DATA MANAGEMENT PLAN

Data Management and Sharing of the Products of Research

Data Types, samples, physical collections, and other materials to be produced: The digital data to be generated from laboratory experiments and instrumentation will include optical, electron, visual, fluorescence, digital X-ray images, CT, SIMS, Raman, microscopic and spectrophotometric and mass spectrometric (isotopic), EDS chemical mapping, absorbance images, pore water and solid phase chemical, and microbial. The data consist of experimentally derived raw data and processed numerical and image data. Monitored and autonomous equipment will be used to gather basic oceanographic data in Great Peconic Bay and in Long Island Sound coastal sediments and water. These include: measurements of temperature, pH, O_2, pCO_2, Ca^{2+}, nitrate, trace elements, nutrients and pigments etc**. Chemical Sensor devices** are solid state fabricated on solid substrates (plastic sheets such as Mylar polyester). Detailed information of sensor metadata fabrications will first be documented in laboratory notebooks. We will then construct a .txt file for each sensor device summarizing the metadata and establish a database which stores the information and history of all the sensor devices.

Standards for data content and format: The numerous methods have their own data formats and standards, which will be followed. All digital metadata generated by the project including ASCII, RAW, TIFF, JPG, will be collected and stored at Stony Brook University. All personnel will be required to keep clear and detailed lab notes. The lab notes will be dated and record all the technical information concerning the project. Experimentally derived images data are stored in TIFF and JPG formats by microscope and camera specific software. Raw data are stored in the binary formats associated with the specific instruments that recorded the data. Summary data suitable for dissemination will be initially stored in notebooks and in Microsoft Excel format. A subset of the spectroscopic data from X-ray, UV-VIS, and fluorescence that are relevant for analysis will be exported and stored in ASCII text format. Data analysis will be carried out using standard software such as Origin Labs, Matlab, Comsol Multiphysics, and Excel. The analyzed data will be linked with the metadata. Both analyzed data and metadata will be linked to the device information database with the corresponding devices.

Storage of Samples: Laboratory and field collected particle samples will be placed in protective containers, and stored under refrigeration or frozen (-20 or -80° C) until analyzed. All samples will be clearly and uniquely labeled with preparation/collection date and time.

The solid sensor foils, after being characterized and studied, will be kept in a designated storage area with appropriate labeling. The procedure will ensure retrieval of sensors which yield publicized data for re-measurements throughout their lifetime.

Physical resources and facilities for data storage, Policies for access and sharing and provisions for protection of privacy, confidentiality, security, and intellectual property rights: All digital data from biogeochemical transport-reaction models, sensor fabrications and applications will be transferred to electronic formats. As we have done in the past, all data will be maintained in standard formats (Origin Labs, Matlab, Comsol Multiphysics, and Excel). Project data sets will be saved daily on redundant, physical hard drives in the laboratories of each PI, minimizing the possibility of data loss. Data will be stored on password-protected computers with access available only to project personnel. We will also take advantage of sciNote (or equivalent), a free, open source electronic lab notebook to help manage data and provide additional, independent storage capability. All members with access to the data will have received instruction on responsible practices in research. In addition we will have physical printouts and laboratory notebooks as backups and will maintain these until the end of the study and the successful creation of a master spreadsheet. Computer, external hard disks, DVDs, and lab note books are stored in

locked rooms only accessible to the PIs' groups. Our computers are behind a fire-walled intranet and are password protected.

Dissemination methods including Sharing, Re-distribution Production of derivatives, Preservation of access, and Data Archiving: Data dissemination will be by means of digital delivery over the Internet through file storage and sharing systems including Dropbox and Google Drive. We will file annual/final reports to the NSF describing our progress on experiments and analyses and results. The data will be broadly disseminated at seminars, workshops, international and national scientific meetings, and in peer-reviewed international scientific journals identified using Digital Object Identifiers (DOIs) and Open Researcher and Contributor IDs (ORCIDs). Copies of all publications will be submitted to the Stony Brook University Academic Commons and stored for permanent open access by the public. In the case of specific journals, embargo periods of 1 year may apply.

The sensor foils will be made available to other investigators upon request with the exception of sensors that involve proprietary information. The PIs retain the right to the data until the resulting publication is produced. We expect that the data will be available approximately 1-2 years after initial experiments and analyses have been conducted (with occasional delays due to unpredictable events such as maternity leave). The data will be saved on the PI's office and laboratory computers, a university file system that is backed up continuously, and on additional external and independent hard disks for **long term archiving** after the project has ended. No special requirements are necessary for data sharing since common formats such as ASCII, JPEG, TIFF, PDF are used. After publication, the authors will open the data to public use, and where possible submit for storage in the **Stony Brook University Academic Commons**. In case our digital data are used for further research, we request acknowledgment or co-authorship of the personnel associated with the data, depending on the involvement of our work and information provided.

In compliance with the NSF OCE Sample and Data Policy requirements, we will work with the BCO-DMO staff to manage the data, and data as well as model results generated during the proposed research project will be contributed to the **BCO-DMO system**.

When sensor foils/devices are provided to other investigators, PIs will retain the right to the device and request that any sensors provided by us shall not be shared by/provided to any third party without our permission. In case further data are generated by our devices (specifically supplied by us), we request acknowledgment or co-authorship, depending on the involvement of our work and information provided.