Applying the Coastal and Marine Ecological Classification Standard (CMECS) to Classify Oregon’s Estuaries: Lessons Learned From a Resource Inventory Classification Project of Oregon Estuarine and Shoreland Habitats

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Abstract
The Oregon Coastal Management Program recently completed a project to compile a comprehensive set of readily available resource information for Oregon’s estuaries into a new online habitat atlas. The project's main goal was to translate the existing information into a single classification framework, using the recently adopted Coastal and Marine Ecological Classification Standard. The resulting database of information includes data corresponding to each of the classification standards components (benthic, substrate, geof orm, water column) and settings (biogeographic and aquatic). The project focused on the translation of data inputs that covered the entire study area, to the exclusion of site specific resources, resulting in a complete coverage throughout the study area boundary. The new digital information is presented to the public, including local governments, planners, and resource management agencies through an online estuary planning atlas that combines the resource management information and the resource inventory information into a single system. The products of the project will serve as a foundation upon which additional site specific information can be incorporated, thereby serving as a framework for continuously improving our knowledge of estuarine habitats and functions.

Methods
The project team used a set of guiding principles to limit the scope of the project, with the goal of creating a statewide estuary CMECS framework that could be built upon in future project work. Those principles were used in the determination of operation procedures which the team followed when working in the GIS and are listed and explained below.

Operational Procedure #1: A vector-based data file type approach was used. While we used raster GIS information in the development of our information products, all products generated from our work are in the vector data format.

Operational Procedure #2: Project Anchor Layers: Project Anchor Layers are GIS layers which form the boundaries of the project analysis layers and are carried through all subsequent GIS processing steps. They enforce key geometry features within the layers (components) for the estuary project. These lines are often used in multiple instances in the CMECS hierarchy.

Operational Procedure #3: Only data layer sources that cover all areas within the project study boundary were used. This decision was made in order to ensure that the many estuaries within project area were all based using the same object-oriented methods, and that the resulting layers would have no nontidal data input. This decision was made to ensure that the many estuaries within project area were all based using the same object-oriented methods, and that the resulting layers would have no nontidal data input. This decision was made to ensure that the many estuaries within project area were all based using the same object-oriented methods, and that the resulting layers would have no nontidal data input. This decision was made to ensure that the many estuaries within project area were all based using the same object-oriented methods, and that the resulting layers would have no nontidal data input.

Operational Procedure #4: The original source geometry was used for component layer transformations (from the source data into CMECS). Source geometries were only altered when polygons with identical attributes were merged.

Results
A Geodatabase of estuary habitat information is available for each estuary (except the Columbia River), including the following layers of information: CMECS Layers for each component, CMECS Metadata layers for each component, LCIDAR products for each estuary, Existing data source inputs. Conclusions, Lessons Learned, & Data Access

* The establishment of the upper extent of estuarine habitats (approximate maximum extent of tidal wetland) was one of the most challenging steps in the classification of estuarine habitats. Our team used NOAA’s exceedance water level analysis to model this.
* The CMECS aquatic setting tidal zone elevational boundaries did not conceptually match the extent of Oregon’s estuarine habitats. Our team used NOAA’s exceedance water level analysis to model this.
* The hierarchical arrangement of units of the settings and components allows users to apply CMECS to the scale and specificity that best suit their interests.
* A single input data source may provide information into multiple CMECS settings or components.
* CMECS settings and components can be used in combination or independently to describe ecosystem features.
* System Modifiers allow users to customize the classification format specific needs.
* The CMECS system is very flexible, and will provide a foundation to build on, as more data is collected, or criteria changes over time.

Download the data at: http://www.coastalatlas.net/cmecs