2022 RMP Annual Meeting

Update on RMP PCB Studies

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One of the Remaining Challenges: PCBs

This is the dataset that defines the problem

Many species have average concentrations well above thresholds

PCBs in San Francisco Bay Fish Species, 2019

- Shiner Surfperch
- Northern Anchovy
- White Surfperch
- Staghorn Sculpin
- Largemouth Bass
- White Croaker
- White Sturgeon
- Striped Bass
- Bat Ray
- Jacksmelt
- California Halibut
- Diamond Turbot
- Pacific Herring
- Brown Rockfish
- Starry Flounder
- Monkeyface Prickleback

Sum of 208 PCBs concentration (ppb ww)

- ATL - no consumption
- ATL - 2 servings/week
- Numeric Target
Understanding the Problem

Part A: Localized margin contamination

• Very high levels
• More controllable
Understanding the Problem

Part B: Regional Bay contamination

- Moderate levels
- Harder to control

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Understanding the Problem

Part A: Localized margin contamination
• Shiner surfperch
Part A: Localized margin contamination
- Shiner surfperch
General Electric Site History

- Transformer production and repair from 1923-1975
- Accidental spills, leaks and negligent disposal (burial)
- Highly contaminated soil and subsurface oil plume
- Cleanup 2012-2013: excavation of soil, on-site capping, groundwater extraction and treatment, and ongoing monitoring
Stormwater (RMP)
Zone 12, Line H
2017: 2,601 ng/g
2020: 1,271 ng/g
Stormwater (RMP)
Zone 12, Line I
2017: 398 ng/g
2020: 263 ng/g
Union Pacific Railroad Site

- Also very high soil and sediment PCBs
- Cleanup has been in planning for several years
Sediment PCBs at select stations in San Leandro Bay, 2016 (ppb)
Real-world complexities demand a data-driven approach

- Straightforward expectations may be wrong
- Cleanup actions may not work as expected
Simple Mass Budget Model for San Leandro Bay

- PMUs will vary
- Fish will follow sediment
- Suggests inputs are continuing
- Reducing watershed inputs would greatly accelerate recovery
- High uncertainty

 loads shown as multiples of estimated current stormwater load
<table>
<thead>
<tr>
<th>Study</th>
<th>Multiple Samples</th>
<th>Prior study</th>
<th>WY2015</th>
<th>WY2016</th>
<th>WY2017</th>
<th>WY2018</th>
<th>WY2019</th>
<th>WY2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulgas Pump Station South</td>
<td>Industrial Road Ditch</td>
<td>Estimated PCB Concentration on Particles in Stormwater (ng/g)</td>
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Steinberger Slough/Redwood Creek
- Includes a long-term fish monitoring station
- Two of the hottest subwatersheds
- Major source areas: Delta Star and Adhesive Engineering/Master Builders, Inc.
- RMP field studies underway
- Collaboration with Dick Luthy and Yeo-Myoung Cho of Stanford
- More surprising results
Science Needs

- **Adequate monitoring**
  - Establish baselines
  - Identify most important sources
  - Support modeling
  - Track improvement
- **More robust fate modeling** for SLB, SS/RC, other margin areas, and the whole Bay
- The RMP (PCB Workgroup) has been laying the groundwork to meet these needs
RMP Take-home Messages for PCBs

- We’re not there yet
- Margin areas have the worst contamination, and greatest potential for improvement
- Low-hanging fruit appears to be present
  - I showed just some examples
- Expect the unexpected in the field – management needs to be data-driven
- Monitoring and modeling are needed
Acknowledgements

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- Bryan Frueh
- + the investigators
More Information

San Leandro Bay Conceptual Model Report

Steinberger Slough/Redwood Creek Conceptual Model Report

Emeryville Crescent Conceptual Model Report

PCBs in Shiner Surfperch in Priority Margin Areas
• https://www.sfei.org/documents/pcbs-shiner-surfperch-priority-margin-areas-san-francisco-bay

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My son’s band’s (Hot Flash Heat Wave) next show
• www.20thstreetblockparty.com