



AGENDA

RMP Steering Committee Meeting

July 15, 2014 10:00 AM – 3:00 PM

San Francisco Estuary Institute
First Floor Conference Room
4911 Central Avenue

Meeting Documents Available Online:
http://www.sfei.org/calendar_events/4471

Item / Time	Subject	Lead By
1 10:00	Introductions and Agenda for Meeting	Tom Mumley
2 10:05	Information: Committee Member Updates	Tom Mumley
3 10:15	Action: Approval of Summary from May 6, 2014 Steering Committee Meeting (Attachments)	Tom Mumley
4 10:25	Information: Summary of June 17, 2014 TRC Meeting (Attachment) Topics of discussion at the meeting included funding for 2015 special studies, modifications to S&T monitoring, and the RMP Annual Meeting.	Jay Davis
5 10:35	Decision: Update on 2014 RMP Budget and Budget Requests (Attachments) <ul style="list-style-type: none"> Cancel Year 2 of Mesohaline Benthic Index Study and re-program remaining funds (\$90,477) to Unencumbered Funds. Allocate \$23,000 from Unencumbered Funds for 2014 study of selenium in sturgeon. Allocate \$26,000 from Unencumbered Funds for analysis of sediments and seal tissue for PFCs. Adopt the State Fiscal Year for RMP budgets with details to be presented at the October SC meeting. Desired outcomes: Feedback on RMP Budget status Approval of budget requests	Phil Trowbridge
6 11:05	Decision: Proposed RMP S&T Monitoring Plan for 2014-2023 (Attachment) The plan reduces the number of sediment and bivalve stations and optimizes the target analyte lists to lower S&T monitoring costs. The TRC recommended approval on June 17, 2014. Desired outcomes: Approval of proposed plan Discussion of cost savings and establish subcommittee	Phil Trowbridge

Item / Time	Subject	Lead By
7 11:20	Decision: Funding for 2015 Special Studies The TRC has recommended a package of studies for 2015. (Attachments) Desired outcomes: Decision on whether to approve the TRC recommendation, or a process for reaching that decision	Jay Davis
12:00	Working Lunch	
8 12:15	Discussion: Multi-Year Plan: Mid-Year Check-In (Attachment) Desired outcomes: Feedback on agenda for the October Planning Workshop	Jay Davis
9 12:30	Discussion: RMP Fees for 2016-2018 RMP fees for 2016-2018 will need to be set by the SC in 2015. Desired outcomes: Agree on process for setting fees for 2016-2018	Tom Mumley
10 1:00	Decision: Communication Strategy – Revisited (Attachment) Continue discussion of the Communication Strategy that was initiated at the May SC meeting. Desired outcomes: Agreement on Communication Strategy goals and priorities Agreement on RMP communication elements in general Decision on whether to do a Pulse in 2015 and the topic Decision on lineup of topics for Estuary News	Jay Davis
11 2:30	Decision: Update on 2014 Annual Meeting and RMP Update (Attachment) Discussion of final details of Annual Meeting agenda, and update on development of the RMP Update. Desired outcomes: Approval of Annual Meeting agenda	Jay Davis
12 2:45	Information: Update on Workgroups and Scorecard (Attachments) Review of workgroup activity, action items, and deliverables.	Phil Trowbridge
13 2:55	Action: Set next meeting date and agenda topics Suggested dates: Monday, October 20 or November 3-7	Tom Mumley
14 3:00	Plus/Delta Continuous Improvement Feedback	Tom Mumley
	Meeting Adjourn	



LIST OF MEETING MATERIALS

RMP Steering Committee Meeting

July 15, 2014 10:00 AM – 3:00 PM

Item 3A: SC Meeting Summary (5/6/14)

Item 3B: Action Item Summary

Item 4: TRC Meeting Summary (6/17/14)

Item 5A: Budget Memo and Tables

Item 5B: Budget Requests

Item 5C: Memo regarding State Fiscal Year Accounting

Item 6: Table of Proposed RMP S&T Monitoring 2014-2023

Item 7: TRC Recommendations for Special Studies

Item 8A: Updated table of budgets for special studies from MYP

Item 8B: Final 2014 MYP with Organizational Chart

Item 8C: Agenda for October Planning Meeting (ready but hold to send with other item 8 documents)

Item 10: Communications Strategy

Item 11: Agenda for Annual meeting (hardcopy handout at meeting)

Item 12A: RMP Deliverables Scorecard

Item 12B: RMP Workgroup Updates

Technical Work Products:

- Poster: Sutton et al. Alternative Flame Retardants in San Francisco Bay
- Summary: Regional Monitoring Program Forum on Science to Support Management of Methylmercury in Restored Tidal Marshes (December 17, 2013)
- USGS Fact Sheet: Sediment Flux To And From Lower South San Francisco Bay (hardcopy handout at meeting)

Note: **Highlighted items** will be distributed by Friday, July 11, 2014.

**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****May 6th, 2014****San Francisco Estuary Institute****Draft Meeting Summary****Attendees:**

Tom Mumley*, SFBRWQCB
Jim Ervin (City of San Jose)
Adam Olivieri, Stormwater
(BASMAA/EOA Inc)
Karin North**, Medium POTWs (City of
Palo Alto)
Dan Tafolla, Small POTWs (Vallejo
Sanitation and Flood Control District)
Peter Carroll, Refineries (Tesoro Golden
Eagle Refinery)

Jay Davis (SFEI)
Jim Kelly (SFEI)
Meg Sedlak (SFEI)
Ellen Willis-Norton (SFEI)
Lawrence Leung (SFEI)
Tony Hale (SFEI)
David Senn (SFEI)
Dave Ceppos (Center for Collaborative
Policy)

I. Approval of Agenda and Minutes [Tom Mumley]

Tom Mumley questioned the need for such detailed meeting summaries, stating that it may be enough to include key discussion pieces and a clear statement of what was agreed upon. Peter Carroll agreed stating that the Se Strategy Team summary was an example of a too detailed summary. Meg Sedlak stated that she would edit the Se Strategy Team summary in both the TRC and SC summaries and send them to Tom for approval. Tom suggested that the level of detail for meeting summaries should be included as part of the RMP's program review. Adam Olivieri suggested that Ellen Willis-Norton write the meeting summary in the same way as in the past and Tom and Adam will subsequently edit it to the appropriate length to be posted on the website.

Items to Approve:

Adam Olivieri motioned to approve the previous SC meeting summary with edits to the Se Strategy Team summary; Karin seconded and the summary was unanimously approved.

II. Committee Member Updates [Group]

Adam Olivieri stated that the State's Contaminants of Emerging Concern (CEC) expert panel met to discuss filling data gaps. He mentioned that the RMP may be able to request funds from the State to fill CEC data gaps in the Bay.

III. Information: TRC Meeting Summary [Meg Sedlak]

Jay Davis provided the SC an update on the Selenium (Se) Strategy. The first Se Strategy Team meeting was held on April 22nd and had good participation and stakeholder representation. The focus of the Strategy will be on Se concentrations in sturgeon. Jay stated that the team recommended isotope analysis of the sturgeon muscle tissue to understand where the sturgeon are foraging. Tom noted that understanding the difference between North Bay and South Bay Se concentrations in sturgeon will be valuable for the TMDL's implementation.

The RMP's 2014 sport fish sampling effort will also collect muscle plugs as well as muscle fillets to develop a correlation between the concentrations. Once a relationship is established, the RMP can join the CA Department of Fish and Wildlife's sturgeon population sampling cruises and collect muscle plugs, increasing the sturgeon sample size. Ideally, sturgeon eggs will also be collected because they are the most sensitive to Se contamination; however, the team is unlikely to find gravid females. The Se Strategy Team stated they are interested in SFEI being the repository for Se data. The next Se Strategy Team meeting will be held on June 3.

IV. Action: Update on 2014 Budget [Lawrence Leung, Jen Hunt, Jay Davis]

Lawrence Leung stated that the Water Board had identified anew RMP participant, the Treasure Island Wastewater Treatment facility. Five invoices were sent to them for Water Year (WY) 2010 through 2014 and the funds will be added to the reserve. Treasure Island will be included in future years' POTWs starting in WY2015 and will contribute \$5,000 a year. Karin North noted that the Treasure Island facility is also becoming a BACWA member.

Lawrence stated that 87% of the participant fees have been received for 2014 and that all invoices will be sent out by May. The America's Cup mitigation fees that have been allocated to a 2014 special study evaluating benthic communities have also been received. Lawrence noted that there is \$12,000 in interest estimated for 2014, but only \$2,169 was received in Q1; therefore, the interest budget may need to be lower. Allied Defense Recycling (ADR) paid \$40,000 of their \$45,000 in fees. Therefore, the \$5,000 will be taken out of the dredger reserve. Tom Mumley noted that Dyan Whyte deserves the majority of the credit for ADR paying their fees.

Lawrence requested an extension of the 2013 labor budget from June 2014 to September 2014. Meg Sedlak stated that the additional time will be used to complete work associated with nutrient studies, modeling efforts, the mesohaline study, and bioanalytical tools study. Tom noted that the SC has still not decided if the second year of the study to develop benthic indices for the mesohaline environment will be funded. Meg agreed, stating that the second year of the mesohaline study is earmarked at \$90,000, but the SC can decide in July whether they would rather put the \$90,000 back into the RMP reserve.

Lawrence stated that SFEI is changing from a calendar year to the State's fiscal year in July 2014. Tom Mumley asked if the RMP should also consider moving to the fiscal year. Meg replied that she would like to reflect and check-in during the July SC meeting.

Items for Approval:

Adam Olivieri motioned to approve the extension of the 2013 labor budget to September 2014. Karin North seconded the motion and the extension was unanimously approved. Karin North motioned to approve additional funding for Selenium in sportfish work for 2014, which will cost \$10,680. Adam seconded the motion and the additional funding was unanimously approved.

The third item for approval was reallocate the remaining 2013 and 2014 funds that were dedicated to developing Event Mean Concentration (EMC) for watershed models. The unexpended funds would be used to synthesize monitoring information collected to date. Meg stated that the Small Tributaries Loading Strategy team strongly supported the reallocation. The team is only requesting \$58,000 of the \$90,000 available for EMC development; the remaining funds will enter the reserve. Adam and Tom agreed that the remaining funds should not enter the reserve, but remain as unencumbered funds within the project. Adam motioned to approve the reallocation, Dan Tafolla seconded, and the reallocation was unanimously approved.

Action Items:

1. Meg Sedlak will add a check-in about the RMP switching to a fiscal year at the July SC meeting.

V. Decision: Communications Strategy – Part II [Jay Davis]

RMP Communications Strategy

Tom Mumley stated that he thought the purpose of the agenda item was to outline the RMP's communication strategy and how the communications portfolio achieves the strategy. Tom added that the communication products should match the mission and goals of the RMP. Karin North noted that the RMP's communications strategy should fit into SFEI's communication strategy.

Tony Hale stated that SFEI has contracted a communications consultant, the Kos-Read Group, to 1) increase funding, 2) encourage effective policy, and 3) increase recognition of SFEI. The official communications plan, which will have embedded in it a communications strategy, will be rolled-out this May. To start addressing SFEI's communications goals staff are creating an institutional one-pager that details what SFEI does; the SFEI webpage is changing; and a quarterly newsletter that features the RMP will be created. Karin North asked the cost of the consultant; Tony responded the Kos-Read Group is under a \$15,000 contract with the Institute.

Tom Mumley stated that the RMP communications strategy should be focused on informing people who have an interest in Water Board decisions. He stated that it was unclear what use informing the general public was and stated that it would require considerable funding. Jay replied that the RMP has had discussions on who they are trying to reach, primarily RMP participants.

RMP One-Pager

Karin stated that it would be useful to develop a one-pager about the RMP to give to new staff members from agencies that are RMP participants. Tom stated that the one-pager should make clear that dischargers would need to individually monitor their receiving waters without the RMP, which costs more money than contributing to the RMP. Peter Carroll thought that the one-pager should focus on different aspects of the RMP depending on the type of participant it is given to. Karin and Adam Olivieri agreed that a standard one-pager would be sufficient.

Current RMP Communication Products

Jay Davis quickly ran through the RMP's current communications products including:

1. Pulse
2. Estuary News articles
3. RMP Web Site
4. RMP Update
5. Technical Reports
6. Journal Publications
7. Annual Meeting
8. Email Updates NEW
9. SFEI Newsletter NEW
10. Social Media NEW
11. Annual Monitoring Results
12. Invited Presentations
13. Workshops
14. Fact Sheets
15. Seminars/Webinars
16. Estuary Portal
17. State of the Estuary Report

Jay stated that The Pulse of the Bay is the central part of the RMP's communication strategy. Jay stated that the RMP Update will be turned into an e-book this year and if successful the same will be done with the Pulse. Tom asked that Jay revisit pursuing a 2015 Pulse of the Bay at the July SC meeting since a State of the Bay report may be produced simultaneously.

Jay stated that the next round of the Estuary Newsletter is coming out in June. He proposed that the article focus on the Small Tributaries Integrated Report. Tom stated that he was concerned about being able to gather the material in time; Jay replied that RMP staff outline the article, but the SFEP staff writes the article and conducts the interviews. Adam stated that he would provide Jay with names of people to interview for the article. Jay suggested that the themes for each quarterly newsletter be recycled (e.g., every September the article would be about PCBs). The schedule would be as follows:

1. June – Small Tributaries Loading
2. September – PCBs
3. December – CECs
4. March – Nutrients

Meg stated that other studies might be interesting to highlight in the Newsletter, such as Copper and the Olfactory Nerve in Salmon. Tom also liked the idea of having Copper as the issue for the September article; the SC agreed that Copper instead of PCBs should be the focus of the article.

Jay stated that the RMP web site is also being updated, including the Contaminant Data Display & Download page, with funding from the State Board. Jay noted that he will continue his presentation of RMP communication products at the next SC meeting and will also provide the SC with a draft communications strategy. Karin and Peter Carroll volunteered to help Jay with the strategy.

RMP Update E-Book

Tony Hale reviewed plans for turning the RMP Update into an e-book. The benefits of an e-book are that documents/information external to the Update can be linked to pages within the e-book, pages within the e-book itself can be linked, and analytics for what people are reading will be available. Additionally, the data can be disaggregated in interactive graphics allowing the reader to interact with the data in new ways. The software is open source and works on any browser that uses html5. Tony noted that a regular pdf version will also be available

The total cost of the e-book is \$50,000. The cost of building the infrastructure is \$15,000, the interactive design costs \$6,000, the interactive maps and charts cost \$8,000 each, video footage to add to the e-book would cost \$10,000, and social media promotion would be \$3,000. Creating the first e-book would cost more than subsequent e-books. Karin noted that with the creation of an e-book the cost of the RMP Update would be similar to that of the Pulse of the Bay. Tony replied that the video portion of the e-book could be removed. Adam asked if the printing costs could be cut by reducing the number of hard copies. Jay replied that fewer copies are printed for the Update (versus the Pulse) and that there is a relative steep printing set up fee and that the cost to order additional copies is not particularly large.

Tom stated that the videos would not impact management decisions. Jay and Jim Ervin replied that it may get more managers to look at the documents or inform stakeholders who don't know about the sampling process. Meg Sedlak added that it may interest the public. Tom stated that he finds adding more interactive charts as a better way to spend the funds than a video. However, he agreed with Jay and Karin that the video could be a pilot to see whether the graphs or the video was more popular.

Tom stated that the funds would have to be taken from the reserve, but he thinks the e-book is a worthwhile investment because it may make a big impact in how the RMP communicates. Meg asked Tony if he could have the e-book ready by the Annual Meeting if the graphics are sent to him in advance; Tony replied affirmatively.

Items to Approve:

Karin North motioned to approve the creation of the e-book, Jim Ervin seconded, and the e-book for the RMP update was unanimously approved.

Action Items:

2. Jay Davis will revisit pursuing a 2015 Pulse of the Bay at the July SC meeting.

3. Adam Olivieri will send Jay Davis names of people to interview for the Small Tributaries Integrated Report article in the Estuary Newsletter.
4. Jay Davis, Karin North, and Peter Carroll will draft a RMP Communications Strategy before the July SC meeting.
5. Jay Davis will email the SC the SurveyMonkey results from the RMP Annual Meeting.

VI. Decision: Optimizing S&T and Request for Funding Margins Planning [Meg Sedlak]

Optimizing S&T

Meg Sedlak stated that the goals for the agenda item were to confirm changes to the S&T program and decide whether to include margins sampling. In water, copper and cyanide will still be sampled biennially because they have site specific objectives. Selenium will also be sampled because of the upcoming TMDL as well as MeHg and ancillary parameters. Every eight years PCBs, PAHs, Pesticides, and total Hg will be sampled. PBDEs will no longer be analyzed in water.

In sediment, the number of sites is dropping from 47 to 27 in the dry season. Sediment would be sampled on a four-year rather than two-year cycle. Every four years, MeHg, toxicity, PBDEs, and ancillary parameter will be measured. Every eight years PAHs, PCBs, Hg, other metals, Se/As, pesticides, and benthos will be measured. Meg noted that she needs to confirm with Brian Anderson and Beth Christian that sampling PAHs, PCBs, and Hg on an eight-year cycle is acceptable. Tom asked why PBDEs and toxicity would be sampled more frequently. Meg replied that the RMP wanted to sample toxicity every four years to sample during both the dry and wet season and that the RMP wanted to catch the decline in PBDEs. Tom and Meg agreed that MeHg and Hg should be sampled together.

The revised S&T includes reducing the number of bivalve stations from 11 to six. Every two years PAHs and PBDEs will be sampled. Every four years PCBs will be sampled to continue to monitor the concentration decline. Legacy pesticides and metals will no longer be sampled in bivalves. The RMP is still deciding how often to include CEC and Se sampling.

Margins Sampling

Meg Sedlak noted that margins sampling is being considered in parallel with changes to the S&T program. The recommendation from the TRC was to monitor the margins biennially at 20 sites starting in 2015. The RMP is requesting \$20,000 from the reserve to begin planning for margins sampling.

Tom Mumley stated that the TRC did not make a formal recommendation to monitor 20 sites biennially. The group decided that sampling should at least consider 20 sites biennially, but wanted to consider sampling more sites and/or more frequently. Meg replied that she will come back to the SC in July with a more detailed margins sampling plan. Tom noted that the margins area is larger than the one in the map Meg presented because the RMP cannot reach some of the stations that are included in the current sampling plan. Jay stated that the RMP can map areas that they have not been able to sample.

After reviewing the MOU, Peter Carroll asked if the RMP is fulfilling its mission of running a baseline program of monitoring trace substances in the Bay. Tom replied affirmatively, the new S&T program does not violate the RMP's MOU. Now that the RMP has learned about the Bay proper, it is time to begin understanding the concentrations in the Bay margins.

Items to Approve:

Jim Ervin motioned to approve moving \$20,000 from the reserve to being margins sampling planning and to reduce the number of sediment stations from 47 to 27 in the dry season, Dan Tafolla seconded and the motion was unanimously approved.

Action Items:

6. Meg Sedlak will come back to the SC in July with a more detailed margins sampling plan.
7. RMP staff will map stations that they have had to skip sampling during the current S&T program.

VII. Action Program review [Dave Ceppos]

Before the Program Review (Ceppos) presentation, Jim Ervin asked if the RMP will need to evolve and begin to look directly at beneficial uses of the Bay (e.g., simple presence/absence of fish and other species). Meg Sedlak replied that the RMP works with partners who evaluate biological condition in the estuary such as CDFW and USGS. Tom Mumley replied that the RMP has typically been contaminant-focused and thinks that looking at other indicators of Bay health may be beyond the current scope of the program. However, Tom stated that Jim's point was valid and the RMP should begin thinking about how it will evolve. Tom stated that the work on nutrients has made the RMP think about and understand the entire Bay ecosystem.

Meg began the discussion on the MOU by stating that when Jim Kelly came on board in January, he found that there were discrepancies between what the RMP MOU said the RMP was doing and what it actually was accomplishing. The MOU is has not been significantly revised since 1996 and much has changed. Every two years, the MOU signing page is revised and signed by the Executive Officer of the Water Board and the Executive Director of the Institute. The RMP is currently in the process of having the signing page signed. As such, it seems like an appropriate time to take a detailed look at the MOU and determine what new information needs to be included. Meg reminded the SC that \$125,000 has been set aside for program review and that these funds could be tapped for revision of the MOU and development of foundational documents. Dave Ceppos, Center for Collaborative Policy (CCP) at the California State University Sacramento, presented a proposal to complete a \$38,000 RMP program review. Tom noted that the goal of the program review was to generate clear foundational documents for the RMP.

Dave Ceppos stated that the program review will be an opportunity to check on the status and management of the RMP in a confidential manner. RMP stakeholders will be asked about the RMP's strengths and weaknesses. Based on the information obtained during the interviews Dave and his team will develop recommendations for the RMP. He noted that he is sensitive to the fact that the RMP is an established program that is successful and will not develop a governance tool

that shifts the group's tone. Dave added that he has staff that specializes in water quality that will be assigned to the RMP.

Discussion:

Peter Carroll noted that Dave Ceppos' proposal includes preparing a draft charter and asked if that is necessary. Dave responded that it is up to the RMP; the charter will lay out a more defined structure and will help answer questions like who is a member, what happens if a member is not attending, or how to replace a member. Tom added that the charter could be a package of documents that would likely be revised at some future point to reflect changes in the program. Dave indicated that the type of product depends on the objective of the program review.

Tom stated that it would be useful to document how the RMP has done business and reflect on how it could be done better. He noted that the program review will also need to include reviewing SFEI's role in context of the RMP since the RMP is a fundamental reason the Institute exists. As SFEI grows, the funds allocated to the RMP have not changed.

Peter asked how detailed the minutes of the various meetings have to be; Dave replied that Peter's question was a legal counsel question, but he stated that an elected body can hold a closed door session with minimal minutes and maybe the RMP could agree to something similar.

Karin North asked if Dave will also look at RMP workgroups; Dave replied that he will not look at them in detail. Adam Olivieri noted that workgroups are an essential part of the program that help decide what special studies move forward to the SC. Adam replied that interviewing 20 RMP participants should cover the SC, TRC, and the workgroups and strategy teams. Tom stated that direct participants, Institute staff, other participating stakeholders (e.g., USEPA and nonprofits such as Baykeeper), and the science advisors should be included in the interviews.

Dave responded that he can address the workgroups, but it may increase the cost of the program review. Tom stated that he was in support of allocating more funds to the review if there is value in digging deeper. He noted that it would be useful to review who is leading the workgroups since the scientists are often running the workgroup and bringing content forward. Tom stated that the RMP's response to a former science advisor's critique of the workgroups would be a useful document to share with Dave since it explains how the workgroups conduct their business.

Jay Davis stated that even though many procedures aren't documented, the RMP does follow specific procedures. He stated that he will write down and share the RMP procedures with Dave. He will also share the names of the SC, TRC, and workgroup and strategy team members. Jay was unsure he could complete the tasks by the next SC meeting. Jim Kelly said he could start it with Phil Trowbridge, the new RMP Program Manager, and give it to Jay to review. Meg suggested that Jim Kelly sit on a committee with Tom and Jay to help move the program review forward because Jim has the unique experience of having been a stakeholder for 15 years and now is the Institute's Interim Executive Director.

The SC agreed to move forward with the program review and approved of the scope of work Dave provided. He noted that the scope of work can change during the process with the SC's approval. Karin North suggested that the three-person committee could allocate \$50,000 to the

program review without needing the SC's approval, as long as SFEI and the Water Board approved of the allocation.

Items to Approve:

Karin North motioned to approve the ability of the RMP to allocate \$50,000 to the program review without coming back to the SC, Peter Carroll seconded the motion, and the motion was unanimously approved.

Action Items:

8. Jim Kelly and Phil Trowbridge will write down and share the RMP procedures with Jay Davis.

VIII. Update on Annual Meeting 2014 and "Pulse Lite" [Jay Davis]

RMP Annual Meeting

The RMP Annual Meeting will have four sections:

1. *Status and Trends*: Barbara Baginska will present on Selenium, Jay Davis on PCBs, and Don Yee on the revised S&T program.
2. *Small Tributary Loads*: Chris Sommers will present on the integrated stormwater monitoring report, Lester Mckee or Alicia Gilbreath will present on the STLS strategy Phase 2, and Jing Wu or Lester will present on green infrastructure.
3. *Nutrients*: Dave Senn will provide a nutrient strategy update, Raph Kudela will present on algal toxins, and Emily Novick on moored sensor work
4. *Contaminants of Emerging Concern*: Becky Sutton will provide a CEC strategy update, Nancy Denslow will present on Bioanalytical tool development, and Ellen Willis-Norton on Fipronil.

Jay Davis stated that other potential talks include Anthony Malkassian presenting on historical nutrient data, Jim Cloern talking about phytoplankton assemblages in the Bay, Dan Schlenk providing a broader discussion on bioanalytical tools, or a Keith Maruya discussing the statewide CEC plan.

Discussion:

Tom Mumley asked why there wasn't a keynote speaker. Jay responded that without a keynote there was more time available for each section. Peter Carroll asked if there was much more information to present about the Small Tributaries Loading Strategy (STLS) or if the update at the last RMP Annual Meeting was sufficient. Jay stated that the talk would focus on Phase 2 of the STLS work. Karin North suggested that Richard Looker lead the Small Tributary Loads Discussion if Chris Sommers is a presenter.

Jim Ervin thought that green infrastructure did not fit in with the Small Tributary Loads section. Tom and Peter said that green infrastructure directly affects loadings to the Bay; Adam Olivieri added that if flow is minimized or eliminated then loads to the Bay are reduced. Adam supported having Matt Fabry present on green infrastructure.

Tom asked if there was enough data to report on the moored sensor work. Karin stated that the Dumbarton sensor has been out in the Bay for eight months. Jay stated that the moored sensor work could be included in Dave's presentation about the nutrient strategy and Anthony could talk about historic data monitoring and associated assessment framework.

Tom asked why Fipronil was being highlighted; he suggested a talk on current use pesticides and highlighting Fipronil as a pesticide of concern. Tom also noted that he did not support a talk on the statewide CEC plan. The group agreed that Dave Senn and Naomi Feger could work together and decide on which speakers they would like to invite.

IX. Deliverables Update [Dave Senn, Meg Sedlak]

Nutrients Update

Moored Sensor

Dave Senn informed the SC that the moored sensor is running at the Dumbarton Bridge and the data correlates with the USGS data. He noted that a summary of year one results is due in May, but another update was accidentally scheduled for June 2014. Only one update will be generated and Dave asked if in the future the SC would like a six month or annual progress report. Jim Ervin stated that an annual update was adequate. Adam Olivieri asked if the materials used to brief BACWA could also be used to brief the RMP. Dave noted that now that the Nutrient SC has formed, moored sensor updates will no longer be sent through BACWA. Karin North suggested that the updates be sent to both the RMP SC and the Nutrient SC.

Modeling

Dave stated that the proposed collaboration with USGS on hydrodynamic and bloom models will begin in June 2014 alongside water quality modeling. Dave noted that, at the nutrient modeling workplan meeting, the focus was translating the science/management questions into modeling relevant questions. From there, a workplan can be developed. The major components of the workplan include 1) proceeding with the Deltares suite of models, 2) partnering with USGS to develop the base hydrodynamic model and basic biological model, and 3) the RMP will focus on the simple water quality models to have ready for the completion of the hydrodynamic model.

The nutrient modeling budget is current \$270,000 for water quality modeling, \$100,000 for the USGS collaboration, \$65,000 for technical collaborators, and \$65,000 for the Deltares models and support. The RMP has provided \$400,000 to date, but funding will be shifting to the Nutrient SC.

Stormwater Technical Report

The final stormwater technical report is near completion and should be released by the end of May.

PCB Conceptual Model

Tom Mumley noted that the original due date of the PCB Conceptual Model Report was March 2012. The report is a critical project that needs to be completed. Jay Davis stated that it took a long time to receive comments and he has been booked since the comments came in. He is going

to try to finalize the report by early June. Adam Olivieri asked Jay to pick a date when the final draft will be received, give the group two weeks to review, and then finalize.

Action Items:

9. Jay Davis will send Adam Olivieri and Tom Mumley the date when the final PCB Conceptual Model draft will be completed.

X. Set next meeting date and Agenda topics [Thomas Mumley]

Meg Sedlak is taking a leave of absence after 10 years working with the RMP. Phil Trowbridge from the New Hampshire Department of the Environment Services and Piscataqua Region Estuaries Partnership will serve as the new RMP Program Manager. He will start full-time on June 23rd.

Karin North suggested increasing the meeting time from 9:30-3:30 pm so the meeting ends on time. The next SC meeting will be held on July 15, 2014.



Item 3: SC Action Items Updated: Wednesday, July 09, 2014

Action Items - May 2014

#	Action Item	Who?	When?	Status
1	Phil Trowbridge will add a check-in about the RMP switching to a fiscal year at the July SC meeting.	Phil Trowbridge		On agenda for 7/15/14 SC Meeting.
2	Jay Davis will revisit pursuing a 2015 Pulse of the Bay at the July SC meeting.	Jay Davis		On agenda for 7/15/14 SC Meeting.
3	Adam Olivieri will send Jay Davis names of people to interview for the Small Tributaries Integrated Report article in the Estuary Newsletter.	Adam Olivieri		
4	Jay Davis, Karin North, and Peter Carroll will draft a RMP Communications Strategy before the July SC meeting.	Jay Davis		Completed.
5	Jay Davis will email the SC the SurveyMonkey results from the RMP Annual Meeting	Jay Davis		On agenda for 7/15/14 SC Meeting.
6	Phil Trowbridge will come back to the SC in July with a more detailed margins sampling plan.	Phil Trowbridge		Deferred to October 2014 SC meeting
7	RMP staff will map stations that they have had to skip sampling during the current S&T program.	Don Yee		Deferred to October 2014 SC meeting
8	Jim Kelly and Phil Trowbridge will write down and share the RMP procedures with Jay Davis.	Phil Trowbridge		Task will be completed as part of RMP Charter development.
9	Jay Davis will send Adam Olivieri and Tom Mumley the date when the final PCB Conceptual Model draft will be completed.	Jay Davis		The final report will be completed by the end of July 2014.

Item 3: SC Action Items

Updated: Wednesday, July 09, 2014

Action Items - January 2014

#	Action Item	Who?	When?	Status
4	Jim Kelly will inform the Board that the RMP has a process for reviewing documents and deciding whether to publish peer-reviewed articles.	Jim Kelly		Task will be completed as part of RMP Charter development.
5	Jay Davis will update the RMP organizational chart and the special studies budget table in the 2014 Multi-Year Plan.	Jay Davis		On agenda for 7/15/14 SC meeting.

Action Items - October 2013

#	Action Item	Who?	When?	Status
2	Tom Mumley, Rebecca Sutton and Phil Trowbridge will write a one to two page summary of CEC management actions to distribute to various agencies	Phil Trowbridge		The scope of this task has been defined. Need to determine deadline, audience, and funding.
5	Phil Trowbridge will consider splitting the program management task into multiple line items.	Phil Trowbridge		This task will be addressed in the 2015 RMP Budget workshop in October 2014.

Action Items - January 2013

#	Action Item	Who?	When?	Status
1	Phil Trowbridge will keep Tom informed about the annual meetings with stakeholder groups.	Phil Trowbridge		On-going. Will hold meetings with BACWA, BASMAA, dredgers, refineries, and other partners before October 2014 Planning Workshop.
10	Tom Mumley will consider talking with congressional delegation or a senior USGS manager about the importance of USGS continuing the monitoring program.	Tom Mumley		In progress

Item 3: SC Action Items Updated: Wednesday, July 09, 2014

Action Items - October 2012

#	Action Item	Who?	When?	Status
7	Arrange a meeting with USGS, including Jim Cloern, EPA and RMP to discuss proposed increases in RMP contribution to USGS monthly monitoring	Jay Davis		This task will be addressed as part of the 2015 RMP Budget Workshop in October 2014.

Action Items - January 2012

#	Action Item	Who?	When?	Status
3	Keep the SC up to date regarding the status of projects pertaining to permit requirements	Phil Trowbridge	ongoing	On-going

Action Items - June 2011

#	Action Item	Who?	When?	Status
2	Discuss developing a plan for monitoring after a catastrophic event to the Bay	Phil Trowbridge	September 2011 TRC meeting	Clarifications on the scope, deadline, and budget for this task are needed.



RMP
Technical Review Committee
June 17th, 2014
San Francisco Estuary Institute
DRAFT Meeting Summary

Attendees

Bridgette DeShields, Integral, Inc.
 Karen Taberski, SFRWQCB
 Ian Wren, San Francisco Baykeeper
 Eric Dunlavey, City of San Jose
 Nirmela Arsem, EBMUD
 Rod Miller, SFPUC
 Mike Connor, EBDA
 Brian Ross, EPA
 Chris Sommers, EOA, Inc. (BASMAA)
 Amy Chastain, AECOM/ SFPUC

Jay Davis, SFEI
 Don Yee, SFEI
 Ellen Willis-Norton, SFEI
 Rebecca Sutton, SFEI
 Alicia Gilbreath, SFEI
 David Senn, SFEI

Call-In

Phil Trowbridge, SFEI

I. Introductions

Bridgette DeShields wondered if it would be worthwhile designating alternates for TRC meetings. Chris Sommers added that it may be useful to designate TRC members as workgroup chairs. Jay replied that the RMP is contracting with David Ceppos, Center for Collaborative Policy (CCP), to create foundational documents that detail RMP meeting procedures.

II. Action: Mesohaline Year 2 Funding [Jay Davis]

Jay Davis noted that in 2012 funding was allocated for a two-year study that would develop a benthic index for the San Francisco Bay mesohaline environment. Phase I of the study was completed in 2013 and the proposal for Phase II (\$106,000) was sent to the TRC. Karen Taberski stated that the study is no longer a near-term priority for the Water Board and noted that Naomi Feger, Tom Mumley, and she agreed that the second year of the study should not be funded in 2015, though it might be re-considered at a later time. Chris Sommers agreed with Karen's recommendation and stated that we would like a full account of how the Phase I money was spent and how much money was left over. Chris stated that the study should be brought back as a potential special study for 2016.

Action Items:

1. Phil Trowbridge will inform Chris Sommers how much money was left over from Phase I of the mesohaline work.

III. Action: Recommendation for Special Studies for 2015 [Group]

Bridgette DeShields noted that many TRC members would like to take the special study proposals to their respective agencies; therefore, the decision on what studies to recommend was not made during the meeting. Chris Sommers stated that he would prefer to receive the special study proposals at least two weeks before the meeting and would like a short paragraph from each workgroup on how the particular studies were developed, reviewed, and chosen. Jay Davis suggested telling the workgroups a specific date after which special studies will not be considered by the TRC. Additionally, Chris would like each study to have a distinct RMP deliverable. He was concerned that if the RMP is only funding a portion of the study it will be difficult to determine how the money is spent and when the work is completed.

Emerging Contaminants Workgroup Studies

1. *CEC Monitoring in Effluents (Sutton) (\$55,000)*
2. *Monitoring CUPs in Napa River/ North Bay (Willis-Norton) (\$55,000)*
3. *Monitoring Microplastics (Willis-Norton) (\$9,000)*

Rebecca Sutton stated that all of the special studies on emerging contaminants were vetted by the ECWG science advisors. The ECWG did not list their priorities between the three studies. Bridgette DeShields stated that her number one priority is CEC monitoring in effluents (Study #1).

Chris Sommers listed monitoring Current Use Pesticides in the Napa River as a moderate or high priority. Karen Taberski stated that the study could be deferred until 2016.

Ian Wren commented that it may be better to conduct sampling after a storm event for the microplastics study. Chris Sommers added that Chelsea Rockman at UC Davis is planning on sampling microplastics in the Bay/Delta region. He suggested contacting her and seeing if there is a possibility for collaboration. Chris also suggested that Ellen Willis-Norton list what the goals of the study are and determine if microplastic monitoring will become a long-term RMP effort. Eric Dunlavey supported microplastic monitoring because of the current lack of information and the low cost.

Sources, Pathways, and Loadings Workgroup Studies

4. *Small tributaries storm water wet weather characterization (McKee) (\$415,000)*
5. *Regional watershed spreadsheet model (RWSM) year 5 (McKee) (\$35,000)*
6. *Watershed loadings trends support (McKee) (\$35,000)*
7. *Small tributaries loading strategy (STLS) coordination support (McKee) (\$26,000)*

Jay Davis stated that the SPLWG met at the end of May and included participation of the workgroup's science advisors. At the meeting the members discussed changing the direction of the small tributary work and emphasizing examining a greater number of watersheds less frequently. The SPLWG members added that the group should also focus on source control options. Chris Sommers stated that reaching more watersheds will give the group a general idea of PCB and Hg sources; the study will help determine what types of old industrial land are associated with high PCB concentrations. The funds for study

#4 (Small tributaries stormwater wet weather characterization) will be used to reach as many watersheds as possible for sampling during the wet weather season.

Chris stated that the next step for the RWSM (study #5) is re-parameterizing the model. Study #6 (Watershed loadings trends support) was proposed because of a comment Barbara Mahler made during the workgroup meeting. Finally, STLS coordination support (study #6) is an ongoing program management cost. Chris noted that the information obtained from the four proposed SPLWG studies will inform the next five year permit term.

Chris and Alicia Gilbreath noted that if any cost reductions were necessary, it would have to come out of study #4 (Small tributaries storm water wet weather characterization), for which \$415,000 is requested. The number of sites sampled would be reduced. Alicia noted that approximately 20 sites could be sampled with \$415,000. Alicia added that labor costs will be reduced in the future because this year they are testing the accuracy of passive samplers, which will also facilitate future sampling at sites that are in confined spaces. Chris noted that the first flush is not as important to catch at the sites because the focus is no longer on loads.

Mike Connor asked how many high priority PCB and Hg sites exist in the Bay Area and if they all could be identified; Chris responded hundreds. But, there are thousands of land parcels that may be associated with PCBs. So far, BASMAA has collected dirt samples from approximately 700-800 sites that can help identify potential drainage sites. Chris stated that the goal is to implement source control at the identified sites. Bridgette DeShields stated that the study can be linked to future margins sampling work. Chris agreed and then noted that the study design will be re-worked if the first year is not successful.

Amy Chastain asked if the study will generate information for contaminants other than PCBs; Chris stated that Hg concentrations will also be analyzed. Dave Senn asked if there was a risk associated with focusing on just PCBs and Hg. He suggested thinking about a longer-term stormwater management strategy for other contaminants. Chris commented that the strategy is based on complying with the permit requirements.

Nutrient Studies

8. Nutrient Modeling (Senn and Yee) (\$100,000)

9. Moored sensor program continuation (Senn and Novick) (\$300,000)

10. Nutrient science program coordination (Senn and Novick) (\$20,000)

11. Monitoring program development (Senn and Novick) (\$50,000)

11.5. Conceptual Model Update (Senn and Novick) (\$30,000)

Dave Senn began the discussion by stating that the Nutrient SC is working on providing a level of oversight on Nutrient Studies that the RMP is comfortable with. In the five year plan the Nutrient SC put together, it stated that the focus of RMP studies would be modeling and moored sensor work. However, Dave noted that the RMP can discuss shifting priorities. Chris Sommers asked how long moored sensor work would be funded

by the RMP. Dave responded that moored sensor work cannot be fully funded by the RMP over the long-term; the RMP was charged with purchasing the infrastructure, setting up the database, and subsequently routine data analysis. The USGS may be able to incorporate moored sensors into future budgets. Dave noted that the coordination task (study #10) ensures that there are funds available to manage projects and provide updates to the RMP.

Ian Wren suggested allocating a lump sum to Nutrient studies and allowing Dave and the Nutrient Steering Committee to decide how to spend the money. Chris disagreed with Ian, stating that he wanted to ensure that each study had a distinct RMP deliverable and was concerned with the RMP only funding a portion of a study. Dave responded that he was following the RMP SC's instructions to set-up an umbrella Nutrient organization where funding was shared between entities.

12. SQO Analysis of Pacific Dry Dock (Willis-Norton) (\$45,000)

Karen Taberski stated that Pacific Dry Dock is a 303(d) listed site that was cleaned up in 1998 and the SFBRWQCB would like to conduct SQO sampling to determine if it can be removed from the 303(d) list. She noted that the study is the only Exposure and Effects Workgroup study and it was originally a 2014 special study that was deferred. Bridgette DeShields and Mike Connor commented that the study does not have any direct management ties and could be deferred another year.

13. Dioxin Synthesis (Yee) (\$40,000)

Chris Sommers and Karen Taberski agreed that the dioxin synthesis could be deferred to 2016.

Selenium Strategy Studies

14. Selenium in White Sturgeon Muscle Plugs (Davis) (2014)

15. South Bay Selenium Synthesis (Davis) (\$20,000)

16. Selenium Data Compilation and Literature Review (Davis) (\$10,000)

Mike Connor and Bridgette DeShields agreed that the Selenium studies were of high priority because they will inform the implementation of the Selenium TMDL.

Jay Davis stated that the Selenium Strategy team also suggested a 2014 study that would be funded by the RMP unencumbered funds (\$23,000). The proposal includes collecting plug samples during California Department of Fish and Wildlife's sturgeon population sampling in the Fall. The goal of the study is to increase the sample size of sturgeon collected for Se analyses. The TRC agreed to recommend the 2014 plug sampling proposal to the SC for funding.

17. PCBs: Priority Margin Unit Conceptual Model Development and Monitoring (Davis) (\$100,000)

Jay Davis stated that the PCB Strategy team met recently and included the Contaminant Fate Workgroup science advisor Frank Gobas. The group agreed to recommend a study proposal to the TRC that included carefully selecting a priority margin unit or units (potentially where management action is already planned upstream) and conducting a conceptual modeling and mass balance exercise to determine if the management action in the watershed would be expected to lead to changes in concentrations in the margin unit. The budget for prioritizing the margin units is \$30,000 and the budget for developing the conceptual and mass balance models is \$60,000, which is anticipated to cover one or two margin units. The Team also recommended allocating \$10,000 for strategy development and planning for 2016.

Chris Sommers suggested engaging stormwater agencies and city staff in developing these models. He added that it would be useful to pick a margin unit that was on a municipality's radar screen. He added that it would be useful to choose a margin unit associated with a relatively small watershed. Chris supported the study because it connects load allocations with Water Board targets. Chris and Rod Miller noted that 2015 stormwater sampling could occur upstream of the priority margin unit.

Amy Chastain noted that she would like to see in writing how the planned S&T margin sampling is connected to the proposed PCB margin conceptual model work.

Final Discussion

Mike Connor suggested allocating an equivalent lump sum to Nutrients and SPLWG for 2015 studies, meaning that SPLWG studies should for now be allocated \$500,000 instead of \$511,000. The TRC agreed to defer study # 2 (Monitoring CUPs in Napa River/ North Bay), study # 12 (SQO Analysis of Pacific Dry Dock), and study # 13 (Dioxin Synthesis) to 2016 or later. The TRC agreed to set up a call or communicate via email to decide whether to use \$76,000 from the reserve to fund the remaining studies or to reduce the funding for the PCB, Nutrient, or SPLWG work.

Action Items:

2. Jay Davis will send out an email to begin the discussion on whether to use \$76,000 from the reserve to fund the remaining special studies or to reduce the funding for the PCB, Nutrient, or SPLWG work.
3. Jay will provide an explanation to the TRC of how the planned S&T margin sampling is connected to the proposed PCB margin conceptual model.

IV. Approval of Agenda and Minutes [Bridgette DeShields]

Karen Taberski motioned to approve the previous TRC summary, Eric Dunlavey seconded, and the motion was unanimously approved. Mike Connor suggested that one person (Ellen Willis-Norton) send out all emails related to the TRC to make it easier to find emails.

V. Information: Steering Committee Report [Jay Davis]

Jay Davis provided the SC report to the TRC and noted that several SC members were interested in having shorter meeting summaries. TRC members agreed that they thought the length of the TRC summaries was appropriate. The RMP communications strategy was discussed during the meeting and is an agenda item for the next SC meeting. The SC agreed that it would be valuable to have a one page description of the RMP to provide to stakeholders.

The SC agreed to fund the collection of muscle plugs during the RMP sport fish collection effort. The SC also agreed to approve funding to turn the RMP Update into an e-book. The SC committed funds from the RMP Review Reserve to fund program-level work by Dave Ceppos from the Center for Collaborative Policy.

The SC also approved \$20,000 for margins sampling planning. Jay stated that at the quarter three TRC meeting a draft margins plan will be presented and TRC members will need to decide if they will recommend the plan to the SC.

VI. Action: Changes to S&T Monitoring [Jay Davis and Don Yee]*Water*

Jay Davis asked the TRC if PCBs, PAHs, pesticides, and toxicity should be sampled in water every 8 or 10 years. California Toxics Rule (CTR) pollutants are sampled every 10 years at three sites and the next round of sampling will occur in 2015. Mike Connor stated that it would be useful to conduct PCB, PAH, and pesticide sampling with the CTR pollutants so he supported a 10 year cycle. However, the EPA supports toxicity testing and Karen Taberski and Mike agreed that water toxicity should be tested biennially.

Sediment

Jay stated that the largest amount of savings will be from reducing the frequency and number of sediment sites sampled. The RMP has not yet decided if PCBs, PAHs, Hg, MeHg, and toxicity should be sampled on a 4 or 8 year cycle. Brian Ross stated that RMP sediment data are important for dredging operations; the data are used to calculate threshold concentrations of contaminants in dredged sediment. If the concentrations exceed the thresholds, the sediment cannot be discharged into the Bay. Additionally, the RMP data are used to calculate bioaccumulation triggers. If dredged sediment is below the bioaccumulation trigger, the dredger saves thousands of dollars because they do not have to conduct toxicity testing. He was concerned that the dredging community and the National Marine Fisheries Service would not be supportive of only sampling every 8 years. However, as long as the concentrations are stable, he thinks the dredging community would be okay with sampling every 4 years. Brian noted that he would prefer that all of the RMP sediment analytes, including metals, are sampled every four years alongside toxicity. The TRC agreed with Brian that the analytes should be sampled on a 4 year cycle.

Margins

SFEI's GIS shop is completing their analysis of the bathymetry and will send the information to a statistician, Don Stevens. The full list of sites will be determined by August and sent to the TRC in September. Don confirmed that the margins and open Bay results will be kept in separate databases.

VII. Action: Re-Analyzing Sediment Samples [Don Yee]

Don Yee reminded the TRC that EBMUD changed their drying procedures for organics in 2007. Therefore, the 2004-2006 numbers were lower by a factor of two or more compared to the 2002-2003 and 2007-2012 concentrations. Don recommended not reanalyzing the 2004-2006 samples because the RMP is moving to a 4 year sampling cycle anyways. Therefore, the 2004-2006 organics data will not be available on the Contaminant Data, Display, and Download tool. The TRC agreed that the three 2005 samples that were reanalyzed should be reported.

VIII. Discussion: RMP Update and RMP Annual Meeting [Jay Davis]

Jay Davis stated that the text of the RMP Update will be sent out by the end of June and will ask the TRC to review the text within one week.

Jay stated that the RMP Annual Meeting agenda is coming together and that the one session that still needs to be finalized is Nutrients, which Naomi Feger and David Senn will discuss. Mike Connor and Amy Chastain agreed that a talk about the Lower South Bay Synthesis report would be more interesting than a talk on the Nutrient Strategy.

Amy asked about the status of the green infrastructure projects SFPUC and SFEI were working on. Mike said that Rosie Jencks at SFPUC would be a good person to ask about the status and could also speak at the Annual Meeting. Mike also suggested shortening the S&T discussion portion and adding time to the talks about small tributaries loading and green infrastructure. Amy asked if the Municipal Regional Stormwater Permit (MRP) could be a talk at the Annual Meeting since it is being reissued next summer. Jay said that he would ask if BASMAA is ready to give a talk about the MRP.

Mike suggested that Adam Olivieri moderate the stormwater section of the Annual Meeting. Amy suggested that Karin North moderate the CEC section.

Action Items:

4. Jay Davis will ask if BASMAA is ready to give a talk about the MRP at the RMP Annual Meeting.
5. Jay Davis will inform Dave Senn that the TRC would rather hear a talk about the Lower South Bay Synthesis report than a talk on the Nutrient Strategy.

IX. Information: Update on Workgroups and Scorecard [Jay Davis]

Jay Davis went over the workgroup updates. He noted that PBDE manuscript is almost complete and that Rebecca Sutton will send the TRC the draft with a deadline for

comments. Meg Sedlak will draft the PFCs in Bay Biota manuscript by the end of August. The 2012 bird egg report has been combined with the 2006/2009 bird egg report and a draft will be completed by September.

The Selenium Strategy Team is considering looking at sturgeon movement in the Bay and putting all Se data into a centralized data database, and will start on this work with 2014 funds allocated for Strategy development. Mike Connor noted that Tetra Tech has recently completed work on Se; Bridgette DeShields replied that she will send the Selenium Strategy team a copy of their report. The PCB Strategy Team is beginning to plan the margin unit study. Jay added that the PCB Synthesis report will be completed by the end of June and sent to the team for final review.

Nutrients Updates [Dave Senn]

Dave Senn stated that the nutrient technical team has met twice now; he noted that future meetings will be planned farther in advance. The Nutrient SC will meet in September.

Dave informed the TRC that the majority of the nutrient modeling budget will be used to hire a water quality modeler. The rest will be used for the USGS and CASCade partnership, working with Deltares, and for the technical advisors. Mike Connor asked how many years it will take to develop the model and about the overall budget. Dave responded that it will take between 5 to 10 years to complete the model and will cost approximately \$500,000 a year. If all the nutrient work related to the modeling (e.g., nutrient sampling) is included, it will cost approximately \$2 million a year. Karen Taberski asked about the status of USGS water quality monitoring. Dave responded that the USGS assured him that they are doing everything they can to ensure the program will continue. They have asked the Nutrient SC to partner with them to purchase a research vessel, which they will subsequently staff.

Dave then informed the TRC of the status of algal toxin sampling with SPATT bags. Raph Kudela's lab at UC Santa Cruz has been running the study. They have not spent the funds the RMP allocated, but did complete the analysis for the 2013 samples. They are asking for a no-cost extension to complete a more substantial data analysis, analyze the 2014 SPATT results, and write a report. Raph is also planning to measure algal toxin concentrations in RMP mussel samples.

Karen stated that she thought the focus would be on increasing the accuracy of the estimation of toxin concentrations in water through lab studies. Dave responded that he will ask Raphe to focus on increasing the accuracy, but that the portioning rate makes it difficult to determine the actual concentration. The TRC was supportive of a no-cost extension for the algal toxin study and asked that the draft report be completed by March 2015.

Dave finished his presentation by stating that the stormwater project will be complete by July and will include two years of data. An interesting result was that there was a lot of organic nitrogen in the stormwater samples.

Action Items:

6. Rebecca Sutton will send the TRC the draft PBDE manuscript with a deadline for comments.
7. Bridgette DeShields will send the Selenium Strategy team a copy of the Tetra Tech Se report.
8. Dave Senn will ask Raphe Kudela to focus on increasing the accuracy of estimates of water concentrations from the SPATT bag algal toxin concentrations, as indicated in the original proposal.

X. Action: Set date for next meeting and Plus/Delta [Bridgette DeShields]

The next TRC meeting will be held on Tuesday, September 23 at SFEI.



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July 8, 2014

Item 5, Attachment 1

MEMORANDUM

To: RMP Steering Committee
From: Phil Trowbridge and Lawrence Leung
Re: Updated Summary of RMP Budget (Years 2011 to 2014) – period ending 5/31/14

This information represents the status of the budget to the best of our knowledge at this time and has been reviewed by Jay Davis (RMP Lead Scientist).

RMP 2014

Requests: Interest income received to date has been less than originally budgeted in January (\$4,000 budgeted vs \$2,325 actual over 4 months); therefore, RMP staff request the annual interest estimate in the 2014 budget be revised downward from \$12,000 to \$7,000 to reflect this decrease in revenue. RMP staff do not anticipate any issues with this shortfall because the total 2014 expenses are budgeted to be \$15,036 less than total revenue.

Updates: None

Revenue:

- **Participant Fees:** Approximately 95% of the participant fees have been received (i.e., \$3,100,868 out of \$3,253,375).
 - **Dredger Shortfall:** \$97,614 shortfall this year. Funding from the Dredger reserve was used to cover this shortfall (see below).
 - **Outstanding Participant Fees:**
 - Quarterly fees for EBDA and Tesoro (approximately total \$69,000).
 - CalTrans. Caltrans will be invoiced \$79,000 upon completion of the RMP Update in October.

Other revenue

- \$100,000 received from the America's Cup mitigation funds (Port of San Francisco). This funds were applied to RMP 2014 USGS Benthic Recovery special study.
- \$12,000 interest in 2014 – received \$2,325 through April 30, 2014. Expected annual interest is \$7,000. RMP staff request the annual interest estimate in the budget be revised downward from \$12,000 to \$7,000 (see above).
- **Previously allocated funds for this year:**

- **Approved set-aside/ carryover funds (i.e., \$625,811):**
 - \$260,700 from 2010-2012 for Sport Fish (set aside)
 - \$147,536 from 2012-2013 for stormwater monitoring (carryover as a result of dry years – see memo 10/15/2013)
 - \$92,500 from 2013 for sediment chemistry (set aside)
 - \$41,000 from 2013 for S&T fieldwork (set aside)
 - \$24,754 from 2013 for nutrients (carryover – see memo 1/28/2014)
 - \$22,500 from 2013 for bivalves (set aside)
 - \$36,821 from 2005-2009 for program review
- **Approved funds from reserve used this year (i.e., \$299,904):**
 - \$121,610 from unencumbered reserve
 - \$97,614 from dredger reserve for dredger shortfall
 - \$50,000 for e-book
 - \$10,680 for additional sport fish analyses
 - \$20,000 for margins planning

Expenditures to Date:

- **Labor:** Expended 35% of the labor budget (i.e., \$680,228 of \$1,929,761) after 5 months (42% of year). RMP labor will be billed at a higher expenditure rate in Q2 and Q3 as a result of S&T field work, production of the RMP Update and e-book, preparation for the RMP annual meeting, nutrient work, and margins planning.
- **Subcontractors:** Expended 34% of the subcontractor budget (i.e., \$624,948 out of \$1,856,868) after 5 months (42% of year). RMP staff have prepared and are executing contracts for field and laboratory work in support of the 2014 S&T sampling for sediment and bivalves totaling \$133,986. Additional contracts will be prepared for S&T sport fish sampling and special studies.
- **Direct Costs:** Expended 24% of the direct cost budget (i.e., \$80,184 out of \$328,326) after 5 months (42% of year). RMP staff expect direct costs to increase in Q2-Q4 due to production costs for RMP Update, RMP Annual Meeting, and field sampling.

RMP 2013

Requests: None

Updates: None

Labor:

- The remaining balance of 2013 labor funds (\$31,148) will support RMP staff as they conduct modeling of nutrients, process data from continuous sensors deployed in the Bay, and develop conceptual models for nutrients. All remaining 2013 funds are expected to be used by the end of the calendar year.

3 UPDATED SUMMARY OF RMP BUDGET (YEARS 2011 TO 2014)

Subcontractors:

- The remaining balance of 2013 subcontract funds is \$236,878. For approximately \$13,000 of these contract funds, the work has been completed but final invoices have not been received. There are open contracts for \$65,606 of services, primarily for nutrient algal biotoxin research. This work is underway and a progress report has been received. Finally, \$158,099 of funds have been allocated to pending contracts that will be executed later this calendar year for sample archiving, nutrient modeling, nutrient sampling, and Year 2 of the development of mesohaline benthic indices (if approved).

RMP 2012

Requests: None

Updates: None

Labor:

- The remaining balance of 2012 labor funds (\$24,019) will support RMP staff as they prepare a report on perfluorinated compounds in the Bay and develop models for nutrients. All remaining 2012 funds are expected to be used by the end of the calendar year.

Subcontractors:

- The remaining balance of 2012 subcontract funds (\$54,677) is for two contracts. One contract is for the development of mesohaline benthic indices (partial funding for Year 2 of the study, if approved). The other contract is for nutrient-related modeling.

RMP 2011

Requests: None

Subcontractors:

- The only open contract is associated with nutrient model development. The \$5,569 balance is slated to be completed by the end of September as approved in a prior meeting.

STATUS OF THE RMP RESERVE

The SC has a goal to maintain its unencumbered reserve at \$200,000 to allow for response to unanticipated funding needs or revenue shortfalls. Any remaining unallocated funding (unencumbered funds) is available for spending at the discretion of the SC. The figures exclude the dredger reserve.

4 UPDATED SUMMARY OF RMP BUDGET (YEARS 2011 TO 2014)

Description	Surplus Amount
Unencumbered Reserve	\$200,000
Unencumbered Funds (May 2014)	\$527,215

STATUS OF THE DREDGER RESERVE

The Dredger Reserve thru 5/31/14 is \$87,834. The following table presents the dredger surplus/shortfall by year. As presented above, \$97,617 was approved to cover a dredger shortfall in 2014.

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

Item 5, Attachment 2

Steering Committee RMP Budget Summary as of 5/31/14

Budget and Current Expenses						
Year	Budget Item	Approved Budget \$	Expended \$	Balance \$	Expended %	Funds to be Expended by
2014	Labor	1,929,761	680,228	1,249,533	35%	
	SubContracts	1,856,868	624,948	1,231,920	34%	
	Direct Costs	328,326	80,184	248,142	24%	
	Set-asides	161,100	0	161,100	0%	
	2014 Total	4,276,055	1,385,361	2,890,694	32%	
2013	Labor	164,280	133,132	31,148	81%	12/31/2014
	Subcontracts	309,777	72,899	236,878	24%	6/30/2015
2012	Labor	50,394	26,375	24,019	52%	12/31/2014
	Subcontracts	84,407	29,730	54,677	35%	12/31/2014
2011	Subcontracts	6,535	966	5,569	15%	9/30/2014
Prior Years Work-to-Complete Total		615,393	263,102	352,291	43%	
Unencumbered Funds, Reserve, and Contingency as of reporting date						
	Item	\$	Notes			
	Total Available Cash	1,250,278				
	Dredger Surplus	(87,834)				
	Annual Contingency	(50,000)				
	2005-2009 Program Review Carryover Funds	(88,179)	TBD; \$37K approved withdrawal last period			
	'13-'14 Water Chemistry Carryover Funds	(110,700)	TBD			
	'13-14 Tern Monitoring Carryover Funds	(50,625)	TBD			
	'13-14 Cormorant Monitoring Carryover Funds	(50,625)	TBD			
	2013 Sediment Benthos Carryover Funds	(30,900)	TBD			
	2013 Sediment Toxicity Carryover Funds	(25,750)	TBD			
	2014 S&T Data Mgmt Carryover Funds	(15,000)	TBD			
	2014 NIST Archive 2014/2015	(8,750)	2015			
	'13-14 Aquatic Toxicity Carryover Funds	(4,700)	TBD			
	Unencumbered Funds	727,215				
	Minus Program Reserve Goal	200,000				
	Unencumbered Funds	527,215				
			Anticipated Collections by			
Plus Accounts Receivables & Interest:						
2014	EBDA	54,639	7/15/2014			
	Tesoro	14,377	7/15/2014			
	Paradise Cay Yacht Harbor	4,744	6/19/2014			
	Caltrans	78,748	11/30/2014			
2012	Glen Cove Marina	1,680	7/15/2014	Negotiated \$1K/mthly payments		
'10-11	Treasure Island (U.S. Navy)	10,000	7/31/2014	Discharge volumes still needed for '10-'11		
Unencumbered Funds after Collections		538,895				

2012 RMP

Task	Budget	Remaining	Work to be Completed	Unencumbered	Rationale
3. STATUS & TRENDS MONITORING					
3.3 S&T Bird Egg	\$20,000	-\$1,011	\$0	\$0	Data QA nearly complete. Report underway.
4. SPECIAL STUDIES					
4.3 ECWG: Monitoring PFCs in Bay Biota	\$46,390	\$23,385	\$23,385	\$0	All data reviewed. Outline developed. Report underway.
4.10 CFWG Modeling	\$60,000	\$634	\$634	\$0	Draft model development plan prepared.
	\$126,390	\$23,009	\$24,019	\$0	
Totals:		Remaining	Work to be Completed	Unencumbered	

2013 RMP

Task	Budget	Remaining	Work to be Completed	Unencumbered	Rationale
1. PROGRAM MANAGEMENT					
1.1 Internal Coordination (PM)	\$351,000				
1.2 External Coordination	\$26,000				
1.3 Contract&Financial Management	\$165,000	\$8,650	\$0	\$8,650	CLOSED
1.4 Program Planning	\$12,000				
2. INFORMATION MANAGEMENT & SYNTHESIS					
2.1 Data Management	\$135,000	-\$29	\$0	-\$29	CLOSED
2.2 RMP Web Site	\$5,000	-\$8,728	\$0	-\$8,728	CLOSED
2.3 Information Dissemination	\$136,000	\$2,282	\$0	\$2,282	CLOSED
2.4 Annual Reporting - Pulse of the Estuary	\$99,000	-\$30,393	\$0	-\$30,393	CLOSED. Pulse over due to multiple articles, graphic design, and development of coding for figures
2.4 Annual Reporting - Ann.Mon.Results 2013	\$40,000	\$19,566	\$0	\$19,565	CLOSED
2.5 QA/QC	\$28,500	-\$189	\$0	-\$189	CLOSED
3. STATUS & TRENDS MONITORING					
3.6 S&T Data Management	\$164,800	\$0	\$0	\$0	CLOSED.
3.2 Fieldwork & Logistics	\$42,000	\$4,122	\$0	\$4,122	CLOSED
4. SPECIAL STUDIES					
4.1 EC: PBDE Summary Report	\$36,050	-\$156	\$0	\$0	CLOSED. Manuscript nearly complete.
4.2 EC: Updating RMP EC Strategy	\$20,600	-\$26	\$0	-\$26	CLOSED
4.3 EC: Current Use Pesticide Focus Meeting	\$15,450	\$4,456	\$0	\$4,456	CLOSED. Ranked pesticides and presented to TRC/ECWG.
4.6 CF: Shared Modeling Proposal	\$30,000	\$26,634	\$26,634	\$0	Tactical plan developed. Will use these funds for model planning and implementation.
4.7 STLS: Stormwater Loads Monitoring in Rep. Watershe	\$152,000	\$33,441	\$0	\$0	CLOSED; \$33,467 carried over into 2014 budget, approved by SC 10/15/13
4.8 STLS: Develop and Update Spreadsheet Model - Year	\$25,000	\$15	\$0	\$15	CLOSED
4.9 STLS: Land use/ Source specific EMC	\$80,000	-\$145	\$0	\$0	CLOSED
4.10 STLS: Management support	\$20,000	\$15	\$0	\$15	CLOSED
4.11 Nutrients: Program Management	\$20,000	\$84	\$0	\$84	CLOSED
4.12 Nutrients: Moored Sensor Monitoring Program	\$105,000	\$4,019	\$4,019	\$0	3 sensors in place. Reviewing data.
4.14 Nutrients: Stormwater measurements	\$20,000	\$25	\$0	\$25	CLOSED
4.15 Nutrients: Nutrient Loads and Data Gaps	\$30,000	-\$206	\$0	-\$206	CLOSED
4.16 Nutrients: Completing Conceptual Model	\$45,000	\$494	\$494	\$0	Draft report prepared. Remaining funds will be used in July 2014.
	\$1,803,400	\$63,933	\$31,148	-\$356	
Totals:		Remaining	Work to be Completed	Unencumbered	

Project Year	Cont #	Contractor	Project Title	Description	Amount	Billed	Balance	Project Mgr	Start Date	Expire Date	Type of Agency	Signed	Contract Status
2011	949	Sea Engineering	PSSS Bay Margins Model	Consulting on model development	\$ 17,000	\$ 11,431.00	\$ 5,569.00	Phil Trowbridge	8/1/2011	9/30/2014	Private	x	Open
TOTAL					\$ 17,000.00	\$ 11,431.00	\$ 5,569.00						
2012	1026	SJSURF	S&T SJSURF	Analysis of samples	\$ 34,593	\$ 34,593.00	\$ -	Phil Trowbridge	6/15/2012	8/1/2014	University	x	CLOSED
2012	1038	SCCWRP	PSSS Benthic Tools	Development of a benthic index	\$ 50,000	\$ 35,323.00	\$ 14,677.00	Phil Trowbridge	8/15/2012	4/30/2013	JPA	x	Open
2012	1046	TBD	PSSS Modeling	Consulting on model implementation	\$ 40,000	\$ -	\$ 40,000.00	Phil Trowbridge					pending
TOTAL					\$ 124,593.00	\$ 69,916.00	\$ 54,677.00						
2013	1043	EBMUD	POC Nutrients		\$ 340	\$ -	\$ 340.00	Emily Novick	9/15/2012	6/1/2014	Contract	x	Open
2013	1051	UCSC	PSSS Nutrients Algal Biotoxins		\$ 65,000	\$ -	\$ 65,000.00	Phil Trowbridge	1/1/2013	4/30/2015	Contract	x	Open
2013	1052	SCCWRP	PSSS Bioanalytical Tools		\$ 22,000	\$ 22,000.00	\$ -	Phil Trowbridge	3/1/2013	6/1/2014	Contract	x	Open
2013	1053	UF	PSSS Bioanalytical Tools		\$ 48,000	\$ 38,592.02	\$ 9,407.98	Phil Trowbridge	3/1/2013	6/30/2014	Contract	x	Open
2013	1060	CCCSD	S&T Cyanide		\$ 2,675	\$ -	\$ 2,675.00	Phil Trowbridge	7/15/2013	4/1/2014		x	Open
2013	1077	NIST	Sampling Refrigeration		\$ 17,500	\$ -	\$ 17,500.00	Phil Trowbridge					pending
2013	10xx	TBD	PSSS Modeling		\$ 63,000	\$ -	\$ 63,000.00	Phil Trowbridge					pending
2013	10xx	SCCWRP	PSSS Mesohaline		\$ 75,800	\$ -	\$ 75,800.00	Phil Trowbridge					pending
2013	10xx	TBD	PSSS Nutrients SW		\$ 1,799	\$ -	\$ 1,799.00	Phil Trowbridge					pending
2013	PO2027	HDR	PSSS Shared Modeling Proposal		\$ 4,750	\$ 4,144.20	\$ 605.80	Phil Trowbridge	1/1/2013	6/1/2014	PO	x	Open
2013	PO2029	KLI	PSSS Nutrients SW Measurements		\$ 1,000	\$ 250.00	\$ 750.00	Phil Trowbridge	10/1/2012	6/1/2014	PO	x	Open
TOTAL					\$ 301,864.00	\$ 64,986.22	\$ 236,877.78						



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July 8, 2014

To: Steering Committee

From: Philip Trowbridge, Meg Sedlak, and Jay Davis

Re: Request for Unencumbered Funds and Cancellation of Mesohaline Year II Task

REQUESTED ACTIONS

1. Cancel Year 2 of the Mesohaline Benthic Index Study and add the remaining funds previously allocated to this study (\$90,477) to Unencumbered Funds. *(Recommended by TRC on June 17, 2014)*
2. Allocate \$26,000 from Unencumbered Funds for analysis of sediments and seal tissue for perfluorinated compounds (PFCs). *(TRC/SC approved modification of S&T elements and analysis of sediment for PFCs was included in recommended action.)*
3. Allocate \$23,000 from Unencumbered Funds for a study of selenium in sturgeon tissue. *(Recommended by TRC on June 17, 2014)*

FISCAL SITUATION

Unencumbered Funds Balance: \$527,215 (as of 5/31/14)

Due to the reduction in sediment and bivalve sites and analyses this year, we currently are projecting at least \$100,000 savings relative to the 2014 Status and Trends (S&T) monitoring budget approved in January of this year. These savings will likely be added to Unencumbered Funds in January 2015 after the 2014 expenses are finalized.

EXPLANATION

Development of Benthic Community Condition Indices for Mesohaline Environments of the San Francisco Bay

The objective of this study is to develop an assessment tool for the mesohaline portions of the Bay. The Southern California Coastal Water Research Project (SCCWRP) is the contractor. The study was originally authorized as a two-year study with a total cost of \$125,800 (\$35,323 for Year 1, \$90,477 for Year 2). Year 2 funding was contingent upon adequate progress (as deemed by the Exposure and Effects Work Group (EEWG) and the RMP Program Manager) and would be authorized through a second contract.

Year 1 of the study is complete and a report has been submitted to the RMP. During discussion of the Year 1 results with the RMP EEWG and interested stakeholders, concerns were raised about the complexity and heterogeneity of the mesohaline portions of the San Francisco Bay. In light of these concerns, the RMP EEWG has suggested to focus the development of a mesohaline index on a smaller area such as the South Bay sub-habitat of the mesohaline San Francisco Bay. Upon successful demonstration of an assessment tool that works in this sub-habitat, its applicability to the other mesohaline habitats could be investigated. As such, the objective of Year 2 of this project will be to develop and calibrate an assessment tool for the evaluation of benthic habitat condition in the mesohaline South Bay sub-habitat of the San Francisco Bay.

The cost for Year 1 of the study was \$35,323; the Year I report summarizing the work has been circulated to EEWG and TRC for comment. For Year 2, an additional \$90,477 of the study was set aside from 2012 and 2013 RMP funds. SCCWRP has requested an additional \$15,702 for Year 2, which would bring the total Year 2 request to \$106,179. If this task were approved, the SC would need to authorize a request of \$15,702 from RMP unencumbered funds.

At its meeting on June 17, 2014, the TRC did not recommend that Year 2 of the study be funded. The research topic is not a priority for the RMP. However, the study should be brought up as a potential special study for 2016.

Perfluorinated Compounds Study

In June, the RMP collected serum samples from harbor seals for the RMP Alternative Flame Retardant 2014 special study; at that time, additional serum sample was collected for pro bono metabolomics analyses and for possible future perfluorinated compounds (PFC) analyses. In August, the RMP will be sampling Bay sediment as part of S&T. The objective of this work is to analyze the sediment and harbor seal samples for PFCs.

There are several compelling reasons to conduct PFC analyses. First, perfluorooctane sulfonate (PFOS), a PFC compound widely observed in biota, was classified as a Tier III compound of moderate concern as a result of elevated concentrations observed in Bay birds and seals. Based on the RMP strategy for Emerging Contaminants, Tier III compounds are recommended for consideration for S&T monitoring and/or special studies. Because PFC precursors can degrade to PFOS, the Emerging Contaminant Work Group recommended that both sediments and effluent

be monitored for PFCs and their precursors. A proposal for a 2015 special study monitoring PFC/precursors in effluent is being considered by the TRC. Monitoring sediment would enhance our understanding of the current reservoir of PFCs and precursors in the Bay and possible pathways to the Bay.

The cost to conduct laboratory analyses of PFCs at 27 sediment sites and precursors at 10 sediment sites is approximately \$22,000. Precursors will be tested at a reduced number of sites in part due to the cost of the analyses which is approximately double the standard PFC analyses. Monitoring of precursors of PFOS and perfluorooctanoic acid (PFOA) are important, as research to date on a limited number of Bay samples suggests that precursors can in some instances be found at concentrations higher than the terminal degradation products, PFOS and PFOA.

Lastly, as part of the 2014 Alternative Flame Retardant special study, the RMP was able to collect seal serum from 10 seals located in the South Bay in June of 2014. Serum samples were archived for PFC analyses. The estimated cost to analyze these samples is approximately \$4,000. To date, seal serum samples from the South Bay have had some of the highest PFC concentrations observed worldwide. The last seal sampling event was 2011.

Results of the PFC projects to date were summarized in the 2013 Pulse and presented at the State of the Estuary/ RMP Annual Meeting. The TRC/SC approved the monitoring of PFC in sediments as part of the revision of the S&T element.

Selenium in Sturgeon Muscle Plugs Study

In April 2014 the RMP formed a Selenium Strategy Team to evaluate information needs that can be addressed by the Program in the next several years. The charge given to the Team by the RMP Steering Committee was to focus on low-cost, near-term monitoring elements that could provide information that provides high value in support of policy development and decision-making. A TMDL for the North Bay is in development by the Regional Water Board, with a staff report in preparation.

The TMDL will establish a target concentration in white sturgeon muscle tissue as the basis for evaluating impairment. White sturgeon is a bottom-feeding species that is considered to be at substantial risk for selenium exposure in the Bay (Beckon and Mauer 2008). White sturgeon are particularly at risk because their diet consists primarily of the overbite clam (*Potamocorbula amurensis*), which are selenium-rich relative to other prey (Stewart et al. 2004). Other increased risk factors for sturgeon include their longevity (they can live over 100 years), their year-round resident status, and long egg maturation times (several years) (Beckon and Mauer 2008). Green sturgeon are also considered to be vulnerable to selenium but their exposure could be limited. Adults and sub-adults spend a large portion of their lives in coastal marine waters outside of the estuary, and are only briefly exposed to high selenium diet during their infrequent spawning migrations through the Bay. In addition, green sturgeon are a threatened species and fishing for them is prohibited.

White sturgeon have been routinely sampled (in 1997, 2000, 2003, 2006, 2009, and 2014) by the RMP sport fish S&T monitoring element since 1997. However, the number of fish collected in each round of sampling has been small (12 fish per round), and the collections are currently

being performed on a five year cycle. The upper end of the distribution of concentrations measured in North Bay sturgeon exceed the target under consideration for the TMDL, but this determination is based on a relatively small number of samples. Identifying a means to obtain a larger number of white sturgeon muscle samples on a more frequent basis has been identified as a high priority by the Selenium Strategy Team, both to obtain a more precise understanding of impairment and to track inter-annual trends.

In the 2009 RMP sport fish sampling, an effort began to establish a nonlethal and efficient method of collecting sturgeon muscle through the use of plugs. Concentrations in plugs were found to correlate well with concentrations in muscle fillets for the 12 fish sampled. Another round of evaluation of this correlation will occur with the 12 sturgeon to be collected in the 2014 sport fish monitoring (note these fish are separate from the fish to be sampled in this proposal). This correlation is opening the door to an opportunity to obtain a larger number of sturgeon muscle samples, non-lethally, through a collaboration with a California Department of Fish and Wildlife annual tagging program that is tracking population trends (DuBois and Harris 2013; more information at <http://www.dfg.ca.gov/delta/data/sturgeon/bibliography.asp>).

This proposal is requesting funds to perform collaborative plug sampling in 2014. Performing this work in 2014 may result in the data being incorporated in the TMDL staff report that is currently in preparation.

This objective of this study is to obtain a relatively large number of sturgeon muscle samples (30 white sturgeon and, if possible, 10 green sturgeon) both to obtain a more precise understanding of impairment and to begin to track inter-annual trends.

The study would 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) would 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 would occur during the course of the CDFW survey in August through October 2014. The budget for the program is \$23,000.

At its meeting on June 17, 2014, the TRC recommended that this study be funded.

References

- Beckon, W. and T. Mauer. 2008. Species at Risk from Selenium Exposure in San Francisco Estuary. Final report to the USEPA. US Department of the Interior, Fish and Wildlife Service.
http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/northsfba/selenium/Species_at_risk_FINAL.pdf
- DuBois, J. and M.D. Harris. 2013. 2013 Field Season Summary for the Adult Sturgeon Population Study. <http://www.dfg.ca.gov/delta/data/sturgeon/bibliography.asp>
- Stewart, R.A., S. Luoma, C. Schlekot, M. Doblin, and K. Hieb. 2004. Food web pathway determines how selenium affects aquatic ecosystems: a San Francisco Bay case study. *Environ. Sci. Technol.* 38. 4519-4526.

Last Updated: 07/08/2014

SUMMARY OF PROPOSED RMP S&T MONITORING 2014-2023

Program	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Comments
Water											22 sites per sampling event
Ancillary, Cu, CN, Se, MeHg		X		X		X		X		X	
Aquatic Toxicity		X		X		X		X		X	9 stations tested for screening to match past practice in 2002, 2007, and 2011.
PCB, PAHs, Pesticides										X	
CTR parameters (metals, cyanide, VOC, SVOC, PAH, PCB, pesticides, dioxin)		X								X	10 samples at 3 sites (diss/part fractions, diss/part blank, 2 QA samples)
Sediment											27 sites per sampling event
TOC, N, % Solids, Grain Size	X				X				X		
Hg	X				X				X		
MeHg	X				X				X		
Al, As, Cd, Cu, Fe, Pb, Mn, Ni, Se, Ag, Zn	X				X				X		
PAHs	X				X				X		
209 PCBs	X				X				X		
Pesticides	X				X				X		
PBDEs	X				X						
Toxicity					X				X		
Benthos									X		
Bivalves											7 sites (6+T1) per sampling event
PAHs	X		X		X		X		X		
209 PCBs	X								X		
PBDEs	X		X		X		X		X		
Se	X		X		X		X		X		
Sport Fish											
Suite of Analytes ¹	X					X					
Bird Eggs											
Suite of Analytes ²		X			X			X			
USGS Cruises											
Nutrients	X	X	X	X	X	X	X	X	X	X	
Suspended Sediments	X	X	X	X	X	X	X	X	X	X	
Archive, Vessel, and Staff Costs											
Contractors	X	X	X	X	X	X	X	X	X	X	
SFEI Labor - Sampling	X	X		X	X	X		X	X	X	
SFEI Labor - Data Mgmt	X	X	X	X	X	X	X	X	X	X	
SFEI Direct Costs	X	X	X	X	X	X	X	X	X	X	
Vessel Costs	X	X	X	X	X	X	X	X	X	X	
Archive (NIST)	X		X		X		X		X		

¹ Sportfish will be analyzed for the following in 2014: PCBs, PBDEs, Hg, Se, dioxins, and PFCs.² Cormorant eggs are analyzed for the following: PCBs, PBDEs, Hg, PFCs, and Se. Tern eggs are analyzed for Hg, PBDEs, and Se.

"X" = Planned sampling event.

Item 10

RMP Communication Strategy: One More Time



Item 10: Desired Outcomes

1. Agreement on Communication Strategy goals and priorities (audiences, products, metrics)
2. Agreement on general content of Communication portfolio
3. Decision on whether to do a Pulse in 2015 and the topic (staff recommendation: yes, State of the Bay)
4. Decision on lineup of topics for Estuary News

Communication Strategy: Goals



General Goal of the RMP

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

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Communication Strategy: Goals

Specific Goals of the Communication Strategy

1. Provide authoritative Bay water quality information in useful forms to decision-makers to promote sound stewardship of the Bay
2. Provide data and technical information to water quality scientists and other interested parties

Communication Strategy: Audiences

Primary

- RMP participants
 - ▣ Tier 1: actively engaged
 - ▣ Tier 2: Paying in, but not actively engaged – top priority for improvement

Secondary

- Other Bay managers
- Policy makers
- Local scientists
- Scientists in general
- Media and outreach specialists
- The public

Elements

1. Pulse
2. Estuary News articles
3. RMP Web Site
4. RMP Update
5. One Page Summaries
6. Technical Reports
7. Journal Publications
8. Annual Meeting
9. Email Updates **NEW**
10. SFEI Newsletter **NEW**
11. Social Media **NEW**
12. Annual Monitoring Results
13. Invited Presentations
14. Workshops, Forums
15. Fact Sheets
16. *State of the Estuary Report*
17. *Estuary Portal*

RMP INFORMATION PRODUCTS AND AUDIENCES	RMP Stakeholders: Tier 1	RMP Stakeholders: Tier 2	Other Bay Managers and Policy Makers	Local Scientists	Scientists in General	Media, Outreach Specialists	The Public
RMP PRODUCTS							
Pulse	X	X	X	X	X	X	X
Estuary News Articles	X	X	X	X		X	X
RMP Web Site	X	X	X	X	X	X	X
RMP Update	X	X					
One Page Summaries	X	X	X	X	X	X	X
Technical Reports	X		o	o	o		
Journal Publications	X		o	X	X		
Annual Meeting	X	X	o	o		o	
Email Updates	X	X	X	X		o	
SFEI Newsletter	o	o	X	X	o	o	o
Social Media	o	o	o			o	
Annual Monitoring Results	X	o	o	o			
Invited presentations at meetings	X	X	o	o			
Workshops, Forums	X	o	X	X			o
Fact Sheets	o	X	X	X	X	o	o
RELATED PRODUCTS							
State of the Estuary Report	o	X	X	X	X	X	X
Estuary Portal			X	X	X	X	X

X – primary means of communicating to the specific audience
o – secondary means of communicating to the specific audience

Priorities for Improvement

- Delivery of useful information to Tier 2 stakeholders
- Delivery of useful information to Other Bay managers and policy-makers

Means of Improvement: Tier 2

Stakeholders

- One page summaries - NEW
- Estuary News articles
- Regular email updates - NEW
- Enhancements of the Pulse and RMP Update
 - ▣ e-Book project – NEW
- Web site improvements

Metrics of Success: Tier 2 Stakeholders

- ❑ Views and downloads of online materials
- ❑ Clicks from email updates
- ❑ Subscriptions to email updates
- ❑ Counts of hard copies distributed
- ❑ Periodic survey of audience

Means of Improvement: Other Managers and Policy Makers

- SOTE Report
- Pulse enhancements
 - ▣ Link to SOTE report
 - ▣ e-book
- Estuary News

Metrics of Success: Other Managers and Policy Makers

- SOTE Report
 - ▣ Circulation, downloads, media coverage
- Pulse
 - ▣ Circulation, downloads, page views, use of interactive elements, media coverage
- Estuary News
 - ▣ Circulation, downloads, page views
- Periodic audience survey?

Details on Each Element

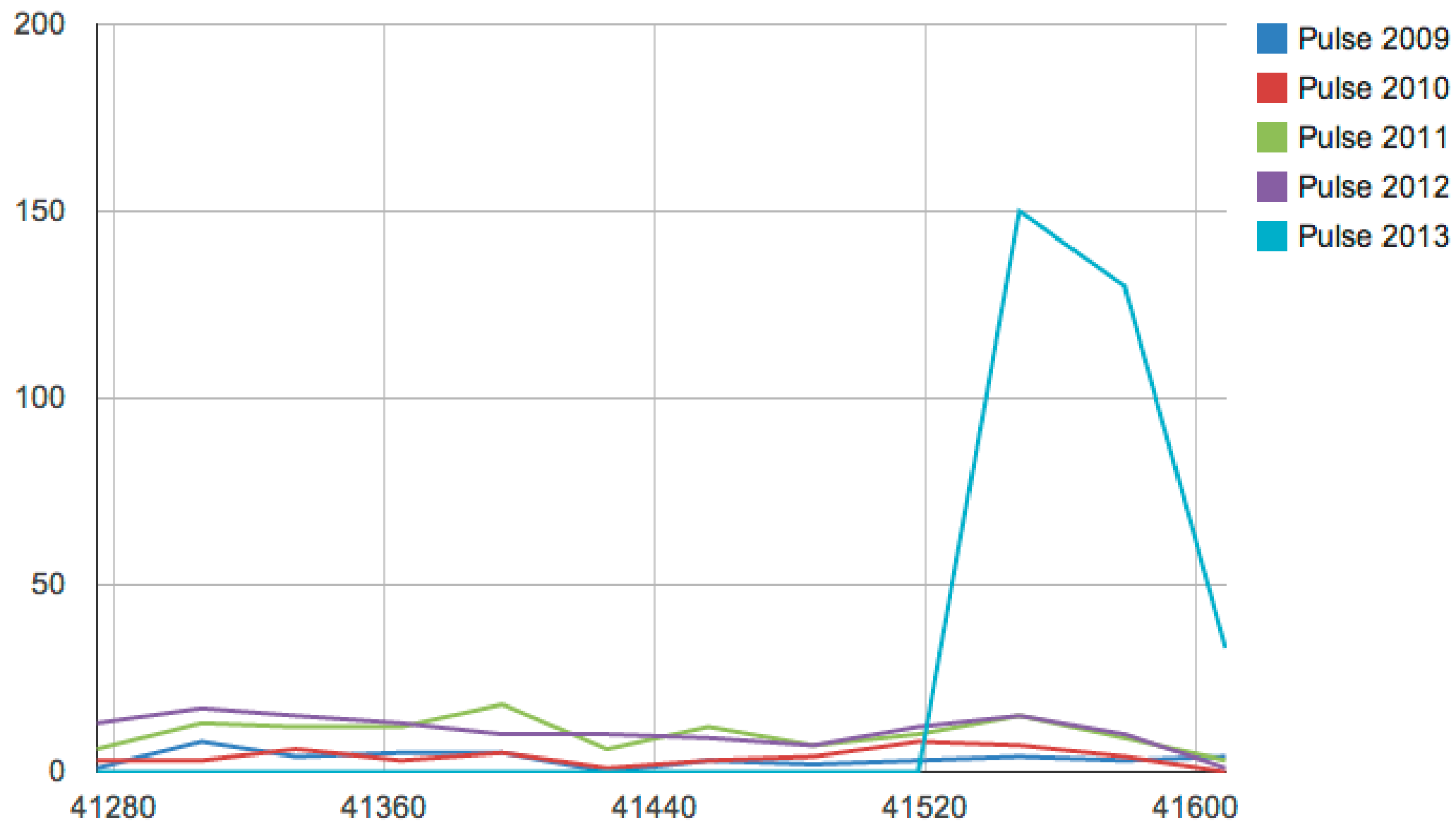


Pulse

- Recent activity
 - ▣ CECs in the Bay
 - ▣ Distribution
 - 3000 printed – xx distributed
 - Downloads xx
 - ▣ Marketing
 - Present to WBs
- Next steps
 - ▣ Next edition in 2015
 - ▣ Potential topics
 - See upcoming slide
- Possible improvements
 - ▣ Make it an interactive e-book
 - ▣ Better promotion
 - SFEI Communication Strategy
 - Other?



Pulse Downloads Over Time in 2013



Pulse: Possible Themes

- Nutrients
 - ▣ NNE, Nutrient Strategy, Nutrient Removal from Wastewater, articles derived from Conceptual Model report, Delta developments
- State of the Bay: Water Quality
 - ▣ Companion to the SOTE report with profiles on major contaminants, similar to Pulse on CECs
- PCBs
 - ▣ Management opportunities, BMP pilot studies, summary of hotspot cleanups, articles derived from Synthesis (new conceptual model, impairment, trends, loads)
- Pollutant Pathways to the Bay
 - ▣ Stormwater integrated report, POTW loads, river loads, etc.
- 20 Years of the RMP
 - ▣ Changing regulatory landscape, evolution of a monitoring program, water quality changes
- POTW Issues
 - ▣ Aging infrastructure, nutrients, pathogens, emerging contaminants, pollution prevention and source control, watershed permit
- Water Quality and Human Uses of the Bay
 - ▣ Beneficial uses (contact recreation, fishing, shellfish harvesting); sport fish monitoring (RMP, SWAMP)
- Selenium?

Estuary News

Recent activity

“Bay Primed for Pea Soup?”

Distribution

3000 printed

Web: Incomplete info – 58 hits on article 3/15-4/30

Next steps and possible improvements

Proposed lineup of topics

Sep 2014: Copper, PCBs

Dec 2014: Stormwater

Mar 2015: CECs

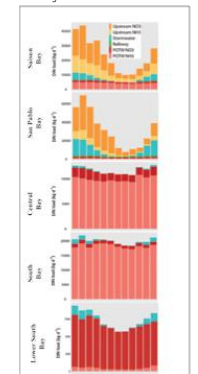
Better promotion through RMP email and web page

POLLUTION

Bay Primed for Pea Soup?

Nutrients could be the next big problem for San Francisco Bay — or make that in the Bay, because they're already here at levels high enough to have caused trouble elsewhere. But despite its excess nitrogen and phosphorus, the Bay has been free of harmful algal blooms and oxygen-depleted dead zones for decades. Indeed, we've been so sure of this immunity to nutrients that most wastewater treatment plants don't even have to remove them before discharging into the Bay. Recent chinks in the Bay's resistance to nutrients are now alerting us, however, to get ready in case there's worse to come.

The tricky part is the Bay's response to nutrients is changing, but it's not yet clear how best to manage them," says David Senn, a scientist at the San Francisco Estuary Institute (SFEI). Another challenge is that because nutrients



Average monthly dissolved inorganic nitrogen (DIN) between 2008-2011. Colors indicate source, see key above. Date: Novick & Senn, 2014

haven't been troublesome here, we have a lot to learn about them in the Bay. "It will take a regional collaborative effort to understand how the Bay is changing and what regulatory actions to take," says Naomi Feger, Planning Chief of the S.F. Bay Regional Water Quality Control Board. To accomplish this, the Board drafted a *Regional Nutrient Management Strategy* in 2012 in collaboration with SFEI, the Regional Monitoring Program, wastewater dischargers and other stakeholders. The goal is to develop monitoring and regulations that proactively protect the Bay from nutrient pollution, backed by solid science. Within this major initiative, Senn is coordinating an expert team to outline monitoring and research needs. "It's a first step toward identifying the scientific issues we need to tackle," he says.

The financial stakes for getting a handle on nutrients in the Bay are high. "It's being called the most costly wastewater issue reoccurring in the Bay since 1970s," Senn says. Most of the nutrients come from the 41 wastewater treatment plants which discharge into the Bay, and retrofitting them could cost billions of dollars. In the North Bay, nutrients also come from agriculture and wastewater in the Central Valley and the Delta.

Why haven't all those nutrients pouring into the Bay caused problems? The answer — based on nearly four decades of US Geological Survey work on the Bay's large swings in phytoplankton abundance — is a combination of three things: suspended sediment, tidal mixing, and clams.

Algae need light to grow but Bay water contains so much sediment that it's murky. "It's like overfertilizing a garden and then covering it with a tarp," Senn says. "The nutrients are there but the other key ingredient, sunlight, is missing." In addition, algae often grows best in estuaries where the entering fresh water floats across the surface. This creates a top layer that concentrates phytoplankton and keeps them near the light. But here, the Bay's strong tides usually break up fresh water layers before algae can bloom. The third factor is large populations of clams and other bottom-dwelling filter feeders that can eat phytoplankton as fast as it can grow.

ESTUARY | MARCH 2014



RMP water quality sensor being hoist to animals called hydrobots. Photo by Emily Novick, SFEI.

So what's changed? At least two of the three factors that increase resistance to algal growth," Senn says. Suspended sediment is down by half since the 1990s in the North Bay and South Bay, letting the algae-boosting light shine twice as deep into the water. This trend toward clearer water is expected to continue because excess sediment from the Gold Rush is thought to have finally washed away.

Another change is that clam populations are down sharply in the South Bay, coinciding with a three-fold algae hike in those waters since the 1990s. The drop in clams and other bottom-dwelling algae eaters may be due to a rise in predators like fish and Dungeness crab, which in turn is linked to a shift in large-scale, long-term ocean patterns called the Pacific Decadal Oscillation.

So far there's less concern about the amount of algae than about the pace of change. "Algae levels were low before so it's not like the Bay is pea green now," Senn says. "But it changed at a fast rate."

Other signs of cracks in the Bay's resilience to nutrients include less dissolved oxygen in places where algae is highest. Microbes that eat dead algae also use oxygen, so algal blooms can lead to dead zones in the water. Also troubling was a rare red tide or undesirable algal bloom in the fall of 2004. In addition, small amounts of algae that cause toxic blooms elsewhere are beginning to pop up here too, and recent monitoring has also detected toxins from harmful algae in the Bay. However, Senn stresses that we can't

tell if this is related to nutrients — or if it's even a change — because this monitoring has only been underway for a few years.

Besides affecting the quantity of algae, nutrients may also affect their quality. While low algae levels are thought to contribute to the dearth of small fish that larger animals eat in Suisun Bay and the Delta, now a new idea implicating high nutrient levels is being floated. For example, recent studies suggest that high levels of nutrients could dampen the growth of 'good' algae or encourage the growth of 'junk' algae not favored by small fish in Suisun Bay. More research is needed to test this hypothesis, however.

Indeed, more research is needed on just about all aspects of nutrients in the Bay. Right now, we don't know much beyond the facts that algae are rising in parts of the Bay, low levels of potentially harmful algae are common, and algal toxins are detectable. In fact, we don't even know if nutrients are behind what we see. "We need to understand the problem better to help identify the most effective fix," says Senn.

That's where the expert team he coordinates comes in. Their report, due out this month, outlines what we know, what we need to find out, and what a range of plausible scenarios might mean for algae in the Bay. Questions include: Will suspended sediments keep dropping? Do high nutrients really tip the phytoplankton balance toward kinds not favored by small fish? Will clam populations rise again after the next shift of the Pacific Decadal Oscillation? How will the changing climate and changing shoreline affect the nutrient balance? And can we keep nutrients out of the Bay in the first place?

The first step to finding answers is a Bay-wide monitoring program aimed at nutrient pollution. Current monitoring is spotty for key measures like nutrients, kinds of algae, algal toxins, dissolved oxygen, and clams, and also lacks sustainable funding.

Besides being costly, stemming the flow of nutrients into the Bay could take decades. Says Senn, "If problems are on the horizon, starting before they are widely entrenched will give us more flexibility."

"We're taking this seriously," adds Feger, whose agency already has a draft regional permit addressing

HOUSE KEEPING

Raising the Dregs

San Francisco Bay's perennial problem with abandoned vessels cluttering and potentially polluting the waters got some uplifting news—literally and figuratively—this winter.

In the finger of water separating Oakland from Alameda, the abandonment situation had become particularly serious in recent years as derelict vessels attracted illegal activity. But thanks to a major cleanup effort by a consortium of more than fifteen agencies and organizations that spent in excess of \$4.3 million, the Oakland Estuary is free of potential environmental and navigational hazards.

"It's a huge success," says Brock de Lappe, Harbor Master of the Alameda Marina who in early 2012 brought stakeholders together to address the problem.

The items removed from the estuary include 58 vessels, four dilapidated docks, and some 365 tons of metal, which has been recycled under the direction of the California Department

of Resources Recycling and Recovery (CalRecycle). The largest crane on the West Coast (see photo) was brought in to lift up and remove two of the vessels—sunk tankers measuring between 100 and 160 feet in length—one of which still contained fuel oil. The endeavor amounted to a Bay Area version of raising the Titanic.

CalRecycle spearheaded the cleanup, contributing \$1.3 million of which \$650,000 came from Clean-up settlement money administered by the Fish and Wildlife Foundation. USEPA put up much of the remainder. While all consider the cleanup a major accomplishment, it was a unique situation. "It's not a template" for vessel abandonment cleanup, says Peter Pelkofter, senior counsel with the California State Lands Commission. CalRecycle, meanwhile, says it has no plans to take on additional abandoned vessel removal projects.

Dealing with the crafts is not only a financial challenge, but almost inevitably requires the coordination of multiple agencies. "Everyone has some authority, but no one has perfect authority," says Adrienne Klein, enforcement chief for the San Francisco Bay Conservation and Development Commission.

Keeping tabs on questionable vessels typically falls to county or city law enforcement, and in recent years many municipalities have strengthened local anchor-out ordinances to aid officers in citing derelict vessels. But according to de Lappe, Alameda County has not followed suit and suffers from a funding cut to its harbor control unit.

"Now that the cleanup has been done, what's to prevent it from happening again?" de Lappe says. Alameda County Supervisor Wilma Chan's office declined to comment. VS

CONTACT: Brock de Lappe, brock@alamedamarina.net

nutrients in wastewater discharges throughout the watershed out for public review. "We don't want to experience the problems we see elsewhere in the country." VS

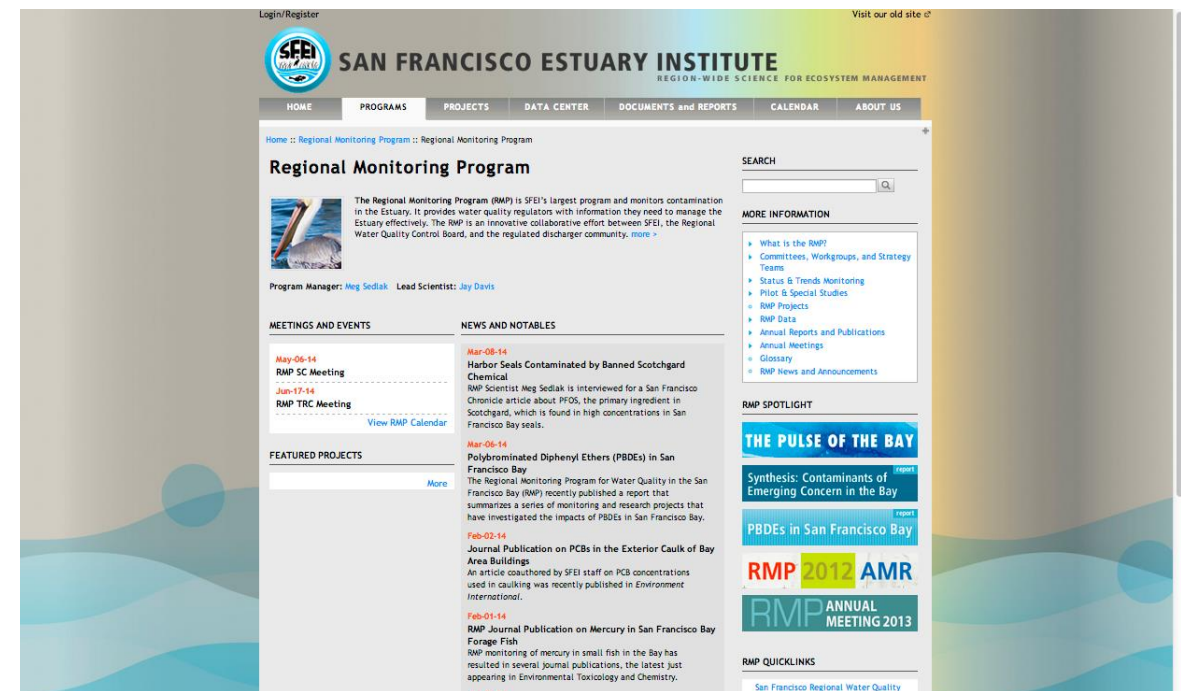
CONTACT: Naomi Feger, Naomi.Feger@waterboards.ca.gov David Senn, david@sfei.org/US65

Monitoring: <http://sfbay.wr.usgs.gov/access/wqdata/index.html>

New Report Due Out Late March: <http://www.sfei.org/documents>

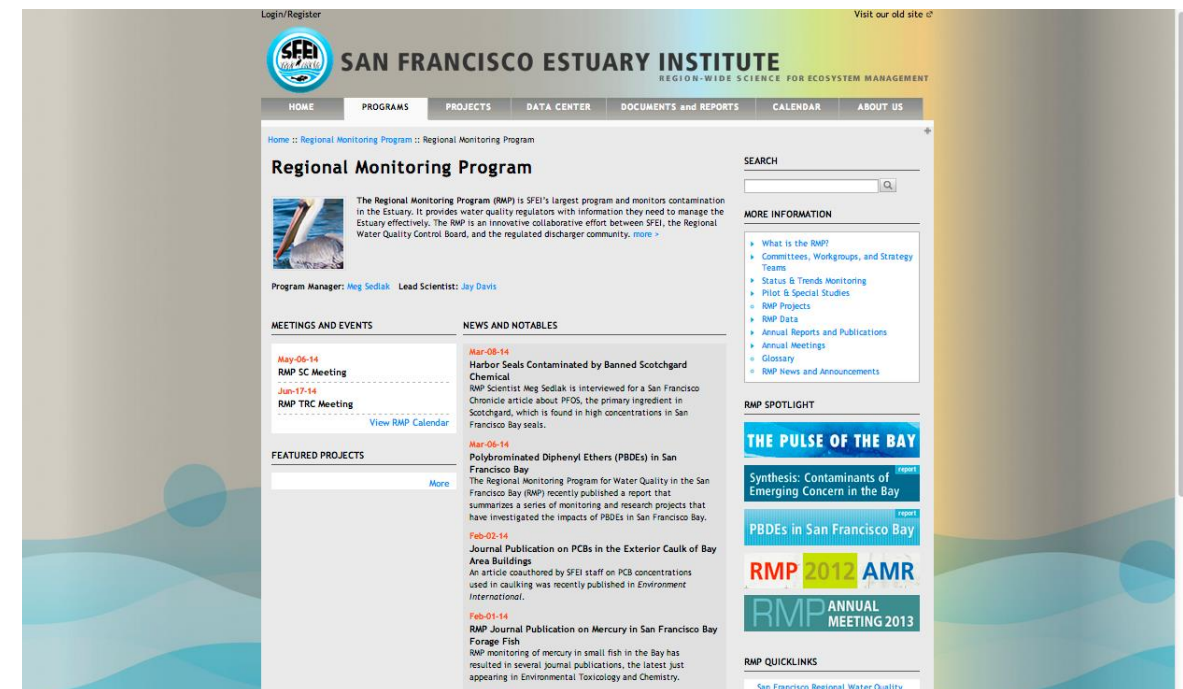
RMP Web Site

- Recent activity
 - ▣ CD3 development work
 - Funded by State Board
 - \$60K worth
 - *Switch to demo*

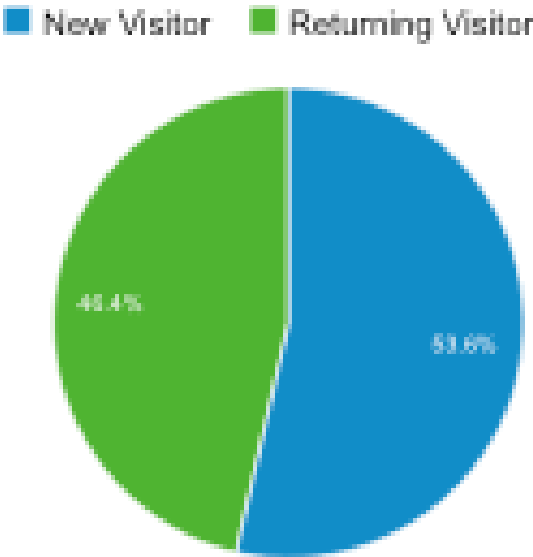
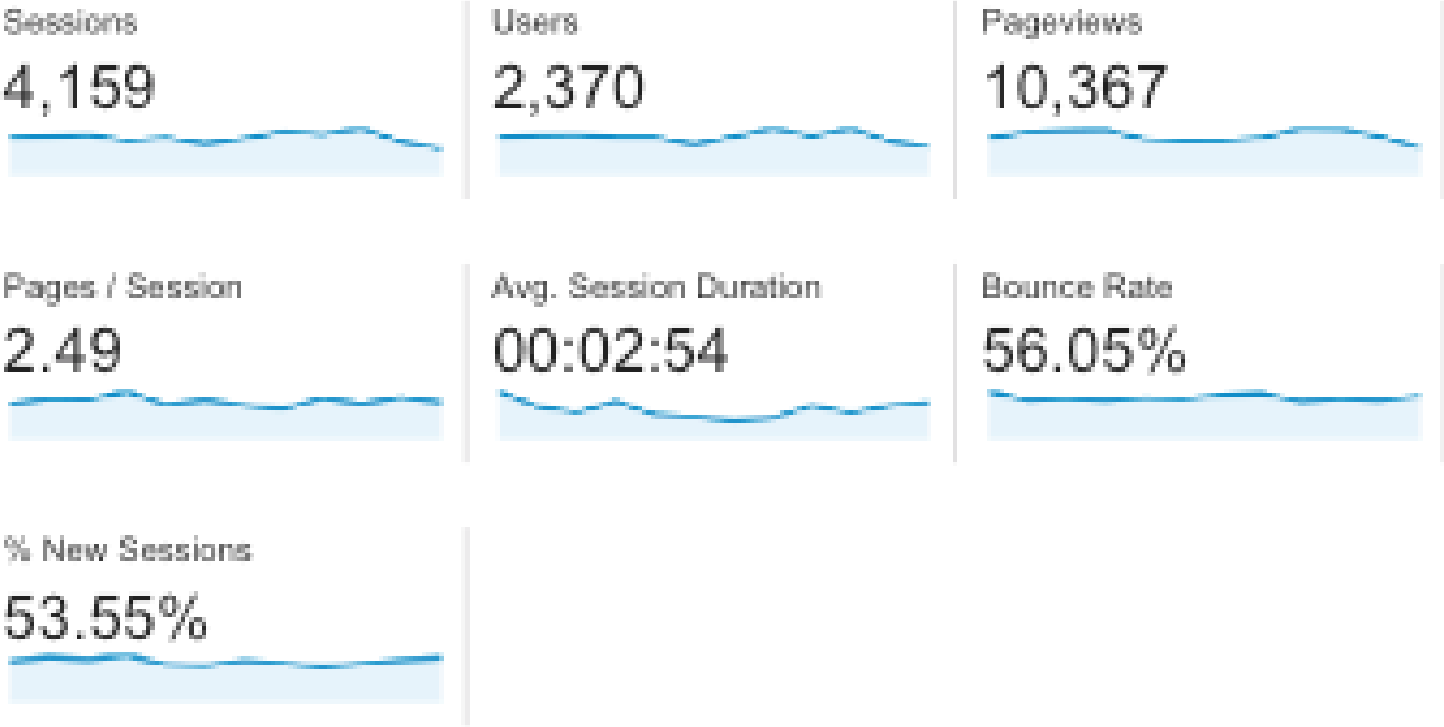
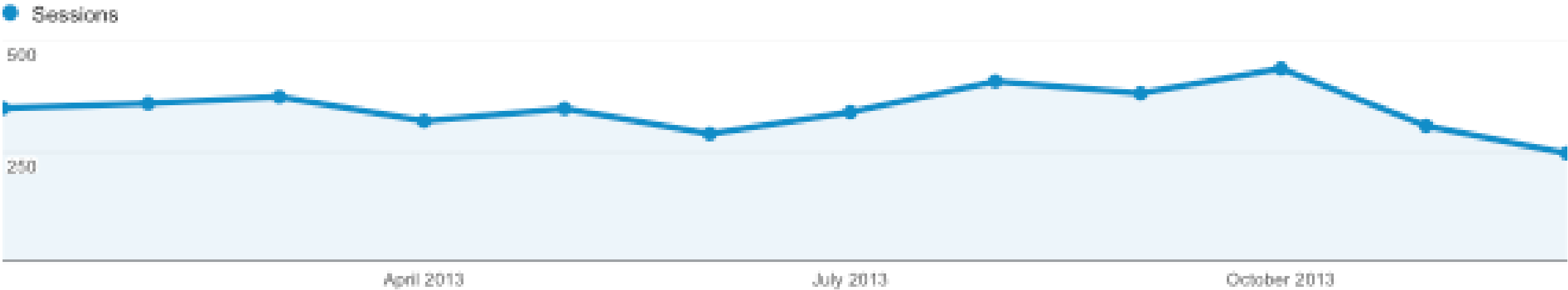


RMP Web Site

- Recent activity
 - ▣ CD3 development work
 - Funded by State Board
 - \$60K worth
 - Switch to demo
 - ▣ Analytics



RMP Web Page Hits



RMP Web Page User Flow

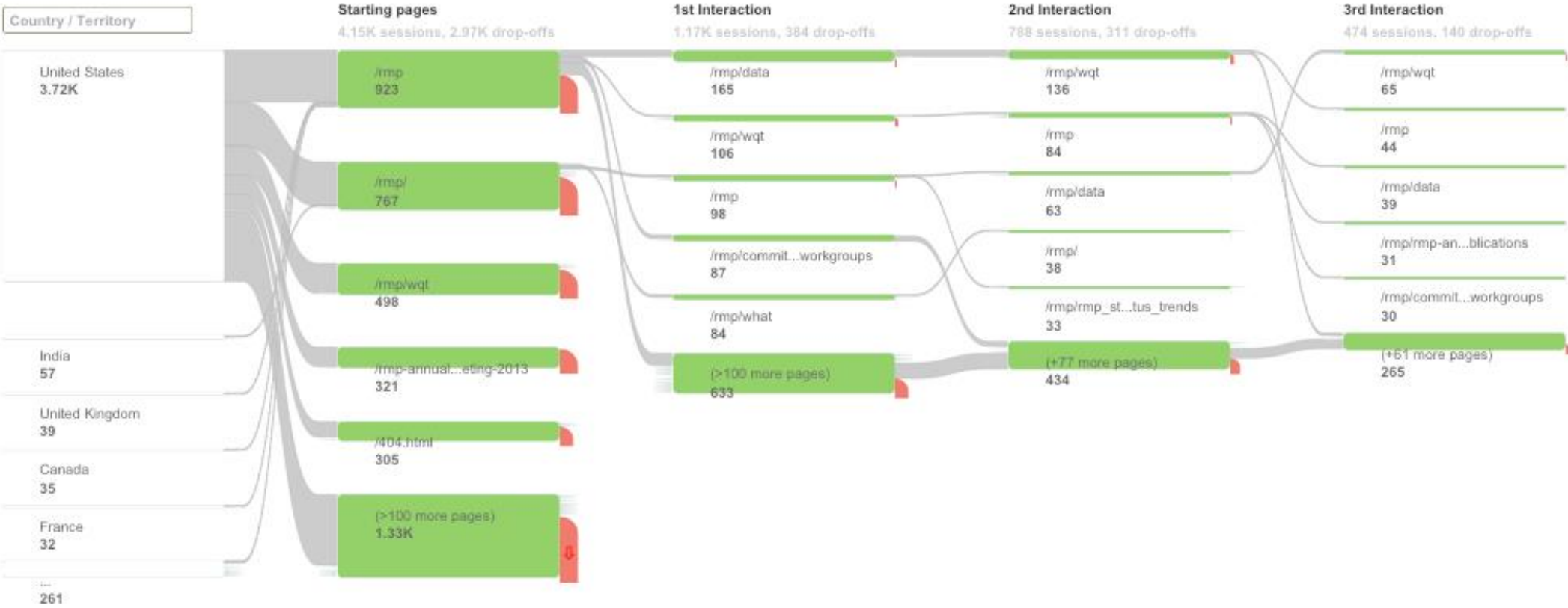


Users Flow

Jan 1, 2013 - Dec 31, 2013

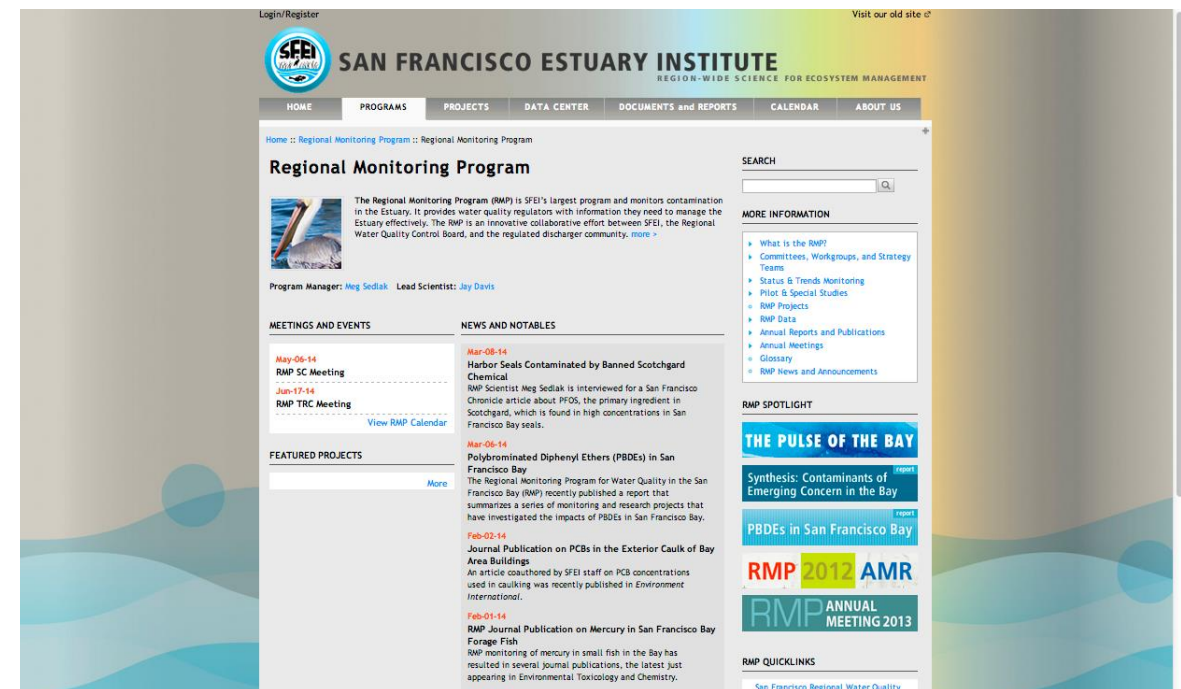
All Sessions
100.00%

This report is based on 4K sessions (96.2% of sessions). [Learn more](#)



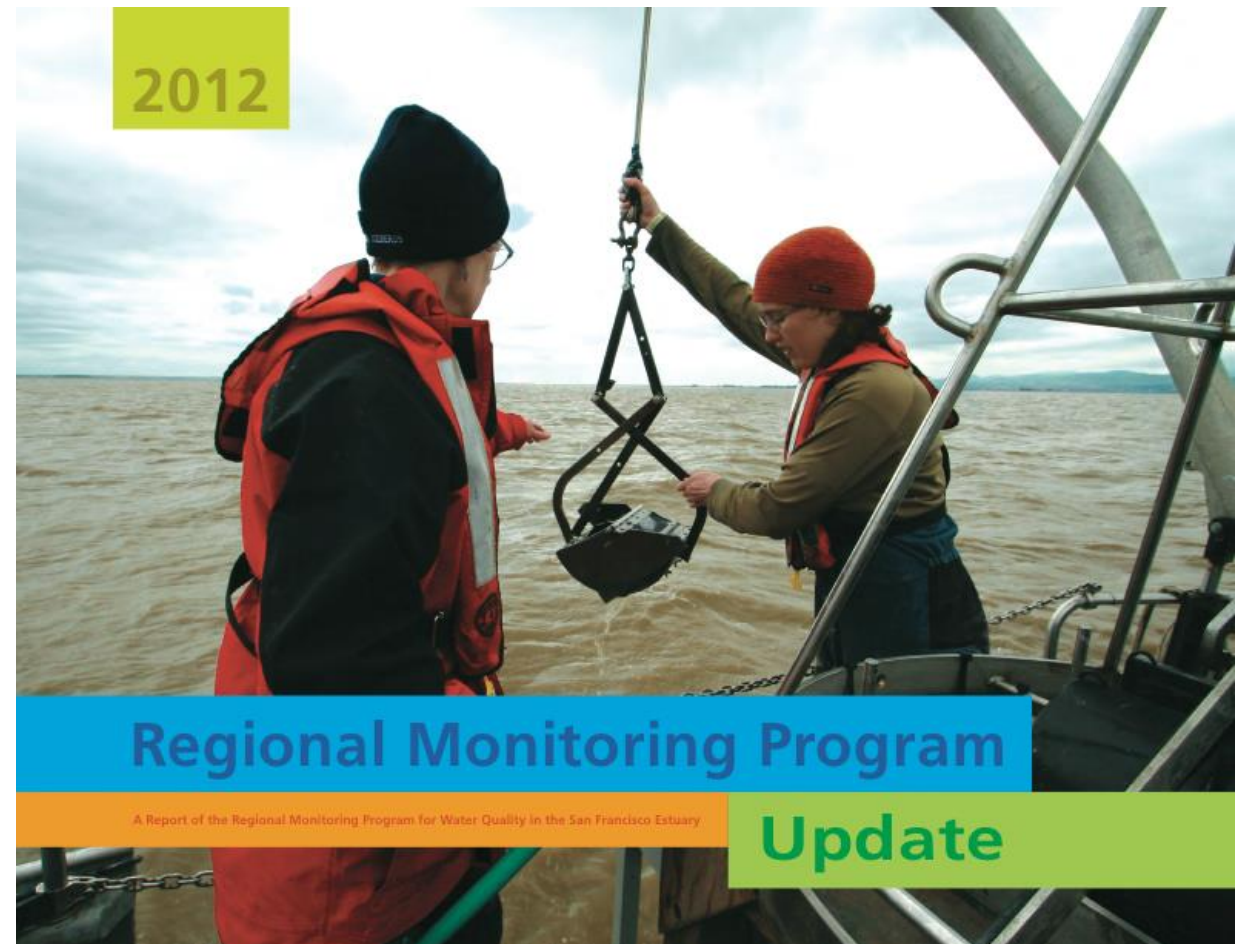
RMP Web Site

- Recent activity
 - ▣ CD3 development work
 - Funded by State Board
 - \$60K worth
 - Switch to demo
 - ▣ Analytics
- Next steps and possible improvements
 - ▣ SFEI Communication Strategy - web site upgrade



RMP Update

- Recent activity
 - ▣ 2012 edition
 - ▣ Distribution
 - 1000 printed – 10 left
- Next steps
 - ▣ Next edition in 2014
- Possible improvements
 - ▣ Make it an interactive e-book pilot



One Page Summaries

- Recent activity
 - ▣ None – a new item
- Next steps
 - ▣ Develop one page summary of the Program as a whole
 - ▣ Develop one page summaries of major projects or products

Technical Reports

- Recent activity
 - ▣ Xx reports in 2013
 - ▣ Highlights
- Next steps
 - ▣ Coming soon...
 - PCB Synthesis
 - Nutrient Conceptual Model
- Possible improvements
 - ▣ Improve access on web site –
page highlighting recent reports

Journal Publications

- Process
 - ▣ Part of project scoping in proposal development
 - ▣ Sometimes augmented or picked up by SFEI
- Recent activity
 - ▣ Xx in 2013
 - ▣ Highlights
- Coming soon...
 - ▣ Coring article
 - ▣ PFC article
- Possible improvements
 - ▣ Improve access on web site – page highlighting recent reports

Annual Meeting

- Recent activity
 - ▣ Joint with SOE in 2013
 - ▣ Attendance
 - 2013 – 100 RMP slots at SOE
 - 2012 – 140 at Brower Center
 - ▣ Social media: Twitter (SOE)
 - 473 posts by 83 users
 - 155,124 unique subscribers
 - 394,092 "impressions"
- Next steps
 - ▣ Program Update theme in 2014
 - ▣ Brower Center
- Possible improvements
 - ▣ Archive video?
 - ▣ Expand social media during Pulse or SOE years



Email Updates

- Recent activity
 - ▣ Pilot in January 2014
 - ▣ Distribution list of 827 people
- Next steps
 - ▣ Continue on quarterly basis
- Possible improvements
 - ▣ Develop formatted version

[View this email in your browser](#)

1. SFEI-ASC Seeks to Fill Two Important Positions: Executive Director, Senior Project Manager
2. Jim Kelly Appointed Interim Director of SFEI-ASC
3. PFCs in the News
4. Special Issue of Marine Geology on Sediment Transport in San Francisco Bay
5. RMP Journal Publication on Mercury in San Francisco Bay Forage Fish

1. SFEI-ASC Seeks to Fill Two Important Positions: Executive Director, Senior Project Manager

Your assistance would be greatly appreciated in helping spread the word about two openings at SFEI.

SFEI-ASC Executive Director: This is an exciting opportunity to lead the San Francisco Estuary Institute/Aquatic Science Center, a well-respected scientific organization whose opinion is sought out by decision-makers across the state. Under the general direction of, and working in partnership with, a Board of Directors, the Executive Director provides leadership, vision, and overall direction of staff, business and operations. The successful candidate will join a semi-academic work setting and lead a diverse group of environmental scientists and administrative support staff whose mission is to foster development of the scientific understanding needed to protect and enhance the San Francisco Estuary. More details are in the attached brochure and on the [SFEI web site](#). Filing date: Sunday, February 16, 2014.

Senior Project Manager: SFEI-ASC is seeking a Senior Project Manager to assist in the management of projects within the Clean Water Program, including the Regional Monitoring Program for Water Quality in San Francisco Bay (Bay RMP), the Delta Regional Monitoring Program (Delta RMP), and the San Francisco Bay Nutrient Management Program. The successful candidate will have a demonstrated range and depth of skills in project management, conducting scientific investigations, or managing environmental stakeholder processes. This position will report directly to SFEI-ASC's Clean Water Program Directors (Drs. Jay Davis and David Senn) and is an integral part of the Clean Water team of senior scientists and managers. Position open until filled. [More information](#).

2. New Interim Executive Director for SFEI-ASC

The SFEI-ASC Board has appointed Jim Kelly, former General Manager of the Contra Costa Sanitation District, to assume the role of Interim Executive Director. With over forty years of experience in environmental engineering and agency management, Mr. Kelly is a seasoned

Campaign Report				
Title:	Bay RMP Announcements and News, Feb 2014 ⁶⁹			
Subject Line:	Bay RMP Announcements and News			
Delivery Date/Time:	Mon, Feb 03, 2014 04:58 pm			
Overall Stats				
Total Recipients:	946			
Successful Deliveries:	781			
Bounces:	165 (17.4%)			
Times Forwarded:	0			
Forwarded Opens:	0			
Recipients Who Opened:	278 (35.6%)			
Total Opens:	1,124			
Last Open Date:	5/2/14 8:40AM			
Recipients Who Clicked:	98 (12.5%)			
Total Clicks:	223			
Last Click Date:	5/4/14 8:07PM			
Total Unsubs:	0			
Total Abuse Complaints:	0			
Times Liked on Facebook:	0			
Clicks by URL				
URL	Total Clicks	Unique Clicks		
http://www.sfei.org/content/senior-project-manager	71	44		
http://www.sfei.org/	60	30		
http://www.sfei.org/news_items/special-issue-marine-geology-published-sediment-transport-san-francisco-bay	40	27		
http://www.sfei.org/news_items/rmp-journal-publication-mercury-san-francisco-bay-forage-fish	24	17		
http://www.sfei.org/news_items/sealing-san-francisco-bay%E2%80%99s-fate-seals-still-contaminated-banned-scotchgard-chemical	15	10		
http://www.sfei.org/news_items/new-interim-executive-director	13	11		

SFEI Newsletter

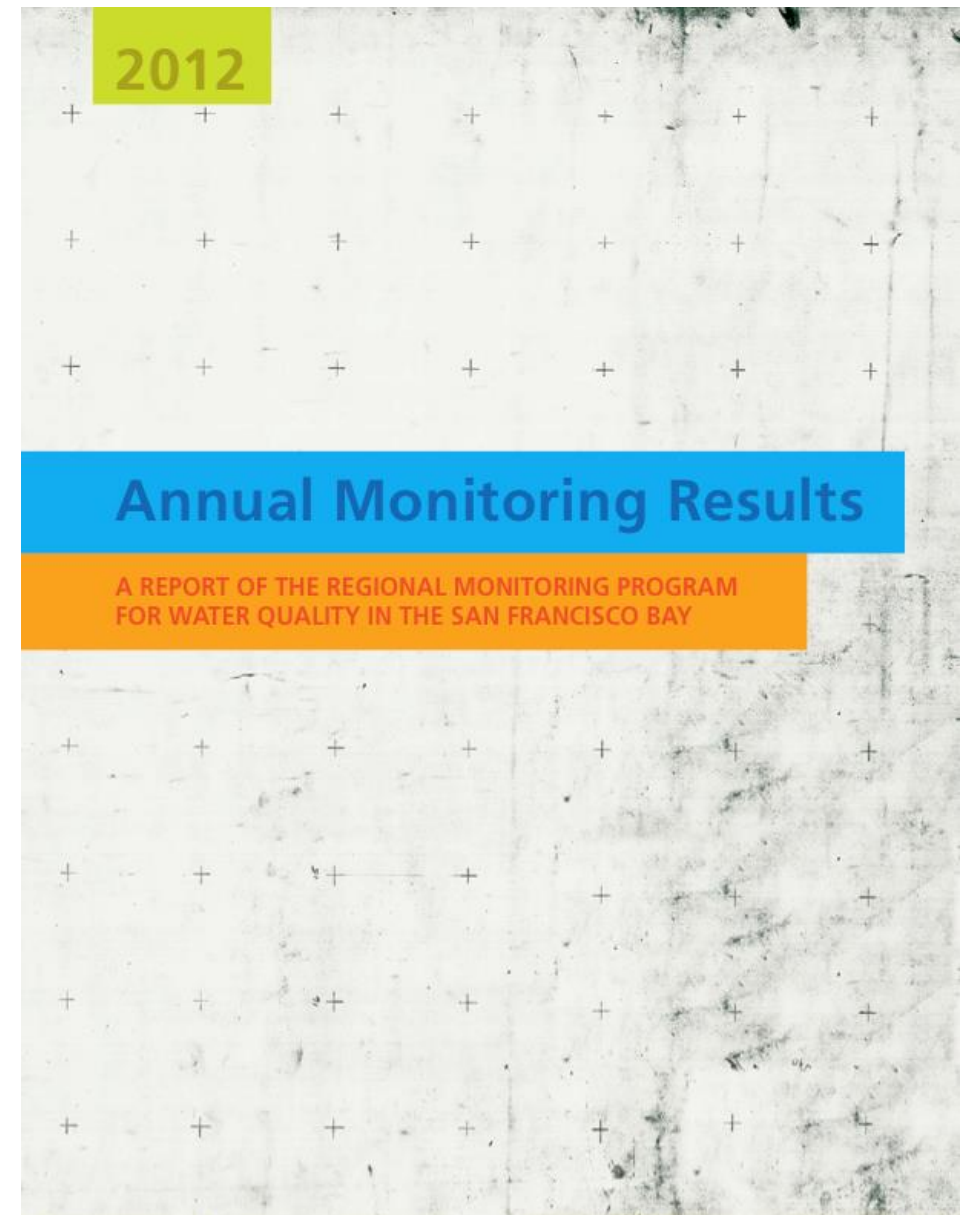
- New item under consideration as part of SFEI Communications Strategy
- Quarterly
- Would include some RMP info as part of a Clean Water update
- Next steps
 - ▣ Approval pending

Social Media

- New item under consideration as part of SFEI Communications Strategy
- Twitter
 - ▣ SOE pilot effort
 - ▣ Jay's legion of followers
- Next steps
 - ▣ Approval pending

Annual Monitoring Results

- Background
 - ▣ Documents methodological changes
 - ▣ Presents some results
- Recent activity
 - ▣ 2012 AMR published in 2014
- Next steps
 - ▣ Publish 2013 AMR in 2015
- Possible improvements
 - ▣ None recommended



State of the Estuary Report

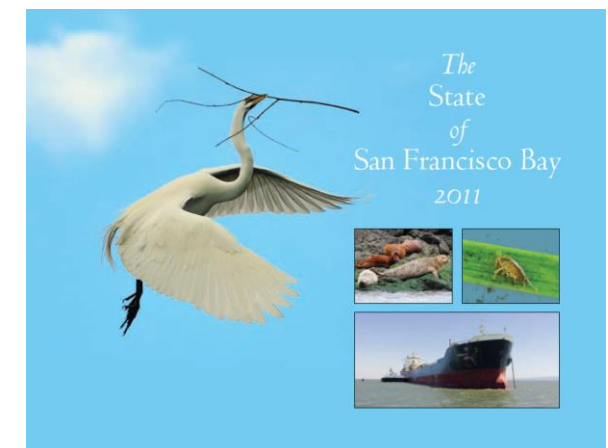
- Background
 - xx
- Recent activity
 - State of the Bay published in 2011
- Next steps
 - State of the Estuary report planned for 2015
- Possible improvements
 - None recommended

Table 4. Water quality summary

SAFE FOR AQUATIC LIFE		SAFE TO EAT		SAFE FOR SWIMMING	
Methylmercury	*	PCBs*	*	Beach Bacteria (Summer)	****
Exotic Species	**	Methylmercury	**	Beach Bacteria (Wet)	***
Sediment Toxicity	**	Dioxins	**		
Trash	***	Legacy Pesticides	*****		
Copper	****	Selenium	*****		
Dissolved Oxygen	*****	PBDEs*	*****		
Silver	*****	Other Priority Pollutants*	*****		
Other Priority Pollutants	*****	Emerging Contaminants	?		
Selenium	?				
PAHs*	?				
PBDE*	?				
PFOS*	?				
Emerging Contaminants	?				

KEY:

poor	*
poor to fair	**
fair	***
fair to good	****
good	*****
goals not established	?










Other Elements

- Invited Presentations
 - ▣ Jay, Meg, Don, Becky
 - ▣ Jay's: Oakland Museum, SFSU, UC Davis, UC Riverside, CWEA
- Workshops/Meetings
 - ▣ Past: Mercury meetings
 - ▣ Future: Nutrients?
- Fact Sheets
 - ▣ Past: Triclosan, Dumbarton Flux
 - ▣ Future: No plans for more at present
- Seminars/Webinars
 - ▣ Haven't done much – but could
- *Estuary Portal*
 - ▣ CWQMC – My Water Quality

RMP Deliverables Scorecard

Deliverable	Lead	Deliverable Type	Start Year	Original Due	Current Due	Stoplight	Comments	Months Overdue
Contaminant Fate								
1) Mercury Synthesis and Conceptual Model Update	JD	Report	2011	Aug-11	Jan-14		Completed in 2014.	35
2) PCB Conceptual Model	JD	Report	2011	Mar-12	Jul-14		Final version sent out for review. Report to be finalized by 7/30/14.	28
Emerging Contaminants								
3) Broadscan Screening of Biota for EC	RS	Report	2012	Mar-12	Jul-14		Received final seal data and interim mussel data. After confirmation of mussel data, project will be complete. NIST to publish results in journals.	28
4) PFCs in Bay Biota	MS	Report	2012	Mar-13	Dec-14		Report will be completed by 12/31/14.	16
5) Developing Bioanalytical Tools (Year 1)	PT	Report	2013	Dec-13	Jun-14		Year one report completed and under review by workgroup.	7
6) PBDE Summary Report	RS	Report	2013	Mar-13	Mar-14		Report completed. Working on manuscript for publication.	16
7) Developing Bioanalytical Tools (Year 2)	PT	Report	2014	Apr-15			Year two contract to be written.	
8) Effects of particle size/shape on toxicity	PT	Report	2014	Dec-14				
Exposure and Effects								
9) Benthic Assessment for Mesohaline	PT	Report	2012	Dec-13	Mar-14		BPJ exercise and year one report completed.	7
10) Copper and the olfactory nerve	PT	Report	2013	Dec-14			Federal budget shortfall resulted in switch from Chinook to Coho. Final report expected by 9/30/14.	
11) Develop Selenium Strategy	JD	Task	2014	Dec-14			Held 2 meetings.	
12) Dioxin Sportfish Report	JD	Report	2014	Dec-15				

Deliverable	Lead	Deliverable Type	Start Year	Original Due	Current Due	Stoplight	Comments	76	Months Overdue
Exposure and Effects									
13) Impacts of Dredging on Benthic Habitats	PT	Report	2014	Dec-16			Technical Assistance Agreement has been executed and research is underway.		
Nutrients									
14) Nutrients Conceptual Model and Scenario Building	DS	Report	2012	Dec-12	Jul-14		Final formatting stage. Final will be completed in July.		19
15) Nutrients Stormwater Sampling (WY 2013)	DS	Field Sampling	2013	Dec-13	Jul-14		Draft report in final internal review.		7
16) Nutrient Model Development	DS/DY	Task	2013	Dec-14			Model development to begin after detailed workplan plan is finalized (Jan 2014).		
17) Detailed Nutrient Modeling Workplan	DS	Report	2013	Jan-14	Jul-14		Will balance between hydrodynamic and water quality models.		6
18) Moored Sensor Pilot Program	DS	Report	2013	May-14	Jul-14		3 sensors now deployed. Scientific investigations and data analysis underway. Year 1 report (and manual) expected in July		2
19) Algal Biotoxin Monitoring	DS/RK	Field Sampling	2013	May-14	Sep-14		Contract extended to allow for more sample analysis. Interim technical report complete.		2
20) Nutrient Monitoring Program Development	DS	Report	2014	Dec-14			Draft program development plan complete and sent to TRC/SC for review		
21) Moored Sensor Monitoring Program - Year 2	DS	Report	2014	May-15					
Status and Trends									
22) USGS South Bay Sediment Budget Factsheet	JD	Factsheet	2011	Mar-13	Apr-14		Distributed at 7/15/14 SC meeting.		16
23) S&T Bird Egg Report (2006/2009/2012)	JR/JD	Report	2012	Jan-13	Dec-14		Data analysis and writing in progress. Report to be done by December 2014.		18

Deliverable	Lead	Deliverable Type	Start Year	Original Due	Current Due	Stoplight	Comments	77	Months Overdue
Status and Trends									
24) Updated Ambient Sediment Threshold Concentrations	EWN	Memo	2013	Jan-14	Sep-14		Memo completed in January but now need to revise without 2004-2006 data. Updated memo due by 9/30/14.		6
25) Coring Manuscript	DY	Manuscript	2013	Oct-13	Jul-14		Waiting for comments from co-authors.		9
26) RMP Website Update	EWN	Task	on-going						
Sources Pathways and Loadings									
27) Load Monitoring - EMC Development (2014)	LM	Task	2014	Dec-14			To be discussed at SC meeting.		
28) Nutrients Stormwater measurements (WY2014)	DS	Report	2014	Dec-14					
29) Load Monitoring in Representative Watersheds (WY2014)	LM	Task	2014	Dec-14					
30) Develop and Update Spreadsheet Model - Year 5	LM	Report	2014	Sep-14	Dec-14				

Workgroup Activities – Third Quarter 2014

A. Sources Pathways and Loading Workgroup (SPLWG)/Small Tributaries Loading Strategy Team (STLST)

Meetings:

- The STLS group continues to hold monthly phone conferences to plan for Water Year 2015 POC monitoring. So far in 2014, meetings have been held on January 22, March 19, April 1, April 16, May 15, June 9, and July 2.

Milestones:

Continued preparations for developing a monitoring design and site list for water year 2015 POC monitoring. Began the QAQC process for water year 2014 POC data.

Activities for the Third Quarter of 2014:

- Continue preparation for water year 2015 POC monitoring
- Develop workplan for 2014 RWSM
- Begin reporting and analysis for water year 2014 POC monitoring
- Continue to meet with STLS on an as needed basis

For more information, see SPLWG minutes and agenda at <http://www.sfei.org/rmp/splwg> or contact the SPLWG lead, Lester McKee, at Lester@sfei.org.

B. Exposure and Effects Workgroup

Meetings:

- The EEWG held a conference call on May 12, 2014. During the meeting, special studies for 2015 were recommended.

Milestones:

- Completion of a draft of the Mesohaline Index Development San Francisco Bay Index Report Phase I. Comments from workgroup's science advisors are being addressed. The report will be finalized by the end of September 2014.
- Completion of the Bioanalytical Year 1 Progress report (sent to workgroups for review, comments requested by July 17th).

Activities for the Third Quarter of 2014:

- Continuation of work on Bioanalytical Tools study (Year 2).
- Copper and olfactory nerve project. The study originally planned on collecting olfactory data from juvenile Chinook salmon late summer 2013 (both before and after smolting in estuarine water). A shutdown of the salmon aquaculture facility at the Mukilteo Research Station earlier this year prevented the study from using Chinook salmon. Coho salmon reared at the Montlake facility in Seattle are available for the study. However, switching to coho salmon required that smolting occur in the Spring of 2014. Most of the experiment has been completed. The end date for the project has been extended to September 30, 2014. No additional funds are needed.
- UC Davis will conduct experiments to (a) establish a dose response relationship between *E. estuarium* survival and percent clay in sediment and (b) investigate whether clay particle shape is correlated with amphipod mortality. The contract with UC Davis has been prepared. The work will be completed by December 31, 2014.

For more information, see previous EEWG minutes and agenda at <http://www.sfei.org/rmp/eewg> or contact the EEWG lead, Phil Trowbridge, philt@sfei.org.

C. Emerging Contaminants WorkgroupMeetings:

- The ECWG met April 15th, 2014. During the meeting special studies for 2015 were recommended. Updates were given on the Bioanalytical Tool study, the PFOS precursor study results, alternative flame retardant work, and current use pesticide mapping exercise.

Milestones:

- Finished the draft PBDE manuscript. After final input from co-authors in July 2014, the manuscript will be distributed to the ECWG, TRC and SC for a two-week review period.
- Collected alternative flame retardant effluent and seal samples.
- Completed the current use mapping pesticide exercise; presentation to TRC and ECWG.
- Presented information to the workgroup on potential pharmaceuticals and personal care products monitoring priorities.
- Prepared a CEC table for the State Panel describing RMP activities in relation to State Panel's recommendation for monitoring estuaries, and attendance at May meeting to discuss pilot study.
- Prepared proposals for June TRC meeting.
- Prepared and presented poster on alternative flame retardants in San Francisco Bay for BFR 2014 conference in Indianapolis.

- Presented RMP body of work on PBDEs and alternative flame retardants at an awards luncheon for the California Section of the American Chemical Society (May), as well as the BACWA laboratory committee (June).
- Finalized 2012 PBDE tern and cormorant egg measurements.
- Meg Sedlak presented a talk titled "Monitoring Chemicals of Emerging Concern in San Francisco Bay" at the Canadian Chemistry Conference on June 3, 2014.

Activities for the Third Quarter of 2014:

- Continuation of NIST broadscan work. NIST has provided the RMP with a final report for harbor seal samples and a preliminary report for mussel samples. NIST plans to publish the results from the seal samples in a manuscript (no date set). The NIST report on mussel samples was sent to the ECWG and comments are due by July 21, 2014. The report will be shared with the TRC after the ECWG review.
- Preparing for the collection of sediment and bivalve samples for alternative flame retardants.
- Preparing for the collection of sediment samples for pro bono quaternary ammonium compounds analyses (with Bruce Brownawell, Stony Brook University), and water samples for hindered phenol analyses (with Derek Muir, Environment Canada).
- Preparing for the August American Chemical Society meeting in San Francisco (poster presentation).
- Conducting metabolomic analyses of 10 seal serum samples collected from the South Bay by AXYS Analytical Services (pro bono).

For more information, see previous EC workgroup minutes and agenda at <http://www.sfei.org/rmp/ecwg> or contact the ECWG lead, Rebecca Sutton, RebeccaS@sfei.org.

D. Nutrients

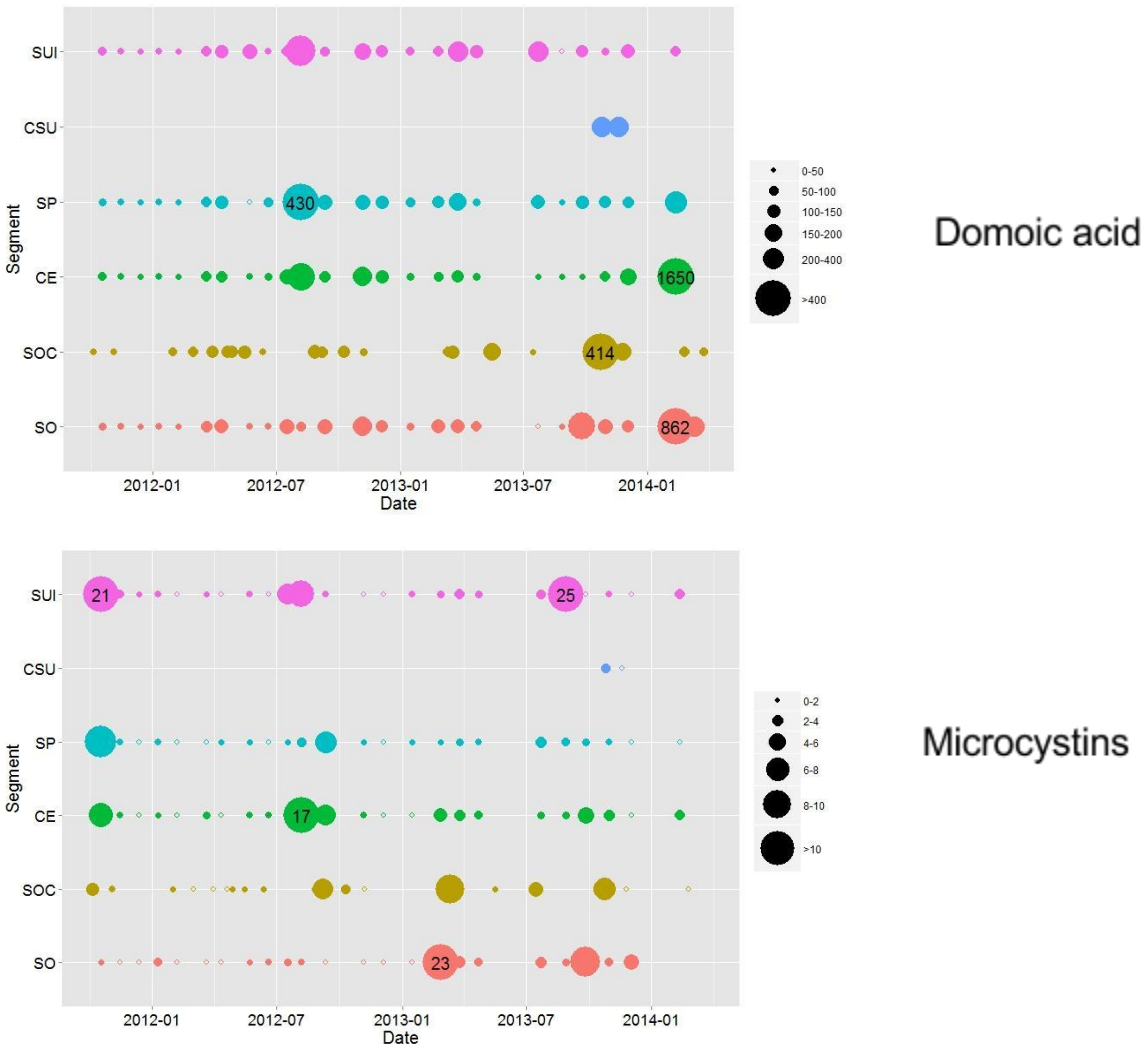
Meetings

In accordance with the newly-developed governance structure for the Nutrient Management Strategy, a Nutrient Technical Workgroup and a Steering Committee have been convened in Q2 2014. A project-specific technical team meeting also took place for the Assessment Framework Development (May 19th, 2014).

Milestones

- An interim report on the Solid Phase Absorption Toxin Tracking (SPATT) project for detecting algal toxins was recently completed (R. Kudela, UCSC). We anticipate a draft final and final project report in Q4 2014, so while this interim report will be distributed to the TRC/SC shortly, there is no need for formal review. SPATT samples have been deployed regularly in-situ and on transect cruises since 2011 (2013 samples funded by RMP) and preliminary analysis has begun (see figure below). 69% of samples were positive for microcystins and 99% were positive for domoic acid. A no-cost extension

has been requested in order to allow for sample collection and analysis to continue through September 2014.



- A draft “Development Plan for the San Francisco Bay Nutrient Monitoring Program” was completed in Q2 2014 and sent to the TRC/SC and the Nutrient Technical Workgroup for comment in early June. Thus far, no comments have been received. This report makes initial recommendations for future monitoring program structure and identifies highest priority data investigations/pilot studies to address remaining questions, and the report will be revised/updated as the results become available. [Funded in part by the RMP].

Activities for the Third Quarter of 2014

- “Scientific Foundation for a San Francisco Bay Nutrient Strategy” (formerly known as “Nutrient Conceptual Model”) will be completed in July 2014 [Funded by the RMP]
- A draft technical memo on the results of WY2012/WY2013 nutrient stormwater sampling is nearly complete and is expected in July 2014, at which point it will be sent to the TRC/SC for review [Funded by the RMP]

- Two draft deliverables for the moored sensor pilot program are expected in July 2014, which will be sent to the TRC/SC and Nutrient Technical Workgroup for review. One is a technical report that summarizes lessons learned about sensor operation, scientific analysis of pilot year data and recommendations for year 2 of the moored sensor program. The second is a manual that will provide guidance on sensor servicing and maintenance [Funded by the RMP and Nutrient Strategy]
- The detailed modeling workplan is currently being developed and is expected to be completed in July 2014. After this workplan is reviewed and approved by the TRC/SC, model development will begin [Funded by the RMP]
- A draft report that synthesizes seasonal, spatial and temporal trends in ecosystem drivers (nutrients, sediments) and responses (chlorophyll, dissolved oxygen) in Lower South Bay is currently in development and is expected to be completed in July 2014. This report is not RMP funded, but will be reviewed by the Nutrient Technical Workgroup.
- A beta web-tool for visualizing real-time moored sensor data from SFEI and USGS instruments is expected to be completed in July 2014.

For more information, please contact David Senn at davids@sfei.org or Emily Novick emilyn@sfei.org.

E. Sport Fish

Meetings

The Sport Fish Workgroup met on December 20th, 2013 to discuss the RMP's 2014 sport fish sampling effort, including the contaminants, species, and regions that will be sampled. Sampling is currently under way.

Activities for the Third Quarter of 2014:

- We are coordinating field activities, lab analysis, and data management for sport fish monitoring.

For more information, please contact April Robinson at april@sfei.org.

F. Selenium Strategy Team

Meetings

- The Selenium Strategy Team held its first meeting on April 22. The meeting was devoted to orientation for the members and preliminary discussion of a Strategy and workplan for 2015.
- A second meeting was held on June 3 that yielded proposals submitted to the TRC for their June meeting.

- The next meeting will occur in Q1 or Q2 of 2015 to review results from the proposed 2014 study of sturgeon muscle plugs and develop a plan for 2016 work.

Activities for the Third Quarter of 2014:

- Finalize written summary of the Selenium Strategy (via email).

G. PCB Strategy Team

Meetings

- The PCB Strategy Team met on June 6 to discuss proposals for work in 2015 and a multi-year workplan. The meeting and subsequent discussion led to the proposal to submitted for TRC consideration.
- The next meeting has not been scheduled yet, but the group will meet again once or twice this year to discuss criteria for prioritizing margin units, set the stage for work to be conducted in 2015, and further flesh out the multi-year workplan for PCBs.

Activities for the Third Quarter of 2014:

- Finalize updated PCB Strategy and possibly hold another meeting.

For more information, please contact Jay Davis at jay@sfei.org.

H. Items of Interest

Delta RMP

The Technical Advisory Committee (TAC) and its four ad-hoc subgroups are in the process of developing and consolidating various components of the initial monitoring design for the initial priorities of the program: current use pesticides, methylmercury, nutrients, and pathogens (Cryptosporidium and Giardia lamblia). POTWs have identified a station network of proposed key locations for reasonable potential analysis. The plan is to integrate these various elements into a unifying design by September, with the intent to start collecting samples in 2015. SFEI staff currently engaged in these planning efforts include: Thomas Jabusch, Jay Davis, David Senn, and April Robinson.

For more information, contact the Delta RMP Project Lead, Thomas Jabusch, at thomas@sfei.org.

Resilient Landscapes

Head of Tide Report Completed

Within the tributaries that drain to San Francisco Bay, there exists a transition between fluvial and tidal processes and conditions. The upstream boundary of this transition, called the head of tide (HoT) zone, can be defined as the inland limit of the effects of average high tides on tributary flows and water surface elevation. This zone is characterized by unique and diverse assemblages of plants and animals, cultural resources, as well as a vulnerability to out-of-channel flooding during high river flow and high tide conditions. As many Bay Area municipalities are built near the HoT zone, there is a growing concern about managing the flooding risk as well as the aquatic resources in the HoT zone for current conditions and future conditions when rapid sea level rise causes the HoT zone to migrate inland. The first step in developing effective management strategies needs to be creating a process, or protocol, for determining where the HoT zone is now and where it will likely be in the future.

SFEI recently completed a pilot study focused on creating a framework for a rapid protocol that can be used to delineate the current and future HoT zone for San Francisco Bay tributaries using both “desktop” and field investigations. The protocol was developed by examining data collected at six tributaries that represented a broad range in watershed size and channel gradient. The desktop investigation used publically available spatial tools as a “first cut,” coarse estimate of the current HoT zone location. The field investigation involved examining multiple physical and biological indicators of both the current and future HoT zones and is intended to refine the estimate given by the desktop investigation. The data were then analyzed to determine the indicators that are most effective at rapidly identifying the HoT zone location and extent.

The study found that a combination of desktop and field investigations can be used to develop rapid yet reasonable estimates of the current and future HoT zones for the San Francisco Bay tributary sites examined. These findings are encouraging and suggest that a robust, validated protocol appropriate for Baywide application can be developed with data from more representative Bay tributaries. SFEI plans to continue protocol development in close coordination with regional management agency partners.

Forum on Science to Support Management of Methylmercury in Restored Tidal Marshes

The RMP sponsored a forum on December 17, 2013 to review information and information needs relating to managing methylmercury in restored tidal marshes in San Francisco Bay. A summary of the meeting will be distributed with the SC agenda package. Meeting materials are available at http://www.sfei.org/calendar_events/4326

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July 8, 2014

To: Steering Committee

From: Philip Trowbridge

Re: Adopting the State Fiscal Year for the RMP

REQUESTED ACTION

1. Adopt the State Fiscal Year for RMP budgets with details to be presented at the October Steering Committee meeting

EXPLANATION

SFEI is in the process of adopting to the State Fiscal Year (SFY) for accounting purposes. The RMP operates on a calendar year (CY) basis. There would be several advantages to switching the RMP to the SFY:

- Reduced audit costs and complexity.
- Ability to use audited numbers to verify RMP budgets and balances.
- Easier to work with state partners and others who follow the SFY.

SFEI recommends adopting the SFY for the RMP. However, the transition from the CY to SFY would require several major changes to the program and details still need to be worked out. The two biggest challenges that SFEI anticipates are: (1) a gap year budget (covering a 6 or 18-month period); and (2) changes to the annual calendar of events for the RMP.

Gap Year Budget

The earliest that the RMP could adopt the SFY would be FY16 (July 1, 2015 – June 30, 2016) or FY17 (July 1, 2016 – June 30, 2017). The RMP has an adopted budget for CY14 which ends on December 31, 2014. Therefore, a gap year budget would be needed for the period January 1, 2015 to June 30, 2015 (or June 30, 2016 for an 18-month period). RMP cash flow is not even across all months of the year so the gap year budget would need to be carefully managed. If a 6-month gap were chosen, the RMP workgroups, TRC, and SC would need to complete an expedited budget process for FY16.

Changes to the RMP Schedule

The schedule followed by the RMP over the calendar year is shown in Table 1. Changing to the SFY would affect this calendar in several ways.

- **Billing:** The time of the year that the RMP invoices participants would change from late fall to spring. If a 6-month gap year is chosen, this change would result in participants being invoiced twice in one year during the transition period: once in November for a half year under the old CY system and once in May for a full year under the new SFY system. In addition, if the data needed to determine fees are not available in the spring, the formulas for calculating fees may need to be changed.
- **Budgeting:** Budgets would need to be developed in the fall and winter and approved in April. If a 6-month gap year is chosen, this change would entail an expedited budget process for FY16 during the first few months of 2015.
- **Annual Meeting and Reporting:** The Steering Committee will need to decide whether to move the Annual Meeting and Pulse reporting to the spring to correspond to the end of the SFY. There may be scheduling reasons to not make this change such as conflicting conferences, availability of venues, and availability of new data.

Table 1: The Current Calendar Year Schedule for the Steering Committee (Source: Multi-Year Plan)

Annual Steering Committee Calendar	
• January	<ul style="list-style-type: none"> ○ Approval of Multi-Year Plan ○ Review of incomplete projects from the previous year
• April	<ul style="list-style-type: none"> ○ Multi-year Plan: Focus on selected element(s) ○ Plan for Annual Meeting ○ Additional guidance to workgroups
• August	<ul style="list-style-type: none"> ○ 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	<ul style="list-style-type: none"> ○ 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	

Regional Monitoring Program Forum: Science to Support Management of Methylmercury in Restored Tidal Marshes *Summary*

December 17, 2013

Topic 1: Short-term vs Long-term Effects

Hypothesis 1: The effect of tidal action on restored sites may result in a local short-term transitory spike or increase in net methylmercury production and biotic exposure, within the project and downstream, but we are unlikely to see levels of concern in biota that warrant management action.

Forum discussion highlights:

- There is not enough evidence from the data presented to accept or reject this hypothesis.
- There was agreement that there will be a short term spike in methylmercury following restoration activities. However there was no consensus around the long-term effect on levels of concern in biota - long-term monitoring would be needed to evaluate this.
- Participants suggested we may be able to learn more from the data we have already collected, and from ongoing projects such as the South Bay Salt Pond monitoring.
- Questions remain: Can we protect beneficial uses by monitoring only long term effects or do we need to also monitor short term effects? What levels warrant management action?

Topic 2: Local vs Regional Impacts

Hypothesis 2: Methylmercury loading from tidal wetland restoration projects is a minor contribution to the total pool of methylmercury available for uptake into the Bay's food web and therefore is a minor factor relative to Bay-wide mercury impairment (e.g., bird and fish tissue levels).

Hypothesis 3: We do not expect to be able to measure the regional impacts to the Bay's food web from tidal wetland restoration projects.

Forum discussion highlights:

- There was support for the conceptual foundation that we would not expect to see a regional increase in methylmercury in the Bay because the amount of methylmercury exported will be a small part of the overall mass balance.
- There was agreement that we have not seen evidence of a **large** regional impact to Bay wildlife from wetland restoration projects. There may be a small or moderate effect on Bay wildlife that our monitoring has not detected.

- The methylmercury risk to marsh and salt pond wildlife (local effects) may still be substantial.

Topic 3: Study Design

Principle 1: Measuring mercury in one or more biosentinel species is an appropriate approach to provide information on management questions 1, 2, 3 and 7, and to identify circumstances where more detailed studies should be performed to understand methylation and bioaccumulation processes.

Principle 2: Process studies should be done at only a subset of sites, which biosentinel monitoring can help to identify. Process studies can help to answer management question 5.

Principle 3: The monitoring program should have a regional scope to ensure that data are relatively consistent across projects so that site-specific variability may be distinguished from regional trends and phenomena.

Forum discussion highlights:

- Both biosentinel and process studies are necessary.
- Design principles 1&2 should be rephrased as: Biosentinel monitoring should be used to generate hypotheses and process studies should be used to test hypotheses.
- Participants agreed that process studies be done at a subset of monitored sites.
- There were different opinions expressed about whether biosentinel monitoring and process studies should be done consecutively or concurrently.
- There was support for a regional approach to monitoring, with some sites selected for detailed investigation.

Topic 4: Restoration Design and Management Actions - Restored Marshes

Hypothesis 4: We do not yet have sufficient information to design tidal marsh restoration projects to reduce methylmercury exposure.

Hypothesis 5: It is possible to design or manage restored marshes to reduce methylmercury exposure.

Forum discussion highlights:

- In order to understand how to design projects to reduce methylmercury risk we would need to invest in research and pilot studies.
- Methylmercury risk may be reduced by prioritizing restoration and erosion prevention in particular areas.

ALTERNATIVE FLAME RETARDANTS IN SAN FRANCISCO BAY

The state of California has implemented unique flammability standards for consumer products and other common goods. In response to nationwide phase-outs of polybrominated diphenyl ether (PBDE) flame retardants, manufacturers began to substitute other flame retardant chemicals in their products. Little is known about many of the diverse array of bromine-, chlorine-, and phosphate-containing compounds that have replaced PBDEs. Some of these chemicals have been in use for decades, while others are new. In recent studies, the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) has detected some of these alternative flame retardants in samples of Bay water, sediment, and biota. Typically, they are found in lower concentrations than PBDEs. The levels observed have been far below the effects thresholds that exist for a few of these compounds, but for most of these chemicals the potential risks are unknown. Starting in 2014, changes to California's flammability standards may lessen the use of chemical flame retardants and therefore reduce the potential risks in the Bay. Preliminary results from a new survey of alternative flame retardants in Bay water, stormwater, and wastewater treatment plant (WWTP) effluent are presented.

TCEP	Tris (2-chloroethyl) phosphate
TCPP	Tris (1-chloro-2-propyl) phosphate (multiple isomers)
TDCCP	Tris (1,3-dichloro-2-propyl) phosphate
TPhP	Triphenyl phosphate
TBP	Tri-n-butyl phosphate
TCrP	Tricresyl phosphate
TPrP	Tripropyl phosphate
TBEP	Tris (2-butoxyethyl) phosphate
TEHP	Tris (2-ethylhexyl) phosphate
EHDPP	2-Ethylhexyl-diphenyl phosphate
TDBPP	Tris (2,3-dibromopropyl) phosphate

Table 1.
Phosphate
Flame
Retardant
Abbreviations

METHODS

Analyses were conducted on 4 L grab samples:

- **AMBIENT BAY WATER:** Single samples from 12 locations; eight collected in July (dry season), four collected in October, and two collected in November (beginning of wet season)
- **STORMWATER:** Two samples collected during each of two storm events from two different urban, industrial channels
- **WASTEWATER:** Single samples of effluent from three WWTPs

Samples were filtered to allow analysis of both particulate and dissolved phases. Some phosphate flame retardants are also used as plasticizers, so sample exposure to plastic was avoided.

All samples were analyzed for tri-ester organophosphate flame retardants using a highly sensitive liquid chromatography-electrospray ionization(+)-triple quadrupole mass spectrometry (LC-ESI(+)-QQQ-MS/MS) based analysis method (Chen et al. 2012; Chu et al. 2011). Labeled internal standards (including d27-TBP, d15-TPhP, d12-TCEP, and 13C12-TBEP) were used. Limits of detection for each compound ranged from 0.1 to 0.3 ng/L for all but TDBPP (0.8 ng/L). A single replicate of each matrix was collected at a representative sample site; further replicates were analyzed by subdividing samples in the laboratory.

Results revealed good quality assurance and control performance. Duplicate analysis revealed relative standard deviations less than 8% except for two samples (15% and 16%, respectively). Spiking tests revealed average recoveries of target analytes ranging from 82% to 99%. Internal standard recoveries ranged from 81% to 92%. Only trace levels of contamination (a total of <10 ng/L) were observed in laboratory and field blanks. Lab blank contamination was subsequently subtracted from final results.

RESULTS

Phosphate flame retardants were widely detected in San Francisco Bay.

- TCPP was typically the most abundant contaminant, followed by TBEP and TPhP. TDCPP, TCEP, and TBP were also widely detected. TCrP, TPrP, TEHP, EHDPP, and TDBPP were detected rarely or not at all.
- Qualitative data from polar organic chemical integrative samplers (POCIS) deployed in the Bay in 2010 also suggested that TCPP was a relatively abundant contaminant; in contrast, there were few detections of TBEP and TPhP (Klosterhaus et al. 2013). Because POCIS are designed to survey polar compounds, they may not adequately characterize less polar phosphate flame retardants.
- Contaminants were more concentrated in southern parts of the Bay, where surface waters experience the least amount of mixing with non-effluent flow, particularly in the dry season, and have the highest hydraulic residence time compared to other segments. The average total concentration of phosphate flame retardants in the South and Lower South Bays was four times higher than in the rest of the Bay. Averages of all individual phosphates were also higher in southern parts of the Bay.
- Comparison to limited data available for other regions indicates San Francisco Bay has higher levels of contamination for most phosphate flame retardants relative to other estuarine or marine regions (Table 2).
- Previous monitoring has detected some of these contaminants in Bay sediment, bivalves, and aquatic bird eggs (Klosterhaus et al. 2013).

Phosphate flame retardants enter the Bay via stormwater and effluent.

- TCPP was typically the most abundant contaminant in stormwater, followed by TBEP, TCEP, TDCPP, TPhP, and TBP were also widely detected. TCrP, TPrP, TEHP, EHDPP, and TDBPP were detected at lower levels.

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Location	Year	TCEP	TCPP	TDCPP	TPhP	TBP	TCrP	TPrP	TBEP	TEHP	EHDPP	TDBPP	Reference
San Francisco Bay	2013	4.2-300	12-2,900	5.9-480	15-300	4.5-39	ND-0.2	11-840	ND-28	ND-20	ND	ND	This study
Southern California Bight	2006-2007	ND	50-36	6-30	0.1-4	2-7.5			ND-90				Vogelbein et al. 2012
North Sea (coastal)	2009								ND-8				Boström et al. 2012
Stormwater													
Richmond, Calif.	2013-2014	24-320	100-1,500	150-180	42-36	20-270	ND-1.6	ND-1.2	710-2,400	ND-1.1	ND-1.4	ND	This study
Sunnyvale, Calif.	2013-2014	21-240	65-2,200	15-77	30-100	13-150	ND-56	0.1-2.0	25-1,000	ND-28	4.5-46	ND-42	This study
WWTP Effluent	2008-2009	33-275	16-5,791	ND-73		4-417			ND-1,616				Reganry and Palmann 2010
San Francisco Bay WWTPs													
SF Bay WWTP 1	2014	180	2,700	180	27	13	ND	ND	ND	ND	ND	ND	This study
SF Bay WWTP 2	2014	320	2,500	320	61	38	6.7	ND	66	ND	ND	ND	This study
SF Bay WWTP 3	2014	160	1,900	120	65	22	14	ND	2,900	17	27	3.5	This study
California, Calif.	2006	ND-373											Jackson and Sutton 2008
Southern California	2006-2007	ND-1,700	610-2,700										Vogelbein et al. 2012
European Union	2006	100-3,000	100-23,000	10-800	10-610	10-6,700	ND-1.3		10-43,000	ND	ND-5,400		Chen et al. 2013
Honolulu	2007	1,000-2,000	1,700-3,100	85-740	1,700-3,500	270-1,300			1,800-3,900		300-710		Green et al. 2008
Australia	2005	ND-1,600	270-1,400	19-1,480	ND-176	ND-810	ND-55		13-5,400	ND			Martinez-Carballo et al. 2007

* Samples taken from stormwater holding tank.

- TDCPP contamination was nearly four times greater at the Richmond site, while TCrP, EHDPP, and TDBPP contamination was more common at the Sunnyvale site.
- Bay stormwater contamination is generally similar to that reported in Frankfurt, Germany, with higher levels of TDCPP and lower levels of TBP (Table 2).
- TCPP was typically the most abundant contaminant in WWTP effluent, followed by TBEP, TCEP, TDCPP, TPhP, and TBP were also widely detected. TCrP was detected at lower levels, while EHDPP, TEHP, and TDBPP were detected only at WWTP 3. TPrP was not detected.
- Bay WWTP effluent contaminant levels were similar to or less than those reported in other regions (Table 2).
- These snapshots suggest effluent may be an especially important pathway for TCPP and TDCPP, while stormwater may be an especially important pathway for TBP, TCrP, EHDPP, and TDBPP. Both pathways also appear to have the potential to deliver significant TCEP, TBEP, and TPhP to the Bay.

Phosphate flame retardants may pose potential risks to Bay wildlife

- Some South Bay samples exhibited concentrations of TPhP approaching the marine aquatic toxicity threshold of 370 ng/L (predicted no effect concentration [PNEC]; ECHA 2014).
- Concentrations of other phosphate flame retardants were generally an order of magnitude or more below concentrations expected to elicit toxic effects in aquatic organisms (ECHA 2014). However, relatively few toxicity studies are available for many of these compounds. Of note, TDCPP and TCEP have been identified by the state of California as carcinogens. Furthermore, the potential for impacts caused by exposure to environmentally relevant mixtures of flame retardants must be explored to thoroughly assess the risks to wildlife.

AMBIENT BAY SAMPLE SITES

- July
- October
- November

CONCLUSIONS

- San Francisco Bay is widely contaminated with phosphate flame retardants, with higher levels measured in the southern region where effluent discharge has a greater influence.
- Detection of phosphate flame retardants in WWTP effluent and stormwater suggests these compounds migrate from consumer products and enter the aquatic environment via both pathways.
- San Francisco Bay monitoring data are a critical addition to the limited number of measurements available for these compounds, especially in estuarine and stormwater matrices.
- TPhP concentrations in the Bay are approaching the marine PNEC; other phosphate flame retardants do not exceed established PNECs (ECHA 2014).
- Lack of ecotoxicity information is a concern, particularly because the effects of long-term exposure to low levels of these contaminants are largely unknown. In addition, the effects of exposure to multiple phosphate flame retardants have not been examined.
- Recent changes to California's flammability standard for foam furniture (TB 117) may reduce the use of some phosphate flame retardants, potentially leading to lower contaminant inputs to the Bay.

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