

Habitat related benthic macrofaunal assemblages of bays and estuaries of the western United States

J. Ananda Ranasinghe, Kathy I. Welch¹, Peter N. Slattery², David E. Montagne³, David D. Huff⁴, Henry Lee, II⁵, Jeffrey L. Hyland⁶, Bruce Thompson⁷, Stephen B. Weisberg, James M. Oakden², Donald B. Cadien⁸ and Ronald G. Velarde⁹

¹Washington State Department of Ecology, Olympia, WA

²Moss Landing Marine Laboratory, Moss Landing, CA

³Retired, Penn Valley, CA

⁴University of Minnesota, Department of Fisheries, Wildlife, and Conservation Biology, St. Paul, MN

⁵United States Environmental Protection Agency, Western Ecology Division, Newport, OR

⁶National Oceanic and Atmospheric Administration, National Ocean Services, Charleston, SC

⁷San Francisco Estuary Institute, Oakland, CA

⁸County Sanitation Districts of Los Angeles County, Whittier, CA

⁹City of San Diego, Marine Biology Laboratory, San Diego, CA

ABSTRACT

Data from seven coast wide and regional benthic surveys were combined and used to assess the number and distribution of estuarine benthic macrofaunal assemblages of the western United States. Q-mode cluster analysis was applied to 714 samples, and site groupings were tested for differences in four habitat factors (latitude, salinity, sediment grain size and depth). Eight macrofaunal assemblages, structured primarily by latitude, salinity, and sediment grain size, were identified: Puget Sound fine sediment (A), Puget Sound coarse sediment (B), southern California marine bays (C), polyhaline central San Francisco Bay (D), shallow estuaries and wetlands (E), saline very coarse sediments (F), mesohaline San Francisco Bay (G), and limnetic and oligohaline (H). Assemblages A, B, C, D, and G were geographically distinct, while Assemblages E, F, and H were distributed widely along the entire coast. A second Q-mode cluster analysis was conducted after adding replicate samples that were available for some sites, and temporal replicates that were available for sites sampled in successive years. Variability due to small spatial scale habitat heterogeneity and temporal change were both low in Puget Sound, but temporal variability was high in the San Francisco estuary where large fluctuations in freshwater inputs and salinity among years leads to spatial relocation of the assemblages.

Full Text

http://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2008AnnualReport/AR08_199_210.pdf