

EPA Grant Number: R-82868401

Subproject: 002

Center: The Atlantic Slope Consortium - Developing Ecological Indicators for Aquatic Ecosystems of the Atlantic Slope Region

Center Director: Robert Brooks

Title: Development of an Optical Indicator of Habitat Suitability for Submersed Aquatic Vegetation

Investigators: Charles Gallegos

Institution: Smithsonian Environmental Research Center

EPA Project Officer: Barbara Levinson

Project Period: March 1, 2001 through February 28, 2005

Project Amount: see main project abstract

Research Category: Environmental Indicators

Objective

This is the second of four subprojects under the Atlantic Slope Consortium (ASC) center. It is closely related to subproject 001, *Integrated Assessment of Estuarine Ecosystems*. The objective of this work is to develop a regionally extensive diagnostic indicator of habitat suitability for submerged aquatic vegetation (SAV), based on optical properties. For this purpose, field studies will be conducted to understand the regional variation in optical properties of suspended particulate material in the Chesapeake Bay region.

Progress Summary

During 2002, the Smithsonian Environmental Research Center (SERC) optical indicator team collected 170 samples for optical water quality measurements from 25 estuarine segments. Optical absorption and scattering measurements and water quality analyses have been completed on all samples. Preliminary analyses of data indicate that, though the water quality conditions differ widely among the mesohaline Chesapeake sites, absorption and scattering coefficients per unit mass do not differ systematically among sites that have been sampled intensively enough to make such comparisons. This contrasts with preliminary comparisons made with similar measurements made by the ACE-INC EaGLes, which come from a polyhaline site.

Collaborative studies have been initiated with investigators in the ACE-INC EaGLes in Morehead City, NC. Personnel there are collecting water samples from 9 sites in and around beds of the seagrass, *Zostera marina* for the purpose of generalizing the optical indicator being developed in the Atlantic slope region. Samples have been analyzed for the same standard water quality measures and optical properties that we measure at SERC. A total of 56 samples have been analyzed to date. Preliminary analyses indicate that absorption and scattering per unit mass of suspended solids at these more energetic sites are lower than at the more protected sites we are studying in ASC.

Publications and Presentations

Gallegos, Charles L. Development of an optical indicator of habitat suitability for submerged aquatic vegetation in estuaries. Presented a paper at the special EaGLes session organized by Hans Paerl, (UNC ACE INC) at the American Society of Limnology and Oceanography meeting, February 2003.

Future Activities

The SERC optical indicator team plans on collecting similar numbers of samples in Year 3 as in Year 2. The locations sampled will follow the locations studied by the SERC estuarine faunal and avian teams (see subproject 1), with re-sampling of nine intensive segments and the addition of 13 new segments.

Supplemental Keywords: ecological indicator, optical indicator, SAV, Chesapeake Bay, mesohaline

Relevant Websites: www.asc.psu.edu