



Summary of 2008 Southern California Bight Regional Monitoring Program (Bight '08)

Estuarine Eutrophication Component

Significance

Nutrient over-enrichment, which leads to symptoms of eutrophication such as excessive algal abundance and low dissolved oxygen, can be a significant threat to estuaries. As a result, the State Water Board, supported by the US EPA, is developing nutrient water quality objectives. However, information on how to express eutrophication status and the extent of eutrophication in southern California estuaries is lacking. The Bight '08 study provided a timely opportunity to conduct the region's first large-scale assessment of estuarine eutrophication, and at the same time develop preliminary agreement on indicators and standard protocols to inform the state's forthcoming estuarine nutrient objectives.

Goals

Goals of this component were to (1) characterize the extent and magnitude of eutrophication in southern California estuaries and (2) evaluate the strength of relationships between nutrient inputs and the symptoms of eutrophication.

Approach

Twenty-seven segments in 23 estuaries were sampled to cover a diversity of estuarine classes (enclosed bay, lagoon, river mouth estuaries) and degrees of tidal restriction (open, restricted, closed tidal inlet). The degree of eutrophication was assessed using three indicators linked to ecosystem function and beneficial uses: macroalgal abundance, phytoplankton biomass, and dissolved oxygen. These data were interpreted using the European Union Water Framework Directive (EU-WFD) to classify ecological condition. Total nitrogen and phosphorus discharged from contributing watersheds, as well as 19 other water column and sediment parameters were also measured.

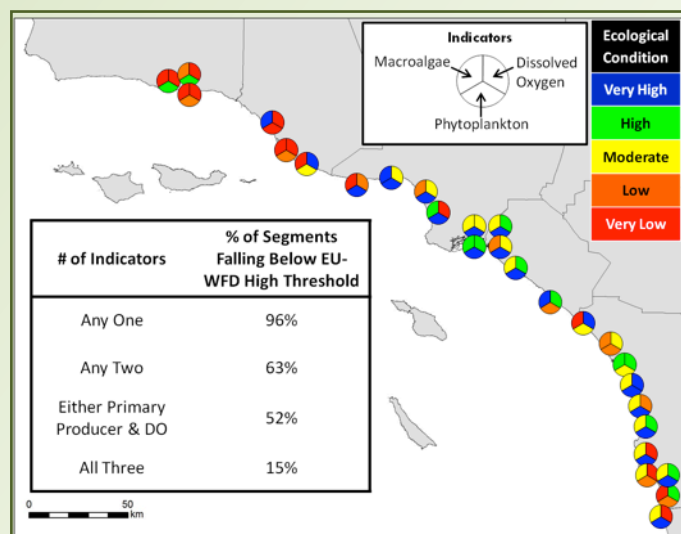
Findings

Eutrophication was extensive in southern California estuaries. Based on the single indicator measures of condition, 78% of segments were assigned "moderate" or worse condition for macroalgae, at which point the EU-WFD suggests management action. The extent of moderate or worse condition was 39% using phytoplankton biomass alone and 63% using dissolved oxygen alone.

Nutrient inputs were an important predictor of macroalgal and phytoplankton biomass. Sediment organic matter had a stronger relationship with dissolved oxygen than nutrient inputs. The degree of tidal restriction had a significant effect in modifying these relationships. Additional work is needed to refine eutrophication models for use in management applications.

Final Report

- Volume VIII. [Estuarine Eutrophication](#). Technical Report 711.



Summary of ecological condition at each site for three indicators of estuarine eutrophication

