SMALL TRIBUTARIES LOADING

Background

- San Francisco Bay PCB and Hg TMDLs established to deal with health effects due to wild life and human exposure
- Small fish and sport fish are recognized as a key indicator of PCBs and Hg impairment in the Bay due to its susceptibility to dietary intake of these species
- Urban tributary loads are named in the TMDL as the primary controllable source for reducing impairment
- Other urban pollutants of interest include Cu, PBDEs, nutrients pesticides and emerging pollutants.

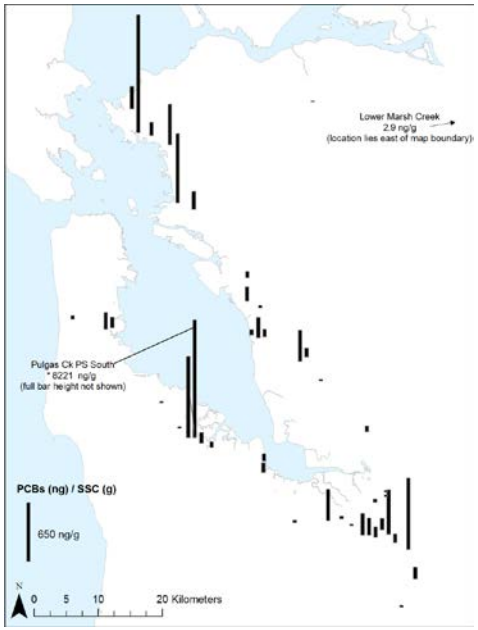
Given these issues and challenges, the Small Tributaries Loading Strategy (STLS) was written in 2009 to help prioritize and coordinate the activities of the RMP and BASMAA permittees that support locating, quantifying and managing PCBs and Hg and other pollutants in the urban environment. Note: "Small tributary" refers to the rivers, creeks, and storm drains that enter the Bay from the nine counties that surround the Bay.

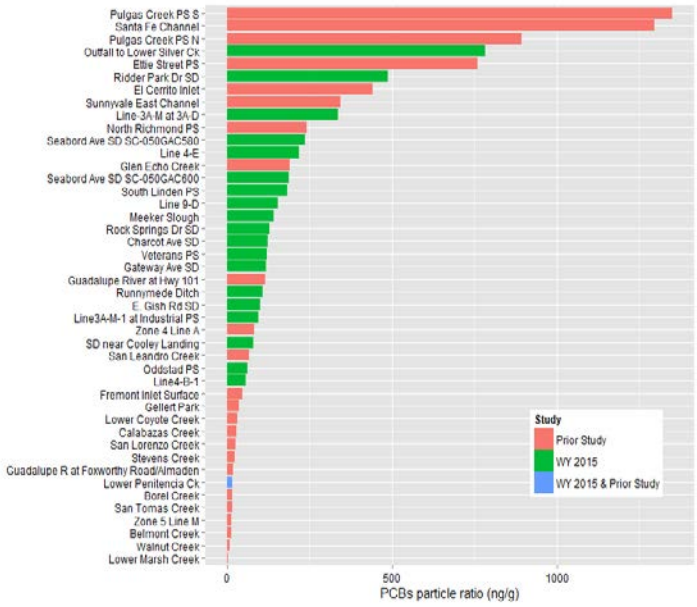
Relevant Management And Policy Decisions

- Refining pollutant loading estimates for future TMDLs and management decisions, including TMDL updates.
- Informing provisions of the current and future versions of the Municipal Regional Stormwater Permit (MRP).
- Identifying small tributaries to prioritize for management actions.
- Informing decisions on the best management practices for reducing concentrations and loads.
- Identifying trends in stormwater loadings.

Priority Questions

1. Which are the "high-leverage" small tributaries that contribute or potentially contribute most to Bay impairment by pollutants of concern?
2. What are the loads or concentrations of pollutants of concern from small tributaries to the Bay?
3. How are loads or concentrations of pollutants of concern from small tributaries changing on a decadal scale?
4. What are the projected impacts of management actions on loads or concentrations of pollutants of concern from the high-leverage small tributaries, and where should management actions be implemented in the region to have the greatest impact?
5. Which sources or watershed source areas provide the greatest opportunities for reductions of POCs in urban stormwater runoff?





Recent Findings

Using PCB particle ratios, the most polluted sites appear to be Pulgas Creek Pump Station North and South, Santa Fe Channel, an outfall to Lower Silver Ck, and the Ettie Street Pump Station. Hg is also relatively high at the Santa Fe and Ettie Street sites

The most recent estimates based on simple scaling of climatically adjusted empirical data for PCB loads are similar to those in the TMDL (20 kg), whereas new evidence suggest a regional load of 113 kg Hg, lower than that of the TMDL (160 kg).

Pulgas Creek PS-South has the highest yield (85 g/km^2) measured to date whereas Guadalupe River has the highest Hg yield (387 g/km^2)

PCB legacy source areas include electrical distribution use and production areas, waste handling areas, railway yards and lines, older industrial areas, and buildings and pavements where caulking was used in joints sealants.

Hg sources include older urban areas, waste handling areas, cement plants, crematoria, refineries, and legacy mining areas.

Workplan Highlights

Stormwater reconnaissance winter sampling: To support a weight-of evidence approach for the identification and management of PCBs and Hg sources, this effort provides further data on concentrations and particle ratios with a focus on the stormwater flowing from of older urban and industrial land use areas.

Regional watershed Spreadsheet model: The RWSM is an average annual time step planning level model designed to estimate sub-regional scale loads of any pollutant of interest. Presently development efforts is mostly focused on PCB and Hg. Once calibrated, model outputs will include maps, tables, and graphs of watershed scale loads and yields, and land use based event mean concentrations, loads and yields. These data estimates can be used to help rank watersheds of interest and provide a baseline for comparing conditions before and after effort.

Trends Strategy: The determination of stormwater loading trends in relation to management efforts and beneficial uses impacts is an important new focus area. To support this focus, a trends strategy is being developed that will provide a rationale for site and water quality indicator selection, analytes and sampling design including the choice of discrete versus composite sampling, storms to focus on and how often to sample. To support this change in direction, a STLS Trends team has been assembled that includes several of the nations leading experts on trends design and analysis.

Relation to Permit Requirements

- C.8.f Pollutants of Concern Monitoring
- C.8.g. iii Wet Weather Pesticides and Toxicity Monitoring
- C.11/12.a Implement Control Measures to Achieve Mercury/ PCB Load Reductions
- C.11/12.b. Assess Mercury/ PCB Load Reductions from Stormwater
- C.11/12.c. Plan and Implement Green Infrastructure to reduce mercury / PCB loads
- C.11/12.d. Prepare Implementation Plan and Schedule to Achieve TMDL Allocations

Collaborators

Key Regulatory and Academic Study Partners

- San Francisco Bay Regional Water Quality Control Board
- Bay Area Storm Water Management Agencies Association
- Michael Stenstrom, UCLA
- Barbara Mahler, Dan Cain, Bob Hirsch, Lori Sprague, USGS
- Kelly Moran, TDC Environmental
- Peter Mangarella, GeoSyntec (Retired)