



**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**

**2022 Detailed Workplan and Budget**

*January 2022*

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## Summary

In 2022 the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) is entering its 31<sup>st</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 2022, the proposed funding levels, and the deliverables for each task.

The total revenue and expenses for 2022 is \$4,038k as shown in Table 1 and Figures 1-2. We will adjust the dredger contribution when we receive the final in-Bay dredge disposal volumes for calendar year 2021. The majority of the expenses in 2022 (61%) will be for Status and Trends monitoring and special studies (Tasks 6-7). The cost for programmatic tasks (Tasks 1-5) is \$95k higher than 2021 due to increased expenses.

Table 1: Bay RMP 2022 Budget by Task.

	Grand Total
1. Program Management	\$360,000
2. Governance	\$363,100
3. QA and Data Services	\$255,000
4. Annual Reporting	\$182,000
5. Communications	\$184,000
6. S&T Monitoring	\$1,007,000
7. Special Studies	\$1,091,500
8. S&T Reserves	\$350,000
9. Unallocated	\$228,913
<b>Grand Total for Expenses</b>	<b>\$4,038,513</b>
Revenue from Fees	\$3,718,033
Supplemental POTW Payments for AMR Program (FY22)	\$320,480
<b>Grand Total for Revenue</b>	<b>\$4,038,513</b>

Figure 1: Bay RMP 2022 Revenue and Expenses.

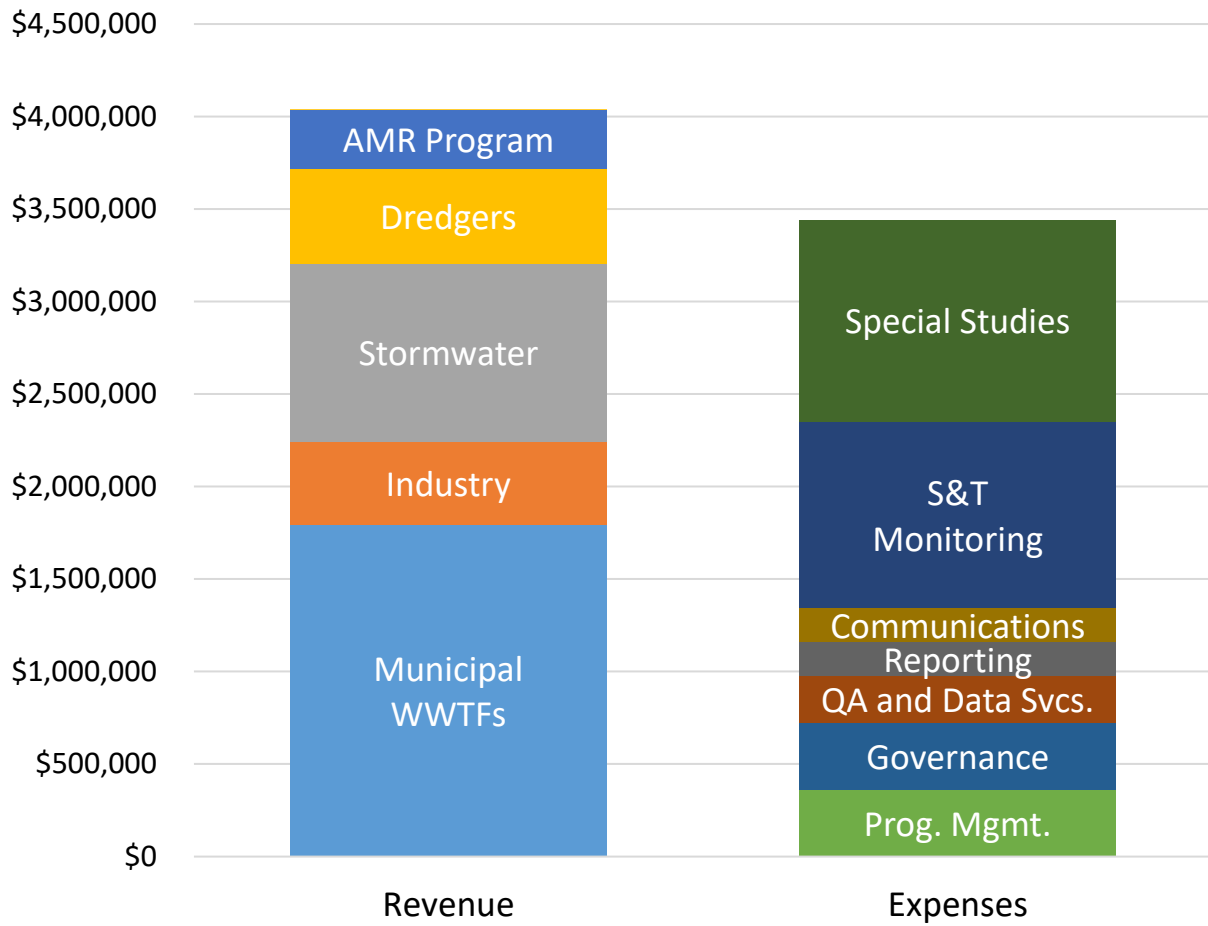
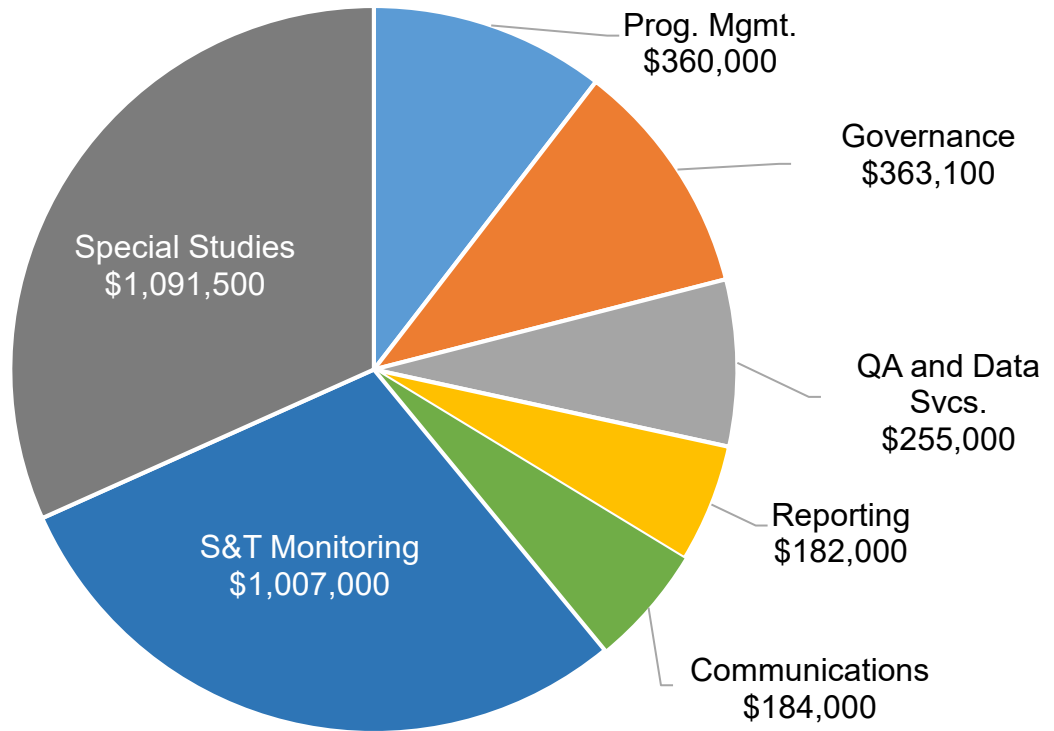


Figure 2: Bay RMP 2022 Budget by Task.



## 2022 Revenue

The total revenue for the RMP in 2022 is \$4,038,513. 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 2022 is \$4,038,033. The manner in which the fees are divided up between Program Participants is shown in Figure 3. Fees were not increased by 3% relative to the 2021 budget as approved by the Steering Committee on October 21, 2020.

b. Amended Monitoring & Reporting Order for RMP CEC studies (BACWA)

For FY2022, the RMP will receive approximately \$320,480 of supplemental funding from the municipal wastewater agencies under the Amended Alternate Monitoring and Reporting (AMR) Program. 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 2022 could be as high as \$15k, but is likely to be lower than recent years due to very low interest rates. Similar to 2021, this interest will not be included in the budget. Instead, the interest will accumulate in 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 later in this document.

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 (-\$720,375 not including the USACE shortfall) because dredger fees in 2018 through 2021 were lower than target fees. The 2022 budget assumes that dredger fees will fall \$200k below the target. This is an approximation based on in-Bay disposal volumes in 2019 and 2020. Revenue (and expense) in the budget may need to be revised based on actual fees from in-Bay disposal. The 2022 dredger fees, and whether there is a shortfall beyond the planned for \$200k, will be known in early 2022.

*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 a lot of monitoring. In 2022, the Status and Trends monitoring costs are lower than average so a \$350k contribution will be made to the S&T Designated Reserve. This contribution is discussed more in the section on Status and Trends expenses.

e. Undesignated Funds

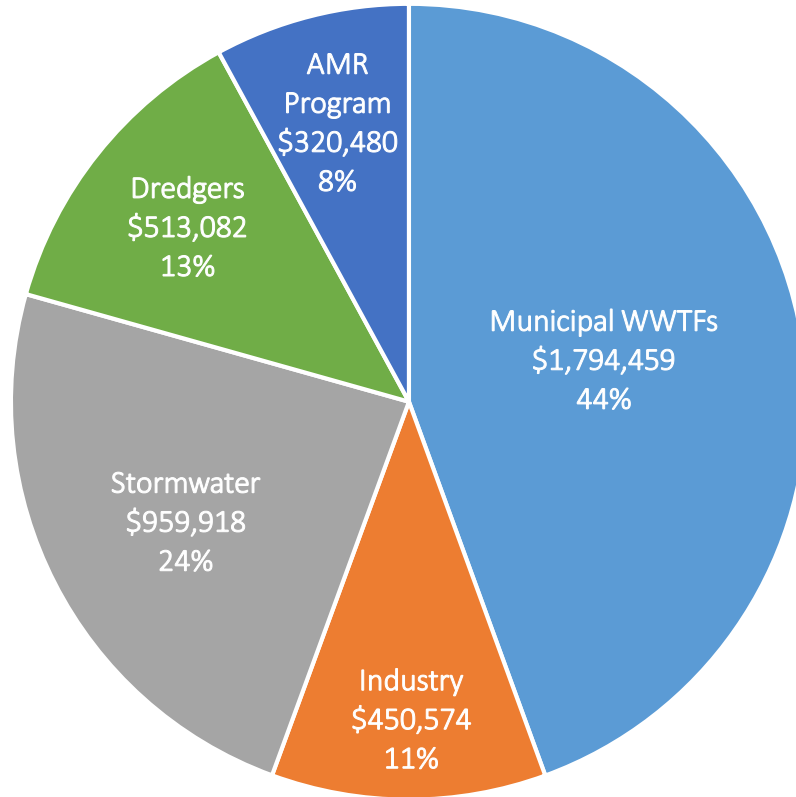
The RMP maintains a balance of Undesignated Funds for contingencies. Higher than anticipated revenues and elimination or reduction of lower priority elements sometimes leads to accumulation of funds that can be used for high priority topics at the discretion of the Steering Committee. The current balance of Undesignated Funds is \$946k.

Table 2: 2022 RMP Revenue.

<b>Revenue Category</b>	<b>Subcategory</b>	<b>Amount</b>
Participant Fees	Municipal wastewater	\$1,794,459
Participant Fees	Industrial wastewater	\$450,574
Participant Fees	Stormwater	\$959,918
Participant Fees	Dredgers	\$513,082*
Supplemental POTW Payments for AMR Program (FY22)		\$320,480
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>\$4,038,513</b>

\*This value does not represent the full 18% dredger contribution but rather the expected contribution from the USACE and non-USACE dredgers for in-Bay placement.

Figure 3: Bay RMP 2022 Fee Allocations for Program Participants.





## 2022 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 2022.

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 2022 is \$1,361k. This budget is \$111k higher than the 2021 budget. The cost increases are summarized in Table 3. The budgets for Program Management, Governance, QA and Data Services, and Communication were all increased for 2022 to account for salary increases and a return to in-person conferences (most likely). The Annual Reporting task budget decreased from 2021. We will produce a Pulse report in 2022 and use some funds from 2021 to support this task in 2022.

Table 3: RMP 2022 Programmatic Budget Compared to the 2021 and 2022 Budgets.

	2021 Budget	2022 Budget	Difference
1. Program Management	\$325,000	\$360,000	\$35,000
2. Governance	\$300,000	\$363,100	\$63,100
3. QA and Data Services	\$240,000	\$255,000	\$15,000
4. Annual Reporting	\$225,000	\$199,000	-\$26,000
5. Communications	\$160,000	\$184,000	\$24,000
Total	\$1,250,000	\$1,361,100	\$111,100

## **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 \$360k, which is \$35k (10%) more than the 2021 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 \$363k which is 20% more than the 2021 amended budget. The cost of workgroup meetings (\$253k) accounts for nearly two-thirds of this line item. The budget for staff time to prepare materials and proposals and attend workgroup meetings is \$193k; the budget for honoraria for external science advisors is \$60k. This budget assumes in person meetings for 2022, increasing 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. There is also an increasing need for more coordination between the workgroups, which requires additional staff time.

## **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 \$255k, \$15k more than it was in

2021. The major quality assurance tasks for 2022 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 2022. 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 2022 is \$50k to work through a long list of updates. In the future, the funding needed to maintain the database will be lower.

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

The total cost for these tasks will be \$199k. This budget is \$27k less than it was in 2021. *The Pulse* will be produced in 2022 and released at the Annual Meeting in October. Funds were allocated in 2021 for a *Pulse*, but the Steering Committee decided a *RMP Update* would suffice. The *RMP Update* is less expensive to produce than *The Pulse*, so the savings in 2021 will be used to support the 2022 *Pulse*. The *Pulse* 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 2021 was originally set at \$70k, assuming an in-person meeting at the David Brower Center in Berkeley. However, the meeting was held remotely and the budget was reduced by \$15k. In 2022, the budget for the annual meeting is \$70k, assuming that the 2022 meeting will be in person.

#### **5. Communications**

Communications tasks include implementing the RMP Communications Strategy, approved by the Steering Committee in July 2014. The total cost for these tasks in 2022 will be \$184k, \$24k more than the original 2021 budget. The 2022 budget is higher because conferences will most likely return to being in person. In addition, RMP staff are being asked to communicate results to an increasing number of agencies and media outlets. 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,

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social media). In 2022, 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, BAMS, 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, 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 and funding from 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 2022 Programmatic Budget by Subtask.

Task	Subtask	Direct Cost	Labor	2022 Total
1. Program Management	A. Budget and Workplan Development		\$44,300	\$44,300
	B. Contract and Financial Management		\$105,200	\$105,200
	C. Technical Oversight		\$66,500	\$66,500
	D. Internal Coordination		\$98,200	\$98,200
	E. External Coordination		\$38,800	\$38,800
	F. Administration	\$2,500	\$4,500	\$7,000
2. Governance	A. SC meetings	\$600	\$53,900	\$54,500
	B. TRC meetings	\$600	\$55,100	\$55,700
	C. WG meetings	\$1,000	\$48,000	\$49,000

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	D. External Science Advisors	\$60,000		\$60,000
	E. Emerging Contaminants WG		\$46,000	\$46,000
	F. Microplastics Workshop		\$11,500	\$11,500
	G. PCB WG		\$17,300	\$17,300
	H. Sediment WG		\$40,300	\$40,300
	I. Sources, Pathways, Loadings WG		\$28,800	\$28,800
3. QA and Data Services	A. Quality Assurance System		\$36,100	\$36,100
	B. Online Data Access: CD3		\$69,100	\$69,100
	C. Database Maintenance		\$63,800	\$63,800
	D. Updates to SOPs and Templates		\$36,100	\$36,100
	E. DMMO Database Support		\$49,900	\$49,900
4. Annual Reporting	A. RMP Pulse Report	\$20,000	\$109,000	\$129,000
	B. Annual Meeting	\$20,000	\$50,000	\$70,000
5. Communications	A. Communications Plan Implementation	\$16,000	\$31,100	\$47,100
	B. Stakeholder Engagement		\$27,000	\$27,000

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	C. Responses to Information Requests		\$20,700	\$20,700
	D. Outreach Products	\$500	\$12,200	\$12,700
	E. Presentations at Conferences and Meetings	\$12,000	\$47,200	\$59,200
	G. RMP Website Maintenance		\$17,300	\$17,300
Grand Total		\$133,200	\$1,227,900	\$1,361,100

## **2022 Status and Trends Monitoring and Reserve Funds**

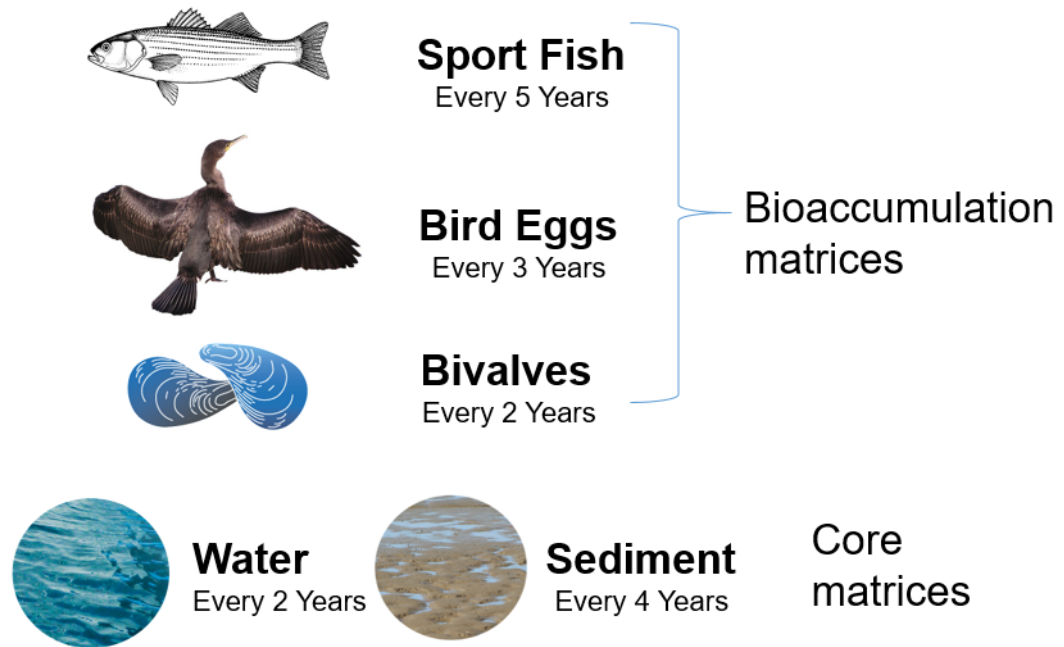
In 2020, the Steering Committee and Technical Review Committee began reviewing the Status and Trends (S&T) Program to identify how the program could be altered to accommodate the inclusion of CECs. This review resulted in recommended changes to the sampling matrices, frequency, and analytes included in the S&T Program. The changes are still being reviewed by the TRC and SC, but the proposed design is shown in Figure 4.

In 2022, based on the revised S&T design, wet and dry season water sampling and bivalve archive collections are scheduled to occur. Monitoring of selenium in clams and water will also occur at two sites in the North Bay for five months in 2022. Sturgeon tissue will also be collected for the RMP by the California Department of Fish and Wildlife during their annual sturgeon tagging efforts. In addition, the RMP provides annual support to the USGS for suspended sediment and nutrient monitoring. This support will continue in 2022. We are also including \$22k for laboratory intercomparison studies. The most likely intercomparison study will include in-house method development for suspended sediment concentration and bivalve tissue analyses from fresh and archived tissue. The total cost for S&T monitoring in 2022 will be \$1,357k, including \$350k deposited in the S&T set-aside account.

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

Figure 4: RMP Status and Trends Monitoring Schedule

# Status and Trends Monitoring



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

This work is led by Dr. Paul Work 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 2022 is \$400k and will support ongoing suspended sediment monitoring in the Bay.

## USGS Menlo Park Support: Monthly Basic Water Quality (\$258k)

This work is led by Dr. Brian Bergamaschi of the USGS California Water Science Center. Monthly water sampling is conducted to evaluate the spatial and temporal trends of water quality parameters at fixed stations throughout the Bay-Delta system. Measurements include salinity, temperature, dissolved oxygen, suspended sediment, and phytoplankton biomass. This information is necessary to follow the seasonal and inter-annual changes in water quality and estuarine habitat because they influence biological communities and the distribution and reactivity of trace contaminants.

The RMP pays a portion of the total cost of these cruises. The RMP, along with the Nutrient Management Strategy and the USGS California Water Science Center recently expanded an existing agreement that now includes the monthly Bay cruises. A multi-year agreement is being developed and will be implemented in FY2022.

### **North Bay Selenium in Clams and Water (\$127k)**

Samples are collected at two sites in the North Bay during two intervals, June-August and December-January. These sampling periods precede key stages in the white sturgeon life history (breeding and juvenile growth) by approximately two months. Data management will be done in 2022 and data will be reviewed to determine if sampling on a biennial basis is sufficient. Sturgeon tissue will also be collected and analyzed in 2022.

### **Winter Water Cruise (\$127k)**

The Status and Trends schedule includes winter water sampling at targeted sites near stormwater inputs into the Bay, as well as ambient Bay stations. Water samples will be collected during the storm season from targeted locations, including stations in Lower South Bay, and sent to laboratories for analyses of bisphenols, organophosphate esters, and PFAS. Samples will also be collected from ambient Bay stations during the Bay-wide nutrient cruises.

### **Laboratory Intercomparison Studies (\$22k)**

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 2022 include developing an in-house method for suspended sediment concentration, analysis for fresh and archived bivalve tissue to assess our revised S&T design to archive bivalve tissue, and interlab comparisons for CEC samples.

### **Sample Archive (\$43k)**

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 2022 will cover continued storage fees for the archives (\$37k for Schaeffer's), as well as labor to manage the archives and the archive database (\$6k). 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.



**Field Sampling Report and Support (\$10k)**

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.

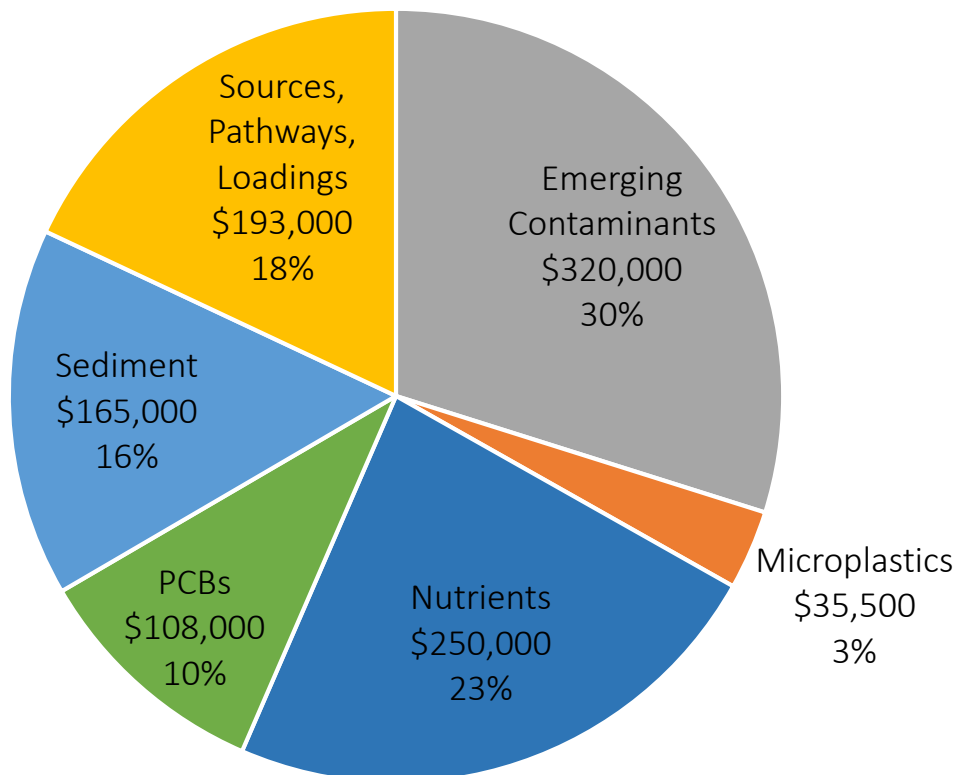
Table 5: Bay RMP 2022 Status and Trends Budget by Subtask.

Task	Subtask	Direct Cost	Labor	Subcontract	2022 Total
6. S&T Monitoring	A. USGS Sacramento Support			\$400,000	\$400,000
	B. USGS Menlo Park Support			\$258,000	\$258,000
	C. Winter Water Cruise	\$5,000	\$60,000	\$42,000	\$107,000
	D. Winter Water Cruise Data Mgmt		\$20,000		\$20,000
	E. S&T Bivalves		\$3,000	\$17,000	\$20,000
	F. North Bay Selenium Monitoring Data Mgmt		\$30,000		\$30,000
	G. North Bay Selenium Monitoring	\$3,000	\$16,000	\$78,000	\$97,000
	G. S&T Laboratory Intercomparison Studies	\$2,000	\$12,000	\$8,000	\$22,000
	H. Sample Archive	\$37,000	\$6,000	\$0	\$43,000
	K. S&T Field Sampling Report & Support		\$10,000		\$10,000
	<b>TOTAL</b>	\$47,000	\$157,000	\$803,000	\$1,007,000

## 2022 Special Studies

The total costs for special studies in 2022 will be \$1,092k and there's a budget of \$1,100k. 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 2022 by Focus Area.



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Table 6: Bay RMP 2022 Special Studies Budget by Subtask.

<b>Workgroup</b>	<b>Task</b>	<b>Direct Costs</b>	<b>Labor</b>	<b>Subcontracts</b>	<b>Total</b>
Strategy	CECs Strategy		\$90,000		\$90,000
Strategy	Microplastic Strategy		\$10,000		\$10,000
Strategy	Sediment Workplan		\$10,000		\$10,000
Strategy	STLS Program Management		\$35,000		\$35,000
ECWG	CECs in stormwater (Year 4 of 4)	\$13,000	\$67,000	\$20,000	\$100,000
ECWG	Stormwater monitoring strategy for CECs		\$46,000	\$4,000	\$50,000
ECWG	Tire-related contaminants in Bay water (wet season)	\$5,700	\$29,300	\$15,000	\$50,000
ECWG	Ethoxylated Surfactants in Ambient Water, Margin Sediment, Wastewater, Part 2	\$1,500	\$7,000	\$21,500	\$30,000
MPWG	RMP Tires Strategy		\$25,500		\$25,500
Nutrients	Moored sensor high-frequency observation network		\$200,000	\$50,000	\$250,000
PCBWG	In-Bay contaminant modeling (SLB)		\$46,000	\$10,000	\$56,000
PCBWG	Baseline Survey of PCBs in Surface Sediment and Prey Fish in the Steinberger Slough/Redwood Creek Complex			\$52,000	\$52,000

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Sediment	Temporal variability in sediment delivery to a North and a Central San Francisco Bay salt marsh			\$155,000	\$155,000
Sediment	Upload Data to Dredged Material Management Office (DMMO) Database		\$20,000		\$20,000
SPLWG	Small Tributaries Pollutants of Concern Reconnaissance Monitoring and Discrete Monitoring to Support Modeling		\$43,000		\$43,000
SPLWG	Regional Model Development to Support Watershed Loads and Trends		\$90,000		\$90,000
SPLWG	CEC stormwater load modeling exploration		\$25,000		\$25,000

Studies highlighted in red are funded or partially funded with the \$320k of Supplemental POTW Payments for AMR Program (FY22). An additional \$39,980 will fund wet season CEC monitoring in the Bay as part of the S&T Program.

Appendix A. Special Study descriptions.

Workgroup	Study Name	Budget	Summary	Deliverables
Emerging Contaminants	CECs in stormwater (Year 4 of 4)	\$100,000	<p>This study is designed to fill critical stormwater data needs for five contaminant classes: 1) a new, targeted list of CECs specific to stormwater; 2) per- and polyfluoroalkyl substances (PFAS); 3) organophosphate ester (OPE) plastic additives/flame retardants; 4) bisphenol plastic additives; and 5) ethoxylated surfactants. Year 1 of this multi-year study was focused on study design and pilot monitoring. Years 2 and 3 were intended to include a significant amount of monitoring and laboratory analysis, though this was constrained due to relatively dry weather and the Coronavirus. As a result, there is funding left in previous years’ budgets, which will be directed towards initial monitoring and all laboratory analysis to occur in Year 4. As scoped in the present proposal, Year 4 would be the final year of funding, and would support further site selection and sample collection for this Bay Area-wide screening study, as well as supplemental allocations for data management, preparation of scientific manuscripts, and preparation of a summary of results to inform water quality managers.</p>	<p>Site selection and reconnaissance, field collection, lab analysis, data management and QA, draft/final manuscript and management summary</p>
Emerging Contaminants	Stormwater monitoring strategy for CECs	\$50,000	<p>Prior RMP projects – including a multi-year stormwater CECs monitoring project initiated in 2018 – identified the presence of CECs of moderate and potential concern in urban runoff. Available data from prior sampling are relatively limited, but nevertheless provide evidence that stormwater is a major pathway for CECs to enter San Francisco Bay. Due to high CECs monitoring costs and technical challenges, a well-thought out, carefully focused approach will be essential. The goals of this project are (1) to develop an approach for prioritizing CECs for stormwater monitoring, and (2) to develop an approach for sampling stormwater CECs in the context of the specific physico-chemical properties, sources, transport</p>	<p>Draft/final strategy, update to SPLWG and ECWG</p>

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			<p>pathways, and fate of prioritized CECs. A stormwater CECs monitoring strategy is the first step in establishing a long-term stormwater CECs monitoring program and would form the basis for addressing both CECs and Sources, Pathways, and Loadings (SPL) management questions, such as estimating CECs loads discharged to the Bay.</p>	
Emerging Contaminants	Tire-related contaminants in Bay water (wet season)	\$50,000	<p>6PPD-quinone and other toxicologically relevant contaminants derived from tires have been observed in Bay Area stormwater. These compounds have not yet been quantified in Bay receiving waters. As part of its Status and Trends (S&amp;T) program, the RMP is expected to undertake a pilot monitoring effort to quantify a number of contaminants in Bay water samples collected following storm events to provide information on the impact of stormwater discharges on Bay contaminant concentrations. This proposed study would leverage the pilot S&amp;T effort to evaluate the concentrations of tire and roadway contaminants in Bay water. Results will indicate whether these stormwater-derived contaminants reach concentrations of concern within receiving waters, filling a data gap relevant to the RMP tiered risk-based framework for emerging contaminants. Findings will also be used to evaluate whether wet season monitoring would be useful to incorporate into the Status and Trends monitoring design for Bay water.</p>	<p>Sampling plan, field sampling, lab analysis, QA/QC and data management, presentation at ECWG, manuscript</p>

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<p>Emerging Contaminants</p>	<p>Ethoxylated Surfactants in Ambient Water, Margin Sediment, Wastewater, Part 2</p>	<p>\$30,000</p>	<p>Ethoxylated surfactants are nonionic surfactants that are widely used in industrial and household products. Results from a 2019 RMP special study quantified a broad suite of ethoxylated surfactants in Bay water, effluent, and stormwater, including lauryl alcohol ethoxylates (C12-14EO), tridecyl alcohol ethoxylates (C16EO), nonylphenol ethoxylates, and octylphenol ethoxylates. These results represent one of the most comprehensive analyses of these compounds in environmental samples to date. Due to limitations in the analytical method, key degradate compounds in this contaminant class (i.e., nonylphenol, octylphenol, and their short chain ethoxylates) were not quantified, which limits our ability to fully address the emerging contaminants workgroup management questions.</p> <p>This proposed study will supplement and fill key data gaps by supporting Duke University to update methods and re-analyze previously analyzed samples to include nonylphenol, octylphenol, and their short chain ethoxylates in addition to the analytes quantified previously. Additional wastewater samples will also be collected to confirm the range of values quantified from previously collected samples. The full dataset will guide development of a monitoring and management strategy for this class of contaminants that has been classified by the RMP as a Moderate Concern in the tiered, risk-based framework for CECs. This project will supplement remaining funds from the 2019 study to complete project deliverables.</p>	<p>Sampling design for wastewater collections, sample collection, lab analysis, QA/QC and data management, presentation at ECWG meeting, draft/final report</p>
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Microplastic	RMP Tires Strategy	\$25,500	<p>We propose to develop a cross-workgroup strategy for the RMP’s efforts around tire microplastics and tire-related water pollutants. The Tires Conceptual Model project, which was funded in 2020 and is currently underway, is identifying key information gaps around the connections between tires and aquatic habitats. The next step is to establish a short-term RMP strategy and multi-year plan spanning up to 5 years, based on stakeholder needs and the special capabilities of the RMP. This project is being recommended in parallel with other tire and stormwater CECs projects because of the high level of stakeholder interest in tire-related water pollution. To prepare the strategy, we will identify relevant, specific management policies or decisions that are being evaluated, and priority RMP stakeholder tire-related science information needs that are not being addressed by others. We will then outline and work with experts and RMP stakeholders to refine a set of recommended RMP special studies related to tires for the years 2023-2028. Because tire-wear microplastics release tire-related water pollutants into stormwater, this is a cross-workgroup strategy proposal involving the Microplastics Workgroup (MPWG), the Emerging Contaminants Workgroup (ECWG), and the Sources, Pathways, and Loadings Workgroup (SPLWG). This inter-workgroup strategy will be designed as a short-term companion to the MPWG, ECWG, and SPLWG multi-year plans. Tire-related work that is needed after the 5-year horizon of this strategy would be integrated into future workgroup-specific strategies and multi-year plans. It will address RMP MPWG, ECWG, and SPLWG management questions.</p>	Draft/final strategy, semi-annual updates to STLS
Nutrients	Moored sensor high-frequency observation network	\$250,000	<p>Bay-wide cruises have been critical to our understanding of the system. The Bay is spatially and temporally heterogeneous, however, and monthly measurements miss changes in water quality that are driven by short time scale processes, including tidal forcing, wind, and biological cycles. The eight sensors in the moored, high-</p>	Sensor maintenance; data management

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			frequency observation network in South Bay collect water quality data every 15 minutes and contribute to our understanding of Bay processes that affect nutrient and chlorophyll dynamics.	
PCBs	Baseline Survey of PCBs in Surface Sediment and Prey Fish in the Steinberger Slough/Redwood Creek Complex	\$52,000	This study would assess the spatial distribution of PCBs in surface sediment and prey fish in the Steinberger Slough/Redwood Creek (SS/RC) priority margin unit (PMU) to address information gaps in the conceptual model for this area and establish baseline data for evaluating the response of these receiving waters to load reduction efforts in the watershed. Funding for this effort would be spread over two years.	Draft/final technical report
PCBs	In-Bay contaminant modeling (SLB)	\$56,000	This study would begin implementation of a strategy and multi-year workplan for modeling PCBs and contaminants of emerging concern (CECs) in the Bay. Modeling is needed to address several management questions that are a priority for PCBs and CECs. For both PCBs and CECs, understanding fate in margin areas that receive stormwater inputs is a high priority information need. The first year of this multi-year project will focus on developing an overall model for the Bay, but with an initial focus on San Leandro Bay, an area of interest for both PCBs and CECs, and where a relatively extensive set of empirical data for PCBs has been developed. A preliminary plan for 2022 is to perform three tasks: 1) Refine existing conceptual site model; 2) Select hydrodynamic and sediment transport modeling frameworks; 3) Develop hydrodynamic and transport model. The 2022 workplan will need additional development and refinement – this will be done with guidance from the PCBWG and ECWG.	Model development, validation, and calibration; draft/final report

Sediment	Temporal variability in sediment delivery to a North and a Central San Francisco Bay salt marsh	\$155,000	<p>Salt marshes provide critical habitat as well as coastal protection. One of the key sediment management questions for San Francisco Bay is whether available sediment is sufficient for marshes to keep pace with sea-level rise. We propose to investigate the influence of tides, waves, and water levels on near-marsh suspended sediment concentration (SSC) and deposition on tidal marsh surfaces. At two marsh sites, we will measure SSC in intertidal and subtidal shallows adjacent to the marsh, deposition and accretion on the marsh (monthly), and the variation in deposition with elevation and vegetation density and type. Data collection will take place over 12 months to determine seasonal effects. We propose two sites: San Pablo Bay National Wildlife Refuge, and Corte Madera Bay in Central Bay. Final site selection will depend on site accessibility and suitability for the study. Our overall objectives are to investigate 1) the relationship between SSC adjacent to the marsh edge and deposition in the marsh, 2) the relationship between SSC adjacent to the marsh edge, in subtidal shallows, and at long-term channel monitoring stations; 3) the influence of tides, waves, Delta outflow, and water levels on SSC adjacent to a marsh and sediment deposition in the marsh; and 4) to produce data sets for testing numerical models of sediment transport between the Bay and marshes. Results will be useful for prioritizing marsh restoration sites, assessing restoration actions, and understanding mechanisms of sediment delivery to marshes.</p>	Data release, draft/final report, presentation to RMP, presentation at Bay Delta Science or State of the Estuary Conference
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Sediment	Upload Data to Dredged Material Management Office (DMMO) Database	\$20,000	<p>In 2018, SFEI began hosting and managing the DMMO database and website (<a href="http://www.dmmosfbay.org">www.dmmosfbay.org</a>). A DMMO Project Team with representatives from the partner agencies USEPA, USACE, SFBRWQCB, and BCDC convene regularly to set priorities for SFEI. SFEI is also responsible for uploading testing results to the DMMO database. Due to the limited budget, SFEI has focused on uploading testing results provided in the standardized data template format, since there are established procedures and documentation for uploading these results to the database. However, since providing results in the data template format is currently not a requirement, there is a backlog of data that have been provided in a PDF report that needs to be transcribed to the template format and uploaded to the database.</p> <p>This proposed project will work through the backlog of datasets pending upload to the DMMO database and make these results accessible to researchers, managers, and the DMMO user community. Tasks include (1) coordinating with the DMMO Project Team to prioritize the list of approximately 80 datasets that are pending upload; (2) transcribe the results to the data template format and upload the results to the DMMO database; and (3) make the results available on the DMMO website to support DMMO data mining and synthesis efforts.</p>	<p>Prioritized list of datasets to upload; transcribe and upload datasets; DMMO website data release</p>
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Sources, Pathways, and Loadings	Small Tributaries Pollutants of Concern Reconnaissance Monitoring and Discrete Monitoring to Support Modeling	\$43,000	<p>The RMP has monitored stormwater throughout the region using multiple techniques over the last 19 years. With the exception of 2011, from 2002 to 2014, intensive loads monitoring during multiple storms and years was carried out to compute loads in single watersheds and support modeling to estimate regional loads. In contrast, in 2011 and from 2015 to 2021, a reconnaissance monitoring style (single storm composite samples) was adopted to identify high leverage watersheds of potential management interest. However, now in 2021, the RMP stormwater stakeholders are calling for data to support both goals (identifying high leverage watersheds and regional modeling). This project proposal addresses both needs by presenting a flexible monitoring design that includes both reconnaissance monitoring at multiple sites and discrete sampling at a few selected and existing flow stations to support modeling. Stormwater monitoring for pollutants of concern occurs in coordination with stormwater monitoring for the Emerging Contaminants Workgroup (ECWG) (for specific emerging contaminants), the PCBs Workgroup (PCBWG), and potentially future work overseen by the Sediment Workgroup (SedWG). Decisions about where to monitor during each storm will be supported by a decision tree that will be developed in consultation with those WG leads.</p> <p>This is primarily a field study and the level of effort will be tailored to the amount of budget available. There is no phasing proposed.</p>	Site selection, sample collection, lab analysis, QA/QC and data management, draft/final report
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Sources, Pathways, and Loadings	Regional Model Development to Support Watershed Loads and Trends	\$90,000	<p>The 2018 Small Tributary Loading Strategy (STLS) prioritized further assessment of the spatial and regional estimates and temporal trends in contaminant loads, and developed a multi-year plan for model development. Although initially conceived as a tool for evaluating PCB and Hg trends, advice provided at the May 2019 SPLWG meeting placed greater emphasis on developing a model to support better estimates of loads of sediment and other contaminants in addition to PCBs and Hg. The focus in 2021 is on developing and calibrating the sediment model. This proposal is for funding in 2022 for the fourth year of the multi-year modeling plan and focuses on developing the contaminant model. The two main objectives of the model development are to: 1) create a flexible watershed modeling platform for general contaminant simulation; and 2) answer management questions related to PCBs, Hg, and emerging contaminants. The model will initially be used to evaluate PCB and Hg loadings at watershed and regional scales. The trial using these two well-sampled pollutants will provide a proof of concept for other contaminants. The developed model structure can be a basis for and further modified for other contaminants in the future. Trends associated with control measures, land-use changes, or other scenarios could then be explored.</p>	Data collation and preparation, model setup and calibration, draft/final report
Sources, Pathways, and Loadings	CEC stormwater load modeling exploration	\$25,000	<p>Previous studies provide evidence that stormwater is a major pathway for contaminants of emerging concern (CECs) to enter San Francisco Bay. But how the loads of individual CECs from the stormwater pathway compare to loads from other pathways is a high priority management question. Building upon the CECs watershed modeling roadmap being created by the RMP 'Integrated watershed modeling and monitoring implementation strategy' project, this project would provide a basis for the RMP to select appropriate modeling tools for screening-level CECs stormwater loads estimation. While individual CECs have a diverse array of source/use and physico-chemical properties relevant to stormwater,</p>	Presentations to ECWG and SPLWG, draft/final report outlining modeling options

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			<p>we anticipate that our initial, screening level loads estimation approach will be broadly applicable. The specific goals of this study are: 1) review the existing modeling options and approaches for estimating emerging contaminant stormwater loads; 2) examine the suitability of modeling options for early and inexpensive estimation of CECs stormwater loads given the characteristics of the Bay watershed and the anticipated relatively limited monitoring data available in the near term; and 3) provide recommendations for modeling capacity development and monitoring design to support screening-level CECs stormwater loads estimation in the near term. This model review study will help address both SPLWG and ECWG management questions.</p>	
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