Environmental determinants of the distribution of deep-sea coral species

Within the marine environment deep-sea coral species remain understudied in comparison to their tropical reef counterparts. Most of our understanding of the distribution of deep-sea corals are driven by spatial analyses, including habitat suitability modeling, and direct habitat analysis. While these approaches provide much needed insight into the responses of coral species to environmental variables that drive their distributions, such as temperature and salinity, they do not capture the necessary co-located data that are needed to fully understand the response of these organisms to factors such as natural and human caused perturbation that can vary significantly over multiple temporal (weeks, months, to seasons and years) and spatial scales (meters to kilometers).

To aid our understanding of the distribution of deep-sea corals and their response to changing environments, SURFO students will be responsible for the analysis of environmental datasets collected using benthic lander platforms deployed at deep-sea coral sites in the Gulf of Mexico, ranging from short-term deployments (5-25 days), and up to a year for longer deployments. These landers platforms are equipped with a suite of oceanographic sensors, providing multi-parameter datasets (temperature, salinity, chlorophyll fluorescence, turbidity, current speed and direction) with high temporal resolution. Additionally, SURFO will perform annotation of video transects of these deep-sea coral sites, allowing for an assessment of the distribution of coral species, and associated benthic fauna. The co-analysis of these datasets will provide not only an environmental baseline for these sites and their associated benthic communities, but also insight into how site specific conditions shape these communities and their response to environmental perturbation.

Required qualifications: Familiarity with basic data analysis skills (e.g. electronic data recording, graphing data).

Preferred qualifications: Some familiarity with R or other coding languages, experience with analysis of environmental datasets, experience with GIS.

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