RMP Small Tributaries Loading Strategy

Management Questions

1) Impairment

Which are the "high-leverage" small tributaries that contribute most to Bay impairment by pollutants of concern?

- We are interested in the contribution to impairment on multiple scales: local (Bay margin), Bay segment, and whole Bay.
- Pollutant-specific modeling and monitoring will be needed to establish the linkage between impairment at the Bay margin with the watersheds and with sources within watersheds that contribute to impairment.
- Determining how impairment is occurring is a priority for the RMP. For bioaccumulative pollutants, this requires an understanding of where and when uptake into the food web is occurring. This has been identified as the first step in the Mercury Strategy, and extensive sampling of small fish has been initiated to contribute to information. A similar understanding is needed for PCBs and other organic pollutants. The RMP will perform a review of existing information to attempt to answer this question. Information needed includes the natural history of sport fish and their prey, a conceptual or quantitative understanding of the dynamics of uptake, and the spatial and temporal patterns of contamination of water and sediment. Existing information is probably not sufficient to answer this question. Consequently, as in the Mercury Strategy, obtaining field data on finer-scale patterns of food web uptake of organics is needed.

2) Loading

What are the average annual loads or concentrations of pollutants of concern from small tributaries to the Bay?

- We are interested in loads at multiple scales: from watersheds, to segments, and to the whole Bay.
- Loads at the whole Bay and segment scale are needed to establish and refine TMDLs and develop load allocations.
- Since we can't monitor all watersheds, loads at the watershed scale from selected watersheds are needed to support models that extrapolate from watershed loads to the broader scales (segments and the whole Bay).
- Either loads or sediment concentrations may be measured – whichever is the optimal indicator for a particular situation. The optimal indicator may be different for different management strategies or pollutant properties and distributions.

3) Trends

How are loads or concentrations of pollutants of concern from small tributaries changing on a decadal scale?

- We are interested in trends in loads at multiple scales: from a watershed, to segments, and to the whole Bay.
- Trends in loads and/or concentrations of pollutants or potential surrogates of particle-bound pollutants (e.g, turbidity and/or SCC) may be evaluated – whatever is optimal for a particular situation. Usually some fraction of the water samples collected is analyzed for a surrogate only to increase the dataset size within available budgets. The optimal approach may be different for different management strategies or pollutant properties and distributions. For example, for a particle-associated pollutant with a uniform distribution across the watershed, measurement of SSC loads may be a suitable index of pollutant loads, and turbidity may be a suitable surrogate for SCC in the majority of samples. Measurement of SSC loads may also be suitable where management consists of reducing SSC from the watershed. For a pollutant with an uneven distribution in a watershed, a management strategy might be to control transport from hotspots; pollutant concentrations on particles might be a suitable index in this scenario.
- This information is especially critical for the high-leverage watersheds.
- The time scale of interest is 10 years or more. Establishing trends for shorter time frames is probably neither practical nor useful for management.

4) Support for Management Actions

What are the projected impacts of management actions on loads or concentrations of pollutants of concern from the high-leverage small tributaries and where should management actions be implemented in the region to have the greatest impact?

- Answering these questions requires a good understanding of pollutant sources, fate, and transport, as well as management actions that are feasible and likely to occur or be considered.
- One type of projection needed is for "no action" scenarios (simple attenuation trend forecasts).
- Answers to Question 1 (which tributaries are "high leverage") will help in choosing actions to take.
- Answering these questions will require development of both Bay/margin transport model(s) as well as watershed model(s).

Guiding Principles

- Focus on what should be done, rather than what can be done. Implement control measures where they are most likely to impact Bay water quality impairments.
- Seek opportunities for obtaining information on multiple pollutants in a cost-effective manner (e.g., piggybacking).
- [this idea is captured in the first bullet I think]

- Seek areas where collaboration can be maximized

Definitions

- Small tributary: Rivers, creeks, and storm drains that enter the Bay downstream of the confluence of the Sacramento and San Joaquin rivers.
- Pollutants of concern (POC): Use SPLWG prioritized list.

Strategy for Answering These Questions

- Questions 1 and 2 are the highest priority in the near-term.
- Establishing a foundation for 3 and 4 is also important so it is important to develop modeling capability and design monitoring programs with these in mind.