

 <p>SFEI AQUATIC SCIENCE CENTER</p> <p>4911 Central Ave Richmond, CA 94804</p>	<p>RMP Steering Committee</p> <p>January 29, 2015 10:00 AM – 3:00 PM</p>
---	---

WEBEX Info

<https://sfei.webex.com/sfei/j.php?MTID=md07b7c882510b596b88f34fda40f0390>

Join by phone: 1-650-479-3208, Access Code 625 368 895

AGENDA

1.	Introductions and Review Agenda	10:00 Tom Mumley
2.	Decision: Approve Meeting Summary from November 13, 2014 Steering Committee Meeting and Multi-Year Planning Workshop Desired outcome: To approve the meeting summary	10:05 Tom Mumley
3.	Information: TRC Meeting Summary Topics discussed at the December TRC meeting included: the 2015 Detailed Workplan, benthic invertebrate indicators, proposed Bay margins sampling, and PCB Special Studies.	10:10 Phil Trowbridge
4.	Decision: 2014 Budget Status, Incomplete 2014 Projects, and Funds to be Carried-Over to the 2015 Budget Desired outcome: To approve the incomplete 2014 projects (and funds) to be continued in 2015	10:20 Lawrence Leung Phil Trowbridge
5.	Decision: Outline and Budget for 2015 Pulse Report A revised scope for the Pulse has been developed in consultation with the Chair and Vice Chair. The report will have a greater emphasis on the use of infographics and significantly less emphasis on text. The revised outline and a mockup of a section for one of the contaminants (PCBs) are attached. The revised budget is \$125K. Desired outcome: To approve the Pulse report outline and budget	10:35 Jay Davis
6.	Decision: Request to merge Set-Aside Funds and to establish a Monitoring Contingency Fund Desired outcome: To approve the recommended policies and to discuss what a future policy for requests for undesignated funds should contain	10:50 Phil Trowbridge
7.	Decision: 2015 Multi-Year Plan, 2015 Program Plan and 2015 Detailed Workplan Desired outcome: To approve the 2015 planning documents	11:15 Phil Trowbridge

8.	Decision: Fees for Cooling Water Participants Desired outcome: To decide fees for Cooling Water participants for 2015 and establish a subcommittee to recommend fees for 2016	11:30 Thomas Mumley
	Lunch Break	12:00
9.	Discussion: Presentation of Draft RMP Charter Desired outcome: To inform the committee about the draft RMP Charter and to receive initial comments. Committee Representatives may also send written comments after the meeting.	12:30 Dave Ceppos Rich Wilson
10.	Discussion: Topics for SOTE Conference Desired outcome: To solicit advice about draft presentation topics for the plenary session and 2 RMP concurrent sessions at the SOTE Conference	1:30 Phil Trowbridge
11.	Discussion: Topics for Estuary News Desired outcome: To inform the committee about potential topics for upcoming Estuary News articles and to receive comments from the committee on articles to date and future topics	2:00 Jay Davis
12.	Discussion: Status of Deliverables, Action Items, and Upcoming Meetings Desired outcome: To inform the committee about RMP deliverables and upcoming meetings and the new methods that will be used in 2015	2:15 Phil Trowbridge
13.	Discussion: Planning agenda topics for March and June meetings Desired outcome: To identify program updates and topics that the Committee would like on the agenda for future meetings.	2:45 Jay Davis
14.	Discussion: Plus/Delta	3:00 Thomas Mumley
14.	Adjourn	3:05



SAN FRANCISCO ESTUARY INSTITUTE

4911 Central Avenue, Richmond, CA 94804 • p 510-746-7334 • f 510-746-7300 www.sfei.org

RMP Multi-Year Planning Workshop

November 13, 2014

San Francisco Estuary Institute

Meeting Summary

Priority discussions for review are highlighted in yellow.

Attendees

SC Member	Affiliation	Representing	Present
Jim Ervin	City of San Jose	POTW-Large	Yes
Dan Tafolla	Vallejo Sanitation and Flood Control District	POTW-Small	Yes
Karin North**	City of Palo Alto	POTW-Medium	Yes
Adam Olivieri	BASMAA / EOA, Inc.	Stormwater	Yes
Peter Carroll	Tesoro Golden Eagle Refinery	Refineries	Yes
John Coleman	Bay Planning Coalition	Dredgers	Yes
Rob Lawrence	US Army Corps of Engineers	USACE	Yes (by phone)
VACANT		Industry	NA
David Frandsen	NRG Energy	Cooling Water	Yes
Tom Mumley*	SFB Regional Water Quality Control Board	Water Board	Yes

* Chair, ** Vice Chair

Guests and Staff

- Rod Miller (SFPUC)
- Luisa Valiela (EPA)
- Chris Sommers (EOA, Inc.)
- Karen Taberski (Water Board)
- Austin Perez (BPC)
- Jay Davis (SFEI)
- Phil Trowbridge (SFEI)
- Adam Wong (SFEI)
- Warner Chabot (SFEI)
- Lawrence Leung (SFEI)
- Dave Senn (SFEI)
- Lester McKee (SFEI)

I. Goals and Ground Rules [Tom Mumley]

Tom Mumley began the meeting by stating the goals of reviewing the multi-year plan and setting short and long term priorities. He explained that typically this will relate to determining potential funding levels for pilot and small studies, specifically the 2016 pilot and special studies.

II. Action: Anticipated management decisions and policies, and related information needs [Tom Mumley]

Discussion began by focusing on the Current and Anticipated Management Decisions, Policies and Actions by the Regulatory Agencies that Manage Bay Water Quality table found on page 6 of the draft Multi-Year Plan (MYP).

Biennial 303(d) List and 305(b) Report

Tom Mumley explained that the schedule for updating the 303(d) list and 305(b) report will not be biennial for every region. The state will be split into three groups of regions, with each group only having to deliver an update every six years. Region 2 is part of the group that will update the 303(d) list in 2016 and 2022.

Legacy Pesticides (DDT, Dieldrin, Chlordane)

Tom Mumley explained that the item within the table relates to reviewing a possible delisting of the legacy pesticides. Legacy pesticides were considered for delisting due to an updated OEHHA analysis, which indicated that they were no longer a significant risk. However, enough measured values are still above California Toxics Rule (CTR) thresholds that it appears that these pollutants cannot be delisted. Tom acknowledged that there are not any dials to turn to lower legacy pesticide loads and immediately improve conditions.

Sediment Quality Objectives and Hot Spots

Sediment Quality Objectives and Sediment Contamination Hot Spots were listed on two different rows of this table in the past, but Tom Mumley explained that it was decided that they were too closely related and so they were merged. There are still hotspots that are listed and need attention. The Water Board had proposed that special studies monies be used to reassess Pacific Drydock in the Oakland Inner Harbor. It was considered a low priority by the TRC, and therefore was not funded by the RMP for 2015. The Water Board is directing SWAMP resources for the reanalysis of that site and others.

Mercury and PCBs

Luisa Valiela wanted to clarify that there was work to be done before the listed dates for TMDL re-evaluation of 2018 (Mercury) and 2020 (PCBs). She was under the impression that the TMDL revisions were due earlier than those dates. Tom Mumley explained that originally the concept was for a 10 year review, which would have meant 2014/2016, but the decision was made to push that off until 2018/2020. He said that some of the dates within the table were facts, like the triennial review for copper and cyanide or the 303(d) list update. Other dates have fluidity and he was looking for stakeholder feedback. Adam Olivieri expressed a desire for a clearer idea of how the synthesis documents, integrated monitoring reports, and Clean Water for Clean Bay data were brought together to inform the date change decisions. Tom accepted the challenge on behalf of Water Board staff to produce a frame of reference document to

show where we are and where we are going for both PCBs and Mercury. Generally he thought that the date change was a result of workload issues, but agreed that there were other factors in play. He wanted to ensure that they were clear on what information would be used to do a robust review. He added that next year, there would be a better vetted PCB plan.

Selenium

Peter Carroll asked if the pending EPA Region 9 selenium water quality criteria belonged on the chart. Tom agreed that for completeness sake, it should be added.

Dioxins

Peter Carroll began the discussion by asking why the subtitle for this box was vague, and that it implied that there might be no delisting or no TMDL. Tom explained that the fact that the Bay can assimilate dioxin loads in the short term has made it reasonable for recent permits to not have numeric discharge limits for dioxin. He noted that a Dioxin TMDL, similar to the selenium work, could add flexibility by establishing wasteload allocations to dischargers, instead of relying on default calculations from the State implementation policy. There was further discussion that currently there is no push from EPA to act on dioxins, and if there was, the Water Board would be looking first for EPA to develop a national strategy. Peter clarified that all refineries do have numerical limits on their discharges, but it is based on TEQs and, at least at Tesoro, the TEQ values are 0.0 currently.

Pathogens

Adam Olivieri asked to clarify the pathogens section, as he was under the impression the TMDL was just for indicators at Bay beaches. Tom said he would get additional information, but yes it was for Bay beach listings at Candlestick Point, Aquatic Park in San Mateo, China Camp in Marin, and a few others. The listings were an outgrowth of beach monitoring and each was unique, developed with local players.

Mercury and PCB (2)

There was a quick point made by Luisa Valiela that a link should be shown between the 2018 and 2020 Mercury and PCB TMDL revisions and the 2015/2020 reissuances of the Municipal Regional Stormwater Permit. Tom agreed, and said that by the 2020 reissuance, hopefully the PCB and Mercury reviews are done, as the Mercury TMDL calls for municipalities to reduce loads by 50%, and that number needs a reality check. Adam Olivieri added there could also be a link shown to the POTW permit.

Action Items

1. Phil
 - a. Update the Current and Anticipated Management Decisions, Policies and Actions table on page 6 of the draft MYP to reflect the feedback from the meeting.
2. Tom
 - a. The Water Board will produce a “frame of reference” document on where we are and where we are going with mercury and PCBs in the basin. The document will contain information on all that has been done (e.g., PCB Synthesis) and is planned to provide the information needed to revise the TMDLs for mercury and PCBs.

III. Information: Overview of existing plans and budgets, possible future direction, updated Multi-Year Plan [Phil Trowbridge]

Phil began by providing an overview of spending within the RMP. He outlined that the two biggest items are Status and Trends monitoring and Special Studies. The S&T monitoring effort costs have seen reductions due to savings recently, allowing those monies to be spent elsewhere. There are plans for the most recent \$120k reduction to be used to fund margins work. Overall the S&T budget has stayed the same but the base work is now cheaper, in total it is around \$900k per year on average. Special Studies has been \$1.15 million on average per year, and that is the number used for future planning. Phil explained that the proposals for special studies funding in the MYP are greater than the \$1.15 million funding level, because demands are simply higher than available funding.

Undesignated Funds

Phil presented a graph of the RMP Undesignated Funds Balance from 2003 to 2015, explaining that in previous years these fund had been referred to as unencumbered funds. That term had been causing some confusion with the auditors, so the language was changed. Chris Sommers asked what happened in 2009, when the balance dropped by ~\$200k. Phil and Lawrence Leung explained that a monitoring shortfall from 2008 had to be replenished, and additionally there were monies used to fund the Dioxin Strategy. Tom said he appreciated the data in graphical form and hoped it allowed the Steering Committee (SC) to be better informed when there were future requests to use those funds.

Special Studies Multi-Year Plan

Jay Davis presented a draft of the MYP, with the intention of incorporating comments into a final draft for approval at the next SC meeting. Adam Olivieri relayed that his project managers liked being able to see the document, and wished it was more easily accessible from the website. Jay explained that the plan was deliberately difficult to find on the website, in that the document was not intended for a broad audience, but that SFEI would explore ways of making it more readily available to stakeholders. The group agreed to have comments back to Jay by December 15, 2014, and that the final version would be ready for the meeting in January. Before moving on, Chris wanted to make sure people knew that the projected numbers were soft numbers representing needs, but with large error bars. Karin suggested that there be a stronger visual cue (e.g., italics) for forecasted numbers (2016 and on). Chris pointed out that special studies originally only comprised around 17% of the overall budget, and that number was now up to 32%. This indicated a growing need while the whole pot of money had not grown very much.

Action Items

1. SFEI Staff
 - a. Make the MYP available on the website more easily. Make sure stakeholders have the actual URL of the document and direct links to important documents.
2. SC Members
 - a. Have review comments in by December 15th - this is to be based on the current document, with the knowledge that there is cleanup that is in progress already
3. Jay
 - a. Have new version of the MYP ready for the January SC meeting (by Jan 1).
4. Phil
 - a. Update the RMP Special Studies 2013-2018 table on Page 13 to make it clearer that 2016-2018 numbers are estimates.

IV. Specific program priorities for 2016 and general priorities for 2017-2020 [Tom Mumley]

Nutrients

David Senn introduced the subject of RMP funding of Nutrients work by explaining that there is now a Nutrients Steering Committee that is guiding Bay wide work. Additionally, expenditures in this arena are not just from the RMP, but also from the Watershed Nutrients Permit. He said that needs for funding were growing, but that did not presume that those needs would all be met by the RMP. Currently, \$880k comes from the Watershed Nutrient Permit, and \$500k comes from RMP funding, and additional sources of revenue are being pursued. Tom added that the Nutrients program is in a transition phase. With the formation of the Nutrient Steering Committee, things will be much clearer next year. The Science Plan that David Senn is working on will give the details of proposed studies along with cost estimates. The proposals contained in the Science Plan were not constrained by funding possibilities, though the actual implementation of those proposals obviously will be.

Adam Olivieri made a point about the timelines for data needs. The dates of regulatory drivers that were covered earlier in the meeting would serve as deadlines for which special studies work needed to be done, and when. If the dates from Management Decisions, Policies, and Actions table were flexible, then the deliverables would become more doable. Local agencies are constrained and are not able to easily increase funding for these projects. Tom Mumley explained that the goal is to have nutrients standards established in 10 years, though depending on when you set the start date, and what you see as the end product, there is some flexibility in the actual end date. A Basin Plan amendment is one possible option, but a standards action could possibly be delayed if there is close coordination on the reissuance of the Watershed Nutrients Permit. The variables of time and effort allow for some flexibility, but the Water Board wants to be able to make a very informed decision in 10 years.

David Senn added that the numbers represented nonspecific needs for funding for nutrients work. Tom clarified that these numbers are not meant as locked earmarks, and Jay Davis said that these numbers were meant to represent funding levels up to which the RMP would consider funding special studies.

Small Tributary Loading Studies

Jay Davis and Lester McKee began by explaining that the wet weather studies are moving in a new direction. This year there will be a reconnaissance study with an emphasis on contaminant concentrations on suspended particles. Additionally there will be some work on the spreadsheet model and a trends strategy. Lester explained that the wet weather studies funded by the RMP had been focusing on Questions 1 through 3 from the Municipal Regional Permit (MRP) up until this point. SFEI has been doing work on Question 4, but with outside grant funding (EPA for instance). With a static level of funding from the RMP, the implication would be a decreased level of work on Questions 1 through 3 moving forward in order to do some of the Question 4 work, or a necessity of increased funding. The numbers out in 2018 and 2019 are even less certain due to the renewal of the MRP, and the changes in funding distribution or level that would come with it.

Discussion of Nutrients and STLS funding

Karin raised the issue that the MYP shows an increasing funding need for nutrients but a flat budget for stormwater (STLS). This could give the wrong impression to dischargers about the programs priorities.

Tom agreed that it was unwise to show an increase in the proposed nutrients budget; it sent the incorrect message that there was a prioritization of nutrients over STLS. The group agreed to set the funding level at \$500k for both nutrient and STLS, with the agreement that that number would not represent a hard cap on the total level of funding for proposals that the SC would hear for either program. SFEI will send out a revised MYP to be reviewed for the January meeting.

Mercury

Tom Mumley explained that the \$0 funding level shown in the MYP for all years was a reflection of no additional studies being projected. The RMP did sponsor a workshop on mercury in wetlands. There are still questions to ask and ongoing monitoring needs, but they are beyond the RMP for now. Chris Sommers pointed out that because mercury is a driver for small tributaries, there is still work being done there. It is also part of RMP S&T monitoring.

PCBs

Jay Davis introduced the new path that the PCB Strategy is moving down, in conjunction with STLS, looking to identify high leverage watersheds with monitoring in the Bay margins areas where these watersheds discharge. Five top target watersheds will be selected, with the first having conceptual model and mass balance work done in 2015. Monitoring efforts will be designed to be inexpensive, starting at one site in 2016. That effort would ramp up to all five in 2018/2019, and would represent an ongoing expense.

There was then a discussion about the balance between the targeted PCB sampling in the margins and the randomized margins work funded through S&T. Chris Sommers asked whether the targeted approach might inform stakeholders more quickly. Tom Mumley added that the two efforts were not exclusive of each other, and that he also shared concerns that the randomized sampling did not account for our existing knowledge. Phil Trowbridge asked where the discussions about the targeted and randomized sampling could be unified. The group agreed that it would be on the agenda for the next TRC meeting, though it might be brought to an ad hoc workgroup after that. The group had no issues with the proposed funding level for PCBs at this time.

Dioxins

The only remaining item is the Dioxins Synthesis, which has been pushed back to 2016.

Emerging Contaminants

Contaminants of Emerging Concern (CECs) have been nominally funded at \$100k each year. In 2014 that number was bumped up using undesignated funds. There were no firm plans presented for the next few years, but the funding level was kept the same. Tom Mumley shared that Becky Sutton at SFEI is working crafting a new long-term plan for CECs, and that the needs will be much larger than the numbers presented. When her work is done, it will be possible to be much more specific about needs for prioritized work.

Exposures and Effects

Jay Davis explained that sediment benthos and toxicity work was postponed for now. The \$45k funding proposed for exposures and effects work would be used to study hotspots of sediment contamination.

Selenium

Jay Davis explained that a simplified Selenium Strategy is being implemented. Tissue plug sampling of sturgeon was piloted this year, and will become an ongoing monitoring effort with low sampling costs because it is piggybacked on specimen tagging efforts by CDFW. Other sampling avenues are being explored, including egg collection from the water column and fin ray analysis that could potentially provide multi-decadal data. Both are in early stages. Tom Mumley talked about the TMDL being a mechanism to provide regulatory certainty for the dischargers while also providing protection for the Bay. The long term and ongoing RMP data would serve as a backstop to identify any trends.

Ocean Acidification

Phil Trowbridge explained that the initial approach for the Bay would be a synthesis to determine what we have in the current databases. Simple pH data is too noisy. The goal will be to look at ratios of other acidification parameters such as hardness, alkalinity, pCO₂ to calculate aragonite saturation states. Jim Ervin shared that, even accounting for large error bars, over many decades their (City of San Jose) data showed pH moving up. Nothing has been proposed yet, but Phil is working on a proposal for the TRC. Tom Mumley expressed the need to present more than an exploration of whether acidification could happen, to include the potential impacts as well.

Action Items

1. SFEI Staff (Dave/Jay/Phil)
 - a. Amend tables on pages 13, 18 and 19 to reflect MYP discussion.
 - b. Add an item to TRC agenda to discuss a how to synthesize the following related projects: PCB Strategy, PCB Conceptual Model, Bay Margins Sediment Monitoring, PCB Priority Margin Unit Conceptual Model (and monitoring eventually), and regulatory drivers (MRP). The TRC can create an ad hoc subcommittee to work on this issue if needed.
 - c. Research the potential impacts of ocean acidification on the Bay and prepare a special study proposal for the TRC to consider.
 - d. Track the adoption of CEC guidance by the State Water Board and determine if there will be any funding allocated to implementation.

V. Summary, Action Items, Adjourn Planning Session

Phil Trowbridge asked if there was any opposition to a summary of the meeting being posted online. It was agreed to make that decision part of SC business for January.

Action Items

1. Phil
 - a. Distribute the MYP Workshop meeting summary to the SC in January and ask for approval. Even though the SC does not include everyone who was present at the MYP workshop, the SC is the appropriate body to approve the summary.
 - b. Past meeting summaries are valuable and should be posted on the RMP website.



SAN FRANCISCO ESTUARY INSTITUTE

4911 Central Avenue, Richmond, CA 94804 • p 510-746-7334 • f 510-746-7300 www.sfei.org

RMP Steering Committee Meeting

November 13, 2014

San Francisco Estuary Institute

Meeting Summary

Priority discussions for review are highlighted in yellow.

Attendees

SC Member	Affiliation	Representing	Present
Jim Ervin	City of San Jose	POTW-Large	Yes
Dan Tafolla	Vallejo Sanitation and Flood Control District	POTW-Small	Yes
Karin North**	City of Palo Alto	POTW-Medium	Yes
Adam Olivieri	BASMAA / EOA, Inc.	Stormwater	Yes
Peter Carroll	Tesoro Golden Eagle Refinery	Refineries	Yes
John Coleman	Bay Planning Coalition	Dredgers	Yes
Rob Lawrence	US Army Corps of Engineers	USACE	Yes (by phone)
VACANT		Industry	NA
David Frandsen	NRG Energy	Cooling Water	Yes
Tom Mumley*	SFB Regional Water Quality Control Board	Water Board	Yes

* Chair, ** Vice Chair

Guests and Staff

- Dave Ceppos (CSUS-Center for Collaborative Policy)
- Lawrence Leung (SFEI)
- Jay Davis (SFEI)
- Phil Trowbridge (SFEI)
- Adam Wong (SFEI)
- Warner Chabot (SFEI)
- Jim Kelly (SFEI)

I. Approval of Agenda and Minutes [Tom Mumley]

Peter Carroll reopened the discussion from the July 12th meeting summary with regards to the detail level of SC meeting summaries. The group agreed that SFEI will continue to provide summaries with the same level of detail. When SFEI sends out the meeting summary for review, they will highlight sections of particular importance for review. No sections were deemed to be of issue in the previous summary.

Items for Approval:

Adam Olivieri motioned to approve the previous SC Meeting Minutes, Karin North seconded, and they were unanimously approved.

II. Confirmation of Chairs [Tom Mumley]

Peter Carroll began a brief discussion about the possibility of term lengths and limits, and the group agreed that those items should be codified in the forthcoming draft Charter.

Items for Approval:

Peter Carroll motioned to maintain the current Chairperson, Tom Mumley, and Vice-Chair, Karin North. Adam Olivieri seconded the motion. SC members voted unanimously in favor of the proposal.

III. Information: TRC Meeting Summary [Phil Trowbridge]

Phil Trowbridge highlighted four issues from the September 23, 2014, TRC meeting.

1. A two-year proposal for the randomized monitoring of the Bay margins was delivered to the TRC, with a scope of work totaling \$511k over two years. The TRC requested that SFEI look into ways to reduce that budget. SFEI has since issued a small Request for Proposals in order to receive more realistic numbers from subcontractors. During this process, Water Board staff and others expressed the desire for targeted sampling to complement the randomized Margins sampling. SFEI is currently working on a revised proposal for the TRC.
2. USGS presented on their suspended sediments work, projecting an increase of \$60k in costs for the next year to maintain their current level of work. The RMP has been using USACOE funding for this project, which has been provided at a static level since 1992. A request for funding has been submitted to the Bureau of Reclamation, but no response has been received yet.
3. Phil presented his decision to not shift the RMP to a fiscal year, which the TRC agreed with. The proposal has been postponed until FY 2017. Additionally, Phil relayed that he had checked with the auditors, and the RMP would not incur additional costs due to remaining on a Calendar Year accounting while SFEI switched to a Fiscal Year.

4. The TRC recommended that \$8,000 of undesignated funds be allocated to add the 2012 bird egg data to the 2006/2009 Bird Egg Report. This proposal was sent to the SC by email, and was unanimously approved on October 2, 2014.

Adam Olivieri raised a question with regards to Page 1 of the TRC minutes, indicating that it was unlikely that Chris Sommers had presented on Dave Ceppos charter development work.

Action Items:

1. SFEI Staff will confirm TRC minutes from 9/23/14. Double check who reported on the Charter Review (listed as Chris Sommers).

IV. Information: 2014 Budget Status [Lawrence Leung]

Lawrence Leung reviewed the November 6 Memo. He highlighted that SFEI would like to combine all the active RMP projects into the current budget year, rather than keeping old budget years open for multiple years. Tom Mumley and Karin North agreed with the proposal, no vote was taken as it was pointed out that this was a previously agreed upon item that was only now being implemented.

Adam Olivieri asked for clarification about the various representations of the \$200k reserve funds across the first figure on page 23, the chart on page 24, and the chart on page 38 of the agenda package. Additionally, he and Karin North identified several uses of "unencumbered funds" left un-updated in the documents.

Adam Olivieri also inquired as to the composition of the carryover funds originating from 2013. Phil Trowbridge explained that these funds were mainly from the Nutrients conceptual model work and wet weather sampling that was delayed due to drought conditions. These items can be seen as lines 4.6 and 4.7 in the Item 4, Attachment 2.

Tom Mumley opened discussion about the appropriate location to account for incoming monies from Caltrans. He explained that the current line item under "Cash, Set-Asides, and Undesignated Funds as of reporting date", seemed inappropriate as Caltrans is contractually obligated to deliver those funds. Karin North explained that in the past, Meg Sedlak had been reticent to include the Caltrans monies in the budget until they were in hand. Tom Mumley elaborated that previously, Caltrans had not been under contract, but that the budget should be updated to reflect the new situation.

[Note: Subsequent to the SC meeting, SFEI determined that the CalTrans funds are part of the expected stormwater fees. They are tracked as accounts receivable because CalTrans does not pay the fees until they receive an annual report. SFEI includes these funds in the expected RMP fee revenue for the year. These funds do not go directly in the undesignated funds as was suggested at the meeting.]

Action Items:

1. SFEI Staff
 - a. In section starting on page 20, clean up use of "unencumbered" vs. "undesignated"

- b. Develop consistent representation of \$200k reserve policy within the Undesignated fund. Add a note to the Balance Sheet that the RMP has a policy to maintain a \$200k minimum balance of Undesignated Funds.
- c. Figure out where to appropriately account for the Caltrans money. They are contractually obligated to pay us. Are these funds additional revenue that goes directly into the Undesignated Fund?

V. Action: Approval of the Line Item 2015 Budget and the 2015 Program Plan [Phil Trowbridge]

Introduction

Phil Trowbridge began by acknowledging that he had received direction from the SC in the July meeting to deliver a more detailed budget that was better tied to deliverables, with more line items and more categories. In response, he split the “Program Management” category and its 4 line items into two categories: “Program Management” and “Governance”. Likewise, the category “Information Management & Synthesis” was split into “Data Management”, “Annual Reporting”, and “Communications”. Status & Trends and Special Studies remain as categories. In total, the number of line items increased from 36 to 53.

Dredger Revenue

Phil presented dredger revenues for 2015, explaining that there is a shortfall of \$165k due to dredger volumes and their associated fees decreasing due to regulatory incentives. Part of the 2015 budget proposal was the use of the remaining \$88k in the Designated Dredger Reserve Funds and \$77k from Undesignated funds to cover this shortfall. Tom Mumley clarified where the Dredger Reserve funds originated, explaining that a target exists every year for incoming revenues from dredgers, and that any amount received above that target went into reserve. Revenues have been below targets for several years and there is no expectation that that trajectory will reverse. John Coleman asked if the volume calculations for dredgers fees included the beneficial reuse of in-Bay sediments. Phil Trowbridge responded that the algorithm only accounted for in-Bay disposal of dredged materials, as tracked by the Water Board, and that reuse of dredged materials on land was not included. Rob Lawrence explained that there is no current in-Bay beneficial reuse of sediments. Tom Mumley summarized by saying that the current algorithm has probably run its course, and that a new plan is needed.

Set Asides

Phil Trowbridge explained that there is a lot of complexity involved in maintaining separate set asides in multiple categories (Water Chemistry, Program Review, Cormorant Monitoring, etc. See Page 37 of the Agenda). He proposed combining all set asides, and presented the forecasted withdrawals or deposits from 2015 to 2023.

Tom Mumley requested an explanation and some additional thought with regards to the \$111k balance that was projected to be carried at the end of 2023. He explained that part of the carryover related to sediment benthos and toxicity sampling analysis, two items with uncertain futures. He wanted to make sure that these funds were enough to cover those items that the Program is committed to in the future. He

also sought clarification of the necessity to maintain a second reserve in tandem with the undesignated funds reserve.

Phil Trowbridge explained that the current projections included the full costs of items like benthos sampling in 2018, but that by combining each of the set aside items into one item, it would give the Program additional flexibility.

[Note: Subsequent to the meeting, SFEI determined that the reason that there was a projected Set Aside balance of \$111k in 2023 was because there was an \$88k Set Aside for a Program Review that was being carried forward each year. Whenever the SC decides to conduct the next RMP Program Review, these funds will be used up. For the S&T Set Aside funds, there will only be \$23k left over after 2023. Therefore, the S&T Set Asides do not constitute a second undesignated funds reserve.]

Undesignated Funds

Phil Trowbridge presented the ledger of balance changes to the Undesignated Funds. The budgeted use of Undesignated Funds in 2015 would total \$211k.

Program Management and Communications Costs:

Phil Trowbridge opened the discussion by explaining that the increase in Program Management costs was due to an increase from \$12k to \$50k for budgeting and planning. The \$12k budget for this task was unreasonable given the amount of work needed to produce the annual budget, Multi-Year Plan, Program Plan, and Detailed Workplan.

Communications costs were also increased in the 2015 budget due to it being a full Pulse year, as well as for increased stakeholder engagement. Tom Mumley asked to clarify what the costs were for stakeholder engagement. Phil Trowbridge explained that it was a new line item for \$42k and that it reflected requests by outside stakeholders for RMP staff to attend their board meetings. It would include attending different board meetings, other meetings, and phone communications with stakeholders. Tom Mumley clarified that because this was a new line item, this work had previously been a part of general Program Management. Peter Carroll expressed his appreciation of SFEI staff making themselves available, while also pointing out that costs might be highest in this first year with two key individuals (Warner Chabot and Phil Trowbridge) being new to the program. Phil Trowbridge agreed that it was possible that these costs would be reduced in future years. His main goal was to make sure that it was included as a new line item, as this will allow for better tracking and understanding of the true costs of these tasks. He and Karin North both expressed keen interest in what the actual numbers for 2015 would be.

Adam Olivieri asked for clarification about the difference between items 5B (Stakeholder Engagement) and 1E (External Coordination) from the RMP 2015 Expenses table (page 41). Phil Trowbridge explained that 1E was for communicating and coordinating with entities external to the RMP (such as the Delta RMP and SCCWRP), while 5B was for engaging with RMP Stakeholders.

Unfunded Items

Phil Trowbridge wanted to call specific attention to four line items that were included in the budget but were unfunded.

1. The first was California Toxics Rule Water Chemistry Monitoring. The data were last collected 10 years ago, and the cost of completing the monitoring effort is estimated at \$50k for three samples. This cost estimate was high because the RMP would have to collect the samples during the winter season (worse case condition) instead of during the summer during the planned RMP sampling efforts. Tom Mumley expressed agreement on keeping this item unfunded. He acknowledged that there is value in the regulatory arena for these analyses, but wanted to be sure that the current data on hand are not excessively dated. Jim Ervin said that the results for CTR analyses could be confusing and that most importantly he wants the decisions made about monitoring to loop back to the regulatory policy. He stated that if data are not going to be collected, then it seems unfair for the dischargers to be regulated on those parameters. Tom Mumley and Karin North came to the conclusion that the most appropriate course of action would be to have Water Board staff attend a BACWA meeting to discuss whether or not these analyses are an issue.
2. Phil Trowbridge explained that the potential increase in funding for the USGS suspended sediments work was not yet confirmed, so it was not included. The line item for the USGS-Sacramento reflects the current estimate for the cost of that work.
3. Phil Trowbridge then discussed funding for a redesign of the SFEI website. He explained that while the site does need a redesign, funding for that effort was not included in order to balance the budget.
4. Phil Trowbridge explained a similar situation with regard to the line item for Products for New Media (e.g., an eBook for the Pulse). There is work to be done under this line item, but at this point it is a lower priority and thus will remain unfunded. Karin North inquired as to what the cost differential was between the paper Pulse and an eBook version. Adam Olivieri expressed that he was fine with a digital version only. Peter Carroll said that there are varied preferences among his constituents. Karin North asked if reducing the number of copies printed was actually much of a savings; short of not producing a paper version at all, there might not be a large cost savings. Jay Davis clarified that the line item of Products for New Media was for the eBook only, a PDF version of the Pulse was a trivial cost, and would still be produced. Tom Mumley said that he was under the impression that the eBook was a one-time cost and that he was surprised to see it as a recurring item. Phil Trowbridge replied that the original eBook costs for software and developing expertise were one-time costs, but that the development of additional content (videos, interactive elements, etc.) were encompassed by this line item. He added that if the desire was only to animate the PDF version of the Pulse every year, then it would be very close to the one-time cost. Tom Mumley shared that he received feedback that there was added value from video and the like, but that the Program has to work out an optimum communication plan. He added that there would obviously have to be some give and take in the budget if these new media elements were prioritized, that the money would have to be pulled in from somewhere.

2015 Pulse Costs and Content

Adam Olivieri questioned if we need a full edition of the Pulse for 2015. Phil Trowbridge stated that it was planned to be a companion piece to the 2015 State of the Estuary conference, focusing on Pollutants of Concern. Karin North said that, while the plan had been to produce a full Pulse every other year, that should not drive the program to produce a product out of a sense of obligation. She is most interested in a full version if we can produce profiles on Pollutants of Concern similar to those about Contaminants of Emerging Concern produced in 2013. Phil asked if the Pulse would be an appropriate place to capture the outcomes of the reference document that the Water Board plans to produce about where we are and where we are going with mercury and PCB TMDLs. Tom answered that there is not enough time to have that work ready for the 2015 Pulse, and that he worried that there was not enough time for the RMP to both generate the storylines and to produce the content for the Pulse in 2015. He asked how consistently we would be able to rank Pollutants of Concern. He also said that there is no expectation for the Pulse to complement the SOE conference. Jay responded that there was at least some expectation, due to planned work for the Pulse to update indicator values in support of the SOE report. Tom Mumley proposed revisiting the specifics of this line item at a later date, but moving on unless there was a motion to cut it entirely from the budget. Jay Davis expressed his view that the Pulse is the key information product of the RMP, and that he would send out an outline to move the decision process along before the January SC meeting.

Next there was discussion about the differences between the “full” and “lite” versions of the Pulse. Karin gave feedback that her colleagues did not necessarily see the difference, as they both have high production quality. Jay responded that there is a difference in focus between the two versions (the Pulse is about the Bay, while the RMP Update is about the RMP), and that perhaps it would be possible to do a bay-wide focused Pulse with an effort level similar to the RMP Update version. Tom agreed that that option may need to be pursued due to time constraints. He worried that, with approximately 6 months until print, there was not an approved outline and that Jay has additional commitments in the coming year. The agreement was that Jay could move forward with scoping a full version of the Pulse, contingent on approval of the outline that will be sent out before the January meeting.

Dredger Fee Algorithm

Phil Trowbridge and John Coleman discussed a schedule for holding meetings about the algorithm for collecting RMP fees from dredgers. It is anticipated that 2 or 3 meetings will be needed. Phil will coordinate with John to hold a planning meeting in early 2015 to be ready to present the issue at a BPC meeting in May 2015. The issue needs to be resolved by September 2015 when the invoices for the 2016 RMP budget will be issued.

Program Plan

Jay Davis quickly addressed the Program Plan draft, and questioned if it was providing value to the SC in addition to that provided by the Detailed Workplan. Tom Mumley admitted that other than him, very few people probably read the Program Plan, and it is not used as a reference. It was agreed that it would be reviewed in January when it could be compared with the Detailed Workplan.

Items for Approval

1. Karin North motioned to approve the first recommended motion (Page 36). Peter Carroll seconded the motion and it was approved unanimously.

Action Items

1. TM
 - a. Water Board staff will attend a meeting of the BACWA Permits Committee discuss whether water testing for CTR parameters is necessary.
2. JD
 - a. Send out a proposal for the 2015 Pulse to SC via email. (Note: the SC questioned the need for a full Pulse; asked if fewer hard copies could be printed; asked for an eBook minus new content)
3. PT
 - a. Add an item to the January SC agenda to discuss Set-Aside Funds, Monitoring Contingency, CalTrans payments, and Undesignated Funds. Clarify the rationale for having \$100k in S&T Monitoring Set-Aside Funds in 2023. Are these funds needed for the next cycle of expensive monitoring?
 - b. Schedule 2-3 meetings with the BPC, Water Board, and others regarding the algorithm for dredger fees. Schedule an initial planning meeting with BPC. Need a final answer by September 2015.
 - c. Add an item to the January SC agenda to discuss whether both the Program Plan and the Detailed Workplan are needed. The 2015 Program Plan was not approved at the November 13, 2014 meeting.

VI. Action: Set RMP Fees for 2016-2018

Karin North, speaking on behalf of Dan Tafolla and Jim Ervin, conveyed that the POTW community were willing to accept a 3.5% increase in fees, which was approved at the BACWA retreat. Adam Olivieri said that for BASMAA, a 4% fee increase was not possible, and that even going above 2% was difficult to approve. He felt he could put 3% on the table, but also wanted to stress the importance of pursuing efficiencies and expense reductions where possible. He clarified that an approval for 3% was not in the minutes from the previous stormwater management meeting, but he thought stormwater agencies would go along with that number. John Coleman said that, based on comments from within the dredger community, 2.5 or 3% would work. He expressed a desire to go fully electronic with the various RMP communication products.

David Frandsen, representing power generators with once-through cooling, opened a discussion on the fee structure as a whole. He explained that the distribution of fees had not changed since they were set in 1992. However, at the Pittsburg Power Plant (PPP), the 14 units that were operating in 1992 were now down to 2 units and the operating hours were down to 1.5% of the total from 1992. He added that his company, which is now the only remaining fee payer for cooling water, pays fees of 4% of the total RMP fees, currently \$137k per year. Finally he said that all cooling water operations of this type would cease by 2017 at the latest, and possibly by 2016. Therefore he requested that the Cooling Water sector's fees be dropped to 1%, including a refund for 2015 fees down to that 1% level.

Tom Mumley summarized this as two separate issues. The first being that within three years 4% of the budget would be permanently removed from the program, and then secondly, the reduction in fees for the interim years. David agreed and asked why this had not come up before. Tom responded that there had not been attendance at RMP meetings from the Cooling Water sector in years, but that he was

appreciative of David's presence. Tom also remarked that making this downwards adjustment for generators would essentially offset the increases that the other members had just been discussing. Peter Carroll asked if it was within the power of the SC to change the distribution of fees or to issue a refund. Tom explained that the SC has this authority. The most important issue thinking in his view was that it would set a precedent for changing the fee distribution. Jim Kelly added that as someone who used to represent wastewater treatment plants, he knew that the metals loads that determined the initial fee distribution for POTWs were 75 to 80% lower now than in 1992, and worried that making changes could be opening Pandora's Box. Karin North agreed that changing the distribution of fees was a significant item that needed to be discussed at the next meeting. She asked that the SC vote on the decision about increasing the fees for the 2016-2018 budget.

Rob Lawrence left the call-in to the meeting.

Items for Approval

1. Peter Carroll motion for a 3% increase of fees per year for 2016 through 2018. John Coleman seconded. The measure was approved unanimously.

Action Items

1. Phil Trowbridge - Prepare a proposal for how to deal with the Cooling Water fees for the SC to consider in January 2015. The proposal put forward by NRG was reduce their fees from 4% to 1% of the RMP budget, retroactive to 2015. Impacts on the overall RMP budget and other stakeholder groups need to be considered.

VII. Information: Presentation of Result of Charter Review [David Ceppos]

David Ceppos from the Center for Collaborative Policy at Sacramento State presented the findings from a series of interviews with RMP stakeholders. He started by saying that there was no presumption that anything was currently broken, and that they were not looking to kick sleeping dogs. He and Rich Wilson came away from the interviews with an appreciation that the RMP is functioning very well, but that fine-tuning is always possible. He explained that the interview process was confidential, with standardized questions, designed to allow his team to provide a qualitative assessment of the program. They looked for trends or the lack thereof, without attributing responses to individuals, so as to not weigh any single statement unevenly. In order to reduce costs, the report for this project was provided as a Powerpoint.

Tom Mumley asked for clarification on an issue raised regarding improved communications between groups (TRC and SC). Phil Trowbridge responded that it primarily dealt with some groups needing to improve communication between their members of the TRC and SC. Tom accepted this and suggested that the charter clearly enunciate what the responsibilities are of members of both the SC and TRC. He also suggested that there could be potential improvements in digital archiving that would allow greater accessibility for committee members to shared information.

There was a discussion about who should be a member of the TRC, following a slide sharing a quote: "We should not require participation from non-technical people as this doesn't work." The SC agreed that it was an issue that needed to be addressed but also seemed to agree that high level thinking by TRC members helps drive a broad understanding of issues.

David Ceppos also raised the question of what the exact role is for Water Board staff within the RMP. He asked if they were meant to be a first among equals or a true equal member? He shared that the trend from most respondents was that they simply did not know. The organic way in which the RMP evolved has worked very well, but it is also important to memorialize the roles that have developed. Tom acknowledged that he can be a dominant participant in the meetings, but attributed that to his personality rather than his job, but expressed a desire to make sure others were not unhappy. He said that it was only recently that he had taken up the chairmanship, and that it was a position that had been purposely avoided by Water Board staff in the past because of the potential impression. The SC seemed to be comfortable with the current setup, but he would step aside without hesitation. David was quick to clarify that that was not at all what was being recommended. Instead he was just looking for clarification of the Water Board's role, stemming from the MOU's language when the RMP was formed. He hoped that the charter process could clarify and put that role in writing, and similarly memorialize some of the other norms of the SC, including decisions by consensus.

David Ceppos finished by saying that if there was any feedback please contact him or Rich Wilson. Peter Carroll briefly raised the question of whether the SC wanted to move forward with a draft charter, but the group agreed that it would be valuable.

VIII. Information: Deliverables, Action Items, and Workgroup Updates [Phil Trowbridge]

Phil highlighted four deliverables that were on the stoplight report with red lights. The Broadscan analysis by NIST was stalled on NIST's end, but progress is being made. Meg Sedlak's PFC work is on track to be finished by the end of the year. The bird egg report with 2012 data should be done by the end of the year. Don Yee's Coring Manuscript is out for comments from coauthors, and he is having difficulty getting back comments, but it too should be finished by year's end.

Phil expressed a desire to set tentative dates for all four 2015 SC meetings, however, there were conflicts with the proposed January meeting dates for both Adam Olivieri and John Coleman. Tom said it was difficult for people to commit to dates so far in advance, but Peter expressed support for at least attempting to set the full slate of meeting dates.

Tom Mumley skipped the plus-delta and adjourned the meeting.

Action Items

1. Phil Trowbridge
 - a. Propose several options for the slate of 2015 SC meeting dates.
 - b. Work with NIST, Don Yee, Meg Sedlak, and Jay to complete the late deliverables by the end of the year (Broadscan report, Coring manuscript, PFC manuscript, and Bird Egg report, respectively).
 - c. Check with TM on completion of previous action items.



SAN FRANCISCO ESTUARY INSTITUTE

4911 Central Avenue, Richmond, CA 94804 • p 510-746-7334 • f 510-746-7300 www.sfei.org

RMP Technical Review Committee Meeting

December 10, 2014

San Francisco Estuary Institute

Meeting Summary

Attendees

TRC Member	Affiliation	Representing	Present
Nirmela Arsem	EBMUD	POTWs	No
Rod Miller	SFPUC	POTWs	Yes
Tom Hall	EOA, Inc.	South Bay Dischargers	Yes
Amy Chastain	City and County of San Francisco	CCSF	No
Eric Dunlavey	City of San Jose	City of San Jose	No
Bridgette DeShields*	Integral Consulting	Refineries	Yes
VACANT		Industry	NA
VACANT		Cooling Water	NA
Chris Sommers	BASMAA (EOA, Inc.)	Stormwater	No
John Prall	Port of Oakland	Dredgers	No
Rob Lawrence	US Army Corps of Engineers	USACE	Yes (By Phone)
Karen Taberski	SFB RWQCB	Water Board	Yes
Luisa Valiela	US EPA	US-EPA IX	Yes

*Chair

Guests and Staff

- Mike Connor (EBDA)
- Phil Trowbridge (SFEI)
- Jay Davis (SFEI)
- Rebecca Sutton (SFEI)
- Don Yee (SFEI)
- Adam Wong (SFEI)
- Amy Franz (SFEI)
- Warner Chabot (SFEI)
- Lester McKee (SFEI)

1 – Action: Introduction and Approve Agenda

The group verbally approved of the agenda. The order of items was rearranged so that the meeting went Items 1-7, 10, 11, 9, 8.

2 – Action: Approve Meeting Summaries from 6/17 and 9/23

Bridgette DeShields asked the group for feedback on the two TRC meeting summaries. Karen Taberski provided feedback on three items, which are represented in action items below. Tom Hall brought up action item number 9 on page 20 of the agenda packet, which opened a discussion on informing TRC members of workshops and other meetings prior to their occurrence. Luisa Valiela suggested that if there were an exhaustive RMP meetings calendar, encompassing more than just TRC, SC and Workgroup meetings, it would be the responsibility of committee members to attend or send representation to meetings in which they were interested. Phil Trowbridge explained that the 6/17 Meeting Summary had already been approved, but that he wanted official approval of the note added to page 8 of the packet that described a decision of the TRC made over email.

Items for Approval

Karen Taberski motioned that both Meeting Summaries be approved, Rod Miller seconded, and approval was unanimous.

Action Items

1. Phil Trowbridge
 - a. Work with SFEI staff to make schedule for upcoming RMP relevant meetings and workshops available to committee members. Possibly this could mean having a calendar of all meetings, not just TRC/SC/Workgroups. Additionally, make sure that final reports are announced and made available when they are complete.
 - b. Update the summary on page 14 of packet. 9/23 TRC Meeting, Items to Approve section. Tom Hall not Tom Mumley seconded the motion.
 - c. Update the 9/23 TRC summary on the top of page 15: The current cost of the margins sampling with MLML is 6 times less, Karen was not referring to Bay Protection sampling from 1994.
 - d. Page 19 of the packet, second paragraph: "Therefore, they cannot be released at the time", should be "Therefore, they cannot be released at the same time"
2. Tom Hall
 - a. At the BACWA Executive Board Meeting, bring up the need for a meeting with the Water Board about the available CTR data, how to truncate old data, and whether new CTR data are needed.

3 – Information: Steering Committee Report

Phil Trowbridge summarized the main items from the Steering Committee that were of interest to the TRC, highlighting the approved budget, future fee increases, fees for cooling water industry, and the charter development process.

With regards to the budget, there was a small discussion about the exclusion of funding for sampling and analysis of CTR parameters, with Tom Hall to follow up with BACWA and the Water Board at the BACWA Executive Board meeting on 12/19.

Work on the charter drew requests from TRC members to have involvement on those sections that would affect their committee. Jay Davis suggested that the draft charter would be sent out to TRC members and that they should pass their comments along to their respective SC members. The group also discussed how voting worked for the TRC, with the agreement being that there was always an attempt to reach a consensus, but voting was used sometimes. A desire to have a clearly defined method for voting was expressed. The group also felt that the structure of official representatives on the TRC should mirror the structure for the SC.

Jay began a discussion about the Pulse for 2015, and the SC's guidance to limit its scope and budget. His current idea is to present recent developments on the major pollutants with infographics, providing more detailed information on items that will be touched upon in the State of the Estuary report. Tom suggested a possible section on success stories in the Bay, describing why contaminants like copper, DDT, and cyanide were no longer of concern. The group seemed in favor of this idea; Jay will explore the possibilities.

Action Items

1. Phil Trowbridge
 - a. Share the draft RMP Charter with the TRC when it is ready for review with instructions to forward their comments to their SC representatives.

4 – Information: Planning Workshop Report

Jay Davis gave a quick summary of the Multi-Year Planning Meeting, and passed out a revised Appendix 1 table, detailing funding guidelines for RMP Special Studies. Regarding studies on ocean acidification, Luisa Valiela told Phil Trowbridge that he should follow up with Letitia Grenier about some ongoing research at the Gulf of the Farallones National Marine Sanctuary.

Action Items

1. Phil Trowbridge
 - a. Talk with Letitia Grenier regarding ocean acidification research in the SOTER and develop a proposal for some background ocean acidification research for the TRC to consider for 2016.

5 – Decision: 2015 Detailed Workplan

Phil Trowbridge provided a quick rundown of the major deliverables for the RMP for 2015. Luisa Valiela asked if the March and August targets for Margins design and sampling were realistic. Phil said yes, as long as there was some basic agreement after the discussion later in the meeting. Next, Phil outlined the redesign of the Annual Monitoring Report to just a report of sampling efforts, which should reduce costs. Additionally, there will be a manuscript on RMP influence on management decisions, and Phil asked if there was interest on the TRC for input/co-authorship. Karen Taberski expressed interest in contributing.

Tom Hall and Karen Taberski both expressed a desire for better communication when each of the deliverables was completed.

Action Items

1. Phil Trowbridge
 - a. Organize a group to assist with the manuscript on the RMP and its influence on management. Invite all TRC and SC members to participate.

6 – Information: Update on Data Management Activities

Amy Franz gave a presentation on the highlights of work completed by the Data Services and other Environmental Informatics collaborators during 2014. Processing of the 2013 Status and Trends and special study data generally met timeliness targets, and the new RMP QAPP is out for review. The CD3 tool (cd3.sfei.org) for mapping data from the SFEI Regional Data Center went live on the day of the meeting, Jay Davis described upcoming improvements including presets to quickly view often-requested RMP data within the tool. Tom Hall asked where continuous data were represented; Phil Trowbridge explained that they aren't currently in CD3, but an internal tool for nutrients continuous monitoring data visualization is being developed.

7 – Discussion: Next Steps for Developing Benthic Invertebrate

Indicators

Phil Trowbridge asked for feedback on next steps for developing benthic indices for the Bay. The consensus was that benthic index development was a low priority and that no proposals for special studies on this topic should be prepared for 2016. Management actions on contaminated areas will mostly be performed in the polyhaline region, where there is already a functional index. The value of indices to understand impacts of contamination is confounded by the abundance of invasive species in the Bay and the temporal dynamics of the benthos in this estuarine environment. However, the group agreed that benthic abundance data had value and the RMP should continue to plan to collect these data in 2018 but should confirm with the TRC before actually doing the work.

10 - Information: Update on Workgroups and Scorecard

Phil Trowbridge gave a quick rundown on the red light items on the scorecard (Page 72 of the agenda packet - see the 11/13/14 SC Meeting Notes for additional details). Tom Hall asked about the copper and olfactory nerve work. Phil responded that NOAA has had some problems with their lab for water chemistry, but that the biological piece of the analysis is done. Phil asked for feedback on the Workgroup Activities summary (page 75 of the agenda packet), noting that he felt there was overlap between that document, the scorecard and the action items database. Mike Connor expressed satisfaction with the current version of the summary, noting that it seemed pared down from previous versions. Bridgette DeShields provided the example of the sturgeon plug work (Page 79) as an example of information that went beyond the scope of the deliverables scorecard, and suggested that the summary document helped prevent Phil and Jay Davis from fielding as many phone calls. The general group consensus was that the document was valuable. Phil will move forward with removing overlap and consolidation, but won't remove the level of detail found in the Workgroup summary document.

Action Items

1. Phil Trowbridge/Jay Davis
 - a. Follow up with David Baldwin at NOAA regarding the Copper and the Olfactory Nerve Study.

11 – Decision: Set next meeting date and agenda topics

Phil Trowbridge proposed meeting on the third Wednesday of the last month of each quarter with the exception of September 2015 which was moved to the fourth Wednesday to avoid a conflict with the State of the Estuary conference.

*Note: Following the meeting, Karen Taberski reported that there was a conflict with the proposed meeting date of March 18, which is the same date as the IEP Annual Workshop. Another meeting date will be proposed.

9 – Information: PCB-related Special Studies: 2014 Highlights and 2015 Planned Activities

Jay Davis outlined the new focus of the PCB strategy, to work on detecting the response to small tributary load reductions. He highlighted three required ingredients for that task: a strong linkage between loading and the chosen indicator, a significant reduction in load to provide the strongest possible signal, and baseline data before the reduction happens. He shared the plans for developing conceptual models and sampling 5 sites over the next three years. Sites will be selected over the next year. Bridgette DeShields expressed a desire to see all currently available data taken into account before site selection to avoid sampling at sites like Hunter's Point that are already well characterized.

Jay walked through an example of a potential site, the Emeryville Crescent area that receives stormwater from the Ettie Street Pump Station. He described possible indicators such as shiner surfperch, small fish, bivalves (*Macoma* specifically), passive samplers, and sediment. The budget of \$30k per margin unit for sampling fish and sediment included 3 locations within each unit per year, but that will need to be discussed. Mike Connor expressed concern that the proposed sampling areas are too small, and that there is too much drainage/mixing to be able to get information about loads. He said that a very rough mass balance needs to happen for a site proposal to see if there's any possibility of seeing the signal from the load. Luisa Valiela asked if using small fish as the indicator would ameliorate the sample area issue. Don Yee replied that small fish are better at representing a lifetime, rather than loading exposure. The group discussed some options for tracking invertebrate flux and particle tracking.

Mike asked about what management actions depend on the outcome of this work. Bridgette replied that it helps prioritize load management versus in-bay efforts. Jay added that even if in there wasn't a detectable short term change from load reductions, the argument can be made that over a longer time-scale those management actions can still make a difference.

Specific ideas:

- Compare the mass of PCBs in the sediment reservoir to the expected load reductions from stormwater.
- Research how far new particles move when loaded from stormwater.
- Use different PCB congeners as a way to distinguish between legacy contamination and ongoing watershed loads.
- Use tracers to measure sediment flux from the margin areas to open Bay areas. See previous work by Eric Adams and Keith Stolzenbach.
- As an initial step, look for gradients from stormwater outfalls.
- Use paint particles or mark a sediment horizon to understand net accumulation or loss of sediments from an area.

The PCB team will meet in 2015 and chart a plan for this research and invite outside experts to assist as needed.

8 – Decision: Proposed Bay Margins Sampling Plan

Don Yee presented the latest proposal for the randomized margins sampling, showing a new focus on the Central Bay. Focusing on a smaller area allows it to be characterized more quickly, and increases the density of sampling points, making it more likely to get close to "warm" spots. The tradeoff is that it provides less information for the rest of the system.

Karen Taberski started a discussion about weighting or excluding sites to focus more on the East Bay where management actions will take place, as compared to an area like Marin. Mike Connor added that land-use could be useful as part of the weighting calculation. Don said that while he understood the desire for weighting and exclusion, the targeted sampling that Jay Davis described does part of that work, and he wanted to avoid creating a single-purpose dataset. Purely random (not stratified random) is the most flexible design because it can be post-stratified many ways. The group seemed to agree that there was value from knowing what the ambient situation was in the margins, and that probabilistic sampling was the way to approach that.

Bridgette DeShields and Mike suggested that areas that were very well characterized from previous studies could be removed from the potential sampling frame. There was some discussion about other sources of data and concerns about depth of sampling and congener choice, but it was agreed that some data would likely be useable within to-be-determined guidelines.

In summary the group agreed that the RMP should move forward with probabilistic sampling of 40 sites in the Central Bay in 2015 and outlined the following next steps:

1. Pull in all the existing data for PCBs in the Bay and margin areas. The SQO database does not contain all of the sediment chemistry data. Evaluate whether the data can be used to investigate the following questions:
 - a. Is the distribution of data consistent with the conceptual model for PCBs in the Bay?
 - b. Are there any patterns with PCBs in margin sediment relative to adjacent land use?
 - c. How do the random stations for the margins fall relative to adjacent land use?
 - d. Identify areas that are sufficiently characterized already such that these areas might be excluded from random sampling.

- e. Examine how far PCB contamination extends from known sources.
2. Assemble subcommittee to look at weighting (by adjacent land use, different areas of Central Bay) and exclusion criteria (e.g., by grain size, by proximity to area with existing data). Karen and Bridgette offered to be on the subcommittee. Jay recommended that Don Stevens should be included in these discussions. After the meeting, Chris Sommers agreed to be on the subcommittee.
3. Look into the possibility of expanding the routine sampling frame for Status and Trends sediment sampling to include the margin areas and, therefore, slowly add more data at margin sites during the regular sediment cruises.
4. Prepare a revised proposal for the March TRC meeting.

Action Items

1. Don Yee
 - a. Evaluate whether other sources of data for PCBs in margin sediments (Envirostor, Geotracker) should be compiled and compile them if appropriate.
 - b. Set up subcommittee to look at the weighting and exclusion issues with the probabilistic monitoring design.
 - c. Work with Don Stevens to expand the sampling frame for Status and Trends sediment sampling to cover the margin areas.
 - d. Prepare a revised monitoring design for Bay margins sediments for the March 2015 TRC meeting.



SAN FRANCISCO ESTUARY INSTITUTE

4911 Central Avenue, Richmond, CA 94804 • p 510-746-7334 • f 510-746-7300

www.sfei.org

DATE: January 28, 2015

TO: RMP Steering Committee

FROM: Philip Trowbridge and Lawrence Leung

RE: Status and Carryover Recommendations for RMP 2012, 2013 and 2014 Budgets

The purpose of this memorandum is to provide an update for all open RMP budget years (2012, 2013, and 2014) so that the Steering Committee can approve the continued use of these funds in 2015. All of the values presented are current as of 12/31/14. The 2015 RMP budget year has just begun. The first update on the 2015 budget year will be in April.

The memo also summarizes cash position of the RMP and the balances of Designated Dredger Reserve Fund, Designated Set-Aside Funds, and Undesignated Funds.

Funds Remaining from RMP Budget Year 2012

There are \$42,596 remaining in the RMP 2012 budget. The remaining balance of 2012 labor funds (\$10,596) is needed support for RMP staff as they prepare a report on perfluorinated compounds in the Bay. The remaining balance of 2012 subcontract funds of \$32,000 is for an active contract with Deltares for nutrient-related modeling (see Note 1).

Recommendation: Authorize the carryover of \$10,596 in labor and \$32,000 in subcontractor funds originally from the 2012 RMP budget.

Funds Remaining from RMP Budget Year 2013

There are \$126,123 remaining in the RMP 2013 budget. The remaining labor funds (\$15,933) are needed to support RMP staff for nutrient modeling tasks. The remaining subcontract funds are associated with two active contracts. One contract is with Deltares for nutrient-related modeling with a \$61,350 balance (see Note 1). The other contract is with UC Santa Cruz for algal biotoxin

monitoring with a \$47,041 balance. A small amount (\$1,799) of the funds from 2013 are no longer needed and will be added to the Undesignated Funds.

Recommendation: Authorize the carryover of \$15,933 in labor and \$108,391 in subcontractor funds originally from the 2013 RMP budget.

Funds Remaining from RMP Budget Year 2014

As of 12/31/14, 64% of the RMP 2014 budget was spent overall. The total balance remaining is \$1,619,180. Most of the remaining funds are needed to support multi-year studies that will continue in 2015 or projects that were delayed. Attachment 2 provides details and justifications for the \$361,115 in labor funds to be carried over. Attachment 3 shows the \$769,051 in subcontracts that should remain open into 2015. Payments to subcontractors are expected to increase in early 2015 after the 2014 Status & Trends monitoring data are finalized and lab invoices can be paid. The \$124,286 of direct costs recommended to be carried over are for honoraria for science advisers (\$15,000) equipment purchases for moored sensors (\$85,857), other expenses for stormwater program expenses (\$22,088), and minor end of year expenses booked in January (\$1,341). All of these direct costs will be made in the first quarter of 2015. Table 1 summarizes the 2014 budget, amount expended, balance, and carryover request for labor, subcontractor, and direct expenses.

While many of the 2014 Workplan tasks are still ongoing, it appears that the RMP will complete the work at least \$153,628 under budgeted expenses. The major contributors to these savings were:

- 2014 Status and Trends monitoring because a more efficient design was implemented in 2014 (\$118k savings);
- 2013 Annual Monitoring Results Report which was streamlined (\$20k savings expected once the report is complete, which offsets a \$7k cumulative overage on other tasks, primary from the RMP Update Report); and
- 2014 other direct costs (\$19k).

Therefore, these extra funds have been released from the 2014 budget to the Undesignated Funds.

Recommendation: Authorize the carryover of \$361,115 in labor funds, \$769,051 in subcontractor funds, and \$124,286 in direct expense funds originally from the 2014 RMP budget. (See Table 1 for a summary and Attachments 2 and 3 for line item details).

Note 1: There is actually one subcontract with Deltares for nutrient-related modeling. The contract is for \$100,000 but it draws upon RMP funds from 2012 (\$32,000), 2013 (\$61,350), and 2014 (\$6,650). The older funds will be the first ones used to pay invoices on this contract.

Table 1: RMP 2014 Budget, Expenses, Carryover Request, and Undesignated Funds as of 12/31/14

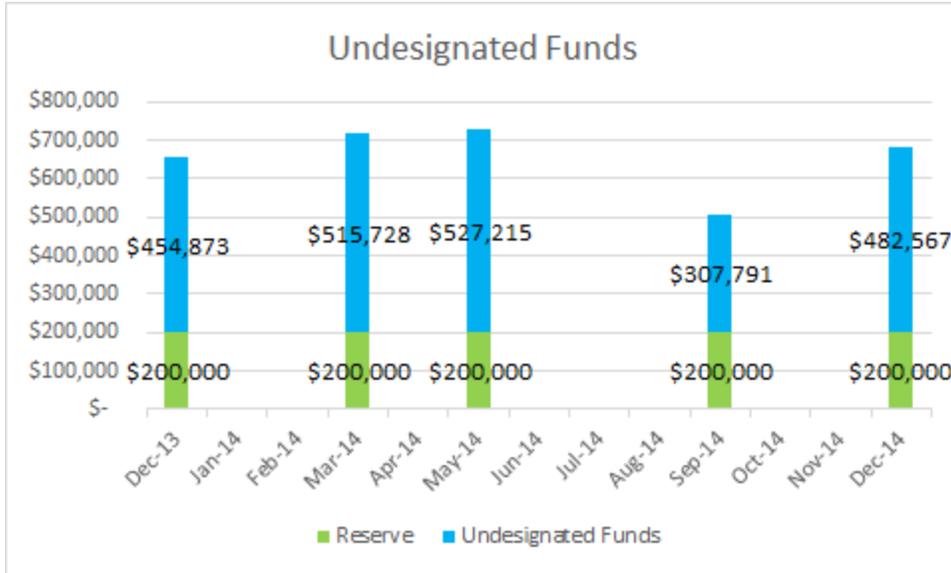
	Budget	Spent	Balance	Carry-over	Un-encumber
Labor	\$1,946,100	\$1,571,582	\$374,518	\$361,115	\$13,404
Subcontractors	\$1,883,529	\$993,265	\$890,264	\$769,051	\$121,213
Direct Costs	\$328,326	\$185,029	\$143,297	\$124,286	\$19,011
Set-Aside and Contingency Funds	\$211,100	\$0	\$211,100	\$211,100	\$0
Total	\$4,369,055	\$2,749,875	\$1,619,180	\$1,465,552	\$153,628

Summary of 2012, 2013, and 2014 RMP Budgets, Cash Position and Fund Balances

Attachment 1 shows the RMP Budget Summary, cash position, Designated Dredger Reserve, Designated Set-Asides, and Undesignated Funds. Additional detail on the Undesignated Funds and Designated Dredger Reserve Funds are provided below.

STATUS OF THE RMP UNDESIGNATED FUNDS

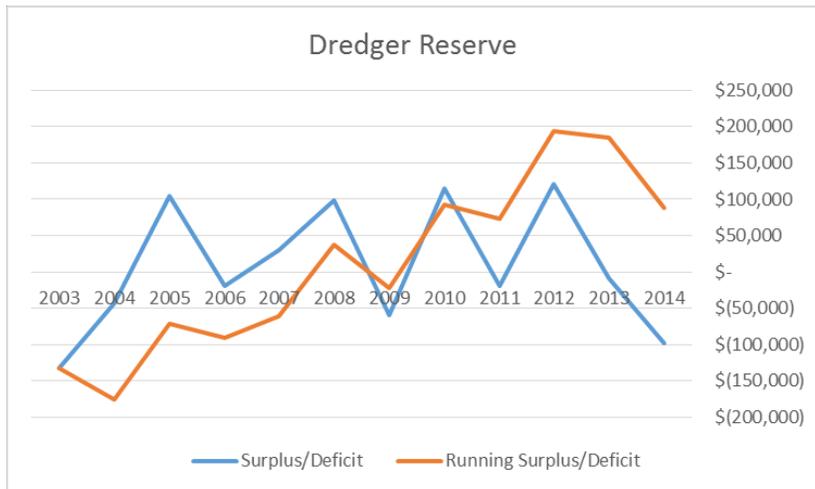
The RMP has a policy to maintain its cash reserve of at least \$200,000 to allow for response to unanticipated funding needs or revenue shortfalls. Any remaining Undesignated Funds are available for spending at the discretion of the Steering Committee. The graph below shows how the balance of Undesignated Funds has changed over time. The height of the bar shows the total balance of the Undesignated Funds. However, the bar is color coded to indicate the RMP policy that \$200,000 of the Undesignated Funds should not be spent subject to the reason stated above. The current balance of Undesignated Funds through 12/31/14 is **\$682,567**. The current balance includes the \$160,969 recently released from the 2014 RMP budget (the \$154,969 discussed in this memo and \$6,000 released from the 2014 Selenium Plug Study on 1/15/15).



STATUS OF THE DREDGER RESERVE

The Dredger Reserve balance through 12/31/14 is \$87,834. The following table presents the dredger surplus/shortfall by year. The reserve balance has fallen to \$0 in the 2015 budget year because all of these funds have been used to partially cover a shortfall in dredger fees collected of \$164,777.

Dredger Reserve	
Year	Surplus/Deficit
2014	\$ (97,614)
2013	\$ (8,359)
2012	\$ 120,214
2011	\$ (19,480)
2010	\$ 115,342
2009	\$ (59,576)
2008	\$ 97,815
2007	\$ 29,542
2006	\$ (19,324)
2005	\$ 104,520
2004	\$ (42,352)
2003	\$ (132,894)
TOTAL	\$ 87,834



Steering Committee RMP Budget Summary as of 12/31/14

Budget and Current Expenses						
Year	Budget Item	Approved Budget	Expended	Balance	Expended	Funds to be Expended
		\$	\$	\$	%	by
2014	Labor	1,946,100	1,571,582	374,518	81%	12/31/2015
	SubContracts	1,883,529	993,265	890,264	53%	3/15/2017
	Direct Costs	328,326	185,029	143,297	56%	3/31/2015
	Set-asides	161,100	0	161,100	0%	TBD
	2014 Total	4,319,055	2,749,875	1,569,180	64%	3/15/2017
2013	Labor	164,280	148,347	15,933	90%	6/30/2015
	Subcontracts	309,777	199,587	110,190	64%	5/31/2015
2012	Labor	50,394	39,798	10,596	79%	9/30/2015
	Subcontracts	84,407	52,407	32,000	62%	5/31/2015
	Prior Years Work-to-Complete Total	608,858	440,139	168,719	72%	3/15/2017
Cash, Set-Asides, and Undesignated Funds as of reporting date						
	Item	\$ Notes				
	Cash on Hand	2,549,726				
	Total Current Liabilities (2012-2014 carryover)	(1,423,171)				
	Dredger Surplus	(87,834)				
	'13-'14 Water Chemistry	(110,700)				
Set-Asides	2005-2009 Program Review	(88,179) TBD; previously \$125K, \$37K approved withdrawal 5/6/14				
	'13-14 Tern Monitoring	(50,625) TBD				
	Monitoring Contingency	(50,000) TBD				
	2013 Sediment Benthos	(30,900) TBD				
	2013 Sediment Toxicity	(25,750) TBD				
	Undesignated Funds	682,567 RMP SC has set a policy to maintain a minimum balance of \$200K of Undesignated Funds				
	Plus Accounts Receivables & Interest:	Anticipated Collections by				
'10-11	Treasure Island (U.S. Navy)	11,309 Unknown				
	Undesignated Funds after Collections	693,876				

Attachment 2

2012 RMP

Task	Budget	Remaining	Work to be Completed	Date to be Completed	Unencumbered	Rationale
4. SPECIAL STUDIES						
4.3 ECWG: Monitoring PFCs in Bay Biota	\$46,390	\$10,596	\$10,596	9/30/15	\$0	Report drafted and under review by co-author.
TOTAL	\$46,390	\$10,596	\$10,596	9/30/15	\$0	

2013 RMP

Task	Budget	Remaining	Work to be Completed	Date to be Completed	Unencumbered	Rationale
4. SPECIAL STUDIES						
4.6 CF: Shared Modeling Proposal	\$30,000	\$15,933	\$15,933	6/30/15	\$0	Tactical plan developed. Will use these funds for model planning and implementation. Deadline extended to 6/30/15 to match State Fiscal Year (SFY is used by the Nutrient Steering Committee).
TOTAL	\$30,000	\$15,933	\$15,933	6/30/15	\$0	

2014 RMP

Task	Budget	Remaining	Work to be Completed	Date to be Completed	Unencumbered	Rationale
2. INFORMATION MANAGEMENT & SYNTHESIS						
2.3 Information Dissemination	\$136,000	\$12,534	\$12,534	3/31/15	\$0	SFEI did not receive NIST Broadscan Report until December 2014. Some of the remaining funds will be used to prepare a fact sheet to translate the highly technical report. After this is complete in March 2015, the balance of the funds will be unencumbered.
2.4 Annual Reporting - Annual Monitoring Results 2013	\$40,000	\$30,427	\$10,427	3/31/15	\$20,000	2013 and 2014 Annual Monitoring Report delayed due to staffing changes. The report is expect to be half as expensive as budgeted.
3. STATUS & TRENDS MONITORING						
3.3 Sportfish	\$45,800	\$33,941	\$33,941	12/31/15	\$0	This is a multi-year study so the task must be kept open into 2015.
4. SPECIAL STUDIES						
4.1 EC: Alternative Flame Retardants	\$40,262	\$15,801	\$15,801	12/31/15	\$0	This is a multi-year study so the task must be kept open into 2015.
4.2 EC: EC Strategy Update	\$20,000	\$2,202	\$2,202	1/31/15	\$0	
4.7 STLS: Stormwater Loads Monitoring in Rep. Watersheds	\$224,199	\$47,635	\$47,635	6/30/15	\$0	Report delayed from 12/31/14 to 2/28/15. A proposal will be developed for any potential cost savings from not being able to complete all stormwater sampling events due to the drought.
4.8 STLS: Develop and Update Spreadsheet Model - Yr5	\$30,000	\$23,222	\$23,222	6/30/15	\$0	Report delayed from 9/30/14 to 6/30/15 due to staffing changes.
4.9 STLS: Land use/ Source Specific EMC	\$58,000	\$30,692	\$30,692	6/30/15	\$0	Final report delayed from 12/31/14 to 2/28/15.
4.9 STLS: Land use/ Source Specific EMC	\$22,000	\$22,000	\$22,000	6/30/15	\$0	Funds held in reserve for task 4.9 if needed.
4.11 Nutrients: Program Management	\$20,000	\$688	\$688	3/31/15	\$0	
4.12 Nutrients: Monitoring Program Development	\$42,000	\$36,175	\$36,175	6/30/15	\$0	Deadline extended to 6/30/15 to match State Fiscal Year (SFY is used by the Nutrient Steering Committee)
4.14 Nutrients: Stormwater Measurements	\$10,000	\$9,958	\$9,958	6/30/15	\$0	Report due date changed from 12/31/14 to 6/30/15 to allow for public release of data (expected Q1 2014).
4.15 Nutrients: Modeling	\$100,000	\$99,246	\$99,246	12/31/15	\$0	These funds will be used for nutrient modeling after the 2013 nutrient modeling funds are exhausted.
4.17 Dioxin: Sportfish Monitoring	\$4,000	\$4,000	\$4,000	12/31/15	\$0	This is a multi-year study so the task must be kept open into 2015. Dioxin results will be reported with the sportfish report.
4.21 Selenium: 2014 Plug Sampling	\$13,900	\$8,727	\$8,727	6/30/15	\$0	This is a multi-year study so the task must be kept open into 2015.
ALL OTHER TASKS	\$1,139,939	-\$2,729	\$3,867	1/15/15	-\$6,596	Cumulative balance of closed tasks. Remaining work indicates delayed billing. Overage is largely due to the RMP Update Report.
TOTAL	\$1,946,100	\$374,518	\$361,115	12/31/15	\$13,404	
2012-2014 TOTAL	\$2,022,490	\$401,047	\$387,644	12/31/15	\$13,404	

Attachment 3

Project Year	Cont #	Contractor	Project Title	Amount	Billed	Balance	Carryover	Unencumber	Project Mgr	Start Date	Expire Date	Type of Agency	Contract Status
2012	1091	Deltares	PSSS Modeling	\$ 32,000	\$ -	\$ 32,000.00	\$ 32,000.00	\$0.00	Phil Trowbridge	10/1/2014	5/31/2015	Private	Open
TOTAL				\$ 32,000.00	\$ -	\$ 32,000.00	\$ 32,000.00	\$ -			5/31/2015		
2013	1051	UCSC	PSSS Nutrients Algal Biotoxins	\$ 65,000	\$ 17,959.09	\$ 47,040.91	\$ 47,040.91	\$0.00	Phil Trowbridge	1/1/2013	4/30/2015	University	Open
2013	1091	Deltares	PSSS Modeling	\$ 61,350	\$ -	\$ 61,350.00	\$ 61,350.00	\$0.00	Phil Trowbridge	10/1/2014	5/31/2015	Private	Open
2013			PSSS Nutrients SW	\$ 1,799	\$ -	\$ 1,799.00	\$ -	\$1,799.00	Phil Trowbridge				CLOSED
TOTAL				\$ 128,149.00	\$ 17,959.09	\$ 110,189.91	\$ 108,390.91	\$ 1,799.00			5/31/2015		
2014	1069	Caltest	PSSS POC Nutrients	\$ 20,944	\$9,972.00	\$10,972.40	\$10,972.40	\$0.00	Emily Novick	9/15/2013	9/30/2014	Private	CLOSED
2014	PO2056	ADH	PSSS POC Nutrients	\$ 1,000	\$1,000.00	\$0.00	\$0.00	\$0.00	Emily Novick	10/1/2013	9/30/2014	Private	CLOSED
2014		TBD	PSSS POC Nutrients	\$ 12,133	\$0.00	\$12,132.60	\$12,132.60	\$0.00					
2014		TBD	PSSS NUTRIENTS MONITORING PROGRAM DEVELOPMENT	\$ 8,000	\$0.00	\$8,000.00	\$8,000.00	\$0.00					
2014	1080	SIU	PSSS Alternative Flame Retardants	\$ 53,000		\$53,000.00	\$53,000.00	\$0.00	Phil Trowbridge	5/1/2014	4/30/2015	University	Signed
2014	1087	SJSURF	PSSS Alternative Flame Retardants	\$ 12,038	\$12,022.71	\$15.29		\$15.29	Phil Trowbridge	4/1/2014	11/1/2014	University	Signed
2014	1073	USGS	PSSS Benthic Recovery Study	\$ 150,000	\$27,885.96	\$122,114.04	\$122,114.04	\$0.00	Phil Trowbridge	3/31/2014	3/15/2017	Federal	Signed
2014	1100	UF	PSSS Bioanalytical Tools	\$ 26,000	\$1,782.03	\$24,217.97	\$24,217.97	\$0.00	Phil Trowbridge	7/1/2014	12/31/2015	University	Signed
2014	1101	SCCWRP	PSSS Bioanalytical Tools	\$ 30,000		\$30,000.00	\$30,000.00	\$0.00	Phil Trowbridge	7/1/2014	12/31/2015	JPA	Signed
2014	1099	AXYS	PSSS Dioxin in Sport Fish	\$ 20,850		\$20,850.00	\$20,850.00	\$0.00	Phil Trowbridge	8/1/2014	9/30/2015	Private	Signed
2014	PO2076	Don Stevens	PSSS Margins Planning	\$ 4,500	\$2,400.00	\$2,100.00	\$2,100.00	\$0.00	Phil Trowbridge	8/1/2014	6/30/2015	Consultant	Signed
2014	1091	Deltares	PSSS Modeling	\$ 6,650		\$6,650.00	\$6,650.00	\$0.00	Phil Trowbridge	10/1/2014	5/31/2015	Private	Signed
2014		TBD	PSSS MODELING	\$ 93,350	\$ -	\$93,350.00	\$93,350.00	\$0.00					
2014	1088	UCD	PSSS Moderate Toxicity	\$ 30,000	\$14,644.17	\$15,355.83	\$15,355.83	\$0.00	Phil Trowbridge	6/1/2014	4/30/2015	University	Signed
2014	1109	USGS	PSSS Nutrients Sensor	\$ 5,000	\$5,000.00	\$0.00		\$0.00	Emily Novick			Federal	CLOSED
2014	1119	USGS	PSSS Nutrients Sensor	\$ 15,000	\$15,000.00	\$0.00		\$0.00	Emily Novick			Federal	CLOSED
2014		TBD	PSSS Nutrients Sensor	\$ 35,000		\$35,000.00	\$35,000.00	\$0.00					
2014	963	RiverMetrics	PSSS POC Monitoring	\$ 3,795	\$250.00	\$3,544.90	\$3,544.90	\$0.00	Jennifer Hunt	8/1/2011	9/30/2014	Consultant	CLOSED
2014	987	Brooks Rand	PSSS POC Monitoring	\$ 518	\$174.00	\$344.00	\$344.00	\$0.00	Jennifer Hunt	10/15/2011	8/31/2014	Private	CLOSED
2014	989	EBMUD	PSSS POC Monitoring	\$ 470	\$435.00	\$35.00	\$35.00	\$0.00	Jennifer Hunt	10/1/2011	9/30/2014	County	CLOSED
2014	PO2054	GGWS	PSSS POC Monitoring	\$ 4,000	\$920.00	\$3,080.00	\$3,080.00	\$0.00	Jennifer Hunt	9/27/2013	5/31/2015	Consultant	Signed
2014	1064	Caltest	PSSS POC Monitoring (Source 2)	\$ 42,959	\$38,367.57	\$4,590.96	\$4,590.96	\$0.00	Jennifer Hunt	9/1/2013	9/30/2014	Private	CLOSED
2014	1065	AXYS	PSSS POC Monitoring (Source 2)	\$ 79,273	\$54,968.55	\$24,304.65	\$24,304.65	\$0.00	Jennifer Hunt	9/1/2013	10/1/2014	Private	CLOSED
2014	1066	PERL	PSSS POC Monitoring (Source 2)	\$ 51,873	\$35,895.00	\$15,978.00	\$15,978.00	\$0.00	Jennifer Hunt	9/1/2013	10/1/2014	Private	CLOSED
2014	1067	SJSURF	PSSS POC Monitoring (Source 2)	\$ 15,321	\$14,588.90	\$731.60	\$731.60	\$0.00	Jennifer Hunt	9/1/2013	10/1/2014	University	CLOSED
2014		Unwritten	PSSS POC MONITORING	\$ 35,144		\$35,143.87	\$35,143.87	\$0.00					

Project Year	Cont #	Contractor	Project Title	Amount	Billed	Balance	Carryover	Unencumber	Project Mgr	Start Date	Expire Date	Type of Agency	Contract Status
2014	1089	CSUS	PSSS Program Review	\$ 36,821	\$20,950.46	\$15,870.54	\$15,870.54	\$0.00	Phil Trowbridge	6/9/2014	6/30/2015	University	Signed
2014	1096	AXYS	PSSS PFCs	\$ 21,975	\$22,228.21	(\$253.21)	\$0.00	(\$253.21)	Phil Trowbridge	7/1/2014	6/30/2015	Private	CLOSED
2014	1113	AXYS	PSSS Seal Serum	\$ 4,250	\$102.85	\$4,147.15	\$4,147.15	\$0.00	Phil Trowbridge	9/15/2014	3/31/2015	Private	Signed
2014	1117	USGS	PSSS Selenium Study	\$ 1,510		\$1,510.00	\$1,510.00	\$0.00	Phil Trowbridge	9/1/2014	3/31/2015	Federal	pending
2014		UCD	PSSS Selenium Study	\$ 1,590		\$1,590.00	\$1,590.00	\$0.00					
2014	1074	SFEP	PSSS Support of Estuary News	\$ 10,000	\$10,000.00	\$0.00		\$0.00	Phil Trowbridge	1/1/2014	12/31/2014	State	CLOSED
2014		Werme	PSSS PULSE	\$ 3,061		\$3,061.00		\$3,061.00					
2014	1092	ALS	S&T ALS	\$ 6,075	\$6,075.00	\$0.00		\$0.00	Phil Trowbridge	7/1/2014	6/30/2015	Private	CLOSED
2014	1084	AMS	S&T AMS	\$ 142,103	\$117,407.23	\$24,695.77	\$24,695.77	\$0.00	Phil Trowbridge	3/1/2014	2/1/2015	Private	Signed
2014	1096	AXYS	S&T AXYS	\$ 17,695	\$495.00	\$17,200.00	\$17,200.00	\$0.00	Phil Trowbridge	7/1/2014	6/30/2015	Private	Signed
2014	1093	Brooks Rand	S&T Brooks Rand	\$ 15,606	\$15,717.00	(\$111.00)	(\$111.00)	\$0.00	Phil Trowbridge	7/1/2014	6/30/2015	Private	Signed
2014	1094	CCSF	S&T CCSF	\$ 4,860		\$4,860.00	\$4,860.00	\$0.00	Phil Trowbridge	7/1/2014	6/30/2015	University	Signed
2014	PO2071	RTCES	S&T Cruise Vessel Rental	\$ 12,600	\$9,450.00	\$3,150.00		\$3,150.00	Phil Trowbridge	6/1/2014	10/1/2014	University	CLOSED
2014	1095	EBMUD	S&T EBMUD	\$ 67,775		\$67,775.00	\$67,775.00	\$0.00	Phil Trowbridge	8/1/2014	6/30/2015	County	Signed
2014	1078	CCR	S&T Sport Fish	\$ 115,533	\$115,533.00	\$0.00		\$0.00	Jennifer Hunt	1/17/2014	12/31/2014	Nonprofit	CLOSED
2014	1086	SJSURF	S&T Sport Fish	\$ 101,142		\$101,142.00	\$101,142.00	\$0.00	Phil Trowbridge	4/1/2014	6/30/2015	University	Signed
2014	1099	AXYS	S&T Sport Fish	\$ 8,040		\$8,040.00	\$8,040.00	\$0.00	Phil Trowbridge	8/1/2014	9/30/2015	Private	Signed
2014	PO2080	UCR	S&T Sport Fish	\$ 452		\$452.00	\$452.00	\$0.00	Phil Trowbridge	9/1/2014	3/31/2015	University	Signed
2014		UCD	S&T Sport Fish	\$ 384		\$384.00	\$384.00	\$0.00	Phil Trowbridge			University	pending
2014	1061	USGS	S&T USGS	\$ 165,000	\$165,000.00	\$0.00		\$0.00	Phil Trowbridge	10/1/2013	9/30/2014	Federal	CLOSED
2014		USGS	S&T USACE	\$ 250,000	\$250,000.00	\$0.00		\$0.00	Phil Trowbridge			Federal	
2014		USGS	S&T USGS	\$ 25,000	\$25,000.00	\$0.00		\$0.00	Phil Trowbridge			Federal	CLOSED
2014		Unallocated	S&T unallocated	\$ 115,240		\$115,240.00		\$115,240.00					
2014 TOTAL				\$ 1,883,529	\$993,264.64	\$890,264.36	\$769,051.28	\$121,213.08			3/15/2017		
2012-2014 TOTAL				\$ 2,043,678	\$1,011,223.73	\$1,032,454.27	\$909,442.19	\$123,012.08			3/15/2017		



SAN FRANCISCO ESTUARY INSTITUTE

4911 Central Avenue, Richmond, CA 94804 • p 510-746-7334 • f 510-746-7300

www.sfei.org

DATE: January 28, 2015

TO: RMP Steering Committee

FROM: Philip Trowbridge, RMP Manager

RE: Undesignated Funds for Selenium Study

On January 15, 2015, RMP staff sent an email request to the Steering Committee to approve \$8,950 of Undesignated Funds for the analysis of selenium in the fin rays of sturgeon caught in annual Sturgeon Derby in Martinez. The \$8,950 would be added to the existing \$20,000 already allocated in the 2015 RMP budget for monitoring selenium in sturgeon fish tissue at the Derby. The proposal was endorsed by the Selenium Strategy Team.

Six of the nine Steering Committee representatives replied to the email, which is considered a quorum. All were in favor. The representatives who replied were: Peter Carroll, John Coleman, Dan Tafolla, David Frandsen, Rob Lawrence, and Tom Mumley.

The Undesignated Funds will be allocated to the Selenium Delta Fish Derby Monitoring task in the 2015 RMP budget (3015.00 Task 045) as follows:

Category	Original Budget	Additional Funds	Updated Budget
Labor	\$14,100	\$0	\$14,100
Subcontractors	\$5,900	\$5,950	\$11,850
Direct Expenses	\$0	\$3,000	\$3,000
Total	\$20,000	\$8,950	\$28,950

The \$8,950 of Undesignated Funds allocated to this project will be partially offset because a 2014 RMP study of selenium in sturgeon plugs came in \$6,000 under budget due to an inability to collect the planned number of samples. The left-over \$6,000 has been added to the Undesignated Funds.

NEW DRAFT Pulse Outline for 2015

Theme: The State of Bay Water Quality: 2015 (Companion to the State of the Estuary Report [SOTER])

Total length: ~77 pages of content

ARTICLE IDEAS

Article: Management Overview Article - 6 pages Author Options: 1) Mumley, et al.
2) One of Ariel's writers does interviews and writes

- Topics
 - Progress since last SOTE report
 - Priorities for the next few years
 - Management Update Sidebars
 - xx
 - The 303(d) List: 1 page
 - Regulatory Status of Pollutants of Concern: 1 page
 - Success stories: copper, DDT, cyanide, etc. - one per edition (make it an article?)

Article: Summary of Bay Water Quality - 6 pages Authors: Davis et al.

- Platform for elaboration on SOTE Report, with a Bay focus
- Topics
 - Progress since last SOTE report
 - Information gathering priorities for the next few years
 - General discussion of certain topics
 - The many priority pollutants that meet objectives
 - Any pollutants worth mentioning that aren't profiled below
 - Sidebars
 - Climate change and sea level rise?

Another Option: Bay Water Quality in 2065 - 6 pages Authors: Davis et al.

- Tie-in
- Topics
 - Sea level rise implications
 - Acidification
 - Forecasts for priority contaminants

UPDATES ON PRIORITY CONTAMINANTS (focus on new information since last SOTER)

Introduction: 1 page - Davis

1. Mercury: 4 pages - Davis - Mercury synthesis, Forum, restoration monitoring
2. PCBs: 6 pages - Davis - PCB synthesis
3. Nutrients: 6-8 pages - Senn et al. - nutrient conceptual model - tie-in with SOTER sidebar
4. Selenium: 4 pages - Davis - include bird eggs
5. Toxicity: 6 pages - Davis - tie-in with SOTER
6. CECs (include ones with new information)
 - Current Use Pesticides - 2-4 pages - Sutton - tie-in with SOTER sidebar
 - Fipronil - Kelly's SETAC poster - Ellen's synthesis paper
 - PFOS - 2 pages - Meg's synthesis paper
 - Any others?
7. Copper: 2 pages - xx
8. Exotic Species: 2 pages - xx
9. Trash: 2 pages - xx
10. PAHs: 4 pages - xx
11. Pathogens: 2 pages - xx - Beach monitoring data
12. Dioxins: 2 pages - xx - may delete (no new data)
13. Legacy Pesticides: 2 pages - xx - may delete (no new data)

General Outline for Each Profile

1. Summary (new addition)
2. What we've learned in the last two years
3. Display of the State of the Estuary indicator
4. Infographic update on impairment
5. Infographic update on spatial and temporal patterns in sediment and/or water
6. Infographic update on sources, pathways, and loadings - including current loading estimates
7. Infographic update on important new findings
8. Where we're heading with management and monitoring

Notes from 2014 Update feedback and other

- reconsider trend graph groupings
- Consider Selenium in sturgeon and bird eggs
- Look at including SPOT data and watershed info (Mike C 12/1) - look at mapping them

Photos

- Swim Across America Oct 2013

Budget for 2015 Pulse Report

Line Item	Original Budget	Revised Budget	Comments
Labor	\$110,000	\$95,000	Assuming 100 hours for Lead Scientist, 230 hours for technical staff/Program Mgr/ED, 60 hours for data mgmt/GIS staff, 500 hours for design staff, 20 hours for web staff.
Office Supplies	\$500	\$0	\$653 in office supply costs in 2013
Printing	\$40,000	\$20,000	2013 Pulse print run cost \$35,250 for 3000 copies. 2014 RMP Update print run was \$17,850 for 1200 copies.
Consultants	\$15,000	\$10,000	Subcontracts for writing and editing.
Total	\$165,500	\$125,000	2013 Pulse cost \$189,000. 2014 RMP Update cost \$83k.

PCBs

Recent Advances

In 2014 the RMP completed a report summarizing advances in understanding of PCBs in the Bay since the development of a control plan (the PCBs TMDL - SFBRWQCB [2008]).

New information obtained from RMP monitoring of small fish collected along the margins of the Bay in 2010 fundamentally altered our understanding of PCB contamination of the Bay food web and potential pathways of exposure for sensitive wildlife species such as birds and seals.

The data on PCBs in fish and sediment indicate that there are two broad habitat categories with food webs that are largely distinct: the margins and the open Bay. PCB concentrations in many areas on the margins are very high and persistent. The report presented a conceptual model update that shifted focus from the open Bay to the contaminated areas on the margins where impairment is greatest, where load reductions are being pursued, and where improvement in response to load reductions would be most apparent. The report concluded that these margin areas should be treated as discrete local-scale units for monitoring, forecasting, and management. Local-scale actions in upstream watersheds or in the margin areas themselves will be needed to reduce contamination within that area.

PCB inputs to the Bay from local watersheds are significant and a focus of management attention. Several watersheds have been identified as “high leverage” such that control actions may be a cost-effective way of reducing Bay impairment. Management measures are currently being evaluated by stormwater management agencies to address the load reduction requirements outlined in the PCBs TMDL. RMP studies over the next several years are being designed to track the effectiveness of these management measures in reducing concentrations in the Bay.

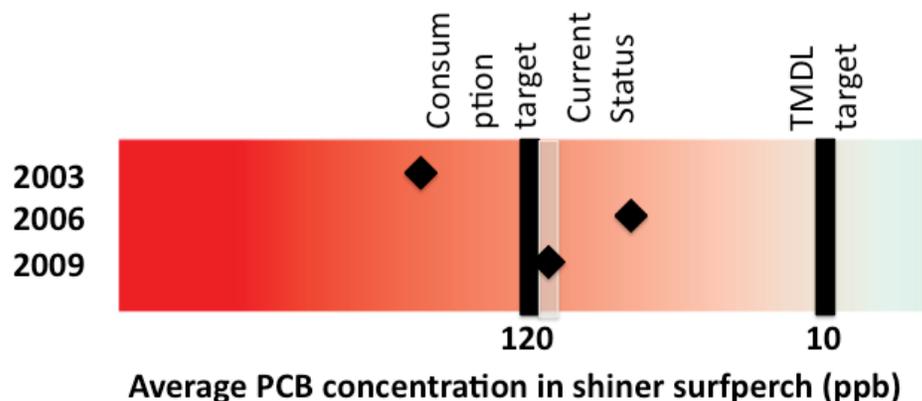
State of the Estuary Indicator

Are Bay fish safe to eat?

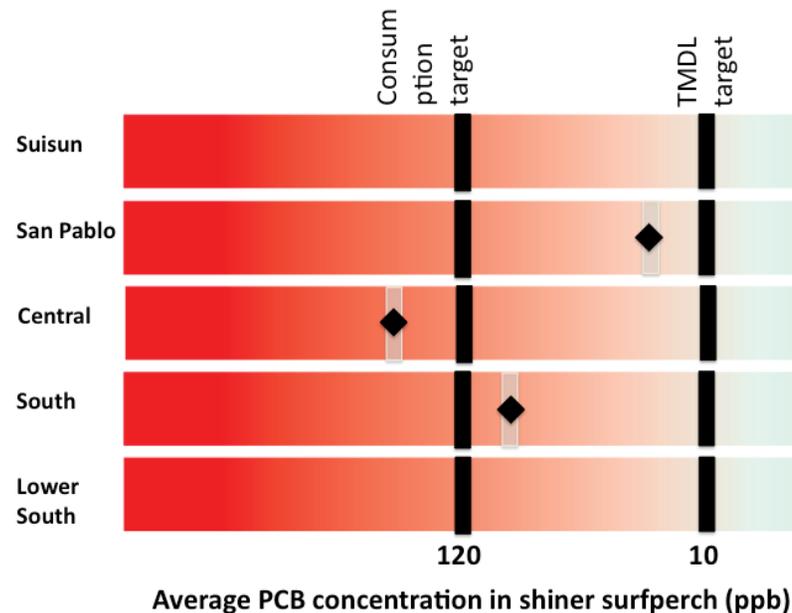
PCBs

Progress Toward the Targets

PCB concentrations in sport fish should be less than 120 ppb to allow limited consumption, and less than 10 ppb to meet the cleanup target established by the TMDL.



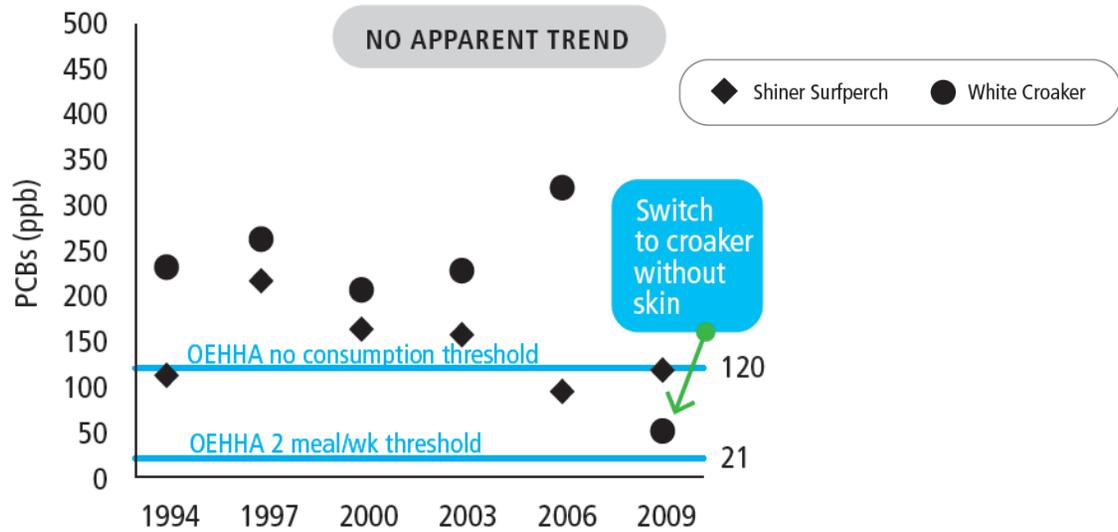
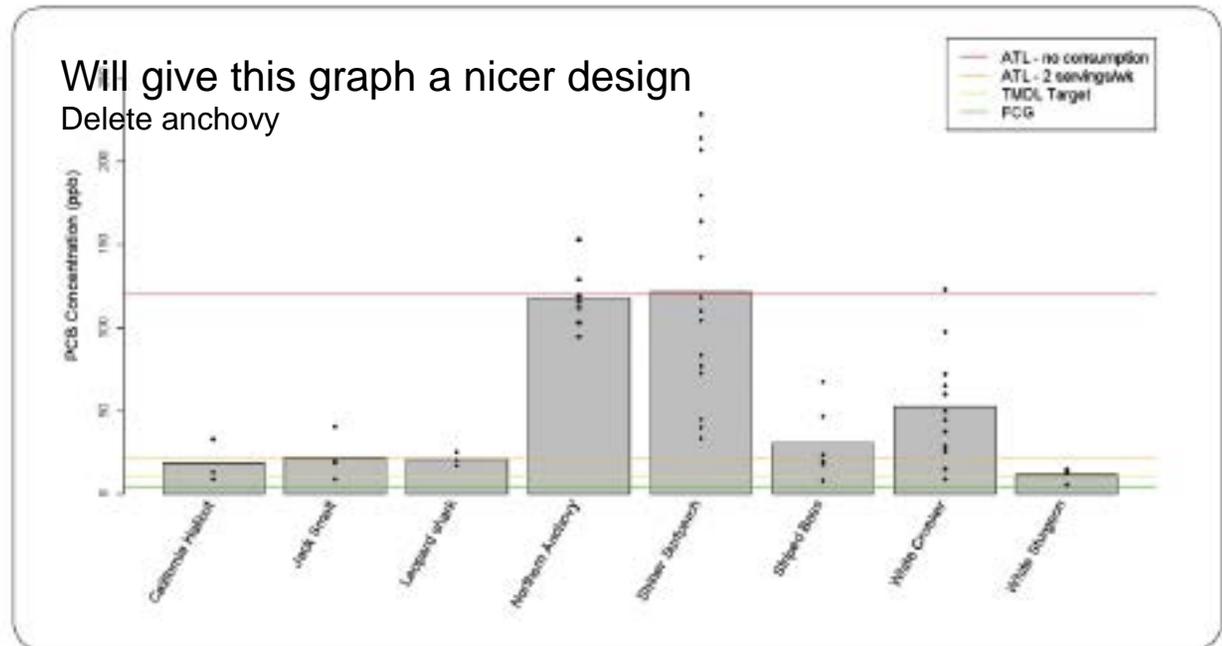
Progress Toward the Targets By Segment



Impairment

Variation Among Species

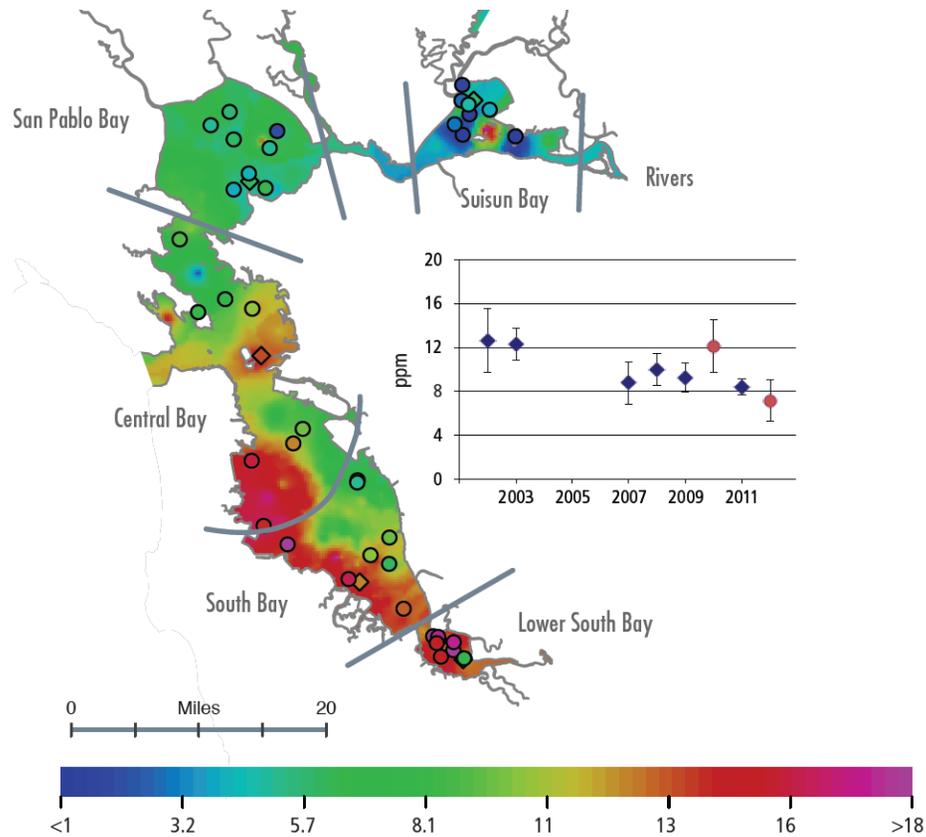
Concern for PCBs in the Bay is primarily driven by concentrations in sport fish. Shiner surfperch have the highest concentrations - 12 times higher than the cleanup target established in the TMDL. Because of the high concentrations in shiner surfperch, the Office of Environmental Health Hazard Assessment advises no consumption of any surfperch species in the Bay. All other sport fish species monitored also have average concentrations exceeding the TMDL target. There is also evidence of PCB exposure in birds, seals, and fish to a degree that may be reducing their health and survival.



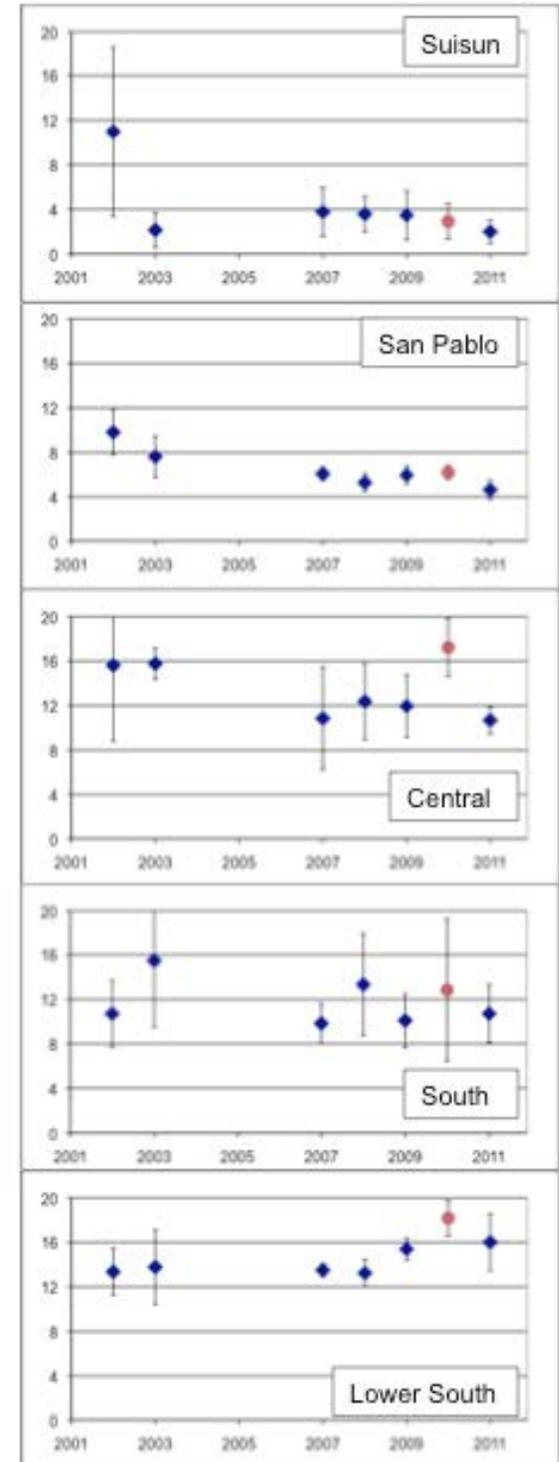
Trends Over Time

PCB concentrations in shiner surfperch, a key indicator species in the TMDL, have shown little evidence of decline. The Bay-wide average shiner surfperch concentration was lower in 2009 than in 1997, but not significantly different from 2000, 2003, or 2006. Furthermore, the variation that has been seen over the five rounds of sampling was primarily due to variation in the fat content of the fish, and not due to declines in PCBs in the food web.

Spatial and Temporal Patterns



Long-term average dry season PCB concentrations in Bay sediment have been highest in the southern reach of the Bay: Lower South Bay (14.2 ppb), South Bay (11.7 ppb), and Central Bay (12.9 ppb), and lower in San Pablo Bay (6.2 ppb) and Suisun Bay (4.5 ppb). Bay-wide average concentrations observed in 2007-2012 were lower than those in 2002-2003, particularly in Suisun, San Pablo, and Central bays - additional sampling will be needed to determine whether this is indicative of a long-term decline. Models suggest that sediment PCB concentrations must decline to about 1 ppb for concentrations in sport fish to fall below the threshold of concern. Suisun Bay has been closest to this level, with a minimum annual average of 2.0 ppb in 2011. Concentrations in South Bay and Lower South Bay do not appear to be declining.

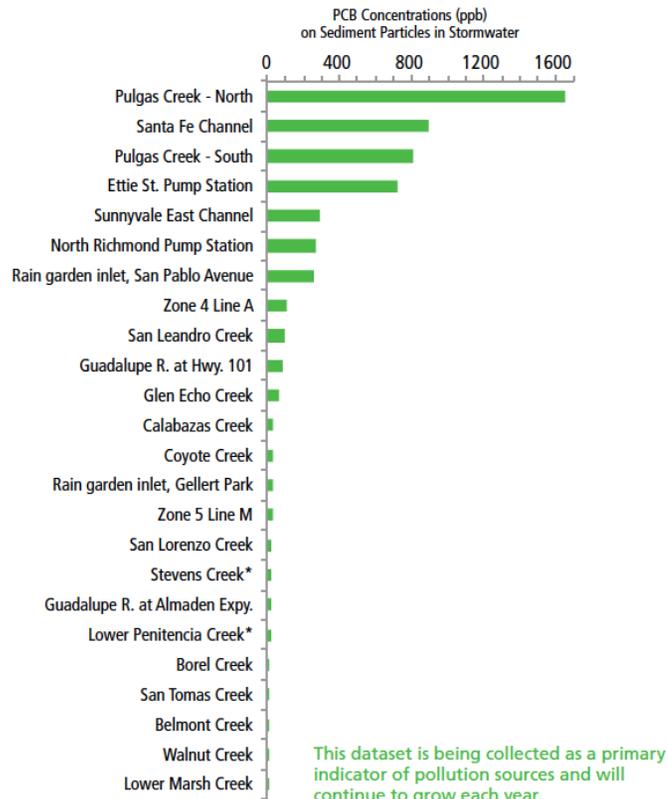


Sources, Pathways, and Loadings

Latest Loading Estimates

Although much has been learned about PCBs in stormwater monitoring over the past decade, a new estimate of total regional stormwater loads from Bay Area small tributaries has not yet been generated. However, stormwater likely remains the largest pathway. For loads to the Bay from the Delta, an updated estimate was developed that was slightly lower than the estimate included in the PCB TMDL. Recent estimates of total loads for POTWs and industrial facilities were well below the load allocations in the TMDL.

Pathway	TMDL Allocation	TMDL Load Estimate	Latest Load Estimate	Comments
POTWs	2	2.3	0.95	
Industry	0.035	0.035	0.007	
Stormwater	2	20	NA	New estimate not available
Central Valley	5	11	7.9	
Atmospheric Deposition	0	Net loss	Net loss	No new information



Important Loading Information

Pulgas Creek Pump Station North and South, Santa Fe Channel, and Ettie Street Pump Station appear to have relatively polluted sediment particles and to represent high leverage watersheds where control actions will be a cost-effective way of reducing inputs to the Bay. Data on sediment particles from additional watersheds are being collected as a primary indicator of degree of contamination and potential for effective management action.

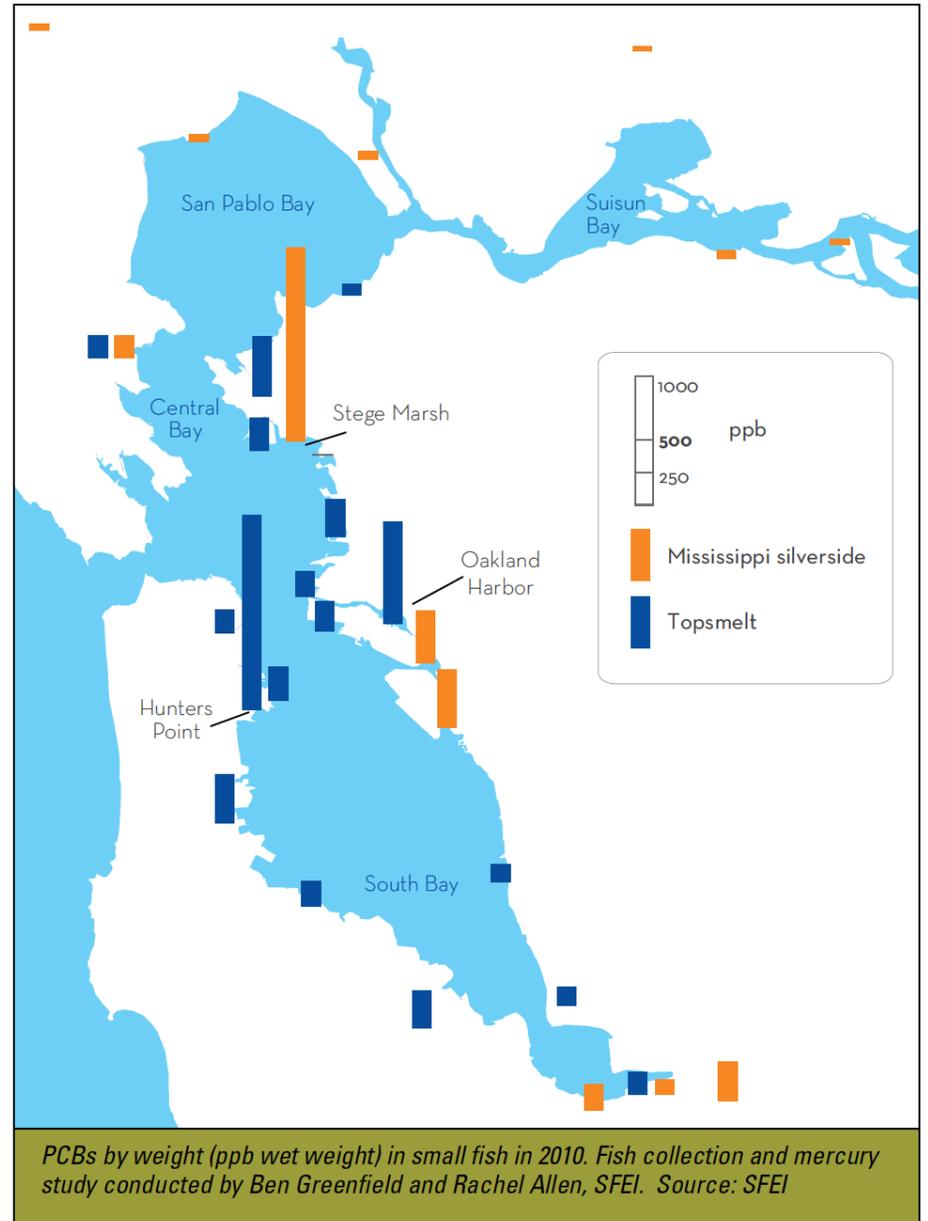
Important New Findings

PCBs in Small Fish

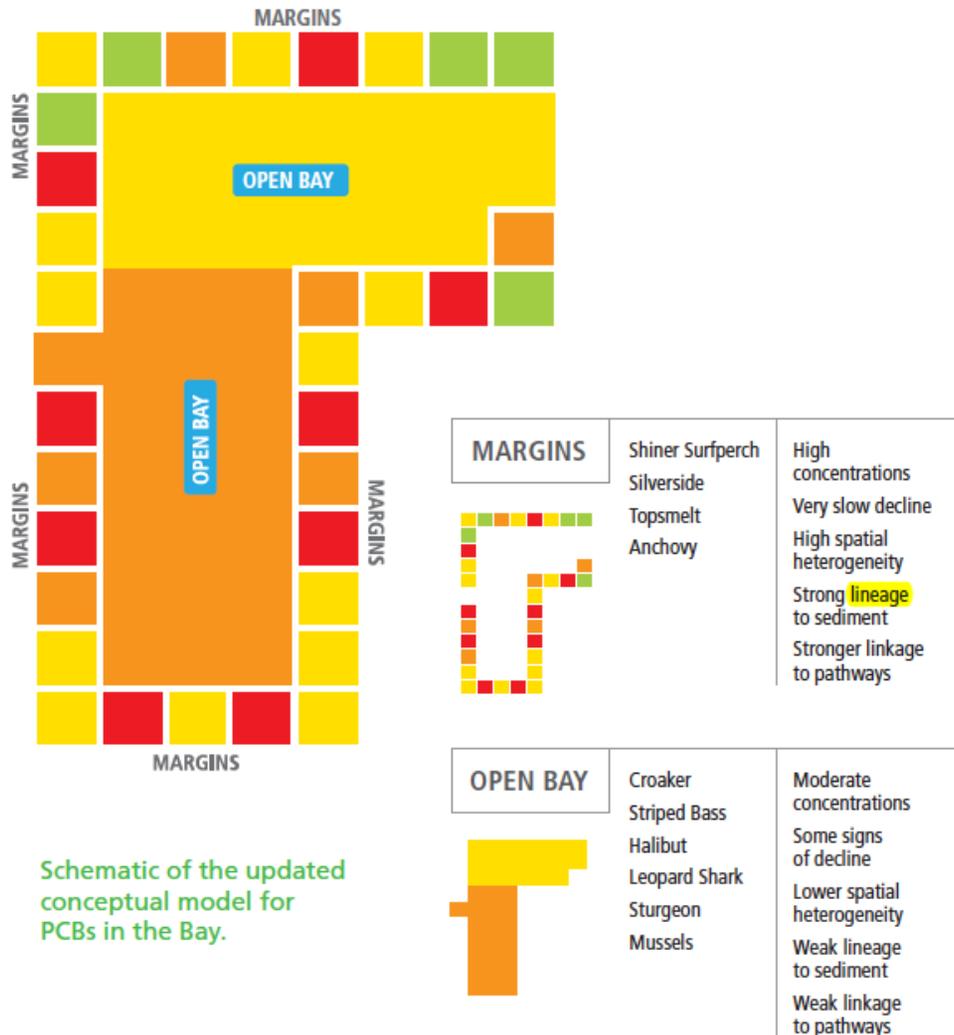
New information obtained from RMP monitoring of small fish collected along the margins of the Bay in 2010 fundamentally altered our understanding of PCB contamination of the Bay food web and potential pathways of exposure for sensitive wildlife species such as birds and seals. Small fish collected on the Bay margins accumulate high concentrations of PCBs that correlate with concentrations in sediment and represent a pathway for impact on fish-eating wildlife. These data, along with data for shiner surfperch, point to several contaminated margin sites that are high priorities for management, including: Hunters Point, Stege Marsh, Oakland Inner Harbor, Richmond Inner Harbor, San Leandro Harbor, San Leandro Bay, and Coyote Point.

New PCBs? (PCB 11)

Recent studies have identified PCB 11, a PCB that had been previously overlooked, as a ubiquitous contaminant owing to its widespread use in pigments that are present in paint and in ink used in newspapers, magazines, and cardboard boxes. Based on the RMP data, PCB 11 that enters the Bay in wastewater and urban runoff is not persistent and is not accumulating in the food web. PCB 11 should be considered separately from the Aroclor-derived PCBs that are driving risks to humans and wildlife.



Where We're Heading



The PCB Synthesis was the foundation for a 2014 update of the PCB Strategy that calls for a multi-year effort to identify margin areas that are high priorities for management and monitoring, develop site-specific assessments and optimized monitoring plans for margin areas downstream of watersheds where management actions will occur, and perform monitoring in these areas as a performance measure.

The current plan is to develop and initiate monitoring for five priority margin areas over the next several years. Longer-term monitoring of these areas would then continue in order to detect PCB reductions in response to the actions taken.

A thorough and thoughtful effort is warranted given the large expenditures of resources that will be needed to implement management actions to reduce PCB loads from urban stormwater.



DATE: January 22, 2015
TO: RMP Steering Committee
FROM: Philip Trowbridge, RMP Manager
RE: Set-Aside Fund for Monitoring Contingency

Recommendation

Approve the transfer of \$50,000 unused monitoring contingency funds from the 2014 budget to a Designated Set-Aside Fund for Monitoring Contingency.

Explanation

Past RMP budgets have included \$50,000 for monitoring contingencies. If the funds were not used by the end of the year, they would be carried over into the following year budget. This practice had the effect of making the revenue and expense of the RMP budget \$50,000 higher than planned and complicating the accounting.

The 2015 budget does not contain a line item for monitoring contingency. Instead, we are recommending that the \$50,000 from the 2014 budget be placed in a Set-Aside Fund for Monitoring Contingencies.

The Set-Aside Fund for Monitoring Contingency would only be used for unexpected monitoring costs or opportunities that arise during the course of the year after the RMP budget has been approved. The RMP Manager may authorize use of these funds up to \$10,000, without prior approval from the Steering Committee, under the following circumstances:

- A strategically important sampling opportunity arises (e.g., due to rare weather events or a chance to leverage other monitoring efforts);
- A mechanical failure during field sampling necessitates rapid action to repair or replace equipment in order to maintain the sampling schedule; or

- An unexpected event that, in the judgment of the RMP Manager, requires immediate action.

Should the monitoring contingency funds be obligated by the RMP Manager under these circumstances, the RMP Manager would inform the Steering Committee via email and provide a justification. The Steering Committee would then provide feedback at the next scheduled meeting on the appropriateness of the decision to maintain clear expectations for use of these funds.

The RMP Manager would seek Steering Committee approval to replenish the Set-Aside Fund for Monitoring Contingency to the \$50,000 balance when requesting approval for the next year's budget.



DATE: January 22, 2015

TO: RMP Steering Committee

FROM: Philip Trowbridge, RMP Manager

RE: Consolidating the Existing Set-Aside Funds for Monitoring

Recommendation

Approve the merger of Designated Set-Aside Funds for water chemistry (\$110,700), bird egg monitoring (\$50,625), sediment benthos (\$30,900), and sediment toxicity (\$25,750) into a single Designated Set-Aside Fund for Status & Trends Monitoring with a balance of \$217,975.

Explanation

Over the years, the RMP has accumulated 17 different Set-Aside Funds. The purpose of these funds are to spread out the cost of large monitoring projects across multiple budget years. For example, sport fish monitoring is conducted every five years and typically costs \$150k for field and lab work. By contributing \$30k to the Set-Aside Fund for Sport Fish Monitoring each year, the cost of the program is spread across five budget cycles. The full list of set-aside funds and their current balances after the 2015 budget is shown in Table 1.

The past practice of maintaining separate set-aside funds for specific monitoring activities has become very difficult to administer. The current design for Status and Trends (S&T) monitoring calls for different monitoring activities to occur on different schedules. As a result, the RMP needs to both contribute to and withdraw from monitoring set-aside funds in any given budget year. For example, in 2014, the RMP used \$454k from certain set-aside funds to pay for 2014 monitoring and then contributed \$161k to other set-aside funds for future monitoring. It is not efficient to keep track of these cash flows into and out of set-aside funds in the same year.

The S&T Program was designed to be implemented as a whole, rather than separate pieces. S&T monitoring activities for water, sediment, bivalves, sport fish and avian eggs are planned through

2023. Smoothing out the cost of each separate piece of the S&T Program is unnecessarily complicated. The overall goal of smoothing out the yearly costs of Program could be more efficiently achieved using a single Set-Aside Fund for S&T Monitoring.

Table 2 shows how a single set-aside fund could be used to smooth out the costs of the whole program between 2015 and 2023. The RMP would need to save \$200,000, \$125,000, and \$225,000 in 2016, 2017, and 2020, respectively, in the Set-Aside Fund. These funds plus the starting balance would be used to partially offset S&T costs in the other years.

Table 1: RMP Set-Aside Funds Balances as of January 1, 2015

Set-Aside Fund	Balance
Aquatic Toxicity	\$0
Bivalve Monitoring	\$0
Causes of Sediment Toxicity	\$0
Cormorant Monitoring	\$0
Fish Contamination	\$0
Guadalupe Loads	\$0
Large Tributaries	\$0
NIST Archive	\$0
Program Review	\$88,179
S&T Data Management	\$0
S&T Fieldwork and Logistics	\$0
Sediment Benthos	\$30,900
Sediment Chemistry	\$0
Sediment Toxicity	\$25,750
Sport Fish Monitoring	\$0
Tern Monitoring	\$50,625
Water Chemistry	\$110,700

Table 2: Proposed Schedule for Using and Saving Set-Aside Funds for S&T Monitoring

Year	S&T Expense	Set-Aside Funds Used	Set-Aside Funds Saved	S&T Funds Needed	Set-Aside Funds Balance
2014 actl	\$993,352	\$416,700	\$161,100	\$737,752	\$297,050
2015 bdgt	\$861,000*	\$79,075	\$0	\$781,925	\$217,975
2016 fest	\$622,436	\$0	\$200,000	\$822,436	\$417,975
2017 fest	\$741,280	\$0	\$125,000	\$866,280	\$542,975
2018 fest	\$1,110,862	\$225,000	\$0	\$885,862	\$317,975
2019 fest	\$1,039,753	\$150,000	\$0	\$889,753	\$167,975
2020 fest	\$687,053	\$0	\$225,000	\$912,053	\$392,975
2021 fest	\$992,188	\$75,000	\$0	\$917,188	\$317,975
2022 fest	\$1,098,498	\$175,000	\$0	\$923,498	\$142,975
2023 fest	\$1,047,508	\$120,000	\$0	\$927,508	\$22,975

Notes:

*includes \$50k for CTR monitoring which was part of the 2014-2023 design but was not funded in the 2015 budget.

There is also \$88,179 in another Set-Aside Fund for the Program Review. These funds are not recommended to be merged with the others since they are for a fundamentally different purpose.

REGIONAL MONITORING PROGRAM FOR
WATER QUALITY IN SAN FRANCISCO BAY

MULTI-YEAR PLAN

2015 ANNUAL UPDATE

FINAL: January 2015

RMP ORIGIN AND PURPOSE

In 1992 the San Francisco Bay Regional Water Board passed Resolution No. 92-043 directing the Executive Officer to send a letter to regulated dischargers requiring them to implement a regional multi-media pollutant monitoring program for water quality (RMP) in San Francisco Bay. The Water Board's regulatory authority to require such a program comes from California Water Code Sections 13267, 13383, 13268 and 13385. The Water Board offered to suspend some effluent and local receiving water monitoring requirements for individual discharges to provide cost savings to implement baseline portions of the RMP, although they recognized that additional resources would be necessary. The Resolution also included a provision that the requirement for a RMP be included in discharger permits. The RMP began in 1993, and over the past 21 years has been a successful and effective partnership of regulatory agencies and the regulated community.

The goal of the RMP is to collect data and communicate information about water quality in San Francisco Bay in support of management decisions.

This goal is achieved through a cooperative effort of a wide range of regulators, dischargers, scientists, and environmental advocates. This collaboration has fostered the development of a multifaceted, sophisticated, and efficient program that has demonstrated the capacity for considerable adaptation in response to changing

management priorities and advances in scientific understanding.

RMP PLANNING

This collaboration and adaptation is achieved through the participation of stakeholders and scientists in frequent committee and workgroup meetings (Figure 1).

The annual planning cycle begins with a workshop in October in which the Steering Committee articulates general priorities among the information needs on water quality topics of concern. In the second quarter of the following year the workgroups and strategy teams forward recommendations for study plans to the TRC. At their June meeting, the TRC combines all of this input into a study plan for the following year that is submitted to the Steering Committee. The Steering Committee then considers this recommendation and makes the final decision on the annual workplan.

In order to fulfill the overarching goal of the RMP, the Program has to be forward-thinking and anticipate what decisions are on the horizon, so that when their time comes, the scientific knowledge needed to inform the decisions is at hand. Consequently, each of the workgroups and teams develops five-year plans for studies to address the highest priority management questions for their subject area. Collectively, the efforts of all these groups represent a substantial body of deliberation and planning.

PURPOSE AND ORGANIZATION OF THIS DOCUMENT

The purpose of this document is to guide efforts and summarize plans developed within the RMP. The intended audience includes representatives of the many organizations who directly participate in the Program. This document will also be useful for individuals who are not directly involved with the RMP but are interested in an overview of the Program and where it is heading.

The organization of this Multi-Year Plan parallels the RMP planning process (Figure 2). Section 1 presents the long-term management plans of the agencies responsible for managing water quality in the Bay and the overarching management questions that guide the Program. The agencies' long-term management plans provide the foundation for RMP planning (page 6). The first step the RMP takes to support these plans, is to distill prioritized lists of management questions that need to be answered in order to turn the plans into effective actions (page 7). The prioritized management questions then serve as a roadmap for scientists on the Technical Review Committee, the workgroups, and the strategy teams to plan and implement scientific studies to address the most urgent information needs. This information sharpens the focus on management actions that will most effectively and efficiently improve water quality in the Bay.

Figure 1. Collaboration and adaptation in the RMP are achieved through the engagement of stakeholders and scientists in frequent committee and workgroup meetings.

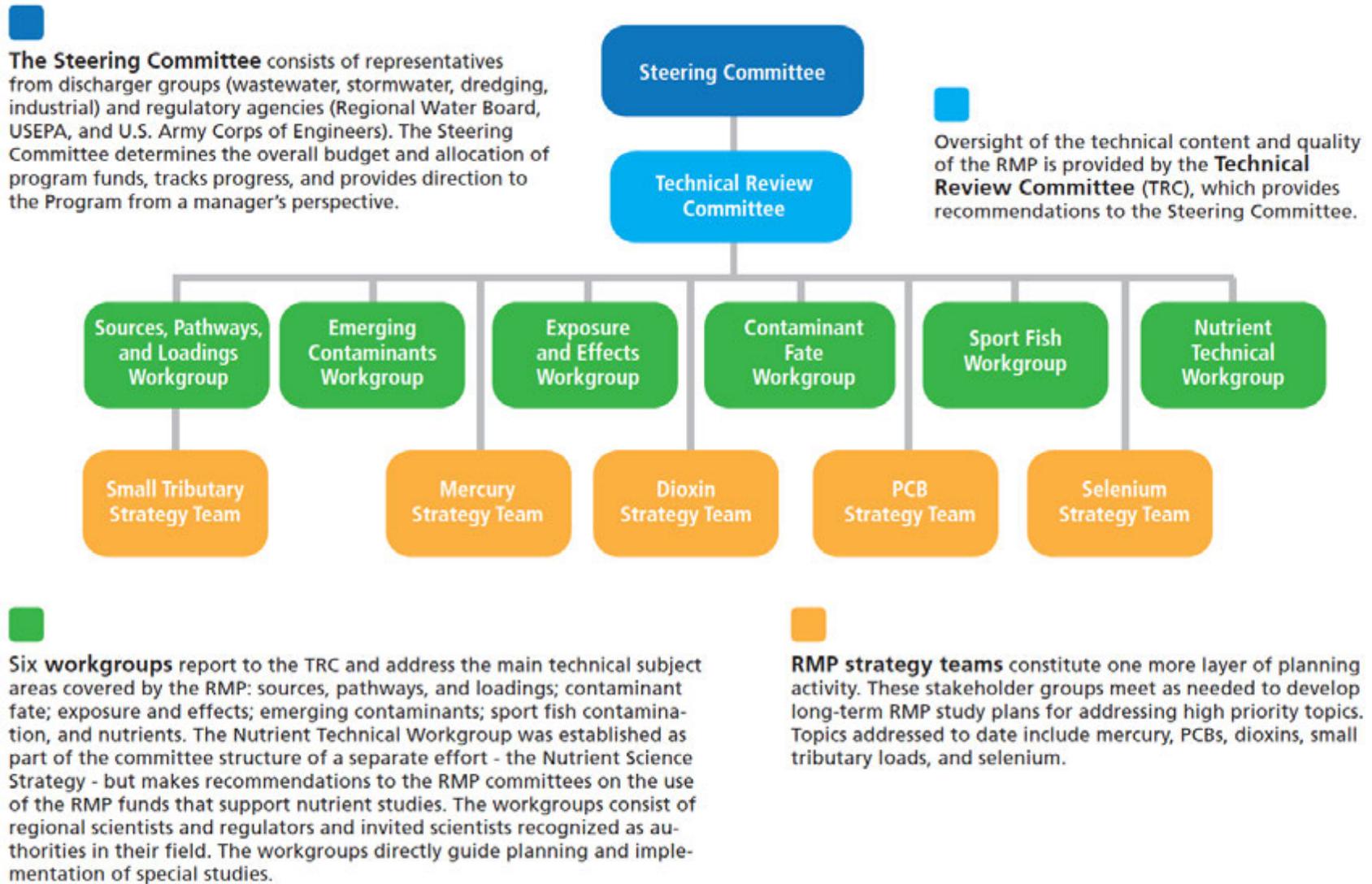


Figure 2. Science in support of water quality management.



Section 2 provides an overview of the budget of the RMP, including where the funding comes from and how it is allocated among different elements of the Program. This section provides a summary of the priority topics to be addressed by the Program over the next five years.

Section 3 presents the five-year plans developed by the workgroups and strategy teams for specific priority topics: mercury, PCBs, dioxins, emerging contaminants, small tributary loads, exposure and effects, forecasting, nutrients, and status and trends. Led by the stakeholder representatives that participate in these groups, each workgroup and strategy team has developed a specific list of management questions for each topic that the RMP will strive to answer over the next five years. With guidance from the science advisors on the workgroups, plans have been developed to address these questions. These plans include proposed projects and

tasks and projected annual budgets. Information synthesis efforts are often conducted to yield recommendations for a next phase of studies. For now, study plans and budget allocations for these strategies are largely labelled as “to be determined”. Other pieces of information are also included to provide context for the multi-year plans. First, for each high priority topic, specific management policies or decisions that are anticipated to occur in the next few years are listed. Second, the latest advances in understanding achieved through the RMP and other programs on Bay water quality topics of greatest concern are summarized. Lastly, additional context is provided by listing studies performed within the last two years and studies that are currently underway.

Section 4 describes five-year plans for other elements that are essential to the mission of the RMP: communications, data management, and quality assurance.

A Living Document

The RMP Multi-Year Plan is updated annually to provide an up-to-date description of the priorities and directions of the Program. An annual Planning Workshop is held in conjunction with the October Steering Committee meeting. A draft Multi-Year Plan is prepared after the workshop, and approved by the Steering Committee at the January meeting.

More detailed descriptions of the elements of the RMP are provided in the annual Program Plan and in the annual Detailed Workplan (both available at www.sfei.org/rmp/what).

For additional information on the RMP please visit our website at www.sfei.org/rmp.

Please contact Phil Trowbridge (philt@sfei.org) with questions or suggestions for improving this document.

Figure 3. Annual planning calendar for the Steering Committee.

Annual Steering Committee Calendar

- January
 - Approval of Multi-Year Plan
 - Review of incomplete projects from the previous year
- April
 - Multi-year Plan: Focus on selected element(s)
 - Plan for Annual Meeting
 - Additional guidance to workgroups
- August
 - Multi-year Plan: mid-year check-in, workshop planning
 - Decision on special studies recommended by the TRC for next year
 - Plan for Annual Meeting
 - Report on SFEI financial audit
 - Brief discussion of fees for year after next
- October
 - Confirm chair(s)
 - Planning Workshop
 - Decision on fees for the year after next
 - Approve Program Plan and detailed budget for next year
 - Approval of Pulse outline for next year
 - Decision on workshops to be held next year

Agendas and meeting summaries available at <http://www.sfei.org/rmp/sc>

**CURRENT AND ANTICIPATED MANAGEMENT DECISIONS, POLICIES, AND ACTIONS
BY THE REGULATORY AGENCIES THAT MANAGE BAY WATER QUALITY**

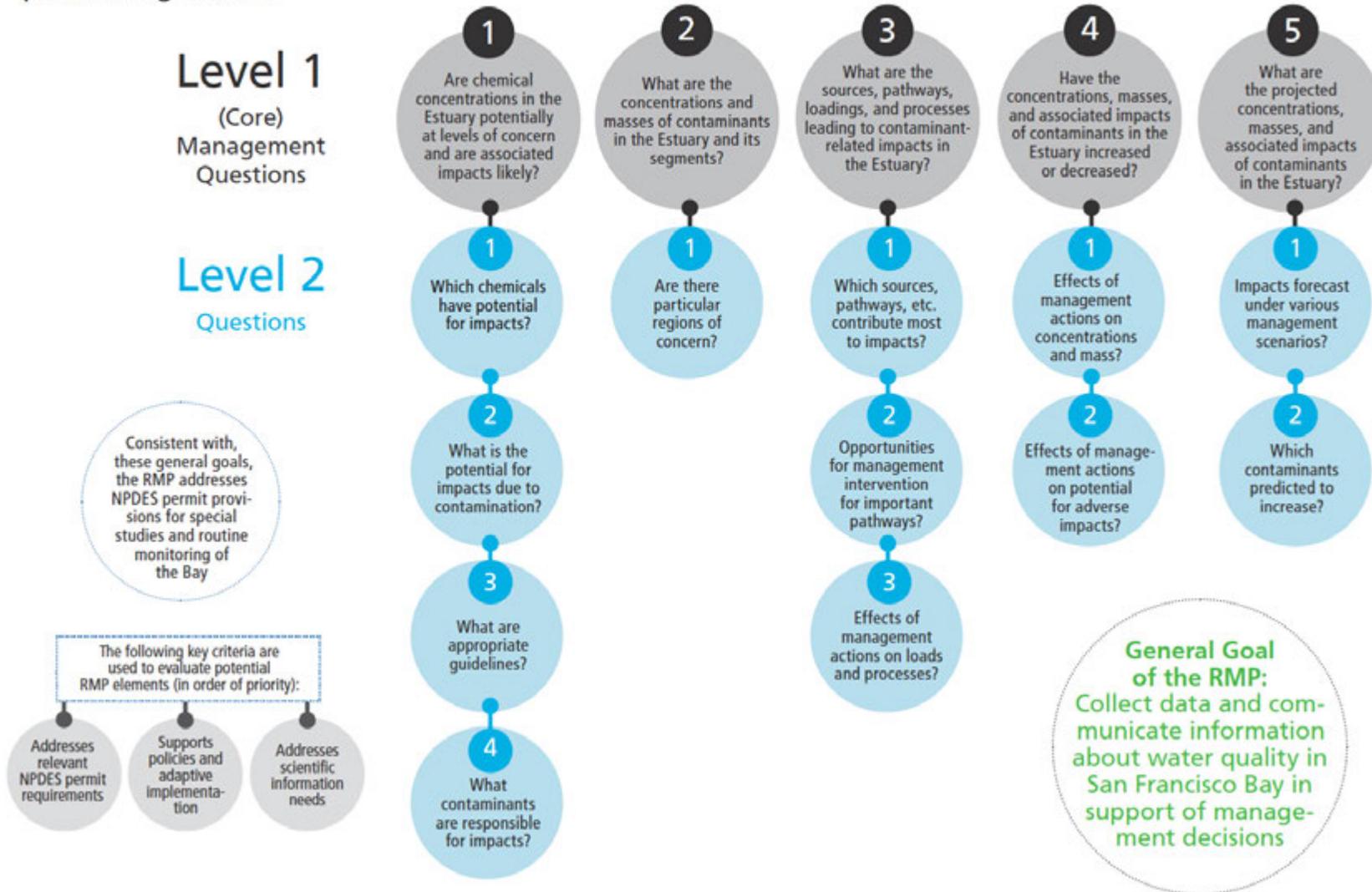
Decisions, Policies, and Actions	Timing
<i>ONGOING AND EXISTING</i>	
<i>Determination of Reasonable Potential and Permit Limits</i>	Ongoing
<i>Long-Term Management Strategy for Placement of Dredged Material/Dredged Material Management Office</i> <i>Regional Sediment Management Strategy</i>	Ongoing
<i>Dredging Permits</i> Bioaccumulation testing triggers and in-Bay disposal levels	Annual
<i>303(d) List and 305(b) Report</i>	2016, 2022
<i>Copper</i> Compare levels to site specific objectives triggers Evaluation of the site-specific objectives	Annual Triennial (2015)
<i>Cyanide</i> Compare levels to site specific objectives triggers Evaluation of the site-specific objectives	Annual Triennial (2015)
<i>Selenium</i> North Bay Selenium TMDL EPA Water Quality Criteria South Bay Selenium TMDL	2015 2016 >2016
<i>Dioxins</i> Review 303(d) listings and establish TMDL development plan or alternative	2018
<i>Mercury</i> Review existing TMDL and establish plan to revise*	2018
<i>PCBs</i> Review existing TMDL and establish plan to revise*	2020

Decisions, Policies, and Actions	Timing
<i>NEW AND FUTURE</i>	
<i>Nutrients</i> Nutrient Management Strategy Nutrient Water Quality Objective	Ongoing 2024
<i>Legacy Pesticides (DDT, Dieldrin, Chlordane)</i> Review 303(d) listings and delist, establish TMDL development plan or alternative	2016
<i>Pathogens</i> Bay Beaches Bacteria TMDL	2015
<i>Sediment Quality Objectives and Hot Spots</i> Review 303(d) listings and establish TMDL development plan or alternative	2016
<i>Chemicals of Emerging Concern</i> Review of RMP strategy	Annual
<i>Toxicity</i> New state plan on effluent and receiving water toxicity	2015
<i>BAY WATERSHED PERMITS</i>	
<i>Municipal Regional Stormwater Permit</i>	2015, 2020*
<i>Mercury and PCBs Watershed Permit for Municipal and Industrial Wastewater</i>	2017
<i>Nutrient Watershed Permit for Municipal Wastewater</i>	2019

* The schedules for revising the Mercury and PCB TMDLs coincide with the schedule for reissuing the Municipal Regional Stormwater Permit.

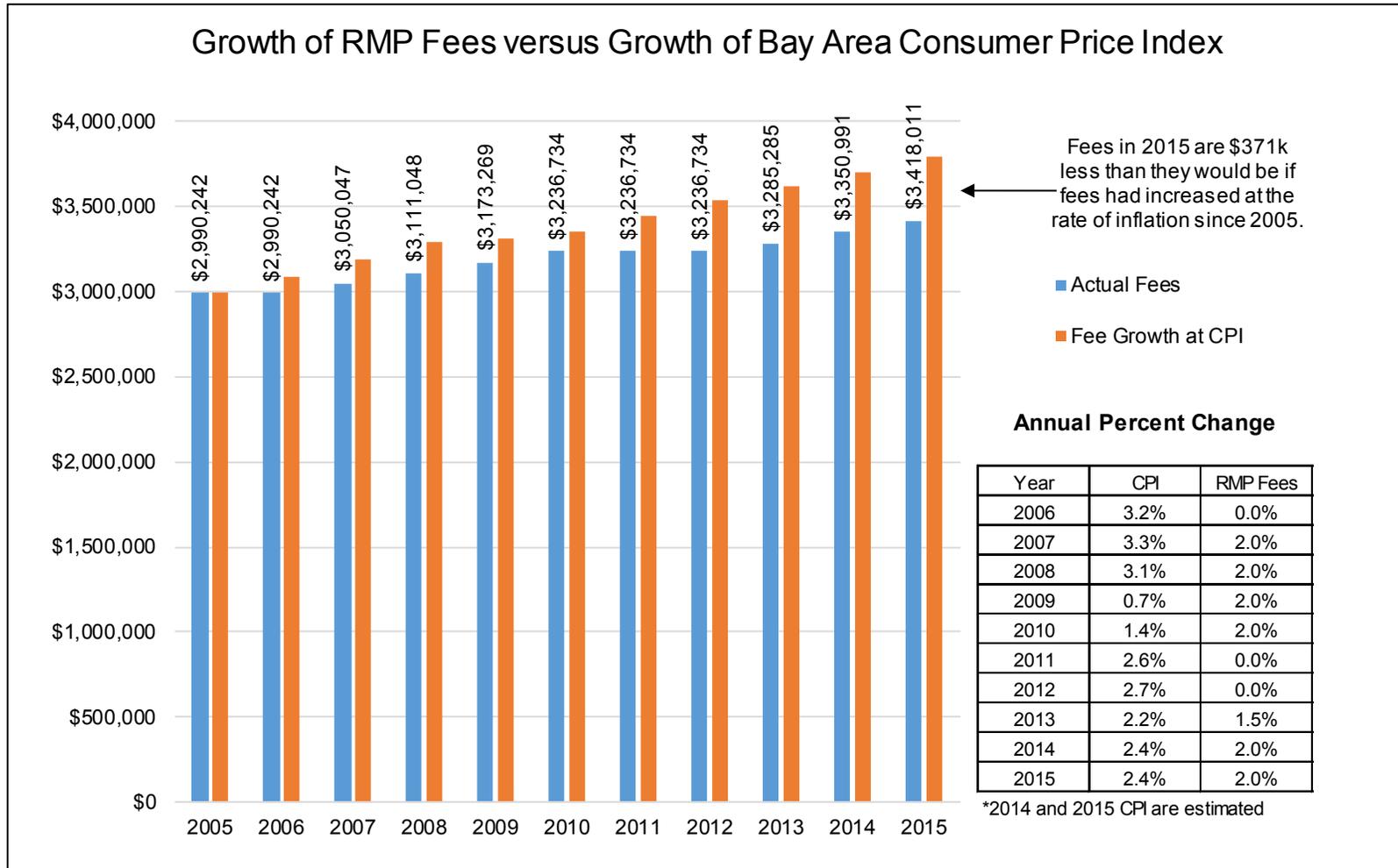
RMP GOAL AND MANAGEMENT QUESTIONS

RMP stakeholders have articulated an overarching goal and a tiered framework of management questions that organize and guide RMP studies. The management questions are closely linked to existing and planned regulations.



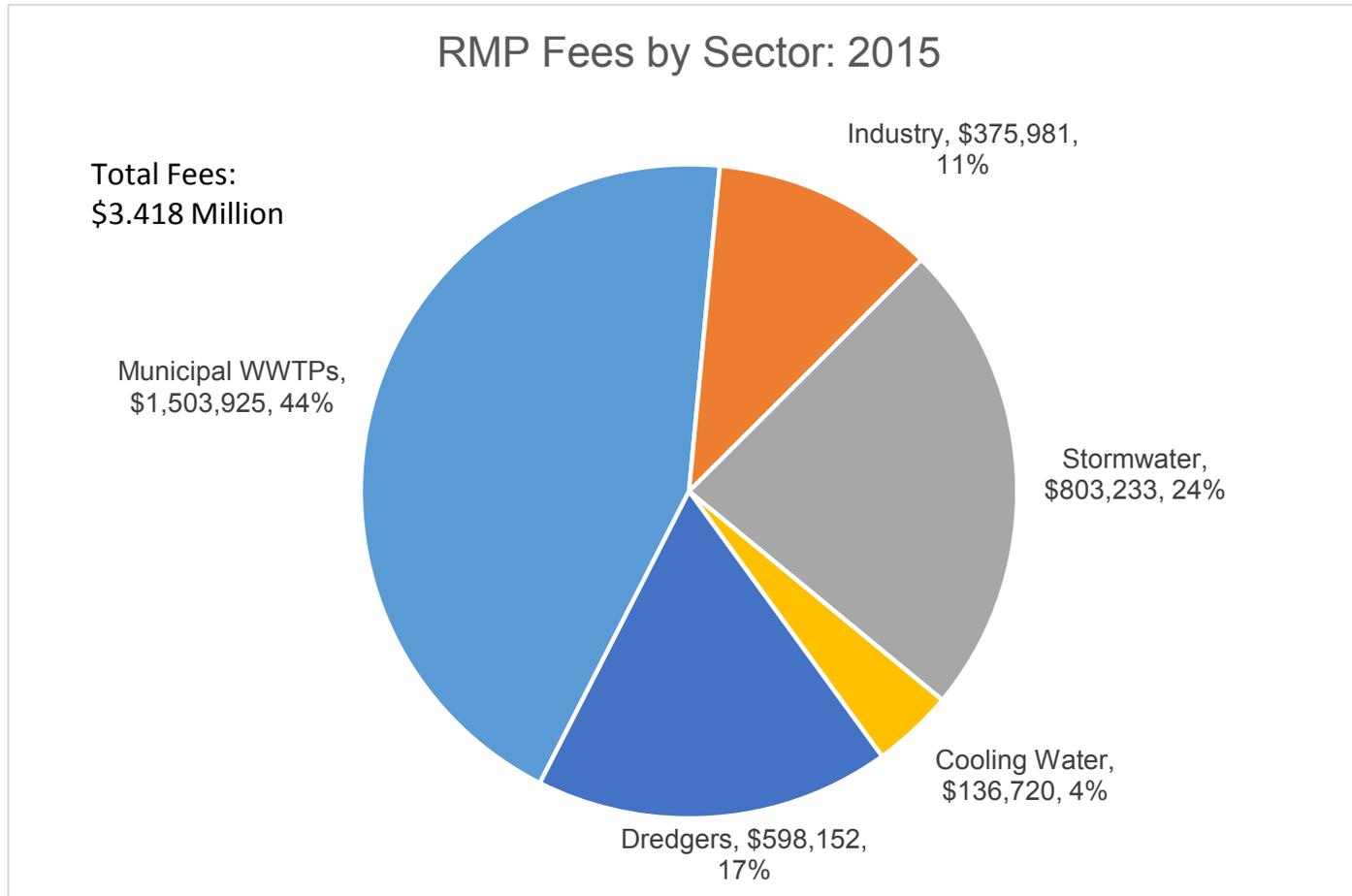
BUDGET: Revenue by Year

RMP fees in 2015 are \$3.418 Million. The schedule for fee increases is set by the Steering Committee every three years. Between 2005 and 2015, the RMP fees have grown at an annual average rate of 1.3%, which is slower than inflation (2.4% for 2005-2013).



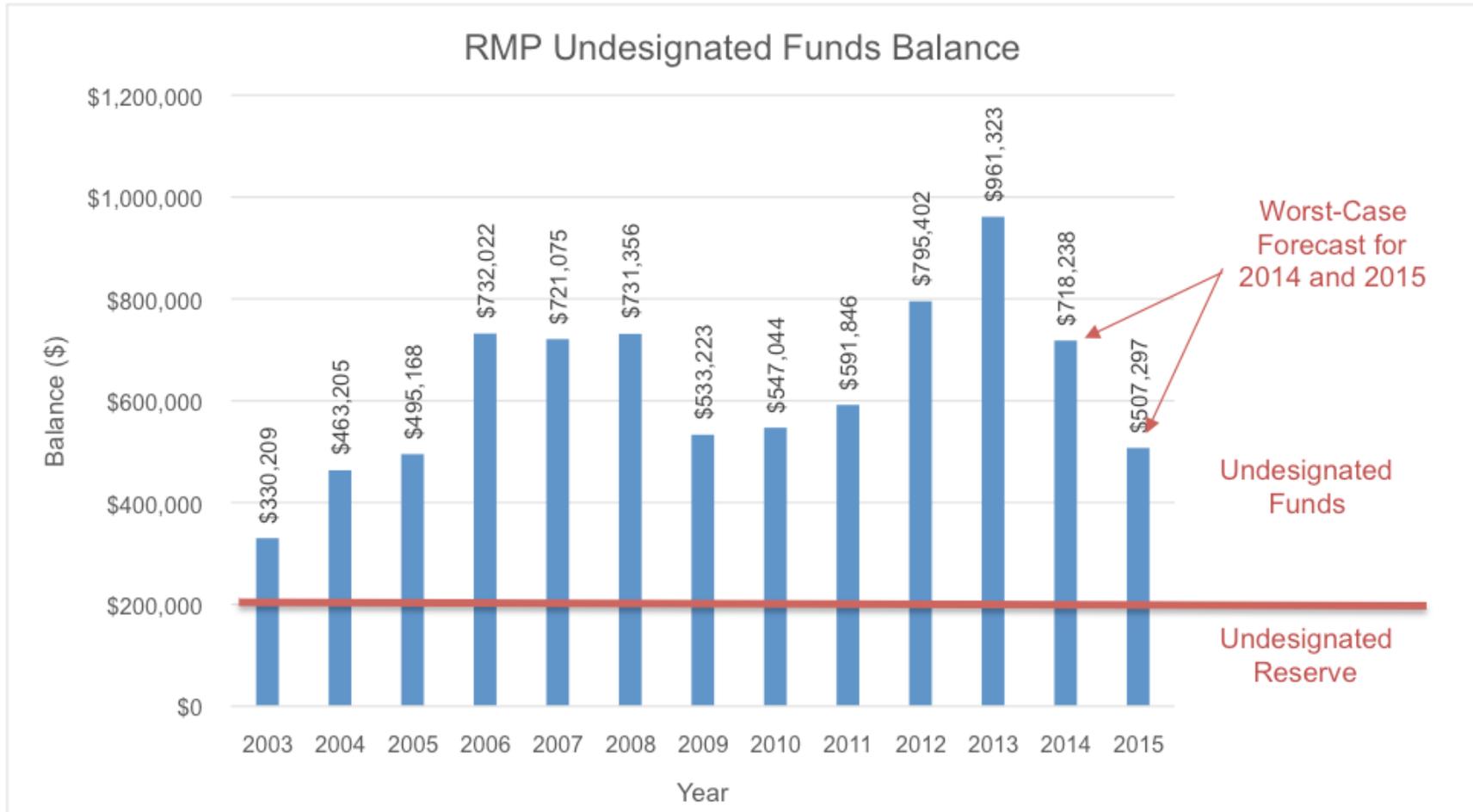
BUDGET: Revenue by Sector

The RMP fees are divided among five major discharger groups. Municipal wastewater treatment plants are the largest contributor (44%), stormwater agencies are the second largest contributor (24%). The contribution from dredgers includes \$250,000 from the U.S. Army Corps of Engineers. Refineries constitute the majority of the industrial sector, and also contribute to the program due to dredging activities at their facilities.



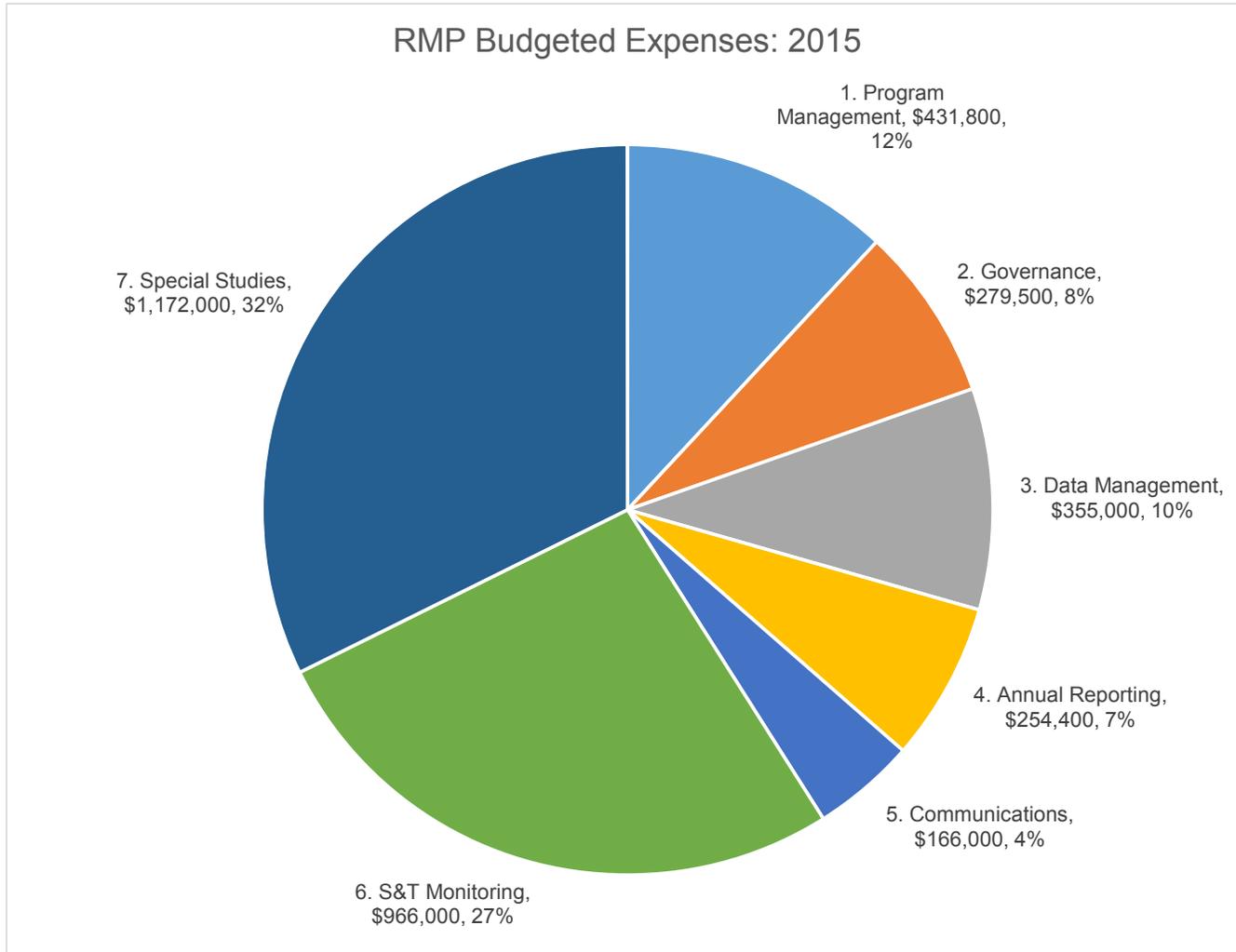
BUDGET: Reserve Funds

The RMP maintains a balance of Undesignated Funds for contingencies. Higher than anticipated revenues and elimination or reduction of lower priority elements sometimes leads to accumulation of funds that can be used for high priority topics at the discretion of the Steering Committee. It is the policy of the RMP to maintain a minimum balance of \$200,000 of the Undesignated Funds as a reserve for unanticipated urgent priorities.



BUDGET: Budgeted Expenses

The budget for the RMP reflects the priorities of the program. Fifty-nine percent of the expenses are for monitoring and special studies. Reporting results and properly archiving data comprise 11% and 10% of the budget, respectively. Governance meetings (8%) are critical to ensure that RMP is addressing stakeholder needs. Finally, 12% of the budget is needed for program management, including fiduciary oversight of contracts and expenditures.



COORDINATION WITH OTHER ORGANIZATIONS AND PROGRAMS

Small Tributary Loads

- MRP cities, counties, and districts
- San Francisco Bay Water Board
- San Francisco Estuary Institute

Nutrients

- U.S. Geological Survey
- State Water Board
- San Francisco Bay Water Board
- Bay Area Clean Water Agencies
- Central Contra Costa Sanitation District
- Interagency Ecological Program
- State and Federal Contractors Water Agency
- San Francisco Estuary Institute

Forecasting

- U.S. Geological Survey
- Bay Area Clean Water Agencies
- San Francisco Estuary Institute

Emerging Contaminants

- State Water Board
- San Francisco Bay Water Board
- National Oceanic and Atmospheric Administration
- Southern California Coastal Water Research Project
- San Francisco Estuary Institute

Legacy Contaminants

- State Water Board (SWAMP)
- San Francisco Bay Water Board
- San Francisco Estuary Institute

Exposure and Effects

- State Water Board
- San Francisco Bay Water Board
- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers
- Bay Planning Coalition
- National Oceanic and Atmospheric Administration
- Southern California Coastal Water Research Project
- U.S. Geological Survey
- San Francisco Estuary Institute

Status and Trends

- U.S. Geological Survey
- State Water Board (SWAMP)
- San Francisco Bay Water Board
- Interagency Ecological Program
- San Francisco Estuary Institute

Communication

- San Francisco Estuary Partnership
- California Water Quality Monitoring Council
- San Francisco Estuary Institute

Data Management

- State Water Board (CEDEN)
- San Francisco Estuary Institute

RMP SPECIAL STUDIES: 2013-2018

RMP expenditures on special study topics. Figures for 2013-2015 are actual amounts. Figures for 2016 and beyond are estimates for planning.

	ACTUAL BUDGETS			ESTIMATED BUDGETS		
	2013	2014	2015	2016	2017	2018
SPECIAL STUDIES TOTAL	\$1,228,000	\$1,353,000	\$1,172,000	\$1,348,000	\$1,373,000	\$1,353,000
Mercury	\$0	\$0	\$0	\$0	\$0	\$0
PCBs	\$0	\$0	\$85,000	\$120,000	\$180,000	\$160,000
Dioxins	\$0	\$24,000	\$0	\$40,000	\$0	\$0
Emerging Contaminants	\$141,000	\$209,000	\$84,000	\$100,000	\$100,000	\$100,000
Small Tributaries*	\$468,000	\$487,000	\$470,000	\$500,000	\$500,000	\$500,000
Other SPL	\$0	\$0	\$0	\$0	\$0	\$0
Exposure and Effects	\$114,000	\$80,000	\$0	\$45,000	\$0	\$0
Forecasting	\$100,000	\$0	\$0	\$0	\$0	\$0
Selenium		\$33,000	\$63,000	\$43,000	\$93,000	\$93,000
Nutrients*	\$405,000	\$520,000	\$470,000	\$500,000	\$500,000	\$500,000

*The estimated RMP budgets on this table do not cover all of the research needs for the Nutrients Management Strategy and Small Tributary Loading Strategy. Research for these strategies is partially supported by additional funds from other sources.

TBD – To be determined through synthesis efforts and workgroup discussion.

Nutrient synthesis and monitoring, and forecasting of future scenarios for nutrients are high priorities. Characterization of **small tributary loads** of pollutant remains a high priority. Screening for and improving tools for monitoring **emerging contaminants** is also a continuing priority.

SMALL TRIBUTARY LOADING

Relevant Management Policies and Decisions

- Refining pollutant loading estimates for future TMDLs and management decisions, including TMDL updates.
- Provisions of the current and future versions of the Municipal Regional Stormwater Permit (MRP).
- Identifying small tributaries to prioritize for management actions.
- Informing decisions on the best management actions for reducing concentrations and loads.



Recent Noteworthy Findings

- Small tributaries are the dominant loading pathway for suspended sediment, PCBs, and mercury.
- PCB and mercury loads in stormwater are primarily associated with large storms and transport of suspended sediment particles.
- Greater PCB and mercury concentrations are associated with older urban and industrial land uses.
- PCB concentrations vary more widely in stormwater and soils relative to mercury because PCB uses were historically more localized and mercury more readily cycles to and from the atmosphere.
- Based on data collected at 24 locations so far, primarily using RMP funding, PCB concentrations on particles in stormwater are greatest in the watersheds of Pulgas Creek Pump Station (North and South), Santa Fe Channel and Ettie Street Pump Station. In addition, several samples indicate sources in the Sunnyvale East Channel watershed. This dataset is being collected as a primary indicator of pollution sources and will continue to grow each year.
- Stormwater agencies are pursuing PCB mitigation efforts in five pilot drainage areas in the cities of Richmond (Lauritzen and Parr Channels), Oakland (Ettie Street Pump Station), San Jose (Leo Avenue), and San Carlos (Pulgas Creek).
- The next MRP will continue to focus on reducing PCB loads in urban stormwater.

Water quality sampling device in the North Richmond Pump Station. Photograph by Lester McKee.

Note:
"Small tributary" refers to the rivers, creeks, and storm drains that enter the Bay

Priority Questions for the Next Five Years

1. Which are the "high-leverage" small tributaries that contribute or potentially contribute most to Bay impairment by pollutants of concern?
2. What are the loads or concentrations of pollutants of concern from small tributaries to the Bay?
3. How are loads or concentrations of pollutants of concern from small tributaries changing on a decadal scale?
4. 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?

SMALL TRIBUTARIES LOADING STRATEGY

Screening to identify high-leverage watersheds will be the major emphasis for the next several years. This work will be closely coordinated with and substantially augmented by MRP monitoring.

Small tributaries loading studies in the RMP from 2013 to 2018. Numbers indicate budget allocations in \$1000s.

Funder	Task Description	2013	2014	2015	2016	2017	2018
RMP	Coordination and management	20	25	26	26	26	26
	Regional Watershed Spreadsheet Model						
RMP	Phase I – Water, Sediment, PCBs and Mercury	25	30	35	35	35	35
BASMAA	Phase I – Sediment		(32)				
RMP	Phase II – Other Pollutants of Concern						
BASMAA	Phase II– PBDE, DDT, chlordane, dieldrin		(20)				
RMP	Phase III – Periodic Updates						
RMP	Source Area Monitoring / EMC Development	80	80				
	Small Tributaries Monitoring						
RMP	Monitor Two Representative Small Tributaries	343	352				
BASMAA	Monitor Two to Four Representative Small Tributaries or Sites Downstream of Management Actions	(480)	(480)				
BASMAA	Lab Analyses, Quality Assurance, Data Management	(320)	(320)				
BASMAA	Data Analysis, Communications, Administration	(85)					
RMP	Watershed Screening			374	374	374	374
RMP	Trends Strategy			35	35	35	35
RMP Total		468	487	470	470	470	470
BASMAA Total		885		TBD	TBD	TBD	TBD
	TOTAL	1,403		TBD	TBD	TBD	TBD

NUTRIENTS

Relevant Management Policies and Decisions

- Nutrient numeric endpoints and assessment framework
- Evaluate need for revised objectives for dissolved oxygen (DO) and ammonia/ammonium
- Water quality assessment – impairment status
- NPDES permits (e.g., POTW, MRP) - ongoing

Recent Noteworthy Findings

- Several lines of evidence suggest that San Francisco Bay's resistance to the harmful effects of nutrient enrichment is weakening.
- Since the late 1990s, regions of the Bay have experienced significant increases in phytoplankton biomass (30-105% from Suisun to South Bay). Data from the last 3-4 years suggest biomass levels may be leveling off in South Bay.

- Observed biomass increases could be related to one or more factors, including: higher light levels from declining suspended sediments in the Bay and decreases in benthic grazers.
- Continuous sensor measurements at Dumbarton Bridge showed that DO concentration varies substantially with tides, with minimum DO occurring at lowest tide. During some periods, chlorophyll also showed strong tidal variations, with peaks at low tide.
- While DO in deep subtidal areas is typically above 5 mg/L, analysis of data in sloughs and creeks south of Dumbarton Bridge suggest that DO < 5 mg/L is a common occurrence at some sites.
- Although treated wastewater effluent is the greatest source of nitrogen and phosphorus south of the Bay Bridge, effluent loads to Suisun Bay are smaller than Delta loads to Suisun Bay.



Video available in eBook edition: up14.sfei.org/26

- The phycotoxins (toxins produced by phytoplankton) domoic acid and microcystin are detected throughout the Bay.
 - Recent reports confirm a continued need for long-term status and trends monitoring of nutrients, and the need for greater effort directed toward phytoplankton composition, phycotoxins, high frequency measurements, and monitoring in Bay margins and sloughs.

Priority Questions for the Next Five Years

1. Is there a problem or are there signs of a problem?
 - a. Are anthropogenic nutrients currently, or trending towards, adversely affecting beneficial uses of the Bay?
 - b. Are beneficial uses in segments of the Bay impaired by any form of nutrients?
 - c. Are trends spatially the same or different in the segments of the Bay?
2. What are appropriate guidelines for assessing the Bay's health with respect to nutrients and eutrophication?
3. Which nutrient sources, pathways, and transformation processes contribute most to concern?
 - a. What is the relative contribution of each loading pathway (POTW, Delta, urban stormwater runoff, non-point sources, etc.) to the Bay overall and the Bay's key sub-systems, and how do these loads vary seasonally?
 - b. What is the contribution of nutrient regeneration (benthic fluxes) from sediments and denitrification/nitrogen fixation to Bay nutrient budgets?
4. What nutrient loads can the Bay assimilate (without impairment of beneficial uses)?
5. What future impairment is predicted for nutrients in the Bay?



Inspecting the continuous monitoring probe in Alviso Slough. Photograph by April Robinson.

NUTRIENT STRATEGY

Five-Year Goals for Nutrient Strategy

- 1) Document our current understanding of nutrient dynamics in the Bay, highlighting what is known and the crucial questions that need to be answered
- 2) Implement a monitoring program that supports regular assessments of the Bay, and characterizes/quantifies key internal processes that exert important influence over the Bay's response to nutrient loading
- 3) Establish guidelines (water quality objectives; i.e., assessment framework) for eutrophication and other adverse effects of nutrient overenrichment, if needed
- 4) Quantify nutrient loads to and important processes in the Bay
- 5) Establish a modeling strategy to support decisions regarding nutrient management for the Bay

The Nutrient Science Strategy for the Bay is a collaborative effort with major contributions from BACWA, RMP, USGS, the State and Regional Boards, and hopefully others. Funding and oversight are provided by these multiple organizations through the Nutrient Strategy Steering Committee. Multiagency collaboration is essential to address the information needs for nutrients in the Bay.

Nutrient studies in the Bay from 2011 to 2018. Numbers indicate budget allocations in \$1000s.

Tasks	Funding Agency	Questions Addressed	2011	2012	2013	2014	2015	2016	2017	2018
<i>RMP-funded tasks</i>										
Program coordination	RMP	1-5	20	10	20	20				
Monitoring/special studies: moored sensors	RMP	1			200	215	190			
Monitoring/special studies: algal biotoxins	RMP	1			65					
Monitoring/special studies: stormwater loads	RMP	3		30	40	35				
Monitoring/special studies: monitoring program development	RMP	1,3				50				
Modeling ¹	RMP	4,5		100	100	200	165			
Synthesis: conceptual model report	RMP	1-5		80	50					
Synthesis: nutrient loads and data gaps	RMP	3		20	30					
General allocation (exact projects TBD)	RMP						115	500	500	500
RMP S&T ship-based monitoring (USGS, Cloern)	RMP	1,3	110	110	110	172	172	172+?	172+?	172+?
SUBTOTALS	RMP S&T Monitoring		110	110	110	172	172	172+?	172+?	172+?
	RMP Nutrients Studies		20	240	505	520	470	500	500	500
<i>BACWA-funded tasks</i>										
Program coordination	BACWA	1-5	10	135	135	75	100 ²			
Science plan development	BACWA	1-5			15	15				
Monitoring/special studies: ship-based sampling	BACWA	1					75 ²			
Monitoring/special studies: moored sensor	BACWA	1			75	75	150 ²			
Monitoring/special studies: POTW and refinery effluent characterization ³	Dischargers, BACWA	3		200	315	200				
Monitoring/special studies: algal toxins	BACWA	1					175 ²			
Monitoring/special studies: phytoplankton composition	BACWA	1			60	60				
Monitoring/special studies: monitoring program development	BACWA	1,3			35	40	80 ²			
Synthesis: Suisun Bay, Lower South Bay, other	BACWA	1,3		100	100	150				
General allocation (exact projects TBD)	BACWA						285 ²	880 ²	880 ²	880 ²
SUBTOTALS	BACWA Total		10	435	735	615	865^{2,4}	880^{2,4}	880^{2,4}	880^{2,4}

Tasks	Funding Agency	Questions Addressed	2011	2012	2013	2014	2015	2016	2017	2018
<i>Other funding sources⁵</i>										
Program coordination	SWRCB	1-5	15	5						
Science plan development	SFBRWQCB	1-5				100				
Monitoring: program development	SWRCB	1,3		10	20	20				
Delta loads to Suisun	DWR-EMP	3			90	90				
<i>Grand total</i>										
RMP, BACWA and other funding sources			145	800	1,460	1,517	1,507	1,552 + ?	1,552 + ?	1,552 + ?

¹ Originally allocated as a combined proposal with RMP Forecasting Strategy

² Bay-wide nutrient permit funding. The Bay-wide Nutrient Permit funds (\$880k/yr) are being directed toward nutrient science studies in the Bay. The intent is for these funds to be combined with funds from the RMP and other entities, and that the Nutrient Management Strategy Steering Committee will make decisions about how to allocate funds, based on recommendations in a Science Plan, which is under development. Therefore, other than total anticipated funds requested from the RMP, the specific categories are not identified here.

³ Non-BACWA dischargers (i.e. refineries) also contributed to effluent characterization, but all data interpretation was BACWA-funded (15k in 2013, unspecified amount in 2014)

⁴ Indicates fiscal year

⁵ This table only lists contributions from other funding sources for projects that SFEI is directly involved in. There are additional efforts by numerous agencies (USGS, DWR-EMP, SFCWA, SFBRWQCB, SWRCB) that directly or indirectly support the Nutrient Management Strategy, but are not included here for simplicity

TBD = To be determined.

EMERGING CONTAMINANTS



Relevant Management Policies and Decisions

- Support for early management intervention, including recommendations for green chemistry and pollution prevention
- Narrative water quality objectives for toxicity, bioaccumulation, and aquatic organisms population and community ecology

Recent Noteworthy Findings

- In 2013, the RMP published both a summary of the current state of knowledge on emerging contaminants in the Bay and a strategy for future investigations.
- Synthesis of a decade of Bay PBDE monitoring data indicates levels have declined in biota and sediment following nationwide phase-outs and state bans of these toxic and persistent flame retardant chemicals.
- A study to screen Bay wildlife for emerging contaminants with an analytical technique that allows detection of a broad spectrum of contaminants, rather than just those that are on a pre-defined list of target chemicals, detected seven chemicals of potential interest. Levels of these newly identified contaminants were significantly lower than those for legacy contaminants of concern, such as PCBs.



Video available in eBook edition: up14.sfei.org/28

Harbor seal sampling. Conducted under NOAA-NMFS permit number 16991. Photograph by Linda Wanczyk.

- Special studies of perfluorochemicals (PFCs), including toxic compounds once used in the manufacture of Scotchgard, Teflon, and other surface coatings, revealed new details about these contaminants. Bay harbor seals have unusually high levels of perfluorooctane sulfonate (PFOS), despite a nationwide phase-out in 2002. Cormorant egg PFOS levels measured in 2012 were one-third lower than levels measured in 2006 and 2009. New toxicity data suggest that these levels may still be harmful to birds. Analyses of treated wastewater and Bay sediment have uncovered the presence of many different PFCs, including so-called "precursor" chemicals that may degrade to form PFOS or other potentially toxic and persistent PFCs.
- Fipronil, a broad-spectrum insecticide of particular concern due in part to growing urban uses, has been detected in Bay stormwater and sediment. Observed concentrations of fipronil and its degradation products in sediment have exceeded effect thresholds on occasion, suggesting these compounds may pose risks to Bay aquatic life. In 2013, fipronil and its degradation products were not detected in Bay ambient water samples.
- Siloxanes, found in cleaning solvents and personal care products, were detected at low levels in bivalves from all 11 Bay sites sampled. Concentrations were highest in Central Bay samples. Siloxane levels are unlikely to be a concern for humans consuming Bay shellfish

Priority Questions for the Next Five Years

1. What emerging contaminants have the potential to adversely impact beneficial uses of the Bay?

EMERGING CONTAMINANTS

Emerging contaminant studies in the RMP have been augmented substantially by coordination and pro bono work. Monitoring of two high priority CECs (PFOS and fipronil) in wastewater is a highlight for 2015.

Emerging contaminant studies and monitoring in the RMP from 2008 to 2018. Numbers indicate budget allocations in \$1000s. Matching funds and source indicated in parentheses. CDFO-Canada Department of Fisheries and Oceans; MMC-Marine Mammal Center; NIST-National Institute of Standards and Technology.

Element	Questions Addressed	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Perfluorinated Compounds	1	35	52			87		26				
Alternative Flame Retardants	1	48						107				
Chlorinated Paraffins in Biota (CDFO)	1	0 (5)										
Triclosan in Sediment (USEPA)	1	0 (5)										
CECs in Wastewater	1		30						55			
Nonylphenol in Small Fish (Cal Poly)	1		0 (2)									
AXYS Brominated Dioxins in Sediments and Biota (AXYS)	1			0(18)								
Broadscan Screening of Biota for EC (NIST, SCCWRP, MMC, SDSU)	1			55 (75)	70 (75)							
AXYS Mussel Study (AXYS)	1			27 (33)								
NOAA Mussel Pilot Study (NOAA, SCCWRP, SWRCB)	1			33 (50)								
EC Synthesis, Strategy Development	1				30	30	20	20	20	20	20	20
Bioanalytical Tools	1						70	56				
PBDE Synthesis	1						36					
Current Use Pesticides	1						15			55		
EC Strategy Implementation	1											
Nanoparticles (Duke Univ.)	1			0 (5)								
Microplastics	1								9			
General Allocation	1									25	80	80
RMP Total		83	82	115	100	117	141	209	84	100	100	100
Non-RMP Total		10	2	176	75	0	0	0	TBD	TBD	TBD	TBD
Overall Total		93	84	291	175	117	141	209	TBD	TBD	TBD	TBD

Gray cells – further work on this topic not anticipated

Possibilities: additional work on flame retardants, broadscan followup

EXPOSURE AND EFFECTS

Relevant Management Policies and Decisions

- Implementation of sediment quality objectives
- Permitting decisions regarding dredging projects
- Implementation of narrative water quality objectives for toxicity, bioaccumulation, and aquatic organisms population and community ecology
- Review contaminated sediment 303(d) listing and potential to delist
- Copper control plan, especially with regard to risks to salmon

Recent Noteworthy Findings

- Sediment quality objective (SQO) analyses of 125 RMP sites from 2008 to 2012 indicate that severe impacts to the benthic community are not observed in the Bay. Forty percent of the Bay was classified as Possibly Impacted, indicating that the impacts are small or uncertain due to conflicting lines of evidence.
- Recent studies by NOAA indicate that even at very high concentrations of copper in seawater ($> 100 \mu\text{g/L}$), Chinook salmon's sense of smell is not impaired.
- Tern embryos are less sensitive to PBDE exposure than the most sensitive species studied (American Kestrel). Reproductive and developmental effects on tern embryos at the concentrations found in the Bay do not appear likely.

Priority Questions for the Next Five Years

Effects on Benthos

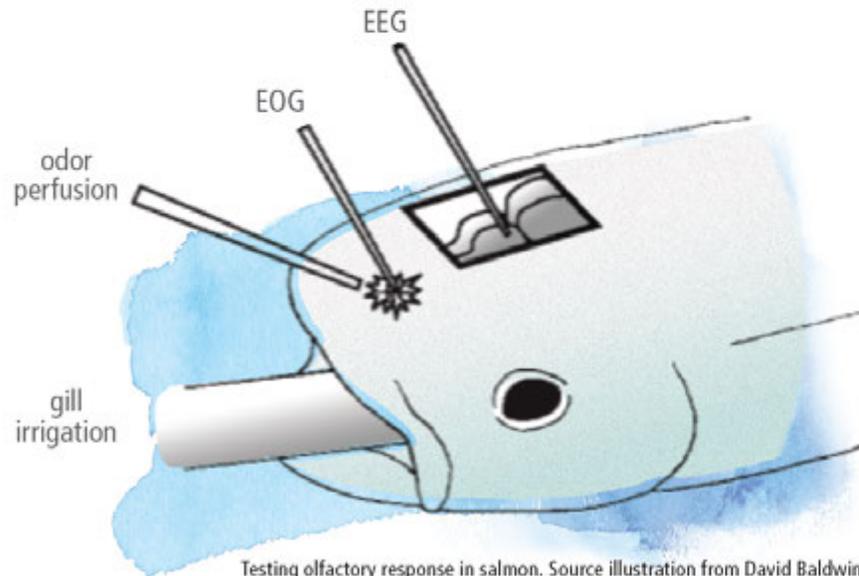
1. What are the spatial and temporal patterns of impacts of sediment contamination?
2. Which pollutants are responsible for observed impacts?
3. Are the toxicity tests, benthic community assessment approaches, and the overall SQO assessment framework reliable indicators of impacts?

Effects on Fish

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

Effects on Birds

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



EXPOSURE AND EFFECTS

Exposure and effects studies and monitoring in the RMP from 2008 to 2017. Numbers indicate budget allocations in \$1000s.

Studies to address information needs relating to dredged material testing are a priority for 2014. No studies are planned for 2015.

	Element	Questions Addressed	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Benthos	Benthic Assessment Tools	3	20	25	30		50	76				
	Causes of Sediment Toxicity: TIEs and LC50 Work	2	10	80								
	Causes of Sediment Toxicity: Molecular TIEs	2			60							
	Causes of Sediment Toxicity: Moderate Toxicity Strategy	2,3					50		30			
	USEPA Water Quality Synthesis (National Coastal Condition Assessment) (USEPA)	1,3				(100)	(50)					
	Hotspot Followup Study	1,2,3				60	30				50	
	Reference Site, Benthos Recovery After Dredging	1							50			
Fish	Endocrine Disruption in Fish	4,6	35									
	Effects of PAHs on Flatfish (NOAA)	4,5,6	40	50								
	Effects of Copper on Salmon (NOAA)	4,5				37		(38)				
Birds	Mercury and Selenium Effects on Terns (USGS)	7,8,9,10	75	54								
	PBDEs: Sensitivity in Terns	8			48							
RMP Total			179	209	138	97	130	76	80	TBD	TBD	TBD
Non-RMP Total			0	0	0	100	50	38	TBD	TBD	TBD	TBD
Overall Total			179	209	138	197	180	114	TBD	TBD	TBD	TBD

Gray cells – further work on this topic not anticipated

PCBS

Relevant Management Policies and Decisions

- PCBs TMDL and potential update
- Selecting management actions for reducing PCB impairment

Recent Noteworthy Findings

- Shiner surfperch have concentrations 12 times higher than the TMDL target, and these have resulted in an advisory from OEHHA recommending no consumption for all surfperch in the Bay. Concentrations in shiner surfperch and white croaker show no clear sign of decline.
- Small fish on the Bay margins accumulate high concentrations of PCBs that correlate with concentrations in sediment and represent a pathway for impact on piscivorous wildlife.
- For birds, seals, and fish there is evidence of PCB exposure to a degree in certain locations that may be reducing health and survival.
- Average concentrations in Suisun Bay sediments are lower than in the other Bay segments.
- Wetland sediment cores provide evidence of dramatic declines from the 1960s to the present.
- Patterns of PCB bioaccumulation suggest that there are two broad habitat categories that appear to have food webs that are largely distinct: the margins

and the open Bay. Impairment is far more severe in contaminated margin locations.

- Monitoring, forecasting, and management should treat these margin locations as discrete local-scale units. Local-scale actions within a margin area, or in upstream watersheds, will be needed to reduce exposure within that area.
- Santa Fe Channel, Pulgas Creek Pump Station North and South, Ettie Street Pump Station, and North Richmond Pump Station appear to have relatively polluted sediment particles and have the potential to be high leverage watersheds where control actions are a cost-effective way of reducing downstream impacts.
- Recent fish monitoring data point to several contaminated margin sites that are high priorities for management, including: Hunters Point, Stege Marsh, Oakland Inner Harbor, Richmond Inner Harbor, San Leandro Harbor, San Leandro Bay, and Coyote Point.

- Stormwater management actions are being developed and tested.
- Recent estimates of total loads for POTWs and industrial facilities were well below the waste-load allocations in the TMDL.
- The RMP list of 40 congeners is the most appropriate PCB index for monitoring in support of the PCB TMDL.

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?
2. What are the present loads and long-term trends in loading from each of the major pathways?
3. What role do in-Bay contaminated sites play in segment-scale recovery rates?
4. Which small tributaries and contaminated margin sites are the highest priorities for cleanup?
5. What management actions have the greatest potential for accelerating recovery or reducing exposure?
6. What are the near-term effects of management actions on the potential for adverse impacts on humans and aquatic life due to Bay contamination? (newly added question)



Collecting small fish with a beach seine.
Photograph by Ben Greenfield.

PCBs

PCB studies and monitoring in the RMP from 2010 to 2019. Numbers indicate budget allocations in \$1000s.

Studies under the PCB Strategy began in 2010. A synthesis completed in 2014 set the stage for a multi-year study plan for 2015 and beyond, focusing on monitoring the response to management actions in high-leverage watersheds.

Element	PCB Questions Addressed	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Food Web Uptake (Small Fish)	1,7	50									
PCB Conceptual Model Update	1,2,3,4,5,6,7,8,9		53								
Development of multi-year workplan							10	10	10	10	10
Prioritize Margin Units							30				
Develop Conceptual Site Models and Mass Balances for PMUs (5 PMUs)							45	80	80		
PMU Trend Monitoring (5 PMUs)								30	90	150	150
TOTAL		50	53				85	120	180	160	160

SELENIUM

Relevant Management Policies and Decisions

- North Bay TMDL – Board consideration 2015
- South Bay TMDL or other control plan – After 2016

Recent Noteworthy Findings

- Sturgeon, a benthic species, is recognized as a key indicator of selenium impairment in the North Bay due to its susceptibility to selenium bioaccumulation.
- No trend is apparent in sturgeon concentrations in monitoring going back to 1987.
- The Lower South Bay has much higher average selenium concentrations in water than the other Bay segments, but white sturgeon collected in South Bay have had lower concentrations than North Bay sturgeon.
- Selenium concentrations in bird eggs are usually well below a target developed to protect birds in Newport Bay.
- Concentrations in cormorant eggs were unusually high in 2009, but were back down to more typical concentrations in 2012.

*Another potentially relevant management policy and decision are the water quality criteria that are being developed by EPA Region IX.

Priority Questions for the Next Five Years

1. What are appropriate thresholds?
2. Are the beneficial uses of San Francisco Bay impaired by selenium?
3. What is the spatial pattern of selenium impairment?
4. How do selenium concentrations and loadings change over time?
5. What is the relative importance of each pathway of selenium loading in the Bay?

Workplan Highlights

- Monitoring of selenium in plugs of muscle tissue obtained non-lethally

Partners and Coordination

- California Department of Fish and Wildlife
- US Fish and Wildlife Service
- US Geological Survey



White sturgeon collected in RMP fish sampling.
Photograph by Zachary Epperson.

Selenium

Selenium studies and monitoring in the RMP from 2010 to 2019. Numbers indicate budget allocations in \$1000s.

Monitoring of selenium in plugs of sturgeon muscle tissue obtained non-lethally is a focus for 2014 and 2015.

Element	Selenium Questions Addressed	2014	2015	2016	2017	2018	2019
Selenium Strategy Coordination	1,2,3,4,5	10	10	10	10	10	10
Selenium Information Synthesis	1,2,3,4,5		10	10	10	10	10
Selenium Sturgeon Plugs	2,3,4	23	23	23	23	23	23
Selenium Sturgeon Derby	1,2,3,4		20				
Selenium South Bay Synthesis	1,2,3,4,5				50		
Selenium South Bay Food Web Sampling	2,3,4					50	
Selenium South Bay Model	5						
	TOTAL	33	63	43	93	93	43

DIOXINS

Relevant Management Policies and Decisions

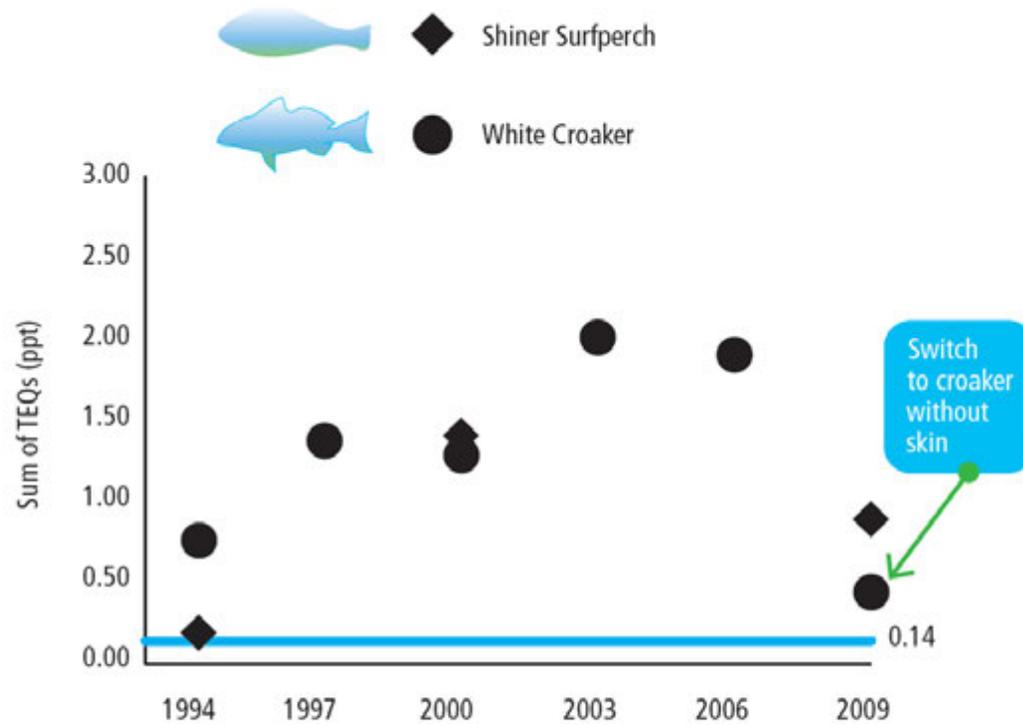
- Review 303(d) listings and establish TMDL development plan or alternative

Recent Noteworthy Findings

- The key sport fish indicator species (shiner surfperch and white croaker) have been higher than the Water Board screening value of 0.14 ppt and show no sign of decline, but there is a great deal of uncertainty regarding the human health risk associated with dioxins in sport fish.
- Dioxin toxic equivalents in Least Tern, Caspian Tern, and Forster's Tern eggs are at or above estimated thresholds for adverse effects; risks are especially significant in combination with dioxin-like PCBs.
- Wetland sediment cores suggest rapidly declining inputs from local watersheds during recent decades, though additional coring data are needed to support this hypothesis.
- Few data on dioxins are available on other priority questions – the Dioxin Strategy was developed to address this need.

Priority Questions for the Next Five Years

1. What is the dioxin reservoir in Bay sediments and water?
2. Have dioxin loadings/concentrations changed over time?
3. What is the relative contribution of each loading pathway as a source of dioxin impairment in the Bay?



Baywide average dioxin and furan TEQ concentrations (ppt) in white croaker (circles) and shiner surfperch (diamonds). Blue line indicates screening value.

DIOXINS

Dioxin studies and monitoring in the RMP from 2008 to 2017. 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 2013. Synthesis activities are planned for 2016 after the data from the earlier studies are available.

General Area	Element	Dioxin Questions Addressed	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Dioxin Strategy	Quality Assurance	1,2,3,4,5,6		14								
Status and Trends	Sport Fish	1,2,4		22					24			
	Avian Eggs	1,2,4					13					
	Surface Sediments	2,3		58	58							
	Water	2,3		26		26						
Loads	Small Tributary Loading	4,5,6			65		52					
	River Loading (THg)	4,5,6			34							
Forecast	Sediment Cores	3,4,6			57							
	Synthesis: One-Box Model	3,4,5,6									20	
	Synthesis: Food Web Model	5,6									20	
Loads	Atmospheric Deposition	5,6			20							
RMP Total			0	120	234	26	65	0	TBD	TBD	TBD	TBD
Non-RMP Total			0	0	0	0	0	0	TBD	TBD	TBD	TBD
Overall Total			0	120	234	26	65	0	TBD	TBD	TBD	TBD

STATUS AND TRENDS

Relevant Management Decisions

- Development of Se TMDL for North Bay and possibly for South Bay
- Copper site-specific objective and cyanide anti-degradation policies
- Evaluation of sediment and water quality objectives
- Water Quality Assessment - 303(d) impairment listings or de-listings
- Determination of whether there is reasonable potential that a NPDES permitted discharge may cause violation of a water quality standard
- Dredged material management
- Defining ambient conditions in Bay
- Development and evaluation of a Nutrient Assessment Framework (i.e., development of water quality objectives)

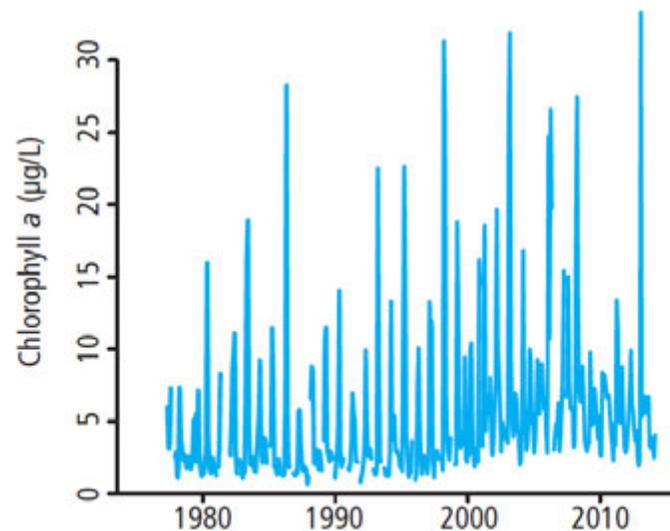
Recent Noteworthy Findings

- Annual sampling of water and sediment chemistry has documented a general lack of trend in persistent pollutants and spatial patterns that vary by pollutant but are consistent from year to year.
- A sudden decrease in suspended-sediment concentrations occurred in 1999 and has persisted since that time.
- Increasing chlorophyll concentrations have been observed in the Bay and are attributed to a variety of possible drivers (e.g., decrease in suspended-sediment concentrations and an increase in bivalve predators).

- PBDE levels have declined in bivalves, bird eggs, sport fish, and sediment following nationwide phase-outs and state bans of these toxic and persistent flame retardant chemicals.
- Average PAH concentrations in sediment have been highest along the southwestern shoreline of Central Bay.

Priority Questions for the Next Five Years

1. Are chemicals at levels of concern?
2. What are the concentrations and masses of priority contaminants?
3. Have concentrations and masses increased or decreased?

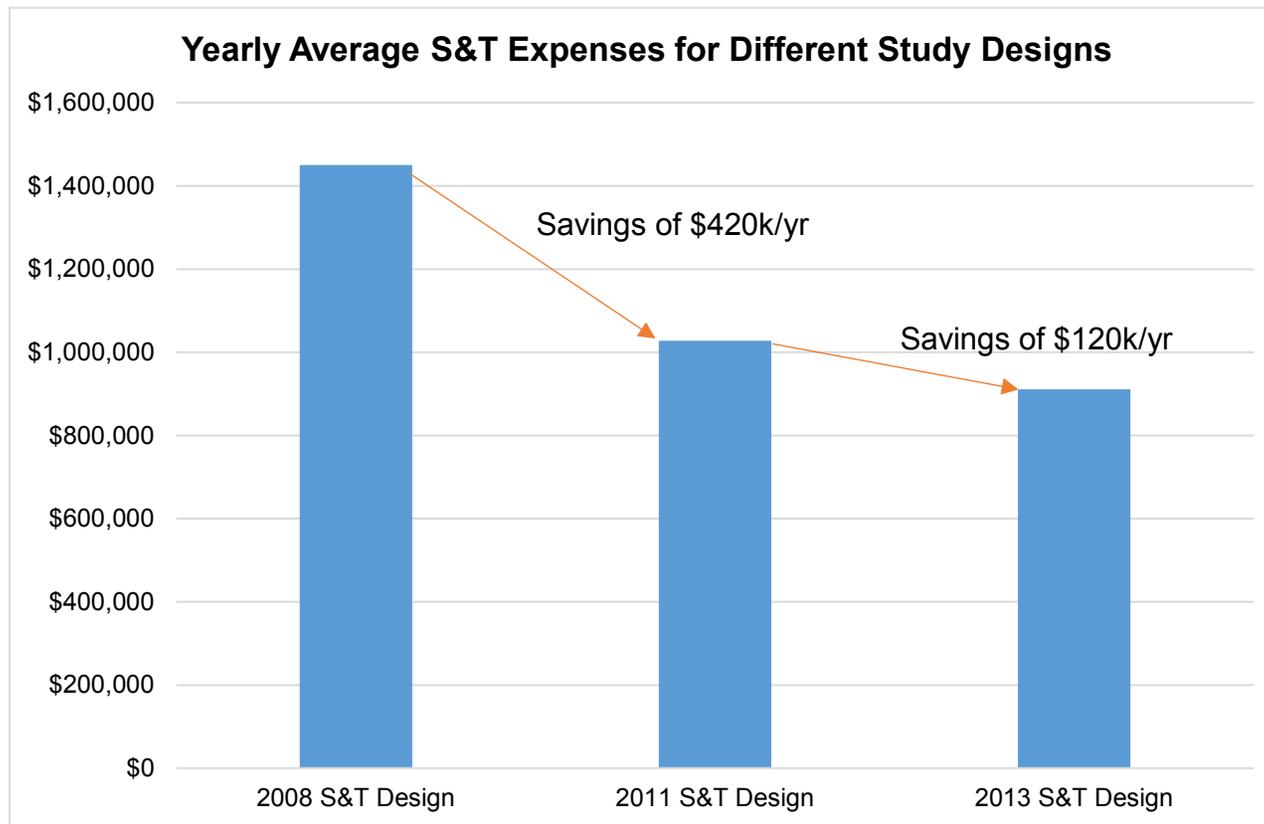


Monthly average chlorophyll concentrations in South Bay have increased in recent years relative to the 1980s and 1990s.

STATUS AND TRENDS

The Status and Trends monitoring design was changed in 2011 and 2013 to optimize performance and save money.

The 2011 redesign reduced the frequency of sampling from annual to biennial for water and sediment. The amount of information gained from annual sampling was diminishing while needs for special studies to generate information on other topics were increasing. The change in sampling frequency freed up approximately \$400,000 per year for studies on other topics. The S&T design was further optimized in 2013. The frequency of sediment sampling was decreased to every four years and parameters that were changing slowly were scheduled to be monitored less often. The 2013 redesign saved approximately \$120,000 per year.



Status and trends monitoring budget allocations in the RMP from 2014 to 2023.

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Notes
Water (22 sites per sampling event)											
Chemistry	\$0	\$37	\$0	\$37	\$0	\$37	\$0	\$37	\$0	\$141	MeHg, Cu, Se, CN (plus PCB, PAH, pesticides in 2023)
Aquatic Toxicity	\$0	\$8	\$0	\$8	\$0	\$8	\$0	\$8	\$0	\$8	
CTR Parameters	\$0		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$50	Planned for 2015 but canceled due to insufficient funds
Sediment (27 sites per sampling event)											
Chemistry	\$94	\$0	\$0	\$0	\$94	\$0	\$0	\$0	\$75	\$0	PBDEs not monitored in 2022
Toxicity	\$0	\$0	\$0	\$0	\$52	\$0	\$0	\$0	\$52	\$0	
Benthos	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$53	\$0	
Bivalves (7 sites (6+T1) per sampling event)											
Chemistry	\$18	\$0	\$11	\$0	\$11	\$0	\$11	\$0	\$18	\$0	PAHs, PBDEs, Se, and(PCBs (monitored every 8 years)
Sport Fish											
Chemistry	\$231	\$0	\$0	\$0	\$0	\$231	\$0	\$0	\$0	\$0	PCBs, PBDEs, PFCs, Hg, Se
Bird Eggs											
Chemistry	\$0	\$150	\$0	\$0	\$150	\$0	\$0	\$150	\$0	\$0	PCBs, PBDEs, PFCs, Hg, Se
USGS Monitoring											
Nutrients	\$173	\$173	\$223	\$223	\$223	\$223	\$223	\$223	\$223	\$223	
SSC/Moored Sensors	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	\$250	
Field Work and Logistics											
Field, logistics, archive	\$228	\$193	\$128	\$193	\$253	\$193	\$128	\$193	\$253	\$193	
Analysis of S&T Impacts		\$15									
Bay Margins Sediment Study		\$140	\$120	\$120	\$120	\$120	\$120	\$120	\$120	\$120	Savings from 2013 redesign allocated to bay margins
Total	\$993	\$966	\$732	\$831	\$1,153	\$1,062	\$732	\$981	\$1,045	\$985	

* 2014 value are actual costs. 2015 values are budgets. 2016-2023 are forecast values in 2014 or 2015 \$\$.

PROGRAM MANAGEMENT

- Includes the following categories of activities:
 - Program planning (\$50k)
 - Contract and financial management (\$187k)
 - Technical oversight (\$50k)
 - Internal coordination (\$90k)
 - External coordination (\$30k)
 - Training (\$5k)
 - Administration (\$20k)

Program Review

Periodically, the RMP conducts an overall peer review of the Program as a whole. Two Program Reviews have been conducted to date, in 1997 and in 2003. The timing and scope of Program Reviews are determined by the Steering Committee.

- The RMP has evolved considerably since the 2003 Review, with greatly enhanced planning processes that have made the Program much more forward-looking and thoroughly peer-reviewed.
 - Workgroups have been permanently established to address the major topical areas of the Program.
 - Strategy Teams consisting of stakeholders and local scientists have been formed to identify the highest priority management questions on important topics and to formulate long-term workplans to answer them.
 - The Steering Committee has also taken a more forward-thinking approach, capturing all of the workgroup and strategy team plans in a RMP Master Plan, and in holding an annual planning workshop (beginning in 2010) to provide direction to all of the subcommittees.
 - With carefully considered guidance from stakeholders and peer reviewers, the RMP has prioritized and addressed the topics recommended in the 2003 review, and is continually sharpening its focus on using the resources that are available in an efficient manner to provide the information that is most needed to support TMDLs and other management initiatives.
- The Steering Committee does not consider a Program Review necessary at this time because ongoing review of critical elements is well established. A Review will be conducted after the Master Planning process has become established and when a clear need for an overarching review becomes apparent.
- A review of RMP governance was conducted in 2014 and a charter for the Program was developed.

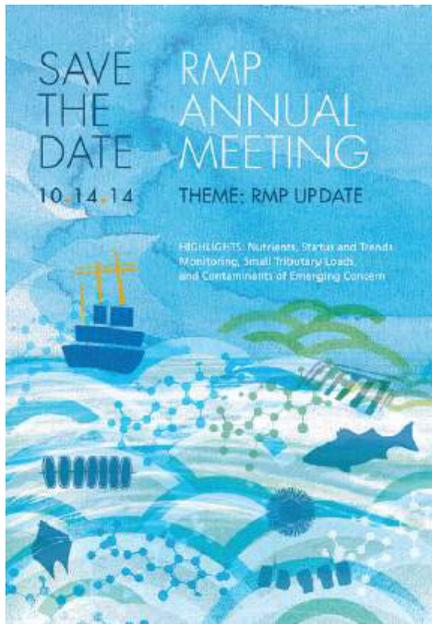
Peer Review

Extensive peer review is a key to the cost-effective production of reliable information in the RMP. This peer review is accomplished through the following mechanisms.

- Workgroups. The RMP Workgroups include leading scientists that work with stakeholders to develop workplans. Peer review occurs at all stages of a project: planning, implementation, and reporting.
- Technical Review Committee. Provides general technical oversight of the Program.
- Peer-reviewed Publications. Another layer of peer review occurs when journal publications are prepared. This occurs for most significant RMP studies.

COMMUNICATIONS

- Averages \$166k per year (5% of the total budget).
- Includes the Pulse of the Estuary, Annual Meeting, Multi-Year Plan, State of the Estuary report card, RMP web site, Annual Monitoring Results, technical reports, journal publications, newsletter, oral presentations and posters, media outreach.
- These platforms are used to make information from the RMP available to the following target audiences.

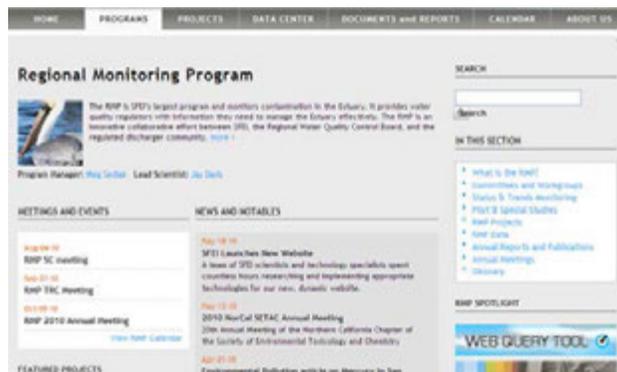


- Primary Audience
 - RMP Participants. Need information to encourage support for the RMP and water quality programs in the Bay. The Pulse, Annual Meeting, Multi-Year Plan, State of the Estuary report card, RMP web site, newsletter, fact sheets, oral presentations, media outreach.
- Secondary Audiences
 - Other regional managers. Need information to inform their decisions and evaluate effectiveness of their actions. A target audience for all communication products.
 - Regional law and policy makers. Need information to encourage support for water quality programs in the Bay. The Pulse, State of the Estuary report card, media outreach.
 - Regional Scientists. Need to share information to increase understanding of water quality and maintain technical quality of the science. A target audience for all communication products.
 - Media, public outreach specialists, educators. Need information to encourage support for the RMP and water quality programs in the Bay, and to protect their health. The Pulse, Master Plan, State of the Estuary report card, RMP web site, newsletter, fact sheets, media outreach.
 - Managers and scientists from other regions.



Highlights for the Next Five Years

- Next Pulse: 2015
- Closer partnership with SFEP to reach broader audience
- Annual Meeting joint with State of the Estuary in 2015
- Continued web site improvement



Home page for the RMP web site.

DATA MANAGEMENT AND QUALITY ASSURANCE

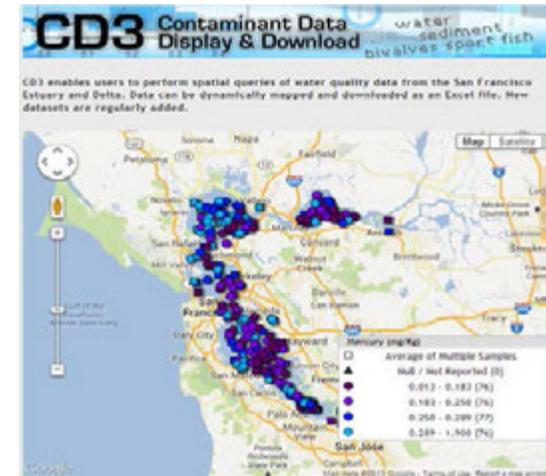
(\$355k/year)

■ Data Management

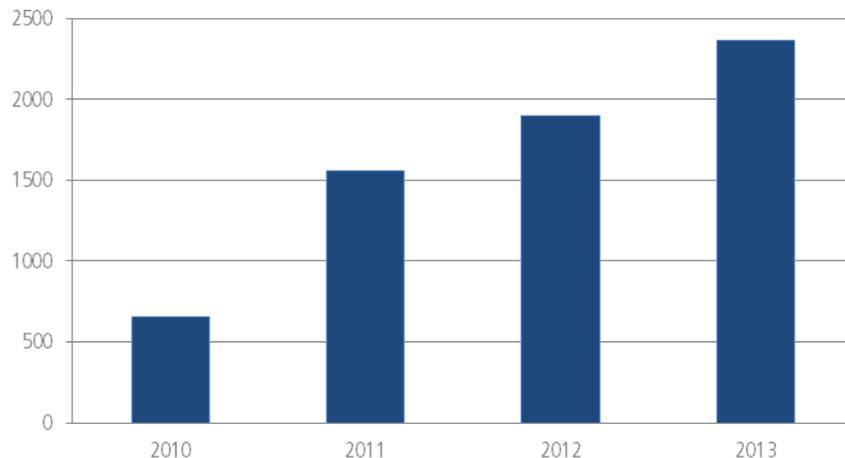
- The RMP database contains approximately 1.1 million records generated since the Program began in 1993.
- Includes formatting, uploading, and reporting each year's data; managing, maintaining, and improving the RMP database to enable easy access to RMP data through the RMP website; coordination with statewide data management initiatives (i.e., SWAMP and CEDEN); support for quality assurance evaluation, data analysis, and RMP report production.
- Web-based data access tools include user-defined queries, data download and printing functionality, maps of sampling locations, and visualization tools. Through the user-defined query tool, results can be downloaded into Excel in both a cross-tabulated and flat-file format. Dynamic mapping of concentrations allows users to view spatial distributions across

the Estuary, and statistical functions, such as cumulative distribution function plots, provide aggregated summaries.

- These platforms are used to make information from the RMP available to water quality managers, stakeholders, scientists, and the public.



A data display by the RMP CD3 Tool.



2400 users used the Contaminant Data Display and Download Tool in 2013.

■ Quality Assurance

- Includes QA review of the data that are submitted by the laboratories. Development and application of the QAPP. Review in comparison to data quality objectives and prior results. Review of congener ratios.
- Troubleshooting problems with chemical analyses.
- Occasional special studies to assess sampling methods, analytical methods, or lab performance.

New Initiatives for the Next Five Years

- Efficiencies in Data Uploading and Formatting
- Enhancement of Visualization Tools
- Coordination with the Estuary Portal
- Coordination with SFEI EDIT Program

RMP AND NON-RMP STUDIES RELATED TO WATER QUALITY IMPACTS OF DREDGING AND DREDGED MATERIAL DISPOSAL

Notable Activities

- In 2011 the RMP created a web page to provide the latest information on thresholds for bioaccumulation testing and in-Bay disposal (<http://www.sfei.org/content/dmmo-ambient-sediment-conditions>). These thresholds are based on RMP Status & Trends data.

Dredging related studies. Dollar amounts in thousands.

	Study	2009	2010	2011	2012	2013	2014	2015	2016	2017
RMP Status & Trends	S&T Sediment Triad	260	250	250	250		250		250	
RMP Status & Trends	USGS Suspended Sediment Studies	250	250	250	250	250	250	250	250	250
RMP Exposure and Effects	Benthic Assessment Tools		30		50	76				
RMP Exposure and Effects	Causes of Sediment Toxicity: TIES	76								
RMP Exposure and Effects	Causes of Sediment Toxicity: Molecular TIES		60							
RMP Exposure and Effects	Causes of Sediment Toxicity: Moderate Toxicity Strategy				50		30			
RMP Exposure and Effects	Impact of Dredging on Benthos						50			
RMP Exposure and Effects	Effects of PAHs on Flatfish	50								
RMP Exposure and Effects	Hotspot Followup			60	30				50	
LTMS	Eelgrass Buffer Zone Study(2) - proposed									

1 identifying a reference site for toxicity testing rather than referring to disposal sites

2 evaluating the appropriateness of the 250 foot buffer zone in effect to protect eelgrass from dredging

RMP STUDIES SATISFYING SPECIFIC PERMIT CONDITIONS

Industrial Wastewater Treatment Plants

Policy	Provision	Study
Mercury Watershed Permit	Better understand mercury fate, transport, the conditions under which methylation occurs, and biological uptake	Mercury Strategy Studies: Food Web Uptake (small fish), DGTs, Isotopes
Copper Action Plan	Investigate possible copper sediment toxicity	S&T Sediment Toxicity
Copper Action Plan	Investigate sublethal effects on salmonids	Effects of Copper on Salmon (NOAA)

RMP STUDIES SATISFYING SPECIFIC PERMIT CONDITIONS

Municipal Wastewater Treatment Plants

Policy	Provision	Study
Mercury Watershed Permit	Better understand mercury fate, transport, the conditions under which methylation occurs, and biological uptake	Mercury Strategy Studies: Food Web Uptake (small fish), DGTs, Isotopes
Copper Action Plan	Investigate possible copper sediment toxicity	S&T Sediment Toxicity
Copper Action Plan	Investigate sublethal effects on salmonids	Effects of Copper on Salmon (NOAA)

RMP STUDIES SATISFYING SPECIFIC PERMIT CONDITIONS

Urban Stormwater

Policy	Provision	Study
Municipal Regional Stormwater Permit (MRP)	C.8.e Pollutants of Concern and Long-Term Trends Monitoring	Small Tributary Loading Strategy (STLS) Studies
MRP	C.11.b. Monitor Methylmercury	STLS
MRP	C.11.g. Monitor Stormwater Mercury Pollutant Loads and Loads Reduced	STLS
MRP	C.11.h. Fate and Transport Study of Mercury in Urban Runoff	Mercury Strategy Studies (Small Fish, DGTs, Isotopes); Modeling Strategy Studies
MRP	C.12.g. Monitor Stormwater PCB Pollutant Loads and Loads Reduced	STLS
MRP	C.12.h. Fate and Transport Study of PCBs in Urban Runoff	PCBs in small fish, Modeling Strategy Studies, Priority Margin Site Studies
MRP	C.13.e. Studies to Reduce Copper Pollutant Impact Uncertainties	S&T Sediment Toxicity, Effects of Copper on Salmon (NOAA)
MRP	C.14.a. Control Program for PBDEs, Legacy Pesticides, and Selenium.	STLS

Regional Monitoring Program for Water Quality in San Francisco Bay

2015 Program Plan

HIGHLIGHTS OF THE 2015 PROGRAM

In 2015 the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) is entering its 23rd year of collecting data and communicating information to support water quality management decisions.

Status and Trends Monitoring

A continuing goal is to make optimal use of the funds that participants provide to the Program. High priority topics continue to emerge (e.g., nutrients and selenium), and information needs continue to grow. Status and trends monitoring of open Bay waters is a cornerstone of the Program, but after 20 years of repeated sampling the information yield has gradually diminished.

In 2014, the Steering Committee and Technical Review Committee continued a process of seeking efficiencies in status and trends monitoring. The committees reduced the frequency of sediment sampling from a two-year cycle to a four-year cycle. Water will continue to be sampled on a two-year cycle, but many of the more expensive parameters will be measured a greatly reduced frequency. As one example, PCBs in water will now be analyzed once every 10 years - commensurate with the value of additional water PCB data in promoting understanding and supporting decision-making. Other matrices that are more crucial for PCBs, such as sport fish, bird eggs, and sediment, will continue to be monitored at a higher frequency. This belt-tightening has freed up resources that can be applied to higher priority information needs, such as sampling of sediment on the shallow margins of the Bay, which have historically not been included in status and trends monitoring.

The revised schedule for status and trends monitoring is as follows:

- continuous monitoring of suspended sediment,
- monthly monitoring of basic water quality parameters (salinity, temperature and dissolved oxygen; suspended sediments; and phytoplankton biomass),
- biennial water and bivalve monitoring,
- triennial bird egg monitoring, and
- sediment monitoring on a four-year cycle, and
- sport fish monitoring on a five-year cycle.

In 2015, the schedule calls for sampling of water and bird eggs. Water analytes will include copper, cyanide, selenium, methylmercury, ancillary parameters, and aquatic toxicity. Eggs of double-crested cormorants and Forster's Terns will be collected. Cormorant eggs will be analyzed for PCBs, PBDEs, Hg, PFCs, and Se. Tern eggs will be analyzed for Hg, PBDEs, and Se.

Discussions are in progress regarding using the funds freed up by the reductions in water and open-Bay sediment monitoring to sample sediment on the Bay margins. Due to the type of sampling vessel used in open Bay monitoring, sediment sampling to date has not included areas on the margin of the Bay where the water is less than 1 ft deep at mean lower low water. In parts of the Bay, especially Lower South Bay, this encompasses an extensive area of important habitat.

Special Studies

Special study funds in 2015 will primarily go to work on nutrients and small tributary loading. Smaller amounts will go to studies on emerging contaminants, PCBs, and selenium.

Nutrients

RMP funds will provide support for the Nutrient Science Strategy, augmenting major funding from BACWA, USGS, and other sources. RMP funds will primarily be used for moored sensor work. RMP moored sensor monitoring began in 2013 to better assess the Bay's condition, and to collect high frequency data to calibrate water quality models. The sensors gather data on chlorophyll, dissolved oxygen, turbidity, temperature, and other parameters were deployed at three stations in Lower South Bay and South Bay. RMP funds are also supporting development of models that will allow forecasting the response of the Bay to changes in nutrient loads and other factors that drive potential impairment related to nutrients.

Small Tributaries

RMP work on small tributary load monitoring is being conducted in close coordination with monitoring being performed by members of the Bay Area Stormwater Management Agencies Association. Work elements to be performed with funds from 2015 will include:

- a characterization study to support identification of additional watersheds for management consideration through analysis of contaminant concentrations on suspended sediment particles, with a design that includes sampling of fine sediments using settling chambers,
- ongoing regional-scale stormwater load estimation using the regional watershed spreadsheet model, and
- development of a trend monitoring strategy.

Chemicals of Emerging Concern

Monitoring of chemicals of emerging concern continues to be a priority for the Program. Activities in 2015 will include:

- a study of perfluorochemicals (PFCs or Teflon chemicals) and the pesticide fipronil in treated wastewater discharged to the Bay, and
- analysis of microplastic pollution in Bay water and sediment.

PCBs

A synthesis and conceptual model update published in 2014 shifted focus from the open Bay to the contaminated areas on the margins where impairment is greatest, where load reductions are being pursued, and where reductions in impairment, in response to load reductions, will be most apparent. The Synthesis was the foundation for a 2014 update of the PCB Strategy that calls for a multi-year effort to identify margin areas that are high priorities for management and monitoring, develop site-specific conceptual models and sediment mass balances for margin areas downstream of watersheds where management actions will occur, and perform monitoring in these areas as a performance measure. Work in 2015 will include selection of priority margin areas for evaluation and development of conceptual models and mass balances for one or two of these areas.

Selenium

In April 2014 the RMP formed a Selenium Strategy Team to evaluate low-cost, near-term information needs that can be addressed by the Program in the next several years. The Team recommended exploring an opportunity to obtain a larger number of sturgeon muscle samples, non-lethally and inexpensively, through collection of small plugs of sturgeon muscle in a collaboration with a California Department of Fish and Wildlife annual tagging program. A pilot effort using this technique was conducted in 2014, and the approach will be applied again in 2015. Another small study of selenium in sturgeon will be performed in collaboration with a fishing derby in the Delta. Tissues will be obtained from fish caught for the derby that will allow a comparison of muscle plugs, which are easy to obtain, with concentrations in eggs or ovaries, which is the exposure of interest toxicologically.

Communications

A Pulse of the Bay will be produced in 2015, to be released at the Annual Meeting which will once again be held jointly with the State of the Estuary Conference in September. This edition of the *Pulse* will be a companion to the *State of the Estuary Report*, which will also be released in September. The 2015 *Pulse* will provide profiles of the contaminants of concern in the Bay, similar to the profiles provided for CECs in the 2013 *Pulse*.

This Program Plan is a brief summary of activities planned for 2015. A Detailed Workplan and budget are prepared separately and are reviewed and approved by the Technical Review Committee and Steering Committee. A budget summary of the total cost for each program element is included in Table 1. Detailed scopes of work and budgets will be presented in the 2015 Detailed Workplan.

TASK DESCRIPTIONS

1. Program Management

The administration and management of the RMP requires a substantial effort from SFEI staff. Program management tasks include:

- program planning
- contract and financial management
- technical oversight
- internal coordination
- external coordination
- safety training
- administration

Approximately half of the cost for this category is fiduciary oversight, project-specific safety training, and office administrative costs. Deliverables associated with this line item include documents describing the budget, the Multi-Year Plan, the Detailed Workplan, and the Program Plan. The funds for technical oversight allow for internal review by senior staff of the many reports, presentations, posters, workplans, memos, and other communications coming out of the RMP. The funds for external coordination cover participation in meetings with external partners to coordinate programs and leverage RMP funds (e.g., coordinating work on the Pulse Report with the State of the Estuary Report, coordination with SCCWRP, and serving as liaison to the Delta RMP and other RMPs).

The total cost for these tasks in 2015 will be \$432k.

2. Governance

Governance tasks include convening, coordinating, and facilitating Steering Committee, Technical Review Committee, and Workgroup meetings. Tasks include preparing agendas, agenda packages, participating in meetings, writing meeting summaries, action item follow-up, reviewing minutes from past meetings, coordination with committee chairs, and honoraria and travel for external advisors.

The total budget for governance is \$280k.

3. Data Management

Data management tasks include processing of new data, maintaining the RMP database and providing online access, and providing quality assurance.

Results from the large number of samples collected in 2014 will be processed and quality assured in 2015. Processing of new data includes formatting, performing QA/QC review, and uploading RMP field and analytical results from laboratories to SFEI's Regional Data Center database and replicating to CEDEN, maintaining the database of archived RMP samples and

coordinating with archive facilities, coordinating our team, collection agencies, and laboratories, and tracking data deliverables and pending issues.

The RMP database currently includes approximately 1.1 million records generated since the Program began in 1993. Database maintenance includes incorporating updates and corrections to data as needed, including re-analyzed results and updates implemented by CEDEN/SWAMP; and adding enhancements and updates to web-based data access tools such as CD3. Web-based data access tools provided by CD3 include user-defined queries, data download and printing functionality, maps of sampling locations, and visualization tools.

Quality assurance tasks include updating the Quality Assurance Project Plan, writing QA memos for datasets, conducting interlaboratory comparison tests, researching analytical methods, and maintaining our laboratory SOP file system.

The total cost for these tasks in 2015 will be \$355k.

4. Annual Reporting

A Pulse of the Bay will be produced in 2015, to be released at the Annual Meeting which will once again be held jointly with the State of the Estuary Conference in September. This edition of the *Pulse* will be a companion to the *State of the Estuary Report*, which will also be released in September. The 2015 *Pulse* will provide profiles of the contaminants of concern in the Bay, similar to the profiles provided for CECs in the 2013 *Pulse*.

Tasks related to production of the *Pulse* include preparation of technical content (text, analyses, graphics), graphic design, and web presence. Subcontractors assist with editing and preparing content.

Tasks related to the Annual Meeting include developing the meeting agenda, managing logistics, advertising about the meeting, managing attendee registration, preparing presentations, and staffing the meeting.

In 2015 the report formerly titled “Annual Monitoring Results” will be scaled back and renamed the “Annual Monitoring Report.” The report will now only provide summary information on data collection.

The total cost for these tasks in 2015 will be \$254k.

5. Communications

Communications tasks will implement the plans included in the RMP Communications Strategy, approved by the Steering Committee in July 2014. Tasks will include the distribution of RMP information to stakeholders, natural resource managers, and the public through multiple media channels (e.g., website, publications, email newsletters, fact sheets, social media, etc.).

Stakeholder engagement is critically important to addressing the information needs of

RMP participants. Tasks include preparing for and attending RMP stakeholder meetings (e.g., BACWA, BASMAA, LTMS, WSPA) as well as communicating directly with stakeholder representatives.

Other communications tasks include responding to inquiries for RMP data and reports, including press calls, producing summary information on important topics in convenient formats, and planning and reviewing content for *Estuary News*. Participation in workshops and conferences for SWAMP, SETAC, ACS, and other professional organizations allows sharing of RMP information, gathering of information from other investigators on the latest advances in monitoring and understanding, and identification of opportunities for collaboration with other organizations. Presentations at local meetings and to local audiences are also important for collaboration and information dissemination to scientific partners. Keeping the website up to date is another important component of communication.

The total cost for these tasks in 2015 will be \$166k.

6. Status and Trends Monitoring

A continuing goal is to make optimal use of the funds that participants provide to the Program. High priority topics continue to emerge (e.g., nutrients and selenium), and information needs continue to grow. Status and trends monitoring of open Bay waters is a cornerstone of the Program, but after 20 years of repeated sampling the information yield has gradually diminished.

In 2014, the Steering Committee and Technical Review Committee continued a process of seeking efficiencies in status and trends monitoring. The committees reduced the frequency of sediment sampling from a two-year cycle to a four-year cycle. Water will continue to be sampled on a two-year cycle, but many of the more expensive parameters will be measured a greatly reduced frequency. As one example, PCBs in water will now be analyzed once every 10 years - commensurate with the value of additional water PCB data in promoting understanding and supporting decision-making. Other matrices that are more crucial for PCBs, such as sport fish, bird eggs, and sediment, will continue to be monitored at a higher frequency. This belt-tightening has freed up resources that can be applied to higher priority information needs, such as sampling of sediment on the shallow margins of the Bay, which have historically not been included in status and trends monitoring.

The revised schedule for status and trends monitoring is as follows:

- continuous monitoring of suspended sediment,
- monthly monitoring of basic water quality parameters (salinity, temperature and dissolved oxygen; suspended sediments; and phytoplankton biomass),
- biennial water and bivalve monitoring,
- triennial bird egg monitoring, and
- sediment monitoring on a four-year cycle, and
- sport fish monitoring on a five-year cycle.

In 2015, the schedule calls for sampling of water and bird eggs. Water analytes will include copper, cyanide, selenium, methylmercury, ancillary parameters, and aquatic toxicity.

Eggs of double-crested cormorants and Forster's Terns will be collected. Cormorant eggs will be analyzed for PCBs, PBDEs, Hg, PFCs, and Se. Tern eggs will be analyzed for Hg, PBDEs, and Se.

Discussions are in progress regarding using the funds freed up by the reductions in water and open-Bay sediment monitoring to sample sediment on the Bay margins. Due to the type of sampling vessel used in open Bay monitoring, sediment sampling to date has not included areas on the margin of the Bay where the water is less than 1 ft deep at mean lower low water. In parts of the Bay, especially Lower South Bay, this encompasses an extensive area of important habitat.

The total costs for these tasks in 2015 will be \$966k. Brief summaries of each of the Status and Trends elements for 2015 are provided below.

Continuous Monitoring of Suspended Sediment (\$250k)

Tides and wind waves are constantly moving water and altering the water quality of San Francisco Bay. The USGS California Water Science Center provides the RMP water quality measurements at the tidal time scale through continuous monitoring of suspended-sediment concentration and dissolved oxygen at multiple locations in the Bay. At each station, turbidity and dissolved oxygen sensors are deployed in the water column and automatically collect measurements every 15 minutes. Approximately every 3 weeks technicians visit the stations to clean the sensors, check their calibrations, and download data. Data are processed and edited to remove values that are corrupted by biofouling. Data are available at <http://waterdata.usgs.gov/ca/nwis/sw/>. Data are analyzed and the resulting reports are available at <http://ca.water.usgs.gov/projects/baydelta/publications.html>.

This monitoring has been conducted since the Program began in 1993, and revealed that suspended sediment concentrations in the Bay declined sharply beginning in 1999. This work is led by Dr. David Schoellhamer of the USGS in Sacramento.

USGS maintains five suspended sediment stations in the Estuary (i.e., Mallard Island, Benicia, Richmond Bridge, Alcatraz, and Dumbarton Bridge) and funding for a temporary site. The USGS used the temporary site funding for 2013 for better understanding the sediment flux at the Golden Gate. In 2014, the temporary site funding was used to install a suspended sediment station at the Exploratorium (Pier 15). Discussions are underway to determine how to maintain the existing monitoring scheme in light of increasing costs and the available budget, which has been fixed at \$250k since 1993.

Hydrography and Phytoplankton (\$173k)

This work is led by Dr. Jim Cloern of the USGS in Menlo Park. The study performs monthly water sampling to map the spatial distributions and temporal trends of basic water quality parameters along the entire Bay-Delta system. Measurements include salinity, temperature, dissolved oxygen, suspended sediments, and phytoplankton biomass. This basic information is required to follow the seasonal changes in water quality and estuarine habitat as they influence biological communities and the distribution and reactivity of trace contaminants.

This monitoring has played a crucial role in documenting changes in the Bay that have raised concern for the possible impacts of nutrients and provided an impetus for the Nutrient Science Strategy.

USGS also provides funding for this monitoring. This funding decreased in 2014, and the contribution from the RMP increased from the \$110k that had been in place for many years to \$173k.

Water Chemistry (\$45k)

Monitoring for trace elements and water quality parameters will occur at 22 sites in 2015. Water analytes will include copper, cyanide, selenium, methylmercury, ancillary parameters, and aquatic toxicity. As in prior years, SFEI staff will assist in the collection of water samples. Subcontractors conducting the water chemistry analyses will include EBMUD for ancillary, ALS Laboratory Group for nutrients, Brooks Rand for inorganics, City and County of San Francisco for cyanide, and City of San Jose for splits of copper and nickel. We may also work with a specialty lab to be determined for lower selenium detection limits. Applied Marine Sciences has will continue to serve as our logistics coordinator.

Bird Eggs (\$150k)

Avian egg monitoring is a tool that was piloted in the Exposure and Effects Pilot Study and retained as an element of RMP Status and Trends monitoring (Davis et al., 2006). Avian egg monitoring in other aquatic ecosystems has proven to be a highly effective tool for assessment of long-term trends in persistent, bioaccumulative contaminants. Egg monitoring is now conducted in the RMP once every three years.

Double-crested Cormorants (*Phalacrocorax auritus*) are now routinely monitored by the RMP as a sentinel species for the open waters of the Bay. Cormorant eggs are sampled Bay-wide every three years and analyzed for mercury, selenium, PBDEs, PCBs, legacy pesticides, and, starting in 2009, perfluorinated compounds (PFCs). Sampling locations include Wheeler Island in Suisun Bay, the Richmond Bridge, and Don Edwards Wildlife Refuge in the Lower South Bay.

Forster's Tern eggs were selected as another avian indicator because this species feeds primarily on small fish in shallow water habitats on the Bay margins, including managed ponds. The spatial and habitat coverage of this species (Bay margins and managed ponds) therefore complements that of Double-crested Cormorants (open waters and large sloughs). Studies by the U.S. Geological Survey (USGS) have resulted in the establishment of Forster's Tern eggs as a primary biosentinel tool for monitoring of mercury risk to Bay wildlife. Tern eggs are also sampled every three years and analyzed for mercury, PBDEs, and selenium. Forster's Tern nesting locations vary from year to year. Past sampling locations have included Knight Island and Napa Marsh near the Napa River (San Pablo Bay segment); salt ponds near Hayward (South Bay segment); and salt ponds in Lower South Bay.

Field Work and Logistics (\$175k)

This task includes work by SFEI to assist with sampling and coordination (\$45k); a subcontractor (Applied Marine Sciences) to plan cruise logistics, collect samples, ship samples to laboratories, and manage the sample archive (\$95k); funds for renting the research vessel (the USGS R/V Turning Tide) (\$25k); and funds for other miscellaneous items.

Margin Sediment Sampling: Planning (\$20k) and Sampling (\$120k)

As mentioned above, discussions are in progress regarding using the funds freed up by the reductions in water and open-Bay sediment monitoring to sample sediment on the Bay margins. In parts of the Bay, especially Lower South Bay, this encompasses an extensive area of important habitat. The 2014 workplan included \$20k for development of a draft probabilistic sampling design. An additional \$20k is needed to support continued discussion and sampling design development. The reductions in the water and open-Bay sediment elements of RMP status and trends monitoring have made \$120k available for margin sediment sampling.

Sample Archive (\$18k)

This item covers storage costs for the long-term archive of sediment, bivalve, bird egg, and sport fish samples at NIST. Selected RMP samples are stored at ultra-low temperatures. Payments are made in odd numbered years. An archiving protocol documents the procedures: <http://www.sfei.org/sites/default/files/Report%20628%20Archive%20Protocol.pdf>

Data Analysis (\$15k)

The RMP has been invited to submit a paper for a special issue of the new journal *Regional Studies in Marine Science*. The special issue will focus on successful regional monitoring programs around the US. These funds will allow for an article documenting the evolution of and lessons learned from RMP monitoring, including data analysis.

7. Special Studies

The following studies were reviewed by the TRC and SC and approved for incorporation into the 2014 Program Plan. The total costs for special studies in 2015 will be \$1,172k.

Nutrients (\$470k)

San Francisco Bay has long been recognized as a nutrient-enriched estuary, but one that has historically proven resilient to the harmful effects of nutrient enrichment, such as excessive phytoplankton blooms and hypoxia. Available information suggests that the accumulation of phytoplankton biomass in the Bay is strongly limited by tidal mixing, grazing pressure by invasive clams, light limitation from high turbidity, and potentially, in the North Bay, ammonium inhibition of diatom uptake of nitrate. However, evidence is building that, since the late 1990s, the historic resilience of the Bay to the harmful effects of nutrient enrichment is

weakening. In response to these apparent changes in the Bay's resilience to nutrient loading, a Nutrient Science Strategy has been developed.

Bay-wide Nutrient Permit funds from BACWA (\$880k/yr) are being directed toward nutrient science studies in the Bay. The intent is for these funds to be combined with funds from the RMP (\$470k in 2015) and other entities, and that the Nutrient Management Strategy Steering Committee will make decisions about how to allocate funds, based on recommendations in a Science Plan, which is under development. Tentative plans for the use of the funds from the RMP are presented here.

Moored Sensor Monitoring (\$190k)

While monitoring has occurred regularly in the Bay over the past 40 years, most of the data have been collected at weekly or monthly time intervals. Phytoplankton, nutrients, dissolved oxygen, and other parameters such as suspended sediment (which dictates the light available for phytoplankton growth) vary strongly over much shorter time scales (e.g., on an hourly basis) due to the daily cycle of photosynthesis and respiration in phytoplankton, mixing, biogeochemical processes, and tides. To better assess the Bay's condition, and to collect high-frequency data to calibrate water quality models, the RMP is funding a moored sensor network. Beginning in summer 2013, sensors for chlorophyll, dissolved oxygen, turbidity, temperature, and other parameters were deployed at three stations in Lower South Bay and South Bay. In 2015, plans include addition of one more permanent deployment in a slough or margin habitat in South Bay, and performing a number of shorter-term deployments at a network of margin sites, with a specific focus on characterizing dissolved oxygen in the system. Telemetry will be added to new and existing sites. Experiments will also be conducted to improve our ability to accurately infer chlorophyll-a concentration from fluorescence measurements.

Modeling (\$165k)

RMP funds are also supporting development of models that will allow forecasting the response of the Bay to changes in nutrient loads and other factors that drive potential impairment related to nutrients. Among its recommendations, the Nutrient Strategy calls for developing models to quantitatively characterize the Bay's response to nutrient loads; explore ecosystem response under future environmental conditions; and test the effectiveness of load reduction scenarios and other scenarios that mitigate or prevent impairment. A draft modeling workplan for 2015-2021 is currently in review.

The draft workplan calls for a phased approach, quality assurance protocols, and an open-source modeling platform to promote efficiency, produce quality results, and maximize the value of the modeling investment. In Phase 1 of model development, models will be simplified-domain (several boxes, with "real" hydrodynamics through grid aggregation of an existing hydrodynamic model), and focused on South Bay/Lower South Bay and Suisun Bay. The simplified domain models will allow effort to be directed toward parameter sensitivity analysis, subembayment scale calibration, exploration of underlying causes of observed changes in ecosystem response, and identification of key data needs to prioritize among other research and monitoring activities in subsequent years. Phase 1 will begin in 2015 and conclude in 2017.

For Phase 2, beginning in 2017, work will gradually move toward higher degrees of spatial resolution, building toward a whole bay model and will provide preliminary answers to key management questions about the role of nutrients in the Bay. Phase 3 modeling, planned to begin in 2021, will involve more complicated and/or multi-year scenarios to answer management questions with a higher degree of certainty.

Small Tributary Loadings

RMP work on small tributary load monitoring is being conducted in close coordination with monitoring being performed by members of the Bay Area Stormwater Management Agencies Association as required by the Municipal Regional Permit.

Wet Weather Characterization (\$374k)

Most of the budget for small tributary load monitoring in 2015 will support a characterization study in the winter of 2014-15 to identify additional watersheds with high-concentration sources areas for potential actions to reduce loads of PCBs and mercury. The basic design of this effort will be to collect one composite in the tidal reaches of up to 25 selected tributaries. Concentrations of PCBs, mercury, and other metals will be analyzed on suspended sediment particles. In addition, a pilot study will be conducted to collect fine sediments using special settling chambers. If this approach works, it will provide a highly cost-effective means of evaluating concentrations on particles for future monitoring.

Regional Watershed Spreadsheet Model (\$35k)

To accurately assess total contaminant loads entering San Francisco Bay, it is necessary to estimate loads from local watersheds. "Spreadsheet models" of stormwater quality provide a useful and relatively cheap tool for estimating regional scale watershed loads. Spreadsheet models have advantages over mechanistic models because the data for many of the input parameters required by those models do not currently exist, and also require large calibration datasets which take money and time to collect. Development of a spreadsheet model for the Bay has been underway since 2010.

Tasks for 2015 depend upon the outcomes of the work for 2014 which is still underway. Possible uses of the 2015 funds include improving the basis of the model by shifting the model to a water-based starting point or completing further structural improvements to the sediment-based model, or incorporation of additional calibration watersheds and BASMAA studies.

Trends Strategy (\$35k)

The Sources, Pathways, and Loadings Workgroup recommended an effort to define where and how trends may be most effectively measured in relation to management effort so that data collection methods deployed over the next several years support this future need. A trends strategy white paper will be developed in 2015 addressing where trends should be measured, appropriate media and metrics, numerical methods for assessing trends, and sampling design.

Small Tributary Loading Strategy Coordination (\$26k)

The RMP Small Tributaries Loading Strategy Team provides the forum for planning and coordinating projects for the improvement of information on small tributary loads to the Bay. This task will include quarterly STLS meetings to coordinate monitoring, and provide updates and solicit input on spreadsheet model and trends strategy development. Monthly phone conferences calls will be convened to provide brief updates and information sharing.

Chemicals of Emerging Concern (CECs)

CECs in Municipal Wastewater (\$55k)

The State Water Resources Control Board's Chemicals of Emerging Concern (CECs) Science Advisory Panel has recommended that programs include sampling wastewater treatment plant (WWTP) effluent and stormwater when screening for emerging contaminants. The follow-up state pilot study, now under development, similarly emphasizes examination of these contamination pathways as an important means of providing managers with the data they need to make sound decisions regarding CECs. A study in 2015 will expand our knowledge of the role of WWTP effluent in contaminating the Bay environment by monitoring high priority and newly-identified CECs in this matrix. This study will expand on previously-approved plans to sample WWTP effluent monitoring for alternative flame retardants and estrogenic contaminants. The 2015 funds will be used to screen for perfluorinated compounds (including PFOS) and fipronil in effluent from eight WWTPs. Both PFOS and fipronil are Tier 3 (moderate concern) CECs according to the RMP prioritization scheme.

Microplastics in the Bay and Municipal Wastewater (\$9k)

Microplastic is a term used to describe fragments of plastic that are less than 5 mm. Microplastics can be pellets that are used as precursors for industrial products, microbeads used in consumer products (e.g. exfoliants), or fragments/fibers of plastics that are the breakdown products of larger plastic materials. Microplastics can enter the aquatic environment through wind, stormwater runoff, or illegal dumping of plastic materials. Additionally, both microbeads from cosmetic products and plastic fibers (e.g., polyester and acrylic) from clothing can be washed down the drain and enter wastewater treatment plants. Microplastics are not captured by wastewater treatment plants because they are buoyant and do not flocculate; therefore, they are released in wastewater. California and New York have proposed bans on microplastics found in cosmetics. Additionally, Johnson & Johnson, L'Oréal, Colgate-Palmolive, and Procter & Gamble have pledged to phase out the use of microbeads in their skin cleansers. Therefore, the concentrations entering wastewater may decrease in the future.

Microplastics are found in surface waters, the water column, and sediment. They can also be found in the gut and circulatory system of aquatic organisms that ingest the particles. Ingestion of microplastics can block the digestive tract, reduce growth rates, block enzyme production, lower steroid hormone levels, affect reproduction, and cause the adsorption of contaminants.

Samples of ambient Bay water and sediment from 10 sites will be analyzed for microplastics in two size classes: >0.355-mm and 0.125-0.355-mm (the size fraction that is characteristic of personal care product microbeads). Effluent from six WWTPs will also be analyzed.

CEC Information Synthesis (\$20k)

Information on CECs is rapidly evolving. The RMP CEC Strategy (<http://www.sfei.org/sites/default/files/SFEI%20CEC%20strategy%20FINAL.pdf>) calls for routine review of work done by others to identify new chemicals, new methods, and new collaborators. RMP staff actively read the latest literature, attend scientific conferences, and confer with leading CEC scientists to obtain feedback on existing RMP studies, to identify new CECs, and to forge new partnerships. This information feeds into annual study plans and refinement of the CEC Strategy.

PCBs (\$85k)

A synthesis and conceptual model update published in 2014 shifted focus from the open Bay to the contaminated areas on the margins where impairment is greatest, where load reductions are being pursued, and where reductions in impairment, in response to load reductions, will be most apparent. The Synthesis was the foundation for a 2014 update of the PCB Strategy that calls for a multi-year effort to identify margin areas that are high priorities for management and monitoring, develop site-specific conceptual models and sediment mass balances for margin areas downstream of watersheds where management actions will occur, and perform monitoring in these areas as a performance measure.

Tasks in 2015 will include 1) selection of priority margin areas for evaluation and 2) development of conceptual models and mass balances for one or two of these areas.

Task 1 will be performed by the PCB Strategy Team with staff support from SFEI. An initial survey and prioritization of all the margin units will be conducted. Properties of the margin units to be evaluated will be determined through Team discussion. Data gathering and analysis will be needed to support the prioritization effort, including evaluation of data on contamination in the watersheds and in the Bay, mapping information to link watersheds with margin units, and mapping to delineate boundaries of margin units. All margin units will be considered in this prioritization phase, not just those for which data are already available.

For task 2, the one or two highest priority margin units (PMUs) will be evaluated in detail in 2015. The following approach will be applied to each PMU. A relatively large Conceptual Site Model Workgroup (CSMW) will be assembled that includes members of the PCB Strategy Team, along with experts on potential biotic indicators, sediment movement from watersheds to margins to the open Bay, and local conditions. This CSMW will meet two to three times to develop and document conceptual understanding and a monitoring plan for the PMU.

Selenium

In April 2014 the RMP formed a Selenium Strategy Team to evaluate low-cost, near-term information needs that can be addressed by the Program in the next several years.

Sturgeon Tissue Plug Monitoring (\$23k)

The Team recommended exploring an opportunity to obtain a larger number of sturgeon muscle samples, non-lethally and inexpensively, through collection of small plugs of sturgeon muscle in a collaboration with a California Department of Fish and Wildlife annual tagging program. A pilot effort using this technique was conducted in 2014, and the approach will be applied again in 2015. This task will be performed in collaboration with CDFW and USGS. SFEI staff would plan the study, train CDFW staff and perform sampling, manage the data, and write a brief technical report. USGS (Robin Stewart and her team) will perform analysis of selenium and stable isotopes of C, N, and S in the plugs. The stable isotopes provide information on diet and habitat use by the sturgeon. The sampling will occur during the course of the CDFW survey in August through October. Thirty white sturgeon plugs will be collected and analyzed. Another 30 will be collected and archived in case additional samples are needed.

Sturgeon Derby Study (\$20k)

Another small study of selenium in sturgeon will be performed in collaboration with an annual sturgeon fishing derby in the Delta. Tissues will be obtained from fish caught for the derby that will allow a comparison of muscle plugs, which are easy to obtain, with concentrations in eggs or ovaries, which is the exposure of interest toxicologically. This study will be performed in collaboration with USFWS and USGS. SFEI staff will plan the study, perform sampling, manage the data, and write a brief technical report. USGS (Robin Stewart and her team) will analyze of selenium and stable isotopes of C, N, and S in the plugs, and of selenium on the eggs or ovaries. The stable isotopes provide information on diet and habitat use by the sturgeon. The sampling would occur on Super Bowl weekend in 2015.

Fifteen white sturgeon muscle plugs will be collected and analyzed. Fifteen splits of their egg or ovary samples will also be obtained from USFWS for analysis by USGS.

Selenium Information Synthesis (\$10k)

The Selenium Strategy Team recommended the allocation of \$10k per year to support compilation of data and information, review of literature, and continuing Strategy development.

Selenium Strategy Team (\$10k)

The Selenium Strategy Team provides the forum for planning and coordinating projects for the improvement of information on selenium in the Bay. This task will include one or two meetings in 2015 to coordinate monitoring, provide updates and solicit input on current projects, and plan projects for 2016 and beyond.

Table 1: RMP 2015 Expenses

Row Labels	2015 Budget Proposed
Expense	\$3,624,700
1. Program Management	\$431,800
A. Program Planning	\$50,000
B. Contract and Financial Management	\$187,100
C. Technical Oversight	\$50,000
D. Internal Coordination	\$90,000
E. External Coordination	\$30,000
F. Safety Training	\$5,000
G. Administration	\$19,700
2. Governance	\$279,500
A. SC meetings	\$66,500
B. TRC meetings	\$81,500
C. WG meetings	\$81,500
D. External Science Advisors	\$50,000
3. Data Management	\$355,000
A. Data Processing, Quality Assurance, and Upload to CEDEN	\$160,000
B. Database Maintenance and Online Data Access	\$140,000
C. Quality Assurance System	\$25,000
D. Updates to SOPs and Templates	\$30,000
4. Annual Reporting	\$254,400
A. Pulse or Pulse Lite Report	\$165,500
B. Annual Meeting	\$73,900
C. Annual Monitoring Results Report	\$10,000
D. Updates to Copper SSO and Dredged Material Thresholds	\$5,000
5. Communications	\$166,000
A. Communications Plan Implementation	\$22,000
B. Stakeholder Engagement	\$42,000
C. Responses to Information Requests	\$10,000
D. Fact Sheets and Outreach Products	\$10,500
E. Support for "Estuary News"	\$18,500
F. Presentations at Conferences and Meetings	\$48,000
G. RMP Website Maintenance	\$15,000
H. RMP Website Redesign	\$0
I. Products for New Media	\$0
6. S&T Monitoring	\$966,000
A. Field Work and Logistics	\$175,000
B. USGS Sacramento Support	\$250,000
C. USGS Menlo Park Support	\$173,000
D. Water Chemistry Monitoring	\$45,000
E. Water Chemistry CTR Monitoring	\$0
F. Bird Egg Monitoring	\$150,000
G. Sample Archive	\$18,000
H. Planning for Bay Margins Sediment Study	\$20,000
I. Bay Margins Sediment Study	\$120,000
J. Analysis of S&T Impacts, Changes, and Data	\$15,000
7. Special Studies	\$1,172,000
EC Microplastics Monitoring	\$9,000
EC Strategy Support	\$20,000
EC Wastewater Monitoring	\$55,000
Nutrient Modeling Program Development	\$165,000
Nutrient Moored Sensor Program Development	\$190,000
Nutrient Research TBD	\$115,000
PCB: PMU Conceptual Model	\$85,000
Selenium Delta Fish Derby Monitoring	\$20,000
Selenium Information Synthesis	\$10,000
Selenium Sturgeon Tissue Plug Monitoring	\$23,000
Selenium Strategy Team Meeting	\$10,000
STLS Regional Watershed Model	\$35,000
STLS Strategy Coordination	\$26,000
STLS Trends strategy	\$35,000
STLS Wet Weather Characterization	\$374,000
Grand Total	\$3,624,700

Regional Monitoring Program for Water Quality in San Francisco Bay

2015 Detailed Workplan

Overview

In 2015 the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) is entering its 23rd year of collecting data and communicating information to support water quality management decisions. The 2015 RMP Budget was approved by the Steering Committee on November 13, 2014 (Table 1). This Detailed Workplan provides details of activities that will be completed with the budgeted funds. Most importantly, the workplan establishes the deliverables that will be produced for each line item of the budget. RMP staff will report on progress toward completing these deliverables throughout the year using a standardized “stoplight” report.

HIGHLIGHTS OF THE 2015 PROGRAM

Status and Trends Monitoring

A continuing goal is to make optimal use of the funds that participants provide to the Program. High priority topics continue to emerge (e.g., nutrients and selenium), and information needs continue to grow. Status and trends monitoring of open Bay waters is a cornerstone of the Program, but after 20 years of repeated sampling the information yield has gradually diminished.

In 2014, the Steering Committee and Technical Review Committee continued a process of seeking efficiencies in status and trends monitoring. The committees reduced the frequency of sediment sampling from a two-year cycle to a four-year cycle. Water will continue to be sampled on a two-year cycle, but many of the more expensive parameters will be measured a greatly reduced frequency. As one example, PCBs in water will now be analyzed once every 10 years - commensurate with the value of additional water PCB data in promoting understanding and supporting decision-making. Other matrices that are more crucial for PCBs, such as sport fish, bird eggs, and sediment, will continue to be monitored at a higher frequency. This belt-tightening has freed up resources that can be applied to higher priority information needs, such as sampling of sediment on the shallow margins of the Bay, which have historically not been included in status and trends monitoring.

The revised schedule for status and trends monitoring is as follows:

- continuous monitoring of suspended sediment,
- monthly monitoring of basic water quality parameters (salinity, temperature and dissolved oxygen; suspended sediments; and phytoplankton biomass),
- biennial water and bivalve monitoring,
- triennial bird egg monitoring, and

- sediment monitoring on a four-year cycle, and
- sport fish monitoring on a five-year cycle.

In 2015, the schedule calls for sampling of water and bird eggs. Water analytes will include copper, cyanide, selenium, methylmercury, ancillary parameters, and aquatic toxicity. Eggs of double-crested cormorants and Forster's Terns will be collected. Cormorant eggs will be analyzed for PCBs, PBDEs, Hg, PFCs, and Se. Tern eggs will be analyzed for Hg, PBDEs, and Se.

Discussions are in progress regarding using the funds freed up by the reductions in water and open-Bay sediment monitoring to sample sediment on the Bay margins. Due to the type of sampling vessel used in open Bay monitoring, sediment sampling to date has not included areas on the margin of the Bay where the water is less than 1 ft deep at mean lower low water. In parts of the Bay, especially Lower South Bay, this encompasses an extensive area of important habitat.

Special Studies

Special study funds in 2015 will primarily go to work on nutrients and small tributary loading. Smaller amounts will go to studies on emerging contaminants, PCBs, and selenium.

Nutrients

RMP funds will provide support for the Nutrient Science Strategy, augmenting major funding from BACWA, USGS, and other sources. RMP funds will primarily be used for moored sensor work. RMP moored sensor monitoring began in 2013 to better assess the Bay's condition, and to collect high frequency data to calibrate water quality models. The sensors gather data on chlorophyll, dissolved oxygen, turbidity, temperature, and other parameters were deployed at three stations in Lower South Bay and South Bay. RMP funds are also supporting development of models that will allow forecasting the response of the Bay to changes in nutrient loads and other factors that drive potential impairment related to nutrients.

Small Tributaries

RMP work on small tributary load monitoring is being conducted in close coordination with monitoring being performed by members of the Bay Area Stormwater Management Agencies Association. Work elements to be performed with funds from 2015 will include:

- a characterization study to support identification of additional watersheds for management consideration through analysis of contaminant concentrations on suspended sediment particles, with a design that includes sampling of fine sediments using settling chambers,
- ongoing regional-scale stormwater load estimation using the regional watershed spreadsheet model, and
- development of a trend monitoring strategy.

Chemicals of Emerging Concern

Monitoring of chemicals of emerging concern continues to be a priority for the Program. Activities in 2015 will include:

- a study of perfluorochemicals (PFCs or Teflon chemicals) and the pesticide fipronil in treated wastewater discharged to the Bay, and
- analysis of microplastic pollution in Bay water and sediment.

PCBs

A synthesis and conceptual model update published in 2014 shifted focus from the open Bay to the contaminated areas on the margins where impairment is greatest, where load reductions are being pursued, and where reductions in impairment, in response to load reductions, will be most apparent. The Synthesis was the foundation for a 2014 update of the PCB Strategy that calls for a multi-year effort to identify margin areas that are high priorities for management and monitoring, develop site-specific conceptual models and sediment mass balances for margin areas downstream of watersheds where management actions will occur, and perform monitoring in these areas as a performance measure. Work in 2015 will include selection of priority margin areas for evaluation and development of conceptual models and mass balances for one or two of these areas.

Selenium

In April 2014 the RMP formed a Selenium Strategy Team to evaluate low-cost, near-term information needs that can be addressed by the Program in the next several years. The Team recommended exploring an opportunity to obtain a larger number of sturgeon muscle samples, non-lethally and inexpensively, through collection of small plugs of sturgeon muscle in a collaboration with a California Department of Fish and Wildlife annual tagging program. A pilot effort using this technique was conducted in 2014, and the approach will be applied again in 2015. Another small study of selenium in sturgeon will be performed in collaboration with a fishing derby in the Delta. Tissues will be obtained from fish caught for the derby that will allow a comparison of muscle plugs, which are easy to obtain, with concentrations in eggs or ovaries, which is the exposure of interest toxicologically.

Communications

A *Pulse of the Bay* will be produced in 2015, to be released at the Annual Meeting which will once again be held jointly with the State of the Estuary Conference in September. This edition of the *Pulse* will be a companion to the *State of the Estuary Report*, which will also be released in September. The 2015 *Pulse* will provide profiles of the contaminants of concern in the Bay, similar to the profiles provided for CECs in the 2013 *Pulse*.

TASK DESCRIPTIONS

1. Program Management

The administration and management of the RMP requires a substantial effort from SFEI staff. Program management tasks include:

- program planning
- contract and financial management
- technical oversight
- internal coordination
- external coordination
- safety training
- administration

Approximately half of the cost for this category is fiduciary oversight, project-specific safety training, and office administrative costs. Deliverables associated with this line item include documents describing the budget, the Multi-Year Plan, the Detailed Workplan, and the Program Plan. The funds for technical oversight allow for internal review by senior staff of the many reports, presentations, posters, workplans, memos, and other communications coming out of the RMP. The funds for external coordination cover participation in meetings with external partners to coordinate programs and leverage RMP funds (e.g., coordinating work on the Pulse Report with the State of the Estuary Report, coordination with SCCWRP, and serving as liaison to the Delta RMP and other RMPs).

The total cost for these tasks in 2015 will be \$432k. SFEI labor will be \$402k. The labor tasks and deliverables are summarized below.

Subtask	Description	Deliverables	Budget
A. Program Planning	Preparing annual workplans and budgets (Program Plan, Detailed Workplan, Multi-Year Plan). Preparing presentation of RMP activities for the coming year for Planning Workshop and outreach meetings. Updating the MOU between SFEI-ASC and the Water Board biennially	2016 Budget Memo (October), 2016 Multi-Year Plan (draft in October, final in January '15), 2016 Program Plan (October). 2016 Detailed Workplan (Draft to TRC in December, final to SC in January '15)	\$50,000
B. Contract and Financial Management	Tracking expenditures versus budget, accounting, working with auditors, providing financial updates to RMP SC, developing contracts, overseeing contracts, invoicing stakeholders.	Updates on 2015 Budget (quarterly at SC meetings)	\$170,000 (labor) \$187,100 (total)

C. Technical Oversight	Review of work products by Lead Scientist, Program Manager, and Senior Scientists to ensure the quality of RMP deliverables. These funds will also be used to provide advice to junior staff on technical problems. When possible, technical reviews will be completed using funds in the labor budget for the project. However, some projects are underbudgeted for internal review; some projects would benefit from a broader set of internal reviewers than originally planned; and review is often needed on small deliverables such as slides.	Improved quality work products	\$50,000
D. Internal Coordination	Workflow planning, tracking deliverables, and holding staff meetings.	RMP Deliverables Tracking System and Stoplight Reports (quarterly at SC meetings)	\$90,000
E. External Coordination	Participation in meetings with external partners to coordinate programs (e.g., coordinating work on the Pulse Report with the State of the Estuary Report, linking RMP monitoring with SWAMP, meeting with SCCWRP, serving as liaison to the Delta RMP and other RMPs)	20 external meetings for SOTER planning, SWAMP, Delta RMP, SCCWRP coordination, etc.	\$30,000
F. Safety Training	Field and lab safety training associated with RMP monitoring activities	Field and Lab Training (June)	\$5,000
G. Administration	Office management assistance (e.g., ordering supplies, arranging travel) and supplies	NA	\$7,000 (labor) \$19,700 (total)

2. Governance

Governance tasks include convening, coordinating, and facilitating Steering Committee, Technical Review Committee, and Workgroup meetings. Tasks include preparing agendas, agenda packages, participating in meetings, writing meeting summaries, action item follow-up, reviewing minutes from past meetings, coordination with committee chairs, and honoraria and travel for external advisors.

The total budget for governance is \$280k. SFEI labor will be \$225k. The labor tasks and deliverables are summarized below. In addition to the line items shown on the table, \$50k has been budgeted for honoraria and travel for external science advisors.

Subtask	Description	Deliverables	Budget
A. SC meetings	Preparing agendas, agenda packages, participating in meetings, writing meeting summaries, action item follow-up, reviewing minutes from past meetings. Pre-meeting with Chair and Co-Chair.	4 SC meetings	\$65,000 (labor) \$66,500 (total)
B. TRC meetings	Preparing agendas, agenda packages, participating in meetings, writing meeting summaries, action item follow-up, reviewing minutes from past meetings.	4 TRC meetings	\$80,000 (labor) \$81,500 (total)
C. WG meetings	Preparing agendas, agenda packages, participating in meetings, writing meeting summaries, action item follow-up, reviewing past meeting minutes.	4 Workgroup meetings - ECWG (April), SPLWG (May), EEWG (TBD), Sport Fish WG (fall)	\$80,000 (labor) \$81,500 (total)

3. Data Management

Data management tasks include processing of new data, maintaining the RMP database, providing online data access, and providing quality assurance review. Results from the large number of samples collected in 2014 will be processed and quality assured in 2015.

In addition to processing new data, the program needs to maintain the approximately 1.1 million records generated since the Program began in 1993. Database maintenance includes incorporating updates and corrections to data as needed, including re-analyzed results and updates implemented by CEDEN/SWAMP. RMP staff also maintain and enhance web-based data access and visualization tools such as CD3.

Quality assurance is a critical foundation for the scientific investigations of the RMP. The major quality assurance tasks for 2014 are keeping the Quality Assurance Project Plan up to date, preparing QA summaries for datasets, and conducting interlaboratory comparison tests.

The total cost for these tasks in 2015 will be \$355k. SFEI labor will be \$345k. The labor tasks and deliverables are summarized below.

Subtask	Description	Deliverables	Budget
A. Data Processing, Quality Assurance, and Upload to CEDEN	Formatting, performing QA/QC review, and uploading RMP field and analytical results from laboratories to SFEI's RDC database and replicating these results to CEDEN. Maintaining the database of archived RMP samples and coordinating with archive facilities. Coordinating team, collection agencies, and laboratories. Tracking data deliverables and pending issues.	Processing, QA summary preparation, and upload of 2014 sediment data, 2014 bivalve data, and 2014 sport fish data (September). Preparations for 2015 water data and 2015 bird egg data (December).	\$160,000
B. Database Maintenance and Online Data Access	Incorporating updates and corrections to data as needed, including re-analyzed results and updates implemented by CEDEN/SWAMP. Adding enhancements and updates to web-based data access tools such as CD3.	Present CD3 Phase 2 enhancements and updates to TRC/SC (December). Present archive database redesign and online web tool to TRC/SC (December). Upload historic datasets to RDC database (e.g., 2012 RMP EEPS bird and EEPS small fish data) (September). Present summary of data updates and database maintenance to TRC/SC (December).	\$140,000
C. Quality Assurance System	Updating the Quality Assurance Project Plan, writing QA summaries for datasets, conducting interlaboratory comparison tests, and researching analytical methods. Maintaining laboratory SOP file system.	Revisions to QAPP (December). Report on laboratory methods comparison study for Selenium in water (December). Present summary of maintenance activities for the lab SOP directory to TRC/SC (December).	\$15,000 (labor) \$25,000 (total)
D. Updates to SOPs and Templates	Developing and enhancing software tools and processes such as EDD templates, and developing and maintaining internal SOPs to increase efficiency of data management tasks.	Replace existing RMP data templates and online data checker with the new CEDEN templates and data checker (June). Replace existing RMP QA review queries with ones that use new CEDEN templates (June).	\$30,000

4. Annual Reporting

A *Pulse of the Bay* will be produced in 2015, to be released at the Annual Meeting which will once again be held jointly with the State of the Estuary Conference in September. This edition of the *Pulse* will be a companion to the *State of the Estuary Report*, which will also be released in September. The 2015 *Pulse* will provide profiles of the contaminants of concern in the Bay.

Tasks related to production of the *Pulse* include preparation of technical content (text, analyses, graphics), graphic design, and web presence. Subcontractors assist with editing and preparing content.

Tasks related to the Annual Meeting include developing the meeting agenda, managing logistics, advertising about the meeting, managing attendee registration, preparing presentations, and staffing the meeting.

In 2015 the report formerly titled “Annual Monitoring Results” will be scaled back and renamed the “Annual Monitoring Report.” The report will now only provide summary information on data collection.

The total cost for these tasks in 2015 will be \$254k. SFEI labor will be \$175k. The labor tasks and deliverables are summarized below.

Subtask	Description	Deliverables	Budget
A. Pulse or Pulse Lite Report	SFEI staff time for technical content (text, analyses, graphics), design, and web presence. Direct costs for printing and mailing report. Subcontractors for editorial content.	2015 Pulse Report (September)	\$110,000 (labor) \$165,000 (total)
B. Annual Meeting	Developing the meeting agenda, managing logistics, advertising about the meeting, managing attendee registration, preparing presentations, staffing the meeting. Direct costs for Save the Date mailings, venue, and catering. Travel funds for outside speakers.	2015 Annual Meeting as part of the State of the Estuaries Conference (September)	\$50,000 (labor) \$73,900 (total)
C. Annual Monitoring Report	Preparing summary information for a streamlined report to document the activities taken during the field season. The report will be part of the QA System, along with the QAPP, cruise reports, QA memos for datasets.	2015 Annual Monitoring Report (December)	\$10,000

D. Updates to Copper SSO and Dredged Material Thresholds	Updating the rolling average of dissolved copper concentrations in water in each segment of the Bay and making comparison to SSO. Updating ambient sediment concentrations for the Dredged Material Management Office for determining when bioaccumulation testing will be required for dredged material. Due to the alternating schedule of water and sediment sampling, these calculations will be done in alternate years.	Updated webpage for Copper SSO (December)	\$5,000
--	---	---	---------

5. Communications

Communications tasks will implement the plans included in the RMP Communications Strategy, approved by the Steering Committee in July 2014. Tasks will include the distribution of RMP information to stakeholders, natural resource managers, and the public through multiple media channels (e.g., website, publications, email newsletters, fact sheets, social media, etc.).

Stakeholder engagement is critically important to addressing the information needs of RMP participants. Tasks include preparing for and attending RMP stakeholder meetings (e.g., BACWA, BASMAA, BPC, LTMS, WSPA) as well as communicating directly with stakeholder representatives.

Other communications tasks include responding to inquiries for RMP data and reports, including press calls, producing summary information on important topics in convenient formats, and planning and reviewing content for *Estuary News*. Participation in workshops and conferences for SWAMP, SETAC, ACS, and other professional organizations allows sharing of RMP information, gathering of information from other investigators on the latest advances in monitoring and understanding, and identification of opportunities for collaboration with other organizations. Presentations at local meetings and to local audiences are also important for collaboration and information dissemination to scientific partners. Keeping the website up to date is another important component of communication.

The total cost for these tasks in 2015 will be \$166k. SFEI labor will be \$145k. The labor tasks and deliverables are summarized below.

Subtask	Description	Deliverables	Budget
A. Communications Plan Implementation	Coordinate the distribution of RMP information to RMP stakeholders, natural resource managers, and the public through multiple media channels (e.g., website, publications, email newsletters, fact sheets, social media, etc.). Develop a calendar of RMP communications products, identify appropriate media channels, and implement calendarized events.	List of events and communications products for RMP in 2015 (February)	\$22,000
B. Stakeholder Engagement	Preparing for and attending RMP stakeholder meetings (e.g., BACWA, BASMAA, LTMS, WSPA) as well as communicating directly with stakeholder representatives.	RMP presentations at BACWA, BASMAA, LTMS, BPC, and WSPA Board Meetings.	\$42,000
C. Responses to Information Requests	Responding to inquiries for RMP data and reports, including press calls.	TBD	\$10,000
D. Fact Sheets and Outreach Products	Producing summary information on important topics in a convenient format (includes miscellaneous design products). Production costs for hard-copy fact sheets and other outreach materials.	Microplastics fact sheet and manuscript for journal publication (Draft in September, Final by March '16). Review by ECWG.	\$10,000 (labor) \$10,500 (total)
E. Support for "Estuary News"	Coordinating and reviewing content for the newsletter. Cash support to SFEP for Estuary News. Subcontracts for editorial content and graphic design.	4 issues of Estuary News with RMP content (quarterly)	\$6,500 (labor) \$18,500 (total)
F. Presentations at Conferences and Meetings	Participation in workshops and conferences for SWAMP, NorCal SETAC, ACS, and other professional organizations; as well as presentations at local meetings. Direct costs for travel and conference registration.	Presentation of RMP data at 3 conferences (December). 10 presentations at local meetings (quarterly).	\$40,000 (labor) \$48,000 (total)
G. RMP Website Maintenance	Updating the RMP website with new reports. Funds for online data access tools (e.g., CD3) are in the Data Management budget. Funds for website redesign are a separate line item.	Review of RMP website to determine out-of-date material (February). Updates to website (quarterly).	\$15,000

6. Status and Trends Monitoring

A continuing goal is to make optimal use of the funds that participants provide to the Program. High priority topics continue to emerge (e.g., nutrients and selenium), and information needs continue to grow. Status and trends monitoring of open Bay waters is a cornerstone of the Program but, due to competing demands for funds, must be done efficiently.

In 2014, the Steering Committee and Technical Review Committee continued a process of seeking efficiencies in status and trends monitoring. The committees reduced the frequency of sediment sampling from a two-year cycle to a four-year cycle. Water will continue to be sampled on a two-year cycle, but many of the more expensive parameters will be measured a greatly reduced frequency. As one example, PCBs in water will now be analyzed once every 10 years - commensurate with the value of additional water PCB data in promoting understanding and supporting decision-making. Other matrices that are more crucial for PCBs, such as sport fish, bird eggs, and sediment, will continue to be monitored at a higher frequency. This belt-tightening has freed up resources that can be applied to higher priority information needs, such as sampling of sediment on the shallow margins of the Bay, which have historically not been included in status and trends monitoring.

The revised schedule for status and trends monitoring is as follows:

- continuous monitoring of suspended sediment,
- monthly monitoring of basic water quality parameters (salinity, temperature and dissolved oxygen; suspended sediments; and phytoplankton biomass),
- biennial water and bivalve monitoring,
- triennial bird egg monitoring, and
- sediment monitoring on a four-year cycle, and
- sport fish monitoring on a five-year cycle.

In 2015, the schedule calls for sampling of water and bird eggs. Water analytes will include copper, cyanide, selenium, methylmercury, ancillary parameters, and aquatic toxicity. Eggs of double-crested cormorants and Forster's Terns will be collected. Cormorant eggs will be analyzed for PCBs, PBDEs, Hg, PFCs, and Se. Tern eggs will be analyzed for Hg, PBDEs, and Se.

Discussions are in progress regarding using the funds freed up by the reductions in water and open-Bay sediment monitoring to sample sediment on the Bay margins. Due to the type of sampling vessel used in open Bay monitoring, sediment sampling to date has not included areas on the margin of the Bay where the water is less than 1 ft deep at mean lower low water. In parts of the Bay, especially Lower South Bay, this encompasses an extensive area of important habitat.

Brief summaries of each of the Status and Trends elements for 2015 are provided below.

Continuous Monitoring of Suspended Sediment (\$250k)

Tides and wind waves are constantly moving water and altering the water quality of San

Francisco Bay. The USGS California Water Science Center provides the RMP water quality measurements at the tidal time scale through continuous monitoring of suspended-sediment concentration and dissolved oxygen at multiple locations in the Bay. At each station, turbidity and dissolved oxygen sensors are deployed in the water column and automatically collect measurements every 15 minutes. Approximately every 3 weeks technicians visit the stations to clean the sensors, check their calibrations, and download data. Data are processed and edited to remove values that are corrupted by biofouling. Data are available at <http://waterdata.usgs.gov/ca/nwis/sw/>. Data are analyzed and the resulting reports are available at <http://ca.water.usgs.gov/projects/baydelta/publications.html>.

This monitoring has been conducted since the Program began in 1993, and revealed that suspended sediment concentrations in the Bay declined sharply beginning in 1999. This work is led by Dr. David Schoellhamer of the USGS in Sacramento.

USGS maintains five suspended sediment stations in the Estuary (i.e., Mallard Island, Benicia, Richmond Bridge, Alcatraz, and Dumbarton Bridge) and funding for a temporary site. The USGS used the temporary site funding for 2013 for better understanding the sediment flux at the Golden Gate. In 2014, the temporary site funding was used to install a suspended sediment station at the Exploratorium (Pier 15). Discussions are underway to determine how to maintain the existing monitoring scheme in light of increasing costs and the available budget, which has been fixed at \$250k since 1993.

Hydrography and Phytoplankton (\$173k)

This work is led by Dr. Jim Cloern of the USGS in Menlo Park. The study performs monthly water sampling to map the spatial distributions and temporal trends of basic water quality parameters along the entire Bay-Delta system. Measurements include salinity, temperature, dissolved oxygen, suspended sediments, and phytoplankton biomass. This basic information is required to follow the seasonal changes in water quality and estuarine habitat as they influence biological communities and the distribution and reactivity of trace contaminants. This monitoring has played a crucial role in documenting changes in the Bay that have raised concern for the possible impacts of nutrients and provided an impetus for the Nutrient Science Strategy.

USGS also provides funding for this monitoring. This funding decreased in 2014, and the contribution from the RMP increased from the \$110k that had been in place for many years to \$173k.

Water Chemistry (\$45k)

Monitoring for trace elements and water quality parameters will occur at 22 sites in 2015. Water analytes will include copper, cyanide, selenium, methylmercury, ancillary parameters, and aquatic toxicity. As in prior years, SFEI staff will assist in the collection of water samples. Subcontractors conducting the water chemistry analyses will likely include EBMUD for ancillary, ALS Laboratory Group for nutrients, Brooks Rand for inorganics, CCCSD for cyanide,

and City of San Jose for splits of copper and nickel, pending review of previous data and pricing. We may also work with a specialty lab to be determined for lower selenium detection limits. Applied Marine Sciences has will continue to serve as our logistics coordinator.

Bird Eggs (\$150k)

Avian egg monitoring is a tool that was piloted in the Exposure and Effects Pilot Study and retained as an element of RMP Status and Trends monitoring (Davis et al., 2006). Avian egg monitoring in other aquatic ecosystems has proven to be a highly effective tool for assessment of long-term trends in persistent, bioaccumulative contaminants. Egg monitoring is now conducted in the RMP once every three years. The RMP will contract with USGS to collect the eggs. The contract laboratories are expected to the same as in past years (AXYS, USGS, MLML, and California DFW).

Double-crested Cormorants (*Phalacrocorax auritus*) are now routinely monitored by the RMP as a sentinel species for the open waters of the Bay. Cormorant eggs are sampled Bay-wide every three years and analyzed for mercury, selenium, PBDEs, PCBs, legacy pesticides, and, starting in 2009, perfluorinated compounds (PFCs). Sampling locations include Wheeler Island in Suisun Bay, the Richmond Bridge, and Don Edwards Wildlife Refuge in the Lower South Bay.

Forster's Tern eggs were selected as another avian indicator because this species feeds primarily on small fish in shallow water habitats on the Bay margins, including managed ponds. The spatial and habitat coverage of this species (Bay margins and managed ponds) therefore complements that of Double-crested Cormorants (open waters and large sloughs). Studies by the U.S. Geological Survey (USGS) have resulted in the establishment of Forster's Tern eggs as a primary biosentinel tool for monitoring of mercury risk to Bay wildlife. Tern eggs are also sampled every three years and analyzed for mercury, PBDEs, and selenium. Forster's Tern nesting locations vary from year to year. Past sampling locations have included Knight Island and Napa Marsh near the Napa River (San Pablo Bay segment); salt ponds near Hayward (South Bay segment); and salt ponds in Lower South Bay.

Field Work and Logistics (\$175k)

This task includes work by SFEI to assist with sampling and coordination (\$45k); a subcontractor (Applied Marine Sciences) to plan cruise logistics, collect samples, ship samples to laboratories, and manage the sample archive (\$95k); funds for renting the research vessel (the USGS R/V Turning Tide) (\$25k); and funds for other miscellaneous items.

Margin Sediment Sampling: Planning (\$20k) and Sampling (\$120k)

As mentioned above, discussions are in progress regarding using the funds freed up by the reductions in water and open-Bay sediment monitoring to sample sediment on the Bay margins. In parts of the Bay, especially Lower South Bay, this encompasses an extensive area of important habitat. The 2014 workplan included \$20k for development of a draft probabilistic

sampling design. An additional \$20k is needed to support continued discussion and sampling design development. The reductions in the water and open-Bay sediment elements of RMP status and trends monitoring have made \$120k available for margin sediment sampling. Once a monitoring design is approved by the TRC and SC, then these funds will be used to pay for field sample collection and laboratory costs.

Analysis of S&T Impacts, Changes, and Data (\$15k)

The RMP has been invited to submit a paper for a special issue of the new journal *Regional Studies in Marine Science*. The special issue will focus on successful regional monitoring programs around the US. These funds will support an article documenting the evolution of and lessons learned from RMP monitoring, including data analysis. The funds will also support production of a document that clearly documents changes to the S&T design over time.

The total costs for these tasks in 2015 will be \$966k. SFEI labor will be \$145k. The labor tasks and deliverables are summarized below. Note: tasks without a SFEI labor component (i.e., 100% subcontractor) are not shown on this table.

Subtask	Description	Deliverables	Budget
A. Field Work and Logistics	Coordinating field sampling, preparing cruise plans, making maps of sampling locations, field sampling, and ensuring delivery of samples to laboratories. Subcontractors to assist with field data collection and research vessels. Direct costs for sampling equipment, supplies, and insurance.	Collection of water samples (August). Collection of bird egg samples (May).	\$45,000 (labor) \$175,000 (total)
H. Planning for Bay Margins Sediment Study	Preparing a final sampling design, which will involve working with statistics, analyzing available data, issuing RFPs for subcontractors, and holding meetings with stakeholders.	Monitoring Design for Bay Margins Sediment Sampling (March)	\$20,000
J. Analysis of S&T Impacts, Changes, and Data	Compiling information on how the S&T program has affected management decisions. Documenting changes to the S&T design. Analyzing RMP data to plan future monitoring or address management questions. Preparation of a manuscript for a special edition of the Journal of Regional Studies in Marine Science.	Manuscript summarizing S&T fipronil data (Draft in April, Final by December). Review by ECWG. Manuscript on RMP design and influence (Draft in February, Final by December). Review by TRC and SC. White paper on RMP website that summarizes S&T design changes (March).	\$15,000

7. Special Studies

The following studies were reviewed by the TRC and SC and approved for incorporation into the 2014 Program Plan. The total costs for special studies in 2015 will be \$1,172k. SFEI labor will be \$993k. The labor tasks and deliverables are summarized below.

Nutrients (\$470k)

Overview

San Francisco Bay has long been recognized as a nutrient-enriched estuary, but one that has historically proven resilient to the harmful effects of nutrient enrichment, such as excessive phytoplankton blooms and hypoxia. Available information suggests that the accumulation of phytoplankton biomass in the Bay is strongly limited by tidal mixing, grazing pressure by invasive clams, light limitation from high turbidity, and potentially, altered nutrient forms and ratios in the North Bay. However, evidence is building that, since the late 1990s, the historic resilience of the Bay to the harmful effects of nutrient enrichment is weakening. In response to these apparent changes in the Bay's resilience to nutrient loading, a Nutrient Science Strategy has been developed.

Bay-wide Nutrient Permit funds (\$880k/yr for FY2015) are being directed toward nutrient science studies in the Bay. The intent is for these funds to be combined with funds from the RMP (\$470k in CY2015) and other entities, with the Nutrient Management Strategy (NMS) Steering Committee making decisions about how to allocate funds, based on recommendations in a Science Plan (under development). Plans for the use of the RMP portion of the funds are presented here, based on the projects approved by the NMS Steering Committee for FY2015. Since nutrient Permit funding follows a fiscal year and the RMP follows the calendar year, and all of the FY2015 funding decisions have not yet been made, the exact project(s) to which the remaining portion of the RMP CY2015 funds will be allocated remains to be determined.

Moored Sensor Monitoring (\$190k)

While monitoring has occurred regularly in the Bay over the past 40 years, most of the data have been collected at weekly or monthly time intervals. Phytoplankton, nutrients, dissolved oxygen, and other parameters such as suspended sediment (which dictates the light available for phytoplankton growth) vary strongly over much shorter time scales (e.g., on an hourly basis) due to the daily cycle of photosynthesis and respiration in phytoplankton, mixing, biogeochemical processes, and tides. To better assess the Bay's condition on these time scales, and to collect high-frequency data to calibrate water quality models, the RMP is funding a moored sensor monitoring network. Beginning in summer 2013, sensors for chlorophyll, dissolved oxygen, turbidity, temperature, and other parameters were deployed at two stations in Lower South Bay (Alviso Slough, Dumbarton Bridge). A third site (San Mateo Bridge) was added in 2014. In 2015, funds will be directed toward on-going maintenance and data interpretation at the 3

existing sites and the addition of one more permanent site in Lower South Bay, likely in Coyote Creek. Work in 2015 will also include deployment of a SUNA-NO₃ sensor at Dumbarton Bridge (purchased in 2013), potentially adding another SUNA-NO₃ sensor at the Coyote Creek site, and field experiments, calibration, and data interpretation related to the SUNA-NO₃ sensor. Telemetry will be added to new and existing sites. Experiments will also be conducted to improve our ability to accurately infer chlorophyll-a concentration from fluorescence measurements. In a related project (funded by Nutrient Permit funds) we will also be performing a number of shorter-term deployments at a network of margin sites, with a specific focus on characterizing dissolved oxygen in the system; results from those deployments will be highly complementary with the open Bay station data, and the overall focus in Lower South Bay will lead to efficiencies in terms of field work costs .

Year 2 of moored sensor data collection will conclude in June 2015. Carryover funds from the 2014 RMP budget and the 2015 RMP funds will be used to complete the year 2 progress report, which will summarize lessons learned in the second year of instrument deployment (June 2014-May 2015) and make recommendations for year 3 of the program. The 2014 and 2015 RMP funds need to be combined for this deliverable because the moored sensor program runs on a fiscal year schedule, which spans the two calendar years of RMP funding.

Modeling (\$165k)

RMP funds are also supporting development of models that will allow forecasting the response of the Bay to changes in nutrient loads and other factors that drive potential impairment related to nutrients. Among its recommendations, the Nutrient Strategy calls for developing models to quantitatively characterize the Bay's response to nutrient loads; explore ecosystem response under future environmental conditions; and test the effectiveness of load reduction scenarios and other scenarios that mitigate or prevent impairment. A draft modeling workplan for 2015-2021 is currently in review.

The draft workplan calls for a phased approach, quality assurance protocols, and an open-source modeling platform to promote efficiency, produce quality results, and maximize the value of the modeling investment. In Phase 1 of model development, models will be simplified-domain (several boxes, with "real" hydrodynamics through grid aggregation of an existing hydrodynamic model), and focused on South Bay/Lower South Bay and Suisun Bay. The simplified domain models will allow effort to be directed toward parameter sensitivity analysis, subembayment scale calibration, exploration of underlying causes of observed changes in ecosystem response, and identification of key data needs to prioritize among other research and monitoring activities in subsequent years. Phase 1 will begin in 2015 and conclude in 2017.

For Phase 2, beginning in 2017, work will gradually move toward higher degrees of spatial resolution, building toward a whole bay model and will provide preliminary answers to key management questions about the role of nutrients in the Bay. Phase 3 modeling, planned to begin in 2021, will involve more complicated and/or multi-year scenarios to answer management questions with a higher degree of certainty.

The total cost for modeling work during 2015 is \$490k (see attached proposal), but because of carryover funds from previous RMP years, only \$165k was requested from RMP in 2015.

To Be Determined (\$115k)

In July 2014, the Nutrient Steering Committee approved moving forward with a subset of FY2015 projects totaling to \$945,000, tabling decisions on allocating the remaining \$390,000 until a later date. RMP representatives have requested that RMP funds be distributed across as few projects as possible to facilitate the tracking of those funds and deliverables. For that reason, although all of the RMP’s funds could have been distributed across the approved projects, \$115,000 of the RMP funds have been reserved as “to be determined” (as well as \$285k in BACWA funding). It is expected that in Q1 2015, the Nutrient Steering Committee will revisit the original set of proposals and allocate the remaining funding. Potential projects include: additional monitoring efforts (new locations/parameters); monitoring program development (using monitoring data and modeling output); and, mechanistic special studies to further define the role of nutrients in determining phytoplankton abundance/composition.

Subtask	Description	Deliverables	Budget
Nutrient Moored Sensor Program Development	Special study approved by SC on 7/15/14. See description above.	Nutrient Moored Sensor Program Year 2 Final Report (Draft in August , Final in September). Review by the NTW*.	\$190,000
Nutrient Modeling Program Development	Special study approved by SC on 7/15/14. See description above.	Data Quality Objectives Project Plan for Phase I modeling (Draft in March, Final in June). Review by the MAT*. Progress report on Phase I modeling (June '16).	\$140,000 (labor) \$165,000 (total)
Nutrient Research TBD	Exact project not yet determined. Allocation decision expected in Q1 or Q2 of 2015.	Nutrient Research Report, (Draft in TBD, Final in TBD. Date depends on project funded). Review by NTW.	\$115,000

*MAT = Modeling Advisory Team, NTW = Nutrient Technical Workgroup.

Small Tributary Loadings

The San Francisco Bay Hg and PCB TMDLs call for a reduction in loads by 50 and 90% respectively. In response, the Municipal Regional Permit for Stormwater (MRP) calls for a range of actions including gaining a better understanding of which Bay tributaries contribute most loading to sensitive areas of biological interest on the Bay margin, better quantification of loads of sediments and trace contaminants on a watershed basis and regionally, a better understanding of how and where trends might best be measured, and an improved understanding of which management measures may be most effective in reducing impairment. These same needs are

reflected in the small tributary loading strategy (STLS) priority questions. Much has been learned over the past 15 years and during the first MRP term from 2009 to 2014 but the focus of RMP funding was largely devoted to better understanding loadings. However, during the next permit term (MRP 2.0), the Water Board and BASMAA are asking for an increased focus on identifying watersheds and areas within watersheds that are producing disproportional loads in relation to impairment in Bay margin areas while maintaining some effort on the loadings question, and developing and implementing a plan to determine trends (demonstrating that management efforts are effective at reducing impairment). Consistent with this new focus, the following tasks and deliverables will be completed:

Wet Weather Characterization (\$374k)

Most of the budget for small tributary load monitoring in 2015 will support a characterization study in the winter of 2014-15 to identify additional watersheds with high-concentration sources areas for potential actions to reduce loads of PCBs and mercury. The basic design of this effort will be to collect one composite in the downstream reaches of up to 20 selected tributaries. Concentrations of PCBs, mercury, and other metals will be analyzed in water samples at all locations. In addition, a pilot study will be conducted at a subset of 12 locations to collect fine sediments using special settling chambers. If this approach works, it will provide a highly cost-effective means of characterizing watersheds and subwatersheds for particulate bound pollutant concentrations during future monitoring years.

Regional Watershed Spreadsheet Model (\$35k)

To accurately assess total contaminant loads entering San Francisco Bay, it is necessary to estimate loads from local watersheds. "Spreadsheet models" of stormwater quality provide a useful and relatively cheap tool for estimating regional scale watershed loads. Spreadsheet models have advantages over mechanistic models because the data for many of the input parameters required by those models do not currently exist, and also require large calibration datasets which take money and time to collect. Development of a spreadsheet model for the Bay has been underway since 2010 and to-date models and software development has been completed for water and copper, and draft models have been completed for suspended sediments, PCBs, and Hg. During 2014, work was planned to improve these models based on improved GIS layers being developed by BASMAA, an improved iterative calibration technique, and an improved method of modeling that includes generation of ranges in loads estimates as a component of the modeling process. The 2014 work remains on hold pending GIS layer delivery. Tasks for 2015 depend upon the outcomes of the work for 2014. Possible uses of the 2015 funds include improving the basis of the model by shifting the model to a water-based starting point or completing further structural improvements to the sediment-based model, or incorporation of additional calibration watersheds and BASMAA studies. Decisions will be made in consultation with the STLS and after discussions at the SPLWG meeting slated for May, 2015.

Trends Strategy (\$35k)

The Sources, Pathways, and Loadings Workgroup recommended an effort to define where and how trends may be most effectively measured in relation to management effort so that data collection methods deployed over the next several years support this future need. A trends strategy white paper will be developed in 2015 addressing where trends should be measured, appropriate media and metrics, numerical methods for assessing trends, and sampling design. The workplan for the trends strategy will be developed in consultation with the STLS during the first quarter 2015 and presented to the SPLWG for review in May.

Small Tributary Loading Strategy Coordination (\$26k)

The RMP Small Tributaries Loading Strategy Team provides the forum for planning and coordinating projects for the improvement of information on small tributary loads to the Bay. This task will include quarterly STLS meetings to coordinate monitoring, and provide updates and solicit input on spreadsheet model and trends strategy development. Monthly phone conferences calls will be convened to provide brief updates and information sharing.

Subtask	Description	Deliverables	Budget
STLS Wet Weather Characterization	Special study approved by SC on 7/15/14. See description above.	Collection of stormwater samples (October '14-April '15) at up to 20 sites. Report on Pollutants of Concern monitoring in WY 2015 (Draft in March '16, Final in June '16). Review by SPLWG and STLS*.	\$267,000 (labor) \$374,000 (total)
STLS Regional Watershed Model	Special study approved by SC on 7/15/14. See description above.	New version of the RWSM for PCB and Hg prepared for May 2015 SPLWG meeting. Proposed work plan for CY 2015 budget also prepared for SPLWG meeting. Report on model sensitivity analysis and documentation (Draft in December, Final in March '16). Review by SPLWG and STLS.	\$35,000
STLS Trends Strategy	Special study approved by SC on 7/15/14. See description above.	Work plan prepared and discussed at May SPLWG meeting. Stormwater Trends Strategy White Paper (Draft in August, Final in October). Review by SPLWG and STLS.	\$35,000
STLS Strategy Coordination	Special study approved by SC on 7/15/14. See description above.	5-8 STLS meetings (March-December)	\$26,000

*SPLWG = Sources, Pathways and Loadings Workgroup. STLS = Small Tributary Loading Strategy Team.

Chemicals of Emerging Concern (CECs)

More than 100,000 chemicals have been registered or approved for commercial use in the U.S. For many of these chemicals, major information gaps limit the ability of scientists to assess their potential risks, and environmental monitoring of these chemicals is not required. Some of these chemicals have been classified as contaminants of emerging concern (CECs), often due to their high volume use, potential for toxicity in non-target species, and the increasing number of studies that report their occurrence in the environment. CECs can be broadly defined as synthetic or naturally occurring chemicals that are not regulated or commonly monitored in the environment but have the potential to enter the environment and cause adverse ecological or human health impacts.

The RMP has been investigating CECs since 2001 and developed a formal workgroup to address the issue in 2006. In 2013, the RMP finalized a three-element strategy to guide future work on CECs. The first element of the strategy is a continuation of targeted monitoring of CECs in San Francisco Bay via Special Studies, an RMP effort that has generated one of the world's most comprehensive datasets for CECs in an estuarine ecosystem. The relative risk of detected CECs is evaluated using a tiered risk and management action framework.

The second element of the RMP CEC strategy involves review of the scientific literature and other CEC aquatic monitoring programs as a means of identifying new CECs for which no Bay occurrence data yet exist. The third element of the strategy consists of non-targeted monitoring, including a) broadscan analyses of Bay biota samples, and b) development of bioassays to identify estrogenic effects, are designed to identify previously unknown CECs present in the Bay. The RMP's CEC program provides data critical to efforts of regulators working to manage the ever-growing variety of chemicals in commerce to ensure that they do not adversely impact human and environmental health.

CECs in Municipal Wastewater (\$55k)

The State Water Resources Control Board's Chemicals of Emerging Concern (CECs) Science Advisory Panel has recommended that programs include sampling wastewater treatment plant (WWTP) effluent and stormwater when screening for emerging contaminants. The follow-up state pilot study guidance, now under development, similarly emphasizes examination of these contamination pathways as an important means of providing managers with the data they need to make sound decisions regarding CECs. A study in 2015 will expand our knowledge of the role of WWTP effluent in contaminating the Bay environment by monitoring high priority and newly-identified CECs in this matrix. This study will expand on previously-approved plans to sample WWTP effluent monitoring for alternative flame retardants and estrogenic contaminants. The 2015 funds will be used to screen for perfluorinated compounds (including PFOS) and fipronil in effluent from eight WWTPs. Both PFOS and fipronil are Tier 3 (moderate concern) CECs according to the RMP prioritization scheme.

Microplastics in the Bay and Municipal Wastewater (\$9k)

Microplastic is a term used to describe fragments of plastic that are less than 5 mm. Microplastics can be pellets that are used as precursors for industrial products, microbeads used in consumer products (e.g. exfoliants), or fragments/fibers of plastics that are the breakdown products of larger plastic materials. Microplastics can enter the aquatic environment through wind, stormwater runoff, or illegal dumping of plastic materials. Additionally, both microbeads from cosmetic products and plastic fibers (e.g., polyester and acrylic) from clothing can be washed down the drain and enter wastewater treatment plants. Microplastics may not be captured by wastewater treatment plants because they are buoyant and do not flocculate; therefore, they can be released in wastewater.

Microplastics are found in surface waters, the water column, and sediment. They can also be found in the gut and circulatory system of aquatic organisms that ingest the particles. Ingestion of microplastics can block the digestive tract, reduce growth rates, block enzyme production, lower steroid hormone levels, affect reproduction, and cause the adsorption of contaminants.

Samples of ambient Bay water and sediment from 10 sites will be analyzed for microplastics in two size classes: >0.355-mm (the size fraction that is characteristic of personal care product microbeads) and 0.125-0.355-mm (the size fraction that is characteristic of clothing fibers). Effluent from eight WWTPs will also be analyzed.

CEC Strategy Support (\$20k)

Information on CECs is rapidly evolving. The RMP CEC Strategy (<http://www.sfei.org/sites/default/files/SFEI%20CEC%20strategy%20FINAL.pdf>) calls for routine review of work done by others to identify new chemicals, new methods, and new collaborators. RMP staff actively read the latest literature, attend scientific conferences, and confer with leading CEC scientists to obtain feedback on existing RMP studies, to identify new CECs, and to forge new partnerships. This information feeds into annual study plans and refinement of the CEC Strategy, including annual updates of the levels of concern associated with different emerging contaminants using the tiered Risk and Management Action Framework for San Francisco Bay.

Subtask	Description	Deliverables	Budget
EC Microplastics Monitoring	Special study approved by SC on 7/15/14. See description above.	Presentation of microplastics data to ECWG (April)	\$6,200 (labor) \$9,000 (total)

EC Wastewater Monitoring	Special study approved by SC on 7/15/14. See description above.	Report on EC monitoring in wastewater in a format that can be submitted to a journal (Draft in December, Final in March '16). Review by ECWG.	\$25,378 (labor) \$55,000 (total)
EC Strategy Support	Special study approved by SC on 7/15/14. See description above.	Brief Water Board on findings; update the CEC Strategy document with the latest tiered placement of chemicals, information needs and proposed studies, and a 5-year plan for research (Summer).	\$20,000

*ECWG = Emerging Contaminants Workgroup

PCBs

A synthesis and conceptual model update published in 2014 shifted focus from the open Bay to the contaminated areas on the margins where impairment is greatest, where load reductions are being pursued, and where reductions in impairment, in response to load reductions, will be most apparent. The Synthesis was the foundation for a 2014 update of the PCB Strategy that calls for a multi-year effort to identify margin areas that are high priorities for management and monitoring, develop site-specific conceptual models and sediment mass balances for margin areas downstream of watersheds where management actions will occur, and perform monitoring in these areas as a performance measure.

Tasks in 2015 will include 1) selection of priority margin areas for evaluation and 2) development of conceptual models and mass balances for one or two of these areas.

Task 1 will be performed by the PCB Strategy Team with staff support from SFEI. An initial survey and prioritization of all the margin units will be conducted. Properties of the margin units to be evaluated will be determined through Team discussion. Data gathering and analysis will be needed to support the prioritization effort, including evaluation of data on contamination in the watersheds and in the Bay, mapping information to link watersheds with margin units, and mapping to delineate boundaries of margin units. All margin units will be considered in this prioritization phase, not just those for which data are already available.

For task 2, the one or two highest priority margin units (PMUs) will be evaluated in detail in 2015. The following approach will be applied to each PMU. A relatively large Conceptual Site Model Workgroup (CSMW) will be assembled that includes members of the PCB Strategy Team, along with experts on potential biotic indicators, sediment movement from watersheds to margins to the open Bay, and local conditions. This CSMW will meet two to three times to develop and document conceptual understanding and a monitoring plan for the PMU.

Subtask	Description	Deliverables	Budget
PCB: PMU Conceptual Model	Special study approved by SC on 7/15/14. See description above.	3 PCB Strategy Team meetings (September). Brief report on margin unit prioritization: draft in March, final in April. Review by PCB Strategy Team. Priority Margin Unit Conceptual Model Report: Draft in December, Final in February 2016. Review by PCB Strategy Team.	\$85,000

Selenium

In April 2014 the RMP formed a Selenium Strategy Team to evaluate low-cost, near-term information needs that can be addressed by the Program in the next several years.

Sturgeon Tissue Plug Monitoring (\$23k)

The Team recommended exploring an opportunity to obtain a larger number of sturgeon muscle samples, non-lethally and inexpensively, through collection of small plugs of sturgeon muscle in a collaboration with a California Department of Fish and Wildlife annual tagging program. A pilot effort using this technique was conducted in 2014, and the approach will be applied again in 2015. This task will be performed in collaboration with CDFW and USGS. SFEI staff would plan the study, train CDFW staff and perform sampling, manage the data, and write a brief technical report. USGS (Robin Stewart and her team) will perform analysis of selenium and stable isotopes of C, N, and S in the plugs. The stable isotopes provide information on diet and habitat use by the sturgeon. The sampling will occur during the course of the CDFW survey in August through October. Thirty white sturgeon plugs will be collected and analyzed. Another 30 will be collected and archived in case additional samples are needed.

Sturgeon Derby Study (\$20k)

Another small study of selenium in sturgeon will be performed in collaboration with an annual sturgeon fishing derby in the Delta. Tissues will be obtained from fish caught for the derby that will allow a comparison of muscle plugs, which are easy to obtain, with concentrations in eggs or ovaries, which is the exposure of interest toxicologically. This study will be performed in collaboration with USFWS and USGS. SFEI staff will plan the study, perform sampling, manage the data, and write a brief technical report. USGS (Robin Stewart and her team) will analyze of selenium and stable isotopes of C, N, and S in the plugs, and of selenium on the eggs or ovaries. The stable isotopes provide information on diet and habitat use by the sturgeon. The sampling would occur on Super Bowl weekend in 2015.

Fifteen white sturgeon muscle plugs will be collected and analyzed. Fifteen splits of their egg or ovary samples will also be obtained from USFWS for analysis by USGS.

Selenium Information Synthesis (\$10k)

The Selenium Strategy Team recommended the allocation of \$10k per year to support compilation of data and information, review of literature, and continuing Strategy development.

Selenium Strategy Team (\$10k)

The Selenium Strategy Team provides the forum for planning and coordinating projects for the improvement of information on selenium in the Bay. This task will include one or two meetings in 2015 to coordinate monitoring, provide updates and solicit input on current projects, and plan projects for 2016 and beyond.

Subtask	Description	Deliverables	Budget
Selenium Sturgeon Tissue Plug Monitoring	Special study approved by SC on 7/15/14. See description above.	Draft and final reports on Selenium in Fish Tissue in Sturgeon Plugs Collected in 2015 (February 2016, March 2016). Review by Selenium Strategy Team.	\$13,900 (labor) \$23,000 (total)
Selenium Delta Fish Derby Monitoring	Special study approved by SC on 7/15/14. See description above.	Draft and final Reports on Selenium in Fish Tissue from the 2015 Sturgeon Derby (December 2015, February 2016). Review by Selenium Strategy Team.	\$14,100 (labor) \$20,000 (total)
Selenium Information Synthesis	Special study approved by SC on 7/15/14. See description above.	Update to Selenium Strategy (December)	\$10,000
Selenium Strategy Team Meeting	Strategy Team meeting to provide oversight to the three selenium-related special studies planned for 2015.	Selenium Strategy Team meeting (March).	\$10,000



DATE: January 22, 2015

TO: RMP Steering Committee

FROM: Philip Trowbridge, RMP Manager

RE: RMP Fees for Once Through Cooling (OTC) Water Dischargers

Once Through Cooling (OTC) dischargers pay 4% of the total RMP fees. There is only one discharger in this category currently, the Pittsburg Power Plant (PPP). The representative from PPP has requested that the plant's contribution be reduced from 4% to 1% of the total RMP fees because the plant has reduced the use of OTC significantly and is required to abandon OTC discharges by 2017. For 2015, the PPP fee was \$137k. PPP is requesting a refund of \$103k.

Recommendation

The 2015 fees for PPP should not be changed. However, the Steering Committee should discuss reducing the fees for PPP for the remaining years that it will be in RMP (2016 and 2017). A decision will need to be made by July 2015 when invoices for the 2016 fees will be mailed.

Explanation

The OTC sector is not the only sector with reduced loadings to the Bay. The discharge of metals and other pollutants by wastewater agencies and in-Bay disposal of dredged material have also declined considerably. Refineries have reduced loads of selenium.

The 2015 fees have already been collected and budgeted. The 2015 budget was developed based on revenue that was already in-hand from PPP and other participants. Work began on some tasks starting in October 2014. Reversing decisions made on the collection and use of these funds would be disruptive and problematic.

However, the OTC sector is unique in that it will cease to be a discharger to the Bay after 2017 as mandated by the State Water Resources Control Board. Therefore, it would be appropriate for

the the Steering Committee to discuss changing the allocation of fees for 2016 and 2017. These discussions need to consider many important issues such as ongoing efforts to update the dredgers' fee algorithm, RMP fee increases of 3% per year for 2016-2018, and governance processes being outlined in the draft RMP Charter.

January 2015

DRAFT CHARTER

Regional Monitoring Program for Water Quality in San Francisco Bay

Purpose, Organization and Governance

1.0 Introduction and Background

1.1 Purpose

This Charter describes the purpose and function of the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP). Established in 1993, the RMP is a collaborative effort between the San Francisco Estuary Institute, the California Regional Water Quality Control Board, San Francisco Bay Region, and the regulated discharger community.

1.2 Definitions

RMP or “the Program” means the Regional Monitoring Program for Water Quality in San Francisco Bay;

The “Regional Board” means Regional Water Quality Control Board, San Francisco Bay Region;

USEPA mean the U.S. Environmental Protection Agency, Region IX

SFEI or “the Institute” means San Francisco Estuary Institute;

“Participants” means organizations that contribute to the RMP to satisfy a permit condition, the Regional Board, USEPA, and SFEI (see Appendix A);

“Participant Groups” means groups of similar types of Participants such as publicly owned treatment works (POTWs), dredgers, stormwater agencies, refineries & industrial dischargers, cooling water dischargers, and the individual regulatory agencies; and

“Representative” means a person who represents a particular Participant Group on a committee.

“Interested Parties” means organizations or individuals who have expressed an interest in the Program, such as non-governmental organizations, state agencies, federal agencies, and businesses, but are not Participants as defined above.

Commented [P1]: One issue that comes up throughout the document is: Who should be on the “Interested Parties” list and how should this list be used to notify non-Participants of meetings and decisions?

“Interested Parties” should be defined here rather than editing the dozens of references throughout the document.

2.0 Guiding Principles of the Regional Monitoring Program

STEERING COMMITTEE REVIEW NOTE: THESE PRINCIPLES HAVE GENERALLY BEEN DISTILLED FROM PROGRAM DOCUMENTS AND ASSESSMENT INTERVIEWS.

The overarching goal of the RMP is to collect data and communicate information about water quality in San Francisco Bay in support of management decisions. The RMP was created in 1993 through Regional Board Resolution No. 92-043 that directed the Executive Officer to implement a Regional Monitoring Plan in collaboration with permitted dischargers pursuant to California Water Code, Sections 13267, 13383, 13268, and 13385. The goal was to replace individual receiving water monitoring requirements for dischargers with a comprehensive Regional Monitoring Program.

The Program is guided by a Memorandum of Understanding (MOU) between the Regional Board and SFEI, first approved in 1996 and amended at various times since (see Appendix C of this Charter). Section VIII of the MOU states the roles and responsibilities of the Regional Board and SFEI in the implementation of the Program. Participating dischargers pay fees to the Program to comply with discharge permit requirements. The cost allocation schedule for Participants is described in Appendix B. The RMP provides an open forum for a wide range of Participant Groups and other Interested Parties to discuss contaminant issues, prioritize science needs, and monitor potential impacts of discharges on the Bay.

In support of the overarching goal described above, the following guiding principles define the intentions and expectations of RMP Participants. Implementation of the RMP will:

- Develop sound scientific information on water quality in the Bay;
- Prioritize funding decisions through collaborative discussions;
- Conduct decision-making in a transparent manner that consistently represents the diversity of RMP Participant interests;
- Utilize external science advisors for guidance and peer review;
- Maintain and make publicly available the data collected by the Program;
- Enhance public awareness and support by regularly communicating the status and trends of water quality in the Bay; and
- Coordinate with other monitoring and scientific studies in the Bay-Delta region to ensure efficiency.

3.0 Regional Monitoring Program Governance Structure

The RMP governance structure is comprised of a Steering Committee, Technical Review Committee and Workgroups. In addition, Strategy Teams are created to focus on specific program interests. SFEI serves as the Implementing Entity for the RMP. Figure 1 illustrates the RMP structure. The following sections describe the functions, roles, membership, and decision-making protocols of the various committees, workgroups, and teams in the RMP governance structure.

3.1 *Steering Committee*

The Steering Committee is a formal stakeholder body, structured to represent all of the RMP Participant Groups.

3.1.1 *Steering Committee Role*

The Steering Committee is the decision-making body for the RMP. All recommendations and information from various groups in the RMP governance structure ultimately flow to the Steering Committee to support its decision-making. Steering Committee meetings are held quarterly and in person. Meetings are open to the public. Notice is provided to non-members through an Interested Parties mailing list. The agenda packet is posted on the RMP website no less than one week before the meeting. SFEI staff attend meetings to share information, but do not participate in decision-making. Decisions are made by designated Representatives only (see sections 3.1.2 and 3.4).

The primary tasks of the Steering Committee include:

- Provide a management perspective that guides the direction of the RMP;
- Consider and decide whether to approve Technical Review Committee recommendations;
- Approve an annual workplan and budget;
- Allocate funds for key program areas and special studies;
- Track overall progress of the RMP;
- Review RMP operations and peer review processes to ensure optimal performance; and
- Address other administrative, strategic planning and “big picture” issues as needed.

3.1.2 Steering Committee Representatives and Commitment

The Steering Committee should include a Representative from each of the following Participant Groups:

- Small Municipal POTWs
- Medium Municipal POTWs
- Large Municipal POTWs
- Stormwater agencies
- Regional Water Board
- Petroleum Refineries
- Industrial Dischargers
- Dredgers
- US Army Corps of Engineers
- Cooling Water Dischargers

Each Participant Group selects their representative in a manner of their own choosing.

All Representatives work in partnership to fulfill their role on the Steering Committee. Representatives have no term limits and may continue to serve indefinitely with support of their Participant Group, unless removed as described in section 3.1.6.

Representatives are expected to read the agenda package and be prepared to discuss and act on recommendations from the Technical Review Committee as well as other issues related to the Steering Committee’s primary tasks. Representatives are also expected to keep their Participant Group, as well as Technical Review Committee Representatives for their same Participant Group, informed about Steering Committee activities, decisions, and outcomes, and bring constituent views into the discussion in an informed and transparent manner. Representatives will strive to be physically present at meetings. Conference calls and use of web-based conferencing tools afford an alternative method for Representative attendance at meetings.

3.1.3 Steering Committee Chair and Vice Chair

The diversity of tasks and decision-making that falls upon the Steering Committee necessitates effective agenda planning, facilitation, and Representative participation at any given meeting. To coordinate this process, the Steering Committee will select or reaffirm a Chair and Vice Chair, during the last meeting of the calendar year, using its decision-making procedures (see Section 3.4). The Chair and Vice Chair have no term limits and may continue to serve annual terms indefinitely with support of the Steering Committee.

Meeting agendas will be developed by SFEI staff in consultation with the Chair and Vice Chair of the Steering Committee. The Chair will facilitate each meeting. If the Chair is absent, the Vice Chair will facilitate the meeting. If both the Chair and Vice Chair are absent from a meeting without notice but there is a quorum, the Representatives present will select a temporary Chair for the meeting.

The Chair and Vice Chair are also responsible for maintaining consistent representation of RMP Participant Groups. This includes communication with existing Representatives to

Commented [P2]: Should the POTWs be segregated into 3 size categories? It would provide more flexibility to just have 3 representatives from POTWs regardless of their size.

Should Stormwater Agencies should have 2 seats on the SC? Stormwater Agencies have a cost allocation of 23.5% and have one seat. Dredgers have a cost allocation of 17.5% and have two seats (including USACE). Industrial discharges have a cost allocation of 11% and have two seats.

Should there be separate seats for both refineries and industrial dischargers? Refineries and industrial dischargers share a single cost allocation (11%).

promote regular participation in RMP activities, to address when participation is lacking, and to ensure Representatives remain interested in being involved with the Program.

3.1.4 *Steering Committee Alternates*

To ensure continuity and broad Participant Group attendance at Steering Committee meetings, Representatives are encouraged, but not required, to use Alternates on an as-needed basis. Alternates must be identified by the Representative to the RMP Manager and the Steering Committee Chair and Vice Chair in advance of a given meeting, be fully briefed by the Representative, and be able to represent the interests of the Participant Group during the meeting. Alternates are expected to be informed on RMP activities by the Representative on an ongoing basis and be fully prepared to discuss agenda items and participate in decision-making. No items addressed at previous meetings will be revisited to accommodate an Alternate.

3.1.5 *Steering Committee Representative Resignation and Replacement*

Representatives may resign from the Steering Committee at their choosing. If this occurs, the Participant Group will be notified and will be requested to select a new Representative for the Group. The Representative will use the following steps to resign:

1. Provide written resignation communication (e.g., letter, email) to the Steering Committee Chair, Vice Chair and RMP Manager at SFEI; and
2. Notify the Representative's Participant Group.

3.1.6 *Steering Committee Representative Removal (OPTIONAL)*

STEERING COMMITTEE REVIEW NOTE: A small minority of RMP Steering Committee members expressed concerns about the lack of consistent participation, at both the level of the Steering Committee and the Technical Review Committee, by other Members. Most others characterized the RMP as running smoothly. CCP recommends that while the RMP does not seem to need a 'member removal' provision at this time, it may be beneficial in the event that a situation arises in the future where a member needs to be or should be removed. CCP recognizes this is a challenging topic and we look forward to assisting the group to discuss the issue. This section can be removed if considered unnecessary or inappropriate. This comment and associated protocol may also apply to the Technical Review Committee.

Representatives are expected to uphold their commitments to actively participate in all Steering Committee meetings, review all materials in a timely and thoughtful manner, and be prepared to provide input and participate in Committee decision-making. If a Representative does not fulfill these commitments, he/she can be removed from the Steering Committee and be replaced by another person from the same Participant Group. If warranted, a Representative will be removed through the following steps:

1. The Steering Committee Chair will contact the Representative in question to better understand why he/she may not be fulfilling their commitments (as reflected in 3.1.2).

2. The Representative in question (and organization) will be allowed time (as determined by the Chair) to resolve his/her participation challenge and fulfill his/her commitments to the process.
3. If after the prescribed period of time, the Representative in question does not resolve his/her participation challenges, the Chair will provide a removal recommendation to the Steering Committee for discussion.
4. The Steering Committee will use its decision-making procedures outlined in section 3.4 to remove the Representative and/or organization and to start Representative replacement steps.

3.1.7 Steering Committee Representative Recruitment

At times, the Steering Committee Chair, Vice Chair, or SFEI staff may need to assist in the recruitment of Representatives, particularly in the event that a Participant Group does not select a Representative or for any other reason a Representative seat remains open. Under this scenario, the Chair, Vice Chair, and RMP Manager will seek out candidates who can represent the Participant Group and are familiar with the Program. If a potential candidate is found, the Chair, Vice Chair, or RMP Manager will present the candidate to the Participant Group. The Participants in this Group will decide whether or not this person will represent them on the Steering Committee.

3.2 Technical Review Committee

Similar to the Steering Committee, the Technical Review Committee is a formal stakeholder body, structured to represent the Program Participant Groups.

3.2.1 Technical Review Committee Role

The Technical Review Committee provides oversight of the technical content and quality of scientific investigations conducted for the RMP and serves as the critical link for recommendations that emanate from Workgroups and Strategy Teams and advance to the Steering Committee. Representatives are expected to possess either technical expertise or management experience on the topics under consideration by the RMP.

The Technical Review Committee reviews special study proposals developed by the various Workgroups and Strategy Teams. Following a review of proposal pros, cons, and costs, the Technical Review Committee makes recommendations to the Steering Committee on which proposals should be funded. The Technical Review Committee also provides oversight for Status & Trends monitoring, reviews reports from completed studies, and reviews RMP communication products to technical accuracy.

Technical Review Committee meetings are held quarterly and in-person. SFEI staff attends Technical Review Committee meetings to provide information but does not participate in decision-making. Meetings are open to the public. Notice is provided to non-members through an Interested Parties mailing list. The agenda packet is posted on the RMP website no less than one week before the meeting.

3.2.2 Technical Review Representatives and Commitment

REVIEW NOTE: This draft charter is proposing that TRC membership mirrors the Steering Committee structure. Five TRC Members currently represent three municipal POTW seats. The Steering Committee will have to ask these TRC Members who will represent the three seats.

The Technical Review Committee representation is the same as the Steering Committee plus U.S. Environmental Protection Agency. To ensure a formalized connection between the Steering Committee and Technical Review Committee, it is desirable (but not required) that one Technical Review Committee Representative also sits on the Steering Committee. The Technical Review Committee has Representatives from the following Participant Groups:

- Small Size Municipal POTWs
- Medium Size Municipal POTWs
- Large Size Municipal POTWs
- Stormwater agencies
- Regional Water Board
- US Environmental Protection Agency
- Refineries
- Industrial Dischargers
- Dredgers
- US Army Corps of Engineers
- Cooling Water Dischargers

All Representatives work in partnership with each other and SFEI to fulfill their role on the Technical Review Committee. Representatives have no term limits and may continue to serve indefinitely with support of their Participant Group, unless removed as described in section 3.2.6.

Continuity of attendance at Technical Review Committee meetings by a balanced and representative array of Participant Groups is critical to produce informed and equitable recommendations. Representatives are expected to read the agenda package and adequately prepare for meetings in order to discuss agenda items and make recommendations for Steering Committee consideration. Representatives are also expected to keep their respective Participant Groups, as well as Steering Committee Representatives for the same Participant Group, informed about Technical Review Committee activities, decisions, and outcomes, and bring constituent views into the discussion in an informed and transparent manner. Representatives will strive to be physically present at meetings. Conference calls and use of web-based conferencing tools afford an alternate method for Representative attendance at meetings.

3.2.3 Technical Review Committee Chair

The number and type of agenda items to be considered at each Technical Review Committee meeting requires thoughtful agenda planning, preparation of information, facilitation, and Representative participation. To coordinate this process, the Technical Review Committee will, during the last meeting of the calendar year, select or reaffirm a

Commented [P3]: The SC and TRC should discuss this recommendation and who might fill this role.

Commented [P4]: The comments regarding the number of seats on the SC also apply to the TRC representation.

Chair using its decision-making procedures (see Section 3.4). The Chair may continue to serve indefinitely with support of the Technical Review Committee.

Commented [P5]: Should the TRC have a vice chair also?

Meeting agendas are developed by SFEI staff in consultation with the Chair. The Chair will facilitate each meeting. If the Chair will be absent, he/she will appoint a temporary Chair in advance of the meeting to provide facilitation. If the Chair is absent from a meeting without notice but there is a quorum, the Representatives present will select a temporary Chair for the meeting.

As needed or appropriate, the Chair will attend Steering Committee meetings to explain the rationale behind recommended projects and/or studies and to answer questions.

3.2.4 Technical Review Committee Alternates

To ensure continuity and broad Participant Group attendance at Technical Review Committee meetings, Representatives are encouraged, but not required, to use Alternates on an as-needed basis. Alternates must be identified by the Representative to the RMP Manager and the Technical Review Committee Chair in advance of a given meeting, be fully briefed by the Representative, and be able to represent the interests of the Participant Group during the meeting. Alternates are expected to be informed on RMP activities by the Representative on an ongoing basis and be fully prepared to discuss agenda items and participate in decision-making. No items addressed at previous meetings will be revisited to accommodate an Alternate.

3.2.5 Technical Review Committee Representative Resignation and Replacement

Representatives may resign from the Technical Review Committee at their choosing. If this occurs, the Participant Group will be notified and will be requested to select a new Representative for the Group. The Representative will use the following steps to resign:

1. Provide written resignation communication (e.g., letter, email) to the Steering Committee Chair, Vice Chair TRC Chair, and RMP Manager at SFEI; and
2. Notify the Representative's Participant Group.

3.2.6 Technical Review Committee Representative Removal

Representatives are expected to uphold their commitments to actively participate in all Technical Review Committee meetings, review all agenda materials in a timely and thoughtful manner, and be prepared to forge recommendations for Steering Committee consideration. If a Representative does not fulfill these commitments, he/she can be removed from the Technical Review Committee and be replaced by another person from the Participant Group. The Technical Review Committee will follow the protocols outlined in section 3.1.6 and gain the concurrence of the Steering Committee to remove Representatives.

3.2.7 Technical Review Committee Representative Recruitment

At times, the Technical Review Committee Chair or SFEI staff may need to assist in the recruitment of Representatives, particularly in the event that a Participant Group does not

select a Representative or for any other reason a Representative seat remains open. If recruitment is necessary, the Technical Review Committee will follow the protocols outlined in section 3.1.7.

3.3 Workgroups and Strategy Teams

Various Workgroups and Strategy Teams report to the Technical Review Committee. The Workgroups and Strategy Teams serve as the basis of the “bottom up” planning process by meeting as needed to develop long-term RMP study plans that address high priority topics.

3.3.1 Role of Workgroups and Strategy Teams

Workgroups and Strategy Teams guide the planning and implementation of pilot and special studies. Specifically, the Workgroups and Strategy Teams make recommendations to the Technical Review Committee regarding research priorities and technical products of specific Program areas. Workgroups cover broad themes (e.g., Emerging Contaminants) whereas Strategy Teams focus on more specific topics (e.g., PCB Strategy). Workgroups also provide peer review for specific Program areas.

Workgroup and Strategy Team meetings are held as needed. Meetings are usually in person, but occasionally via teleconference. SFEI staff develops Workgroup and Strategy Team meeting agendas, prepares relevant materials, and facilitates the meetings. Meetings are open to the public and notice is provided to Interested Parties through an Interested Parties mailing list. The agenda packet is posted on the RMP website no less than one week before the meeting. Conference calls and use of web-based conferencing tools afford an alternative method for attendance.

As needed, Workgroup or Strategy Team Representatives may attend Technical Review Committee meetings to explain the rationale behind proposed projects and/or studies and to answer questions.

3.3.2 Workgroup and Strategy Team Representatives and Commitment

Workgroups consist of RMP Participant Group Representatives, invited scientists recognized as experts in their field (Science Advisors, see Section 3.3.3), SFEI staff, and Interested Parties. Strategy Teams consist of RMP Participant Group Representatives, local scientists, SFEI staff and Interested Parties.

Each RMP Participant Group may send Representatives at its own discretion based on interest in a particular Workgroup or Strategy Team topic. Workgroup and Strategy Teams Representatives are expected to keep their respective Participant Groups informed about potential studies and research topics in order to bring constituent views into the discussion in an informed and transparent manner. Representatives will strive to be physically present at in-person meetings. Representatives are not required to have Alternates. Representatives who wish to resign will notify the RMP Manager via email. Participant groups are encouraged to self-select replacements for Representatives that resign.

Commented [P6]: Should this process be improved to get feedback from Participants on the agenda?

Commented [P7]: Although improving, management of workgroup meetings remains an issue. Often too much material made available to late before a meeting. Should the Charter provide expectations for effective workgroup and team meetings?

Commented [P8]: Should there be different sets of Interested Parties for different WGs?

3.3.3 Science Advisors

An important component of the RMP planning and implementation process is robust, peer-reviewed science. RMP Workgroups include invited scientists that serve as external peer reviewers (Science Advisors). Science Advisors are individuals who possess expertise on topics applicable to the RMP. Each RMP science advisor is paid an annual honorarium. Science advisors have no personal interest or conflict of interest with studies performed under the RMP. Science advisors are selected by SFEI in consultation with Steering Committee and Technical Review Committee Representatives that are knowledgeable in the subject area. The specific roles of science advisors include the following:

- Ensure objectivity and quality of RMP studies;
- Participate in Workgroup meetings and assist in the development of recommendations for pilot and special studies; and
- Provide input and peer review on workplans, progress of studies, and technical products.

3.3.4 Workgroup and Strategy Team Chairs

No Workgroup or Strategy Team has an elected Chair. The RMP Manager or Lead Scientist facilitates Workgroup and Strategy Team meetings. This arrangement allows the SFEI Senior Scientists with expertise in the topic area to focus on technical presentations and discussion during the course of the meeting, rather than facilitating the discussion.

Commented [P9]: Should WGs and Strategy Teams be able to elect a chair if they want? An Chair might help RMP staff with developing agendas and engaging other WG participants.

3.3.5 Nutrient Management Strategy

Studies carried out in support of the San Francisco Bay Nutrient Management Strategy (NMS) receive funding from the RMP, funds mandated by a Bay-wide nutrient permit¹, the Regional Board, and other entities. As laid out in its Charter, the NMS Steering Committee (NSC) provides oversight for all nutrient studies completed with these pooled funds.

Commented [P10]: This section is a proposal to clarify the roles of the RMP and the NMS related to nutrient special studies. Both the RMP SC and the NSC should review this text.

There are several connections between the RMP and the NSC. First, there should be at least one member of the NSC that also serves on the RMP Steering Committee. Second, the NMS Nutrient Technical Workgroup serves as the forum through which RMP stakeholders can provide technical input on NMS work products, funding priorities, or other issues being considered by the NSC. Finally, the RMP and NSC have a duty to monitor how RMP funds are spent for nutrient research.

The following steps aim to clarify the roles of the two programs when RMP funds are contributed to fund NMS studies:

1. Each year, RMP Participants set the approximate funding level for future, nutrient-related special studies.

¹ Funds originating from the Bay Area Clean Water Agencies

2. Following its own charter, the NSC determines the best use of the available RMP funds for studying nutrients in the Bay.
3. The NSC communicates the overall priorities and recommends nutrient projects with clearly defined deliverables to the RMP Technical Review Committee so that these studies can be included in the suite of special studies recommended to the RMP Steering Committee. If there are insufficient RMP funds available for all the nutrient studies, the RMP will request that the NSC modify the specific proposals to match the available funds.
4. Oversight of the RMP-funded nutrient studies will be the responsibility of the NSC. However, the RMP will receive progress reports prepared for the NSC, which will address both NMS and RMP reporting needs for deliverables. The RMP Steering Committee and Technical Review Committee Representatives will also be included on the mailing list when the deliverables are released for comments and when the deliverables are complete.

The NSC and the RMP Steering Committee may interact regarding nutrients for other reasons besides allocating RMP funds for nutrient-related studies. For example, the NSC may recommend changes to the RMP Status & Trends Monitoring Program. If the NSC has such recommendations, an item will be placed on the agenda for the Steering Committee or Technical Review Committee (whichever is more appropriate) for discussion at the next regularly scheduled meeting.

3.4 Decision-Making

In general, all RMP committees work towards consensus as a fundamental principle. The consensus-seeking decision method described in this section is most applicable, though not exclusive, to the RMP Steering Committee. Consensus is desirable, though not required, at the Technical Review Committee, Workgroups, and Strategy Teams. Varying levels of time and effort are expected to reach consensus with the highest degree of effort required by the Steering Committee.

3.4.1 Definition of Consensus

Consensus means that all Representatives on the committee support a decision or recommendation, and believe that a majority of their respective constituents do as well. In reaching consensus some Representatives may strongly endorse a particular decision or recommendation while others may accept it as “workable.” Others may only be able to “live with it.” Still others may choose to “stand aside” by verbally noting a disagreement yet allowing the group to reach consensus without them. Any of these actions still constitutes consensus.

3.4.2 Definition of a Quorum

A quorum is recommended, though not required, for Steering Committee and Technical Review Committee meetings to proceed. A quorum is a minimum of one-half of Steering

Committee Representatives or Technical Review Committee Representatives present at their respective meetings, or attending via teleconference (vacant seats do not count in the quorum calculation). If a quorum is not achieved, the Steering Committee or Technical Review Committee meetings proceed and preliminary decisions are made. Then, the procedures for making decisions between meetings (Section 3.4.5) are followed to propose the preliminary decision to the full committee and reach a formal decision.

3.4.3 Consensus-Seeking Decision Method

The RMP consensus decision method is based on the principle of “consensus with accountability.” Consensus with accountability requires all RMP Representatives to try to reach consensus, while at all times supporting and expressing their self-interest. In the event a Representative must reject a proposal, that Representative is expected to provide an amendment to the proposal or an alternative proposal that attempts to achieve their interest and interests of other Representatives.

At all times, Representatives will ensure they are providing input commensurate to their prescribed role and reflective of the constituency they represent. In general, all RMP committees, groups, and teams will explore agenda topics and attempt to reach consensus decisions or recommendations using the following steps:

- Facilitate open discussion and dialogue on key agenda items;
- Weigh pros and cons of proposals and/or recommendations being discussed;
- Give minority opinion due consideration; and
- Take time needed to get to consensus.

3.4.3.1 Steering Committee Decisions

For items requiring Steering Committee decisions, the item in question will be presented and discussed. After discussion is completed, any Steering Committee Representative may make a motion for a decision, followed by a second, followed by a poll of those in favor and not in favor. If there is consensus, or lack thereof, it is noted verbally at the meeting and memorialized in the meeting summary. Attendees who are not Representatives may participate in discussions, but do not weigh in on final decisions (see Section 3.4.6).

3.4.3.2 Technical Review Committee Decisions

For approval of administrative decisions (see Section 3.4.4), the Technical Review Committee may express consensus through a simple poll.

For substantive decisions (see Section 3.4.4), the item in question will be presented and discussed. After discussion is completed, consensus decisions or recommendations are made without a formal process or a vote. Members of the public attending the meeting can participate in discussions, but do not weigh in on decisions or recommendations (see Section 3.4.6).

Commented [P11]: TRC may disagree with this. However, my experience with advisory committee governance is that they should operate this way. Advisory committees should advise and executive committees should decide.

In the event that the Technical Review Committee cannot come to consensus on a recommendation or set of recommendations, majority and minority opinions will be noted verbally at the meeting and described in detail, with attribution of Representative viewpoints (see Section 3.5), in the meeting summary. The Technical Review Committee Chair will coordinate with the RMP Manager to ensure that the meeting summary adequately documents majority and minority viewpoints, and will utilize the meeting summary as the primary tool to communicate Technical Review Committee discussions to the Steering Committee.

3.4.3.2 Workgroup and Strategy Team Decisions

For approval of administrative decisions (see Section 3.4.4), the Workgroups and Strategy Teams may express consensus through a simple poll.

The substantive decisions made by Workgroups and Strategy Teams are recommendations to the Technical Review Committee regarding use of RMP funds for proposed pilot and special studies. Before these decisions are made, all the Principal Investigators of the proposed studies and anyone with a conflict of interest are asked to leave the meeting to allow for free discussion of the merits of the proposals. The RMP Manager, RMP Lead Scientist, and a RMP staff person will remain to facilitate, provide information, and take notes, respectively. After the Principal Investigators have left the meeting, Workgroup and Strategy Team recommendations are made by consensus if possible. In the event that consensus cannot be reached, majority and minority opinions will be noted verbally at the meeting and described in detail, without attribution, in the meeting summary. The RMP Manager will utilize the meeting summary as the primary tool to communicate Workgroup or Strategy Team recommendations to the Technical Review Committee.

Commented [P12]: What level of detail should be reported from the anonymous review session? The non-attributed details or a summary of the decision?

3.4.4 Steering Committee Voting Decision Method

In the absence of consensus, the Steering Committee with a quorum will vote on a motion. For administrative decisions (defined below), the motion will pass with if 50% or greater of the Representatives in attendance vote for it. For Substantive Decisions (defined below), the motion will pass if 67% or greater of the Representatives in attendance vote for it.

Commented [P13]: The supermajority percentage should be discussed by the SC.

- Administrative Decisions. Administrative decisions are about the day-to-day activities (including but not limited to logistics, meeting dates and times, agenda revisions, schedules, etc.).
- Substantive Decisions. Substantive decisions concern financial and programmatic issues (including but not limited to budgets, contracts, policies, changes to the Charter, removal of Representatives, etc.)

In the absence of consensus, all other committees, workgroups and teams will simply document majority and minority viewpoints, verbally at the meeting and in the subsequent meeting summary, rather than voting in order to make a decision or recommendation.

3.4.5 Decision-Making in Between Meetings

Decisions in between meetings for any committee, workgroup, or team will be made either by email or, if warranted, by conference call.

Commented [P14]: Should there be notice to Interested Parties for upcoming decisions between meetings? How should this be done?

For decisions by email, the RMP Manager will present the Representatives with a motion and use a poll to determine if there is consensus. If one half of the Representatives reply, there will be a quorum for the decision. If needed, the voting decision method from Section 3.4.4 will be used for the Steering Committee to take a formal vote on the motion. The number of Representatives that reply will be considered the number of attendees for calculating percentages of the vote.

Any Representative or the RMP Manager may request a conference call to make a decision between meetings. Decisions made by conference call would follow the same procedures as an in-person meeting. Criteria by which to forgo an email decision in favor of a conference call may include the following:

- Inability to make a decision via email;
- Complexity of topic or length of email; and
- Conference call request by a Representative or SFEI staff.

Decisions made in between meetings will be reported by the RMP Manager at the following meeting, and documented in the summary of that meeting.

Commented [P15]: Should we include possibility of reconsidering, with cause, decisions made between meetings at a subsequent meeting? Cause could be further analysis by a participant, critical input from a participant unavailable for an email poll or conference call, or consideration of significant public input. If reconsideration is allowed for these decisions, should ALL decisions (even those made during in-person meetings) have the opportunity to be reconsidered?

3.4.6 Decision-Making and Public Engagement

For major decisions by any RMP committee, workgroup, or team, public input is desirable and beneficial. If there is significant public input, all facilitators (e.g., Chairs, Vice Chairs, or temporary Chairs) will use the following basic approach to ensure effective discussion by the RMP group and appropriate feedback from the public.

- The meeting agenda with substantive decisions will be distributed to Interested Parties no less than one week in advance so that the RMP committee, workgroup, or team and public know such a decision is pending.
- The facilitator will move the committee, workgroup, or team into discussion about the decision topic and will begin with discussion by the Representatives only.
- When the committee, workgroup, or team Representatives have completed all the discussion they wish to have, the facilitator will open the floor for public comment. Public comment will then ensue.
- When all Representatives of the public that wish to speak have spoken, the facilitator will check with the committee, team, or workgroup Representatives to see if they have any questions of the public. If so, Representatives will engage with the appropriate members of the public to discuss an item related to the pending decision.
- When this/these discussions are complete, the facilitator will bring the attention of the committee, workgroup, or team back to their decision-task. The facilitator will clearly read the motion to ensure the committee, workgroup, or team knows what

Commented [P16]: What is the best way to reach all "Interested Parties"? Can the organizations representing Participants take on the duty of notifying their members? Should the RMP have one "Interested Parties" mailing list? Should there be different mailing lists for different topics/issues? Should we just rely on website postings?

Does the RMP need to broadcast notice of the meetings any more than it currently does?

they are considering. The committee, workgroup, or team will then conduct decision-making using the method described above.

3.5 Record Keeping

SFEI staff prepares summaries for all Steering Committee, Technical Review Committee, Workgroup, and Strategy Team meetings. As noted above, decisions, recommendations, and majority/minority viewpoints on substantive issues at any RMP meeting will be noted verbally at the meeting and subsequently memorialized in the appropriate summary. Any RMP Representatives holding a minority viewpoint will have the opportunity to coordinate with SFEI staff to ensure accurate representation of said viewpoint. In general, summaries will include the following:

- Attendees;
- Decisions or recommendations made;
- Action items;
- Pros, cons, and rationale behind proposals and decisions; and
- Documentation of majority/minority viewpoints on decisions or recommendations.

It is expected that Technical Advisory Committee meeting summaries will have the most level of detail, including attribution of Representative viewpoints on proposed recommendations. Steering Committee meeting summaries may follow the same general approach but have significantly less detail than Technical Review Committee meeting summaries. Workgroup meeting summaries will be similar to those for the Technical Review Committee except that comments during the anonymous review session will not be attributed to individuals.

3.6 RMP Implementing Entity

SFEI is the Implementing Entity for the RMP. In this capacity SFEI largely plays a facilitative and operational role for a stakeholder-driven process that prioritizes key questions and associated scientific investigations. Operating in this context SFEI helps identify stakeholder information needs, develops scientific workplans that address these needs, and then implements these plans. SFEI is also the fiduciary agent for RMP stakeholder funds. The SFEI Board does not provide direct oversight of the RMP but does approve the yearly RMP Workplan.

3.6.1 SFEI Roles and Responsibilities

Specific SFEI staff roles and responsibilities include, but are not limited to, the following:

- Provide fiscal, contractual, and programmatic administration;
- Conduct or cause to be conducted long-term monitoring of the Bay and implement special studies based on Technical Review Committee recommendations and subsequent Steering Committee approval;
- Organize and staff meetings of the Steering and Technical Review Committees, Workgroups, and Strategy Teams;
 - Prepare and disseminate information packages, meeting agendas, and announcements to all committees, workgroups, teams, and Interested

Commented [P17]: Should this Charter contain detailed contracting procedures that SFEI must follow for selecting labs and consultants?

Are there any specific requirements that flow down from the State Contracting Manual?

Should this section contain policies such as maintaining \$200k in Undesignated Funds, protocols for allocating Undesignated Funds, etc?

- Parties no less than one week before meetings, and post materials on relevant Program web pages;
- Coordinate between-meeting decision-making (via email or teleconference) with all committees, workgroups, and teams on an as needed basis;
- Prepare and disseminate all committee, workgroup, and team meeting summaries and post on the RMP webpage and other venues as appropriate.
- Coordinate with other agencies or organizations which monitor the water quality of the San Francisco Bay;
- Report on progress in executing annual workplan on a quarterly basis;
- Produce an annual report which provides analysis and interpretation of the results of the Program;
- Make all data available for public review;
- Ensure that thorough technical review of reports are conducted, and that reports are made available to the public; and
- Organize an annual meeting of the Program Participants for the purpose of review of the Program results.

3.7 Program Review

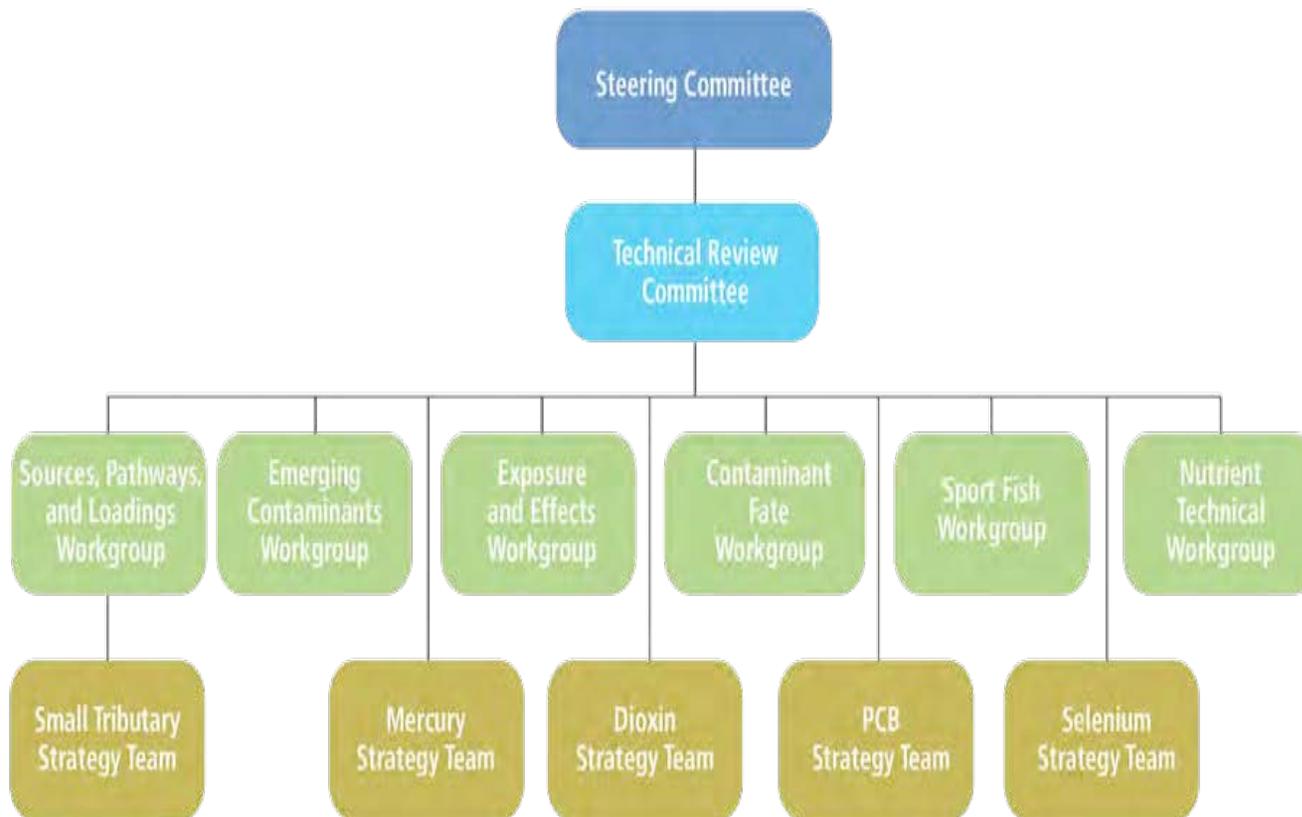
Periodically, with no fixed schedule, a Program Review of the RMP should be conducted. The Program Reviews are performed by experts in estuarine monitoring and management who are not associated with the RMP. The Steering Committee convenes these experts and provides them with a set of charge questions regarding how well the Program is achieving its mission. The specific charge questions for any given Program Review will depend on the priorities of the Steering Committee at the time. The reviewers report back to the Steering Committee with their findings.

Program Reviews for the RMP were performed in 1997 and 2003.

4.0 Charter Revisions

The Steering Committee, as the primary decision-making body of the RMP, may amend this Charter by following the consensus decision method described in section 3.4 above. Charter amendments may be proposed by Steering Committee or Technical Review Committee Representatives, or SFEI staff, either during or between meetings. Any proposed amendments will be placed on the Steering Committee meeting agenda for discussion and possible action, or decided through email or conference call communication if feasible and appropriate.

Figure 1. Governance Structure of the Regional Monitoring Program



**Appendix A
RMP Participants**

POTW Dischargers

Burlingame Waste Water Treatment Plant
 Central Contra Costa Sanitary District
 Central Marin Sanitation Agency
 City of Benicia
 City of Calistoga
 City of Palo Alto
 City of Petaluma
 City of Pinole/Hercules
 City of Saint Helena
 City and County of San Francisco
 City of San Jose/Santa Clara
 City of San Mateo
 City of South San Francisco/San Bruno
 City of Sunnyvale
 Delta Diablo Sanitation District
 East Bay Dischargers Authority
 East Bay Municipal Utility District
 Fairfield-Suisun Sewer District
 Las Gallinas Valley Sanitation District
 Marin County Sanitary District #5, Tiburon
 Millbrae Waste Water Treatment Plant
 Mountain View Sanitary District
 Napa Sanitation District
 Novato Sanitation District
 Rodeo Sanitary District
 San Francisco International Airport
 Sausalito/Marin City Sanitation District
 Sonoma County Water Agency
 Silicon Valley Clean Water
 Town of Yountville
 Union Sanitary District
 Vallejo Sanitation & Flood Control District
 West County Agency

Cooling Water Dischargers

Pittsburg Power Plant

Regulatory Agencies

San Francisco Bay Regional Water Quality
 Control Board
 U.S. Environmental Protection Agency,
 Region IX

Industrial Dischargers

C & H Sugar Company
 Chevron Products Company
 Phillips 66
 Crockett Cogeneration
 Rhodia, Inc.
 Shell Martinez Refining Company
 Tesoro Golden Eagle Refinery
 USS - POSCO Industries
 Valero Refining Company

Dredgers

Alameda Point
 BAE Systems
 Chevron Richmond Long Wharf
 City of Benicia Marina
 Conoco Phillips (Tosco-Rodeo)
 Marin Yacht Club
 Marina Bay Yacht Harbor
 Marina Vista Homeowners Association
 Napa Yacht Club
 Port of Oakland
 Port of San Francisco
 San Francisco Marina
 San Rafael Yacht Harbor
 Sausalito Yacht Harbor
 U.S. Army Corps of Engineers
 Vallejo Ferry Terminal
 Valero Refining Co.

Stormwater

Alameda Countywide Clean Water Program
 Caltrans
 Napa Countywide Stormwater Pollution Prevention
 Program?
 Contra Costa Clean Water Program
 Fairfield-Suisun Urban Runoff Management Program
 Marin County Stormwater Pollution Prevention
 Program
 San Mateo Countywide Stormwater Pollution
 Prevention Program
 Santa Clara Valley Urban Runoff Pollution Prevention
 Program
 Vallejo Sanitation and Flood Control District

Commented [P18]: Is this name correct? Should CCSF be included?

Appendix B
Allocation of Costs for the Regional Monitoring Program

For at least the 10 years prior to 2014, the total cost of the Program has been set by the Steering Committee and divided up between the Participant Groups using the following percentages:

Participant Group	Percent of Total Program Cost
Publicly Owned Treatment Works	44%
Stormwater Agencies	23.5%
Dredgers	17.5%
Refineries and Industrial Dischargers	11%
Cooling Water Dischargers	4%

Each Participant Group uses a formula of its own choosing to divide up its cost allocation between the Participants in the Group.

The formula used by a Group must be flexible enough to account for Participants joining and leaving the Program. The formula for a Group may be changed by the Group at any time so long as the Group as a whole contributes the full cost allocation to the Program.

If all of the Participants in a Participant Group leave the Program, then the cost allocation for this Group will be divided between the remaining Groups in proportion to their previous allocations.

Commented [P19]: This proposal is relevant to what might happen when Cooling Water discharges cease and should be discussed by the SC.

APPENDIX C
RMP Memorandum of Understanding
(PDF to be added to approved version of charter)

MEMORANDUM OF UNDERSTANDING

between the

SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD

and the

SAN FRANCISCO ESTUARY INSTITUTE

concerning the implementation of the

REGIONAL MONITORING PROGRAM FOR TRACE SUBSTANCES

This Memorandum of Understanding is made and entered into by the San Francisco Bay Regional Water Quality Control Board (the Board) and the San Francisco Estuary Institute (the Institute). The purpose of this Memorandum is to document the relationship between the Board and the Institute as it pertains to the implementation of the Regional Monitoring Program for Trace Substances (the Program) adopted by the Board on April 18, 1992. It outlines the responsibilities of both parties, and establishes a process for oversight and management of the Program.

I. BACKGROUND

Beginning in 1989, the Board has been conducting pilot studies to develop a long-term multimedia monitoring program for the San Francisco Estuary. The Board has been conducting the pilot studies using funds from the Bay Protection and Toxic Cleanup Program, Basin Planning Program, and grants from the U.S. Environmental Protection Agency. During State Fiscal Year (FY) 1991-1992 the Board conducted a pilot regional monitoring program that included the monitoring of chemical concentrations in water, sediment, and tissues and the measurement of toxicity in water and sediments throughout the San Francisco Estuary. The Board continued its monitoring and research efforts in FY 1992-1993.

On April 15, 1992, the Board adopted Resolution 92-043 endorsing in concept the Regional Monitoring Program and instructing the Board's Executive Officer to begin implementation. The Board's Executive Officer requested the participation of 48 permit holders to implement the baseline portions of the Program. The 48 permit holders began collectively implementing the Program through the Institute in 1992, and funded the first year of monitoring (1993). In 1993, 15 additional permit holders were added to the program, and paid for the RMP in 1994 and subsequent monitoring years.

The San Francisco Estuary Project (SFEP), a State/Federal cooperative endeavor, conducted a Regional Monitoring Workshop in 1991 to begin identifying long-term program elements of the strategy including institutional arrangements and research needs. Subsequently, SFEP has developed a Regional Monitoring Strategy in which the SFEI was named as one of the organizations responsible for coordinating and overseeing the implementation of the Strategy.

II. DEFINITIONS

In this document the following terms shall have the following meanings:

- (a) Board shall mean the California Regional Water Quality Control Board, San Francisco Bay Region.
- (b) Institute shall mean the San Francisco Estuary Institute or its successor.
- (c) Program shall mean the Regional Monitoring Program for Toxic Pollutants as adopted by the Board, currently referred to as the Regional Monitoring Program for Trace Substances.
- (d) Implementation Plan shall mean the detailed plan for implementing the baseline portion of the Program by the Institute.
- (e) Program Participants shall mean those entities that the Board has required to participate in the Program, and that have agreed to satisfy this requirement through participating in a joint effort through the Institute.
- (f) Cost Allocation Schedule shall mean the document, developed by the program participants, that documents the amount that each category of participants will contribute to the execution of the Implementation Plan.
- (g) Program Plan means the plan by which the Program is carried out, and which includes the Implementation Plan, the Cost Allocation Schedule, this MOU, and other relevant documents.

III. EFFECTIVE DATE OF AGREEMENT

The effective date of this MOU is January 1, 1996.

IV. STATEMENT OF WORK

The work carried out under this MOU involves a baseline program for the monitoring of trace substances in the San Francisco Estuary. It includes chemical analysis of ambient water, sediment and tissue, and toxicity tests of ambient waters and sediment at 16 fixed stations, or subsets of those stations, throughout the Estuary. In addition, a variety of pilot studies to test new program elements and special studies to improve program design or the interpretability of results, are conducted.

V. PROGRAM MANAGEMENT

The Board will hold the Institute responsible for ensuring that the Implementation Plan is executed in a technically sound manner, and for cost-effective expenditure of funds provided by program participants. The Board is committed to working with the Institute to ensure that the Implementation Plan is technically sound and is executed in a cost-effective manner.

The Institute shall not be responsible for financial participation by individual participants. Designating program participants, working with participants to establish equitable allocation of costs, and ensuring their participation, will remain solely the responsibility of the Board.

VI. ALLOCATION OF COSTS AND FULFILLMENT OF PERMITTEE OBLIGATIONS

The cost of this Program shall be set annually by the Executive Officer of the Board after consultation with the program participants. Each program participant shall pay a portion of those costs, according to discharger category. The Board shall assign each participant to a discharger category and shall determine the amount to be paid by each participant. The final cost allocation formula shall be provided in the Implementation Plan. The Board shall consider each program participant that provides funding in the required amount to the Institute to have fulfilled its obligation under section 13267 of the California Water Code. The Institute will inform the Board on a quarterly basis of which program participants are contributing financially in the Program.

In the event that there are excess funds at the conclusion of the year of execution of the Implementation Plan, they shall be applied to subsequent years of implementation. In the event that funds are insufficient to carry out the full Implementation Plan, including the reasonable management costs of the Institute, the Institute shall propose amendments to the Implementation Plan such that it can be implemented within the budget, or propose to use other sources of funds, such as interest or matching funds, to complete the program.

VII. COMMITTEES

The Board and the Institute will form a Steering Committee to work on such issues as allocation of future program costs, selection criteria for contractors, participation in proposal review and selection, review of progress, and evaluation of the effectiveness of the program on a periodic basis. Program participants will be represented on the Steering Committee by at least one per discharger category.

The Board and the Institute will form a Program Technical Review Committee to periodically review program design and program results.

VIII. RESPONSIBILITIES OF SIGNATORIES

It shall be the responsibility of the Board to:

1. Approve the Implementation Plan and any subsequent amendments. The Board will notify the Institute in writing regarding approval of the Implementation Plan including any amendments made by the Board.
2. Select the dischargers that must participate in the Program, and notify them of their responsibilities.
3. Document any concerns it may have regarding the progress of work to the Institute and other members of the Steering Committee throughout the year.

4. Share results of related monitoring and research carried out by the Board in a timely fashion, and provide access to all available data collected in such efforts.
5. Review and comment on the draft annual report and approve a final report in a timely manner.
6. Make any additional requirements for future efforts known to the participants at least three months prior to the time at which they must be implemented.
7. Take the results and experience of the effort of the first and subsequent years of work into account prior to imposing new requirements.
8. Identify and notify additional permitted dischargers of their responsibility to participate in the program, and inform the Institute and current participants of additional dischargers to be included.

It shall be the responsibility of the Institute to:

1. Enter into agreements with participants such that they can be invoiced for their share of program costs.
2. Set up a separate account for such funds, and use it to pay for program costs.
3. Contract for services required by the Implementation Plan.
4. Manage contracts entered into to fulfill the Implementation Plan.
5. Organize and staff meetings of the Steering and Program Technical Review Committees as needed.
6. Coordinate with all other agencies or organizations which monitor the water quality of the Estuary.
7. Report to the Board on the progress in executing the Implementation Plan on a quarterly basis.
8. Produce an annual report which provides analysis and interpretation of the results of the Program. Data upon which the report is based will be made available for public review.
9. Ensure that thorough technical review of the report is conducted, and that the report is made available to the public.
10. Organize an annual meeting of the program participants for the purpose of review of the Program results.

IX. DURATION OF AGREEMENT

It is anticipated by the signatories that the Program will be of long-term duration, and that this agreement or a similar agreement will be in effect for many years. This agreement was originally entered into by the Board and the Institute on July 1, 1992 with an expiration date of December 31, 1993. On December 23, 1993, through written notification by the Board, the expiration date was extended to December 31, 1995. This agreement will now expire, unless reenacted, on December 31, 1997 . This agreement may be reenacted for periods of one to three years at any time after December 31, 1996.

X. AMENDMENTS TO THE AGREEMENT

This agreement may be modified only by written amendment to this agreement and signed by both parties. Whenever this agreement is modified, the Institute shall inform all program participants in a timely fashion.

XI. FINANCIAL RECORDS AND ACCOUNTING

The Institute shall set up an account for funds received for the purpose of execution of the Implementation Plan. The Institute shall keep adequate financial records of all transactions relating to the execution of the Implementation Plan. The Institute will report quarterly to the Board on the financial status of the RMP account. The report will include the status of payments from each participant, payments made to subcontractors, and amounts used to reimburse the Institute for time and materials expended according to the Implementation Plan. All participants in the Program shall have access to financial records regarding this account. Financial records shall be audited on an annual basis. Receipts and expenditures shall be detailed in an annual report on the Program which shall be provided to each participant.

**FOR THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD,
SAN FRANCISCO BAY REGION:**

Loretta Barsamian
Loretta Barsamian, Executive Officer

DATE: *April 17, 1996*

FOR THE SAN FRANCISCO ESTUARY INSTITUTE:

Margaret Johnston
Margaret Johnston, Executive Director

DATE: *March 19, 1996*



2015 State of the Estuary Conference

Draft Ideas for Plenary Topics, Speakers, and Session Tracks

Conference Theme: Simply “The State of the Bay & Delta Estuary”. The intent is to have a long-term (50-100 yrs.), forward-thinking focus.

Plenary Speaker Ideas

Futurists, with a focus on environment (climate change, sea level rise), technology, urban planning, green infrastructure, policy, engineering, culture. Options include:

- **Bob Perciasepe** -30 years at EPA now head of the Pew “spinoff” Center for Climate and Energy Solutions (C2ES) - availability confirmed
- **David Sedlak** (Water 4.0.& ReNUWIt) - availability confirmed – “*Re-Inventing the Nation’s Urban Water Infrastructure*”
- Other “ReNUWit” Berkeley or Stanford Urban Water Policy visionaries
- **Michael Boots** – Acting Chair – White House Council on Environmental Quality
- **Susan Tatayon**, Managing Director of the California Water Program at The Nature Conservancy, & Delta Stewardship Council Member [suggestion from Delta Stewardship Council]
- **New Delta Science lead** [taking Dr. Peter Goodwin’s place] TBD [suggestion from Delta Science Program]
- **Barry Lopez**, writer [suggestion by SFEP]
- **Steward Brand** – Futurist, Founder of “The Long Now Foundation, The Well, The Global Business Network, Advisor to Gov. Brown, Creator of the “Whole Earth Catalogue” - “A Vision for a Hopeful and Sustainable Future.”
- **Letitia Grenier** - “State of the Estuary 2015”
- **Robin Grossinger** - “Historical Ecology: 200 years ago and 200 years into the future”
- **Warner Chabot** – “How the Bay Area Will Lead the Nation (world?) on Climate Change”
- **Robert Glennon** - “Living with Drought” (author of Unquenchable: America’s Water Crisis and What to Do About It. University of Arizona)
- **Carl Guardino** &/or Silicon Valley Business Leaders (Google, Apple, Yahoo, Facebook, Linked-IN,
- **Lisa Jackson** – Apple Chief Sustainability Officer
- **Foundation Community Leaders** (e.g. Pisces, Hewlett, Moore, Packard, San Francisco) leaders - e.g. Kai Lee (recently retired science director at Packard)

Political Leaders:

- Governor Brown, Attorney General K. Harris, Lt. Gov. G. Newsom, Senate Leader K. DeLeon, Assembly Speaker T. Atkins
- (Local/State/National Legislators) re: Sea Level Rise- e.g. S.M. County Supervisor Pine, Assem. Gordon, Sen. Leno, Assem. Chu, Congressperson’s Speier, Congressman Huffman, CA Resources Secretary Laird

Plenary and Follow-up Workshop Option –

- 1) **Plenary Speakers:** Invite 6-10 Plenary speakers to provide brief (e.g. 15 minute) but bold, challenging plenary talks. They should present visionary concepts or ideas on how the Bay & Delta’s urban and rural communities could transform over the next 50-100 years to support an ecologically sustainable region that will face the dual challenge of:
 - A population 3-4 times the current 7M people
 - A natural water supply of 1/4th to 1/3rd the current supply due to global climate change.
- 2) **Follow-up Panels:** Then have these plenary speakers either lead or co-chair panels in subsequent 2 hr. workshops. These workshops could have panels comprised of 2-5 “thought leaders” representing diverse backgrounds from science, government, business, policy, engineering etc.

The morning sessions would provide the media (and possible on-line audience?), with rich material for news stories, blogs etc. The afternoon sessions could simply be dialogues that focus on the long-term science, economic or policy challenges facing decision makers and institutions.

Or the afternoon sessions could be given an added charge to “report back” to the full conference at the end of the day or next day.

Water Quality Plenary Speaker Ideas (with a focus on envisioning future Bay water quality)

Subtheme: Visions for Bay-Delta Water Quality in 2065/2115

- Water Board - Terry Young? Tom Mumley?
- USEPA?
- Municipalities
- SFEI
- Baykeeper?
- Sedlak could possibly fit here too
- Other ideas?

Ideas for Concurrent Sessions

<u>Species/Restoration</u> -Living Ecosystems -Historical Ecology & Future Ecology	<u>Management Challenges</u> -Water Supply -Drought
<u>Water Quality</u> -SOTER summary -Priority Bay RMP topics (core of Day 2) -Delta RMP update -Other priority WQ topics	<u>Sustainable Communities</u> -Engineering & Technology -Green Infrastructure -Land Use Planning & Governance

Ideas for RMP Session Talks

- Success story talk or talks - Pulse tie-in
- Nutrient talk
- Tributary loading talk
- Pesticide talk - Kelly Moran?
- CEC overview talk - Becky Sutton
- Selenium talk
- Ocean acidification - Weisberg?
- Mercury monitoring by marsh restoration projects

Ideas for Other Priority WQ Topics

- Exotic species update - progress on ballast water RMP Staff Activities for the SOTE Conference
 1. Recruit RMP stakeholders and others (e.g., municipal officials, business leaders)
 2. Develop and distribute recruitment material (e.g., Save the Date notices)
 3. Cultivate press coverage
 4. Plan and implement a social media campaign
 5. Organize a poster session highlighting the RMP (to increase connection time for RMP attendees)
 6. Develop standardized templates and branding elements for RMP slides and posters
 7. Participate in Steering Committee meetings to plan the conference
 8. Organize speakers for RMP sessions according to a common theme
 9. RMP staff to attend and present at conference

Optional tasks with additional funding

10. Process and share videos of presentations on YouTube
11. Broadcast presentations live

Bay RMP Deliverables Scorecard Report

Key to Status Colors:

Green indicates greater than 90 days until the deliverable is due.

Yellow indicates a deliverable due within 90 days.

Red indicates a deliverable that is overdue.

Focus Area	Primary	Deliverable	Assigned To	Due Date	Original Due Date	Status	Comments
Annual Reporting	Final Pulse Report	Final Report	Jay Davis	09/18/15			
Annual Reporting	State of the Estuaries Conference	Conference	Philip Trowbridge	09/18/15			
Annual Reporting	Final Annual Monitoring Report	Final Report	Philip Trowbridge	12/16/15			
Annual Reporting	Final Copper SSO Memo	Final Memo	Philip Trowbridge	12/16/15			
Communications	Calendar of RMP Events and Communications Products	Memo	Philip Trowbridge	02/28/15			
Data Management	Revisions to QAPP	Updated QAPP	Don Yee	03/31/15			
Data Management	Laboratory IC Study for Selenium in Water	Report	Don Yee	12/16/15			
Emerging Contaminants	Broadscan Screening of Biota for CECs	Final Report	Rebecca Sutton	12/31/14	03/31/12		Received final technical reports from NIST. In order to make the results accessible to most readers, RMP is producing a 4 page fact sheet. The fact sheet content has been written. After the sheet is designed and formatted, it will be distributed to ECWG and TRC for review in February and be finalized in March.
Emerging Contaminants	PFCs in Bay Biota	Final Report	Meg Sedlak	12/31/14	03/31/13		Draft article e-mailed to co-author J. Benskin to include sections on precursors. Expect to distribute manuscript to ECWG, TRC, and SC in February and to submit to a journal in March.
Emerging Contaminants	Developing Bioanalytical Tools (Year 1)	Final Report	Rebecca Sutton	12/31/14	12/31/13	Complete	Year 1 report completed.
Emerging Contaminants	2014 Q4 Update: Additional Milestones Completed, Problems Encountered, and Plans for Next Quarter.	Update	Rebecca Sutton	01/01/15		Complete	November 2014: Gave talk on RMP work on flame retardants at green chemistry symposium at UC Berkeley. Presented preliminary alternative flame retardants monitoring at Society of Environmental Toxicology and Chemistry meeting in Vancouver. Assisted SF Bay Water Board with comment letter regarding EPA's proposed SNUR on nonylphenol and nonylphenol ethoxylates (Tier III contaminants). December 2014: PBDE declines manuscript accepted by Environmental Science and Technology and published online; significant press coverage including San Francisco Chronicle and Scientific American.

Focus Area	Primary	Deliverable	Assigned To	Due Date	Original Due Date	Status	Comments
Emerging Contaminants	Microplastics Water Sample Collection	Field Sampling	Rebecca Sutton	01/30/15		Complete	Microplastics water samples collected in January 2015.
Emerging Contaminants	Developing Bioanalytical Tools (Year 2)	Final Report	Rebecca Sutton	04/30/15			Year 2 work underway.
Emerging Contaminants	Emerging Contaminants Workgroup Meeting	Meeting	Rebecca Sutton	04/30/15			Meeting date set for 4/30/15.
Emerging Contaminants	Update CEC Strategy Document	Final Report	Rebecca Sutton	08/31/15			
Emerging Contaminants	CEC Briefing for Water Board	Presentation	Rebecca Sutton	08/31/15			
Emerging Contaminants	Final Report on Alternative Flame Retardants Study	Final Report	Rebecca Sutton	12/31/15	06/30/15		Will give a talk on preliminary data at the Flame Retardant Dilemma symposium at UC Berkeley on 2/13.
Emerging Contaminants	Final Microplastics Manuscript	Manuscript	Ellen Willis-Norton	03/31/16			
Emerging Contaminants	Final Microplastics Fact Sheet	Fact Sheet	Ellen Willis-Norton	03/31/16			
Emerging Contaminants	Summary of Effluent Monitoring for CECs	Manuscript	Rebecca Sutton	03/31/16			Effluent sampling was completed in October 2014. Laboratories have provided data, which are undergoing QA/QC review. Fipronil and PFC data will be written up in separate manuscripts.
Exposure and Effects	Copper and the Olfactory Nerve Study	Final Report	Philip Trowbridge	12/31/14	12/31/13		NOAA has produced a draft final report which will be distributed to the TRC and external advisors for comments. The report has been delayed because the lab running the water samples had an equipment failure.
Exposure and Effects	2014 Q4 Update: Additional Milestones Completed, Problems Encountered, and Plans for Next Quarter.	Update	Philip Trowbridge	01/01/15		Complete	No EEWG meetings have been scheduled. It may not be necessary for this group to meet in 2015.
Exposure and Effects	Effects of Particle Size/Shape on Toxicity	Final Report	Philip Trowbridge	04/30/15	12/31/14		6-month no-cost extension granted to allow for a third experiment
Exposure and Effects	Exposure and Effects Workgroup Meeting	Meeting	Philip Trowbridge	05/31/15			The EEWG may not meet in 2015.
Exposure and Effects	Assessing the Impacts of Periodic Dredging on Benthic Habitat Quality	Final Report	Philip Trowbridge	12/01/16			Technical Assistance Agreement has been executed and research is underway.
Nutrients	Nutrients Conceptual Model and Scenario Building	Final Report	Dave Senn	09/30/14	12/31/12	Complete	
Nutrients	Nutrients Stormwater Sampling (WY 2013)	Final Report	Dave Senn	12/31/14	12/31/13	Complete	Report posted on sfbaynutrients.sfei.org
Nutrients	Detailed Nutrient Modeling Workplan	Final Report	Dave Senn	12/31/14	01/31/14	Complete	Report posted on sfbaynutrients.sfei.org
Nutrients	Moored Sensor Pilot Program	Final Report	Dave Senn	12/31/14	05/31/14	Complete	Report posted on sfbaynutrients.sfei.org
Nutrients	Algal Biotoxin Monitoring	Final Report	Dave Senn	12/31/14	05/31/14		Contract extended to allow for more sample analysis. Interim technical report posted to sfbaynutrients.sfei.org .

Focus Area	Primary	Deliverable	Assigned To	Due Date	Original Due Date	Status	Comments
Nutrients	2014 Q4 Update: Additional Milestones Completed, Problems Encountered, and Plans for Next Quarter.	Update	Dave Senn	01/01/15		Complete	No additional updates for 2014 Q4.
Nutrients	Nutrient Model Development	Progress Report	Dave Senn	06/30/15	12/31/14		This task is for actual model development. Due date extended to 6/30/15 to match Fiscal Year. A technical report summarizing progress will be completed at that time.
Nutrients	Nutrient Monitoring Program Development	Final Report	Dave Senn	06/30/15	12/31/14		Program Development Plan completed in June 2014. Report of the first year of results due by 6/30/15.
Nutrients	Nutrients Stormwater measurements (WY2014)	Final Report	Dave Senn	06/30/15	12/31/14		Report due date changed to allow for public release of data (expected Q1 2014)
Nutrients	Phase 1 Nutrient Modeling Data Quality Objectives Plan	Final Report	Dave Senn	06/30/15			
Nutrients	Moored Sensor Monitoring Program - Year 2	Final Report	Dave Senn	09/30/15	05/31/15		End date extended to 9/30/15 to allow for two full years of data collection. Year 2 of the moored sensor program will use partial funding from both 2014 and 2015 RMP budgets.
Nutrients	Nutrient Moored Sensor Program Year 2 Report	Final Report	Dave Senn	09/30/15			
Nutrients	Progress Report on Phase 1 Modeling	Progress Report	Dave Senn	06/30/16			
Nutrients	Nutrient Research TBD	TBD	Dave Senn	06/30/16			
PCB Strategy	2014 Q4 Update: Additional Milestones Completed, Problems Encountered, and Plans for Next Quarter.	Update	Jay Davis	01/01/15		Complete	Held a PCB Team meeting on January 8, 2015. Work on the 2015 special study will begin in Q1, with the initial focus on prioritizing the margin units.
PCB Strategy	PCB Margin Unit Prioritization Report	Final Report	Jay Davis	04/30/15			
PCB Strategy	PCB Strategy Team Meetings		Jay Davis	09/30/15			1 of 3 meetings held on 1/8/15.
PCB Strategy	PCB Priority Margin Unit Conceptual Model Report	Final Report	Jay Davis	02/26/16			
Program Management	RMP Charter Review	Charter Document	Philip Trowbridge	06/30/15			The draft charter document is on the agenda for the 1/29/15 SC meeting.
Selenium Strategy	2014 Q4 Update: Additional Milestones Completed, Problems Encountered, and Plans for Next Quarter.	Update	Jay Davis	01/01/15		Complete	No activities in Q4 because 2014 funds ran out. Coordination for Sturgeon Derby will occur in January.

Focus Area	Primary	Deliverable	Assigned To	Due Date	Original Due Date	Status	Comments
Selenium Strategy	Selenium in Fish Tissue Plugs CY2014 Report	Final Report	April Robinson	06/30/15			Conducted sturgeon muscle plug field sampling with CDFW in the fall of 2014. Sampling proved more difficult than anticipated due to low fish counts, difficulty in removing the tissue plugs from the fish, and small sample masses. Sampling methods were improved over the course of several days of fieldwork and through consultation with sturgeon researchers in Ohio. A total of 9 samples were collected, and preliminary dry weight calculations from USGS suggest 5 of these likely have enough mass to analyze for Se. Samples will be analyzed in early 2015 along with samples from the Delta Derby.
Selenium Strategy	Selenium Strategy Team Meeting		Jay Davis	06/30/15	03/31/15		RMP convened the Selenium Strategy Team for a teleconference on 1/14/15 to consider a proposal on sturgeon fin ray analysis and to coordinate field monitoring efforts.. The next meeting will be scheduled before 6/30/15.
Selenium Strategy	2015 Selenium Strategy Update	Final Strategy	Jay Davis	12/31/15			
Selenium Strategy	Selenium in Fish Tissue from 2015 Derby Report	Final Report	Jay Davis	02/26/16			Field sampling will be conducted 1/31/15 and 2/1/15. Scope of sampling has been expanded to include fin ray analyses.
Selenium Strategy	Selenium in Fish Tissue Plugs CY2015 Report	Final Report	Jay Davis	06/30/16			
Sources Pathways and Loadings	Develop and Update Spreadsheet Model - Year 5	Final Report	Lester McKee	12/31/14	09/30/14		Report is delayed due to staffing changes. A draft of the report is expected in March 2015.
Sources Pathways and Loadings	2014 Q4 Update: Additional Milestones Completed, Problems Encountered, and Plans for Next Quarter.	Update	Lester McKee	01/01/15		Complete	No additional 2014 Q4 updates.
Sources Pathways and Loadings	Load Monitoring in Representative Watersheds (WY2014)	Final Report	Lester McKee	02/26/15	12/31/14		Draft report delivered to BASMAA on 1/20/2015. Final report due end of Feb 2015
Sources Pathways and Loadings	Load Monitoring - EMC Development (2014)	Final Report	Lester McKee	02/28/15	12/31/14		Multi-year POC synthesis report. A draft is expected in February 2015.
Sources Pathways and Loadings	Collection of Stormwater Samples at 20 sites		Lester McKee	04/30/15			In progress. During the rainy period in early December, we were very successful and collected WQ samples from 12 locations. We currently have 26 sites on our list (attached) which puts us at about 46% complete for the season.
Sources Pathways and Loadings	Update Regional Watershed Model for PCB and Mercury	Updated Model	Lester McKee	05/29/15			
Sources Pathways and Loadings	Workplan for Regional Watershed Model CY15 Updates	Workplan	Lester McKee	05/29/15			
Sources Pathways and Loadings	Workplan for Stormwater Trends Strategy	Workplan	Lester McKee	05/29/15			
Sources Pathways and Loadings	Sources Pathways Loading Workgroup Meeting	Meeting	Lester McKee	05/31/15			Meeting Date TBD
Sources Pathways and Loadings	Stormwater Trends Strategy White Paper	Final Report	Lester McKee	10/30/15			

Focus Area	Primary	Deliverable	Assigned To	Due Date	Original Due Date	Status	Comments
Sources Pathways and Loadings	Regional Watershed Model Sensitivity Analysis and Documentation	Final Report	Lester McKee	03/31/16			
Sources Pathways and Loadings	POC Monitoring Report WY2015	Final Report	Lester McKee	06/30/16			
Sport Fish	Sport Fish Workgroup Meeting	Meeting	Jay Davis	09/30/15			Meeting Date TBD
Sport Fish	2014 Sportfish Monitoring Report	Final Report	Jay Davis	12/31/15			Data collected. Report will be written after data are received from labs.
Status and Trends	S&T Bird Egg Report (2006/2009/2012)	Final Report	Jay Davis	12/31/14	01/31/13		Report completed and distributed to TRC and Science Advisors in January 2015. Report will be finalized in February 2015.
Status and Trends	Updated Ambient Sediment Threshold Concentrations	Memo	Don Yee	12/31/14	01/31/14		Memo delayed due to staffing changes.
Status and Trends	Coring Manuscript	Manuscript	Don Yee	12/31/14	10/31/13		Waiting for comments from co-authors.
Status and Trends	H. Planning for Bay Margins Sediment Study	Monitoring Design	Don Yee	03/01/15			Revised monitoring plan presented to TRC on 12/10/14. The report will be updated for the 3/11/15 TRC meeting.
Status and Trends	Summary of RMP Design Changes	Final Report	Philip Trowbridge	03/31/15			
Status and Trends	Collection of Bird Egg Samples	Field Sampling	Philip Trowbridge	06/30/15			
Status and Trends	Manuscript on RMP Influence on Mgmt Decisions	Final Manuscript	Philip Trowbridge	06/30/15			Draft manuscript is due by March 2015.
Status and Trends	Collection of Water Samples	Field Sampling	Philip Trowbridge	08/31/15			
Status and Trends	I. Bay Margins Sediment Study	Field Sampling	Philip Trowbridge	08/31/15			
Status and Trends	Manuscript on RMP Fipronil Data	Final Manuscript	Ellen Willis-Norton	12/31/15			

Bay RMP Steering Committee Action Items

Key to Status Colors:

Green indicates greater than 90 days until the deliverable is due.

Yellow indicates a deliverable is due within 90 days.

Red indicates a deliverable that is overdue.

Focus Area	Primary	Assigned To	Due Date	Status	Comments
SC Action Items from 2011-06-07	2. Discuss developing a plan for monitoring after a catastrophic event to the Bay	Philip Trowbridge	09/30/11	Complete	On 1/29/15 SC Agenda
SC Action Items from 2014-05-06	6. Phil Trowbridge will come back to the SC in July with a more detailed margins sampling plan.	Philip Trowbridge	07/15/14	Complete	A more detailed margins sampling plan was presented to the TRC in December 2012.
SC Action Items from 2014-07-15	6. Phil Trowbridge will scope out the effort and role that the RMP (or SFEI) could play for catastrophic event monitoring	Philip Trowbridge	11/13/14	Complete	On 1/29/15 SC Agenda
SC Action Items from 2014-07-15	16. Phil Trowbridge will create a calendar of key stakeholder meetings that the RMP should attend each year.	Philip Trowbridge	11/13/14		RMP Stakeholder meetings will be part of the RMP communications calendar for 2015, which is still being developed.
SC Action Items from 2014-11-13	0. Update the Current and Anticipated Management Decisions, Policies and Actions table on page 6 of the draft MYP to reflect the feedback from the meeting.	Philip Trowbridge	01/29/15	Complete	
SC Action Items from 2014-11-13	2. Make the MYP available on the website more easily. Make sure stakeholders have the actual URL of the document and direct links to important documents.	Philip Trowbridge	01/29/15		Will incorporate the MYP into a more easily accessible site for program documents. Will distribute URL after plan is approved by SC.
SC Action Items from 2014-11-13	3. Have review comments in by December 15th - this is to be based on the current document, with the knowledge that there is cleanup that is in progress already	Reviewers	01/29/15	Complete	
SC Action Items from 2014-11-13	4. Incorporate edits on the MYP received at the 11/13/14 meeting and via email and produce a new version of the report for the January SC meeting.	Jay Davis	01/29/15	Complete	

Focus Area	Primary	Assigned To	Due Date	Status	Comments
SC Action Items from 2014-11-13	5. Update the RMP Special Studies 2013-2018 table on Page 13 to make it clearer that 2016-2018 numbers are estimates.	Philip Trowbridge	01/29/15	Complete	
SC Action Items from 2014-11-13	6. Amend tables on pages 13, 18 and 19 to reflect MYP discussion.	Philip Trowbridge	01/29/15	Complete	
SC Action Items from 2014-11-13	7. Add an item to the TRC agenda to discuss how to synthesize various PCB projects	Philip Trowbridge	01/29/15	Complete	The various PCB projects planned for 2015 were discussed at the 12/10/14 TRC meeting.
SC Action Items from 2014-11-13	10. Distribute the MYP Workshop meeting summary to the SC in January and ask for approval. Even though the SC does not include everyone who was present at the MYP workshop, the SC is the appropriate body to approve the summary.	Philip Trowbridge	01/29/15	Complete	On 1/29/15 SC Agenda
SC Action Items from 2014-11-13	11. Past meeting summaries are valuable and should be posted on the RMP website.	Philip Trowbridge	01/29/15		Will post past meeting summaries on the re-designed website after the 2015 MYP is approved.
SC Action Items from 2014-11-13	100. Confirm TRC minutes from 9/23/14. Double check who reported on the Charter Review (listed as Chris Sommers)	Philip Trowbridge	01/29/15	Complete	
SC Action Items from 2014-11-13	101. In section starting on page 20, clean up use of "unencumbered" vs. "undesignated"	Lawrence Leung	01/29/15	Complete	
SC Action Items from 2014-11-13	102. Develop consistent representation of \$200k reserve policy within the Undesignated fund. Add a note to the Balance Sheet that the RMP has a policy to maintain a \$200k minimum balance of the Undesignated Funds.	Lawrence Leung	01/29/15	Complete	
SC Action Items from 2014-11-13	103. Figure out where to appropriately account for the Caltrans money. They are contractually obligated to pay us. Are these funds additional revenue that goes directly into the Undesignated Fund?	Lawrence Leung	01/29/15	Complete	CalTrans funds are part of the 23.5% of fees allocated to stormwater agencies. The RMP receives the CalTrans funds later in the year, which is why they are tracked separately.

Focus Area	Primary	Assigned To	Due Date	Status	Comments
SC Action Items from 2014-11-13	104. Water Board staff will attend a meeting of the BACWA Permits Committee discuss whether water testing for CTR parameters is necessary.	Tom Mumley	01/29/15		This deliverable should be completed by the RB and BACWA before the next TRC meeting (3/11/15).
SC Action Items from 2014-11-13	105. Send out a proposal for the 2015 Pulse to SC via email.	Jay Davis	01/29/15	Complete	On 1/29/15 SC Agenda
SC Action Items from 2014-11-13	106. Add an item to the January SC agenda to discuss Set-Aside Funds, Monitoring Contingency, CalTrans payments, and Undesignated Funds. Clarify the rationale for having \$100k in S&T Monitoring Set-Aside Funds in 2023.	Philip Trowbridge	01/29/15	Complete	On 1/29/15 SC Agenda
SC Action Items from 2014-11-13	107. Schedule 2-3 meetings with the BPC, Water Board, and others regarding the algorithm for dredger fees. Schedule an initial planning meeting with BPC. Need a final answer by September 2015.	Philip Trowbridge	01/29/15	Complete	Phil Trowbridge met with BPC on 1/8/15 and developed a plan for meetings in 2015.
SC Action Items from 2014-11-13	108. Add an item to the January SC agenda to discuss whether both the Program Plan and the Detailed Workplan are needed. The 2015 Program Plan was not approved at the November 13, 2014 meeting.	Philip Trowbridge	01/29/15	Complete	On 1/29/15 SC Agenda
SC Action Items from 2014-11-13	109. Prepare a proposal for how to deal with the Cooling Water fees for the SC to consider in January 2015. The proposal put forward by NRG was reduce their fees from 4% to 1% of the RMP budget, retroactive to 2015.	Philip Trowbridge	01/29/15	Complete	On 1/29/15 SC Agenda
SC Action Items from 2014-11-13	110. Propose several options for the slate of 2015 SC meeting dates.	Philip Trowbridge	01/29/15	Complete	
SC Action Items from 2014-11-13	111. Work with NIST, Don Yee, Meg Sedlak, and Jay to complete the late deliverables by the end of the year (Broadscan report, Coring manuscript, PFC manuscript, and Bird Egg report, respectively).	Philip Trowbridge	01/29/15	Complete	3 of the 4 late deliverables were completed and sent out for review in January. The coring manuscript is still not complete because an external coauthor is non-responsive. All of these deliverables will continue to be tracked in the stoplight report.
SC Action Items from 2014-11-13	112. Check with Tom Mumley on completion of previous action items.	Philip Trowbridge	01/29/15	Complete	

Focus Area	Primary	Assigned To	Due Date	Status	Comments
SC Action Items from 2014-11-13	9. Track the adoption of CEC guidance by the State Water Board and determine if there will be any funding allocated to implementation.	Rebecca Sutton	04/30/15		The status of State guidance for CECs will be reported at the ECWG meeting on 4/30/15.
SC Action Items from 2014-11-13	8. Research the potential impacts of ocean acidification on the Bay and prepare a special study proposal for the TRC to consider.	Philip Trowbridge	05/31/15		RMP staff will prepare a proposal for the June TRC meeting.
SC Action Items from 2014-11-13	1. Produce a "frame of reference" document on where we are and where we are going with mercury and PCBs in the basin.	Tom Mumley	09/30/15		The RB has committed to producing this deliverable before the 2015 RMP Multi-Year Planning meeting (normally in October).