

Special Study Proposal: Microplastic Strategy

Summary: In late 2019, SFEI will complete a major three-year project on microplastic monitoring, modeling, and policy guidance, which was primarily funded by the Gordon and Betty Moore Foundation with generous added contributions 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.

Estimated Cost: \$10,000

Oversight Group: Microplastic Workgroup

Proposed by: Rebecca Sutton, Diana Lin, and Meg Sedlak (SFEI)

Time sensitive: Yes. Without this funding, we are unable to track and management microplastic work, leverage funds, respond to requests, and identify new area of *pro bono* collaboration

PROPOSED DELIVERABLES AND TIMELINE

Deliverable	Due Date
Task 1. Information gathering from a variety of sources throughout the year, including presentations at scientific conferences	Year-round
Task 2. Respond to information requests from the Water Board and other RMP stakeholders	Year-round
Task 3. Coordinate <i>pro bono</i> studies with analytical partners	Year-round
Task 4. Update the multi-year plan at Spring Workgroup meeting	May 2020

Background

The science and management of microplastics is an area of dynamic development. The RMP has taken a leadership role on this issue, first by developing a Microplastic Monitoring and Science Strategy for San Francisco Bay (Sutton and Sedlak 2017), and then by co-funding and participating in a three-year project to monitor and model microplastic contamination in the Bay and adjacent Marine Sanctuaries, leveraging significant external funding from the Moore Foundation.

In late 2019, the project with the Moore Foundation will be completed. As this was a special project between program areas, there will be no additional funding available from this Foundation. To assure the RMP receives reliable and up-to-date science guidance on this rapidly evolving field, ongoing support for microplastic strategy development is recommended. Microplastic strategy funding is needed to review new methods and data in this rapidly changing field, track research approaches in other geographies, and keep stakeholders apprised of findings. The strategy budget will also enable us to coordinate *pro bono* analyses that contribute to our understanding of microplastics and add value to RMP-supported research in the Bay. Perhaps most important, funding could be used to provide relevant, objective science to inform the growing number of science and policy actions related to plastic and microplastic pollution. As an example, in the fall of 2018, the California State Legislators tasked the Ocean Protection Council with developing a state-wide microplastic strategy. Having completed an RMP microplastic strategy for the Bay, it will be important for SFEI staff to provide input and ensure coordination with the state-wide process.

Study Objectives and Applicable RMP Management Questions

Table 1: Study objectives and questions relevant to RMP Microplastic Workgroup management questions

Management Question	Study Objective	Example Information Application
1) How much microplastic pollution is there in the Bay?	<p>Compare existing Bay occurrence data with levels reported elsewhere in the scientific literature to provide context for Bay observations.</p> <p>Track new and evolving methods for microplastic sample collection and analysis to ensure RMP studies use appropriate methods.</p>	<p>Does the latest science suggest Bay contamination levels are typical of urban areas? Are there any unique aspects to observations in the Bay?</p> <p>Are newly developed methods for sample collection and analysis good candidates for use in the Bay? How do measurements made with new methods compare to those made with methods previously used to characterize the Bay?</p>
2) What are the health risks?	<p>Review the scientific literature for toxicity thresholds as they emerge.</p> <p>Evaluate future monitoring needs and toxicity data gaps.</p>	<p>Do levels of microplastic in the Bay exceed available toxicity thresholds?</p> <p>Can microplastic occurrence be linked to the presence of plastic additive CECs in the Bay?</p>

<p>3) What are the sources, pathways, loadings, and processes leading to microplastic pollution in the Bay?</p>	<p>Evaluate new knowledge regarding sources, pathways, loadings, and processes for microplastic in the context of a comprehensive conceptual model to allow prioritization of data gaps the RMP can fill.</p> <p>Compare model predictions to monitoring results; assess potential reasons for differences between predicted and measured values.</p>	<p>What are the key sources, pathways, and processes that affect concentrations of microplastic in the Bay?</p> <p>Are relative levels of microplastic in different matrices or subembayments consistent with our expectations?</p>
<p>4) Have the concentrations of microplastic in the Bay increased or decreased?</p>	<p>N/A</p>	
<p>5) Which management actions may be effective in reducing microplastic pollution?</p>	<p>Evaluate available data on the impacts of existing and proposed management actions in the Bay Area and elsewhere.</p> <p>Evaluate the expected impacts of changes to population, climate, affluence, and other factors.</p>	<p>How might existing or proposed management actions impact levels of different types of microplastic particles in the Bay?</p> <p>What are the possible effects of changes to population, climate, and affluence on concentrations of microplastic and associated risk?</p>

Approach

Funding for this task will allow us to think strategically about the latest science around microplastic monitoring and management so the RMP can continue to generate the information water quality managers need to effectively address microplastic contamination in the Bay. As the Moore Foundation project concludes in late 2019, it will be essential for the RMP to establish priorities for future work and seek opportunities to leverage external funding and scientific efforts.

Microplastic strategy funding would support the review of key information sources throughout the year. These sources include:

- Abstracts and newly published articles in key peer-reviewed journals (e.g., Environmental Health Perspectives, Environmental Science and Technology, Environmental Toxicology and Chemistry, Marine Pollution Bulletin, Science of the Total Environment)
- Documents produced by other programs (e.g., USEPA, NOAA Marine Debris Program, Australia’s CSIRO Research Program, Woods Hole Oceanographic Institute, Environment and Climate Change Canada, European Chemicals Agency, Great Lakes CEC Program)

- Abstracts and proceedings from relevant conferences (e.g., Society of Environmental Toxicology and Chemistry, International Marine Debris Conference)

In addition, strategy funding allows staff to provide additional services, such as:

- Updating the multi-year plan for microplastics
- Presentations, briefings, and stakeholder interactions
- Scientific assistance to the Water Board
- Scientific assistance to stakeholders engaged in microplastic-related policy
- Coordination of *pro bono* analyses

The proposed deliverables table on the first page of this proposal lists the specific tasks to be completed and their due dates.

Budget

Table 2. 2020 Microplastic Strategy budget

Deliverables	Budget
Tasks 1-4: (1) Information gathering from a variety of sources throughout the year, including presentations at scientific conferences; (2) Respond to information requests from the Water Board and other RMP stakeholders; (3) Coordinate <i>pro bono</i> studies with analytical partners; and (4) Present recent findings to the workgroup.	\$10,000

Budget Justification

This budget represents 10 hours of staff time for information requests; 10 hours for presentations and coordination of *pro bono* studies; and 40 hours for information gathering and reviewing literature.

Reporting

Presentation at RMP Microplastic Workgroup meeting, Technical Review Committee and/or Annual Meeting.

References

Sutton R, Sedlak M. 2017. Microplastic Monitoring and Science Strategy for San Francisco Bay. SFEI Contribution 798. San Francisco Estuary Institute, Richmond, CA.