Deepwater Horizon Oil Spill (DWHOS)
Water Column Technical Working Group

Addendum to:
NRDA 1-meter MOCNESS Spring 2011 Plankton Sampling Cruise Plan

Sampling Vessel: M/V *Nick Skansi*

June 16, 2011

Prepared by:
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Reviewed by:
NOAA: Dan Hahn, John Quinlan
Louisiana: Amanda Vincent (LDEQ)
BP: William Graeber, Jeffrey Simms, & Amy Piko (Cardno ENTRIX) on behalf of BP

Cruise Dates
June 16 – June 27, 2011

Except as amended herein, all provisions of the NRDA 1-meter MOCNESS Spring 2011 Plankton Sampling Cruise Plan remain in effect.

Background/ Justification

The cooperative spring 2011 *Nick Skansi* deep water 1-m^2 MOCNESS sampling plan is being undertaken according to the agreed-upon and signed cruise plan (see above-named plan for details). This addendum incorporates into the plan additional sampling effort and vessel coordination in conjunction with the Water Column Technical Working Group's plan entitled "NRDA Summer 2011 Plankton Imaging Sampling Cruise Plan Sampling Vessel: R/V *McArthur II*."

The *McArthur II* will be conducting the first Leg of the Plankton Imaging plan from June 12-30, 2011. The primary activity of this cruise is to collect plankton image data using the In Situ Ichthyoplankton Imaging System (ISIIS). 1-m^2 MOCNESS tows will also be carried out aboard the *McArthur II* at 10 stations along the ISIIS transects during nighttime hours (See Figure 1, purple circles). The ISIIS transects and these nighttime 1-m^2 MOCNESS tows will not be carried out simultaneously due to vessel towing restrictions and towing speed differences but will be conducted in close temporal proximity (~ 8 hours). Data from these 1-m^2 MOCNESS tows will used to aid the interpretation of data collected by ISIIS.

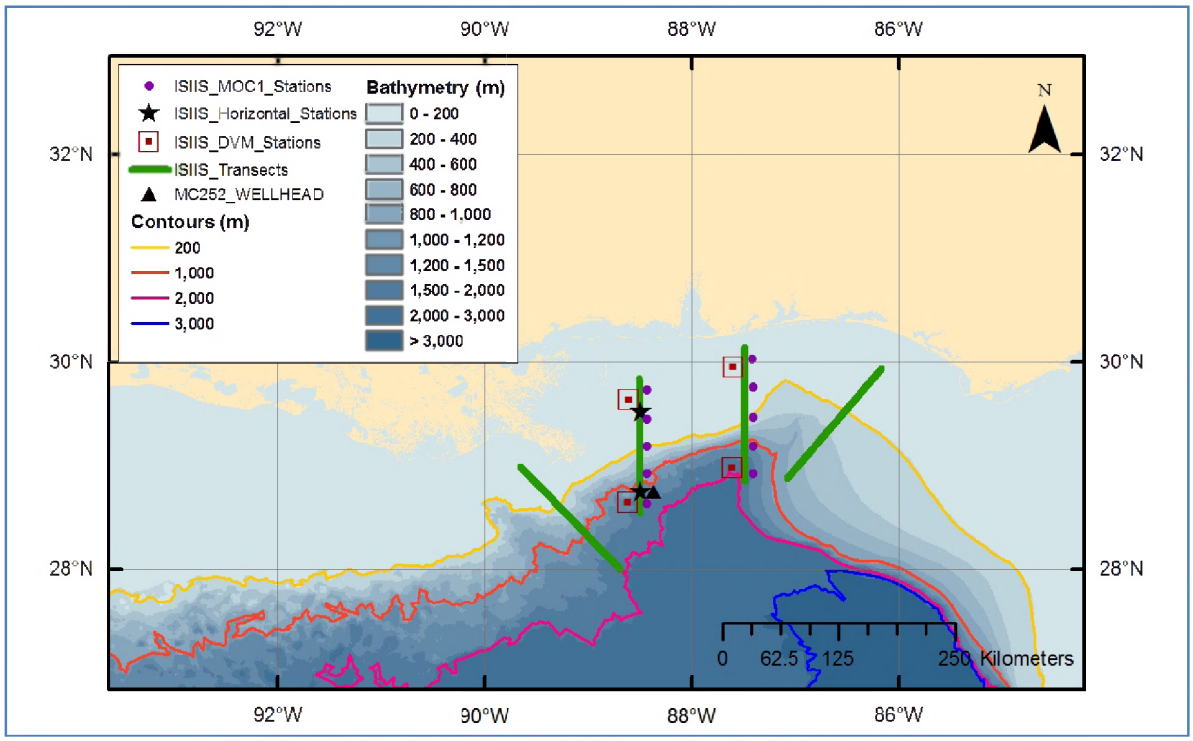

Figure 1. Sample Design: ISIIS cross isobaths long transects (green lines) on shelf, slope and offshore pelagic habitats. Finescale horizontal sampling 'stars' (black stars) located in both shelf and offshore pelagic habitats (symbols are not to scale). Diel vertical migration DVM stations (dark red boxes) are positioned at two shelf and two offshore pelagic locations. MOCNESS stations (purple circles) are located along two ISIIS transects (5 per transect). Location of the DWH well is noted with black triangle.

Additional 1-m^2 MOCNESS samples will be collected by the *Nick Skansi* in unison with daytime *McArthur II* ISIIS deployments along the cross-isobath long transects (Figure 1, green lines). These deployments will occur "side by side" and as close in proximity as possible, given safety measures, with the goal that the same water mass will be sampled by each gear type. Coordination between the vessels *Nick Skansi* and *McArthur II* of simultaneous 1-m^2 MOCNESS sampling will take place during Leg 5: June 16-27 of the *Nick Skansi* Spring 2011 Plankton Sampling Cruise. It is anticipated that the *Nick Skansi* will be able to perform 3-4 MOCNESS tows during a single day, coordinated with an 8-hour cross-isobath transect. Sampling will occur coordinated with the ISIIS transect passing through the wellhead area (Figure 10), performing 3-4 MOCNESS tows during the inshore 8-hour ISIIS transect and another 3-4 MOCNESS tows during the offshore 8-hour ISIIS transect Thus, the target is to perform a total of 8 MOCNESS tows coordinated with ISIIS long transects, 4 tows each of two days.

As with the nighttime 1-m^2 MOCNESS tows aboard the *McArthur II*, the primary purpose of the coordinated MOCNESS samples collected aboard the *Nick Skansi* is to aid in the interpretation of data collected by ISIIS.

Methodology

Sampling Stations
Stations will be in close proximity to the ISIIS cross isobaths long transects (Figure 1, green lines). The exact number of 1-m^2 MOCNESS samples and locations will be determined in the field and depend on vessel coordination logistics. Although, given the time allotted for this additional sampling it is expected that no more than ten 1-m^2 MOCNESS tows aboard the *Nick Skansi* is achievable.

1-m^2 MOCNESS Deployment
1-m^2 MOCNESS deployment protocols for stations sampled in conjunction with the ISIIS transects are different from the deep tows typically carried out the 1-m^2 MOCNESS sampling aboard the *Nick Skansi*. As these net tows are explicitly designed for comparison to ISIIS sampling, each tow will be sampled to a maximum depth equal to the maximum ISIIS depths at the location and not to exceed 120 m. A total of five nets will be used for each tow: one down (zero net) and 4 nets in the upward tow (with equal depth bins). For 1-m^2 MOCNESS deployment protocols see Attachment 13 of the NRDA Summer 2011 Plankton Imaging Sampling Cruise Plan Sampling Vessel: R/V *McArthur II*. All samples will be preserved in 70% ethanol, in the same fashion as described for net zero in Attachment 11 of the NRDA 1-meter MOCNESS Spring 2011 Plankton Sampling Cruise Plan Sampling Vessel: *Nick Skansi*.

Due to equipment availability limitations the mesh size of the five nets outfitted on the 1-m^2 MOCNESS aboard the *McArthur II* for Leg 1 of the Summer Plankton Imaging Plan will be 150 μm. This differs from the *Nick Skansi* 1-m^2 MOCNESS mesh (333 μm). It is expected that 333 μm nets will be available for Legs 2 & 3 on the *McArthur II*.

CTD Deployment
A Seabird CTD profiling package will be deployed from the *Nick Skansi* before each MOCNESS tow to 200 m or 10m above the seafloor with the following sensors: dissolved oxygen, chlorophyll fluorometer, turbidity, transmissometer, conductivity, temperature, and depth sensor.

In general, CTD casts should be conducted while the vessel is drifting. Because the plankton tows are performed over a tow path, as opposed to at a single location, the objective is to characterize the water properties over the general area of the tow. The start and finish locations shall be recorded for both the down- and the up-cast of the CTD. Local conditions in sea state and operational areas will dictate if maintaining position with dynamic positioning (DP) is necessary. It should be recorded whether a cast was completed while drifting or under DP.

Laboratory
MOCNESS samples will be transferred (under NOAA NRDA chain of custody) to Dr. Malinda Sutor of the Department of Oceanography and Coastal Sciences of Louisiana State University. Samples may be transferred to Dr. Robert Cowen of the University of Miami for processing dependent on a forthcoming sample processing plan. In either location, all samples will be stored in a secure facility. Samples will be processed in theses labs and data distributed as described in a separate workplan (currently under development).

Sample and Data Management
All samples, logs, Chain-of-Custody forms, and related electronic data (including photographs) will be controlled and managed by the trustees under project protocols, including Chain-of-Custody tracking of electronic data and the hard drives. Data is generally organized by station and all electronic data files will be filed into this structure by NOAA NRDA data manager with the assistance of the operator/data logger. All electronic data (including photographs) will be saved to an on-board computer, and all data shall be

migrated to a dedicated hard drive. The electronic data will be duplicated in full immediately following the cruise and provided to (1) the Louisiana Oil Spill Coordinator's Office (LOSCO) on behalf of the State of Louisiana, and to (2) Cardno ENTRIX on behalf of BP. The original hard drive with electronic data shall be kept in a secure facility in trustee custody.

By the end of the cruise, all documentation produced onboard, including COCs, field notes, sampling logs, sampling forms, photos, photo logs, ship logs, and GPS tracking shall be transferred to the NOAA NRDA Sample Intake Team following NRDA data management protocols. An identical copy of all documentation will be provided to LOSCO, on behalf of the State of Louisiana, and to BP/Cardno ENTRIX at the end of the cruise.

Sample Retention

All materials associated with the collection or analysis of samples under these protocols or pursuant to any approved work plan, except those consumed as a consequence of the applicable sampling or analytical process, must be retained unless and until approval is given for their disposal in accordance with the retention requirements set forth in paragraph 14 of Pretrial Order # 1 (issued August 10, 2010) and any other applicable Court Orders governing tangible items that are or may be issued in MDL No. 2179 IN RE: Oil Spill by the Oil Rig "DEEPWATER HORIZON" (E.D. LA 2010). Such approval to dispose must be given in writing and by a person authorized to direct such action on behalf of the state or federal agency whose employees or contractors are in possession or control of such materials.

Budgeting

There will be no change to the budget as the result of this amendment.

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Cruise Dates: 16 April – 27 June 2011

Plan Date: June 16, 2011

Approvals

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

BP Approval	Joyce Mulay Printed Name	Joyce Mulay Signature	1/29/2012 Date
Federal Trustee Approval	Daniel Hama Printed Name	 Signature	 Date
Louisiana Approval	KAROLIEN DEBUSS CHEN Printed Name	FOR ROLAND GUIDRY Signature	2/17/2012 Date