

## **Data Management Plan**

Title and contact information “Collaborative Research: Z Inventories of Primary Productivity (ZIPP) by In-situ Mass Spectrometry in the euphotic zone” *Responsible data manager*: Brice Loose, brice@gso.uri.edu, 401.874.6676.

### **I. Data policy Compliance**

**Data description:** Processed data will contain chemical analysis, as output files from instruments. The expected size of collection of the project data is less than 500GB.

**Data compliance:** Soon after the completion of the cruise, the original underway data will be contributed by the vessel operator to the UNOLS central data repository at <http://www.rvdata.us/catalog/> managed by the Rolling Deck to Repository (R2R) project. Also, R2R will ensure that the original underway measurements will be archived permanently at NODC and/or NGDC as appropriate for the data type. The measurements made by the science party will be managed by the Biological and Chemical Oceanography Data Management Office (BCO-DMO) and the data sets will be available online from the BCO-DMO data system (<http://bco-dmo.org/data/>). BCO-DMO will also archive all the data they manage at the appropriate national archive facility, such as NODC and NGDC.

### **III. Data and metadata formats, standards, and organization**

#### **A. Formats**

Raw data from underwater and shipboard mass spectrometers will be in ASCII format, with comma-separated values and/or in spreadsheet format. Any resulting hydrographic data will be submitted in CSV format in accordance with the format specified by the CLIVAR Carbon and Hydrographic Data Office. These formats conform to the long-term database formats established by CCHDO and will facilitate the integration of this project’s data with prior data. ASCII data is universally readable by most if not all analysis software.

#### **A. Metadata**

We will consult with the Biological and Chemical Oceanography Data Management Office (BCO-DMO) to utilize a metadata format that conforms to the protocols of their repository. In the case that neither R2R nor BCO-DMO will receive laboratory data, complete metadata will be submitted to them before the end of the award.

#### **B. Data organization**

**Preplanning** will be coordinated through e-mail, teleconference and project meeting for instrument inter-calibration, and a sample plan for each cruise will be drafted to finalize the following questions: a) All necessary types of data and metadata to be collected to achieve project's goals; b) Sampling strategy and coordination of activities aboard the ship. c) Data management during the cruises of opportunity.

**During the cruises** a designated “data cop” will be responsible for collecting, organizing and documenting all data sources generated aboard the ship. We will follow the BCO-DMO protocols for sample nomenclature, type and quality control. A sample log will be kept in paper copy and also transcribed to a spreadsheet recording all available meta information. The spreadsheet and other at-sea cruise files will be backed up daily on the ship’s data storage repository. At the end of each cruise, a cruise report will be prepared, all digital data will be

copied onto identical flash drives and distributed to cruise participants as well as archived on Dropbox. All data will be stored on a desktop computer and backed up to a remote storage system at URI, as well as to an off-site computer.

**Post-cruise analysis** will generate data stored in ASCII format and backed up on the URI-GSO data storage system as well as on Dropbox. Laboratory notebooks and sample logs will be scanned and digital files stored in the same way as described above.

### **C. Data quality**

For chemical analyses, the primary concern is instrument drift as well as background contamination in the sample equipment. Sample “blanks” will regularly be conducted, and daily calibrations will be performed on all gas analysis equipment. All notebooks and written sample logs will be scanned and stored electronically, as well as other information relevant to the collection, processing, and analyses of the samples. Data files and information will be kept on the computers of the respective PIs, who all have established robust institutional data management policies.

### **II. Data access and sharing**

All processed data will be added to the BCO-DMO database within one year after the end of the grant.

### **III. Data Preservation**

During the field and laboratory work, a collective log of samples collected and allocated for each measurement type will be kept in spreadsheet form to build the first stage of a data archive. The event log and the analytical data collected during the lab work will be stored on multiple physical disks locally and on Dropbox. This plan for backups will permit restoration in the event of a hard disk failure, fire or other incident, which might affect multiple computers in one physical location. After the completion of the post-cruise QA/QC, all data and metadata will be submitted to BCO-DMO.