

RMP OBJECTIVES AND MANAGEMENT QUESTIONS (ANNOTATED VERSION)

DRAFT 2007

GENERAL GOAL OF THE PROGRAM

Provide information needed to support management decisions

OBJECTIVES AND MANAGEMENT QUESTIONS

Objective 1. Describe spatial patterns and long-term trends of pollutant concentrations in the Estuary

1.1 Do pollutant spatial patterns and long-term trends indicate particular regions of concern?

Spatial patterns indicate regions of concern, but persistence of patterns over time is also a factor

Includes goal of finding effective analytical methods and sampling designs and to identify the best chemical species to monitor

1.2 Are management actions effective in reducing pollutant concentrations in the Estuary?

Includes characterization of inventory.

Priority management actions to monitor include:

- Source control (including chemical bans)
- Wastewater and stormwater treatment
- Habitat restoration
- Pollution prevention

Objective 2. Project future impairment

2.1 What patterns of impairment are forecast for major segments of the Estuary under various management scenarios?

Includes goal of finding the most effective modeling approaches, including:

- Conceptual models
- Simple quantitative models (if appropriate)
- Complex quantitative models (if appropriate)

Implies need to predict:

- Future loads from important sources and pathways
- Losses through different mechanisms (outflow, degradation, etc.)
- Recovery of each Bay segment (which, in turn, implies the need for accurate models – conceptual and numeric – of pollutant fate)
- Future trends in estuarine processes. Important estuarine processes include:
 - sea level rise
 - changing river inflows
 - rising temperatures
 - changes in sedimentation patterns
 - food web shifts
 - exotic species invasions

Management scenarios include:

- Source control (including chemical bans)
- Wastewater and stormwater treatment
- Habitat restoration
- Development

2.2 Which contaminants are predicted to increase and potentially cause impairment in the Estuary?

Captures need to identify emerging pollutants based on chemical properties and actual or proposed uses

Objective 3. Describe sources, pathways, loading, and processes leading to pollutant-related impairment in the Estuary

3.1 Which sources, pathways, and processes contribute most to impairment?

Includes goal of finding the most effective indicators of loadings to support decision-making. Examples of loading indicators include:

- TSS (already used extensively)
- Other potential indicators (bioaccumulation assays, SPMDs)

Implies need to understand:

- Mass loads – essential for TMDLs
- Speciation (availability) of different inputs
- Temporal dynamics
 - seasonality
- Spatial patterns
 - Local impacts
- Linkage to impairment calls for modeling

For all of the major pathways:

- Wastewater effluents
- Urban runoff
- Nonurban runoff
- Atmospheric deposition
- Delta outflow
- Dredging and dredged material disposal
- Remobilization from Bay sediment
- In-Bay cycling
- In-Bay hotspots
- Wetlands

Processes include:

- Net methylation within the Estuary
- Erosion of buried sediment
- Diagenetic remobilization

3.2 What are the best opportunities for management intervention for the most important pollutant sources, pathways, and processes?

This is focused on intervention points for pathways and processes within the Estuary (e.g., net methylation hotspots, other pollutant hotspots)

The following questions are included under this broader question:

- Where are/were the largest pollutant sources?

- What processes cause release of pollutants from these sources?
- What are the best points for management intervention between source areas and the Bay?
- What management strategies are expected to be effective?

3.3 Are management actions effective in reducing loads from the most important sources, pathways, and processes?

Objective 4. Characterize the potential for adverse effects on humans and aquatic life due to pollution of the Estuary ecosystem

4.1 Which chemicals have the potential to adversely effect humans and aquatic life and should be monitored?

- Screening level evaluation of chemicals through review of existing information
- Captures need to identify pollutants of concern, including new and emerging pollutants
- Does not suggest that RMP will be performing laboratory dose-response studies of emerging pollutants

4.2 What potential for adverse effects on humans and aquatic life exists due to pollutants in the Estuary ecosystem?

This question drives thorough evaluation of the most serious concerns
This includes concerns due to:

- individual pollutants of concern
- the synergistic or antagonistic effects of pollutant mixtures
- the interaction of pollutants with other stressors

Includes concerns at regional and local scales

Sub-question: What are appropriate thresholds for concern?

Includes goal of finding the most effective indicators of effects to support decision-making. Possible examples include:

- biomarkers in fish that link to effects at the population level
- abiotic surrogates of risk and exposure (e.g., methylmercury in water – if a link to uptake in the Bay could be established)

4.3 Are management actions effective in reducing the potential for adverse effects on humans and aquatic life due to Bay pollution?

Captures need for sustained monitoring of risk indicators to determine whether risks are reduced

Objective 5. Provide monitoring information for comparison to regulatory guidelines and for establishing regulatory guidelines

Guidelines include TMDL targets, tissue screening values, water quality objectives, sediment quality objectives, and effluent concentrations

5.1 What percentage of the Bay is impaired?

Captures need for Bay-wide assessment

Implies need for probabilistic Bay wide sampling to determine spatial extent of impairment (exceedance of existing guidelines)

5.2 What is the percentage and degree of impairment in each Bay segment?

Implies need for understanding spatial extent and degree of guideline exceedance by segment so management attention can be focused accordingly

5.3 What are appropriate guidelines for protection of beneficial uses?

RMP has a role in providing the information needed in development of guidelines. Examples include:

- Effluent limits – CTR monitoring in support of permit development
- Water quality objectives – e.g., copper and nickel
- Sediment effects thresholds – e.g., studies to evaluate whether effects in the Estuary do occur at the 1 ppm PAH threshold being applied by NOAA

This does not mean that RMP will be independently evaluating or recommending water quality objectives and other guidelines.

Objective 6. Effectively communicate information from a range of sources to present a comprehensive picture of the sources, distribution, fate, and effects of pollutants and beneficial use attainment or impairment in the Estuary ecosystem.

This objective applies to all of the questions listed under objectives 1 – 5.