DATA MANAGEMENT PLAN

1. Types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project

This project will generate primarily laboratory analytical and field sampling and experimental data from the two GEOTRACES cruises.

2. Standards to be used for data and metadata format and content

We will follow best practices for recording and archiving laboratory data, whether analyzed at sea or within our respective laboratories of the four institutions. All results of laboratory and field experiments and analyses will be stored electronically, including the raw data from analysis, both on the equipment – the automated Tekrans, ICP-MS and other equipment that have internal data storage capacity or are linked to laptops - and on lab data storage folders (e.g. Dropbox). Where instruments generate paper data output, which is rare, this will also be stored for five years. These data will include quality assurance information such as blanks, calibration curves, replicates, spike recovery and related data. We will contribute data to the related GEOTRACES data websites that will be setup post-cruise, as we have done in the past. All of our research groups participate regularly in national or international intercalibration exercises, such as the previous GEOTRACES Intercalibration exercises hosted by Lars-Eric Heimbürger in France in the past and proposed for the future by us in Santa Cruz, CA. Mason also distributed inter-calibration samples from a recent Arctic research cruise for analysis by others to continue these efforts. Data will be backed up on computers as well as on Dropbox, flash drives, and/or external hard drives, to ensure redundancy and protection of data integrity. These various storage media will be kept in multiple locations and will be properly labeled to ensure clarity.

3. Policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements;

We have no specific privacy, confidentiality, security or intellectual property concerns relevant to this project. The raw data from the laboratory and field experiments are not normally posted on websites in order to avoid issues of inaccuracy since these have not yet been peer-reviewed. However, data will be available to all legitimate colleagues and institutions upon request, as we have done in the past, once they have been properly evaluated using our internal quality assurance (QA) procedures. Once the data is published in the peer-reviewed literature, then the data will be made available publicly, and submitted to the required data storage facilities. These published data will be made readily accessible by means of databases that mine the published literature, as done in the past. Published papers will thoroughly describe all experimental protocols and conditions. Because the PIs believe in openness, transparency, and reproducibility of the scientific process, they intend to share any primary data and relevant samples with colleagues at other institutions, upon reasonable request and as possible, and also will comply with any regulations from NSF and the GEOTRACES program. This project will not generate data that will impact upon national security nor do the PIs produce data that will infringe upon the personal privacy and confidentiality of any individual.

4. Policies and provisions for re-use, re-distribution, and the production of derivatives

We have no current plans for re-use, re-distribution or the production of derivatives.

5. Plans for archiving data, samples, and research products, and for preservation of access to them.

All data will be archived, including analyzed data, standard operating procedures and data analysis methods, to ensure access to these materials regardless of the presence of key personnel for 3+ years after the project is complete. Secondary data generated through data manipulation and extrapolation will also be stored at a central location (e.g. labgroup Dropbox folders). When field and lab data have undergone QA processing, they will be archived and reported to the GEOTRACES International Data Management Centre (GDAC) at the British Oceanographic Data Centre (Liverpool, United Kingdom) as established by the GEOTRACES Scientific Steering Committee. We understand that all cruise metadata will be publicly

accessible (GDAC web site) as soon as it is available. The PIs will also submit the data generated by these studies to be archived in the BCO-DMO (Biological and Chemical Oceanography Data Management Office) database, and will comply with their recommendations with regard to data formatting and metadata generation in all instances. The PIs have and will continue to participate in the data certification process so that their results will be included in future Data Products issued by the international GEOTRACES program office. The process includes the review of their data and metadata formatting as well as review of intercomparison efforts and operating procedures by the GEOTRACES Standards and Intercalibration Committee via the DOoR portal.