

May 6, 2008

Scope of Work**2008 RMP Data Integration – Benthic Index Development**

A recent RMP study that applied the sediment quality objectives (SQO) methodology to an evaluation of the San Francisco Estuary identified several SQO indicators that need to be revised (Thompson and Lowe, 2008 Draft Report). One major SQO component in need of revision was the benthic indices used in the mesohaline (moderate salinity) areas of the Estuary. Although the Index of Biotic Integrity (IBI; Thompson and Lowe, 2004) and Relative Benthic Index (RBI; Hunt *et al.* 2001) have been published and applied previously, they often produced different results. Thus, the sediment assessments in these areas were uncertain. Additionally, oligohaline (low salinity) areas of the Estuary, such as Suisun Bay, southern sloughs, and lower reaches of major rivers, there was no benthic index available for use. Therefore, SQOs cannot presently be applied to these areas.

The objective of this project is initiate the refinement and development of benthic indices for use in the mesohaline and/or oligohaline portions of the Estuary. This will be accomplished by establishing a benthic work group to guide the project and through two workshops.

This project represents the beginning of a process to refine and develop these indices. There is inadequate funding to complete the process in 2008, but may be completed in 2009. Additionally, a similar process is planned for the Delta under SQO Phase 2, funded by the SWRCB through SCCWRP. The benthic work group formed under this project could also serve to address the same issues for the Delta, and they should be closely coordinated for optimal efficiency.

Tasks

1. Work Plan Refinement.

Goal: Conduct meetings (SFEI and SCCWRP) to agree on final work plan approach. To be completed by June 15, 2008

- Internal meeting: Lowe, Melwani, Thompson
- Phone conference call with SCCWRP: Lowe, Melwani, Thompson
- Revise work plan as needed: Thompson

2. Establish Workgroup. To be completed by June 30, 2008

- Phone calls to prospective participants: Thompson
- Produce prospectus for the workgroup: Thompson

3. Workshop # 1

Goals: Review currently used SQO benthic indices. Discuss and agree upon concepts to be included in benthic assessments and design a best professional judgment (BPJ) exercise. To be conducted in July 2008.

- Planning: Meet with planning team (SCCWRP, SFEI), Thompson, Lowe, Melwani
- Preparation: Workshop materials and presentations. Thompson, Lowe and Melwani.
Possible topics for consideration in the workshop include the definition of reference, disturbed, and impacted benthos; conceptual models of benthic response; how a benthic impact should be identified, deciding whether a BPJ exercise would be useful for this project, and determining what data is available for use.
- Conduct Workshop: Thompson, Lowe, Melwani

4. Data Analysis

Goal: To address analysis needs identified from Workshop # 1. To be completed by September 30, 2008. Melwani and Thompson.

This will most likely include:

- Identifying 'reference' vs. 'impacted' samples.
- BPJ exercise: coordinate 'experts', distribute data, analyze.
- Evaluate and identify potential benthic indicator metrics for use in indices (alternatives, options)

5. Workshop # 2

Goals: Present results of data analysis and identify options for revised indices. To be conducted in October, 2008.

- Planning: Meet with team (SFEI and SCCWRP). Thompson, Lowe, Melwani
- Preparation: Workshop materials and presentations. Thompson and Melwani
- Presentations will include:
 - results of BPJ
 - evaluation of indicators that come from BPJ
 - index options
- Conduct Workshop: Thompson, Lowe and Melawani

6. Progress Report

Goal: Summarize findings of data analysis and workshops. To be completed by Dec. 31, 2008. Thompson, Lowe, and Melwani

- Definitions of reference vs. disturbed or impacted

- Conceptual models of benthic ‘disturbance’
- Results of BPJ, metrics evaluated
- Evaluation of benthic index options
- Proposal for how to complete index testing and validation.

References Cited

Hunt, J. W., B. S. Anderson, B. M. Phillips, R. S. Tjeerdema, K. M. Taberski, C. J. Wilson, H. M. Puckett, M. Stephenson, R. Fairey, and J. Oakden. 2001. A large-scale categorization of sites in San Francisco Bay, USA, based on the sediment quality triad, toxicity identification evaluations, and gradient studies. *Environ Toxicol Chem* 20:1252-1265.

Thompson, B. and S. Lowe, 2008. Sediment Quality Assessments in the San Francisco Estuary. Draft RMP Technical Report, SFEI, Oakland, CA.

Thompson, B. and S. Lowe. 2004. Assessment of macrobenthos response to sediment contamination in the San Francisco Estuary, California, USA. *Environ Toxicol Chem* 23:2178-2187.