

Collaborative Research: Identification of nitrogen sources for toxic *Alexandrium* blooms using a novel species-specific tracer, $\delta^{15}\text{N}$ -saxitoxin

DATA MANAGEMENT PLAN

Principal Investigator, J. Smith, has corresponded with the Biological and Chemical Oceanography Data Management Office (BCO-DMO), an NSF-funded data repository office, and has been assured that they will be able to archive the data generated from this project. If funded, Smith will continue communication with BCO-DMO to ensure that data are collected and submitted in agreement with the current NSF OCE Sample and Data Policy.

Data Description

The types of data we will collect and produce as a result of this project include:

1. Physical samples collected from field.
2. Environmental data from Northport-Huntington Bay Complex, Gulf of Maine, and Nauset Marsh.
3. Laboratory-generated data for nutrient concentrations, toxin concentration, cell abundance, and isotopic signatures.

Physical Samples: In Years 2 and 3, short one-day cruises will be run to collect physical samples (phytoplankton and whole water) for further laboratory-based processing from two sites with the Nauset Marsh System and Northport-Huntington Bay Complex. In addition, as part of a separate project, phytoplankton and whole water samples will be collected from two sites within the Gulf of Maine within the same timeframe. Additionally, physical samples will be collected during the laboratory experiments in Years 1 and 2. Samples collected by the Anderson/Smith and Gobler laboratories will be organized and tracked through a single sample database under the responsibility of project PI Smith. Samples will be labeled and tracked using pre-printed labels and sample logs. Each sample will have a unique 4-digit number and corresponding log sheet. Data will be entered into MS excel spreadsheets, and transferred to a password-protected FileMakerPro database in the Anderson laboratory where the unique 4-digit label can be linked to other relevant data, including post-processing and environmental data.

Samples collected from all three waterbodies (Nauset Marsh System, Gulf of Maine, and Northport-Huntington Bay Complex) will be transported or shipped to WHOI accompanied by a chain of custody form. Sample processing for nutrient concentration analysis, stable N isotope analysis of NH_4^+ , saxitoxin, whole cells, and particulate organic matter, toxin quantification and cell enumeration) will be conducted and analyzed at the Anderson laboratory. Samples for stable N isotope analysis of NO_3^- will be mailed to the University of Texas – Marine Science Institute, post processing at WHOI, with a chain of custody for isotopic analysis on a GC-IRMS.

Samples for isotopic analysis will be fully consumed during analysis, nutrient samples will not be archived, and samples for cell enumeration and toxin quantification will be archived for three years following the completion of this project and available to others. Longer storage is unreasonable due to chemical instability beyond this period. All archived samples will be assigned the same number as the parent sample and storage areas for the archived samples will be entered into the FileMaker Pro database and the associated entry to the Biological and Chemical Oceanography Data Management Office, BCO-DMO (see below).

Environmental Data: Environmental data will be collected using software associated with each instrument and will be processed for quality control in Matlab. Processed data will include vertical profiles from the two sites in each waterbody over the sampling period and hydrological moorings associated with a separate project. Data generated will include salinity, dissolved oxygen, temperature, fluorescence, PAR, wind speed, and flow rate. All data will be tagged with appropriate metadata, including instrument type and serial number, geospatial coordinates, calibration information, and QA/QC

steps taken. Environmental data will be linked to the corresponding 4-digit code associated with the physical samples. The environmental data will be written out to ASCII format for archiving with the Biological and Chemical Oceanography Data Management Office (BCO-DMO, <http://www.bco-dmo.org/>). Data archived with BCO-DMO are publically available and easily searchable, including by location, date of collection, type of data, and project name. Environmental data will be submitted to the BCO-DMO at the completion of the two field years, Years 2 and 3.

Laboratory-generated Data: Physical samples will be processed and analyzed; digital data will be generated, including dissolved nutrient concentrations, toxin concentrations, cell abundance, and isotopic signatures of NH_4^+ , NO_3^- , saxitoxins, whole cells, and particulate organic matter. Nutrients will be analyzed by the WHOI Nutrient Analytical Facility using EPA approved methods and standards. Toxin concentrations will be quantified using certified reference standards from the National Research Council – Canada that are injected every 5th sample to ensure quality control. Isotopic measurements will be calibrated against standard reference material procured from NIST, including IAEA-N1 (potassium nitrate), USGS-40 (glutamic acid) and an additional well-characterized laboratory standard of glycine. The laboratory-generated data will be written out to ASCII format for archiving with the BCO-DMO (<http://www.bco-dmo.org/>). Data archived with BCO-DMO are publically available and easily searchable, including by location, date of collection, type of data, and project name. Laboratory-generated data will be compiled and submitted to the BCO-DMO at the completion of each project objective.