

E-ESTUARY: A DECISION SUPPORT SYSTEM FOR COASTAL WATER AND ECOSYSTEM MANAGEMENT IN THE U.S.A.

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Ready access to geographic information is needed to support management decisions for estuaries at local, state, regional, and national scales. The U.S. Environmental Protection Agency (US EPA) is developing e-Estuary, a decision-support system for coastal management. E-Estuary has three elements: an estuarine geo-referenced relational database, associated watershed Geographic Information System (GIS) coverages, and tools to support decision-making. A population of 300 estuaries with associated watersheds at the HUC-10 scale (16-100 ha) or larger within the conterminous U.S. has been identified for characterization of estuarine geomorphology, tidal and hydrologic regime, and land-use/land-cover of associated watersheds. Historic estuarine water-quality data from Federal and State agencies and local estuarine management groups have been integrated within a geodatabase structure consistent with the Water Quality Exchange (WQ-X) schema established by US EPA for XML-based data transfer between reporting units and national databases. An ArcHydro-based geodatabase structure is being created to facilitate merger of national hydrographic databases (NHD-Plus) with emerging coastal data models (e.g., Analytical Framework for Coastal/Estuarine Systems), to provide linkages with web services for delivery of time series data, and to provide linkages between monitoring data and modeling applications.

Tools and associated datasets under development include: 1) nationwide classification schemes to reduce variance in nutrient-response relationships, 2) regional regression relationships to normalize total organic carbon in sediments to sediment grain-size to support diagnosis of eutrophication, 3) estuary-scale segmentation and parameterization of simple tidal prism models to refine loading targets, and 4) habitat zonation schemes to help refine aquatic life designated uses. Additionally, collaborative strategies are being developed for dissemination of these tools, training in their use, and insuring that application by stakeholders meets their needs.

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