Introduction
- Fecal coliform (FC) levels in Oakland Bay suggest that pathogens may threaten human health, recreation, and shellfish harvesting.
- The Department of Ecology developed a model of Oakland Bay to assess the impact of nonpoint pollution source control on bacteria concentrations.
- The “GEMSS” model provides a “TMDL” management tool.
- Approach to improve water quality in Oakland Bay:
  - Predict FC concentrations at Department of Health (DOH) marine water quality stations.
  - Establish target reductions at the tributary mouths to meet marine standards in the bay.
  - Assess role of sediment and wind as a secondary source of FC.

Materials and Methods

Results
- Model calibration based on freshwater tributary loading rates of FC underpredicted observed concentrations at DOH Station 614.
- Sediments were established as a secondary source of bacteria.
- A multiple regression analysis using wind speed, wind direction and FC concentrations showed that wind speed and direction was ten-times better at predicting observed FC concentrations relative to tributary loading alone.
- If all tributaries meet marine standard at their mouths, there is a 4% reduction in 50th percentile concentrations, but no change in geometric means.
- With no load from the tributaries, there is a 11% reduction in 90th percentile concentrations and a 6% reduction in geometric means.

Conclusions: to meet water quality standards and protect beneficial uses like recreation and shellfish harvest—
- Meet marine FC standards at the mouths of all creeks and outfalls discharging directly to the bay.
- Eliminate all human sources of bacteria especially in upper Oakland Bay and Chapman Cove.
- Implement best management practices to reduce FC bacteria and sediment transport at all potential sources including State Hwy 3 outfalls.
- Minimize suspended solids discharge at all outfalls to reduce sediment load.