



RMP Microplastic Workgroup Meeting

April 9th, 2020 (remotely held meeting)

Meeting Summary

Advisors

Name	Affiliation/Roles	Present
Chelsea Rochman	University of Toronto	Yes
Anna-Marie Cook	US Environmental Protection Agency	Yes

Attendees:

Adam Wong (SFEI)	Kevin Messner (Association of Home Appliance Manufacturers)
Alexander Black (Virginia Wellington Cabot Foundation)	Leah Thorton Hampton (SCCRWP)
Alicia Gilbreath (SFEI)	Lester McKee (SFEI)
Alvina Mehinto (SCCWRP)	Lisa Domotrovitch (SFEI)
Anne Hnsen Balis (City of San Jose)	Lorien Fono (BACWA)
Artem Dyachenko (EBMUD)	Luisa Valiela (EPA)
Ashley LaBass (Bay Planning Coalition)	Margaret McCauley (EPA)
Autumn Cleave (SFPUC)	Mary Lou Esparza (CCCSD)
Barbara Baginska (SFB RWQCB)	Maureen Dunn (Chevron)
Bryan Frueh (City of San Jose)	Melissa Foley (SFEI)
Carolynn Box (5 Gyres)	Miguel Mendez (SFEI)
Charles Wong (SCCRWP)	Miriam Diamond (University of Toronto)
Chris Sommers (BASMAA)	Molly Martin (EPA)
Cole Burchiel (SF Baykeeper)	Nina Buzby (SFEI)
Dane Hardin (Applied Marine Sciences)	Rebecca Sutton (SFEI)
Diana Lin (SFEI)	Robert Wilson (City of Petaluma)
Don Yee (SFEI)	Samantha Harper (SFB RWQCB)
Dawit Tadesse (SWRCB)	Scott Coffin (SWRCB)
Eric Hansen (Silicon Valley Clean Water)	Shelly Moore (SCCWRP)
Emma Sharpe (Western Washington University)	Shelly Walther (LA County Sanitary District)
Eric Dunlavey (City of San Jose)	Sherry Lippiat (NOAA)
Erika Senyk (Applied Marine Sciences)	Simona Balan (DTSC)
Ezra Miller (SFEI)	Simret Yigzaw (City of San Jose)
Farid Ramezanzadeh (Hayward)	Stephanie Hughes (Shell)
Holly Wyer (Ocean Protection Council)	Stephanie Karba (Patagonia)
Jay Davis (SFEI)	Steve Weisberg (SCCWRP)
Jaylyn Babitch (San Jose)	Sutapa Ghosal (CDPH)
Jeremy Conkle (Texas A&M University Corpus Christi)	Tony Hale (SFEI)
Karin North (City of Palo Alto)	Tony Luz (Integral Consulting)
Kelly Moran (TDC Environmental)	Violet Renich (Orange County Sanitation)
	Wayne Landis (Western Washington University)

1. Introductions and Goals for This Meeting

Melissa Foley began the meeting by conveying a few remote meeting tips and reviewing some of the Zoom platform functionalities. Melissa then reviewed the day's agenda and introduced the Workgroup's advisors and invited guests. After a brief roll call, Melissa then gave an overview of the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP), outlining the program objectives and budget allocations related to special studies.

Melissa also communicated the goals for the day, highlighting the role of advisors and stakeholders in providing input on special study proposals, multi-year planning, and the microplastic conceptual model.

2. Discussion: Microplastic Strategy and Collaborations Update

Diana Lin introduced the item by reviewing the past efforts of the Workgroup, in particular the findings and deliverables from the 3-year study supported by the Moore Foundation. She then presented changes to the WG's multi-year plan (MYP) for the coming year (2021) based on the special study proposals that would be presented in the afternoon; noting that the long-term discussion of the MYP could be held later when there is more clarity on the future of the MPWG.

Going into more detail on outside-RMP work, Diana outlined SFEI's involvement in efforts to develop a risk assessment framework for microplastics. The Ocean Protection Council is convening a science advisory team (SAT) working group to develop a risk assessment framework for microplastic to inform the OPC's microplastic strategy. Diana is involved as an external advisor to the SAT working group.

Diana is also working on an upcoming collaboration with Dr. Wayne Landis from Western Washington University (WWU) to develop a microplastic risk assessment. The goal of the collaboration is to generate a San Francisco Bay risk assessment case study using the SF Bay monitoring data with the results from a recently funded NSF grant to Oregon State University (OSU; Principal Investigators Stacey Harper, Susanne Brander, Chris Langdon, Matt Hawkyard) on the toxicity and fate of microplastics. The purpose of the study is to build a structure for understanding the risk probabilities for microplastics, identify the key uncertainties, inform decision makers, and generate peer-reviewed publications. The NSF project will be supporting the team at OSU and WWU, and Diana Lin will be supported by Microplastic Strategy funds. The research will be presented at scientific conferences and published in peer-reviewed journals.

Meeting participants commented that looking for opportunities to leverage larger external efforts is a common and important aspect of effectively utilizing RMP resources. In particular, workgroup members mentioned the importance of outside collaboration related to the need to better understand ecotoxicological effects of microplastics.

Meeting participants then provided input on the future of MPWG within the RMP, expressing both support for the work of the MPWG and concern for the RMP's ability to continue funding the MPWG. Concern stemmed from both the lack of current management applications and the amount of work needed to better understand effects. The MPWG, however, provides a unique regional and pollutant-focused approach that is advantageous to state agencies. Melissa encouraged meeting attendees to reach out to herself and/or Diana with additional comments on the value of the MPWG.

3. Discussion: State Water Board Definition of Microplastics in Drinking Water

Scott Coffin from the State Water Board presented the proposed definition of microplastics in drinking water that was developed as required by Senate Bill 1422. Because of the lack of consensus in existing definitions and diversity in microplastics as a contaminant suite, the State Board developed a definition that follows a categorization framework. Categorizing by state, substance, and size the State Board definition closely follows the European Chemicals Agency's (ECHA) most recent version of defining microplastics but omits exceptions for biodegradable plastics.

After fully outlining the proposed categorization, Scott noted the opportunity for public comment until April 24th and provided his contact information to anyone with further questions. Meeting participants utilized the Zoom platform chat function to ask a few technical questions and to get more information on how to provide comments on the proposed definition.

4. Information: Stormwater Conceptual Model

Alicia Gilbreath presented on the current status of the stormwater conceptual model development, a special study funded from the previous year's workgroup meeting. The focus of the conceptual model work was on rubber pieces resulting from tire-wear because they made up the majority of fragments found in Bay Area stormwater samples. Additionally, there is evidence that suggests aqueous leachate from tires may induce acute toxicity to coho salmon.

Alicia conveyed some of the data gaps identified so far, including density data on tire/road wear particles (TRWP), information on tire-derived product usages, and annual distance/area traveled by vehicle type. She posed a few questions to the workgroup members asking for input on any missing aspects and data gap priorities. Meeting participants mentioned a lack of attention to agriculture and interest in synthetic turf usage as potential sources. Additionally the group asked about the timeline for this work, which Alicia and Diana noted would be dependent on whether a second year of funding is approved.

5. Information: The Ecological Impacts of Microplastics in the Environment

Dr. Chelsea Rochman presented data from a literature review and meta-analysis on ecological impacts of macro- and micro-plastics published by her research group recently. The review systematically categorizes reviewed studies based on level of biological organization (e.g., molecules, cell, organ, organism, population, assemblage) and size class of microplastics measured. Findings from the review showed that in recent years the amount of studies detecting an impact is equal to those that did not detect an effect, indicating the complexity of microplastics. Several factors in the study design influence whether an effect from microplastics was measured, including microplastic dose, shape, type, and size, and organism taxa studied, and experimental design.

The review makes a call for more ecologically and environmentally relevant studies, through the use of field studies, and use of environmentally relevant concentrations and sizes. Another identified gap was effects on freshwater organisms; however, Chelsea noted current work on this subject in collaboration with Dr. Miriam Diamond (also of University of Toronto). Wayne Landis commented on the lack of studies on dose response to microplastics and lack of transparency in how studies develop toxicity thresholds which are needed to inform a microplastic risk assessment.

6. Discussion: Microplastic Proposals for 2021

Diana Lin briefly outlined each of the proposed studies to the members of the workgroup, noting the motivation for each study along with the associated budgets and deliverables. After explaining each proposal, meeting participants were given a chance to ask questions and discuss topics with proposal authors prior to the closed session.

The majority of the conversation on the ecotoxicological effects workshop proposal centered on the collaboration with SCCRWP, timing of the effort, and resulting products. Kelly Moran also noted the importance of including exposure routes besides ingestion, such as uptake through the skin or gills of chemicals that leach out of microplastics. When discussing the budget, meeting participants noted the large fraction of funds intended for developing a manuscript. Holly Wyer noted that the workshop would help directly inform the state microplastic strategy being developed by the OPC, highlighting the benefit in having both northern and southern regions of the state represented and the greater applicability of a technical report compared to a journal publication.

Presentation of the stormwater conceptual model proposal did not elicit many questions because it would cover the second year of funding. Barbara Baginska of the Water Board noted that managers would value any findings that inform sample and analysis methods included in final deliverables. There were also no questions resulting from Diana's presentation proposing the analysis of microplastic in archived sport fish tissue. This study was proposed but not fully

funded at the 2019 MPWG meeting (although sample collection was funded), so the updates mostly provided more details on the number of fish available and associated analytical costs.

After outlining the proposed sediment core study, meeting participants posed a number of technical questions related to methodology and the possible density bias in fragments found in sediment compared to the water column. Chelsea Rochman expressed the value in adding core dating to the study to provide more details on trends. Diana clarified that any engagement with additional outside efforts, such as the risk assessment collaboration with Western Washington University, would be covered by the the workgroup's strategy budget.

7. Closed Session - Decision: Recommendations for 2021 Special Studies Funding

Because Chelsea Rochman would benefit financially from the microplastic in sport fish proposal (as the contract lab), she normally would not participate in the closed session discussions. However, to utilize her expertise, the workgroup members discussed the other three proposals with Chelsea present and had her rank proposals prior to leaving. A Zoom poll was used by the participants to help with ranking proposals given the remote meeting platform. The result of the discussions are shown in the following prioritization table.

Study Name	Budget	Modified Budget	Priority	Comments	Worthwhile Study (Y,N)
Ecotoxicological Workshop	\$35,950	\$18,000	1	only fund workshop and report, reduce manuscript writing budget; important to identify gaps and next steps	Y
Stormwater Conceptual Model (Year 2)	\$30,000	\$30,000	3	want to inform modeling and monitoring - would a conceptual model focused on fibers help us with that? broaden fibers beyond stormwater? add tire dust to tire model?	Y
Microplastic in South Bay Sediment Cores	\$50,475	\$50,475	4	method development important before proceeding, but methods do exist; trends important for particle types (e.g., tires, current use); baseline for monitoring important; helpful to track source reductions/mitigations on land; adding dating would	Y

				add a lot to this study; would archiving (freezing) be a possibility?	
Microplastic in Sport Fish	\$50,775–92, 775	\$51,000	2	better to drop stations than replicates within stations; important to know if it is getting into fish that people eat; difficult to correlate plastic in stomachs with contaminants in tissue that is eaten	Y

About the RMP

RMP ORIGIN AND PURPOSE

In 1992 the San Francisco Bay Regional Water Board passed Resolution No. 92-043 directing the Executive Officer to send a letter to regulated dischargers requiring them to implement a regional multi-media pollutant monitoring program for water quality (RMP) in San Francisco Bay. The Water Board's regulatory authority to require such a program comes from California Water Code Sections 13267, 13383, 13268 and 13385. The Water Board offered to suspend some effluent and local receiving water monitoring requirements for individual discharges to provide cost savings to implement baseline portions of the RMP, although they recognized that additional resources would be necessary. The Resolution also included a provision that the requirement for a RMP be included in discharger permits. The RMP began in 1993, and over ensuing years has been a successful and effective partnership of regulatory agencies and the regulated community.

The goal of the RMP is to collect data and communicate information about water quality in San Francisco Bay in support of management decisions.

This goal is achieved through a cooperative effort of a wide range of regulators, dischargers, scientists, and environmental advocates. This collaboration has fostered the development of a multifaceted, sophisticated, and efficient program that has demonstrated the capacity for considerable adaptation in response to changing management priorities and advances in scientific understanding.

RMP PLANNING

This collaboration and adaptation is achieved through the participation of stakeholders and scientists in frequent committee and workgroup meetings (see Organizational Chart, next page).

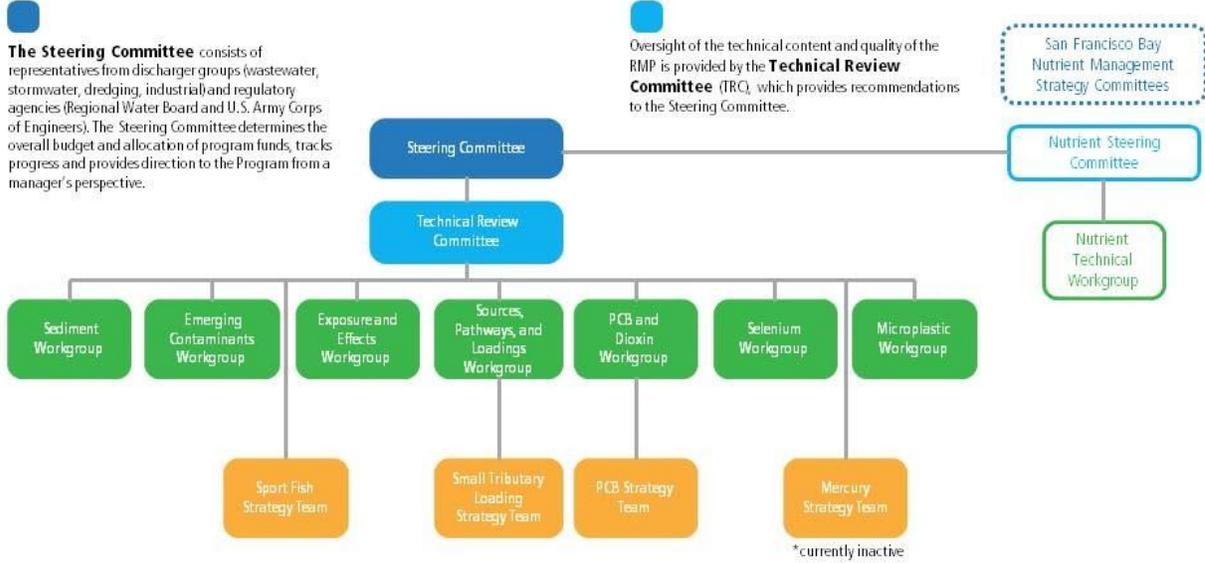
The annual planning cycle begins with a workshop in October in which the Steering Committee articulates general priorities among the information needs on water quality topics of concern. In the second quarter of the following year the workgroups and strategy teams forward recommendations for study plans to the Technical Review Committee (TRC). At their June meeting, the TRC combines all of this input into a study plan for the following year that is submitted to the Steering Committee. The Steering Committee then considers this recommendation and makes the final decision on the annual workplan.

In order to fulfill the overarching goal of the RMP, the Program has to be forward-thinking and anticipate what decisions are on the horizon, so that when their time comes, the scientific knowledge needed to inform the decisions is at hand. Consequently, each of the workgroups and teams develops five-year plans for studies to address the highest priority management questions for their subject area. Collectively, the efforts of all these groups represent a substantial body of deliberation and planning.

PURPOSE OF THIS DOCUMENT

The purpose of this document is to summarize the key discussion points and outcomes of a workgroup meeting.

Governance Structure for the Regional Monitoring Program for Water Quality in San Francisco Bay



The Steering Committee consists of representatives from discharger groups (wastewater, stormwater, dredging, industrial) and regulatory agencies (Regional Water Board and U.S. Army Corps of Engineers). The Steering Committee determines the overall budget and allocation of program funds, tracks progress and provides direction to the Program from a manager's perspective.

Oversight of the technical content and quality of the RMP is provided by the **Technical Review Committee (TRC)**, which provides recommendations to the Steering Committee.

Workgroups report to the TRC and address the main technical subject areas covered by the RMP. The Nutrient Technical Workgroup was established as part of the committee structure of a separate effort – the Nutrient Management Strategy – but makes recommendations to the RMP committees on the use of the RMP funds that support nutrient studies. The workgroups consist of regional scientists and regulators and invited scientists recognized as authorities in the field. The workgroups directly guide planning and implementation of special studies.

RMP strategy teams constitute one more layer of planning activity. These stakeholder groups meet as needed to develop long-term RMP study plans for addressing high priority topics.