Gulf Coral Atlas Part II: Predictive models for management

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Information on the distribution of sensitive biota such as deep-sea corals and chemosynthetic communities in the U.S. Gulf of Mexico (GoM) Outer Continental Shelf (OCS) is critical for the Bureau of Ocean Energy Management's (BOEM) environmental assessments and their activity review process. Under Interagency Agreement M15PG00020 BOEM has partnered with NOAA's National Centers for Coastal Ocean Science (NCCOS) to characterize the potential distributions of deep-sea corals and chemosynthetic communities in the U.S. GoM OCS using spatial predictive models to map the probability of their occurrence across the region. Previous spatial predictive models developed by NOAA NCCOS for deep-sea corals in the U.S. GoM OCS relied on presence-only data, limiting their predictions to relative likelihood of habitat suitability. The new models will utilize a comprehensive database of presence-absence information, which has been compiled as part of the same project (Salgado et al., also presented at this Information Transfer Meeting session), allowing predictions of the probability of occurrence. Environmental predictor datasets will be updated and expanded relative to the previous modeling. For example, a new bathymetry synthesis will be developed that incorporates the BOEM seafloor map presented by Shedd and Kramer (also at this Information Transfer Meeting session). A Bayesian statistical framework will be used allowing accounting for data uncertainty (e.g., precision of survey locations) and characterization of uncertainty in model predictions. The new models will provide maps of the predicted probability of occurrence of deep-sea corals and chemosynthetic communities (and uncertainty in those predictions) specifically tailored for environmental assessment, management, and decision-making needs in the region.