



**CARTHE III:
Consortium for Advanced Research
on Transport of Hydrocarbon in the Environment III**

Data Management Plan

Section 1: Research Consortium Information

1. *Project Title*

Consortium for Advanced Research on Transport of Hydrocarbon in the Environment III (CARTHE-III)

2. *Lead Principal Investigator*

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3. *Data Manager*

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4. *Data Manager Roles and Responsibilities*

The Data Manager is responsible for coordinating the consortium's efforts to comply with GoMRI's data policy, to include data planning, documenting, and archiving. In this role, she will work with researchers to develop individual data management strategies, which shall include ultimately the submission of all CARTHE-related datasets to GRIIDC. The Data Manager will disseminate information to CARTHE members regarding data submission to GRIIDC, assist consortium members with the preparation, submission, and revision of datasets, work with GRIIDC to devise solutions to idiosyncratic issues, and act as a point of contact between GRIIDC and CARTHE. She is responsible for the data management plan and quarterly reporting of dataset status and will participate in advising GRIIDC on the development and implementation of the database.

To fulfill these roles, the Data Manager requires a good understanding of the many datasets generated by models, laboratory, and field experiments as well as familiarity with the policies and practices of GRIIDC. These skills have been honed over the last three years, during CARTHE-II.

It is expected that the data management responsibilities will require 1.5 months of effort each year of the project.

5. *Data Submission to GRIIDC*

During the initial planning stages, information regarding all anticipated datasets is collected by the Data Manager from the consortium's co-PIs. This information will be converted into DIFs for GRIIDC, which will be submitted mainly by the Data Manager. For the submission of datasets corresponding to this set of DIFs, as well as for the submission of new DIFs after the data management plan has been finalized, the Data Manager will facilitate submissions performed almost exclusively directly by the researchers. If necessary, the Data Manager may submit a dataset for a researcher, but in general her role is to assist with the process, so that those with the best knowledge of the details of the data will create the metadata and compile the dataset files for submission.

The Data Manager will be involved in responding to all requests for revisions. If possible, she will resolve questions directly. Otherwise, she will communicate with the dataset authors and/or submitters to obtain responses. This task includes the responsibility to ensure that GRIIDC and researchers understand each other's perspective and interpretation of the GoMRI data policy and, if needed, mediate any conflicting views.

6. *Data Management Training*

Data management training covering best practices and reminders of GoMRI's data policy will be provided at all-hands meetings. Other training, especially with regards to the utilization of GRIIDC's system, will be provided on an individual basis when the need arises. This has proven most effective in the past, as researchers often do not retain this information unless they need to use it.

7. *Communicating Data Submission Requirements*

Most CARTHE-III members have experience submitting data to GRIIDC from CARTHE and CARTHE-II. Where GRIIDC guidance has changed recently (e.g. with regards to cruise data), the GRIIDC guidance documents for specific data types will be e-mailed to individual members of the Consortium who have indicated that they are planning to collect that kind of data. The guidance documents will also be shared when any questions arise and when researchers are reminded to upload their data.

8. *Data Storage Backup*

Each of the participating institutions of CARTHE-III maintains and manages its own data storage facilities, including back-up strategies. Those investigators without adequate access to secure and backed-up data storage facilities at their home institutions may also utilize the CARTHE data server at the University of Miami. Co-PIs are responsible for ensuring adequate storage and back-up for their data prior to submission to GRIIDC. It is recommended that new datasets are backed up as soon as possible after acquisition. The feasible timeframe depends on the circumstances of data collection.

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

CARTHE-III will not perform research involving human subjects.

Section 2: Methods Information

1. *Research Cruises*

CARTHE-III is not planning any large research cruises. However, additional analysis products from past cruises may be developed and submitted.

2. *Non-Cruise Field Work*

CARTHE-III will conduct several experiments from small boats. The exact dates and locations are not yet determined, nor the identity of the vessels to be used. Most likely, the experiments will take place in the fall of 2018 and spring and summer of 2019. Datasets resulting from these expeditions include the following:

- Bacterial sampling of the sea surface microlayer, accompanied by standard oceanographic and meteorological sampling
- Polarimetric, current, and wave data from a coastal region near Miami, FL
- Drone visual spectrum imagery for current detection in coastal region near Miami, FL

3. *Environmental Sample Lab Analysis*

As mentioned above, under “Non-Cruise Field Work”, CARTHE-III anticipates the collection of sea surface microlayer samples to be tested for bacterial abundance in the lab.

4. *Microcosms/Mesocosms*

CARTHE-III is not planning any microcosm/masocosm experiments.

5. *Pure Lab-Based Studies*

CARTHE-III will perform a variety of laboratory studies. The planned experiments are as follows:

- Measuring droplet and bubble size distributions in underwater releases of jets of oil and/or differentially buoyant water
- Measuring upper ocean transport and mixing under controlled wind and wave conditions in the SUSTAIN lab
- Measuring oil droplet sizes as test data for a new shadowgraph

6. *Modeling*

CARTHE-III will produce several model datasets. Modeling activities will include the following; the public accessibility of the model code is identified for each.

- Gas-oil-seawater plume simulations (based on the publicly available non-hydrostatic version of the MITgcm in a large-eddy-resolving implementation; see <http://mitgcm.org/>)
- Turbulence simulations (using modifications to the NCAR Large Eddy Simulation (LES) code, available by request from Dr. Peter Sullivan at NCAR, but generally not authorized for redistribution)
- Oil plume simulations (using proprietary VDROP-J code)
- Computational fluid dynamics simulations (using the commercial software ANSYS)

7. *Mapping*

CARTHE-III is not planning any mapping activities.

8. *Remote Sensing and Aerial Imagery*

To support field studies and analyses, CARTHE-III may make use of standard satellite imagery, such as SAR. These data will not be submitted to GRIIDC as they belong to the space agencies and are distributed by them through their own data management programs. CARTHE-III does not anticipate purchasing proprietary imagery. Derived data products, if any, will be submitted to GRIIDC.

9. *Images*

CARTHE-III is planning to obtain high-frequency images of the sea surface from a drone platform during several coastal field experiments. Images will also be collected during laboratory studies of sub-surface droplet evolution within a plume.

10. *Video*

The lab study of underwater releases of jets will result in the collection of video data.

11. *Social Surveys and Interviews*

CARTHE-III is not planning any surveys of people or in-person interviews.

12. *Economics*

CARTHE-III is not planning to acquire or use any economic data.

13. *Other Methods and Data Types*

CARTHE-III is not anticipating any other data types to be collected or generated.

Section 3: Dataset Information Forms

Dataset Title	PoC	UDI
LES Simulations of Rotating Gas-Oil-Seawater Plumes	Dewar	R6.x806.000:0001
LES Simulations of Non-Rotating Gas-Oil-Seawater Plumes	Dewar	R6.x806.000:0002
Langmuir Turbulence Simulations	Harcourt	R6.x806.000:0003
Droplet and bubble size distribution from underwater releases	Boufadel	R6.x806.000:0004
Video of underwater releases of oil plumes	Boufadel	R6.x806.000:0005
Modeling of droplet and bubble size distributions in underwater releases of oil	Boufadel	R6.x806.000:0006
Sea surface microlayer samples	Soloviev	R6.x806.000:0007
Horizontal and vertical salinity and temperature profiles, supporting microlayer bacterial sampling	Soloviev	R6.x806.000:0008
Computational Fluid Dynamics Model Simulations of the Sea Surface Microlayer	Soloviev	R6.x806.000:0009
Upper ocean transport in the coastal region in Biscayne Bay	Haus	R6.x806.000:0010
SUSTAIN laboratory studies of upper ocean transport and mixing	Haus	R6.x806.000:0011
Drone-based visual photography for current detection, experiment 1, coastal ocean near Miami, FL	Novelli	R6.x806.000:0012
Drone-based visual photography for current detection, experiment 2, coastal ocean near Miami, FL	Novelli	R6.x806.000:0013
Drone-based visual photography for current detection, experiment 3, coastal ocean near Miami, FL	Novelli	R6.x806.000:0014
Shadowgraph oil droplet size test data	Guigand	R6.x806.000:0015

Live oil plume simulation in LES model	Poje	R6.x806.000:0016
Large Eddy Simulation of wind- and wave-driven turbulence	Fox-Kemper	R6.x806.000:0017