

DATA MANAGEMENT PLAN

1. Data Policy Compliance

Data generated from this project will comply with the NSF Division of Ocean Sciences Data and Sample Policy as per document *NSF 17-037* and the University of Texas at Austin's DMPTools Guidelines. We will coordinate data sharing and archiving with the Biological and Chemical Oceanography Data Management Office (BCO-DMO). We will comply with the Policy requirement that all project data be archived at BCO-DMO within 2 years of collection.

2. Overview

We will collect a suite of different datasets over the course of two years, all from the same coral reef in Belize, to examine how environmental and structural properties of the reef affect the relative contribution of energy sources and pathways to reef fish biomass. All raw data will be collected in the field during two 3 week field-trips, and include the collection of environmental data, underwater photographs, underwater video-footage, organismal tissue samples, and aerial drone footage. All datasets collected as part of the project are listed in Table 1.

Dataset description	Collection method	Format	Processing	Resulting data	Responsibility
Environmental properties of reef patches: temperature, wave energy, depth, reef orientation	<i>In situ</i> data loggers and diver recordings	Excel data file	None	One .xlsx file with all environmental attributes	Brandl
Structure-from-motion photogrammetry: structural complexity and benthic composition of reef patches	Underwater photographs of the benthos	Raw images	3D rendering	One .xlsx file with structural complexity attributes (surface elevation, rugosity), one .xlsx file with benthic community composition	Brandl
Remote underwater stereo-video: mobile fish communities	Video recordings	Raw videos	Video analyses	One .xlsx file with fish community compositions at different time intercepts	Brandl
Biological collections: cryptobenthic fishes and invertebrates	Anesthetic stations	Whole animals	Identification and isotope analyses	One .xlsx file with fish and invertebrate community composition, one .xlsx file	Brandl

				with isotope values	
Biological collections: source material and large mobile fishes	Collection by hand and spearfishing	Whole organisms	Isotope analyses	One .xlsx file with isotope values for sources, one .xlsx file with isotope values for consumers	Brandl
Drone surveys: aerial footage of the reef	Drone surveys	Raw images	Rectification, orthomosaic creation, and quantitative color pattern analysis	One .xlsx file with color values for each frame	Joyce/Brandl

3. Data Handling

All data collected directly in the field (depth, cardinal orientation) will be recorded on underwater paper by SCUBA-divers. Upon return to the field station, slates will be photographed and the data will be entered into an .xlsx spreadsheet on the same day. All recorded data sheets will be archived in the field and brought back to the PI's lab. For biological collections, all samples will be identified, measured, photographed, and recorded in a laboratory notebook. All notebook pages will be photographed and archived. Samples will then be either 1) stored in 95% ETOH for long-term preservation, or 2) frozen/freeze-dried for isotope analyses. Any large bodied specimens will be discarded as per the local research station's guidelines after all tissue samples have been obtained. All data collected via data loggers or cameras will be downloaded from the device immediately after collection in the field and archived on two hard-drives, stored separately, before travel back to the mainland.

Upon return to the PI's home institution, all digital data will be stored on an additional stationary hard-drive and uploaded to the cloud service provided by UT Box. Biological samples will either be stored in PI Brandl's lab (ETOH-preserved specimens), or processed for compound specific isotope analyses of amino acids in the UTMSI Core Laboratory. We will ensure to process only 50% of available material to ensure a back-up source of material that will be stored at 4°C after freeze-drying. Upon completion of CSIA-AA, all data will be stored on UT Box and two physical hard drives. Underwater images and video files will be processed and recorded data will be regularly uploaded to UT Box during processing. Finally, aerial drone survey media will be processed through GeoNadir, a cloud-based platform for drone footage processing and hosting. Data will be made available as they are processed and photo-frames will be extracted and stored separately on UT Box, from where they can be processed for quantitative color pattern analyses. Results of this analysis will result in an .xlsx file that will be stored on hard drives and UT Box. At all time, we will ensure to have at least three versions of each digital dataset (with at least one physical backup and one cloud-based repository), and, wherever possible, two aliquots of physical samples that are used for processing. **All PIs and project personnel will have access to cloud-based versions of the data throughout the duration of the project.**

Upon completion of the two-year project, all data will be deposited on the Texas Data Repository for long-term data storage, on FigShare, on GitHub, and at BCO-DMO. We will publish all relevant datasets along with their primary research outputs, creating Digital Object Identifiers for each data entry as has been done by PI Brandl for several years. We will also deposit all isotopic data on IsoBank, a database associated with UT Austin that seeks to collate and deposit stable isotope data. All physical collections will be preserved in PI Brandl's laboratory.