USING BIOSENTINELS TO ASSESS METHYLMERCURY RISK IN WETLAND RESTORATION PROJECTS

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BACKGROUND
Methylmercury (MeHg) contamination in food webs is one of the primary water quality issues in San Francisco Bay. Wetlands have been shown to be important sites of MeHg production and there is concern that wetland restoration projects may result in increased MeHg bioaccumulation. Biosentinel monitoring can be used to directly evaluate the impacts of marsh projects on marsh wildlife at risk of mercury contamination. Here we present data from the first year of a two-year project that is using a region-wide approach to monitoring wetland restoration in San Pablo Bay. Risk varies by site and species but many fish in the North Bay are at levels of concern.

STUDY DESIGN
The design for this project was developed with input from a Science Advisory Group consisting of experts in biosentinel monitoring for mercury and the ecology of potential biosentinel species. The Science Advisors made the following recommendations:

- Monitoring should answer management questions related to beneficial uses of wetlands.
- Biosentinels should accurately represent MeHg risk at a small spatial and temporal scale.
- Sampling should be done for each major habitat type because MeHg risk and wildlife support differ between habitats.
- Sample when ecological risk is highest (breeding season for piscivorous birds).

MANAGEMENT QUESTIONS
The approach and sampling plan were vetted with local stakeholders, who articulated the following FOUR management questions

1. What is the current potential for impairment of beneficial uses due to MeHg in each major habitat of interest in the North Bay intertidal habitat restoration projects?
2. How will the status of impairment due to MeHg in each major habitat of interest change over a timescale of years in response to the project?
3. How do the status and trends in impairment due to MeHg at this project compare to status and trends in impairment in other project and non-project wetlands in the region?
4. Will tidal marsh restoration introduce a problematic amount of MeHg into the Bay?

CONCLUSIONS/NEXT STEPS
- Need to prioritize management questions. Set up monitoring in different ways to answer different questions.
- Regional coordinated monitoring can answer management questions in a cost-effective way

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