

Special Study Proposal: Assessing Novel Persistent and Bioaccumulative Contaminants in San Francisco Bay: Implication for Human and Wildlife Exposure

Summary: To leverage RMP funds, we have sought external support for a non-targeted analysis of Bay tissue samples, originally planned for 2020 according to the RMP’s approved Multi-Year Plan. We have outlined a three-year project and are requesting \$250,000 from Sea Grant; matching funding of \$75,000 over three years is requested from the RMP. The proposed study will employ a novel non-targeted analytical approach to examine samples of Bay sport fish to identify a broad array of persistent and bioaccumulative contaminants of emerging concern (CECs). Analysis of cormorant eggs and harbor seals will be used to assess the potential for biomagnification of these CECs in the food web. Comparison of the contaminant profiles of fish species with different feeding habits and collected from different sites in the Bay will be used to identify pollution hotspots. Insights about the potential sources and pathways of these CECs may be obtained through comparison with findings from an ongoing RMP study of near-shore sediment samples collected from San Francisco Bay. Results will be presented to the RMP’s ECWG, EEWG, and Sport Fish Strategy team. Potential outcomes may include the development of fish consumption advisory tissue levels for newly identified contaminants, follow-up research from the scientific community to fill targeted data gaps, and pollution prevention activities.

Estimated Cost: RMP match \$75,000 over three years (\$25,000 per year)
Cal Sea Grant Proposal \$250,000 over three years

Oversight Group: ECWG

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PROPOSED DELIVERABLES AND TIMELINE

Deliverable	Due Date
Task 1. Field collection of samples	Summer 2019
Task 2. Laboratory analysis of samples	Fall – Winter 2019
Task 3. Review data and prepare preliminary report of findings	Spring 2020
Task 4. Present findings to ECWG, EEWG, and Sport Fish Strategy Team and solicit feedback	Spring 2020
Task 5. Additional contaminant review based on expert feedback	Summer – Fall 2020
Task 6. Draft manuscript and fact sheet	Spring 2021
Task 7. Final manuscript and fact sheet	Fall 2021

Background

The Principal Investigators have submitted a three-page pre-proposal, “Assessing Novel Persistent and Bioaccumulative Contaminants in San Francisco Bay: Implication for Human and Wildlife Exposure” (attached), to USC Sea Grant in response to the Ocean Protection Council Prop 84: USC Competitive Grants Program call. Pre-proposals are undergoing review now, and the program will announce its decision as to which should be developed into full proposals in June. Full proposals will be due August 1, 2018, and those selected for funding will be announced by November. Funding is awarded in December.

According to the Multi-Year Plan for the ECWG, a non-targeted analysis of Bay tissue samples is scheduled for the year 2020. To best leverage precious RMP funds, we have sought external funds for this element of the strategy. We have outlined a three-year project and are requesting \$250,000 from Sea Grant to conduct non-targeted analyses of Bay samples (see attached pre-preproposal for details). However, State funding does not fully cover our costs due to the low multiplier so we are requesting matching funds of \$75,000 over three years from the RMP, for a total project budget of \$325,000.

Study Objectives and Applicable RMP Management Questions

Table 1: Study objectives and questions relevant to RMP ECWG management questions

Management Question	Study Objective	Example Information Application
1) Which CECs have the potential to adversely impact beneficial uses in San Francisco Bay?	Identify unexpected contaminants in Bay sport fish, cormorant egg, and harbor seal blubber, and review available toxicity information in the scientific literature. Evaluate future monitoring needs and toxicity data gaps.	Which newly identified contaminants merit further monitoring? Which merit management actions to prevent pollution or reduce risk (e.g., development of risk-based thresholds such as advisory tissue levels)?
2) What are the sources, pathways and loadings leading to the presence of individual CECs or groups of CECs in the Bay?	Determine whether hot spots of contamination exist. Compare tissue contaminants to those present in the RMP’s 2018 special study of margin sediment, to see if inferences can be made about potential sources or pathways.	What are the key pathways that impact concentrations and potential risk of emerging contaminants? Does influence of these pathways explain any hot spots observed in the samples?
3) What are the physical, chemical, and biological processes that may affect the transport and fate of individual CECs or groups of CECs in the Bay?	Determine whether any of the newly identified contaminants biomagnify in the Bay food web.	Do contaminants that biomagnify in the Bay food web merit examination with respect to human exposure and health concerns?

4) Have the concentrations of individual CECs or groups of CECs increased or decreased in the Bay?	N/A	
5) Are the concentrations of individual CECs or groups of CECs predicted to increase or decrease in the future?	N/A	
6) What are the effects of management actions?	N/A	

Budget

Budget Justification (Table 2)

Leveraged Funding Opportunity

If we are successful in obtaining a Sea Grant for \$250,000, we will have been able to substantially leverage the amount of funding we are requesting from the RMP. At present, we are asking the RMP to help enhance the project deliverables as well as cover the shortfall from the low multiplier that the State requires.

Field Costs

Field costs are minimized by leveraging the RMP 2019 sport fish and 2018 (archived) cormorant egg sampling efforts. Experienced contractors will be employed for harbor seal blubber (Moss Landing) and reference Tomales Bay sediment (Coastal Conservation & Research) sample collection. The budget includes staff hours to aid in drafting the sport fish sampling and analysis plan and to assist in the harbor seal and reference sediment sample collection events.

Laboratory Costs

The RMP will benefit from prior negotiations to reduce the indirect costs charged by San Diego State, from 50.5% to 25%. The RMP is funding margin sediment non-targeted analysis through a 2018 special study; the information generated in this project can inform interpretation of the findings generated by the proposed project.

Reporting Costs

Preliminary data will be presented to three separate RMP advisory groups, the ECWG, the EEWG, and the Sport Fish Strategy Team. A single, preliminary report will be prepared; this report is anticipated to require more extensive analysis than a report prepared for a single advisory group. RMP staff also anticipate significant participation in writing of the manuscript, and will lead the preparation of the fact sheet.

Data Management Costs

No data management is needed for this proposed project, as it is not targeted, analyte-specific analysis.

Table 2. Estimated costs for a three-year project to analyze Bay tissue samples for persistent and bioaccumulative contaminants using non-targeted analysis.

Expense	Estimated Hours	Estimated Cost
Labor		
Project Staff	690	117,200
Senior Management Review	40	9,000
Project Management	40	6,800
Contract Management	20	3,800
Data Technical Services		0
GIS Services	18	2,000
Creative Services	60	7,500
IT Services		0
Communications	32	6,000
Operations		0
Subcontracts		
Name of contractor		
Moss Landing Marine Lab (harbor seal capture)		25,000
Coastal Conservation & Research (reference sediment)		15,000
San Diego State - Non-targeted analysis		120,000
Additional peer review		4,000
Direct Costs		
Equipment		2,000
Travel		3,200
Printing		500
Shipping		3,000
Other		0
Grand Total		325,000

Reporting

Preliminary findings will be reported to the ECWG, the EEWG, and the Sport Fish Strategy Team. Final deliverables include a journal manuscript and a fact sheet. Findings from the project may also be summarized in other RMP documents, such as the Pulse of the Bay.

Attachment

The following attachment is a three-page pre-proposal, “Assessing Novel Persistent and Bioaccumulative Contaminants in San Francisco Bay: Implication for Human and Wildlife Exposure,” submitted on March 15th to USC eSeaGrant in response to the Ocean Protection Council Prop 84: USC Competitive Grants Program call.