Ken Buja
NOAA, National Centers for Coastal Ocean Science, Biogeography Branch
1305 East West Highway, N/SCI12, Silver Spring MD 20910
(301) 713-3028 x140, Ken.Buja@noaa.gov

The Biogeography Branch of NOAA's National Centers for Coastal Ocean Science has been a leader in defining the relationships and distributions of animals within coastal and ocean environments. Maps, assessments, and other products that we have developed provide managers, scientists, and communities with up-to –date information to conserve the nation's marine resources. We collaborate closely with decision maker and data providers in government, private sector, non-government organizations, and academia to ensure our products meet the needs of the management community.

Our projects cover a wide range of activities, such as coastal and marine spatial planning, where we provided the State of New York with ecological information which will support plans to balance ocean uses and environmental conservation. We have created many models of predicting animal distributions, one of which was used to support adjust shipping lanes in the Gulf of Maine to reduce the risk of boat strikes on whales. Many of our projects are ecological characterizations, including biogeographic assessments of many of the national marine sanctuaries to support management decisions or boundary revisions. Another project examined the marine biogeography of the Samoan archipelago with a focus on regional ocean climate, connectivity among islands due to larval transport, distributions of reef fish and coral communities, and the extent of existing marine protected areas. We have conducted many benthic habitat mapping projects in the US Virgin Islands, Puerto Rico, Hawaii, American Samoa, Guam, the Northern Mariana Islands, Palau, the Marshall Islands, and the Palmyra Atoll. This has given us baseline data to conduct reef fish ecological studies, characterizing and monitoring the distribution, abundance, and size of both reef fishes and macro-invertebrates in Puerto Rico and the US Virgin Islands.

To do much of this mapping and analysis, we have developed a suite of ArcGIS tools. The first is ArcGIS extension to assist in the digitizing process of delineating features by visually interpreting georeferenced images, and also to select attributes using a dialog containing a custom hierarchical classification scheme. In addition, we have created a tool for developing sampling strategies whereby existing data informs new design decisions by making accurate, high-precision estimates of population metrics. Other tools include an extension that helps marsh restoration planners identify suitable locations for planting marsh plant species to improve the success of restoration projects, as well as a tool designed to calculate the relative distribution of spatial data inside and outside of defined spatial areas to help analyze the distribution of marine resources.

One of the main issues we face is finding better spatial data. The driving forces for many of our analyses are datasets for bathymetry, benthic habitat, oceanography, and biota surveys with a wide range of scale, grain, and time period characteristics. All too often, this data has poor resolution, had coarse scale, or is infrequently collected. We also need better ways of comparing datasets that originate from a variety of sources. Often times, the data are collected with various methodologies and standardizing them to a common framework can be very difficult.