Technical Review Committee

December 14, 2017
9:30 AM – 3:30 PM

REMOTE ACCESS
Audio by Phone: +1.415.655.0381, Access Code 943-326-397#
Slides: https://join.me/sfei-conf-cw1

AGENDA

1.	**Introductions and Review Agenda**	9:30 Bridgette DeShields
2.	**Decision: Approve Meeting Summary from September 14, 2017 and confirm/set dates for future meetings.** One of the action items from the September TRC meeting a report out on RMP data on legacy pesticides relevant to 303d listings. This information is relevant to deciding on the target analytes for the 2019 S&T sport fish monitoring. Scheduled meetings: SC: 1/24/18 EEWG: 4/11/18 ECWG: 4/12/18 - 4/13/18 SC: 4/25/18 SC: 7/25/18 SC: 10/24/18 Proposed meetings: TRC: Move March TRC meeting from 3/8/18 to 3/14/18 TRC: 6/14/18 Materials: See pages 1-14 September 14 TRC Meeting Summary Slides summarizing RMP data on legacy pesticides Desired outcome: Approve meeting summary, schedule future TRC meeting dates	9:35 Bridgette DeShields & Jay Davis

3.	**Information: MYP/SC Meeting Summary from November 1, 2017** Topics discussed at the November MYP/SC meeting included: ● Multi-Year Planning Workshop ● 2018 Detailed Workplan and Budget ● Funding request for Analyzing Archived Tern Eggs for PBDEs ● Funding request for North Bay Fire Monitoring ● 2018 Pulse and Annual Meeting Materials: See pages 15-24 Multi-Year Planning Meeting Summary Steering Committee Meeting Summary Desired Outcome: Informed committee	9:50 Phil Trowbridge
4.	**Decision: Recommend Purchase of Acoustic-Release Systems for S&T Bivalve Monitoring** The RMP is planning to sample bivalves in 2018 as part of Status and Trends monitoring. Aquatic Marine Sciences has managed the bivalve sampling in the past and is proposing a new method for bivalve deployment and collection that involves an acoustic-release system. The proposed bivalve monitoring design will be discussed along with the proposed cost and projected savings. The TRC will decide whether to switch to this new methodology for 2018 and beyond. Materials: See pages 25-34 Slides from AMS regarding pros/cons of acoustic-release systems Desired outcome: Approve new acoustic-release system for future S&T bivalve monitoring.	10:30 Paul Salop
5.	**Information: 2017 Copper and Cyanide Water Concentrations Relative to Site-Specific Objectives and Latest Aquatic Toxicity Results** Preliminary data from the 2017 water cruise for copper, cyanide, and aquatic toxicity will be presented. The TRC will provide guidance on how to interpret the results and discuss the frequency of aquatic toxicity testing (past and future). Materials: None. Slides will be presented at the meeting. Desired outcome: Informed committee and guidance on the schedule for future aquatic toxicity testing.	11:00 Ila Shimabuku

6.	**Information/Decision: Fire Response Monitoring** **A) Status of Proposal to Monitor Stormwater from North Bay Fires** A draft of the North Bay Fire Monitoring effort was sent out to the TRC for review on November 13, 2017. The Steering Committee approved a modified proposal on November 29, 2017. RMP staff will give a quick update on the status of the project. **B) Add Dioxins to 2018 Bird Egg Monitoring for Fire Response** The TRC will decide whether to add dioxins to the list of analytes for 2018 Status and Trends bird egg monitoring as additional fire response monitoring. Archiving bird egg samples for later analyses of dioxins is another option. RMP staff will present pricing and time series of previous bird egg data. Materials: See pages 35-57 Proposal to monitor Stormwater from North Bay fires Slides summarizing dioxin concentrations in cormorant eggs Desired outcome: ● Informed committee on status of North Bay fire monitoring ● Recommendation on whether to add dioxins to analyte list for 2018 bird egg monitoring	11:30 Rebecca Sutton and Jay Davis
	LUNCH	12:30
7.	**Discussion: Laboratory Intercomparison Study Plans** Maintaining highly accurate measurements and coherent time series are both critically important to the RMP. The RMP recently changed labs for PCBs in sediment and a new lab for PCBs in fish tissue will be needed in 2019. On November 1, the Steering Committee approved a total of $50,000 for laboratory intercomparison (IC) studies in 2018. The Southern California Coastal Water Research Project (SCCWRP) is organizing an intercomparison study of sediment and fish in 2018 which presents a partnering opportunity. Options for different approaches to this topic will be presented and discussed. Materials: See pages 58-66 Slides on options for lab IC studies Desired outcome: Guidance on RMP IC Studies in 2018	1:00 Don Yee
8.	**Information: Informatics and Data Services Update** The RMP invested $315k on data management, quality assurance, and visualization tools in 2017. This investment is critical to making RMP data accessible and useable now and in the future. The purpose of this agenda item is to highlight all of the accomplishments in 2017 and the value of this work. Materials: None. Slides will be presented at the meeting. Desired outcome: Informed committee	2:00 Cristina Grosso Amy Franz Michael Weaver

9.	**Information: Plans for the 2018 RMP Update Report, Annual Meeting, and Upcoming Reports & Communications Products** RMP staff will present a draft outline of 2018 RMP Update report for discussion. The group will also discuss impressions from the 2017 Annual Meeting and plans for a session at the 2018 SETAC conference in Sacramento. Materials: See pages 67-71 Draft outline for 2018 RMP Update Report Desired outcomes: ● Refined outline for the 2018 RMP Update report ● Brainstorming on SETAC sessions	2:45 Jay Davis
10.	**Information: Status of Deliverables and Action Items** Materials: See pages 72-end Desired outcome: Informed committee about the status of RMP deliverables.	3:00 Phil Trowbridge
11.	**Discussion: Plan agenda items for future meetings** Desired outcome: Identify future agenda items.	3:15 Jay Davis Phil Trowbridge
12.	**Discussion: Plus/Delta**	3:20 Bridgette DeShields
13.	**Adjourn**	3:30

Recently Completed RMP Products

2017 Pulse of the Bay! www.sfei.org/rmp/pulse.

2018 Detailed Workplan and Budget. Approved by Steering Committee, 11/1/17. http://www.sfei.org/documents/2018-rmp-detailed-workplan-and-budget.

Updated Charter. Trowbridge P. Charter: Regional Monitoring Program for Water Quality in San Francisco Bay. Richmond, CA: San Francisco Estuary Institute ; 2017 . Report No.: 844. http://www.sfei.org/documents/charter-regional-monitoring-program-water-quality-san-francisco-bay-0.

Updated CEC Strategy. Sutton, R.; Sedlak, M.; Sun, J.; Lin, D. 2017. Contaminants of Emerging Concern in San Francisco Bay: A Strategy for Future Investigations. 2017 Revision. SFEI Contribution No. 815. http://www.sfei.org/documents/contaminants-emerging-concern-san-francisco-bay-strategy-future-investigations-2017

Chen et al. 2017. Water Column Selenium Concentrations in the San Francisco Bay-Delta: Recent Data and Recommendations for Future Monitoring. Prepared by Tetra Tech, Inc. SFEI Contribution No. 836. http://www.sfei.org/sites/default/files/biblio_files/Water%20Column%20Selenium%20Concentrations%20in%20the%20San%20Francisco%20Bay-Delta.pdf

S&T Cruise Reports

- Trowbridge P, Sun J, Franz A, Yee D. 2017 Margins Microplastics Cruise Plan. Richmond, CA: San Francisco Estuary Institute ; 2017 . Report No.: 847. http://www.sfei.org/documents/2017-margins-microplastics-cruise-plan.
- Fairey R, Sigala M. 2017 Margins Microplastics Cruise Report. Moss Landing, CA: Coastal Conservancy & Research; 2017 . Report No.: 848. http://www.sfei.org/documents/2017-margins-microplastics-cruise-report.
- Lin D, Sun J, Yee D, Franz A, Trowbridge P, Salop P. 2017 RMP Water Cruise Plan. Richmond, CA: San Francisco Estuary Institute ; 2017 . Report No.: 845. http://www.sfei.org/documents/2017-rmp-water-cruise-plan.
- Salop P. 2017 RMP Water Cruise Report. Livermore, CA: Applied Marine Sciences; 2017. http://www.sfei.org/documents/2017-rmp-water-cruise-report.

Datasets and Tools

- 2003-2014 Historic Sportfish Dioxin Furan TEQs data is available in CD3. Go to cd3.sfei.org. Click on “Direct Download Tool” and select the project ‘2003 RMP Fish’ or ‘2006 RMP Fish’ or ‘2009 RMP Fish’ or ‘2014 RMP Fish’ , the analyte group ‘DioxinsDibenzofurans’, and the Analyte Sub Group ‘TEQs’.
- RMP SEP 2016 San Leandro Bay Fish PCBs Data is available in CD3. Go to cd3.sfei.org. Click on “Direct Download Tool” and select the project called “RMP Special Study San Leandro Bay PCB Study (SEP)”.
- Released CD3 v3.2 – new functionality includes a new result threshold filter tool, new API for sharing data (https://cd3.sfei.org/api.php), updated metadata information for the datasets displayed in CD3 (https://cd3.sfei.org/info.php), installation of a SSL security certificate, and addition of data use notes in the download files.

Bay RMP Technical Review Committee Meeting
September 14, 2017
San Francisco Estuary Institute

Meeting Summary

Attendees

TRC Member	Affiliation	Representing	Present
Nirmela Arsem	EBMUD	POTWs	No
Rod Miller	SFPUC	POTWs	**Yes**
Tom Hall	EOA, Inc.	POTWs	**Yes**
Amy Chastain	SFPUC	POTWs	No
Eric Dunlavey	City of San Jose	POTWs	**Yes**
Bridgette DeShields*	Integral Consulting	Refineries	**Yes**
Chris Sommers	BASMAA (EOA, Inc.)	Stormwater	**Yes**
Shannon Alford	Port of SF	Dredgers	**Yes**
Ian Wren	San Francisco Baykeeper	NGOs	No
Richard Looker	SFB RWQCB	Water Board	**Yes**
Luisa Valiela	US EPA	US-EPA IX	**Yes**

*Chair

Guests and Staff

- Paul Salop - Applied Marine Sciences
- Mary Lou Esparza - CCSF (Remote Access)
- Naomi Feger - RWQCB (Remote Access)
- Phil Trowbridge - SFEI
- Jennifer Sun - SFEI
- Ila Shimabuku - SFEI
- Rebecca Sutton - SFEI
- Diana Lin - SFEI
- Jay Davis - SFEI (Remote Access)

1. Introductions and Review Agenda

Phil Trowbridge presented the agenda for today's meeting and raised the importance of three morning items: the decision on whether to archive tern eggs for PBDE analysis, developing a strategy for laboratory intercomparison studies, and a check-in on the 10-year plan for Status and Trends Monitoring. He also notified the TRC that part of Item 9, a preview of Alicia Gilbreath's Annual Meeting talk on pollutant loads entering the margins) would be skipped and that the meeting should end early.

2. Decision: Approve Meeting Summary from June 8, 2017 and confirm/set dates for future meetings.

Bridgette DeShields brought forward the meeting summary from the June Technical Review Committee meeting for any comments or edits. None were made.

Everyone except Shannon Alford confirmed their registration for the RMP's Annual Meeting on October 6. Phil Trowbridge continued by reminding TRC members of the November 1 Multi-Year Planning Workshop as well as the next scheduled TRC meeting on December 14. Phil then proposed that March 8 be the date for the following TRC meeting, continuing to use the second Thursdays of the month.

Decision:

- Eric Dunlavey motioned to approve the June 8, 2017 TRC meeting summary. Chris Sommers seconded the motion. The motion for approval was carried by all present members.

Action Items:

- Finalize the June 8, 2017, TRC meeting summary and post to the public meetings folder. (Ila Shimabuku, 9/25/17)
- Create a calendar event for the March 8, 2018, TRC meeting. (Ila Shimabuku, 9/25/17)
- Adjust the calendar event for the November 1, 2017, Multi-Year Planning meeting to include TRC members. (Ila Shimabuku, 9/25/17)
- Reach out to all TRC and SC members to confirm their planned attendance at the RMP's Annual Meeting. (Phil Trowbridge, 9/25/17)

3. Information: Steering Committee Meeting Summary from July 19, 2017

Phil Trowbridge quickly summarized the July Steering Committee meeting by explaining that the SC accepted the TRC's recommendations regarding funding for special studies and were able to secure funding for all TRC-recommended projects by combining RMP funds with Supplemental Environmental Project funds.

4. Decision: Recommendation for Analyzing Archived Tern Eggs for PBDEs

Phil Trowbridge introduced Jennifer Sun's proposal to analyze PBDEs in archived tern eggs. These tern egg samples were collected in 2016 with the intended analysis for PBDEs, once funding had become

available. This sample set is comprised of twelve field samples and four quality-control samples which requires a total budget of $14,300 for sample analysis.

The type of PBDEs that has historically been present in terns are penta-brominated PBDEs that were phased out of production in 2004. The main purpose of these analyses will be to evaluate trends in PBDEs in tern eggs. If PBDE levels continue to plateau or decline, analysis of PBDEs in tern eggs could be taken off the Status and Trends design after two more rounds of sampling (2018 and 2021).

Decision:

- The proposal to analyze archived tern egg samples for PBDE analysis should be brought to the SC for approval. (Consensus)

Action Item:

- Revise the funding request memo for PBDEs in Tern eggs and put it on the agenda for the SC (Phil Trowbridge, 11/1/17)

5. Discussion: Laboratory Intercomparison Studies for Critical RMP Analytes

Don Yee began his presentation on laboratory intercomparison studies by stating that the RMP would like to develop a more comprehensive approach for how and when these studies are performed. Large amounts of the RMP budget are spent on Status and Trends monitoring. Laboratory intercomparisons boost confidence in methodology and results, act as an insurance policy for unforeseeable changes in analysis procedures and analytical contractors, and provide many other benefits. Don outlined two strategies that differ based on whether certain analytes can be archived. He recommended that for persistent contaminants (e.g., PCBs, etc.) that can be archived and analyzed at later dates, different matrices should be stockpiled for later analysis at different labs. For analytes that degrade when archived or require frequent measurements (nutrients, selenium, etc.), rolling intercomparison work is necessary to evaluate and assess possible biases in methods, labs, etc.

Don highlighted intercomparison work for particulate and dissolved selenium as well as organics analysis in fish tissue as the highest priority and recommended that these be conducted as soon as possible. The TRC agreed with these priorities and highlighted PFASs, selenium in fish tissue, organics in bird eggs, and organics in bivalves as also being priorities. In general, however, possible intercomparison studies will need to be evaluated and prioritized on a case-by-case basis as opportunities arise.

Several strategic questions arose: how many labs should be involved in one intercomparison study; how large does a bias need to be indicate a problem; once conclusions about methodologies have been drawn do they need to be tested again down the line; how big or small do changes in cost, personnel, methods, etc., need to be in order to trigger intercomparisons; and whether more language on when the RMP is notified of these changes should be included in laboratory contracts. Two general strategic structures were proposed. One approach would be to run low-level intercomparison efforts for each round of sampling and have a separate protocol for targeted intercomparison studies when certain red flags arise. The low-level intercomparison could be in the form of “back-comparing” using archives from the last round of monitoring to see if the lab is still getting the same results before running the new samples. Another approach was to conduct large efforts every four to six years.

Overall, the TRC agreed on the value of intercomparison work and expressed interest in continuing to develop a more clear and robust strategy. A few members were also interested in surveying for intersecting interest from related programs, labs, agencies, and researchers (e.g., in Puget Sound or NOAA) and seeing whether others would be interested in contributing joint intercomparison work to reduce costs.

Action Item:

- Develop a more specific plan for intercomparison studies to discuss at the December TRC meeting. (Don Yee, 12/14/17)

6. Discussion: Status and Trends Design and Projected Costs through 2027

Phil Trowbridge introduced this agenda item by presenting the compiled budgets and expenses for Status and Trends work since 2014 and past S&T expenses for each cruise type. He highlighted the fact that close to half (43%) of S&T expenses are for USGS suspended sediment and USGS nutrients work. Another chart showed past S&T expenses separated by the types of work. The leading expense based on the type of work was subcontracted laboratories (29%) followed by subcontracted field work (27%). He continued by listing some possible, future cost-saving options for S&T.

There was a discussion about how much more data are needed on legacy pesticides to support a de-listing decision. There are public-perception consequences to having impairments for the Bay. Richard Looker agreed to look into the matrix that is driving the impairment. Phil Trowbridge will gather up all the RMP data on legacy pesticides collected since the last listing cycle (2006). The TRC will discuss this information in December and decide about including legacy pesticides in the 2018 S&T monitoring.

Sampling of sediment in the margins for 2022, 2024, and 2026 should be confirmed by the TRC before proceeding. Margins sampling could be combined with open Bay sediment sampling or could be scheduled based on weather conditions.

Overall, TRC members agreed with Phil's approach to planning for the costs of Status and Trends work, with the assumption that planning costs for intercomparison studies will be reduced. The numbers he proposed and the overall increase of the Status and Trends budget from $1.0 million to $1.2 million were approved for planning purposes.

The TRC also agreed to conduct future sediment cruises during the summer season only. Additional special studies during the winter season will be added if there is a need to collect data during the wet season.

Decision:

- Conduct sediment cruises in the summer seasons and conduct special studies for winter sediment sampling, if necessary. (Consensus)

Action Items:

- Revise S&T Design based on feedback from the TRC and include it in the Multi-Year Plan (Phil Trowbridge, 11/1/17)
- Determine why the RMP decided to test for water column toxicity every 2 years instead of less frequently and report back to the TRC. (Jay Davis, 12/14/17)
- Report back to the TRC in December with information on the matrix drives the continuing 303d listing for legacy pesticides and information on OEHHA guidelines for legacy pesticides in fish tissue. (Richard Looker, 12/14/17)
- Send information to TRC on all RMP data on legacy pesticides collected after 2006. Include both data tables and time series plots. (Phil Trowbridge, 11/15/17)
- Agendize a discussion of deploying radio-controlled moorings for bivalve samples for the December TRC meeting. (Phil Trowbridge, 12/14/17)

Lunch

7. Information: Overview of New Report on Per and Polyfluoroalkyl Substances (PFASs)

Phil Trowbridge commenced the second half of the day by introducing Meg Sedlak and her presentation on the new Synthesis and Strategy Report for Per and Polyfluoroalkyl Substances (PFASs). Meg began her presentation by highlighting that Rebecca Sutton, Diana Lin, and Adam Wong played large parts in generating this report that involved synthesizing 10 years of findings with PFASs, reviewing recent literature to determine whether any of the CEC tiers for PFASs need reassessment, and developing our recommended monitoring strategy. PFASs are widely manufactured with over 3,000 different PFASs in industry because they are chemically inert, thermally stable, and have surfactant characteristics. There are quite a few sources for PFASs in the Bay and they are especially difficult to track. While PFOSs and PFOAs have been found to bioaccumulate and be harmful to human and ecological health, toxicity data are lacking for other long-chain PFASs that are predicted to behave similarly.

The recommendations outlined out in the PFAS strategy including monitoring seals, sediment, and a few species of fish, as well as using advanced analytical screening techniques to reveal other possible PFASs of concern. It also includes recommendations for stormwater sampling that would be compared to stormwater work in 2010 to assess whether there have been decreases in concentrations of discontinued PFASs. TRC members were supportive of the strategy and also suggested exploring external interest that could morph into more funding for future PFAS studies. Comments on the PFASs report are due by the end of September.

8. Discussion: Update on AQUA-GAPS Passive Sampler Deployment

Diana Lin began her presentation by explaining that Aquatic Global Passive Sampling (AQUA-GAPS) is a global effort to measure a set list of persistent organic pollutants worldwide using passive samplers. The RMP was suggested by one of the leading participants, Derek Muir, to be in charge deploying a passive sampler in the San Francisco Bay. The passive sampler was deployed at the Dumbarton Bridge on July 25, 2017, and will be retrieved in late October.

A short discussion took place regarding whether these passive samplers could provide quantitative data to augment or replace water samples. A few members expressed interest in asking researchers in charge of other stations if they are doing any intercomparability studies with concurrent water samples. The predicted water concentrations from the sampler in SF Bay could be compared to water concentrations from past RMP water cruises to see if they match.

Action Items:

- Ask Derek Muir about comparing results from the passive samplers to measured water concentrations. Report back to the TRC with the results from AQUAGAPS and how water concentrations from past RMP cruises compare. (Diana Lin, 6/30/18)

9. Information: Preview of Annual Meeting Presentations

Jennifer Sun gave a preview of her Annual Meeting talk on non-targeted analysis of contaminants of emerging concern in the Bay. The TRC provided feedback on the presentation.

10. Information: Update on Pulse, Annual Meeting, and Other Communications Products

Phil Trowbridge reminded the TRC of the RMP's Annual Meeting and the reception to follow, for which Jay Davis is recruiting RMP alumni. The Pulse is in its final stage and will be ready for distribution soon. Jay will contact reporters about covering the Annual Meeting, Pulse, and the 25th anniversary.

11. Information: Status of Deliverables and Action Items

Phil Trowbridge mentioned reports that have been completed in the recent months and highlighted the PFASs strategy and the Guadalupe Mercury Monitoring manuscript as reports that are currently out for review.

12. Discussion: Plan agenda items for future meetings

The group reiterated the following topics for inclusion in future TRC meetings: intercomparison studies, pesticides in fish tissue, margins planning, frequency of water-toxicity testing, and an update on the AQUA-GAPS project.

13. Discussion: Plus/Delta

One member expressed gratitude for the timely preparation of the agenda package, succinct and effective presentations, and general organization of TRC meetings.

Adjourn

Item 2: Action Item Follow-Up

Information on Legacy Pesticides in Fish

Desired outcome: Informed committee

TABLE 2. ADVISORY TISSUE LEVELS (ATLS) FOR SELECTED FISH CONTAMINANTS BASED ON CANCER OR NON-CANCER RISK USING AN 8 OUNCE SERVING SIZE (PRIOR TO COOKING) (PPB, WET WEIGHT)

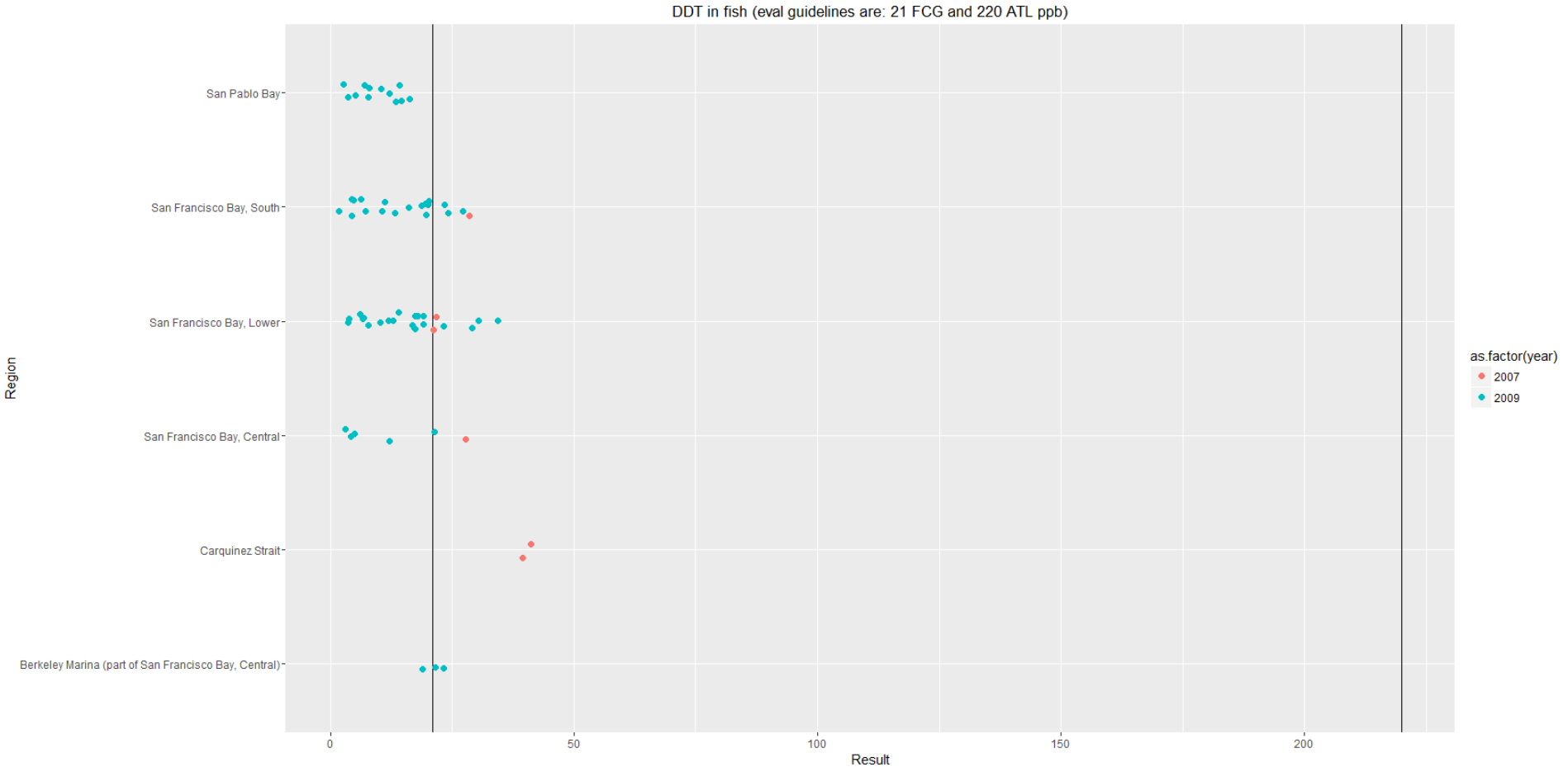
Contaminant	Consumption Frequency Categories (8-ounce servings/week)[a] and ATLs (in ppb)							
	7	6	5	4	3	2	1	0
Chlordanes[c]		>80-90	>90-110	>110-140	>140-190	>190-280	>280-560	>560
DDTs[**]		>220-260	>260-310	>310-390	>390-520	>520-1,000	>1,000-2,100	>2,100
Dieldrin[c]		>7-8	>8-9	>9-11	>11-15	>15-23	>23-46	>46
Mercury[nc] (Women 18-45 and children 1-17)		>31-36	>36-44	>44-55	>55-70	>70-150	>150-440	>440
Mercury[nc] (Women > 45 and men)		>94-109	>109-130	>130-160	>160-220	>220-440	>440-1,310	>1,310
PBDEs[nc]		>45-52	>52-63	>63-78	>78-100	>100-210	>210-630	>630
PCBs[nc]		>9-10	>10-13	>13-16	>16-21	>21-42	>42-120	>120
Selenium[nc]		>1,000-1200	>1,200-1,400	>1,400-1,800	>1,800-2,500	>2,500-4,900	>4,900-15,000	>15,000
Toxaphene[c]		>87-100	>100-120	>120-150	>150-200	>200-300	>300-610	>610

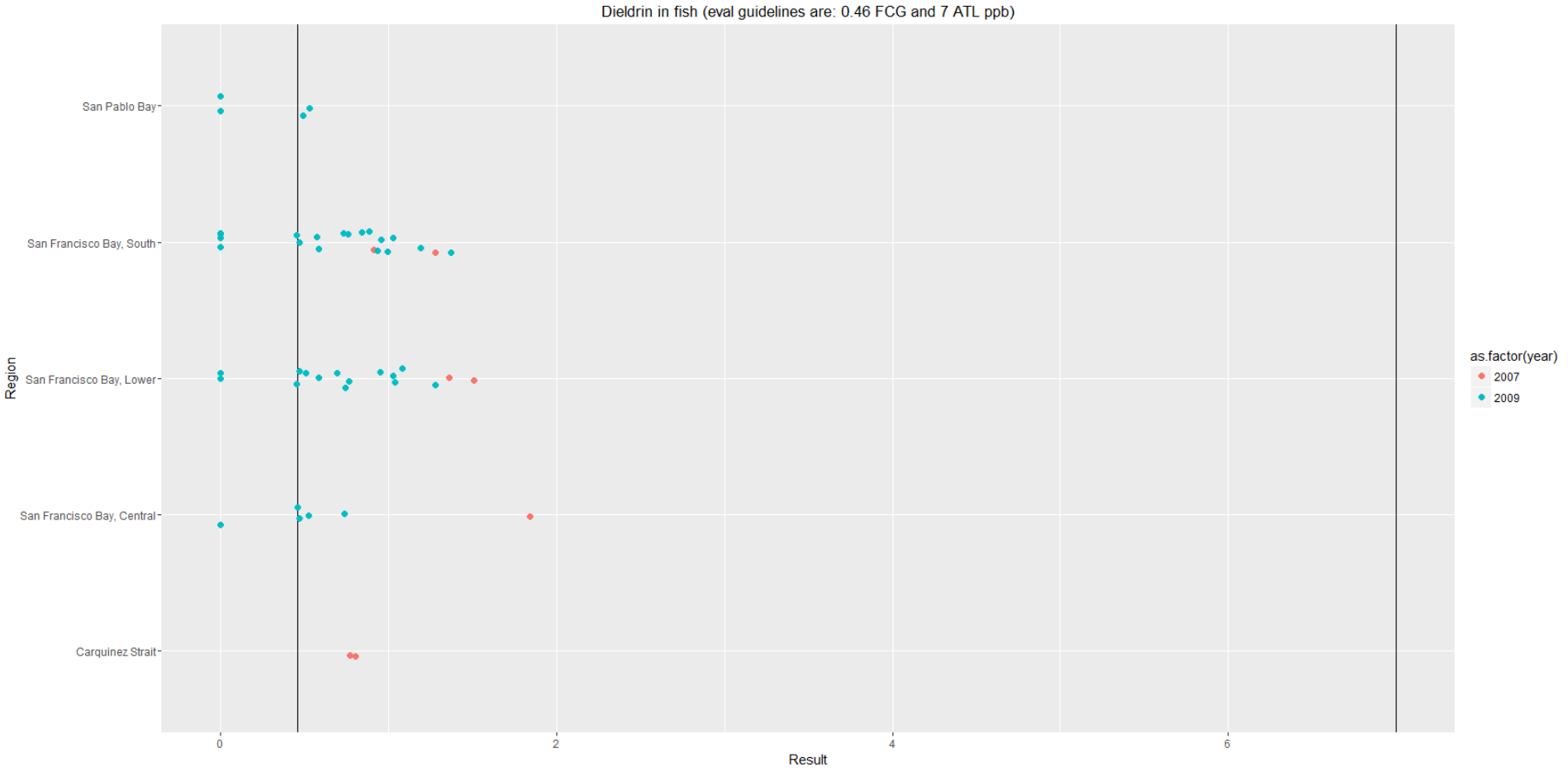
[c]ATLs are based on cancer risk

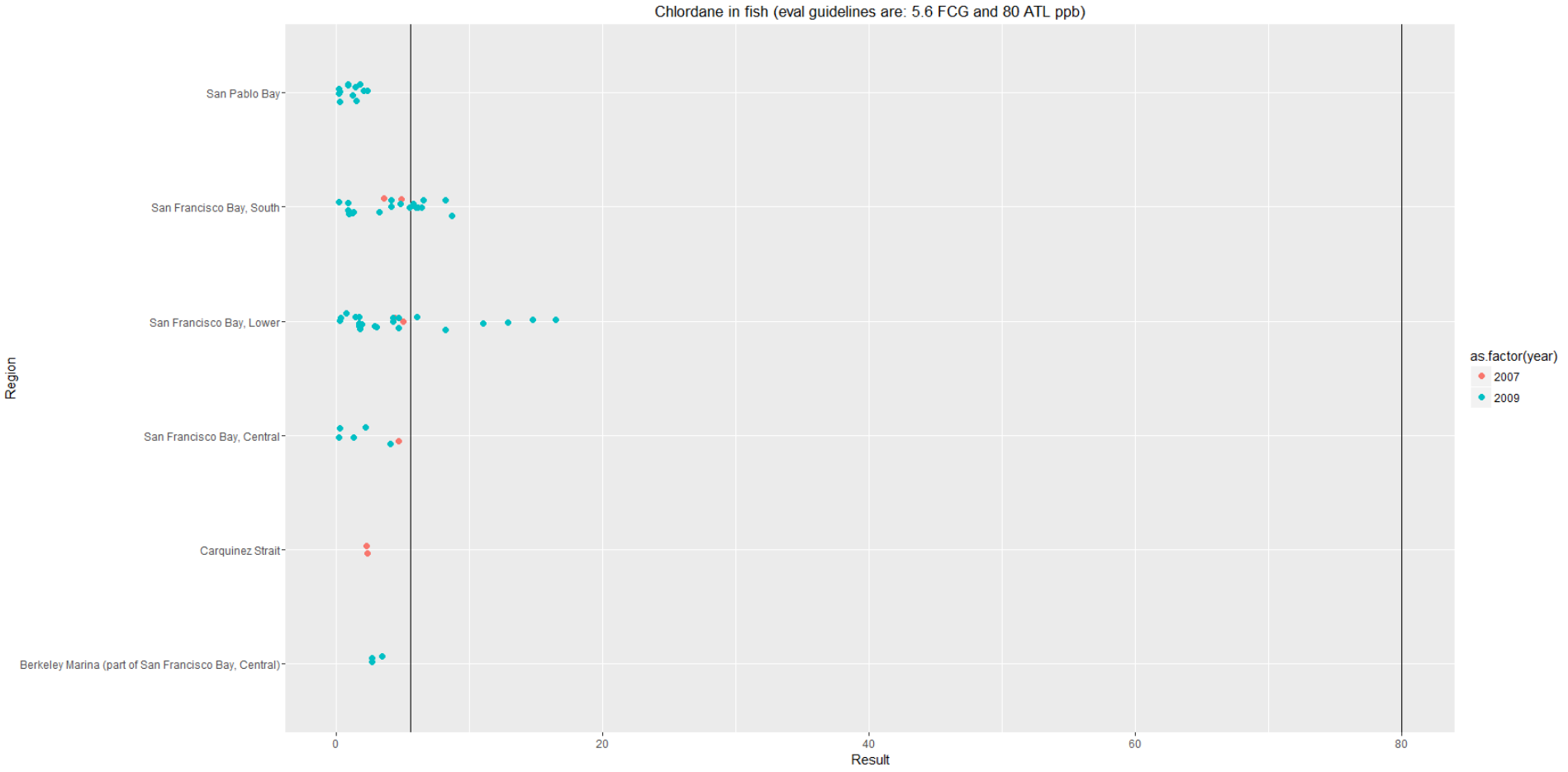
[nc]ATLs are based on non-cancer risk

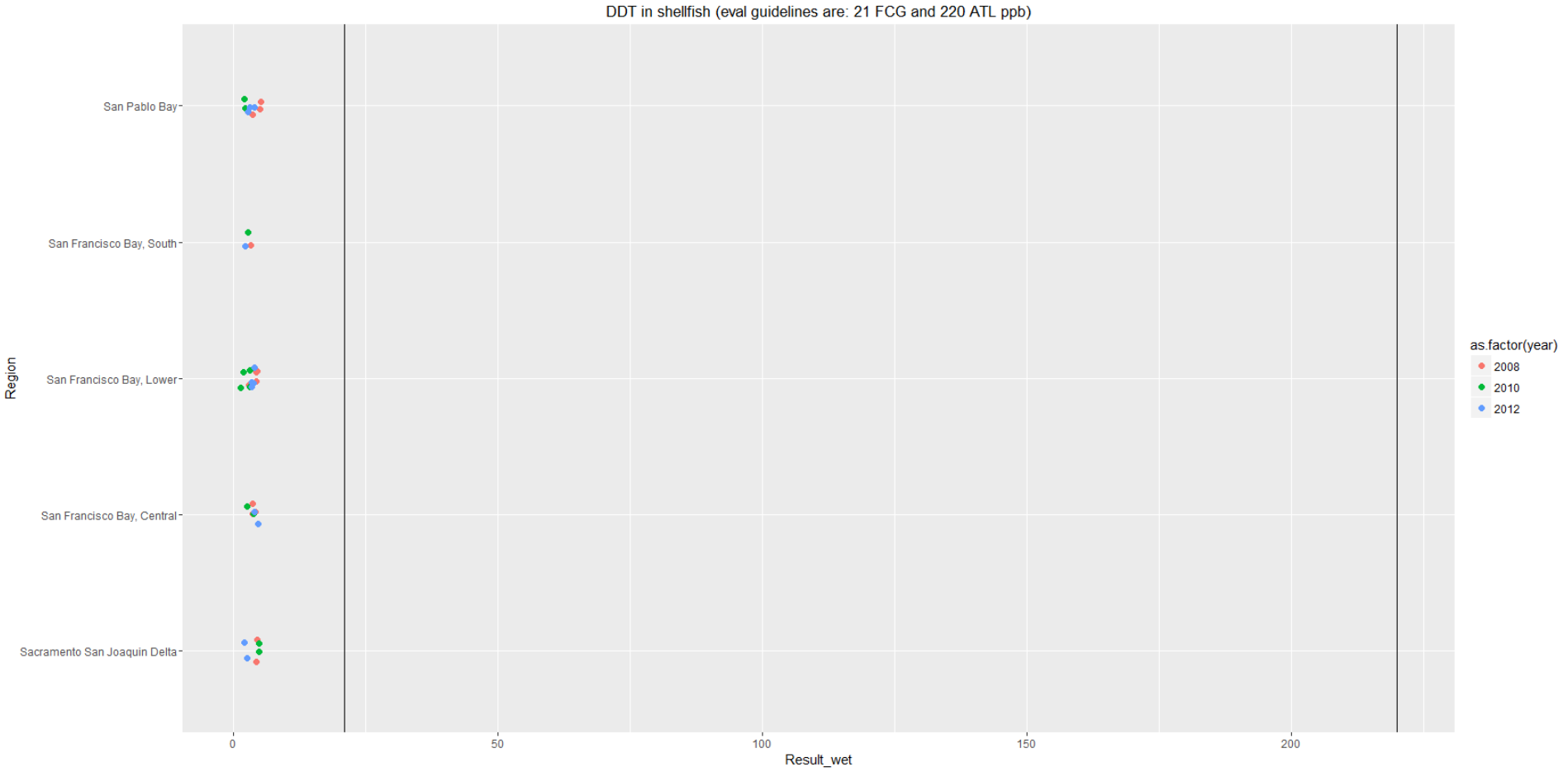
*Serving sizes are based on an average 160 pound person. Individuals weighing less than 160 pounds should eat proportionately smaller amounts (for example, individuals weighing 80 pounds should eat one 4-ounce serving a week when the table recommends eating one 8-ounce serving a week).

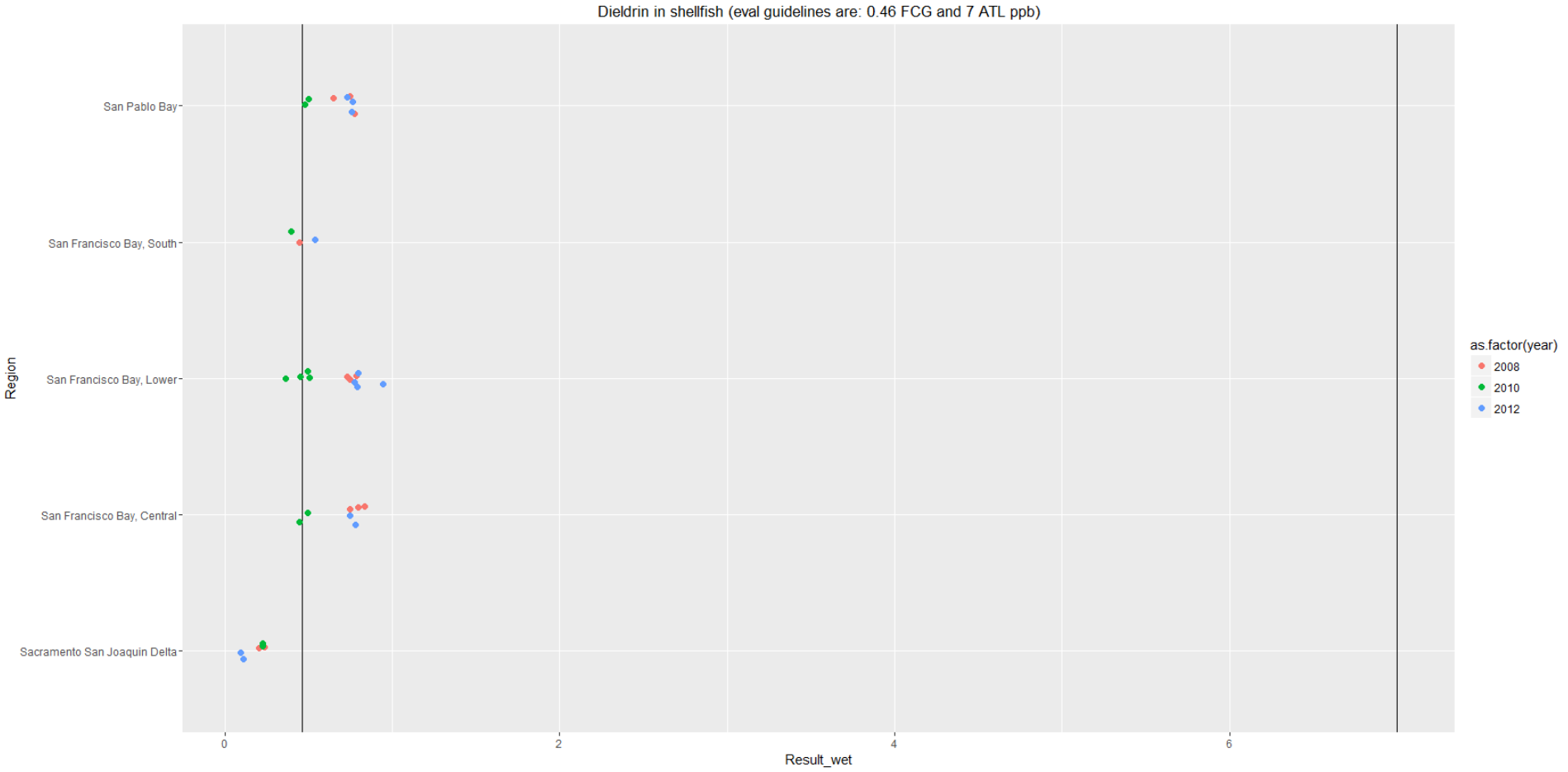
**ATLS for DDTs are based on non-cancer risk for two and three servings per week and cancer risk for one serving per week.

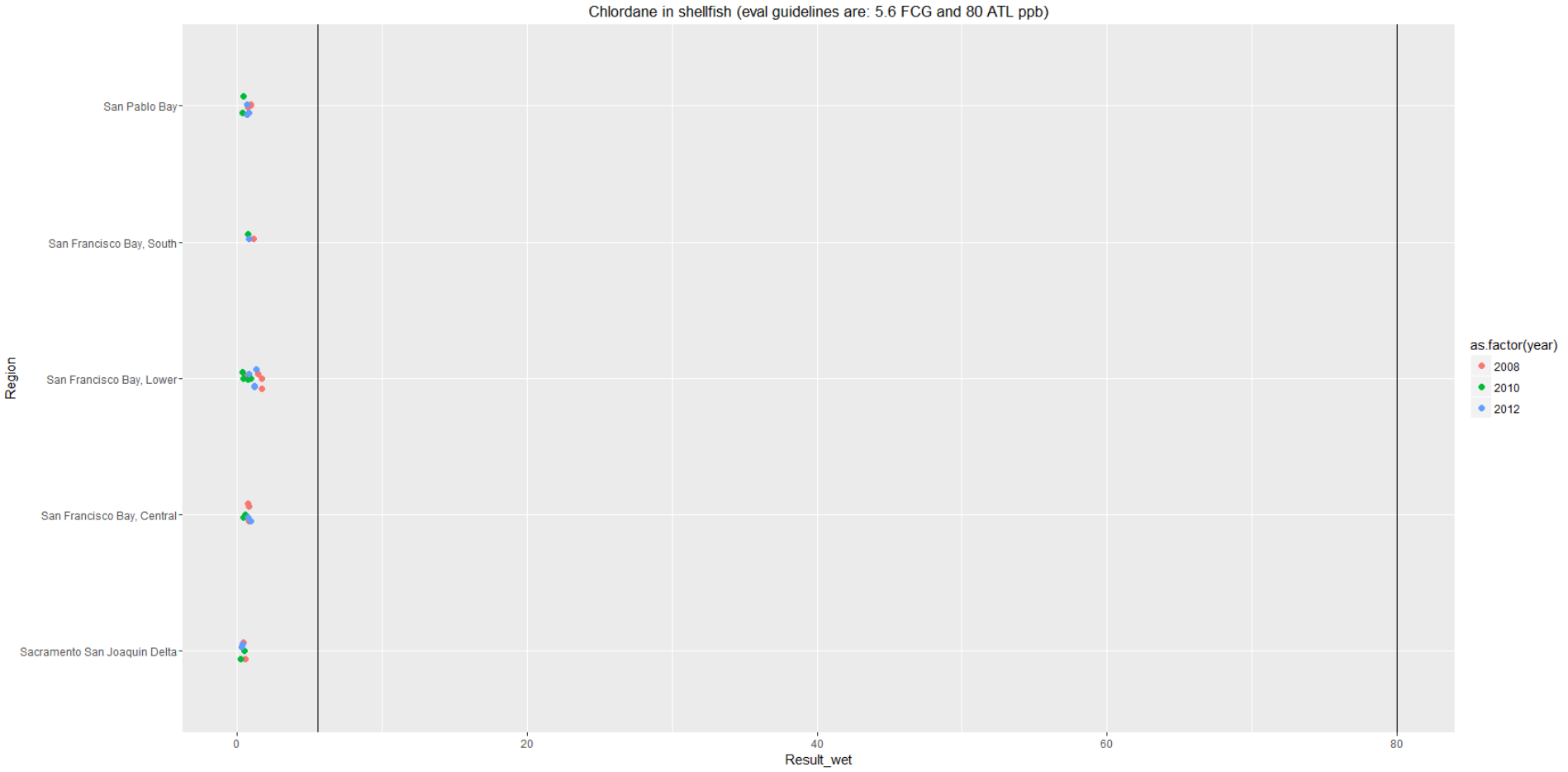

DDT in fish (eval guidelines are: 21 FCG and 220 ATL ppb)
San Pablo Bay
San Francisco Bay, South
San Francisco Bay, Lower
San Francisco Bay, Central
Carquinez Strait
Berkeley Marina (part of San Francisco Bay, Central)
Region
0
50
100
150
200
Result
as.factor(year)
2007
2009


Dieldrin in fish (eval guidelines are: 0.46 FCG and 7 ATL ppb)
San Pablo Bay
San Francisco Bay, South
San Francisco Bay, Lower
San Francisco Bay, Central
Carquinez Strait
Region
0
2
4
6
Result
as.factor(year)
2007
2009


Chlordane in fish (eval guidelines are: 5.6 FCG and 80 ATL ppb)
San Pablo Bay
San Francisco Bay, South
San Francisco Bay, Lower
San Francisco Bay, Central
Carquinez Strait
Berkeley Marina (part of San Francisco Bay, Central)
Region
0
20
40
60
80
Result
as.factor(year)
2007
2009


DDT in shellfish (eval guidelines are: 21 FCG and 220 ATL ppb)
San Pablo Bay
San Francisco Bay, South
San Francisco Bay, Lower
San Francisco Bay, Central
Sacramento San Joaquin Delta
Region
0
50
100
150
200
Result_wet
as.factor(year)
2008
2010
2012


Dieldrin in shellfish (eval guidelines are: 0.46 FCG and 7 ATL ppb)
San Pablo Bay
San Francisco Bay, South
San Francisco Bay, Lower
San Francisco Bay, Central
Sacramento San Joaquin Delta
Region
0
2
4
6
Result_wet
as.factor(year)
2008
2010
2012


Chlordane in shellfish (eval guidelines are: 5.6 FCG and 80 ATL ppb)
San Pablo Bay
San Francisco Bay, South
San Francisco Bay, Lower
San Francisco Bay, Central
Sacramento San Joaquin Delta
Region
0
20
40
60
80
Result_wet
as.factor(year)
2008
2010
2012

Bay RMP Multi-Year Planning Workshop
November 1, 2017
San Francisco Estuary Institute

Meeting Summary

Attendees

SC Member	Affiliation	Representing	Present
Jim Ervin	City of San Jose	POTW-Large	**Yes**
Robert Wilson	City of Petaluma	POTW-Small	**Yes** (alternate for Leah Walker)
Karin North**	City of Palo Alto	POTW-Medium	**Yes**
Adam Olivieri	BASMAA / EOA, Inc.	Stormwater	**Yes**
Peter Carroll	Tesoro Golden Eagle Refinery	Refineries	**Yes**
John Coleman	Bay Planning Coalition	Dredgers	**Yes**
Jessica Burton Evans	US Army Corps of Engineers	USACE	**Yes**
Tom Mumley*	SFB Regional Water Quality Control Board	Water Board	**Yes**

* Chair, ** Vice Chair

Guests and Staff

- Luisa Valiela - USEPA Region 9
- Bridgette DeShields - Integral Consulting
- Richard Looker - SFB RWQCB
- Rod Miller - SFPUC
- Eric Dunlavey - City of San Jose
- Craig Connor - USACE
- Phil Trowbridge - SFEI
- Jay Davis -SFEI
- Rebecca Sutton -SFEI
- Jennifer Sun -SFEI
- Ila Shimabuku -SFEI
- Ross Duggan - SFPUC (Remote Access)

1. Introductions and Review Agenda

Tom Mumley welcomed all in attendance, allowed for introductions, and quickly ran through the agenda for the Multi-Year Planning (MYP) workshop. There were no changes made to the MYP agenda.

2. Discussion: Anticipated management decisions and policies, and related information needs

Phil Trowbridge commenced this discussion by providing a brief overview of the Regional Monitoring Program and reviewing the current management drivers. Some of the discussion focused on the list of "Possible Future Drivers" for the RMP but none were added to the current table. Jim Ervin warned that there should be some anticipatory planning regarding the upcoming state plan for toxicity which could potentially lead to discharges being in exceedence of thresholds. The meeting participants made the following suggestions to the current list of "Management Decisions, Policies, and Actions:"

- Add Phase 2 of Sediment Quality Objectives - Human Health under "New and Future" with a date of 2018
- Add "Test of Significant Toxicity" under "New and Future" with a date of 2018
- Move "Pathogens" from the "New and Future" column to the "Ongoing and Existing" column and include State Board Bacteria Objectives for fresh waters, bays, and estuaries.
- Review and refine the dates prior to 2018 in the "Timing" column (e.g., the timing for the "South Bay Selenium TMDL" should be changed from >2017 to >2018)
- Try to squeeze in potential future topics (such as trash) in a far-right table or at the bottom of the "New and Future" table.

Phil explained that a Wetlands RMP is being formed and some effort is needed in 2018 to determine whether that effort can be part of the existing RMP. Luisa Valiela reported that the EPA is funding a science plan for the Wetlands RMP. Tom Mumley expressed a desire for integration of the two efforts, if possible. Phil will report back to the SC on options for integrating the governance of the Bay RMP and the Wetlands RMP.

The loss of cooling water dischargers as stakeholders sparked the remainder of the discussion which focused on the funding structure for the RMP and how, in theory, the current funding structure is designed so that funding will eventually decline as the Bay becomes cleaner. Unless new management drivers and stakeholders are added or current discharger fees are raised, funding could decrease and there may be a need for the RMP to consider other funding-model options. Members wanted to re-evaluate who and what type of entities could become stakeholders for the RMP. One attendee suggested gaging whether all nine Bay Area counties had interest in contributing ongoing funding for the RMP. This discussion was left open-ended and is to continue at future RMP Steering Committee meetings.

Action Item

- Prepare an agenda item for the SC in April 2018 regarding integration of the Wetlands RMP within the Bay RMP organizational structure. (Phil Trowbridge, 4/30/18)
- Prepare an agenda item about potential changes to the RMP cost allocation structure. (Phil Trowbridge, 4/30/18)

3. Discussion: Specific program priorities for 2019 and general priorities for 2020-2021

Phil Trowbridge introduced the third item by reviewing the RMP budget and highlighted that there was an unusually high number of proposed special studies for 2018. Then Jay Davis, Rebecca Sutton, and Phil

continued by providing brief summaries of specific program plans. A general suggestion to the MYP was to include 1-3 descriptive sentences for every line-item.

Status & Trends: Phil quickly presented the multi-year plan for Status & Trends monitoring and gave an update on finances. The following comments were made regarding the Status & Trends multi-year plan:

- Anticipate how to incorporate CEC's into Status & Trends monitoring, i.e. which sites to monitor, how to utilize current Status & Trends work to accommodate the addition of CECs, how long certain CECs should be monitored, etc.
- Develop a generalized plan for how to add analytes to Status & Trends monitoring
- Suspended sediment monitoring by USGS may need to be increased if an aquatic transfer facility is approved.

Sediment: Phil noted that $215,000 of work has been approved for sediment special studies which warrants a designated workgroup for oversight of sediment studies. The following were comments made regarding the sediment multi-year plan:

- Jessica Burton Evans called for a revision of the fourth "Relevant Management Policies and Decisions" by adding the basin plan as the regulatory driver behind the LTMS.
- Add footnotes to the sediment MYP table to identify where there are overlaps with Status & Trends sediment monitoring.

Emerging Contaminants & Microplastics: Becky highlighted the five, recently-added management questions and asked for comments on the updated Contaminants of Emerging Concern (CEC) strategy that had been sent out a few weeks prior. The committee approved Adam Olivieri to share the CEC strategy in its current draft state to interested external parties. There were no comments on the multi-year plans for CECs or microplastics.

Exposure and Effects: Phil explained that some 2018 funding will allow for the development of a long-term strategy and direction for EEWG. The following comments were made regarding the Exposure and Effects multi-year plan:

- Develop a set of procedures to handle overlaps in workgroup focus areas in general.
- Bioanalytical tool projects should be integrated between the ECWG and EEWG, not just coordinated.
- Keep the Phase 2 Sediment Quality Objectives in mind while conducting the sediment bioaccumulation guidance project.

Selenium: Jay began his discussion by highlighting that Terry Young, the Chair of the Regional Water Board, helped identify selenium data gaps in the North Bay. The following were comments made regarding the selenium multi-year plan:

- As an alternative to monitoring clams for selenium, consider eliminating clams from the Bay as a way to prevent selenium bioaccumulation in sturgeon.
- Take into account the statewide water-quality standards that the EPA will propose by November 2018.
- Add explanatory footnotes to the "0"s in the plan (i.e., cost savings from combined water and clam monitoring by USGS)

PCBs: Jay explained that the PCB workgroup is currently focusing on planning studies that characterize the response of the Bay to reduced PCB loads from selected watersheds. The following comment was made regarding the PCBs multi-year plan:

- Add the Municipal Regional Permit as a driver.

Small Tributary Loadings Strategy: Phil summarized decisions from the recent STLS retreat by framing the direction of STLS work: continue reconnaissance monitoring; invest in analyzing available data; and continue to develop a strategy for monitoring trends that capture changes in the landscape. The following comments were made regarding the STLS multi-year plan:

- Add some text to clarify the purpose of STLS monitoring: to assess contaminant loading to the Bay from urban runoff.
- Projects for measuring BMP effectiveness should be about aggregating results from across the region to answer questions about regional loads. Monitoring of individual BMPs installed in the landscape should not be a RMP task.

Dioxin: Phil explained that planning for dioxin studies is on hold until completion of the dioxin synthesis report.

Tom Mumley concluded this item by reminding committee members to return their reviews of the MYP by December 1, 2017.

Adjourn

Bay RMP Steering Committee Meeting
November 1, 2017
San Francisco Estuary Institute

Meeting Summary

Attendees

SC Member	Affiliation	Representing	Present
Jim Ervin	City of San Jose	POTW-Large	**Yes**
Robert Wilson	City of Petaluma	POTW-Small	**Yes** (alternate for Leah Walker)
Karin North**	City of Palo Alto	POTW-Medium	**Yes**
Adam Olivieri	BASMAA / EOA, Inc.	Stormwater	**Yes**
Peter Carroll	Tesoro Golden Eagle Refinery	Refineries	**Yes**
John Coleman	Bay Planning Coalition	Dredgers	**Yes**
Jessica Burton Evans	US Army Corps of Engineers	USACE	**Yes**
Tom Mumley*	SFB Regional Water Quality Control Board	Water Board	**Yes**

* Chair, ** Vice Chair

Guests and Staff

- Naomi Feger - SFBRWQCB
- Luisa Valiela - USEPA Region 9
- Phil Trowbridge - SFEI
- Ila Shimabuku -SFEI
- Lawrence Leung - SFEI
- Jay Davis -SFEI
- Rebecca Sutton -SFEI

1. Introductions and Review Agenda

Phil Trowbridge proposed that agenda items be covered in the following order to allow extra time for item 6(b): Item 5, 7, 8, 6, 9.

2. Decision: Approve Steering Committee Chairs and Charter Revisions

After a quick discussion about committee member and chair alternates, Tom Mumley and Karin North were approved as chairs and thanked for their contributions to the RMP.

Phil presented proposed changes to the RMP charter to reflect the phase out of cooling water fee payers, namely:

- Remove SC and TRC seats for cooling water participants
- Strike references to cooling water participants throughout charter
- Revise cost allocation table in Appendix B

Decision

- Adam Olivieri motioned to approve Tom Mumley and Karin North to continue in their roles of chair and vice chair, respectively, of the Steering Committee during 2018. Jessica Burton Evans seconded the motion. The motion for approval was carried by all present members.
- Jessica Burton Evans motioned to approve the proposed changes to the charter with the addition of a footnote to Appendix B explaining that the loss of cooling water fees will not be made up by remaining participants. Peter Carroll seconded the motion. The motion for approval was carried by all present members.

Action Item

- Conduct succession planning for the chair and vice chair of the Steering Committee and Technical Review committee. (Tom Mumley & Karin North, 10/31/18)
- Update charter as presented to the SC on 11/1/17. (Phil Trowbridge, 11/17/17)

3. Decision: Approve Meeting Summary from July 19, 2017 and Confirm/Set Dates for Future Meetings

Phil Trowbridge confirmed the next four Steering Committee meeting dates: 1/24/18, 4/25/18, 7/25/18, & 10/24/18. Members cautioned that these meeting dates, especially 7/25/17, should be re-confirmed at future meetings.

Decision

- Karin North motioned to approve the July 19 Steering Committee meeting summary. Jessica Burton Evans seconded the motion. The motion for approval was carried by all present members.

Action Items

- Finalize July Steering Committee meeting summary and upload it to the RMP webpage. (Ila Shimabuku, 11/7/17)
- Create calendar invites for the proposed 7/25/18 and 10/24/18 Steering Committee meetings. (Ila Shimabuku, 11/7/17)

4. Information: TRC Meeting Summary

Phil Trowbridge quickly recapped highlights from the September Technical Review Committee meeting.

5. Information: RMP Financial Update for 2017 Quarter 3

Phil Trowbridge introduced this item by presenting RMP budgets and expenses from 2017. No decisions needed SC approval. Lawrence Leung gave a quick update about the status of the 2017 RMP audit and noted that no adverse impacts were found.

Tom Mumley brought up the issue of adding drydocks to the RMP as new participants in the industrial category.

Action Item

- Plan for the addition of drydocks as contributors to the RMP and present to the SC. Planning will include deciding what category drydocks should fall into (if not their own), fees, and whether they will be required to have a designated representative for the Steering Committee and Technical Review Committee. (Phil Trowbridge, 1/15/18)
- Develop a procedure for how to add stakeholders to the RMP. (Phil Trowbridge, 1/15/18)

7. Decision: Approve 2019-2021 Fees

Phil Trowbridge proposed the target fees for 2019-2021. The proposal was to increase fees by 3% per year to sustain the S&T monitoring program and maintain the same level of effort for special studies. No comments or questions were brought forward.

Proposal: Set the total RMP fees for 2019-2021 as shown in the table below, which is a 3% yearly increase for each participant group (not including cooling water participants)

Year	Total Fees
2019	$3,693,121
2020	$3,803,915
2021	$3,918,033

Decision

- Karin North motioned to approved target fees for the RMP for 2019-2021. Adam Olivieri seconded the motion. The motion for approval was carried by all present members.

8. Decision: Approve the 2018 Budget and Detailed Workplan

Phil Trowbridge presented the projected RMP revenue, expenses, and deliverables for 2018. Phil explained the cuts he had to make to balance the budget. He highlighted that it may be difficult to complete all the programmatic tasks within this budget because most items are flat-funded or reduced in funding. The majority of the proposed work for 2018 will be Status and Trends monitoring and special studies (71%). There were no requested changes to the budget and workplan as proposed.

Decision

- Jessica Burton Evans motioned to approve the 2018 Budget and Detailed Workplan. Karin seconded the motion. The motion for approval was carried by all present members.

6. Decision: Approve Undesignated Funds for (a) Analyzing Archived Tern Eggs for PBDEs, and (b) North Bay Fire Monitoring

A. Approve $14,300 of Undesignated Funds for Analyzing Archived Tern Eggs for PBDEs

Phil Trowbridge quickly summarized the proposal to approve undesignated funds for the analysis of archived tern eggs and answered a few clarifying questions.

Decision

- John Coleman moved to approve the designation of $14,300 from Undesignated Funds for testing PBDEs in archived tern egg samples. Karin North seconded the motion. The motion for approval was carried by all present members.

B. Approve $27,000 of Undesignated Funds for Urgent North Bay Fire monitoring

Phil Trowbridge introduced part B of this item by explaining that Rebecca Sutton and Meg Sedlak had put together a small ($27,000) proposal to partner with the Department of Toxic Substances Control (DTSC) to conduct non-targeted analyses on samples to be collected at the Napa River during a storm event. The straw-man proposal was prepared to see whether the Steering Committee harbored any interest in fire-response monitoring by using $27,000 of undesignated funds to test stormwater runoff for signals from the following classes of contaminants: organophosphate flame retardants, pesticides, per-and-polyfluorinated alkyl substances (PFASs), chlorinated and brominated compounds, and others. Committee members were generally interested in the idea but were skeptical of many aspects of the proposal and, overall, asked for clearer objectives and hypotheses. The Committee decided that, after incorporating their suggestions, a review by Technical Review Committee should be conducted and the proposal should be brought back to the Steering Committee via email for approval of the updated design and budget. The Steering Committee was open to higher funding requests if justified in order to achieve objectives.

The following suggestions were made:

- Clarify the objectives and hypotheses for the study
- Consult with the Technical Review Committee on the study design
- Reevaluate sampling locations and consider monitoring at multiple sites

- Assess whether and how monitoring several events could be beneficial
- Identify additional analytes that could add value at low cost, i.e. nutrients, metals, etc.
- Look into analyzing samples that contain concentrated residential ash (or using EPA data on the ash) to characterize a strong residential-burn signal
- Check in with Scott Dusterhoff to identify and evaluate related fire-response work that is already being done or is being planned. Use findings for leveraging additional study partners and/or stakeholders.
- Identify and evaluate existing relevant data from the R1 Water Board work in the Russian River, 2016 RMP non-targeted ambient Bay water analysis, and any other relevant datasets
- Add in a RMP technical product that can be written for managers, rather than just a manuscript

Decision

- Peter Carroll motioned to direct staff to refine the North Bay Fire Monitoring proposal with $30,000 as the target funding level - but not a hard cap if justified in order to achieve objectives - and to bring it back for approval by the Steering Committee. Karin North seconded the motion. The motion for approval was carried by all present members.

Action Item

- Refine proposal by addressing feedback from the Steering Committee discussion, conduct a review by the TRC, and return to the Steering Committee for further approval. (Rebecca Sutton, 11/20/2017)

9. Discussion: Update on Annual Reports (Pulse, RMP Update), Annual Meeting, and Upcoming Reports and Communications Products

Jay Davis commenced the communications discussion by highlighting major findings from the Annual Meeting participant survey. To prevent large numbers of no-shows at future RMP Annual Meetings, committee members suggested holding the Annual Meeting farther, temporally, from the State of the Estuary Conference (SOTEC), as well as avoiding holding the Annual Meeting on a Friday or on days bordering a holiday weekend. Steering Committee members were in favor of continuing to hold a separate meeting from the SOTEC and holding a social event that follows the meeting.

Action Item

- Send a survey to the list of no-shows to collect information on why so many registered participants did not attend the meeting. (Ila Shimabuku, 11/7/17)

10. Discussion: Status of RMP Deliverables and Action Items

Phil Trowbridge presented the stoplight reports for RMP deliverables and action items and answered a few clarifying questions.

11. Discussion: Plan Agenda Items for Future Meetings

The following is a list of future possible agenda items for the Steering Committee along with their proposed meeting date:

- 1/24/18 - Approving the multi-year plan
- 1/24/18 - Approving the 2018 RMP Update outline
- 1/24/18 - Recommendations and options for incorporation of drydocks into the RMP
- 1/24/18 - Communications update
- 1/24/18 - Brief update on status of North Bay fire monitoring
- 1/24/18 - Two science updates: PFASs, sediment supply synthesis
- 4/25/18 - Restoration authority discussion
- 4/25/18 - Regional wetland monitoring (Luisa Valiela)
- 7/25/18 - Dioxin update & discussion

12. Discussion: Plus/Delta

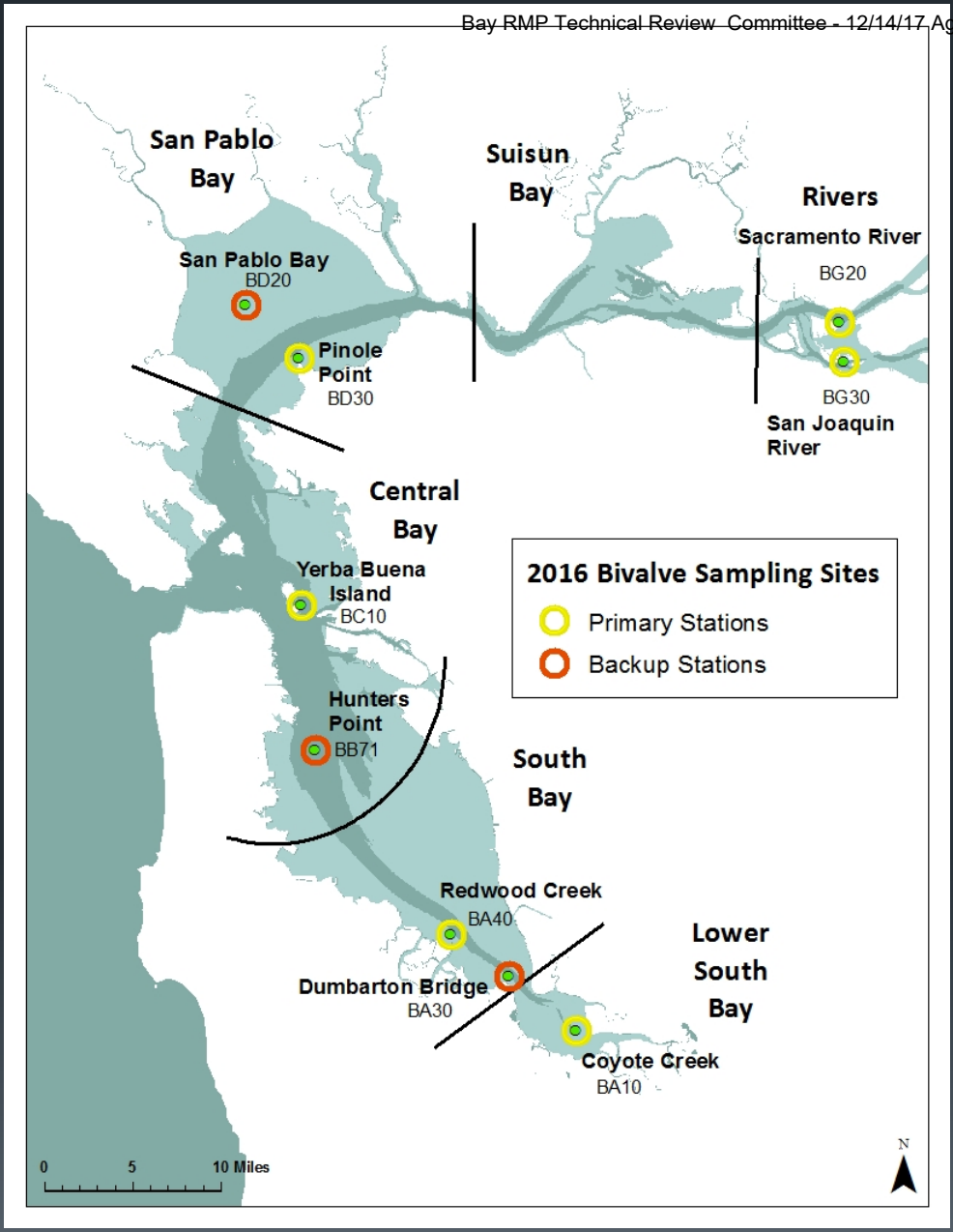
The meeting was adjourned after participants commended RMP staff for an organized meeting and for hosting quality discussions.

Adjourn

RMP Bioaccumulation Program: Deployment System Update

December 2017

APPLIED marine SCIENCES



Transplant Sites

APPLIED marine SCIENCES

Project Recap

- Trigger: 2016 finding that decaying piles at Yerba Buena Island will necessitate new deployment location in near future - no viable fixed structure options at this time.
- Proposal: Switch in 2018 to use of acoustic releases to secure bivalve moorings at all 7 deployment locations
- Goal to keep deployment costs competitive with current scheme while maintaining completeness

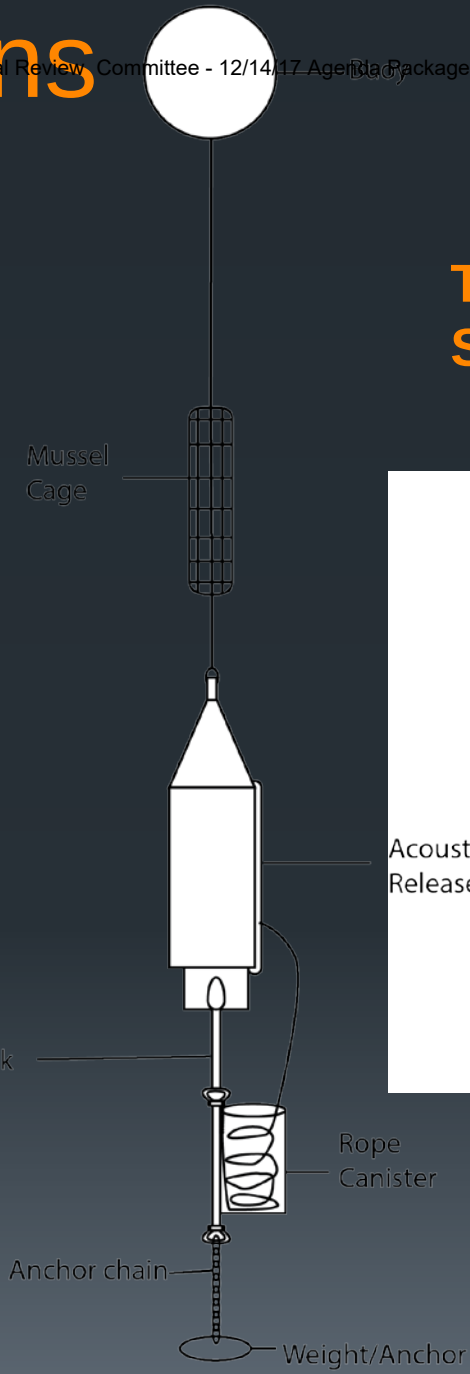
APPLIED marine SCIENCES

Cost Information

- Preferred supplier identified in 2016 no longer manufacturing / servicing
- Proposal:
  - AMS will purchase eight releases and rent back to project at an anticipated cost of approx $3k/unit (with a commitment by RMP to use for a minimum of 2-3 cycles)
  - After cost recovery, AMS and SFEI will agree on arrangement that will support ongoing maintenance / replacement costs
  - Releases would be available to support other RMP-related monitoring outside of typical deployment windows

Current Options

EdgeTech PORT MFE Pop up System



Teledyne Shallow Release System

APPLIED marine SCIENCES

Edgetech System

Port LF

- Depth: 200m
- Weight: 43 lbs
- Battery Life: 5 Years and field replaceable

- Cost per unit: $8000
- Cost per 8 units: $64,000

Deck Unit

- Lightweight
- Rugged/splash proof

- Cost per unit: $6950

Braided Line

- 3/8 in braided
- 45 m
- Allows for weight retrieval

- Cost per unit: $300
- Cost per 8 units: $2400

- Total Estimated Cost: $73,350 (w/o discount)

APPLIED marine SCIENCES

Teledyne System

R500

- Depth: 500m
- Battery Life: 18 Months
- Weight: 13lbs
- Lift Load: ~1000lbs
- Battery: Field replaceable
- No retrieval weight system

- Cost per unit: $5000
- Cost of 8 units: $40,000

Release it: Shallow Water Deck Unit

- Sturdy, dust-tight, and shallow water immersion-resistant case
- Weight: 7lbs
- Battery: internal and rechargeable

- Cost per unit: $7200

Third Party Buoy System

- Allows for weight retrieval
- ¼ inch spectra rope
- 8000lbs rating
- Rope canister
- Syntactic float

- Cost per unit: $2800
- Cost of 8 units: $22,400

- Total Estimated Cost: $69,600

APPLIED marine SCIENCES

Advantages / Disadvantages

- Advantages
  - Avoid Aids to Navigation
  - Decreased labor costs (no. of staff on-board)
  - Decreased vessel costs (no. of days on water)
  - Greater flexibility in scheduling (i.e., not as dependent on currents)

- Disadvantages
  - Increased equipment cost
  - Uncertainty
    - Performance
    - Maintenance

Permitting

- Main permit: BCDC Abbreviated Regionwide Permit (in process)
- Likely to be lease requirement with CSLC (in process)
- Additional coordination with USCG and possibly CCSF (depending on replacement YBI location chosen)

Tentative Schedule

- January – submit permit application to BCDC
- March / April – coordination with CDFW, USCG
- April – purchase releases
- May / June – collect bivalves
- June – deploy bivalves
- Sept / Oct – retrieve bivalves

APPLIED marine SCIENCES

SFEI AQUATIC SCIENCE CENTER
4911 Central Ave, Richmond, CA 94804, p: (510) 746-7334, f: (510) 746-7300 www.sfei.org

Approved by RMP Steering Committee
11/29/17

DATE: November 29, 2017

TO: RMP Steering Committee

FROM: Philip Trowbridge, RMP Manager

RE: Request for Funds for Characterizing Chemicals of Emerging Concern in Runoff from the North Bay Wildfires

REQUESTED ACTION

Approve the use of Undesignated Funds in the amount of $36,000 for a special study to characterize chemicals of emerging concern in runoff from the North Bay Wildfires.

FISCAL SITUATION

Undesignated Funds: $784,597 (as of 11/17/17)

EXPLANATION

Summary of Proposal

In 2017, wildfires devastated communities in the North Bay, burning over 8,500 buildings and 210,000 acres. The plume of smoke from these fires blanketed not only the North Bay but also much of the Bay Area, resulting in poor air quality. Previous wildfires in Southern California have shown a dramatic increase in suspended sediment, metals and polycyclic aromatic hydrocarbon (PAH) concentrations in stormwater runoff, but this is only a small fraction of the compounds that are likely present in the smoke, ash, and combustion debris that remain in the watershed after the fires. The Regional Water Quality Control Board (Region 2) is planning to monitor stormwater from burned watersheds for conventional pollutants such as total dissolved solids, nutrients, metals and PAHs. To complement this effort, we propose to analyze some of the stormwater samples collected by the Water Board using non-targeted analysis. Non-targeted analysis produces information on an extremely broad suite of contaminants and will provide a comprehensive picture of the toxic contaminants that are present in runoff influenced by wildfire. Use of these novel methods will be critical for understanding the risks associated with toxic contaminants due to wildfires in California.

Specifically, the study will involve:

- Analyses of archived samples collected by Water Board staff on November 15, 2017;

- Archiving samples collected by Water Board staff from a second storm for potential analyses in the future; and
- A brief technical memorandum to communicate the results to RMP committees.

Use of RMP funds for some strategic analyses of some second storm samples, based on first storm analyses, would require future approval by the Steering Committee. Further assessment of results and reporting, including use of EcoAtlas, would also be a future Steering Committee decision.

The full proposal is provided in Attachment A.

Proposal: Characterizing Chemicals of Emerging Concern in Runoff from the North Bay Wildfires

Summary: In 2017, wildfires devastated communities in the North Bay, burning over 8,500 buildings and 210,000 acres. The plume of smoke from these fires blanketed not only the North Bay but also much of the Bay Area, resulting in poor air quality. Previous wildfires in Southern California have shown a dramatic increase in suspended sediment, metals and polycyclic aromatic hydrocarbon (PAH) concentrations in stormwater runoff, but this is only a small fraction of the compounds that are likely present in the smoke, ash, and combustion debris that remain in the watershed after the fires. The Regional Water Quality Control Board (Region 2) is planning to monitor stormwater from burned watersheds for conventional pollutants such as total dissolved solids, nutrients, metals and PAHs. To complement this effort, we propose to analyze some of the stormwater samples collected by the Water Board using non-targeted analysis. Non-targeted analysis produces information on an extremely broad suite of contaminants and will provide a comprehensive picture of the toxic contaminants that are present in runoff influenced by wildfire. Use of these novel methods will be critical for understanding the risks associated with toxic contaminants due to wildfires in California.

Estimated Cost: $36,000

Oversight Group: Emerging Contaminants Workgroup

Proposed by: June-Soo Park (DTSC), Myrto Petreas (DTSC), Eunha Hoh (SDSU), Rebecca Sutton (SFEI), Meg Sedlak (SFEI), and Cristina Grosso (SFEI)

PROPOSED DELIVERABLES AND TIMELINE

Deliverable	***Due Date***
Task 1. Field collection of stormwater samples	Winter 2017
Task 2. Laboratory analysis of samples	February – April 2018
Task 3. Update to ECWG on preliminary results	April 2018
Task 4. Review of data	April – June 2018
Task 5. Draft Memorandum to TRC/SC	November 2018
Task 6. Manuscript	January 2019 (tentative)

Background

Wildfires are extremely destructive events that devastate communities and strip the landscape bare. The economic losses of structures, roads, and critical infrastructure are frequently in the billions of dollars. However, the ecological damage is often harder to quantify, based in part on a lack of information on the types and concentrations of chemicals present in affected landscapes and waterways. The purpose of this study is to conduct broad screening of runoff in fire-affected areas to identify the key classes of compounds that may be released from the burn sites.

Studies of wildfires in Southern California suggest that burn areas result in a significant increase in suspended sediment loads for many reasons, including the lack of vegetation to slow runoff, hydrophobic ash coatings on soil, and increase of sheet flow across the soil (Smith et al. 2011). In addition to significant sediment loads, researchers identified in one watershed in Southern California that metals increased three-fold post fire (Burke et al. 2013). A more comprehensive study of runoff from six burn sites and 22 unburned sites indicated that copper, lead and zinc fluxes were between 11- to 736-fold higher in burned catchments (Stein et al. 2012). Polycyclic aromatic hydrocarbon fluxes were four times greater from burn sites than undisturbed sites (Stein et al. 2012). Beyond metals and PAHs, few studies have identified the multitude of other compounds that are likely to result from the combustion of residential and commercial structures, industrial facilities, and manufacturing sites.

The San Francisco Bay Regional Water Quality Control Board (Water Board) has developed a comprehensive plan to survey urban creeks in Sonoma and Napa counties for a suite of traditional contaminants including water quality parameters such as dissolved oxygen, total suspended solids, and pH, as well as nitrogen compounds, metals, and polycyclic aromatic hydrocarbons (Appendix).

This proposal is for a study that will leverage the Water Board monitoring by adding two types of non-targeted analysis to scan for a wide range of organic contaminants in runoff. The purpose of this study is to identify whether there are significant signals from chemicals that are not ordinarily monitored after fires. Given the climatic shifts that are expected in the future (i.e., hotter and drier summers leading to an extended fire season), it is imperative that we develop a list of contaminants that are important to monitor after fire events. Non-targeted analysis is an essential element of the RMP's CEC Strategy (Sutton et al. 2017) and has already been successfully used to identify new chemicals of potential concern in the Bay.

If the non-targeted analysis of runoff identifies new problematic contaminants, the information could be used to inform management decisions about water quality impacts of fires and to develop a broader list of compounds to monitor following wildfires. It could also point to ecotoxicity data gaps or suggest new management priorities. Thus, we anticipate that findings from the proposed study will have very high impact state-wide.

Study Objectives and Applicable RMP Management Questions

The purpose of this study is to conduct non-targeted analysis of runoff from areas burned by wildfires to better understand:

- Whether there are significant classes of compounds that form or are released via combustion or partial combustion of forests, buildings and their contents during wildfires that may present a hazard to aquatic life;
- Which contaminant classes are important to monitor after fires to assure protection of Bay water quality; and
- Whether loads of contaminants from areas of wildfire are expected to be higher than those from unimpacted areas.

Table 1. Study objectives and questions relevant to RMP management questions

Management Question	Study Objective	Example Information Application
1) Are chemical concentrations in the Estuary at levels of potential concern and are associated impacts likely?	To understand whether there are significant classes of compounds that form or are released via combustion or partial combustion of buildings and their contents during wildfires that may present a hazard to aquatic life.	Identify the presence of contaminants, such as organophosphate flame retardants, that are ubiquitous in residential areas and may be released in a fire.
2) What are the concentrations and masses of contaminants in the Estuary and its segments? 2.1 Are there particular regions of concern?	This study will primarily focus on the North Bay.	
3) What are the sources, pathways, loadings, and processes leading to contaminant-related impacts in the Estuary? 3.1. Which sources, pathways, etc. contribute most to impacts?	To understand whether loads of contaminants from areas of wildfire are expected to be higher than those from unimpacted areas. To understand which contaminant classes are important to monitor after fires to assure protection of Bay water quality.	This information may be useful for assessing risks and mitigating impacts from the release of contaminants.
4) Have the concentrations, masses, and associated impacts of contaminants in the Estuary increased or decreased? 4.1. What are the effects of management actions on concentrations and mass?		
5) What are the projected concentrations, masses, and associated impacts of contaminants in the Estuary?		

Approach

This proposal is focused on non-targeted analysis of runoff, using two different techniques designed to probe a wide range of both polar and nonpolar contaminants. The Water Board is currently staffing a major field campaign in both Sonoma and Napa counties to assess water quality in urban creeks affected by the wildfire and will monitor during storm events for conventional pollutants such as metals, PAHs, and basic water quality parameters. We will build off of this effort by having the staff collect water samples for non-targeted analysis for a wide range of chemicals, including: organophosphate flame retardants, pesticides, per and polyfluorinated alkyl substances (PFASs), and other as yet unknown combustion products. Working in collaboration with the Water Board staff will result in a wealth of ancillary information for the sites that we can use to interpret the findings.

We are fortunate to have some pre-wildfire non-targeted analysis data on the Napa River. In 2016, the RMP commenced a study using non-targeted analysis to examine water samples from three locations around the Bay: Coyote Creek, San Leandro Bay, and Napa River. These samples were analyzed for polar compounds by Duke University using non-targeted methods, and are currently being analyzed by San Diego State University for nonpolar compounds. The preliminary results indicate that the Napa River site has the fewest contaminants identified of the three sites; the contaminants that were identified were common to the other two sites such as pesticides and pharmaceuticals. This study will use this pre-wildfire information to help assess the possible change in water quality.

Site Selection

This study will target eight sites, four sites each in Napa and Sonoma counties (see tables below). The eight sites are a subset of the 11 sites that will be sampled by the Water Board (see Appendix). Reference creeks (i.e., Ritchie and Graham Creeks) are included in this list and will be monitored concurrently to allow comparison of the burn-impacted streams to unburned reference areas. The Water Board has chosen these sites based on the land use and density of burned structures, proximity to vulnerable aquatic habitat, availability of prior water quality data, and site accessibility. One site, Napa River at the public dock, was sampled in 2016 and subjected to non-targeted analysis, as described above.

In addition, the North Coast Regional Water Quality Control Board (Region 1) is conducting a similar monitoring effort on stormwater at four sites in the Santa Rosa region severely impacted by wildfires. Samples collected from this region could be included in the non-targeted analytical effort described here for an additional ~$5,000 (one storm) or ~$10,000 (two storms). Efforts are underway to identify funds for this additional analysis.

Sonoma River Watershed:

Site Code	Site Name	Lat	Long
206SON160	Sonoma Creek at Glen Ellen	38.36376	-122.526
206GRA050	Graham Creek 300m u/s of Sonoma Crk confluence (unburned reference site)	38.36704	-122.541
206SONCYP	Sonoma Creek at Cypress Ave	38.4122	-122.554
206YUL010	Yulupa Creek above confluence with Sonoma Creek at Warm Springs Rd	38.3793	-122.553

Napa River Watershed:

Station Code	Station Name	Lat	Long
206MLK100	Miliken Creek at Hedgeside Ave	38.33827	-122.269
206RED400	Redwood Creek d/s of Pickle Crk at Mt Veeder and Redwood Rd. intersection	38.33388	-122.371
206RIC100 *	Ritchie above gabion wall in Napa-Bothe State Park (unburned reference site)	38.55078	-122.521
206NAP020 **	Napa River at public dock on Main and 3rd Street	38.298	-122.283

* Note: Ritchie Creek has different geology and vegetation from the other sites so chemistry may be different from this site regardless of the fire. Results from this site as a "reference" will be interpreted with this context in mind.

** Station where prior non-targeted analysis was conducted; additional sample to be collected for pro bono analysis by Duke University.

Sample Collection

Based on discussions with Water Board staff, field crews will mobilize for precipitation events estimated at 0.5 inches in a 24-hour period. The Water Board has sampled these streams to assess baseline conditions prior to storm events, and will sample again two to three times during storm season. Water Board staff have indicated that they can collect grab samples for the non-targeted analysis.

We propose to collect samples during the course of two storm events. The field crew will collect one grab sample per site per storm. Grab samples will be collected directly from the surface water, rather than through an ISCO sampler, to avoid contamination with plastic additives. Based on discussions with Water Board staff, the field crew will target the rise of the hydrograph; however, the watersheds are small and this can be a challenge given the difficulties of predicting storms for small localized watersheds. Two to four liters of water is sufficient to conduct the analyses.

Grab samples of runoff are preferred over passive samplers due to the implicit bias with passive samplers that the chemicals need to diffuse into the matrix. In the 2016 non-targeted analysis study, a comparison of grab samples with those collected using a passive sampler

found no advantage to passive samplers (Lee Ferguson, personal communication). In fact, the samples collected with the passive sampler from a stormwater influenced site, San Leandro Bay, had somewhat lower abundances of contaminants than the grab samples, possibly indicating the passive sampler had become saturated over the period of deployment.

Analytical Methods

Samples collected from both storms will be archived initially by the laboratories. One set of 8 samples will be analyzed with the funding in the budget. Depending on the first round of results, the Steering Committee may authorize additional funding to analyze the remaining samples.

Water samples and blanks will be analyzed using non-targeted methods developed for polar and nonpolar compounds. Under the direction of Drs. June-Soo Park and Myrto Petreas, staff from the Department of Toxic Substances Control (DTSC) will use liquid chromatography mass spectrometry (LC-QTOF-MS) to identify polar compounds in the stormwater, including organophosphate flame retardants, pesticides, and per and polyfluorinated alkyl substances (PFASs) and other as yet unknown combustion products. Neither the organophosphate flame retardants nor PFASs were used as fire suppression agents, rather their presence is expected as a result of the ubiquitous use of these compounds in residential, commercial, and industrial settings.

An additional water sample and blank will be collected at the Napa River dock site and analyzed using the same polar, non-targeted analytical method previously employed in 2016 by the lab of Dr. Lee Ferguson at Duke University. By using identical analytical methods and collection site, this additional analysis will provide a particularly robust comparison to the pre-fire, 2016 baseline data.

Nonpolar compounds are likely to be present in stormwater due to sorption on suspended particulates or co-solvation with organic matter. Non-polar compound analyses will be conducted by Dr. Hoh's laboratory (San Diego State University) using a novel instrument, and a comprehensive two-dimensional gas chromatograph coupled to time-of-flight mass spectrometry (GC×GC/TOF-MS). This analysis will identify chlorinated and brominated compounds, including as yet unknown combustion products. Qualitative detection of PCBs is possible using this form of non-targeted analysis, though it is not as sensitive as targeted methods designed to detect very low levels of these compounds.

Budget

The following budgets represent estimated costs for this proposed special study (Table 2).

Additional funds ($5,200 - $10,400) are being sought to leverage Region 1 monitoring activities and expand the regional scope of this proposed study to the heavily fire-impacted Santa Rosa region. No RMP funds will be used to analyze the samples from Region 1.

Table 2. Proposed Budget: Includes sampling two storms, analysis of 8 samples, and preparation of a brief technical memorandum.

Personnel	**Budget**
Project Staff (SFEI)	$22,200
Laboratory Analyses (SDSU)	$12,800
Contract Management	NA
Data Technical Services	NA
Direct cost (shipping and blank water)	$1,000
Total Funding Request	**$36,000**
Pro-Bono Contributions	
DTSC Laboratory Analysis (estimated)	$20,000
Water Board Sample Collection (estimated)	$27,000
Duke University Laboratory Analysis (estimated)	$3,000
Total Pro-Bono Contributions	**$50,000**

Budget Justification

SFEI Project Staff Costs
Field Sampling: We are fortunate to be able to leverage the existing effort that the Water Board has underway in Napa and Sonoma counties, which they are providing *pro bono* (approximate value of $15,000 in labor and $12,000 for lab work for 2 storms). SFEI staff will train Water Board staff in the appropriate method of collection. In addition, SFEI will retrieve and ship samples to the laboratories.

Reporting: SFEI proposes to summarize the results in a short technical memorandum and provide presentations to the Emerging Contaminants Workgroup, Technical Review Committee, and Steering Committee if requested. Preparation of a draft manuscript for publication in a peer-reviewed journal will be the responsibility of the analytical partners (Dr. Hoh at SDSU and Drs. June-Soo Park and Myrto Petreas at DTSC), and will require relatively little RMP staff time.

Laboratory Costs
San Diego State University will charge approximately $1,300 per sample and $300 per sample for extraction/archiving, and will not charge for analyses of blanks. Much of the cost of this analysis is associated with the data interpretation to identify new analytes, which is quite time intensive. The DTSC will conduct the polar-focused, non-targeted analyses for all samples *pro bono* (approximate value $20,000). Likewise, scientists at Duke University will conduct a more limited, polar-focused non-targeted analyses *pro bono* (approximate value $3,000).

For the non-targeted analysis samples, we are targeting two storm events in both watersheds (a total of 8 sites for each event, two of which are reference sites). The cost for San Diego State University will be to analyze 8 of the samples and extract/archive 8 of the samples. Note: the Water Board will collect samples at more sites and more storms than are needed for the NTA samples.

As noted above, additional funds ($5,200 - $10,400) are being sought to leverage Region 1 monitoring activities and expand the regional scope of this proposed study to the Santa Rosa region. This expanded scope would add considerably to the power and utility of the proposed study, as this region was heavily fire-impacted. No RMP funds will be used to analyze the samples from Region 1.

Reporting

Deliverables will include: a) a short technical memorandum; b) presentations to the Emerging Contaminants Workgroup, Technical Review Committee, and Steering Committee if requested; and c) a manuscript that will be prepared by our analytical partners *pro bono* on their own schedule.

References

Burke M, Hogue T, Kinoshita A, Barco J, Wessel C and E. Stein. 2013. Pre and post-fire pollutant loads in an urban fringe watershed in Southern California. Environ. Monit. Assess. Vol. 185. P 10131-10145.

Stein E, Brown J, Hogue T, Burke M, and Alicia Kinoshita. 2012. Stormwater contaminant loadings following Southern California wildfires. Environmental Toxicology and Chemistry. Vol. 31 p. 2635-2638.

Smith H, Sherida G, Lanee P, Nyman P and Haydon S. 2011 Wildfire effects on water quality in forest catchments: A review with implications for water supply. Journal of Hydrology. 396, 170-192.

Sutton R, Sedlak M, Sun J, Lin D. 2017. Contaminants of Emerging Concern in San Francisco Bay: A Strategy for Future Investigations. 2017 Revision, *DRAFT*. SFEI Contribution 815. San Francisco Estuary Institute, Richmond, CA.

APPENDIX

San Francisco Bay Regional Water Quality Control Board Fire Response Monitoring Plan v1.0

Purpose

Surface waters within and downstream of areas affected by the recent wildfires in Sonoma and Napa Counties include impaired waterbodies, endangered species habitat, and the source water for drinking water systems. During storm events, surface waters may be affected by pollutants in runoff from burn areas. Watershed partners (e.g. EPA, USACE, Napa and Sonoma RCD, City and County staff) have been working to implement post-fire best management practices (BMPs) within areas that were burned in an effort to prevent pollutant laden stormwater from entering storm drains and reaching surface waters. Monitoring conducted by Regional Water Board staff will help identify areas where BMPs are functioning to effectively remove pollutants and areas where priority should be placed on increased or alternative BMP implementation.

Table 1. Monitoring Design Summary

Management Question	Are Post Fire BMPs Effective for Protection of Surface Water Beneficial Uses? • Sensitive Aquatic Resources • Drinking Water Sources
General Design	Comparison of Surface Water Runoff from Burn Affected Areas to Water Quality Objectives and Historic or Reference Site Data, Where Available, and Comparison to a Reference Non-burned Site
Target Flow Conditions	Post-Fire Base Flow, Subsequent Peak Storm Flow Conditions
Selection of Burned Catchment	Surface Water in or Below Burned Urban Area Within the Sonoma Creek and Napa River Watershed
Selection of Comparison Site	Same or Similar Site with Pre-Wildfire Data Availability
Indicators	Water Chemistry, Field Measurements
Timing	Prior to First Flush, During Three Subsequent Qualifying Storms (0.5 Inch or Greater within 24 Hour Period)

Monitoring Plan Overview

The Regional Water Board is interested in ensuring that sufficient BMPs are in place to protect downstream beneficial uses such as sensitive aquatic habitat and sources of drinking water in impacted watersheds. Some BMPs used to control erosion could also help reduce chemical contaminant loading, including revegetation and application of mulch material such as straw wattles, inlet filtration devices, and others. This monitoring effort will help the Regional Water Board identify locations for BMP implementation as well as assessing the efficacy of any BMPs that have already been installed.

This monitoring effort will evaluate the need for BMPs in urban areas severely impacted by the fire. Post-fire stormwater runoff threats and impacts to the beneficial uses in surface waters downstream of burned areas will be assessed by monitoring water column chemistry. Chemical analyses will target constituents known to become elevated in response to fire and that have potential impacts on drinking water and aquatic life. Staff will evaluate threats and potential impacts to beneficial uses by comparing concentrations of contaminants detected in surface water with water quality objectives established to protect those uses. Where readily available, staff will compare results to pre-fire data for similar parameters and between the fire-impacted and reference sites.

Sample Locations

Not all areas affected by the recent fires need be monitored to inform successive BMP management decisions. The information gained from this targeted sampling may be extrapolated to assist management decisions beyond the areal extent of monitoring, based upon similarities in land use, fire impacts, and BMP deployment.

The Regional Water Board staff will collect samples at three or four locations located downstream of burned areas and one unburned, reference stream for each watershed as indicated below:

Sonoma Creek Watershed:

Site Code	Site Name	Lat	Long
206SON160	Sonoma Creek at Glen Ellen	38.36376	-122.526
206CALASC	Calabazas Creek above Sonoma Creek	38.363	-122.525
206GRA050	Graham Creek 300m u/s of Sonoma Crk confluence (unburned reference site)	38.36704	-122.541
206SONCYP*	Sonoma Creek at Cypress Ave	38.4122	-122.554
206YUL010*	Yulupa Creek above confluence with Sonoma Creek at Warm Springs Rd	38.3793	-122.553
206SON280**	Sonoma Creek on Adobe Cyn Rd 400m u/s of Baker Rd xing	38.43542	-122.55

*Site added after pre-storm sampling event.
**Only sampled during pre-storm sampling event.

Napa River Watershed:

Station Code	Station Name	Lat	Long
206MLK100	Miliken Creek at Hedgeside Ave	38.33827	-122.269
206RED400	Redwood Creek d/s of Pickle Crk at Mt Veeder and Redwood Rd. intersection	38.33388	-122.371
206SOD090*	Soda Creek on Soda Cyn Rd ~2km u/s of Chimney Rock Rd xing	38.4108	-122.296
206RIC100	Ritchie above gabion wall in Napa-Bothe State Park	38.55078	-122.521
206NAP020**	Napa River at public dock on Main and 3rd Street	38.298	-122.283

*Lowest point in watershed with flow at the time of pre-storm sampling. May move site further downstream during storm events to capture more flow lower in the watershed.
**Potential site to accompany SFEI probabilistic sampling

The sampling sites shown in Attachment A, Figure 1 have been strategically chosen to assess stormwater runoff from urban locations damaged by fire, relative to the following:

- Land use and density of burned structures
- Vulnerable aquatic habitat
- Availability of previous or companion water quality data
- Site permission and accessibility

Sample Collection Timing
Staff will collect samples from the locations in Figures 1 and 2 on four occasions; pre-storm, during first flush of the initial qualifying storm of the season, and again during two subsequent qualifying storms. Qualifying storm events shall be considered those storms which have a predicted rainfall of 0.5 inch or greater within a 24 hour period.

First flush monitoring is designed to collect samples near the start of overland runoff to capture the highest pollutant concentrations of the storm event during lower stream flow rates at the beginning of the storm. First flush conditions have the greatest potential for adverse impacts to aquatic species and sources of drinking water. Obtaining first flush water quality samples provides the ability to evaluate monitoring results and determine if additional BMPs are necessary to reduce pollutant concentrations in storm water discharge.

The timing of monitoring for this effort has been determined based upon the likelihood of rainfall conditions to cause erosion or transport of pollutants from the landscape into surface waters. Pre-storm monitoring will be conducted to evaluate existing surface water conditions before the threat of significant pollutant movement associated with a first flush storm event. Pre-storm sampling will provide a baseline for assessment of BMP effectiveness during the first flush storm event. The four sampling events conducted in accordance with this monitoring plan will allow staff to understand the current conditions of surface water, alterations in those conditions related to first flush, and improvements in surface water quality realized in response to any management decisions made as a result of the first two monitoring events.

Monitoring Parameters
Wildfire alters the hydrologic response of watersheds, including peak discharge resulting from rain events, transport of sediment, and rate of erosion and deposition. Increased storm runoff and transport of contaminants by stormwater runoff after a wildfire raises concerns about water quality. Some of the concerns for water quality after a fire include erosion and transport of ash or other materials containing chemicals created or left exposed in burned areas. If sedimentation rates are high, they can alter and often destroy fish habitats and spawning beds, damage drinking water infrastructure, and increase risk of flooding.

Fertilizer is a major component of fire retardants, often consisting of ammonia and phosphate or sulfate ions. Previous studies have shown that a single retardant drop directly into a stream may be sufficient to raise the concentration of ammonia enough to elicit a lethal response in fish and other aquatic organisms. Effects such as this are dependent upon the waterbody size, flow conditions and the volume of retardant reaching the waterway. Additionally, ashes remaining after a fire can impact the environment and ecosystems by raising soil and water pH levels. Post-fire research shows that ash can generate caustic alkalinity in contact with rainwater producing pH levels >12.

Research also shows that fire affected areas contain increased concentrations of contaminants including nutrients (e.g. nitrates and phosphorus), polycyclic aromatic hydrocarbons (PAHs), copper, zinc, mercury, lead and other metals. Several of these pollutants, especially heavy metals, can be detrimental to human health and are often toxic to aquatic life. High levels of nutrients can encourage the development of harmful algal blooms and in the case of Napa and Sonoma County wildfires, downstream waters are already listed as impaired for these constituents. Many pollutants often attach to suspended particles and enter the water.

Therefore an increase in turbidity or total suspended solids (TSS) can often indicate potential pollution, not just a decrease in water quality related to sediment.

The Regional Water Board staff have reviewed available fire response literature, considered the parameters anticipated to be elevated as a result of wildfire, and developed a list of monitoring analytes. Targeted monitoring analytes consider: 1) correlation to fire impacts, 2) potential impacts to water resources, and 3) potential for management practices to mitigate threats or impacts identified through this monitoring effort. In addition to rainfall, Table 1 below provides the list of analyses and field parameters to be performed during this effort.

Table 1 Monitoring Analytes

General	Nutrients	Metals	PAHs
Alkalinity	Ammonia	Aluminum[T,D]	Acenaphthene
Hardness	Nitrate	Arsenic[T,D]	Acenaphthylene
Sulfate	Total Nitrogen	Cadmium[T,D]	Anthracene
Total Organic Carbon	Orthophosphate	Chromium[T,D]	Benzo (a) anthracene
Total Dissolved Solids	Total Phosphorus	Copper[T,D]	Benzo (a) Pyrene
Total Suspended Solids		Iron[D]	Benzo (b) flouranthene
Dissolved Oxygen[F]		Lead[T,D]	Benzo (g,h,I,) Perylene
pH[F]		Manganese[D]	Benzo (k) Fluoranthene
Specific Conductance[F]		Mercury[T,D]	Chrysene
Temperature[F]		Nickel[T,D]	Dibenzo (a,h) anthracene
Turbidity[F]		Selenium[T,D]	Fluoranthene
		Zinc[T,D]	Fluorene
			Ideno(1,2,3-C,D)Pyrene
			Naphthalene
			Phenanthrene
			Pyrene

[F]Field Measurement
[T]Total
[D]Dissolved

Data Evaluation

The Basin Plan specifies numerous water quality objectives for the protection of inland surface waters which include: color, tastes and odors, suspended material, biostimulatory substances, sediment, turbidity, pH, dissolved oxygen, temperature, and chemical constituents. Staff will compare monitoring data results to the water quality objectives, and to past data collected at or near these sites during similar times of year, to evaluate whether surface water downstream of fire-impacted areas is meeting water quality objectives for the protection of beneficial uses and whether the impacts are likely caused due to insufficient or ineffective BMPs resulting in pollutant laden stormwater runoff to surface water. This assessment will be conveyed in a timely manner to staff working with entities in the watershed to inform and prioritize implementation of new or additional BMPs where needed for pollutant control.

Monitoring Quality Assurance and Control

The protocol for sample collection and analyses will follow the State of California Surface Water Ambient Monitoring Program Standard Operating Procedures (SOP) and Quality Assurance Program Plan (QAPrP). The QAPrP serves as an umbrella document for use by each of the Surface Water Ambient Monitoring Program's (SWAMP's) contributing projects. It describes the program's quality system in terms of organizational structure; the functional responsibilities of management and staff; the lines of authority; and the interfaces for those planning, implementing, and assessing all activities conducted.

Data Management

After sampling and analysis, the Regional Water Board staff shall enter this data into a spreadsheet and loaded to the K drive (K:Fire_response/data). This version can be readily shared with other resource managers. The decision about whether to load these data to CEDEN will be determined at a later date.

Distribution list for water quality data:
Shari Gardner (Friends of the Napa River)
Derek Acomb (CA Fish and Wildlife)
Caitlin Cornwall (Sonoma Ecology Center)

Figure 1

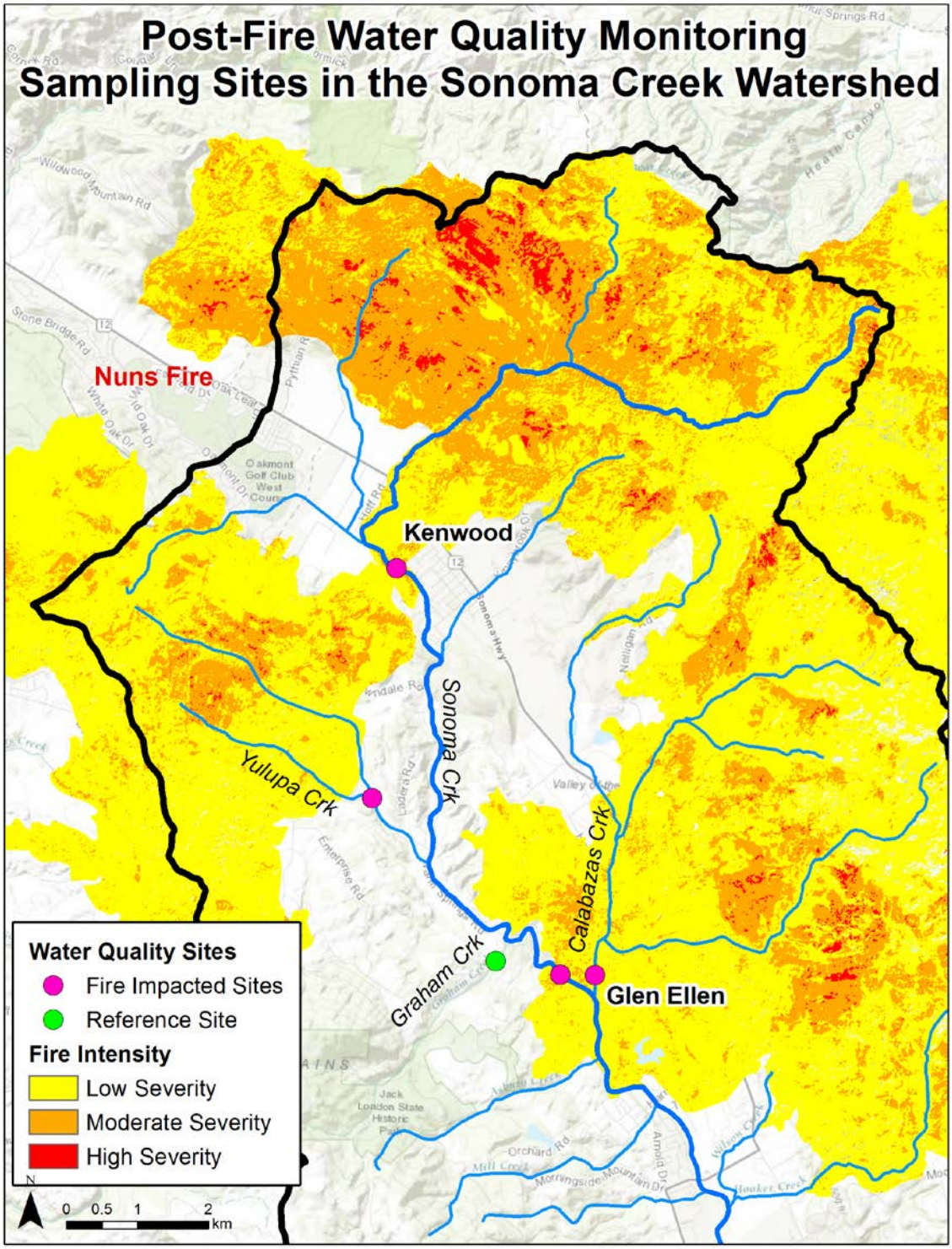
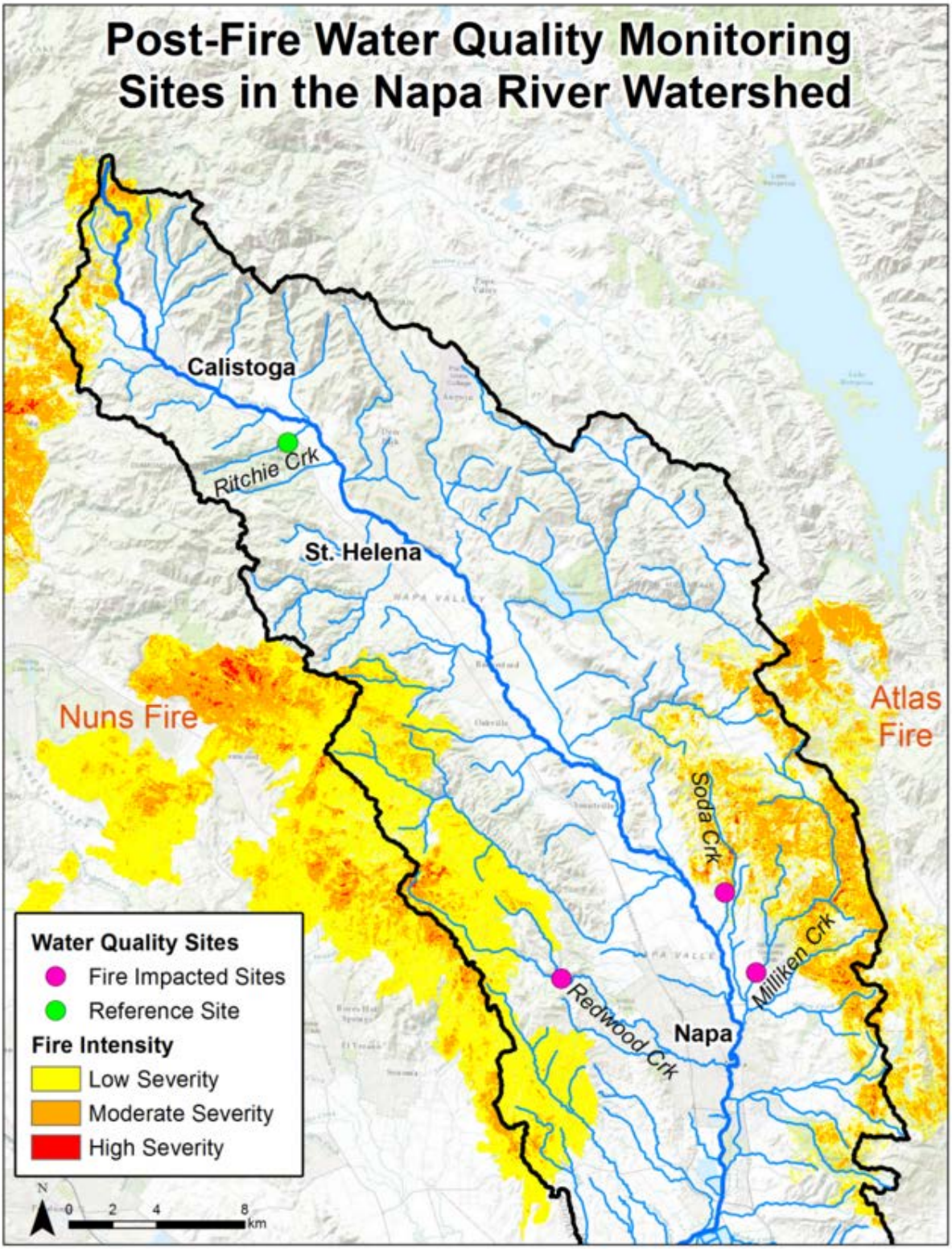

Post-Fire Water Quality Monitoring
Sampling Sites in the Sonoma Creek Watershed
Nuns Fire
Kenwood
Sonoma Crk
Yulupa Crk
Calabazas Crk
Graham Crk
Glen Ellen
Water Quality Sites
Fire Impacted Sites
Reference Site
Fire Intensity
Low Severity
Moderate Severity
High Severity
0 0.5 1 2
km

Figure 2


Post-Fire Water Quality Monitoring Sites in the Napa River Watershed
Calistoga
Ritchie Crk
St. Helena
Nuns Fire
Atlas Fire
Soda Crk
Milliken Crk
Redwood Crk
Napa
Water Quality Sites
Fire Impacted Sites
Reference Site
Fire Intensity
Low Severity
Moderate Severity
High Severity
N
0 2 4 8
km

Item 6: Information/Decision: Fire Response Monitoring

B: Add Dioxins to 2018 Bird Egg Monitoring for Fire Response?

Desired outcome: Decision

MULTI-YEAR PLAN FOR DIOXINS

Special studies and monitoring in the RMP from 2009 to 2017. Numbers indicate budget allocations in $1000s. Budgets in parentheses represent funding or in-kind services from external sources. Budgets that are starred represent funding that has been allocated for the given study within other workgroups.

Category	Study	Funder	Questions addressed	2009	2010	2011	2012	2013	2014	2015	2016	2017
General	Quality Assurance	RMP	1,2,3,4,5,6	14								
S&T	Sport Fish	RMP	1,2,4	22					24			
S&T	Avian Eggs	RMP	1,2,4				13					
S&T	Surface Sediment	RMP	2,3	58	58							
S&T	Water	RMP	2,3	26		26						
Loading	Small Tributary Loading	RMP	4,5,6		65		52					
Loading	River Loading (THg)	RMP	4,5,6		34							
Loading	Sediment Cores	RMP	3,4,6		57							
Loading	Atmospheric Deposition	RMP	5,6		20							
Forecast	Synthesis: RMP and DMMO	RMP	1,2,3,4,5,6									52
	RMP Total			120	234	26	65		24			52
	Other Funding											
	Overall Total			120	234	26	65		24			52

Figure 1. Cormorant and tern egg sampling locations in San Francisco Bay, 2002 - 2012.

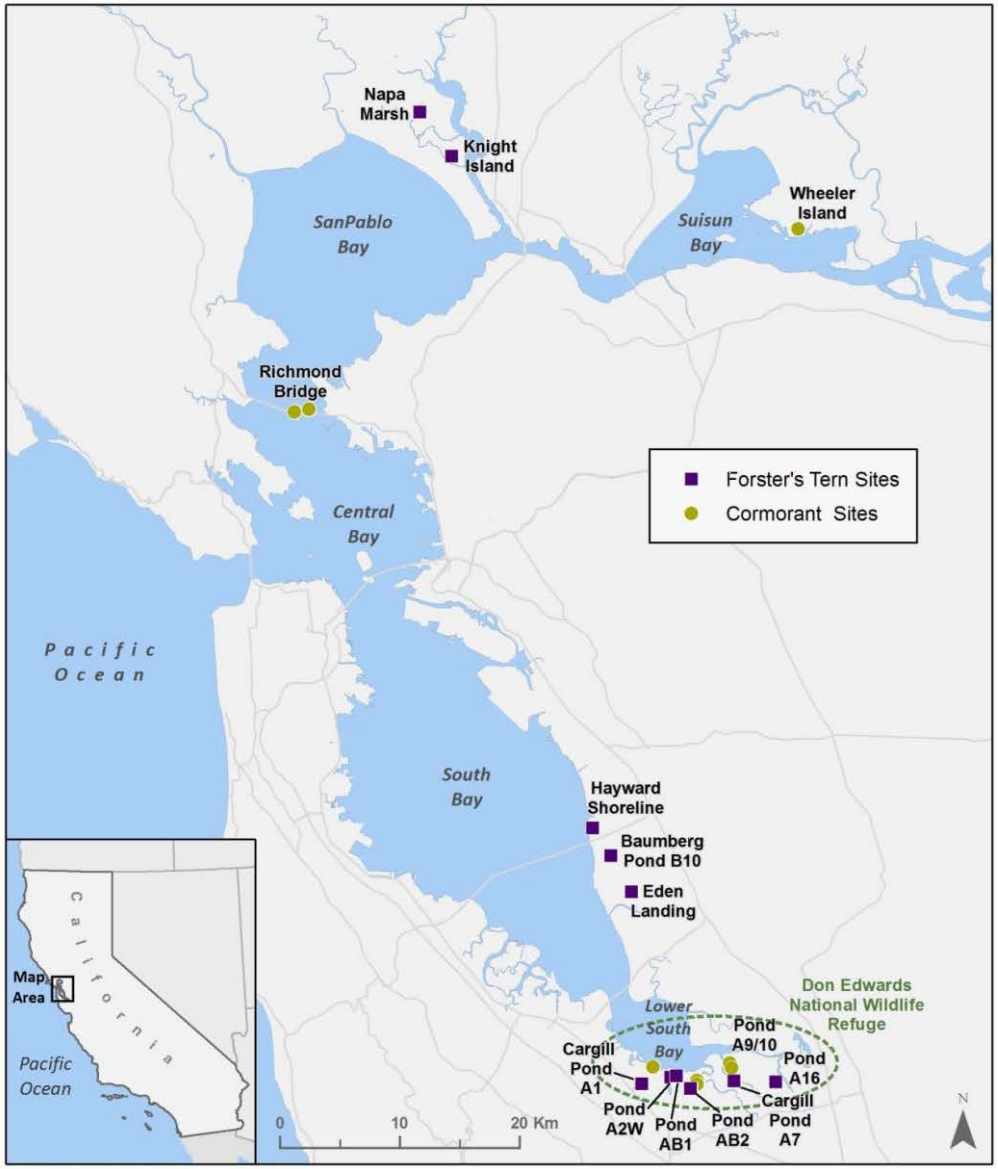
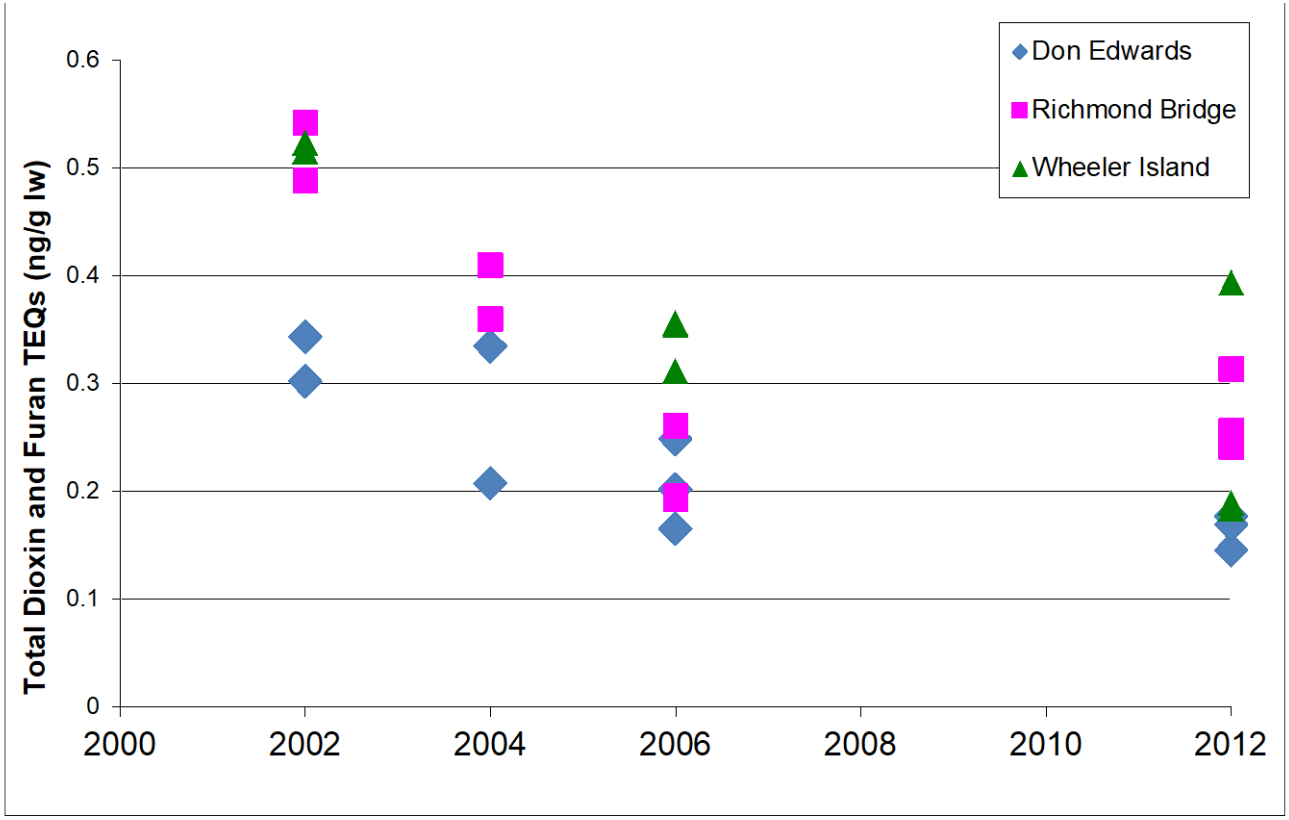


Figure 15. Total dioxin and dibenzofuran TEQ concentrations (ng/g lw) in cormorant egg composites from San Francisco Bay, 2002-2012.



Options for Laboratory Intercomparison (IC) Studies for Critical RMP Analytes

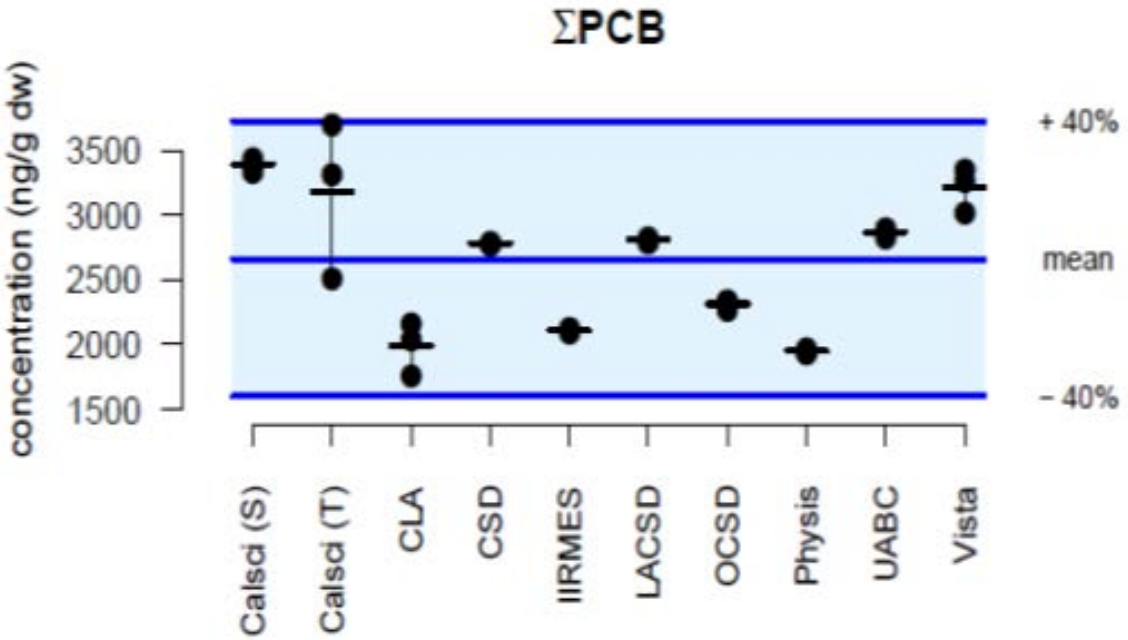
Collaboration Opportunity with SCCWRP

- SCCWRP is organizing a IC study for sediment and tissue in 2018.
- Target analytes
  - Sediment: PCBs, PAHs, metals, chlorinated hydrocarbons (maybe PBDEs)
  - Tissue: Hg, As, Se, PCBs, DDT
- ~10 SoCal labs participate. SWAMP tissue labs will participate. Could add in RMP and RMP partner labs. ELAP is also deciding if they will join.
- Use native samples, not SRMs.
- Each lab runs two samples (high and low concentrations) in triplicate.
- Potential to have one sample from the Bay. Would require a large volume.
- Goal is to get between-lab difference down to within-lab difference (~30%).

Timeline for SCCWRP IC Study

- TRC needs to decide about participation in December. SCCWRP needs to know how many labs will participate.
- Samples would be collected in January
- Samples would be shipped to labs in March, results due in April
- SCCWRP would combine the results and organize a meeting of the labs in mid-year. SCCWRP chemist (and maybe Don) would meet with individual labs as needed.
- In the fall, a second round of samples would be analyzed to show improvement
- Short project report to document the results by end of 2018

Results from Bight '13 Sediment Intercalibration



Questions for the TRC

1) Should we require RMP labs* participate in the SCCWRP IC Study?
    a) (* only those for applicable analytes & matrices)
    b) Even with SCCWRP IC study, should we analyze archived fish samples from previous years (& how many) to ensure consistency between old & new labs?
2) Should other labs used by RMP members also participate?
    a) If so how do we get word out/encourage/solicit participation in time?
3) Which target analytes do we want to include?

Questions for the TRC

3) How should an IC study for bird egg samples be handled? Bird egg samples will be analyzed by a new lab in 2018.
   a) Can we wait for outcomes of sport fish IC study and any potential method updates/modifications for tissue?
   b) IC likely to be fish tissue only, so do we need some analysis of archive eggs to ensure consistency carries across tissue types? (see options on the next page)

Options for Bird Egg IC Study with Archives

1. Select a subset of archive egg samples to be analyzed.
    a. Econo version = one composite each site from a prior event (3 composites), priority to latest round(s) if material available. Each analyzed in duplicate if sufficient material available and/or budget allows, but at least one of those composites analyzed in replicate if enough material.
    b. Mid-range version = one composite each site from one recent and one fairly old event. The latter higher priority for archives slated for discard if any. 2 or 3 replicates spread among those 6 possible composites.
    c. Deluxe version = 3 periods from each of the 3 sites. This would be same #samples (3x3) as ongoing S&T study. Potentially overkill. Would sacrifice many archives at once, at the expense of using those to verify no method drift in the future.

Options for Bird Egg IC Study with Archives (cont.)

2. Decide acceptance band for any variance or bias from previous results.

   a. Lab method precision is ~30%. That would mean a ~30% change would be indistinguishable/too noisy to call. Is this variance acceptable?
   b. Some variance may not be eliminated no matter how much effort is expended in reanalysis and method tweaking. How important is it to squeeze out all variance, vs evaluate net bias/noise, and move on?

Bird Egg (Cormorant) Archives Available

Container Type	Container Volume	Purpose	Location	2009	2012	2016
Glass jar with teflon-lined lid	60 ml	PCBs/PBDEs	Richmond Bridge	9 jars with 22 g-ww each	12 jars with 30 g-ww each	9 jars with 15 g-ww each
			South Bay	9 jars with 22 g-ww each	11 jars with 30 g-ww each	9 jars with 15 g-ww each
			Wheeler Island	9 jars with 19 g-ww each	12 jars with 30 g-ww each	9 jars with 15 g-ww each
Polypropylene jar	30 ml	Mercury	Richmond Bridge	6 jars with 19 g-ww each	6 jars with 15 g-ww each	6 jars with 15 g-ww each
			South Bay	6 jars with 18 g-ww each	6 jars with 15 g-ww each	6 jars with 15 g-ww each
			Wheeler Island	6 jars with 17 g-ww each	6 jars with 15 g-ww each	6 jars with 15 g-ww each
High density polyethylene	15 ml	Selenium	Richmond Bridge			21 jars with 6 g-ww each
			South Bay			20 jars with 6 g-ww each
			Wheeler Island			19 jars with 5 g-ww each

Mass required for:
PCBs/PBDES = 20 g-ww
Hg = 5 g-ww
Selenium = 6 g-ww

Item 9: Information: Plans for the 2018 RMP Update Report, Annual Meeting, and Upcoming Reports & Communications Products

Desired outcome: Informed committee, brainstorming

RMP UPDATE 2016

A Report of the Regional Monitoring Program for Water Quality in San Francisco Bay

TABLE OF CONTENTS

RMP Update Ideas

- Highlight a key publication

SETAC Session Ideas

- CECs
- Microplastics
- Monitoring Recovery from PCB Contamination
- Algal Toxins
- Regional Status and Trends
- Science Informing Management
- Passive Sampling
- Toxic Pollutants in the San Francisco-Bay Delta
- Water Quality Impacts of Fires
- Water Quality Impacts of Fires and Floods

Bay RMP Deliverables Scorecard Report

Key to Status Colors:
Green indicates greater than 90 days until the deliverable is due.
Yellow indicates a deliverable due within 90 days.
Red indicates a deliverable that is overdue.

Focus Area	Project	Primary	Deliverable	Assigned To	Due Date	Due Date Extended	Old Due Date	Status	Comments
Annual Reporting	Bay RMP (2018)	4. Annual Reporting	2018 RMP Update	Jay Davis	09/30/18				
Annual Reporting	Bay RMP (2018)	4. Annual Reporting	2017 Annual Meeting	Philip Trowbridge	10/06/18				
Communications	Bay RMP (2017)	5. Communications	Q4 Estuary News Article	Jay Davis	12/31/17				
Communications	Bay RMP (2017)	5. Communications	Q4 RMP eUpdate	Jay Davis	12/31/17				
Communications	Bay RMP (2017)	5. Communications	Fact Sheet (content TBD)	Philip Trowbridge	12/31/17				
Communications	Bay RMP (2017)	5. Communications	Presentation of RMP data at up to 6 conferences or local meetings (oral presentations and posters)	Philip Trowbridge	12/31/17				
Communications	Bay RMP (2018)	5. Communications	Estuary News Contribution for 2018	Philip Trowbridge	01/31/18				
Communications	Bay RMP (2018)	5. Communications	Q1 Estuary News Article	Jay Davis	03/31/18				
Communications	Bay RMP (2018)	5. Communications	Q1 RMP eUpdate	Jay Davis	03/31/18				
Communications	Bay RMP (2018)	5. Communications	Q2 Estuary News Article	Jay Davis	06/30/18				
Communications	Bay RMP (2018)	5. Communications	Q2 RMP eUpdate	Jay Davis	06/30/18				
Communications	Bay RMP (2018)	5. Communications	Q3 Estuary News Article	Jay Davis	09/30/18				
Communications	Bay RMP (2018)	5. Communications	Q3 RMP eUpdate	Jay Davis	09/30/18				
Communications	Bay RMP (2018)	5. Communications	RMP Update for BACWA Board	Philip Trowbridge	10/31/18				
Communications	Bay RMP (2018)	5. Communications	RMP Update for BASMAA Board	Philip Trowbridge	10/31/18				
Communications	Bay RMP (2018)	5. Communications	RMP Update for LTMS Program Managers	Philip Trowbridge	10/31/18				
Communications	Bay RMP (2018)	5. Communications	RMP Update for BPC	Philip Trowbridge	10/31/18				
Communications	Bay RMP (2018)	5. Communications	RMP Update for WSPA BATS Meeting	Philip Trowbridge	10/31/18				
Communications	Bay RMP (2018)	5. Communications	RMP Update for RB2 staff	Philip Trowbridge	10/31/18				Include a brown bag presentation by RMP staff.
Communications	Bay RMP (2018)	5. Communications	Q4 Estuary News Article	Jay Davis	12/31/18				
Communications	Bay RMP (2018)	5. Communications	Q4 RMP eUpdate	Jay Davis	12/31/18				
Communications	Bay RMP (2018)	5. Communications	Presentation of RMP data at up to 6 conferences or local meetings (oral presentations and posters)	Philip Trowbridge	12/31/18				
Data Management	Bay RMP (2017)	3. QA and Data Services	Host QA Meeting with RMP labs	Don Yee	12/31/17				We plan to discontinue this deliverable given less frequent/large interval monitoring. In its place will be per-lab call/consultation after review/approval of their last dataset.

Focus Area	Project	Primary	Deliverable	Assigned To	Due Date	Due Date Extended	Old Due Date	Status	Comments
Data Management	Bay RMP (2017)	3. QA and Data Services	Database Maintenance: Data uploads and updates and corrections to datasets as needed	Amy Franz	12/31/17				(1) upload priority CEC datasetsas requested by Dr Becky Sutton (2) Upload PFC datasets (3) Upload 1993-2014 CTD data (4) Update database to implement changes made by CEDEN for standard vocabulary codes, business rules and database structure (5) Update records and address issues as identified by internal staff (6) Perform scheduled database maintenance. Carry over from 2016: Historic Sum of TEQs (DTSRDC-219) In Progress; Update QA Code for PCB coelutions to be CEDEN comparable (DTSRDC-186) In Progress; Investigate records that have a rejected QA Code but do not have a Compliance Code that indicates rejection (DTSRDC-33) In Progress
Data Management	Bay RMP (2017)	3. QA and Data Services	Updates to SOPs and Templates	Amy Franz	12/31/17				(1) Develop data submittal portal (2) Modify templates, queries and SOPs as needed (3) Begin discussion on how to manage sums (4) Discuss the roadmap for updating the CEDEN data checker with SWRCB staff
Data Management	Bay RMP (2017)	3. QA and Data Services	QA Officer Report for 2017 Water Data	Don Yee	03/31/18				
Data Management	Bay RMP (2017)	3. QA and Data Services	QA Officer Report for 2017 Margins Sediment Data	Don Yee	03/31/18				
Data Management	Bay RMP (2018)	3. QA and Data Services	Annual QAPP Update	Don Yee	05/31/18				
Data Management	Bay RMP (2018)	3. QA and Data Services	Online Data Access CD3	Cristina Grosso	12/31/18				(1) Automate generation of TEQs; (2) Expand functionality of data download tool; (3) Implement display of toxicity summary data; (4) Tool maintenance and performance upgrades.
Data Management	Bay RMP (2018)	3. QA and Data Services	Database Maintenance	Amy Franz	12/31/18				(1) Add 2002 and 2003 CTR data to CD3 (2) Add basic water quality data from YSI for RMP water cruises in 2010, 11, 12, 15 to CD3 (3) Check that all records in the legacy RMP database are also in the RDC database (4) Make sure all RMP data has associated Lat/Longs so data can be exchanged with WQX (5) Move RDC database to Data 2 (6) Update database to implement changes made by CEDEN for standard vocabulary codes, business rules and database structure (7) Update records and address issues as identified by internal staff (8) Perform scheduled database maintenance.
Data Management	Bay RMP (2018)	3. QA and Data Services	Updates to SOPs and Templates	Amy Franz	12/31/18				(1) Modify and design data reporting templates. (2) Update queries for bird and bivalve tissue data (3) Maintain data management standard operating procedures and work flow documentation (4) Continue discussion on how to manage sums (5) Continue to work with CEDEN to provide input of updating the CEDEN data checker with SWRCB staff.
Data Management	Bay RMP (2018)	3. QA and Data Services	QA Officer Report for 2018 S&T Activities	Don Yee	03/31/19				Report will cover 2018 Bird Egg, 2018 Bivalve, and 2018 Sediment data.
Dioxin	Bay RMP (2017)	Dioxin Synthesis Report	Dioxin Synthesis Report	Don Yee	12/31/17				Draft due 12/31/2017; Final due 3/31/2018 -- Review by Dioxin WG
Emerging Contaminants	Bay RMP (2014)	Emerging Contaminants Special Studies /	Alternative Flame Retardants Study - Final Report	Rebecca Sutton	12/31/17		06/30/15		Delayed due to other priorities. This delay will not affect the MYP process, and the data has already been presented to the ECWG. A draft manuscript has been provided to the analytical partner for review. Original due date: 6/30/15
Emerging Contaminants	Bay RMP (2016)	EC Non-targeted Analysis	Report on Non-Targeted Analysis of Water-Soluble CEC Compounds	Rebecca Sutton	12/31/17		06/30/17		Draft report presented to ECWG on 3/30/17. Dr. Ferguson has requested Draft and Final Report extensions (draft: 9/30, now 12/31; final 12/31, now 3/31/18) to allow him to do additional analyses with newly purchased, faster and higher-resolution equipment. The new machines will double the number of contaminant identifications possible. This extension will not affect decision-making, as Dr. Ferguson has already provided initial findings during the spring ECWG meeting. Original deadline for Final report: 6/30/17. Provide final report to EB Parks.
Emerging Contaminants	Bay RMP (2016)	EC Non-targeted Analysis	Fact Sheet on Non-Targeted Analysis of Water-Soluble CEC Compounds	Rebecca Sutton	12/31/17		06/30/17		Fact sheet is to accompany the final report. Original deadline 6/31/17. Provide final fact sheet to EB Parks.

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Emerging Contaminants	Bay RMP (2017)	PFAS in SFB: Synthesis/Strategy	PFAS Synthesis Report	Meg Sedlak	12/31/17		09/30/17		Draft report was disseminated for review 9/2017; final due by end of year. We are revising the draft document in response to comments.
Emerging Contaminants	Bay RMP (2017)	EC Strategy	Present update of EC strategy, pro bono studies, & new studies to Steering Committee	Rebecca Sutton	01/31/18		12/31/17		
Emerging Contaminants	Bay RMP (2017)	EC Strategy	Communicate findings from annual review of tiered monitoring & management framework to Water Board	Rebecca Sutton	01/31/18		12/31/17		
Emerging Contaminants	Bay RMP (2018)	2. Governance	Emerging Contaminants WG Meeting	Rebecca Sutton	04/12/18				
Emerging Contaminants	Bay RMP (2017)	Triclosan in Small Fish	Report on triclosan in small fish	Rebecca Sutton	04/30/18				Draft report by 4/30/18; final due 7/31/18 -- Review by ECWG
Emerging Contaminants	Bay RMP (2017)	Phosphate Flame Retardants in Bay Water	Report on phosphate flame retardants in ambient Bay water	Rebecca Sutton	05/31/18				Draft report by 5/31/18; final due 8/31/18 -- Review by ECWG
Emerging Contaminants	Bay RMP (2017)	Bisphenol in Bay Water	Report on bisphenol compounds in ambient Bay water	Jennifer Sun	05/31/18				Draft report by 9/30/18; final due 12/31/18 -- Review by ECWG
Emerging Contaminants	Bay RMP (2017)	Imidacloprid in Ambient Bay Water	Fact sheet on imidacloprid in ambient Bay water	Rebecca Sutton	06/30/18				Draft due on 3/31/18; final due on 6/30/18 - Review by ECWG
Emerging Contaminants	Bay RMP (2018)	CUPs and Wastewater Contaminants in Margin Sediment and Water	Technical Report	Rebecca Sutton	07/31/18				Draft report due by summer '18; final due by 9/30/18
Emerging Contaminants	Bay RMP (2018)	Pharmaceuticals in Wastewater: Data Analysis and Reporting	Technical Report	diana@sfei.org	07/31/18				Draft report due by summer '18; final due by 9/30/18
Emerging Contaminants	Bay RMP (2018)	Pharmaceuticals in Wastewater: Data Analysis and Reporting	Data uploaded anonymously to the Regional Data Center; NOT uploaded to CD3 or CEDEN	Amy Franz	09/30/18				
Emerging Contaminants	Bay RMP (2018)	CUPs and Wastewater Contaminants in Margin Sediment and Water	Data upload to CEDEN	Amy Franz	11/01/18				
Emerging Contaminants	Bay RMP (2018)	North Bay Post-Fire Monitoring	Brief technical memorandum with results of non-targeted analysis	Rebecca Sutton	11/30/18				Draft memo to TRC/SC in November 2018. Final memo in February 2019.
Emerging Contaminants	Bay RMP (2018)	EC Strategy	Present CEC update to SC	Rebecca Sutton	12/31/18				Present an update of RMP CEC Strategy, ongoing or completed special and pro bono studies, and new studies to the Steering Committee in summer 2018.
Emerging Contaminants	Bay RMP (2018)	EC Strategy	CEC Strategy Document Update	Rebecca Sutton	12/31/18				Update the RMP CEC Strategy document with revised tiered framework tables and multi-year plan, discussion of new RMP data and information gathered (Task 1); include discussion of role of improved Bay contaminant transport model in informing understanding of fate and transport of emerging contaminants in the Bay
Emerging Contaminants	Bay RMP (2018)	North Bay Post-Fire Monitoring	Manuscript on results of non-targeted analysis	Rebecca Sutton	01/31/19				Manuscript will be prepared by academic partners (SDSU, DTSC, Duke). Not a RMP deliverable.
Emerging Contaminants	Bay RMP (2018)	Non-targeted Analysis of Sediment and Water	Fact sheet and technical report	Rebecca Sutton	05/05/19				Draft report and fact sheet by spring '19 in time for ECWG meeting; Final report and fact sheet by summer '19
Emerging Contaminants	Bay RMP (2018)	Non-targeted Analysis of Sediment and Water	Manuscript	Rebecca Sutton	05/05/19				
Exposure and Effects	Bay RMP (2017)	EE Estrogen Linkage Studies	Estrogen Receptor Assay Technical Report	Nancy Denslow (Univ. Florida)	01/31/18		09/30/17		Draft due by 12/31/17. Final due by 1/31/18. Review by EEWG.
Exposure and Effects	Bay RMP (2018)	2. Governance	Exposure and Effects WG Meeting	Philip Trowbridge	04/11/18				
Exposure and Effects	Bay RMP (2018)	Support for Sediment Bioaccumulation Evaluations	Technical Report	Diana Lin	04/15/18				Draft: April 2018; Final: June 2018
Exposure and Effects	Bay RMP (2018)	Exposure and Effects Workgroup Strategy Coordination and Technical Support	EEWG Strategic Plan	Philip Trowbridge	06/15/18				
Exposure and Effects	Bay RMP (2018)	Synthesis of Benthic Community Data in the Whole of San Francisco Bay using the M-AMBI Index	Technical memo covering the M-AMBI threshold adjustment process and the results of the validation exercise	Philip Trowbridge	12/15/18				
Governance	Bay RMP (2017)	2. Governance	December TRC Meeting	Philip Trowbridge	12/31/17				
Governance	Bay RMP (2017)	2. Governance	Honoraria Payments for Science Advisors	Philip Trowbridge	12/31/17				

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Governance	Bay RMP (2018)	2. Governance	January SC Meeting	Philip Trowbridge	01/24/18				
Governance	Bay RMP (2018)	2. Governance	March TRC Meeting	Philip Trowbridge	03/08/18				
Governance	Bay RMP (2018)	2. Governance	April SC Meeting	Philip Trowbridge	04/25/18				
Governance	Bay RMP (2018)	2. Governance	June TRC Meeting	Philip Trowbridge	06/14/18				
Governance	Bay RMP (2018)	2. Governance	July SC Meeting	Philip Trowbridge	07/25/18				
Governance	Bay RMP (2018)	2. Governance	September TRC Meeting	Philip Trowbridge	09/13/18				
Governance	Bay RMP (2018)	2. Governance	October SC Meeting	Philip Trowbridge	10/24/18				
Governance	Bay RMP (2018)	2. Governance	December TRC Meeting	Philip Trowbridge	12/13/18				
Governance	Bay RMP (2018)	2. Governance	Honoraria Payments for Science Advisors	Philip Trowbridge	12/31/18				
Microplastics	Bay RMP (2018)	2. Governance	Microplastic WG Meeting	Meg Sedlak	03/07/18				
Microplastics	Bay RMP (2017)	Microplastic Characterization Study (Moore Foundation)	Baseline Report - Year 1	Meg Sedlak	05/31/18				
Microplastics	Bay RMP (2018)	Microplastics in San Francisco Bivalves	Technical Report	Meg Sedlak	12/15/18				Results will be included in the Moore Microplastic Project final report.
Microplastics	Bay RMP (2017)	Microplastic Characterization Study (Moore Foundation)	Baseline Report - Year 2	Meg Sedlak	12/31/18				
Microplastics	Bay RMP (2018)	Microplastics in San Francisco Bivalves	Presentation to TRC/SC	Meg Sedlak	03/15/19				
Nutrients	RMP SEP	Hydrodynamic and Water Quality Model in SFB and LSB	An interim report on hydrodynamic and nutrient model calibration and associated development	Dave Senn	12/31/17				
Nutrients	Bay RMP (2018)	Ship-based sampling and sample analysis	Results reported in FY18 NMS Annual Report	Dave Senn	09/15/18				Ship-based discrete samples will be collected by USGS aboard the R/V Peterson on ~12 full-bay cruises and an additional ~12 South Bay cruises.
Nutrients	Bay RMP (2018)	Open-Bay and Slough Moored Sensors: Data Analysis, Interpretation, and Maintenance	Results reported in FY18 NMS Annual Report	Dave Senn	09/15/18				Maintain the network of moored sensors in open waters and margin areas of Lower South Bay measuring dissolved oxygen, etc. Data analysis with a major focus on quantitative mechanistic interpretation to identify factors contributing to observed DO conditions, possibly including the use of simplified reactive-transport models.
Nutrients	RMP SEP	3. Hydrodynamic and Water Quality Model in SFB and LSB	A final hydrodynamic and nutrient calibration and validation report	Dave Senn	12/31/18				The primary goals for this study are to calibrate and validate numerical models used for (1) predicting how anthropogenic nutrients (nitrogen and phosphorous) enter and react within the Bay; (2) predicting how the Bay responds to these inputs, including phytoplankton blooms and low dissolved oxygen; and (3) exploring how various nutrient load reduction management decisions will affect habitat condition.
PCB Strategy	RMP SEP	1. San Leandro Bay PCB Study Phase 1	San Leandro Bay PCB Study Phase 1 Data Report	Jay Davis	12/31/17				
PCB Strategy	RMP SEP	2. San Leandro Bay PCB Study Phase 2	San Leandro Bay PCB Study Phase 2 Data Report	Jay Davis	12/31/17				
PCB Strategy	Bay RMP (2017)	PCB Margins Conceptual Model	Steinberger Slough Priority Margin Unit Conceptual Model Report	Jay Davis	01/31/18		08/31/17		Revised due dates due to workflow: Draft by 1/31/18; Final due 3/31/18 -- Review by PCB WG.
PCB Strategy	Bay RMP (2016)	PCB Margins Conceptual Model	San Leandro Bay Conceptual Model Report	Jay Davis	03/31/18				This deliverable will be an update to the CM report prepared in 2017. The update will incorporate the field data from Phase II and Phase III sampling efforts.
PCB Strategy	Bay RMP (2018)	San Leandro Bay Fish Diet Analysis	Technical Report	Jay Davis	03/31/18				Andy Jahn subcontract. Draft report due 1/31/18; Final report due 3/31/18.
PCB Strategy	Bay RMP (2018)	PCB Strategy Coordination and Technical Support	Updated PCB Multi-Year Plan	Jay Davis	06/15/18				
PCB Strategy	Bay RMP (2018)	Richmond Harbor Priority Margin Unit Conceptual Model Development	Technical Report	Jay Davis	05/15/19				$30K needed from 2019 or SEP. Draft report on Richmond Harbor due May '18; Final report on Richmond Harbor due August '18
Program Management	Bay RMP (2018)	1. Program Management	Q1 RMP Financial Report	Philip Trowbridge	01/24/18				

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Program Management	Bay RMP (2017)	1. Program Management	2018 Multi-Year Plan	Philip Trowbridge	01/31/18				Draft presented to SC. Final in January.
Program Management	Bay RMP (2018)	1. Program Management	Q2 RMP Financial Report	Philip Trowbridge	04/25/18				
Program Management	Bay RMP (2018)	1. Program Management	Q3 RMP Financial Report	Philip Trowbridge	07/25/18				
Program Management	Bay RMP (2018)	1. Program Management	Q4 RMP Financial Report	Philip Trowbridge	10/24/18				
Program Management	Bay RMP (2018)	1. Program Management	2019 Multi-Year Plan	Philip Trowbridge	01/31/19				Draft in October '19, Final in January '19
Program Management	Bay RMP (2018)	1. Program Management	2019 Detailed Workplan	Philip Trowbridge	01/31/19				Draft in October '19, Final in January '19
Sediment Strategy	Bay RMP (2017)	Sediment Supply Synthesis	Sediment Supply Synthesis Final Report	Philip Trowbridge	12/31/17				Draft presented at stakeholder meeting on 10/5/17. Final due by 12/31/17. Review by stakeholder group and TRC. Cannot publishing until January after USGS review is complete. Could be delayed until 2/28/18 if Lester's input is needed to resolve comments.
Sediment Strategy	RMP SEP	4. Golden Gate Sediment Flux Study (2017)	Journal Manuscript or Technical Report	Maureen Downing-Kunz	12/31/17				Results will be reported in a journal manuscript or, if that effort is delayed, in an interpretive report to the RMP by December 31, 2017. Data will be quality reviewed and stored in a USGS database. The report will cover both the 2016 (funded by SFEP and RMP) and 2017 (funded by SEP $) field campaigns. Related to this, USGS is submitting a manuscript on the 2016 Dumbarton work completed with SFEP funds. Following internal review it will be submitted to the journal Estuaries and Coasts.
Sediment Strategy	Bay RMP (2018)	2. Governance	Sediment Workgroup Meeting	Philip Trowbridge	01/21/18				
Sediment Strategy	Bay RMP (2018)	Sediment Strategy Support	1-2 Workgroup meetings	Philip Trowbridge	05/31/18				
Sediment Strategy	Bay RMP (2018)	Sediment Strategy Support	Updated Dredged Material and Sediment Supply Multi-Year Plan	Philip Trowbridge	10/31/18				
Sediment Strategy	Bay RMP (2018)	Hosting and Support for DMMO Database	Provide technical assistance for hosting and maintaining the DMMO database	Cristina Grosso	12/15/18				
Sediment Strategy	Bay RMP (2018)	Hosting and Support for DMMO Database	Assist with data uploads	Cristina Grosso	12/15/18				
Sediment Strategy	Bay RMP (2018)	Hosting and Support for DMMO Database	Develop BETA version of a web-based tool to compile "Tier 1" track records	Cristina Grosso	12/15/18				
Sediment Strategy	Bay RMP (2018)	Improved Lower South Bay suspended-sediment flux measurements at Dumbarton Bridge	Basic Data Report with sediment flux computations, detail of methods used, and data generated from the study, with no interpretation	Philip Trowbridge	12/15/18				USGS subcontract
Sediment Strategy	RMP SEP	8. North Bay Selenium Synthesis	Monitoring Design Framework Report	Jay Davis	12/31/18				Examination of the linkages between three indicators (water, sediment, tissue), statistical framework for monitoring design and data evaluation, and consideration of analytical methods.
Sediment Strategy	Bay RMP (2018)	Mallard Island SuspendedSediment Monitoring	Data collected, processed, and QA/QCed by the USGS. Data made available to the public once approved.	Philip Trowbridge	12/31/18				USGS subcontract
Sediment Strategy	Bay RMP (2017)	Sediment Monitoring Strategy	Sediment Monitoring Strategy (in collaboration with HWRB Project)	Philip Trowbridge	01/01/19				Draft due 1/1/19; Final due 6/30/19. Part of Healthy Watershed Resilient Baylands Project.
Selenium Strategy	Bay RMP (2016)	Selenium 2016 Derby Monitoring	2016 Sturgeon Derby Final Report	Jennifer Sun	12/31/17		12/31/16		2016 Derby results will be combined with 2017 Derby results in one report. Combining data will make for a better analysis. Draft report for Selenium Strategy Team by 12/31/17. Final report by 2/28/18.
Selenium Strategy	Bay RMP (2017)	2017 Sturgeon Derby Monitoring	Technical Report on Selenium in White Sturgeon from the 2017 Sturgeon Derby	Jennifer Sun	12/31/17				Draft due 12/31/17; final due 2/28/2018
Selenium Strategy	Bay RMP (2015)	Selenium Special Studies / Selenium Sturgeon Tissue Plug Monitoring	2015 Sturgeon Muscle Plug Final Report	Jennifer Sun	01/31/18		05/31/16		Preliminary results presented at the Selenium Workgroup meeting in May 2016 and at the RMP Annual Meeting in October.
Selenium Strategy	RMP SEP	6. Suisun Bay Selenium Monitoring Study	Laboratory Analysis of 2016 and 2017 Tissue Plug Samples	Jennifer Sun	03/31/18				Laboratory analysis by USGS and UCD.
Selenium Strategy	Bay RMP (2018)	Selenium Strategy Coordination and Technical Support	Updated Selenium MultiYear Plan	Jay Davis	06/15/18				An updated selenium multi-year plan will be prepared for June 2018. The plan will include a multi-year schedule of budgets and deliverables.

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Selenium Strategy	RMP SEP	6. Suisun Bay Selenium Monitoring Study	Upload 2016 and 2017 Tissue Plug Samples to CEDEN	Jennifer Sun	06/30/18				MMP funds
Selenium Strategy	RMP SEP	6. Suisun Bay Selenium Monitoring Study	Financial Oversight	Jennifer Sun	12/31/18				Laboratory analysis by USGS and UCD.
Selenium Strategy	RMP SEP	6. Suisun Bay Selenium Monitoring Study	Field Studies Report	Jay Davis	12/31/18				MMP funds
Sources Pathways and Loadings	Bay RMP (2017)	STLS POC Watershed Characterization	Report on Pollutants of Concern monitoring in WY 2017	Alicia Gilbreath	12/31/17				Draft December 2017; Final March 2018 -- Review by SPLWG and STLS. This is running ahead of schedule.
Sources Pathways and Loadings	Bay RMP (2017)	STLS Regional Watershed Model	RWSM. Draft model software, model updates, results of the model calibration, and regional loads	Alicia Gilbreath	01/31/18		06/30/17		Draft provided to SPLWG in June 2017. Originally due Sept 2017. SFEI has coordinated with BASMAA to push back due date until BASMAA can work with model (expected sometime Oct-Dec).
Sources Pathways and Loadings	Bay RMP (2017)	Guadalupe River Flood Monitoring	Technical report	Lester McKee	02/28/18		12/31/17		Draft report completed. Results completed at the 2017 Annual Meeting. Waiting to incorporate comments from the Parks District after Lester returns to work in February.
Sources Pathways and Loadings	Bay RMP (2016)	STLS Trends Strategy Support	POC trends. Guadalupe Trends Model Report	Philip Trowbridge	03/31/18		12/31/16		This task started in 2016 but will continue through 2018 as the scope has changed. A trends model for the GR was developed and presented to the SPLWG in May 2017. The model is being refined in 2017. There was a call with the trends advisors in November 2017. Technical work by AMS will conclude by 12/31/17. SFEI will cost out monitoring design options by March 2018, which may be added as section to the AMS report or be a stand-alone memo. 2016 Trends Strategy funds were initially used to explore a power analysis using data from four well-sampled watersheds to determine a monitoring program that would be sufficient to track trends. Peer reviewers later recommended additional data exploration in one watershed (Guadalupe River) including: 1) Develop models for continuous PCB concentrations; 2) Identify gaps in existing storm styles sampled; 3) Compute storm EMCs and loads from continuous models; 4) Develop an "event loads" trends model.
Sources Pathways and Loadings	Bay RMP (2018)	Small Tributaries Loading POC Watershed Characterization Reconnaissance Monitoring	Wet weather field monitoring	Alicia Gilbreath	04/15/18				Wet weather field monitoring: Selected site list by 10/17; Wet season water samples collected and sent to the labs for analysis by 4/18; Laboratory analysis, QA & Data Management by 9/18; Interpretation & reporting by 3/19
Sources Pathways and Loadings	Bay RMP (2018)	Small Tributaries Loading POC Watershed Characterization Reconnaissance Monitoring	Advanced Data Analysis	Jing Wu	05/15/18				Advanced analysis interpretive report due as a draft by May 2018 and final by November 2018. Report to include a stepwise interpretive methodology and a technical appendix outlining the results of the advanced data analysis.
Sources Pathways and Loadings	Bay RMP (2018)	2. Governance	Sources Pathways and Loadings WG Meeting	Lester McKee	05/31/18				
Sources Pathways and Loadings	Bay RMP (2018)	Small Tributaries Loading Program Management	STLS management	Jennifer Hunt	12/31/18				STLS Management (meeting agendas, meeting summaries, tracking and addressing action items)
Sources Pathways and Loadings	Bay RMP (2018)	Small Tributaries Loading POC Watershed Characterization Reconnaissance Monitoring	Technical report on the WY 2018 reconnaissance monitoring	Alicia Gilbreath	03/15/19				
Sport Fish	Bay RMP (2018)	2. Governance	Sport Fish WG Meeting	Jay Davis	05/31/18				
Status and Trends	Bay RMP (2017)	6. Status and Trends K. Annual Monitoring Report	2017 Field Sampling Report	Philip Trowbridge	12/31/17		10/31/17		Report is drafted and awaiting internal review. Final by 12/31/17.
Status and Trends	Bay RMP (2018)	6. Status and Trends I. S&T Laboratory Intercomparison Studies	Design and execution of laboratory intercomparison studies for key parameters in sediment, bivalve tissue, and bird egg tissue. Present to TRC on findings from IC studies.	Don Yee	01/31/18				
Status and Trends	Bay RMP (2018)	6. Status and Trends E. Bird Egg Monitoring (Spring 2018)	Cruise plan	Adam Wong	03/01/18				
Status and Trends	Bay RMP (2017)	6. Status and Trends E. Water Cruise Data Mgmt	Format, QA, and Upload 2017 Water Data	Amy Franz	03/31/18				
Status and Trends	Bay RMP (2017)	6. Status and Trends F. Margins Sediment Study	Format, QA, and Upload 2017 South Bay Margins Sediment Data	Amy Franz	03/31/18				

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Status and Trends	Bay RMP (2017)	6. Status and Trends K. Analysis of S&T Data	Analysis of Selenium IC Samples and presentation to TRC	Don Yee	03/31/18				
Status and Trends	Bay RMP (2018)	6. Status and Trends E. Bird Egg Monitoring (Spring 2018)	Manage subcontracts for field and laboratory work & staff cruise	Adam Wong	03/31/18				
Status and Trends	Bay RMP (2018)	6. Status and Trends A. USGS Sacramento Support	Contract with USGS	Philip Trowbridge	06/01/18				
Status and Trends	Bay RMP (2018)	6. Status and Trends B. USGS Menlo Park Support	Contract with USGS	Philip Trowbridge	06/01/18				
Status and Trends	Bay RMP (2018)	6. Status and Trends C. 2018 Bivalve Cruise (Summer 2018)	Cruise plan	Philip Trowbridge	06/01/18				
Status and Trends	Bay RMP (2018)	6. Status and Trends G. 2018 Sediment Cruise (Summer 2018)	Cruise plan	Philip Trowbridge	06/01/18				
Status and Trends	Bay RMP (2017)	6. Status and Trends L. PBDE Analysis for Archived 2016 Bird Eggs	Analysis of 15 archived tern egg samples. Results reported in an EDD.	Jennifer Sun	06/30/18				Archive samples will be run at the same time as the 2018 samples. The results will be QA'ed and uploaded along with the 2018 samples.
Status and Trends	Bay RMP (2018)	6. Status and Trends G. 2018 Sediment Cruise (Summer 2018)	Manage subcontracts for field and laboratory work & staff cruise	Philip Trowbridge	07/31/18				
Status and Trends	Bay RMP (2018)	6. Status and Trends C. 2018 Bivalve Cruise (Summer 2018)	Manage subcontracts for field and laboratory work & staff cruise	Philip Trowbridge	09/30/18				
Status and Trends	Bay RMP (2018)	6. Status and Trends J. Sample Archive	Maintain and enhance the Archive Data Sample tool and respond to archive sample requests	michaelw@sfei.org	12/31/18				(1) Update documentation and template (2) General upkeep and maintenance for tools and data (3) Set up User Accounts and Help Desk (4) Manage internal and external data requests
Status and Trends	Bay RMP (2018)	6. Status and Trends F. 2018 Bird Egg Monitoring Data Mgmt	Format, QA, and Upload 2018 Bird Egg Data	Amy Franz	01/01/19				As part of the QA Memo, trend plots of bird egg data will be generated.
Status and Trends	Bay RMP (2018)	6. Status and Trends D. Bivalve Cruise Data Management	Format, QA, and Upload 2018 Bivalve Cruise Data	Amy Franz	03/01/19				
Status and Trends	Bay RMP (2018)	6. Status and Trends H. 2018 Sediment Cruise Data Mgmt	Format, QA, and Upload 2018 Sediment Cruise Data	Amy Franz	03/01/19				

Bay RMP Action Items

Key to Status Colors:
Green indicates greater than 90 days until the deliverable is due.
Yellow indicates a deliverable is due within 90 days.
Red indicates a deliverable that is overdue.

Primary	Deliverable	Assigned To	Due Date	Status	Comments	Meeting Date
Steering Committee Action Items from 11/01/17	Conduct succession planning for the chair and vice chair of the Steering Committee and Technical Review committee.	Tom Mumley	10/31/18			11/01/17
Steering Committee Action Items from 11/01/17	Update charter as presented to the SC on 11/1/17.	Philip Trowbridge	11/17/17	Complete	Revised charter available at: http://www.sfei.org/documents/charter-regional-monitoring-program-water-quality-san-francisco-bay-0	11/01/17
Steering Committee Action Items from 11/01/17	Finalize July Steering Committee meeting summary and upload it to the RMP webpage.	Ila Shimabuku	11/07/17	Complete		11/01/17
Steering Committee Action Items from 11/01/17	Create calendar invites for the proposed 7/25/18 and 10/24/18 Steering Committee meetings.	Ila Shimabuku	11/07/17	Complete		11/01/17
Steering Committee Action Items from 11/01/17	Plan for the addition of dry docks as contributors to the RMP and present to the SC. Planning will include deciding what category dry docks should fall into (if not their own), fees, and whether they will be required to have a designated representative for the Steering Committee and Technical Review Committee.	Philip Trowbridge	01/15/18			11/01/17
Steering Committee Action Items from 11/01/17	Develop a procedure for how to add stakeholders to the RMP.	Philip Trowbridge	01/15/18			11/01/17
Steering Committee Action Items from 11/01/17	Refine proposal by addressing feedback from today's discussion, conduct a review by the TRC, and return to the Steering Committee for further approval.	Rebecca Sutton	11/20/17	Complete	Revised proposal approved by SC on 11/29/17.	11/01/17
Steering Committee Action Items from 11/01/17	Send a doodle poll to the list of no-shows to collect information on why so many registered participants did not attend the meeting.	Ila Shimabuku	11/07/17	Complete	We don't have a list of those who did and did not attend so I cannot complete this task.	11/01/17
Technical Review Committee Action Items from 9/14/17	Finalize the June 8, 2017, TRC meeting summary and post to the public meetings folder.	Ila Shimabuku	09/25/17	Complete		09/14/17
Technical Review Committee Action Items from 9/14/17	Create a calendar event for the March 8, 2018 TRC meeting	Ila Shimabuku	09/25/17	Complete		09/14/17
Technical Review Committee Action Items from 9/14/17	Adjust the calendar event for the November 1, 2017, Multi-Year Planning meeting to include TRC members.	Ila Shimabuku	09/25/17	Complete		09/14/17
Technical Review Committee Action Items from 9/14/17	Reach out to all TRC and SC members to confirm their planned attendance at the RMP's Annual Meeting.	Philip Trowbridge	09/25/17	Complete		09/14/17
Technical Review Committee Action Items from 9/14/17	Revise the funding request memo for PBDEs in Tern eggs and put it on the agenda for the SC	Philip Trowbridge	11/01/17	Complete	On SC agenda	09/14/17
Technical Review Committee Action Items from 9/14/17	Develop a more specific plan for intercomparability studies to discuss at the December TRC meeting	Don Yee	12/14/17	Complete	On agenda for December mtg.	09/14/17
Technical Review Committee Action Items from 9/14/17	Revise S&T Design based on feedback from the TRC and include it in the Multi-Year Plan	Philip Trowbridge	11/01/17	Complete		09/14/17
Technical Review Committee Action Items from 9/14/17	Determine why the RMP decided to test for water-column toxicity every 2 years instead of less frequently and report back to the TRC.	Jay Davis	12/14/17	Complete	On agenda for December mtg.	09/14/17

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Technical Review Committee Action Items from 9/14/17	Report back to the TRC in December with information on the matrix that drives the continuing 303d listing for legacy pesticides and information on OEHHA guidelines for legacy pesticide in fish tissue.	Richard Looker	12/14/17	Complete	On agenda for December mtg.	09/14/17
Technical Review Committee Action Items from 9/14/17	Send information on all RMP data on legacy pesticides collected after 2006. Include both data tables and time series plots.	Philip Trowbridge	11/15/17	Complete	On agenda for December mtg.	09/14/17
Technical Review Committee Action Items from 9/14/17	Agendize a discussion of deploying radio-controlled moorings for bivalve samples for the December TRC meeting.	Philip Trowbridge	12/14/17	Complete	On agenda for December meeting	09/14/17
Technical Review Committee Action Items from 9/14/17	Ask Derek Muir about comparing results from the passive samplers to measured water concentrations. Report back to the TRC with the results from AQUAGAPS and how water concentrations from past RMP cruises compare.	Diana Lin	06/30/18			09/14/17
Steering Committee Action Items from 7/19/17	Send calendar invite for April 26, 2018 SC meeting	Ila Shimabuku	08/01/17	Complete		07/19/17
Steering Committee Action Items from 7/19/17	Revise the list of projects eligible for SEPs and share it with the Water Board	Philip Trowbridge	08/01/17	Complete		07/19/17
Steering Committee Action Items from 7/19/17	Revise the matrix showing the Status and Trends design to show the changes taking effect in 2017 and post to the RMP website	Philip Trowbridge	08/01/17	Complete		07/19/17
Steering Committee Action Items from 7/19/17	Send out Annual Meeting registration information to RMP participants	Philip Trowbridge	08/01/17	Complete		07/19/17
Steering Committee Action Items from 7/19/17	Send the SC the article written for the 20th anniversary of the RMP and the article on the 50-year vision from the 2015 Pulse	Jay Davis	08/01/17	Complete		07/19/17
Steering Committee Action Items from 7/19/17	Have a discussion with John Coleman regarding federal funding	Philip Trowbridge	08/01/17	Complete		07/19/17
Steering Committee Action Items from 7/19/17	Reach out to colleagues at other regional programs (Chesapeake, Great Lakes, Puget Sound, etc) about common messages regarding federal funding	Philip Trowbridge	08/01/17	Complete	Discussed issue with Peter Tango and Scott Phillips at CBP.	07/19/17
Steering Committee Action Items from 7/19/17	Prepare a short letter the describes the importance of the USGS Bay Monitoring Program	Philip Trowbridge	09/30/17	Complete	Letter prepared. Seeking WB signatures.	07/19/17
Steering Committee Action Items from 7/19/17	Provide details of Delta RMP monitoring to Jessica Burton Evans	Philip Trowbridge	08/01/17	Complete		07/19/17
Technical Review Committee Action Items from 6/8/17	Update the S&T design with the consensus adjustments: discontinuing PBDE analysis in bivalves; curtailing nutrient monitoring during the Water Cruise; and skipping sediment toxicity and benthos for the 2018 sediment cruise.	Philip Trowbridge	06/30/17	Complete		06/08/17
Technical Review Committee Action Items from 6/8/17	Add an agenda item to a future TRC meeting about CTR parameters for RPA.	Philip Trowbridge	06/30/17	Complete	Added to parking lot for future agenda items.	06/08/17
Technical Review Committee Action Items from 6/8/17	Add particulate selenium to the target list for the 2017 Water Cruise.	Philip Trowbridge	06/30/17	Complete		06/08/17
Technical Review Committee Action Items from 6/8/17	Change S&T design table to note that bird eggs were tested in 2016, not 2015.	Philip Trowbridge	06/30/17	Complete		06/08/17
Technical Review Committee Action Items from 6/8/17	Present a proposal to the TRC for testing archived tern eggs from 2016 for PBDEs. Determine the cost for analysis and data management. Review trends graphs to determine the value of getting more data.	Philip Trowbridge	09/15/17	Complete	Proposal prepared for 9/14/17 TRC meeting.	06/08/17
Technical Review Committee Action Items from 6/8/17	Follow-up with TRC members to reach resolution on summer vs winter for the 2018 sediment cruise.	Philip Trowbridge	09/15/17	Complete	Recommendation prepared for the 9/14/17 TRC meeting.	06/08/17
Technical Review Committee Action Items from 6/8/17	Discuss focusing RMP efforts with SQOs to hotspots during the Multi-Year Planning meeting	Philip Trowbridge	11/01/17	Complete		06/08/17
Technical Review Committee Action Items from 6/8/17	Finalize the minutes from 3/9/17 TRC meeting.	Philip Trowbridge	06/30/17	Complete		06/08/17

Primary	Deliverable	Assigned To	Due Date	Status	Comments	Meeting Date
Steering Committee Action Items from 4/26/17	Review the RMP charter and re-establish a protocol for alternates at RMP governance meetings.	Philip Trowbridge	05/08/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Upload the approved January 17 SC meeting summary to the public meetings Google Drive folder and the calendar event on the SFEI website.	Philip Trowbridge	05/02/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Create website and Google calendar events for the January 25, 2018, Steering Committee meeting.	Philip Trowbridge	05/08/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Hold a phone call with Jim Mazza and Jessica Burton Evans to discuss Jim's attendance at the June, and future, TRC meetings.	Philip Trowbridge	06/02/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Share July SC agenda items two weeks early (July 5th) with John Coleman and Betty Kwan. Hold a phone call with John and Betty to review the July SC agenda ahead of time.	Philip Trowbridge	07/03/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Approve the 2016 write-off of a $804 Caltrans invoice.	Lawrence Leung	06/01/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Approve the unencumbering of $134,585 of left-over 2016 RMP funds and adding them to the reserve.	Lawrence Leung	06/01/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Share EEWG meeting materials with dredging representatives.	Philip Trowbridge	05/08/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Add the issue of "contaminant transport" to the fourth of the proposed sediment research questions in the next Multi-Year Plan.	Philip Trowbridge	10/31/17	Complete	Sediment questions updated for MYP.	04/26/17
Steering Committee Action Items from 4/26/17	Arrange a phone call with Jessica Burton Evans, David Schoellhammer, and the navigation program manager to discuss the USACE's involvement in the USGS Sediment Supply Synthesis.	Philip Trowbridge	06/02/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Reach out to Brenda Goeden at BCDC and Elizabeth Christian at the Water Board regarding the study design of the future sand-transport monitoring effort.	Philip Trowbridge	06/02/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Reach out to key stakeholder groups and recruit more attendees for the EEWG meeting.	Philip Trowbridge	05/05/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Add agenda item to May 9 EEWG meeting: provide a quick summary of the recent ECWG meeting.	Philip Trowbridge	05/01/17	Complete	There was insufficient time at the EEWG for this update but CEC staff were at the meeting to draw connections.	04/26/17
Steering Committee Action Items from 4/26/17	Modify language in the Proposed Questions for the Exposure and Effects Workgroup (for the next Multi-Year Plan) from "Are there any indications of ecological effects caused by exposure to mixtures of contaminants in the Bay?" to "Are there any indications of ecological effects caused by exposure to specific chemicals or mixtures of contaminants in the Bay?"	Jay Davis	10/31/17	Complete	Questions updated and stored in folder for 2018 MYP.	04/26/17
Steering Committee Action Items from 4/26/17	Research whether there's bike parking at the David Brower Center and email Jessica Burton Evans any findings.	Ila Shimabuku	06/01/17	Complete		04/26/17
Steering Committee Action Items from 4/26/17	Send the outline of the Pulse to Naomi Feger, Peter Carroll, and Jim Ervin for review	Jay Davis	05/15/17	Complete		04/26/17
Technical Review Committee Action Items from 3/9/17	Finalize the December 8, 2016 TRC meeting summary and post to the public meetings folder.	Ila Shimabuku	03/20/17	Complete		03/09/17
Technical Review Committee Action Items from 3/9/17	Create a calendar event for the September 14, 2017 and December 14, 2017 TRC meetings.	Ila Shimabuku	03/20/17	Complete		03/09/17
Technical Review Committee Action Items from 3/9/17	Send June 8 TRC meeting agenda items early (2 weeks early is on May 25th) to allow ample time for review by, and collaboration between, Richard Looker and Naomi Feger as Naomi will be filling in for Richard in June.	Philip Trowbridge	05/25/17	Complete	Agenda items will be sent on May 30.	03/09/17
Technical Review Committee Action Items from 3/9/17	Send out sportfish workgroup doodle poll to SC, TRC, & Janet O'Hara (Water Board).	Jay Davis	03/21/17	Complete		03/09/17

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Technical Review Committee Action Items from 3/9/17	Send out KMZ file of random site-location draws to TRC and ask for a two-week turnaround for comments and review.	Don Yee	03/13/17	Complete		03/09/17
Technical Review Committee Action Items from 3/9/17	Change the terminology for “Southern Slough” sites to something more intuitive (e.g., Extreme Lower South Bay”).	Don Yee	04/03/17	Complete	"Extreme LSB" will be used.	03/09/17
Technical Review Committee Action Items from 3/9/17	Organize a brown-bag presentation about the Central Bay Margins Study at the San Francisco Bay RWQCB.	Don Yee	09/30/17	Complete	Brown bag scheduled for 9/20/17.	03/09/17
Technical Review Committee Action Items from 3/9/17	Filter out non-significant results from the 2015 monitoring effort for further presentations.	Don Yee	04/03/17	Complete	Presentation altered for April 2017 ACS meeting presentation	03/09/17
Technical Review Committee Action Items from 3/9/17	Follow up with Steve Weisberg about external review of margins report.	Jay Davis	03/24/17	Complete		03/09/17
Technical Review Committee Action Items from 3/9/17	Share South Bay Margins study information with the South Bay Salt Pond Restoration Project and Bruce Jaffe about site locations and potential add-ons.	Philip Trowbridge	05/31/17	Complete	Draft sampling plan shared with SBSPRP.	03/09/17
Technical Review Committee Action Items from 3/9/17	Revisit list of ideas for monitoring contingency tasks and bring a selection forward to the Steering Committee if any are warranted.	Philip Trowbridge	05/18/17	Complete		03/09/17
Technical Review Committee Action Items from 3/9/17	Look into what areas require a State Lands Commission's Permit and consider avoiding these areas.	Philip Trowbridge	04/03/17	Complete		03/09/17
Technical Review Committee Action Items from 3/9/17	Ask Ian Wren who Phil should contact at the Coast Guard in regards to NOAA vessel navigation.	Ila Shimabuku	03/20/17	Complete		03/09/17
Technical Review Committee Action Items from 3/9/17	Ask EPA (Brian Ross and Allan Ota) and the Coast Guard for information on stations where a large research vessel can operate in the Bay.	Philip Trowbridge	04/03/17	Complete		03/09/17
Technical Review Committee Action Items from 3/9/17	Generate a list of contextual reports on sediment toxicity that the RMP has and send to Chris Sommers.	Philip Trowbridge	03/13/17	Complete		03/09/17
Technical Review Committee Action Items from 3/9/17	Prepare a plan for 2018 RMP sediment toxicity and benthos sampling and discuss it with the Exposure and Effects Workgroup	Philip Trowbridge	05/09/17	Complete	Task underway through the approved workplan.	03/09/17
Technical Review Committee Action Items from 3/9/17	Remove Harry Ohlendorf from the EEWG group to allow him to focus on the sediment workgroup.	Jay Davis	04/17/17	Complete		03/09/17
Technical Review Committee Action Items from 3/9/17	Synthesize committee thoughts from today and bring them to the Steering Committee for further discussion.	Jay Davis	04/17/17	Complete		03/09/17
Steering Committee Action Items from 1/17/17	Confirm November 1, 2017, with all absent Steering Committee members and create a calendar event.	Ila Shimabuku	02/01/17	Complete		01/17/17
Steering Committee Action Items from 1/17/17	Develop a better process for sharing meeting materials with the SC and TRC on the website.	Philip Trowbridge	04/26/17	Complete	The RMP calendar webpages have been reconfigured to make accessing the materials through the website easier.	01/17/17
Steering Committee Action Items from 1/17/17	Add discussion of whether further reductions in S&T monitoring design are warranted (specifically, the cost vs. benefit of continued copper and cyanide monitoring) to the September TRC agenda and the November Multi-Year Planning Workshop.	Philip Trowbridge	08/30/17	Complete	On agenda for June 2017 meeting.	01/17/17
Steering Committee Action Items from 1/17/17	Add a line to the “CURRENT AND ANTICIPATED MANAGEMENT DECISIONS, POLICIES, AND ACTIONS BY THE REGULATORY AGENCIES THAT MANAGE BAY WATER QUALITY” table under “New and Future” related to pending actions on new beneficial uses.	Philip Trowbridge	02/01/17	Complete		01/17/17
Steering Committee Action Items from 1/17/17	Add discussion item about the future of the EEWG to the March Technical Review Committee and April Steering Committee agendas.	Philip Trowbridge	02/01/17	Complete		01/17/17

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Steering Committee Action Items from 1/17/17	Send mercury results from the Guadalupe River sampling effort to the Steering Committee and Technical Review Committee once the results are received from Moss Landing.	Lester McKee	09/30/17	Complete	Report on Guadalupe River storm sampling was sent to the TRC in September.	01/17/17
Steering Committee Action Items from 1/17/17	Discuss the effects of declining state funding for the RDCs on the RMP and the Institute with Tom Mumley.	Philip Trowbridge	03/31/17	Complete		01/17/17
Steering Committee Action Items from 1/17/17	Send the State of the Estuary Report video to the Steering Committee, along with statistics on the number of views.	Cristina Grosso	02/01/17	Complete		01/17/17
Steering Committee Action Items from 1/17/17	Develop and implement a plan to improve the RMP website.	Philip Trowbridge	12/31/17	Complete	Some changes were made to the website (new publications list, meeting materials on calendar pages). Additional improvements will be made during the rest of the year.	01/17/17
Steering Committee Action Items from 1/17/17	Revise the outlines for the 2017 Pulse, Annual Meeting, and 25th Anniversary.	Jay Davis	02/15/17	Complete	Updated outlines prepared for the 3/9/17 TRC meeting.	01/17/17
Steering Committee Action Items from 1/17/17	Update the EEWG narrative as part of the next draft of this document in the fall.	Philip Trowbridge	09/30/17	Complete	This action item will be completed during the next MYP update. New research questions have been drafted and will be discussed with the EEWG on 5/9/17.	01/17/17
Steering Committee Action Items from 1/17/17	Include explicit statement on data fate (e.g., will the data be uploaded to CEDEN) in future proposals and plans, and ensure that critical background information travels with datasets.	Philip Trowbridge	03/31/17	Complete	Staff have been informed. Data management plans will also be added to Sampling and Analysis Plans for individual studies to facilitate communication within the Institute. SFEI's RDC has the flexibility of storing data so it is consistent with State standards, but not sharing the data with CEDEN. This allows data to be standardized and easily aggregated for analysis purposes, but not publicly displayed if this is a concern for a project.	01/17/17
Steering Committee Action Items from 1/17/17	Continue the dialogue on potential Annual Meeting keynote speakers via email.	Jay Davis	02/03/17	Complete		01/17/17
Technical Review Committee Action Items from 12/08/16	Make edits to 9/21 TRC minutes and publish to public meetings folder.	Ila Shimabuku	12/13/16	Complete		12/08/16
Technical Review Committee Action Items from 12/08/16	Confirm first quarter 2017 TRC meeting for March 9, 2017, with all absent TRC members.	Ila Shimabuku	12/22/16	Complete		12/08/16
Technical Review Committee Action Items from 12/08/16	Confirm and schedule second quarter 2017 TRC meeting for June 8, 2017, with all absent TRC members.	Ila Shimabuku	12/22/16	Complete		12/08/16
Technical Review Committee Action Items from 12/08/16	Present information about the global passive sampling initiative and its funders at a future TRC meeting.	Don Yee	03/01/17	Complete	Topic added to list of parking lot items.	12/08/16
Technical Review Committee Action Items from 12/08/16	Consider changing the way margins data are transformed and the margins fines data are censored and possibly consult a statistician to further explore this issue.	Don Yee	03/01/17	Complete		12/08/16
Technical Review Committee Action Items from 12/08/16	Send Don the resources on parametric tests and different methods for data transformations.	Richard Looker	12/16/16	Complete		12/08/16
Technical Review Committee Action Items from 12/08/16	Look into past studies that used isotopes to understand whether PCBs are entering food webs from the margins or open bay.	Jay Davis	03/01/17	Complete		12/08/16
Technical Review Committee Action Items from 12/08/16	Prepare a detailed proposal with options for sampling designs for the South Bay Margins Study for the March TRC meeting.	Don Yee	03/01/17	Complete		12/08/16

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Technical Review Committee Action Items from 12/08/16	Contact the labs to find which fish, water, and sediment sites in SLB were actually sampled (and sampled from the boat) and include this information in the data report.	Jay Davis	12/31/16	Complete		12/08/16
Technical Review Committee Action Items from 12/08/16	Brainstorm a list of potential studies that could be done with the RMP archives and then contact university researchers and others who might be interested in doing these archived samples.	Philip Trowbridge	09/15/17	Complete	Cancelled due to other priorities. Archives will be needed for laboratory intercalibration studies.	12/08/16
Technical Review Committee Action Items from 12/08/16	Contact SCCWRP, NIST, and the California Academy of Sciences to get information on how they use archive samples for scientific research.	Philip Trowbridge	06/30/17	Complete	Feedback received from SCCWRP and NIST. Archives may be needed for laboratory intercalibration studies due to the shut-down of the WPCL laboratory that was used for most PCB analyses of tissue.	12/08/16
Technical Review Committee Action Items from 12/08/16	Collect data on monthly visitors of the CD3 tool and send out to the TRC.	Cristina Grosso	12/22/16	Complete	CD3 visit counts: 162 sessions per month for the period Jan 1, 2016 - Dec 31, 2016	12/08/16
Technical Review Committee Action Items from 12/08/16	Consider using Cristina's statistics on RMP's lifetime of data collection in the 2017 Pulse.	Jay Davis	01/17/17	Complete		12/08/16
Technical Review Committee Action Items from 12/08/16	Update the 2017 Pulse outline with the comments suggested by the TRC and then present it to the SC.	Jay Davis	01/17/17	Complete		12/08/16
Technical Review Committee Action Items from 12/08/16	Experiment with kriging layer transparency and differing color maps on the Pulse PCB map.	Jay Davis	03/01/17	Complete	This advice will be considered for the next version of the Pulse.	12/08/16
Technical Review Committee Action Items from 12/08/16	Pick dates for the 2017 Annual Meeting at the SC meeting on 1/17/17.	Philip Trowbridge	01/17/17	Complete	On agenda for 1/17/17 SC meeting.	12/08/16
Technical Review Committee Action Items from 12/08/16	Post the 2015 Water Cruise copper and cyanide rolling average on the SFEI website and upload slides from TRC presentation. Add the actual SSOs to the tables.	Ila Shimabuku	12/19/16	Complete		12/08/16
Technical Review Committee Action Items from 12/08/16	Review 2015 water data for the sites with moderate toxicity.	Ila Shimabuku	05/05/17	Complete	The water toxicity results and associated chemistry data will be presented to the EEWG on 5/9/17. The water chemistry data did not explain the toxicity but a very limited number of water chemistry parameters were measured.	12/08/16
Technical Review Committee Action Items from 12/08/16	Add discussion of the timing of to the March TRC agenda. Identify why participants were unable to attend in order to reach a solution for future 4th quarter TRC meetings.	Philip Trowbridge	02/27/17	Complete	Item added to parking lot for TRC agendas.	12/08/16