



RMP PCB Workgroup Meeting

Season 12
June 6, 2023

SFEI Housekeeping Reminders

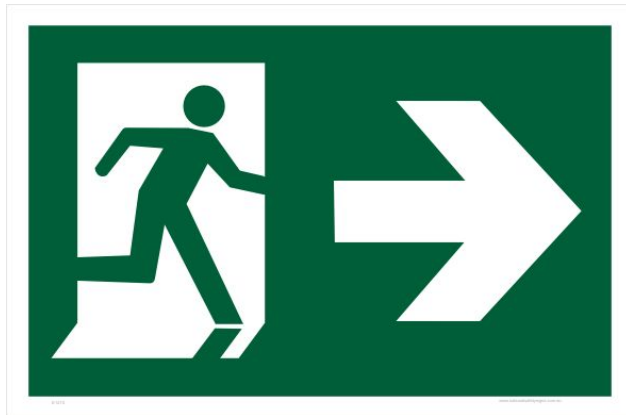


Out the doors and to the right



**Password:
sfsfsfsf**

**Please silence cell
phones & laptops**



Zoom tips

1. Update your name and add your affiliation
2. Raise your hand if you have a comment or question
3. Unmute yourself and turn on video when you are speaking
4. Use the chat function if you have a comment, question, or technical issue

In person attendees

1. Mute your microphone and the volume on your laptop
2. Turn off your camera



Guidelines for Inclusive Conversations

1. Try it on
2. Practice self focus
3. Understand the difference between intent and impact
4. Practice both / and thinking
5. Refrain from blaming or shaming self and others
6. Move up / move back
7. Practice mindful listening
8. Right to pass
9. Avoid jargon
10. It's okay to disagree (respectfully)



We acknowledge the San Francisco Bay is the ancestral homeland of many indigenous people, including the Ohlone, Patwin, Coast Miwok, and Bay Miwok.

(acknowledgement developed by the native people of the SF Bay)



PCBWG Science Advisors

- Frank Gobas, Simon Fraser University
- Earl Hayter, USACE Engineer Research and Development Center



INTRODUCTIONS



Goals for the Meeting

- Discuss management updates for the TMDL and the PMUs
- Review progress and plans on Steinberger Slough/Redwood Creek studies
- Review progress and plans for San Leandro Bay studies
- Review progress and plans for in-Bay model development
- Review and prioritize proposed studies for 2024
- Update the PCBWG multi-year plan



Meeting Agenda

1.	Introductions, Meeting Goals, Agenda Review Major goals for the meeting: <ol style="list-style-type: none"> 1. Discuss management updates for the TMDL and the PMUs 2. Review progress and plans on Steinberger Slough/Redwood Creek studies 3. Review progress and plans for San Leandro Bay studies 4. Review progress and plans for in-Bay model development 5. Review and prioritize proposed studies for 2024 6. Update the PCBWG multi-year plan Materials: None	9:00 Jay Davis
2.	Information: RMP/PCBWG Planning Overview An overview of the RMP and PCBWG planning process will be provided. Updates on management will be discussed, particularly information needs related to the PCBs TMDL. Materials: none Desired Outcome: Group understanding of the RMP/PCBWG planning process, management drivers, and existing plans for PCB studies.	9:15 Jay Davis
3.	Information: The Puget Sound Institute's Cross Program Contaminant Working Group This group was established to coordinate nationally on contaminant science and management, with a focus on PCBs. Their next (second) symposium is happening on June 15, focused on PCB source tracking. Materials: <ul style="list-style-type: none"> • Working Group website Desired Outcome: Informed Workgroup.	9:45 Andy James

Meeting Agenda

4.	Information: Regulatory and Management Update on Steinberger Slough/Redwood Creek Opportunity for Workgroup members to share any information on the latest status of regulation and management actions in the SS/RC watershed. Materials: none Desired Outcome: Informed Workgroup.	10:00 Group
5.	Discussion: Steinberger Slough/Redwood Creek Passive Sampler Study (2020) An initial discussion of this study occurred at the 2022 PCBWG meeting. Subsequently Frank Gobas provided substantive comments and discussed them with the authors. The final report and a manuscript will be revised in response to the comments. Materials: Written comments from Frank Gobas (pages 4-7) Desired Outcome: Obtain Workgroup input on the study and plan for completion.	10:15 Diana Lin Yeo-Myoung Cho
6.	Information: Progress on Steinberger Slough/Redwood Creek Sediment and Prey Fish Study (2022, 2023) Year two of this two-year study (analysis of sediment and prey fish samples) was funded for 2023. A refresher on the scope and an update on progress will be provided. Materials: Powerpoint presented at the meeting Desired Outcome: Informed Workgroup.	10:35 Jay Davis
	Break	10:45
7.	Information: Regulatory and Management Update on San Leandro Bay Opportunity for Workgroup members to share any information on the latest status of regulation and management actions in the San Leandro Bay watershed. Materials: none Desired Outcome: Informed Workgroup.	10:55 Group
8.	Information: Update on PMU Stormwater Sampling (2019 SEP, 2022 Augment) Sampling PCBs in stormwater in PMU watersheds was funded with SEP funds in 2019. Additional funding for sampling stormwater in San Leandro Bay was approved by the Steering Committee in 2022. An update on the status of this work will be provided. Materials: Powerpoint presented at the meeting Desired Outcome: Informed Workgroup.	11:10 Alicia Gilbreath
9.	Discussion: Update on San Leandro Bay Passive Sampler Study (2021) A passive sampler study in San Leandro Bay was funded for 2021. A draft report is nearing completion. Preliminary results will be presented. Materials: Powerpoint presentation (pages 8-29) Desired Outcome: Discussion of preliminary results.	11:20 Yeo-Myoung Cho Diana Lin
	LUNCH	12:00
10.	Discussion: Bay Food Web Modeling The multi-year workplan for In-Bay Modeling includes a task, funded as part of the Destination Clean Bay WQIF project, to develop an updated PCB food	12:45

Meeting Agenda

	<p>web model for the Bay. The work will be done by Frank Gobas and will begin this year.</p> <p>Materials: none</p> <p>Desired Outcome: Obtain Workgroup input on the proposed workplan.</p>	
11.	<p>Discussion: In-Bay Contaminant and Sediment Fate Modeling</p> <p>A multi-year workplan for In-Bay Modeling was initiated by the RMP and will be primarily funded by the Destination Clean Bay WQIF project. Progress to date and future plans will be presented and discussed.</p> <p>Materials: Powerpoint presentation (pages 30-61)</p> <p>Desired Outcome: Obtain Workgroup input on progress to date and the proposed workplan.</p>	<p>1:00</p> <p>Jay Davis Craig Jones</p>
12.	<p>Information: Integrated Watershed-Bay Modeling Strategy</p> <p>A brief update on this separate RMP SEP-funded project.</p> <p>Materials: Powerpoint presentation (pages 62-75)</p> <p>Desired Outcome: Informed Workgroup.</p>	<p>2:00</p> <p>Allie King</p>
13.	<p>Decision: PCBWG Proposals for 2024</p> <p>Two proposals for PCB work in 2024 will be discussed and prioritized. A third proposal will be briefly presented for information.</p> <ol style="list-style-type: none"> 1. PMU Shiner Surfperch Trend Monitoring 2. SLB Sediment Deposition 3. PCB Sniffing Dog (Information) <p>Materials: Proposal writeups (pages 76-91) (dog proposal not included)</p> <p>Desired Outcome: Workgroup recommendation on the proposed studies.</p>	<p>2:15</p> <p>Jay Davis Don Yee Alicia Gilbreath</p>
14.	<p>Discussion: Update of the PCBWG Multi-Year Plan</p> <p>The multi-year plan for RMP PCB studies will be updated based on the day's discussion.</p> <p>Materials: Draft multi-year plan presented at meeting</p> <p>Desired Outcome: Workgroup consensus on a revised multi-year plan.</p>	<p>3:10</p> <p>Jay Davis</p>
15.	<p>Review Next Steps and Action Items and Adjourn</p>	<p>3:30</p> <p>Jay and Group</p>

2. Information: RMP/PCBWG Planning Overview (30 minutes)

Desired Outcomes: Group understanding of the RMP/PCBWG planning process, management drivers, and existing plans for PCB studies

Regional Monitoring Program

Collect data and communicate information about water quality in San Francisco Bay in support of management decisions

~ 68 entities in the Program

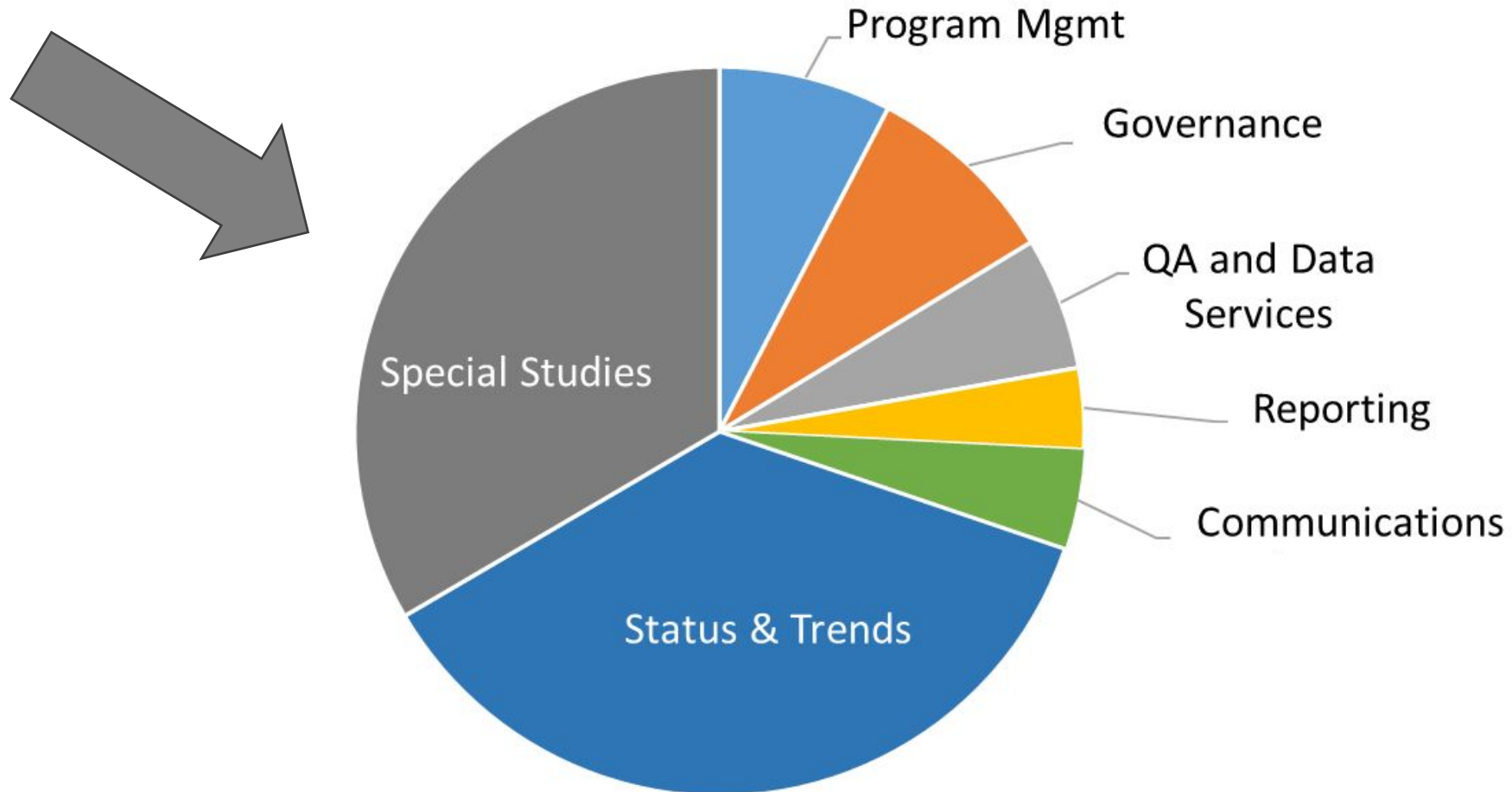
- Municipal wastewater
- Industrial wastewater
- Municipal stormwater
- Dredgers



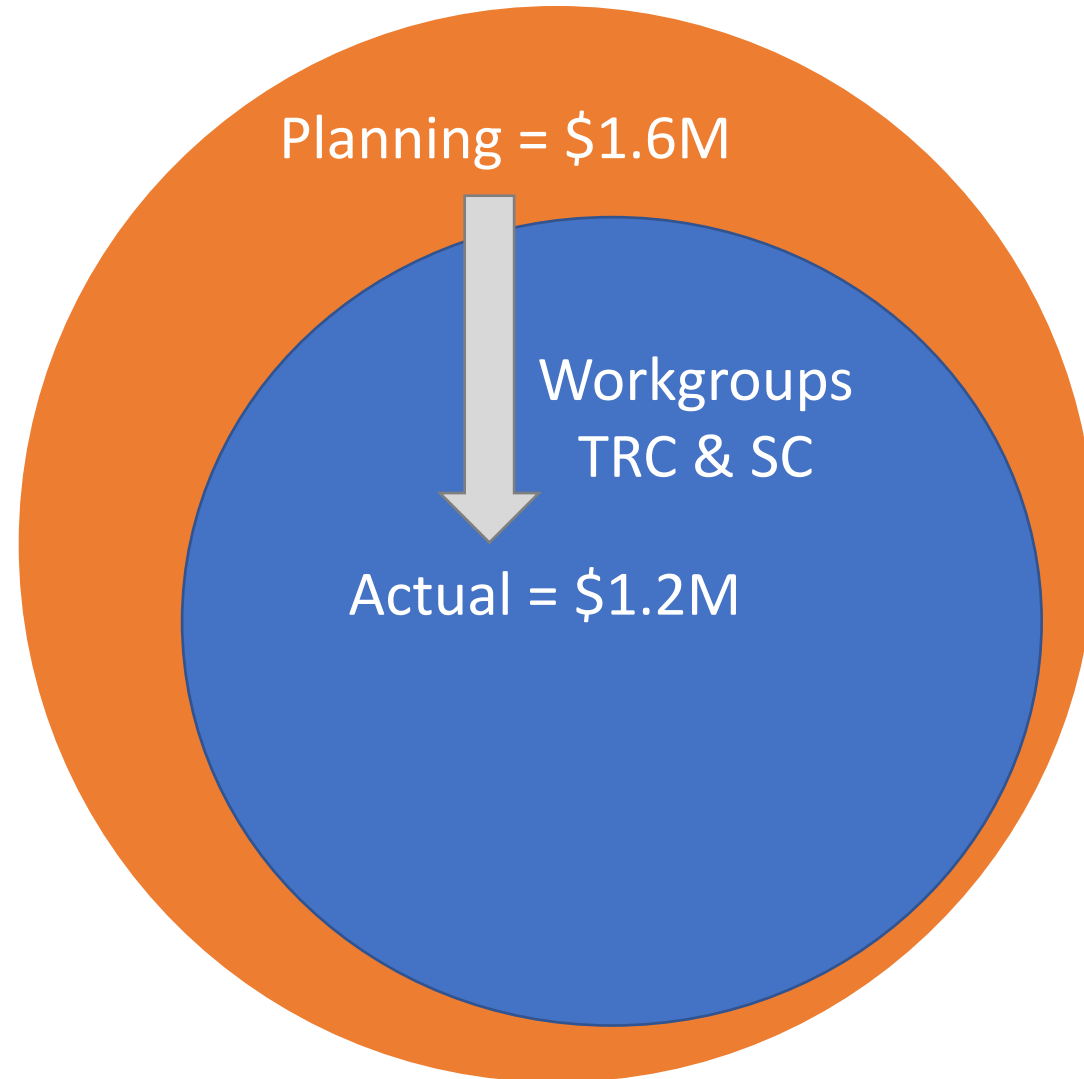
RMP Program Structure



Regional Monitoring Program Budget



Special Studies Budget for 2024





RMP
REGIONAL MONITORING
PROGRAM FOR WATER QUALITY
IN SAN FRANCISCO BAY

sfei.org/rmp

MULTI-YEAR PLAN 2023
ANNUAL UPDATE

FINAL: JANUARY 2023

Contribution Number: 1096

PCBs

Relevant Management Policies and Decisions

PCBs TMDL – support for appropriate changes to the TMDL

NPDES Municipal Regional Stormwater Permit and wastewater permit requirements

Focusing management actions and/or locations for reducing PCB impairment (upland)

Determining cleanup priorities (in-Bay)

Recent Noteworthy Findings

In 2019, shiner surfperch had a Bay-wide average PCB concentration 18 times higher than the TMDL target. These concentrations have resulted in an advisory from the Office of Environmental Health Hazard Assessment (OEHHA) recommending no consumption for all surfperch in the Bay. PCB concentrations in shiner surfperch and white croaker show limited signs of decline.

Urban stormwater is the pathway carrying the largest PCB loads to the Bay and has

the highest load reduction goals. Concentrations of PCBs and mercury on suspended sediment particles from a wide range of watersheds have been measured as an index of the degree of watershed contamination and potential for effective management action. The three sites with the highest estimated particle PCB concentrations as of 2019 were Pulgas Pump Station South (8,220 ng/g), Industrial Rd Ditch in San Carlos (6,139 ng/g), and Line 12H at Coliseum Way in Oakland (2,601 ng/g).

Assessments of three “priority margin units” (Emeryville Crescent, San Leandro Bay [SLB], and the Steinberger Slough/Redwood Creek area [SS/RC]) established conceptual models as a foundation for monitoring response to load reductions and for planning management actions. A key finding was that PCB concentrations in sediment and the food webs in the Crescent and SLB could potentially decline fairly quickly (within 10 years) in response to load reductions from the watershed. In contrast, recovery in SS/RC appears likely to be ultimately limited by the

relatively high PCB concentrations that prevail in the South Bay compared to other subembayments.

In spite of the expected responsiveness of SLB, extensive field studies have documented persistent sediment contamination that is likely due to continuing inputs from the watershed.

Priority Questions for the Next Five Years

1. What are the rates of recovery of the Bay, its segments, and in-Bay contaminated sites from PCB contamination?
 - a. What would be the impact of focused management of PMU watersheds?
 - b. What would be the impact of management of in-Bay contaminated sites (e.g., removing and/or capping hot spots), both within the sites and at a regional scale?

Management drivers and
questions updated in 2021

MULTI-YEAR PLAN FOR PCBs

Special studies and monitoring in the RMP from 2019 to 2025. Numbers indicate budget allocations in \$1000s. Budgets in parentheses represent funding or in-kind services from external sources (e.g., SEP funds). Budgets that are starred represent funding that has been allocated within other workgroups. Bold boxes indicate multi-year studies. Items shaded in yellow are considered high priority for 2024 funding and beyond. ss – Steinberger Slough; sl – San Leandro Bay

Category	Study	Funder	Questions addressed	2019	2020	2021	2022	2023	2024	2025
General	Develop and update multi-year workplan and continued support of PCB Workgroup meetings	RMP	1a,b	10	10					
	In-Bay Fate Model	RMP SEP WQIF	1a,b			45	75	(408) (350) [‡]	(340) [‡]	(235) [‡]
	Integrated Watershed-Bay Model (SPLWG)	SEP	1a,b			(200)*				
	Margins Ambient	RMP								
PMU	PMU Stormwater	SEP	1a	(40)*						
	PMU Sport Fish Monitoring (3 PMUs)	SEP	1a	(60) ^a					50 ^a	
	Passive Samplers	RMP	1a		91ss	87sl				
	PMU Prey Fish Monitoring (4 PMUs)	RMP	1a				26ss ^b	37ss ^c		64sl
	PMU Sediment	RMP	1a,b				26ss ^b	38ss ^c	40	
PMU/General	Food Web Model	WQIF	1a,b					(71) [‡]	(71) [‡]	
RMP-funded Special Studies Subtotal – PCBWG				10	101	132	127	75	90	64
High Priority Special Studies for Future RMP Funding									90	64
RMP-funded Special Studies Subtotal – Other Workgroups				40	0	200	0			
RMP Supplemental Environmental Projects Subtotal				60	0	0	0	408		
Pro-Bono & Externally-funded Special Studies Subtotal				0	0	0	0	421 [‡]	411 [‡]	235 [‡]
OVERALL TOTAL				70	101	132	127	904	501	299

^a Shiner surfperch; ^b Sample collection; ^c Sample analysis and reporting; ^d WQIF

[‡] The RMP has submitted a proposal to the San Francisco Bay Water Quality Improvement Fund (WQIF) that would support stormwater CECs monitoring at a level of ~\$100k per year for three years (2023-2025). This MYP lists these potential funds, and will be updated to reflect the final funding decision relating to this proposal.

PCBWG Multi-Year Plan

page 2
(updated)

MULTI-YEAR PLAN FOR PCBs (updated for PCBWG 06-06-23)

Special studies and monitoring in the RMP from 2019 to 2025. Numbers indicate budget allocations in \$1000s. Budgets in parentheses represent funding or in-kind services from external sources (e.g., SEP funds). Budgets that are starred represent funding that has been allocated within other workgroups. Bold boxes indicate multi-year studies. Items shaded in yellow are considered high priority for 2024 funding and beyond. ss – Steinberger Slough; sl – San Leandro Bay

Category	Study	Funder	Questions addressed	2019	2020	2021	2022	2023	2024	2025
General	Develop and update multi-year workplan and continued support of PCB Workgroup meetings	RMP	1a,b	10	10					
	In-Bay Fate Model	RMP SEP WQIF	1a,b			45	75	(136) (350) [‡]	(136) (340) [‡]	(136) (235) [‡]
	Integrated Watershed-Bay Model (SPLWG)	SEP	1a,b			(200) [*]				
	Margins Ambient	RMP								
PMU	PMU Stormwater	SEP	1a	(40) [*]						
	PMU Sport Fish Monitoring (3 PMUs)	SEP	1a	(60) ^a					39 ^a	
	Passive Samplers	RMP	1a		91ss	87sl				
	PMU Prey Fish Monitoring (4 PMUs)	RMP	1a				26ss ^b	37ss ^c 7sl ^e		
	PMU Sediment	RMP	1a,b				26ss ^b	38ss ^c	67-99	
PMU/General	Food Web Model	WQIF	1a,b					(71) [‡]	(71) [‡]	
RMP-funded Special Studies Subtotal – PCBWG				10	101	132	127	75	xx	0
High Priority Special Studies for Future RMP Funding									xx	0
RMP-funded Special Studies Subtotal – Other Workgroups				40	0	200	0			
RMP Supplemental Environmental Projects Subtotal				60	0	0	0	136	136	136
Pro-Bono & Externally-funded Special Studies Subtotal				0	0	0	0	421 [‡]	411 [‡]	235 [‡]
OVERALL TOTAL				70	101	132	127	632	>547	371

^a Shiner surfperch; ^b Sample collection; ^c Sample analysis and reporting; ^d WQIF; ^e piggybacking on S&T near-field prey fish sampling

[‡] Funds from the San Francisco Bay Water Quality Improvement Fund (WQIF) will support in-Bay modeling at the levels indicated for three years (2023-2025).

3. Information: The Puget Sound Institute's Cross Program Contaminant Working Group (15 minutes)

Desired Outcome: Informed Workgroup

AGENDA

June 15, 2023

Time Pacific	Topic	Presenter
08:45	Informal Networking Time	
09:00	Introduction, purpose, and scope	Andy James, University of Washington Puget Sound Institute
09:15	Source Tracking - Case Study #1 Anacostia River/Lower Beaver Dam Creek	Elisabeth Green Mark Mank Maryland Department of the Environment
10:00	Source Tracking - Case Study #2 Field-based Source Tracking in San Francisco Bay	Jay Davis, San Francisco Estuary Institute
10:45	BREAK	
11:00	Source Tracking - Case Study #3 PCB fingerprinting at the Newtown Creek Superfund Site	Lisa Rodenburg, Rutgers University
11:45	Panel Discussion	
12:30	Closing	

Notes: all case studies will be 30-minute presentation and 15-minute Q&A

4. Information: Regulatory and Management Update on Steinberger Slough/Redwood Creek (15 minutes)

Desired Outcome: Informed Workgroup

5. Discussion: Steinberger Slough/Redwood Creek Passive Sampler Study (2020) (20 minutes)

Desired Outcome: Obtain Workgroup input on the study
and plan for completion

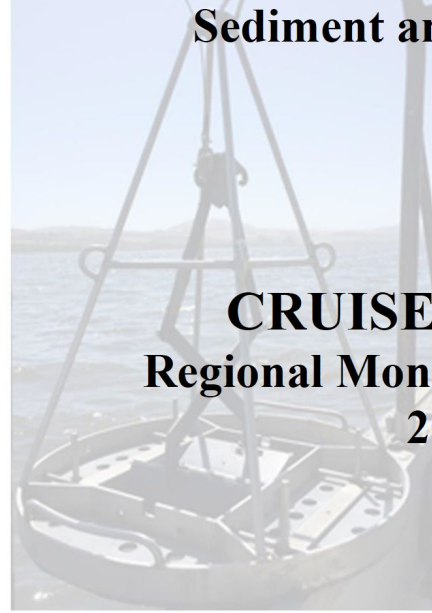
6. Information: Progress on Steinberger Slough/Redwood Creek Sediment and Prey Fish Study (2022, 2023) (10 minutes)

Desired Outcome: Informed Workgroup

Figure 2. Proposed stations for prey fish, including a brief rationale for each.



**Contaminant Concentrations
In Steinberger Slough and Redwood Creek
Sediment and Fish Tissue**



**CRUISE REPORT
Regional Monitoring Program
2022**

**Prepared for the
San Francisco Estuary Institute**



by

**San Jose State University Research Foundation
7544 Sandholdt Rd, Moss Landing, CA 95039**

- We got fish in Steinberger Slough!
- Beach seining worked
- Topsmelt
- 3 composites of 20 fish each at each of the 5 target stations
- PCB analysis on fish and sediment still in progress

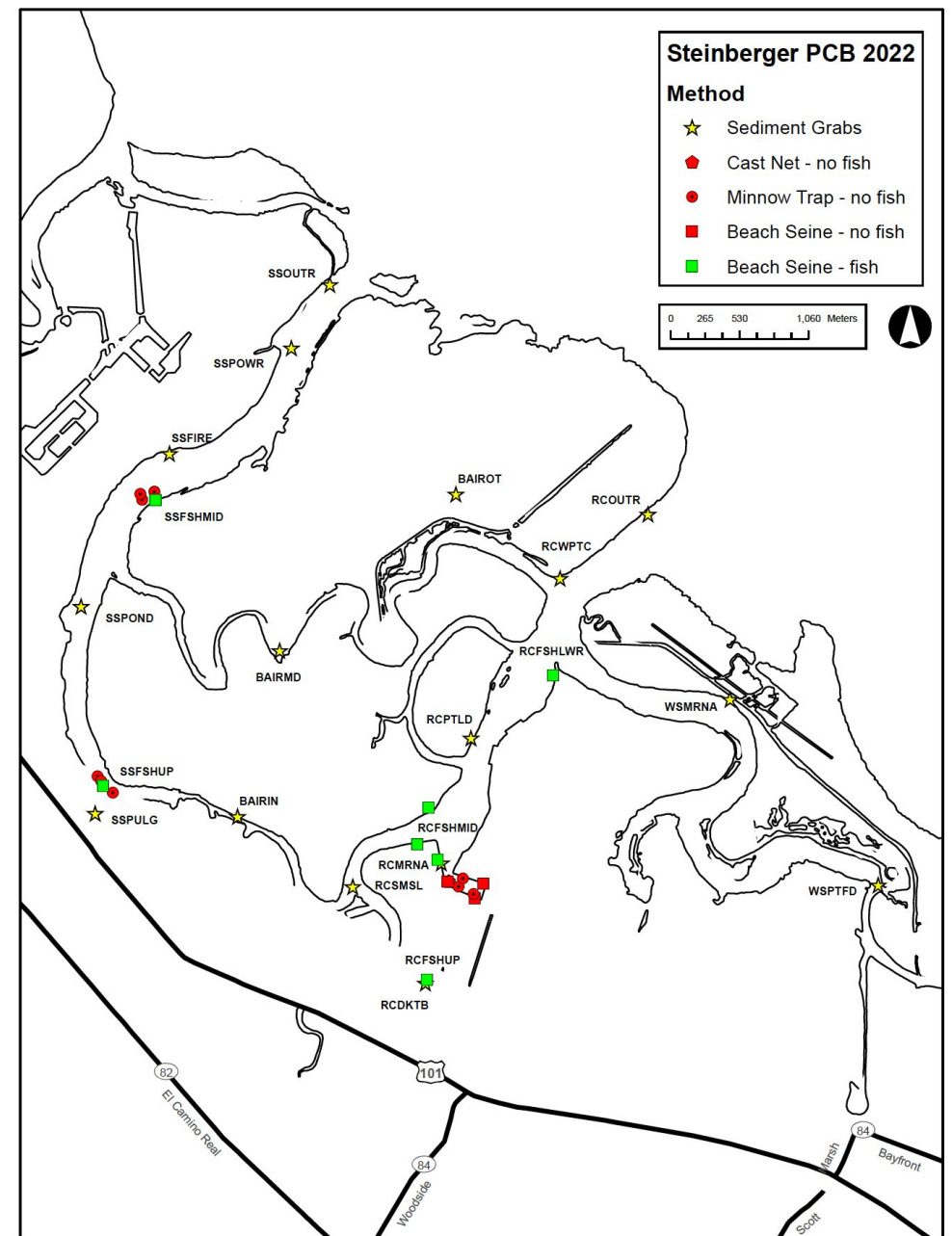


Figure 1: Locations of all 16 sediment and 5 fish sites sampled under the Steinberger Slough and Redwood Creek PCB Study in 2022.

Station	Name	Date	Type	Target Latitude	Target Longitude	Actual Latitude	Actual Longitude	Comments
SSFSHMID	Steinberger Middle	8/23/2022	F	37.529194	-122.240756	37.528617	-122.240761	60 Topsmelt, comp 1 60-74, comp 2 70-90, comp 3 70-90 mm
SSFSHUP	Steinberger Pulgas	8/23/2022	F	37.509450	-122.245311	37.508706	-122.244728	60 Topsmelt, comp 1 60-70, comp 2 60-76, comp 3 68-90 mm
RCFSHUP	Redwood Creek Docktown	8/24/2022	F	37.495550	-122.218317	37.49582	-122.21612	60 Topsmelt, comp 1 60-74, comp 2 66-88, comp 3 74-90 mm
RCFSHMID	Redwood Creek near boat launch	8/24/2022, 9/3/2022, 9/4/2022	F	37.502042	-122.213564	37.50518	-122.217228	60 Topsmelt, comp 1 60-79, comp 2 68-90, comp 3 60-65
RCFSLWR	Redwood Creek near Westpoint	8/24/2022	F	37.519042	-122.203875	37.517106	-122.205758	60 Topsmelt, comp 1 66-86, comp 2 60-74, comp 3 74-90 mm

7. Information: Regulatory and Management Update on San Leandro Bay (15 minutes)

Desired Outcome: Informed Workgroup

8. Information: Update on PMU Stormwater Sampling (2019 SEP, 2022 Augment) (10 minutes)

Desired Outcome: Informed Workgroup

9. Discussion: Update on San Leandro Bay Passive Sampler Study (2021) (40 minutes)

Desired Outcome: Discussion of preliminary results

10. Discussion: Bay Food Web Modeling (15 minutes)

Desired Outcome: Informed Workgroup, general input on modeling plan

Destination Clean Bay

- Decision support tools = models
- Identifying optimal paths to meeting water quality goals
- Half RMP, half NMS
- \$3 million from EPA, matched by RMP and NMS
- Contract execution is imminent
- Four year project

DESTINATION CLEAN BAY

Decision Support Tools for Multi-Benefit Water Quality Improvements

PROPOSAL TO THE EPA WATER QUALITY IMPROVEMENT FUND 2022
SUBMITTED BY THE **SAN FRANCISCO ESTUARY INSTITUTE** with

San Francisco Bay Regional Water Quality Control Board

San Francisco Bay Regional Monitoring Program

Steering Committee composed of state and federal regulators, municipal wastewater, industrial wastewater, municipal stormwater, and dredging entities

San Francisco Bay Nutrient Management Strategy

Steering Committee composed of state and federal agencies, scientific partners, dischargers, and a non-profit organization

Bay Area Clean Water Agencies

A consortium of 65 wastewater agencies and municipalities



SEPTEMBER 20, 2022

PROPOSAL TO THE EPA WATER QUALITY IMPROVEMENT FUND 2022

Applicant Name: San Francisco Estuary Institute

Address: 4911 Central Ave, Richmond CA 94804

DUNS #: 187018866

Contact: Melissa Foley

Phone Number: 510-746-7345

Email Address: melissaf@sfei.org

SFEI San Francisco
Estuary Institute

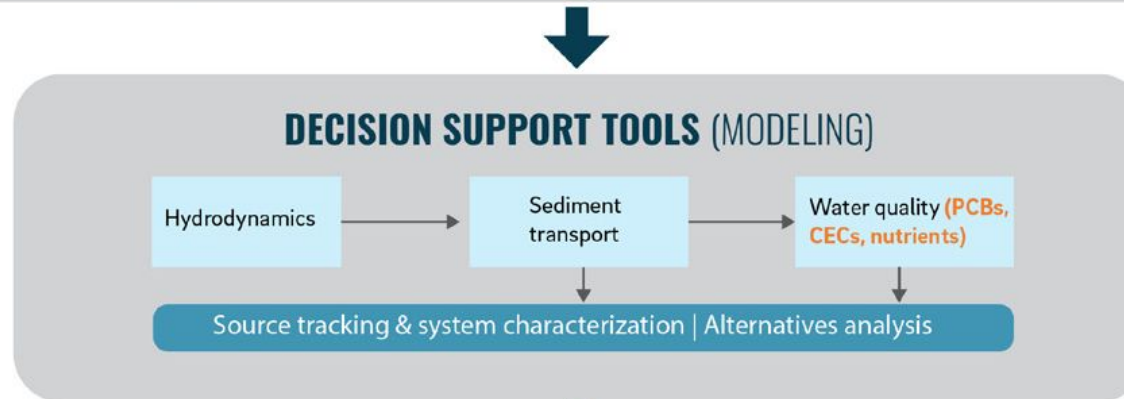
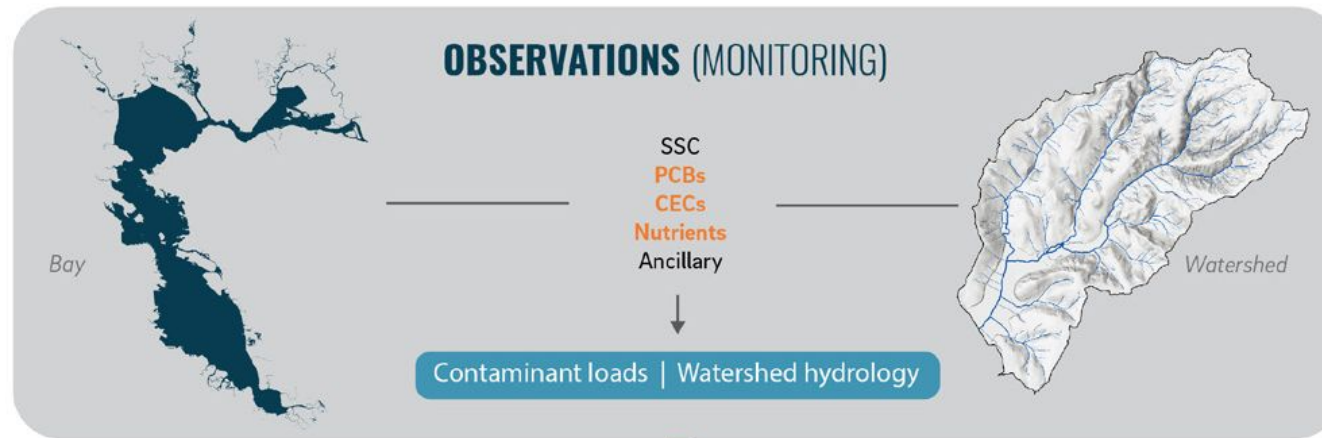


Table 2. Budget Detail and Timeline

<i>Time-frame</i>	<i>Task</i>	<i>Implementing Lead</i>	<i>Federal Portion (EPA grant)</i>	<i>Match</i>	<i>Outputs/Deliverables</i>
Task 1. High Priority Data Collection for Model Development			\$980,000		
Q1-10	1. Local Tributary PCB, CEC, and Nutrient Monitoring	SFEI RMP	\$385,000	\$210,000	<ul style="list-style-type: none"> • Load estimates for priority local tributaries, • Data for Watershed Dynamic Model calibration • Identification of key pollutions source areas • Remote samplers developed
Q9-12	2. Watershed Sediment Supply Synthesis	SFEI RMP	\$75,000	\$0	<ul style="list-style-type: none"> • Sediment load estimates for key watersheds, • Data for Watershed Dynamic Model calibration update • Technical report
Q1-16	3. Bay Water Quality, Sediment, PCB, and CEC Monitoring	SFEI RMP & NMS	\$220,000	\$1,090,000	<ul style="list-style-type: none"> • Extension of long-term water quality and turbidity data sets • PCB and CEC data for priority Bay locations • Data for in-Bay model calibration (nutrients, sediment, PCBs, CECs) • Calibration between turbidity and suspended sediment in South Bay • Calibration data for the in-Bay PCB fate model and PCB food web model • Assessment of potential CEC impacts in the Bay
Q1-10	4. Shoal Monitoring	SFEI NMS	\$100,000	\$180,000	<ul style="list-style-type: none"> • Maps of primary productivity on the shoals in South Bay • Technical report
Q3-10	5. Bay Remote Sensing (Suspended Sediment & nutrients)	SFEI NMS	\$200,000	\$0	<ul style="list-style-type: none"> • Broad-scale sediment and light attenuation estimates and trends • Calibration data for in-Bay sediment model • Resources permitting, chlorophyll-a calibration included for the in-bay nutrient model
Task 2. Watershed Contaminant Load Modeling			\$0		
Q1-10	1. Watershed PCB, CEC, and nutrients model	SFEI RMP	\$0	\$170,000	<ul style="list-style-type: none"> • PCB, CEC, and nutrient load estimates for watersheds draining to San Francisco Bay • Technical report

Task 3. Estuarine Sediment and Water Quality Management Toolbox			\$1,220,000		
Q1-12	1. In-Bay PCB, CEC, and Sediment Model	SFEI RMP & NMS	\$780,000	\$400,000	<ul style="list-style-type: none"> Sediment, PCB, and CEC fate model for the Bay and key priority margin areas Evaluation of PCBs, CECs, and sediment: compare scenarios of different loadings, identify optimal management options
Q1-8	2. Food Web Bioaccumulation Model	SFEI RMP	\$140,000	\$0	<ul style="list-style-type: none"> PCB food web model
Q1-12	3. In-Bay Nutrient Transport Model	SFEI NMS	\$0	\$500,000	<ul style="list-style-type: none"> Nutrient transport model for the Bay
Q10-12	4. Source Apportionment	SFEI RMP & NMS	\$150,000	\$100,000	<ul style="list-style-type: none"> Apportion nutrient sources to particular sub-regions of SF Bay Identify zones of influence, and assess sediment provenance and fate
Q13-16	5. Community Model	SFEI NMS	\$150,000	\$60,000	<ul style="list-style-type: none"> Model documentation Updates and versioning of the model based on expert feedback Convene users and advisors Web hosting for open source use, and model maintenance
Task 4. Management Applications			\$780,000		
Q2-8	1. Future Scenario Evaluation	SFEI RMP & NMS	\$300,000	\$75,000	<ul style="list-style-type: none"> Identify plausible biological (e.g. blooms), physical (e.g. stratification), and biogeochemical consequences on existing and future nutrient loading & recommended protected nutrient levels in a final report
Q8-16	2. Nutrient Management Alternatives	SFEI NMS	\$230,000	\$45,000	<ul style="list-style-type: none"> Establish the biogeochemical consequences of proposed nutrient removal strategies and inform 'safe' levels of nutrients in the Bay in a final report and site-specific evaluations.
Q1-8	3. Nature-based Solutions	SFEI NMS	\$250,000	\$150,000	<ul style="list-style-type: none"> Planning-level designs for three horizontal levees or treatment wetlands at wastewater treatment facilities Quarterly meetings with dischargers and regulators to address barriers to NbS implementation
TOTAL			\$2,980,000	\$2,980,000	



Strategy for In-Bay Fate Modeling to Support Contaminant and Sediment Management in San Francisco Bay

Prepared by:

Craig Jones
Integral Consulting

Don Yee and Jay Davis
San Francisco Estuary Institute

CONTRIBUTION #1060 / AUGUST 2022

2022 Modeling Strategy

11. Discussion: In-Bay Fate Modeling to Support Contaminant and Sediment Management in San Francisco Bay (60 minutes)

Desired Outcome: Obtain Workgroup input on progress to date and the proposed multi-year workplan.

- Draft strategy discussed at April 2022 PCBWG meeting, finalized in August 2022
- General foundation for beginning a multi-year, adaptive workplan
- Addresses management questions for:
 - PCBs
 - Sediment
 - CECs
 - ECWG
 - RMP Status & Trends
- Building on and coordinated with extensive nutrient modeling



RMP
REGIONAL MONITORING
PROGRAM FOR WATER QUALITY
IN SAN FRANCISCO BAY

sfei.org/rmp

Strategy for In-Bay Fate Modeling to Support Contaminant and Sediment Management in San Francisco Bay

Prepared by:

Craig Jones
Integral Consulting

Don Yee and Jay Davis
San Francisco Estuary Institute

CONTRIBUTION #1090 / AUGUST 2022

In-Bay Modeling Connects Multiple Projects and Funding Sources

- RMP
 - Special Study 2022: \$75K
 - **RMP** part of USEPA WQIF: **\$960K**
- RMP/NMS
 - SEP Sediment Transport and Fate Modeling: \$408K
- NMS
 - Additional funds from NMS and WQIF related to light attenuation modeling
- Substantial funding has already been committed
- Primary focus is PCBs and nutrients, but intent is to also address ECWG and SedWG questions



The Modeling Team

- Craig Jones (Integral)
- Sam McWilliams (Integral)
- Allie King (SFEI)
- Don Yee (SFEI)
- Frank Gobas (Simon Fraser University)
- David Senn (SFEI)
- Jay Davis (SFEI)
- Others TBD



Priority Management Questions: PCB Workgroup

1. What are the rates of recovery of the Bay, its segments, and in-Bay contaminated sites from PCB contamination?
 - a. What would be the impact of focused management of priority margin unit (PMU) watersheds?
 - b. What would be the impact of management of in-Bay contaminated sites (e.g., removing and/or capping hotspots), both within the sites and at a regional scale?

Priority Management Questions: Emerging Contaminant Workgroup

1. Which CECs have the potential to adversely impact beneficial uses in the Bay?
2. What are the sources, pathways, and loadings leading to the presence of individual CECs or groups of CECs in the Bay?
3. What are the physical, chemical, and biological processes that may affect the transport and fate of individual CECs or groups of CECs in the Bay?
4. Have the concentrations of individual CECs or groups of CECs increased or decreased
5. Are the concentrations of individual CECs or groups of CECs predicted to increase or decrease in the future?
6. What are the effects of management actions?

Priority Management Questions: Emerging Contaminants

- What is the predicted spatial and temporal extent of potential impact of CECs?
- What are areas of management interest where CECs should be monitored to assess S&T in water and sediment?

Priority Management Questions: Sediment

3. What are the sources, sinks, pathways and loadings of sediment and sediment-bound contaminants to and within the Bay and subembayments?
4. How much sediment is passively reaching tidal marshes and restoration projects and how could the amounts be affected by management actions?
5. What are the concentrations of suspended sediment in the Estuary and its segments?

Phase	Goals	Duration
Phase 1—Site Model for San Leandro Bay and Whole-Bay Dilution Model	Use existing NMS model to address specific PCB loading and sediment recovery questions in SLB. Investigate transport and dilution patterns of dissolved phase CECs from various sources of interest at the whole-Bay scale.	1 year starting in Q1 of 2023
Phase 2—Site Model for Steinberger Slough/Redwood Creek (SS/RC)	Use existing NMS model to address specific PCB loading and sediment recovery questions in SS/RC.	1 year starting in Q3 of 2023
Phase 3—Whole-Bay Model Development	Develop and validate a whole-Bay sediment and contaminant fate model for use in addressing management questions.	2 years starting in Q2 of 2023
Phase 4—Bioaccumulation Model Development	Develop and validate a bioaccumulation model suitable for application with the PMU models.	2 years starting in Q3 of 2023
Phase 5—Model Maintenance and Future Applications	Investigate long-term scenarios, maintain the model, and provide model applications to other management challenges in the Bay.	Ongoing

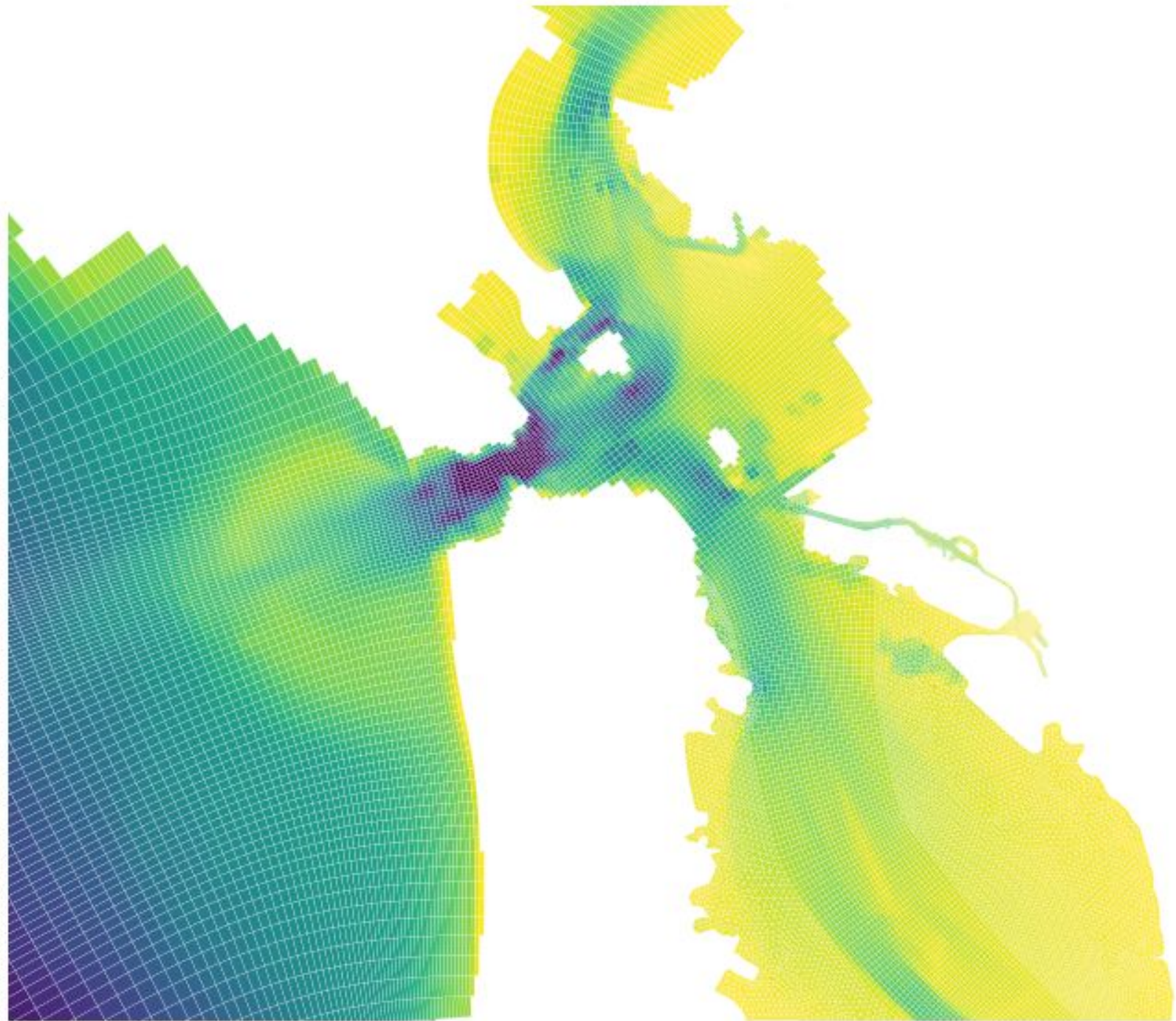
Challenges

- No one model scale, setup, calibration will address all questions
- Each question requires specific metrics to address, which in turn requires specific data for calibration and validation
- Various workgroup needs will have model convergence and divergence points within the same modeling framework

Builds on a Lot of Previous Work

- Monitoring
- PCB modeling
- Nutrient modeling

3D model reproduces
water levels, velocities, and
salinities well throughout
the Bay



Longer-term Timeline

- June PCBWG – Outline of conceptual site model, data gaps, and selected modeling approach; refine timeline
- October 2023 - **Model documentation (part 1)**: compilation of existing information on (a) sediment loadings and boundary conditions and (b) sediment properties and parameters
- November 2023 – Outline of hydrodynamic, sediment transport, and sediment bed model development, validation, and results
- May 2024 – **Draft report** addressing the PCB management questions for San Leandro Bay and illustrating how the approach can be broadly applied
- After that – Whole Bay model, Steinberger Slough model, food web model

WG
Meeting in
Nov/Dec





RMP

REGIONAL MONITORING
PROGRAM FOR WATER QUALITY
IN SAN FRANCISCO BAY

sfei.org/rmp

12. Information: Integrated Watershed-Bay Modeling Strategy (15 minutes)

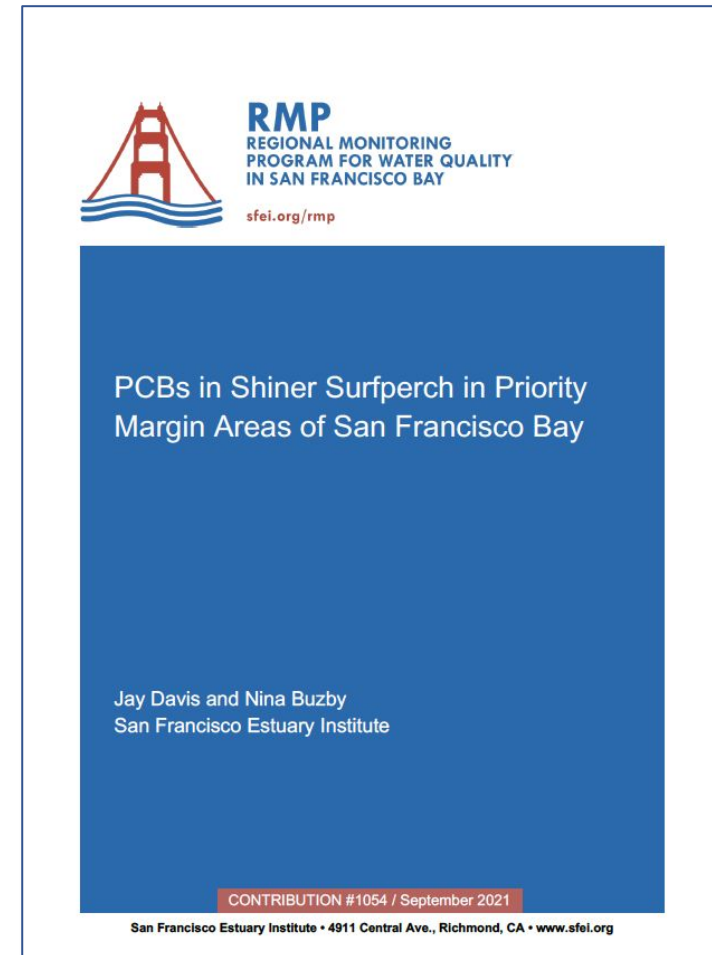
Desired Outcome: Informed Workgroup

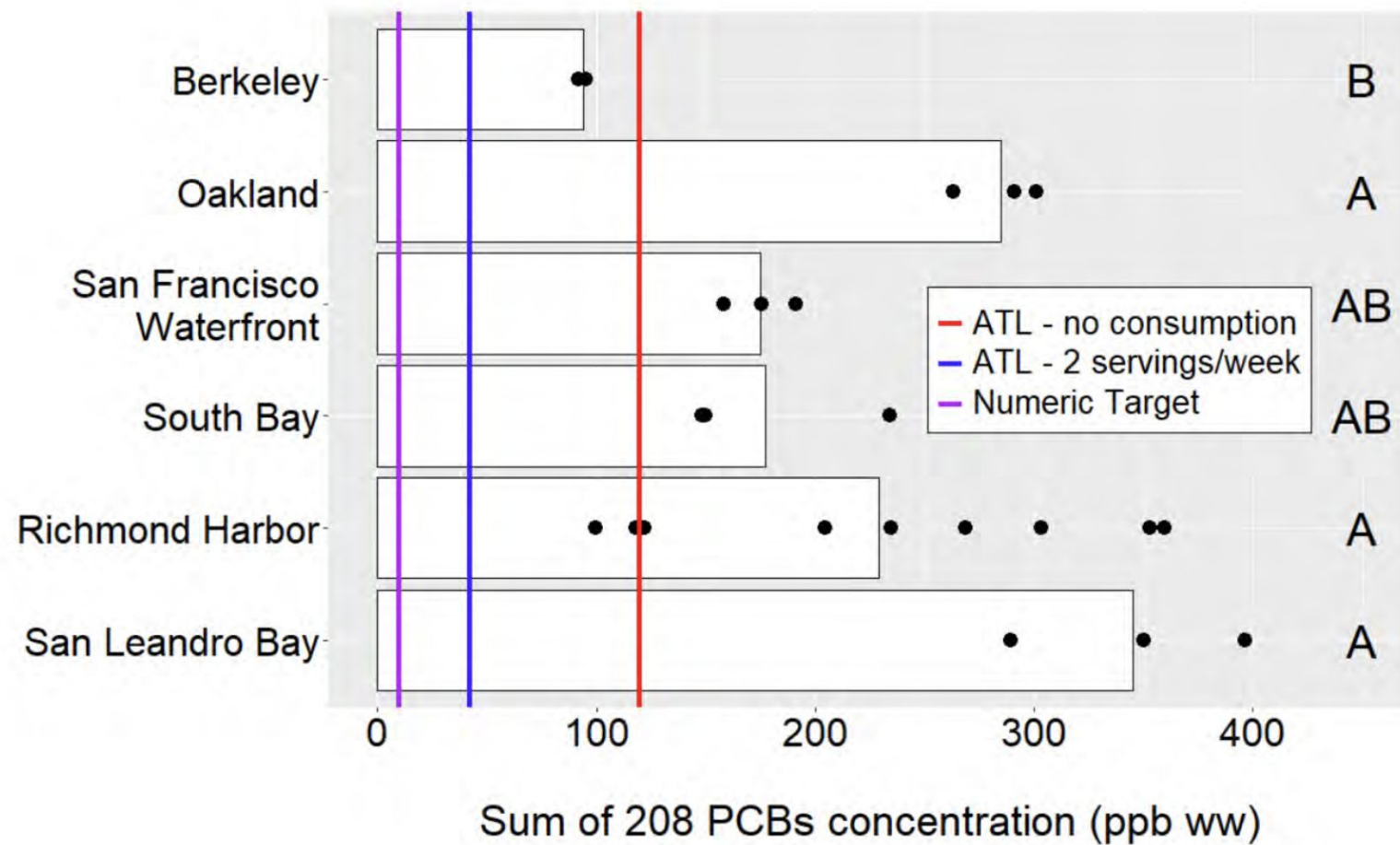
13. Decision: PCBWG Proposals for 2024 (55 minutes)

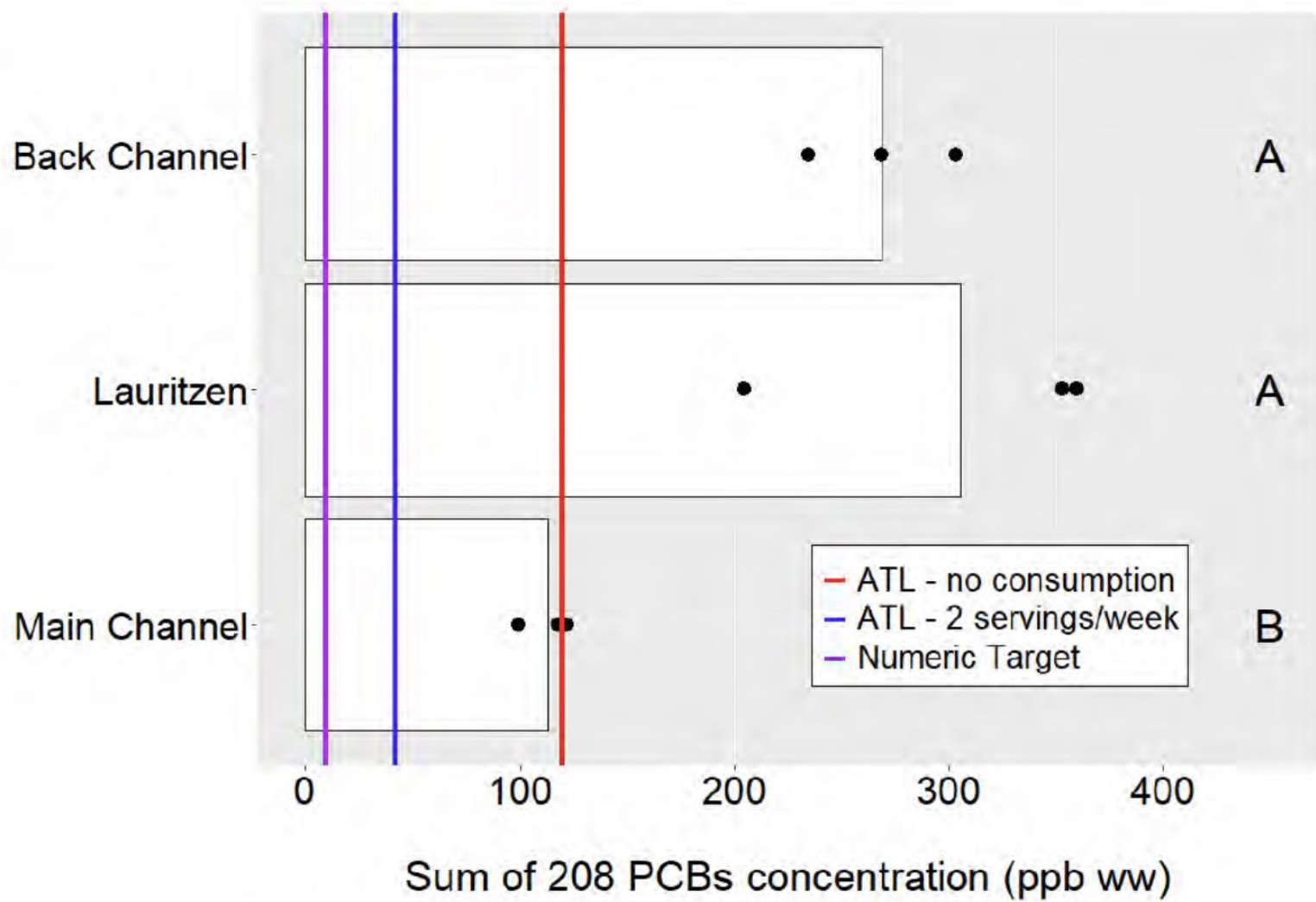
Desired Outcome: Workgroup recommendation on the proposed studies

Proposal #1: Priority Margin Unit Shiner Surfperch PCB Trend Monitoring

- Piloted in 2019
- Candidate for inclusion as part of Status and Trends







Budget breakdown

# of Sites	4
# of Fish Composites per Site	3
# of Samples to Collect	12
Collection Cost per Sample	\$ 2,000
Sample collection cost	\$ 24,000
Dissection and Comp per Sample	\$ 110
Total Dissection and Comp	\$ 1,320
Analytical Cost per Sample	\$ 930
# of Field Samples to Analyze	12
QA Samples	2
Total Analytical Cost	\$ 13,020
Data Management	\$ -
Total Cost	\$ 38,340

Cost per station:

~\$9000