



**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**

**2020 Detailed Workplan and Budget**

**SFEI** | **AQUATIC  
SCIENCE  
CENTER**

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## Summary

In 2020 the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) is entering its 28<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 2020, the proposed funding levels, and the deliverables for each task.

The total revenue and expenses for 2020 is \$4,083k as shown in Table 1 and Figures 1-2. We are reserving \$150k 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 2019. The majority of the expenses in 2020 (65%) will be for Status and Trends monitoring and special studies (Tasks 6-7). The cost for programmatic tasks (Tasks 1-5) is \$2k higher than 2019. The increase is small because it is less expensive to produce the *RMP Update* than the *Pulse of the Bay Report*.

Table 1: Bay RMP 2020 Budget by Task.

	Grand Total
1. Program Management	\$390,000
2. Governance	\$355,000
3. QA and Data Services	\$235,000
4. Annual Reporting	\$131,000
5. Communications	\$179,000
6. S&T Monitoring	\$1,353,000
7. Special Studies	\$1,280,623
8. Unallocated	\$159,593*
Total Actual Expenses	\$3,923,915
Contributions to Reserve Funds	\$0
<b>Grand Total for Expense</b>	<b>\$4,083,216</b>
Revenue from Fees	\$3,803,915
Revenue from AMR Contributions	\$279,301
Interest	\$0
Undesignated Funds Used	\$0
<b>Grand Total for Revenue</b>	<b>\$4,083,216</b>

\*\$150,000 of this is in reserve for potential dredger shortfall.

Figure 1: Bay RMP 2020 Revenue and Expenses.

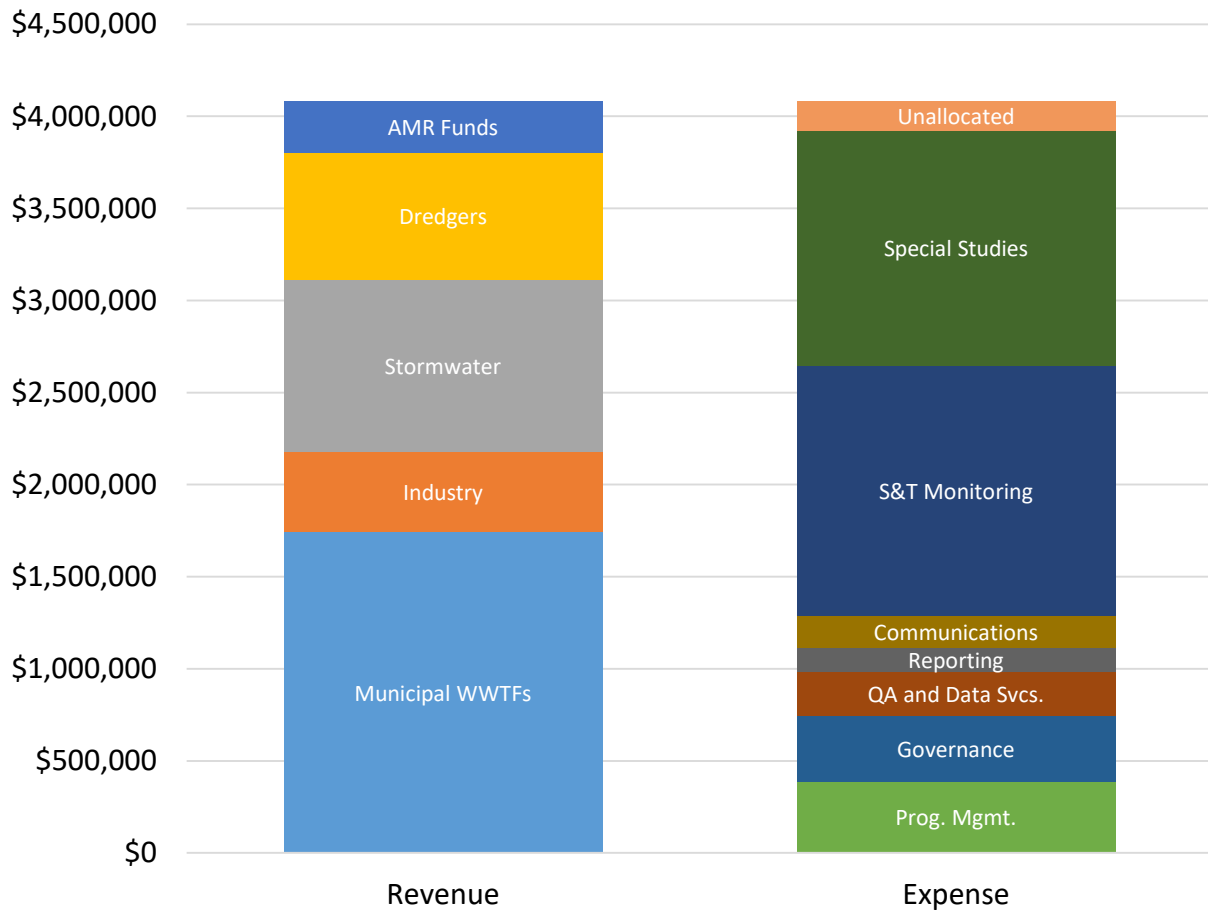
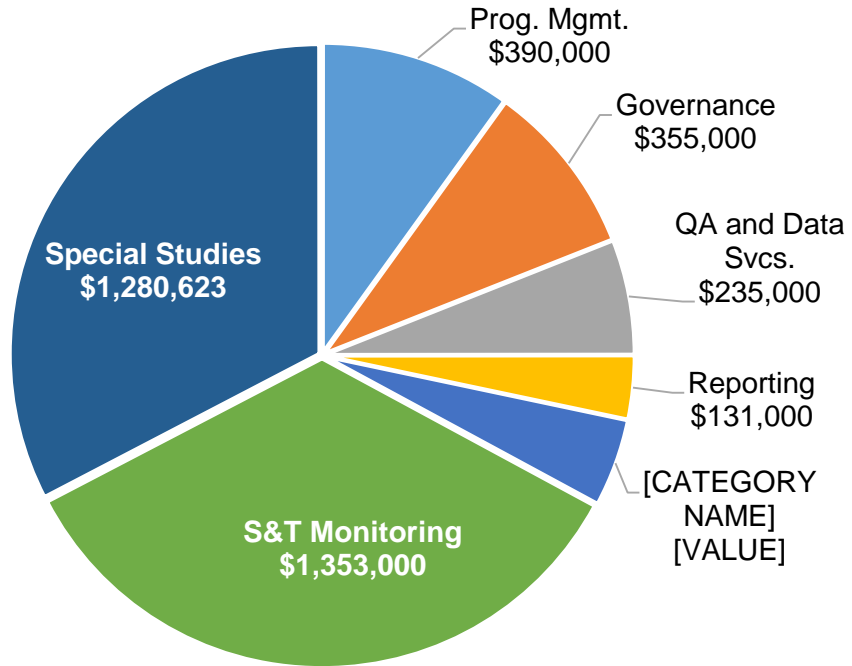


Figure 2: Bay RMP 2020 Budget by Task.



## 2020 Revenue

The total revenue for the RMP in 2020 is \$4,083k. 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 2020 is \$3,804k. 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 2019 budget as approved by the Steering Committee on November 1, 2017. The U.S. Army Corps of Engineers is expected to pay their full \$400k contribution in fiscal year 2020.

b. Alternative Monitoring Requirement Funds

For FY2020, 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 2020 could be as high as \$80k. Similar to 2019, this interest will not be included in the budget. Instead, the interest will accumulate in an interest account. After 2020 is complete, all accrued interest from 2020 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 19.

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 (-\$158,729 not including the USACE shortfall) because dredger fees in 2018 and 2019 were lower than target fees. The 2020 budget assumes that dredger fees will fall \$150k below the target (\$150k reserved in Unallocated Funds). This is an approximation based on in-Bay disposal volumes in 2018 and 2019. If that is not the case, the revenue (and expense) in the budget will need to be revised. The 2020 dredger fees, and whether there is a shortfall, will be known in early 2020.

*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 2020, the Status and Trends monitoring costs are lower than average so a \$275k contribution will be made to the Set-Aside. This contribution is discussed more in the section on Status and Trends expenses (page 16).

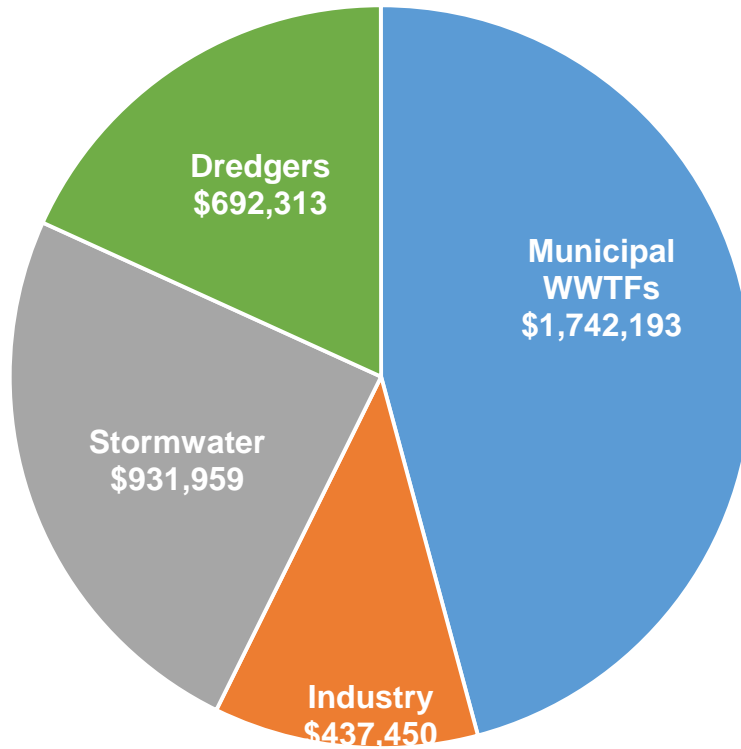
e. Undesignated Funds

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 \$872k. We do not anticipate needing to use any Undesignated Funds to balance the 2020 budget.

Table 2: 2020 RMP Revenue.

Revenue Category	Subcategory	Amount
Participant Fees	Municipal	\$1,742,193
Participant Fees	Industrial	\$437,450
Participant Fees	Stormwater	\$931,959
Participant Fees	Dredgers	\$692,313
Participant Fees	Local Dredgers - expected surplus (deficit)	TBD
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>\$4,083,216</b>

Figure 3: Bay RMP 2020 Fee Allocations for Program Participants.





## 2020 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 2020 is \$1,290k. This budget is \$2k more than the 2019 budget. The cost increases are summarized in Table 3. Most of the year-to-year difference is because a *Pulse of the Bay* report is produced in odd years and a shorter *RMP Update* is produced in even years. The Governance budget was underallocated in 2018 and 2019 so an additional \$40k was added to this task for 2020. Accounting for this increase and the extra funds allocated to the Pulse for 2019, the increase is \$47.1k (3.9%), which is roughly even with inflation.

The Steering Committee increased the budget for some governance tasks in the middle of the year, primarily because of higher than expected costs for workgroup meetings. The 2020 budget includes modest increases to the programmatic tasks because the tasks cannot be completed with less funding. More details about each of these tasks are provided in the following sections and in Table 4.

Table 3: RMP 2020 Programmatic Budget Compared to the 2018 and 2019 Budgets.

	2018 Budget	2019 Budget	2020 Budget	Difference	Comments
1. Program Management	\$370,000	\$376,700	\$390,000	\$13,300	Increase due to inflation.
2. Governance	\$304,200	\$304,200	\$355,000	\$50,800	Budget increased to account for workgroup costs and inflation.
3. QA and Data Services	\$175,000	\$225,000	\$235,000	\$10,000	Increase due to inflation.
4. Annual Reporting	\$115,000	\$209,000	\$131,000	(\$78,000)	Most of the decrease is because a RMP Update will be produced in 2020, which requires \$85k less than the 2019 Pulse Report.
5. Communications	\$162,000	\$173,000	\$179,000	\$6,000	Increase due to inflation.
Total	\$1,126,200	\$1,287,900	\$1,290,000	\$2,100	Ignoring the \$40k increase for the workgroup task and the \$85k decrease for the annual reporting, the effective increase for the budget is \$47.1k (3.9%), which is even with inflation.

## 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 \$390k, which is \$13.3k (3.5%) more than the 2019 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 RMP and other 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 \$355k which is 2% more than the 2019 amended budget. The cost of workgroup meetings (\$237k) accounts for more than half of this line item. The budget for staff time to prepare materials and proposals is \$177k; the budget for honoraria and travel costs for external science advisors is \$60k.

The major deliverables that will be completed with these funds are: quarterly Steering Committee meetings, quarterly Technical Review Committee meetings, and six Scientific Workgroup meetings with external science advisors in the spring. In 2018, the Emerging Contaminants Workgroup meeting was expanded to two days. Feedback on this approach was positive so we will repeat this process in 2020. In 2019, the Sediment Workgroup met twice over the course of the year and may need two meetings again in 2020. This is a relatively new workgroup, so it is meeting more frequently to determine the scope and priorities of the workgroup.

The original 2019 budget for governance tasks was \$304k but the costs for workgroup meetings were higher than expected. On August 13, 2019, the Steering Committee was made aware of the extra costs needed to run the workgroups in 2019. Approval of additional money for the task will be requested at the end of the calendar year when all other programmatic tasks have been completed. The budget for 2020 includes a \$40k increase, as well as a 2% increase for inflation. This is a reasonable budget assuming the same number of meetings as last year. The

only way to significantly reduce the cost of governance is to reduce the number of workgroup meetings.

### **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 \$235k, \$10k more than it was in 2019. The major quality assurance tasks for 2020 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 2020 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 \$131k. This budget is \$78k less than it was in 2019. The *RMP Update* report will be produced in 2020 and released at the Annual Meeting in October. The *RMP Update* is a less expensive product than the *Pulse of the Bay* that was prepared in 2019 (\$60k for the 2020 *RMP Update* vs \$140k for the 2019 *Pulse*). The RMP Update report will contain summaries of the recent plans and findings for each of the focus areas of the Program.

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 2019 was \$69k. The 2020 budget increased to \$71k to cover the increasing costs of catering, venues, and staff time.

### **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 2020 will be \$179k, \$6k more than 2019. 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 2020, 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 2020 Programmatic Budget by Subtask.

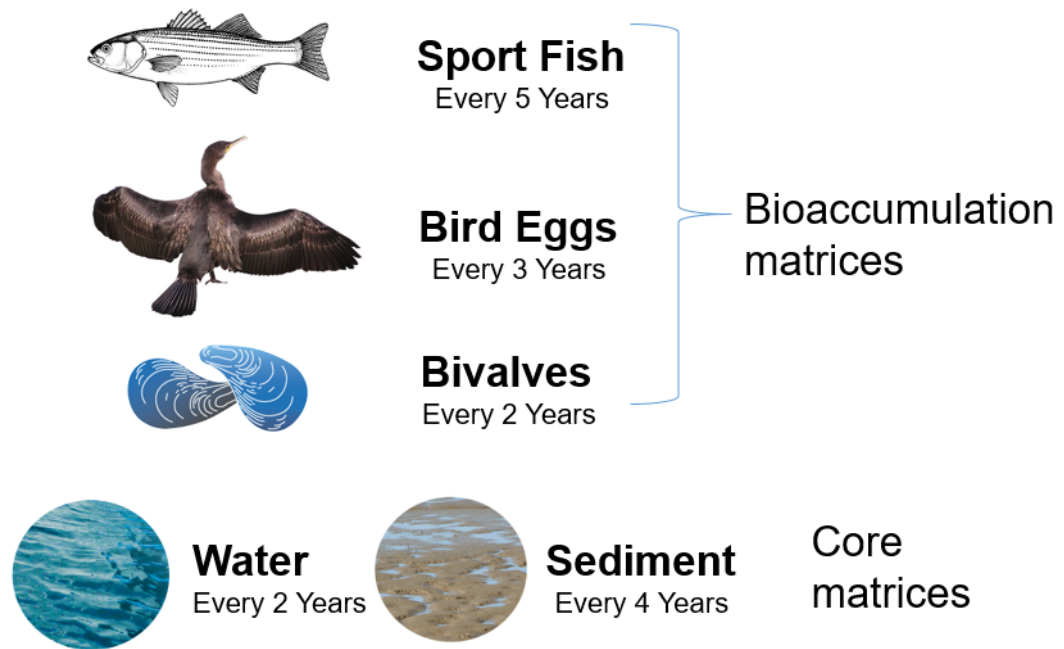
Task	Subtask	Direct Cost	Labor	2020 Total
1. Program Management	A. Budget and Workplan Development		\$46,200	\$46,200
	B. Contract and Financial Management		\$130,900	\$130,900
	C. Technical Oversight		\$65,450	\$65,450
	D. Internal Coordination		\$96,250	\$96,250
	E. External Coordination		\$42,350	\$42,350
	F. Administration	\$5,000	\$3,850	\$8,850
2. Governance	A. SC meetings	\$1,600	\$46,048	\$47,648
	B. TRC meetings	\$1,600	\$48,926	\$50,526
	C. WG meetings	\$4,000	\$192,826	\$196,826
	D. External Science Advisors	\$60,000		\$60,000
3. QA and Data Services	A. Quality Assurance System		\$32,900	\$32,900
	B. Online Data Access: CD3		\$68,150	\$68,150
	C. Database Maintenance		\$54,050	\$54,050
	D. Updates to SOPs and Templates		\$32,900	\$32,900
	E. DMMO Database Support		\$47,000	\$47,000
4. Annual Reporting	A. RMP Update Report	\$15,000	\$47,000	\$68,000
	B. Annual Meeting	\$19,000	\$50,000	\$63,000
5. Communications	A. Communications Plan Implementation	\$16,000	\$30,000	\$46,000
	B. Stakeholder Engagement		\$28,500	\$28,500
	C. Responses to Information Requests		\$15,000	\$15,000
	D. Outreach Products	\$500	\$10,500	\$11,000
	E. Presentations at Conferences and Meetings	\$12,500	\$54,000	\$66,500
	F. RMP Website Maintenance		\$12,000	\$12,000
<b>Grand Total</b>		<b>\$135,200</b>	<b>\$1,154,800</b>	<b>\$1,290,000</b>

## 2020 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 2020, bivalve and North Bay margins sediment sampling will occur. In addition, the RMP provides annual support to the USGS for suspended sediment and nutrient monitoring. This support will continue in 2020. We are also including a budget of \$37k for laboratory intercomparison studies. We may need to do an intercomparison study for copper in water depending on the results from the two methods used by Brooks Analytical Labs to analyze the 2019 water cruise samples. The total cost for S&T monitoring in 2020 will be \$1,353k.

Because 2020 is a light year for S&T monitoring, the budget for 2020 includes a \$275k 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 (\$250k)

This work is led by Dr. Maureen Downing-Kunz of the USGS California Water Science Center. The USGS maintains five suspended-sediment stations in the Estuary with RMP funding (i.e., Mallard Island, Richmond Bridge, Alcatraz Island, Exploratorium, and Dumbarton Bridge). This funding leverages suspended-sediment monitoring at one other station (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 2020 is increased from \$250k to \$400k and will support additional suspended sediment monitoring in the Bay.

### **USGS Menlo Park Support: Monthly Basic Water Quality (\$249k)**

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 2020. Options to continue these cruises beyond FY2020 are being discussed by the Nutrient Management Strategy Steering Committee.

### **2020 Bivalves (\$138k)**

The Status and Trends schedule calls for bivalve sampling every two years. Mussels (*Mytilus californianus*) will be collected from Bodega Head State Marine Reserve, an uncontaminated “background” site of known chemistry, and will be transplanted to seven targeted locations in the Bay. After ~100 days, mussels from the transplanted sites and a sample from Bodega Head will be collected for analysis. Three of the seven transplant sites serve as back-ups in case something goes wrong with the transplants at the four primary sites. At the same time, resident clams (*Corbicula fluminea*) are collected from two sites in the Sacramento River and San Joaquin River. Bivalve tissue samples will be analyzed for selenium and PAHs according to the S&T Monitoring Design.

The total cost for field collection and laboratory analyses will be \$120k. The cost for quality assurance and data management will be \$18k.

### **2020 North Bay Margins Sediment (\$319k)**

In 2015, funds freed up by reductions in water and open-Bay sediment monitoring were used to sample sediment on the margins of Central Bay. Sediment samples were collected from 40 sites on the Bay margins and were analyzed for mercury, PCBs, and trace metals. The budget for that study, including planning and report writing, was \$260k.



The preliminary results of that study were presented to the TRC in September 2016. The TRC supported collecting more sediment samples in the margin areas of the Bay. The South Bay margins were identified as the next study area and were sampled in 2017. Based on the results from the Central and South Bay efforts, the TRC recommended finishing the Bay margins sampling in the North Bay (San Pablo Bay and Suisun Bay). This final section will be sampled in 2020.

A total of \$319k has been budgeted for a North Bay Margins Sediment Study in 2020. These funds will be used to plan, implement, and report the results of the study. Forty stations will be randomly selected around the North Bay that are representative of the area, as well as capture areas of interest to the Bay RMP and the Wetland RMP. A more detailed study plan will be prepared by RMP staff and the TRC for Steering Committee approval before sampling begins.

### **Laboratory Intercomparison Studies (\$37k)**

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 2020 include PCBs in sport fish and dissolved copper in water. The latter will be dependent on the results from the two methods used by Brooks Analytical Labs to analyze the 2019 water cruise samples.

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. Depending on the results of the 2019 water cruise samples, an interlab comparison may need to be undertaken to determine which lab and method should be used to analyze future dissolved copper samples.

### **Sample Archive (\$62k)**

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 Schaeffer's Meat and Storage in Oakland. Long-term archives are stored at NIST in Charleston, South Carolina. Costs in 2020 will cover continued storage fees for the archives (\$35k for Schaeffer's; \$0k for NIST - we pay every other year), as well as labor to manage the archives and the archive database (\$12k). 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.

### **2020 Field Sampling Report and Support (\$23k)**

At the end of the field season, RMP staff will prepare a Field Sampling Report (if needed), which will summarize the 2020 field sampling effort. For some Status & Trends matrices, the Field Sampling Report is completed by our partners. The goal of the report is to document where samples were collected and any complications during field sampling. The report will not contain any data analysis or results. Funds will also be used to update the Field Operations Report, which documents how we collect samples. 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 (\$275k)**

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 2020, the Status and Trends monitoring costs are lower than average so a \$275k contribution will be made to the Set-Aside.

Table 5: Bay RMP 2020 Status and Trends Budget by Subtask.

Task	Subtask	Direct Cost	Labor	Subcontract	Grand Total
6. S&T Monitoring	A. USGS Sacramento Support			\$250,000	\$250,000
	B. USGS Menlo Park Support			\$249,000	\$249,000
	C. 2020 Bivalve Cruise		\$22,800	\$97,200	\$120,000
	D. 2020 Bivalve Data Mgmt		\$18,000		\$18,000
	E. 2020 North Bay Margins Sediment Monitoring				\$259,000
	F. 2020 Margins Sediment Report		\$60,000		\$60,000
	I. S&T Laboratory Intercomparison Studies	\$6,000	\$12,000	\$19,000	\$37,000
	J. Sample Archive	\$35,000	\$12,000	\$15,000	\$62,000
	K. S&T Field Sampling Report & Support		\$12,500	\$10,500	\$23,000
	<b>Total</b>				<b>\$1,078,000</b>
Contributions to Reserve Funds	S&T Monitoring Set Aside Contribution				\$275,000
	Monitoring Contingency Fund Replenishment				\$0
	Undesignated Funds				\$0*
	<b>Total</b>				<b>\$275,000</b>

## 2020 Special Studies

The total costs for special studies in 2020 will be \$1,281k. 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 2020 by Focus Area.

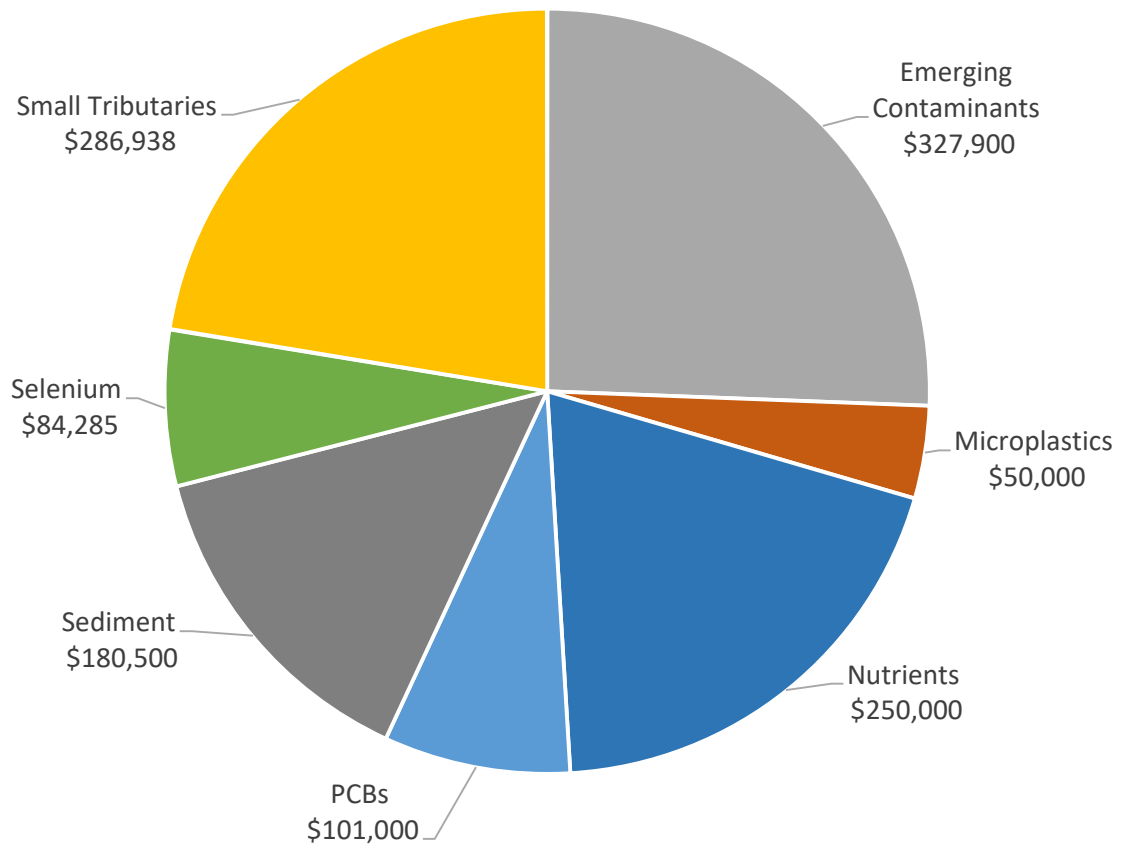


Table 6: Bay RMP 2020 Special Studies Budget by Subtask.

Task	Direct Costs	Labor	Subcontracts	Total
Special Study: EC Bisphenols in Wastewater Effluent*	\$1,900	\$39,200	\$10,200	\$51,300
Special Study: EC Bisphenols in Sediment*	\$1,000	\$10,000	\$9,600	\$20,600
Special Study: EC in Urban Stormwater Year 2*	\$11,200	\$110,000	\$59,800	\$181,000
Special Study: EC Strategy Support		\$75,000		\$75,000
Special Study: Microplastics Conceptual Model for Stormwater Microplastics Pathway to the Bay*		\$25,000	\$5,000	\$30,000
Special Study: Microplastics Strategy		\$20,000		\$20,000
Special Study: Nutrient Special Studies			\$250,000	\$250,000
Special Study: PCB PMU Monitoring with Passive Samplers in Steinberger Slough	\$1,000	\$22,000	\$68,000	\$91,000
Special Study: PCB Strategy Support		\$10,000		\$10,000
Special Study: Sediment Bathymetric Change Study			\$77,000.00	\$77,000
Special Study: Sediment Golden Gate Sediment Flux Modeling Study			\$45,000.00	\$45,000
Special Study: Sediment Bioaccumulation Threshold Review for PCBs		\$22,500		\$22,500
Special Study: Sediment Integrated Modeling and Monitoring Strategy	\$500	\$23,000	\$2,500.00	\$26,000
Special Study: Sediment Workgroup Support and Planning		\$10,000		\$10,000
Special Study: Selenium North Bay Clam and Water	\$16,275	\$9,000	\$49,010	\$74,285
Special Study: Selenium Strategy Support		\$10,000		\$10,000
Special Study: STLS Advanced Data Analysis		\$36,000		\$36,000
Special Study: STLS Regional Model Development		\$100,000		\$100,000
Special Study: STLS WY19 POC Recon Monitoring	\$2,000	\$98,000	\$10,000	\$110,000
Special Study: STLS Strategy Support and Coordination		\$40,000		\$40,000
<b>Grand Total</b>				<b>\$1,279,685</b>

\*These studies will be funded with the FY20 Alternative Monitoring Requirement (AMR) funds.

Appendix A. Special Study descriptions.

Study Name	Budget	Summary	Deliverables
Emerging Contaminants Strategy	\$75,000	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	\$181,000	Monitoring during the first, pilot year of a multi-year study on CECs in stormwater is being completed now. The study is designed to provide critical stormwater data needs for four 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; and 4) ethoxylated surfactants. A fifth contaminant class, bisphenols, was recommended for inclusion by the Emerging Contaminants Workgroup (ECWG) based on detections of bisphenol (BP) A and S in open Bay samples collected in summer 2017.	Sample collection; sample analysis; data review to inform year 3
Bisphenols in effluent and sediment	\$51,900	This study will measure bisphenols in wastewater effluent and archived margins sediment. In addition, sunscreens in wastewater effluent could be added on to this study. Bisphenol A was found throughout the Bay in a 2017 study and the Emerging Contaminants workgroup elevated bisphenol A to a CEC of moderate concern in April 2019. This study is broken down into three tiered design options of increasing scale based on available project funding. Option 1 would only include a screening of bisphenols in effluent. Option 2 would leverage sample collection costs and would include analysis of both bisphenols and sunscreens in wastewater effluent. Option 3 would including bisphenols	Sample collection; sample analysis; data QA/QC; technical report

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		and sunscreen in effluent as well as analysis of bisphenols in archived sediment samples.	
Microplastic Strategy	\$20,000	In early 2019, SFEI will complete a major two-year project on microplastic monitoring, modeling, and policy guidance, which was funded by the Gordon and Betty Moore Foundation with generous matches from the RMP and others. To continue to provide strategic support on this issue to the San Francisco Bay Regional Water Board and other RMP stakeholders, strategy funding is recommended for 2020. 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	In the fall of 2019, SFEI will complete a three-year project to characterize microparticles and microplastics in San Francisco Bay, funded by the Gordon and Betty Moore Foundation and others. A key element of this project was to characterize microplastics in stormwater. The findings suggest that the stormwater pathway contributes more than 200 times the number of microparticles than the wastewater pathway. Given this significant contribution, the Microplastics Workgroup recommends the development of a stormwater conceptual model for microplastics. This proposal is to fund that conceptual model development over a two-year time	Begin development of a conceptual model

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		frame.	
High Frequency Moored Sensor Network: data analysis, interpretation, and maintenance	\$125,000	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.	
Ship-based Monitoring for Nutrient-Related Parameters with USGS	\$125,000	Discrete samples and in-situ sensor-based measurements will be collected during USGS cruises in San Francisco Bay aboard the R/V Peterson on ~12 full-bay cruises and an additional ~12 South Bay cruises (Figure 1), with a SFEI staffer participating as a field technician during cruises. The overall program continues USGS' long-term water quality studies in San Francisco Bay, and is jointly funded by USGS, the RMP, and the NMS. Data from the program play critical roles in nearly all of NMS' activities, including condition assessment, hydrodynamic and biogeochemical model calibration and validation, and improved understanding of nutrient behavior and nutrient-related effects within SFB.	



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PCB Strategy Coordination and Technical Support	\$10,000	The goal of RMP PCB Strategy work over the next few years is to inform the review and possible revision of the PCB TMDL and the reissuance of the Municipal Regional Permit for Stormwater (MRP), both of which are tentatively scheduled to occur in 2020.	Update PCB Multi-year plan (June 2019)
Priority Margin Unit Stormwater PCB Monitoring	\$91,000	The objective of this study is to assess the loading and spatial distribution of PCBs in the Steinberger Slough/Redwood Creek (SS/RC) Priority Margin Unit (PMU) to address information gaps in the conceptual model for this area (Davis et al., 2017). Passive sampling device (PSD) measurements will complement sediment measurements to evaluate the spatial pattern of PCB concentrations in the surface and subsurface sediment. The study would provide information on current spatial patterns in PCB availability (which may provide insights on present patterns of loading) and long-term trends in loading from the tributaries to SS/RC.	Field sampling; technical report
Sediment workgroup support and planning	\$10,000	Coordinate workgroup activities and update the multi-year plan	Workgroup strategy and coordination; update the multi-year plan
Update of Erosion and Deposition in San Francisco Bay	\$77,000	In 2014 and 2015 the Ocean Protection Council (OPC) contracted for bathymetric surveys of large portions of San Francisco Bay. This data along with recent NOAA, USGS, and California State University Monterey Bay surveys can now be combined to create a revised bathymetric Digital Elevation Model (DEM) of the whole of San Francisco Bay (South Bay, Central Bay, San Pablo Bay, and Suisun Bay). Analysis of these surveys and comparison with the USGS DEMs of earlier surveys will provide an update on the quantities and patterns of erosion and accretion in the Bay over the past 25 to 35 years. Such	Final Report

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		information can be used to assess how the Bay has responded to changes in sediment supply from the Delta and tributaries and provide managers with data for making decisions on a variety of issues including exposure of legacy contaminated sediment and strategies for beneficial dredge disposal.	
Golden Gate Sediment Flux Modeling Study	\$45,000	This study proposes to simulate the sediment flux across the February 2017 high flow period, validate the model-predicted sediment flux using the one tidal cycle of flux observations collected by the USGS, and then compute the total predicted sediment flux through the Golden Gate over a 3-month period	Technical report
Sediment bioaccumulation threshold review for PCBs	\$22,500	This study will review all the PCB bioaccumulation test results from San Francisco Bay to assess the performance of current bioaccumulation testing trigger thresholds. The results of this review may be used to support reassessing these thresholds. The recommendations from this study will save dredgers and regulators time and money by improving the efficiency and consistency of dredging project evaluations.	Meeting with stakeholders, analyze PCB data from DMMO database, technical report
Integrated monitoring and modeling strategy	\$26,000	In 2017 and 2018, the Workgroup received funds to develop a sediment monitoring strategy to guide efforts for collecting data to fill key sediment knowledge gaps. During the May 2019 Workgroup Meeting, the members discussed the importance of having a strategy that included sediment modeling as well as monitoring. Developing an integrated sediment monitoring/modeling strategy will require additional workshops with regional sediment scientists beyond what has already been funded for strategy development, and inclusion of modeling elements in the strategy document.	Workshop with experts; integrated monitoring/modeling strategy

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		This request is for supplemental funds to cover additional workshops and inclusion of sediment modeling into the strategy.	
Selenium Strategy Coordination & Technical Support	\$10,000	These funds will support SFEI coordination and technical support for workgroup activities and continuing development of the Selenium Strategy.	Update Selenium Multi-Year Plan
Selenium in North Bay clams and water	\$74,285	Following the development of the North Bay Selenium TMDL, the San Francisco Bay Water Board asked the Selenium Workgroup to develop a long-term monitoring design for North Bay. Concurrent clam ( <i>Potamocorbula amurensis</i> ) and water samples will be collected from two USGS long-term clam monitoring stations in Suisun Bay in July-September 2019 and December 2019-February 2020. These two sampling periods precede (1) the fall sturgeon muscle plug study and (2) the sturgeon pre-spawning period, when reproductive females are particularly sensitive to selenium toxicity. Clam concentrations collected during these preceding months will (1) inform the linkage between dietary selenium patterns and observed sturgeon tissue selenium concentrations, and (2) provide information about selenium exposure patterns that can inform expectations of sturgeon selenium concentrations during the sensitive pre-spawning period when sturgeon will not be sampled directly.	Collect and analyze water and clam samples

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<p>Workgroup coordination and strategy</p>	<p>\$40,000</p>	<p>The goal of the STLS Program 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 and Hg sources, concentrations, loads, and the determination of trends in relation to management efforts and beneficial uses in San Francisco Bay. This task is to support the Small Tributaries POC stormwater concentration and loading program through monthly communication with BASMAA program and Water Board representatives, including regular check in phone calls, planning for and development of meeting agendas and materials, preparation of meeting summaries, and monitoring the agenda of and attendance at key external meetings.</p>	<p>Coordination meetings (8x per year)</p>
<p>POC watershed reconnaissance stormwater sampling</p>	<p>\$110,000</p>	<p>To support a weight-of-evidence approach for the identification and management of PCB and mercury (Hg) sources, stormwater samples will be collected to assess concentrations and particle ratios in stormwater in the areas that have a disproportionately larger area of older urban and industrial land use. Manual sampling will also provide opportunities for CEC piggybacking. The proposal is primarily a field study. The level of effort will be tailored to the amount of budget available. There is no phasing proposed.</p>	<p>Select sampling sites; assess tidal conditions needed for a range of sites; collect &amp; ship wet season samples; wet season sampling organization; SAP for POC monitoring; Lab analysis, QA, and data management; interpretation &amp; reporting</p>
<p>Regional model development to support management decisions</p>	<p>\$100,000</p>	<p>Following the approval of the MIP, this proposal is for funding in 2020 to implement the second task of the multi-year plan - developing a regional model for hydrology. Model development will follow the procedures outlined in the MIP. The hydrology model, once established, will be used as a basis for modeling sediment, POCs, and CECs in subsequent years.</p>	<p>Collect model input and calibration data; model setup; calibration; reporting</p>
<p>Advanced Data Analysis, Phase III</p>	<p>\$36,000</p>	<p>This project proposes to analyze additional available data (likely all the remaining sites) using enhanced ranking and congener fingerprinting methods. The outcome of this project will be a completed application of these new methodologies to existing stormwater datasets to help prioritize areas for</p>	<p>Technical report</p>

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		enhanced management or further sampling.	
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