

DATA MANAGEMENT PLAN

This data management plan describes the policies for collecting, storing, and disseminating data to be produced from this RAPID proposal. The aim of the data management plan described below and the Florida Gulf Coast University (FGCU)'s guidelines is to assure the preservation of data collected and facilitate access by interested researchers.

1. Samples/Data Collection and Data Format:

All field and laboratory samples will be tracked and cataloged from the time they are collected, through sample handling and processing, to storage; the sample custodian will maintain a log of the location of all samples. Any samples or data that require transfer to another PI's laboratory will adhere to location logging requirements and then follow established protocols.

All field data will be entered in bound laboratory notebooks that are stored in the laboratory and digitized after each field trip. Data notebooks will be maintained throughout the life of the project and then at least 10 years beyond the end of the project. In lab or onboard research cruises, the notebooks will be digitized into electronic laboratory notebooks (ELNs). Data transcription to electronic form will be double-checked by the project managers, or a second team member if the Data Manager is the transcriber, to ensure completeness and accuracy of transcription. All datasets from the project will be documented using the ISO 19115-2 metadata standard, including detailed Data Quality/Methodology and Content Information sections as well as Feature Catalogs (ISO 19110) to fully describe all collected, measured, and calculated data variables.

2. Data Storage:

All data and ELNs will be archived on OneDrive (FGCU students and faculty have free access to 1TB storage quota through their school's accounts) as well as FGCU institutional research repository, DigitalFGCU (DigitalFGCU provides open access to research and scholarship produced at FGCU, *viz.*, scholarly journal articles, educational materials, conference presentations & posters, and students' theses to the public).

All the data will be also recorded and archived digitally on the Marine Geochemistry Laboratory's computer and MS Team folder created for this project. Keeping data in digital form allows the PIs to ensure all data is stored automatically, redundantly backed up and readily accessible to all current and future group members. The versatile features of OneDrive and MS Team allow for easy access to data files from anywhere with an Internet connection. The data will be archived using our standard submission form which provides ample opportunity to include data such as sample ID, types of data included in the file, the investigator's name, the project keywords, the publication where the data is reported, and/or the funding source for the study, as applicable. This flexible system is intended to make the data easily discoverable by interested parties *via* standard search engines. The analysis data from instruments will be stored as raw and processed files on the desktop computer associated with the instruments. These files will be backed up on OneDrive on a daily basis and will be stored for a minimum ten-year period beyond the completion of the project. All data, but especially any data not included in the publication or associated supplementary material will be archived on the PI's computer and OneDrive in an appropriate form such as a pdf, or a jpg file. It is expected that, except in unusual circumstances, data will be maintained for a minimum of ten years beyond the report of the project. Data still actively being sought after ten years will be maintained if there is recorded demand for it. Furthermore, an external hard drive will be utilized to routinely back up the data on a monthly schedule. All materials developed in the PI's lab including source files for journal articles, posters, talks and undergraduate theses will also be archived digitally in PI's server, OneDrive, and the external hard drive.

3. Data Dissemination and Sharing:

We will adhere to the NSF OCE Sample and Data Policy for sharing of research data (<https://www.nsf.gov/pubs/2017/nsf17037/nsf17037.jsp>). All oceanographic data collected during this project will be submitted to and managed by the Biological and Chemical Oceanography Data Management Office (BCO-DMO; <http://bcodmo.org/>). BCO-DMO manages and serves oceanographic biogeochemical,

ecological, and companion physical data and information developed in the course of scientific research. The BCO-DMO will also handle submission of the data to NODC for final archiving at the end of the project. PI will contact the BCO-DMO program office regarding the possibility of submitting metadata and data generated from this proposed research. BCO-DMO staff will provide guidance on best practices for field data management (reports and sampling event logs) and facilitate the publication of our results after the sampling cruises. The data will also be made available to EPA Water Quality Exchange (WQX) and the Florida Watershed Information Network (WIN). If applicable, the datasets may also be submitted and made available to other relevant national databases, e.g., NOAA National Centers for Environmental Information (NOAA NCEI). Whenever possible, datasets will be archived in plain text file formats or .csv files so that no specific software packages will be required to view and examine the available data. Additionally, all the above-mentioned data files archived using FGCU's OneDrive will be made available for collaborators when appropriate.

4. Policy of Sharing Information:

Policy across all of our institutions is to communicate results to other investigators so that the findings can be validated and positive results brought to scientific validation as quickly as possible. Results and project progress will be shared with the other project leaders and all those associated with the entire grant on a regular basis. Further, results and project progress will be presented at local and international scientific meetings and published in national and international journals as appropriate. Institutional websites and corresponding seminar series will serve as an additional means of disseminating our findings. We have adopted a collaborative publication policy designed to promote scientific and technical accuracy and ensure that fair credit is given to the authors and to other individuals who have contributed to this work.

It is anticipated that the generated data might be of interest to other scientists in marine chemistry related fields. In accordance with the guidelines of most publishers, all data reported in the scientific literature will be subject to the copyright provisions of the journal in which the data is reported. The PI's are committed to presenting and publishing results in a timely manner. This includes the presentation of work accomplished at local, regional and national scientific conferences, presentations at other academic institutions, and most critically, publication in scholarly journals – as warranted by natural progression of the research. Furthermore, the raw data will be available as supplementary information to the publications. All scientific papers will include in its author list all individuals who have made a scientific contribution to the studies. Co-first authorship will be used for manuscripts with equal contributions.