

DATA MANAGEMENT PLAN

Upon award notification, we will immediately contact the Biological and Chemical Oceanography Data management Office (BCO-DMO) and register our project by submitting applicable project metadata.

Types of data produced by the project

- Photo-quadrats images that will be obtained from the same locations over time (.tiff, jpeg).
- Underwater high-resolution coral maps 3D/4D point cloud data and fluorescent signatures (LAS V1.4, ASPRS, ASCII, GeoTIFF).
- Video footage of animals feeding or using sponges and other benthic organisms has habitat (.mp4).
- Video footage and imagery of benthic sampling in Florida, U.S. Virgin Islands, and Panama (.mp4, .jpeg, .tiff).
- Spreadsheets/databases of field notes on species interactions, in-situ experiments, locations, etc. (.xlsx, .accdb).
- State Transition Simulation Models (ST-Sim).
- 16S and eDNA Metabarcoding Sequencing data (.FASTA).
- Stable isotopes data ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ and ratios).
- Statistical Modeling R-Code (.Rmd)

Standards to be used for data and metadata format and content. All data and metadata obtained will be documented and subjected to Quality Assurance (QA) and Quality Control (QC) procedures. The QA/QC will, at the minimum, adhere to national and/or international standards (depending on the type of data) where appropriate. The PI will be responsible of the QA/QC as is the most familiar person with their data, the standards required, and the sensors used. The metadata will all follow the same standards and will be Federal Geographic Data Committee (FGDC) compliant. At the minimum, they will include the location and time the data have been collected, the instrument used, and the data type. Biological and environmental data will be transcribed from field notes into database software on project-dedicated computers after the cessation of field operations. Data generated during laboratory work on collected specimens (e.g., species identification) will be transcribed manually and entered into digital repositories. All project personnel will maintain the highest standards of data access, maintenance, and quality assurance/quality control; QA/QC will be performed using manual and automated techniques. Additionally, there will be plain-text README documents to describe the data. All data collected will be backed up to a secure password-protected server FAU-HBOI as soon as possible for permanent backup to tape in a hurricane-safe bunker (updated daily).

Policies and procedures for data access and sharing. The Division of Ocean Sciences requires that metadata files, complete data sets, derived data products and physical collections will be made publicly accessible within two (2) years of collection. This includes software and derived data products (e.g., model results, output, and workflows). As per this policy, we will share all products related to genomic techniques and links between genomic and environmental data. Sequence data will be submitted to a publicly accessible data repository (e.g., National Center for Biotechnology Information). Also, stable isotopes data will be submitted to the centralized repository for isotopic data IsoBank. Scientists or entities requiring access to these data prior to two years after collection can make a formal request to the PI.

Policies and provisions for re-use and re-distribution. Data generated from this project will be widely distributed throughout multiple disciplines, leveraging websites, digital archives, and open access peer-reviewed publications in coral reef ecology, molecular ecology, marine biology, microbiology and other related disciplines. Researchers who may wish to make extensive use of the data are required to contact the creator(s) prior to the beginning of their work and must cite the data

in subsequent publications in accordance with the style appropriate to their discipline and are asked to include the Digital Object Identifier.

Plans and timelines for archiving. The PI of this project will handle the data management with collaborators and FAU. She will handle all aspects of electronic data collection and archiving, as well as be responsible for the submission of this data to national data centers such as NCBI, BCO-DMO. All data will be backed up on an additional password-protected server and retained for a minimum of 5 years beyond the completion of this project. BCO-DMO will be also utilized for the long-term preservation of our ecological data, providing the public access to project data and metadata in perpetuity. Metadata will be available to the BCO-DMO database within a month after final data collection. It is anticipated that the QA/QC process will take no longer than one month, after which time the data will be posted on the internal project database for use within the project.

Reporting. PI will provide updates on the status of metadata and data archival in Annual Project Reports. Compliance with the project Data Management Plan will be documented in the Final Project Report. If not deposited in an approved federally or NSF-funded repository, the URLs for archived metadata will be included in these reports in the section entitled "Products-Websites." Where the Final Report is due before the required date of sample or data submission, the PI will report the submission of metadata and plans for final data/sample submission. The PI will notify the cognizant Program Officer by e-mail after final data and/or sample submission.