Data Management Plan

1. **Data description:**

Produced data will consist of two types. 1) concentrations of total carbon (TC), total organic carbon (TOC), total nitrogen (TN), and amino acids (AA) in sinking particles and surficial sediments from Gulf of California (GoCA), equatorial Pacific (EqPac), Sargasso Sea (S-Sea). 2) stable isotopic values of bulk C and N and individual AA in sinking particles and surficial sediments from GoCA, EqPac, and S-Sea.

Dried sinking particles and surficial sediments will be weighed in tin capsules for bulk C and N isotopic analysis. Additional material will be weighed for acid hydrolysis of proteinaceous AA. Weight information will be recorded by hand in notebooks and later input into Microsoft Excel (Excel). Concentrations of individual AA will be corrected based on internal standard norleucine spiked before acid hydrolysis and archived on the acquisition computer connected to Ion-exchange chromatography (IC) using the original output format in Zhang Lab. Concentrations of TC, TOC, and TN will be analyzed in Altabet lab and archived on the acquisition computers connected to the elemental analyzer-isotope ratio mass spectrometers (EA-IRMS). N isotope on nitrous oxide converted from AA will be measured on purge and trap-IRMS (PT-IRMS) in Altabet lab. These compound specific isotope data of individual AA will be calibrated using certified reference materials and reports will be generated using Excel to assess accuracy and precision. The calibrated results and reports on accuracy and precision will be stored on computer in Excel file format. Excel data sheet will be checked for quality control and augmented with metadata regarding sample identification and cross-referenced with sinking particles and sediment databases.

2. **Data formats:**

Metadata will be created for all data files and describe all columns, units, abbreviations, and missing values. Hand-written notebooks will be scanned weekly to make electronic backup files in Adobe PDF format. PDF notes will be stored with the associated data file. These notes will be used to create metadata in the TXT format.

All data in Excel spreadsheets will be backed up to Microsoft Onedrive (cloud-based servers) instantaneously and onto in-house network attached storage (NAS) weekly. Metadata files (TXT format) associated with each Excel spreadsheet in comma separated value (CSV) format will be stored together. PI Zhang will be responsible for all concentration related data. PI Altabet will be responsible for compound specific N isotope data of individual AA. PI Zhang will be responsible for coordinating overall data management and consolidation.

3. **Data archiving and preservation:**

Short-term data preservation: data in Excel spreadsheet saved in CSV format and metadata saved in TXT format will be saved to computers automatically and continuously backed up to Microsoft Onedrive. These computers are also backed up weekly to in-house NAS for redundancy. Hard copies of laboratory notebooks will be also kept and scanned weekly as PDF files.

Long-term data preservation: data and associated metadata will be submitted to the Biological & Chemical Oceanography Data Management Office (BCO-DMO) database within 2 years of the creation of the data. PI Zhang will be responsible for uploading data and metadata to BCO-DMO and serve as the primary contact for the BCO-DMO.

4. **Data sharing and access:**

Security of data during storage of produced data will be maintained by strict control of access to relevant personnel only (limited to PIs, students, and technicians directly involved in the project). All computers and NAS storage associated data will be password protected and data files will not be accessible by non-involved personnel. The authors will retain rights to the data until the journal publication is produced or within two years after the project ends, whichever is first. After that time point, PIs will provide data for public use. This will consist of uploading data to BCO-DMO and

giving access to any users. Although interested parties will not be required to contact authors prior to downloading from BCO-DMO, any use of data from this project will require acknowledgement of authors in any resulting publication. Interested parties can also directly contact PIs for data sharing and acknowledgement of authors will also be required.

5. **Previous data sharing experience:**
Both PIs have many years of experience collecting, preserving, and sharing data with interested parties and open-access databases. PI Zhang involved in North Atlantic Bloom Experiment (2008) funded by NSF funded project that is archiving data outputs at BCO-DMO. PI Altabet has many ongoing NSF and NOAA projects and are preserving data at BCO-DMO and NOAA's Climate Data Center. Through this project, PIs will also train students and technicians in proper data management techniques.