius estuarius* survival

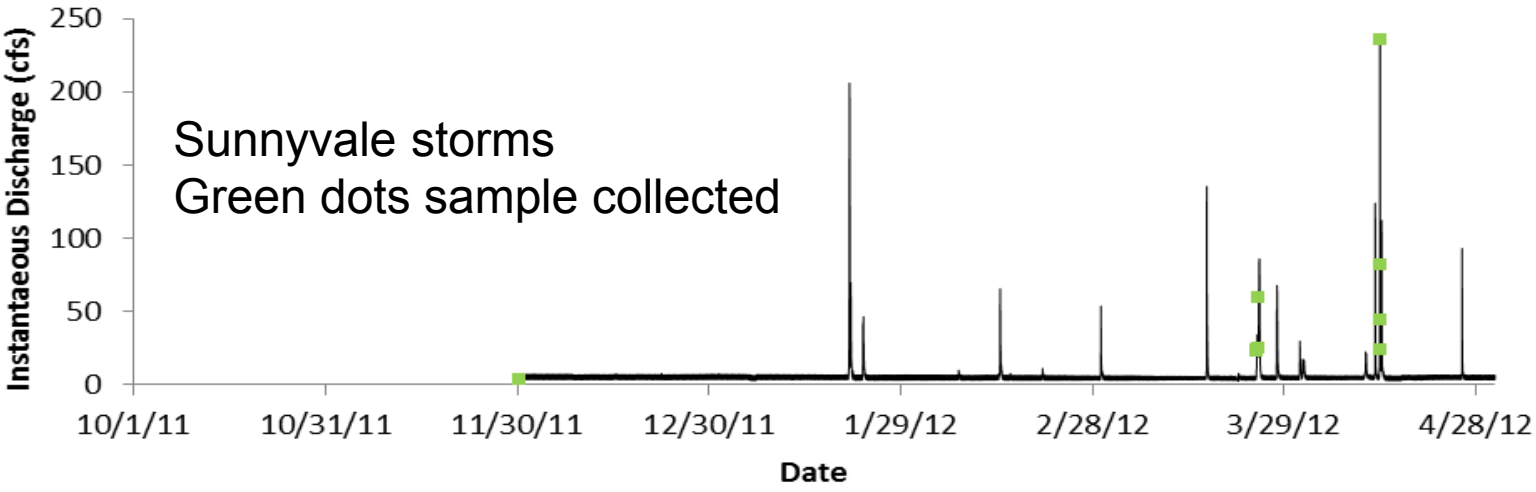
#6 MODERATE TOXICITY FOLLOW UP

- **$119K (winter/summer) - $80K (summer)**
- **Workgroup: EEWG approved**
- **TRC: Fund summer only, use $50K from State Board**
- **Objective:**
  - Understanding causes of amphipod toxicity through evaluation of:
    - Particle size
    - Particle shape
    - Seasonality effects on health of amphipod



#7 STORMWATER LOADS MONITORING

- **$352,000**
- **Workgroup: SPLWG approved**
- **Objective:**
  - Monitor 6 watersheds in 2014 – Sunnyvale (RMP), Guadalupe, Lower Marsh Creek, San Leandro, Pulgas, and Richmond (RMP)



#8 UPDATE SS MODEL – YEAR 5

$30,000

SPLWG/STLS approved

Objective: to continue to develop and refine mass emissions of Hg and PCBs using single watersheds for calibration and verification

- Inexpensive tool for estimating regional loads
- Building upon prior tool development
  - Yr 1 – Hydrology
  - Yr 2 – Additional watersheds and preliminary Hg/PCB version developed
  - Yr 3 – Cu test case for model
  - Yr 4 – Refine Hg and PCB model using GIS data and back calculations of land-use EMCs
- Year 5 – continue model refinement and update Hg and PCB (RWSM version 3)

#9 LAND USE/ SOURCE SPECIFIC EMC

$80,000

SPLWG/STLS approved

Objective: to generate even mean concentration data for the regional watershed spreadsheet model

- Update database on soils for Hg/PCBs
- Potentially conduct fieldwork

#10 MANAGEMENT SUPPORT FOR STLS

$25,000

SPLWG/STLS

Objective: Coordination and meetings regarding monitoring, EMC development and input on RWSM

#14 DIOXIN IN SPORT FISH

- **Budget: $24,000**
- **Workgroup: Dioxin**
- **Objective: Evaluation of dioxin in sport fish**

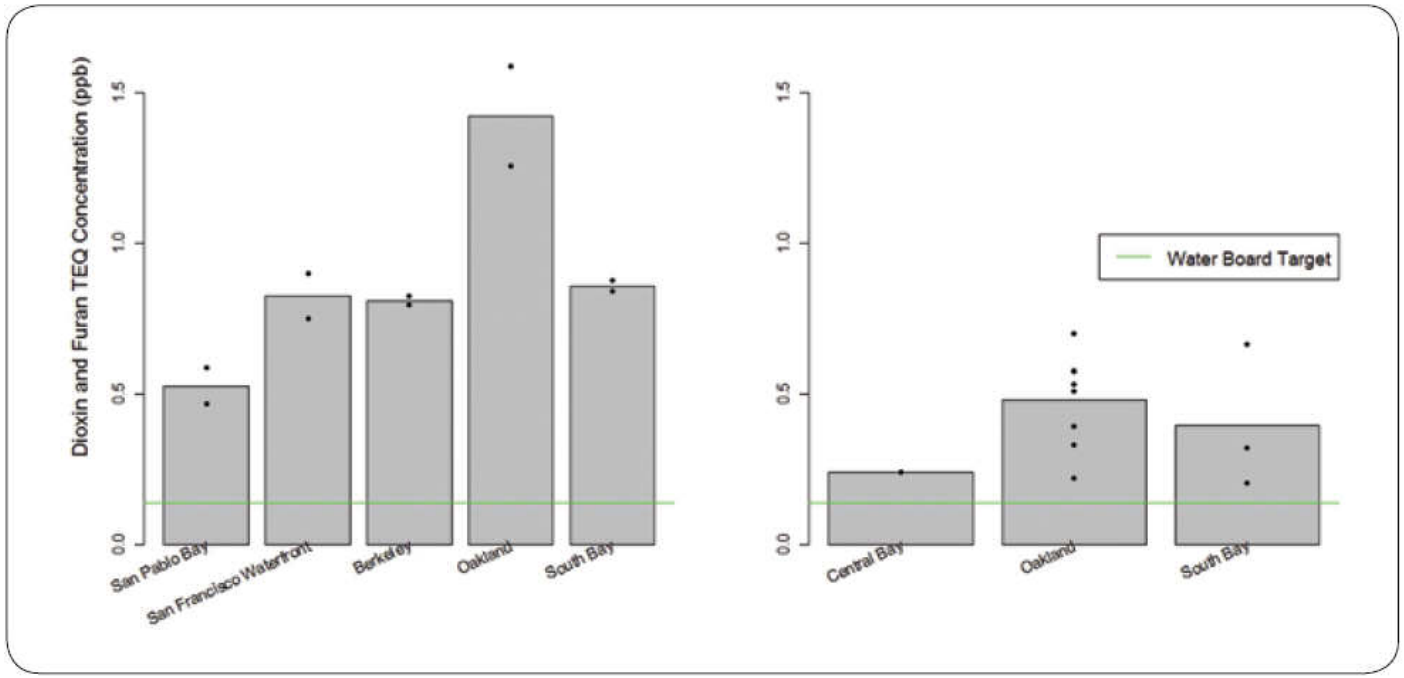
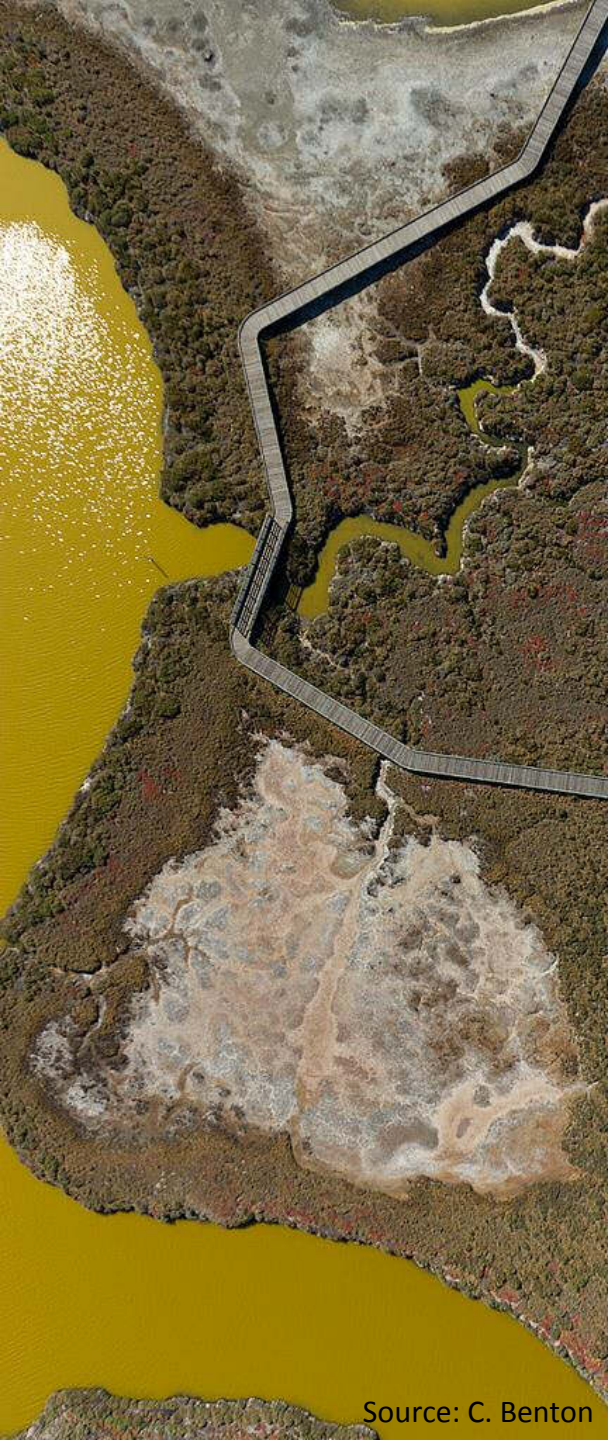


Figure 5-12. Dioxin TEQ concentrations (ppb) in shiner surfperch (left) and white croaker (right, without skin) in San Francisco Bay, 2009. Bars indicate average concentrations. Points represent composite samples.



Nutrient Funding Priorities: RMP CY2014 BACWA FY2014

David Senn, Emily Novick, Jing Wu
June 26, 2013

Overarching Questions:

1. Is San Francisco Bay nutrient-impaired?

2. How can impairment be mitigated or prevented?

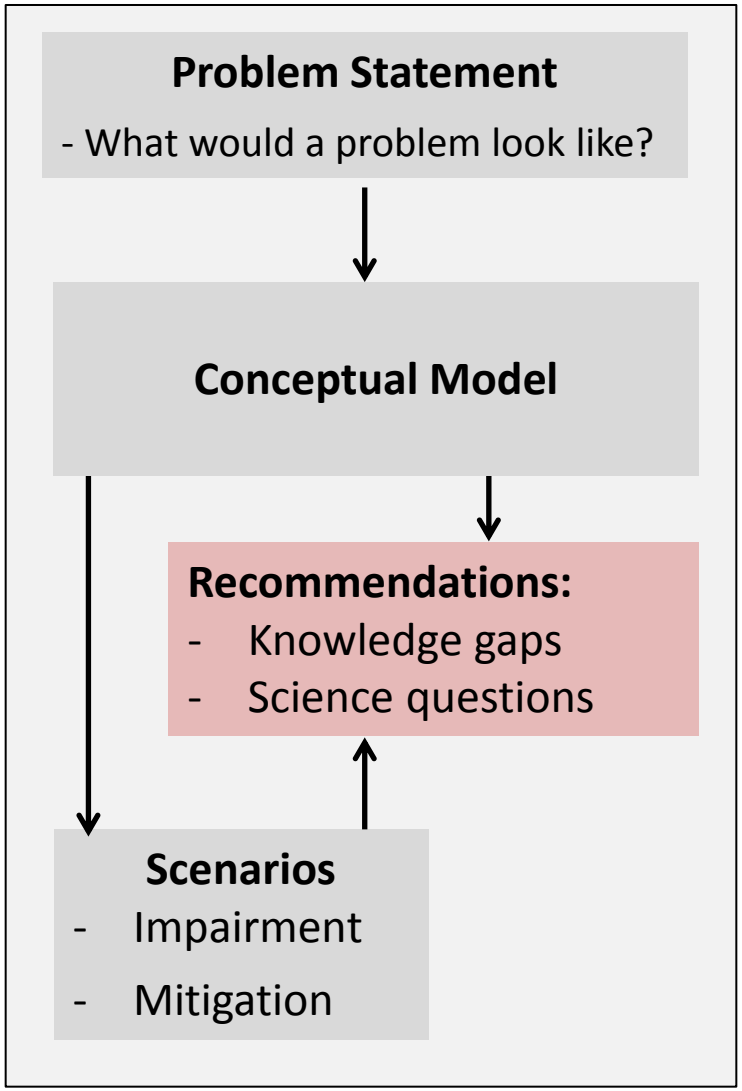
3. What are the highest priority science questions and investigations that will *best* inform 1 and 2?

   – *best* α accurate, incisive, time-sensitive, cost-effective

Recent and On-going Projects/Documents

	Funding
• NNE Literature Review (2011)	SWRCB
• Nutrient Strategy (2012)	SWRCB/BACWA
• External loads (2013)	RMP
• 'Conceptual model' (2013)	RMP
• 'Suisun Synthesis I' (2013)	BACWA
• Moored sensor pilot project: Dumbarton Bridge	RMP
• Nutrient transformations and loads: Delta (modeling)	IEP
• Assessment framework development (2013)	SWRCB

'Scientific Foundation for a San Francisco Bay Nutrient Strategy'



Technical Team

J Cloern	USGS
M Connor	EBDA
R Dugdale	SFSU-RTC
JT Hollibaugh	U-Georgia
L Lucas	USGS
W Kimmerer	RTC
R Kudela	UCSC
A Mueller-Solger	IEP
M Stacey	UCB
M Sutula	SCCWRP

Funding: Regional Monitoring Program

Highest Priority Issues and Goals

- Determine whether increasing biomass signals future impairment
- Quantify factors that adversely affect phytoplankton composition
  - Assess role of nutrients
- Determine if low DO in shallow habitats causes impairment
  - Quantify role of nutrients
- Test future scenarios that may lead to worsening conditions
- Quantify nutrient contributions to different areas of the Bay
- Test mitigation/prevention scenarios

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- Determine whether increasing biomass signals future impairment
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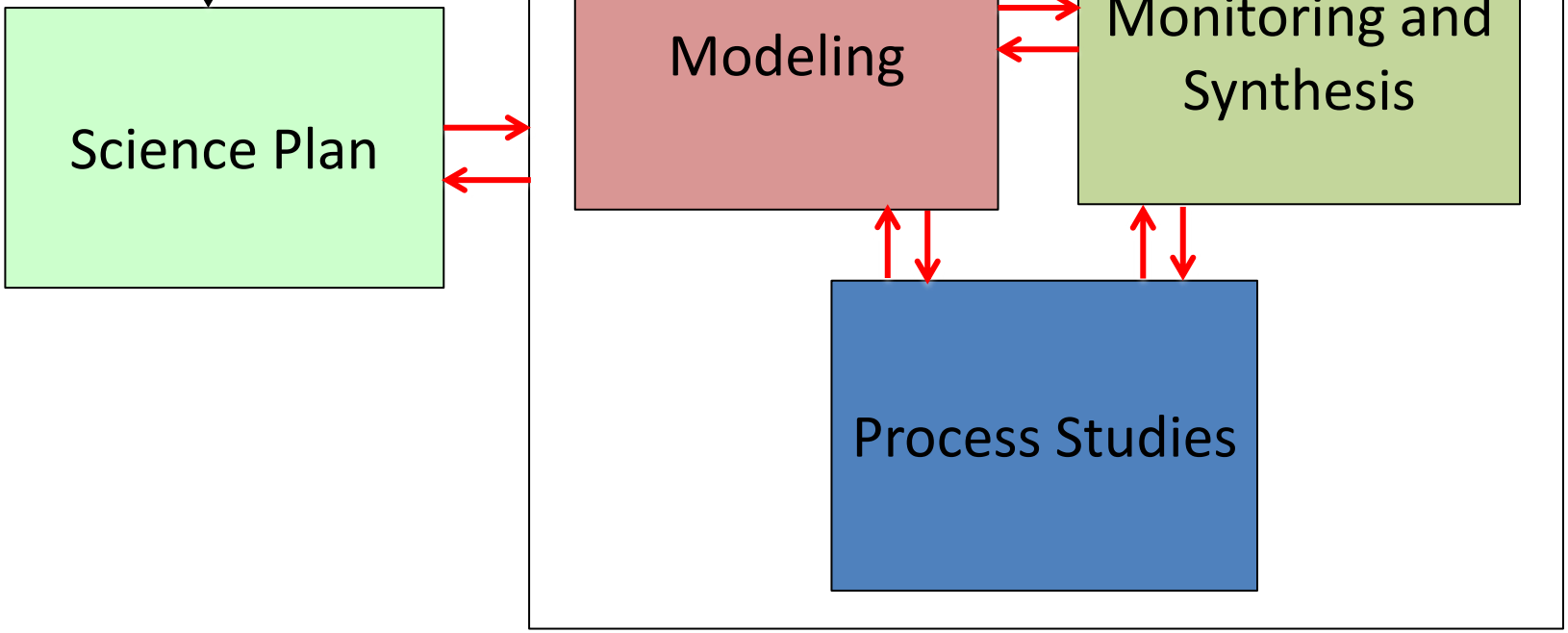


FY/CY 2014
Amounts in $1000s

		BACWA	RMP	IEP	USGS	SFWCA	SWRCB	**TOTAL**
Task 1 Science prioritization and special studies	*Task 1.1* Lower South Bay Synthesis	115						115
	Task 1.2 Suisun Synthesis II	85						85
	Task 1.3 Science Plan	30						30
	Task 1.4 Mechanistic special studies			330*		500*		830
Task 2 Monitoring program development	*Task 2.1* Ongoing Bay-wide monitoring		170	500*	700*			1370
	Task 2.2 Moored sensor pilot studies	150	215					365
	Task 2.3 Comm. comp. pilot study	120						120
	Task 2.4 Program Development	75	50				25	150
	Task 2.5 Stormwater monitoring		35					
Task 3 Assessment framework development	*Task 3.1* Assessment framework development						200	200
Task 4 Model development and modeling	*Task 4.1* Complete tactical plan		45					45
	Task 4.2 Refine hydrodynamic model		100					100
	Task 4.3 Develop phtyo/nutrient model		80					80
	Task 4.4 Refine and apply phyto/nutrient model		100					100
	Task 4.5 Refining stormwater estimates		50					50
	Task 4.6 Nutrient Modeling in the Delta			180				180
Task 5 Load estimation	No proposed work in FY2014							
Task 6 Control strategy identification and testing	No proposed work in FY2014							
Task 7 Program coordination and management	*Task 7.1* Science oversight and coordination	75	20					95
	Task 7.2 Technical review	25						25
	TOTAL	675	865[1]	1010	700	500	225	~3900

[1] Includes $175k in 2012/2013 funds applied to RMP modeling tasks

Proposed RMP Funding: CY2014

- Nutrients $320k
  - Task 1.1 Monitoring program development
  - Task 1.2 Moored sensor network expansion
  - Task 1.3 Continuation of stormwater monitoring
  - Task 1.4 Program Management

- Hydrodynamic and WQ Modeling $150k (+ $170k)
  - Task 2.1 Draft modeling white paper
  - Task 2.2 Model planning meeting
  - Task 2.3 Finalize approach, work plan
  - Task 2.4 Model development: hydrodynamics, water quality

- Stormwater load estimates $50k (+$30k)
  - Task 3.1 Analyze existing data and load estimates from other studies
  - Task 3.2 Improved load estimates and uncertainty analysis (hydrologica simulation model)

BACWA Funding: FY2014

- Synthesis and Science Plan $230k
  - Lower South Bay, Suisun, Science Plan
- Moored sensor program development $150k
- Improved phytoplankton composition $120k
- Nutrient monitoring program development $75k
- Science oversight and coordination $75k
- Coordinate technical review $25k

Proposed RMP Funding: CY2014

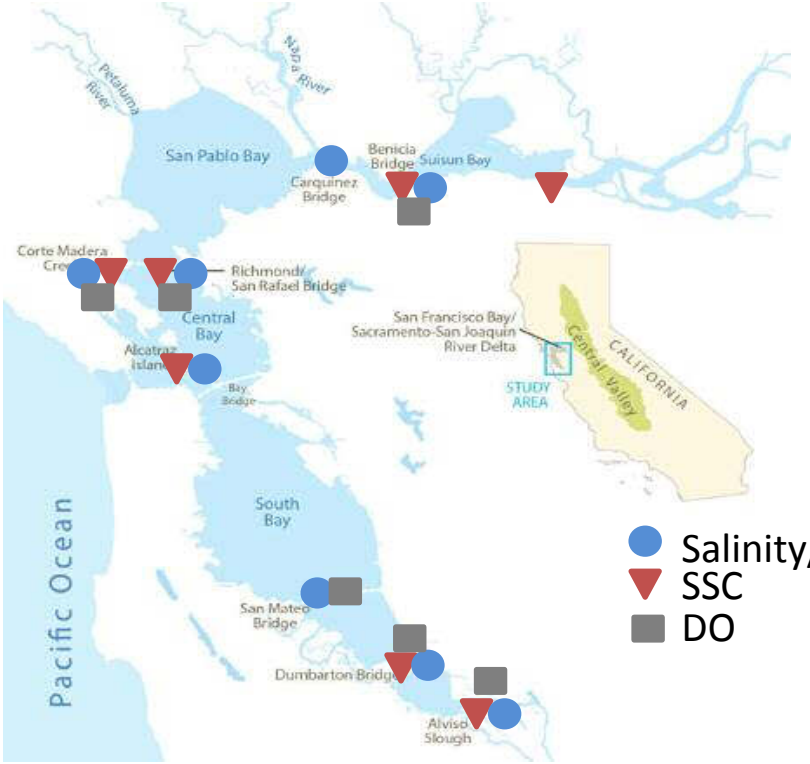
- Nutrients $320k
  - Task 1.1 Monitoring program development *50k*
  - Task 1.2 Moored sensor network expansion *215k*
  - Task 1.3 Continuation of stormwater monitoring *35k*
  - Task 1.4 Program Management *20k*

- Hydrodynamic and WQ Modeling $150k (+ $170k)
  - Task 2.1 Draft modeling white paper *15k*
  - Task 2.2 Model planning meeting *15k*
  - Task 2.3 Finalize approach, work plan *15k*
  - Task 2.4 Model development: hydrodyn., WQ *280k*

- Stormwater load estimates $50k (+$30k)
  - Task 3.1 Existing data, other load estimates *10k*
  - Task 3.2 Improved load estimates and uncertainty analysis (hydrologic simulation model) *70k*

Moored sensor program development

Existing: USGS-Sac



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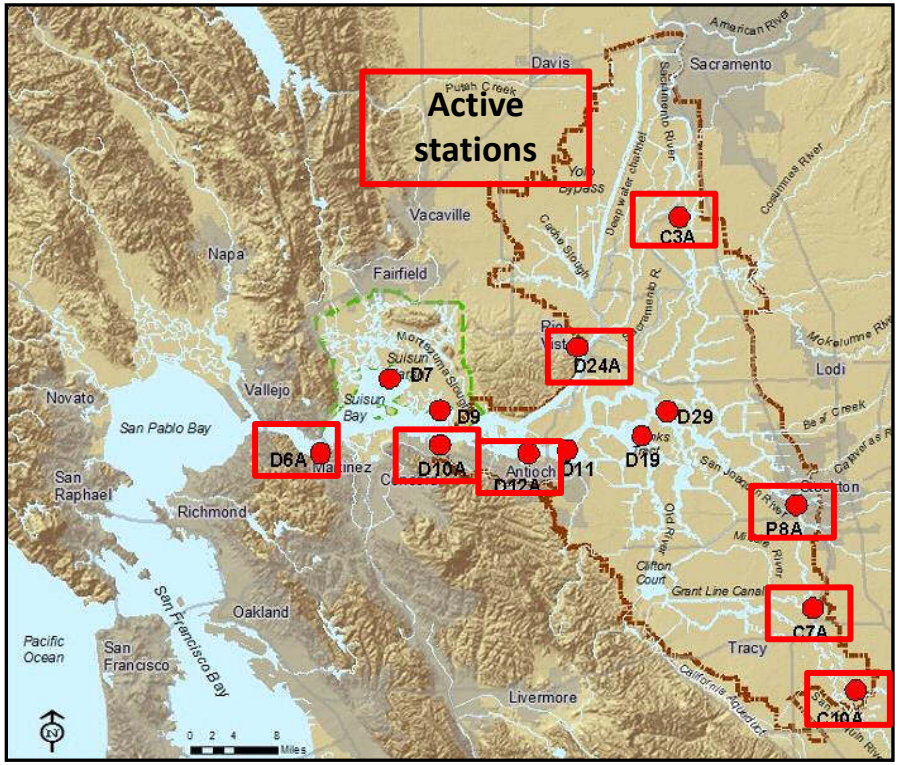
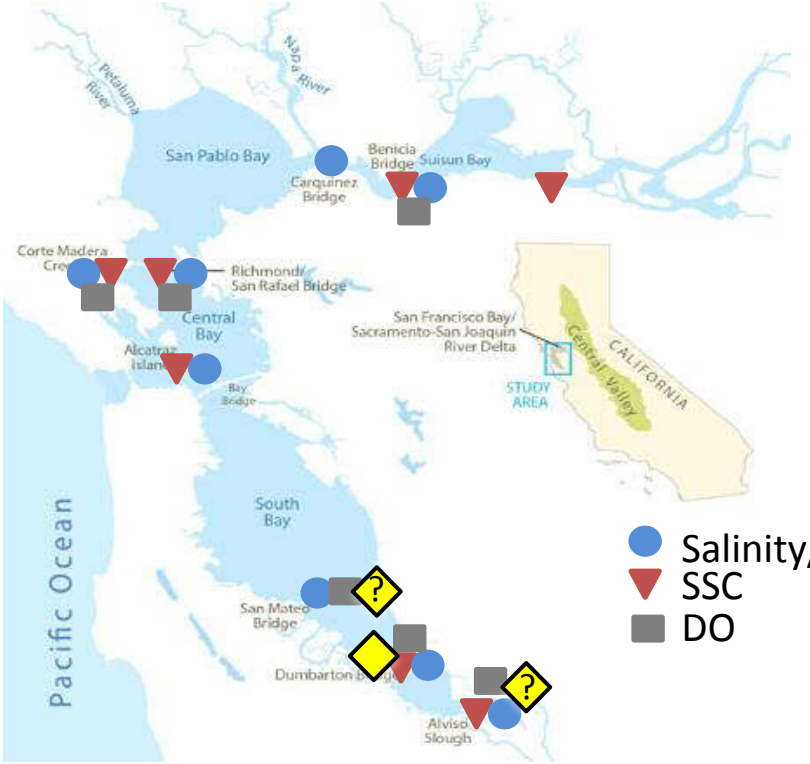


Moored sensor program development

Existing: USGS-Sac



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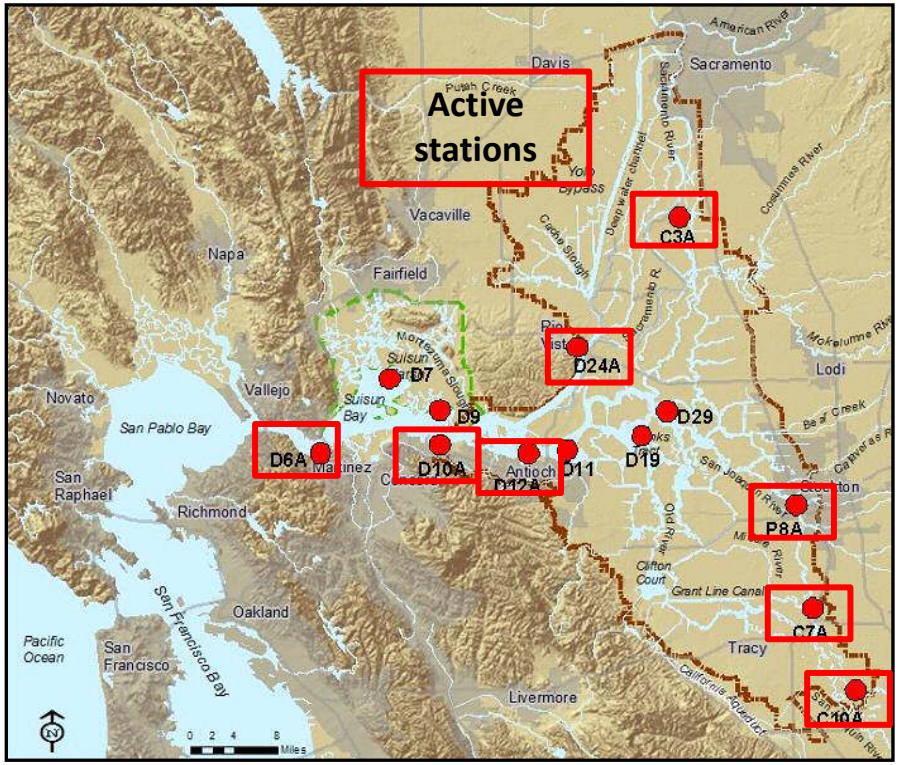
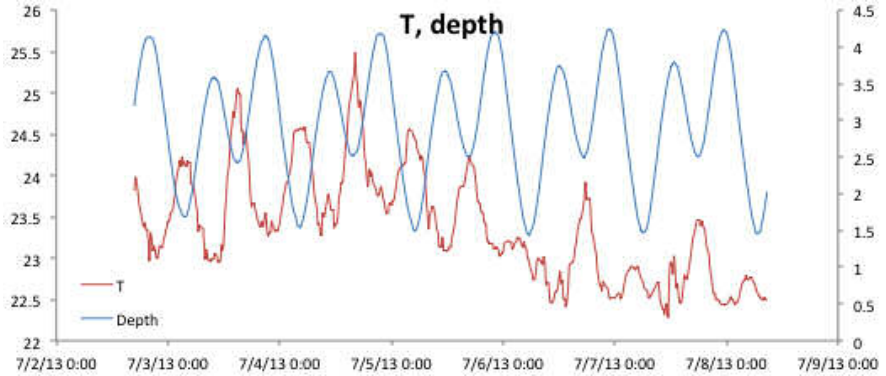


◆ RMP – chl, DO, turb, DO, DOM

RMP: Instrumentation for 2 additional stations, logistics, data management

BACWA: Personnel…design and implement experiments, data analysis, identify best new sites, web interface and visualization (potentially including DWR/IEP sites)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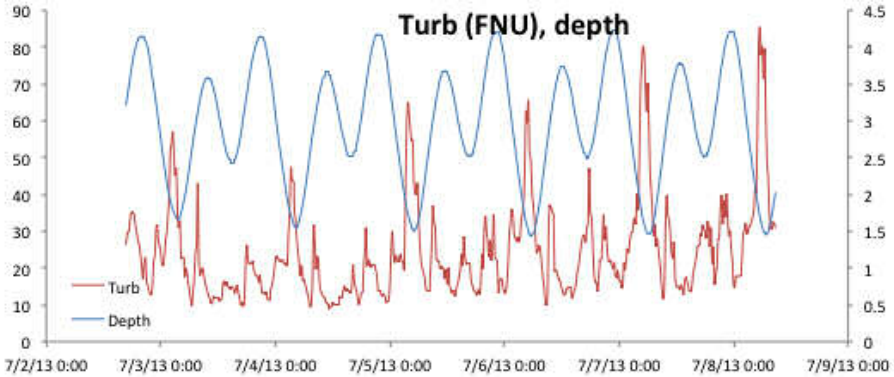
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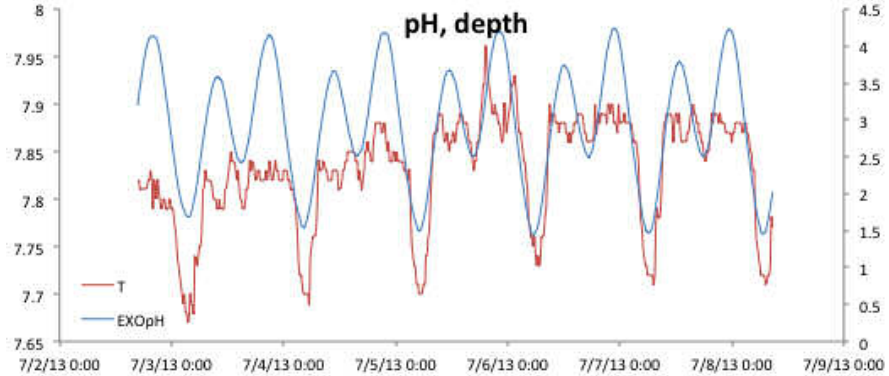
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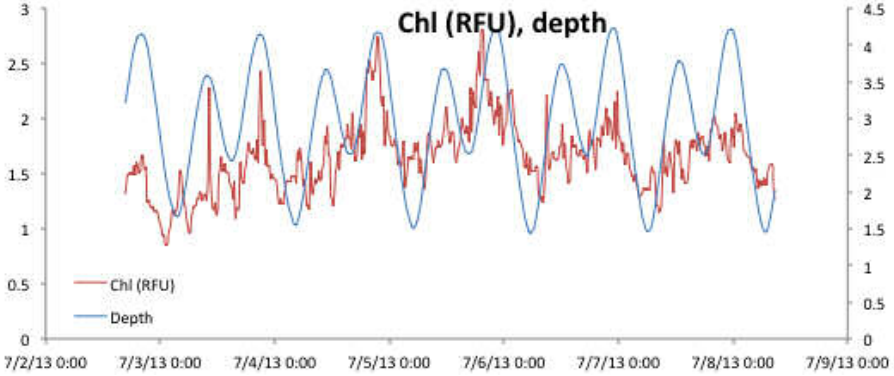
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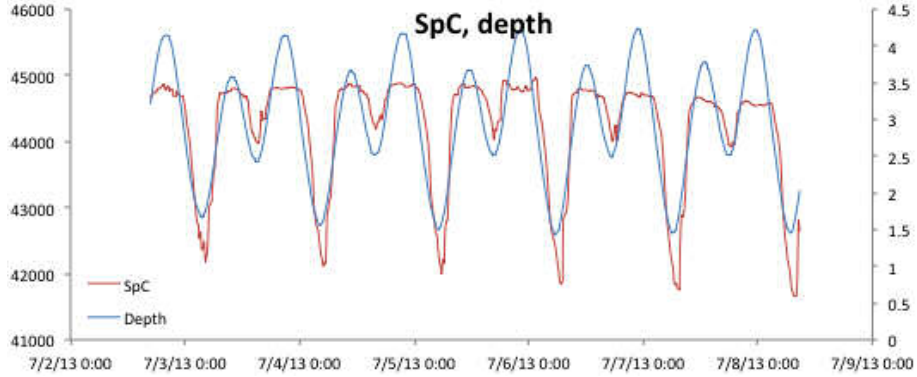
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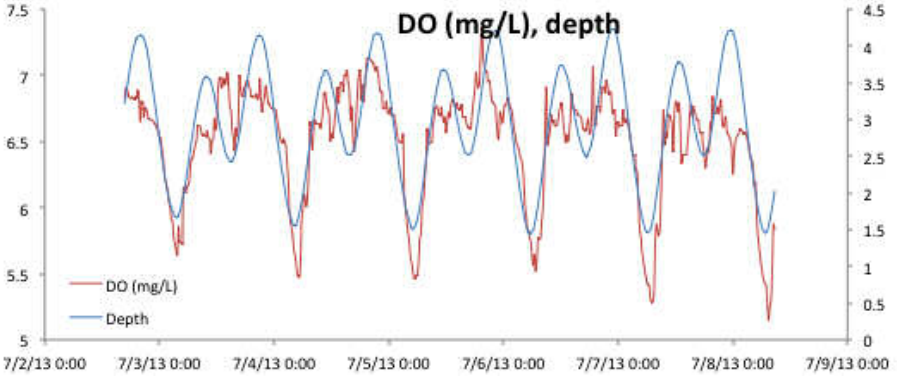
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Sources, Pathways, and Loadings

Lester McKee
Alicia Gilbreath, Jennifer Hunt, David Gluchowski, and Jing Wu
Sources, Pathways, and Loadings Workgroup
San Francisco Estuary Institute
Richmond, California

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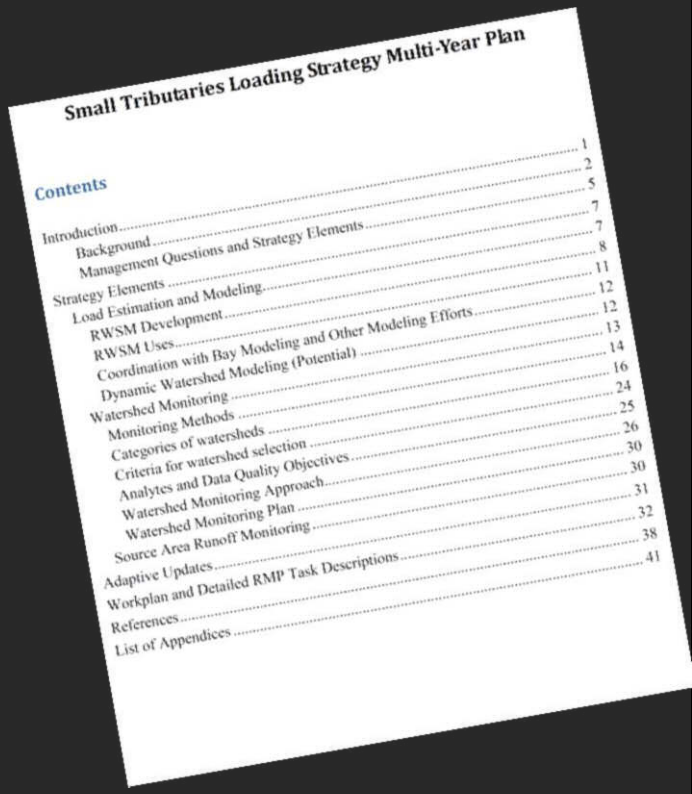
p: 510-746-7334 (SFEI), f: 510-746-7300, www.sfei.org

2013 Summary at a glance

- **Small Tributaries Loading Strategy - MYP**
  - **Regional Watershed Spreadsheet Model (RWSM)**
    - Calibration and verification data
    - Input data (Land use/source area specific "EMCs"
    - GIS layer development for Hg and PCB models
  - **Loadings studies at 6 sites**
  - **Technical reports being developed**
    - RWSM documentation (PCBs and Hg, sediment (BASMAA funds))
    - POC Loads Water Year 2013 (RMP and BASMAA funds)
    - QAQC for continuous data (BASMAA funds)



Small Tributaries Loading Strategy Multi-Year Plan

Contents

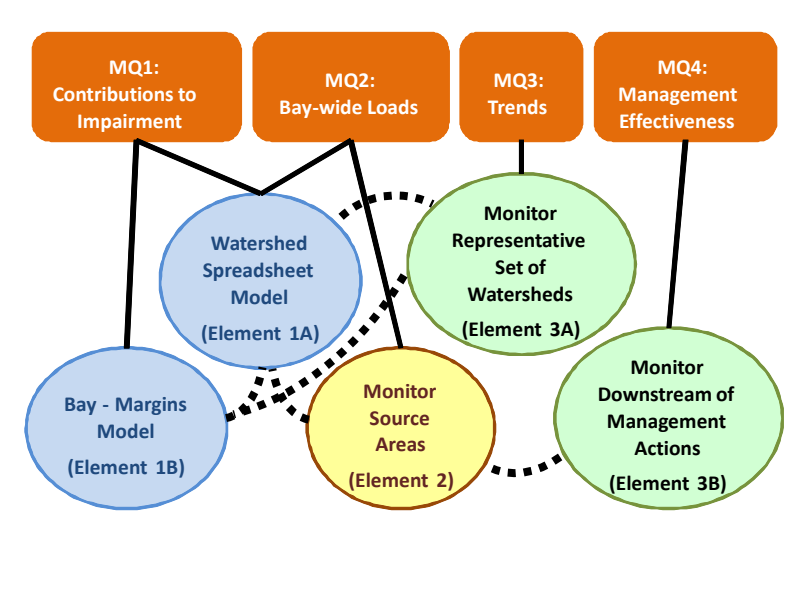
2013 Summary at a Glance (cont.)

- **Linkages**
  - Dioxins strategy – field data (San Leandro Creek, Sunnyvale East Channel)
  - Emerging contaminants strategy – field data (Pyrethriods, Carbaryl and Fipronil)
  - Nutrient strategy – field data (NO2, TKN, NH4, all POC loads stations)

- **Other SFEI projects (enhanced by and enhancing the RMP)**
  - LID strategy and projects (El Cerrito, Fremont; San Pablo Spine; SFPUC LID support) (Analyte list includes PCBs, Hg, others; similar QAQC protocols)
  - Various geomorphology projects (support for regional sediment loads)

Small Tributaries Loading Strategy

- STLS Multi-year plan (MYP) Version "2013" completed
  - Significant effort led by BASMAA
  - Appendices
    - RWSM construction & calibration
    - Optimizing sampling methods for loads/ trends
    - Exploratory watersheds characterization
    - WY 2011 Watershed Characterization Field Study
    - Sampling and analysis QAQC



Submitted to the Water Board in March 2013

Regional Watershed “Spreadsheet” Model (RWSM)

Regional Watershed "Spreadsheet" Model (RWSM)

- **Objective**
  - **Improve regional average annual estimates of suspended sediment and pollutant loads**
    - Support prioritization and management of "high leverage" watersheds in relation to sensitive areas of the Bay margin
    - Provide input into mass balance modeling and food web models of the Bay

- **Progress**
  - **2010 - base hydrology model / initial contaminant models - Y1 report**
  - **2011 - improved hydrology model / model documentation - Y2 report**
  - **2012 - improved user interface, Cu text model, GIS source layers (RMP+BASMAA funds), new "living" report template**
  - **2013**
    - Robust sediment delivery estimate/sediment budget (BASMAA funds)
    - PCB and Hg model runs with an auto-calibration procedure built in

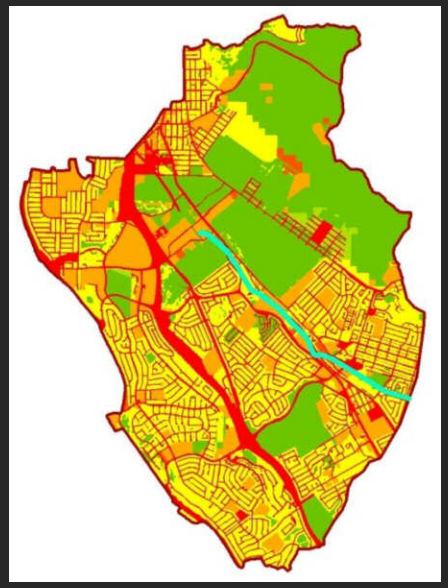
RWSM basic model structure

Objectives

For each watershed, generate average annual:

- Discharge volume
- Sediment load
- POC loads

Runoff volume*	x	Concentration	=	Load



*or sediment load

RWSM data needs

Spatial Data Layers

- ✓ Land use (alternatively, imperviousness)
- ✓ Soils
- ✓ Slope
- ✓ Rainfall
- ✓ Watershed boundaries
- ✓ Source areas (2012 RMP and BASMAA funds)

Numerical Parameters

- ✓ Runoff coefficients
- ✓ Land use/ source area specific “EMCs”

Data

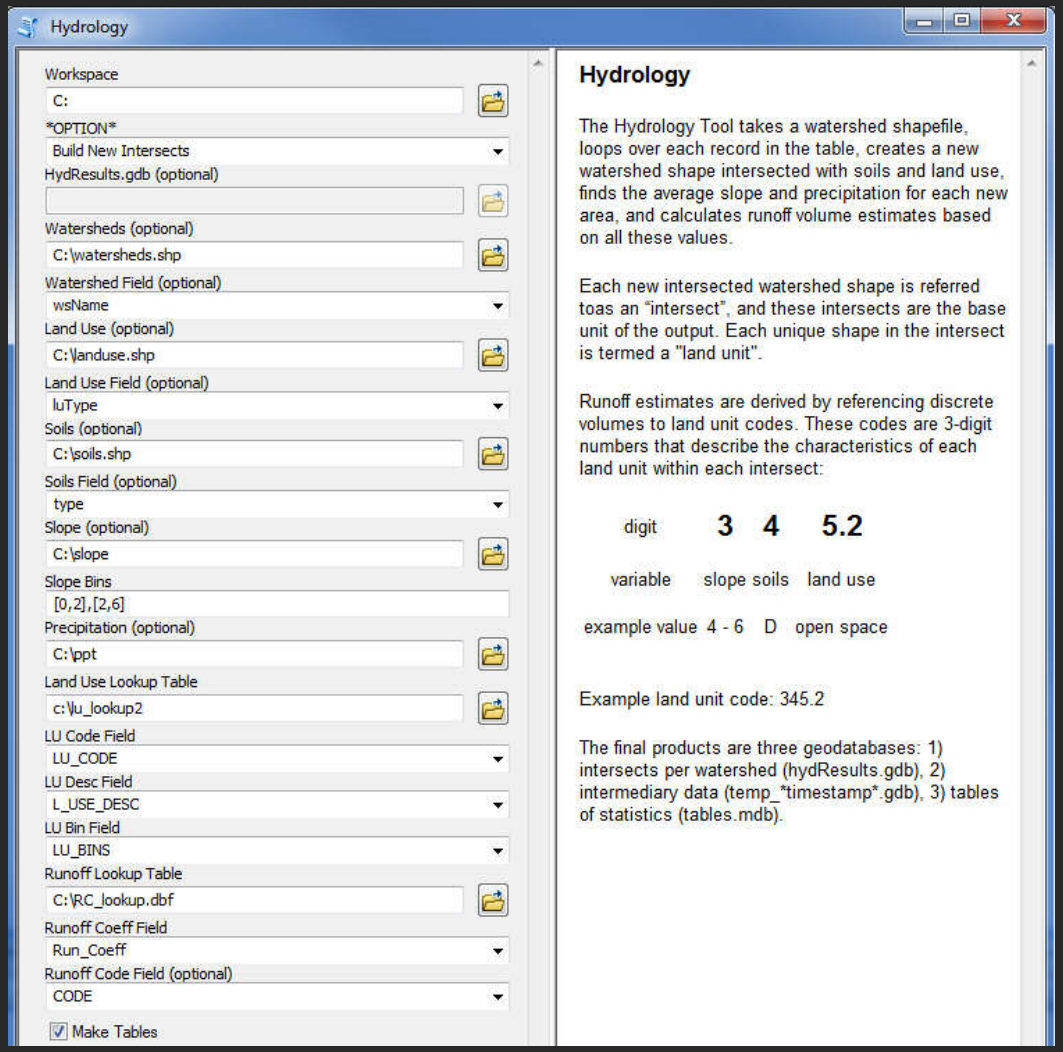
- ✓ Empirical calibration and verification data

RWSM "General" Plan

- Hydrology
- Sediment
- Cu (Test Case)
- Hg
- PCBs
- Selenium
- OC Pest
- PBDEs

1) Develop fact sheet/methodology
2) Develop GIS layers
3) Collate input data and calibration data
4) Run Version 1 of the model
5) Improve model structure or input data
6) Run Version 2 of the model
7) Complete FINAL input dataset
8) Run Version 3 (FINAL) of the model
9) Complete model packaging and user manual

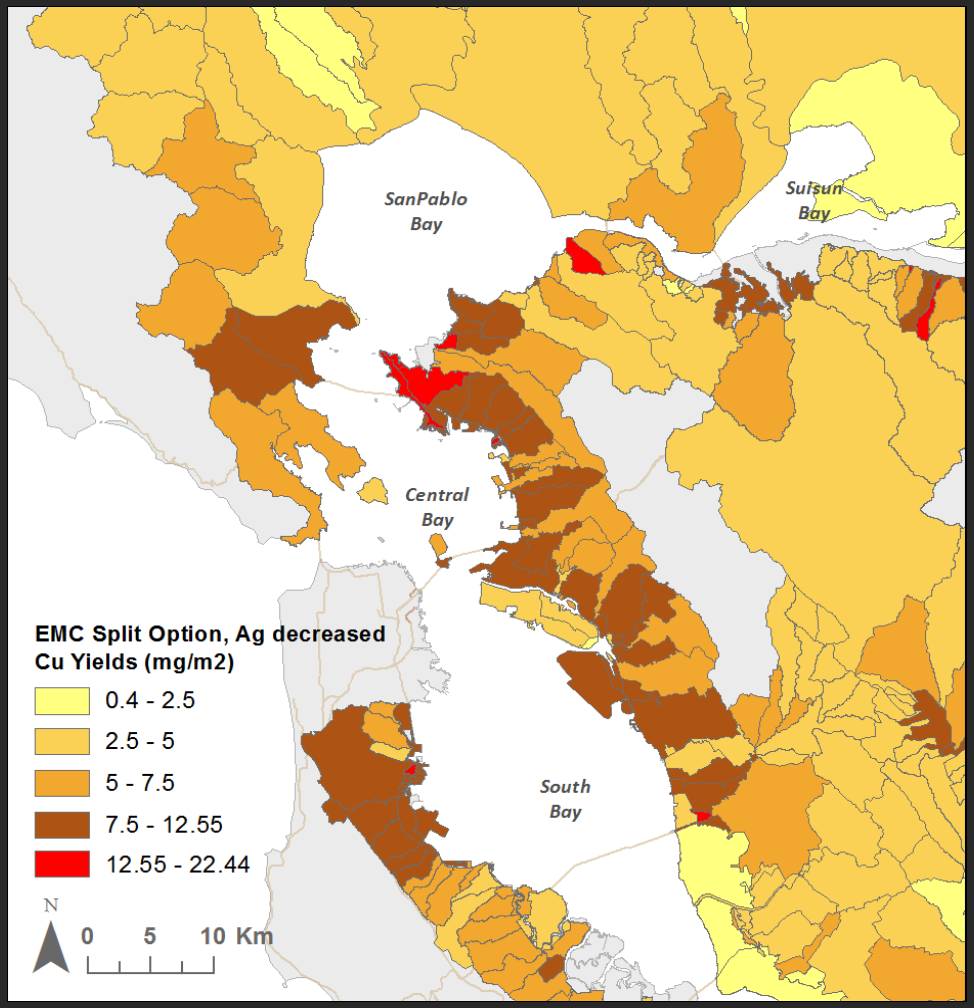
RWSM input interface



- ArcGIS standard tool interface
- Advanced GUI behavior
- All parameters have help text

RWSM Copper test case model

- Example of output
- Examples
  - Estimated 20 highest load watersheds
  - Total estimated load to each RMP segment margin
  - Total load to San Leandro Bay



RWSM 2013 reporting

- ✓ Reporting template developed and approved through STLS
- ✓ Many sections drafted
  - ✓ Background
  - ✓ Workplan
  - ✓ Pollutant specific models structures
  - ✓ GIS info development
  - ✓ EMC data development
    - ✓ Mathematical methods
  - ✓ Copper model test case
  - ✓ Sediment methods
  - ✓ PBDE profile (BASMAA funds)
- Other sections in progress
  - Sediment model and document
  - PCB and Hg models and document
  - OC pest profile (BASMAA funds)

Table of contents

Pollutants of Concern Loads Monitoring Field Studies

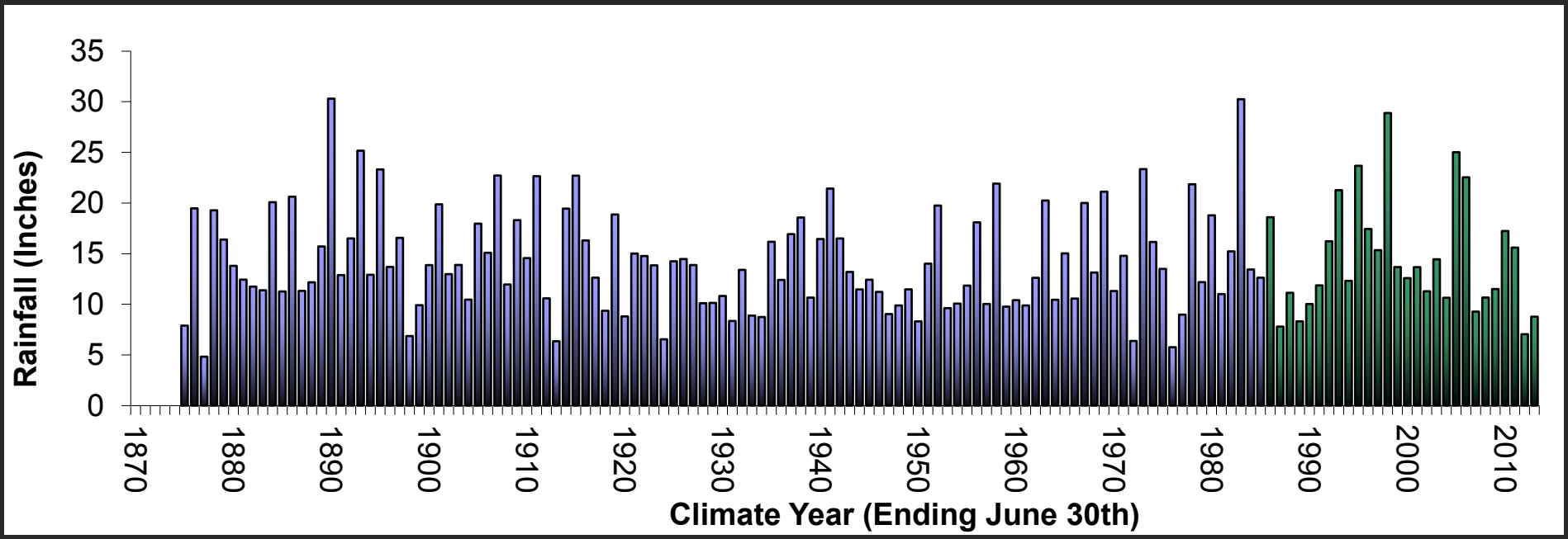
Water Year 2013 POC loads monitoring

- CA - Below average rainfall
- San Jose:
  - CY 2012 7th driest
  - CY 2013 14th driest
- San Francisco
  - CY 2012 69% normal
  - CY 2013 8th driest

- Sampling plan
- WY 2012 – 69% completed
- WY 2013 – 42% completed
- WY 2014 – complete balance

http://ggweather.com/ca2012rain.htm

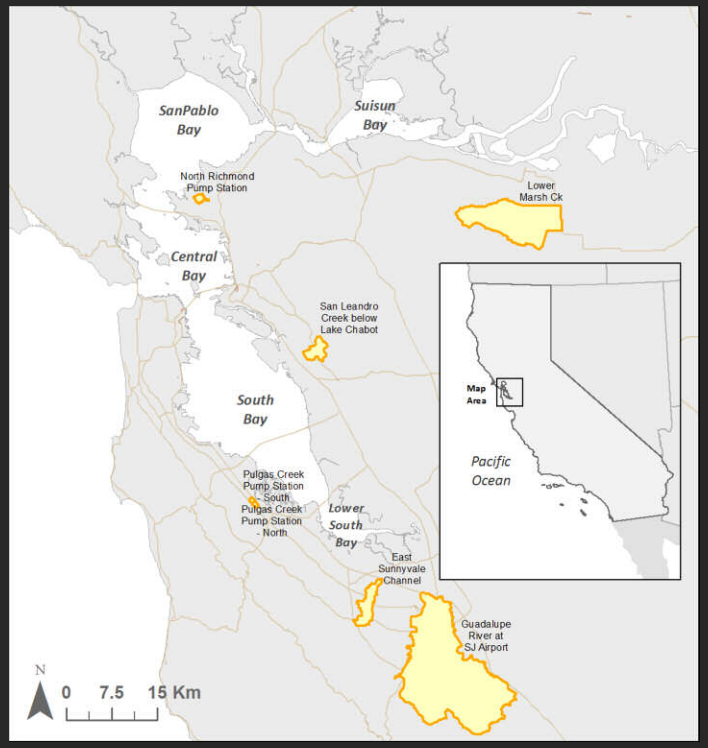
Recent dry year period in perspective



- A period as dry as the last
  - 3 years has not been experienced since 2009 and before that 1991
  - 5 years has not been experienced since 1992
  - 7 years has not been experienced since 1991 and before that 1951
  - 10 years has not been experienced since 1994

WY 2013 loads studies ($343,000)

- 6 watersheds (2 with RMP funds)
- Average of 4 storms per year per watershed
- A 1st flush; a large storm, and 2 others
- Standardized consistent Hybrid POC sampling approach
  - 6712 ISCO - composite and discrete sample collection
  - D95 - total mercury and total methylmercury
  - DH84 - total methylmercury wading stage
- Continuous turbidity and stage measurements
- Manual discharge measurements



Analytes and collection method

Sample Method	Discrete or Composite	Analysis	Sample Number
Manual ISCO	Discrete	PCBs (40)	18
Manual ISCO	Discrete	PAH	4
Manual ISCO	Discrete	PBDE	4
Manual ISCO	Discrete	SSC (GMA)	17
Manual ISCO	Discrete	TOC	18
Manual ISCO	Discrete	Total Phosphorous	18
Manual ISCO	Discrete	Dissolved phosphorus and Nitrate as N	18
Manual ISCO	Discrete	SSC (GMA)	17
Automated ISCO	Composite	Toxicity – water column	4
Automated ISCO	Composite	Pyrethoids**	6
Automated ISCO	Composite	Carbaryl	6
Automated ISCO	Composite	Fipronil	6
Automated ISCO	Composite	Total Cu and Total Se and Hardness	6
Automated ISCO	Composite	Dissolved Cu and Dissolved Se	6
Automated ISCO	Composite	SSC	6
Manual Grab	Discrete	Total methylmercury	10
Manual Grab	Discrete	Total Mercury	18
Manual Grab	Discrete	SSC	19

- Note – Guadalupe will remain manual
  - Turbidity surrogate / USGS flow
  - D95 / composites completed by staff also (with great effort)

WY 2012 PCB and mercury results

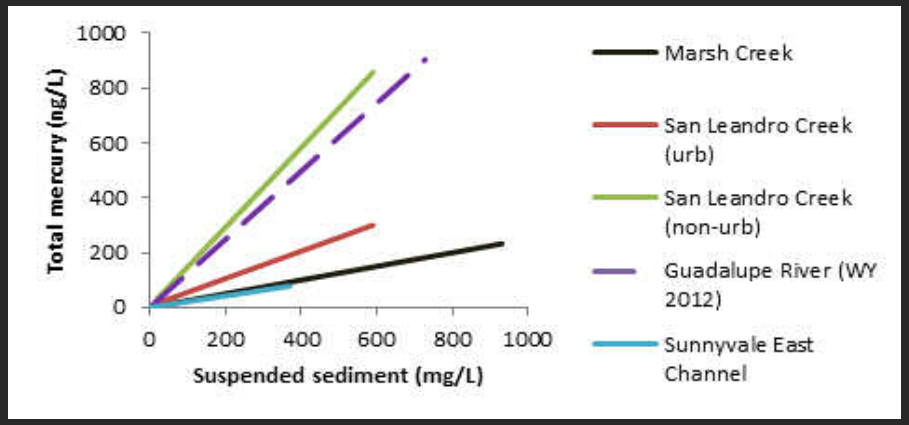
PCBs

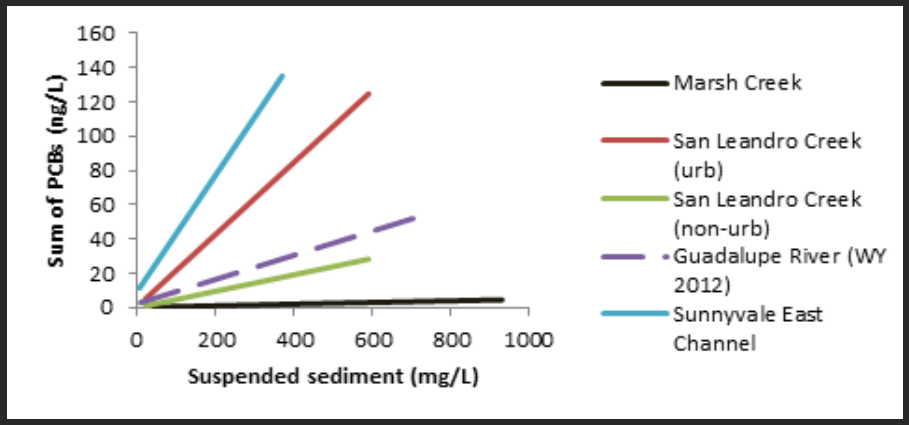
- PCBs in line with reconnaissance findings – higher concentrations in more industrial, more impervious watersheds
- Discrete grab sampling design providing information to answer management questions
- Good relationships between SSC and PCB concentrations

Mercury

- Similar to PCB data – good Hg:SSC relationships
- San Leandro Creek showing high mercury
- Reduced runoff from upper watershed (mining influence) at Lower Marsh Creek and Guadalupe River

WY 2012 PCB and mercury results

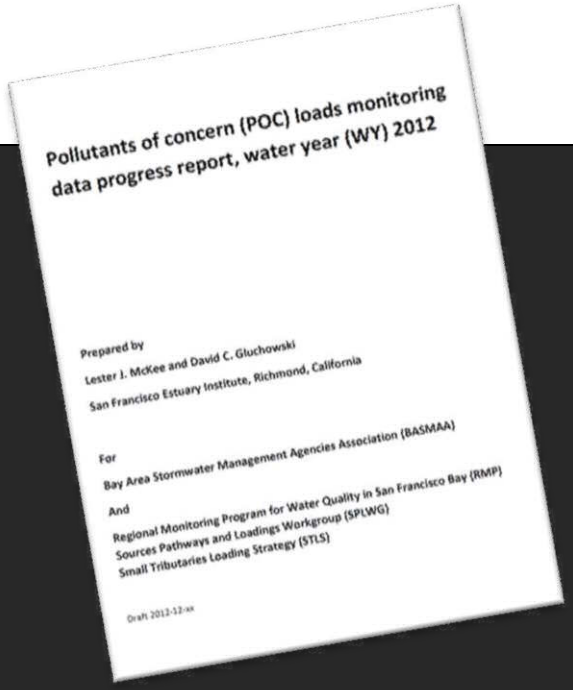




	Unit runoff (m)	SS (t/km^2)	TOC (mg/m^2)	PCBs (µg/m^2)	HgT (µg/m^2)	MeHgT (µg/m^2)	NO3 (mg/m^2)	PO4 (mg/m^2)	Total P (mg/m^2)
Marsh Creek	0.014	2.2	116	0.56	0.011	0.017	-	-	6.8
San Leandro Creek	0.46	11	-	1.7	15	0.20	155	33	116
Guadalupe River	0.11	6.4	553	0.74	7.8	0.057	112	8.2	34
Sunnyvale East Channel	0.14	3.1	888	2.3	1.7	0.020	43	12	30

WY 2013 reporting

- Reporting template that has been developed and approved through the STLS and used in WY 2012
- Gaps left in the report for Richmond and Pulgas that came on line in WY 2013
- Report due September



Pollutants of concern (POC) loads monitoring data progress report, water year (WY) 2012

Prepared by

Lester J. McKee and David C. Gluchowski

San Francisco Estuary Institute, Richmond, California

For

Bay Area Stormwater Management Agencies Association (BASMAA)

And

Regional Monitoring Program for Water Quality in San Francisco Bay (RMP)
Sources Pathways and Loadings Workgroup (SPLWG)
Small Tributaries Loading Strategy (STLS)

Draft 2012-12-xx

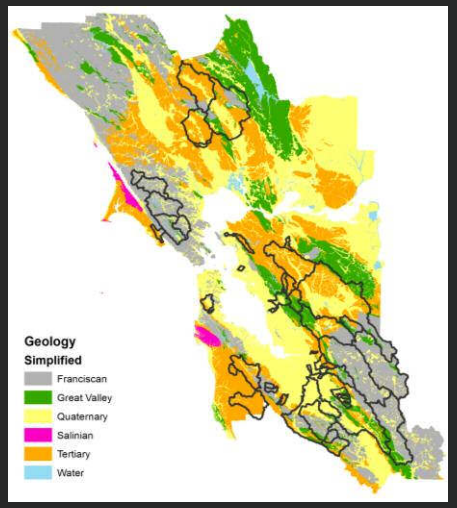
Table of Contents

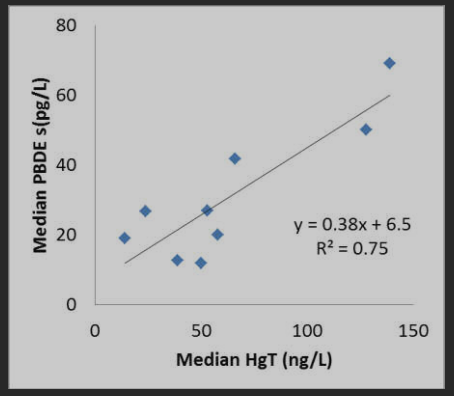
Event Mean Concentration (EMC) development

2013 EMC development

EMC development: $80k + BASMAA funds

- Planned products/ report sections:
  - "Local" coefficients for regional sediment loads (2013 BASMAA funds)
  - PCB and Hg EMC data development including GIS methods, inverse optimization methods, and other desktop calculation methods
  - PBDE/OC Pest contaminant "fact sheets" July 2013 (2
  - Planning for WY 2014 wet season (<u>July - September):</u>
    - POC loads monitoring (RMP 2014 funds)
    - EMC field monitoring? (RMP 2013/2014 funds)





Small Tributary Loading Strategy (STLS) management support

2013 STLS management support ($25K)

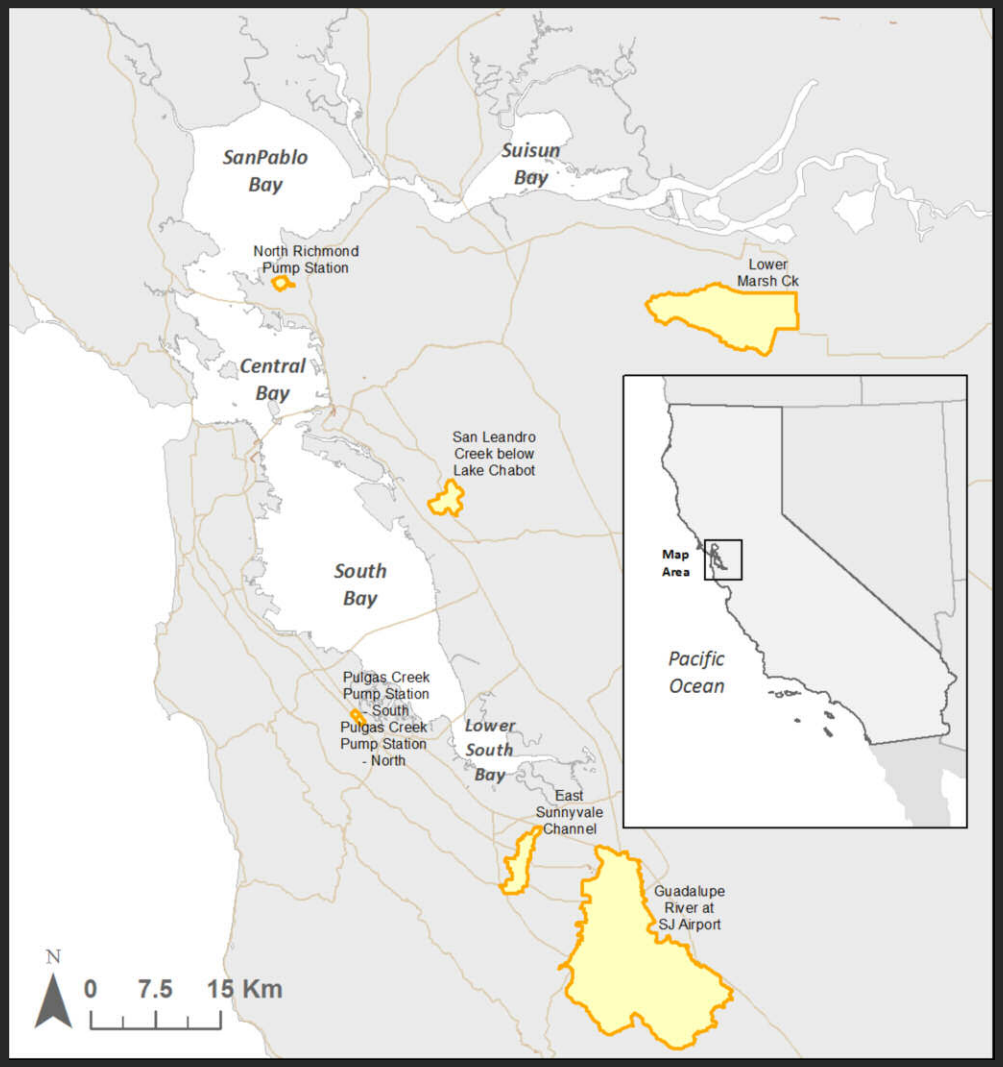
- **Small Tributaries Loading Strategy (STLS) team**
  - **Plans and coordinates loading related projects**
    - Water Board staff
    - BASMAA staff
    - RMP staff
    - BASMAA consultants (ADH, Balance Hydrologics, KLI)

- **Communications and collaboration**
  - **Monthly phone conferences**
    - Heads up discussion of progress and product development
    - "Real-time input" rather than review at the end
  - **Quarterly face-to-face meetings:**
    - Discuss progress and get input
    - Collaborate and coordinate on bigger issues and decisions

2014 proposed studies

Proposed WY 2014 loads studies ($352,000)

- 6 watersheds (2 with RMP funds)
  - Marsh Creek near Brentwood
    - 6 storms
  - San Leandro Creek
    - 5 storms
  - Guadalupe River
    - 6 storms
  - Sunnyvale East Channel
    - 8 storms
  - North Richmond Pump Stn.
    - 5 storms
  - Pulgas Creek Pump Stn.
    - 7 storms
- WY2015?



2014 Other budgeted ongoing items

- Land use/ source area EMC development
  - Requested $80k
- RWSM development and calibration / use
  - Requested $30k
- STLS management support
  - Requested $25k

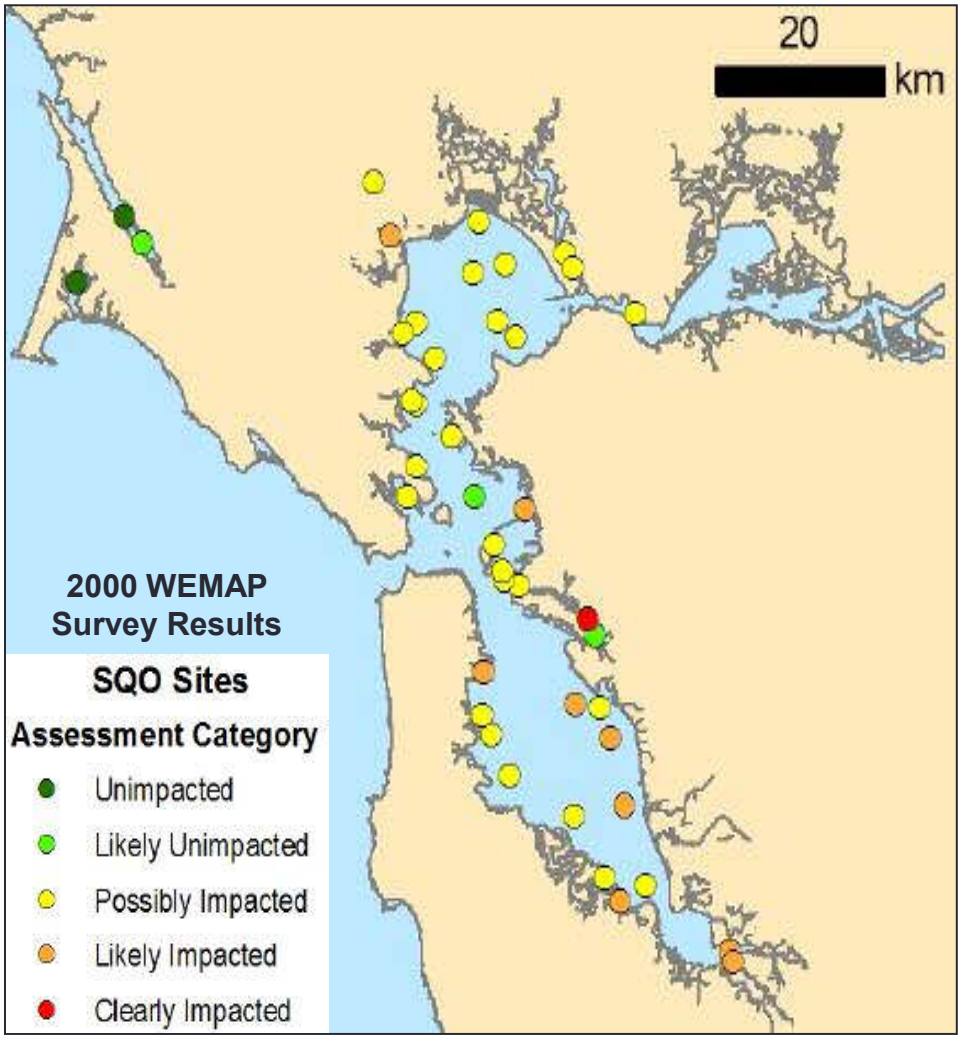
APPLYING SQO ASSESSMENT TO SF BAY SAMPLES (2008-2012)

Study Rationale

- To evaluate spatial and temporal trends in sediment quality in the Bay
  - Multiple lines of evidence increases the accuracy of predicting sediment quality
- SQO is part of Water Quality Control Plan for Enclosed Bays and Estuaries (2009)

SQOs in SF Bay

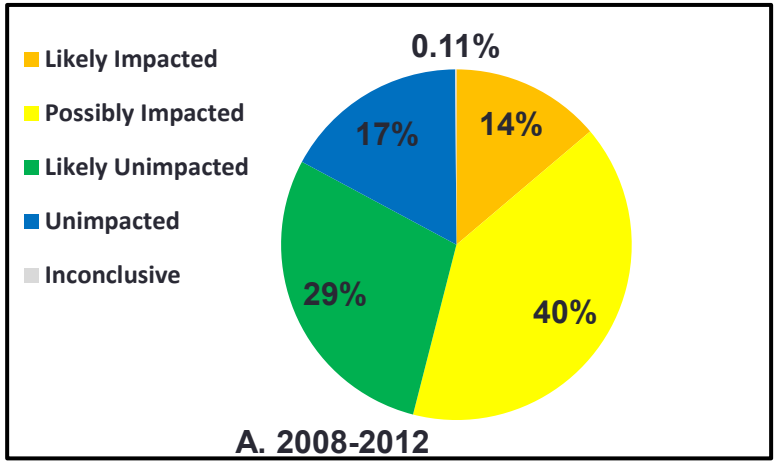
- Two previous SQO assessments
  - Historic, spine of the Bay RMP sites
  - 2000 WEMAP survey
- RMP S&T SQO assessments started in 2008



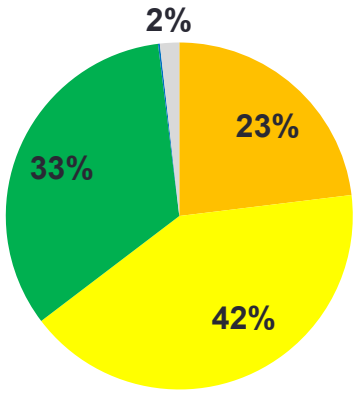
RMP SQO Assessment

- Collected 125 sediment samples 2008-2012 (wet and dry years)
- Analyzed for:
  - Organics (EBMUD)
  - Metals (CCSF)
  - Toxicity (UC Davis-Granite Canyon)
  - Benthos (CCSF-Oceanside Biology Lab/ MLML)
- Data reviewed by SFEI
- SQO assessments calculated by SCCWRP

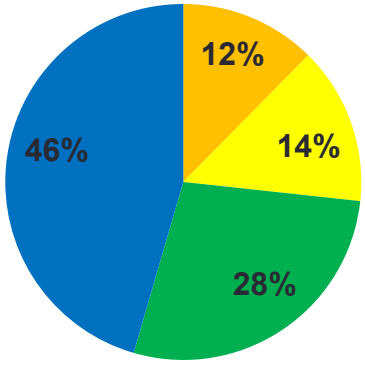
Results



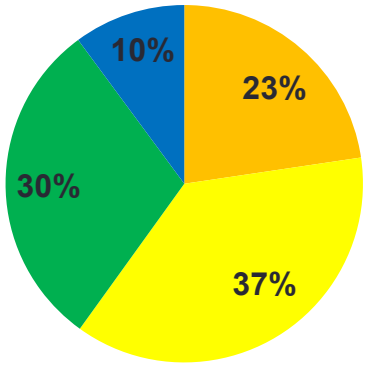
A. 2008-2012



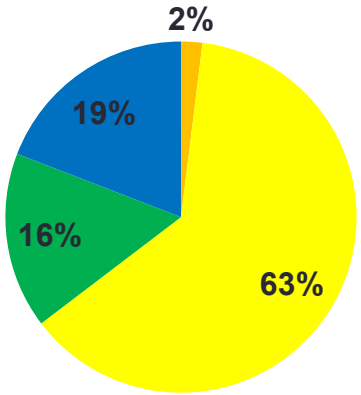
B. 2008 (dry)



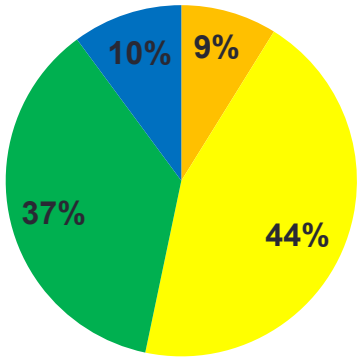
C. 2009 (dry)



D. 2010 (wet)



E. 2011 (dry)



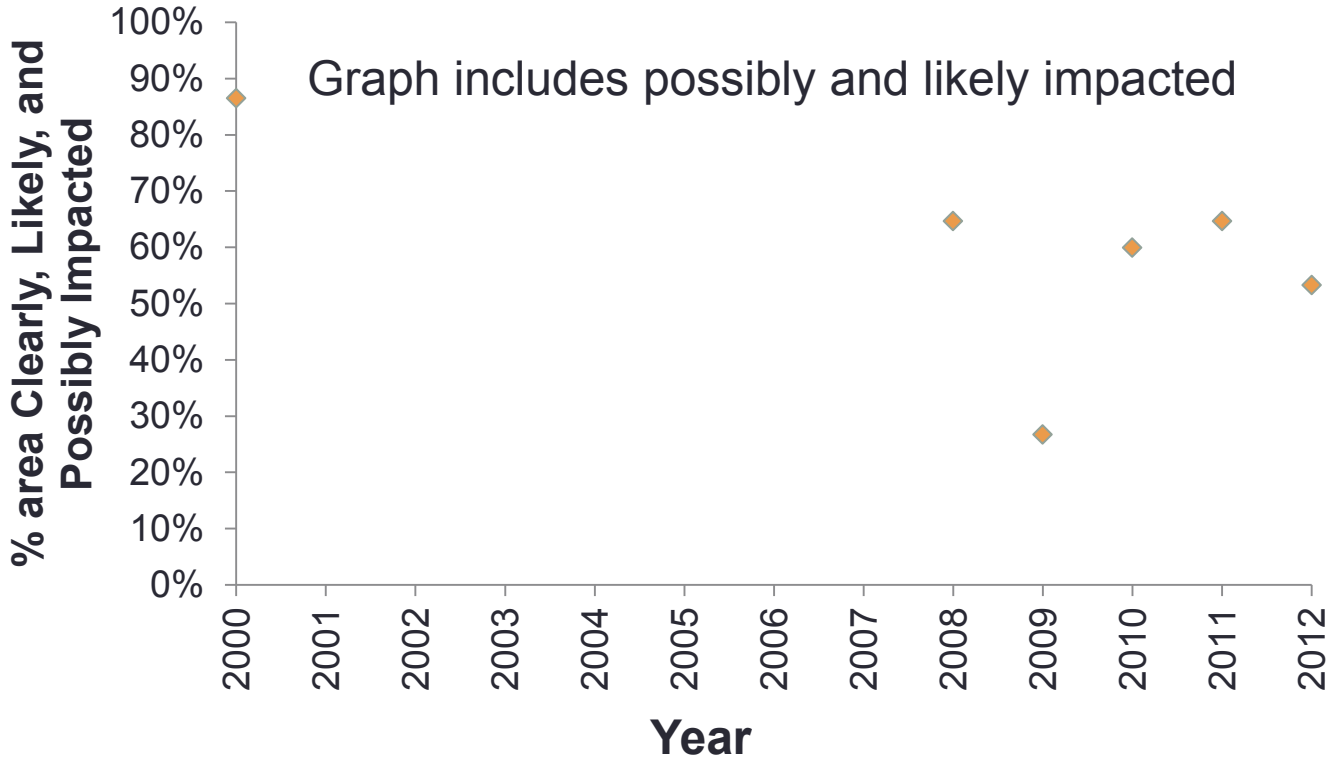
F. 2012 (wet)

Temporal Trends

Average Number of Likely Impacted Sites:

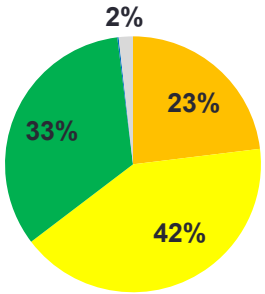
2008-2010: **19 %**

2011-2012: **6 %**

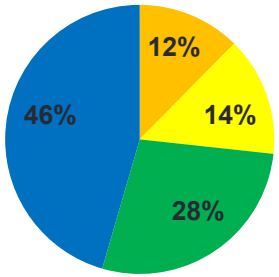


Understanding the individual LOEs

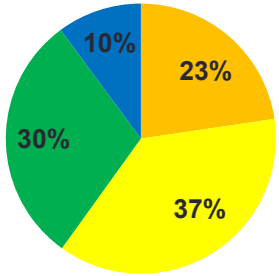
% Area Moderately or Highly Impacted					
Line of Evidence	**2008**	**2009**	**2010**	**2011**	**2012**
Chemical Exposure	0.2%	0%	0%	0%	0%
Toxicity	73%	29%	72%	74%	53%
Benthic Community Condition	44%	24%	39%	2%	32%



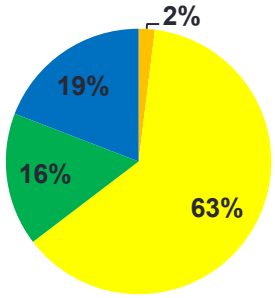
B. 2008 (dry)



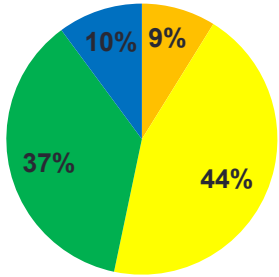
C. 2009 (dry)



D. 2010 (wet)



E. 2011 (dry)



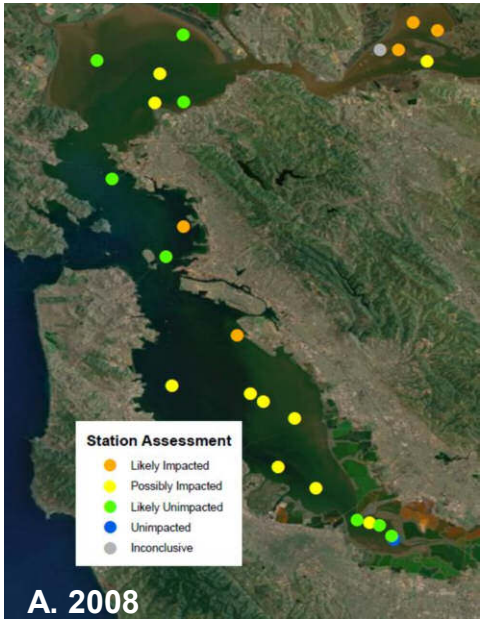
F. 2012 (wet)

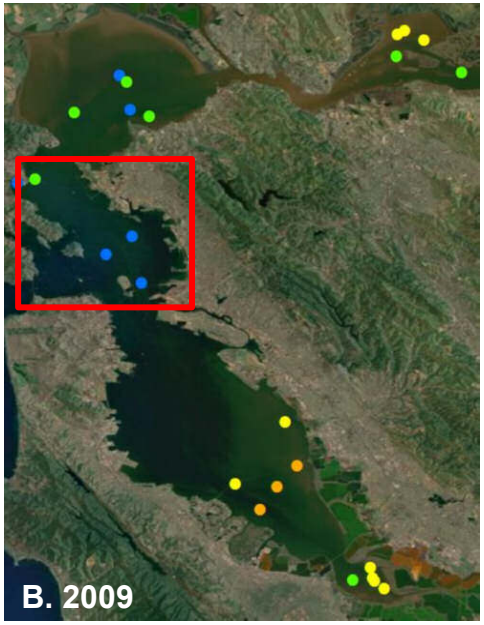
Spatial Trends in the Bay

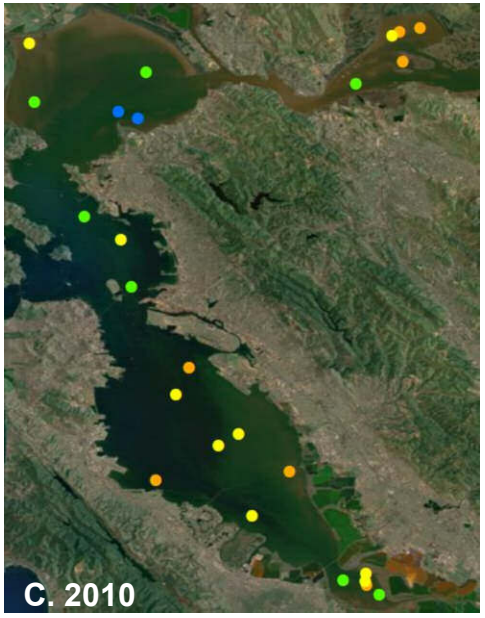
	% Area with Poor Sediment Quality	% Area with Good Sediment Quality	Impacted LOEs (high % area affected)
Lower South Bay	52%	48%	Toxicity
South Bay	88%	12%	Toxicity, Benthos
Central Bay	52%	48%	Toxicity
San Pablo Bay	20%	80%	–
Suisun Bay	80%	16%	Toxicity, Benthos

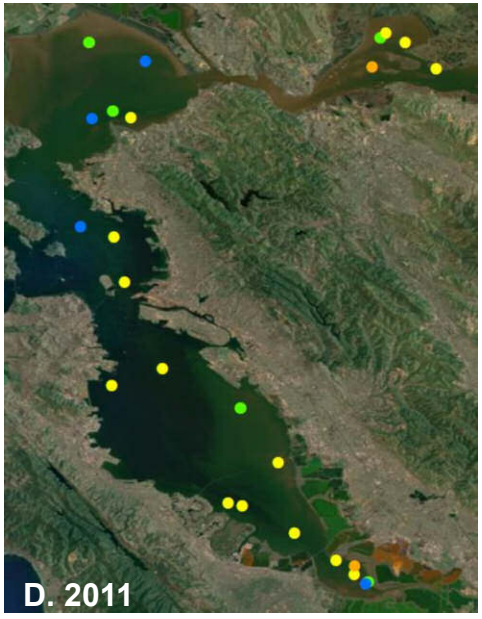
Interannual Variation

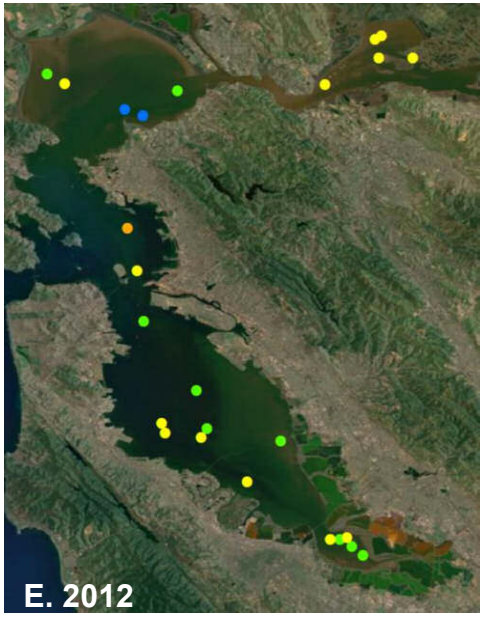
Suisun Bay					
Year	*Station Name*	*Chemical Exposure*	*Toxicity*	*Benthic Disturbance*	*Station Assessment*
2008	BF21	Low	High	High	Likely Impacted
	SU037S	Low	Moderate	Moderate	Likely Impacted
	SU039S	Minimal	Low	High	Inconclusive
	SU040S	Low	Low	High	Possibly Impacted
	SU080S	Low	Moderate	Moderate	Likely Impacted
2009	BF21	Low	High	Low	Possibly Impacted
	SU016S	Low	High	Low	Possibly Impacted
	SU073S	Low	Moderate	Low	Possibly Impacted
	SU085S	Low	Reference	High	Likely Unimpacted
	SU090S	Low	Reference	High	Likely Unimpacted
2010	BF21	Low	High	Moderate	Likely Impacted
	SU060S	Low	Moderate	Moderate	Likely Impacted
	SU073S	Low	Low	Moderate	Possibly Impacted
	SU084S	Low	Moderate	Moderate	Likely Impacted
	SU109S	Minimal	Low	Moderate	Likely Unimpacted
2011	BF21	Low	High	Low	Possibly Impacted
	SU024S	Low	Moderate	Low	Possibly Impacted
	SU073S	Low	Low	Low	Likely Unimpacted
	SU044S	Low	Moderate	Moderate	Likely Impacted
	SU048S	Low	High	Reference	Possibly Impacted
2012	BF21	Low	Low	Moderate	Possibly Impacted
	SU027S	Low	Low	Moderate	Possibly Impacted
	SU073S	Low	Low	Moderate	Possibly Impacted
	SU128S	Low	Low	Moderate	Possibly Impacted
	SU131S	Low	Low	Moderate	Possibly Impacted

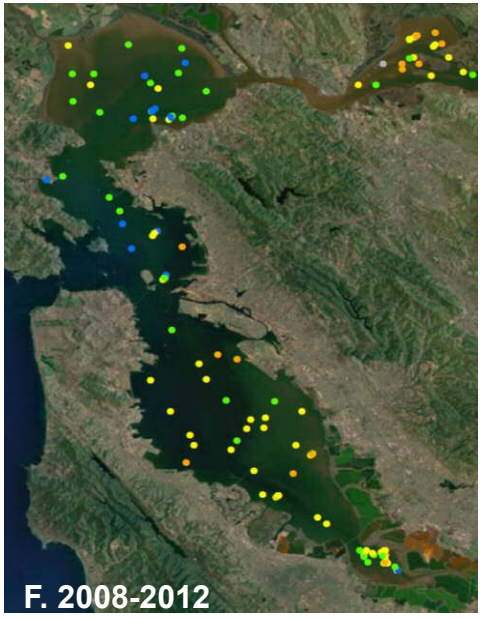

Station Assessment
Likely Impacted
Possibly Impacted
Likely Unimpacted
Unimpacted
Inconclusive
A. 2008


B. 2009


C. 2010


D. 2011


E. 2012


F. 2008-2012

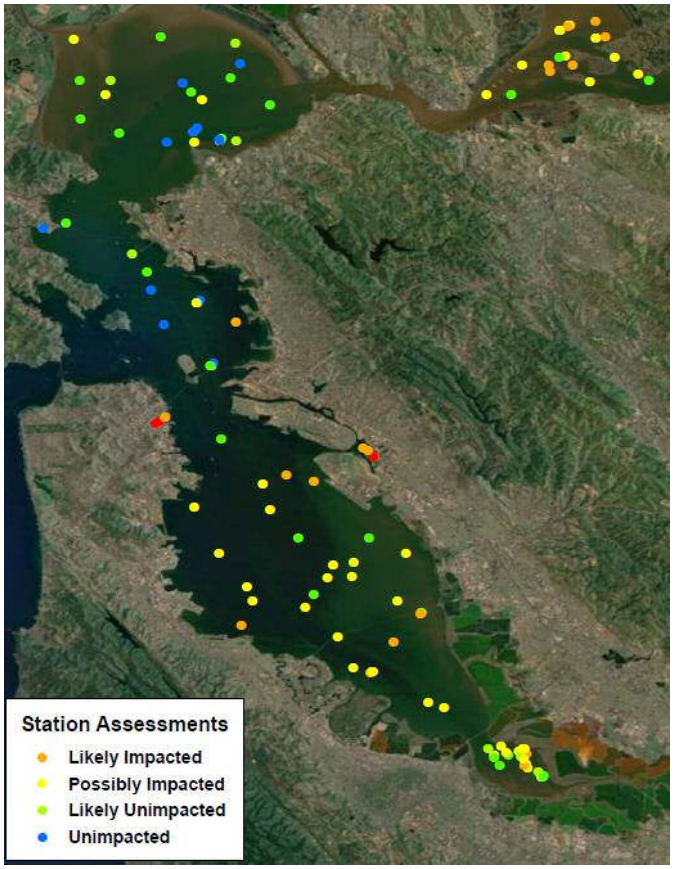
Conclusions

1) Generally, severe impacts on the benthic community are not observed

2) Majority of the Bay remained possibly impacted from 2008-2012 and was characterized by moderate toxicity

3) Sediment quality differed between the five subembayments

4) Sediment quality may have improved over time in the Bay



* ESTUARY MAGAZINE

Diversifying our Publication Funding 2014-2016

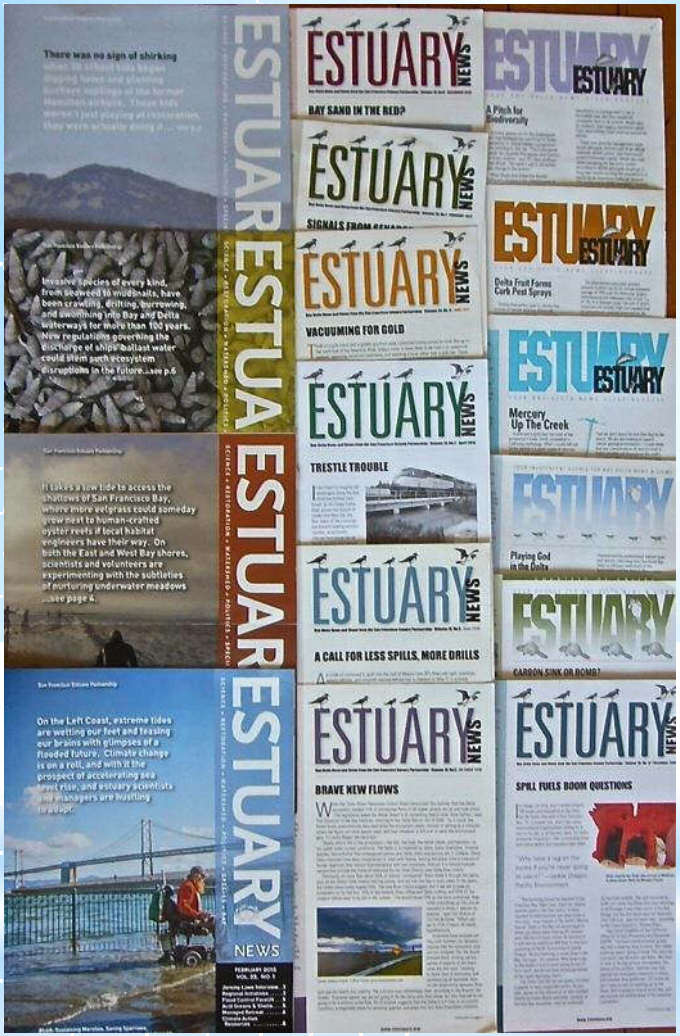
San Francisco Estuary Partnership

Reason for our Visit $$$$

- Loss of federal funding for the magazine due to sequester
- Seeking to diversify our funding base and create stronger local partnerships in producing the magazine.
- Seeing new avenues for collaboration with entities who need to communicate science, policy and action, both to the public and to their peers.

A Brief Orientation

- 20 years award winning coverage
- Fulfilling CCMP mandate public education
- Helped make “estuary” a household word watershed wide…
- Readership – 3000 and growing.
- Current Annual Budget $60,000
- 12 pages, 5 issues per year
- 40-50% readers say topics interest them most are contaminants, stormwater, environmental regulation
- 74% readers enjoy science topics



*The Competition

*Providing news coverage and outreach tool for public agencies

April 2013

Sustaining a living estuary like San Francisco Bay is no cakewalk. You've got to sidestep through unpredictable things like invasive clams, seasonal flows, climate change, and restoration budgets. And you've got to power through the twists and turns of politics and land use debates. The prize might not be as obvious as a lupine in the spring sunlight. But it sure beats sitting out the last dance…

MENTIONS: Alameda County Fish & Game Commission, Assoc. National Estuary Programs, CalRecycle, Cal SCC, Drakes Bay Oyster Company, ESA-PWA, Exploratorium, Napa County Mosquito Abatement, SF Bay Joint Venture, SF State University, Sierra Club, USCOE, UC Berkeley, UC Davis, USGS, Watershed Project.

Featured stories:

Clams Muddle Delta Restoration *by* Robin Meadows
Way-Cool Observatory *by* Ariel Rubissow Okamoto
The Laid Back Levee *by* Joe Eaton
Wet Feet for Silicon Valley? *by* Susan K. Moffat
Slow it, Save it, Sink it *by* Daniel McGlynn
How Wild Should Drakes Estero Be? *By* Jacoba Charles

February 2013

On the Left Coast, extreme tides are wetting our feet and teasing our brains with glimpses of a flooded future. Climate change is on a roll, and with it the prospect of accelerating sea level rise, and estuary scientists and managers are hustling to adapt.

Special Insert: California Landscape Conservation Cooperative

MENTIONS: ABAG, BAECCC, BCDC, Bodega Marine Lab, Cal-IPC, Cal Landscape Conservation Cooperative, ESA-PWA, National Estuarine Research Reserves, National Park Service, Point Reyes Conservation Science, San Francisquito Creek Joint Powers Authority, SFEP, Sonoma Land Trust, The Nature Conservancy, UC Berkeley, UC Davis, UC Riverside, USEPA, USFWS, USGS.

NOVEMBER 2012

Investigating the Delta's historical ecology; preventing PCBs in caulk from entering runoff after building demolition; restoring Cullinan Ranch on the San Pablo Bay Wildlife Refuge; and managing drainage from seasonal wetlands in Suisun Marsh, which contain too much mercury and too little oxygen. Also, Japanese tsunami debris arrives on West Coast; two top scientists review key lessons from four decades of Bay ecosystem research; the Mokelumne River Crest to Coast Trail; and a Bay-Delta science conference town hall on how scientists and policymakers can better communicate.

Special Insert: Flame Retardants in San Francisco Bay, Regional Monitoring Program Fall 2012 Update

KEYWORDS: drivers of ecological change, ducks, food web, geese, eelgrass, linking science to policy, overbite clam, PCBs, trails, restoration, setback levee, wildlife refuge

MENTIONS: Cal DFG, EBMUD, SFEI, SFEP, SF State University, UC Davis, USFWS, USGS

AUGUST 2012

Debating shipboard V shoreside ballast water treatment regulations for California to prevent aquatic invasions; dredging around eelgrass beds, a new federal policy; cataloging creek mouths for resilience; and boating with elected officials to learn about the Bay, a teenager's view. Also sustainable growth in the Central Valley; research on the water temperature range tolerated by hardhead minnows; a national blueprint for water trails; HOA management of private wetlands; a bioblitz of citizen science; and new state dredge and fill protocols for California wetlands.

KEYWORDS: creeks, eelgrass, hardhead minnow, invasive species, land use, living shoreline, native fish, state wetland policy

MENTIONS: ABAG, Bay Planning Coalition, Cal SCC, Cal SLC, Cal SWRCB, Cal Energy Commission, Great Valley Center, Marin Municipal Water District, Marine Science Institute, NMFS, SFEI, SFEP, SF State University, UC Davis, UC Merced, US Coast Guard, US EPA

JUNE 2012

Measuring fresh water flow in the Delta through the flow station network; restoring wetlands with school kids at Hamilton airbase; accommodating both veterans and terns on Alameda naval base; and testing racks, screens, and lights as deterrents for sturgeon around irrigation intakes. Also, levee vegetation policy; legacy mercury mobilization from salt pond restoration; the downturn in restoration funding; abandoned vessel policy; wetland activist Florence La Riviere; and new greywater-friendly plumbing codes for California.

KEYWORDS: abandoned vessels, environmental education, flood control, flows, greywater, land use, least terns, levees, mercury, sturgeon, pollution, restoration

MENTIONS: Cal DWR, Cal SCC, Cal SWRCB, EBRPD, Golden Gate Audubon, PRBO-STRAW, the Navy, UC Davis, USCOE, USFWS, USGS

APRIL 2012

Cleaning up derelict vessels on San Francisco Bay; burning the fuel of the future (FOG-fat, oil and grease) to reduce greenhouse gas emissions; designing micro-islands for shorebirds; and studying how fast restored wetlands reach reference conditions. Also, a regional monitoring plan for restored wetlands; an ecological history of the Napa Valley; and the views of three scientists (Swanson, Rosenfield, Wintemitz) on the Bay-Delta Conservation Plan's effects analysis.

KEYWORDS: avocets, bay regulation, clean energy, contaminants, delta planning, snowy plovers, wetland restoration

MENTIONS: BCDC, Cal SWRCB, EBMUD, National Academy of Sciences, Natural Resources Defense Council, SF Bay Joint Venture, SFEI, SFRWQCB, South Bay Salt Pond Restoration Project, The Bay Institute, The Nature Conservancy

FEBRUARY 2012

Mapping two species of native pondweed in Suisun Bay; blaming stripers for salmon loss in the Sacramento River; and choosing projects to receive the settlement dollars from the Cosco Busan oil spill. Also, asphalt plant on the much- restored Petaluma River; Steve Crooks on blue carbon; climate change impacts on the Delta; and oil spill impacts on herring.

KEYWORDS: climate change, carbon credits, herring, oil spill, pondweed, predation, rivers, salmon, striped bass

MENTIONS: DFG-OSPR, ESA-PWA, NMFS, SF State University, UC Davis, USGS-CASCADE

* Editor, Ariel Okamoto, winner of Harold Gilliam Award for Excellence in Environmental Reporting

Top national and local writers…

* Susan Zakin

  Truthdig, LA Times

* Jacoba Charles

  NYT, Point Reyes Light

* Nate Seltenrich

  East Bay Express, Bay Nature

* Joe Eaton

  Bay Nature, San Francisco Chronicle

AMONG OTHERS

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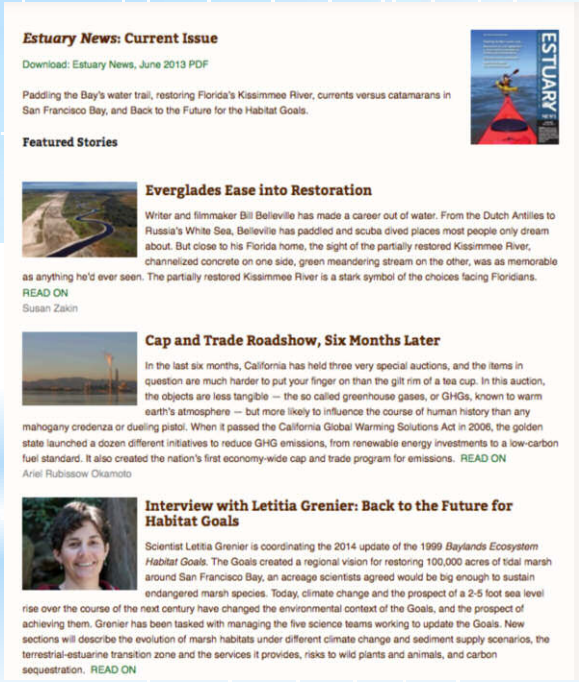

Long Standing relationship to RMP, SFEI & SFBRWCB

- Annual RMP inserts
- Stories on RMP priorities and activities
- Stories about contaminants, water quality, storm water, salinity, historical ecology, dischargers…
- Numerous stories about water quality regulation, TMDLS

Addressing the Funding Gap 2014-2016

- Wonderful response from partners to this funding gap.
- Promise of two years of funding to date, in varying amounts, from:
  - Delta Stewardship Council
  - Cal LCC (climate)
  - USGS
  - NMFS
  - ESA-PWA And others
  - RMP? $10K/2 years

Plans Ahead

* Regroup with a new editorial board, including major new funding partners
* Identify communication gaps and needs for all partners
* Explore ways in which Estuary News team can help you meet gaps.

* MORE RMP IN ESTUARY?

Telling the Story behind the Data!

- Regular column, The Monitor?
- Contaminant of the Month ?
- Good News: Lower levels PBDEs food web
- Trends: Mercury in small fish
- On the Radar: Nutrients again, plankton changes
- New frontiers – treatment plant retrofits for sea level rise…