Deepwater Horizon MC252
NOAA Fisheries Service
Mississippi Laboratories
3209 Frederic St
Pascagoula, MS 39567

JUL 13 2010

Project Instruction

Date Submitted: July 9, 2010

Platform: NOAA Ship *Delaware II*

Project Number: DE-10-07

Project Title: DWH Plankton Survey

Project Dates: July 13-27, 2010

Prepared by: _____ Dated: 7/12/10
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Approved by: _____ Dated: 7/13/10
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Commanding Officer
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I. Overview

A. Project Period: July 13-27, 2010

B. Operating Area: Northern Gulf of Mexico in closed fishing zone 1 (see Figure 1).

C. Objectives:

1. Sample the northern Gulf of Mexico with Southeast Area Monitoring and Assessment Program (SEAMAP) standard sampling gear and protocols to determine the abundance and distribution of planktonic fauna.

2. Conduct CTD casts to profile water temperature, salinity, dissolved oxygen (DO), DO percent saturation, fluorescence, transmittance, and density.

D. Participating Institutions:

1. NOAA Fisheries Service, Mississippi Laboratories (NMFS/MS Lab)
2. NOAA Fisheries Service, Miami Laboratories (NMFS/Miami Lab)
3. IAP World Services (IAP)

E. Participants:

Denice Drass	Field Party Chief	NMFS/MS Labs
Adam Pollack	Field Party	IAP/MS Labs
Jeremy Hall	Field Party	NMFS/Miami Lab
Jennifer Ford	Field Party	Volunteer, Gautier, MS

F. Administrative

1. Point of Contact: Denice Drass, Field Party Chief
3209 Frederic St.
Pascagoula, MS 39567
Denice.Drass@noaa.gov
228-549-1649

2. N/A (There will be no Diplomatic Participants on this survey)

3. Licenses and Permits

This cruise will be conducted under the following permits:

Florida State Permit	Southeast NMFS Regional Permit
Alabama State Permit	Sea Turtle Permit
Mississippi State Permit	Louisiana State Permit
Texas State Permit	

II. Operations

A. Cruise Itinerary:
July 13, 2010 – Depart Pascagoula, MS
July 27, 2010 – Arrive Pascagoula, MS

B. Staging and Destaging – Pascagoula, MS

C. Operations:

1. **Ichthyoplankton Stations:** At each ichthyoplankton station, a bongo and a neuston tow will be conducted.

Bongo Sampling

The SEAMAP bongo plankton sampler is comprised of two 61 cm diameter collars with two 0.335 mm nets. Prior to deployment of the bongo sampler, the watch leader must run software programs and prepare them for the bongo cast. The lab scientist must make sure the bridge AND deck are ready to deploy before hitting >Ok on SBE 19 SEACAT program because this program only allows 60 seconds to turn on the magnetic switch or the setup process must be repeated, often including re-booting the computer. The lab scientist should wait for the bridge and deck to relay their readiness to deploy gear, hit ok on the program, have the deck turn on the magnetic switch at the appropriate time, and wait for data to begin scrolling. There is a small delay between the switch and data scroll, therefore, the lab scientist will relay to the deck when to put the net into the water. The bongo sampler is towed in an oblique path from near bottom, or 200 m maximum, to the surface. The SBE-19 SEACAT will be used to monitor the tow path of the bongo net. Vessel speed should be adjusted during the bongo tow to maintain a 45-degree wire angle in order to uniformly sample throughout the water column. If angle exceeds 55º, falls to 35º OR if combined variation exceeds 15º, then tow must be repeated (the samples will be saved until a better tow is completed). If available, an electronic wire angle indicator with readouts on the bridge and in the dry lab will also be used to monitor wire angle. The net depth will be monitored on the dry lab computer by the watch leader. The Deck Scientist will report wire angles periodically during downcast. On the watch leader's command at maximum depth, stop payout of cable and immediately start retrieval (do not allow net to 'settle'). At that time, the Deck Scientist (or winch operator) will report wire angle and wire out to the watch leader. The watch leader should tell the winch operator to slowly retrieve the bongo array at 20 m per minute for tow depths of 100 m or deeper; for shallower stations the retrieval rate will be determined at each station based on station depth. The Deck Scientist (or winch operator) must report wire angle and remaining wire out to watch leader when asked for (on upcast or downcast). The Deck Scientist should report when the bongo array breaks the surface. Time will be recorded to the second (by the watch leader) when net breaks surface and flowmeters stop turning, at which time the winch operator immediately pulls the frame from the water; taking care not to let the bongo array continue to fish once it breaks the surface. When possible, plankton will be rinsed into cod end of net with seawater hose while the net hangs over the side. In high winds, the watch leader may request that the net is brought directly on board and rinsed down completely on deck. The bongo frame and net are placed on deck. Great care must be taken not to rest the

frame on the nets, scrape the net with the frame against the deck, or walk on the ichthyoplankton nets! The abrasions can easily cause holes in the nets requiring repair or replacement of these expensive sampling devices. If bottom sediment is present in both samples, the tow must be repeated. Any marginal sample will be saved until completion of the next tow. If bottom sediment (no more than 2 tablespoons) is present in only one sample the tow need not be repeated.

In addition to oblique bongo tows, a surface tow using the bongo gear will be conducted at each station.

Neuston Sampling

The neuston net is a 1 x 2 m frame outfitted with a 0.505 mm mesh net. Each neuston tow will be conducted for 10 minutes at a vessel speed of approximately 2 kt to keep half the frame submerged in the water. If necessary, the ship should steam forward in a wide arc to keep the neuston net (mouth opening) out of the influence of the prop wash. The duration of a neuston tow may be shortened up to five minutes when there are high concentrations of jellyfish, ctenophores, Sargassum, floating weed and/or debris. After retrieval, plankton is rinsed into cod end with seawater while net hangs over side (if windy, watch leader may request net to be brought directly on board and rinsed on deck).

In addition to the standard neuston tow, a subsurface neuston tow with a net of 0.505 mm mesh and flowmeter will be submerged to a depth of 10 m and fished between the surface and depth for a tow duration of 10 minutes.

2. **CTD Casts:** The CTD should be submerged at the surface to a depth that will minimize jerking due to wave action, and held at this depth for 3 min so the instrument package can equilibrate to ambient temperature. The unit will then be lowered at the maximum winch rate to within 1 m of the bottom. Then it will be retrieved to the surface (at the maximum winch rate) and returned to the deck.

3. **Oil Stations:** Sampling is scheduled to occur in suspected oil areas. If oil is visible on the surface of the water, the station will be skipped and the vessel will move on to the next station. The location of the station will be noted as well as the amount of oil present. If oil is caught in either the bongo or neuston, extra nets will replace the contaminated nets which will be brought back to land for cleaning. If oil is caught with one of the gears, the other gear will not be deployed.
    I. **At Sea Decontamination Procedures** - Pressure washers are not allowed (aerosolize contaminants) nor are cleaning agents (addition of chemicals to Gulf but ok on land as it will be containerized). Verbal guidance received from the USCG decontamination section in Mobile on June 17th is that as long as the vessel is 1 mile inside a contamination zone then a water flush of equipment is allowable (you may also use brushes to facilitate removal). The latest OMAO decontamination procedure, which is a very fluid document, requires wastewater generated from at sea decontamination activities using cleaning agents be containerized for on shore disposal. Wastewater generated without the use of cleaning agents will be run through their oil water separators.

D. Dive Plan – N/A

E. Applicable Restriction – N/A

II. Equipment

A. Equipment and Capabilities Provided by NMFS/MS Labs:
1. 2- 61 cm bongo frames, chain and weight, (6) 0.335 mm nets
2. 2- 1 x 2 m neuston frames, (4) 0.950 mm nets
3. Flowmeters (6)
4. Plankton sampling supplies box
5. Plankton preserving jars, lids and labels
6. SBE 19 Seacat and SBE 36 deckbox
7. SBE Model 43 oxygen sensor

III. Hazardous Materials

The Chief Scientist is responsible for complying with MOCDOC 15, Fleet Environmental Compliance #07, Hazardous Material and Hazardous Waste Management Requirements for Visiting Scientists, released July 2002. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemical brought aboard. The amount of hazardous material arriving and leaving the vessel shall be accounted for by the Chief Scientist.

A material safety data sheet of each hazardous material brought on board the ship will be provided to the captain by the Field Party Chief. The hazardous materials expected to be brought on board are 95% ethanol, Triton ® X-100, and formaldehyde. Additional chemicals could include 70% ethanol, paraformaldehyde and methanol.

V. Disposition of Data and Reports

Pre-Cruise Meeting: Prior to departure, the Chief Scientist will conduct a meeting of the scientific party to train them in sample collection and inform them of cruise objectives. Some vessel protocols, e.g., meals, watches, etiquette, etc. will be presented by the ship's Operations Officer.

Post-Cruise Meeting: Upon completion of the cruise, a meeting will normally be held at 0830 (unless prior alternate arrangements are made) and attended by the ship's officers, the Chief Scientist and members of the scientific party, the Vessel Coordinator and the Port Captain to

review the cruise. Concerns regarding safety, efficiency, and suggestions for improvements for future cruises should be discussed. Minutes of the post-cruise meeting will be distributed to all participants by email, and to the Commanding Officer and Chief of Operations, Marine Operations Center.

Collection of data will be supervised by the FPC. All collected data will be entered into the appropriate database and sent to Mark McDuff (NMFS/MS Labs) at the completion of the survey. Plankton samples will be transferred to personnel from the Plankton Unit at MS Labs. Chain of custody forms will be maintained for all samples and transferred to the appropriate personnel when the samples are transferred.

Within seven days of the completion of the cruise, a Ship Operation Evaluation form is to be completed by the Chief Scientist. The preferred method of transmittal of this form is via email to OMAO.Customer.Satisfation@noaa.gov . If email is not an option, a hard copy may be forwarded to:

Director, NOAA Marine and Aviation Operations
NOAA Office of Marine and Aviation Operations
8403 Colesville Road, Suite 500
Silver Spring, MD 20910

VI. Meals and Berthing

Meals and berthing are required for up to __ scientists. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the cruise, and ending two hours after the termination of the cruise. Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least seven days prior to the survey.

Berthing requirements, including number and gender of the scientific party, will be provided to the ship by the Chief Scientist. The Chief Scientist and Commanding Officer will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship's complement. The Chief Scientist is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Chief Scientist is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the cruise and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Chief Scientist will ensure that all non NOAA or non Federal scientists aboard also have proper orders. It is the responsibility of the Chief Scientist to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All

personnel must comply with OMAO's Drug and Alcohol Policy dated May 7, 1999 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

VII. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, Revised: 08/08) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website at http://www.omao.noaa.gov/medical/NHSQ_Final_wi_Instructions_fill.pdf The completed form should be sent to the Regional Director of Health Services at Marine Operations Center . The participant can mail, fax, or scan the form into an email using the contact information below. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the cruise to allow time for the participant to obtain and submit additional information that health services might require before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of the NHSQ. Be sure to include proof of tuberculosis (TB) testing, sign and date the form, and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

Contact information:

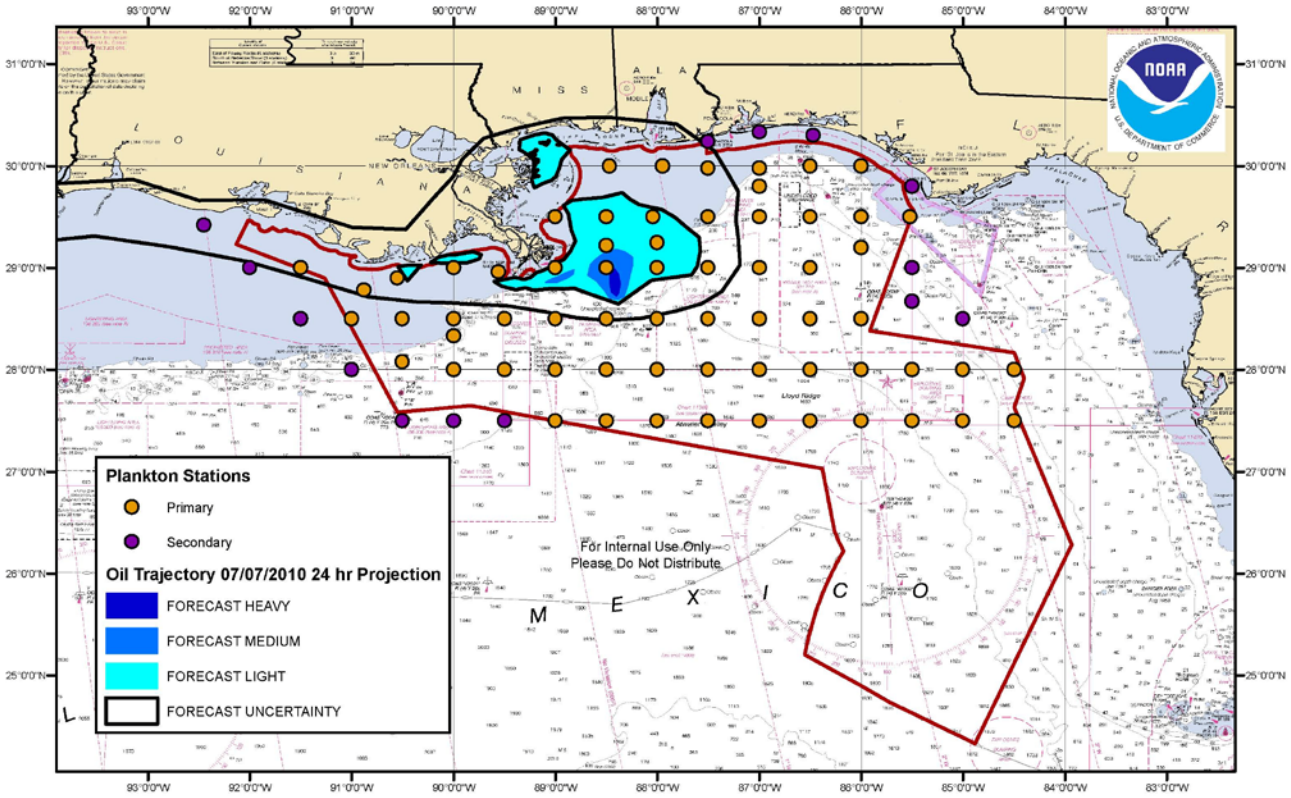
Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone 757.441.6320
Fax 757.441.3760
E-mail MOA.Health.Services@noaa.gov

Prior to departure, the Chief Scientist must provide a listing of emergency contacts to the Executive Officer for all members of the scientific party, with the following information: name, address, relationship to member, and telephone number.

VIII. Shipboard Safety

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. Steel-toed shoes are required to participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide steel-toed boots. Hard hats are also required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

Delware II Proposed Plankton Stations



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APPENDIX 1

Protocols for handling/fixing/storing bongo net samples from 2nd tow at select SEAMAP (B#) plankton stations for RNA and chemical analysis

(Modified from NWFSC guidelines by J. Lyczkowski-Shultz, June 22, 2010)

General guidelines:

If sample is composed mostly of ctenophores or jellyfish (and/or their slime) do not save the sample and move on to the next targeted station.

Samples should be preserved as quickly as possible with minimal handling because RNA degrades at high temperatures.

Please keep fixation solutions pre-chilled on ice or in refrigerator.

Wear gloves to avoid contaminating samples with bare hands.
(Source of contamination is the enzymes on our fingers!)

Specific instructions:

Right Bongo Sample

Quickly wash the net down, concentrate sample in cod end and pour into collecting sieve.

Concentrate sample into one end of the sieve using a squeeze bottle of chilled seawater.

Rinse this concentrate lightly with chilled 70% EtOH using a squeeze bottle over the sink and then wash the entire sample down into the sample jar using that same squeeze bottle of 70% EtOH.

The amount of plankton in a jar should not exceed 1/3 of the jar's volume.
If necessary use multiple jars.

Top jar off with 70% EtOH that has been kept as cool as possible.

Change to new 70% EtOH after 24 hours.

Label samples on the outside of jar (lid) only using SEAMAP plankton labels. More complete labels will be filled out at the Lab.

Record samples in data log.

Left Bongo Sample

Quickly wash down the net, concentrate sample in cod end and pour into a collecting sieve.

Concentrate sample into one end of the sieve using a squeeze bottle of chilled seawater.

With a clean (not previously used) plastic spoon gently transfer 2 to 10 gm of sample into an IChem jar. An exact weight is not necessary, an estimate is acceptable. (Speedy handling of the sample is more important.)

Freeze this portion of the left sample for analytical chemistry.
Store in -20˚C freezer. Label samples on the outside of jar (lid) only.

Rinse the remaining sample in the sieve lightly with chilled 4% buffered paraformaldehyde solution using a squeeze bottle over the sink and then wash the entire sample down into the sample jar using that same squeeze bottle of 4% buffered paraformaldehyde solution.

The amount of plankton in a jar should not exceed 1/3 of the jar's volume.
If necessary use multiple jars.

After 6 hours drain sample through a sieve to remove the paraformaldehyde solution and add full strength methanol to the sample jar(s).

Label samples on the outside of jar (lid) only using SEAMAP plankton labels. More complete labels will be filled out at the Lab.

Record both frozen and preserved samples in data log.

Appendix II
Standard Operating Procedures for plankton sampling
Summer Trawl Survey

(Provided by NWFSC staff, June 18, 2010)

Please take notes on general condition of plankton samples, and whether they are typical or have unusual features.

(A) Sample types to be collected:

1) Bulk plankton fixed in 70% EtOH for RNA/DNA isolation
2) Bulk plankton fixed in 4% paraformaldehyde in Millinog's buffer
   a) Fix in paraformaldehyde overnight
   b) Transfer to 100% MeOH
3) Bulk plankton frozen for analytical chemistry: 10 g wet weight per 4 oz I-Chem jar (can be volumetrically estimated, or can pre-weigh jars)

(B) Materials provided:

8% paraformaldehyde in 100-ml bottles
Millinog's buffer in 1-L bottles
Pre-weighed 25-g lots of NaCl, to be dissolved in 1 liter of Millinog's before use
I-Chem jars (pre-cleaned)
250-ml plastic bottles for paraformaldehyde fixation

(C) Preparation before sample processing

General information: Samples should be prepared as quickly as possible with minimal handling. Wear gloves to avoid contaminating samples with bare hands. Please keep fixation solutions pre-chilled on ice. The working solution of paraformaldehyde is prepared by mixing equal parts 8% paraformaldehyde with Millinog's buffer. The volume of fixative to use will depend on the mass of plankton, ideally plankton mass should be 10-20% of the volume (i.e. 20-40 ml plankton mass to 200 ml fixative). If plankton samples are very large, they can be fixed in a larger volume of paraformaldehyde in a larger vessel. (The largest volume of pre-made paraformaldehyde available is the 100-ml bottles; these can be pooled to make up whatever volume is necessary, e.g. if a tow produces a sample > 20-40 ml).

1) Dissolve 25 g NaCl into 1 liter Millinog's buffer, keep on ice
2) Have 8% paraformaldehyde bottles on ice or refrigerated
3) Prepare 70% ethanol by diluting 95% with distilled water, chill on ice (or prepare large stock for multiple stations and keep refrigerated)

(D) Protocol for preserving plankton samples:

1. Sample 1, EtOH fixed. Collect one side of bongo, rinse with chilled distilled water, estimate mass (volume) and fix in appropriate volume 70% EtOH. Change to new 70% EtOH the next day.
2. Sample 2, 4% paraformaldehyde fixed. Collect second side of bongo, rinse with chilled distilled water. Estimate mass; if much larger than required for 10-g chemistry sample (3), fix larger bulk in appropriate volume of chilled 4% paraformaldehyde/Millinog's.
3. Sample 3, freeze for analytical chemistry. With precleaned tool (e.g. stainless steel spatula) transfer 10 g plankton to IChem jar. Store in -20˚C freezer.
4. Labeling and sample documentation