

Deepwater Horizon Oil Spill (DWHOS)

NRDA UV Radiation Sampling Plan: October 2010 Cruise Plan

CSA-P1-25 ft Parker

Water Column Technical Working Group

October 23, 2010

Prepared by: Deborah French-McCay & Eileen Graham (ASA)

Proposed Cruise Dates

October 25 & 26, 2010 (Rain date: October 27, 2010)

Background

This NRDA UV Radiometer Sampling Plan was designed as a simple information gathering mission. Water quality parameters including turbidity will absorb all light wavelengths, including those in the UV spectrum, in the water column and reduce the distance light can penetrate. As part of the Walton Smith 3 plan, radiometer measurements were made in offshore waters. As the offshore waters are much clearer and lack the turbidity often found in nearshore waters, this plan was designed to sample these vastly different conditions.

The plan was not written as an all-inclusive UV light plan, but rather to provide information to scope the amount of data needed to address light attenuation in the many environments potentially affected by the DWHOS. The plan was fast-tracked because the instrument used in the offshore data collection needs to be returned. In order to ensure that the nearshore and offshore data are as comparable as possible, it is important to collect some nearshore data using this particular instrument before it is returned.

Objectives and Approach: UV Radiation Sampling Plan

The depth penetration of UV radiation into the water is a function of the amount of radiation reaching the surface of the water (i.e., latitude, angle of solar light (by date and time of day) and the presence of clouds) and the degree to which the UV wavelengths are absorbed by particulates and dissolved components in the water. This plan is designed to collect scoping data aimed at evaluating the potential magnitudes of UV light extinction coefficients in nearshore waters. Data collected will help elucidate the amount of data collection needed in the future to quantify extinction coefficients of radiation as a function of sun angle, wavelength and organic and inorganic content in the water. The data collected as part of this plan is exploratory, designed to evaluate what parameters (such as organic material, inorganic material and plant pigments) affect UV light extinction in the water column. This will be used

to guide future cruise planning regarding the measurement of UV light penetration into nearshore waters of the Gulf of Mexico.

The UV radiation data collected aboard Walton Smith 3 in offshore areas will be used to evaluate light penetration into offshore areas. Data from nearshore and coastal waters is important to collect in conjunction because the properties of the water (e.g. salinity, dissolved components, suspended solids) vary greatly from the offshore waters. UV light may not penetrate as far in these waters and therefore the extinction coefficient calculated for clearer offshore waters will not accurately describe the penetration in coastal waters. This plan will help to generate light extinction estimates for UV light in the surface waters of sampling areas included in this plan (nearshore areas). Because it is unknown how variable light extinction in nearshore waters is, this plan will be a “shakedown” cruise aimed at determining how many sites will be needed to properly evaluate the changing nearshore water conditions.

Methodology

Cruise Plan and Sampling Stations

The motor vessel *CSA-P1-25 ft Parker* will be used as a sampling platform to conduct UV light measurements in nearshore and coastal waters. This is a two day cruise plan with a rain date. Other sampling activities are planned in conjunction with the radiometer, including vertical profiles of water column properties (CDT casts), fluorometry profiles (Chelsea Aquatracka and Turner chlorophyll), nutrient sampling (TSS, dissolved organic carbon (DOC), particulate organic matter, and individual nutrients) and chlorophyll. The penetration of UV light may be affected by some or all of these measured properties.

The sampling will be conducted in nearshore waters at two regions, one within the coastal waters (i.e., Barataria Bay) and one several miles outside the barrier islands. Sampling locations were chosen based on proximity to either the USGS or LSU long-term monitoring stations (Figure 1, Table 1) or adjacent to breaks in the barrier island system. The USGS long-term monitoring stations collect data on water level and flow (e.g. gage height, stream velocity) and water quality (e.g. chlorophyll, salinity, temperature). The LSU long-term stations collect similar parameters in addition to plankton samples. Due to the proximity of these long-term monitoring stations, the data collections taken as part of this plan may be evaluated to determine the degree to which the conditions are typical.

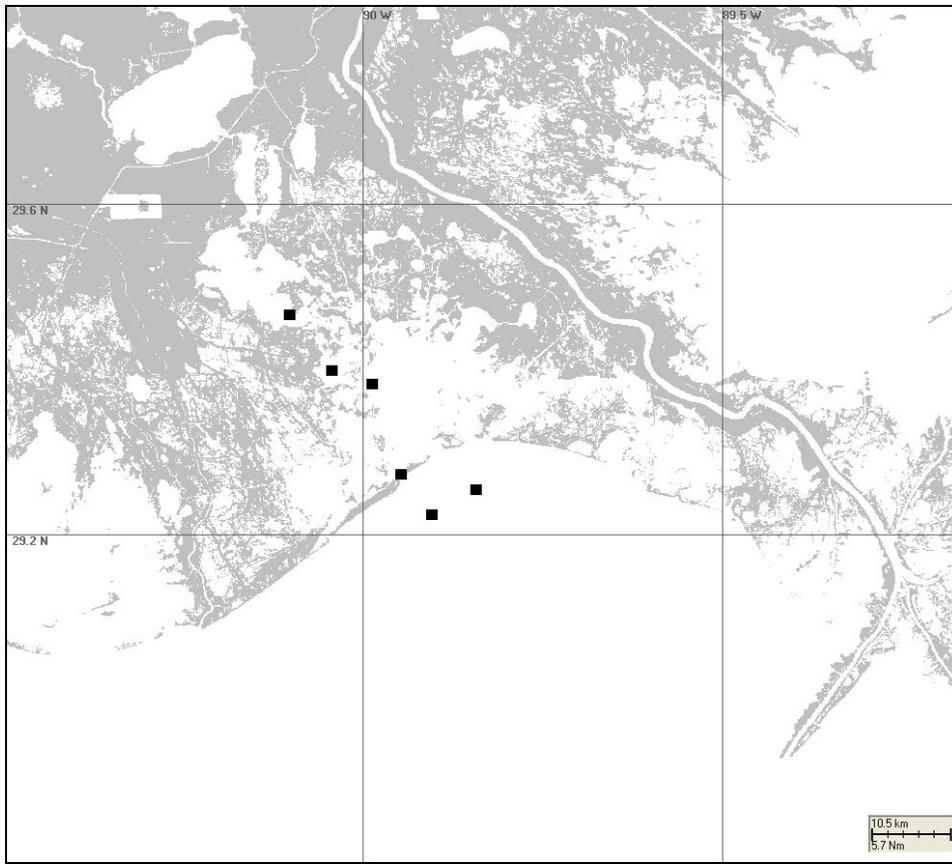


Figure 1. Sampling stations for Nearshore UV Radiation Sampling Plan.

Table 1. Sampling station for Nearshore UV Radiation Sampling Plan.

Station Description	USGS Station Number	LSU Station Number	Latitude	Longitude
Hackberry Bay NW of Grand Isle, LA	073802512	NA	29.3986	-90.0412
Barataria Pass at Grand Isle, LA	073802516	2	29.2728	-89.9468
Little Lake E of Galliano, LA	292800090060000	NA	29.4667	-90.1000
Upper Barataria Bay	NA	8	29.3827	-89.9857
Offshore Barataria Pass	NA	NA	29.2230	-89.9030
Offshore Central Barataria Bay	NA	NA	29.2530	-89.8420

Sampling Procedures

Radiometer: UV and a full spectrum of visible light measurements will be taken using the BioOPS profiling reflectance radiometer supplied by Biospherical Instruments (BSI). Vertical profiles from 0 to up to 30 m will be made in daytime (between the hours of 0900 and 1700) (see Attachment 1).

CTD: We will deploy a Seabird CTD profiling package to collect dissolved oxygen, salinity, temperature, depth, and chlorophyll fluorescence (Attachment 2).

Aquatracka: The Chelsea Aquatracka (to be attached to CTD array, Attachment 3) will be used to detect fluorescence from any submerged oil and/or dissolved organic components that may be present and induce a signal). These measurements will complement similar profiling activities performed on other cruises (e.g., Hos Davis 1 & 2), as described elsewhere.

Water Samples: If peaks in the Aquatracka signal are seen, water samples will be taken in these depth levels. In addition or otherwise (if no Aquatracka signal is seen), water samples will be taken at 1m below the surface. From each Niskin sampling bottle, water sample aliquots will be taken for:

1. PAHs (whole water, unfiltered) (Attachments 7 and 9);
2. Filtered and unfiltered nutrients, total suspended particulates, total organic carbon, and dissolved organic carbon (from filtered samples) (Attachment 4);
3. Chlorophyll (Attachment 2).

Personnel

NOAA Contractors:

- Eileen Graham (ASA, Radiometer technician)
- Alvaro Armas (LSU, Nutrients and Chlorophyll technician)

CSA Personnel:

- Jeremy Schroeder (Boat Captain)
- Dave McGregor (Navigation Technician)

CSA Contractor:

- Local Guide

Vessel

CSA-P1-25 ft Parker – a 25 foot boat with cabin and rear-mounted davit.

Estimated Costs:

Costs	Hrs/Days/Trips	Day/Hr Rate	Total
Field Survey Costs	Hrs/Days/Trips	Day/Hr Rate	Total
Vessel (days):			
CSA-P1-25 ft Parker	1	\$10,000	\$10,000
CSA Labor (days):			
Boat Captain (Jeremy Schroeder)	1	\$3,000	\$ 3,000
Navigation technician (Dave McGregor)	1	\$3,000	\$ 3,000
Local guide	1	\$2,000	\$ 2,000
NOAA Labor (days):			
NOAA technician (Eileen Graham)	1	\$3,000	\$ 3,000
NOAA technician (Alvaro Armas)	1	\$3,000	\$ 3,000
Sample Processing Costs (nutrients)	20	\$100	\$2,000
Travel (air, lodging, per diem)	1	\$2,000	\$2,000
TOTAL			\$28,000

Budgeting

The Parties acknowledge that this budget is an estimate, and that actual costs may prove to be higher due to a number of potential factors. As soon as factors are identified that may increase the estimated

cost, BP will be notified and a change order describing the nature and cause for the increase cost in addition to a revised budget for BP's consideration and review.

Safety Plans

BP's full operations and safety plan is attached, along with the incident reporting form (Attachment 6). In addition, the NOAA incident site safety plan (which all NOAA employees and contractors must sign prior to the cruise) is attached (Attachment 5).

Transfer of the shared electronic media in the onboard equipment to each of the party's hardware for retention and use.

Upon return to port, the vessel Operations Manager shall produce identical copies of the raw and processed electronic media generated during the cruise and deliver one of those copies each to NOAA (or its QA contractor) and to ENTRIX.

Laboratory

Official NRDA chain of custody procedures will be followed for any transfer of samples from ship to laboratory. Procedures outlined in Attachment 9 will be followed for water samples. Water sample intake will be coordinated through standard NRDA field operations and procedures and shipped to a NRDA approved laboratory for analysis.

Distribution of Laboratory Results

Each laboratory shall simultaneously deliver raw data, including all necessary metadata, generated as part of this work plan as a Laboratory Analytical Data Package (LADP) to the trustee Data Management Team (DMT), the Louisiana Oil Spill Coordinator's Office (LOSCO) on behalf of the State of Louisiana and to BP (or ENTRIX behalf of BP). The electronic data deliverable (EDD) spreadsheet with pre-validated analytical results, which is a component of the complete LADP, will also be delivered to the secure FTP drop box maintained by the trustees' Data Management Team (DMT). Any preliminary data distributed to the DMT shall also be distributed to LOSCO and to BP (or ENTRIX on behalf of BP). Thereafter, the DMT will validate and perform quality assurance/quality control (QA/QC) procedures on the LADP consistent with the authorized Quality Assurance Project Plan, after which time the validated/QA/QC'd data shall be made available simultaneously to all trustees and BP (or ENTRIX on behalf of BP). Any questions raised on the validated/QA/QC results shall be handled per the procedures in the Quality Assurance Project Plan and the issue and results shall be distributed to all parties. In the interest of maintaining one consistent data set for use by all parties, only the validated/QA/QC'd data set released by the DMT shall be considered the consensus data set. In order to assure reliability of the consensus data and full review by the parties, no party shall publish consensus data until 7 days after such data has been made available to the parties. Also, the LADP shall not be released by the DMT, LOSCO, BP or ENTRIX prior to validation/QA/QC absent a showing of critical operational need. Should any party show a critical operational need for data prior to validation/QA/QC, any released data will be clearly marked "preliminary/unvalidated" and will be made available equally to all trustees and to BP (or ENTRIX on behalf of BP).

Attachments

Attachment 1. BioOps Radiometer

Attachment 2. CTD and Chlorophyll Procedures

Attachment 3. Chelsea Aquatracka Fluorometer

Attachment 4. Procedures for Nutrients, Carbon, Suspended Particulates, and Trace Metals

Attachment 5. NOAA-NRDA_MC_252_Site_Safety_Plan_5.13.10

- Attachment 6. MC252 HSSE Incident Reporting Final 02 May 10 rev 1
- Attachment 7. MC252 Analytical QAP V2.1
- Attachment 8. NRDA_Field_Sampler_Data_Management_Protocol_7_5_2010
- Attachment 9. Water Sample Handling Procedures

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October 2010 Cruise Plan**

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Water Column Technical Working Group

Cruise Dates: October 25-26, 2010 (Rain date: October 27, 2010)

Plan Date: October 18, 2010

Approvals

Approval of this work plan is for the purposes of obtaining data for the Natural Resource Damage Assessment. Parties each reserve its right to produce its own independent interpretation and analysis of any data collected pursuant to this work plan.

BP Approval

Cosh Fay
Printed Name

[Signature]
Signature

2/3/2012
Date

Federal Trustee Approval

[Signature]
Printed Name

[Signature]
Signature

1/2/12
Date

Louisiana Approval

KAROL COM
DEQUSS COTON
Printed Name

[Signature]
Signature

2/15/2012
Date