

Coral Reef Biological Criteria: Using the Clean Water Act to Protect a National Treasure

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Coral reefs worldwide are experiencing the greatest decline of their known existence and few tools are available to offset the growing impacts from human coastal and watershed activities. Biological criteria (biocriteria) developed under the authority of the Clean Water Act (CWA) are a potentially effective means to evaluate and restore impaired waters. Widely implemented in freshwater systems, biocriteria are not currently used in a marine environment even though the authority of the Clean Water Act extends at least to the 3-mile territorial waters. The objective of the CWA is to restore and maintain the chemical, physical and biological integrity of U.S. waters. Biological endpoints are often overlooked for more easily measured physical and chemical thresholds, but maintaining a natural biological condition is a primary goal of the CWA. Like its counterparts, biological standards and criteria can be defined under the CWA to protect valued aquatic resources such as coral reefs, mangroves, oyster beds, seagrasses and wetlands.

Biocriteria are an important addition to existing management tools for coral reef ecosystems. Simply stated, biocriteria are expectations set by a jurisdiction for the quality and quantity (condition) of living aquatic resources in a defined waterbody. Biocriteria follow the same process and draw on the same CWA authorities as the more familiar physical and chemical criteria. Because they are regulatory, biocriteria must be developed using established methods with transparency, clear objectives and defensible science. Scientific aspects include development and testing of indicators sensitive to human disturbance, delineation of reference conditions and condition gradients using indicator values, and development of a long-term regional monitoring program capable of detecting differences relative to reference condition.

A collaborative Environmental Protection Agency effort is underway to elucidate the technical aspects of coral reef biocriteria implementation. A stony coral rapid bioassessment protocol has been introduced and applied in the Florida Keys and U.S. Virgin Islands, where several indicators were validated for sensitivity to human disturbance. Additional assemblages (fish, octocorals, sponges) are now being examined for responsiveness. Linkage of coral condition to watershed land use activities, using landscape characterization, has been demonstrated in the U.S. Virgin Islands. Assessment options for long-term programs, such as rotating panel designs, have been elucidated and technical guidance developed. Once adopted, a bioassessment monitoring program for biocriteria will provide legally-defensible records of coral condition and regulatory compliance.

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