

## The level of agreement among experts applying best professional judgment to assess the condition of benthic infaunal communities

Stephen B. Weisberg<sup>a</sup>, Bruce Thompson<sup>b</sup>, J. Ananda Ranasinghe<sup>a</sup>, David E. Montagne<sup>c</sup>, Donald B. Cadien<sup>c</sup>, Daniel M. Dauer<sup>d</sup>, Douglas Diener<sup>e</sup>, John Oliver<sup>f</sup>, Donald J. Reish<sup>g</sup>, Ronald G. Velarde<sup>h</sup> and Jack Q. Word<sup>i</sup>

<sup>a</sup>*Southern California Coastal Water Research Project, Costa Mesa, CA*

<sup>b</sup>*San Francisco Estuary Institute, Oakland, CA*

<sup>c</sup>*County Sanitation Districts of Los Angeles County, Whittier, CA*

<sup>d</sup>*Old Dominion University, Department of Biological Sciences, Norfolk, VA*

<sup>e</sup>*Oceanside, CA*

<sup>f</sup>*Moss Landing Marine Laboratories, Moss Landing, CA*

<sup>g</sup>*California State University, Department of Biological Sciences, Long Beach, CA*

<sup>h</sup>*City of San Diego Marine Biology Laboratory, San Diego, CA*

<sup>i</sup>*NewFields Northwest Port Gamble, WA*

### ABSTRACT

Benthic infaunal communities are frequently used to assess aquatic environmental condition, but interpretation of benthic data is often subjective and based on best professional judgment. Here, we examine the repeatability of such assessments by providing species abundance data from 35 sites to 9 independent benthic experts who ranked the sites from best to worst condition. Their site rankings were highly correlated, with an average correlation coefficient of 0.91. The experts also evaluated the sites in terms of four condition categories: (1) unaffected, (2) marginal deviation from reference, (3) affected, or (4) severely affected. At least two-thirds of the experts agreed on site categorization for 94% of the samples and they disagreed by more than one category for less than 1% of the assessment pairs. The experts identified seven parameters used in making their assessments, with four of those parameters (dominance by tolerant taxa, presence of sensitive taxa, species richness, and total abundance) used by all of the experts. Most of the disagreements in site categorization were due to philosophical rather than technical differences, such as whether the presence of invasive species indicates a degraded community. Indices are increasingly being used as an alternative to best professional judgment for assessing benthic condition, but there have been inconsistencies in how sites are selected for validating such indices; the level of agreement found among experts in this study suggests that consensus expert opinion can be a viable benchmark for such evaluations.

**Due to distribution restrictions, the full-text version of this article is available by request only.**

Please contact [pubrequest@sccwrp.org](mailto:pubrequest@sccwrp.org) to request a copy.