

RMP Special Study Proposal: Synthesis of Information on Mercury**Estimated Cost:** \$75,000**Oversight Group:** TRC, CFWG**Proposed by:** Jay Davis, SFEI**PROPOSED DELIVERABLES AND TIME LINE**

Deliverable	Due Date
Draft outline	December 2010
Draft report	May 2011
Final report	August 2011

BACKGROUND AND JUSTIFICATION

The RMP Mercury Strategy has funded a significant body of work to address the first two questions in the Strategy (listed below). This included three years of intensive monitoring of spatial and temporal patterns in mercury in small fish (a total budget of \$450,000), a two-year study of mercury isotopes (\$115,000), and a two-year study of passive samplers for aqueous methylmercury – “DGTs” – (\$80,000). The results of these studies are either just being evaluated now (isotopes and DGTs) or will be available in December 2010 (the three-year dataset on small fish). In addition, extensive monitoring of other indicators of spatial patterns, temporal trends, fate, and effects have been conducted by RMP and other programs and projects in the last few years. Our state of knowledge has been advancing rapidly.

The RMP Mercury Strategy has articulated management questions to guide a long-term program of studies to support the goal of identifying and reducing high leverage pathways and thereby reducing mercury impairment in the Bay. The studies conducted to date are providing partial answers to some of the questions in the Strategy, but it is clear that we have not yet answered all of them. The optimal next steps to take in answering the questions, however, are unclear. A prudent next step to ensure effective use of RMP funds would be to thoroughly evaluate and synthesize all of the information acquired in the last several years and to use this synthesis as the basis for a plan for the next few years of mercury studies.

The complex biogeochemistry and spatial and temporal dynamics of mercury and especially methylmercury pose a challenge for such a synthesis effort. A large body of information on the various aspects of mercury science has been generated in the Estuary in the past few years. An interdisciplinary approach to the synthesis is called for, with the collaboration of a team spanning the different branches of mercury science. It will be important to include tidal wetlands within the scope of the review, given their potential influence on regional patterns of contamination in the Bay and the potential importance as a zone of methylmercury impact.

APPLICABLE RMP MANAGEMENT QUESTIONS

The most relevant questions for this synthesis are the questions articulated specifically for the Mercury Strategy.

1. Where is mercury entering the food web?
2. Which processes, sources, and pathways contribute disproportionately to food web accumulation?
3. What are the best opportunities for management intervention for the most important pollutant sources, pathways, and processes?
4. What are the effects of management actions?
5. Will total mercury reductions result in reduced food web accumulation?

OBJECTIVES AND APPROACH

The goal of the synthesis effort will be to produce a technical report that answers, to the extent possible, the Mercury Strategy questions based on the information that has accumulated to date. Other questions may also be addressed. Stakeholder input on an outline of the report will be obtained as a first step in the project.

A considerable body of information generated by the RMP and other programs has accumulated in recent years. Some of the datasets to be covered in the review are listed below.

- Status and Trends: RMP (Sport fish, Avian eggs, Sediment, Water), USGS Clapper rail feathers
- RMP Mercury Strategy: Small fish, Isotopes, DGTs
- Effects: RMP/CALFED Avian egg work, USFWS Rail work, Effects on fish
- Fate: RMP (cores, methylmercury budget)
- Loading Studies: Central Valley loads (RMP, Region 5), Small tributaries (loading studies, BMP study), atmospheric deposition (global, local), POTWs (Region 2, WERF, Sacramento regional)
- Wetlands: SBSP, Petaluma, Hamilton, Suisun Marsh, Crissy Field, Twitchell Island

Stakeholder suggestions on additional datasets to include will also be encouraged.

The synthesis will also evaluate progress relative to the Conceptual Model of Mercury in San Francisco Bay developed by Tetra Tech (2006) for the Clean Estuary Partnership.

The findings of this synthesis will be incorporated into an article to be published as in a special issue of a journal featuring synthesis papers for seven major ocean regions as part of the Coastal and Marine Mercury Ecosystem Research Collaborative (C-Merc), sponsored by the Dartmouth College Toxic Metals Superfund Research Program. C-Merc has convened a team of scientists and stakeholders to work together over a two-year period to gather and analyze data and publish a series of papers related to the inputs, cycling, and uptake of mercury in marine ecosystems. The other ocean regions to be covered include the Mediterranean, the tropics, the open ocean, the Gulf of Mexico, the

Gulf of Maine, and the arctic. Other papers on global mercury topics (e.g., mercury isotopes, climate change, health effects) will also be included in the special issue. The RMP effort will benefit from the synergy that comes from sharing and comparing data from San Francisco Bay with data from other parts of the world. The use of RMP funds will be strictly limited to answering the management questions identified by RMP stakeholders. Any work for C-Merc beyond that scope will be funded by SFEI. C-Merc will pay for travel to participate in workshops with other C-Merc authors.

LITERATURE CITED

Tetra Tech. 2006. Conceptual Model of Mercury in San Francisco Bay. Prepared for the Clean Estuary Partnership.

BUDGET

The estimated budget for this task is \$75,000, all for SFEI labor. The hours allocated for each staff person are indicated below.

	Hours
Jay Davis	120
Don Yee	120
Ben Greenfield	120
Letitia Grenier	120
Lester McKee	80
Josh Collins	40