

US EPA ARCHIVE DOCUMENT

## Watershed Assessment and Decision Support Tools: e-Estuary – A Decision-Support System for Coastal Managers (WQ MYP)

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## Problem

Coastal zone management is supported by Water Act (CWA) programs and the Coastal Assessment Assessment (e.g., NonPoint Source Act 622), and require the integration of nonpoint-source programs. EPA's Office of Water is more pre-emptive approach to manage problems than is typical of the Section 303(d) Pollutant Assessment Framework. 1991, development-based management approaches are more comprehensive than the science-based approach supported by individual chemical water quality and the traditional Total Maximum Daily Load approach also typically involves engagement of stakeholders in planning and adaptive management. Use resources and development approach technical support for managers in their implementation of watershed and coastal zone at multiple scales.

## Ch Goals

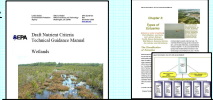
Key goals: Support existing conceptual models to assess in response across systems using integrated and site-specific diagnostic tools. Specific are to: supporting information management framework and coastal watersheds that is compatible with various within the Agency. After classification frameworks for coastal systems, and estimate systems that facilitate of results across systems. Develop a framework for improved being, and management of impaired waters in estuaries and the basin for the estuary aquatic life designated using the listed aquatic life use framework. One of multiple stressors to prioritize actions for regulatory vs. nonregulatory.

Transfer of information and tools to coastal zone projects, including collaborative development of coastal natural resource projects.

## Impact and Outcomes:



## Ongoing



**Risk Assessment: Impact to Outcome** – Watershed classification provided the principles behind watershed-based survey designs, the output of a special session in the EMAP 2003 symposium. Principles were applied through technical support to Office of Estuarine Programs in their development of a national stream monitoring program as part of the 2003 reauthorization process for streams.

**Nutrient criteria guidance** – Classification concepts have been incorporated into and nutrient criteria guidance for wetlands and are being included in draft guidance on approaches to nutrient criteria for estuaries. In collaboration with an emergency workshop, we will be comparing these approaches to classification of estuaries, a conceptual hydrogeomorphic model, EPA NOAA criteria analysis, and a new Bayesian Classification and Regression Tree approach.

The research and development activities described above are providing support for multiple programs in the Office of Water and related activities by EPA Regions, the states, tribes, and local coastal watershed management groups. Activities will provide the basis for:

- 1) the definition of estuaries being segments for assessing 305(b)/303(d) reports the data are required to submit
- 2) a framework for referring aquatic life use designations in estuaries and exploring listed aquatic life use concepts at an ecosystem scale
- 3) classification frameworks to support monitoring and assessment
- 4) prioritization of subwatersheds for management activities, and water quality criteria development (particularly for streams)
- 5) diagnosis of causes of impairment in estuaries
- 6) partitioning effects of local point source or nonpoint source from sediment from sediment
- 7) establishing restoration targets
- 8) ultimately supporting cost-benefit analyses of alternative management strategies for estuaries

## Future Directions

- Globalize
  - Development of a global-scale structure suitable for 4-D estuarine and associated watershed data
  - Incorporation of climatic events (NCA, NWS, STORM, NEXUS, NEP, etc) and real time data streams (COOS, NOAA)
- Classification
  - Comparison of three classification approaches to support derivation of nutrient criteria for estuaries
  - Addition of temporal component with atmospheric-ocean teleconnection indices - hydroclimatic zones
  - Merge of watershed and estuarine classification approaches
- Site-specific diagnostic tools
  - Completion of database of benthic community attributes for diagnostic analysis
  - TOC-gain site relationships
  - Quantile regression to partition effects of multiple stressors
- Outreach
  - ERF 2007 special session and panel discussion on decision-support tools for coastal management (NOAA, NEP, NOAA, states, regions, academia)
  - Coordination with other EPA initiatives
  - Watershed Central (watershed management support tools)
  - Landscape Predictive Tools workshop products
  - Coordination with other agency initiatives
  - NOAA NoCoAST
  - NOAA NE Integrated Ecosystem Assessments
  - Nature Serve Ecosystems-based management tools

