

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

**Addendum to:
NRDA Offshore Deep Meso- and Bathypelagic Fish Sampling Plan, Spring 2011**

NOAA R/V *Pisces*

Water Column and Fish Technical Working Group

April 16, 2011

Prepared by:

Deborah French-McCay (ASA), Dan Hahn (NOAA), Kevin Boswell (LSU), Tracey Sutton (VIMS) on behalf of the Trustees

Reviewed by:

Amanda Vincent (LA) on behalf of the Trustees
William Graeber, Jeffery Simms (Cardno ENTRIX) and Mark Benfield (LSU) on behalf of BP

Cruise Dates

R/V *Pisces* – March 22 – April 11, 2011

Except as amended herein, all provisions of the NRDA Spring 2011 Offshore Deep Meso- and Bathypelagic Fish Sampling Plan remain in effect.

Background

The NRDA Spring 2011 Offshore Deep Meso- and Bathypelagic Fish Sampling Plan, utilizing the R/V *Pisces*, is presently underway as a signed cooperative cruise (date of the signed plan: March 19, 2011). The plan is being conducted along with other surveys to evaluate the composition, distribution, and densities of juvenile and adult fish and larger invertebrates in the offshore Gulf of Mexico waters potentially affected by the Deepwater Horizon Oil Spill (DWHOS) and in surrounding areas.

This addendum documents a change in the cruise plan necessitated by the failure of the portside trawl block on the *Pisces*, which is jammed irreparably. With the jammed block, conducting deep trawls is no longer an option, even with a back-up net. Thus, expanding the acoustic and DIDSON work already being conducted as part of the approved plan is a viable way to acquire information on vertical distributions of biota in the Deep Scattering Layer and at other depths.

Justification

Throughout the many cross shelf transects that we have completed, we have identified a persistent aggregation of biomass, a ‘hotspot’ of sorts, presumably comprised of fish where the deep scattering layer (DSL) intersects the shelf between 400-700m. From offshore to onshore, we have consistently observed (now and in December, as well as aboard the MOCNESS cruises) several layers at discrete depths merging into this bottom-associated aggregation; thus we may be able to target the layers and see whether they correspond (in size and composition) to the aggregation. This layer has been observed on other

cruises such as the marine mammal prey base surveys conducted on the *Gordon Gunter* but attempts to capture the aggregation with net based sampling were only of limited success. This persistent aggregation should be a relatively easy target with a DIDSON camera and the pervasive nature of the layer may be indicative, from a food-web perspective, as a mechanism for energy and carbon transfer from the shelf to pelagic ecosystems.

With the primary net for the deep tows having been torn, and a jammed block which prevents deployment of the back-up net, the proposed sampling will forego the planned net tows at the shallow stations B251 and B081 on the 9th and 10th. Instead of those stations, the vessel will head West to the shelf break and commence with acoustic transects and DIDSON deployment. This sampling will allow for an evaluation of the *in situ* density quantification of the Simrad EK60 with the DIDSON. In addition to acquiring information on size and densities, we will acquire information about the vertical homogeneity of the aggregation with respect to what the EK60 'sees' and what our *in situ* ground truthing approach suggests. It is plausible that this boundary community is comprised of a handful of species, but expect it to be predominantly myctophids. Further, we expect that there will be vertical and horizontal separation among species, though it is unclear the level of resolution that we will be able to achieve in the spatial domain given the short amount of time available for the investigation. Nonetheless, the data are likely to reveal important information about the identity of the organisms in this biological layer and serve to strengthen the acoustics component of our current efforts.

Based on information collected to date by response, academic, and NRDA water column sampling, combined with preliminary fate and transport modeling of a submerged plume, the DSL layers we see offshore may have been exposed to oil released by the Deepwater Horizon blowout. These sites may also be areas of enhanced trophic exchange, not just because of the enhanced pelagic biomass (zooplankton/fish interactions), but also the nature of the consumers (more benthic and shelf species involvement). Given that additional trawls cannot be performed and that the vessel only has a few days left at sea, the expansion of the acoustic component of the cruise coupled with DIDSON deployment, will help to elucidate the dynamics of this trophic exchange and the substitution of the proposed effort will be a value-added component of the biological sampling for water column organisms that were potentially impacted by the spill.

Methodology

Sampling Procedures and Locations

The sampling methods remain as described in the original plan. Sampling with the acoustics and DIDSON will occur along transects across the shelf break and slope, as well as at locations previously sampled where aggregations have been observed, such that we can better determine the ubiquity of the aggregations observed in the cruise to date.

Transects will be targeted to overlap with previously-conducted cross-shelf transects during transit to and from port in Pascagoula, MS (i.e., NRDA *Pisces* cruises in December 2010 and this spring cruise). Transects will be approximately 12 mi in length, run perpendicular to the shelf break, and be spaced approximately 8mi apart. Beginning and ending waypoints for the transects are in Table 1 and Figure 1 below. Following the completion of the first transect, we will perform transects in areas observed during the present cruise to be of high scattering intensity (as listed in Table 1) and deploy the CTD/DIDSON package, while continuously recording acoustic data from the EK60 sonar system. The cruise will be completed, as scheduled, on April 11.

Table 1. Transect waypoints for acoustic survey.

Transect ID	Start Lat/Lon	Ending Lat/Lon
ST1		
ST2		
ST3		
ST4		
ST5		
ST6		

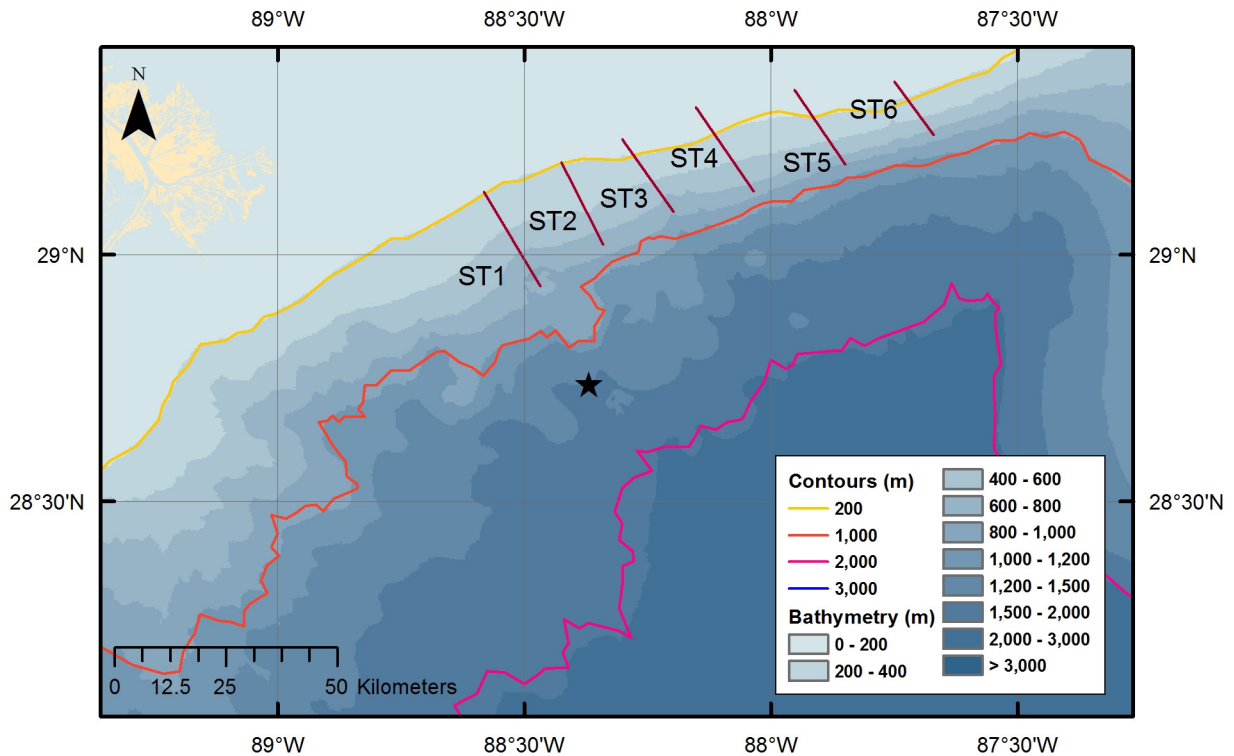


Figure 1. Transects for acoustic survey.

Data Management and Trustee Oversight: All profile, acoustic, and other electronic data will be saved to an on-board computer, and all data shall be migrated to a dedicated hard drive. The data will be controlled and managed by the trustees under project protocols, including Chain-of-Custody tracking of the hard drive. The hard drive will be duplicated in full immediately following the cruise, and the duplicate hard drive will be provided to Cardno ENTRIX on behalf of BP. The original hard drive shall be kept in a secure facility in trustee custody.

Budgeting:

There will be no change in the budget to that in the signed plan.

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

**Addendum to:
NRDA Offshore Deep Meso- and Bathypelagic Fish Sampling Plan, Spring 2011**

NOAA R/V *Places*

Water Column and Fish Technical Working Group

April 16, 2011

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

Robin Bullack
Printed Name

[Signature]
Signature

4-25-11
Date

Federal Trustee Approval

Lisa D. P. int
Printed Name

[Signature]
Signature

4/22/11
Date

Louisiana Approval

KAROLINA ROUSSCHAK
Printed Name

[Signature]
Signature

5/5/11
Date

FCM
KOLUTAS
GUYOT