

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

**NRDA July 2011 McArthur II  
Epipelagic Plankton Bongo & Neuston Sampling  
Cruise Plan**

**Sampling Vessel: R/V *McArthur II***

**July 1, 2011**

**Prepared by:**

Deborah French-McCay, Eileen Graham, Erin Bohaboy, J.A. Macfarlan, and Melanie Schroeder,  
on behalf of the Trustees

**Reviewed by:**

NOAA: Dan Hahn, John Quinlan (NOAA)  
Louisiana: Amanda Vincent (LDEQ)  
BP: Jeffrey Simms, Amy Piko (Cardno ENTRIX) on behalf of BP.

**Cruise Dates**

July 6-15, 2011

**Background/Justification**

**Conceptual Model – Water Column Organisms**

*The trustees have developed a preliminary conceptual model of the DWH release, potential pathways and routes of exposure, and potential receptors. This preliminary model has informed the trustees' decision to pursue the studies outlined in the work plan. By signing this work plan and agreeing to fund the work outlined, BP is not endorsing the model articulated in the work plan nor is BP endorsing the full geographic extent of sampling or the rationale provided for it.*

**Release and Pathway**

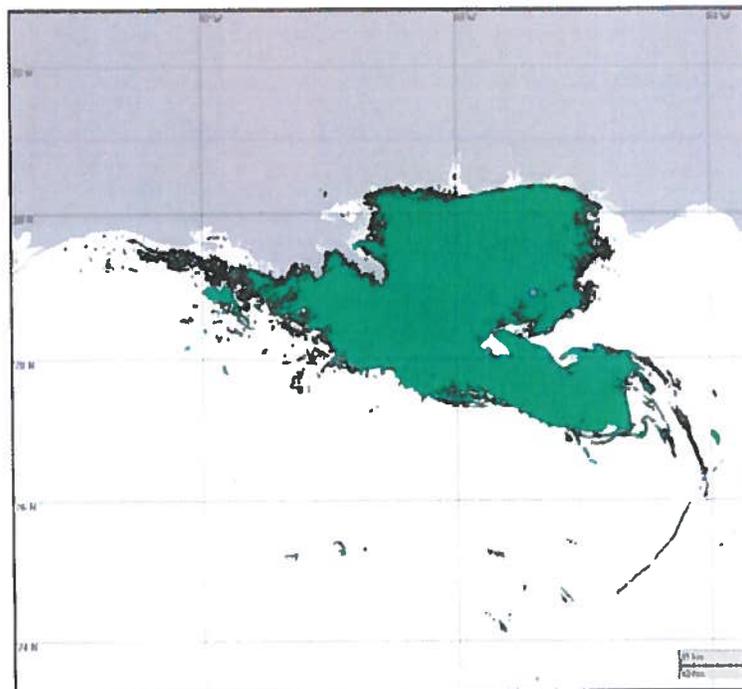
Oil released from the broken well head both dispersed at depth and rose through nearly a mile of water column. The composition of the released gas-liquid mixture changed over time and space as the result of dilution, changes in pressure, dissolution, and addition of other constituents such as dispersants, methanol, and anti-foaming additives. Of oil that made it to the water surface, some entrained water forming mousse, was dispersed into the water column naturally and by application of dispersants, and some was removed mechanically or by *in situ* burning. Floating oil, oil droplets, flocculated and dissolved components were transported large distances at various levels of the water column. Oil also picked up sediments, and other particulate material, some of which became neutrally or slightly negative buoyant, sinking to various depths. The oil dispersed at the wellhead (both via turbulence or by injection of dispersants) was transported by currents that varied in time and space, yielding a complex pathway of subsurface oil contamination that affected abyssal, bathypelagic, and meso-pelagic waters of the offshore Gulf of Mexico.

**Routes of Exposure**

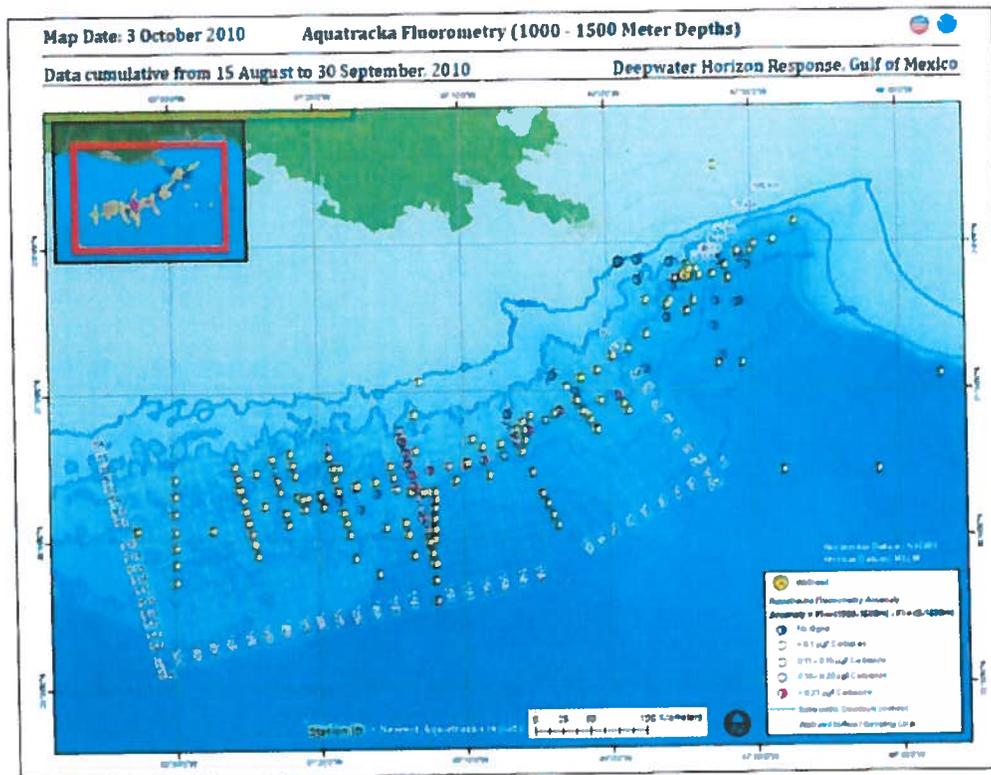
Fish and invertebrates in the water column are exposed to contaminants by swimming through contaminated water, spending time on/in contaminated sediments, taking up contaminants through body surfaces, passing contaminated water over respiratory structures, and ingesting water, oil droplets,

contaminated biota, and particulates contaminated with oil as part of feeding. Additionally, sensitive life stages of pelagic fish and invertebrates come in direct contact with floating oil that covers and is mixed into the neuston layer (upper ~0.5m) where many embryos and larvae develop. Other neustonic organisms exposed to surface oil include many small invertebrates important to the food web. In the water column, organisms are also exposed to suspended oil droplets, which can foul appendages or other body surfaces. Water column organisms have also been exposed to dispersants dissolved in water, on oil droplets and adsorbed to suspended particulate matter. Water column organisms were also exposed to dissolved and water-borne chemical additives such as methanol and anti-foaming agents.

Plankton in the north-eastern Gulf of Mexico, which include early life history stages of fish and invertebrates, as well as smaller invertebrate holo-plankton and gelatinous zooplankton, are among those biota exposed to the released oil and spill-related chemicals. Planktonic organisms throughout the water column of deep offshore slope areas were potentially exposed, including the deeper depth strata where sub-surface oil has been observed (i.e. 1000-1300m). Figure 1 shows the approximate extent of oil observed on the water surface using radar data, which indicates some areas potentially affected by floating oil. Figure 2 shows a cumulative summary of fluorescence measurements between 1000 and 1500m, indicating a possible southwestward transport of the oil and some locations where plankton may have been exposed in deepwater (laboratory analyses to establish whether or not these measurements are linked to MC252 oil have not yet been conducted).



**Figure 1. Cumulative potential surface floating oil extent of the Deepwater Horizon oil spill. (Figure derived from compositing April, May, June, and July 2010 radar shape files available on the National Oceanic and Atmospheric Administration (NOAA) Environmental Response Management Application (ERMA) website. Note that radar images with noted anomalies were not included in composite.)**



**Figure 2. Cumulative summary of Aquatracka fluorescence measurements between 1000 and 1500m, 15 August to 30 September 2010.**

### Summary of Historical Shelf and Offshore Plankton Data

Plankton in the upper 200m of the water column of the Gulf of Mexico off of Texas to Florida have been sampled by the National Marine Fisheries Service (NMFS)/NOAA Southeast Area Monitoring and Assessment Program (SEAMAP) over the past ~25 years (Attachment 1). This program offers a significant resource for understanding the characteristics of the natural state of this community. This is augmented by several state-based surveys that sample in waters closer to shore.

Historically SEAMAP plankton samples (bongo/neuston) collected during the summer months (June, July, and early August) occur as part of the Summer Groundfish trawl survey. The Groundfish survey is a collaborative effort between state partners and NMFS vessels. Each summer 400 randomly generated stations are sampled throughout established "statistical zones" that stretch from the Texas shelf to the Florida shelf. These stations are divided up amongst the state partners and NMFS based on distance from shore and logistical factors such as available days at sea and state resources. This is not a dedicated plankton survey like the gridded Spring, Fall, and Winter SEAMAP surveys conducted by the NMFS Southeast Fisheries Science Center (SEFSC), rather a dedicated trawling effort with plankton sampling as a second priority. The stations (and station type) where plankton sampling occurs varies by state partner. For example Louisiana has historically sampled plankton at both several random trawl stations and at seven gridded SEAMAP plankton stations near the coast. Florida does not conduct any plankton sampling as part of the groundfish survey. Historically NMFS Summer Groundfish vessels have attempted to sample plankton at several of the standard SEAMAP gridded plankton stations focusing effort mainly off the Texas and western Louisiana shelf (with no stations offshore). Typically only 30 to 50 stations get sampled during the gulf-wide SEAMAP Summer Groundfish survey, and this effort is

concentrated to the west of the Deepwater Horizon Oil Spill (DWHOS) region of interest. Figure 5 in Attachment 1 pictures the historical cumulative plankton sampling effort as part of the Summer Groundfish survey from 1982-2008.

The Fall SEAMAP survey is a dedicated plankton sampling effort conducted by NMFS SEFSC. The Fall survey has been running from 1986-present and is conducted from late August to mid-October. There is an established “standard” survey cruise track (Attachment 1, Figure 3), that stretches from the Texas shelf to the Florida shelf. Attachment 1 summarizes the historical and current datasets for plankton fish and crustaceans.

### **Objectives and Approach**

This plan is part of a series of cruises scheduled for the summer of 2011 intended to evaluate the distribution and densities of ichthyoplankton and other zooplankton in Gulf of Mexico waters potentially affected by the DWHOS and in surrounding areas. The overall NRDA plankton sampling plan takes advantage of the historical SEAMAP data sets and plans for continuation and extension of the SEFSC SEAMAP program into deep water areas in the vicinity of the MC252 well head.

This plan, the NRDA July 2011 Epipelagic Plankton survey, describes the NRDA survey for July 6-15, 2011 where a subset of the SEAMAP stations have been selected for sampling of ichthyo- and other plankton in the upper water column (*i.e.*, epipelagic). The primary objective of the NRDA survey is to assess the occurrence, abundance, and distribution of the early life stages of fishes, commercially important invertebrates (lobsters, decapods), and other zooplankton found in the surface waters <200m in the north-central Gulf of Mexico. The primary objectives of this cruise are to evaluate the changing conditions between the NRDA Spring 2011 and Summer 2011 Epipelagic Plankton surveys, sampling a subset of the plankton program stations, *i.e.*, those close to the incident site and in the region which experienced surface oiling during July 2010. Ichthyo- and other zooplankton in the upper water column will be sampled using paired bongo nets and a 1-m MOCNESS net, and at the water surface with a rectangular neuston net (SEAMAP standard) and a manta neuston net (California Cooperative Oceanic Fisheries Investigations (CalCOFI) standard). Day-night paired sampling will be performed in offshore stations (with water depth >200m) to evaluate diel changes, as the bongos only sample down to 200m and animals may move below that in part of the diel cycle. We will perform side-by-side sampling using each of the sampling gears that have been used in the seasonal epipelagic plankton cruises, to allow more detailed analysis of the distributions at these stations and compare catches from each gear. Double neuston samples will be taken at the same station using each of the neuston nets, preserving one each in formalin and ethanol, allowing additional flexibility in evaluating the material for taxonomic and other purposes. (Note that prior neuston samples were only preserved in formalin, but ethanol-preserved samples would be useful for genetic analyses).

In addition, this survey will also take advantage of the opportunity to observe the occurrence of adult and juvenile flyingfish (multiple species in the family Exocoetidae) while transiting between the selected SEAMAP plankton sampling stations. Data on the occurrence of flyingfish will be collected by visual observation only, and no gear will be deployed to target any flyingfish.

This plan will be implemented consistent with existing trustee regulations and policies. All applicable state and federal permits must be obtained prior to conducting work.

Attachments 2 and 2A through 2D provide standard operating procedures (SOPs) for the protection and conservation of marine mammals and any species listed under the Endangered Species Act as appropriate for the vessel and sampling equipment operations to be conducted on this cruise.

This particular effort is being developed as a cooperative program, but is ultimately Trustee-led as required by the Oil Pollution Act of 1990 (OPA) regulations. As such, these cruises will be led at sea by a Trustee-appointed Chief Scientist who serves as a Trustee representative. This Chief Scientist will work to ensure that cruise objectives are met and that time at sea is utilized efficiently for collecting information pertinent to the investigation. When not on duty, the Chief Scientist will designate a Watch Lead. This Watch Lead will also be a Trustee representative. The Chief Scientist may be supported on-board by a senior scientist appointed by the Responsible Parties. This senior scientist is to consult with the Chief Scientist on logistical and scientific matters, but ultimate decision making authority rests with the Chief Scientist. The Chief Scientist will also consult as needed with shore-side Trustee support (*i.e.*, Drs. French McCay, Hahn, and Quinlan).

The Captain and Chief Scientist will confer regarding the operational plan and schedule, and any changes to the plan or schedule that are required due to logistics, breakdowns or weather concerns. The Chief Scientist will be responsible for notifying the designated NOAA and RP leads regarding schedule changes, so that each lead may notify staff and adjust their respective staff mobilization schedules, as needed.

## **Methodology**

### ***Sampling Stations***

The cruise track and selected stations for the NRDA R/V *McArthur II* July 2011 survey are designed to obtain data at offshore and inshore stations, to perform sampling in the areas affected by surface oiling during July 2010, and to revisit stations sampled during the winter and spring 2011 surveys (Figure 3).

Based on the pace of the spring 2011 survey, approximately two stations can be sampled (paired day and night) every 24 hours. This plan proposes 24 stations, realizing all stations may not be sampled. There are 17 first priority stations and 7 additional secondary stations (Table 1). Stations are listed in priority order; therefore, those at the bottom of the list may be dropped if there is not sufficient time to complete all stations.

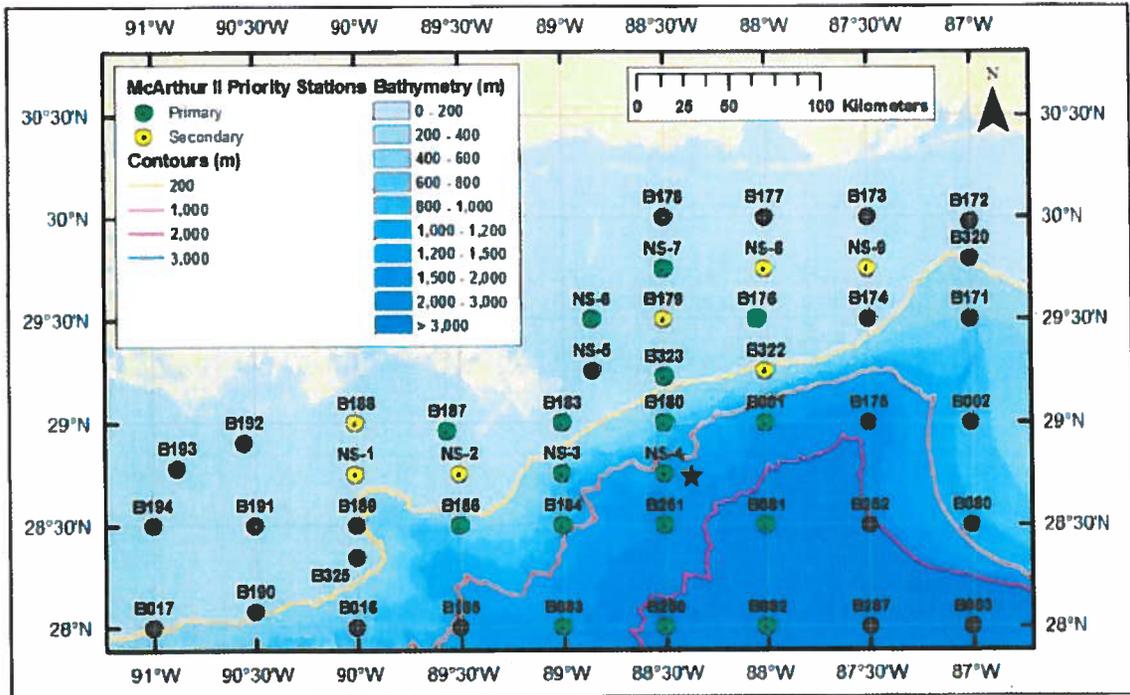


Figure 3. NRDA July 2011 epipelagic plankton stations: the star denotes the Deepwater Horizon wellhead position, green and yellow dots denote priority ranking of stations, and black dots denote nearby SEAMAP stations sampled other seasons.

Table 1. NRDA July 2011 epipelagic plankton stations.

Priority	Station Order	Station Number	Longitude (W)	Latitude (N)	Depth Range (m)
Primary: High Priority	1	B176	██████	██████	< 200
	2	B001	██████	██████	1200-1500
	3	B081	██████	██████	2000-3000
	4	B082	██████	██████	2000-3000
	5	B3250	██████	██████	2000-3000
	6	B251	██████	██████	1500-2000
	7	NS-4	██████	██████	1200-1500
	8	B180	██████	██████	400-600
	9	B323	██████	██████	< 200
	10	NS-7	██████	██████	< 200
	11	NS-6	██████	██████	< 200
	12	B183	██████	██████	< 200
	13	NS-3	██████	██████	400-600
	14	B184	██████	██████	800-1000
	15	B083	██████	██████	1200-1500
	16	B186	██████	██████	400-600
	17	B187	██████	██████	< 200

Priority	Station Order	Station Number	Longitude (W)	Latitude (N)	Depth Range (m)
Secondary Priority	18	B188	█	█	< 200
	19	NS-1	█	█	< 200
	20	NS-2	█	█	< 200
	21	NS-8	█	█	< 200
	22	NS-9	█	█	< 200
	23	B322	█	█	200-400
	24	B179	█	█	< 200

### **Sampling Procedures**

Plankton sampling will occur around the clock with the exception of at least +/- 30 minutes around sun rise/set during which time no net sampling will occur, and avoiding +/- 60 minutes of sun rise/set if feasible. Each station where water depth exceeds 200m (see table 1) will be sampled once during the day and once at night. This protocol is designed to capture changes in densities due to the diel cycle of zooplankton vertical migration. For stations where water depth is <200m, the entire water column is sampled by the deep bongo tow, and thus only one sampling event will occur at these sites, regardless of photoperiod, but maintaining the exclusion of at least +/- 30 minutes (preferably +/- 60 minutes) around sun rise/set. Of the 24 stations in Table 1, 12 are in waters >200m, and so there are 36 sampling events indicated (including 28 priority station samplings). With 8 days for sampling, the plan is to sample 2 - 4 stations in a 24-hour period.

In the upper 200m of the water column, ichthyo- and zooplankton will be sampled using two different systems (paired bongo nets and 1-m MOCNESS nets). In addition, ichthyo- and zooplankton will be sampled at the water surface using two different neuston nets (rectangular and manta). Standard SEAMAP sampling protocols will be followed at each station for the oblique bongo tows to a maximum depth of 200 m (0.333 mm mesh), the 1-m MOCNESS tows to 160 m, and the 10 minute rectangular neuston tows (0.950 mm mesh). In addition, the 10 minute manta neuston net tows (0.950 mm mesh; Attachment 3) will follow the standard CalCOFI sampling protocols. The manta net is designed to maintain the net frame in close contact with the water surface and keep the gear away from the vessel during the tow. Data from paired neuston and manta tows will allow inter-gear comparison of sampling efficiency. A CTD profile will be conducted to a maximum depth of 250m (the bongo tow and CTD cast will be shallower than 200m if the local water depth is <200m). For all sampling gears, detailed observations (abundance, wet weight volume, and species) of net-caught jellyfish, ctenophores, and other large items, such as *Sargassum*, will be made. Large biota and other items will be rinsed, quantified, recorded, photographed, and discarded. Any observable variations from the normal appearance of each living biota caught in the nets will be documented. These items will not be kept due to storage capacity limitations.

During the transit between stations, visual observations for flyingfish will be conducted. These observations are based on visual transect procedures as discussed in the literature (see Attachment 9 for a literature review). These surveys will not attempt to speciate individuals, instead counts will be gathered at the family level, concentrating on number encountered.

The following sampling will occur at every station and transit.

### **Bongo Nets:**

**Deep Tows:** Deep bongo tows (333 µm mesh) will be conducted to a maximum depth of 200m, towed obliquely as per standard SEAMAP sampling protocols. If the local water depth is less than 200m, the nets will be deployed to a maximum of 10 m above the bottom. The sample attained from the left bongo

net will be immediately preserved in 70% ethanol and transferred approximately 24-48 hours later into fresh 70% ethanol. Samples from the right bongo will be immediately preserved in 10% buffered formalin. For detailed description of bongo net deployment protocols and sample processing see Attachment 4.

**Shallow Tows:** Shallow bongo tows (333  $\mu\text{m}$  mesh) will be conducted to a variable depth coinciding with the pycnocline delineating the upper mixed layer (generally  $\sim 40\text{m}$ ), as determined by the CTD cast. The bongo will be lowered to the depth of the pycnocline and recovered obliquely as per the protocols for the deep tows (see above). The sample attained from the left bongo net will be immediately preserved in 70% ethanol and transferred approximately 24-48 hours later into fresh 70% ethanol. Samples from the right bongo will be immediately preserved in 10% buffered formalin. For detailed description of bongo net deployment protocols and sample processing see Attachment 4.

**MOCNESS:** Vertical distribution of plankton in the water column (with a safety margin near bottom) will be measured by sampling in discrete depth intervals using a 1- $\text{m}^2$  Multiple Opening and Closing Net and Environmental Sensing System (MOCNESS) (333  $\mu\text{m}$  mesh). The MOCNESS is an instrumented net system that is capable of taking discrete samples over specific depth strata. The instrument package on the MOCNESS can record data on water column physical properties as well as chlorophyll fluorescence. The nets will be deployed to a maximum of 160 m, similar to the standard SEAMAP deployment protocols. Details of the MOC1 deployment protocol are in Attachment 5 and the MOC1 sample handling protocols are in Attachment 6.

**Rectangular Neuston Net:** In the top 1m of the water column ichthyo- and zooplankton will be sampled using a rectangular neuston net (0.950 mm mesh). Standard SEAMAP sampling protocols will be followed at each station – a 10 minute tow. This net will be deployed twice at each station in immediate succession; the first sample preserved in 70% ethanol, the second in 10% formalin (see Attachment 7). The duration of a neuston tow may be shortened to no less than 5 minutes when high concentrations of jellyfish, ctenophores, *Sargassum*, floating weed and/or debris are present in the water, or weather requires it. For detailed description of the neuston net deployment protocols and sample processing see Attachment 7.

**Manta Neuston Net:** In the top 1m of the water column ichthyo- and zooplankton will be sampled using a manta neuston net (0.950 mm mesh) during a 10 minute tow. This net will be deployed twice at each station in immediate succession; the first sample preserved in 70% ethanol, the second in 10% formalin (see Attachment 3). The duration of a neuston tow may be shortened to no less than 5 minutes when high concentrations of jellyfish, ctenophores, *Sargassum*, floating weed, or debris are present in the water, or weather requires it. For detailed description of the manta net and sample processing see Attachment 3.

**CTD:** At each station prior to the net sampling, a Seabird CTD profiling package will be deployed to 250 m (or to 10m off the seafloor, whichever is shallower) with the following sensors: chlorophyll fluorometer, salinity, temperature, and depth (i.e., pressure).

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 will be recorded whether a cast was completed while drifting or under DP.

**Acoustics:** The SIMRAD EK60 scientific echosounder system will be used to collect data on acoustic backscatter in the water column. The R/V *McArthur II* has a suite of transducers operating at 12 kHz, 38

kHZ, 120 kHz and 200 kHz frequencies. Acoustic data will be collected throughout the cruise during all sampling. The purpose of the acoustic surveys is two-fold: (1) collection of bathymetry data to understand seafloor morphology and plan sampling depths, and (2) potential identification of backscatter anomalies in the water column that may indicate biota. For a further description of acoustic data collection including a deep water collection SOP, please see Attachment 8.

**Flying Fish Observations:** Flyingfish may have been exposed to oil on or near the surface; thus, evaluations of their distribution and relative densities will be made to assess their potential exposure. Visual counts of flyingfish will be conducted in 10-minute time segments during daylight hours while transiting between plankton sampling stations. During longer transits between the offshore plankton sampling stations, at least 2 hours of each transit (twelve 10-minute time segments) will be used to conduct flyingfish visual surveys. During shorter transits between the plankton sampling stations that are closer inshore, at least 1 hour of each transit (six 10-minute time segments) will be used to conduct flyingfish visual surveys. The ship's location (latitude and longitude) will be recorded at the beginning and end of each 10-minute time segment. Two observers will be stationed on the flyingbridge: one facing towards port and one facing towards starboard. Each observer will be positioned at a constant distance in front of a 1-m wide viewing frame attached to the ship rail of the flyingbridge. While maintaining a constant bearing at 10 knots, each observer will count (with the use of a hand-held click-counter) the number of flyingfish that they observe leaping from the water within the viewing frame. At the end of each 10-minute time segment, the observer will record the number of flyingfish on a datasheet and reset the counter. Each observer should conduct visual count surveys for no more than six consecutive 10-minute time segments before resting for at least 30 minutes. For a detailed description of the flyingfish visual survey design and methodology see Attachment 9.

#### ***Data Management and Trustee Oversight***

All profile, acoustic, and other electronic data (including photographs) 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. 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. The hard drive will be duplicated in full immediately following the cruise, and the duplicate hard drives will be 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 shall be kept in a secure facility in trustee custody.

Under the direction of the Chief Scientist, a NOAA Data Manager on board each vessel will summarize sampling activities and scientific observations throughout the day and email a daily report to a designated list of recipients and NOAA NRDA [REDACTED] by midnight each day of the cruise.

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 BP/Cardno ENTRIX at the end of the cruise. Attachment 10 contains additional details on the NRDA field sampler data management protocol.

#### **Logistics**

##### ***Vessel***

Operations will be completed on the R/V *McArthur II*, currently ported in Pascagoula, MS.

**Personnel for R/V McArthur II**

Chief Scientist  
Alternate Watch Lead  
2 NOAA Data Managers  
4 NOAA Samplers  
Cardno ENTRIX Lead  
2 Cardno ENTRIX Representatives

**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.

Budget Chart #1.

Field Survey Costs	Days	Day Rate	Total
NOAA Vessel Cost			\$500,000
NOAA Labor (days):			
NOAA Chief Scientist	1	\$25,000	\$25,000
NOAA Alternate Watch Lead	1	\$20,000	\$20,000
4 Plankton/Net handlers/Flyingfish observers	15	\$4,000	\$60,000
2 Data Managers	15	\$2,000	\$30,000
Misc Costs Sample Handling	1	\$10,000	\$10,000
Travel	1	\$15,000	\$15,000
<b>Total NOAA NRDA (not including vessel)</b>			<b>\$160,000</b>
<b>TOTAL</b>			<b>\$660,000</b>

Days/Trips based on 10 potential cruising days. Labor is estimated days and cost.

**Safety Plans**

BP's full operations and safety plans are attached as appendices. A HASP binder is provided to each vessel. In addition, the NOAA incident site safety plan (which all NOAA employees and contractors must sign prior to the cruise) is attached (Attachment 11). Vessels will call into SIMOPS based on the current regulations (Attachment 12). Vessels will report in daily using the attached situation report (Attachment 13).

**Laboratory**

Epipelagic samples will be transferred, and held under NOAA chain of custody, to Dr. Malinda Sutor of the Department of Oceanography and Coastal Sciences of Louisiana State University for further processing. All samples will be stored in a secure facility. Samples will be processed in the lab and data distributed as described in a separate workplan (currently under development).

**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.

***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 Cardno ENTRIX on 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 Cardno 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 Analytical Quality Assurance Plan, after which time the validated/QA/QC'd data shall be made available simultaneously to all trustees and BP (or Cardno ENTRIX on behalf of BP). Any questions raised on the validated/QA/QC results shall be handled per the procedures in the Analytical Quality Assurance 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. The LADP shall not be released by the DMT, LOSCO, BP or Cardno 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 Cardno ENTRIX on behalf of BP).

**Attachments**

- Attachment 1. Summary of SEAMAP Historical Shelf and Offshore Plankton Data
- Attachment 2. Protected Species Interaction Prevention Procedures for No-impact Gear Types
- Attachment 2A. NMFS Protocol for Dead Entangled Small Cetaceans
- Attachment 2B. Sea Turtle Retrieval Resuscitation Protocols
- Attachment 2C. Turtle Stranding Report Forms STSSN
- Attachment 2D. Vessel Strike Avoidance Guidance
- Attachment 2E. 201106016\_Final acoustic measures\_NRDA BMPs.pdf
- Attachment 3. Manta Net Specifications and Deployment
- Attachment 4. Bongo Net Specifications and Deployment
- Attachment 5. MOCI Deployment Protocol
- Attachment 6. MOCI Sampling Protocol
- Attachment 7. Rectangular Neuston Net Specifications and Deployment
- Attachment 8. Acoustic Data Collection EK60
- Attachment 9. Flyingfish Visual Survey Protocol
- Attachment 10. NRDA\_Field\_Sampler\_Data\_Management\_Protocol\_10\_23\_2010
- Attachment 11. NRDA\_Ops\_Safety\_plan\_08DEC2010
- Attachment 12. NRDA SIMOPS Procedures 040711
- Attachment 13. DWH Vessel Daily SitRep
- Attachment 14. Transfer of Personnel and Material at Sea 070510
- Attachment 15. MC252 HSSE Incident Reporting Final 02 May 10 rev 1
- Attachment 16. MC252 Analytical QAP V2.2

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**Cruise Dates: July 6-15, 2011**

**July 1, 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

Lawrence K. Malinor  
Printed Name

[Signature] July 7, 2011  
Signature Date

Federal Trustee Approval

Jessica White  
Printed Name

Jessica White 7/7/2011  
Signature Date

Louisiana Approval

MAROLINE DISBOSSCHON  
Printed Name

[Signature] 7/13/2011  
Signature Date  
FOR R/V RMA  
OUI 0211