

Coastal and Marine Ecological Classification Standard



The Coastal and Marine Ecological Classification Standard (CMECS) is a descriptive framework for organizing and integrating observational data collected in marine, estuarine, and lacustrine environments, and translating it into comprehensive ecosystem characterizations. CMECS consists of a set of defined terms (ecological “units”) arranged in a modular and hierarchical structure, providing a common language so that ecosystems can be identified, characterized, and mapped in a standard way from the head-of-tides to the deep ocean, and across regional and national boundaries.

The standard complements existing wetland and upland classification systems, thus facilitating the sharing and comparison of ecosystem information, and offers outputs applicable to a wide and multidisciplinary user base.

The standard is composed of two settings (biogeographic and aquatic) and four components (water column, geomorph, substrate, biotic) that represent different aspects of the environment. The settings describe the broader systems (marine, estuarine, and lacustrine), while the components

offer large-scale to small-scale descriptors, narrowing to the most detailed physical and biological features associated with a specific habitat type (biotic community) and providing clear definitions of features at all scales. Additional descriptive information such as salinity, turbidity, and percent cover are included in CMECS as modifiers.

The Federal Geographic Data Committee (FGDC) endorsed CMECS as a national standard in 2012. Their endorsement followed a long period of public review that included input from a wide variety of experts and stakeholders. As an approved FGDC standard, CMECS is required if federal funds are to be used for a project (see examples below). Since 2012, CMECS has been used by many government, private, and academic organizations. The National Oceanic and Atmospheric Administration (NOAA), along with other members of the CMECS partnership, continue to gather suggestions for updating the standard to ensure its continued utility.

What types of projects can CMECS be applied to?

- Ecosystem inventory, mapping, and services evaluation
- Resource management and monitoring
- Habitat modeling
- Coastal and marine spatial planning
- Marine protected area selection, evaluation, and assessment
- Conservation status assessment
- Assessment of benthic condition
- Consistent definitions of terms for use in publications, e.g., to describe study sites



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CMECS Features

- CMECS incorporates water column habitats and associated land forms of the coastal and marine environment. This multi-component approach allows end users to evaluate environmental drivers that influence species distributions and conditions independent of the observation process.
- All the physical, biological, and chemical-forcing functions that collectively determine a habitat type can be captured to provide a holistic understanding of the ecosystem.
- The framework is sensor and scale independent, allowing data collected by different sensors and methods and at different resolutions to be integrated into a single database.
- The settings and components can be applied individually or together to meet the needs of the user; there is no requirement to complete all elements of the framework.
- The framework is designed to be dynamic and have the flexibility to accommodate new units as additional information becomes available.
- The CMECS hierarchy allows users to describe features at different levels in the hierarchy at the scale best supported by data.
- CMECS also supports planning and management activities, such as status and trend monitoring, restoration, fisheries, and policy development.

Applying CMECS

- Using the CMECS standard at the outset of your project will allow for future integration of data from multiple sources.
- Use CMECS as an authoritative organized dictionary of terms for coastal and marine features.
- Cross-walk your existing data into the CMECS framework to allow broader application of your results.
- Propose new units based on your data or application experience for incorporation into future revisions of the standard.
- Share your experiences in applying the standard with others.
- Define what you see and communicate it to others.

For more information, visit:

<https://www.ncei.noaa.gov/products/coastal-marine-ecological-classification-standard>
or contact ocm.cmece-ig@noaa.gov

