

Data Management Plan for the Research Proposal: The Biophysics of Coral Reef Resilience: hydrodynamic and ecological drivers of coral survival under extreme heat.

PIs: Anne Cohen, Michael Fox, Weifeng Zhang, Steven Lentz and Simon Thorrold

The project will generate a unique set of oceanographic, atmospheric, ecological, skeletal and physiological data, realistic meter-scale 3-D hydrodynamic simulations of a coral reef island, and a suite of bulk and compound specific stable isotope data from corals, their zooxanthellae, and plankton in the water in which they live. Our goal in generating this dataset is to enable exploration of the mechanisms by which a) large scale oceanic and atmospheric processes interact with reef geomorphology to drive spatial and temporal variability in the reef environment, b) coral communities respond ecologically and physiologically to environmental gradients and changes within the reef environment and c) fine-scale hydrodynamics facilitates coral survival of extreme heat via different strategies. The strategies we focus on here are heterotrophic feeding by corals, and development of thermal tolerance by corals exposed to chronic heat or highly variable temperatures within the reef environment. While our overall goal is an integrated picture of the hydrodynamic-biological interactions that facilitate survival, each dataset contributes valuable new insights in their own right and will be made available to the scientific community for their use, analysis and interpretation.

All field observational data, analytical data, model simulations and CT scans generated under this grant will be submitted to and archived by WHOI's Biological and Chemical Oceanography Data Management Office. Data will be made publicly available within two years of data generation. BCO-DMO ensures that the data are archived at the National Centers for Environmental Information (NCEI; <https://www.ncei.noaa.gov/>). In addition, we will submit our data for curation, archiving and distribution by EPOCA (<http://www.epoca-project.eu/index.php/data.html>) in cooperation with the World Data Center for Marine Environmental Sciences (WDC-MARE). Data are archived in Pangaea, an information system operated as an Open Access library aimed at archiving, publishing and distributing georeferenced data from earth system research. (<http://www.pangaea.de/about/>).

The PIs, students and post-doc on the proposal will participate in and present papers at international meetings and workshops, including the International Coral Reef Society meeting, the American Geophysical Union (AGU) annual meeting and the Ocean Science/American Society for Limnology and Oceanography (ASLO) meetings which alternate each year. In addition, our results will be communicated through a variety of media platforms and disseminated in a timely manner through peer-reviewed publications.