# DATA MANAGEMENT PLAN

**Data Policy Compliance**

The PI will comply with the data management and dissemination policies described by the NSF Award and Administration Guide (AAG, Chapter VI.D.4) and the NSF Division of Ocean Sciences Sample and Data Policy.

**Description of Data Types**

**Observational datasets:**

Temperature and pH: These data will be collected using a SeaFET (SeaBird Electronics) deployed on the reef. Salinity: Data will be collected using HOBO salinity/conductivity loggers (Onset). Light (PAR): Downwelling light levels will be collected using Odyssey PAR loggers. All data will be downloaded and backed up locally immediately following instrument recovery. All relevant metadata will be recorded and saved with the data files. File types: .ctd, .csv, .txt. Repository: BCO-DMO.

**Experimental datasets:**

Confocal microscopy images: All images will be saved in their full metadata formats, which can be analyzed with freely available software packages (e.g. ImageJ, LAS X Core). File types: .czi (Hawaii), .lsm (Penn) Repository: PennBox; external hard drive.

Aquarium temperature and pH: These parameters will be controlled and recorded every 15 min using Neptune Apex controllers. Verification of Apex probe temperature probe readings with certified thermometers and monitoring of carbonate chemistry parameters (pH, TA) will be logged by hand and transcribed to Excel files. File types: .xls, .csv. Repository: BCO-DMO.

Coral samples: Fragments of coral colonies will be collected for acidification resilience measurements, thermal stress experiments, energetics, and histology. All metadata for collected coral colonies, including species, depth, GPS coordinates, tag number (where applicable), patch reef number, date, and time will be recorded by hand and transcribed into Excel files. Photographs of each colony will be taken using a digital underwater camera. Coral histology samples will be stored long term in paraffin, and archival samples for DNA will be stored in the PIs lab at Penn. File types: .xls, .csv, .jpg. Repository: BCO-DMO.

**Data and Metadata Formats and Standards**

Field observation data (temperature, pH, salinity and light) will be stored in flat ASCII files, which can be read easily by different software packages. Field data will include date, time, latitude, longitude, and depth. Metadata will be prepared in accordance with BCO-DMO conventions (i.e. using the BCO-DMO metadata forms) and will include detailed descriptions of collection and analysis procedures.

**Data Storage and Access During the Project**

All data generated by this project will be stored on the investigators' computers, and backed up on external hard drives and using the PennBox cloud storage system. PennBox allows

unlimited data storage and backup, and will be used to facilitate the sharing of data files and analyses between investigators.

**Mechanisms and Policies for Access, Sharing, Re-Use, and Re-Distribution**

Immediately after completion of each field season, data and metadata will be submitted to the Rolling Deck to Repository (R2R) project. DNA sequences will be deposited in the National Center for Biotechnology Information (NCBI) database GenBank upon submission of manuscripts. GenBank accession numbers will be provided to the Biological and Chemical Oceanography Data Management Office (BCO-DMO) in an Excel spreadsheet or .CSV file and metadata will be provided using the BCO-DMO Dataset Metadata submission form. Data sets produced will be made available through the BCO-DMO data system within two-years from the date of collection. The project investigators will work with BCO-DMO data managers to make project data available online in compliance with the NSF OCE Sample and Data Policy. Data, samples, and other information collected under this project can be made publically available without restriction once submitted to the public repositories.

Data produced by this project may be of interest to chemical and biological oceanographers, and climate scientists interested in the role of biogeochemistry in the global climate system. We will adhere to and promote the standards, policies, and provisions for data and metadata submission, access, re-use, distribution, and ownership as prescribed by the BCO-DMO Terms of Use (http://www.bco-dmo.org/terms-use).

**Plans for Archiving**

After data contributed to BCO-DMO are online and fully documented, BCO-DMO ensures that the data are archived properly at the appropriate National Data Center (e.g. NCEI) for long-term archive preservation. The PI will work to ensure data are archived appropriately with the complete metadata.

Archived coral samples will be made available two years after the end of the project, or following publication of the data in the peer-reviewed literature, whichever is sooner. Because corals are listed under Appendix II of the Convention on International Trade in Endangered Species (CITES), we are obligated to ensure that all samples comply with CITES regulations when shipped internationally.

**Roles and Responsibilities**

The PI will be responsible for ensuring the data are shared among the project participants in a timely fashion. The PI will submit the resulting sequences to the National Center for Biotechnology Information's (NCBI) GenBank database, and will coordinate the overall data management and sharing process, and will work along with the postdoc to submit the project data, including GenBank accession numbers, and metadata to the Biological and Chemical Oceanography Data Management Office (BCO-DMO), who will be responsible for forwarding these data and metadata to the appropriate national archive.

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