

## **A comparative ecological approach to assess the role of watersheds in estuarine condition**

James S. Latimer, Christine Tilburg, Adria Elskus, Marilyn Ten Brink, Jane Copeland, John Brawley, Peter Wells

Estuarine condition is a function of the geophysical nature of the estuary, the ocean (and atmospheric) system, and the upstream watershed. To fully understand and predict how an estuary will respond to a mixture of natural and anthropogenic drivers and pressures each compartment must be characterized. For example, eutrophication's effects on estuarine condition are generally well known; less understood is how the attributes of estuarine watersheds, and their spatial distributions, relate to downstream estuarine conditions. The main goal of a new Safe and Sustainable Water Resources Research Program is to develop methods and indicators for mapping watershed integrity and aquatic condition in order to predict watershed condition nationally (<http://epa.gov/research/priorities/docs/sswr-fact-sheet.pdf>). As part of the national program, a comparative ecological approach is used to examine relationships between watershed characteristics and estuarine condition. The analysis utilizes a common set of watershed spatial indicators and estuarine state/impact indicators. This study builds on past work in Southern New England on relationships between land use characteristics and aquatic habitat extent metrics (e.g., eelgrass) and on current work in Northern New England, through the EcoSystem Indicator Partnership, which has assembled a large database of watershed, contaminants, climate change, aquaculture and eutrophication variables. The aquatic condition data are comprised of regional data sets including EPA's National Coastal Assessment. Watersheds are being characterized by a combination of indicators developed in other efforts within the national program and those already acquired, or are under development regionally. The results of this regional approach will be used to develop methods, models, and data on estuarine condition and watershed characteristics that can ultimately be used to help protect watershed integrity across the country.