

Applying a Standardized Classification Scheme (CMECS) to Multibeam Sonar and ROV Video Data on Gosnold Seamount

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The Coastal and Marine Ecological Classification Standard (CMECS) is a federally-endorsed marine ecological classification scheme used in the United States. CMECS provides a useful framework for integrating available datasets about a marine region in order to characterize environmental attributes and habitat features. Developing pragmatic methods to apply the standard in a repeatable way (with limited field data) for initial characterization of deep sea habitats remains a challenge.

This study focused on application of CMECS to Gosnold Seamount within the New England Seamount Chain by analyzing multibeam sonar bathymetry and backscatter data and high-definition remotely-operated vehicle (ROV) video data collected by NOAA's Office of Ocean Exploration and Research. A preliminary spatial segmentation was obtained by first automatically segmenting the seafloor into geomorphic landform types (i.e. CMECS "geoform" units) based on multibeam bathymetry; then, to inform potential CMECS "substrate" classification, the method used co-located multibeam backscatter to detect similarity among segments. ROV video imagery was analyzed through a separate annotation process and used as ground-truth information to describe the general substrate character of seafloor segments over which the ROV had traversed. ROV video imagery was also analyzed to describe biological composition, diversity, and abundance (i.e. the CMECS "biotic" component).

This work provides a case study to assess methodology for practical application of CMECS for initial characterization of a deep sea seamount feature by combining observations from a ROV and multibeam sonar-derived bathymetry and backscatter.