

Water Resources Action Plan (WRAP) Hydrodynamic and Water Quality Model

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Technical Advisory Committee Meeting

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Presentation Overview

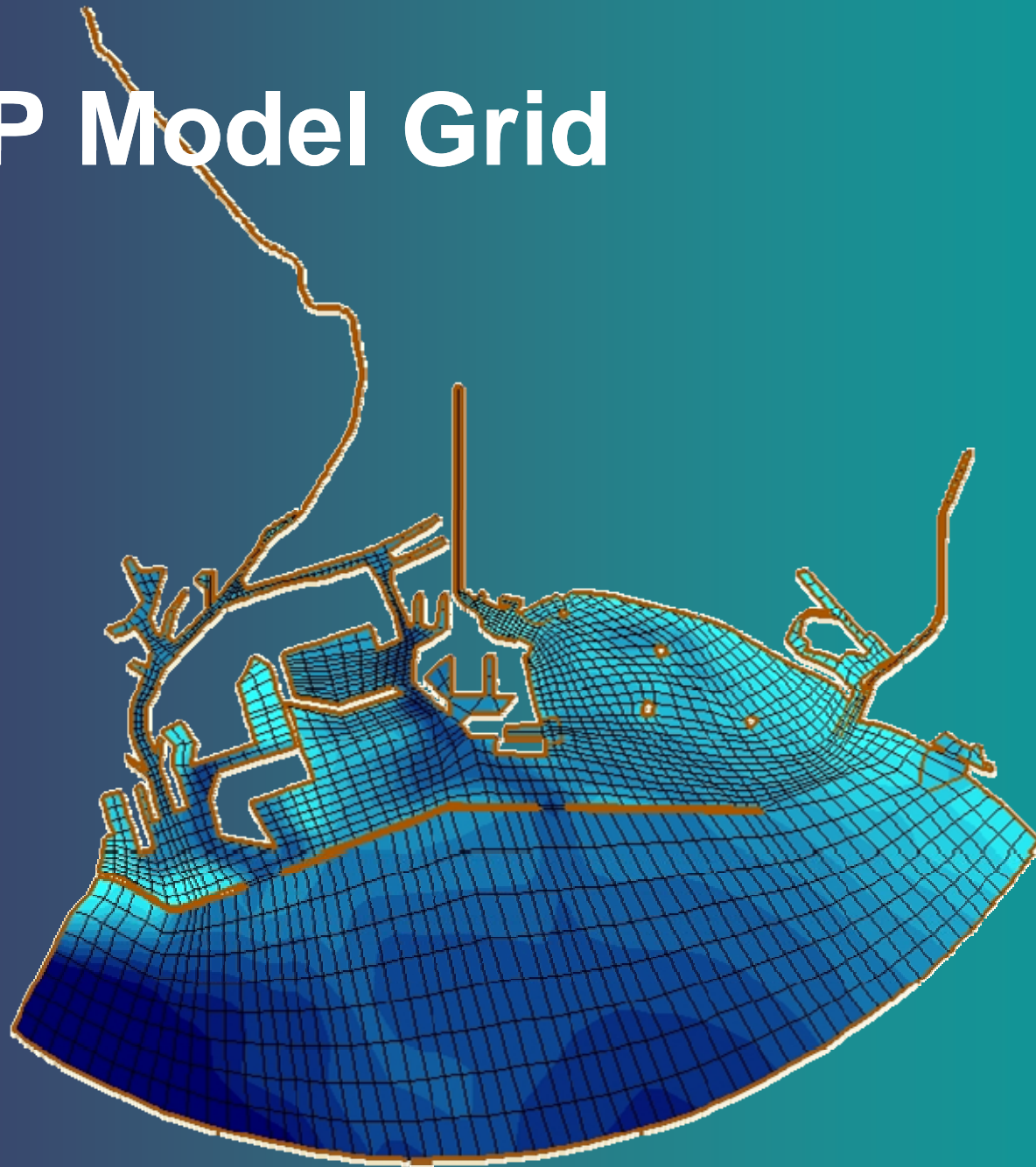
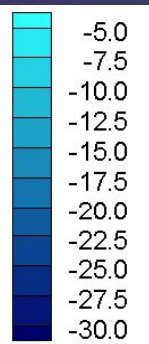
❖ EPA and WRAP Model Comparisons

- Ports intend to use their WRAP Model for some TMDL-related simulations in cooperation with EPA; first step is to compare whether the WRAP Model and EPA Model produce similar calibration results based on the same watershed inputs and initial harbor conditions

❖ Preliminary WRAP Model simulation results for “hotspots”

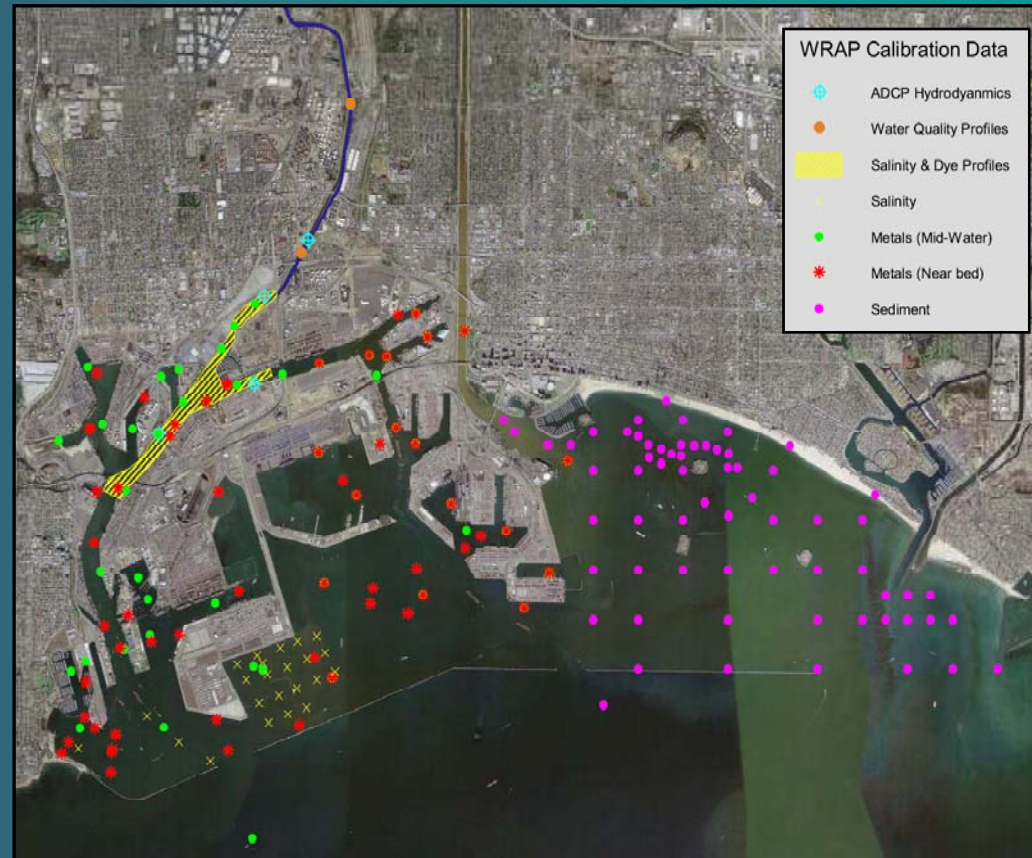
WRAP Model Grid

Bottom Elevation
(m, MLLW)



WRAP Model Calibration

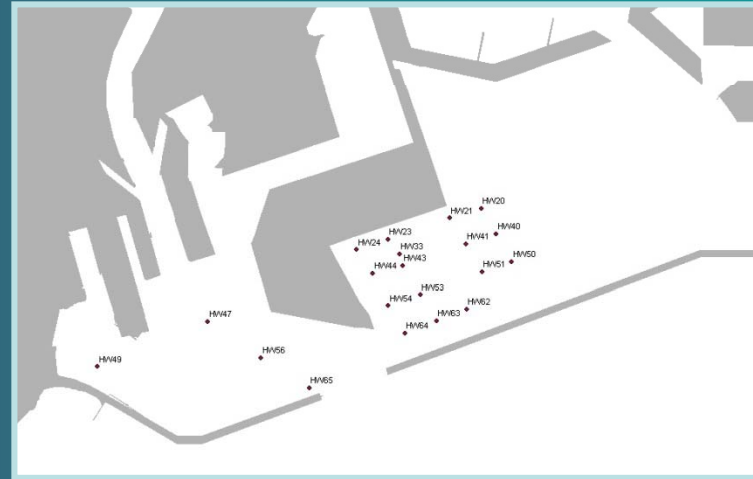
- Water Level
- Velocity
- Dye
- Salinity*
- TSS*
- Sediment Tracer
- Metals*



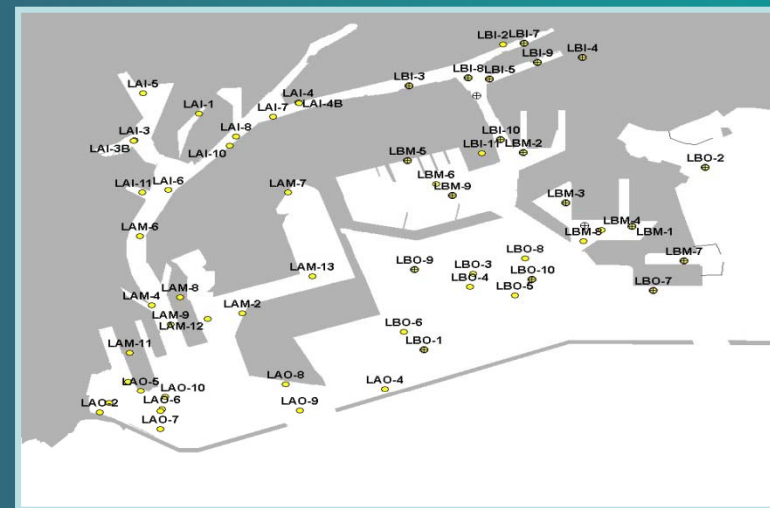
*Parameters compared

Calibration Locations

salinity

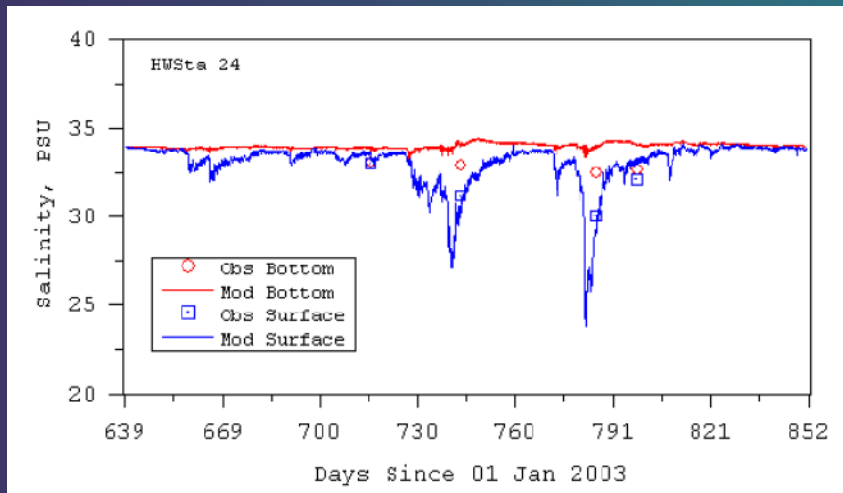


TSS and Metals

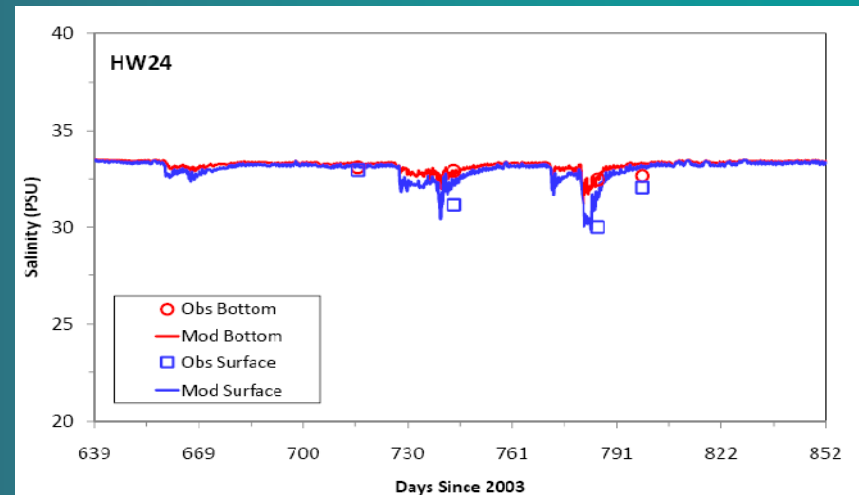


Salinity Comparison – HW24

EPA Model

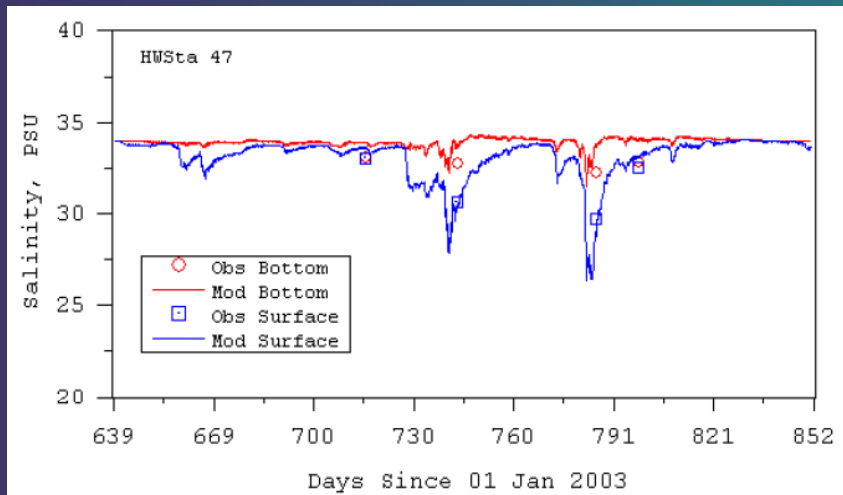


WRAP Model

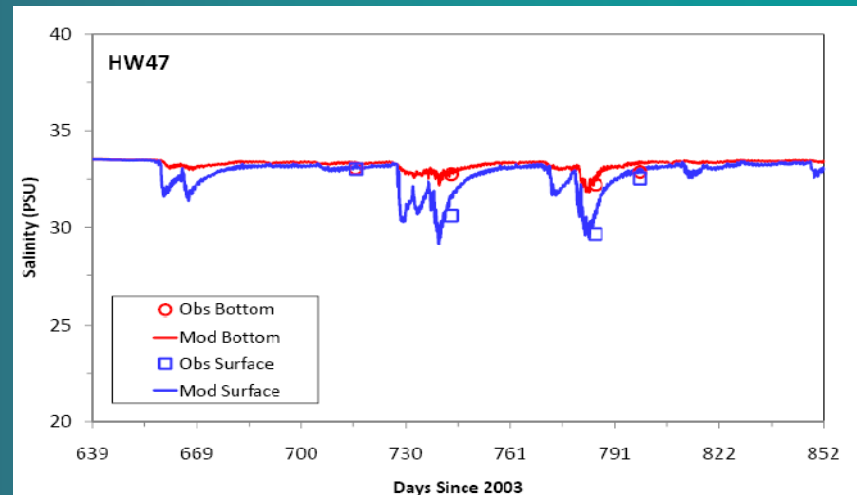


Salinity Comparison – HW47

EPA Model

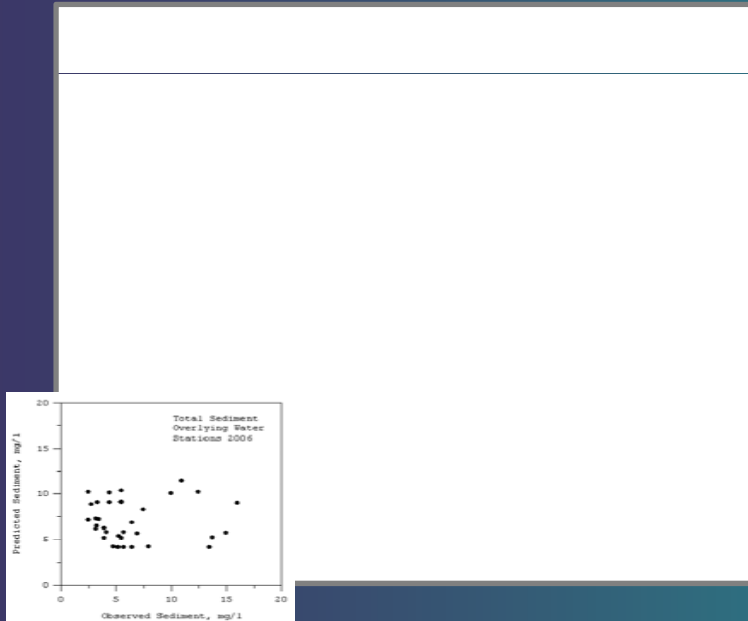


WRAP Model

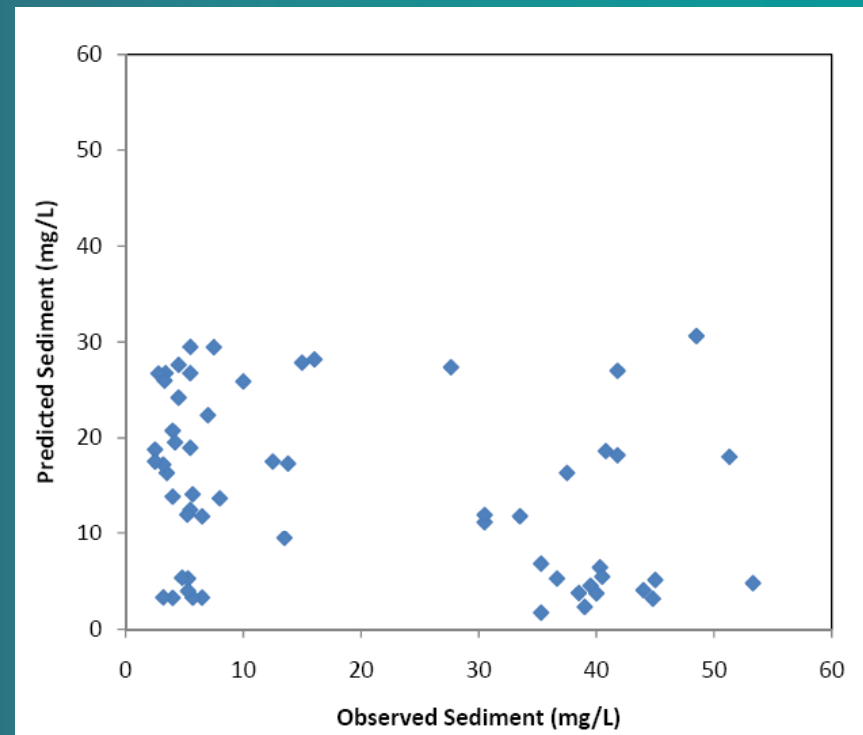


TSS – Overlying 2006 Sites

EPA Model

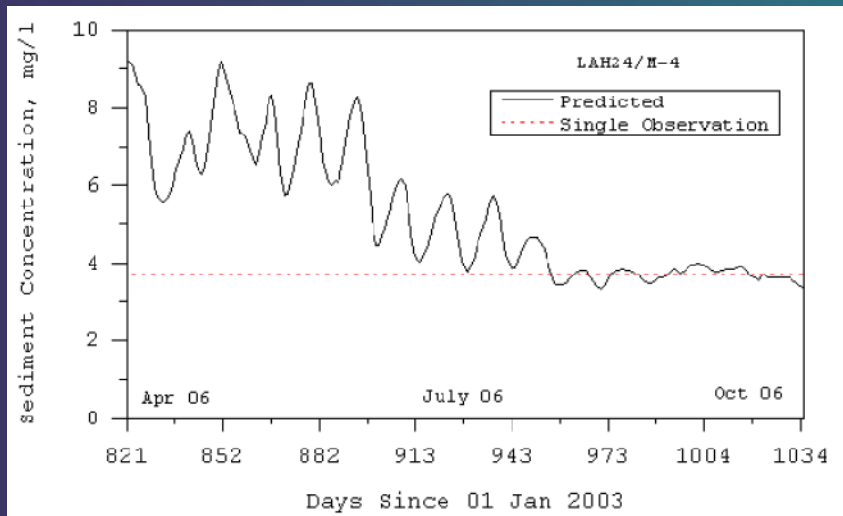


WRAP Model

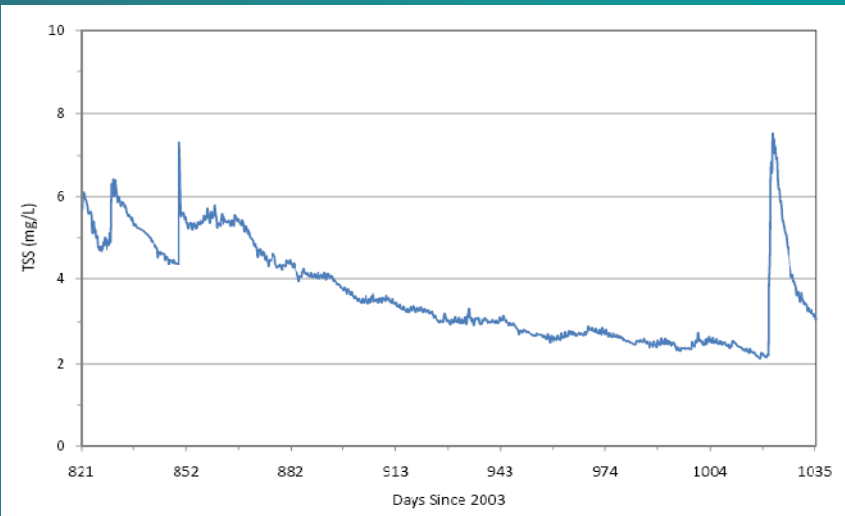


TSS Time Series

EPA Model

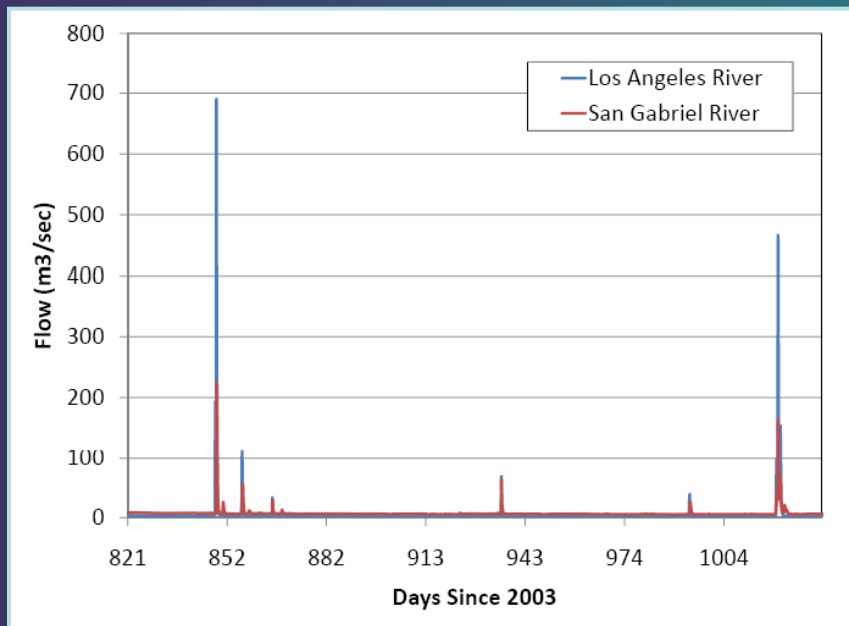


WRAP Model

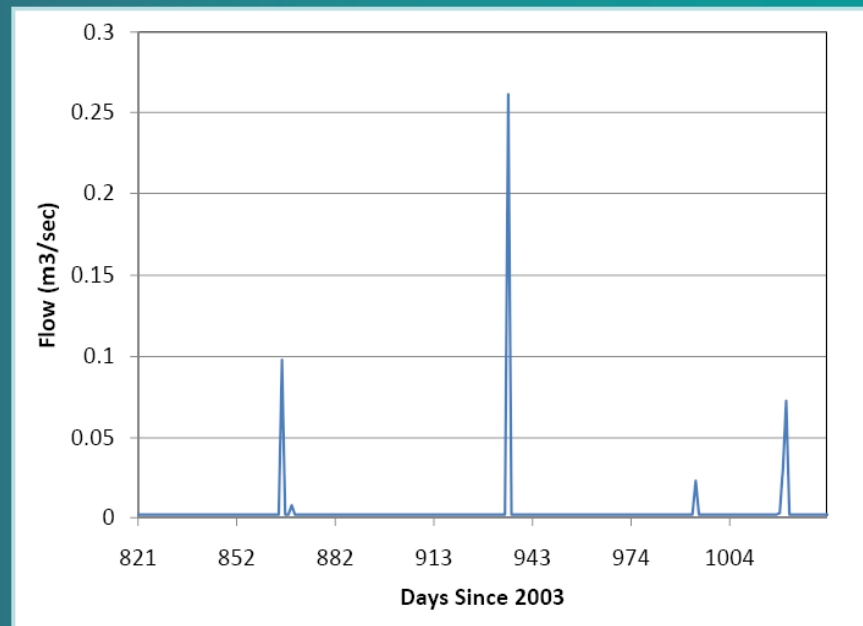


Inflows

LAR and SGR Flow



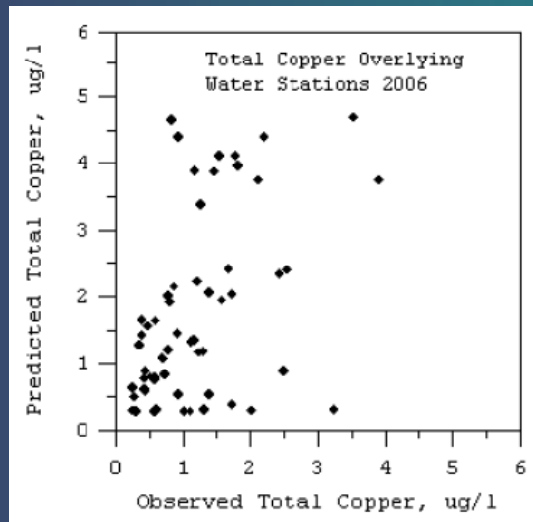
Nearshore Watershed Flow



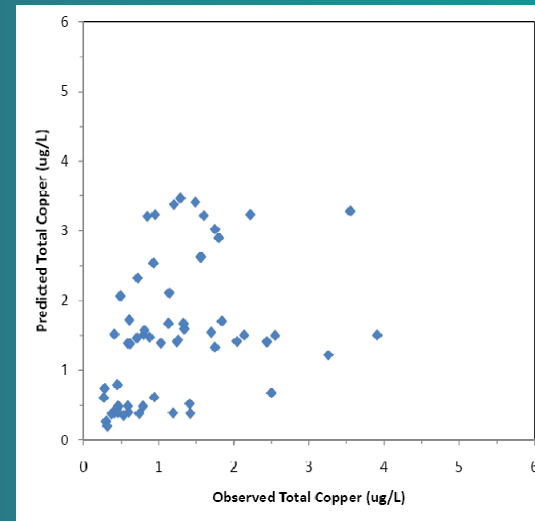
Copper

Overlying
Sites

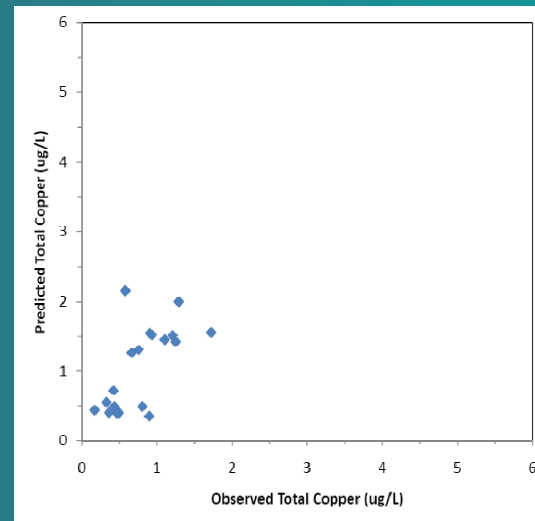
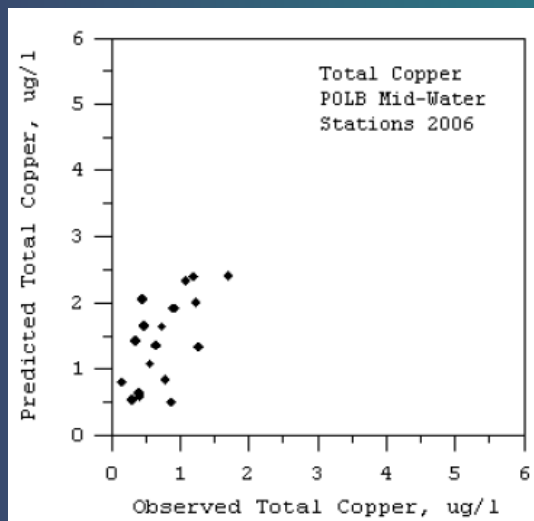
EPA Model



WRAP Model



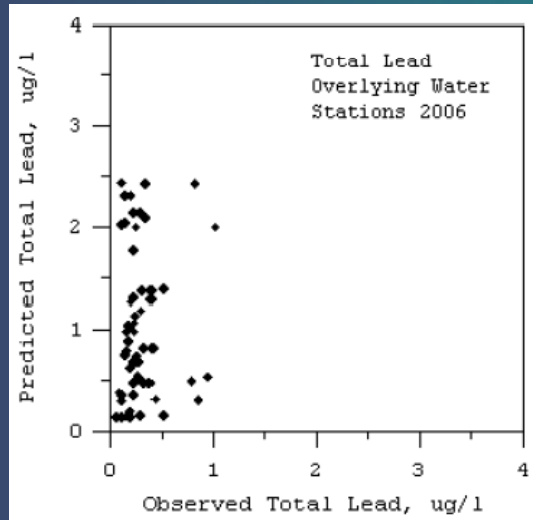
Mid-Water
Sites



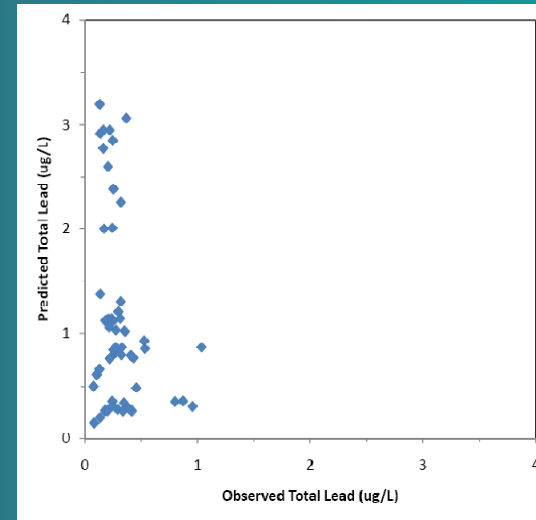
Lead

Overlying Sites

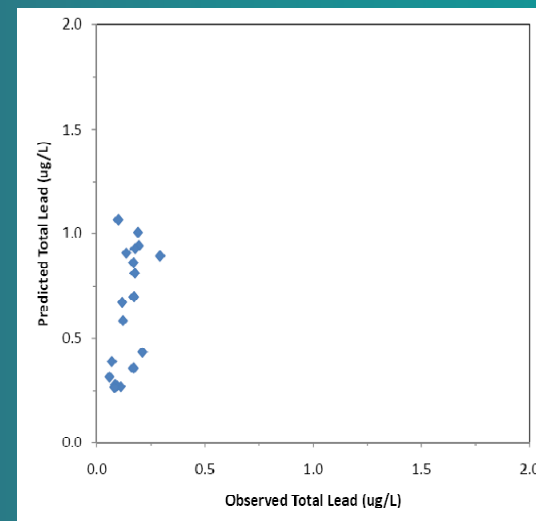
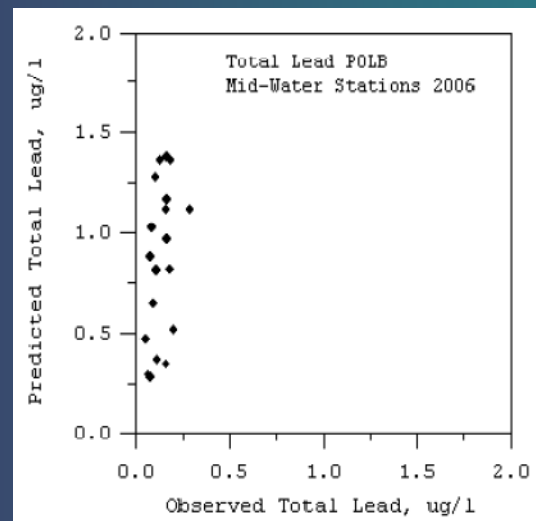
EPA Model



WRAP Model



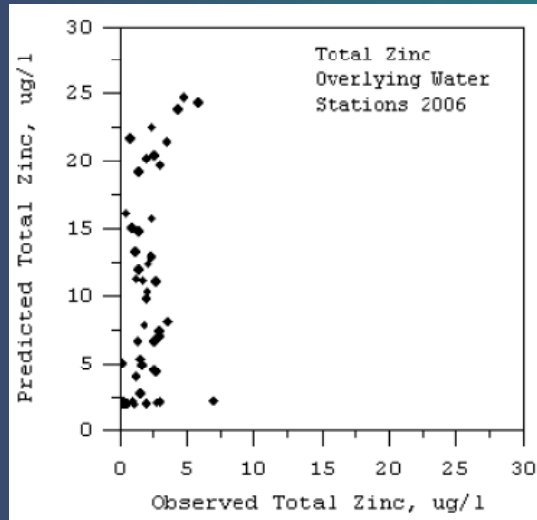
Mid-Water Sites



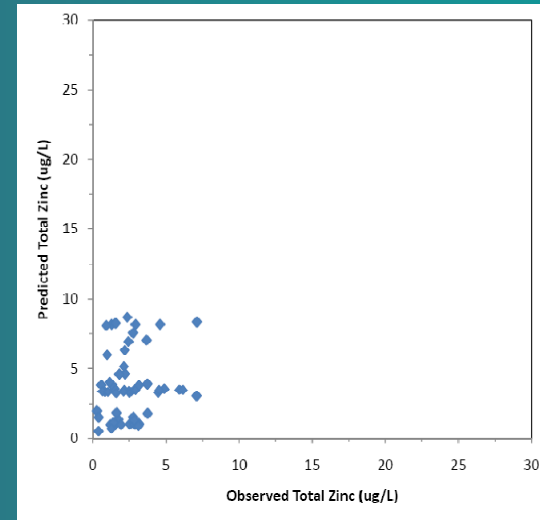
Zinc

Overlying
Sites

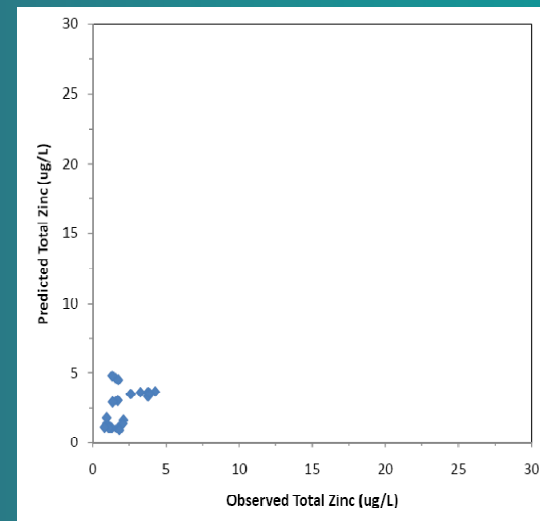
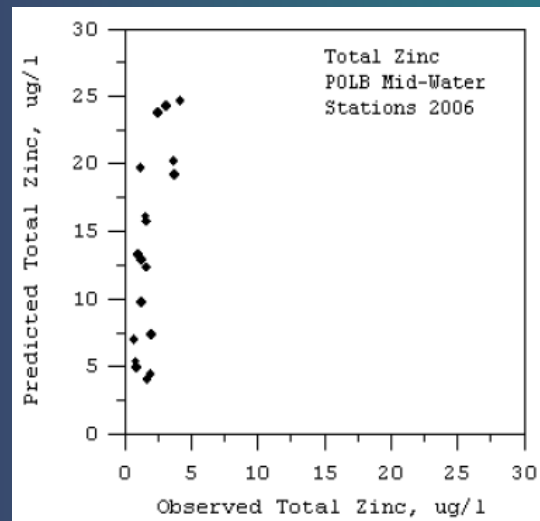
EPA Model



WRAP Model



Mid-Water
Sites



Model Comparison Summary

- ❖ Based on the same inputs and initial conditions, the EPA and WRAP models predict similar levels of TSS and metals in the harbor compared to field data under dry weather conditions.
- ❖ The two models differ in their predictions under wet weather conditions

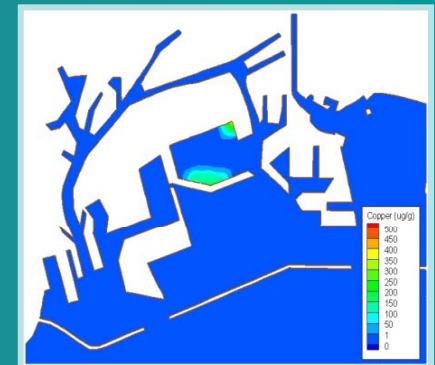
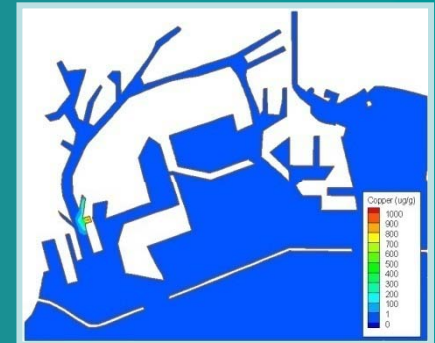
Hotspot Evaluation – Total Copper

❖ Assumptions:

- No copper loadings from watershed but keeping the flows to drive the hydrodynamics
- No copper in sediment bed except for hotspot

❖ Objective:

- Isolate the release of copper from hotspot into water column and subsequent mixing, transport and deposition throughout the harbor under both dry and wet weather (Jan 2005) conditions



Hot Spot Evaluation Summary

- ❖ For the SWM and IR7 sites, the resultant copper concentrations in the harbor water due to the release of copper from the two sites are many orders of magnitudes less than the ambient copper concentrations under both dry and wet weather conditions

Thank You

