



GULF OF MEXICO RESEARCH INITIATIVE DATA MANAGEMENT PLAN TEMPLATE FOR RESEARCH CONSORTIA

SECTION 1: CONSORTIUM INFORMATION

1. Project Title

Consortium for Simulation of Oil-Microbial Interactions in the Ocean (CSOMIO)

2. Lead Principal Investigator and Contact Information

Dr. Eric Chassignet
Center for Ocean-Atmospheric Prediction Studies
The Florida State University
2000 Levy Avenue, Building A, Suite 292
PO Box 3062741
Tallahassee, FL 32306-2741
850-644-3846, echassignet@fsu.edu

3. Data Manager and Contact Information

Dr. Steven Morey
Center for Ocean-Atmospheric Prediction Studies
The Florida State University
2000 Levy Avenue, Building A, Suite 292
PO Box 3062741
Tallahassee, FL 32306-2741
850-644-0345, smorey@fsu.edu

4. Data Manager Roles and Responsibilities

Dr. Morey will oversee data management for this project, coordinating with the PI team to ensure that data are stored and submitted to GRIIDC as required by GOMRI and in accordance with GRIIDC procedures. Dr. Morey has extensive experience with ocean model and observational data, and is familiar with CF-compliant data formats and standards. Dr. Morey will routinely monitor submission of data, including model source code and configuration files, to GRIIDC by the PI team to ensure compliance, and will present data management updates and reminders of GOMRI data policies at each

project team meeting. Dr. Morey will devote 20% of his contracted effort (7 months per year) on data management responsibilities.

5. Data Submission to GRIIDC

Data management policies and guidelines have already been presented to the consortium at the initial project team meeting. Through this, and subsequent email communication, the project team has been instructed on how to submit DIFs and datasets to GRIIDC. The data manager will assist project team members with these tasks, monitor data submission activities, and review their submissions as necessary.

6. Data Management Training

Each consortium investigator has completed the required GRIIDC training.

7. Communicating Data Submission Requirements

GRIIDC requirements for submission of the different datasets has already been communicated to the project team through the GRIIDC training, and during a talk on data management presented by the Data Manager at the initial PI meeting. New data requirements will be communicated to the members of the Research Consortium via email, with reminders during the data management updates at our quarterly meetings.

8. Data Storage Backup

A significant portion of the Research Consortium work consists of model development. The modelers will be using the GitHub cloud repository for collaborative development of model code. This system will not only serve as a backup for the code developed on the investigators institutional computers, but also facilitate version tracking. Model simulations are run on the university supercomputers (FSU Research Computing Center cluster and the TAMU High Performance Research Computing Cluster) with model output duplicated onto the investigators' workstations. All other data from numerical and laboratory experiments, as well as ancillary source code for configuration or analysis are stored on workstations with external backup with at least daily backup frequency. Final datasets and model code will be transferred to GRIIDC, as well as remain at the investigators' institutions.

9. Ethics and Compliance Information – Data Involving Human Research Subjects

a) Do any components of the research project require Institutional Review Board approval?

No

b) Are there any Institutional Review Board (IRB) or HIPPA (Health Insurance Portability and Accountability Act) issues that might preclude sharing data?

No

SECTION 2: METHODS INFORMATION

1. Research Cruises

a) Will your RC be organizing or participating in research cruises?

No

2. Non-Cruise Field Work

- a) If your RC is not participating in research cruises, will any field work be performed?
No

3. Environmental Sample Lab Analysis

- a) Will your RC be collecting any samples in the field that will then be analyzed in the lab?
No

4. Microcosms/Mesocosms

- a) Will your RC be performing any microcosm or mesocosm experiments?
No

5. Pure Lab-Based Studies

- a) Will your RC be performing any purely lab based work? (examples: measuring properties of standard chemicals, developing new dispersants, measuring flow rates of jets)
Yes

If yes,

- b) What purely lab based experiments will your RC perform?
- 1) Sediment (Kaolin, Bentonite, sand, natural mud), organic materials, seawater, and crude oil physical properties (weight, size, concentration) by electronic scales, particle size analyser;
 - 2) Flow turbulence (turbulence kinetic energy and turbulent dissipation rate) by Vectrino/ADV in laboratory experiments;
 - 3) Sediment and oil flocs, including oil-mineral aggregates (OMA) and marine oil snow (MOS) created in laboratory jars (2L) using magnetic stirrer and shaker devices;
 - 4) Floc samples analysis in lab using LabSFLOC-2 floc camera system (settling column, camera, computer).
 - 5) Digital Microscope analysis of floc structures in lab for selected oil-floc samples.
 - 6) Annular flume (1.5 m wide) experiments (sediment-oil-floc creation and analysis) in lab.

6. Modeling

- a) Will your RC be conducting any numerical or computational modeling?
Yes.

If yes,

- b) What modeling activities will your RC perform?
- 1) Modification of the GENOME model (Coles et al., Science 358, 1149-1154) to include microbial degradation of hydrocarbons.
 - 2) Coupled sediment transport – physical oceanography model, with model development including adaptation of modules that account for the presence of oil within Oil – Mineral – Aggregates (OMAs). This is a modification of the CSTMS (Community Sediment Transport Modeling System) that is incorporated in the COAWST model (below).
 - 3) Modification of the publicly-available COAWST coupled modeling package to include oil modeling components and biogeochemistry (including the GENOME from above), new coupling parameterizations and functions between the modeling systems, and new numerical schemes for

efficient sediment calculations.

- 4) Coupled model hindcasts of several time periods using the CSOMIO-modified COAWST (above).
- 5) Conduct simulations using the modeling framework of the DwH oil spill and other potential spill scenarios in the region, including similar deepwater releases under conditions that favor transport onto adjacent shallow shelves and coastal areas, oil spills occurring directly on the shelf, spills occurring during cold winter conditions, oil spills in the presence of low oxygen environments, and spills occurring during large river discharge and/or storm events.”

c) Do any of these models use non-publicly available code? If so, please list.

No. The resulting modified modeling system will be made available through GRIIDC.

7. Mapping

a) Will your RC be conducting any mapping activities?

No

8. Remote Sensing and Aerial Imagery

a) Will your RC be using or acquiring any remotely sensed or other aerial imagery data?

No

9. Images

a) Will any of your RC activities produce images as data? (NOTE: This does not include images taken through education or outreach activities or photos of research work that are taken for use in presentations, etc.)

Yes

If yes,

b) What activities will produce images as data?

- 1) Laboratory settling column experiments for OMA and MOS using LabSFLOC-2 system produces high resolution images as part of data.
- 2) Digital microscope analysis of interested floc structure produced in the laboratory experiments also generates high resolution image data.

10. Video

a) Will any of your RC activities produce videos as data? (NOTE: This does not include videos taken through education or outreach activities or videos of research work that are taken for use in presentations, etc.)

Yes

If yes,

b) What activities will produce video as data? (example: microscopy)

- 1) Laboratory floc settling experiments for OMA and MOS using LabSFLOC-2 system produce videos as part of data.

11. Social Surveys and Interviews

a) Will your RC be performing any surveys of people or in-person interviews?

No

12. Economics

a) Will your RC acquire or use any economic data?

No

13. Other Methods and Data Types

N/A

SECTION 3: DATASET INFORMATION FORMS

Dataset Title (in GRIIDC)	UDI
CSOMIO Coupled Model Hindcast for the Deepwater Horizon Oil Spill	R6.x803.000:0001
CSOMIO Coupled Model Simulation Scenario - Oil Spill with transport onto Texas-Louisiana Shelf	R6.x803.000:0010
CSOMIO Coupled Model Simulation Scenario - Oil Spill occurring on Texas-Louisiana Shelf	R6.x803.000:0011
CSOMIO Coupled Model Simulation Scenario - Oil Spill occurring during winter	R6.x803.000:0012
CSOMIO Coupled Model Simulation Scenario - Oil Spill occurring during large river discharge event	R6.x803.000:0013
Sediment-Oil-Floc Laboratory OMA Jar/Shaker tests (Stage-1/April, 2018) conducted in the Center for Applied Coastal Research of department of civil & environmental engineering, University of Delaware	R6.x803.000:0003
Sediment-Oil-Floc Laboratory OMA and MOS Jar tests (Stage-2/June, 2018) conducted in the Center for Applied Coastal Research of Department of Civil & Environmental Engineering, University of Delaware	R6.x803.000:0004
Sediment-Oil-Floc Laboratory Annular Flume experiments (Stage-3/August, 2018) conducted in the Center for Applied Coastal Research of Department of Civil & Environmental Engineering, University of Delaware	R6.x803.000:0005
Sediment-Oil-Floc Laboratory Annular Flume experiments (Stage-4/October, 2018) conducted in the Center for Applied Coastal Research of Department of Civil & Environmental Engineering, University of Delaware	R6.x803.000:0006
Sediment-Oil-Floc Laboratory Annular Flume experiments (Stage-5/January, 2019) conducted in the Center for Applied Coastal Research of Department of Civil & Environmental Engineering, University of Delaware	R6.x803.000:0007
Sediment-Oil-Floc Laboratory Annular Flume experiments (Stage-6/April, 2019) conducted in the Center for Applied Coastal Research of Department of Civil & Environmental Engineering, University of Delaware	R6.x803.000:0008
CSOMIO One-Dimensional Coupled Sediment / Oil Models	R6.x803.000:0009
CSOMIO Coupled Model source code	R6.x803.000:0014