Linkage to Management Questions – Long Term Perspective

Karin North, City of Palo Alto
San Francisco Bay

BIG, URBANIZED
Area = 4,100 km²

SHALLOW, COMPLEX
Median Depth = 4 m

LARGE WATERSHED
40% of CA
Regional Monitoring Program

Partnership to understand the health of San Francisco Bay

Celebrating our 25th year!
Specific Regulations Addressed by the RMP

303d Listings
NPDES Permits
Nutrient Watershed Permit
CEC Action Plans
Copper SSO Implementation Plan
Selenium TMDL
Mercury TMDL
PCBs TMDL
Mercury and PCBs Watershed Permit
Achieving Our Goal

RMP Impacts on Management Decisions

<table>
<thead>
<tr>
<th>Scale</th>
<th>National/State Scale</th>
<th>Regional Scale</th>
<th>Local Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Product phase outs</td>
<td>Fish Consumption Advisories Nutrient Management Strategy</td>
<td>Ambient sediment and water concentrations for permitting</td>
</tr>
<tr>
<td></td>
<td>Identifying high risk CECs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Silver in Clams in the San Francisco Bay
Contaminants of Emerging Concern

PFOS
PFAS
PBDEs & Flame Retardants
Pesticides

William Duke, NYTimes
RMP Focus on CECs

• 10+ years of monitoring and studies
  • Primarily ambient water, sediment, biota
  • Some wastewater and stormwater

• 2013 CEC Synthesis and Strategy
  • Added non-targeted analysis, bioanalytical tools

• 2017 Strategy Revision
Management Questions

Which CECs have the potential to adversely impact beneficial uses in San Francisco Bay?

What are the sources, pathways, loadings, and processes leading to CEC pollution in the Bay?

Have the concentrations of CECs in the Bay increased or decreased?

Which management actions may be effective in reducing CEC levels?
Risk Tiers

TIER 4
High probability of moderate or high level effect on Bay wildlife

TIER 3
High probability of low level effect on Bay wildlife

TIER 2
High probability of no effect on Bay wildlife

TIER 1
Uncertainty in Bay levels or toxic thresholds
Monitoring Strategy

Studies to support Total Maximum Daily Load (TMDL) or alternatives

Trends monitoring and/or fate, effects, and sources and loadings studies

Periodic ambient and/or source trend screening

Ambient and source screening
Management Strategy

303(d) list → TMDL or alternative(s)

Action plan or strategy
  – Aggressive pollution prevention
  – Seek product or chemical alternatives

Track product use and market trends
Easy, low-cost source identification and pollution prevention actions

Identify and prioritize potential CECs
Develop bio and chemistry methods
None currently

PFOS
Fipronil
Nonylphenol

PBDEs and HBCD
Pyrethroids*
Pharmaceuticals and Personal Care Products
PBDDs and PBDFs

Alternative Flame Retardants
PFAS (Fluorinated Chemicals)
Pesticides, Plasticizers
Microplastic
PCB 11, PHCZs, others
Management Actions: Moderate Concern (Tier III)

Regional CEC Action Plans:

• Source identification
• Source control identification and evaluation
• Track product use and market trends
• Communication and outreach
• Monitoring/study strategy
• Track recovery
• Referral to other regulatory authority(s)
PBDE Recovery

Shiner Surfperch

PBDE concentration (ppb ww)

2003  2006  2009  2014

TIER 2 LOW CONCERN

RMP
Alternative Flame Retardants

PBDE replacements detected in consumer products and San Francisco Bay led to management actions:

- California Bureau of Home Furnishings
  - TB117-2013: New standard for foam furniture, exemptions for baby products
  - SB 1019: Furniture labeling law
PFOS Recovery

South Bay
Harbor seals
PFOS in Serum
(ng/g or ng/mL)

TIER 3
MODERATE CONCERN
Microplastics

- 10:1 leveraging of RMP $$
- Sampling underway for
  - Water
  - Sediment
  - Prey Fish
- RMP testing for MP in bivalves funded for 2018

Microplastic Study Budget, $1M total

Moore Fdn
Microplastic

2015 Bay study levels higher than:

- Great Lakes
- Chesapeake
- Salish Sea

Sutton et al. 2016
Microplastic: Broader Impacts

Policy:

- Federal **Microbead-Free Waters Act** signed into law (2015)

Funding:

- Gordon & Betty Moore Foundation 2-year, $880,000 grant for further study
- Guided by RMP Microplastic Monitoring and Science Strategy
Triclosan

Palo Alto and other SF Bay wastewater agencies

• Consumer education
• Purchasing
Triclosan

2016: **FDA** bans triclosan and 18 other antibacterials from hand & body washes

**Other uses** may be addressed via DTSC:

- **Safer Consumer Products Program** (Green Chemistry)
Pharmaceuticals

Support for extended producer responsibility:

• RMP data for Senate hearings, council meetings, boards of supervisors

• 2016-2017 testing by wastewater agencies
Leveraging Resources

• Partnership with other organizations
  • Department of Toxic Substances Control
  • Department of Pesticide Regulations
  • Pro bono academic projects

• Alternative Monitoring Permit – provides RMP with extra funding for CECs ($235,000)
• Supplemental Environmental Projects (Enforcement) funding possible
Keys to RMP’s Success

Forum for Collaboration

Clear Objectives

Adaptability

Long Range Planning

Stable Funding

Allocation of RMP Fees by Sector

- Municipal WWTFs: 44.4%
- Stormwater: 23.5%
- Dredgers: 17.5%
- Cooling Water: 4.0%
- Industry: 11.0%
A vision for the future
Thank you

For more information:
Karin.north@cityofpaloalto.org