

# DATA MANAGEMENT PLAN: MODERATE DISSOLVED INORGANIC CARBON ISOTOPE ENRICHMENT FOR IMPROVED EVALUATION OF RESPIRATION AT SEA

## ROLES AND RESPONSIBILITIES

Stubbins, as lead PI, will be ultimately responsible for all data management tasks, including being the primary person responsible for ultimately ensuring compliance with the Data Management Plan. Galy will be responsible for radiocarbon data management. Guo will be responsible for NMR data management.

## TYPES OF DATA PRODUCED

The project will produce several analytical datasets, described in the list below. Observational data will also be collected for fieldwork samples.

### *OBSERVATIONAL DATASETS:*

Background information about sampling: Ancillary data for field samples will include a minimum of time, date, position, depth, salinity, and temperature. File types: Excel files. Repository: BCO-DMO.

Event log: Cruise and other fieldwork scientific sampling event log; will include event numbers, start/end dates, times, volumes of water processed, & locations. Will be recorded in Excel and on paper log sheets. File types: Excel file converted to .csv; scanned PDFs. Repository: BCO-DMO.

### *ANALYTICAL and EXPERIMENTAL DATASETS:*

Extraction method validation: Data for refinement and validation of the sampling and extraction methods (Objectives 1 & 2) will include blanks, gravimetric and C-based recoveries of POC and plastic-C, and chemical confirmation of the purity of plastic-C extracts. Data will also include full descriptions of the protocols trialed and the protocols recommended for field data collection. File types: Instrument specific method, log and data files; Excel files of raw and processed data. Repository: BCO-DMO.

Field data for POC and plastic-C extracts: Data for field samples of POC and plastic-C extracts will include mass, C-mass,  $\delta^{13}\text{C}$  and  $\Delta^{14}\text{C}$  values, and FT-IR and NMR spectra. Ancillary data for these samples is addressed above under observational data. File types: Instrument specific method, log and data

## APPROXIMATE NUMBER AND SIZE OF DATA FILES

Extraction method development will generate an unknown number of small datasets for mass and C-based recoveries of standards that can be combined into a single file. Other files will include photographs and written descriptions of the methods developed. Total ~1 GB (depends upon size of photos).

Field sampling method development will generate an unknown number of small datasets for mass and C-based recoveries that can be combined into a single file. Other files will include photographs and written descriptions of the methods developed. Total ~1 GB (depends upon size of photos).

Field data, including ancillary data, POC data, and plastic-C data will range from 40 to 200 samples with the number of discrete measurements depending upon sample throughput in the field (filtration) and the laboratory (suite of analytical methods). Total size of each processed data file will be ~1MB. Thus, approximately 0.04 to 0.2 GB of data may be generated.

## TYPES OF METADATA

Pre-fieldwork planning for the local and oceanic work will be done via teleconferencing and a planning workshop between the PIs and PhD student. Detailed plans for station locations, plastic sampling strategy, and plastic sample documentation and storage will be written up as a science implementation plan. Actual

sampling events will be recorded on paper logs (scanned into PDF documents) and in a digital event log within Excel.

The project will collect and record a description of the time of sample collection in the field, along with the times of sample extraction and analysis in the laboratory. Data will include the personnel involved. The exact locations and conditions of the field sites will be described as well as the laboratory conditions. A detailed description of the sample collection and processing methods in the field, as well as the analytical methods will be included. Units will be recorded for all analyses.

Quality control procedures will be followed in both the field and the laboratory during sample collection and processing, and the details of these procedures will be included. The decisions for the inclusion of each component of the project, including the specific sampling methods, units, and procedures, will be provided. The hardware and software used will be provided.

## **DATA AND METADATA FORMATS**

Field observation data will be stored in flat ASCII files, which can be read easily by different software packages. Field data will include date, time, latitude, longitude, sample number, depth, and other data that may be available during different types of field work (e.g. local fieldwork vs. BIOS work). Quality flags will be assigned according to the ODS IODE Quality Flag scheme (IOC Manuals and Guides, 54, volume 3; [http://www.iode.org/mg54\\_3](http://www.iode.org/mg54_3)). 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, experimental, analysis and modeling procedures.

## **POLICIES FOR ACCESS AND SHARING**

The investigators will store project data (including spreadsheets, ASCII files, images, videos, and PDFs of scanned logs) on laboratory computers that are backed up to cloud locations (e.g. Northeastern will sync data to OneDrive). Data will be compiled at Northeastern for consolidated archiving and quality assessment. Data will be shared between project members by email (small files) and file sharing (e.g. OneDrive, larger files).

Data, samples, and other information from this project can be made publicly available without restriction once at public repositories.

The data will be released within two years of data collection.

## **POLICIES FOR RE-USE AND RE-DISTRIBUTION**

Data produced may be of interest to chemical, physical and biological oceanographers, environmental scientists, as well as the general public. Data may be used to reassess the amount, source, chemistry and radiocarbon age of carbon and plastic in surface waters. Data may be used to implement the methods developed in other laboratories.

Data will be submitted to BCO-DMO in Excel and metadata provided using the BCO-DMO Dataset Metadata submission form. Data produced by the project will be made available through BCO-DMO within two-years of quality assurance. PIs will work with BCO-DMO to make data available online as per NSFOCE Policy. Data, samples, and other information from this project can be made publically available without restriction once at public repositories. We will adhere to and promote 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 AND PRESERVATION**

BCO-DMO will ensure project data are submitted to appropriate national data archive. PI will work with BCO-DMO to ensure data are archived appropriately along with proper and complete documentation.