

Linking Biodiversity in the Deep Sea to International Management Needs

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The oceans beyond national jurisdiction have biological diversity equivalent to or exceeding that found on land. Such diversity provides goods (e.g., food for human consumption, bioactive compounds, and mineral resources) and services (e.g., related to regulation of the biosphere, carbon sequestration, nutrient supply to the photic zone) that significantly affect human well being. As the human population grows and technological prowess increases, nations are increasingly seeking resources from these global commons. However, our understanding of the diversity and distribution of organisms in the deep sea is relatively rudimentary and the ability to

location (e.g., descriptions of new species by Stephen Cairns, Smithsonian Institution), so their population and conservation status remain unknown.

The geographic relationships within and between coral species across seamounts are also complex. Molecular approaches have revealed that there are four “types” of octocorals in the genus *Paramuricea* collected from 16 locations across the western North Atlantic (New England and Corner Rise seamounts, submarine canyons along the continental margin of North America, and deep basins in the Gulf of Maine) at depths between 200-2200 m. Eighty-nine of the sampled specimens could not be distinguished at a species level based on morphology but genetic data show there are at least four types, corresponding to three or four species (J.N. Thomas and S.C. France, University of Louisiana at Lafayette). All types were found on at least some seamounts, but only type 'A' was found on the continental margin (submarine canyons and Gulf of Maine). Types B & C were widely distributed on seamounts across the sampled region, although type C was absent from the four easternmost locations in the Corner Rise Seamounts, and type B was absent from the two westernmost locations (Bear and Retriever seamounts).

Observations of fishes on seamounts at 900-2500 m depth suggest that while over 40 species interact with seamount habitats only false boarfish *Neocyttus helgae* has at least a direct facultative relationship with fan and whip octocoral habitats (Peter Auster and Jon Moore from Florida Atlantic University). However, direct observations confirm that significant damage to hard coral, soft coral, and sponge communities on seamounts arise from fishing operations