

## Plan Overview

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*A Data Management Plan created using DMPTool*

**Title:** Development and Intercomparison of Methodologies to Measure Ferrous Iron in Seawater

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**Funder:** National Science Foundation (nsf.gov)

**Funding opportunity number:** 32251

**Grant:** [https://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1459584](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1459584)

**Template:** BCO-DMO NSF OCE: Biological and Chemical Oceanography

### **Project abstract:**

There is an urgent need in the ocean science community for accurate, unambiguous measurements of iron(II) (Fe(II)) in the marine water column. Without these data it is impossible to obtain a complete understanding of the iron cycle and its biological implications. While the luminol chemiluminescence method and existing data obtained from oxygen minimum zones are probably robust, this method may overestimate Fe(II) in the euphotic zone. Moffett proposes here take on the challenge of producing alternative methods that will be effective throughout the water column. This research will develop a methodology with independent chemistry to compare with the chemiluminescence in both regimes: the oxygenated euphotic zone, and the oxygen minimum zone, where nitrate is the primary terminal electron acceptor.

**Last modified:** 03-21-2018

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# Development and Intercomparison of Methodologies to Measure Ferrous Iron in Seawater

## Data Policy Compliance

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Identify any published data policies with which the project will comply, including the NSF OCE Data and Sample Policy as well as other policies that may be relevant if the project is part of a large coordinated research program (e.g. GEOTRACES).

The project investigators will comply with the data management and dissemination policies described in the NSF Award and Administration Guide (AAG, Chapter VI.D.4) and the NSF Division of Ocean Sciences Sample and Data Policy.

## Pre-Cruise Planning

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If the proposed project involves a research cruise, describe the cruise plans. (Skip this section if it is not relevant to your proposal.) Consider the following questions:

1. How will pre-cruise planning be coordinated? (e.g. email, teleconference, workshop)
2. What types of sampling instruments will be deployed on the cruise?
3. How will the cruise event log be recorded? (e.g. the Rolling Deck to Repository (R2R) event logger application, an Excel spreadsheet, or paper logs)
4. Will you prepare a cruise report?

Pre-cruise planning was carried out beginning 18 months prior to the cruise in consultation with Professor Marjorie Mulholland at Old Dominion University.

Our sampling was carried out with a trace metal rosette sampling system.

## Description of Data Types

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Provide a description of the types of data to be produced during the project. Identify the types of data, samples, physical collections, software, derived models, curriculum materials, and other materials to be produced in the course of the project. Include a description of the location of collection, collection methods and instruments, expected dates or duration of collection. If you will be using existing datasets, state this and include how you will obtain them.

Concentrations of dissolved ferrous iron measured by two independent methodologies under development during the cruise. These samples will be obtained from trace metal clean external Spring Niskin Bottles. Other metals will also be measured from these samples.

CTD data collected using a SeaBird SBE CTD package; processing to be done using SeaBird's SeaSave software; data will include standard environmental measurements (such as pressure, temperature, salinity, fluorescence). File types: Raw (.con, .hdr, .hex, .bl) and processed and .cnv, .asc, .bt) ASCII files. Repository: BCO-DMO

Cruise scientific sampling event log; will include event numbers, start/end dates, times & locations of instrument deployments. Will be recorded using the R2R event logger (if available) and on paper log sheets. File types: Excel file converted to .csv; scanned PDFs. Repository: BCO-DMO and Rolling Deck to Repository (R2R).

## Data and Metadata Formats and Standards

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**Identify the formats and standards to be used for data and metadata formatting and content. Where existing standards are absent or deemed inadequate, these formats and contents should be documented along with any proposed solutions or remedies. Consider the following questions:**

1. Which file formats will be used to store your data?
2. What type of contextual details (metadata) will you document and how?
3. Are there specific data or metadata standards that you will be adhering to?
4. Will you be using or creating a data dictionary, code list, or glossary?
5. What types of quality control will be used? How will data quality be assessed and flagged?

All data stored in excel spreadsheets

Metadata will be prepared in accordance with BCO-DMO conventions (i.e. using the BCO-DMO metadata forms) and will include detailed descriptions of collection and analysis procedures.

In some cases the results are summaries of experiments (ie process measurements). Experimental data will include a full description of the parameters that were varied and how they were quantified.

## Data Storage and Access During the Project

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Describe how project data will be stored, accessed, and shared among project participants during the course of the project. Consider the following:

1. How will data be shared among project participants during the data collection and analysis phases? (e.g. web page, shared network drive)
2. How/where will data be stored and backed-up?
3. If data volumes will be significant, what is the estimated total file size?

1. Shared network drive
2. External hard drives
3. NA

## Mechanisms and Policies for Access, Sharing, Re-Use, and Re-Distribution

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Describe mechanisms for data access and sharing, and describe any related policies and provisions for re-use, re-distribution, and the production of derivatives. Include provisions for appropriate protections of privacy, confidentiality, security, intellectual property, or other rights or requirements. Consider the following:

1. When will data be made publicly available and how? Identify the data repositories you plan to use to make data available.
2. Are the data sensitive in nature (e.g. endangered species concerns, potential patentability)? If so, is public access inappropriate and how will access be provided? (e.g. formal consent agreements, restricted access)
3. Will any permission restrictions (such as an embargo period) need to be placed on the data? If so, what are the reasons and what is the duration of the embargo?
4. Who holds intellectual property rights to the data and how might this affect data access?
5. Who is likely to be interested in re-using the data? What are the foreseeable re-uses of the data?

1. We anticipate data will be publicly available no later than 2 years after expiration of the project.
2. NA
3. NA

4. NA

5. Other researchers who work on iron redox chemistry in natural waters

## Plans for Archiving

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Describe the plans for long-term archiving of data, samples, and other research products, and for preservation of access to them. Consider the following:

1. What is your long-term strategy for maintaining, curating, and archiving the data?
2. What archive(s) have you identified as a place to deposit data and other research products?

1. Submission to BCO-DMO and storage on external hard drive devices in my laboratory

## Roles and Responsibilities

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Describe the roles and responsibilities of all parties with respect to the management of the data. Consider the following:

1. If there are multiple investigators involved, what are the data management responsibilities of each person
2. Who will be the lead or primary person responsible for ultimately ensuring compliance with the Data Management Plan?

Data management is the sole responsibility of PI Moffett

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