

## 2016 Special Studies Proposals

Workgroup	Proposal Name	Principal Investigator	Funding Request	Notes	Page Number in Agenda Package
Dioxin	Dioxin Synthesis Report	Don Yee (SFEI)	\$40,000		27-29
Emerging Contaminants	Emerging Contaminants Strategy	Rebecca Sutton (SFEI)	\$48,000	First of four funding priorities; would support pro bono studies	30-36
Emerging Contaminants	Non-targeted Analysis of Water-soluble Compounds	Rebecca Sutton (SFEI) and Lee Ferguson (Duke University)	\$52,000	Second of four funding priorities	37-46
Emerging Contaminants	Fipronil and Degradates in WWTP Influent and Effluent	Rebecca Sutton and Jennifer Sun (SFEI)	\$30,000	Third of four funding priorities	47-53
Emerging Contaminants	Monitoring Microplastics in the Margin	Rebecca Sutton (SFEI)	\$14,325	Fourth of four funding priorities	54-59
Exposure and Effects	Effects of Clay on E. Estuariarius	Brian Anderson (UCD)	\$30,000	State Board funding may be available to cover some of the cost.	60-63
Exposure and Effects	Ocean Acidification Strategy Development	Philip Trowbridge (SFEI)	\$30,000		64-68
Nutrients	Dissolved Oxygen monitoring in shallow margin habitats	David Senn (SFEI)	\$200,000	Approved by NSC on June 12, 2015	69-72
Nutrients	Moored sensor monitoring	David Senn (SFEI)	\$200,000	Approved by NSC on June 12, 2015	73-76
PCBs	Priority Margin Unit Conceptual Model Development	Jay Davis (SFEI)	\$80,000		77-82
Selenium	Selenium Strategy Support	Jay Davis (SFEI)	\$10,000	This proposal was a top priority for the WG	83-84
Selenium	2016 Sturgeon Derby Monitoring	Jay Davis (SFEI)	\$37,000	This proposal was a top priority for the WG	85-90
Selenium	2016 Sturgeon Muscle Plug Monitoring	Jay Davis (SFEI)	\$42,000	This proposal was a lower priority for the WG	91-97
Sources, Pathways and Loadings	Implementation of Small Tributaries Loading Strategy	Lester McKee and Jen Hunt (SFEI)	\$416,000		98-104
<b>Total</b>			<b>\$1,229,325</b>		

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Dioxin	Dioxin Synthesis Report	Don Yee (SFEI)	\$40,000	Additional data on dioxin concentrations and loads have been collected in various media since the last dioxin synthesis in 2004. This effort would formally report this new information and evaluate the needs or potential for additional data collection or management action for dioxins. Aside from a set of bird egg data in 2012 and fish data in 2014, much of the data will be 5 years old or older in 2016.		27-29
Emerging Contaminants	Emerging Contaminants Strategy	Rebecca Sutton (SFEI)	\$48,000	<p>Increasing engagement on emerging contaminants issues by the San Francisco Bay Regional Water Board, RMP stakeholders, and the general public is reflected in headline news as well as policy actions at local, state, and federal levels. Work to advance the RMP's Emerging Contaminants Strategy has increased significantly in the last year, driven by increased demand for independent information on key contaminants. Critical new deliverables, such as assisting the Water Board as the agency prepares emerging contaminants action plans for the Bay, have been added to the primary deliverables of this strategy: Tracking new information regarding contaminant occurrence and toxicity and updating the RMP's tiered risk and management action framework for emerging contaminants in San Francisco Bay (see Sutton et al. 2013). Coordination of pro bono analyses is another rapidly expanding component of the strategy fund. For this reason, this proposal requests an additional \$13,000 for strategic emerging contaminants tasks.</p> <p>New developments like the recently disseminated pilot CEC study guidance (Dodder et al. 2015), along with the completion of critical RMP studies on non-targeted analysis, and frequent questions concerning process, indicate the need to formally revise the RMP CEC strategy document (Sutton et al. 2013). This proposal requests an additional \$15,000 to create a fully updated strategy document as a key deliverable for the 2016 Emerging Contaminants Strategy Special Study.</p>	First of four funding priorities; would support pro bono studies	30-36

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Emerging Contaminants	Non-targeted Analysis of Water-soluble Compounds	Rebecca Sutton (SFEI) and Lee Ferguson (Duke University)	\$52,000	Non-targeted analysis, a key element of the RMP's CEC strategy and recent state CEC guidance, can help to provide a measure of assurance that the RMP is not missing unexpected yet potentially harmful contaminants simply because of failures to predict their occurrence based on use or exposure prioritization criteria. The RMP has completed non-targeted analysis of fat-soluble compounds in bivalve tissue and seal blubber, but another major class of chemicals, water-soluble (polar) organic contaminants, has not been evaluated. This proposed study will fill this data gap by conducting a broad screen of ambient Bay water (passive and grab samples) and wastewater (composite samples) for polar organic compounds such as: detergents and other surfactants, pesticide and pharmaceutical breakdown products, and plastic additives. This type of non-targeted study will lay the foundation for future targeted CEC monitoring by helping to identify new potential contaminants of concern without a priori knowledge of their occurrence.	Second of four funding priorities	37-46
Emerging Contaminants	Fipronil and Degradates in WWTP Influent and Effluent	Rebecca Sutton and Jennifer Sun (SFEI)	\$30,000	Fipronil is a moderate concern (Tier III) CEC for the Bay. Recent RMP-funded monitoring of 24-hour composite samples of influent and effluent from eight Bay wastewater treatment plants (WWTPs) assessed dissolved phase concentrations of fipronil and degradates. A lack of information concerning levels of particle-associated contaminants limits the conclusions that can be drawn from existing data concerning the effects of treatment on contaminant discharges. The proposed study aims to fill this data gap, by analyzing total water samples of influent and effluent. Findings are likely to influence ongoing efforts within the California Department of Pesticide Regulation aimed at reducing environmental contamination and ecological impacts of fipronil and its degradates.	Third of four funding priorities	47-53
Emerging Contaminants	Monitoring Microplastics in the Margin	Rebecca Sutton (SFEI)	\$14,325	Building upon the RMP Special Study for 2015 to characterize microplastics in Bay Area effluent and ambient Bay sediment and water, this study seeks to augment the planned 2015 Bay Margins Sediment Study by including microplastics monitoring in the study design. Microplastics are well known to accumulate in sediments from densely urban areas. This study will provide a characterization of microplastics in surface sediments in the shallow Central Bay margin areas, thereby addressing an important data gap.	Fourth of four funding priorities	54-59

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Exposure and Effects	Effects of Clay on E. Estuariarius	Brian Anderson (UCD)	\$30,000	This study will confirm results of the 2014 Regional Monitoring Program (RMP) Special Study showing that sediment clay causes size specific effects on the amphipod Eohaustorius estuariarius. Experiments with field sediments from the San Francisco Estuary will be used to corroborate laboratory experiments conducted in 2014 which showed that larger amphipods were less tolerant of kaolin clay. These results have the potential to inform policy regarding the use of this species in monitoring clay-rich sediments. These experiments may result in a revision of the toxicity testing protocol to use smaller test organisms to minimize the confounding effect of clay on toxicity test results.	State Board funding may be available to cover some of the cost.	60-63
Exposure and Effects	Ocean Acidification Strategy Development	Philip Trowbridge (SFEI)	\$30,000	Ocean acidification has the potential to cause widespread impacts to marine ecosystems by reducing calcification in key marine organisms and altering the impacts of other water quality contaminants on wildlife. However, the current status and impacts of ocean acidification on the San Francisco Bay are largely unknown. This study will convene ocean acidification researchers, managers, and monitoring entities to assess whether ocean acidification is a likely concern in the Bay, and to identify its potential impacts of beneficial uses, cost-effective monitoring strategies, and potential management actions.		64-68
Nutrients	Dissolved Oxygen monitoring in shallow margin habitats	David Senn (SFEI)	\$200,000	Most data on dissolved oxygen concentrations over the past ~20+ years have been collected in deep subtidal habitats, and DO concentrations, in general, have met or exceeded the Basin Plan criterion of 5 mg/L or 80% saturation. Considerably less data is available for shallow margin habitats in San Francisco Bay, including sloughs, creeks, tidal wetlands, and former salt ponds undergoing restoration. One excellent data set, collected in Alviso Slough demonstrates that low DO exhibits strong periodicity and persists at levels <2-3 mg/L for 12 hours or more over several days. Funding was allocated in FY2015 and work moved forward on study design, field reconnaissance, equipment purchasing, and sensor deployment. Funding is being requested for FY2016 to continue this project, which will determine the frequency, duration, and spatial extent of low DO in representative margin habits (sloughs, creeks) using moored sensors complemented by field sampling/calibration. This project's major goals, include: (1) Characterize temporal (tides, diel) and spatial patterns in DO and related parameters; (2) Determine the frequency and duration of events with DO < 5 mg/L; (3) Through the use of basic modeling and field data, semi-quantitatively test hypotheses for why low DO occurs.	Approved by NSC on June 12, 2015	69-73

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Workgroup	Proposal Name	Principal Investigator	Funding Request	Abstract	Notes	Page Number in Agenda Package
Nutrients	Moored sensor monitoring	David Senn (SFEI)	\$200,000	To better assess the Bay's condition, and to collect high-frequency data to calibrate water quality models, the RMP launched a moored sensor network in 2013. We propose this work be continued in FY2016, with an increased emphasis on data interpretation to better understand the factors that regulate the budgets and concentrations of DO, phytoplankton biomass, and nutrients. FY 2016 activities will include: (1) Sensor maintenance and calibration; (2) Data management, including QA/QC, and applying semi-automated routines to correct for noise and sensor drift; (3) Sensor calibration through discrete sample collection to improve accuracy and precision of predictions; (4) Install SUNA nitrate sensors at 1-2 sites and assess the importance of this data; (5) Continued development of the web-based platform ( <a href="http://www.enviz.org">www.enviz.org</a> ) for visualizing and downloading historic and real-time continuous data, and; (6) Data analysis and interpretation to inform understanding about factors that influence DO, phytoplankton biomass, and nutrient cycling.	Approved by NSC on June 12, 2015	74-76
PCBs	Priority Margin Unit Conceptual Model Development	Jay Davis (SFEI)	\$80,000	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. Conceptual model development for a set of representative priority margin units will provide a foundation for establishing an effective and efficient monitoring plan to track responses to load reductions and also help guide planning of management actions.		77-82
Selenium	Selenium Strategy Support	Jay Davis (SFEI)	\$10,000	A selenium TMDL for the North San Francisco Bay is in development by the Regional Water Board. Development of a TMDL for the South Bay will be considered after the North Bay TMDL is completed. Funds for this task would enable SFEI to continue to convene the Selenium Strategy Team to allow discussions of plans for the North Bay TMDL and the consideration of a TMDL for South Bay, to develop RMP workplans to support these efforts, and for any small-scale synthesis of information that is necessary to support these discussions.	This proposal was a top priority for the WG	83-84

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Selenium	2016 Sturgeon Derby Monitoring	Jay Davis (SFEI)	\$37,000	The Regional Water Board is currently developing a selenium TMDL for the North San Francisco Bay, which will establish a target concentration in white sturgeon muscle tissue as the basis for evaluating impairment. This study proposes the collection of tissues from female sturgeon sacrificed as part of the annual Sturgeon Derby in order to establish relationships between selenium concentrations measured in non-lethally collected tissues (muscle plugs, fin rays) and those more closely tied to, or predictive of, adverse impacts in white sturgeon due to selenium (ovaries, otoliths).	This proposal was a top priority for the WG	85-90
Selenium	2016 Sturgeon Muscle Plug Monitoring	Jay Davis (SFEI)	\$42,000	The Regional Water Board is currently developing a selenium TMDL for the North San Francisco Bay, which will establish a target concentration in white sturgeon muscle tissue as the basis for evaluating impairment. In 2014, the RMP successfully collaborated with CDFW to non-lethally collect white sturgeon muscle tissue for selenium analysis, and a follow-up study has been approved for 2015. This study proposes a continuation of this sampling in collaboration with CDFW and USFWS in 2016, with the addition of blood plasma analyses for determination of fish sex and sexual maturity.	This proposal was a lower priority for the WG	91-97
Sources, Pathways and Loadings	Implementation of Small Tributaries Loading Strategy	Lester McKee and Jen Hunt (SFEI)	\$416,000	This proposal requests funding to implement four components of the Small Tributaries Loading Strategy: Pollutants of concern monitoring (\$200,000), Regional Watershed Spreadsheet Model (\$40,000), STLS Trends Strategy Development and Implementation (\$150,000), and STLS Management Support (\$26,000). This package of activities has been prioritized for implementation by the STLS Team and reviewed by the Sources, Pathways and Loadings WG. We can scale each of these tasks to a lower funding level of \$316,000 via a STLS process.		98-104