Sustaining a Long-Term Water Quality Monitoring Program: The Lessons from San Francisco Bay

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Why Does a Monitoring Program Persist for 13 Years With Increased Funding?

- History
- Evidence of Success
  - Funding History
  - Stakeholder Survey
  - Publications Track Record
- Elements of Success
  - Governance
  - Relevance
  - Trust
History of the Regional Monitoring Program

Resolution 92-043 .......April 15, 1992

EO to implement the RMP

A coordinated multi-media regional monitoring program
Implementation of the Regional Monitoring Program

- Section 13267 Request……..June 12, 1992

  Program to be phased-in to limit cost increases

  Reduction of routine effluent and receiving water monitoring
Implementation of the Regional Monitoring Program

- RB Correspondence……..August 5, 1992

Payment to the Aquatic Habitat Institute constitutes compliance

MOU includes development of San Francisco Estuary Institute
The Result: Collaborative Monitoring with > 70 participants

Municipal Dischargers

Industrial Dischargers

Stormwater

Dredges

Cooling Water
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RMP Annual Budget (Fees- $ Millions)
# A Monitoring Report Card for the RMP

<table>
<thead>
<tr>
<th>Subject</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
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<tbody>
<tr>
<td>Clear goals and objectives</td>
<td>37</td>
<td>33</td>
<td>18</td>
<td>7</td>
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<tr>
<td>Carefully crafted questions</td>
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<td>Technical design based on the current understanding of system linkages and processes</td>
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<td>42</td>
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<tr>
<td>Stability of financial support</td>
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<tr>
<td>Identified set of clients</td>
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<td>Public education program</td>
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<td>38</td>
<td>12</td>
<td>12</td>
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<tr>
<td>Integration into decision-making system</td>
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<td>37</td>
<td>26</td>
<td>11</td>
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<tr>
<td>Coupling to research and modeling programs</td>
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<td>44</td>
<td>33</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Subject</td>
<td>A</td>
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<tr>
<td>Informational products tailored to primary and secondary clients</td>
<td>26</td>
<td>37</td>
<td>26</td>
<td>11</td>
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<td>Timely synthesis of results</td>
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<td>37</td>
<td>30</td>
<td>11</td>
<td>4</td>
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<tr>
<td>Flexibility of program</td>
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<td>62</td>
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<td>Frequency and quality of peer-reviews</td>
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<td>50</td>
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<td>On-going forum of stakeholders</td>
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<td>8</td>
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<td>Integration with other monitoring programs</td>
<td>15</td>
<td>42</td>
<td>31</td>
<td>12</td>
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<tr>
<td>Appropriate allocation of resources</td>
<td>17</td>
<td>52</td>
<td>26</td>
<td>4</td>
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RMP Journal Publications

- Special Issue of Environmental Research coming soon
  - Davis et al. Submitted. Polychlorinated biphenyls (PCBs) in San Francisco Bay
  - Connor et al. Submitted. The slow recovery of the San Francisco Estuary from the legacy of organochlorine pesticides.
  - Hoenicke et al. Submitted. Adapting an Ambient Monitoring Program to the Challenge of Managing Emerging Pollutants in the San Francisco Estuary
  - Yee et al. In prep. Quality assurance
  - Sedlak et al. In prep. Nickel
Other recent publications

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RMPs governance balances agency and funder viewpoints with science review

RMP COMMITTEE ORGANIZATION CHART

STEERING COMMITTEE

TECHNICAL REVIEW COMMITTEE

SOURCES, PATHWAYS, AND LOADING WORKGROUP
EXPOSURE AND EFFECTS WORKGROUP
CONTAMINANT FATE WORKGROUP
RMP participants have many chances to weigh in:

- Project design
- Project review
- Committee & annual mtgs.
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Objective 1

Describe the distribution and trends of pollutant concentrations in the Estuary

- Water chemistry
- Sediment chemistry
- Mussel watch
- Sport fish
- Small fish
- Avian eggs
Objective 2

Project future contaminant status and trends using current understanding of ecosystem processes and human activities

- Multibox mass budget model
- Coring study
Objective 3

Describe sources, pathways, and loading of pollutants entering the Estuary

- Guadalupe River Study
- Mallard Island Study
- Multibox model - erosion of buried sediment
- Atmospheric deposition
Objective 4

Measure pollution exposure and effects on selected parts of the Estuary ecosystem (including humans)

• Shiner Surfperch Study
• Sediment Toxicity
• Aquatic Toxicity
• Benthic Community Analysis
• Tern Egg Hatchability
• Sport Fish Chemistry (human exposure)
• Small Fish Study (wildlife exposure)
Objective 5

Compare monitoring information to relevant benchmarks, such as TMDL targets, tissue screening levels, water quality objectives, and sediment quality objectives.

- Water chemistry
- Aquatic toxicity
- Sediment chemistry
- Sediment toxicity
- Sport fish
Objective 6

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

- Pulse of the Estuary
- 10 Year Synthesis Special Issue of Environmental Research
- Annual Meeting
- Literature Reviews
- Web site
Listing impaired waters and developing TMDLs have become the major water quality policy focus.
RMP switched to a randomized design to allow better assessment of 303(d) impaired segments.
• TMDL Modeling
  – 50 Model Boxes
  – 2 Vertical Layers
  – 100 cm of sediments

• Physics Forced by:
  – Golden Gate Tides
  – ‘Delta Outflow’
  – Local Tributaries
  – Wind, Rain
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QA Multi-Step Review

• Data verification- Do we get what we expect?
  – Completeness and correctness of field and QC samples (sample & analyte names, formats, units)

• Data validation- Is what we get any good?
  1. Performance on specific QC samples/measures- blanks, replicates, spikes, reference materials
  2. Consistency checks- internal (e.g. relative congener abundance) and external (vs. previous year, other region data sets)
  3. Marginal and suspect data flagged or censored

Poster: Variability in Long Term RMP Data (Yee)  Presentation: Why is My Blank Not Blank (Sedlak)
Data & QC Info Web Accessible

Poster: (Grosso et al.) Facilitating the Exchange and Reporting of Monitoring Data
Five-Year Program Review Regional Monitoring Program for Trace Substances in the San Francisco Estuary

Panel:
Dr. Donald Boesch, University of Maryland, Center for Estuarine and Environmental Studies
Mr. Robert Cushman, Oak Ridge National Laboratory, Carbon Dioxide Information Analysis Center
Mr. William Crooks, private consultant
Dr. Alan Mearns, NOAA Ocean Assessment Division
Dr. Susan Metzger, Lawler, Matusky and Skelly Engineers
Dr. Thomas O'Connor, NOAA National Status and Trends Program
Dr. Allan Stewart-Oaten, University of California at Santa Barbara

Coordinators:
Dr. Brock Bernstein, EcoAnalysis, Inc.
Dr. Joseph O'Connor, private consultant

Final July 21, 1997

RMP Contribution #28
Reports and information available at:
SFEI Booth

[www.sfei.org](http://www.sfei.org)

jay@sfei.org