Delta RMP Mercury Monitoring: Findings from the First Four Years

Jay Davis, ASC
Wes Heim, Moss Landing Marine Laboratories
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Delta RMP Mercury Monitoring

- Began in 2016
- Stations spread across the subareas
- Smaller effort initially
- More intensive monitoring in 2018 and 2019 to inform reevaluation of the TMDL

Figure 1. Map showing the boundary of the Delta, the eight subareas delineated in the TMDL, and the sampling stations for fish and water in year 3 of Delta RMP mercury monitoring. Lower Mokelumne River 6 station was not sampled for water until October 2017.
Black Bass: Average Concentrations 2016-2019

- Spatial pattern consistent with past data – high concentrations around periphery, lower concentrations in Central Delta

Figure 3. Length-adjusted (350 mm) mean MeHg concentration (ppm wet weight) in black bass at each station. Mean of four years of sampling from 2016-2019. Error bars show ± 2SE.
Black Bass: Are trends over time in MeHg similar or different among Delta subareas?

- **Answer:** Different!

- Two stations have very high interannual variation, and reach very high concentrations (> 1.4 ppm)

- Concentrations are much less variable over time at the other four stations, very consistent with “historic” data

- Water data showed similar patterns
Black Bass: Maximum Concentrations in the Delta Are Very High

- Comparison to statewide length-adjusted largemouth bass dataset for lakes
- Only two lakes out of 194 lakes had means higher than 1.4 ppm
Black Bass: What Is Causing the High Interannual Variation?

- Obvious possibility: interannual variation in flow and floodplain inundation
- Relationship not significant for current water year data
- Relationship at Vernalis is significant using prior year water data (almost significant at Mokelumne)
- Suggests hypothesis of a lag time
- More data needed
Black Bass: What Is Causing the High Interannual Variation?

- Relationship to previous water year not as well supported by Mokelumne data
Water Monitoring

• Generated a robust dataset, especially for 2018 and 2019
What is the relationship between MeHg in black bass and MeHg in water?

- TMDL linkage analysis was based on a limited dataset.
- Robust dataset for bass and water from 2018 and 2019 exhibited a very similar relationship to that observed in 2000.

From TMDL:

Using Delta RMP Data:
What is the relationship between MeHg in black bass and MeHg in water?

- Yolo Bypass a bit of an outlier

Using Delta RMP Data

Mar-Oct

No Yolo

With Yolo
Highlights from the First 3+ Years of Delta RMP Mercury Monitoring

Significant progress in answering management questions
Supported a reevaluation of the TMDL
Interannual variation is very high
Concentrations of high concern observed
Hypothesis generation: hydrology appears to be a driver
Supported development of a leaner design
What’s Next?

Continued black bass monitoring
- Core stations
- Restoration stations

Continued water monitoring (Mar, Apr, Sep)

Prey fish monitoring was designed and planned, but permit was denied due to Delta smelt concerns
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More Information

deltarmp.org
jay@sfei.org
wheim@mlml.calstate.edu