



**RMP**  
**REGIONAL MONITORING**  
**PROGRAM FOR WATER QUALITY**  
**IN SAN FRANCISCO BAY**

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**Regional Monitoring Program for Water Quality  
in San Francisco Bay**

**2021 Detailed Workplan and Budget**

*Approved 20 October 2020*

**SFEI** | **AQUATIC  
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SAN FRANCISCO ESTUARY INSTITUTE & THE AQUATIC SCIENCE CENTER  
4911 Central Ave, Richmond, CA 94804, p: 510-746-7334 f: 510-746-7300

## Summary

In 2021 the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) is entering its 29<sup>th</sup> year of collecting data and communicating information to support water quality management decisions. This Detailed Workplan and Budget describes the activities that will be completed in 2021, the proposed funding levels, and the deliverables for each task.

The total revenue and expenses for 2021 is \$4,083k as shown in Table 1 and Figures 1-2. We are reserving \$200k in Unallocated due to a consistent shortfall in dredger revenue. We will adjust this number when we receive the final in-Bay dredge disposal volumes for calendar year 2020. The majority of the expenses in 2021 (69%) will be for Status and Trends monitoring and special studies (Tasks 6-7). The cost for programmatic tasks (Tasks 1-5) is \$40k lower than 2020. The decrease is due to a reduction in the Program Management and Governance tasks. There is an expected shortfall in the 2021 budget largely due to the added expense of the S&T Review (\$220,000 budget)

Table 1: Bay RMP 2021 Budget by Task.

	Grand Total
1. Program Management	\$325,000
2. Governance	\$300,000
3. QA and Data Services	\$240,000
4. Annual Reporting	\$225,000
5. Communications	\$160,000
6. S&T Monitoring (includes S&T Review)	\$1,565,000
7. Special Studies	\$1,263,560
8. Unallocated	\$0
Total Actual Expenses	\$4,078,560
Contributions to Reserve Funds	\$50,000
<b>Grand Total for Expense</b>	<b>\$4,128,560</b>
Revenue from Fees	\$3,918,033
Revenue from AMR Contributions	\$279,301
Dredger Reserve*	-\$200,000
Undesignated Funds Used	\$0
<b>Grand Total for Revenue</b>	<b>\$3,997,334</b>

\*Dredger Reserve indicates the expected shortfall in dredger revenue for 2021.

Figure 1: Bay RMP 2021 Revenue and Expenses.

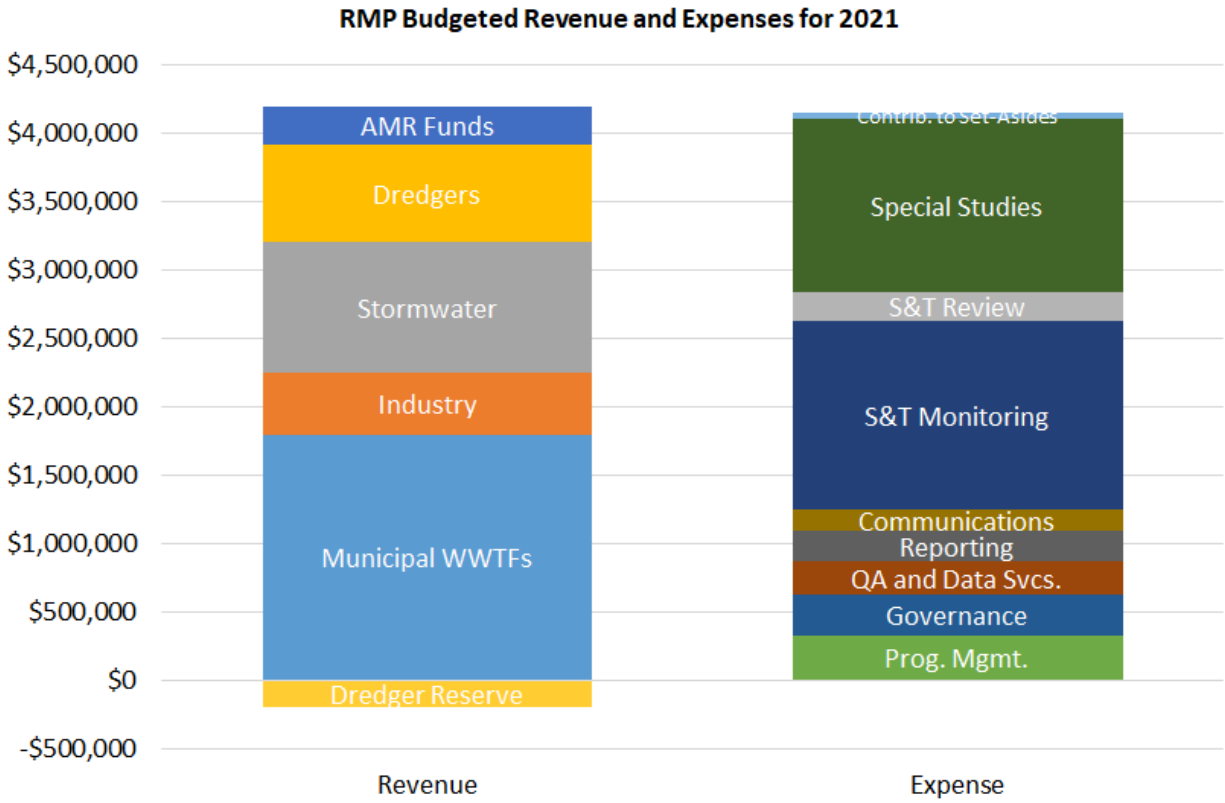
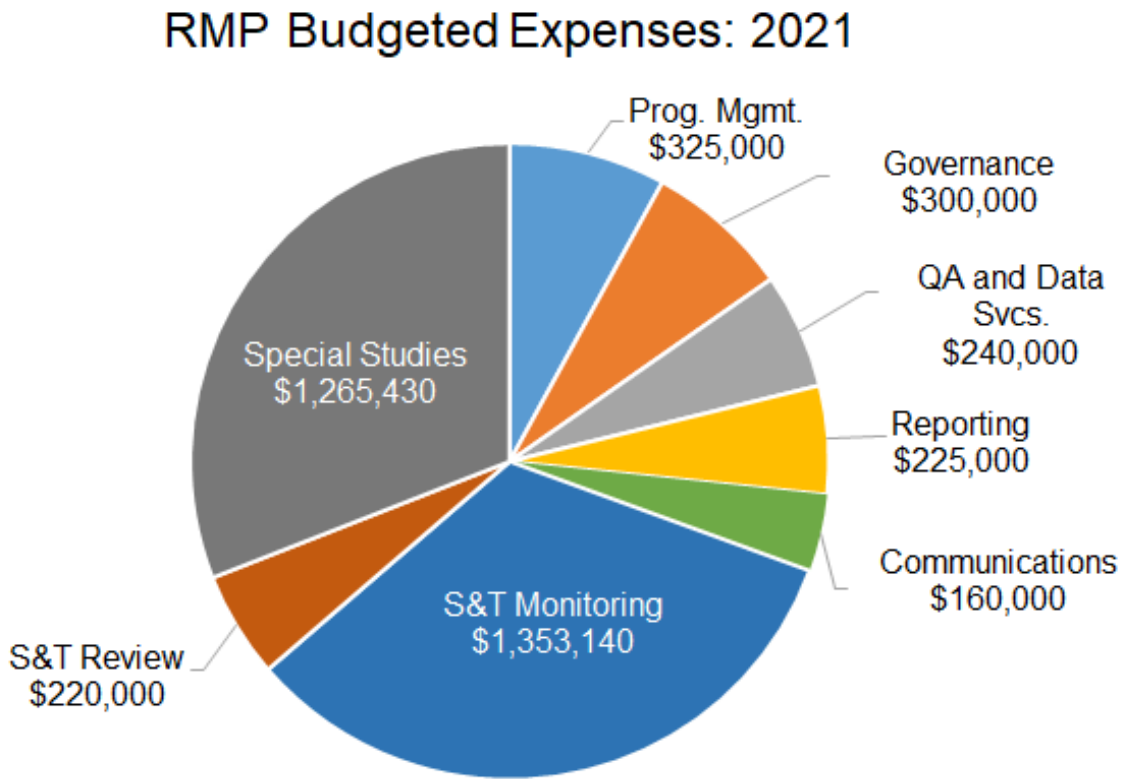


Figure 2: Bay RMP 2021 Budget by Task.



## 2021 Revenue

The total revenue for the RMP in 2021 is \$4,197k. The breakdown of this revenue between participant fees, interest income, designated reserve funds, and Undesignated Funds is shown in Table 2.

a. Participant Fee Revenue

The target fee revenue for the RMP in 2021 is \$3,918k. The manner in which the fees are divided up between Program Participants is shown in Figure 3. Fees were increased by 3% relative to the 2020 budget as approved by the Steering Committee on November 1, 2017.

b. Alternative Monitoring Requirement Funds

For FY2021, the RMP received \$279k of supplemental funding from municipal wastewater agencies under the Alternative Monitoring Requirement (AMR) order. The intended use of these funds is for emerging contaminants studies.

c. Interest Revenue

RMP funds earn interest from the Local Agency Investment Fund. Interest in 2021 could be as high as \$80k, but is likely to be lower than recent years. Similar to 2020, this interest will not be included in the budget. Instead, the interest will accumulate in an interest account. After 2021 is complete, all accrued interest from the year will be transferred to the Undesignated Funds account. Accounting for interest as income during the year was confusing to staff and risky because the income was not guaranteed. This money will be available for the Steering Committee to use at its discretion but it will first be saved as Undesignated Funds. Use of this interest to fund a contribution to the Status and Trends Set-Aside account is discussed on page 18.

d. Designated Reserve Funds

i. *Dredger Reserve Fund*

Dredging activity and in-Bay disposal of dredged material is variable over the years. In years where there is a lot of activity, any dredger fees that are greater than the target fees are stored in the Dredger Reserve Fund. These funds are held in reserve and can only be used to pay for shortfalls in dredger fees in future years. The balance of the Dredger Reserve Fund is negative (-\$518,227 not including the USACE shortfall) because dredger fees in 2018 through 2020 were lower than target fees. The 2021 budget assumes that dredger fees will fall \$200k below the target. This is an approximation based on in-Bay disposal volumes in 2018 and 2019. Revenue (and expense) in the budget may need to be revised based on actual fees from in-Bay disposal. The 2021 dredger fees, and whether there is a shortfall, will be known in early 2021.

ii. *Set-Aside Funds*

The RMP uses designated funds (called “Set-Asides”) to smooth out the year-to-year expenses of the Status and Trends program. Rather than having a spike in expenses in one year, the Steering Committee designates some funds to be set aside in light years and withdrawn in years with lots of monitoring. In 2021, the Status and Trends monitoring costs are lower than average so a \$50k contribution will be made to the Set-Aside. This contribution is discussed more in the section on Status and Trends expenses (page 15).

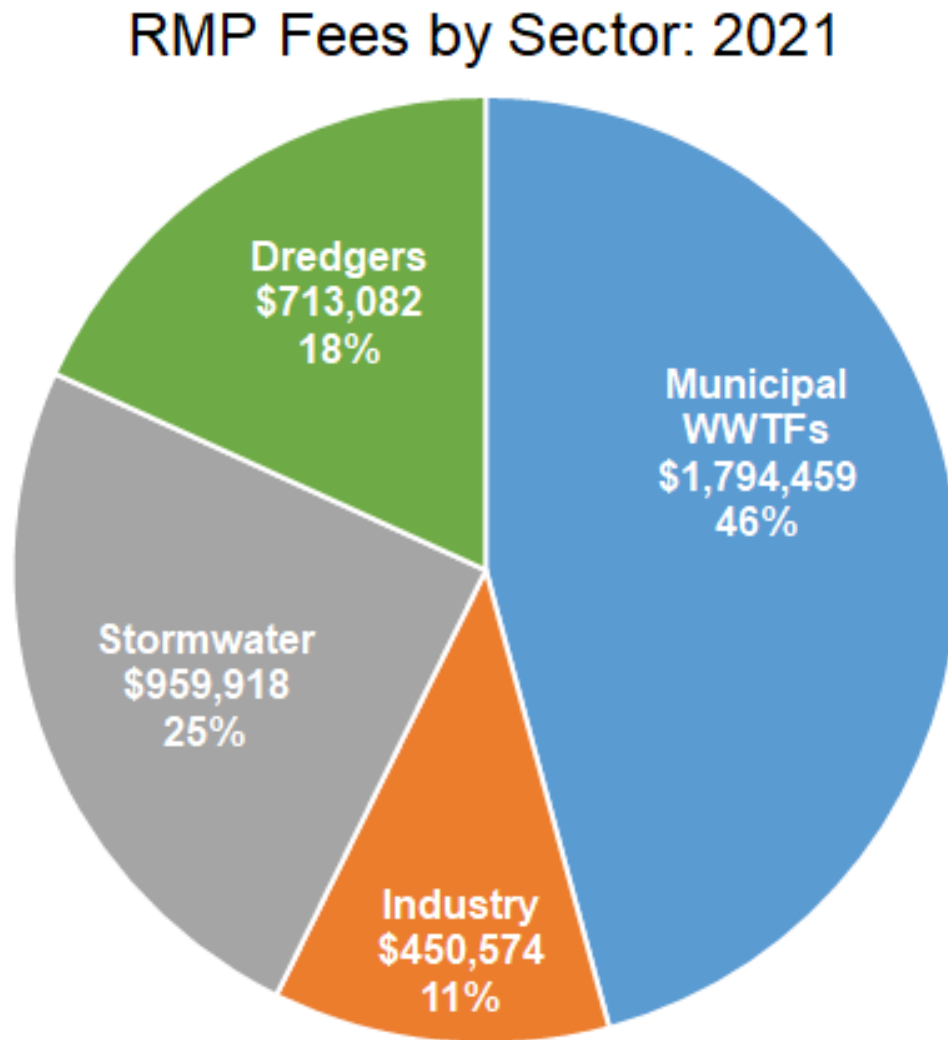
e. Undesignated Funds

The RMP maintains a balance of Undesignated Funds for contingencies. Higher than anticipated revenues and elimination or reduction of lower priority elements sometimes lead to accumulation of funds that can be used for high priority topics at the discretion of the Steering Committee. The current balance of Undesignated Funds is \$971k. We anticipate needing to use Undesignated Funds to balance the 2021 budget due to the increased expense associated with the Status and Trends Program Review.

Table 2: 2020 RMP Revenue.

Revenue Category	Subcategory	Amount
Participant Fees	Municipal wastewater	\$1,794,459
Participant Fees	Industrial wastewater	\$450,574
Participant Fees	Stormwater	\$959,918
Participant Fees	Dredgers	\$713,082
Participant Fees	Local Dredgers - expected surplus (deficit)	(\$200,000)
Participant Fees	USACE Dredgers - expected surplus (deficit)	\$0
Supplemental POTW Payments for AMR Order Coverage (FY20)		\$279,301
Interest Income		\$0
Designated Reserve Funds	Set-Aside Funds for S&T Monitoring	\$0
Designated Reserve Funds	Dredger Reserve Funds	\$0
Undesignated Reserve Funds		\$0
<b>TOTAL REVENUE</b>		<b>\$3,997,333</b>

Figure 3: Bay RMP 2021 Fee Allocations for Program Participants.





## **2021 Programmatic Tasks**

RMP expenses fall into three broad categories: programmatic expenses, Status and Trends monitoring, and special studies. This section details the budgets for programmatic expenses for 2020.

The programmatic budget covers the following tasks:

- Program management
- Governance
- Quality Assurance (QA) and Data Services
- Annual reporting
- Communications

The total cost to implement these tasks in 2021 is \$1,250k. This budget is \$40k less than the 2020 budget. The cost decreases are summarized in Table 3. The budgets for Program Management and Governance were both reduced for 2021, based on actual costs in 2020 and changes to the workgroup structure for 2021. In light of a flat budget for 2022, the budget for 2021 was trimmed down to allow for budget increases due to inflation within program expenses in 2022.

The number of workgroups in 2021 was reduced from six to five (Selenium Workgroup projects moved to Status & Trends), with an additional workgroup, Microplastics, having a smaller meeting budget.

Table 3: RMP 2021 Programmatic Budget Compared to the 2019 and 2020 Budgets.

	2019 Budget	2020 Budget	2021 Budget	Difference	Comments
1. Program Management	\$376,700	\$390,000	\$325,000	(\$65,000)	Decrease based on actual costs of program management in 2020.
2. Governance	\$304,200	\$355,000	\$300,000	(\$55,000)	Budget decreased to account for modified workgroup structure.
3. QA and Data Services	\$225,000	\$235,000	\$240,000	\$5,000	Increase due to inflation.
4. Annual Reporting	\$209,000	\$131,000	\$225,000	\$95,000	Increase due to the Pulse of the Bay being produced in 2021, as well as the expectation of an in-person Annual Meeting.
5. Communications	\$173,000	\$179,000	\$160,000	(\$19,000)	Decrease due to presumed lack of in person conferences.
Total	\$1,287,900	\$1,290,000	\$1,250,000	(\$40,000)	Decrease due to cuts to the Program Management, Governance, and Communications tasks based on changes to program structure and ongoing effects of the coronavirus pandemic.

## 1. Program Management

Program management subtasks include program planning, contract and financial management, technical oversight, internal and external coordination, and administration. The total expense for these tasks is \$325k, which is \$65k (20%) less than the 2020 budget. Approximately half of the cost for this category is fiduciary oversight of program expenses and contractors. These financial management funds also support staff time to manage funds and contracts for Supplemental Environmental Projects (SEPs) that are performed by the RMP.

The major deliverables that will be completed with these funds include: the Multi-Year Plan, the Detailed Workplan, quarterly financial updates to the Steering Committee, quarterly tracking of deliverables and action items, and contract management. Funds for technical oversight allow for internal review by senior staff of the many reports, presentations, posters, workplans, memos, and other communications coming out of the RMP. The funds for external coordination cover participation in meetings with external partners to coordinate programs and leverage RMP funds (e.g., coordinating work on the Pulse and other reports, coordination with SCCWRP, and serving as liaison to the Delta and Wetland RMPs).

## 2. Governance

Governance subtasks include convening, coordinating, and facilitating Steering Committee, Technical Review Committee, and Workgroup meetings. Tasks include preparing agendas and agenda packages, participating in meetings, writing meeting summaries, following up on action items, reviewing minutes from past meetings, and coordinating with committee chairs. This budget item also includes honoraria and travel for external advisors. The total budget for these tasks is \$300k which is 15% less than the 2020 amended budget. The cost of workgroup meetings (\$195k) accounts for nearly two-thirds of this line item. The budget for staff time to prepare materials and proposals and attend workgroup meetings is \$165k; the budget for honoraria for external science advisors is \$30k. This budget assumes virtual meetings again for 2021, reducing travel expenses for the expert advisors.

The major deliverables that will be completed with these funds are: quarterly Steering Committee meetings, quarterly Technical Review Committee meetings, and five Scientific Workgroup meetings with external science advisors in the spring. The Emerging Contaminants Workgroup will continue to meet for two consecutive days, and it is likely that the Sediment Workgroup will hold two workgroup meetings in the spring. The Sediment Workgroup is a relatively new workgroup, so it is meeting more frequently to determine the scope and priorities of the workgroup.

## 3. QA and Data Services

Quality assurance and data management are critical foundations for the scientific investigations of the RMP. The total cost for these tasks will be \$240k, \$5k more than it was in 2020. The major quality assurance tasks for 2021 are keeping the Quality Assurance Project Plan up to date and preparing QA summaries for datasets. In addition to processing new data, the

RMP needs to maintain the millions of records generated since it began in 1993. Database maintenance includes incorporating updates and corrections to data, including re-analyzed results and updates implemented by CEDEN/SWAMP. RMP staff also maintain and enhance web-based data access and visualization tools, such as CD3, and an automated system to handle data submittals from the laboratories.

DMMO Database Support will continue in 2020. Special study funding in 2018 was used to migrate the DMMO database and website to the SFEI server. DMMO managers would like to continue this collaboration indefinitely because it provides a more secure platform for the database. Benefits to the RMP include better access to sediment testing records in the DMMO database and more efficient invoicing methods for dredger fees. Therefore, ongoing funding for this project is included as part of the QA and Data Services task. The funding requested in 2021 is \$47k to work through a long list of updates. In future, the funding needed to maintain the database will be lower.

#### **4. Annual Reporting**

The total cost for these tasks will be \$240k. This budget is \$95k more than it was in 2020. The *Pulse of the Bay* will be produced in 2021 and released at the Annual Meeting in October. The *Pulse* is a more expensive product than the *RMP Update* that was prepared in 2020 (\$62k for the 2020 *RMP Update* vs \$155k for the 2021 *Pulse*). The *Pulse of the Bay* report will contain articles on a theme chosen by the Steering Committee plus updated indicators of water quality in the Bay.

Tasks related to the Annual Meeting include developing the meeting agenda, coordinating speaker participation, managing logistics, advertising the meeting, managing attendee registration, preparing presentations, and staffing the meeting. The budget for the Annual meeting in 2020 was \$50k. The 2021 budget increased to \$70k to cover the increasing costs of catering, venues, and staff time. The 2021 budget assumes an in-person meeting at the David Brower Center in Berkeley.

#### **5. Communications**

Communications tasks will implement the plans included in the RMP Communications Strategy, approved by the Steering Committee in July 2014. The total cost for these tasks in 2021 will be \$160k, \$19k less than the original 2020 budget. The 2021 budget is lower to account for the likelihood that conferences will be virtual through at least the first half of CY2021. Tasks will include the distribution of RMP information to stakeholders, natural resource managers, and the public through multiple media channels (e.g., website, publications, email newsletters, fact sheets, social media). In 2021, the RMP will continue to provide support for *Estuary News* (\$16k) plus staff time to plan and review content.

Stakeholder engagement is critically important to addressing the information needs of RMP participants. Tasks include preparing for and attending RMP stakeholder meetings (e.g.,

BACWA, BASMAA, BPC, LTMS, WSPA, and RB2), as well as communicating directly with stakeholder representatives.

Other communications tasks include responding to inquiries for RMP data and reports, including media inquiries, and producing summary information on important topics in convenient formats. Participation in workshops and conferences for SWAMP, SETAC, ACS, and other professional organizations allows sharing of RMP information, gathering of information from other investigators on the latest advances in monitoring and understanding, and identification of opportunities for collaboration with other organizations. Presentations at local meetings and to local audiences are also important for collaboration and information dissemination to scientific partners. Funding for this task also supports maintenance of the RMP website.

Table 4: Bay RMP 2021 Programmatic Budget by Subtask.

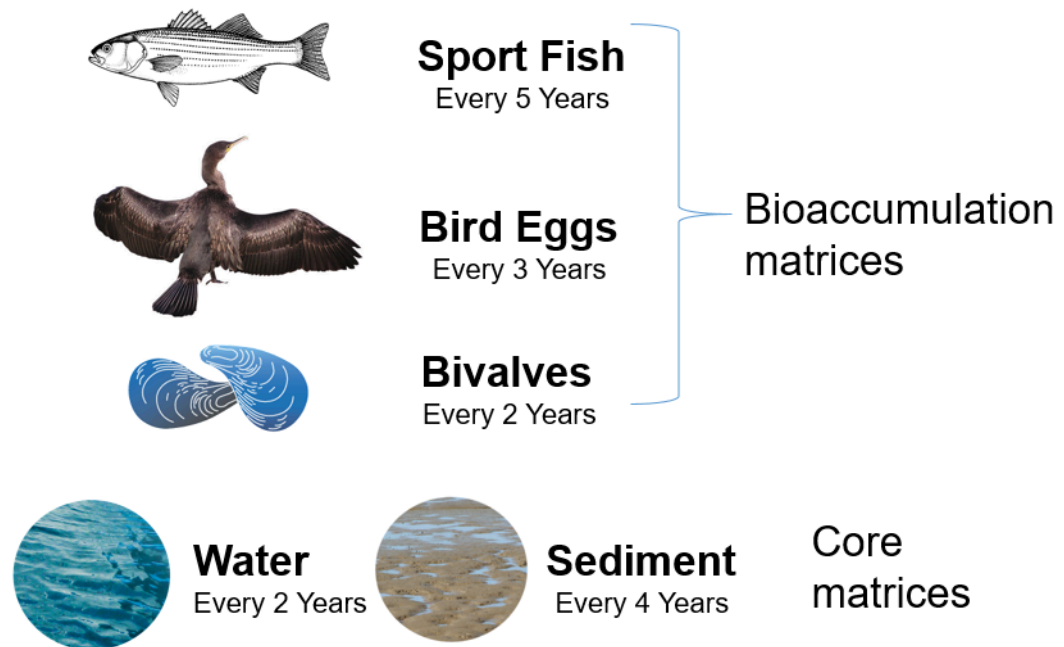
Task	Subtask	Direct Cost	Labor	2021 Grand Total
1. Program Management	A. Budget and Workplan Development		\$40,000	\$40,000
	B. Contract and Financial Management		\$95,000	\$95,000
	C. Technical Oversight		\$60,000	\$60,000
	D. Internal Coordination		\$88,650	\$88,650
	E. External Coordination		\$35,000	\$35,000
	F. Administration	\$2,500	\$3,850	\$6,350
2. Governance	A. SC meetings	\$600	\$46,800	\$47,400
	B. TRC meetings	\$600	\$48,000	\$48,600
	C. WG meetings	\$1,000	\$48,000	\$49,000
	D. External Science Advisors	\$30,000		\$30,000
	E. Emerging Contaminants WG		\$40,000	\$40,000
	F. Microplastics Workshop		\$10,000	\$10,000
	G. PCB WG		\$15,000	\$15,000
	H. Sediment WG		\$35,000	\$35,000
	I. Sources, Pathways, Loadings WG		\$25,000	\$25,000
3. QA and Data Services	A. Quality Assurance System		\$34,000	\$34,000
	B. Online Data Access: CD3		\$65,000	\$65,000
	C. Database Maintenance		\$60,000	\$60,000
	D. Updates to SOPs and Templates		\$34,000	\$34,000
	E. DMMO Database Support		\$47,000	\$47,000
4. Annual Reporting	A. RMP Pulse Report	\$20,000	\$135,000	\$155,000
	B. Annual Meeting	\$20,000	\$50,000	\$70,000
5. Communications	A. Communications Plan Implementation	\$16,000	\$25,000	\$41,000
	B. Stakeholder Engagement		\$23,500	\$23,500
	C. Responses to Information Requests		\$18,000	\$18,000
	D. Outreach Products	\$500	\$10,500	\$11,000
	E. Presentations at Conferences and Meetings	\$12,000	\$39,500	\$51,500
	G. RMP Website Maintenance		\$15,000	\$15,000
Grand Total		\$97,700	\$1,152,300	\$1,250,000

## 2021 Status and Trends Monitoring and Reserve Funds

In 2014, the Steering Committee and Technical Review Committee revised the Status and Trends (S&T) sampling schedule to free up resources. The current schedule is shown in Figure 4.

Figure 4: RMP Status and Trends Monitoring Schedule

# Status and Trends Monitoring



In 2021, bird egg and water sampling are scheduled to occur. Monitoring of selenium in clams and water will also occur at two sites in the North Bay throughout 2021. In addition, the RMP provides annual support to the USGS for suspended sediment and nutrient monitoring. This support will continue in 2021. We are also including a budget of \$45k for laboratory intercomparison studies. The most likely intercomparison study will be another round of copper in water based on the results from the two methods used by Brooks Analytical Labs to analyze the 2017 and 2019 water cruise samples. The total cost for S&T monitoring in 2021 will be \$1,584k. Part of the increase over 2020 is due to the North Bay selenium monitoring moving from special studies to S&T. The cost for that effort is \$80,000.

Because 2021 is a light year for S&T monitoring, the budget for 2021 includes a \$50k contribution to the Designated Set-Aside account for future S&T activities.

More information about each of the S&T tasks is provided in the line item budget (Table 5) and the sections below.

### **USGS Sacramento Support: Continuous Monitoring of Suspended Sediment (\$400k)**

This work is led by Dr. Maureen Downing-Kunz of the USGS California Water Science Center. The USGS maintains four suspended-sediment stations in the Estuary with RMP funding (Richmond Bridge, Alcatraz Island, Pier 17, and Dumbarton Bridge). This funding leverages suspended-sediment monitoring at two other stations (Mallard Island and Benicia Bridge) and salinity at seven stations that are funded by other partners. Funding for these activities is provided by the U.S. Army Corps of Engineers directly to the USGS. The contribution in 2021 is \$400k and will support additional suspended sediment monitoring in the Bay.

### **USGS Menlo Park Support: Monthly Basic Water Quality (\$250k)**

This work is led by Tara Schraga of the USGS in Menlo Park. The study performs monthly water sampling to map the spatial distributions and temporal trends of basic water quality parameters at fixed stations throughout the Bay-Delta system. Measurements include salinity, temperature, dissolved oxygen, suspended sediment, and phytoplankton biomass. This basic information is necessary to follow the seasonal changes in water quality and estuarine habitat because they influence biological communities and the distribution and reactivity of trace contaminants.

The RMP pays a fraction of the total cost of these cruises. Ongoing USGS support for the cruises is uncertain beyond September 2021. Options to continue these cruises beyond FY2021 are being discussed by the Nutrient Management Strategy Steering Committee.

### **2021 North Bay Selenium in Clams and Water (\$72k)**

The North Bay selenium monitoring in clams and water is being moved to Status and Trends in 2021. Samples are collected at two sites in the North Bay in two, three month intervals, June-August and December-February every year. These sampling periods precede key stages in the white sturgeon life history (breeding and juvenile growth) by approximately two months. Data management is done every other year in even years.

### **2021 Bird Eggs (\$256k)**

The Status and Trends schedule calls for bird egg monitoring every three years. The last bird egg samples were collected in 2018. Two species of birds will be monitored in 2021. Double-crested Cormorants (*Phalacrocorax auritus*) will be collected at three sites: Don Edwards National Wildlife Refuge, the Richmond-San Rafael Bridge, and Wheeler Island. It is possible that collections from Wheeler Island will not be possible due to access issues and a shrinking colony. The USGS will choose another site in the North Bay if that is the case. Forster's Tern (*Sterna forsteri*) will be collected from multiple sites in the Don Edwards National Wildlife Refuge and the Hayward Shoreline Regional Park, if possible. The USGS was not given permission to sample at the Hayward Shoreline Regional Park in 2018, so all samples were



collected from South Bay sites. This may need to happen again in 2021. According to the Monitoring Design, egg tissue will be analyzed for mercury, selenium, PCBs, PBDEs, and PFCs in cormorant eggs and mercury, selenium, and PBDEs in tern eggs. The total cost for the field collection and laboratory analyses will be \$216k. The cost for quality assurance and data management will be \$43k.

### **2021 Water Cruise (\$243k)**

The Status and Trends schedule calls for water sampling every two years. Water samples from 22 random and targeted sites will be collected and sent to laboratories for analyses of metals, conventional parameters, and aquatic toxicity. Subcontracts for the vessel (\$32k), sample collection/logistics (\$100k), and laboratories (\$75k) make up the majority of the cost. The cost to QA and manage the data from this sampling effort will be \$35k.

### **Laboratory Intercomparison Studies (\$28k)**

Laboratory intercomparison studies boost confidence in analytical methods and results, act as an insurance policy for unforeseeable changes in analysis procedures and analytical contractors, and provide many other benefits. Potential intercalibration studies for 2021 include dissolved copper in water. The results from the two methods used by Brooks Analytical Labs to analyze the 2019 water cruise samples still showed some differences that will continue to be investigated in 2021.

In 2017, Brooks Analytical Lab started analyzing the dissolved fraction of our water column copper samples using a different method (column chelation) than previously used (reductive precipitate) on past RMP samples. Reported concentrations of dissolved copper were 30-50% higher than previous Bay samples. In order to determine if copper concentrations had changed or if the method was faulty, the City and County of San Francisco (CCSF) laboratory analyzed water samples for dissolved copper using a direct ICP-MS method. The concentrations they reported were more consistent with historical samples.

### **Sample Archive (\$84k)**

The RMP stores archives of sediment, bivalve, bird eggs, and sport fish samples, as well as other miscellaneous samples, in archives for potential future analyses. Short-term archives (< 10 years) are stored at Schaefer's Meat and Storage in Oakland. Long-term archives are stored at NIST in Charleston, South Carolina. Costs in 2021 will cover continued storage fees for the archives (\$40k for Schaeffer's; \$24k for NIST), as well as labor to manage the archives and the archive database (\$20k). The cost also includes subcontractor support from AMS to access the archives and to support ongoing organization and purging of samples. We completed a major purge and consolidation in 2019, reducing the number of pallets at Schaeffer's from 18 to nine. Staff will continue to look for ways to strategically use the archives, both within the RMP and with academic partners. This task also includes time for the Data Management team to update and improve the archived sample tracking system.

**2021 Field Sampling Report and Support (\$12k)**

At the end of the field season, RMP staff will update the Field Operations Report and Sampling and Analysis plans for each S&T activity completed. They will also compile all of the Field Sampling Reports produced by our partners, which document where samples were collected and any complications during field sampling. The report will not contain any data analysis or results. Clear documentation of field sampling effort is part of the overall quality assurance system for the Program. This budget line also includes miscellaneous logistical support from AMS for RMP sampling. Shipping preserved samples or international shipping is a common request.

**Contributions to Reserve Funds (\$50k)**

The RMP uses designated funds (called “Set-Asides”) to smooth out the year-to-year expenses of the Status and Trends program. Rather than having a spike in expenses in one year, the Steering Committee designates some funds to be set aside in light years and withdrawn in years with lots of monitoring. In 2021, the Status and Trends monitoring costs are lower than average so a \$50k contribution will be made to the Set-Aside.

Table 5: Bay RMP 2021 Status and Trends Budget by Subtask.

Task	Subtask	Direct Cost	Labor	Subcontract	2021 Grand Total
6. S&T Monitoring	A. USGS Sacramento Support			\$400,000	\$400,000
	B. USGS Menlo Park Support			\$250,000	\$250,000
	C. 2021 Water Cruise	\$5,000	\$60,000	\$143,000	\$208,000
	D. 2021 Water Cruise Data Mgmt		\$35,000		
	E. 2021 Bird Egg Sampling		\$40,000	\$186,000	\$226,000
	F. 2021 Bird Egg Data Mgmt		\$30,000		\$30,000
	G. North Bay Selenium Monitoring	\$2,000	\$58,500	\$11,500	\$72,000
	I. S&T Laboratory Intercomparison Studies	\$2,000	\$16,000	\$10,000	\$28,000
	J. Sample Archive	\$40,000	\$14,000	\$30,000	\$84,000
		K. S&T Field Sampling Report & Support		\$12,000	
	<b>TOTAL</b>				\$1,345,000
Contributions to Reserve Funds	S&T Monitoring Set Aside Contribution				\$50,000
	Monitoring Contingency Fund Replenishment				\$0
	Undesignated Funds				\$0

## 2021 Special Studies

The total costs for special studies in 2021 will be \$1,265k. Figure 5 shows how these costs are distributed across the seven focus areas. Additional details on each of the studies are provided in the line item budget (Table 6).

Figure 5: RMP Special Studies Funding for 2021 by Focus Area.

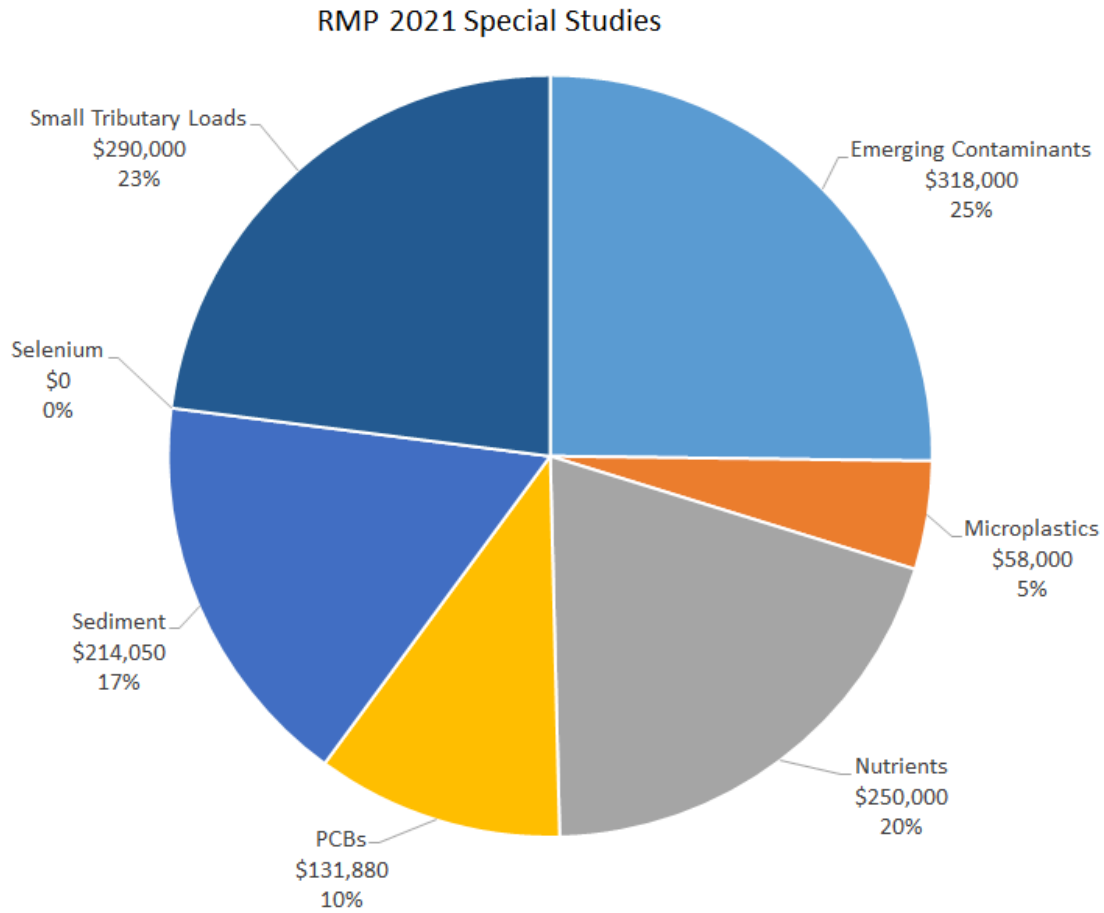


Table 6: Bay RMP 2021 Special Studies Budget by Subtask.

Task	Direct Costs	Labor	Subcontracts	Total
Special Study: EC in Urban Stormwater Year 3*	\$14,900	\$88,800	\$44,300	\$148,000
Special Study: PFAS in Bay water*	\$1,290	\$36,400	\$12,310	\$50,000
Special Study: Toxicology Strategy*		\$60,000		\$60,000
Special Study: EC Strategy Support		\$60,000		\$60,000
Special Study: Microplastics Conceptual Model for Stormwater Microplastics Pathway to the Bay		\$26,000	\$4,000	\$30,000
Special Study: Microplastics Ecotoxicological Workshop		\$18,000		\$18,000
Special Study: Microplastics Strategy		\$10,000		\$10,000
Special Study: Nutrient Special Studies		\$250,000		\$250,000
Special Study: PCB Strategy for in-Bay Modeling		\$35,050	\$10,000	\$45,050
Special Study: PCB Remediation Monitoring in SLB	\$700	\$24,600	\$61,530	\$86,830
Special Study: Floating Percentile Methodology		\$36,040		\$36,040
Special Study: DMMO Database Enhancements		\$40,000		\$40,000
Special Study: Sediment Delivery to Marshes			\$140,000	\$140,000
Special Study: STLS Integrated Conceptual Model		\$49,640		\$49,640
Special Study: STLS Regional Model Development		\$150,000		\$150,000
Special Study: STLS WY21 POC Recon Monitoring	\$3,000	\$50,000	\$12,000	\$65,000
Special Study: STLS Strategy Support and Coordination		\$25,000		\$25,000
<b>Grand Total</b>				<b>\$1,263,560</b>

\*These studies are funded with the \$270k of FY20 Alternative Monitoring Requirement (AMR) funds.

Appendix A. Special Study descriptions.

Study Name	Budget	Summary	Deliverables
Emerging Contaminants Strategy	\$60,000	Annual update of CEC Strategy, including tracking new information, updating the Tiered Framework and Multi-Year Plan, developing a toxicology strategy, and developing conceptual models. Increasing needs for stakeholder support, coordination of pro bono studies, and development and use of CEC transport model.	Update RMP CEC Strategy document; Present updated strategy at SC
CECs in Urban Stormwater	\$148,000	Monitoring during the third of a multi-year study on CECs in stormwater is being completed. The study is designed to provide critical stormwater data needs for five contaminant classes: 1) a new, targeted list of CECs specific to stormwater; 2) per- and polyfluoroalkyl substances (PFASs); 3) organophosphate ester (OPE) plastic additives/flame retardants; 4) ethoxylated surfactants; and 5) bisphenols..	Sample collection; sample analysis; data review to inform a potential year 4
PFAS in Bay Water	\$50,000	The ECWG classified PFOS, PFOA, and other long-chain perfluoroalkyl carboxylates as Moderate Concern in the RMP tiered risk-based framework due to concentrations in Bay biota linked to potential risks. However, the most recent Bay water monitoring occurred in 2009, and included just 13 PFAS. Since that time, several new members of the PFAS class have been identified in environmental matrices elsewhere, and standardized analytical methods have been expanded to include a broader suite of analytes. We propose a study to assess the concentrations of 33 PFAS in Bay water to characterize newly identified PFAS and begin to assess trends in those previously observed PFAS.	Sample collection; sample analysis; data QA/QC; technical report
Toxicology Strategy	\$60,000	The RMP uses a risk-based framework for prioritizing monitoring of contaminants of emerging concern (CECs). Environmental toxicity threshold values are variable in availability and quality, and inappropriate thresholds may easily be used by researchers without toxicology knowledge. Past identification of toxicity thresholds for the Bay RMP has been on a study-by-study basis. This study proposes synthesizing and assessing the quality of the available thresholds for CECs detected in the	Synthesize and assess available CEC thresholds; identify knowledge gaps; calculate new thresholds; technical report; "living document" synthesis of thresholds

2021 RMP Detailed Workplan – Approved

		Bay in the past ten years, calculating or estimating thresholds for data-poor contaminants using EU guidance and predictive toxicology methods, and risk screening for the Bay using a risk characterization ratio approach. This project will result in a “living document” of CEC ecotoxicity thresholds and their quality, and will inform design of future monitoring. The estimation and compilation of toxicity thresholds may support recategorization of some contaminants currently classified as Possible Concern due to insufficient toxicity data.	
Microplastic Strategy	\$10,000	Core tasks include tracking new information regarding microplastic occurrence and toxicity; responding to requests for information from the Water Board and other stakeholders; and, in collaboration with the Workgroup, identifying any essential data gaps for San Francisco Bay that could be filled by the RMP or others. Strategy funding also allows for important leveraging activities such as the coordination of pro bono analyses by partners.	Update RMP Microplastic Strategy
Conceptual model for microplastic pathways from stormwater	\$30,000	The recently completed study of microplastics in San Francisco Bay identified stormwater to be a major pathway. Given this finding, the Microplastics Workgroup has prioritized the development of a stormwater conceptual model for microplastics. A first year of work focused on black rubbery fragments that were the most abundant type of microplastic in stormwater. This proposal is for a second year of funds to further develop the conceptual model by focusing on other prioritized microplastics, such as fibers, which were the second most abundant type of microplastic in stormwater. Development of the conceptual model for microplastics in stormwater will help inform available management actions to address microplastic pollution and identify data gaps and monitoring data needs to address Workgroup management questions, and to inform the Ocean Protection Council’s state-wide microplastic strategy.	Literature review and discussion with experts; conceptual model report

2021 RMP Detailed Workplan – Approved

<p>Ecotoxicological Workshop</p>	<p>\$18,000 (\$56K matching funds from SCCWRP)</p>	<p>SFEI and SCCWRP will work together to convene world experts on microplastic environmental and human health toxicology for a three-day workshop aimed at summarizing the current state of scientific knowledge on the potential risks of microplastics to aquatic life and humans. Through this project, we will identify environmentally relevant exposure information for different particle types, and develop a roadmap describing what additional research should be prioritized to give managers the relevant insights they need to develop a comprehensive risk management plan. This project would fund SFEI staff time to facilitate the workshop and write follow-up documents, and leverages significant contributions from SCCWRP in planning and hosting the workshop.</p>	<p>Facilitate workshop; summary report</p>
<p>High Frequency Moored Sensor Network: data analysis, interpretation, and maintenance</p>	<p>\$125,000</p>	<p>High frequency water quality data will be collected through a network of in situ moored sensors in Lower South Bay and South Bay. Instruments measure multiple parameters, including specific conductance (or salinity), temperature, depth, dissolved oxygen, turbidity, chlorophyll-a, fDOM, and phycocyanin. Two key aims for the mooring network were to allow for more comprehensive condition assessment, and to foster data collection that will allow us to better characterize and quantify ecosystem response to SFB's high nutrient loads, including by aiding the calibration of numerical models. Funding will be used for mooring maintenance, data management (including QA/QC), and data interpretation.</p>	<p>Sensor maintenance; data management</p>
<p>Suspended sediment light attenuation in San Francisco Bay</p>	<p>\$125,000</p>	<p>Recent NMS modeling work indicates that space-time variations in water column light extinction are among the most important data gaps with regard to predicting both phytoplankton production and nutrient cycling. In general, the main control on light extinction in SFB is suspended sediment concentration (SSC). This project will build capacity to predict, or hindcast, suspended sediment concentrations (SSC) through supporting improvements to sediment transport models and by data</p>	<p>Model output; technical memo</p>



2021 RMP Detailed Workplan – Approved

		collection and data analysis to improve model calibration.	
Strategy for In-Bay Modeling of PCBs and Other Contaminants	\$45,050	This study would develop a strategy and multi-year workplan for modeling PCBs and other contaminants in the Bay. Modeling is needed to address several management questions that are a priority for PCBs, and a platform developed for PCBs could also be applied to answering management questions for other contaminants.	Strategy technical report
Monitoring the Impact of Remediation Actions on San Leandro Bay Recovery from PCB Contamination	\$86,830 (\$60K in-kind from Stanford)	This study would establish baseline conditions to monitor changes in PCB loadings to the San Leandro Bay Priority Margin Unit expected from recent and pending upstream management actions in the watershed. Cleanup action at a former GE facility, an expected major source of PCBs to the watershed, has largely been completed. Cleanup activity at a second site (Union Pacific Railroad) is planned in the next few years. Passive samplers and sediment traps will be deployed downstream of completed and planned management activities to monitor PCB loadings to San Leandro Bay. A reference site in San Leandro Bay further away from direct watershed influences will also be sampled to evaluate spatial patterns. Since management activities either have been implemented or are planned in the next few years, there is urgency to establishing baseline conditions in order to document expected changes in PCB loadings.	Sample collection; sample analysis; technical report
DMMO San Francisco Bay Floating Percentile Method Update	\$36,040	This project will use recent estuarine data reported to the Dredged Materials Management Office (DMMO) and data from the San Francisco Bay Regional Monitoring Program (RMP) to update a regional application of the Floating Percentile Methodology conducted previously in 2004 for the Sediment Screening Guidelines study and report (Germano & Associates, 2004). This method provides additional weight of evidence for the derivation of thresholds that can be used to determine whether dredged sediment can be used for beneficial reuse purposes. The outcomes of this analysis will be reviewed as an option for	Data compilation and cleanup; technical report

		updating the draft sediment screening guidelines for beneficial reuse.	
Temporal variability in sediment delivery to a South San Francisco Bay salt marsh	\$140,000	We will measure suspended sediment concentration (SSC) and suspended sediment flux (SSF) in the shallows adjacent to a marsh, SSF into the marsh through a tidal creek, deposition and accretion on the marsh, and the variation in deposition with elevation and vegetation density and type. Data collection will be repeated in winter and summer, to determine seasonal effects. The study will be conducted in a marsh with a wave-exposed edge and large wind fetch. We anticipate a site on the eastern shore of South Bay, between the San Mateo and Dumbarton Bridges, but final site selection will depend on site accessibility and suitability for the study. Our overall objectives are to connect sediment dynamics in the shallows to rates of deposition and accretion across the marsh surface, and to assess seasonal variation in the effectiveness of sediment delivery. Results will be useful for prioritizing marsh restoration sites, assessing restoration actions, and understanding mechanisms of sediment delivery to and sea-level rise vulnerability of marshes.	Release time series, deposition, accretion, and vegetation characteristics data; technical report; presentation at Delta Science Symposium or State of the Estuary Conference
DMMO database enhancements	\$40,000	A DMMO Project Team with representatives from the partner agencies USEPA, USACE, SFBRWQCB, and BCDC convene regularly to set priorities for the DMMO database. The DMMO database user community seeks more database functionality and an improved user interface.  This project will improve the DMMO database to make it more accessible by the user community. Enhancements to the database would (1) improve efficiencies and streamline the process of making data available in a timely manner for querying; (2) enable the integration of DMMO data into SFEI's other data visualization tools, such as the Contaminant Data Display and Download tool (cd3.sfei.org), which is the primary data access and visualization tool for the Regional Monitoring Program's long-term dataset; and (3) support DMMO data mining and synthesis efforts.	Enhance database functionality and access to DMMO data

2021 RMP Detailed Workplan – Approved

<p>STLS Program Management</p>	<p>\$25,000</p>	<p>The goal of the Small Tributary Loading Strategy (STLS) over the next few years is to continue to provide information to RMP stakeholders and the public that directly supports the identification and management of PCBs, Hg, and other pollutant sources, concentrations, and loads in stormwater, and the determination of trends in relation to management efforts in San Francisco Bay. This proposal is to provide STLS program management to help achieve this goal. The outcome of this task is to maintain communication with the BASMAA program and Water Board representatives via in-person and phone meetings, and to participate in RMP inter-workgroup meetings aimed at maximizing efficient collaboration. Specific activities include coordinating regular meetings, planning and developing agendas and materials, preparing meeting summaries, and attendance at key external meetings.</p>	<p>Hold 6 STLS meetings; attend key external meetings</p>
<p>Regional Model Development to Support Watershed Loads and Trends</p>	<p>\$150,000</p>	<p>Funding in 2021 will be used to complete the sediment model and continue working on the conceptual design of the POC model. The hydrology and sediment model, once established, will be used as a basis for POC modeling in subsequent years. Although there is a more general objective to support multiple pollutants, initially the model will be developed for PCBs and Hg. After PCB calibration and validation, the model will be used to evaluate PCB loadings at watershed and regional scales. Trends associated with control measures, land-use changes, or other scenarios could then be explored.</p>	<p>Complete sediment model setup and calibration; collate PCB and Hg model data; begin planning on general POC modeling</p>
<p>Integrated Monitoring and Modeling Strategy - CEC Conceptual Model</p>	<p>\$50,000</p>	<p>As the focus of modeling moves towards supporting a broader suite of contaminants including sediment, nutrients and CECs beyond just PCBs and Hg, the information and the monitoring required to model contaminant groups with similar characteristics (chemical and physical properties, sources, pathways, etc.) needs to be systematically identified, and the model structure needed to support these priorities needs to be considered from inception.</p>	<p>Integrated watershed modeling and monitoring implementation strategy report</p>

2021 RMP Detailed Workplan – Approved

		<p>This project will address these issues by building an integrated watershed modeling and monitoring implementation strategy to lay out the information needs and associated monitoring and modeling processes to address management questions for any contaminant of interest when the need arises.</p>	
<p>Small Tributaries Loading POC Watershed Reconnaissance Monitoring</p>	<p>\$65,000</p>	<p>Over the past six years, the RMP has funded reconnaissance monitoring to identify high leverage watersheds and subwatersheds for PCBs and Hg sources and to develop a remote sampler method to decrease costs and increase ease of data collection. We propose to continue reconnaissance monitoring during winter storms in WY 2021. The study will help gain further knowledge and understanding of PCB and Hg concentrations, particle ratios, congener patterns, and yields in areas that have a disproportionately larger area of older urban and industrial land use. In addition, this sampling program is being coordinated with the needs of the ECWG (for specific emerging contaminants), the microplastics WG, and the PCBWG, all who pay a share of the field cost, their own analytical and data management costs. It is primarily a field study and the level of effort will be tailored to the amount of budget available and collaboration with the other groups. There is no phasing proposed.</p>	<p>Select sampling sites; sample collection; sample analysis; data QA/QC; technical report</p>