

## **EPA Kicks-off Coral Reef Biocriteria Program using Coral Seas Inc Research**

The United States Environmental Protection (EPA) agency kicked-off its new coral reef biocriteria program during a National workshop on Biological Criteria for Coral Reefs held May 5, 2006 in conjunction with the US Coral Reef Task Force Meeting. Coral Seas Inc. provided the critical research to establish this new initiative including: a coral reef biocriteria feasibility study; a research strategy for creating coral reef indexes of biotic integrity (IBI); and guidance on establishing a custom coral reef classification system and IBI reference conditions. Publications on these four topics can be found at [www.coralseas.com/press.html](http://www.coralseas.com/press.html). Dr. Stephen C. Jameson, President of Coral Seas Inc, was publicly recognized at the workshop for his critical scientific contributions to this initiative and for laying the foundation for this effort in the scientific literature.

Under the Clean Water Act, states may adopt water quality criteria based on biological, as well as, physical and chemical criteria. Standards based on biological criteria (biocriteria) are powerful management tools because biological communities are dependable indicators of the health of an aquatic ecosystem. The criteria are generated as narrative descriptions or numeric values that represent the biological condition of the community. Rigorous biological assessments are needed to identify metrics for a monitoring program and to set expectations for the water body. These are used to develop a scoring system to indicate the health of the water body and to develop biocriteria for each class or designated use. Many states have biocriteria for locally important aquatic systems such as streams, lakes, and estuaries. This biological information allows states to compare biological condition across sites and over time, as well as provide a regulatory framework for action when a water body is found to be impaired.

EPA is committed to providing technical and regulatory guidance for states and territories on development and implementation of biocriteria for coral reefs. Technical guidance for stony coral bioassessment will be published in 2006 by EPA. A framework for evaluating sensitivity of bioassessment metrics to climate change is under development. Additionally, EPA is working with states and territories that are already in the process of developing biocriteria for coral reefs.

The following summarizes EPA's recent activities related to biocriteria.

**Bioassessment Protocol:** EPA completed the first phase of a biological survey in St. Croix, US Virgin Islands to inform and calibrate a long-term monitoring strategy for development of coral reef biocriteria. Using EPA's Ocean Survey Vessel BOLD as a platform for operations, EPA and USVI personnel completed physical and biological measurements of nearly 4,000 corals and 62 stations around St. Croix. In the first phase, stations were targeted to fulfill some of the requirements of a defensible long-term monitoring program; these included definition of management zones, reef types and sampling units, documentation of measurement variability and reference conditions, and characterization of metric responses to gradients of human activity. Data from the biological survey are being used to validate metrics and an approach proposed in a Rapid Bioassessment Protocol.

**Coral Biocriteria and Climate Change:** EPA developed a draft framework for categorizing potential coral reef biocriteria according to their sensitivity to changes in climate. The framework outlines three categories of biocriteria: (1) biocriteria sensitive to climate change; (2) biocriteria insensitive to climate change; and (3) biocriteria sensitive to climate change and other stressors. Recognizing the potential influences of climate change can help managers select indicators that will not confound climate change effects with other stressors.

**Biocriteria Workshops:** In addition to the national workshop mentioned above, EPA held workshops in Guam and Honolulu to facilitate networking among the Pacific Islands for development of coral reef biocriteria. EPA's rapid bioassessment protocol for stony corals was presented along with status reports from each island. CNMI has completed bioassessments, developed sensitive metrics, and will propose coral reef biocriteria for adoption in their water quality standards. American Samoa is also developing coral biocriteria using similar methods. CNMI and American Samoa have led efforts to develop coral biocriteria in the Pacific and will likely be one of the first to propose and adopt biocriteria for coral reefs in the US. Recommendations were developed regarding improved narrative criteria, protecting water quality during coral spawning, and assistance needed to move forward on biocriteria in the states and territories.