

A review of approaches for classifying benthic habitats and evaluating habitat quality



" We have assessed the current state of knowledge relative to methods used in assessing sub-tidal benthic habitat quality and the classification of benthic habitats. While our main focus is on marine habitat, we extensively draw on knowledge gained in freshwater systems where benthic assessment procedures are at an advanced stage of maturity. We found a broad range of sophistication/complication in terms of the methods applied in assessing and mapping benthic habitats. The simplest index or metric involved some assessment of species richness, while the most complicated required utilizing multi-variate analysis. The simplest mapping attempts equated physical substrate with benthic habitat while the most sophisticated relied on extensive environmental preference and groundtruth data for species of concern. The leading edge of methods for benthic habitat mapping involves combining the advances in optical and acoustic methods that allow for routine classifying and mapping of the seafloor with biological and habitat data for species of concern. The objective of this melding of disparate methods is to produce benthic habitat maps with broad system wide coverage and sound biological underpinning. It is clear that the disparity in information density between the physical and biological sides of the equation currently hinder applicability and acceptability of benthic habitat mapping efforts. In addition to the lack of basic information on the biological and environmental tolerances of targeted species, the proliferation of metrics for characterizing and assessing biological conditions further clouds the usefulness of any broad scale mapping attempt. The problem of data density mismatch between physical and biological

methods will likely not be solved until acoustic methods can routinely resolve the elusive biological components that make a physical substrate a habitat."

Auteurs du document : DIAZ R. J., SOLAN M., VALENTE R. M.

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