Adaptive Monitoring

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San Francisco Estuary Institute
RMP Annual Meeting
September 12th, 2006

Mt Kilimanjaro ~ 1970s

Mt Kilimanjaro today
Adaptive Monitoring and the RMP

Regulatory Priorities

Understanding of the Bay

Management of Bay

Adapt the RMP through:
1) Pilot Studies/Special Studies (short term)
2) Status & Trends (longer term)
Adaptive Management Requires Quick Turnaround

Organics (Water): Todd Fisher, Dale Hoover, Georgina Brooks, & Richard Grace

Metals: Colin Davies & Elizabeth Madonick

Organics (Sediment): Nirmela Arsem, Francois Rodigari & Saskia van Bergen

Metals (Sediment): Lonnie Butler & Toni Rattonetti

Tissues: Dave Crane & Loc Nguyen
Adaptive Management Requires Easily Accessible Data

- Increasing data access
  - Web query
  - State network node
- Formats that are comparable with state agencies

http://www.sfei.org/RMP/report
Providing Information

• Pulse
• Annual Monitoring Results
• Newsletters
  – RMP Newsletter/ Hg News
• Workshops
  – Hg
  – PAHs
  – Pyrethroids
  – Benthos
• Annual Meeting
Measuring fluxes into the Bay....

- SS 2007: Small Tributary Loading Study
  - Continuation of characterization of loads from urban runoff
  - Small industrialized watershed

![Graph of Mercury Loads from the Guadalupe River](chart.png)
Measuring fluxes into the Bay... and out of the Bay

- SS 2007: Remote Sensing of the Bay
  - Using satellite images to characterize fluxes during episodic events

Photo courtesy of USGS
2006 SS CEP/RMP Coring Study

- Sediment inventory will control recovery
- SFEI/AMS collecting cores in Bay and wetlands
  - Segment, radiodate and conduct chemical analyses
Exposure & Effects
Pilot Study

• Changing regulatory focus:
  – Increase focus on biota in TMDL (e.g., fish and birds)

• Changing management of Bay
  – Need to understand impact of wetland restoration

• EEPS goal:
  – Develop tools for assessing impacts to biota. Incorporate into S&T.
EEPS 2006
Shiner Surfperch

- Effects of contamination on health
  - Examining wide variety of indices (sex ratios, offspring, choriogenin, histopathology)

- Altered sex ratios in the Bay

Source: Spies and Springman, unpub. data
Endocrine disruption in fish

- Impairment of endocrine system in fish in So CA Bight
  - Kevin Kelley, CSU-Long Beach
  - Suppression of growth, defense capabilities & reproduction

- RMP study
  - Measure cortisol, estradiol, testosterone, and insulin-like growth factors in SF fish

Pacific staghorn sculpin
Shiner surfperch
EEPS 2006: Benthos

- Sediment Quality Objectives (SQOs)
  - Triad approach
  - Scheduled to be promulgated 2008

- Need to understand causes of sediment toxicity
Emerging Contaminants

• Increasing focus on emerging contaminants (EC)
• RMP formed EC Workgroup
  – Strategy for identifying ECs
  – Criteria for inclusion into S&T
  – Recommendations for 2007 PS/SS
    • Pharmaceuticals/personal care products in Bay
    • PFOS/PBDE in seals
Emerging Contaminants in Effluent and the Bay

• Determine concentrations of pharmaceuticals and personal care products in:
  – Influent/effluent from two WWTP
  – Ten stations in South Bay

• In-kind contributions
  – City of Palo Alto (Karin North)
  – City of San Jose (Dave Tucker)
  – AXYS analytical (Million Woudneh)

Triclosan
Perfluorinated Compounds

- Widely-used
- Detected worldwide
- Deleterious health effects
- Collaborating w/ Marine Mammal Center to look at apex predators
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Redesigning S&T

• Addressing RMP Objectives?
  – 1. Describe distribution and trends
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Redesigning S&T

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  – 1. Describe distribution and trends
  – 2. Project future contaminant status and trends
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  – 1. Describe distribution and trends
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  – 3. Describe sources pathways and loading of pollutants

![Mercury Loads from the Delta Graph]

Average (1995-2005) = 182 kg
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Redesigning S&T

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  – 1. Describe distribution and trends
  – 2. Project future contaminant status and trends
  – 3. Describe sources pathways and loading of pollutants
  – 4. Measure exposure and effects
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Redesigning S&T

• Addressing RMP Objectives?
  – 1. Describe distribution and trends
  – 2. Project future contaminant status and trends
  – 3. Describe sources pathways and loading of pollutants
  – 4. Measure exposure and effects
  – 5. Compare to guidelines (TMDLs, WQOs, SQOs, etc.)
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Redesigning S&T

• Redesign Meeting -- September 19th
• Asking for your vote TODAY
  – Dots in your agenda package
  – Can vote for RMP objective or specific management question
• Votes compiled for meeting
• RSVP for a good seat
  – Meg@sfei.org
Adaptive Monitoring

- Change is the law of life. And those who look only to the past or present are certain to miss the future.

  John F. Kennedy (35th US President)
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- *Change is the law of life. And those who look only to the past or present are certain to miss the future.*
  
  John F. Kennedy (35th US President)

- *I skate to where the puck is going to be, not where it has been.*
  
  Wayne Gretzky (US Hockey Player)
Questions?

Photo courtesy of Nicole David