



Using 'best professional judgement' to rate the benthic zone

Assessing the environmental condition of sediments and bottom waters of coastal and marine ecosystems over wide geographic areas can be a problem when indicators used to evaluate specific ecological conditions cannot be easily compared. A recent study suggests that a common scale of assessment can be established by experts from different regions using "best professional judgement".

Benthic indices have been developed to assess the ecological conditions and habitat quality of the benthic zone (the water and sediment layer at the bottom of water bodies). Typically, benthic indices use invertebrates that live in the benthic zone as indicators of habitat quality, because these species react predictably to natural and human stressors, for example, physical disturbances, low oxygen levels, nutrient loading and sediment contamination.

However, these benthic indices are frequently developed for specific habitats and ecoregions and making comparisons across large geographic areas can be difficult. The composition of benthic species varies naturally across habitats and regions and the benthic indices can be based on various combinations of different characteristics of the benthic community.

One way to overcome this difficulty is to use the best professional judgement (BPJ) of experts. The credibility of this method naturally depends on the ability of experts from different regions to reach a consensus about the classifications of benthic community conditions in regions other than their home region.

Partly funded under the EU ECASA project¹, 16 benthic experts from four different geographic regions, the West and East coasts of the United States and Europe's Atlantic and Mediterranean coasts, were asked to assess the conditions of marine benthic communities at 12 sites in each region using BPJ. The experts were given species-abundance data and habitat data for each site in the four regions. Site samples came from a range of conditions, from unimpacted to highly disturbed.

The level of agreement among the benthic experts was evaluated to see whether the BPJ assessments were independent of the home regions of each expert. In addition, it was assessed whether there was sufficient agreement to be able to establish a common scale for benthic assessment that could standardise comparisons of benthic indices and sampling methodologies across the four regions.

The closest agreement amongst the experts was found in ranking the relative condition of the sites, from 'best' to 'worst' within each region and across regions, irrespective of whether the sites were from the expert's home region. The 'best' conditions were those least likely to have been disturbed whilst the 'worst' were those most likely to have been disturbed. Good agreement occurred among the experts when they were asked to categorise the condition of the benthic communities at each site from 'unaffected' through to 'severely affected' by physical, chemical, natural or human-induced stresses.

In both these assessments, there was closer agreement among the experts when assessing conditions at the extremes of the disturbance gradient than in the middle categories. However, agreement near the centre is more useful, particularly when a site could potentially be at the good/bad threshold.

Although the experts disagreed about some sites, the generally high level of agreement in this study seems to confirm the European Water Framework Directive suggestion that BPJ is a viable means of standardising comparisons of ecosystem condition indices.

1. ECASA (ECosystem Approach for Sustainable Aquaculture) was supported by the European Commission under the Sixth Framework Programme. See: www.ecasa.org.uk

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