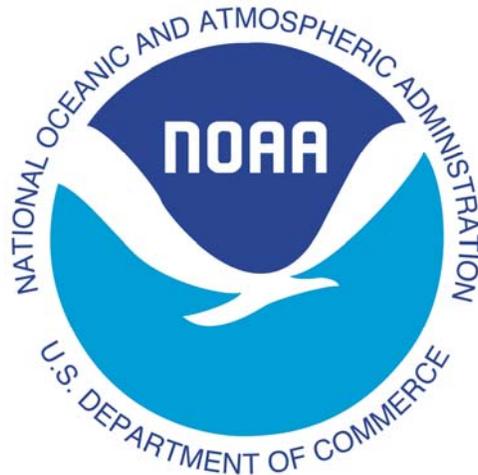


**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION**

**Interim, Partial Claim for Assessment and Restoration Planning Costs**

**20 April 2010 Deepwater Horizon (MC252) Incident**

**Time Period: April-December 2012**



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**March 1, 2012**

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## Executive Summary

On April 20, 2010, an explosion and fire on the *Deepwater Horizon* mobile offshore drilling unit resulted in 11 worker fatalities and discharges of oil and other substances from the rig and seabed wellhead into the Gulf of Mexico. Pursuant to section 1006 of the Oil Pollution Act ("OPA"), 33 U.S.C. §§ 2701, *et seq.*, federal, state, and federally recognized tribes are Trustees for natural resources and are authorized to act on behalf of the public to: (1) assess natural resource injuries resulting from a discharge of oil or the substantial threat of a discharge and response activities and; (2) develop and implement a plan for restoration of such injured resources.

Immediately following the *Deepwater Horizon*/Mississippi Canyon 252 ("MC252") Oil Spill, the affected Trustees initiated joint efforts to begin the collection and analysis of: (1) data reasonably expected to be necessary to make a determination of jurisdiction or a determination to conduct restoration planning; (2) ephemeral data; and (3) information needed to design or implement anticipated emergency restoration and assessment activities as part of the Restoration Planning Phase. In addition, pursuant to Natural Resource Damage Assessment (NRDA) regulations (15 CFR § 990.14), one of the identified Responsible Parties, BP Exploration and Production, Inc. "BP", informed the Trustees of its intent to participate in the NRDA. As a result, the Trustees provided opportunities for BP to comment on Trustee-developed assessment plans and to participate in field work when the Trustees and BP reached a mutual agreement. As a condition of participation, BP is required to fund the joint plans. In this Claim, the *Deepwater Horizon*/MC252 Oil Spill is referred to as "Oil Spill" or "Incident" which may include, as applicable, all Incident(s) related to the events of the explosion, fire and subsequent discharges of oil and other substances from the rig and wellhead on the seabed into the Gulf of Mexico.

Pursuant to the NRDA regulations applicable to OPA, 15 C.F.R. Part 990 ("NRDA regulations"), the Trustees issued a Notice of Intent to Conduct Restoration Planning ("Notice"). That Notice confirmed the Trustees were ready to proceed with restoration planning to fully evaluate, assess, and quantify and develop plans for restoring, replacing or acquiring the equivalent of natural resources and their services injured by and losses resulting from the Incident. The restoration planning process will include collection of information that the Trustees determine is appropriate for identifying and quantifying natural resource injuries and associated losses of resources and their services, and determination of the need for, and type and scale of restoration actions.

This Claim document identifies assessment and restoration planning activities in seven broad groupings, including studies, that the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) plans to implement in 2012 to inform injury determination, injury quantification, and restoration selection activities associated with the Incident. The collection of activities identified in this Claim reflect consideration of the factors identified in 15 C.F.R. §990.27 (use of assessment procedures), §990.51 (injury determination) and §990.52 (injury quantification). The assessment activities also reflect consideration of data and analyses conducted during the pre-assessment phase of the NRDA. Restoration planning activities identified reflect consideration of the factors identified in 15 C.F.R. §990.53 (developing restoration alternatives), §990.54 (evaluation of alternatives), and §990.55 (developing restoration plans). Scientific information to support injury determination and

quantification, although incomplete, is sufficient for the Trustees to proceed with restoration planning. NOAA assessment and restoration planning activities in this Claim are a subset of the NRDA activities conducted by all Trustees. NOAA activities in this Claim focus on affected natural resources that NOAA directly manages – including coastal habitats, fisheries, marine mammals and sea turtles, endangered and threatened marine species, and resources associated with National Estuarine Research Reserves and National Marine Sanctuaries. NOAA reserves its ability to supplement the assessment and restoration planning procedures identified herein.

This Claim covers NOAA’s assessment and restoration planning activities and estimated costs from April 1, 2012 to December 31, 2012. The document is organized to provide a description of NOAA’s proposed activities and associated expenditures in seven major groupings. The groups reflect core areas of NOAA effort and contain related procedures and studies in a large geographic area, resource category, or activity area.<sup>1</sup> NOAA combined labor costs of all scientists and attorneys required to prepare a comprehensive injury assessment. NOAA requests a total of \$16,437,898 to complete NRDA activities during the budgeted period. Although different labor rates and total hours were estimated for a variety of NOAA personnel, the total cost of \$16.4M is used to cover expenses from more than one hundred administrative support specialists, scientists, restoration specialists, attorneys, and program managers working on the NRDA. A contract sub-total is provided in each section of the Claim to clearly indicate the amount money needed for a particular study or activity. In total, NOAA requests \$99,036,063 for contract support to complete NRDA procedures outlined in this Claim. NOAA requests contingency funds for restoration scaling and planning because those activities may cost more than expected. A 5% contingency cost (\$478,246) is requested to account for a high degree of uncertainty in the timing and duration of early restoration planning activities in 2012.

- Offshore Aquatic Habitat and Resource Investigations
- Nearshore Aquatic Habitat and Resource Investigations
- Shoreline Habitat and Resources Investigations
- Toxicity to Aquatic Organisms
- Data Management and Visualization
- Restoration Scaling and Planning
- Injury Assessment Management and Administration

NOAA and co-Trustees also are examining human use patterns in the region affected by the Incident, and how the oil is affecting recreational activities or use of the Gulf of Mexico. The Trustees are surveying for potential direct, lost human-uses related to this Oil Spill, including effects to outdoor recreation. NOAA submitted a separate claim for assessment costs on November 9, 2011 to the RPs to address these activities and to the National Pollution Funds Center on February 15, 2012.

In total, NOAA requests a sum certain of \$115,952,207 for injury assessment and restoration planning activities specified in this Claim.

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<sup>1</sup> The Technical Working Group (TWG) structure used by the Trustees to develop and implement studies was determined to be sub-optimal for structuring NOAA’s Claim, primarily because many of NOAA’s activities support assessment and restoration activities across multiple resource categories and TWGs.

**Table 1. Summary of requested funding by category.**

Category	Requested Funds
NOAA	\$16,437,898
Restoration Contingency (5%)	\$478,246
Contract	\$99,036,063
<b>Total</b>	<b>\$115,952,207</b>

**Table 2. Total requested contract funds in seven activity groups presented in this Claim.**

Groups	Requested Contract Funds
A – Offshore Habitat and Resource Investigations	\$8,939,751
B – Nearshore Aquatic and Habitat Resource Investigations	\$4,546,325
C – Shoreline Habitat and Resource Investigations	\$3,645,283
D – Toxicity to Aquatic Organisms	\$2,139,190
E – Data Management and Visualization	\$49,999,200
F – Restoration Scaling and Planning	\$3,641,714
G – Injury Assessment Management and Administration	\$23,285,400
<i>General coordination and support</i>	\$2,839,200
<b>Total</b>	<b>\$99,036,063</b>

**Table 3. Summary of contract costs by injury and restoration procedures.**

Grouping & Activity	Requested Contract Funds
<i>Offshore Habitat and Resource Investigations</i>	
Deep sea soft bottom sediments	\$3,153,501
Deep sea hard ground corals	\$822,500
Mesophotic reefs	\$102,000
Benthic Megafauna	\$240,500
Satellite telemetry with sperm whales and bluefin tuna	\$472,500
Transport, fate, and effects modeling	\$3,446,000
<i>Sargassum</i> Communities	\$636,000
Oceanic sea turtle investigations associated with <i>Sargassum</i>	\$66,750
<i>Nearshore Aquatic and Habitat Resource Investigations</i>	
Chandeleur Island field assessment and imagery analysis	\$138,500
Chandeleur Island benthic invertebrate analysis	\$93,000
2011 Oyster recruitment and reproductive condition	\$173,250
2012 Oyster recruitment and reproductive condition	\$441,050
2011 Oyster abundance and biomass	\$567,125

Grouping & Activity	Requested Contract Funds
2012 Oyster abundance and biomass monitoring	\$944,750
Oyster resource mapping - subtidal and intertidal	\$113,750
Oyster biofouling	\$156,750
Injury quantification to organisms from contaminated sediments	\$238,500
Analysis of dead, live captured, and stranded sea turtles	\$280,500
Neritic sea turtle injury assessment	\$15,000
Abundance and distribution of neritic sea turtles	\$43,700
Sea turtle prey availability and quality	\$207,250
Analysis of dead remote biopsied and stranded mammals	\$182,000
Estuarine Dolphin population distribution and health assessment	\$409,000
Abundance and distribution of coastal and offshore mammals	\$100,700
Marine mammal prey availability and quality	\$319,250
Inhalation/Near Water Modeling	\$122,250
 <i>Shoreline Habitat and Resources Investigations</i>	
Shoreline oiling database and mapping	\$124,500
Coastal wetland vegetation study	\$3,050,093
Coastal wetland faunal study	\$415,190
Coastal wetland erosion	\$55,500
<i>Toxicity to Aquatic Organisms</i>	\$2,139,190
 <i>Data Management and Visualization</i>	
Data Management Systems	\$3,936,000
Sample and observational records intake	\$6,103,200
Laboratory Analysis	\$29,811,000
Tracking, QA/QC, and posting	\$5,797,500
Response data compilation and synthesis	\$307,500
Aerial Imagery	\$300,000
RP data reports	\$624,000
Trustee data management support	\$3,120,000
<i>Restoration Scaling and Planning</i>	\$3,641,714
<i>Injury Assessment Management &amp; Administration</i>	\$23,285,400
<b>Subtotal for assessment and restoration procedures</b>	<b>\$96,196,863</b>
<b>Subtotal for general TWG coordination and support</b>	<b>\$2,839,200</b>
<b>Total contract funds</b>	<b>\$99,036,063</b>

## Administrative Information

### ***Claimant eligibility and coordination with co-Trustees***

The following entities are designated natural resource Trustees under OPA and are acting as Trustees for this Incident:

- the National Oceanic and Atmospheric Administration ("NOAA"), on behalf of the U.S. Department of Commerce;
- the U.S. DOI, as represented by the National Park Service ("NPS"), United States Fish and Wildlife Service ("USFWS"), Bureau of Indian Affairs ("BIA"), and Bureau of Land Management ("BLM");
- the U.S. Department of Defense ("DOD");
- the State of Louisiana's Coastal Protection and Restoration Authority, Oil Spill Coordinator's Office, Department of Environmental Quality, Department of Wildlife and Fisheries and Department of Natural Resources;
- the State of Mississippi's Department of Environmental Quality;
- the State of Alabama's Department of Conservation and Natural Resources and Geological Survey of Alabama;
- the State of Florida's Department of Environmental Protection; and Florida Fish and Wildlife Conservation Commission;
- the State of Texas' Parks and Wildlife Department, General Land Office, and Commission on Environmental Quality.

In addition to acting as Trustees for this Incident under OPA, the States of Louisiana, Mississippi, Alabama, Florida and Texas are also acting pursuant to their applicable state laws and authorities, including the Louisiana Oil Spill Prevention and Response Act of 1991, La. R.S. 30:2451 *et seq.*, and accompanying regulations, La. Admin. Code 43: 10 1 *et seq.*; the Texas Oil Spill Prevention and Response Act, Tex. Nat. Res. Code, Chapter 40, Section 376.011 *et seq.*, Fla. Statutes, and Section 403.161, Fla. Statutes; the Mississippi Air and Water Pollution Control Law, Miss. Code Ann. § § 49-17-1 through 49-17-43; and Alabama Code § § 9-2-1 *et seq.* and 9-4-1 *et seq.*

Several technical working groups (TWGs) are led by the Trustees to guide and coordinate data collection and analysis for the NRDA. As appropriate, these TWGs coordinate with and consider input from BP on joint plans. With one exception, all of the procedures identified in this document are planned to be implemented by NOAA personnel, and were developed in coordination with co-Trustees, including extensive review in the appropriate TWGs. Proposed assessment work in deepwater communities are planned to be implemented by NOAA and DOI scientists. Expenses incurred in the following Claim categories may occur from NOAA or DOI personnel:

- Deep sea soft bottom sediments
- Deep sea hard ground corals
- Mesophotic reefs
- Benthic megafauna

NOAA's requested funds for all of the procedures identified in this document are separate and distinct from the activities of other Trustees.

### ***Responsible Party information***

The Responsible Parties ("RPs") identified for this Incident thus far are BP Exploration and Production, Inc. ("BP"); Transocean Holdings Inc. ("Transocean"); Triton Asset Leasing GmbH ("Triton"); Transocean Offshore Deepwater Drilling Inc. ("Transocean Offshore"); Transocean Deepwater Inc. ("Transocean Deepwater"); Anadarko Petroleum ("Anadarko"); Anadarko E&P Company LP ("Anadarko E&P"); and MOEX Offshore 2007 LLC ("MOEX"). Pursuant to 15 CFR § 990.14(c), concurrent with the publication of the Notice to Conduct Restoration Planning, the Trustees invited the RPs identified above to participate in an NRDA. The Trustees have coordinated with BP, the only RP who accepted this invitation to actively participate in the NRDA process.

### ***Determination of jurisdiction***

For reasons identified in the Notice of Intent to Conduct Restoration Planning for this Incident, the Trustees determined they have jurisdiction to pursue restoration under OPA. 75 Fed. Reg. 60800 (Oct. 1, 2010).

### ***Time limitations on claims***

This Claim for funding of reasonably necessary assessment and restoration planning procedures to inform Incident-specific injury determination and quantification analyses is presented in writing to the Director, National Pollution Funds Center (NPFC) within time limits specified in 33 C.F.R. §136. 101. The NRDA for this Incident is not complete.

### ***Legal action***

On December 15, 2010, the United States filed its complaint against the RPs in the Eastern District of Louisiana (Civil Case no.2:10-cv-04536). At this time, the Court has scheduled no proceedings on any of the natural resource damages claims arising from the Incident.

### ***Reimbursed Costs***

An invoice for advanced funding totaling \$62,451,000 was submitted to BP on November 11, 2011 for NOAA assessment activities from November 2011 to March 2012. On December 5, BP indicated their agreement to pay only \$35,670,000 of the total request for short-term (i.e., completed before March 2012) assessment activities and laboratory analysis of samples that were occurring under cooperative, signed work plans. They generally denied forward funding for ongoing assessment activities, data interpretation activities, and data reporting in the cooperative TWG structure from November 2011 to March 2012. NOAA has not included costs in this Claim for activities or procedures that were (or will be) completed with BP forward funding.

### ***Claim presentation***

This Interim, Partial Claim for Assessment and Restoration Planning Costs has been presented for a sum certain, in accordance with OPA to all of the identified RPs by letters dated December 23, 2011.

## **Assessment: Overview of Approach**

OPA regulations provide that NRDA procedures be tailored to the circumstances of the Incident and the information needed to determine appropriate restoration. With respect to standards for assessment procedures, the regulations provide that (15 CFR § 990.27(a)):

- (1) The procedure(s) must be capable of providing assessment information of use in determining the type and scale of restoration appropriate for a particular injury;
- (2) The additional cost of a more complex procedure must be reasonably related to the expected increase in the quantity and/or quality of relevant information provided by the more complex procedure; and
- (3) The procedure must be reliable and valid for the particular Incident.

OPA regulations identify several categories of assessment procedures available to Trustees, including but not limited to: procedures conducted in the field or laboratory; model-based procedures; and/or literature-based procedures (15 CFR § 990.27(b)). If a range of assessment procedures providing the same type and quality of information is available, the most cost-effective procedure must be used (15 CFR § 990.27(c)). Finally, assessment procedures must contribute to injury determination (i.e., by establishing the spatial and temporal magnitude of exposure to oil, the pathway(s) of exposure, and/or the presence of injury, as described in 15 CFR § 990.51) and/or injury quantification (i.e., quantifying the degree, spatial and temporal extent of injury to natural resources and the associated reduction in services caused by the injury, as described in 15 CFR § 990.52).

The goal of NOAA's assessment is to create a holistic view of the effects to the Gulf of Mexico ecosystem from the discharged oil. Immediately following the Incident, NOAA evaluated the resources at risk in the affected area and developed injury assessment hypotheses and conceptual models to guide field investigations. NOAA then developed work plans to document the pathway and exposure of discharged oil to resources and services that may have been affected by the Incident. Finally, NOAA and co-Trustees designed and implemented studies to evaluate the severity and extent of injuries to resources and services from discharged oil and to evaluate alternative hypotheses for potential injuries. As of December 16, 2001, NOAA completed or is participating in more than 100 NRDA investigations in all resource categories except birds and terrestrial mammals.

Many ongoing and proposed activities in 2012 involve the collection and analysis of field data needed to confirm the presence of natural resource injury or inform estimates of the magnitude of injury and associated reductions in services. Models and literature-based methods also are used in selected investigations. The scale and cost of each proposed activity was carefully considered with co-Trustees, and represents a balance between the need for cost-effective assessment efforts and the unprecedented geographic scale and complexity of this Oil Spill.

NOAA determined that the assessment procedures identified in this document meet the requirements set forth in the OPA regulations, and are integrated with and not duplicative of co-Trustee NRDA data collection and analysis activities. Modifications to the identified assessment procedures may be made because of the participation of BP in the NRDA pursuant to 15 CFR § 990.14. A description of each assessment activity's purpose and related implementation

information is provided in subsequent sections of this document and in the related work plans. Additional budget detail or information about the proposed activities can be provided upon request.

NOAA regularly posts final NRDA work plans and study-related data on the Internet. For the official record of Trustee NRDA investigations, visit the Deepwater Horizon Oil Spill [NRDA Administrative Record](#). As of March 1, 2012, the site contains links to 122 NRDA work plans. Many of these work plans provide detailed technical methods, implementation information, and costs, and are incorporated by reference into this Claim. Although some work plans made available on the Internet contain cost estimates to complete the scientific investigations, this Claim covers NOAA's assessment and restoration planning activities from April 1, 2012 to December 31, 2012.

[NRDA work plans and study-related data](#)

<http://www.gulfspillrestoration.noaa.gov/oil-spill/gulf-spill-data/>

[NRDA Administrative Record](#)

<http://www.doi.gov/deepwaterhorizon/adminrecord/index.cfm>

## Offshore Aquatic Habitat and Resource Investigations

NOAA leads the Trustee effort to determine injuries to OFFSHORE AQUATIC habitats and resources following the Incident. Assessment activities in the offshore aquatic grouping are focused on the status of deepwater and *Sargassum* communities after the Incident, behavior of species with special status via satellite telemetry, and completing modeling to understand the transport, fate, and effects of discharged oil and dispersants. The scientific investigations are focused on numerous physical, chemical, and biological components in the Gulf of Mexico, and as such, require extensive overlap with other areas of NOAA's injury assessment, concurrent Oil Spill-related research activities in the Gulf of Mexico, and close coordination with co-Trustees and the Responsible Party.

Offshore aquatic contract costs are segmented into eight major activity areas:

- Deep sea soft bottom sediments
- Deep sea hard ground corals
- Mesophotic reefs
- Benthic megafauna
- Satellite telemetry with Bluefin tuna and sperm whales
- Transport, fate, and effects modeling
- *Sargassum* communities
- Oceanic sea turtle injuries associated with *Sargassum*

Total Contract Cost for OFFSHORE AQUATIC: \$8,939,751

### **Background**

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 volatilized in the air, entrained water forming mousse, was dispersed into the water column naturally and by application of dispersants, and was removed mechanically or by in situ burning. Floating oil, oil droplets 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) and 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 Gulf of Mexico.

Fish and invertebrates in the water column are exposed to contaminants by swimming through the water column, passing water over respiratory structures, and ingesting water and particulates contaminated with oil as part of feeding. Sensitive life stages of pelagic fish and invertebrates come in direct contact with floating oil that covered and mixed into the neuston layer where 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 that may foul appendages or other body surfaces. Water column organisms have been exposed to dispersants dissolved in water and on oil droplets and adsorbed to suspended particulate matter. Offshore water column organisms also were exposed to dissolved and water-borne chemical additives such as methanol and anti-foaming agents.

Water column biota exposed to the discharged oil and Oil Spill-related chemicals in the Gulf of Mexico include:

- Plankton in the upper water column (<200m deep, both offshore and on the shelf), including early life history stages of fish and invertebrates, as well as smaller invertebrate holo-plankton and gelatinous zooplankton;
- Plankton in the meso-pelagic, bathypelagic and abyssal zones of the water column (below 200m in offshore waters);
- Fish and large motile invertebrates in the upper water column (<200m deep, both offshore and on the shelf);
- Fish and large motile invertebrates in the meso-pelagic, bathypelagic and abyssal zones of the water column (below 200m in offshore waters).

Exposure of fish and invertebrates to dissolved hydrocarbons in the water column results in uptake into body tissues, which then may cause a variety of lethal and sublethal effects. In addition, particulate oil may foul the gills, decrease respiratory function of the gills, and have a negative effect on the overall physiology of the organism that translates to a reduction in fitness and increased susceptibility to predation and mortality. Developing embryos, when exposed to oil, are shown to have genetic, physiological, metabolic, and developmental problems that lead to reduced fitness and higher mortality. Cardiac edema, reduced heart rate and blood flow, and spinal deformations are likely effects, contributing to an overall increase in mortality. Effects to the eggs, developing embryos, juveniles and adults are a function of both physical fouling with oil and the toxicity of oil constituents. Microscopic oil droplets may affect aquatic biota either mechanically or taken up via the gills or digestive tract. Dispersants and other chemicals introduced into the water column during the Incident response may have increased toxicity of or vulnerability to oil hydrocarbon effects.

The oil fate model used by NOAA and co-Trustees estimates the distribution of oil in the water column, on the water surface, on shorelines, and in the sediments. Processes simulated by the model and its sub-components include rising and spreading of subsurface released oil, floating oil spreading and emulsification, evaporation from surface oil, transport on the water surface and in the water column, entrainment of oil as droplets into the water column by natural processes and application of dispersant, resurfacing of larger droplets, dissolution of soluble components, volatilization from the water column, partitioning onto suspended particulate matter, sedimentation, stranding on shorelines, and degradation. Surfactants and other chemicals are modeled as adsorbed onto oil and dissolved in the water, along with the processes evaluated for oil. The model results provide estimates of water volumes exposed above various thresholds indicating injury, such as water quality criteria and other standards. The oil fates model also estimates distributions of floating oil over time, mass and characterization of oil sedimented to the sea floor and mass and characterization of oil coming ashore.

Fish and invertebrate injury in the water column resulting from exposure to dissolved hydrocarbons and other organic chemical stressors (e.g., dispersants) will be quantified by NOAA using the available toxicological information. Injury modeling is a proven method for integrating complex biological, chemical, and transport mechanisms to obtain a valid estimate of resources injured by releases of oil. The toxic effects to aquatic animals are a function of dose where tissue concentrations exceed effects thresholds. NRDA toxicity studies using representative species provide data for input parameters in the models. The toxicity enhancement caused by ultraviolet light exposure is applied in the biological effects modeling too. The models include Polycyclic Aromatic Hydrocarbons (PAH) bioassay studies using ultraviolet light and species representative of Gulf of Mexico biota.

Injuries to aquatic animals from exposure to microscopic oil droplets in the water is quantified based on exposure concentrations and effects levels established by oil bioassay studies with oil weathered to varying degrees (and where toxicity of the dissolved components may be parsed from the effects of the droplets themselves). Oil effects to resources in the neuston layer are derived from modeled and measured concentrations of droplets and dissolved components immediately beneath surface floating oil. After quantification of animal losses, population modeling is used to project future losses and lost future production. Lost reproductive output is quantified based on the modeled remaining life span of the killed individuals.

### ***Deep sea soft bottom sediments***

NOAA is evaluating the spatial extent and severity of exposure of soft bottom sediments in the Gulf of Mexico to discharged oil, drilling muds, and dispersant. The objective of the investigation is to confirm the pathway of oil or released hazardous substances from the source to soft bottom sediments and address potential injury to sediment-dwelling biota and larvae from contaminated sediments. The studies also inform transport, fate, and biological effects modeling conducted by the Trustees. Response-oriented sample collection occurred along the sea floor in many areas of the Gulf of Mexico, but supplemental NRDA studies were conducted to address gaps and obtain samples for more detailed laboratory analysis.

Injury assessment activities in 2012 are focused on the laboratory analysis of sediment cores for oil and enumeration of fauna to determine abundance, diversity, and community structure. Sediment cores that are proposed for analysis from 58 stations were collected during several research cruises in 2011. The findings of this study will be presented in a data and summary report(s) by NOAA and the Principal Investigators from Texas A&M University and U.S. Geological Survey (USGS). Analysis and reporting of field and laboratory data from sediment trap investigations in 2011 also will occur. Specialized hydrocarbon analysis of low mass samples is needed for the NRDA and laboratory expenditures are included in the Claim. NRDA science activities related to sediment traps will be conducted by NOAA and personnel from Woods Hole Oceanographic Institution (WHOI). Additional field work is not expected in 2012.

Contract cost for deep sea soft bottom sediments: \$3,153,501

### ***Deep sea hard ground corals***

NOAA pre-assessment activities following the Incident were focused on evaluating exposure of deep sea coral communities to discharged oil and dispersants, primarily through the collection of

environmental samples co-located with hard ground areas and underwater video. Environmental samples were collected with Remotely Operated Vehicles on several research cruises. Upcoming assessment activities are focused on the analysis of photographic imagery (e.g., coral species identification, spatial extent of coral communities, and visual assessment of coral health), coral ageing and histology, and data analysis, interpretation, and reporting. Data from the evaluations are important for NOAA and co-Trustees to quantify injuries to corals in hard ground areas. Additional field work is not expected in 2012. NOAA personnel are working with contractors from Penn State, Temple University, and WHOI.

Contract cost for deep sea hard ground corals: \$822,500

### ***Mesophotic reefs***

NOAA pre-assessment activities following the Incident were focused on evaluating exposure of mesophotic reefs to oil and dispersants, primarily through the collection of sediments co-located with reef areas and underwater video. A large portion of NOAA's assessment activities are focused on analysis of video imagery to evaluate coral reef health and potential adverse effects to resident reef-dwelling fish, coral species identification, data interpretation, and reporting. Video imagery will be evaluated by NOAA personnel and scientists with the USGS to assess potential effects to resident planktivorous fish and other reef megafauna. NOAA and USGS also are evaluating potential injuries to mesophotic reef corals. The video imagery was collected on a research cruise conducted in September, 2011. Data from the video evaluations are important for NOAA and co-Trustees to quantify injuries to mesophotic reefs. Additional field work is not expected in 2012. Additional historical (pre-Oil Spill) imagery will be compiled and evaluated to address baseline conditions in mesophotic reef areas.

Contract cost for mesophotic reefs: \$102,000

### ***Benthic megafauna***

Baseline information on the abundance or density of benthic megafauna is rudimentary in most of the Gulf of Mexico. Red crabs are known to occupy potentially oiled sea floor in the Gulf of Mexico. Therefore, the Trustees are conducting a red crab assessment to investigate whether this species was adversely affected by the Oil Spill. NOAA collected field information on red crab catch per unit effort, reproductive health, and tissue histology in areas near and distant from the Oil Spill source. Upcoming assessment activities are focused on the analysis and interpretation of field-collected data. Laboratory analysis of crab tissue samples for reproductive health and histology effects will occur in 2012. Additional field work is not expected in 2012. NOAA personnel from the Northwest and Alaska Fisheries Science Centers and scientists from the Gulf Coast Research Laboratory are completing the work.

Contract cost for benthic megafauna: \$240,500

### ***Satellite telemetry with bluefin tuna and sperm whales***

NOAA uses satellite telemetry records from animals tagged before, during, and after the Incident to evaluate whether movement patterns and habitat use of tagged animals were affected by discharged oil. NOAA initially focused on compiling and visualizing telemetry records collected during and after the Oil Spill and analyzing that information for injury assessment. NOAA

requests funds to work with experts at Stanford University and Oregon State University to efficiently compile raw telemetry data into an existing analysis system. The system, called GulfTOPP, ensures animal tracks are displayed consistently and are already in the proper format to support spatial analyses and comparisons with historical data. NOAA will undertake desktop analyses in 2012 to quantify injuries from potentially-significant changes in site fidelity, movement patterns, and spawning area selection that are connected to the discharged oil. Bluefin tuna and marine mammal experts from NOAA's Southeast Fisheries Science Center will be consulted during the injury assessment. NOAA's science activities for sperm whales and bluefin tuna (and dolphins, described further in Nearshore Aquatic Habitat and Resources Investigations) are complementary to DOI's telemetry data analysis and visualization work with sea turtles, Gulf Sturgeon, and birds. Additional animal tagging is not expected in 2012.

Contract cost for satellite telemetry with bluefin tuna and sperm whales: \$472,500

### ***Transport, fate, and effects modeling***

NOAA uses oil and chemical transport and fate modeling to evaluate the pathway and resulting distributions of oil hydrocarbons and chemicals introduced into the water column during Oil Spill response. Modeling includes several components: currents from hydrodynamic modeling; wind and other measured environmental variables; geographical information (bathymetry, habitat types); and physical-chemical property data for the oil, hydrocarbon components and chemicals of concern. Each component of the injury modeling will be based on the best available science and given the complexities related to this particular Oil Spill, no off-the-shelf modeling package is sufficient. NOAA undertook a number of studies and data compilation activities to define everything from the release scenario (i.e., flow rate, droplet size, response actions) to the biological abundances in the affected region. Numerous updates to hydrodynamic models and biological databases were necessary and included the assimilation of ocean currents, other oceanographic information, and biological information collected on cruises.

NOAA will address seven major injury assessment tasks in 2012 related to offshore fish and water column biota:

- Compiling and interpreting in-situ and remotely sensed oceanographic data;
- Completing hydrodynamic models including final stages of model comparisons with in-situ data;
- Updating biological databases with evidence that will be processed in labs through 2012;
- Additional field efforts to quantify the distribution and abundance of small pelagic fishes during a time that is temporally equivalent to the Oil Spill timeframe (early summer 2012);
- Defining the spatial and temporal trends in distribution and abundance of biological resources;
- Integrating NRDA toxicity studies as they become available throughout 2012; and
- Refining injury model runs using the most complete chemical, biological, physical, and toxicological information available.

Contract cost for transport, fate, and effects modeling: \$3,446,000

## ***Sargassum communities***

Floating *Sargassum* patches are an important habitat for a variety of invertebrate and vertebrate species. NOAA and co-Trustees hypothesized that fisheries and sea turtle assemblages in *Sargassum* communities was altered after the Incident, and that *Sargassum* habitat was affected. NOAA activities that will occur between April and December, 2012 include mapping *Sargassum* distributions in 2010 and 2011 based on remote sensing, determining intersections between *Sargassum* and surface oiling, characterizing organisms associated with *Sargassum*, and planning evaluations of injury to *Sargassum*. Mapping activities include gathering available data layers and selecting the best layers to show oil and *Sargassum* distribution, including aerial observations and remote sensing data. NOAA also requests funds to characterize *Sargassum* biota collected during recent field investigations. Detailed *Sargassum* evaluations are useful for determining oil exposure to resources in *Sargassum* communities and modeling injury.

Contract cost for *Sargassum* communities: \$636,000

## ***Oceanic sea turtle investigations associated with Sargassum***

*Sargassum* patches are a key nursery habitat for four of the species of sea turtles that inhabit the Gulf of Mexico: loggerhead, green, Kemp's ridley, and hawksbill. NOAA is undertaking studies to assess potential exposure and injury to sea turtles from contaminated *Sargassum* habitat. The main objectives of this study are to: 1) determine the areal extent and distribution of *Sargassum* in the north-central and eastern Gulf of Mexico, and its spatial relationship to previously observed surface oil and dispersants associated with the MC 252 discharge via aerial surveys; and 2) document the density, condition, diet, and potential oil exposure of pelagic neonate sea turtles associated with floating *Sargassum* in the north-central and eastern Gulf of Mexico. There are few studies in the literature that quantitatively link sea turtles with *Sargassum* in a large marine ecosystem like the Gulf of Mexico and even fewer that inform NRDA injury assessment and quantification activities.

*Sargassum* clumps and mats are concentrated in the Northern Gulf of Mexico in convergence zones—also where oil tended to concentrate based on response and pre-assessment field investigations after the Oil Spill. Hundreds of sea turtles from the neonate life stage and *Sargassum* habitat were encountered during directed rescue and capture efforts during the Incident response. A small number of these sea turtles were recovered dead in heavy oil or died in rehabilitation facilities. Other sea turtles were never found because it was difficult for wildlife responders to reach remote locations and carcasses may sink or rapidly decompose. NOAA requests funding to complete the analysis and interpretation of field-collected and laboratory data generated during the response phase and NRDA sea turtle *Sargassum* studies. All field work was completed between November 2010 and September 2011. NOAA intends to fully examine the spatial distribution of captured sea turtles in relation to *Sargassum* distributions to improve sea turtle exposure estimates. NOAA is using agency personnel and contractors with mapping and statistical expertise to interpret NRDA information. Observational data on *Sargassum* structure at assessment locations and turtle diets will inform NOAA's injury quantification activities for sea turtles, particularly in the neonate life stage.

Contract cost for oceanic turtle investigations associated with *Sargassum*: \$66,750

## **Nearshore Aquatic Habitat and Resource Investigations**

NOAA requests funds to determine injuries to resources and services in nearshore habitats following the Incident. The NEARSHORE AQUATIC activity grouping is diverse. Scientific investigations in this group are focused in five major areas:

- Submerged Aquatic Vegetation (SAV)
- Oysters
- Injury quantification to organisms from contaminated sediments
- Sea turtles
- Marine mammals

Total contract cost for NEARSHORE AQUATIC: \$4,546,325

### **SAV**

NOAA assessment activities in the SAV grouping are focused on the Chandeleur Islands. The Trustees are completing a Spring 2012 sampling event, evaluating aerial imagery to detect temporal changes in SAV beds, and sorting and analyzing field-collected invertebrates to assess faunal effects from discharged oil. Contract charges are segmented into two major activity areas and NOAA science and legal labor expenditures are combined for all activities. NOAA only requests assessment costs for analyzing imagery for the Chandeleur Islands to determine whether SAV beds have detectable changes in a geographic area or shifts in distribution as a result of the Incident.

### **Chandeleur Island field assessment and imagery analysis**

The Trustees use traditional field assessment techniques at fixed stations to characterize SAV habitat and determine changes to bed structure and health. NOAA and co-Trustees also evaluate SAV habitat using functional assessment metrics. Trawling data are used to evaluate the fish assemblage at oiled and un-oiled SAV beds over time and invertebrate cores are collected to evaluate possible changes in invertebrate composition and abundance. High-altitude, high-resolution aerial images are available for SAV areas potentially affected by the Incident. Images collected during four aerial missions are analyzed by NOAA using object-based habitat classification techniques in spatial software. The scientific investigations in 2012 are conducted to quantify the level of structural and functional injuries in Chandeleur Island SAV beds.

Contract cost for Chandeleur Island imagery analysis: \$138,500

### **Chandeleur Island benthic invertebrate analysis**

Several hundred benthic invertebrate samples are available to NOAA and co-Trustees. The samples were collected during each field event since the NRDA began and need to be analyzed. All remaining benthic invertebrate samples will be sorted and analyzed in 2012 to quantify injuries to SAV habitat. NOAA requests funds to complete laboratory analyses, interpret benthic community data, and complete scientific reporting.

Contract cost for Chandeleur Island benthic invertebrate analysis: \$93,000

## ***Oysters***

At field sites across the Gulf Coast, NOAA participates in injury assessment activities centered on measuring oyster abundance and spatial extent of oyster communities and assessing reproductive condition of oysters. Oyster sampling occurs in unoiled areas, oiled areas, and areas with low salinities because of the openings of the freshwater diversion structures in 2010 and the Bonnet Carré and Morganza spillways in 2011. NOAA is concerned that both spat settlement and abundance of live seed and market oysters are low in non-harvest areas throughout much of the Gulf of Mexico following the Incident. NOAA and co-Trustees are monitoring oyster recovery through additional quadrat sampling and use of settlement plates in 2012. Evidence obtained from these studies are needed for quantifying oyster injuries and to refine the Trustees' understanding of the oyster recovery trajectory. Also in Spring 2012, NOAA is gathering and compiling historical oyster data, information on environmental conditions during and after the Incident, and evaluating oyster health metrics contained in the literature and in state-specific annual monitoring programs. These data are used in a multivariate analysis to assess the likely cause(s) and magnitude of injury to oysters.

After that work is completed, NOAA and co-Trustees will synthesize and interpret all the results of the analyses and develop injury quantification reports. NOAA personnel are reviewing data reports from the Responsible Party and non-NRDA Incident-related research reports and papers in scientific journals. NOAA personnel working on oyster studies regularly handle regulatory issues and protected species consultations since field activities may affect other animals.

### **2011 Oyster recruitment and reproductive condition**

NOAA and co-Trustees collected a large volume of information on oyster reproductive condition and larval recruitment since April 2011. Reproductive condition is assessed by collecting samples of market sized oysters for gonadal index measurements. Recruitment of oyster larvae onto hard substrate, a critical event in the oyster life cycle, is assessed using settlement plates that are deployed at three week intervals during periods of oyster reproductive activity, and enumerating live and dead spat on the plates following retrieval. NOAA requests funding to complete the analysis and interpretation of oyster reproductive condition information and analyze archived oyster tissues for oil contamination. The study requires funds for chemical analysis of about 160 oyster tissue composite samples and contract support for mapping specialists, oyster specialists, and statisticians.

Contract cost for 2011 reproductive monitoring: \$173,250

### **2012 Oyster recruitment and reproductive condition**

NOAA intends to monitor recruitment of oyster larvae in Spring 2012. About 400 settlement plates will be deployed for three weeks and Trustees will enumerate live and dead spat that settle at these stations following retrieval of the plates. Gonadal index also is measured from about 200 samples of adult oysters to help understand the reproductive status of oysters and to identify when spawning is approaching and when it has occurred. Field work is expected to begin in April 2012. This study will provide information about the trajectory of oyster recruitment recovery. After spring sampling is completed, NOAA and co-Trustees will synthesize and interpret all the results of the analyses and develop injury quantification reports. The study

requires funds for field sampling support, technical support from Dauphin Island Sea Lab and University of New Orleans, mapping specialists, oyster specialists, and statisticians.

Contract cost for 2012 reproductive monitoring: \$441,050

### **2011 Oyster abundance and biomass**

Field-based investigations to determine oyster abundance and biomass were completed recently. NOAA requests funding to complete data compilation, analysis, and interpretation of oyster abundance and biomass information collected in 2011. NOAA also requests funding to analyze about 500 sediment samples and about 150 oyster tissue composite samples for evidence of discharged oil that were archived. NOAA and co-Trustees are using oyster abundance and biomass to quantify injuries and these metrics are important to consider when assessing compensatory restoration needs for oysters. The study requires funds for chemical analysis of oysters, technical support from Dauphin Island Sea Lab personnel, mapping specialists, oyster specialists, and statisticians.

Contract cost for 2011 oyster abundance and biomass study: \$567,125

### **2012 Oyster abundance and biomass**

NOAA requests funds to monitor selected sampling sites from past oyster assessment plans for signs of potential recovery of oyster populations. Oyster abundance and biomass, by size class, are measured within quadrats at fifty percent of the stations from the most recent oyster abundance study. This study provides evidence useful in determining temporal extent of injury to adult and juvenile oyster populations. Another season of spat data provides additional rigor to the oyster assessment in subtidal areas. Field work is expected to begin in Spring 2012. The study requires funds for processing about 300 quadrat samples, technical support from Dauphin Island Sea Lab personnel, field operations, mapping specialists, oyster specialists, and statisticians.

Contract cost for 2012 abundance and biomass monitoring: \$944,750

### **Oyster resource mapping – subtidal and intertidal**

As part of the NRDA, NOAA conducts oyster assessment studies to document exposure, pathway, and injury. Detailed maps of oyster resources in subtidal and intertidal areas are important for the Trustees to understand the percent cover of oyster resources in areas with suitable environmental conditions. These maps are necessary for the Trustees to proceed with injury quantification and restoration scaling. Oyster habitat maps are incomplete or outdated in many coastal areas. The field component of subtidal oyster mapping is expected to be completed in late-Spring 2012. NOAA requests funds to complete the processing and visualization of field-collected data in 2012. Intertidal oyster mapping, including field work and analysis, is not expected to begin until after subtidal mapping field work is complete. The result of this investigation will be detailed habitat maps that are used as the basis for quantifying injuries to oyster resources. The study requires funds for field operations and mapping specialists.

Contract cost for oyster resource mapping: \$113,750

## **Oyster biofouling**

NOAA requests funds to quantify the frequency of occurrence and average severity of biofouling in order to assess whether it may contribute to any adverse effects on oyster health and whether it is correlated with exposures that may be related to the Incident. The investigation involves undertaking a small-scale analysis of the occurrence of biofouling in previously collected oyster samples and identifying the organisms responsible. Biofouling work will be completed in late 2011 or early 2012. State Trustees observed biofouling (e.g., algae) of oysters in several locations within the study area, at levels they believe to be greater than seen previously. These observations following the Incident are of concern to the Trustees. If the initial scientific review suggests a large-scale biofouling event, then NOAA and co-Trustees will conduct a follow-up investigation of all archived oyster samples to document the presence and degree of biofouling in each sample. The study requires funds for technical support and sample processing from Dauphin Island Sea Lab personnel and statisticians. The requested funds are used to evaluate biofouling in about 2,000 settlement plates, 100 dredge samples, and 900 quadrat samples.

Contract cost for biofouling analysis: \$156,750

## ***Injury quantification to organisms from contaminated sediments***

Activities between April and December, 2012 include mapping PAH concentrations in sediment in 2010 and 2011 and assessing injury to benthic organisms, including fish. Maps of 2010 concentrations will be produced using results of sample collections from 2010 (including response data). 2011 maps will be produced using data collected specifically for determining sediment concentrations along the coast based on geomorphological/observed oiling strata (see workplans for more details on strata). Injury associated with sediment PAH concentrations will be interpreted using a tiered approach. The first tier involves gathering and evaluating literature on toxicity of PAHs to key nearshore Gulf organisms to determine injury thresholds. Tissue concentrations will be collated and compared to sediment concentrations at co-located stations. Later tiers include laboratory toxicity testing of sediment to key organisms to validate injury thresholds. Maps of sediment concentrations will be interpreted to indicate spatial extent and magnitude of injury to benthic organisms in nearshore areas. Literature and previous studies of populations and communities of benthic organisms will be used to assess injuries to benthic populations and communities.

Contract cost for contaminated nearshore sediments: \$238,500

## ***Sea turtles***

NOAA's assessment activities for marine turtles are wide-ranging to account for potential injuries in marine waters, on land, in *Sargassum* communities, and as part of response operations. NOAA is working with Trustees, NOAA protected resources, and NOAA enforcement personnel during injury assessment activities. Contract expenses for turtle investigations are segmented into five major activity areas and NOAA science and legal labor costs are combined for all nearshore aquatic activities. NOAA also requests funds for general technical support during the completion of turtle investigations.

## **Analysis of dead, live captured, and stranded sea turtles**

NOAA and its contractors are analyzing turtle tissues taken from stranded sea turtles and rehabilitated sea turtles captured during the response effort. Laboratory analysis of turtle tissues is intended to identify or confirm potential exposure of sea turtles to discharged oil. Turtle exposure to discharged oil could have resulted from direct contact with oil or ingestion of contaminated prey. Analysis of about 200 tissue samples are conducted through NOAA labs for PAHs/PAH metabolites and dispersant. About 100 external swabs of stranded sea turtles reported to be oiled will be analyzed for presence of discharged oil or re-analyzed for oil fingerprinting.

NOAA requests funds for turtle experts from University of Florida and its contractors to compile, summarize, review, map, and interpret analytical results to supplement other exposure-focused NRDA information. NOAA personnel from the Northwest Fisheries Science Center also will review and interpret analytical chemistry data collected from dead, live captured, and stranded sea turtles.

Contract cost for analysis of dead, live captured, and stranded sea turtles: \$280,500

## **Abundance and distribution of neritic sea turtles**

Aerial transect surveys covering an area over 75,000 km<sup>2</sup> during and after the Incident confirmed that loggerhead, Kemp's riddle, green, hawksbill, and leatherback turtle populations were in coastal and offshore waters near the discharge site where oil and response activities occurred. NOAA uses these surveys to document the abundance and spatial distribution of endangered sea turtle populations to assess how many animals were exposed to discharged oil during the Incident. Turtle investigations designed to clarify abundance and distribution of these animals in the Gulf of Mexico also are important for identifying potential changes in population size or shifts in spatial distribution relative to baseline conditions.

NOAA requests funding to complete analysis and statistical interpretation of field data. Analysis and interpretation are undertaken by NOAA personnel and experienced contractors. Aerial surveys information from May 2010 to March 2012 will be combined with the results of satellite tagging studies to provide a more complete picture of sea turtle distribution and movement patterns throughout the Northern Gulf of Mexico. The satellite tagging records are particularly useful in establishing dive behavior of turtles. Turtle behavior records are used to adjust the aerial sightings for time spent at the surface. NOAA's requested costs are not duplicative of study-related funds requested by DOI in their July 1, 2011 Claim.

Contract cost for abundance and distribution of sea turtles: \$43,700

## **Neritic sea turtle injury assessment**

NRDA information on neritic turtles to date is focused on documenting exposure (oiling maps coupled with aerial surveys for mammals/turtles) and potentially documenting potential large scale abundance or distribution shifts (based on aerial surveys). NOAA requests funding to help investigate longer-term effects to sea turtle populations using inwater studies of population and individual health metrics. The neritic sea turtle assessment is led by USFWS and is included in

the U. S. DOI's Interim, Partial Claim for Assessment Costs (dated July 1, 2011). Contract expenditures included in this claim are for supporting study development and implementation.

Contract cost for neritic sea turtle injury assessment: \$15,000

### **Sea turtle prey availability and quality**

The Trustees are assessing whether common prey species of sea turtles still are contaminated with oil discharged during the Incident. NOAA requests funding to complete prey availability and quality studies, with emphasis on analyzing about 200 archived whole body samples of crustaceans and fish for PAHs and dispersants, and for generally interpreting and analyzing the NRDA information generated from the work plan. The objective of the prey study is to determine levels of prey exposure to discharged oil by sampling key prey items in nearshore Louisiana waters (no farther out than the 10-meter isobath). Samples of the prey items are collected from five geographic strata across Louisiana for contaminant analyses, including PAHs, dispersants, and fingerprinting for discharged oil (where external oil is found). The field work for this study began in the Fall of 2011 and is planned to continue throughout 2012. Consumption of prey contaminated with discharged oil could potentially cause injury to sea turtles in the Northern Gulf of Mexico.

Contract cost for sea turtle prey availability and quality: \$207,250

### ***Marine mammals***

NOAA addresses potential injuries to marine mammals in offshore, nearshore, and estuarine waters during the NRDA. NOAA works with Trustees, NOAA protected resources, and NOAA enforcement personnel during injury assessment activities. Marine mammal investigations are segmented into six major areas and NOAA science and legal labor expenses are combined for all nearshore aquatic activities. NOAA also requests funds for general technical support during the completion of marine mammal investigations.

### **Analysis of dead, remote biopsied, and stranded mammals**

NOAA and its contractors are analyzing tissue samples taken from a NRDA marine mammal health assessment and mark/recapture studies as well as tissues taken from stranded marine mammals. Laboratory analysis of marine mammal tissues is intended to identify or confirm potential exposure of marine mammals to discharged oil. Marine mammal exposure to discharged oil could have resulted from direct contact with oil or ingestion of contaminated prey. Genetic analyses also are conducted to identify sex, species (in some cases), whether an animal is part of a nearshore or offshore population, and to measure enzyme and gene transcription activity. The results of the analyses are used to assess the duration and severity of exposure of different mammal populations and also assess home range and site fidelity in stock structure. Analysis of tissues is conducted through NOAA labs for PAHs/PAH metabolites. External swabs of stranded marine mammals reported to be oiled will be analyzed for presence of discharged oil or re-analyzed for oil fingerprinting.

NOAA requests funds to compile, summarize, review, map, and interpret analytical results to supplement other exposure-focused NRDA information. NOAA and its contractor also will review and interpret analytical chemistry data collected from dead, live captured, and stranded

marine mammals. NOAA requests funds to analyze tissues for biomarkers (e.g., Cytochrome P4501a) that may indicate oil exposure and use microarray gene expression analyses to measure gene transcription activity.

Contract cost for analysis of dead, remote biopsied, and stranded mammals: \$182,000

### **Estuarine dolphin population distribution and health assessment**

Discharged oil from the Oil Spill is documented in Barataria Bay, Chandeleur Sound, Mississippi Sound, and other estuarine areas along the Gulf Coast. Each of these areas is inhabited by bottlenose dolphins, and dolphin surveys in several Louisiana and Mississippi estuaries were conducted from May 2010 to August 2011. Initial field surveys documented the presence of individual dolphins through photo identification and genetic sampling. NOAA is using follow-up field surveys in 2012 to assess potential changes in seasonal dolphin abundance, estimate dolphin survival rates, and collect longitudinal tissue samples for a total of two years after the Oil Spill began. NOAA requests funds to analyze and interpret information from dolphin identification studies to support marine mammal injury quantification.

Dolphins in poor health were captured in Barataria Bay in 2011 as part of a NRDA investigation. NOAA and co-Trustees are concerned the dolphins may be subject to adverse effects if oil and associated chemicals persist in the marine environment, including the marine food web. If effects are observed, they have the potential to affect the sustainability of dolphin stocks or communities. Sub-lethal or latent effects, such as organ damage and immune dysfunction, are not detectable by the initial photographic and genetic studies. NOAA is completing a capture-release health assessment of bottlenose dolphins in Barataria Bay, LA and a reference site (Sarasota Bay, FL) to assess the potential sub-lethal, chronic and indirect health effects of discharged oil to dolphins. This NRDA investigation involves a team of veterinarians, biologists and wildlife epidemiologists working together to conduct comprehensive health evaluations. The health assessments enable Trustee researchers to directly assess potential injury endpoints (anemia, organ damage, immune suppression, calving success, endocrine disruption, indication of nutritional and chronic stress) in individuals and among cohorts.

NOAA requests funds to analyze and interpret information from capture-release health studies to support marine mammal injury quantification. NOAA and its contractors will undertake statistical analyses to evaluate changes in annual abundance, evaluate changes in health indices over time, and interpret and synthesize data from the field and laboratory analysis.

Contract cost for dolphin population and health assessment: \$409,000

### **Abundance and distribution of coastal and offshore mammals**

Aerial transect surveys covering an area over 75,000 km<sup>2</sup> during and after the Incident confirmed that marine mammals were in coastal and offshore waters near the discharge site where oil and response activities occurred. NOAA is documenting the abundance and spatial distribution of marine mammal populations to assess how many animals were exposed to discharged oil during the Incident. Marine mammal investigations designed to clarify abundance and distribution of these animals in the Gulf of Mexico also are important for identifying potential changes in population size or shifts in spatial distribution relative to baseline conditions. Several studies are

informing the Trustees' assessment of marine mammal abundance and distribution, including aerial surveys, oceanic cruises to attach satellite tags on and collect remote biopsies of marine mammals, and passive acoustic studies to document the movement of marine mammals throughout the Northern Gulf of Mexico.

NOAA requests funding to complete analysis and statistical interpretation activities for field data that has been collected. Analysis and interpretation are undertaken by NOAA personnel and experienced contractors. Aerial surveys information from May 2010 to March 2012 will be combined with the results of satellite tagging studies to provide a more complete picture of marine mammal distribution and movement patterns throughout the Northern Gulf of Mexico. The satellite tagging records are particularly useful in establishing dive behavior of marine mammals. Marine mammal behavior records are used to adjust the aerial sightings for time spent at the surface. NOAA's requested costs are not duplicative of study-related funds requested by DOI in their July 1, 2011 Claim.

Contract cost for abundance and distribution of marine mammals: \$100,700

### **Marine mammal prey availability and quality**

The Trustees are using two field studies to assess whether common prey species of marine mammals are contaminated with oil discharged during the Incident. Consumption of prey contaminated with discharged oil could potentially cause injury to marine mammals in the Northern Gulf of Mexico. The initial study involved collecting squid and mesopelagic fish by trawling to assess prey availability for whales and oceanic dolphins. These trawls took place in the fall of 2010. The second study is aimed at prey items for nearshore cetaceans (and sea turtles) in the Gulf of Mexico that may have been exposed to discharged oil. The objective of the marine mammal prey investigations is to determine levels of prey exposure to discharged oil by sampling key prey items in nearshore Louisiana waters (no farther out than the 10-meter isobath). Samples of the prey items are collected from five geographic strata across Louisiana for contaminant analyses, including PAHs, dispersants, and fingerprinting for discharged oil (where external oil is found). Field work for the oceanic study has been completed, however, the field work for the nearshore study will continue throughout 2012 because oiling in nearshore waters of Louisiana is observed.

NOAA requests funding to complete nearshore prey availability and quality studies and to interpret and analyze all NRDA information generated from both work plans. Analysis and interpretation is undertaken by NOAA personnel and experienced contractors.

Contract cost for marine mammal prey availability and quality: \$319,250

### **Inhalation/Near-water exposure modeling for marine mammals**

NOAA is addressing concerns that airborne contaminants associated with the Incident and related response activities caused harm to marine mammals and sea turtles. Inhalation of contaminants and resulting detrimental effects is a potential exposure pathway for both marine mammals and sea turtles. Contaminants from discharged oil are the result of volatilization of oil from the ocean surface and the generation of particulate matter and products of incomplete

combustion during controlled burns conducted during the response effort. NOAA and its contractors are compiling available information on concentrations of airborne contaminants during the Oil Spill and the potential lethal and sub-lethal biological effects of exposure. Evidence from previous studies are relevant to potential exposure of people working on boats because air samples were collected several meters from the surface. Therefore, it is necessary to model the exposure concentrations close to the water surface to represent the breathing zone for marine mammals. The desktop literature review and exposure modeling will help NOAA better understand thresholds for injury to marine mammals and sea turtles based on field and modeled exposure concentrations.

Contract cost for inhalation exposure modeling: \$122,250

## **Shoreline Habitat and Resources Investigations**

Assessment activities in the SHORELINE grouping are focused on finalizing oil exposure maps and quantifying injury to shoreline habitat, affected fauna, and measuring the amount of erosional habitat loss resulting from the Incident. Contract expenses are segmented into four major activity areas:

- Shoreline oiling database and mapping
- Coastal wetland vegetation study
- Coastal wetland faunal study
- Coastal wetland erosion study

Total contract cost for SHORELINE: \$3,645,283

### ***Shoreline oiling database and mapping***

A final shoreline oiling map and supporting database is the key product for Trustees to demonstrate exposure of shoreline habitat to MC252 oil in the affected area. The map is used to represent levels of shoreline oiling across coastal wetlands and beaches and to help quantify injuries. A geospatial database that combines shoreline oiling datasets collected by response and NRDA groups is under development by NOAA and the co-Trustees. Activities from April to December 2012 are focused on modifications to the geodatabase, generation of mapping products, quantification of exposed habitats, and final documentation and metadata development. NOAA and contract experts in geographic information systems (GIS) and spatial analyses, statistics, and database development are required to complete these activities.

Contract cost for shoreline oiling database and mapping: \$124,500

### ***Coastal wetland vegetation study***

The Trustees are using the coastal wetland vegetation study to assess injury to coastal marshes and mangroves as a result of exposure to discharged oil. NOAA requests funds to complete a Fall 2012 sampling event and complete analysis, interpretation, and reporting activities for previous sampling events. Coastal wetland investigations are designed to detect changes in primary production, reproduction, and soil function. Injury metrics included in the study are above and below ground biomass, chlorophyll content, soil quality and function, and percent live and dead plant cover.

Coastal wetland data collected in Fall 2012 will be compiled and analyzed quickly because reporting from other sampling events will be complete and the Trustees are not collecting any environmental samples. NOAA and contract experts in coastal wetland systems, statistics, and field-based habitat assessment will participate in Fall 2012 field sampling. As part of this study, NOAA and contract staff will lead a Trustee process to validate all observational datasets from each of the coastal habitat assessment sampling periods. The funds also will be used to create summary and interpretive data reports.

The Aerial Imagery TWG acquired aerial and satellite imagery over multiple time periods since the release. The imagery will be used to develop oiling and habitat maps and interpret vegetative health. These products may be used to supplement results from the coastal wetland vegetation study to evaluate changes over time and enhance habitat classification in affected areas. Funding is requested for interpretation and application of these products in the vegetation assessment.

Contract cost for coastal wetland vegetation study: \$3,050,093

### ***Coastal wetland faunal study***

The potential effects of oiling on fiddler crab and periwinkles will be used to represent effects to secondary production more broadly in marsh communities and will complement the assessment of effects to vegetation. The fiddler crab is a good indicator species because of its abundance, importance to the marsh community and food web, and sensitivity to oil. The marsh periwinkle is another common organism found in coastal marshes that health of the habitat.

NOAA requests funds to conduct a Fall 2012 sampling event to investigate the potential mortality, reduced abundance, and changes in demographics of fiddler crabs and periwinkles. The requested funds also will support NOAA's analysis and interpretation of faunal field data and integrate 2011 results with the Fall 2011 faunal dataset. Activities from April to December 2012 include an additional field study in early Fall 2012. Data collected will be observational and do not require lab analysis. Therefore, the field records will be quickly processed and evaluated after collection. NOAA and contract staff will lead a process to validate faunal data collected after the Incident. Experts in the fields of statistics, coastal wetland systems, and NRDA will participate in the faunal investigation.

Contract cost for coastal wetland faunal study: \$415,190

### ***Coastal wetland erosion study***

Loss of substrate and structure of wetland habitat is another component of the injury assessment of coastal wetlands. Loss of vegetation because of oiling may render areas vulnerable to erosion. A variety of data has been collected to evaluate potential erosion. Real Time Kinetic (RTK) elevation surveys were conducted in association with Louisiana sites assessed for vegetative health. These surveys were conducted November 2010 through June 2011; additional studies are proposed for January/February 2012. LiDAR imagery was collected in Spring 2011 and is proposed for additional collection in January/February 2012. In addition, the Aerial Imagery TWG acquired aerial imagery over multiple time periods since the release. The RTK and LiDAR data collections have been funded by BP or Louisiana.

Activities from April through December 2012 include interpretation and analysis of these datasets. Historical erosion rates will need to be collected and synthesized. Potential erosion due to oiling will need to be evaluated relative to historical erosion rates and unoiled areas. NOAA and contract experts in coastal geology, coastal wetland systems, and NRDA will participate in the marsh erosion investigation.

Contract cost for coastal wetland erosion study: \$55,550

## **Toxicity to Aquatic Organisms**

Assessment activities in the TOXICITY grouping are focused on understanding the exposure, pathway, and effects of oil and dispersant from the Incident on a variety of test animals. NOAA requests funds to complete tests that were started in 2011, continue analytical testing of oil and dispersant formulations, and design and implement additional toxicity tests. Contract expenditures are included to cover all laboratory-based toxicity testing, sample analysis, and Principal Investigators and their teams to oversee the work. The Trustees, through NOAA, are working with 15 Principal Investigators and implementing tests in nine research laboratories to complete toxicity investigations for the NRDA. Toxicity testing investigations are not collaborative with the Responsible Party and thus signed study plans are not available.

Total contract cost for TOXICITY: \$2,139,190

The primary goal of the toxicity investigations is to evaluate toxicological responses of representative Gulf of Mexico aquatic animals to discharged oil and dispersants. To assess the effects of oil discharged by the Incident, a variety of tests are conducted using Gulf of Mexico fish and invertebrate species. The lethal and sub-lethal toxicity of field-collected MC252 oil, artificially weathered collected MC252 oil, COREXIT 9500, and oiled sediments is evaluated using several exposure pathways and endpoints. Pathways investigated include water accommodated fractions (WAFs) of oil, exposure to oil droplets, exposure to oiled sediment, and ingestion of contaminated prey. The type(s) of oil used for test exposures depend on what oil(s) species were likely exposed to over the duration of the Oil Spill. Endpoints evaluated during these tests include survival, growth, reproductive metrics, development, tissue damage (histology), gene expression, immunological effects, and behavior. The majority of tests are focused on the effects to early life stages (e.g., embryo and larvae) or on adults during their reproductive cycles. The Trustee schedule of toxicity testing coincides with the reproductive season(s) for each test species.

A number of planned tests could not be completed in 2011, primarily because of pre-trial orders and the timing of reproductive cycles for certain test species. Many tests are planned when organisms begin spawning and reproducing in the spring of 2012. After tests have been completed, NOAA and co-Trustees are going to evaluate evidence from all of the investigations. Testing reports will contain dose-response curves, chemical analyses of exposure media, and other observational data associated with performing toxicity tests.

NOAA initially established contracts with nine institutions to complete the initial phase of toxicity testing. NOAA also is in the process of securing contracts with other institutions to complete the work by the end of 2012. To date, NOAA is working with the following institutions to complete laboratory-based toxicity work:

- Florida Gulf Coast University
- Miami University of Ohio
- Monterey Bay Aquarium and Stanford University
- Mote Marine Laboratory
- University of North Texas

- Queen's University
- University of Manchester
- University of Miami Rosenstiel School of Marine and Atmospheric Science
- University of Southern Mississippi Gulf Coast Research Laboratory

Toxicity tests are performed with the following 12 species:

- Inland silverside (*Menidia beryllina*)
- Sheepshead minnow (*Cyprinodon variegates*)
- Red drum (*Sciaenops ocellatus*)
- Southern flounder (*Paralichthys lethostigmata*)
- Speckled sea trout (*Cynoscion nebulosus*)
- Goggle eye (*Selar crumenophthalmus*)
- Cobia (*Rachycentron canadum*)
- Mahi-mahi (*Coryphaena hippurus*)
- Bluefin tuna (*Thunnus thynnus*)
- Grass shrimp (*Palaemonetes pugio*)
- Blue crab (*Callinectes sapidus*)
- Eastern oyster (*Crassostrea virginica*).

Toxicity investigations scheduled between April and December 2012 use animals from a variety of ecological habitats that are addressed in our injury assessment. Further testing will be conducted on pelagic fish (e.g., tuna, goggle eye, cobia, and mahi-mahi), invertebrates (e.g., shrimp), and predatory fish (e.g., red drum) and prey fish (e.g., inland silverside and sheepshead minnow). To address potential injuries in benthic habitats, testing is planned for invertebrates (e.g., blue crab). NOAA is completing tests, with all appropriate oil and dispersant formulations, on the organisms and life stages that were started in 2011. Then tests will be conducted on appropriate life stages that were not started in 2011. Included in NOAA's estimate are funds to support planned toxicity testing using various life stages, endpoints, exposure scenarios and test species.

NOAA requests funds for laboratory analysis of samples collected during the tests. Water and sediment samples are analyzed during the course of each toxicity test. Also included in the budget are funds for analysis and interpretation of the resulting data. Water samples analyzed for PAHs and dispersant markers cost approximately \$400 per sample. The unit cost for analysis of sediments is higher. Each test that Trustees conduct results in approximately 5-15 water samples sent to the lab, and depending on the testing scenario, multiple sediment samples too.

In summary, the full complement of toxicity tests on a cross-section of species and life stages, as they are designed, are necessary for Trustees to complete their injury assessment. The unique release and response scenario associated with the Incident and paucity of toxicity testing literature on Gulf of Mexico species influence the complex toxicity testing design. Further, toxicity testing is a proven, reasonable, and cost-effective assessment method to address potential injuries to a wide variety of resources and habitats potentially exposed in a large marine ecosystem. The Trustees will use the toxicity results to aid interpretation of field exposures and support injury quantification activities. NOAA's technical leaders involved in toxicity

investigations are coordinating extensively with other NRDA state and Federal scientists. NOAA and co-Trustees also are coordinating with representatives with the Responsible Party, as appropriate.

## **Data Management and Visualization**

NOAA Assessment and Restoration Division's Spatial Data Team is leading the Trustee effort in many areas to provide DATA MANAGEMENT AND VISUALIZATION support across all areas of the injury assessment. The scope of Trustee data management needs for NRDA is large. As of December 13, 2011, NOAA manages metadata and results associated with over 49,000 Trustee-collected chemistry samples and almost 60,000 observational forms and associated electronic files (i.e., terabytes of data). Through a variety of systems hosted by NOAA, Trustees across the region and nationally are able to access observational data and analytical results in near real-time. Some of the data management systems support the Trustees' effort to map and visualize results and trends. Other systems support queries of data segmented in disparate data sets or support the ability to check on the status of an individual sample or data parcel as it moves from the field to third party validation. NOAA data management activities are essential for the Trustees to analyze and interpret NRDA information efficiently to support assessment and restoration planning activities. All of NOAA's proposed costs in the data management and visualization group are NRDA-related.

NOAA relies on a large number of contractors to address data management issues for potential litigation and to support the science needs of agency scientists working in the TWGs. NOAA's activities and associated expenses in this grouping are sub-divided into eight different areas for clarity:

- Data Management Systems
- Laboratory Analysis
- Tracking, QA/QC, Posting
- Sample and Observational Records Intake
- Response Data Compilation and Synthesis
- Aerial Imagery
- RP Data Reports, and
- Trustee Data Management Support

Generally, NOAA's data management contractors work on discrete tasks that are associated with the areas listed above. Therefore, our data management contract needs are presented efficiently within that structure instead of by individual study or small-scale science investigation. NOAA labor expenses generally support the kinds of activities necessary to make all of the different data management and visualization activities function efficiently together.

In the laboratory analysis activity area, NOAA costs are combined to receive and analyze the total number of analytical and environmental samples from the majority of Trustee field studies. Segmenting out sample intake and analysis expenses by study or TWG is not efficient because NOAA does not have individual laboratory analysis and Quality Assurance/Quality Control (QA/QC) contracts in place for each Technical Working Group. Data management and visualization of NRDA information is by nature a holistic NRDA process.

The Trustees developed data sharing language and guidelines immediately after the Incident with the Responsible Party. The data sharing language is included in each cooperative, signed study

plan. Therefore, NOAA and other Trustees do not have separate study plans that are specifically oriented toward data management and visualization of NRDA information.

Contract cost for DATA MANAGEMENT: \$49,999,200

### ***Data management systems***

Maintenance of NRDA data requires robust repositories designed for proper loading, storage, and sharing. The systems support sharing and integration of data among Trustees and the RP during assessment and restoration planning.

- Environmental Response Management Application (ERMA): Integrates and synthesizes various real-time and static datasets into a single interactive map, thus provides fast visualization of the situation and improves communication and coordination. The Trustees use ERMA often to visualize overlapping data layers, inform sampling design decisions, and convey synthesized data to a wide variety of stakeholders. Trustees also are able to download metadata and associated data that are correlated with the displayed data layers. ERMA was considered by the Coast Guard the common operational data visualization platform during the Incident response and is widely used by the Trustees for NRDA.
- NOAA NRDA/Resource Catalog: Repository of field data (including source file inventories as well as the data warehouse containing the detailed database records) collected as part of the NRDA as well as associated study documentation and plans. The resource catalog in NOAA NRDA provides on-demand and user-defined access to the full complement of NRDA information across most resource and habitat types and NRDA studies. NOAA NRDA is complementary to DOI and state-led data management efforts, primarily because the content, search, and organizational capabilities of NOAA NRDA are not duplicative.
- QueryManager web (QMweb) interface and database: Repository for the analytical chemistry results. Trustees use QMweb to run standard queries of analytical chemistry results from the laboratory and display results in tabular and spatial formats. NOAA developed QM prior to the Incident and thus Trustees also are able to query analytical data efficiently from datasets that help characterize baseline or pre-Oil Spill conditions.
- Photologger: Searchable interface for exploring photographs taken during field events. Trustees use Photologger during injury assessment to efficiently track changes of environmental conditions over time and manage field-collected photos. Photos of oiled habitat and resources are critical to conveying the extent of exposure and potential injury from discharged oil. Almost all of the photos are geo-spatially referenced to support integration of photos into injury quantification activities.
- GulfTOPP: Tracking of telemetry records associated with the NRDA. GulfTOPP is used by the Trustees to display animal tracks over space and time for multiple species. Oceanographic datasets are uploaded into GulfTOPP so that animal movement patterns and site fidelity can be analyzed with associated environmental data that indicates ambient conditions. GulfTOPP has been used extensively along the West Coast to unify telemetry datasets from a large variety of species and studies.

The system contains literature-based algorithms that display telemetry tracks appropriately for analysis.

Contract cost for data management systems: \$3,936,000

### ***Sample and observational records intake***

NOAA data management personnel participate in most nearshore and offshore NRDA field studies. Their expertise is needed in the field to ensure proper chain of custody for all NRDA information and to assist with the rapid integration of field-collected samples and observational information into a variety of NOAA and co-Trustee data management systems. NOAA is expecting to provide storage and technical support for thousands of samples and ten times that amount for observational data during the period covered in this Claim. Sample intake teams collect information across the Gulf Coast as soon as scientists return from the field.

NOAA's work involves the intake, evaluation, and field processing of many kinds of data, including chemistry, photo/video, and field observations. Analytical and observational information is processed from TWGs into the systems from field work conducted along the entire Gulf Coast. NOAA also supports continued training for sampling teams, sample intake teams and equipment, and personnel specializing in field data QA/QC, chain of custody, and sample shipping.

Contract cost for sample and observational records intake: \$6,103,200

### ***Laboratory analysis***

Samples collected for the various NRDA field investigations require laboratory analyses. All costs associated with storage and processing the analytical chemistry and non-chemistry analytical samples in the contract laboratories are included in this part of the Claim. Across all resource areas of the assessment and studies in the budgeted period, NOAA data management personnel are expecting to process 5,000-10,000 samples per quarter. Some of the samples were collected in 2011 but have not been analyzed yet because of the sample analysis backlog. Other samples will be collected in 2012 as part of Trustee-led field work. For example, samples collected in 2012 will be analyzed associated with SAV monitoring in the Chandeleur Islands, oyster biofouling, abundance monitoring, and reproductive condition monitoring, marine mammal and sea turtle tissue analyses, deepwater community assessment, aquatic toxicity investigations, and shoreline faunal and vegetation studies. NOAA requests funds to process NRDA samples in the laboratory so the results are available to the Trustees for injury assessment and quantification.

Contract cost for laboratory analysis: \$29,811,000

### ***Tracking, QA/QC, and posting***

In addition to the analysis of laboratory samples, proper data management requires a series of efforts to ensure legal and scientific rigor of evidence. NOAA ensures sample results derived from almost all Trustee NRDA studies undergo a rigorous third-party validation (analytical chemistry) or appropriate quality review (other laboratory analyses). NOAA then standardizes information to promote cross-study analysis and integration. Throughout the process, NOAA

tracks each of the samples through each step of the analysis and validation pathway and provides Trustees with standard reports summarizing progress. After samples and associated data are validated, NOAA organizes and streams the results through the systems described in this Claim. The number of samples required to undergo the validation process is large on a quarterly basis and more than 20 contract specialists are needed. The amount of money to perform the work is necessary for NOAA to maintain litigation-quality information and communicate validated results from NRDA studies to scientists across the country.

Contract cost for tracking, QA/QC, and posting: \$5,797,500

### ***Response data compilation and synthesis***

During the response phase, a significant volume of data were collected to characterize the extent of contamination and to plan response activities. Although NOAA was involved in the response and was using ERMA to support operations, a large volume of data was hosted by the Responsible Party, other non-Trustee government agencies, and third party institutions and universities. NOAA uses contractors to help compile a subset of these data to aid the Trustees' injury assessment activities and presenting the information in formats useable by Trustees. The majority of NOAA effort in the budgeted period is focused on compiling information on aquatic sampling results and a subset of response activities in 2011 that have the potential to affect injury quantification, such as the location and duration of nearshore submerged oil recovery operations, beach cleanup, SCAT surveys, and animal collection and rehabilitation.

Contract cost for response data compilation and synthesis: \$307,500

### ***Aerial imagery***

NOAA data management personnel and contractors use response- and NRDA-collected imagery from a variety of sources. Shoreline imagery collected by NOAA (pre- and post- Oil Spill) and by the RP (post-Oil Spill) has been used for SAV emergency restoration and a variety of restoration planning activities. NRDA imagery also informs many study design decisions and is a critical component of injury quantification when time series information is used to detect changes in habitat coverage, quality, and oiling severity. Habitat mapping by the Trustees is generated from imagery, providing baseline and post-Oil Spill resource maps that are used by the Trustees. Hyperspectral satellite imagery is used to support the Trustees' assessment of vegetation health and oil penetration in marshes and mangroves, *Sargassum* distribution and oiling in the Gulf of Mexico, and characterizing open water oil thickness. Using imagery collected before, during, and after the Incident is important to NOAA and co-Trustees because imagery can fill data gaps on landscape-level scales cost-effectively compared to traditional field efforts.

NOAA requests funds to maintain involvement in the Aerial Imagery TWG and to fully complete an oil-on-water analysis. The surface oil analysis will use imagery from different platforms to evaluate the presence and thickness of oil at the surface and near subsurface. A multi-disciplinary panel of 6-8 experts from Universities and resource agencies across the United States is regularly meeting to review the imagery and work toward the product of a final surface oiling map derived from aerial imagery.

Contract costs for aerial imagery: \$300,000

### ***RP data reports***

After compiling NRDA data, all parties review and identify any necessary additions or corrections. Trustees create standard data reports that serve as a compendium of available data in a particular resource area or TWG. NOAA and its contractors will have regular meetings with Trustee and RP representatives to review and complete the data reports from over 200 individual studies. NOAA's involvement in the report review process is vital to ensure the consistency and completeness of cooperative data shared among parties and the reflection of final NRDA data in NOAA's data management systems.

Contract cost for RP data reports: \$624,000

### ***Trustee data management support***

NOAA data management personnel and contractors support a wide variety of NRDA activities and needs of individual Trustees. A data management specialist is permanently embedded in one or more of the TWGs in the NRDA and other specialists are used as needed to help Trustees across the region when questions arise. The data liaison role is vital for Trustees in the region to efficiently locate information that may be scattered within multiple data management systems, create meaningful outputs from custom queries, or to regularly train and update NRDA scientists about the status or location of information in NOAA data management systems. Trustee data management support activities, include, but are not limited to, the following areas:

- Training staff on proper protocols for collection and integration of data into the NOAA systems.
- Transcription of collected data into the constituent systems
- Supporting staff with understanding the available data
- Mining the databases to identify data appropriate for use in specific analyses
- Mapping and analysis of spatial data
- Visualizing raw data and analysis products

Contract cost for Trustee data management support: \$3,120,000

## Restoration Scaling and Planning

NOAA and other Trustees are undertaking restoration scaling and planning activities simultaneously with injury assessment activities. NOAA and co-Trustees first addressed emergency restoration activities after the Incident and then negotiated a framework agreement with the RP centered on \$1B for early restoration. The implementation of the early restoration framework agreement and associated legal and restoration offset discussions will continue in 2012; however, it is important to note that the \$1B resides in an escrow account of BP's Gulf Coast Claims Facility fund and neither NOAA nor the other Trustees can access these funds to support restoration planning. Restoration specialists are working with the injury assessment teams to ensure NRDA information is factored into scaling discussions, early restoration planning, public communication, and regulatory documentation. Additional information on the Trustee restoration planning activities is provided by following the links below:

### [NRDA Emergency Restoration Fact Sheet \(Summer 2011\)](http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/2011/08/TC_Toolkit_EmergRest_FINALweb.pdf)

[http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/2011/08/TC\\_Toolkit\\_EmergRest\\_FINALweb.pdf](http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/2011/08/TC_Toolkit_EmergRest_FINALweb.pdf)

### [Early Restoration Framework Agreement \(released April 21, 2011\)](http://www.restorethegulf.gov/sites/default/files/documents/pdf/framework-for-early-restoration-04212011.pdf)

<http://www.restorethegulf.gov/sites/default/files/documents/pdf/framework-for-early-restoration-04212011.pdf>

### [Draft Early Restoration Plan \(released December 14, 2011\)](http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/)

<http://www.gulfspillrestoration.noaa.gov/restoration/early-restoration/>

NOAA's Marine Fisheries Service Office of Habitat Conservation, Restoration Center has seven focus areas to effectively coordinate restoration scaling and planning for the Incident. Costs for these activities are separated from the other groupings to convey the relative proportion of NOAA's proposed expenses for technically-focused restoration scaling and planning activities compared with total NOAA expenditures. NOAA has a variety of roles in each of the restoration activity groupings and is working with co-Trustees on all aspects of restoration scaling and planning and with the RP within the Early Restoration Framework.

- Case Management
- Finance
- Early Restoration Project Development and Compliance
- Long-term Restoration Planning
- Programmatic Environmental Impact Statement (PEIS) and Environmental Planning
- Data Management, and
- Communications.

Total contract cost for RESTORATION PLANNING: \$3,641,714

The Case Management team, which includes General Counsel support, provides overall intra- and inter-agency coordination, management, oversight and budgeting for all facets of restoration planning associated with the BP Oil Spill. Major subtasks for the Finance sub-team are budget planning, tracking and execution as well as cost recovery. The finance sub-team also supports major restoration planning efforts requiring contracts or other procurement actions requiring staff knowledgeable in both agency policy as well as Federal Acquisition Regulations. Cost recovery

requires dedicated staff to track, review and compile all supporting cost documentation needed to satisfy both program requirements as well as responsible party and NPFC requirements.

The Early Restoration Project Development and Compliance team comprises several functional areas. One team has been assembled for co-Trustee negotiation for the purposes of project scaling, parameter and offset development during early restoration project negotiations. Additional staff are assigned to project management and are responsible for (a) active project development for emergency, early and long-term restoration for both NOAA and co-Trustees; (b) negotiation and ultimately project implementation; (3) overseeing project management of restoration for all phases of restoration planning; and (4) participating in development of a NOAA-based, strategic restoration vision for restoration planning effort. The early restoration project development team is coordinating with regional Protected Resources technical staff for guidance and support on issues involving potential effects of restoration options on threatened and endangered species, managed species, and permits.

Long-term NRDA restoration project planning has both offshore and nearshore planning effort components. These teams include regional members from each Gulf state who have, and will continue to, systematically review project ideas from many sources that will offset injuries. Members of this group research and draft briefing papers about different potential restoration options/concepts and the appropriateness and feasibility of restoration planning. Intra-agency participation and coordination costs are included as an essential component in the development of offshore restoration alternatives and actions development. The long-term restoration planning team will continue to coordinate closely with the Programmatic Environmental Impact Statement (PEIS) team to ensure accurate incorporation of promising concepts into the PEIS.

The PEIS team is coordinated across other Federal agencies, Trustees and NOAA Line Offices in the development of a Programmatic EIS for Restoration Planning. The PEIS effort includes development of a scope of work, contract award and subsequent oversight and coordination with a highly qualified contracting team that assists in the preparation of the PEIS. The effort requires detailed attention to Federal and state law, regulations and procedures.

The Data Management and communications teams provide cross cutting support for the entire planning effort. The Data Management team supports the document and information needs of the restoration-focused teams. Personnel on the data management team continue to develop and manage a SharePoint site and provide guidance, technical expertise and problem solving skills to all case team members (Federal and state). In addition, the Data Management team provides guidance on records management, and ensures appropriate documentation is included in the Administrative Record. The Data Management team coordinates with the communications team to maintain sections of the website and supports the collection, review, and summation of public comments. The Data Management team also develops and maintains a database to collect and analyze restoration project suggestions and collaborates with other federal and state Trustees to compile all suggested projects. Finally, the team supports the spatial analysis and mapping needs of the case team, with an emphasis on offshore restoration alternatives planning. All of the requested data management expenditures are for NRDA-related activities.

The Communications team is tasked with providing cross-cutting support for internal and external communication needs for restoration planning. Major subtasks include the planning of public meetings, production of a wide range of print and electronic content, management of media inquiries, and coordination of inter-Trustee outreach initiatives.

NOAA's proposed expenses in the restoration grouping are derived from labor estimates for more than 60 agency staff. Not all of these NOAA personnel are working full-time on the Incident. Habitat restoration specialists, regional staff with the Restoration Center, and scientists with the Southeast Fisheries Science Center are contributing to Oil Spill restoration planning activities. NOAA staff experienced in administrative support, communications, management, and legal aspects of restoration planning are working on the NRDA. Over 20 contractors also are supporting NOAA to varying degrees during the early restoration planning process. About one-third of the estimated contract cost in this grouping is to cover contractors working on restoration planning issues. The other two-thirds of the total are segmented into several areas:

- Communications support for five PEIS public review meetings (\$35K)
- Regulatory documentation for Final Restoration Plan (\$1.3M) and Final PEIS (\$0.5M)
- Two public restoration planning engagement meetings for offshore and nearshore projects (\$900K)
- Data management support, including a restoration project database (\$39K)
- Communications support for additional video and web tutorial videos (\$28K)

## **Injury Assessment Management and Administration**

NOAA continues to take a lead role in coordinating Trustee-wide field operations out of the New Orleans command post. On-site personnel manage region-wide Trustee communications, ensure safety of field operations, and generally assist with the coordination and implementation of all NRDA science activities in the field. On-site contractors provide support for Trustees on vessel procurement and tracking, coordinating sample and data intake activities in the field across TWGs, document shipping, Trustee email account and file management, work plan tracking and associated coordination, staffing of field operations across TWGs, and coordinating the delivery of equipment and supplies. The on-site operations team routinely works closely with representatives from the Responsible Party.

NOAA requires more than \$23M to support contract needs during the budgeted period to maintain all phases of the field operations command center in New Orleans, Louisiana. More than \$21M of the funds are required to ensure Trustees have small vessels available to complete all planned field work in 2012. The remaining requested costs cover safety, planning, equipment procurement, Trustee communication and work plan tracking, and various other duties associated with a regional command post designed to support all Trustee NRDA field operations.

Total contract cost for MANAGEMENT & ADMINISTRATION: \$23,285,400