

Data Management Plan for “Connecting Microbial and Biogeochemical Processes of the Ocean Interior - A Diagnostic Capability for Future Ocean Deoxygenation”

Data Generation Activities:

Hydrographic, chemical and biological datasets will be generated from the proposed cruise. Hydrographic datasets (CTDs, ship's and the Saito/Lamborg Trace Metal Rosette CTD) datasets will be collected at sea. Chemical and biological datasets will include total dissolved metals (Fe, Cu, Zn, Co) (Saito), global and targeted metaproteome datasets (Saito), nitrogen reaction rate datasets (Santoro), and mercury chemical datasets (Lamborg). These datasets will be generated for each major station (odd stations), and on a limited capacity for the intermediary stations.

Roles and Responsibilities: Each PI listed above will be responsible for capturing data, metadata, and transferring both to SOI, as well as to corresponding public repositories such as BCO-DMO. Saito will work with the BCO-DMO staff to create a cruise data page.

In-Project Data Management: Cruise logs, hydrographic data and cruise metadata will be collected at sea in digital form. All datasets will be backed-up using multiple backup drives and disseminated to the Science party to avoid any possibility of loss. Hard copies of notebooks used at sea will be hand carried from the ship and digital copies made upon returning to laboratories.

Metadata and Documentation: The collection and incorporation of metadata will be modeled on the “best practices” recommendations of BCO-DMO ([found here](#)). Cruise level metadata will include 1) a cruise plan, 2) a cruise report, 3) a cruise summary and 4) an event log. For each dataset, relevant metadata will be included in the datafile itself as a header and will include PI name, affiliation, dataset name, cruise name, vessel, a brief description of analytical methods and then a variable summary listing variable name, a description and units. Adherence to these recommendations will ease the inclusion of the datasets into BCO-DMO as well as act as a reminder for all the important metadata that should be collected at the time of the cruise.

Data Quality: Standards will be used for quality control whenever available. For example, the GEOTRACES and SAFE trace metal standards will be used to verify accuracy of trace metal measurements. Quality control of targeted protein measurements is an emerging area, and we are currently using synthesized standards from peptide synthesis vendors that we work closely with. We will continue to work with them to monitor accuracy of standards during these early stages of protein measurements. Hydrographic data will be collected using recently calibrated sensors on the trace metal rosette Seabird-19 system. We will verify that the R/V Falkor CTD sensors have also been recently calibrated. At sea oxygen measurements (Winkler titrations) will be made to verify and calibrate sensor oxygen measurements. Any advances in the production of accurate and stable low-level oxygen electrode (optodes) will be explored prior to the cruise to supplement our standard sensor packages if available.

Funding for Data Management Tasks: Funding is available from our existing GBMF and NSF grants to conduct the planned data management tasks. All final datasets will be deposited into BCO-DMO.