Assessing the robustness of a morphometric classification model to help predict Australia's benthic marine habitat diversity

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A major challenge facing marine scientists is to develop a robust and defensible way to represent potential seabed habitats and ecosystems based on easily mapped physical properties. In this research we investigate a benthic morphometric classification model to produce a classification of the seafloor to identify features at multiple scales. The results contribute to a larger nation wide research project with the aim to provide an improved understanding of the utility of different marine biophysical variables as surrogates for benthic habitats and patterns for marine biodiversity in Australian waters.
By applying geomorphometry theory developed by terrestrial ecologists, we were able to convert multibeam bathymetric data into models that classify six distinct features of the seabed and provide a quantifiable level of seabed complexity. The resulting classification maps are geo-referenced, high resolution, scale-independent, reproducible and have assigned levels of uncertainty in the classification of features.

The results of this research will improve our understanding of the degree and form of relationships between physical variables and benthic marine biota, and identify the best analysis methods to relate these variables to biological data. We will continue to examine the performance of a number of statistical/mathematical methods for modeling the relationships between biodiversity and the physical environment from multibeam bathymetric surfaces at multiple scales.
Future research includes working with Australia's marine biologists to correlate the morphometric models with high-resolution biological data.