Regional Monitoring Program Forum: Science to Support Management of Methylmercury in Restored Tidal Marshes

Summary

December 17, 2013

Topic 1: Short-term vs Long-term Effects

Hypothesis 1: The effect of tidal action on restored sites may result in a local short-term transitory spike or increase in net methylmercury production and biotic exposure, within the project and downstream, but we are unlikely to see levels of concern in biota that warrant management action.

Forum discussion highlights:

- There is not enough evidence from the data presented to accept or reject this hypothesis.
- There was agreement that there will be a short term spike in methylmercury following restoration activities. However there was no consensus around the long-term effect on levels of concern in biota - long-term monitoring would be needed to evaluate this.
- Participants suggested we may be able to learn more from the data we have already collected, and from ongoing projects such as the South Bay Salt Pond monitoring.
- Questions remain: Can we protect beneficial uses by monitoring only long term effects or do we need to also monitor short term effects? What levels warrant management action?

Topic 2: Local vs Regional Impacts

Hypothesis 2: Methylmercury loading from tidal wetland restoration projects is a minor contribution to the total pool of methylmercury available for uptake into the Bay's food web and therefore is a minor factor relative to Bay-wide mercury impairment (e.g., bird and fish tissue levels).

Hypothesis 3: We do not expect to be able to measure the regional impacts to the Bay's food web from tidal wetland restoration projects.

Forum discussion highlights:

- There was support for the conceptual foundation that we would not expect to see a regional increase in methylmercury in the Bay because the amount of methylmercury exported will be a small part of the overall mass balance.
- There was agreement that we have not seen evidence of a **large** regional impact to Bay wildlife from wetland restoration projects. There may be a small or moderate effect on Bay wildlife that our monitoring has not detected.

- The methylmercury risk to marsh and salt pond wildlife (local effects) may still be substantial.

Topic 3: Study Design

Principle 1: Measuring mercury in one or more biosentinel species is an appropriate approach to provide information on management questions 1, 2, 3 and 7, and to identify circumstances where more detailed studies should be performed to understand methylation and bioaccumulation processes.
Principle 2: Process studies should be done at only a subset of sites, which biosentinel monitoring can help to identify. Process studies can help to answer management question 5.
Principle 3: The monitoring program should have a regional scope to ensure that data are relatively consistent across projects so that site-specific variability may be distinguished from regional trends and phenomena.

Forum discussion highlights:

- Both biosentinel and process studies are necessary.
- Design principles 1&2 should be rephrased as: Biosentinel monitoring should be used to generate hypotheses and process studies should be used to test hypotheses.
- Participants agreed that process studies be done at a subset of monitored sites.
- There were different opinions expressed about whether biosentinel monitoring and process studies should be done consecutively or concurrently.
- There was support for a regional approach to monitoring, with some sites selected for detailed investigation.

Topic 4: Restoration Design and Management Actions - Restored Marshes

Hypothesis 4: We do not yet have sufficient information to design tidal marsh restoration projects to reduce methylmercury exposure.
Hypothesis 5: It is possible to design or manage restored marshes to reduce methylmercury exposure.

Forum discussion highlights:

- In order to understand how to design projects to reduce methylmercury risk we would need to invest in research and pilot studies.
- Methylmercury risk may be reduced by prioritizing restoration and erosion prevention in particular areas.