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Using Zeta Diversity in Describing the Health of Soft Sediment Benthic Macroinvertebrates in the Southern California Bight

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ABSTRACT
Ecological assessments of marine sediments have often focused on measures derived from the taxonomic, and sometimes functional, diversity of individual assemblages of benthic macroinvertebrates (BMIs). These assemblages are linked by a variety of ecological processes, demonstrating a need to describe groupings of them using regional measures of diversity. Here the use of zeta diversity is demonstrated, as a novel generalization of diversity measures, in assessing the health of regional groupings of BMI assemblages in the sediments of nearshore habitats such as estuaries and embayments. Using 1203 samples of BMI assemblages found in Southern California Bight (SCB), a model was constructed using three orders of zeta diversity, which accounted for up to 86% of regional variation in the mean health of assemblages, as described by the Benthic Response Index. Also investigated was the use of zeta diversity in assessing the relative likelihood of models of community assembly for regional groupings of BMIs, with niche assembly found to be likelier in both nearshore and offshore habitats.

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