

Defining and Applying Environmental Indicators in Coastal Ecosystems

Ecological Society of America Annual Meeting, Savannah, Georgia

Thursday, August 7, 2003; 1:30 – 5:00

Room: SITCC Chatham B

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Symposium Summary

Despite a tumultuous history in the ecological literature, indicators of ecological condition or environmental health have gained increasing importance for public policy and sustainable resource management. National and state water quality standards, biodiversity mandates on public lands, and concern about the impacts of long-term climate change, for example, demand quantitative measurements that can be repeated consistently at different times and places. The widely accepted framework of adaptive resource management also requires that ecological conditions are monitored and assessed rigorously. This symposium describes recent multidisciplinary efforts to develop environmental indicators in coastal ecosystems of the United States. Funded by the U.S. Environmental Protection Agency's Science to Achieve Results (STAR) program, scientists from more than 20 universities and 9 government research labs are collaborating to develop and assess measures of ecological integrity in coastal ecosystems, which include some of the most heavily stressed environments in North America. Quantitative indicators of ecological condition are not easily defined for any complex, multi-scale system, but the highly dynamic character of coastal ecosystems presents especially serious challenges. Speakers will describe a variety of approaches to indicator development in coastal regions, addressing ecological, statistical, sociological, and political issues. Case studies will outline modeling efforts at multiple geographic scales and involving a wide range of organisms. The underlying objective will be to explore both the science of environmental assessment in coastal ecosystems and the ability of different approaches to provide meaningful and defensible indicators of ecological condition.

1. MCDONALD, M. and B. LEVINSON. Environmental Monitoring and Assessment Program, U.S. Environmental Protection Agency. Why do we need environmental indicators?

2. HOWE, R. 1., J. KARR 2., AND A. WOLF 3. 1, 3. University of Wisconsin-Green Bay. 2. University of Washington. Historical and recent approaches to the assessment of ecological condition.

3. PAERL, H. University of North Carolina. Opportunities and constraints for developing environmental indicators in Atlantic estuarine ecosystems.

4. JOHNSTON, C.¹, B. BEDFORD², M. BOURDAGHS¹, T. BROWN¹, C. FRIESWYK³, L. VACCARO², and J. ZEDLER³. 1. University of Minnesota-Duluth, 2. Cornell University, 3. University of Wisconsin-Madison. Plants as environmental indicators in Great Lakes coastal wetlands.

5. HANOWSKI, J. 1., R. HOWE 2., C. SMITH 3, D. MARKS 2. and S. PRICE 2. 1. Natural Resources Research Institute, University of Minnesota-Duluth. 2. University of Wisconsin-Green Bay. 3. Cornell University. What can birds and amphibians indicate about the ecological condition of coastal ecosystems?

6. WARDROP, D., R. BROOKS, W. MYERS, G.P. PATIL, AND C. TAILLE. The Pennsylvania State University. Modeling ecological condition in upstream watersheds and downstream estuaries in the Atlantic Slope region.

7. NIEMI, G.J., N. DANZ, R. REGAL, T. HOLLENHORST, V. BRADY, T. BROWN, L. JOHNSON, and J. HANOWSKI. University of Minnesota-Duluth. Experimental design for linking stress with response in the Great Lakes coastal ecosystem.

8. SHORTLE, J., R. O'CONNOR, A. FISCHER, and J. FINLEY. The Pennsylvania State University. Socioeconomic dimensions of environmental indicators and their applications to coastal resource management.