National Commission on the

BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING

# Briefing Book

# Continued from Part 1

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# The Deepwater Horizon Oil Spill: Response and Restoration

**4,900,000 million barrels** of crude oil and gas released.

**1,840,000 million gallons** of total dispersant have been applied (1,070,000 million on the surface, 771,000 sub-sea).

**39,885 square miles** of Gulf of Mexico federal waters currently closed to fishing.

**600 miles** of the Gulf coast beaches, wetlands, and other coastal habitats have been oiled, of which 115 miles were designated as moderately to heavily oiled.

As of September 21, 2010:

**2075 living oiled birds** have been collected, of which all were visibly oiled and 1208 have been rehabilitated and released.

**6033 dead birds** have been collected, of which 2262 were visibly oiled.

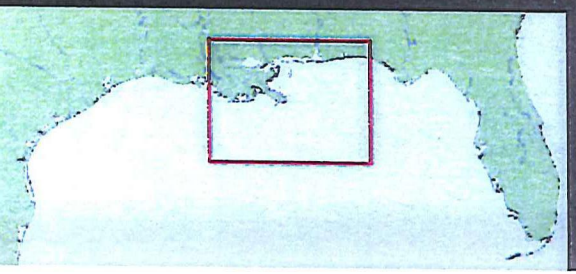
**533 living sea turtles** have been collected, of which 456 were visibly oiled and 314 have been rehabilitated and released.

**589 dead sea turtles** have been collected, of which 17 were visibly oiled and 451 are pending a determination of oiling.

**9 living marine mammals** have been collected, of which 2 were visibly oiled and 3 have been rehabilitated and released.

**94 dead marine mammals** have been collected, of which 4 were visibly oiled and 7 are pending a determination of oiling.

# Oil Slick as Seen From Space



May 24, 2010

**CHRIS JOHNS**

**Editor in Chief, *National Geographic***

*Day 2, Panel 1: The Delta Vanished and No One Noticed*

Anticipated Focus:

Many Americans experienced the Deepwater Horizon disaster from afar—visually. Chris Johns will tell the story of the spill and its impact in photographs.

Biography:

From Anchorage, Alaska to Africa's Zambezi River, Chris Johns' *National Geographic* magazine assignments have taken him all over the globe. And in 2005, this versatile photographer—comfortable photographing people, wildlife, landscapes, and complex environmental issues—became *National Geographic*'s Editor in Chief.

Johns' career in photojournalism began while studying animal science at Oregon State University. He graduated with a degree in technical journalism and a minor in agriculture. He worked as a teaching assistant while studying for a master's degree in photojournalism at the University of Minnesota. In 1975 Johns became a staff photographer at the *Topeka (Kansas) Capital-Journal* and in 1979 was named National Newspaper Photographer of the Year. In 1980 he joined the *Seattle Times* as a picture editor and special projects photographer. Three years later Johns became a freelance photographer largely working for *Life*, *Time*, and *National Geographic*. *National Geographic* made him a contract photographer in 1985, and Johns joined the magazine staff in 1995.

In 1990 Johns photographed and wrote the critically acclaimed book *Valley of Life: Africa's Great Rift*. He followed with a National Geographic Society book, *Hawaii's Hidden Treasures*, which dealt with Hawaii's extinction crisis.

**JOHN BARRY**

**Author, *Rising Tide***

*Day 2, Panel 1: The Delta Vanished and No One Noticed*

Anticipated Focus:

The Gulf states, particularly Louisiana and Mississippi, have years of restoration thought and experience behind them. John Barry will describe the urgency of wetland loss and storm protection issues in Louisiana. Existing state restoration programs and a federal "road map" are in place, but require major funding and stable federal-regional leadership, which are the topics of today's hearing.

Biography:

John Barry is a *New York Times* best-selling author whose books have won more than twenty awards. In 2005 the National Academies of Science named *The Great Influenza*, a study of the 1918 pandemic, the year's outstanding book on science or medicine. In 2006 the National Academies also invited him to give its annual Abel Wolman Distinguished Lecture; he is the only non-scientist ever to give that lecture. In 1998, *Rising Tide: The Great Mississippi Flood of 1927 and How It Changed America* won the Francis Parkman Prize of the Society of American Historians for the year's best book of American history.

Both *The Great Influenza* and *Rising Tide* have proven influential in recent years. Barry was invited by the Bush and Obama administrations to advise on pandemic preparedness and response, and he has advised other federal, state, United Nations, and World Health Organization officials on influenza, water-related disasters, crisis management and risk communication. A member of advisory boards at M.I.T's Center for Engineering Systems Fundamentals and the Johns Hopkins Bloomberg School of Public Health, Barry was also the only non-scientist on a federal government Infectious Disease Board of Experts.

After Hurricane Katrina, the Louisiana congressional delegation asked Barry to chair a bipartisan working group on flood control. In 2007, he was appointed to the Southeast Louisiana Flood Protection Authority, which oversees several levee districts in the metropolitan New Orleans area, and the Louisiana Coastal Protection and Restoration Authority, which is responsible both for the state's hurricane protection and for rebuilding the 2100 square miles of land the state has lost in recent decades. Barry has discussed Katrina and its aftermath in venues including *Meet the Press*, NPR, and the BBC, and he has written about it for *The New York Times*, *Time Magazine*, *USA Today*, *The Washington Post* and *The Smithsonian*.

**National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling**

---Draft---

Staff Working Paper No. 2[1]

# Natural Resource Damage Assessment:

# Evolution, Current Practice, and Preliminary Findings Related to the Deepwater Horizon Oil Spill

Now that oil has stopped flowing from BP's damaged Macondo well some of the most important—and still open— questions about the spill concern (a) how much damage it caused and (b) whether the legal, regulatory, and policy mechanisms in place to address these damages are adequate to ensure that restoration efforts will be fully implemented and paid for. This background paper describes the process that was established under the Oil Pollution Act of 1990 for assessing damages and restoring public resources in the aftermath of an oil spill. Known as Natural Resource Damage Assessment (NRDA), this process is still in the early phases of being applied to the BP spill and conclusions about its ultimate efficacy or success in this instance will be impossible to draw for a number of years. This background paper describes the history and purpose of the NRDA, reviews the main steps in the NRDA process, and reports on the status of current damage assessment efforts in the Gulf.

## I. Natural Resource Damage Assessment: History and Purpose

In the wake of the *Exxon Valdez* disaster in 1989, Congress passed comprehensive legislation specifically aimed at responding to and addressing damages from oil spills. As part of the Oil Pollution Act of 1990 (OPA), 33 U.S.C. § 2701 et seq, "responsible parties"[2] were made liable for the removal costs and

[1] Staff Working Papers are written by the staff of the BP Deep Horizon Oil Spill Commission for the use of the members of the Commission. They are prepared before the conclusion of the Commission's work and are subject to further refinement and updating.

[2] In the case of offshore facilities, "responsible party" is defined as the "lessee or permittee of the area in which the facility is located or the holder of the right of use and easement granted under applicable State law or the Outer Continental Shelf Lands Act for the area in which the facility is located(if the holder is a different person than the lessee or permittee) . . ."

damages resulting from discharges of oil from vessels or facilities. Among other things, this liability extends to:

> Damages for injury to, destruction of, loss of, or loss of use of, natural resources, including the reasonable costs of assessing the damage, which shall be recoverable by a United States trustee, a State trustee, in Indian tribe trustee, or a foreign trustee.[3]

The measure of damages under OPA, 33 U.S.C. § 2702(b)(2)(A), includes:

(A) The cost of restoring, rehabilitating, replacing or acquiring the equivalent of, the damaged natural resources;
(B) The diminution in value of those natural resources pending restoration; plus
(C) The reasonable cost of assessing those damages.

Under OPA, responsibility for promulgating regulations to guide the assessment of natural resource damages fell to the National Atmospheric and Oceanic Administration (NOAA) Id. at 2706(d). NOAA completed this task in 1996 and NRDA regulations became effective on February 5, 1996. 15 C.F.R. § 990.

Prior to 1990, damage assessments and associated cost recovery for oil spills were governed by the Comprehensive Environmental Response, Cleanup and Liability Act of 1980, or CERCLA, which imposed liability for damages resulting from releases of "hazardous substances" as defined by the statute.[4] CERCLA regulations provided the model for the natural resource damage authority set forth in the OPA and continued to govern damage assessments for oil spills during the years between 1990 and 1996, when NOAA was developing new regulations under OPA.

One way in which NOAA, in promulgating the OPA regulations, sought to improve on existing law was by providing for cooperative damage assessments. This is the process now being used in the Deepwater Horizon case, where BP (the "responsible party") is working with government agencies (i.e., the "trustees") to identify and quantify damages. Under CERCLA, by contrast, damage assessments were carried out, for the most part, in a non-cooperative and adversarial manner. Since the trustees could essentially dictate how damages would be determined, responsible parties typically opted to conduct their own assessment in preparation for a court defense should the case end up in litigation. CERCLA (and OPA) regulations impose a "rebuttable presumption" in favor of the trustee's damage assessment: If the responsible party disagrees, it bears the burden of proving the trustee's assessment was wrong.

This regulatory arrangement often set the stage for parallel and dueling assessments, as emerged in the aftermath of the *Exxon Valdez* incident, which spilled 11 million gallons (262,000 barrels) of crude oil in

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[3] Trustees act "on behalf of the public" as trustees for natural resources. Federal trustees are designated by the President. State trustees are designated by their Governors. Affected Tribal and foreign nations can also claim trustee authority.

[4] CERCLA, in turn, built on provisions in the Clean Water Act Amendments of 1977 that first codified federal authority to recover damages for natural resources. Specifically, CERCLA provided additional direction concerning the measure of damages, the use and effect of natural resource damage assessments, and the designation of trustees.

Prince William Sound, Alaska. Trustees involved in that assessment could recount times when they were collecting environmental samples from fishing boats in Prince William Sound while parties working for Exxon collected the same data on another boat 20 yards away. As the level of parallel effort and secrecy in the *Exxon Valdez* case escalated, so did the level of distrust between industry, government, and the public. Ultimately, the federal government and the State of Alaska brought suits against Exxon for civil and criminal penalties, as well as natural resource damages. Two-and-a-half years after the spill (in October 1991) the parties reached a joint settlement that included $900 million in clean-up and restoration funds,[5] along with a "reopener" clause that allowed for up to approximately another $100 million in additional funds if deemed necessary by the court. [6]

The inclusion of a cooperative damage assessment option in the OPA regulations was intended to offer a more efficient and less litigious process than that which had characterized the *Exxon Valdez* experience. To support this option, NOAA developed supplemental guidance documents that discuss specifics of the cooperative process, including level of participation, dispute resolution, agreement on scientific methods, sharing of equipment and experts, and funding[7]. As the guidance suggests, these issues are generally laid out in a memorandum of agreement between the trustees and the responsible party. Whether this process will work as intended in the BP case remains uncertain at this juncture. Analysis by Commission staff suggests that past attempts to use the cooperative assessment process did not measurably shorten the time or administrative costs incurred between the event and final settlement. Nonetheless, trustees interviewed are quick to point out that aside from time and money, the cooperative assessment process provides other advantages. In particular, states that do not have dedicated damage assessment programs[8] would not have the budget or resources to carry out damage assessments if not for funding agreements and the sharing of equipment and experts.

Before moving on to a description of the NRDA process itself, it is important to highlight the distinction between legal action to recover costs for damages to natural resources, and enforcement actions aimed at imposing civil or criminal penalties under an environmental statute. Both actions may be pursued, under separate authority, by states and the federal government in response to an event such as an oil

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[5] In addition, Exxon was fined $150 million, the largest fine ever imposed for an environmental crime. The court forgave $125 million of that fine in recognition of Exxon's cooperation in cleaning up the spill and paying certain private claims. Of the remaining $25 million, $12 million went to the North American Wetlands Conservation Fund and $13 million went to the national Victims of Crime Fund. Also, Exxon agreed to pay $100 million in restitution for injuries caused to fish, wildlife, and lands in the spill region. This money was divided evenly between the State and the federal government. Exxon Valdez Oil Spill Trustee Council:
http://www.evostc.state.ak.us/facts/settlement_glance.cfm

[6] The State of Alaska and the federal government filed an application for these funds in 1996. Per communication with a Department of Justice attorney in September 2010, that application is still pending as the trustees conduct additional monitoring and research, to be paid for with reopener money, to determine the exact level of funding required to address residual oil, monitoring and restoration.

[7] NOAA OPA Preassessment Phase Guidance Document. August 1996.
http://www.darrp.noaa.gov/library/pdf/ppd.pdf

[8] With the exception of a few coastal states, damage assessment training, resources, and staff are often gathered on-the-fly when a spill occurs. Expertise is pulled from within state agencies.

spill. In bringing an enforcement action for civil or criminal penalties, the Department of Justice—on behalf of EPA, the Coast Guard, or another agency—acts in the role of prosecutor. When the Department of Justice sues to recover natural resource damages, it is acting on behalf of the Department of the Interior, NOAA or other trustees with jurisdiction over the injured resources and the action is in many ways similar to a tort action. (The same distinction applies in the case of actions brought by state attorneys general on behalf of state agencies.) Under most federal environmental statutes, funds recovered as a result of civil or criminal enforcement actions are deposited in the federal Treasury and may not be used to redress the harms caused by the pollution event or incident.[9] The authority to recover costs for damages to natural resources, by contrast, is unique in that the funds recovered from responsible parties must be used to restore the specific resources injured by the event.[10]

## II. Understanding the NRDA Process

NRDA is the regulatory process used by designated natural resource trustees to identify, assess and restore damages to: (1) public natural resources, (2) the services they provide (e.g. oysters provide water filtration) and (3) the public's lost use of those resources. Based on the damage assessment, the trustees either bring a lawsuit against the responsible party to recover the damages (which may be settled), or enter into a settlement with the responsible party without filing a lawsuit.

When an oil spill occurs, the trustees must work through three phases to determine the appropriate type and amount of restoration required to compensate the public:

1. *Preliminary Assessment* (referred to as preassessment). In the aftermath of the release, the trustees collect time-sensitive data and observations and conduct research to determine if damage to a particular resource has occurred or is likely to occur. Did damage likely occur? If so, the trustees move to the next phase.

2. *Restoration Planning* (which includes injury assessment). In this phase, the trustees conduct scientific and economic studies to quantify damages and use local knowledge and expertise to identify potential restoration projects. A draft restoration plan describing potential compensatory restoration projects and recommending preferred projects based on applicable regulatory criteria is made available to the public for review and comment.

3. *Restoration Implementation.* At this point, restoration as proposed by the trustees and approved by the public is implemented and monitored to ensure its success. The restoration

[9] There are some exceptions to this general rule. A description of the sources and uses of penalties and fines resulting from oil spills is provided in a separate briefing memo.

[10] In the Exxon *Valdez* case, of the $900 million recovered from Exxon in a civil settlement, roughly one-fourth ($213.1 million) was used to reimburse the federal government and the State of Alaska for costs incurred in damage assessment and spill response. The remaining $686.9 million was spent in Alaska on efforts to restore resources that were directly harmed by the spill (e.g., sea birds, sea otters, whales and their habitat, etc.). If the State and federal government had brought suit solely under criminal fine or civil penalty authority, only a small portion of the funds recovered from Exxon would have been used to restore resources damaged by the spill.

plan will often include an Environmental Assessment as required under the National Environmental Policy Act. The responsible party has the option to either (a) implement and monitor the chosen projects with trustee oversight, or (b) provide funding for the trustees to carry out project implementation and monitoring.

Though the logic of this progression is straightforward, its implementation—as one would expect—is anything but. Identifying and quantifying damages, particularly where complex ecosystems are involved, presents enormous challenges. Developing sound sampling protocols that cover adequate time scales, teasing out other environmental disturbances, and scaling the damages to the appropriate restoration project often takes considerable time; in fact, a typical damage assessment can take years.[11] Two sets of determinations—one concerning the baseline conditions against which damages will be assessed and one concerning the quantification of those damages—are particularly difficult and consequential in terms of the overall assessment results.

A. Determining Baseline Conditions

The OPA defines the baseline against which damages are to be measured as "...the condition of the natural resources and services that would have existed ***had the incident not occurred.***" Making this determination, however, is often inherently difficult and highly contentious. Baseline conditions may be estimated, according to the OPA regulations, "using historical data, reference data, control data, or data on incremental changes (e.g., number of dead animals), alone or in combination, as appropriate."[12] Without a well-established and agreed-upon definition of baseline conditions, there can be no agreement about a subsequent assessment of damages or quantification of required restoration. Given that the ecological baseline can vary seasonally, annually, and over much longer time scales, it can be difficult to pinpoint the exact condition of an ecosystem prior a spill. Since long-term historical data sets are often non-existent or discontinuous in many areas of the country, natural resource trustees are likely to be disadvantaged by a lack of sufficient data to fully characterize the condition of relevant ecosystems prior to the incident in question.

As the language of the OPA regulations indicate, "baseline" for purposes of damage assessment in the NRDA context is generally considered to be the condition of the resource just prior to the spill. The precise application of this definition has particular importance in the Gulf of Mexico context, where many coastal habitats have been substantially degraded over decades—even centuries—under the pressure of ever-expanding industrial, commercial, and residential development. The NRDA regulations, as generally applied, require that BP restore Gulf resources to their functioning level as of April 19, 2010. However, the Gulf ecosystem in April 2010 was already weakened. Every year in the Gulf, for example, nutrient runoff from farms throughout the Mississippi River watershed creates a "dead zone" of extremely low oxygen levels in which few water organisms can survive. In some years, the area affected by this dead zone is as large as New Jersey. Throughout the region, erosion and destabilization of wetlands has been accelerated by the patchwork of canals carved out by the oil and

[11] A compilation of NOAA oil spill Damage Assessment cases as pursued under both CERCLA and OPA and their approximate time from initial oil discharge to settlement is included as attachment A.
[12] 15 CFR § 990.30.

gas industry. Cut off from natural deposits of sediment from the Mississippi River, delta wetlands have been unable to keep pace with rising sea levels and are sinking into the Gulf. These are only a few of the factors contributing to an imbalanced and already degraded Gulf ecosystem. In this context, effective long-term restoration will require the stabilization and eventual reversal of a number of long-standing, damaging trends.

B. Quantifying Damages

Once baseline conditions have been established, it becomes possible—though by no means easy—to quantify damages. This quantification, in turn, determines the appropriate amount of restoration required to compensate for the natural resource damages that have been incurred. Scientists use various methods to measure a reduction in ecological services. These methods are highly dependent on the resource being assessed and on the proxies available for measuring the ecological function or output of interest. For example, one study may use measured reductions in nutrient filtration to determine relative impact on a wetland while another may use decreased juvenile fish growth to determine relative impact on particular fish stocks.

Figure 1 provides a conceptual illustration of the effect of an oil spill on an ecosystem and the relationship of damage estimates to restoration. Typically, there is a fluctuating ecological baseline at the time of the spill. Once the spill occurs there is some decrease in the function of the resources (e.g., decrease in nutrient filtration, decline in an animal population, or loss of a public beach). If the ecosystem is left to recover naturally, it may eventually return to baseline conditions.[13] However, restoration efforts must compensate for the damages that occur (relative to baseline) during this period of natural recovery. Active primary restoration, if implemented, can curtail the resource decline that would otherwise occur after an oil spill and, hence, reduce the amount of compensatory restoration required in the aftermath. In the end, the amount of compensatory restoration required should be scaled to compensate for the full amount of interim ecosystem damages incurred.

[13] There are times when an ecosystem experiences a total loss in services and cannot recover naturally. In this case, the services are considered to be lost in perpetuity and compensatory restoration is calculated accordingly.

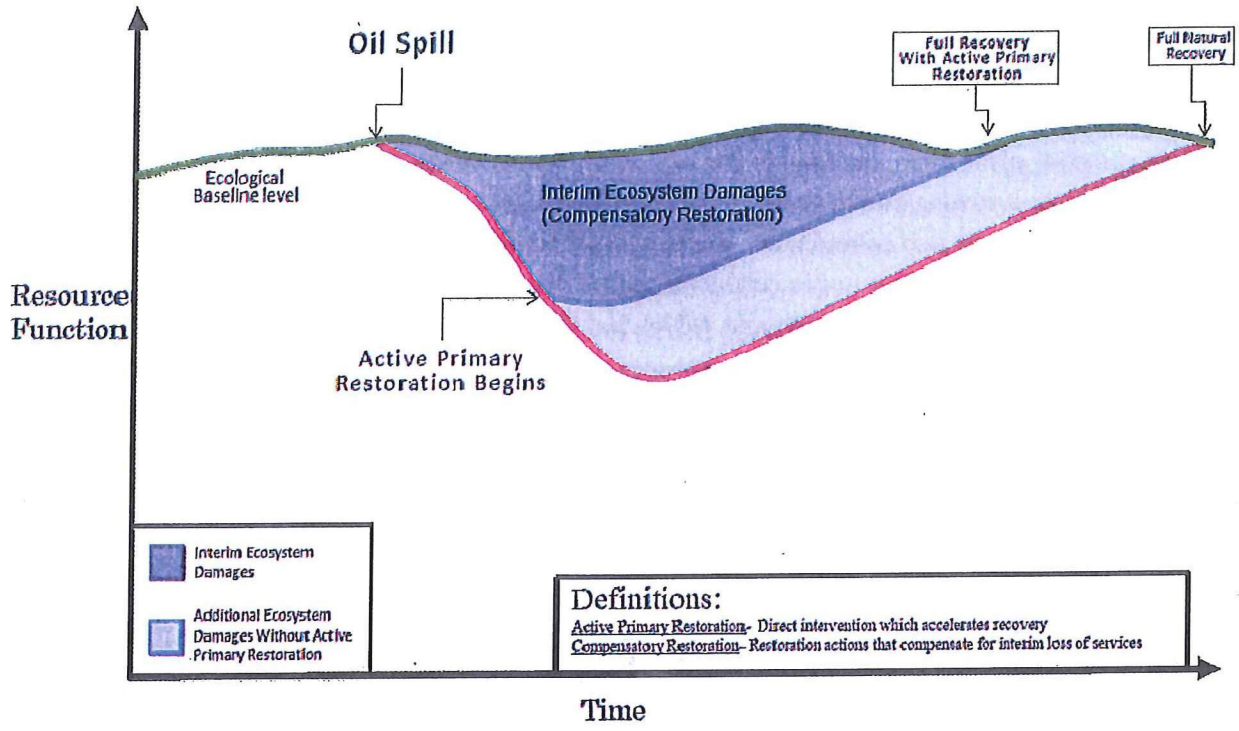


**Figure 1:** The Oil Pollution Act requires that the responsible party restore damaged natural resources to their baseline (pre-accident) condition. The amount of compensatory restoration required is equal to the interim ecosystem damages.

## III. Applying the NRDA Process to the Deepwater Horizon Oil Spill

### A. Initial Response and Organization of Damage Assessment Activities

When the Deepwater Horizon explosion occurred in April 2010, NOAA's Assessment and Restoration Division was already extremely busy conducting a number of oil spill and waste damage assessments and training activities. Ironically, the Division had just participated in a drill aimed at testing preparations for a "spill of national significance" (the drill took place in Portland, Maine in late March 2010). While such a spill had never been declared before, the Division was focused on evaluating and developing lessons learned from the drill, in coordination with its sister division, the NOAA Emergency Response Division, participating co-trustees, and the acting responsible party and sponsor for the drill, Shell Oil Company.

The Assessment and Restoration Division was first notified of the Deepwater Horizon explosion via a hotline report generated by the Emergency Response Division's Scientific Support Coordinator, Charlie Henry, in early morning hours of April 21, 2010. The initial report indicated that there was oil on board the rig. At this point, the standard procedure for the Division is to stand by and initiate contact with other federal and potentially affected state and tribal trustees. By April 25th, the Assessment and

Restoration Division was on-scene in Houma, Louisiana and ready to begin collecting time-sensitive data that would help establish the toxicity of the oil and the baseline condition of potentially affected resources. By late April, NOAA offered to take the lead in organizing damage assessment activities and daily conference calls were scheduled among the trustees to provide situational updates and adapt future field sampling plans. From the time of the explosion, Florida, Alabama, Mississippi, Louisiana and Texas trustees began watching events unfold from their coastal offices. By Saturday, May 1st, experienced environmental and contaminant scientists from Florida, Alabama, and Mississippi, as along with various academic institutions, began collecting coastal baseline data in anticipation of the oil reaching their respective coastlines. In Houma, NOAA, the State of Louisiana, and the Department of the Interior began organizing technical working groups and collecting baseline data along the Louisiana coast. Texas, with an experienced damage assessment program in place, was also engaged and was monitoring the movement of oil from the spill. The pregnant pause between the day of the explosion and the day the oil finally reached the coastline allowed the trustees to organize and collect vital background data over a large portion of the Gulf coastline. Figure 2 lists the trustee agencies currently involved in the Deepwater Horizon damage assessment.

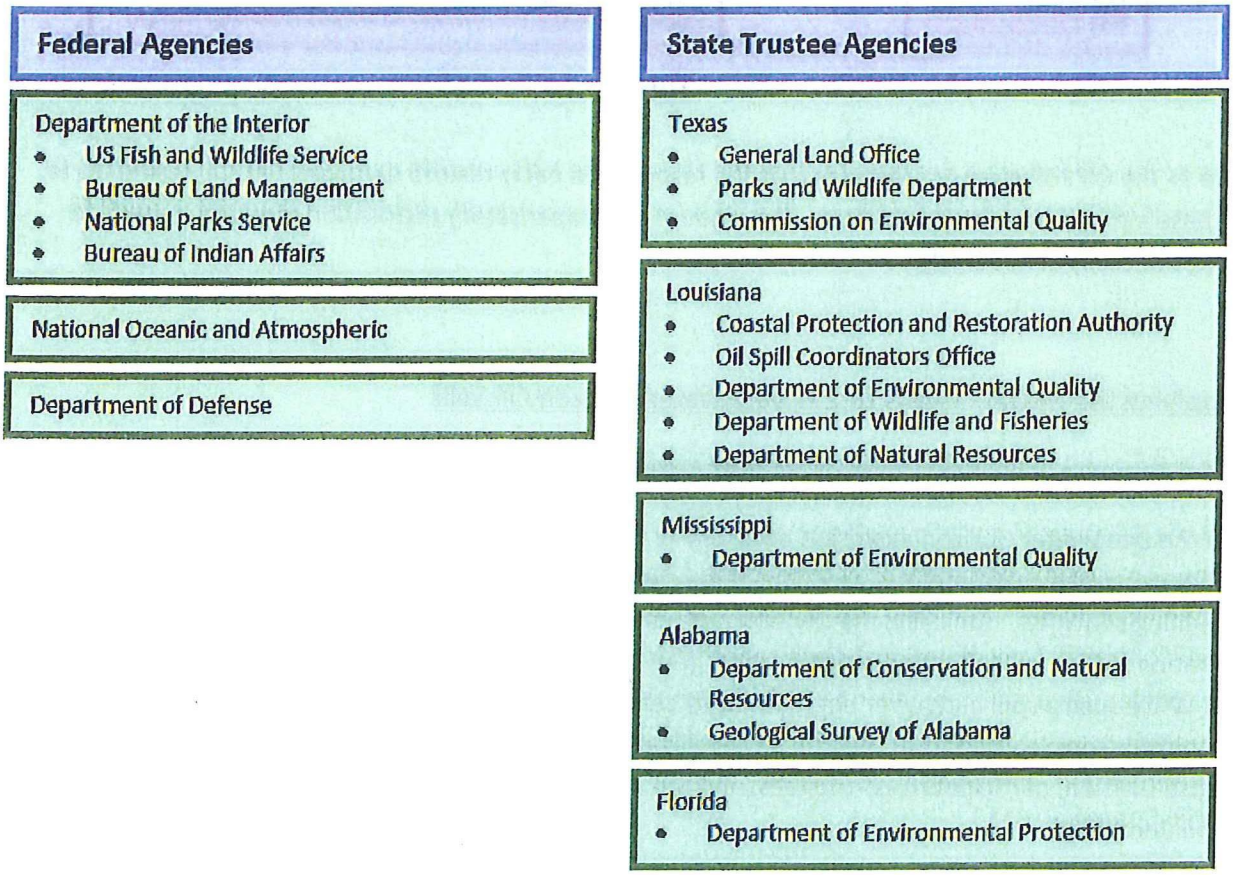


**Figure 2:** With two federal and 12 state agencies participating in the Deepwater Horizon NRDA process, coordinating schedules, reviewing documents, and communicating effectively across so many trustee agencies is complicated.

In the days following the Deepwater Horizon explosion, it became clear to NOAA's Assessment and Restoration Division that this was a once-in-a-generation spill that would require the majority of Division staff and resources to conduct a comprehensive damage assessment. Existing work load was left to a handful of staff that would remain behind to hold down the fort. By early May, BP and the trustees agreed to work under the cooperative framework to assess potential damages from the spill. Two week rotational staffing assignments were quickly put in place and emergency contracts for technical support staff were activated. Charlie Henry, the Division's Scientific Support Coordinator warned that the response and impact assessment of this release would not be a sprint; it would be a marathon.

At present, damage assessment activities being carried out across the Gulf are being managed from a central "war room" at the Incident Command Center in Houma, Louisiana. Needless to say, the scale of the undertaking represents new challenges for everyone involved—not only in terms of the geographic scale of the area being studied (both horizontally and vertically), but also in terms of the sophistication of the oceanographic equipment and the breadth of expertise being tapped to conduct the assessment. Field work is being carried out from various staging locations around the Gulf, including Boothville, Louisiana; Mobile, Alabama; Pascagoula, Mississipi, and the Florida Keys. Scientists are observing oiled shorelines, tracking marine mammals, assessing fisheries impacts, and collecting water, oil, and sediment samples. To the extent practicable, each field team consists of at least one state and one federal trustee representative, as well as at least one BP representative to ensure that proper data collection and chain of custody is witnessed by all parties. The safety and logistics team in Houma outfits each team with a sophisticated GPS tracking system to monitor its sampling locations and assure team safety on a daily basis. BP and the trustees also have four to seven dedicated research vessels collecting data throughout the water column at various intervals.

The war room and field staff likewise includes representatives from both BP and the trustee agencies. Per the cooperative process, the lead trustee coordinator is working in tandem with the lead BP representative in Houma to conduct regular communications with the field staff, orchestrate the flow of proposed field plans from inception through final approval, coordinate trustee agency communication, and work with the Operations Coordinator to manage field safety and logistics.

B. Status and Early Results of the Damage Assessment Effort

As a first step in assessing damages from the Deepwater Horizon spill, state and federal trustees identified numerous categories of resources that might be at risk of adverse impacts and began developing and carrying out preliminary assessment plans. Table 1 lists the specific resources being studied by the trustees and BP through their technical representative, Entrix, as part of the damage assessment process.

**Table 1:** The trustees are currently assessing potential damages to the following resource categories in the preassessment phase. If there is a determination that an injury occurred the magnitude of the injury will be quantified as part of the restoration planning phase.

| Resource Focus | Preassessment Studies | Status |
|---|---|---|
| **All Resources** | • *Review historical information* to help document pre-spill conditions. | • *Ongoing* |
| **Water Column and Sediment**<br>*Water*<br>*Oil*<br>*Sediment* | Document the amount of oil in the water, and determine how and where the oil is moving.<br>• *Various types of Water quality surveys* document the presence of oil at various depths.<br>• *Transect surveys and sentinel stations* detect submerged oil.<br>• *Plume modeling and other studies* provide detail about the type of oil and how it moves in water.<br>• *Sediment sampling* documents the presence of oil across habitats. | • *Ongoing*<br>• *Ongoing*<br>• *Ongoing*<br>• *Ongoing* |
| **Shorelines**<br>*Beaches*<br>*Wetlands*<br>*Mudflats*<br>*Mangroves* | Document the extent and amount of oil on shoreline habitats.<br>• *Aerial surveys* provide a bird's eye view of coastlines to determine the extent of oil; the resulting maps and data help target ground surveys.<br>• *Ground surveys* allow scientists to collect more detailed data on the degree of oiling (e.g. light vs. heavy) and focus future data collection efforts. | • *Ongoing*<br>• *Ongoing* |
| **Aquatic Vegetation**<br>*Seagrasses*<br>*Sargassum* | Document the presence/diversity of aquatic vegetation, and determine if it has been oiled.<br>• *Aerial surveys* help identify where and to what extent aquatic vegetation may be oiled.<br>• *Ground surveys* help identify location and extent of oiled aquatic vegetation. | • *Ongoing*<br>• *Ongoing* |
| **Fisheries**<br>*Plankton*<br>*Fish larvae*<br>*Nearshore fish*<br>*Offshore fish* | Document the presence/diversity of fish and plankton, and determine if they have been oiled.<br>• *Plankton, invertebrate, fish, and fish larvae surveys* help determine the presence and/or abundance of these resources in oiled and non-oiled open water areas. | • *Ongoing* |
| **Shellfish**<br>*Oysters*<br>*Mussels*<br>*Shrimp*<br>*Crabs* | Document the presence/diversity of shellfish, and determine if they have been oiled.<br>• *Oyster surveys* document the presence and/or abundance of oysters in affected areas, and provide scientists with tissue for lab analysis.<br>• *Mussel collections* at monitoring stations help identify if mussels have been oiled, and if so, provide data for future studies.<br>• *Shrimp collections* help document the presence and abundance of shrimp in the open water and in oil plumes. | • *Ongoing*<br>• *Ongoing*<br>• *Ongoing* |
| **Corals**<br>*Shallow water corals*<br>*Deep water corals* | Document the presence/diversity of corals, and determine if they have been oiled.<br>• *Shallow-water coral surveys and tissue collection* help identify and evaluate exposure to existing communities.<br>• *Deep-water coral surveys and tissue collection* help identify and evaluate exposure to existing communities.<br>• *Monitoring devices* are installed in coral communities to determine exposure to oil.. | • *Ongoing*<br>• *Ongoing*<br>• *Ongoing* |

| Resource Focus | Preassessment Studies | Status |
|---|---|---|
| **Marine Mammals and Turtles**<br>*Whales*<br>*Manatees*<br>*Dolphins*<br>*Sea Turtles* | Document the presence/diversity of marine mammals and turtles, and determine if they have been oiled.<br>• *Aerial surveys* document the location of marine mammals and turtles before they have been impacted by oil, and document the location and number of marine mammals and turtles that may be oiled, distressed, or dead; these surveys also document the potential changes in marine mammal behavior and distribution.<br>• *Tissue sampling* from live and dead sea turtles and marine mammals helps assess oil exposure.<br>• *Acoustic technology and satellite tags* help scientists assess the behavior and movement of marine mammals. | • *Ongoing*<br>• *Ongoing*<br>• *Ongoing* |
| **Birds**<br>*Shorebirds*<br>*Colonial seabirds*<br>*Pelagic seabirds*<br>*Secretive/marsh birds* | Document the presence/diversity of birds, and determine if they have been oiled.<br>• *Ground surveys* identify injured, dead, or oiled birds on shorelines.<br>• *Aerial and photograph surveys of open sea, shorelines, and islands* help identify the location and abundance of birds, and determine if they and/or their habitats have been oiled.<br>• *Ground and boat surveys* in marshes document the abundance and degree of oil affecting marsh birds; *radio transmitters* provide for the assessment of bird movement and mortality.<br>• *Point and transect boat surveys* help scientists monitor pelagic birds. | • *Ongoing*<br>• *Ongoing*<br>• *Ongoing*<br>• *Ongoing* |
| **Terrestrial Species**<br>*Terrapins*<br>*Crocodiles*<br>*Small Mammals* | Document the presence/diversity of terrestrial species, and determine if they have been oiled.<br>• *Ground surveys* help identify and quantify oiled animals and/or habitats. | • *Ongoing* |
| **Human Use**<br>*Public beaches and parks*<br>*Public facilities*<br>*Cultural uses* | Document the many ways humans recreationally use and enjoy the natural resources of the Gulf, if these uses or enjoyment have been impacted by the spill, and if so, to what extent.<br>• *Overflight Surveys* identify public beach use.<br>• *Intercept Surveys* identify public boat ramp use.<br>• *Information Surveys* to assess cultural uses. | • *Ongoing*<br>• *Ongoing*<br>• *Ongoing* |

As of September 20, 2010, the trustees report that 50 of 60 preliminary assessment studies have been completed. Trustees expect to enter the restoration planning/injury assessment phase of the process later in September, 2010. To date, more than 17,000 water, sediment, tissue, tarball, and oil samples have been collected and over 3,300 analyses, mostly on water samples, have been completed and validated. Validated data are being made public at www.geoplatform.gov and www.data.gov.

As of September 17, 2010, wildlife responders had collected 8,030 birds, 1,114 sea turtles and 101 marine mammals, alive and dead; oiled and unoiled. These numbers are sure to increase over the coming weeks and months, but presumably, now that the oil has stopped flowing, the numbers will soon plateau. Given that collection efforts are bound to miss some number of affected animals, many of which will never be intercepted because of the effects of hiding, scavenging, sinking, decomposition, or the sheer size of the search area, the trustees will have to make assumptions to quantify impacts on

wildlife. A common practice is to assign a multiplier to the final *observed* number of different types of animals depending on the species, its behavior, and its habitat. The multiplier is then used to estimate the *total* number of animals impacted.

Results of the assessment effort to date indicate that more than 600 miles of Gulf coast beaches, wetlands, and other coastal habitats have been oiled, of which 115 miles have been designated as moderately to heavily oiled. Oiled birds and beaches are often the most visually disturbing and widely disseminated images associated with a major oil spill, however, public and scientific concern in the Deepwater Horizon case has for some time focused on the impacts of an invisible sub-surface "plume" or "cloud" of oil. As part of the response and damage assessment effort being coordinated by BP and the trustees, 23 research vessels have been working to collect thousands of data points over 5000 feet of water column to assess potential impacts on subsurface biota, both from the oil and from the use of dispersants.

While the biological impacts are not fully yet understood, the National Incident Command's Joint Analysis Group, an inter-agency workgroup that was set up to analyze sub-surface data collected by scientists from federal, private, and academic institutions, released a report that described the chemical behavior of the subsurface oil.[14] The report summarizes 419 data points collected from 9 different vessels between May 8, 2010 and August 9, 2010. According to these data, depressed oxygen levels have been detected more than 80 km from the wellhead. The report concludes that while oxygen levels are depressed in the subsurface plume as a result of biodegradation (referred to in the report as biochemical oxygen demand), oxygen levels that would be detrimental to water column organisms have not been found and are not expected.

Meanwhile, three peer-reviewed studies have been published to date in *Science* related to the behavior of oil from the Deepwater Horizon spill in the deep sea environment. (No studies have been published yet that discuss the potential toxicity of recorded oil concentrations to various organisms in the water column.)

- Camilli, et al. discovered, tracked and sampled a deepwater plume of dispersed hydrocarbons measuring at least 35 km long by 2 km wide and 200 m high at a depth of about 1100 m below the ocean surface from June 19 to June 28, 2010.[15] While they found no significant drawdown of oxygen inside the cloud, they do note that relatively slow microbial respiration in the plume "suggests that if the hydrocarbons are indeed susceptible to biodegradation, then it may require many months before microbes significantly attenuate the hydrocarbon plume to the point that oxygen minimum zones develop that are intense enough to threaten Gulf fisheries."

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[14] National Incident Command Joint Analysis Group. 2010. Review of Preliminary Data to Examine Oxygen Levels In the Vicinity of MC252#1: May 8 to August 9, 2010. August 16, 2010.

[15] Richard Camilli at al., *Tracking Hydrocarbon Plume Transport and Biodegradation at* Deepwater Horizon, SCIENCE EXPRESS, at 1 (Aug. 19, 2010).

- Hazen, et al.measured physical, chemical and microbiological properties of water samples taken from the same research area as Camilli, et al. from May 25 to June 2, 2010.[16] They report similar findings of only slight oxygen drawdown, and contend that the rate of biodegradation inside the plume is much faster than reported by Camilli et al.
- Valentine, et al. investigated dissolved hydrocarbon gases (methane, ethane, and propane) in the Gulf of Mexico water column from June 11 to 21, 2010.[17] This study again confirms the presence of the southwest plume at an average depth of 1100 m and identifies additional plumes, defined by elevated levels of methane, to the north and east of the well head, which probably were formed earlier when currents flowed in a different direction. The study suggests that the microbes in the plume have a preference for the lighter petroleum constituents (ethane and propane). They conclude, therefore, that the aging plume, once devoid of the lighter constituents, have bacterial populations that are primed for degradation of other hydrocarbons, but at a slower rate.

Taken together, these studies show the presence of deepwater plumes of highly dispersed oil droplets and dissolved gases between at 1000 and 1300 meters deep. Bacterial decomposition begins quickly for the light hydrocarbon gases propane and ethane but more slowly for the heavier hydrocarbons typically present in a liquid form and for the predominant gas, methane. The degradation rates are sufficient to reduce the dissolved oxygen concentrations, but not to harmfully low levels associated with "dead zones." Subsequent dilution with well oxygenated, uncontaminated waters is sufficient to prevent any further drawn down of dissolved oxygen in the aging plumes.

At this point, because data are still being collected on water column and fisheries impacts, it is too soon to tell whether the immediate effects of the Deepwater Horizon oil spill on coastal areas and wildlife will turn out to be smaller in scale than those associated with the *Exxon Valdez* oil spill. Based on current information on marine life fatalities, that remains a possibility. In the aftermath of the *Exxon Valdez*, for example, more than 35,000 dead birds and 1,000 dead sea otters were recovered. The *Exxon Valdez* Trustee Council estimated the final wildlife death toll to be "250,000 seabirds, 2,800 sea otters, 300 harbor seals, 250 bald eagles, up to 22 killer whales, and billions of salmon and herring eggs." Additionally, that spill oiled 1500 miles of Alaska coastline, of which 350 miles were heavily oiled. Those *Exxon Valdez* numbers are higher than currently known numbers for the Deepwer Horizon spill. Because, however, the Deepwater Horizon spill was of a very different character, occurring in the subsea in the first instance, a focus on readily discernible surface expressions of harm measured by marine life fatalities may not ultimately prove to be a fair basis for comparison.

C. Next Steps in the Damage Assessment and Restoration Process

The data collected as part of the damage assessment process will at some point be evaluated by resource specialists for both the trustees and BP. Given that there is no way to exactly quantify the

[16] Terry C. Hazen et al., *Deep-Sea Oil Plume Enriches Indigenous Oil-Degrading Bacteria*, SCIENCE EXPRESS, at 1 (Aug. 24, 2010).
[17] David L. Valentine et al., *Propane Respiration Jump-Starts Microbial Response to a Deep Oil Spill*, SCIENCE EXPRESS, at 1 (Sept. 16, 2010).

extent of shoreline oiling or the number of birds or other wildlife impacted, the final damage assessment will inevitably consist of estimates developed on the basis of careful examination of the field data (including on-going studies), comparisons to existing baseline data, reviews of the relevant literature, and much debate among the parties involved. Best professional judgment will be needed where data gaps or uncertainty exist.

When the trustees reach a conclusion as to the extent and nature of the damages that occurred and the appropriate amount of restoration required to compensate for the damages, then the matter may proceed to litigation, and be resolved by either court order or settlement. Or, in the spirit of cooperative assessment, the parties may reach a settlement without pursuing litigation. Once a settlement is reached, depending on the terms of the settlement, the responsible party may have two choices. It can opt to implement the required amount of restoration with trustee oversight, or it can pay the trustees to implement the required restoration. Either way, the terms of the agreement are memorialized through a consent decree which must be approved by the Department of Justice.

Experienced damage assessment practitioners will agree that once a final damage settlement is reached, whether this occurs after one year or ten, the results will be simultaneously debated, criticized, and praised by the public, industry, government and academia. There will be many educated opinions and no right answer. Given the high level of public interest in the Deepwater Horizon spill, the debate over what constitutes adequate restoration to compensate for the public's injured resources is certain to be intense.

With numerous studies ongoing, both under the auspices of the formal damage assessment process and outside it, the published literature regarding environmental impacts from the Deepwater Horizon spill can be expected to grow substantially in the months and years ahead. Some of the major research commitments that have already been made include the following:

- The National Science Foundation (NSF) has funded 8 studies aimed at better understanding potential impacts to coastal and marine habitats and resources under their Grants for Rapid Response Research Program. The research noted previously by Camilli et al (2010) was funded by this program, which has been praised for being virtually a sole-source of emergency funding for independent scientists during the response phase. Dr. Samantha Joye, who has reportedly found a thick layer of oil on the deep ocean floor, is also funded by NSF. Apparently, this program became so popular as an emergency funding mechanism for scientists that it has exhausted its available funds for the fiscal year.
- BP has dedicated $500 million for ecosystem assessment and recovery efforts. Reportedly, little of that money has been allocated for multiple procedural and political reasons; meanwhile, the window on collecting valuable time-sensitive data is closing[18].
- The Gulf of Mexico Sea Grant Program hosts a database for scientists to post summaries of their spill-related research. The range of research topics covered by this database includes economic,

[18] See Shaila Dewan, *The Spill's Money Squeeze*, New York Times, A:16 (September 12, 2010) ( describing how BP money "...has become mired in a political fight over control" and Gulf state governors are at the center of the controversy).

mental health, and ecosystem impacts, the results of modeling analyses, and restoration studies. At present, summary of more than 100 planned and on-going studies related to ecological baseline and impacts have been posted. The database includes BP and NSF funded projects, including some of those mentioned above.

Sources of additional information on the NRDA process:

- Damage Assessment Remediation and Restoration Program: www.darrp.noaa.gov
- Online tool that provides you with near-real time information about the response effort. Developed by NOAA with the Environmental Protection Agency, U.S. Coast Guard, and the Department of the Interior, the site offers you a "one-stop shop" for spill response information: www.geoplatform.gov
- Data from the Department of Energy, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, the Department of the Interior, and the states of Florida and Louisiana related to the spill, its effects, and the cleanup effort: www.data.gov/restorethegulf
- Office of Response and Restoration: deepwaterhorizon.noaa.gov

**Staff Background Paper**
**Restoring the Gulf Brand: The Louisiana Plan**

On May 29, 2010, Louisiana state officials sent a letter to BP, asking it to foot the bill for a $457 million makeover of the "Louisiana brand" for injuries to consumer confidence and tourism occasioned by the oil spill. The letter highlighted the seafood industry's role as "one of Louisiana's staple economic engines," and argued that a long-term strategy grounded in marketing and better science was needed to restore eroding public confidence:

> We believe it is important to act swiftly to reassure the public of the quality of our seafood. And we believe a long-term, sustained effort is necessary if we are going to impact consumer attitudes. . . . [W]e must be able to convincingly make the case that our seafood product is safe and of high quality. The images of oil and dispersants will be difficult to overcome without science to back up our claims, and Louisiana is committed to taking these steps as quickly as possible.[1]

In this spirit, the letter attached a proposal for a 20-year multi-agency initiative that would seek to accomplish three goals:

1. Implementation of a science-based seafood safety testing program with transparent metrics of safety and quality.
2. Implementation of a certification program for quality and processing of certified Louisiana seafood.
3. A successful short-term and sustained long-term consumer information campaigns designed to reassert the Louisiana brand.[2]

After several months of negotiation with BP, the State's proposal has been significantly pared down. The current plan under consideration is a five-year, $173 million plan that could be extended (at BP's cost) if certain metrics are not satisfied at the close of the original five-year period. Specifically, Louisiana will use three criteria to determine the success of the initial five years of work:

1. Tissue sample results show no indicators that oil from the Deepwater Horizon spill is present.
2. Landings of Louisiana's major species of seafood (shrimp, crabs, oysters and fish) are at or above pre-spill levels.
3. Louisiana's markets are restored and the overall value of our seafood is at or above pre-spill amounts.

If these conditions are not met by the end of the fifth year, the plan provides that BP should fund an additional three years of the project. Henceforth, funding in three year intervals up to a maximum of 20 years should take place until the criteria are met.

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[1] Letter to Mr. Tony Hayward, Chief Executive Officer British Petroleum International, May 29, 2010, available at: http://www.wlf.louisiana.gov/news/30711.

[2] Louisiana Seafood Safety Response and Quality Certification Plan: Post-Mississippi Canyon 252 Oil Spill, August 21, 2010.

Most recently, Louisiana Lieutenant Governor Scott Angelle asked BP to provide $75 million to promote tourism and seafood in the wake of the oil spill. This amount is additional to BP's initial infusion to the state of $15 million for the same purpose. It is unclear whether these monies or part of, or separate from, the $173M five-year plan currently under consideration. In substantiating the request, Lt. Gov. Angelle pointed to a national tourist perception study done in August suggesting that 29 percent of potential visitors have canceled or postponed plans to visit Louisiana because of the spill. The same study also showed that 48 percent of the national audience believes that Louisiana restaurants are putting their patrons at risk if they serve locally produced seafood.[3]

[3] Times-Picayune Editorial: Repairing Louisiana's brand after BP's oil spill, September 17, 2010, available at: http://blog.nola.com/2010_gulf_oil_spill/print.html?entry=/2010/09/repairing_louisianas_brand_aft.html.

# Ixtoc I Oil Spill Background

The Ixtoc I was an exploratory offshore oil well located in the Campeche Bay 80km northwest of Ciudad del Carmen, Mexico near the southern part of the Gulf of Mexico (Figure 1). In the early morning on June 3, 1973 the *Sedco 135F,* a drilling platform owned by the state-owned company Petróleos Mexicanos (PEMEX), experienced a blowout after losing pressure containment due to a failure in drilling-mud circulation. An attempt to seal the well failed and the resulting blowout caused an explosion which sunk the platform and resulted in a 290-day oil spill lasting until March 23, 1980.[1] Prior to the Deepwater Horizon oil spill, Ixtoc was by far the largest marine oil spill to occur with over 3 million barrels of oil released, a surface oil sheen covering over 3,000 square kilometers, and an impact area that stretched into Texas 900 kilometers away.[2]

The events surrounding the Ixtoc incident closely resemble that of the Deepwater Horizon. Following the initial blowout of the well the *Sedco 135F* quickly sunk and damaged the underwater pipe, breaking it off close to the ocean floor and rendering the blowout preventer useless. Though located only 50 meters underwater, efforts to stem the oil flow were hindered by high oil pressure, weather, and technical challenges. Techniques also used in Deepwater Horizon oil spill to stop the flow - capping, junkshot, and the "sombrero" or "top hat" - were employed on the Ixtoc well with moderate success reducing the initial flow rate of 30,000 barrels per day to around 10,000 barrels per day.[1]

As a response tool, over 2.3 million gallons[3] (9,000 metric tons) of aerial dispersants, mainly Corexit, were applied.[1] However, efforts to remove the oil from the surface waters were notably ineffective. Strong currents, daylight-only operations, and severe weather hindered attempts to contain the oil. An estimated 225,000 barrels (30,000 tons) of oil made its way onto the Mexican barrier islands and back into the ecologically sensitive shallow lagoon habitats along the coast; much of it in the form of large floating tar mats.[1] Beach cleanup along the Mexican coast was almost non-existent. The limited cleanup efforts consisted of in-place burial on the shore and the vast majority of the oil was left to naturally decay where it came ashore. To complicate matters, a smaller oil spill from the *Burmah Agate* oil tanker off of Galveston, Texas on November 1, 1979 made Ixtoc-specific impact assessment difficult. Ultimately, an estimated 71,428 barrels (3 million gallons) of Ixtoc oil, primarily in the form of small tarballs, affected the Texan coast.[4]

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[1] Jernelöv, A. and O. Lindén. 1981. Ixtoc I: a case study of the world's largest oil spill. Ambio 10(6): 299-306.

[2] http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Fact_Sheets/Protecting_ocean_life/PEG_IXTOCISpill_May2010.pdf?n=7627 Accessed 9-22-20

[3] Based on an approximate Corexit weight of 8.4 pounds per gallon. 1.84 million gallons of Corexit were used during the Deepwater Horizon oil spill.

[4] *Ixtoc Oil Spill Assessment, Final Report, Executive Summary Prepared for the US Bureau of Land Management, Contract No. AA851-CTO-71*. US Department of the Interior, Minerals Management Service Mission. p. 27. http://invertebrates.si.edu/mms/reports/IXTOC_exec.pdf.

The full extent of Ixtoc's ecological damage in Mexico is not well established as the area had limited pre-oiling baseline data and few follow up studies were conducted. PEMEX spent only $100 million on capping and cleanup before claiming "sovereign immunity" to damages leaving little money available for monitoring.[5] As a result, most long term monitoring was conducted by US institutions. One study conducted a year after the spill by Dr. Tunnell, currently with the Harte Research Institute at Texas A&M, found that along 140 miles of affected Texan coastline, 80 percent of the fauna died and nearly half of the benthic organisms had disappeared from the near shore.[6] In addition, a Mexican cruise that took place between 1981 and 1982 sampled zooplankton, the important base of the ocean's food chain, and reported a population decline of 4 orders of magnitude.[7] These impacts on sea life reverberated up the food chain and the 1981 catches in the Bay of Campeche were greatly diminished by 50 to 70 percent.[1] The long-term effects of the oil spill are not completely understood in the Gulf and even 30 years later effects of the spill still linger.[8]

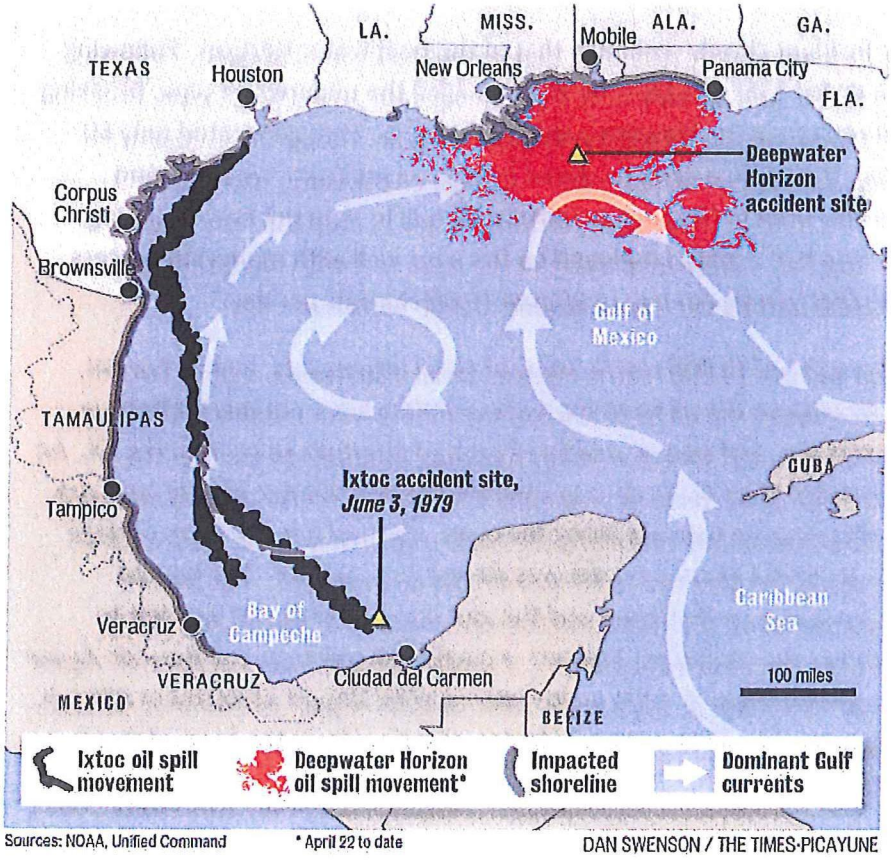


Figure 1. Size and impact area of the Ixtoc and BP oil spills as of April 22, 2010.

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[5] http://www.reuters.com/article/idUSTRE64N57U20100524 Accessed 9-22-2010

[6] Tunnell, J. W., Jr., Dokken, Q. R., Kindinger, M. E., and L. C. Thebeau. 1981. Effects of the Ixtoc I oil spill on the intertidal and subtidal infaunal populations along lower Texas coast barrier island beaches. Proceedings of the 1981 Oil Spill Conference, American Petroleum Institute, Washington, D.C., 467-475.

[7] Guzmán del Proés, et. al. 1986. The impact of the Ixtoc-1 oil spill on zooplankton. Journal of Plankton Research 8(3): 557-581.

[8] http://blog.al.com/live/2010/09/ixtoc_spill_still_contaminates.html Accessed 9-22-2010.
"It (hardened tar mats) was, I'd say, 5 to 10 percent of the size that it was 30 years ago," Dr. Tunnell

# LOUISIANA

OFFICE OF THE LT. GOVERNOR

**FOR IMMEDIATE RELEASE**
August 17, 2010
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## LIEUTENANT GOVERNOR SCOTT ANGELLE'S TESTIMONY AT U.S. SENATE COMMITTEE ON SMALL BUSINESS & ENTREPRENEURSHIP FIELD HEARING

LAFAYETTE, LA – Today, Lieutenant Governor Scott Angelle testified before U.S. Senate Committee on Small Business & Entrepreneurship Chairman Mary Landrieu and Acting Ranking Member David Vitter in Lafayette, LA at the Louisiana Immersive Technologies Enterprise (LITE) Center in a Field Hearing entitled "The Deepwater Drilling Moratorium: An Economic Disaster for Louisiana's Small Businesses."

Note: These are remarks as prepared for delivery. Lt. Governor Angelle frequently ad-libs remarks.

***Lt. Governor Scott Angelle***
***The Deepwater Drilling Moratorium: An Economic Disaster for Louisiana's Small Businesses***

"Good Morning Madam Chairman and Ranking Member Vitter.

"I bring greetings to you from Governor Jindal and the men and women of Louisiana who have been working for the past 120 days to restore our environmental and economic way of life. I thank you for bringing this hearing of the United States Senate Committee on Small Business to Louisiana which proudly hosts America's most prominent oil and gas economy.

"Since oral testimony is limited to five minutes, I will offer brief comments and introduce a few "faces of the moratorium" to make certain the public record reflects that this is policy is a burden imposed mostly on the middle class of America.

"I thank each of you for your public service and your continued interest in a strong, safe domestic oil and gas industry. I say strong and safe because that is what we have been about, and are about, in the Gulf of Mexico, with a proven track record of nearly 50,000 wells drilled over the last 60 years.

"The issuance of a six month moratorium on deepwater drilling in the United States of America is an overreach, is not necessary and has been deemed arbitrary and capricious by the federal courts. Not only did five of seven of Secretary Salazar's experts chosen to review his safety study publicly oppose the moratorium saying, "it will not measurably reduce risk further and it will have a lasting impact on the nation's economy...," but at least five independently conducted studies referenced in my written comments forecast a huge negative impact on the small businesses of America.

"I am not speaking of the stockholders of BP, Conoco, Shell, Exxon or Chevron. I am speaking of the middle class American men and women who work on the drillings rigs - the ones who put on their hard hats and steel toe boots, kiss their families goodbye for weeks at a time and do the tough work of exploring for the energy to fuel America. But that's not all. The companies that employ welders, fabricators, diesel mechanics, pipefitters, boat captains and forklift operators are seeing a decrease in business. And that's not all. The companies that employ hotel workers, retail clerks, auto mechanics, restaurant workers and caterers are impacted. And that's not all. The banks, auto dealers and real estate folks are feeling the pressure.

"I have said before this moratorium is not about big oil, but rather about the Calaises, the Cheramies, the Dupuises, the Robins and the Boudreauxs and Thibodeauxs—just a few of the South Louisiana middle class families that have taken the risk, borrowed the money, created the jobs, paid the taxes, found the energy, have done nothing wrong and yet find themselves in the bull's-eye of this poor public policy to shut down deepwater drilling.

"But don't just take my word for it.

"Todd Citron, of Hub City Ford, reports a 20 percent drop in sales of both new and used cars since the moratorium."

"Flo Meadows, a Lafayette Realtor, reports that she has had more commercial contracts dropped before closing in the last five months than in the last five years combined.

"Ken Veron, who employs 38 workers at his family owned Café Vermilionville Restaurant, reports his holiday event schedule is normally booked at this time by oilfield service companies, with deposits in hand. Today he does not have a single oilfield service company booked for a holiday event, and two other energy companies have recently cancelled events.

"Layoffs are happening all around us for all the wrong reasons. This comes at a time when our nation has invested nearly $800 billion in stimulus funding to boost the economy and create jobs, yet we still have an unacceptable employment rate.

"There is not one shred of evidence of systemic failure for the operations in the Gulf of Mexico, yet we are being treated with a one size fits all approach. We certainly have the wherewithal in America to immediately institute enhanced safety practices if we are serious and have a sense of urgency about a strong and safe domestic oil and gas industry.

"So the rest of the country can be clear there are real people impacted by this moratorium, allow me to introduce you to a few great Americans.

"The Dustin and Gwen Guillote family from Broussard: Neither are employed in the oil and gas business, but because Dustin's employer, a flooring contractor, has experienced a slow down in work from oil and gas companies, they have been forced to cancel home building plans -- an example of a cascading impact on the economy.

"Bayou Country Harley-Davidson: Since the moratorium, owner Mike Bruno's stores in Slidell and Houma have seen a 38% decrease in sales revenue, and a reduction in net operating profit in excess of $400,000. He has eliminated all advertising, reduced inventory and laid off 14 of the employees pictured here.

"From Cut Off, Kirk and Sheila Rousse and their six children ages 6 to 17: Kirk is an owner/operator-truck driver and terminal manager, hauling offshore equipment and earning commission for the loads he transports. The dramatic decrease in work since the moratorium has the Rousse's unsure of how they

will send their oldest son, a heart patient, to college this fall now that they can't afford to pay health insurance premiums.

"Dwayne Rebstock invested $3 million in a Port Fourchon multi-service dock facility that opened less than three months before the moratorium. Since then, he has laid off some of his 30 employees and made other cutbacks as he has attempted to find work not released to the oil and gas industry and keep his business going.

"Thank you again Senator Landrieu and Senator Vitter for having me here today. With your help, Louisiana will not give up on this fight. Not today. Not tomorrow. Never."

###

# Deepwater Horizon Response Consolidated Fish and Wildlife Collection Report

## Date: September 21, 2010

*To report injured or dead wildlife in the impact area call: 1-866-557-1401*

Operational Period 154

This report covers the consolidated numbers reported through the report date from noon to noon.

These are the consolidated numbers of collected fish and wildlife that have been reported to the Unified Area Command from the U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), incident area commands, rehabilitation centers and other authorized sources operating within the Deepwater Horizon/BP incident impact area.

At this phase in the response, field-level staff will document all injured or dead fish and wildlife encountered in the impact area. This document reflects only the initial, field-level, evaluation and does not reflect a final determination of the cause of injury, or death. Not all of the injured or dead fish and wildlife reflected in these numbers were necessarily caused by the Deepwater Horizon/BP incident. Official designations of cause of death will be determined at a later date.

Part of the long-term assessment process is to carefully examine and determine the cause of death or injury for impacted fish and wildlife. Some fish and wildlife reported here have likely died or been injured by natural causes, not due to the oil spill. Due to the increased number of trained people evaluating the spill impacted areas, it is also likely that we will recover more naturally injured or dead fish and wildlife than normal.

Once found or captured, collected fish and wildlife are given an identifying number that will follow it throughout the evaluation process. Collected fish and wildlife are given an initial examination to search for broken bones, external oil or other injuries. As needed, this may be followed by a more thorough examination to search for less obvious injuries, such as oil in the mouth, throat or eyes. An additional step may include a partial or full necropsy (an autopsy for animals) to help determine the exact cause of death if possible.

*** These numbers are accurate to the best of our knowledge at the time the report was created. The numbers of injured and dead fish and wildlife, as well as the cause of injury or death, are not official until verified. The categories on this report -- visibly oiled, no visible oil or pending -- are not an official determination of cause of death.*

*NOTE: It is normal for reported numbers to fluctuate between "visibly oiled," "no visible oil" and "pending." If staff are unable to make a determination at a field location, the number will be placed in the pending column and evaluated as soon as possible. Once a determination is made, the number will be moved from "pending" to the appropriate column.*

### Birds

| Birds | Consolidated #'s Collected Alive | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| Alabama | 0 | 155 | 0 | 0 | 0 | 0 | 0 | 155 |
| Florida | 0 | 254 | 0 | 0 | 0 | 0 | 0 | 254 |
| Louisiana | 0 | 1541 | 0 | 0 | 0 | 0 | 0 | 1541 |
| Mississippi | 0 | 125 | 0 | 0 | 0 | 0 | 0 | 125 |
| Texas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| On-Water | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 2075 | 0 | 0 | 0 | 0 | 0 | 2075 |

| Consolidated #'s Collected Dead | | | | | | | |
|---|---|---|---|---|---|---|---|
| Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| 1 | 193 | 2 | 540 | 0 | 1 | 3 | 734 |
| 0 | 230 | 0 | 715 | 0 | 0 | 0 | 953 |
| 0 | 1487 | 0 | 1850 | 0 | 0 | 0 | 3337 |
| 0 | 344 | 0 | 652 | 0 | 13 | 0 | 1009 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 2262 | 2 | 3757 | 0 | 14 | 3 | 6033 |

| Consolidated #'s Total Collected | | | | | | | |
|---|---|---|---|---|---|---|---|
| Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| 1 | 348 | 2 | 540 | 0 | 1 | 3 | 889 |
| 0 | 492 | 0 | 715 | 0 | 0 | 0 | 1207 |
| 0 | 3028 | 0 | 1850 | 0 | 0 | 0 | 4878 |
| 0 | 459 | 0 | 652 | 0 | 13 | 0 | 1134 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 4337 | 2 | 3757 | 0 | 14 | 3 | 8108 |

| Consolidated #'s Released |
|---|
| Total |
| 50 |
| 36 |
| 1089 |
| 33 |
| 0 |
| 0 |
| 1208 |

### Sea Turtles

| Sea Turtles | Collected Alive | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| Alabama | 0 | 5 | 0 | 7 | 0 | 0 | 0 | 12 |
| Florida | 0 | 3 | 0 | 14 | 0 | 0 | 0 | 17 |
| Louisiana | 0 | 3 | 0 | 6 | 0 | 0 | 0 | 9 |
| Mississippi | 0 | 0 | 1 | 39 | 0 | 0 | 1 | 39 |
| Texas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| On-Water | 0 | 445 | 0 | 11 | 0 | 0 | 0 | 456 |
| Total | 0 | 456 | 1 | 77 | 0 | 0 | 1 | 533 |

| Collected Dead | | | | | | | |
|---|---|---|---|---|---|---|---|
| Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| 0 | 6 | 0 | 43 | 0 | 68 | 0 | 117 |
| 0 | 1 | 0 | 0 | 1 | 62 | 1 | 63 |
| 0 | 5 | 0 | 2 | 0 | 120 | 0 | 127 |
| 0 | 1 | 0 | 75 | 0 | 200 | 0 | 276 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 4 | 0 | 1 | 0 | 1 | 0 | 6 |
| 0 | 17 | 0 | 121 | 1 | 451 | 1 | 589 |

| Total Collected | | | | | | | |
|---|---|---|---|---|---|---|---|
| Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| 0 | 11 | 0 | 50 | 0 | 68 | 0 | 129 |
| 0 | 4 | 0 | 14 | 1 | 62 | 1 | 80 |
| 0 | 8 | 0 | 8 | 0 | 120 | 0 | 136 |
| 0 | 1 | 1 | 114 | 0 | 200 | 1 | 315 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 449 | 0 | 12 | 0 | 1 | 0 | 462 |
| 0 | 473 | 1 | 198 | 1 | 451 | 2 | 1122 |

| Released | | | | |
|---|---|---|---|---|
| Total | # Nests Transported | | # Hatchlings Released | |
| | Collected Yesterday | Total | Collected Yesterday | Total |
| 1 | 0 | 16 | 0 | 986 |
| 5 | 0 | 262 | 0 | 13688 |
| 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |
| 284 | 0 | 0 | 0 | 0 |
| 314 | 0 | 278 | 0 | 14676 |

### Mammals*

* Includes Dolphins

| Mammals* | Collected Alive | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| Alabama | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Florida | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 4 |
| Louisiana | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 3 |
| Mississippi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Texas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| On-Water | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Total | 0 | 2 | 0 | 7 | 0 | 0 | 0 | 9 |

| Collected Dead | | | | | | | |
|---|---|---|---|---|---|---|---|
| Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| 0 | 0 | 0 | 4 | 1 | 3 | 1 | 7 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 0 | 3 | 0 | 54 | 0 | 4 | 0 | 61 |
| 0 | 1 | 0 | 23 | 0 | 0 | 0 | 24 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 0 | 4 | 0 | 83 | 1 | 7 | 1 | 94 |

| Total Collected | | | | | | | |
|---|---|---|---|---|---|---|---|
| Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| 0 | 0 | 0 | 5 | 1 | 3 | 1 | 8 |
| 0 | 1 | 0 | 4 | 0 | 0 | 0 | 5 |
| 0 | 4 | 0 | 56 | 0 | 4 | 0 | 64 |
| 0 | 1 | 0 | 23 | 0 | 0 | 0 | 24 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| 0 | 6 | 0 | 90 | 1 | 7 | 1 | 103 |

| Released |
|---|
| Total |
| 1 |
| 0 |
| 1 |
| 0 |
| 0 |
| 1 |
| 3 |

### Other Reptiles

| Other Reptiles | Collected Alive | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| Alabama | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Florida | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Louisiana | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Mississippi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Texas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| On-Water | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

| Collected Dead | | | | | | | |
|---|---|---|---|---|---|---|---|
| Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

| Total Collected | | | | | | | |
|---|---|---|---|---|---|---|---|
| Visibly Oiled | | No Visible Oil | | Pending | | Total | |
| Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total | Collected Yesterday | Total |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 |

| Released |
|---|
| Total |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |

END REPORT

**TESTIMONY OF JANE LYDER, DEPUTY ASSISTANT SECRETARY FOR FISH AND WILDLIFE AND PARKS, DEPARTMENT OF THE INTERIOR, BEFORE THE HOUSE NATURAL RESOURCES SUBCOMMITTEE ON INSULAR AFFAIRS, OCEANS AND WILDLIFE, REGARDING "OUR NATURAL RESOURCES AT RISK: THE SHORT AND LONG TERM IMPACTS OF THE DEEPWATER HORIZON OIL SPILL"**

**June 10, 2010**

Chairwoman Bordallo and Members of the Subcommittee, thank you for the opportunity to be here today to discuss the impacts of the Deepwater Horizon Oil Spill on fish and wildlife and their habitat in the Gulf of Mexico, and the Administration's ongoing response. Before I begin, I would like to take a moment to express my condolences to the families of those who lost their lives, to those who were injured in the explosion and sinking of the Deepwater Horizon, and to those whose livelihoods are being devastated by this oil spill.

It has been more than 50 days since BP's *Deepwater Horizon* offshore oil drilling platform exploded and sank 40 miles southeast of the Louisiana coast, releasing millions of gallons of crude oil into the Gulf of Mexico. The volume of escaped oil continues to grow, expanding the area of impact and increasing the impacts to precious natural resources throughout the Gulf region.

Federal authorities have been on scene from the very beginning—since the first hours of this disaster when it began as a search and rescue mission. Our highest priority is stopping the ongoing leak and preventing more oil from being released.

An equally important priority is protecting the resources that are or may be affected by this spill. To that end, the U.S. Fish and Wildlife Service (FWS), the National Park Service (NPS), and other federal agencies are working tirelessly to protect fish and wildlife, safeguard vital habitat, and public lands and resources that belong to the American people. These professionals are also documenting impacts and working to understand the long-term effects of the spill, so that we can hold the responsible parties accountable.

The scope and impacts of this spill are extraordinary. We do not know at this time the extent of the impacts, but we believe that in all likelihood, they will affect fish and wildlife and plant resources in the Gulf – and across the country – for years, if not more likely decades, to come.

**The Administration's Response**

The Deepwater Horizon incident is being managed under a Unified Command System, located in Houma, LA. Operational activities are being directed from Incident Commands in Houma, LA, Mobile, AL, St. Petersburg, FL, and Houston/Galveston, TX. An additional Command Center is being established in Miami, FL. The U.S. Fish and Wildlife Service is the lead federal agency for Wildlife Operations, under the command of the Incident Commander. A Joint Information Center (JIC) has been established in Robert, LA to provide informational support and serve as a conduit for ensuring that information is forwarded to the public.

In addition, Secretary Salazar dispatched me and others from the Department's natural resources and science team to Incident Command centers, including the Assistant Secretary for Fish and Wildlife and Parks, Tom Strickland; the Director of the National Park Service, Jon Jarvis; the Acting Director of the U.S. Fish and Wildlife Service, Rowan Gould; and the Director of the Bureau of Land Management, Bob Abbey and Dr. Marcia McNutt, Director of the U.S. Geological Survey and Science Advisor to the Secretary. In total, more than 24,000 federal and private personnel are responding to the incident.

The National Incident Commander and the Federal On Scene Coordinator are directing efforts and are accountable for the Administration's response. They will ensure that BP, one of the responsible parties, is meeting its obligations and pursuing all possible contingencies and bringing the right resources to respond to this spill. The Administration is working to ensure that all necessary and available federal resources are being directed to this crisis.

All of these leaders, along with personnel from bureaus and offices within the Department, work with other federal, state, and local officials to monitor and respond to immediate threats to fragile habitat; assess and address long-term damage to impacted resources; and develop and provide data and information for use by the Unified Command in responding to the incident.

This is the most complex and challenging oil spill our country has ever encountered. The source of the spill is 5,000 feet beneath the ocean surface where there is no human access and almost all the work is being done with remotely operated vehicles. The damaged well is continuously discharging large volumes of hydrocarbons into the water column. Access to the discharge site is controlled by the technology that was used for the drilling, which is owned by the private sector. Due to its technical expertise, specialized equipment, and on-site presence, BP's involvement in the efforts to stop the leak is vital to reaching a solution. The responsible parties are also responsible for the cleanup and environmental damage, and BP, one of the responsible parties, has assured the Administration that it will pay for the response and subsequent restoration efforts.

As of June 8, 377 FWS personnel, 97 NPS personnel, 45 U.S. Geological Survey personnel and the following DOI personnel are stationed on the frontlines at National Wildlife Refuges and National Park units, involved in key decisions at command centers, and participating in air, sea and beach operations to respond to reports of injured wildlife and impacted coastal habitat:

**Department of the Interior Deployed Resources – Deepwater Horizon**
*Source: Department of the Interior Bureau and Office Reports – June 8, 2010*

| Bureau/Office | Personnel | Locations |
|---|---|---|
| DOI Office of the Secretary | 38 | Washington and Gulf Area |
| Fish and Wildlife Service | 377 | Refuges and Incident Command Posts |
| Minerals Management Service | 170 | Response Centers. Others at District, Regional, and Headquarters. Oversight Support Teams. |
| National Park Service | 97 | Parks and Incident Command Posts |
| USGS | 45 | Regional Offices and Incident Command Posts |
| **TOTALS** | 727 | |

In addition, there is a FWS All Hazard Team located at the Regional Spill Response Center, in the FWS Southeast Regional Office in Atlanta, GA, providing support. Finally, many more Department of the Interior employees are working on the spill from their home duty stations.

Examples of field operations directly involving FWS, NPS, and USGS staff include:

- Helping deploy and maintain almost 2 million feet of containment boom, with the goal of protecting the most sensitive areas of marsh and other vital habitats along the Gulf coast.
- Conducting beach surveys to monitor sea turtle nests and developing protocols for cleanup crews should we discover oiled nests.
- Engaging in multiple over flights to survey for birds, manatees and other wildlife along the coasts of Louisiana, Mississippi, Alabama, and western Florida. These over flights aid in establishing a baseline that will help us document and quantify impacts as they occur and quantify impacts and predict effects into the future.
- Conducting Natural Resource Damage pre-assessments that will help us hold BP and other parties responsible for natural resource damage, and help fund restoration of the vital ecosystems of the Gulf once this spill has been contained.

**Impacts to Wildlife and Habitat**

The Gulf of Mexico is one of the world's most ecologically rich areas and provides habitat for a great diversity of fish, birds, mammals, reptiles and other wildlife. Many species of wildlife, including some that are threatened or endangered, live along the Gulf Coast and are being affected by the oil spill. The Department of the Interior and its bureaus have responsibility for a spectrum of natural resources in the Gulf that will be impacted by the oil spill, including National Wildlife Refuges, National Park units, migratory birds, and threatened and endangered species, such as manatees, and sea turtles.

Short-Term Impacts

Oil spills affect wildlife and their habitats in many ways. The severity of the damage depends on the:

- Type and quantity of oil spilled;

- Condition of the oil on and below the surface, including the length of time it is in the water before it hits land or wildlife encounters it;
- Season and prevailing weather;
- Type of shoreline; and
- Type of waves and tidal energy in the area of the spill.
- Presence of dispersants

Hundreds of miles of Louisiana shoreline have been directly impacted by oil, and last week oil came ashore in neighboring states. Many acres of marsh have been impacted by the spill, while additional acres have been impacted by sheening, a process whereby oil spreads out on the surface of the water. Over 300,000 acres of Louisiana marshland are currently being monitored.

We believe 35 National Wildlife Refuges located in the Gulf are potentially at risk from the oil spill. So far, two have been directly impacted by oil – Breton (LA) and Bon Secour (AL). Only Breton NWR has been closed to the public. Low-level over flights are prohibited there to protect nesting brown pelicans and terns. Last week, we also saw impacts to the Gulf Shore National Seashore. There are ten National Park System units that are potentially at risk from the oil spill. Petit Bois Island and Horn Island at Gulf Islands National Seashore were the first National Park units to be impacted, with tar balls and oil sheen washing up along a two-mile stretch of beach, but the island remains open to the public. Teams have been evaluating and responding to the situation, but cleanup efforts have been hampered by inclement weather. A light scattering of oil appeared this past Monday at Peridio Key that clean-up crews addressed and the Fort Pickens and Santa Rosa areas continue to receive light oiling, which are being cleaned-up. Tar balls have also been observed in Dry Tortugas National Park, but these were determined to not be affiliated with the Deepwater Horizon oil spill. The affected areas were cleaned over Memorial Day weekend. There has been no oil from the Deepwater Horizon incident at other national parks in the Gulf, and monitoring continues at all park coastal areas.

Additionally, coastal habitat associated with projects funded by millions of dollars of the North American Wetlands Conservation Act (NAWCA) grants are potentially threatened by the oil spill. Significant NAWCA grant and partner match dollars have been or are being invested in coastal areas of Texas, Louisiana, Mississippi, Alabama and Florida Gulf to protect, restore, and enhance wetlands and wetland-associated uplands for migratory birds and other wildlife. We are also concerned about Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) projects. CWPPRA provides for targeted funds to be used for planning and implementing projects that create, protect, restore and enhance wetlands in coastal Louisiana and other Gulf states. The CWPPRA program receives millions of dollars in federal funding each year to fund projects.

This spill occurred at the peak of the breeding or spawning periods of a large number of species in the Gulf, including sea turtles, many local bird species such as brown pelicans and least terns, as well as various fish and invertebrates that are critical species at the base of the ecosystem. As these birds and other wildlife ingest oil, inhale fumes, become covered with oil, and consume marine resources that are affected by oil, the entire Gulf ecosystem will be impacted throughout the food chain, from marine plankton, fish, and shellfish, to birds, mammals and other wildlife.

Direct mortality will occur. We also expect wildlife impacts to be subtle and chronic and persist for years and could possibly have population-level impacts.

Oil causes harm to wildlife through physical contact, ingestion, inhalation and absorption. Floating oil can contaminate plankton, which includes algae, fish eggs and the larvae of various invertebrates. Fish and some seabirds can become contaminated by feeding on these organisms as prey, or by direct toxic effects of oil. Larger animals in the food chain can consume contaminated organisms as they feed on these fish and other prey and die, thus impacting entire ecosystems through a cascading effect.

We share the public's frustrations that BP has been unable to protect the Gulf coastline from oil coming ashore. For this reason, we are redoubling our efforts to pressure BP to deploy more resources where they are needed most.

Long-Term Impacts

The long-term impacts from the Deepwater Horizon release cannot be determined at this point. There are still unanswered questions about the amount of oil released and remaining in the Gulf, the effects of dispersants used at the surface and at depth, and how this particular oil will degrade in the environment. An Environmental Incident Science Team, led by the USGS and with personnel from FWS, NPS, and MMS representing their bureaus' science and resource-management needs, is developing a long-term science plan designed to address these needs as we move from the immediate response phase into the longer-term response and recovery phase. Even before completion of this plan, we can make reasonable inferences based on scientific literature, prior experience, and expert judgment.

We expect to see a high degree of mortality in microscopic and macroscopic life (e.g. zooplankton, larval fish and crustaceans) that encounter oil and other toxins in the water. We also fully expect secondary, tertiary, and top consumers/predators in the food web, such as invertebrates, fish, birds, turtles, and mammals, to be negatively impacted directly or through cascading effects in the ecosystem.

We are particularly concerned about the health of birds in the Gulf of Mexico, including the millions of migratory birds that range across the Western Hemisphere but ultimately winter in or migrate through the estuaries, marshes and other coastal areas of the Gulf as they move through the central flyway. Birds are a key indicator species of the health of the Gulf environment and we have begun the numerous investigations necessary to understand the extent and magnitude of the impact to bird species in the region.

Many of the migratory birds that winter along the Gulf Coast are currently farther north on their breeding grounds in Canada and the northern prairies of the United States. However, we expect the oil to persist long-term in the food chain. When these migratory birds return to the Gulf Coast in the fall, they will likely be exposed to oil as they forage, or possibly face starvation as a result of depleted insect, marine and plant life due to oil incursion. These coastal areas are also the key stopover sites for hundreds of millions of neotropical migratory songbirds that rest and

feed in these habitats during both their spring and fall migrations. With the likely persistence of this oil and its impacts for years to come, myriad bird species will potentially be affected.

Assuming substantial quantities of oil enter the coastal marshes of Louisiana, Mississippi, Alabama and Florida, we can expect very significant impact to the entire coastal ecosystem of these areas. In addition to the severe, and likely long-term, impact to marsh vegetation, various invertebrates such as crabs and shrimp and many vertebrates including fish, birds, turtles, and some mammals could be significantly affected. The injury suffered by water and wading birds such as the brown pelican, mottled duck, egrets, ibises, and herons will be potentially dramatic. We have all already seen the terrible photographs of fully oiled pelicans either dead or struggling to survive.

Health effects to birds of exposure to oil include death, poisoning, skin irritation, matting of feathers leading to loss of flight and poor temperature regulation. Longer-term effects of oil on birds and marine mammals are less understood than are short-term impacts, but oil ingestion has been shown to cause suppression of the immune system, organ damage, as well as reproductive changes such as embryo death in eggs and behavioral changes leading to reproductive impairment. Damage to the immune system can lead to secondary infections that cause death and behavioral changes may affect an animal's ability to find food or avoid predators. Long-term consequences can include impaired fitness and reproduction, potentially impacting population levels.

Oil has the potential to endure in the environment long after a spill event and has been detected in sediment 30 years after a spill. In tidal flats and salt marshes, oil may seep into muddy bottoms and persist for an extended period of time, remaining toxic and preventing the germination and growth of coastal and marine plants. The effects of oil on the vegetation and invertebrates in these systems will undoubtedly have long-term impacts on fish and wildlife populations. These plants are important to the buffering capacity of marshes and wetlands from storm events and provide habitat for birds and other animals. Impacts associated with the conversion of wetlands to open water, subsidence, and sea level rise will serve to only weaken the ability of the coastal wetlands to withstand and recovery from the impacts of future storm or spill events.

Furthermore, any projection of damages may be impacted by the use of dispersants in response to this spill. This spill has resulted in the use of dispersants in quantities unprecedented in the United States (over 1,100,000 gallons), and the first use of dispersants at significant depth (over 300,000 gallons). EPA Administrator Lisa Jackson has pointed out the following:

- We know that dispersants are less toxic than oil.
- We know that surface use of dispersants decreases the risks to shorelines and organisms at the surface. And we know that dispersants breakdown over weeks rather than remaining for several years as untreated oil might.
- After testing and authorizing dispersant use underwater, we also remain optimistic that we are achieving similar results with the use of less chemicals.

The dispersants are meant to help breakdown the oil and decrease the resulting damage. As the dispersant is used underwater, EPA is requiring BP to do constant, scientifically rigorous monitoring so that EPA scientists can determine the dispersants' effectiveness and impact on the environment, water and air quality, and human health. The Administration will continue to closely scrutinize the monitoring results and reserve the right to stop the use of subsea dispersants if the science indicates that this method has negative impacts on the environment that outweighs its benefits.

The preliminary assessment of wildlife and habitat impacts to date from the Deepwater Horizon Oil Spill is only a precursor of major and long-lasting ecological impacts to the Gulf of Mexico, and beyond, should the Loop Current carry the oil toward the Florida Straits.

**Engaging the Public**

The Administration is undertaking a variety of activities to engage the general public and local communities and to disseminate and receive information about the environmental impacts of the Deepwater Horizon oil spill.

Secretary of the Interior Salazar, as well as other Administration leaders, is meeting regularly with national, state and locally elected officials to share information and receive input. In addition, Administration representatives are meeting with communities at town hall meetings and in other forums. For example, this week, representatives from the U.S. Coast Guard, U.S. Fish & Wildlife Service, the Environmental Protection Agency and other state and partner agencies responding to the Deepwater Horizon incident, will host two Open House Expos in Plaquemines Parish, Louisiana. The Open House Expos will offer Plaquemines residents the opportunity to engage one-on-one with experts about the techniques, strategies and materials being used in the spill response. Officials have also participated in teleconference briefings for congressional staff, frequently held press announcements and briefings for the media, and provided other periodic briefings for nongovernmental organizations and other partners.

The Administration is utilizing new media to reach interested members of the public. As of June 9, there were: 32,148 Facebook followers, 7,218 Twitter followers, 2.3 million views on YouTube of more than 55 posted videos, 136,682 views of the photographs posted on Flickr, and over 78 million hits on the primary website set-up for the incident, www.deepwaterhorizonresponse.com/. All information is being coordinated through the JIC, which is staffed with representatives from federal agencies and others.

A number of incident "hotlines" were established early in the Administration's response to the oil spill to encourage information sharing directly with the public. For example, there is an environmental hotline with community information (866-448-5816), an assistance hotline to make requests for booms and offering vessels of opportunity (281-366-5511), a wildlife distress hotline (866-557-1401), a claims hotline (800-440-0858) and a volunteering hotline (866-647-2338). Contacts have also been set-up to receive technical response suggestions and forward them to the Unified Command if they are useful.

Looking forward, the Department of the Interior, in conjunction with the Department of Homeland Security, has launched an investigation into the causes of the *Deepwater Horizon* offshore oil drilling platform explosion, and is holding public hearings, calling witnesses, and taking any other steps needed to determine the cause of the spill. In addition, the 30-day safety review that President Obama ordered the Department of the Interior to undertake has been presented to the President and has helped us understand what safety measures should be immediately implemented.

In mid-May, the National Academy of Engineering agreed to the Secretary of the Interior's request to review the Deepwater Horizon spill. This highly respected organization is a part of the National Academy of Sciences (NAS), and will bring a fresh set of eyes to this tragedy. The National Academy of Engineering will conduct a rigorous, independent, science-based analysis of the causes of this oil spill. The NAS has carried out similar independent investigations into events like the space shuttle Challenger accident.

**Restoring Natural Resources**

In order to restore natural resources in the Gulf of Mexico injured by the Deepwater Horizon oil spill, the Administration's efforts must initially focus on stopping the release of oil from the well and containing the oil to mitigate impacts to trust resources along our fragile coastline. We must also direct our efforts towards determining the magnitude of the injuries to natural resources so that BP and other responsible parties can be held accountable for restoring them.

Preparation for determining the extent of the injuries to natural and cultural resources is already underway, as natural and cultural resource experts in the FWS, NPS and other federal agencies are actively collecting baseline sediment, water and photographic data, conducting beach surveys on public lands, surveying the coasts for injured birds, manatees and other wildlife, and conducting Natural Resource Damage pre-assessments. FWS and NPS, along with other Interior, state, tribal and federal partners, will act as "trustees" for natural resources injured by the oil spill. FWS has responsibility for National Wildlife Refuges, threatened and endangered species, migratory birds, anadromous fish, and other natural resources that fall under the jurisdiction of FWS. NPS has responsibility for National Park units and the natural and cultural resources and habitats protected within their boundaries including wildlife, seagrass beds, coral reefs, mangroves, salt marshes and shipwrecks and other historic features. As trustees, we will identify the natural and cultural resources injured, determine the extent of the injuries, recover damages from the responsible parties, and plan and carry out natural resource restoration activities. Even though some assessment work has begun, natural resource trustee agencies will not be able to determine the magnitude of the resource injuries until the oil spill is stopped and the effects are understood.

Once the magnitude of the resource damage is determined, the trustees will pursue a claim against BP and other responsible parties of the Government's conclusions as to the full costs of the restoration, for the loss of natural resources and natural resource services to the general public, and for the cost of the response and assessment activities. In testimony before the House Energy and Commerce Committee on May 25, the Department of Justice reiterated the

Administration's commitment to explore all legal avenues to ensure that those responsible for this disaster pay for *all* of the devastation that they have caused.

The Oil Pollution Act of 1990 (OPA) was passed in the wake of the Exxon Valdez disaster to provide specific legal authority for dealing with the consequences of oil spills. OPA assigns responsibility for cleaning up such spills. It also provides a liability scheme for payment of damages, ranging from the immediate and ongoing economic harm that individuals and communities suffer to the potentially devastating and long-term harm done to precious natural resources.

Although OPA is the primary federal vehicle for addressing liability for response costs and damages resulting from oil spills, it is not the only legal vehicle for seeking compensation for incidents such as those now unfolding in the Gulf. OPA expressly preserves state and other federal mechanisms for pursuing damages for injuries caused by such incidents and for assessing penalties for the underlying conduct that may cause such disasters. For example, the National Park System Resource Protection Act (16 U.S.C.19jj) establishes additional authority for addressing natural and cultural resources for which the National Park Service is trustee.

After the claim is resolved, whether by settlement or litigation, the trustees will develop a final restoration plan with public input that specifies the actions necessary to restore the injured resources. The trustees will then monitor the restoration projects to gauge progress, performance and success of the restoration actions as well as the need for any interim corrective action.

The Secretary of the Interior has made absolutely clear in meetings with BP executives that BP, as a responsible party, will be held fully accountable for paying costs associated with this spill. In a letter to Secretary Salazar and Homeland Security Secretary Janet Napolitano, BP has confirmed that it will pay all damages regardless of whether the statutory liability cap contained in the OPA applies. While the investigations into the cause of this disaster are still underway, the Administration will ensure that those found responsible will be held accountable for their actions.

**Looking Forward**

The Administration believes the visible natural resource impacts to date, particularly to fisheries and wildlife, are only the start of what will be a major and long-lasting ecological disaster. Science underpins everything we do in conserving fish and wildlife and other natural resources. It broadens and deepens our understanding of natural processes and ecosystems, and in so doing it enables us to be more effective, judiciously allocate our budget and assets, make sound decisions, and better meet our stewardship responsibilities in serving the American people.

For the past 18 months, the Department of the Interior has focused most of our new capacities in landscape planning and science to build what we call Landscape Conservation Cooperatives, or LCCs. These LCCs are designed to help us and our conservation partners develop and apply up-to-date scientific theory and practical approaches to helping fish and wildlife adapt to the adverse effects of large-scale ecological disruptions, such as climate change and now the Deepwater Horizon oil spill.

In addition, other areas within FWS such as the migratory bird and habitat conservation programs have a significant role in assessing the oil spill's impacts and developing monitoring programs and protocols. Our National Wildlife Refuge System has moved forward to develop unified, integrated systems to monitor resources on refuges, inventory those resources, and make that information available for analysis by our own scientists and their counterparts in other agencies, nongovernmental organizations, universities, and the public. Inventory and vital signs monitoring programs currently in place in National Park units will contribute to analyses and assessment of impacts as well. Additional efforts by the Department are currently underway to develop long-term integrated science plans for the marine and coastal ecosystems of the Gulf of Mexico.

Addressing the environmental impacts of this oil spill is going to be very challenging. Fortunately, we are in a better position now that we have begun to bring partners together to develop science capacity through the LCCs surrounding the Gulf Coast. As with our work on climate change, the BP Deepwater Horizon oil spill disaster will require the cooperation and shared resources of many partners to come together, bring ideas, and analyze, address, and mitigate impacts to fish and wildlife and other natural resources using science. When it comes to the long-term restoration efforts, the LCCs now being established will play a key role in helping us determine when and how that restoration will occur along the Gulf Coast.

Through these conservation partnerships we plan to bring together the scientific capabilities, ideas, resources, and the ability to leverage resources to address challenges posed by the oil spill and reduce its effects on fish and wildlife, National Wildlife Refuges, National Park units, commercial fishing, ecosystem functions, and other important resources in the Gulf.

Dealing with the more immediate challenges presented by BP's offshore platform disaster will require better coordination of science, planning, and operations to address the ongoing impacts to the Gulf of Mexico and the likely broader effects that may occur outside this area.

**Conclusion**

The Deepwater Horizon Oil Spill is the latest in the series of events graphically illustrating our Nation's need to understand, value, and nurture the Gulf of Mexico ecosystem. The spill has illuminated the need for additional information about wildlife, fisheries, and habitats as we try to quantify the damage, and understand the cumulative effects of the catastrophic stressors acting on the Gulf Coast system. The immediate impacts of the spill are graphic, obvious, and tragic to our natural resources and the people who cherish and make their livelihood from the Gulf. The deepwater location of this spill, in combination with the volume of oil discharged and oceanographic and weather influences introduce major uncertainty into defining the full range of foreseeable impacts.

We must bring to bear our best scientists and our best science, to understand the Gulf's resources at risk, the impact of oil on the health of those resources, and the future trajectories of critically important resources to Gulf Coast communities and our nation as a whole. We must better

understand, and predict the future paths of the fisheries, the migratory birds, the endangered species, and the local and national economies associated with these resources.

This Administration is committed to helping the people and communities of the Gulf Coast region persevere through this disaster, to protecting our important places, and to learning valuable lessons that will help prevent similar spills in the future.

# The Natural Resource Damage Assessment and Restoration Program

*When hazardous substances enter the environment, fish, wildlife, and other natural resources can be injured. The Departments of Interior and Commerce, along with state, tribal and other federal partners, act as "trustees" for these resources. Trustees seek to identify the natural resources injured and determine the extent of the injuries, recover damages from those responsible, and plan and carry out natural resource restoration activities. These efforts are possible under the Natural Resource Damage Assessment and Restoration Program, the goal of which is to restore natural resources injured by contamination.*

FWS/Drew Wirwa

*Brown pelicans nesting at Breton NWR.*

## Benefiting the Public

The primary benefit of the Restoration Program is that injured natural resources can be restored at no cost to the American taxpayers. Instead, the parties responsible for the injuries pay for the restoration. Because of this program, people across the country enjoy rivers and lands that are once again healthy and teeming with fish and wildlife, and public places that are safe for recreation and other uses. Through the dedication of state and federal agencies, as well as organizations and individuals committed to caring for the environment, we are making progress toward a cleaner, healthier environment for all living things.

## The Program's Origin

Hazardous substances are a constant threat to our fish, wildlife, and other natural resources. As a result of concern over the influx of contaminants into the environment, and a wish to ensure that the responsible parties—not the taxpayers—pay for the cleanup and restoration, Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (also known as CERCLA or "Superfund"), the Clean Water Act, and the Oil Pollution Act of 1990. These three laws provide trustees the authority to carry out the responsibilities of the Restoration Program.

## Entrusting Our Natural Resources

As the Nation's principal conservation agency, the Department of the Interior is trustee for most of our nationally owned public lands and natural resources.

These include lands such as National Parks, National Wildlife Refuges, and lands managed by the Bureau of Land Management; Indian lands and natural resources held in trust by the federal government; waters managed by the Bureau of Reclamation; and, federally protected plants and animals such as endangered species, migratory birds, and wild horses and burros. The agencies within the Department responsible for the management of trust resources are the Fish and Wildlife Service, Bureau of Indian Affairs, Bureau of Land Management, Bureau of Reclamation, and National Park Service.

Other federal agencies with trust responsibilities for our Nation's natural resources include the National Oceanic and Atmospheric

## Deepwater Horizon Oil Spill Trustee Council

FWS/Drew Wirwa

*Nesting colony of Royal terns.*

Administration (NOAA), U.S. Forest Service, and Department of Energy. The Departments of Defense and Agriculture have been invited to participate. Like the Department of Interior, they have responsibility for certain lands, waters, and other specified trust resources and most have active restoration programs. States and Indian Tribes also are trustees with the authority to conduct damage assessments and restoration activities on their own behalf. When there is overlapping trusteeship, trustees benefit from working together.

### Restoring The Resources

To fulfill the mission of restoring natural resources that have been injured by oil spills or hazardous substance releases, several steps must be taken.

Generally, the process works like this:

- Oil is spilled or a hazardous material is released into the environment. Many of these incidents involve discharges into bodies of water—oceans, lakes, and rivers—where the oil or hazardous material has the potential to spread far beyond the original source.
- The source of the discharge is contained by the Coast Guard, the Environmental Protection Agency, a State agency, and/or the responsible party.
- The oil or hazardous material is cleaned up to the greatest extent possible. This can be a fairly straightforward process for a small oil spill where the contained oil can be skimmed off the surface of the water. It can be very complicated when dealing with larger spill events and old mine wastes or hazardous chemicals which have been absorbed into the soil and are contaminating groundwater and surface water.
- Natural resource trustees determine the magnitude of the injuries to natural resources. This can begin during the response and cleanup or afterwards. Generally, however, it cannot be finished until after the cleanup is completed because the full extent of the injuries cannot be determined until then.
- The trustees contact the responsible parties and attempt to reach a settlement for the cost of the restoration, for the loss of the use of the land or resources to the general public, and for the money the trustees spent to assess the damages. When the responsible parties agree to do the restoration work themselves, money for restoration is not collected by the trustees. This is called in-kind work.
- If a negotiated settlement cannot be reached, the trustees can take the responsible parties to court. Most cases are settled out of court.
- When a settlement is reached, a restoration plan is developed with public input that specifies the actions necessary to restore the injured resources. These actions can be carried out on the lands where the contamination occurred or at an alternate site which, when restored, provides a suitable replacement for the injured or lost resources. Sometimes the responsible party donates land to be restored and protected.
- The trustees monitor the restoration projects to assure they continue to be properly operated and to ensure the long-term success of the restoration.

For more information about the Natural Resource Damage Assessment and Restoration Program, go to: http://www.fws.gov/contaminants/.

### Hotlines

For media: Joint Information Center: 713/323 1670 and 713/323 1671.

To report claims related to damages: 800/440 0858

To volunteer: 866/448 5816

To report oiled or injured wildlife: 866/557 1401

**August 2010**

**DR. JOHN FARRINGTON**

**Interim Dean, School of Marine Science and Technology, University of Massachusetts, Dartmouth**

*Day 2, Panel 2: Impacts: Environmental and Economic*

Anticipated Focus:

Dr. John Farrington will discuss his experience with oil spills, including the 1979 Ixtoc I spill in the Gulf of Mexico. He will also articulate his current understanding of the Deepwater Horizon oil spill and the resiliency of the Gulf ecosystem.

Biography:

Dr. John Farrington holds a doctorate from the Graduate School of Oceanography at the University of Rhode Island. He spent the bulk of his distinguished career at the Woods Hole Oceanographic Institution (WHOI) in a succession of positions from postdoctoral investigator to senior scientist (the equivalent of full professor in WHOI's system) in the Chemistry Department. From 1981-1987, Farrington held leadership positions as Director of WHOI's Coastal Research Center (1981-1987), Associate Director for Education and Dean of Graduate Studies (1990-2002), and Vice President for Academic Programs and Dean (2002-2005). Farrington retired from WHOI in March 2006, and since that time holds the title of Scientist Emeritus at WHOI.

From 1988 to 1990, Farrington was the Michael P. Walsh Professor and Director of the Environmental Sciences Program at UMass Boston. His professional interests are: biogeochemistry of fossil fuel and anthropogenic compounds in the marine environment; environmental sciences; science-policy interactions, especially as related to environmental issues and diversity issues; leadership in academic, research, educational and non-profit organizations; education in the sciences, both formal and informal, including progress for a diversity of learners; science and religion interactions; organic geochemistry of the marine environment; biochemistry of marine organisms; and petroleum geochemistry. He has published 119 scientific papers and chapters in the scientific literature and more than 30 papers about science-policy interactions and education in marine sciences.

Farrington is currently the president of the Ocean Sciences Section of the American Geophysical Union. He serves as chair of the Board of Trustees of the New Bedford Oceanarium, which operates as the Ocean Explorium at New Bedford Seaport; a member of the Board of Trustees of the Bermuda Institute of Ocean Sciences; and a member of the Board of Overseers of the Sea Education Association.

**JANE LYDER**

**Deputy Assistant Secretary, Fish and Wildlife and Parks, Department of the Interior**

*Day 2, Panel 2: Impacts: Environmental and Economic*

Anticipated Focus:

Deputy Assistant Secretary Jane Lyder will discuss wildlife impacts to Interior resources, including shorelines, sea turtles and birds.

Biography:

Deputy Assistant Secretary Jane Lyder has worked within the federal government for 34 years. For more than 30 years, she was in the Department of Interior's Office of Congressional and Legislative Affairs, where she was the longest serving legislative counsel in the history of the department. Lyder started her federal career in 1975 as an attorney in the Office of the Legislative Counsel for the House of Representatives.

Lyder has played a major role in a number of landmark pieces of legislation affecting Native Americans, parks, fish and wildlife, energy development, wilderness, administration of the U.S. territories and other aspects of the Department of the Interior. She currently is a Deputy to Assistant Secretary Tom Strickland who in March 2010 will head the United States delegation to the 15th Conference of the Parties of the Convention on International Trade in Endangered Species in Doha Qatar. Lyder will attend as the Alternate Head of Delegation.

Lyder is the recipient of various Secretarial awards for her service to the Department of the Interior. In 2008, she received the President's Meritorious Executive Rank Award. She received a Bachelor of Arts degree from Fordham University and her law degree from the University of North Carolina Law School in Chapel Hill, NC.

**THE HONORABLE SCOTT ANGELLE**

**Lieutenant Governor of Louisiana**

*Day 2, Panel 2: Impacts: Environmental and Economic*

Anticipated Focus:

Lieutenant Governor Scott Angelle will discuss Louisiana's efforts to assess the Gulf oil spill's impacts on seafood and tourism. He will also comment on Louisiana's efforts to quantify these direct and indirect effects.

Biography:

Prior to being appointed Lieutenant Governor, Scott Angelle was Secretary of the Department of Natural Resources and served part-time as the legislative liaison for the Governor's Office. As Lieutenant Governor, he continues his service in the latter role.

Angelle led the state's efforts in the Louisiana Legislature to pass a constitutional amendment dedicating future Outer Continental Shelf (OCS) revenues to finance the coastal restoration and hurricane protection plan. He also led efforts to pass legislation to create the Coastal Protection and Restoration Authority (CPRA) to integrate coastal restoration and hurricane protection efforts in the state.

From 2000 to 2004, Angelle served as the Parish President of St. Martin Parish. He was the first president in the parish's history, and he worked to reduce business property taxes, upgrade the parish's health care system and establish an advanced regional fire fighting training program. Angelle is chairman of the Louisiana State Mineral Board, and a member of the Atchafalaya Basin Program Research and Promotion Board and the LSU Center of Energy Studies Advisory Council. Angelle has a B.S. in petroleum land management from the University of Southwestern Louisiana (now the University of Louisiana in Lafayette).

NEWS

Aug. 16, 2010

## GOVERNOR BARBOUR ESTABLISHES PANEL TO SET VISION FOR GULF COAST RECOVERY, DEVELOPMENT

Governor Haley Barbour today announced the creation of a broad-based panel that will report on the impact of the Deepwater Horizon oil spill and aid in the development of a long-term vision to enhance the Gulf of Mexico for the Mississippi Gulf Coast.

The Mississippi Gulf of Mexico Commission is a 24-member board of scientists and business leaders with representatives of state and local governments acting as ex officio members.

"In the wake of the oil spill, we have an opportunity to address any number of issues in a comprehensive way, not just for right now, but into the future," Gov. Barbour said. "This commission will have a wide charge, from preliminarily determining the impact of the oil spill on Gulf ecosystems to addressing concerns about seafood safety to improving hurricane protection and habitat restoration. The Gulf of Mexico is the driving force of the Gulf Coast economy, so effective long-term planning and action to improve this asset will result in long-term economic growth for the MS Gulf Coast."

The commission will work closely with the Gulf of Mexico Alliance and various state agencies to develop a plan to submit to Navy Secretary Ray Mabus, the former Mississippi governor tapped to lead the long-term restoration of the Gulf of Mexico. The Commission's first meeting is scheduled for 2:30 p.m., Tuesday, Aug. 17, on the 7th floor of the Hancock Bank, 2510 14th St., Gulfport.

Commission members include Co-Chairs Dr. Bill Walker, director of the Department of Marine Resources, and Trudy Fisher, director of the Department of Environmental Quality; Richard Gollott representing seafood processors; Tom Becker representing the Mississippi Gulf Coast Charter Boats Association; Dr. Vernon Asper, marine science professor at USM; Dr. Ray Highsmith, director of the National Institute for Undersea Science and Technology at Ole Miss; Dr. David Shaw, vice president for Research and Economic Development at MSU; Dr. LaDon Swann, director of Mississippi-Alabama Sea Grant Consortium; Dr. Jay Grimes, professor of marine microbial ecology at USM; Ron Peresich, chairman of the Gulf Coast Business Council; John Hairston with Hancock Bank; Jerry St. Pe, Jackson County businessman; Chuck Benvenutti, Hancock County businessman; Robert Khayat, former Ole Miss Chancellor; Frances Turnage with the State Port Commission; Hank Bounds, IHL commissioner; Steve Renfroe with Chevron; Tish Williams, Director of the Hancock County Chamber of Commerce; Senator Tommy Moffatt; Representative Frances Fredericks; 11 mayors; and the presidents of the Jackson, Harrison, and Hancock county Boards of Supervisors.

P.O. Box 139 | Jackson, MS 39205 | Phone: 601.359.3150 | Fax: 601.359.3741

**Summary of the RESPOND Act, S. 3873**

On August 5, 2010, Senator Mary Landrieu of Louisiana introduced S. 3763, the Restoring Ecosystem Sustainability and Protection on the Delta (RESPOND) Act "for the long-term economic, environmental and human recovery from the BP oil spill in the Gulf of Mexico."[1] Building on a previous bill introduced by the Senator last May, the RESPOND Act includes provisions to lift the deepwater drilling moratorium, accelerate the sharing of oil and gas revenues, address polluter liability, start new construction of coastal restoration projects, and ensure accountability in the BP claims process.[2]

The provisions of the RESPOND Act most salient to Gulf restoration are Section 2, "Accelerated Revenue Sharing to Promote Coastal Resiliency Among Gulf Producing States," Section 4, "Gulf Coast Ecosystem Restoration," and Section 5, "Modifications to Louisiana Coastal Area Program."

*Sec. 2: Accelerated Revenue Sharing*

Section 2 would amend the Gulf of Mexico Energy Security Act of 2006 (GOMESA),[3] which dedicated a portion of offshore oil and gas revenues to coastal protection and restoration in the four Gulf producing states: Louisiana, Texas, Mississippi and Alabama. The pool of potential revenue expands in 2017. Under Section 2 of the RESPOND Act, funds from new leases off Louisiana's coast would be shared beginning immediately, instead of in 2017. Revenues received would be used for coastal conservation, restoration and hurricane protection.

*Sec. 4: Gulf Coast Ecosystem Restoration*

Section 4 would establish a "Gulf Coast Ecosystem Restoration Task Force," led by a federal official appointed by the President.[4] Within 180 days of enactment of the Act, the Task Force Chair would be

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[1] 8/6/10 Press Release: "Landrieu Unveils Strengthened RESPOND Act to Bring Justice to Spill-Impacted States," available at: http://landrieu.senate.gov/mediacenter/pressreleases/08-06-2010-1.cfm.

[2] Senator Landrieu introduced a bill by the same name on May 20, 2010, S. 3391, which was referred to the Committee on Energy and Natural Resources. That bill was considerably shorter, focusing only on the revenue-sharing component and related amendments to the Gulf of Mexico Energy Security Act of 2006.

[3] The Gulf of Mexico Energy Security Act of 2006 (Pub. Law 109-432) created revenue sharing provisions for the four Gulf oil and gas producing states, and their coastal political subdivisions. Specifically, it provided that 37.5 percent of all qualified OCS revenues from new leases would be allocated between the four states. The Act provided for two phases of revenue sharing: Phase 1 was slated to, and did, begin in fiscal year 2007, while Phase 2 expands the number of qualifying leases, beginning in 2017. The effective date for most of the revenue sharing was pushed out to 2017 in the original authorization to avoid the need to offset the loss of those revenues to the federal treasury. Under the budget "scoring" rules, if an action will cost the treasury, the loss must be either offset with another source of revenue or the Congress in essence agrees that amount will be added to the deficit.

[4] The Task Force would consist of (1) agency heads (or their designees) from the Department of the Interior, Department of Commerce, Department of the Army, Department of Justice, Department of Homeland Security, Environmental Protection Agency, Coast Guard, Department of Transportation, Department of Agriculture; (2) a representative of each affected Indian tribe; (3) two representatives of each of the States of Alabama, Florida, Florida Louisiana, and Mississippi; as well as (5) two representatives of local government within each of those States. The Duties of the Task Force would include: consult with and provide recommendations to the Chair during development of the Comprehensive Plan; coordinate the development of consistent plans for restoring the Gulf; establish a Gulf-Coast based working group; coordinate scientific and other research; prepare an integrated financial plan and coordinated budget requests; and submit an annual report to Congress.

required to develop a "comprehensive plan for the purpose of long-term conservation, flood protection, and restoration of biological integrity, productivity and ecosystem functions in the Gulf ecosystem." Further, the Chair would be required to "incorporate any applicable plans previously developed by Federal, State, and local agencies for the restoration of coastal wetland and other areas of the Gulf Coast ecosystem . . . [t]o the maximum extent practicable."

For purposes of the Comprehensive Plan, the Chair would create a list of priority projects to be funded and carried out during the subsequent three-year period. "In developing the list, the Task Force shall give priority to – (i) projects, programs, and activities authorized by title VII of the Water Resources Development Act of 2007 (WRDA; 121 Stat. 1270); (ii) the goals, analysis, and design of the comprehensive coastal protection master plan authorized and defined under Act 8 of the First Extraordinary Session of the Louisiana State Legislature, 2005; (iii) projects, programs, and activities that maximize the beneficial use of dredge material from Gulf Coast waterways, in coordination with navigation interests; and (iv) projects benefitting the areas that were most adversely impacted by the blowout and explosion of the mobile offshore drilling unit Deepwater Horizon that occurred on April 20, 2010, and by the resulting hydrocarbon releases into the environment."

Title VII of the Water Resources Development Act of 2007, "Louisiana Coastal Area," directs the Army Corps of Engineers to develop with Louisiana a comprehensive coastal plan, make it compatible with previous calls for hurricane protection, and consistent with the state's own Master Plan. The Louisiana Coastal Area title identifies and authorizes major restoration projects believed to put the state on a better footing toward its twin goals of slowing wetland decay and boosting hurricane protection. The projects have not yet been funded, although the presidential budget proposal for fiscal year 2011 requests $19 million to go toward initiating a construction project.

Section 4 also provides a fast-track mechanism for "critical and emergency restoration projects and activities," that would allow the Chair to "proceed expeditiously" should he determine that a particular project would "produce independent, immediate, and substantial conservation, protection, or restoration benefits."

Finally, Section 4 would establish a "Gulf Coast Ecosystem Restoration Fund," into which he Secretary of the Treasury would be required to transfer "no less than" 80 percent of any fines collected from BP for violations of the Clean Water Act. The Fund would be available to the Chair for uses consistent with the Comprehensive Plan.[5]

*Sec. 5: Modifications to Louisiana Coastal Area Program*

The RESPOND Act would amend Section 7006 of the Water Resources Development Act (WRDA) of 2007 (121 Stat. 1277) by allowing projects that would aid recovery from Deepwater Horizon spill impacts, or modify existing projects for that reason.

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[5] Note that beyond the Restoration Fund provided for in the RESPOND Act, Senator Landrieu also supports the State's position that BP should pay a share of the expected NRDA mitigation costs in advance, with the money financing restoration projects that are part of the state's coastal master plan. *See, e.g.*, Mark Schleifstein, Sen. Mary Landrieu, *Rep. Steve Scalise unite behind coastal restoration strategy*, New Orleans Times-Picayune, September 14, 2010, available at: http://www.nola.com/news/gulf-oil-spill/index.ssf/2010/09/sen_mary_landrieu_rep_steve_sc.html.

## THE HONORABLE HALEY BARBOUR

**Governor of Mississippi**

*Day 2, Panel 3: Elected Officials from the Region*

Anticipated Focus:

Governor Haley Barbour recently established a commission for Mississippi that will study the impacts of the Deepwater Horizon spill, and help create a long-term vision for the Gulf of Mexico and the state's coast. Erosion is taking away the state's barrier islands, which help protect the shore from large storms. The Army Corps of Engineers has begun work on a congressionally authorized Mississippi Coastal Improvements Program to build them back.

Biography:

Governor Haley Barbour was born in Yazoo City, Mississippi. He earned a law degree from the University of Mississippi Law School in 1973. He advised President Ronald Reagan as Director of the White House Office of Political Affairs, and served two terms as chairman of the Republican National Committee. Prior to his election as governor, he headed Barbour Griffith and Rogers, one of the nation's top lobbying firms. In November 2003, Barbour was elected Mississippi's governor in the largest voter turnout in a gubernatorial election in state history.

As governor, Barbour has enacted the most comprehensive tort reform in the nation, restoring balance for plaintiffs and defendants in the state's civil justice system. He implemented, "Momentum Mississippi," an update to the state's long-range economic development strategy. Mississippi has now seen the largest increase in net new jobs since 1999 and the largest increase in personal income since 1998. He also initiated the most comprehensive overhaul of workforce training and development programs in state history. Barbour implemented across-the-board reforms in public education with new laws that reward teacher and school performance, reduce state bureaucracy and strengthen discipline. Also, during his term funding has increased by record levels for public education from K-12 through community colleges and the state's universities and colleges. He saved the Medicaid program for truly needy recipients, emphasizing preventative care and implementing the strongest anti-fraud plan in the history of Mississippi Medicaid. Barbour and the legislature passed six pro-life laws that make Mississippi "the safest place in America for an unborn child," according to a national right-to-life organization.

In the face of the worst natural disaster in American history – Hurricane Katrina, which struck on August 29, 2005 –Barbour took the lead to help Mississippians rebuild and recover. He and First Lady Marsha Barbour worked tirelessly and innovatively with local, state and national leadership to tap into many resources for victims of Hurricane Katrina. Barbour created the Governor's Commission on Recovery, Rebuilding, and Renewal to develop a broad vision for opportunities to help South Mississippi rebuild bigger and better than ever. For his leadership after Katrina, Governor Barbour was awarded the Thomas Jefferson Freedom Award. He was also named Governor of the Year by Washington, D.C.-based *Governing* magazine and awarded the Gulf Guardian Award by the U.S. Environmental Protection Agency for his work to rebuild and protect sensitive Coast ecosystems.

**THE HONORABLE MARY LANDRIEU**

**U.S. Senator, Louisiana**

*Day 2; Panel 3: Elected Officials from the Region*

Anticipated Focus:

Senator Mary Landrieu is a leading thinker and voice on coastal issues. In April she issued a policy vision for Louisiana coastal restoration and in August introduced the RESPOND Act, which would tie 80 percent of money from BP to making the coast resilient in the long term. The bill would also accelerate by five years federal oil-and-gas revenue sharing with Gulf states.

Biography:

Senator Mary Landrieu has been fighting and winning for Louisiana since she was first elected to the Louisiana state legislature at the age of 23. After serving eight years as a state representative and two terms as State Treasurer, in 1996 she became the first woman from Louisiana elected to a full term in the U.S. Senate. Landrieu is currently the chair of the Senate Small Business Committee, and a member of the Appropriations and Energy and Natural Resources Committees. The nonpartisan Congress.org has ranked Landrieu as the tenth most effective legislator in the Senate.

Landrieu has been the leading voice in Washington for the Gulf Coast recovery effort. In the wake of Hurricanes Katrina and Rita and the failures of the federal levee system, she secured billions in recovery dollars and has worked extensively to jumpstart recovery projects. She chairs the Senate Homeland Security and Governmental Affairs Committee Disaster Recovery Subcommittee, and is committed to reforming the Federal Emergency Management Agency to ensure the nation's disaster response arm is speedy and effective the next time a disaster strikes the United States.

As chair of the Small Business Committee, she is leading efforts to ensure all small businesses have access to capital and contracts, superior health insurance at a low cost and the resources needed to help boost our economy and guarantee America's competiveness in the global marketplace. As a member of the Senate Appropriations Committee, Landrieu is a strong and effective voice for Louisiana. This Committee approves more than $300 billion in federal discretionary spending each year, and is considered the most powerful panel on Capitol Hill. From this seat, she fights for Louisiana's jobs and economic interests and the funding the state needs to rebuild from the 2005 and 2008 hurricanes. Landrieu, a member of the Energy Committee, coauthored the landmark Domenici-Landrieu Gulf of Mexico Energy Security Act, which was signed into law in 2006. The bill expanded oil and gas production in the Gulf of Mexico by more than 8 million acres and shares the revenues with Louisiana to restore and protect the eroding wetlands along the Gulf Coast.

**Staff Background Paper:**
**Federal Protocols for Fisheries Closures and Reopenings after the Deepwater Horizon Oil Spill**

## I. Background

This memorandum provides historical information on the closure of federal fisheries in the wake of the Deepwater Horizon oil spill disaster, including a summary of (1) the various emergency rules that established the closures, (2) the subsequent sampling and monitoring protocols by the National Oceanic and Atmospheric Administration (NOAA) and the Food and Drug Administration (FDA), and (3) the joint NOAA-FDA reopening protocols.

## II. The Emergency Closures

NOAA's National Marine Fisheries Service (NMFS) responded to the April 20, 2010 Deepwater Horizon oil spill by closing a portion of the Gulf Exclusive Economic Zone to all fishing through an emergency rule effective May 2, 2010.[1] 75 FR 24822, May 6, 2010. The closure covered an area of the Gulf approximately 6,817 square miles, or 3 percent of the total area of the Gulf Exclusive Economic Zone. Due to the evolving nature of the oil spill, NMFS revised the closed area in a second emergency rule that became effective May 7, 2010. 75 FR 26679, May 12, 2010. This second emergency rule closed an area of the Gulf approximately 10,807 square miles, or 4.5 percent of the total area of the Gulf Exclusive Economic Zone.

Each of the first two emergency rules was set to apply for a ten-day window, with the presumption that the closed waters would automatically reopen upon expiration of the rule. However, before either rule expired, a new rule was promulgated that expanded the reach and duration of the formerly applicable rule. The third emergency rule, published May 14, simply provided that it would "remain in effect until terminated by subsequent rulemaking, which will occur once the existing emergency conditions from the oil spill no longer exist." 75 FR 27217, May 14, 2010. In explaining the need for a more flexible rule, the Federal Register notice further provided:

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[1] Note that NOAA's statutory authority to temporarily close fisheries in federal waters arises out of the Magnuson-Stevens Fishery Conservation and Management Act. 16 U.S.C. §§ 1801-1884. The Act, while predominantly concerned with the effective management and conservation of fisheries, provides limited authority to the Secretary of Commerce to close fisheries in the case of an "emergency." Section 305(c) provides:

> EMERGENCY ACTIONS AND INTERIM MEASURES.—
> (1) If the Secretary finds that an emergency or overfishing exists or that interim measures are needed to reduce overfishing for any fishery, he may promulgate emergency regulations or interim measures necessary to address the emergency or overfishing, without regard to whether a fishery management plan exists for such fishery.

16 U.S.C. § 1855(c).

> The oil spill continues to shift locations in the Gulf of Mexico and could reach South Atlantic and/or Caribbean Federal waters. Wind speed and direction, currents, waves, and other weather patterns lead to changes in oil location. As the weather conditions controlling the movement of the oil change, the oil could move in directions not initially predicted. This emergency rule allows NMFS to make more timely revisions to the area closed to all fishing. This will become necessary as new information on the location of the Deepwater Horizon oil spill becomes available. Continuing to follow the process of revising the closed area through publication of successive emergency rules does not allow for timely modification of the closure and could lead to possible harvest of adulterated seafood products from an area where oil is actually present. Sale of adulterated seafood is not in the public interest.

*Id.* While previous iterations of the rule were justified by reference to generalized concerns about public safety, the third rule was explicit in its aim to keep contaminated seafood out of the marketplace and, for the first time, referenced Food and Drug Administration standards on "adulteration:"

> Fish and shellfish in oil affected waters may be contaminated with levels of hydrocarbons above baseline levels. The U.S. Food and Drug Administration (FDA) considers such seafood to be adulterated. The intent of this emergency rule is to prohibit the harvest of adulterated seafood and for public safety.

*Id.* The third emergency rule did not include any kind of sunset provision. Rather, it contemplated the revision of area boundaries on an *ad hoc* basis:

> NMFS will revise the closed area to all fishing in the Southeast EEZ [Exclusive Economic Zone] based on the current location of the oil spill. Wind speed and direction, currents, waves, and other weather patterns lead to changes in oil location. Closed areas may be reopened if NMFS has determined that oil has never been in that area. Closed areas may also be reopened if NMFS has determined that fish and other marine species located in that area have returned to their baseline levels of hydrocarbons.

*Id.* While none of the emergency rules provided defined criteria for closure, a subsequent "Fishery Area Closure and Surveillance Plan" posted on the deepwaterhorizonresponse.com website (the precursor to the official RestoreTheGulf.gov website currently in use) indicated that the following areas were susceptible to closure:

- Areas where there is any visible oil on the surface;
- Areas where there is clearly detectable levels of subsurface oil from the BP oil spill;

- Areas that do not currently have surface oil but where NOAA projects there will be surface oil based on the National Oceanic and Atmospheric Administration's 48-72 hour surface oil trajectory forecasts and subsurface oil locations;
- A five mile buffer surrounding any closed area as a precautionary measure to account for "uncertainties in the actual boundaries of the oil and movement of fish."

*Protecting the Public from Oil-Contaminated Seafood: Fishery Area Closure and Surveillance Plan*, June 14, 2010, *available at*:
http://www.deepwaterhorizonresponse.com/posted/2931/NOAA_FDA_Surveillance_Plan_6_2_14_CLEARED_658415.658415.pdf

Based on continued monitoring of oil location and trajectory, as well as sampling of fish caught in or near restricted areas, NOAA continued to close additional areas as needed from May through July. By June 2, the closed area was the largest, totaling 88,522 square miles, or roughly 37% of the Gulf. *See Deepwater Horizon/BP Oil Spill: Size and Percent Coverage of Fishing Area Closures Due to BP Oil Spill*, available at
http://sero.nmfs.noaa.gov/ClosureSizeandPercentCoverage.htm

## III. NOAA and the Food and Drug Administration (FDA) Join Forces

The June 14th Fishery Area Closure and Surveillance Plan also laid out the parameters of a new working relationship between NOAA and the Food and Drug Administration (FDA) with respect to seafood safety. The division of responsibility was as follows:

**NOAA:**

- *Ocean surveillance* --
  - Continue to sample fish in the vicinity of the closed area to account for the possibility that contaminated fish may move out of the closed area.
  - If NOAA finds tainted fish outside the closure area (i.e., those with elevated levels of oil compounds as compared to baseline data), NOAA will expand the boundaries and buffer zones of the closed area accordingly.
- *Dockside Sampling* --
  - Implement a targeted dockside sampling program to ensure that fish caught from outside the closed area are not contaminated.
  - If tainted fish are found in dockside sampling, NOAA will notify the appropriate FDA and State seafood officials who have the authority to prevent oiled fish from entering commerce in fish markets or elsewhere, and evaluate whether there is sufficient evidence to warrant changes to the closure boundary.

**FDA:**

- *Heightened Precautions under Seafood Safety Program* –

- FDA operates a mandatory safety program for all fishery products. In particular, its seafood Hazard Analysis and Critical Control Point (HACCP) regulation requires processors to identify and control hazards reasonably likely to occur.
- Remind fish and fishery product processors of FDA's regulations concerning the food safety hazard of environmental chemical contaminants, including importance of verifying that fish have not come from closed waters.
- Increase inspections of Gulf Coast seafood processors to ensure compliance.

- *Market Surveillance* --
  - Implement a risk-based surveillance sampling program targeting seafood products at Gulf Coast seafood processors.
  - In particular, program will target oysters, crabs, and shrimp, which could retain contaminants longer than finfish.
  - These sampling activities will complement the dockside monitoring of finfish already planned by NOAA and described above.

*Protecting the Public from Oil-Contaminated Seafood: Fishery Area Closure and Surveillance Plan*, June 14, 2010, *available at*:
http://www.deepwaterhorizonresponse.com/posted/2931/NOAA_FDA_Surveillance_Plan_6_2_14_CLEARED_658415.658415.pdf

## IV. The Reopening Protocol

NOAA and FDA's joint reopening protocol was published on June 18, 2010. *Protocol for Interpretation and Use of Sensory Testing and Analytical Chemistry Results for Re-Opening Oil-Impacted Areas Closed to Seafood Harvesting* ("Reopening Protocol" or "Protocol"), available at: http://sero.nmfs.noaa.gov/sf/deepwater_horizon/attachment1(3).pdf

By its terms, the Protocol is applicable to reopenings of fisheries in both federal and state waters, and attempts to strike a balance between keeping tainted seafood from market and unnecessarily crippling the seafood industry. The Protocol sets forth the following background principles:

- NOAA and the FDA are working with other federal and state agencies to protect consumers from adulterated and unsafe seafood, while minimizing undue economic burden on any impacted seafood industries.
- Once oil or chemical contaminants are visually observed on the surface, it is recommended that the fishery be closed until free of sheen, and subsequent testing has been completed to confirm that seafood from affected areas are wholesome and safe for human consumption and use in animal feed.

- After the initial fishery closure, the best approach for determining the safety and acceptability of seafood from oil-contaminated areas is one that involves organoleptic analysis of products (i.e. sensory testing) followed by chemical analysis.
- Fishery closure areas also include areas that NOAA projects will have surface oil and a precautionary buffer zone around known contaminated waters to account for uncertainty. After confirming through subsequent evaluation that oil did not enter an area, the area may be re-opened without subjecting seafood samples to evaluation under this protocol. *This protocol is an added layer of protection being applied to seafood only in areas known to have been contaminated.*[2]

Reopening Protocol at p. 1 (emphasis added). Beyond this prefatory guidance, the Protocol lists four specific criteria which must be satisfied before a previously closed area may be reopened:

1. Low threat of exposure: The area must be free of oil and oil sheen on the surface.
2. Evaluation of oil movement: There is low risk or threat of future exposure to oil based on the current predictions
3. Sensory testing of seafood: Seafood must pass sensory sampling for oil exposure
4. Chemical analysis of seafood: Seafood must pass chemical analysis for oil exposure.

The testing of seafood samples for oil contamination is at the heart of the Reopening Protocol. According to the Protocol, oil contamination presents two kinds of risks: the presence of petroleum taint that renders seafood unfit for human consumption, and the presence of polycyclic aromatic hydrocarbons that are chemical hazards. The Protocol further provides that oil-contaminated seafood is adulterated if the contamination is perceivable by olfaction (taint), or in the absence of taint, chemical analysis determines that the level of PAHs in it exceeds FDA levels of concern.

Seafood first undergoes sensory testing, where a minimum of 10 expert assessors who are trained to detect oil-tainted fish assess each sample. 70% of the assessors must find no detectable odor from the raw or cooked sample and no detectable taste from the cooked sample. If any sample fails, then the entire site slated for reopening fails and the area remains closed. If a sample passes sensory analysis, it must also undergo chemical analysis. The purpose of the chemical analysis is to assess the concentration of polycyclic aromatic hydrocarbons in the sample, and to ensure it falls below thresholds for tissue contamination

[2] The fact that seafood from only certain areas of the Gulf is subject to sampling under the Protocol is a source of concern for some local fishermen, who worry about liability issues should consumers become sick after buying their catch. Several have pointed to the need for more extensive dockside sampling and certification procedures, and suggest that if the government has made the determination that certain fishing grounds are safe and should be reopened, then the onus should likewise be on NOAA/FDA to give its "stamp of approval" to Gulf seafood so that any potential liability can be shared.

previously identified by FDA as posing an unacceptable risk to human health (using standard FDA and EPA risk assessment methods).

Each of NOAA's reopening decisions was accompanied by a memorandum entitled "Metabolism of PAHs by Teleost Fish" which highlighted the common wisdom that Teleost fish (fish with backbones such as grouper, snapper, tuna etc.) are able to rapidly metabolize polycyclic aromatic hydrocarbons such that that these compounds do not become stored in their tissue in any significant quantity. Thus, the memo provides, even when fish are exposed to oil, there is little chance for harmful polycyclic aromatic hydrocarbons compounds to travel up the food chain to human consumers. Memorandum to NOAA from John Stein, PhD, Deputy Director Northwest Fisheries Science Center, NMFS, available at: http://sero.nmfs.noaa.gov/sf/deepwater_horizon/Attachment_5.pdf. Notably, similar claims are not made with respect to other, non-Teleost, staples of the Gulf seafood industry, including crabs, oysters, shrimp, clams, and scallops.

In response to food safety concerns regarding the use of dispersants and how these compounds might impact seafood, the Protocol provides:

> To date, available information indicates that the dispersants being used to combat the oil spill do not appear to accumulate in seafood and therefore, there is likely little public health concern from them due to seafood consumption. However, as per this protocol, sensory testing and further work to identify component compounds in known exposed fish will be conducted for dispersants.

http://sero.nmfs.noaa.gov/sf/deepwater_horizon/attachment1(3).pdf

## V. Federal Waters Reopenings

As noted above, federal fisheries closures had reached their zenith on June 2, when approximately 37 percent of Gulf Exclusive Economic Zone was closed to fishing. According to a NOAA chart chronicling the status of closures over time, the first reopening of federal waters took place on June 4, when approximately 12 percent of the closed area was reopened. See Chart at Appendix A. Because the joint NOAA-FDA reopening protocol was still under construction, it is unclear on what basis this first opening took place. A second significant reopening took place on June 23, when an additional 9.6 percent of previously closed waters were reopened. A third major reopening took place on July 22, when NOAA issued a press release announcing that it had re-opened one third, or about 26,388 square miles, of previously closed waters. Additional reopenings of federal waters took place in August and September as follows:

- August 10 – 5,144 square miles Gulf waters reopened
- August 27 – 4,281 square miles Gulf waters reopened
- September 2 – 5,130 square miles Gulf waters reopened
- September 3 – 3,115 Gulf waters reopened
- September 21 – 7,970 Gulf waters reopened

As of September 21, the area of the Gulf Exclusive Economic Zone that remains closed to fishing spans approximately 31,915 square miles, down by almost two-thirds since its peak of 88,522 on June 2. The situation is very fluid and additional reopenings will undoubtedly take place in the days and weeks head. For the latest data, please refer to the official NOAA closures chart, available at: http://sero.nmfs.noaa.gov/ClosureSizeandPercentCoverage.htm

# Appendix A

## Deepwater Horizon/BP Oil Spill: Size and Percent Coverage of Fishing Area Closures Due to BP Oil Spill

| Date of Closure | Area (sq mi) | Area (sq km) | Percent Coverage of Gulf EEZ | Percent Change in Coverage |
|---|---|---|---|---|
| May 2 | 6,817 | 17,648 | 2.8 | N/A |
| May 7 | 10,807 | 27,989 | 4.5 | 58.5 |
| May 11 | 16,027 | 41,511 | 6.6 | 48.3 |
| May 12 | 17,651 | 45,717 | 7.3 | 10.1 |
| May 14 | 19,377 | 50,187 | 8.0 | 9.8 |
| May 17 | 24,241 | 62,784 | 10.0 | 25.1 |
| May 18 | 45,728 | 118,435 | 18.9 | 88.6 |
| May 21 | 48,005 | 124,333 | 19.8 | 5.0 |
| May 25 | 54,096 | 140,109 | 22.4 | 12.7 |
| May 28 | 60,683 | 157,169 | 25.1 | 12.2 |
| May 31 | 61,854 | 160,200 | 25.6 | 1.9 |
| June 1 | 75,920 | 196,633 | 31.4 | 22.7 |
| June 2 | 88,522 | 229,270 | 36.6 | 16.6 |
| June 4 | 78,182 | 202,491 | 32.3 | -11.7 |
| June 5 | 78,603 | 203,582 | 32.5 | 0.5 |
| June 7 | 78,264 | 202,703 | 32.3 | -0.4 |
| June 16 | 80,806 | 209,286 | 33.4 | 3.2 |
| June 21 | 86,985 | 225,290 | 35.9 | 7.6 |
| June 23 | 78,597 | 203,564 | 32.5 | -9.6 |
| June 28 | 80,228 | 207,790 | 33.2 | 2.1 |
| July 4 | 81,181 | 210,259 | 33.5 | 1.2 |
| July 12 | 84,101 | 217,821 | 34.8 | 3.6 |
| July 13 | 83,927 | 217,371 | 34.7 | -0.2 |
| July 22 | 57,539 | 149,026 | 23.8 | -31.4 |
| August 10 | 52,395 | 135,703 | 21.7 | -8.9 |
| August 27 | 48,114 | 124,614 | 19.9 | -8.2 |
| September 2 | 43,000 | 111,369 | 17.8 | -10.6 |
| September 3 | 39,885 | 103,303 | 16.5 | -7.2 |
| September 21 | 31,915 | 82,659 | 13.2 | -20.0 |

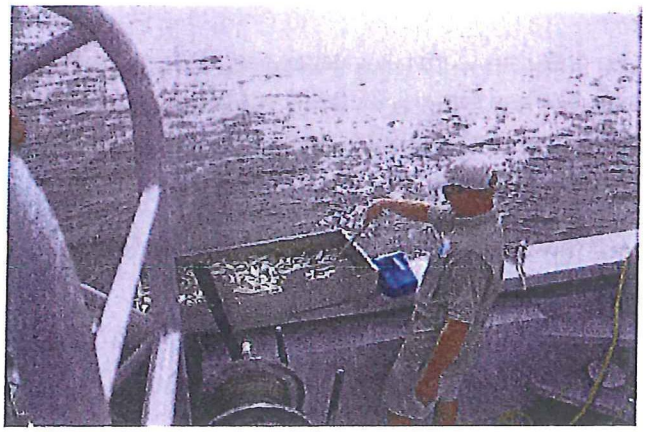
# Mississippi Seafood Safety

September 2010

*In Partnership with:*

Mississippi Department of Marine Resources (MDMR)

Mississippi Department of Environmental Quality (DEQ)



## Introduction

Commercial and recreational fishing are two vital components of life on the Mississippi Gulf Coast. Ensuring the safety of the seafood-consuming public and maintaining the integrity of Gulf Coast seafood in the marketplace are two important priorities for state and federal agencies working on the response to the Deepwater Horizon Oil Spill. Long before any oil reached Mississippi waters, the Mississippi Department of Marine Resources (MDMR), the Mississippi Department of Environmental Quality (MDEQ),the Mississippi State Department of Health (MSDH) and the Mississippi State Chemical Laboratory (MSCL) were working with federal agencies including the U.S. Food and Drug Administration (FDA), the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) along with the other Gulf States to achieve these goals.

Together these agencies developed a plan that would be applied consistently across the Gulf, in both State and Federal waters. The plan called for precautionary closures when oil was present or sometimes projected to be present in an area. This helped to ensure that no oil-contaminated seafood reached the market or was brought in by fishermen. While no tissue testing was required to close an area, a rigorous testing protocol was put in place for reopening an area.

Oil contamination presents two kinds of risks to the seafood-consuming public, and the reopening protocol was designed to address both. The first type of risk is the presence of petroleum-related taint or off flavor, which renders seafood unfit for human consumption. Some petrochemicals create objectionable taste and odor at very low concentrations. The second risk is due to health risks caused by the presence of chemical contaminants, primarily polycyclic aromatic hydrocarbons (PAHs) in the edible portions of seafood. The safety of commercial seafood is generally determined by comparison of tissue contaminant concentrations to FDA levels of concern. Toxicologists from federal and state agencies established criteria for PAHs in fish and shellfish, using standard FDA and EPA risk assessment methods, which are protective of human health and would be applied consistently in each of the states and in federal waters.

While the closure and reopening protocols were being developed, state and federal agencies were also out in the field actively collecting seafood samples for tissue analyses before, during and after the spill had reached our waters. There were at least four separate phases of this sampling, and the State of Mississippi was actively involved in the first three:

- Baseline sampling for the Natural Resource Damage Assessment (NRDA)
- Response Sampling
- Reopening Sampling
- Federal Sampling

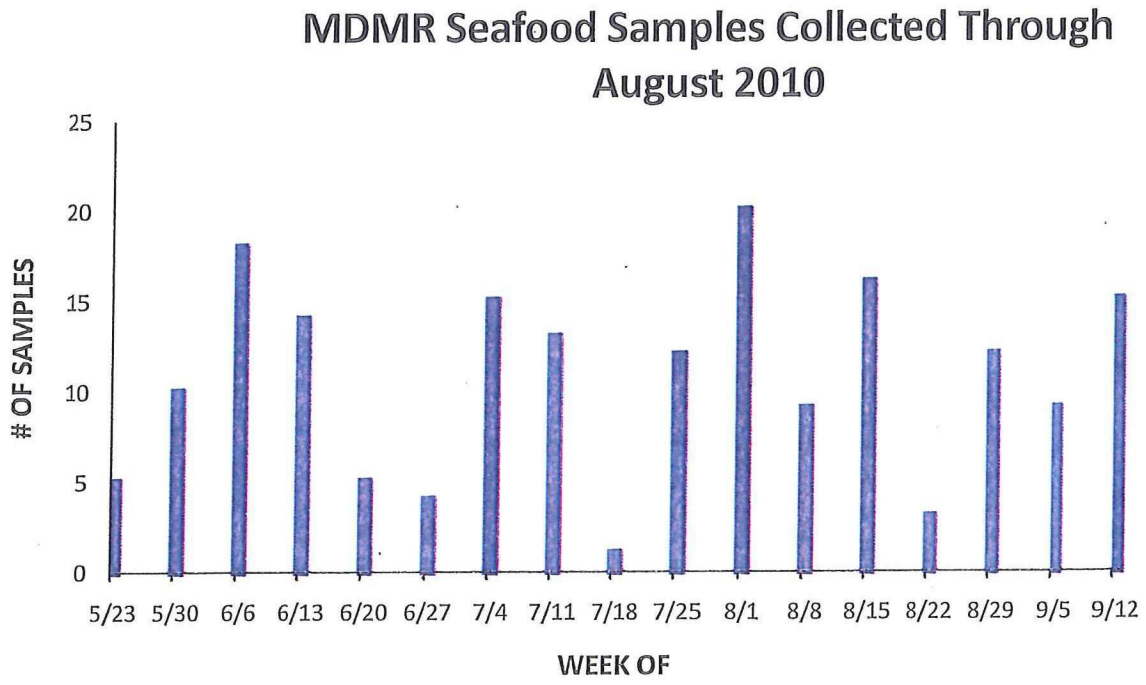
### Natural Resource Damage Assessment Sampling (NRDA)

Baseline or background samples were collected by MDMR and MDEQ in April and May before the spill reached Mississippi waters as part of the NRDA. This will be a long-term effort to evaluate damages

over time due to the oil spill, but in order to accurately evaluate damages, it is critical to establish baseline conditions to define pre-spill conditions. Samples include fish, shrimp, crabs and oysters.

**Response Sampling**

After the NRDA baseline samples were collected, MDMR began response sampling in May. This sampling included chemical analyses of both pre- and post- oil samples, data which was needed immediately to help make public health decisions. This monitoring was conducted in coordination with MDEQ and MSCL and included tissue sampling of: blue crabs, finfish, shrimp and oysters. Bi-weekly (every other week) tissue sampling of these species began May 23, 2010 as a precautionary measure. Bi-weekly sampling will end October 1, 2010, when monthly sampling will begin.




**MDMR Seafood Samples Collected**

For each of the four fishery categories, 0.5 pounds of edible tissue is needed for testing. The number of specimens needed to extract the required amount of tissue varies by species: 10 to 12 blue crabs, 1 pound whole shrimp, etc. Finfish species used for this type sampling include, but are not limited to, menhaden, mullet, cobia, croaker, white trout, spotted sea trout and red drum. Tissue samples are analyzed at the MSCL located at Mississippi State University. All Mississippi response samples collected to date have been significantly below levels of concern. The results for each of Mississippi's four major fisheries are summarized in Table 1 below. All of the target PAH Compounds detected were trace amounts, well below levels of concern, as shown in Table 2.

MDEQ also collected water samples in conjunction with the tissue collections, and the results are available online at: http://www.deq.state.ms.us.

Table 1. Mississippi Response Seafood Sampling Results

| Sample Dates: 5/26/10-9/2/10 | Total | Above Levels of Concern | Lab Results Pending |
|---|---|---|---|
| Shrimp | 52 | 0 | 21 |
| Crab | 34 | 0 | 15 |
| Finfish | 60 | 0 | 25 |
| Oysters | 35 | 0 | 10 |
| All Seafood | 181 | 0 | 71 |

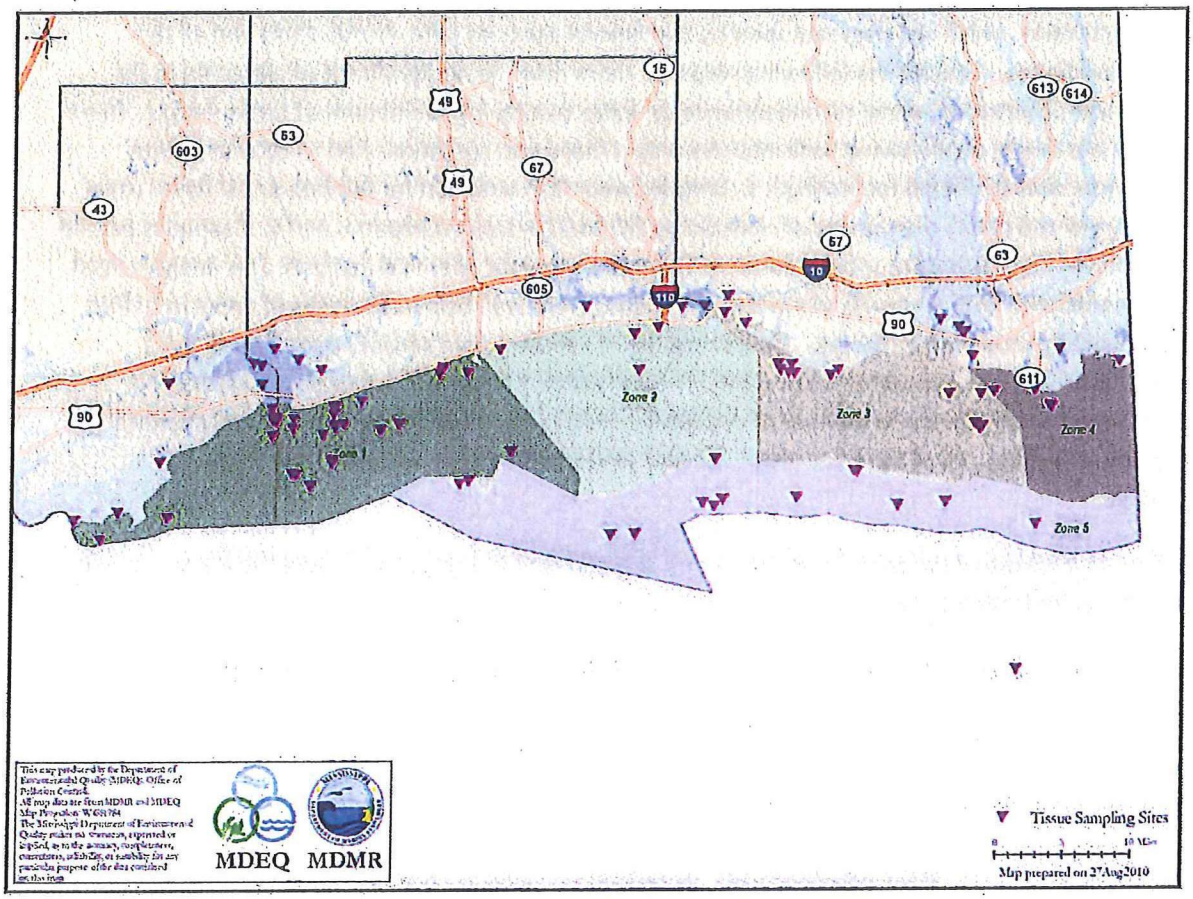
Table 2. Amounts of Detected and Levels of Concern (ppm)

| PAH Compounds | Shrimp | | Fish | | Crab | | Oyster | |
|---|---|---|---|---|---|---|---|---|
| | Max Detected | Level of Concern | Max Detected | Level of Concern | Max Detected | Level of Concern | Max Detected | Level of Concern |
| Napthalene | 0.00495 | 123 | 0.00483 | 32.7 | 0.00525 | 123 | 0.0196 | 133 |
| Fluorene | 0.00282 | 246 | 0.00211 | 65.3 | 0.00345 | 246 | 0.00695 | 267 |
| Anthracene/Phenanthrene | 0.0271 | 1846 | 0.00519 | 490 | 0.0305 | 1846 | 0.01595 | 2000 |
| Pyrene | 0.00366 | 185 | 0.006 | 49 | 0.077 | 185 | 0.0169 | 200 |
| Fluoranthene | 0.00477 | 246 | 0.006 | 65.3 | 0.0116 | 246 | 0.00294 | 267 |
| Chrysene | 0 | 132 | 0 | 35 | 0.000751 | 132 | 0.000547 | 143 |
| Benzo(k)fluoranthene | 0 | 13.2 | 0 | 3.5 | 0 | 13.2 | 0.000656 | 14.3 |
| Benzo(b)fluoranthene | 0 | 1.32 | 0 | 0.35 | 0.000644 | 1.32 | 0.000554 | 1.43 |
| Benz(a)anthracene | 0 | 1.32 | 0 | 0.35 | 0 | 1.32 | 0.000628 | 1.43 |
| Indeno(1,2,3-cd)pyrene | 0 | 1.32 | 0 | 0.35 | 0 | 1.32 | 0.00189 | 1.43 |
| Dibenz(a,h)anthracene | 0.000505 | 0.132 | 0 | 0.035 | 0 | 0.132 | 0.00209 | 0.143 |
| Benzo(a)pyrene | 0 | 0.132 | 0 | 0.035 | 0 | 0.132 | 0.00291 | 0.143 |

ppm = Parts per million

Fixed sampling locations were chosen to represent five distinct zones to aid in making fisheries reopening decisions. These areas are shown in Figure 1, and cover the three coastal counties out to the state territorial limit, three miles beyond the barrier islands.

Figure 1. Fish and Shellfish Sampling Location




## Fishery Closures

Precautionary fishery closures were implemented in an area when significant visible oil was observed on the surface. These closure areas included the immediate vicinity of the observed oil as well as a designated buffer zone. Light sheen and tar balls were not considered significant oil according to the protocols due to the low risk of bioaccumulation from these weathered materials. No tissue or water analyses were required to close an area.

The first closure was issued on June 1, 2010, as winds pushed oil into the eastern part of the Mississippi Sound. Based on boat and plane surveillance, additional areas were closed as oil spread across Mississippi waters, and by July 1, 2010, most of Mississippi territorial waters, including the Mississippi Sound and the adjoining Gulf of Mexico waters out to the territorial limit were closed to commercial and recreational fishing.

## Reopening Sampling

Reopening criteria, which were agreed upon by the federal agencies (EPA, NOAA, FDA) and all the affected Gulf States, included the following steps: 1. There must be no significant oil detected in the area by visual observation, aerial reconnaissance or water testing for a minimum of three days; 2. There must be a low threat of oil moving back into the area. (These two conditions had to be met before samples were sent to the lab for testing); 3. Samples were first screened for tainting or off flavor using sensory (smell and taste) assessment of seafood by NOAA/FDA-trained experts; and 4. If samples passed the sensory testing, they were submitted to an FDA Laboratory for chemical analysis. This analysis must have demonstrated that the levels of PAHs in the tissues were well below the levels of concern before an area could be reopened to fishing. Reopening tissue samples were sensory tested by NOAA's Pascagoula, Mississippi, Laboratory and were chemically tested by an FDA Laboratory in Maryland. Table 3 shows the approximate number of organisms needed to complete the sensory and chemical testing for reopening. All of the Mississippi samples passed both the sensory and the chemical screening.

The FDA has a wealth of information about the oil spill and seafood safety, including the full reopening protocols, on their Web site at:

http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/Seafood/ucm210970.htm

Or contact the FDA at 1-888-INFO-FDA (1-888-463-6332).

**Table 3. Number of Organisms Needed for Each Location for Reopening.**

**Seafood Samples to be Collected at each Sample Location**

| Number of Animals per Subsample | Sensory Testing | | Chemical Testing[2] | Total Field Collection[1] (Animals per Sample Location) |
|---|---|---|---|---|
| | # of Subsamples per Sample Location | Field Collection[1] (Animals per Sample Location) | Individual Animals Needed per Sample Location | |
| Crabs: 6 (~2 lbs) | 6 | Collect 36 | 10 | Collect 46 |
| Oysters: 10 | 3 | Collect 30 | 15 | Collect 45 |
| Shrimp: 0.5 lbs | 6 | Collect 3 lbs | 0.5 lbs | Collect 3.5 lbs |
| Fin Fish: 1 fish | 6[3] | Collect 6 fish | 6[3] | Collect 6 - 12 |
| Sufficient material must be provided to be able to perform the necessary sensory analyses. Providing the amounts per sample indicated above will meet this need. | | | | |

[1]Field collections methods should be similar to commercial harvest methods.
[2]Animals from a sampling station will be combined into a composite sample for each station.
[3]Fish should be large enough or in sufficient quantity to provide at least 0.5 lb sample size for each sensory evaluation and chemistry testing. For large fish, fewer fish may be needed for both sensory and chemistry testing with one filet going to sensory and one filet to chemistry. (E.g. fish over 10 lbs, a sample unit is 6 lbs of filet with skin on.) For small fish lacking filet size of at least 200 g individually, collect (6) 0.5 lb sample units for sensory and (6) 0.5 lb sample units for chemistry. (E.g. for butterfish and menhaden collect (6) 0.5 lb sample units for sensory and (6) 0.5 lb sample units for chemistry.)

**Federal Sampling**

In addition to the tissue sampling conducted by the states, FDA and NOAA conducted extensive sampling in both closed and open areas of the Gulf, in both federal and state waters. As of August 28, 2010, the NOAA Seafood Inspection Lab at Pascagoula had processed 4,018 samples from federal waters and 731 samples from state waters.

**Fishery Reopenings**

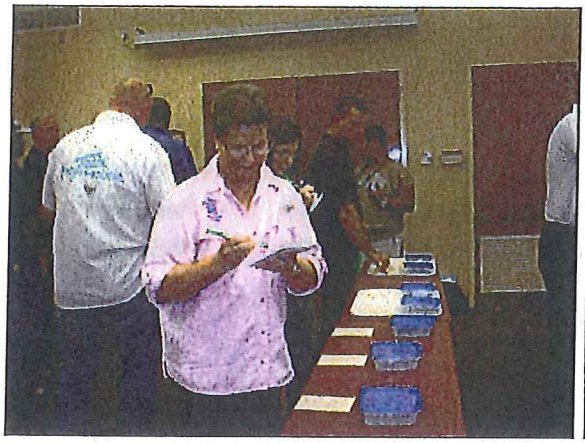
On July 30, 2010, based on the results of the reopening samples, which showed no impairment due to taste and odor or chemical contamination, Mississippi officials, with the concurrence of NOAA and FDA, opened the waters north of the barrier islands to commercial and recreational shrimping and fishing. MDMR continued to systematically sample using the reopening protocols, and on August 6, 2010 all Mississippi territorial waters were opened for shrimp and finfish. By August 21, 2010, all Mississippi waters were opened for blue crab fishing, and on August 25, 2010, FDA granted concurrence for the opening of oyster harvest. MDMR typically opens oyster season in late September or October.

The reopening results mirror the results from the other state and federal monitoring efforts, showing very little or no presence of PAHs in seafood tissues. This sampling includes hundreds of samples from state waters and thousands of samples from federal waters.

**Seafood Safety and Dispersants**

Sampling in Mississippi state waters continues to show no evidence of dispersants. Scientific data indicate that the dispersants used to combat the oil spill break down rapidly and become highly dispersed in Gulf waters. Scientific data to date indicate that dispersants do not accumulate in seafood. For more information:

http://www.fda.gov/downloads/Food/FoodSafety/Product-SpecificInformation/Seafood/UCM221659.pdf



**SAFE SEAFOOD ASSURANCE WORKSHOP**

Members of the Mississippi seafood industry learned firsthand the different sensory characteristics of seafood, crude, diesel and oxidized oil in varying concentrations. More than 70 participants, a mixture of state certified seafood dealers and processors, MSDH personnel, Mississippi State University (MSU) researchers, and MDMR seafood officers and educators, attended the free training session on August 26, 2010, at the MSU Coastal Research and Extension Center. The workshop provided dealers and processors with additional evidence to help improve buyer confidence in the safety of Mississippi seafood and public welfare.

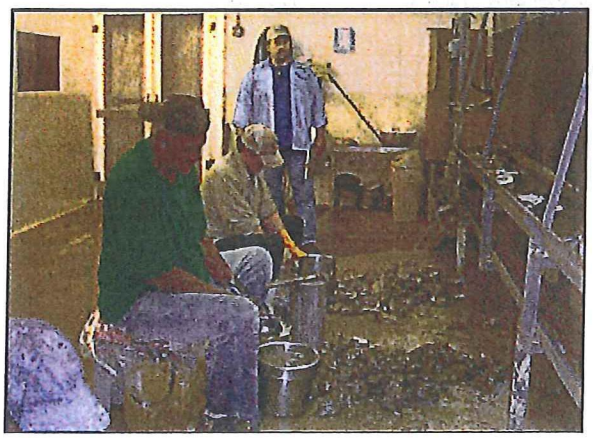
Another program introduced was the "HOW method = Harvest from Open Waters". This program was spearheaded by Dr. Steve Otwell of Florida State University and developed by a team of experts from the five Gulf states. It was hosted by the Mississippi-Alabama Sea Grant Consortium and MSU-CREC team of David Burrage, Dr. Benedict Posadas, Susan Deblanc, Amanda Seymour, Randy Coker and Mary Dikes.


## DOCKSIDE VISITS

MDMR's Seafood Technology Bureau reached out to Mississippi fishermen by including dockside visits in their regular monitoring of Mississippi seafood products. Visits included visually checking shrimp caught during the open season and interviews with fishermen. Interviews provided MDMR with valuable feedback from fishermen about their observations during their fishing trips in the Mississippi Sound including observations of marine animals and oil sightings. MDMR seafood inspectors and officers continue weekly dockside visits to encourage open dialogue with the state's fishermen and to obtain valuable data from their at-sea activities.

## MONITORING AND INSPECTIONS OF SEAFOOD FACILITIES AND OPERATIONS

As a response to the Deep Water Horizon oil spill, an increase in the frequency of monitoring and inspections of seafood processing facilities and courtesy inspections of seafood markets in the three coastal counties was immediately implemented. From May to July 2010, seafood officers conducted 99 courtesy visits and provided technical assistance in 20 counties throughout the state. Continued regulatory quarterly inspections, courtesy visits and organoleptic (taste, color, odor and texture) inspections are being conducted by the MDMR Seafood Technology Bureau as well as certifying new seafood dealers.



## Helpful Related Links:

DEQ Water Quality Results

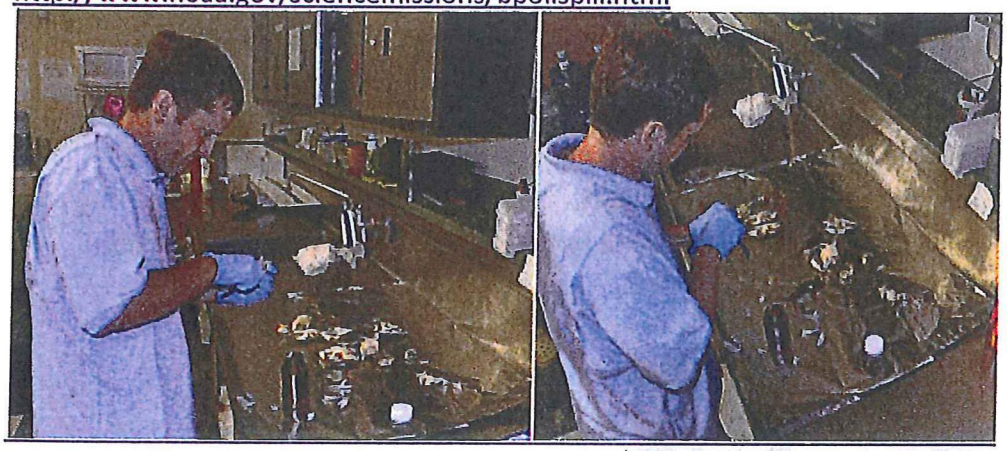
http://www.deq.state.ms.us

The Science of the Spill (USM, MSU & Partners)

http://www.spillscience.com

Deepwater Horizon/BP Oil Spill Science Missions & Data (NOAA)

http://www.noaa.gov/sciencemissions/bpoilspill.html



For more information about fishery openings and closures, please contact the MDMR at (228) 374-5000 or visit our website at www.dmr.ms.gov.

**DR. STEVEN MURAWSKI**

**Director of Scientific Programs and Chief Science Advisor, National Marine Fisheries**

*Day 2, Panel 4: Impacts: The Gulf and Seafood Safety*

Anticipated Focus:

Dr. Steven Murawski will discuss all NOAA science in the Gulf, with a particular focus on seafood testing. He will also address the coordination of academic interagency research.

Biography:

Dr. Steven Murawski is responsible for directing the operations of NOAA Fisheries' six regional Science Centers as well as the headquarters Office of Science and Technology. The NOAA Fisheries science organization consists of 25 laboratories and field stations, scientific operations conducted aboard 11 NOAA research vessels, and employs 2,000 scientists, technicians and support staff throughout the United States. His organization's mission is to provide the scientific basis for conservation and management of living marine resources and their ecosystems, including requirements under the Magnuson Stevens Fishery Conservation and Management Act, the Marine Mammal Protection Act, the Endangered Species Act, and numerous other statutes.

Murawski was previously director of the Office of Science and Technology, a position he held beginning in 2004. Prior to coming to NOAA Fisheries headquarters, he served as chief stock assessment scientist for the Northeast Fisheries Science Center in Woods Hole, Massachusetts (1990-2004). His research background is in fisheries stock assessment and marine ecosystem science. He has published over 160 papers, reports and book chapters in numerous technical and policy journals. During his career, Murawski has been a key representative on numerous committees and councils. His current roles include official U.S. delegate and vice president of the International Council for the Exploration of the Sea, leader of NOAA's Ecosystem Goal Team, and co-chair of the National Science and Technology Council's Joint Subcommittee on Ocean Science and Technology. He was a senior advisor for NOAA to President Obama's Ocean Policy Task Force.

Murawski has been the recipient of many honors during his career, including the Presidential Rank Award for Meritorious Senior Executive Service (2009); the Department of Commerce Gold Medal (2007); four NOAA Bronze Medal Awards (1994, 1999, 2003, and 2007); the NOAA Fisheries Employee of the Year (2002); the Distinguished Alumni Award from the Department of Natural Resource Conservation, University of Massachusetts (2003); and the David Belding Marine Conservation Award from the Massachusetts Divisions of Marine Fisheries (2004). He received his Ph.D. in Wildlife and Fisheries Biology from the University of Massachusetts, Amherst.

**DR. BILL WALKER**

**Executive Director, Mississippi Department of Marine Resources**

*Day 2, Panel 4: Impacts: The Gulf and Seafood Safety*

Anticipated Focus:

Dr. Bill Walker will comment on state and FDA seafood sampling. He will discuss reopening procedures for fisheries. Walker will also address the general impacts the Gulf oil spill has had on fisheries.

Biography:

Dr. Bill Walker is an expert in ecological diagnostics who has worked at the Mississippi Department of Marine Resources since 2002. He serves as the Mississippi governor's representative on the Gulf of Mexico Governor's Alliance. The Alliance is a partnership of Alabama, Mississippi, Florida, Louisiana and Texas focused on regional governance.

Walker previously served as the chief of the Molecular Ecology Branch and Ecological Diagnostics Branch at the U.S. EPA Gulf Ecology Division. He also served as an EPA fellow in the office of the Honorable Trent Lott.

Walker received his B.S. in botany and microbiology from Southeastern Louisiana University. He holds a M.S. and Ph.D. in soil microbiology and biochemistry from Mississippi State University.

**DRAFT**

September 22, 2010

**TO:** Senior Research Staff

**FROM:** Legal Research Staff

**RE:** Authorities to Assess Penalties and Recover Funds from Responsible Parties for Unlawful Discharges of Oil

## I. Introduction

The purpose of this memo is to provide an overview of the sources and uses of penalties and other funds recovered as a result of a discharge of oil. There are a number of provisions in federal environmental statutes that authorize the federal and/or state governments to impose fines and penalties for violations, and to recover clean up and removal costs as well as funds to restore natural resources.

Relevant federal statutes include environmental laws (the Clean Water Act and the Oil Pollution Act) as well as wildlife statutes (the Endangered Species Act, the Marine Mammal Protection Act, and the Migratory Bird Treaty Act). This memo is intended to cover the primary federal enforcement and recovery authorities but is not comprehensive. For example, it does not address criminal acts not covered under environmental and wildlife statutes, or state laws that are applicable to oil spills.

The Department of Justice (DOJ) has announced that it will fully enforce civil authorities and consider appropriate criminal enforcement to assure that the responsible parties are held accountable for the Deepwater Horizon oil spill.[1] In a recent court filing, DOJ indicated that it "expects that it may file a civil complaint" and noted that the federal government has causes of action under the CWA and OPA "that may apply here."[2]

This memo covers the following topics:

I. Clean Water Act civil and criminal enforcement authority, including authority for Supplemental Environmental Projects;
II. Sources and uses of the Oil Spill Liability Trust Fund under the Oil Pollution Act;
III. Authority to recover removal, clean up, and natural resource damages costs;
IV. Limitations on liability under the Oil Pollution Act; and
V. Authority for civil and criminal actions under certain wildlife laws.

The conclusion lists sources of funds that may be directed to the Gulf.

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[1] Attorney General Eric Holder on Gulf Oil Spill, DOJ, June 1, 2010. Available: http://www.justice.gov/ag/speeches/2010/ag-speech-100601.html.

[2] Statement of Interest of the United States Related to the Initial Pretrial Conference at 1-2, 3, In Re: Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico, on April 20, 2010, 10-md-2179 (E.D. La. September 13, 2010), EFC No. 222.

## II. Clean Water Act

The CWA authorizes the Environmental Protection Agency (EPA) and the Coast Guard to bring actions for administrative penalties. It authorizes DOJ, on behalf of EPA and the Coast Guard, to bring actions for civil judicial and criminal penalties.[3]

A. Civil administrative penalties.

Section 311(b)(6) of the CWA provides for the EPA and Coast Guard to assess administrative penalties (either Class I or Class II, depending on level of severity) for unpermitted discharges of oil. A class I civil penalty may not exceed $16,000 per violation, up to a maximum of $37,500. A class II civil penalty may not exceed $16,000 per day of violation, up to a total penalty amount of $177,500.[4] In this instance, administrative action would likely yield smaller penalty than civil judicial action because of the volume of oil released. Such action would preclude civil judicial penalties under Section 311(b)(7) and citizen suits.[5]

B. Civil judicial penalties.

1. Penalties. Section 311(b)(7) of the CWA governs civil penalties for unpermitted discharges of oil. Penalties for unpermitted discharges of oil are up to $37,500 per day of violation or $1,100 per barrel of oil discharged. If the violation is the result of *gross negligence* or *willful misconduct* of the operator, the penalty is not less than $140,000 per day and not more than $4,300 per barrel of oil discharged.[6] EPA has interpreted these provisions to mean that the government may elect whether per day or volumetric penalties may apply.[7] The following factors are considered when determining the civil penalty:

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[3] In addition to the federal government's authority to bring enforcement actions, the Clean Water Act has a citizen suit provision. Specifically, the Clean Water Act allows citizen enforcement of violations of "an effluent standard or limitation" or "an order issued by the Administrator or a State with respect to such a standard or limitation" pursuant to 33 U.S.C. § 1365. Subsection (a)(1). Under the Act, a "citizen" is an individual, corporation, partnership, association, state, municipality, commission, political subdivision of a state, or interstate body with an interest that is or may be adversely affected. Citizens do not have authority to bring suit under Section 311(unpermitted oil discharges) but may bring suit under Section 301 (general unpermitted discharges). Daily penalties are the same under both Sections but Section 311 has additional penalty provisions based number of barrels released. Notice must be given to EPA and the state, and EPA may intervene in such an action. Citizen suits are precluded if the government can show diligent prosecution of the violations. If the United States is not party to an action, it must be given 45 days to review any consent judgment. Federal or state enforcement of federal law may be preempted or precluded by a citizen action. Citizens may not sue for wholly past violations. To date, several citizen suits have been filed.

[4] 33 U.S.C. § 1321(b)(6)(B); 40 C.F.R. § 19.4.

[5] 33 U.S.C. § 1321(b)(6)(E).

[6] 33 U.S.C. § 1321(b)(7); 40 C.F.R. § 19.4.

[7] Civil Penalty Policy for Section 311(b)(3) and Section 311(j) of the Clean Water Act, EPA Office of Enforcement and Compliance Assurance, August 1998. Available: http://epa.gov/compliance/resources/policies/civil/cwa/311pen.pdf.

> the seriousness of the violation or violations, the economic benefit to the violator, if any, resulting from the violation, the degree of culpability involved, any other penalty for the same incident, any history of prior violations, the nature, extent, and degree of success of any efforts of the violator to minimize or mitigate the effects of the discharge, the economic impact of the penalty on the violator, and any other matters as justice may require.[8]

Given the severity of the spill, the civil penalties for the Gulf spill may be very high. News sources have estimated that the maximum civil penalty could be between $4.5 billion and $21 billion.[9]

Penalties for violations of Section 311 are deposited into the Oil Spill Liability Trust Fund.[10] Part III below describes the Fund and its uses.

2. Supplemental Environmental Projects. A judicial civil penalty may be reduced if the defendant agrees to fund or perform a Supplemental Environmental Project (SEP) or similar initiative. SEPs are a tool used by EPA in environmental enforcement settlements. Projects are voluntarily undertaken by defendants to improve environmental quality where violations occur.

   a. Purpose of SEPs. In its 1998 guidance, EPA states that "the primary purpose of this Policy is to encourage and obtain environmental and public health protection and improvements that may not otherwise have occurred without the settlement incentives provided by this Policy."[11] The EPA SEP Policy encourages use of SEPs in communities where environmental justice may be an issue. SEPs offer a unique opportunity for environmental improvement beyond compliance, and benefit the community where violations occurred. SEPs have been used successfully to prevent or reduce pollution, and to protect and restore the environment.[12]

   b. Basic requirements. SEPs must be consistent with provisions of underlying statutes, advance objectives of environmental statutes that are the basis of the enforcement action, have a nexus to the violations, and be explained in detail in the settlement. EPA may not manage or control funds nor may federal agencies authorize SEPs for statutory duties or particular activities for which Congress has

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[8] 33 U.S.C. § 1321(b)(8).
[9] Calculations are based on penalty per barrel amount multiplied by estimated number of barrels of oil released. Washington Post: http://www.washingtonpost.com/wp-dyn/content/article/2010/08/02/AR2010080204695_pf.html; Times Picayune: http://www.nola.com/news/gulf-oil-spill/index.ssf/2010/09/criminal_charges_being_conside.html; Wall Street Journal: http://blogs.wsj.com/law/2010/09/09/the-bp-report-an-exercise-in-rebutting-gross-negligence-claims/?KEYWORDS=oil+spill+penalty.
[10] 26 U.S.C. § 9509; 33 U.S.C. § 1321(s).
[11] EPA Supplemental Environmental Projects Policy, 2 (1998). Available: http://www.epa.gov/compliance/resources/policies/civil/seps/fnlsup-hermn-mem.pdf.
[12] Beyond Compliance: Supplemental Environmental Projects, EPA, 2001.

otherwise made funds available. A defendant may not use a SEP to comply with obligations otherwise required by law. [13]

c. Penalty mitigation. If a defendant agrees to a SEP, EPA may reduce the civil penalty that the defendant would otherwise be obligated to pay. EPA uses a combination of quantitative and qualitative factors to determine the mitigation percentage and final settlement penalty.

C. Criminal penalties (fines and/or imprisonment).

1. Criminal penalty authority. Section 309(c) of the CWA authorizes criminal prosecution of unpermitted oil discharges. For purposes of Section 309, the term "person" means "an individual, corporation, partnership...[or] any responsible corporate officer."[14] Depending on the level of intent, violators may be fined, imprisoned, or both.

a. A person who *negligently* violates the oil discharge provisions of the CWA (Section 311) may be punished by a fine between $2,500 and $25,000 per day of violation, imprisonment for up to a year, or both for a first conviction. For subsequent convictions, penalties increase to $50,000 per day, two years imprisonment, or both.[15]

b. A person who *knowingly* violates CWA Section 311 is punishable by a fine ranging from $5,000 to $50,000 per day of violation, imprisonment for up to three years, or both for a first offense, and a fine of up to $100,000 per day, imprisonment for up to six years, or both for subsequent offenses.[16]

c. A person who *knowingly* violates Section 311 and who "*knows at the time that he thereby places another person in imminent danger of death or serious bodily injury*" (knowing endangerment) shall be subject to a fine of not more than $250,000, imprisonment for up to 15 years, or both.[17] If the person is an organization, it shall be subject to a fine of not more than $1,000,000. After the first conviction, the maximum punishment is doubled with respect to fine and imprisonment.

Fines collected pursuant to Section 309(c) of the CWA for violating Section 311 are paid to the Oil Spill Liability Trust Fund, which is described in Part III below.[18]

2. Criminal sentences and fines: other factors.

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[13] EPA SEP Policy, 6.
[14] 33 U.S.C. §§ 1319(c)(6), 1362(5).
[15] 33 U.S.C. § 1319(c)(1).
[16] 33 U.S.C. § 1319(c)(2).
[17] 33 U.S.C. § 1319(c)(3).
[18] 26 U.S.C. § 9509(b)(8); 33 U.S.C. § 1321(s).

a. General factors. When imposing a criminal sentence, the court may consider the nature and circumstances of the offense; history and characteristics of the defendant; need for the sentence imposed (provide just punishment, promote respect for the law, and assure adequate deterrence); and need to provide restitution to any victims of the offense.[19]

In assessing a fine, the court may consider, among other things, the defendant's income, earning capacity, and financial resources; the burden a fine will impose on the defendant; any monetary loss inflicted on others; whether the defendant can pass on the expense of the fine to consumers or other persons; if an organization, the size of the organization and measures taken to discipline any agent responsible for the offense; and whether restitution is ordered and the amount of such restitution.[20]

b. Restitution. The court may order restitution in any criminal case where required or allowed by law, and to the extent agreed to by the parties in a plea agreement.[21] Restitution may be paid to the government for use in restoring natural resources.[22] The defendant's ability to pay restitution may not be limited or affected by any fine or penalty imposed by the court.[23]

c. Alternative Fines Act. 18 U.S.C. § 3571 authorizes criminal fines for organizations up to the greatest of (a) the amount specified by statute; (b) $200,000 for a misdemeanor and $500,000 for a felony; or (c) twice the gross gain or gross loss resulting from the offense. In the case of the Gulf spill, the final provision could allow the imposition of immense criminal fines equaling twice the aggregate losses resulting from the spill.

d. Additional components of a sentence. The U.S. Sentencing Guidelines allow imposition of a "community service payment" as an additional component of the sentence to repair harms caused by defendant's actions.[24] Such payments punish the defendant, deter similar future conduct, and benefit the public because the payment goes to remedy the effects of the pollution. Community service payments occur with some regularity in criminal environmental cases.[25]

e. Exxon-Valdez criminal plea agreement. In 1991, Exxon pled guilty to violations of the CWA, Migratory Bird Treaty Act, and Refuse Act and agreed to a $150 million criminal fine ($125 of which was remitted in recognition of Exxon's

[19] 18 U.S.C. § 3553(a).
[20] 18 U.S.C. § 3572(a).
[21] 18 U.S.C. § 3663.
[22] See, e.g., Settlement, Exxon Valdez Oil Spill Trustee Council. Available: http://www.evostc.state.ak.us/facts/settlement.cfm.
[23] 18 U.S.C. § 3572(b).
[24] U.S.S.G. § 8B1.3.
[25] See, e.g., Plea Agreement, United States v. Overseas Shipholding Group, Inc., 06-cr-65 (E.D. Tex. December 18, 2006), EFC 163 (defendant pleaded guilty and agreed to a $9.2 million community service payment in addition to a $27.8 million fine).

cooperation in cleaning up with spill). Of the remaining $25 million, $13 million went to the Crime Victims Fund and $12 million went to the North American Wetlands Conservation Fund. Exxon also paid $100 million in criminal restitution, split evenly between the federal government and Alaska, for restoration.

## III. Oil Spill Liability Trust Fund

The Oil Spill Liability Trust Fund (OSLTF or Fund) was established by Congress as a funding source for removal costs and damages resulting from oil discharges.[26] The Fund is located within the U.S. Treasury and is managed by the National Pollution Funds Center, an independent unit within the Coast Guard.

A. OSLTF funding sources. Funding for the OSLTF comes from the following sources: transfers from pre-existing funds; a per barrel tax on petroleum produced in or imported to the U.S.; cost recovery from responsible parties; civil and criminal penalties collected under Section 311 of the CWA; penalties for violations of certain other statutes; and investment interest on the Fund's principal.[27]

In October 2008, Congress raised the tax per barrel from $0.05 to $0.08 until January 1, 2017, and to $0.09 from January 1, 2017 to December 31, 2017.[28] It also removed any restrictions on the size of the Fund.[29] The barrel tax is the largest source of income.[30]

The Fund has two components:

1. the Emergency Fund, which contains $50 million that may be expended for removal activities and initiation of natural resource damage assessments without further appropriation. Congress amended OPA in June 2010 to allow the Coast Guard to obtain one or more advances of up to $100 million each, for Deepwater Horizon removal costs, as long as there is still money in the Fund;[31] and

2. the Principal Fund, which funds the remaining expenditures.

B. OSLTF expenditures. Uses of the OSLTF funds that are relevant here include:

- payment of removal costs by federal and state governments;
- payment of costs of natural resource damage assessments as well as development and implementation of restoration plans;

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[26] Oil Spill Liability Trust Fund (OSLTF) Funding for Oil Spills, U.S. Coast Guard, January 2006. Available: http://www.uscg.mil/npfc/docs/PDFs/OSLTF_Funding_for_Oil_Spills.pdf.
[27] 26 U.S.C. § 9509.
[28] Emergency Economic Stabilization Act of 2008, P.L. 110-343, 122 Stat. 3860; 26 U.S.C. § 4611 (2007); 26 U.S.C. § 4611 (2010).
[29] Id.
[30] Oil Pollution Act (OPA) Frequently Asked Questions, National Pollution Funds Center. Available: http://www.uscg.mil/npfc/About_NPFC/opa_faqs.asp#faq1.
[31] Act to Amend the Oil Pollution Act of 1990, Pub. L. No. 111-191, 124 Stat. 1278 (2010).

- payment of claims by individual persons or governments for removal costs and damages;
- payment of costs of federal agencies to administer and enforce OPA; and
- research and development.[32]

OSLTF funds are also appropriated by Congress to the Denali Commission (to repair or replace storage tanks in Alaska) and to the Prince William Sound Oil Spill Recovery Institute.

Sums expended by the OSLTF for response, removal, and recovery may be recovered from the responsible party. Recovered response and removal costs are not used to respond to the incident for which they were collected; rather, recovered funds go to the Principal Fund for use in future spills. When no responsible party is identified, the OSLTF finances response, clean up and claims.

Expenditures are limited to $1 billion per oil pollution incident or the balance of the fund, whichever is less. Natural resource damage claims and assessments are limited to $500 million per incident.[33]

## IV. Removal Costs and Natural Resources Damages Authority

In addition to civil and criminal liability under the Clean Water Act, responsible parties are liable for two types of costs under the Oil Pollution Act of 1990:

A. Removal costs including (a) removal costs incurred by the United States, a state or an Indian tribe under the Clean Water Act, the Intervention on the High Seas Act, or state law; and (b) removal costs incurred by any person which are consistent with the National Contingency Plan.[34]

B. Damages for injury to natural resources; injury to or destruction of real or personal property; loss of subsistence use of natural resources; loss of revenues, profits and earning capacity due to the destruction of real or personal property or natural resources; and costs of increased public services during or after removal.[35]

Authority to recover damages for injuries to natural resources is addressed in a separate staff working paper entitled Natural Resource Damage Assessment: Evolution, Current Practice and Preliminary Findings Related to the Deepwater Horizon Oil Spill. In brief, OPA authorizes natural resource trustees—federal, state, Indian, or foreign governments—to recover "the cost of restoring, rehabilitating, replacing, or acquiring the equivalent of, the damaged natural resources; the diminution in value of those natural resources pending restoration; plus the reasonable cost of assessing those damages."[36] Natural resource damages are deposited in a revolving trust account

[32] 26 U.S.C. § 9509(c)(1).
[33] Id. at (c)(2).
[34] 33 U.S.C. § 2702(b)(1).
[35] 33 U.S.C. § 2702(b)(2).
[36] 33 U.S.C. § 2706(d).

"without further appropriation, for use only to reimburse or pay costs incurred by the trustee...with respect to the damaged natural resources."[37]

## V. Limitation of Liability under the Oil Pollution Act of 1990

Responsible parties (RPs) are not liable for the above costs if violations are caused solely by an act of God, act of war, or act or omission of a third party.[38] Based on the Deepwater Horizon's status as a mobile offshore drilling unit, gross tonnage, and current response costs, it appears that liability may be limited to all removal costs plus $75 million.[39] The limit would not apply if the incident was proximately caused by a RP's gross negligence, willful misconduct, or violation of applicable Federal safety, construction or operation regulation.[40] It also does not apply to claims brought under state law.[41]

BP has committed to paying "all necessary clean up costs and all legitimate claims for other losses and damages caused by the spill."[42] As of September 7, 2010, BP had paid or approved for payment over $1.5 billion in claims.[43] Congress, the White House, and private citizens have questioned whether current OPA limits on liability are appropriate and whether they should be raised or removed.

## VI. Selected Wildlife Statutes

The Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA) and the Migratory Bird Treaty Act (MBTA) authorize prosecution for actions that harm protected wildlife. Below is a brief description of each of these laws, which are potentially applicable to the Gulf spill.

A. Endangered Species Act. Under the ESA, it is illegal to "take" or kill a species listed as endangered or threatened.[44] Persons who *knowingly* violate criminal and civil provisions may be subject to penalties ranging from $13,200 to $32,500 per offense.[45] Anyone who otherwise violates the ESA is subject to a civil penalty up to $650 per offense.[46] Each violation is a separate offense.

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[37] 33 U.S.C. § 2706(f).
[38] 33 U.S.C. § 2703.
[39] 33 U.S.C. § 2704.
[40] 33 U.S.C. § 2704(c)(1).
[41] 33 U.S.C. § 2718.
[42] *The Role of BP in the Deepwater Horizon Explosion and Oil Spill: Hearing before the Subcomm. On Oversight and Investigations of the H. Comm. on Energy and Commerce*, 111th Cong. (2010)(written testimony of Tony Hayward, CEO of BP).
[43] Claims and Government Payments Gulf of Mexico Spill Public Report, BP, September 2010. Available: http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/incident_response/STAGING/local_assets/downloads_pdfs/Public_Report_9_7_10.pdf.
[44] 16 U.S.C. § 1538. Take means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19).
[45] 16 U.S.C. § 1540; 15 C.F.R. § 6.4(e)(13).
[46] 16 U.S.C. § 1540(a)(1); 15 C.F.R. § 6.4(e)(13).

Under the ESA, penalties and fines collected for violations of the Act may be used to pay costs incurred by a person providing temporary care for fish, wildlife, or plants pending the outcome of a legal proceeding under the Act up to $500,000. Excess funds are deposited in the Cooperative Endangered Species Conservation Fund which provides grants to states and territories for species and habitat conservation.[47]

B. Marine Mammal Protection Act. The MMPA prohibits actions that harass or kill marine mammals. Any person who *knowingly* violates the MMPA may be fined up to $20,000, imprisoned for up to a year, or both for each violation.[48] Under the civil enforcement provisions, violations are punishable by a penalty of up to $11,000 per violation.[49] According to a Congressional Research Service report, MMPA civil penalties could be substantial for this spill because of the broad statutory definition of "harassment."[50]

Criminal fines for violations of the MMPA may be used by the U.S. Fish and Wildlife Service for protection and recovery of manatees, polar bears, sea otters, and walruses.[51] Civil penalties under the MMPA are paid to the U.S. Treasury.

C. Migratory Bird Treaty Act. The MBTA criminalizes taking or killing migratory birds.[52] Violators are strictly liable under the misdemeanor provisions and may be fined not more than $15,000, imprisoned not more than six months, or both.[53] Felony provisions, which require that a person *knowingly* took a bird with intent to sell it or baited a bird, are punishable with a $2,000 fine, up to two years imprisonment, or both.[54]

Criminal penalties under the MBTA have historically varied in severity. Fines are often, but not always, determined per dead bird. One court has held that penalties should be calculated based on the number of acts that led to birds being killed, not the number of dead birds.[55] Examples of the variation in penalties under the MBTA are as follows: one company paid a $500 penalty for killing 92 birds; when five birds were found dead in machine, another company was fined $1,500; a third company pled guilty to killing approximately 85 birds in five states over five years and agreed to a criminal fine of

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[47] 16 U.S.C. §§ 1535, 1540(d).
[48] 16 U.S.C. § 1375(b).
[49] 16 U.S.C. § 1375(a)(1); 15 C.F.R. § 6.4(e)(10).
[50] The 2010 Oil Spill: Criminal Liability Under Wildlife Laws, Congressional Research Service, June 28, 2010. Available: http://assets.opencrs.com/rpts/R41308_20100628.pdf. Harassment is defined as "any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." 16 U.S.C. § 1362(18)(a).
[51] 16 U.S.C. § 1375a.
[52] In the relevant part, the MBTA makes it a criminal act "to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess... any migratory bird, any part, nest, or eggs of any such bird." 16 U.S.C. § 703(a).
[53] 16 U.S.C. § 707(a).
[54] 16 U.S.C. § 707(b)-(c).
[55] United States v. Corbin Farm Service, 444 F. Supp. 510 (E.D. Cal. 1978).

$400,000, community service payments totaling $200,000, and an Environmental Compliance Plan which cost the company over $2.5 million.[56]

After the Exxon Valdez spill, 35,000 birds were found dead and an estimated 250,000 were believed to have died as a result of the spill. Exxon pled guilty to violations of federal law including the MBTA, but it is not clear what portion of the fine was imposed pursuant to the MBTA. In the Gulf of Mexico, the number of birds found as of September 1, 2010 is in the mid-7,000s.[57] The MBTA may be an effective tool for assessing criminal fines resulting from the spill.

Criminal fines are generally paid to the Crime Victims Fund.[58] Fines and penalties received for violations of the MBTA may be appropriated to the North American Wetlands Conservation Fund for wetlands projects that benefit migratory birds and other wildlife.[59]

A Congressional Research Service report discussing liability related to the spill under wildlife laws concluded that it would be difficult to prosecute under the ESA, the criminal provisions of MMPA, and the felony provisions of the MBTA because of the *mens rea* requirements.[60] By contrast, according to the report, it would be easier to prosecute under the strict liability civil provisions of the MMPA and the misdemeanor provisions of the MBTA.

## VII. Conclusion

Some applicable federal legal authorities provide that recovered funds may be directed to the Gulf. Others may direct funds to unrelated environmental uses. Below is a list of how funds recovered under specific authorities may be used.

- Clean up and removal costs obtained under OPA are directed to past or ongoing costs of cleanup activities resulting from the spill;
- Natural Resource Damage recoveries obtained under OPA are directed to the Gulf;
- Civil penalties under the CWA are deposited into the Oil Spill Liability Trust Fund (OSTLF) which in turn is used to pay for response, clean up, restoration costs, and claims in future spills, but not to fund restoration or other activities in the Gulf;
- A CWA civil settlement could include a Supplemental Environmental Project, which would likely aim to restore and enhance the Gulf and coastal areas;

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[56] CRS Report; United States v. FMC Corp., 572 F.2d 902 (2d Cir. 1978); United States v. Apollo Energies, Inc., 611 F.3d 679 (10th Cir. 2010); Plea Agreement, United States v. Exxon Mobil Corp., 09-mj-1097 (D. Col. May, 29, 2009), 09-mj-112 (D. Wyo.), 09-mj-1106 (W.D. Okla.), 09-mj-1117 (D. Kan.), 09-mj-1109 (N.D. Tex.).

[57] Leslie Kaufman and Shaila Dewan, Gulf May Avoid Direst Predictions After Oil Spill, New York Times, September 13, 2010. Available: http://www.nytimes.com/2010/09/14/science/earth/14spill.html?twt=nytimes&pagewanted=print.

[58] 42 U.S.C. § 10601.

[59] 16 U.S.C. § 4406.

[60] CRS Report.

- Criminal fines under the CWA are deposited into the OSLTF. However, a court may order restitution and/or community service payments, both of which could be used in the Gulf;
- Criminal fines under the Migratory Bird Treaty Act may go to the North American Wetlands Conservation Fund which provides funds for wetlands conservation projects;
- Fines and penalties under the Endangered Species Act may go to the Cooperative Endangered Species Conservation Fund for species and habitat conservation; and
- Criminal fines under the Marine Mammal Protection Act may be used by the U.S. Fish and Wildlife Service for protection and recovery of manatees, polar bears, sea otters, and walruses.

**RICHARD B. STEWART**

**University Professor and John Edward Sexton Professor of Law, New York University School of Law**

*Day 2, Panel 5: Legal Authorities for Funding and Restoration Management*

Anticipated Focus:

The 1989 *Exxon Valdez* disaster presents a key case study for insight into the legal authorities governing oil spills. Richard B. Stewart oversaw the U.S. Department of Justice investigation into the matter and will provide an overview of possible post-spill legal pathways.

Biography:

Richard B. Stewart is recognized as one of the world's leading scholars in environmental and administrative law. Prior to joining the NYU School of Law faculty, Stewart served as a Byrne Professor of Administrative Law at Harvard Law School and a member of the faculty of the Kennedy School of Government at Harvard, Assistant Attorney General in charge of the Environment and Natural Resource Division of the U.S. Department of Justice, and chairman of the Environmental Defense Fund.

Stewart directs the Center on Environmental and Land Use Law at NYU's School of Law, which sponsors research, conferences, and publications on cutting-edge issues in environmental and land use law. He is currently leading a major Center project, funded by the Rockefeller foundation to examine international conflicts over the regulation of genetically-modified (GMO) crops and foods. The project will examine the conflicting perspectives and interests of the U.S. and other exporters of GMO agricultural products, including the EU and developing countries; evaluate the performance of existing international laws and institutions for resolving these conflicts; and recommend new approaches to international governance to promote the socially beneficial development of agricultural biotechnologies. Stewart, along with NYU Professor Benedict Kingsbury, has also launched a major new project on Global Administrative Law, examining how procedural opportunities for public participation in administrative decision making and review mechanisms can help meet accountability gaps in current global regulatory institutions, ranging from the WTO and the UN to informal networks of environmental and economic regulatory officials. This project, headquartered at NYU, is proceeding in collaboration with academics and officials around the globe.

Stewart assists the UN's efforts to combat global warming by developing a system for an international market in CO2 emissions reductions credits. He has also taken part in the UN's formulation of principles to award damages from environmental injuries caused by Iraq during the Gulf War. A prolific author, Stewart has published ten books and more than 80 articles on environmental and administrative law, including the intersection between theory and practice in environmental law and the need to develop innovative methods for environmental protection. His writing favors a reliance on a market-oriented approach to environmental protection, rather than the central-planning systems of command and control regulation that have been used for the past 30 years.

**JAMES T.B. TRIPP**

**Senior Counsel, Environmental Defense Fund**

*Day 2, Panel 5: Legal Authorities for Funding and Restoration Management*

Anticipated Focus:

The Deepwater Horizon explosion occurred in a region with an already complex array of environmental challenges. Proposals have begun to emerge that "bridge" the immediate and long-term disasters.

Biography:

James T.B. Tripp is responsible for the review of all Environmental Defense Fund legal action initiatives and has been admitted to the New York State Bar, the Southern and Eastern Districts of New York, several U.S. courts of appeal and the United States Supreme Court. He has been engaged in state and federal efforts to restore the Mississippi River Delta in south Louisiana and bottomland hardwood resources in the lower Mississippi Basin for more than 30 years. Tripp served on former Louisiana Governor Michael Foster's Commission on the Future of Coastal Louisiana, and has served on the Louisiana Governor's Commission on Coastal Restoration and Conservation.

Tripp also works on a wide range of land use, transportation, water resources, solid waste, ecosystem restoration and energy issues in the NY metropolitan region. His expertise led to his appointment to the New York State Department of Transportation's Advisory Panel on Transportation Policy for 2025 (2004), New York Governor George Pataki's Greenhouse Gas Task Force (2001-2002) and Governor Pataki's Superfund Work Group (1999-2000).

Tripp helped to design a Transfer of Development Rights (TDR) program in the Long Island Pine Barrens, and has also been extensively involved in land conservation and smart growth efforts in the Highlands ecosystem, which stretches from eastern Pennsylvania through New Jersey and New York into western Connecticut. Prior to joining the Environmental Defense Fund, Tripp was an Assistant U.S. Attorney in the Southern District of New York. He holds a L.L.B from Yale Law School, a M.A. from Yale Graduate School, and a B.A. from Yale College.

**STANLEY SENNER**

**Director of Conservation Science, Ocean Conservancy**

*Day 2, Panel 5: Legal Authorities for Funding and Restoration Management*

Anticipated Focus:

The Trustee Council overseeing the *Exxon Valdez* recovery was able in some cases to improve the environment to a state better than the day before the spill. What enabled this was the addition of the word "enhancing" to the settlement agreement. Stanley Senner will address which lessons learned from the *Exxon Valdez* settlement could be useful in the Gulf.

Biography:

Stanley Senner started with Ocean Conservancy in October 2009. For the previous 10 years he was executive director of the National Audubon Society's Alaska State Office, where he was deeply engaged in coastal and marine conservation issues, such as oil and gas development in the Arctic. In the 1990s, Senner worked for nearly 7 years as the restoration planner manager for the State of Alaska following the *Exxon Valdez* oil spill and as science coordinator for the state-federal *Exxon Valdez* Oil Spill Trustee Council. In the late 1970s-early 1980s, Senner worked for the Wilderness Society to secure the passage of the Alaska National Interest Lands Conservation Act. He was also on the professional staff of the U.S. House of Representatives Committee on Merchant Marine and Fisheries, where he worked on ocean dumping and other marine conservation issues.

Senner has a M.S. degree in biology from the University of Alaska Fairbanks. He has published more than 25 technical papers on the ecology and conservation of migratory birds and other natural resources conservation topics.

# BACKGROUND MEMO ON GULF COAST RESTORATION (Draft)

The Deepwater Horizon disaster is unprecedented in scale. The total volume of oil released—estimated at nearly 207 million gallons[1]—makes it the largest accidental spill in history. But given its location, a mile below the sea and 40 miles from an environmentally distressed coast, the spill is also unprecedented in complexity.

The event unifies three conversations into one: How to clean up the oil and compensate for its effects, how to address coastal wetland decay, and how to keep the Gulf of Mexico healthy so that future generations can prosper by it. The past decade has seen comprehensive, public efforts in Washington to understand the condition of federal waters, where the spill occurred, and recommend stewardship improvements to maintain their productivity and heath. The past two decades, at least, have seen increasingly aggressive efforts around the Gulf to better gird for large storms and to address chronic decay in and around the Mississippi Delta. This memo provides an overview of this latter history and divides into several parts: this short introduction; the geology of the delta and coast; major causes of wetland decay; and a chronology of policy efforts.

"Restoration" carries three distinct meanings after the Deepwater Horizon tragedy. There is the legal restoration process, guided by the official damage assessment. Catastrophic wetland loss in Louisiana, and barrier island decay in Mississippi, and erosion in Florida, Alabama, and Texas have led to state and federal coastal restoration programs of varying scale to slow decay and protect the states from powerful storms. Finally, the Gulf of Mexico itself is targeted for a more holistic Gulf-wide restoration as new federal authority and tighter regional coordination enable best practices in ocean stewardship.

The Gulf of Mexico is among the most productive and complex industrial-ecological systems on the planet. Americans enjoy the benefits of its natural resources and the vast work it takes to harness them. Gulf beaches are among the finest in the world. Estuaries preserve America's treasured biodiversity. Barrier islands reduce hurricane impacts on population centers. A third of the oil the U.S. produces, and 40 percent of its seafood haul come from the Gulf. Nearly half of U.S. shipping tonnage travels through Gulf ports, and more than 37 percent through Louisiana and Texas alone.

The Deepwater Horizon tragedy occurs in a Gulf already under strain. All five states share concerns about further deepwater oil spills, hurricanes, and various effects of shoreline erosion. The seafood industry is struggling from immediate impacts of the spill and long-

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[1] "Deepwater Horizon MC252 Gulf Incident Oil Budget, Government Estimates Through August 01 (Day 104)." US Geological Survey, National Oceanic and Atmospheric Administration, U.S. Coast Guard. http://www.noaanews.noaa.gov/stories2010/PDFs/DeepwaterHorizonOilBudget20100801.pdf. Accessed 9/22/10

term pressures common to many fisheries, particularly oysters, which are decimated globally.[2]

Beyond that, focus varies from region to region, state to state. Some states have established histories with an issue, such as Florida's long-term abstention from oil production because of the potential risks to its beaches and tourism industry. Erosion, from manmade navigation channels, beach modifications, and natural forces, threatens nearly 60 percent of Florida beaches; about 46 percent of the state's sandy shores are seeing "critical erosion."[3] Alabama's Dauphin Island, Orange Beach, and Gulf Shores, are a beach tourism hub—a huge economic difference from barrier islands in Mississippi and Louisiana, for example, which are uninhabited ecosystems and therefore prime candidates for restoration. Alabama shares long-term interests in restoring oyster reefs and making its estuaries healthy. The state is reeling from the hits to the seafood industry—particularly its food processing industry, and to tourism. Earlier this month, a group of nongovernmental organizations in Mobile, Ala. launched a plan to restore 100 miles of oyster reefs and 1,000 square miles of wetlands in the next five years.[4] Texas experiences reef strain, beach erosion, and threats to marsh. The state continues to restore beaches, wetlands, and estuaries, particularly around Galveston Bay.

The Mississippi River Delta is an epic in itself, the site of a more than century-long industrial-scale program to keep nature straitjacketed. The trouble is, nature prefers not to be straitjacketed, and tends to compensate elsewhere wherever it is restricted. Consequently, Louisiana continues to face catastrophic wetland loss that could imperil Delta communities, navigation, oil and gas infrastructure, fishing, conservation, and many other economic, social, and environmental priorities. Some of the most environmentally sensitive areas of the Gulf were hit with the most oil.

It's not so much that the delta is different because it has an acute environmental problem. It's hardly unique that way, particularly in and around the Gulf of Mexico. To be more precise, the land at the foot of the Mississippi River is different because, simply, it is not like its neighbors. It is physically different, a fact at the core of catastrophic wetland loss.[5] The underlying rock is hundreds of feet below the surface, buried by centuries of Mississippi mud. River sediment creates the land. The sea takes it away.

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[2] Beck, Michael W. et al. *Shellfish Reefs at Risk.* http://www.nature.org/initiatives/marine/shellfish/. Accessed 9/22/10.

[3] http://www.dep.state.fl.us/beaches/programs/bcherosn.htm. Accessed 9/17/10

[4] Associated Press. "Restoration Projects Announced for Gulf Coast." *Sun Herald.* 9/15/10. Accessed 9/17/10

[5] This is a descriptive geological observation without inherent consequence for policy-making.

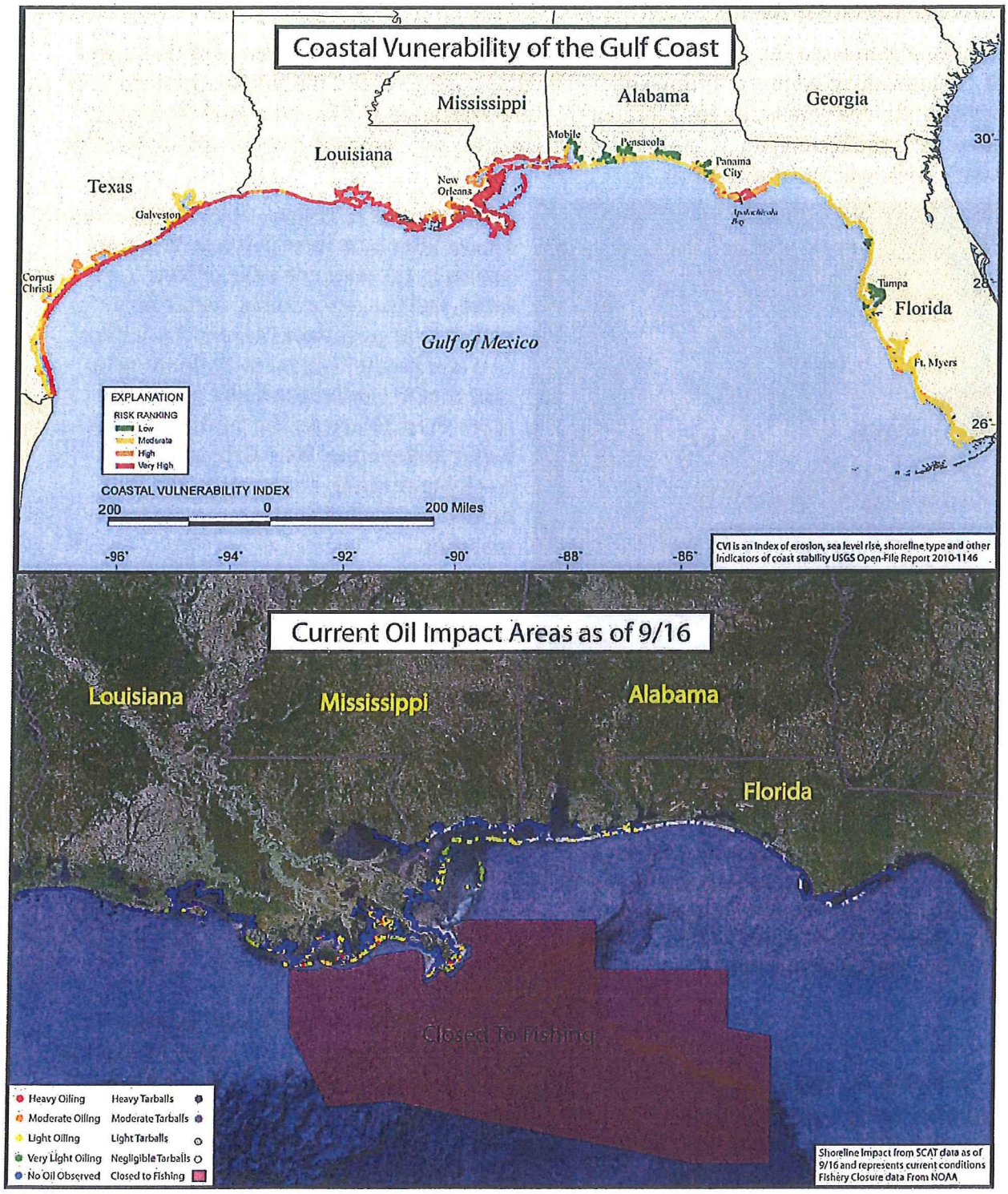


**Figure 1.** Comparing Coastal Vulnerability (CVI), an index of erosional issues, to areas impacted by the oil spill. Notice that the areas most affected by the oil spill are high erosion areas. This will likely keep much of the oiled material actively cycling through the system. In addition, any vegetation die offs in the affected areas can accelerate erosion.

## The Mississippi River Basin

The national conversation about improved Gulf resilience begins nowhere near the coast itself. Technically it begins at Minnesota's Lake Itasca, more than 2,500 miles up river. The Mississippi River Basin is the third largest in the world, after the Amazon and the Congo. Water enters the basin from 31 states. Before the Internet, before the telegraph, before the railroad, there was the Mississippi.

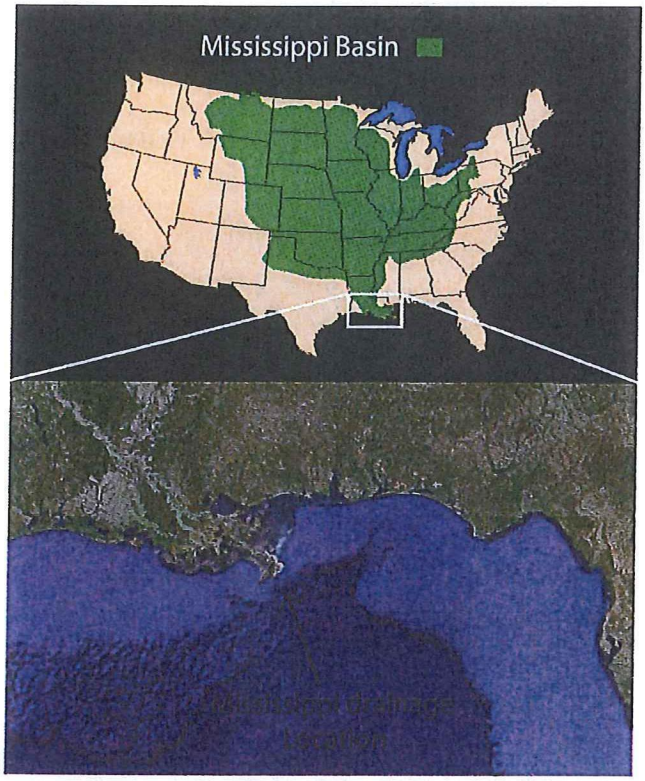


**Figure 2.** The Mississippi River Basin drainage area is over 1.1 million sq. mi. and drains nearly 40 percent of the US. The rivers current mouth deposits much of the collected sediment off the continental shelf rendering it inaccessible to the coastline.

When it rains in Helena, Mont., water flows weeks later past New Orleans. When it snows in the western edge of New York State, and the snow melts, water flows weeks later past New Orleans. Less than two weeks after the historic flooding in May that drowned Nashville and killed more than 30 across the Southeast, the water flowed past New Orleans. The freshwater swell, upon exit to the Gulf, helped push oiled seawater away from marshes.

As the Mississippi meanders south, it sweeps away silt and sand, and broken-down organic materials. The river casts this sediment across the wetland plane, called a deltaic lobe, before draining to the Gulf. This material accumulates over time, and attracts the microbes and marsh grass and Brown Pelicans that drive the ecosystem. The Mississippi River has shaped and re-shaped its delta for 6,000-7,000 years.

The river likes wiggle room. Human infrastructure likes to stay put. That's the core conflict in the delta. About 150 years ago, the Mississippi River became restless again, as it does roughly every millennium. A distributary, the Atchafalaya River, began to siphon more and more water—about 30 percent of the main river's load by the middle of the 20th century. The Army Corps of Engineers has managed the flow between the Mississippi and Atchafalaya since 1963, sending 70 percent of the water down past New Orleans and the rest down the Atchafalaya. All other distributaries have been closed.

River management accelerates coastal erosion. Navigation and leveeing have traditionally driven management of the river. The infrastructure was built to prevent flooding, sparing

destructive trauma to communities, a goal tragically overwhelmed by Hurricane Katrina. But flooding is also what feeds the land – and is at the core of many key delta restoration projects. The river's sediment now travels out to the Gulf, where it is deposited beyond the reach of natural deltaic processes: River management has essentially broken the delta's means for self-preservation. The Gulf of Mexico floor drops off into deep water not too far from the Louisiana "bird's foot," down below the reach of engineers. Essentially, current delta management throws away the material that built it in the first place and that is needed for long-term restoration.

## Subsidence and land loss

"Sediment starvation" describes the unintended consequence of river management: The material that formed the land no longer nourishes it. The land can't fight encroaching seas, and withers.

That's part of a larger concern that scientists refer to as "relative sea-level rise," the net effect of subsidence, sea-level rise, sediment starvation, and other factors. Subsidence is a critical issue in the gulf region, which naturally experiences between 1 and 5 millimeters of it a year.[6] It's particularly intense in the Mississippi River Delta, where the Gulf has swallowed 2,300 square miles of wetlands since the early part of the 20th century. Understanding that the land sinks has been known probably since the first house was built in the region. It's a long-term problem, but might be felt in the short-term by acute events. Parts of New Orleans underwent accelerated subsidence in the three years before Hurricane Katrina. Some levees could be as much as a meter lower than when they were first built.[7]

Many onlookers have documented the problem, from the local population, to the Army Corps of Engineers, U.S. Geological Survey, and academic research scientists. However, the causes of subsidence remain a topic of scientific inquiry. Researchers have pursued several lines of evidence explaining why it might be occurring. They have studied how land laid down during the past several thousand years or so compacts under pressure.[8] Another line of study suggests that deep tectonic faulting is the main contributor to subsidence from Texas to Alabama.[9] Recent work has drawn correlations between hydrocarbon extraction

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[6] Morton, R. et. al Rapid Subsidence and Historical Wetland Loss in the Mississippi Delta Plain: Likely Causes and Future Implications. 2005 USGS Open-File Report 2005-1216. http://pubs.usgs.gov/of/2005/1216/ofr-2005-1216.pdf. Accessed 9/22/10

[7] Dixon, Timothy H., Falk Amelung, Alessandro Ferretti, Fabrizio Novali, Fabio Rocca, Roy Dokka, Giovanni Sella, Sang-Wan Kim, Shimon Wdowinski, and Dean Whitman. "Subsidence and flooding in New Orleans." *Nature*, v. 441, June 1, 2006, pp 587-8.

[8] Tornqvist, Torbjorn E., Davin J. Wallace, Joep E. A. Storms, Jakob Wallinga, Remke L. van Dam, Martijn Blaauw, Mayke S. Derksen, Cornelis J. W. Klerks, Camiel Meijneken, and Els M. A. Snijders. "Mississippi Delta subsidence primarily caused by compaction of Holocene strata. "*Nature Geoscience,* 1 (March 2008), 173-176

[9] Dokka, Roy K. "Modern-day tectonic subsidence in coastal Louisiana." *Geology;* April 2006; v. 34; no. 4; p. 281–284;

and subsidence-driven wetland loss.[10] The disposal of sediment into the Gulf means land generation cannot keep pace with sea-level rise.

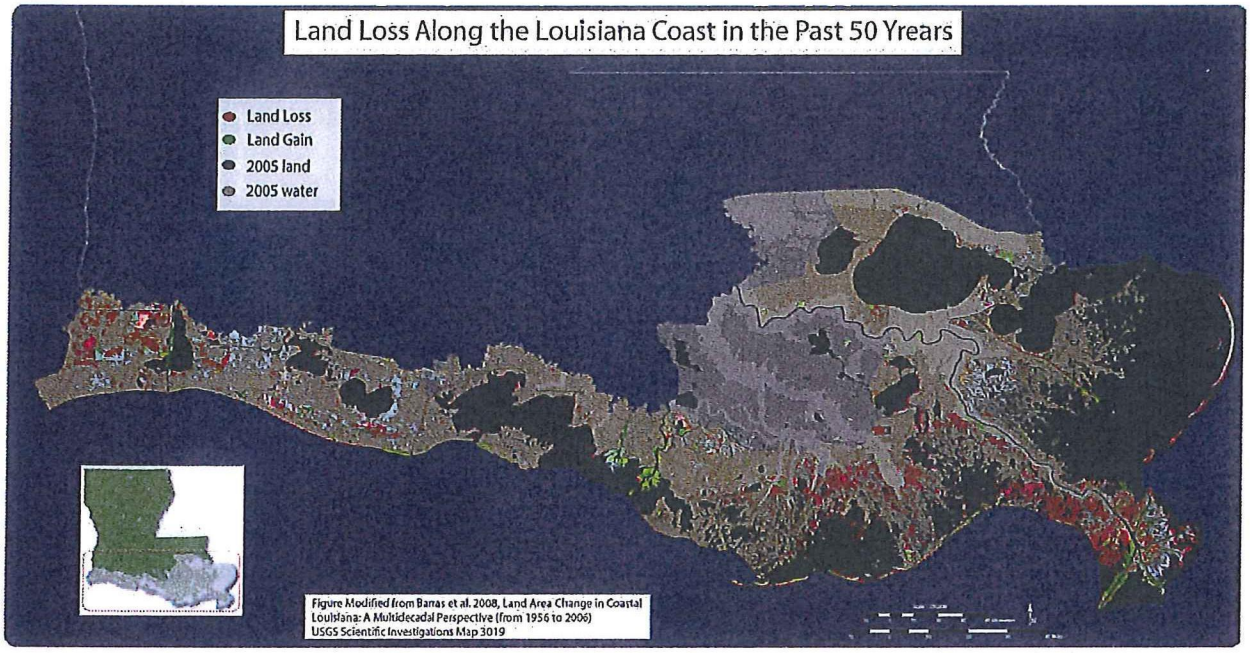


**Figure 3**. Land loss along the Louisiana coast in the past 50 years.

## Navigation and Infrastructure Channels Through Wetlands

Oil and gas infrastructure grew rapidly through the middle of the last century, peaking between the 1960s and 1980s. The industry dredged thousands of miles of canals through wetlands, leaving arrow-straight chutes, often at unnatural perpendiculars, for navigation or pipelines. As unnatural as the straight lines through marsh might look from above, indirect damage from the canals likely cause more damage than building them in the first place. Dredged sediment lines the canal as spill banks. These artificial banks change water flow and prevent flooding, so sediment can't re-nourish the land. Water pools up behind them, submerging marsh. The channels also let saltwater flow into freshwater environments, further jeopardizing the ecosystem. Estimates vary widely regarding the canals' indirect effects to wetland loss; 35 percent is one estimate that comes up amid debate.[11]

Graft on to such a complicated physical landscape a complicated legal regime. Wetlands vary within a spectrum of ownership scenarios from public ownership, to various,

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[10] Morton, Robert A., Julie C. Bernier, John A. Barras. "Evidence of regional subsidence and associated interior wetland loss induced by hydrocarbon production, Gulf Coast region, USA." *Environmental Geology* 50 (2006), 261-274.

[11] Gosselink, James G. "Comments on 'Wetland Loss in the Northern Gulf of Mexico: Multiple Working Hypotheses.'" *Estuaries*, 24:4 (August 2001), pp 636-651.

# Supplemental Information

intermingled public-private ownership, to full private ownership.[12] A 2006 Louisiana state law brings closer to reality a structure by which private lands ripe for restoration can be transferred to an "acquiring authority," a land trust, under the Department of Natural Resources. The law stipulates that no agreements can be made until its rules and regulations are written, a process still moving through the state regulatory process.

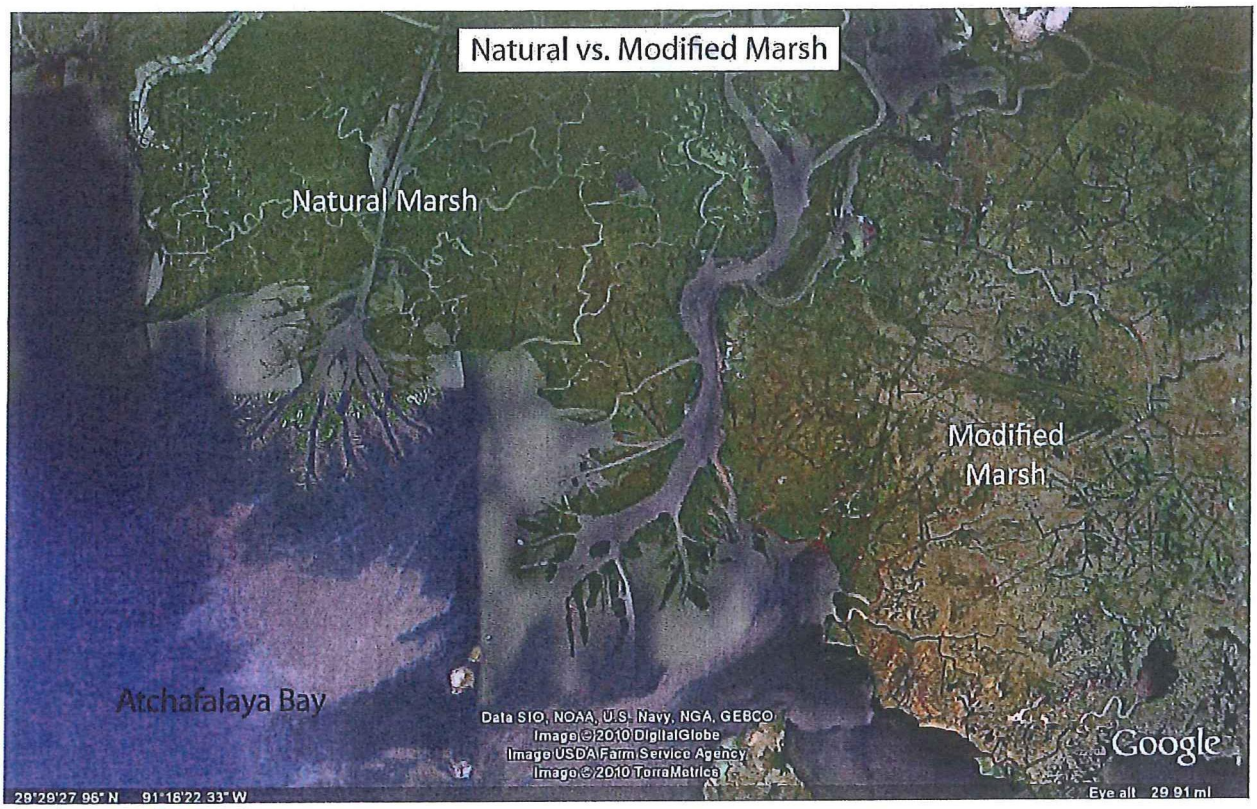


**Figure 4**. An image of natural and modified marsh. The area to the upper left is green because it is routinely flooded by the Atchafalaya River, which delivers water and sediment. The modified marsh to the right has been canalled and its drainage altered.

## Fixing the Delta: A Short History

The Great Flood of 1927 set the management of the Mississippi River on its modern path. Catastrophic rains began that spring, topping already swollen rivers. On April 16, a 1,200-foot span of levee collapsed in Dorena, Missouri. Three months and 144 more failed levees later, at least 246 people were dead and water ravaged the river basin causing the equivalent of $2 billion to $5 billion in 2005 dollars.[13] The Flood Control Act of 1928 set up the largest civil works project in history—a levee-building program geared toward preventing anything like the Great Flood from happening again. Today, river and coastal

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[12] David, Mark. "A whole new ballgame: Coastal restoration, storm protection, and the legal landscape after Katrina." *Louisiana Law Review*, 68:2 (winter 2008), pp 420-441.

[13] Kosar, Kevin R. "Disaster Response and Appointment of a Recovery Czar: The Executive Branch's Response to the Flood of 1927." CRS Report for Congress. Congressional Research Service, Oct. 25, 2005.

management must accommodate their original goals of flood control and navigation amid new programs and responsibilities to address the decimation of the coast. Louisiana has developed a strategy for restoring coastal wetlands and tools that has continued to evolve.

*1989-1990*

A convenient starting date for the state's recent attempts to confront its coastal problems is 1989, when the legislature passed "Act 6," a law that established a wetlands authority and an executive branch office to prioritize and manage a restoration strategy and projects. Congress moved the following year, creating an ongoing civil works program called the **Coastal Wetlands Planning, Protection and Restoration Act**, or "quip-ruh," after its long acronym, CWPPRA. The program pursues several goals, including marsh regeneration, shoreline protection, barrier island reconstruction, hydrologic engineering, and the use of dredged material for restoration purposes. Its budget has ranged from $30 million to $80 million a year, and is generated from fees on small-engine fuel use and sport fishing. A collaboration among Louisiana and five federal agencies, including the Army Corps of Engineers, this program marked its 20th anniversary two weeks before the Deepwater Horizon tragedy. It has administered 144 built projects, protecting 110,000 acres of wetlands.

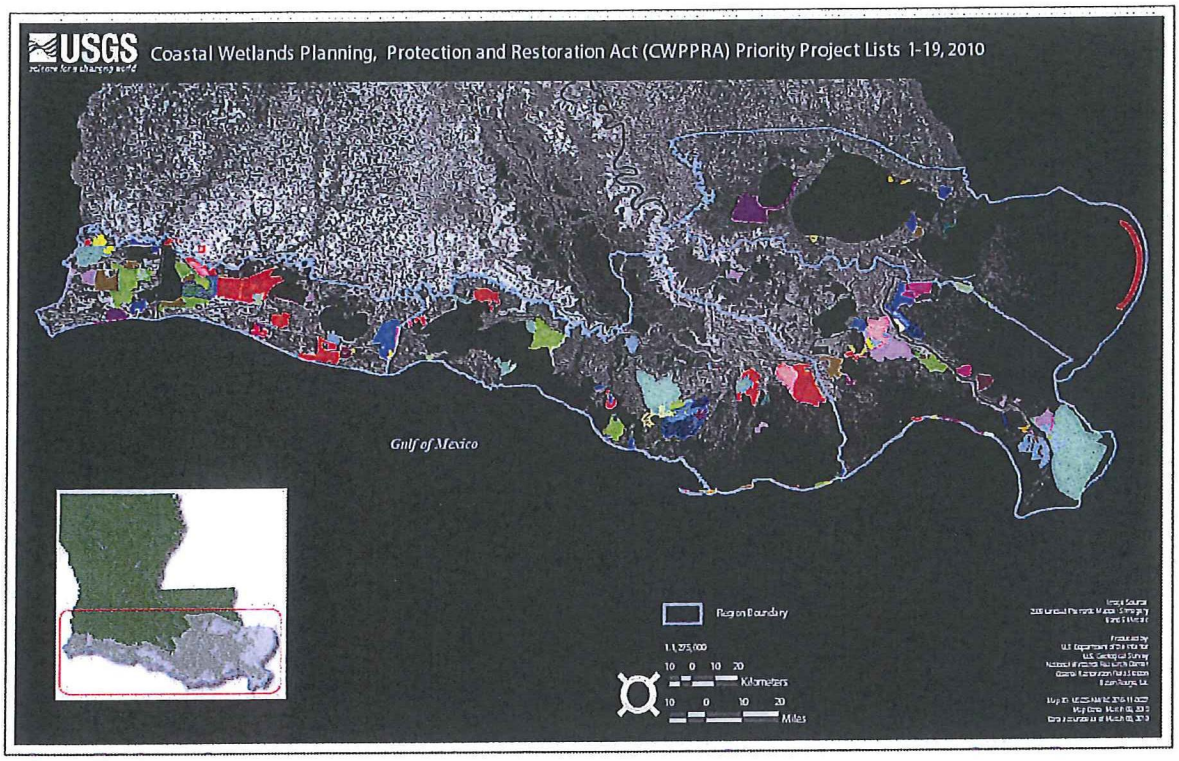


**Figure 5.** Location of projects along the Louisiana coast funded by a 1990. (Colors indicate various project priority level that each area belongs to.)

*1998*

A rigorous, 18-month initiative ending in 1998 brought together diverse groups, industries, communities into Louisiana's ***Coast 2050*** project, a comprehensive survey of coastal needs, and public and professional sentiment. The report guided planning for the next several years, as the Army Corps of Engineers developed its first suite of proposals to address catastrophic wetland loss.

*2005-2006*

Hurricanes Katrina and Rita added urgency and complexity to coastal restoration planning. Devastated areas struggle to return five years later.

Weeks after Katrina destroyed much of New Orleans, the state legislature established a Coastal Protection and Restoration Authority that wound wetland loss and hurricane risk into a single conversation. The lawmakers also converted the Wetlands Conservation and Restoration Fund to this purpose. Thirteen months after the storm, Louisianans approved by a 4-1 margin a state constitutional amendment that explicitly ties outer continental shelf oil-and-gas revenues to storm protection and rebuilding wetlands.

The Coastal Protection and Restoration Fund takes in a steady stream of money from state mineral income, about $25 million a year, and other irregular payments. Two federal revenue streams feed the fund. A 2005 energy policy law set up the **Coastal Impact Assistance Program**, which authorizes $250 million split among six states in each fiscal year from 2007-2010 to fund recovery from damages to natural resources, conservation, and protective measures. The 2006 **Gulf of Mexico Energy Security Act** boosts offshore revenue and gas income with coastal states that are generated from new lease areas. Participating Gulf states (all but Florida) share 37.5 percent of revenue from new leases. Another fraction goes to the Land and Water Conservation Fund. Beginning in fiscal year 2017, states stand to receive revenue from an expanded number of wells on the Outer Continental Shelf, which will multiply their oil-and-gas income. Projections vary with energy prices.

A 2006 Department of Defense appropriation directed the Army Corps of Engineers to develop a suite of improvements to the Louisiana and Mississippi coasts, including salves for "hurricane and storm damage reduction, prevention of saltwater intrusion, preservation of fish and wildlife, prevention of erosion, and other related water resource purposes at full Federal expense." In September 2009 a Chief of Engineers' report suggested 12 projects for Mississippi, totaling more than $1 billion, that would help make its coast more resilient to storms. These elements became the foundation of the **Mississippi Coastal Improvements Program (MsCIP) Comprehensive Plan** that should help restore barrier islands, particularly Hope, Petit Bois, East Ship Island, and part of Cat Island. The plan calls for bringing back beaches, sensitive habitats, and coastal ecosystems. In 2009, Congress appropriated $439 million toward Mississippi's program, in part to gird the barrier islands.

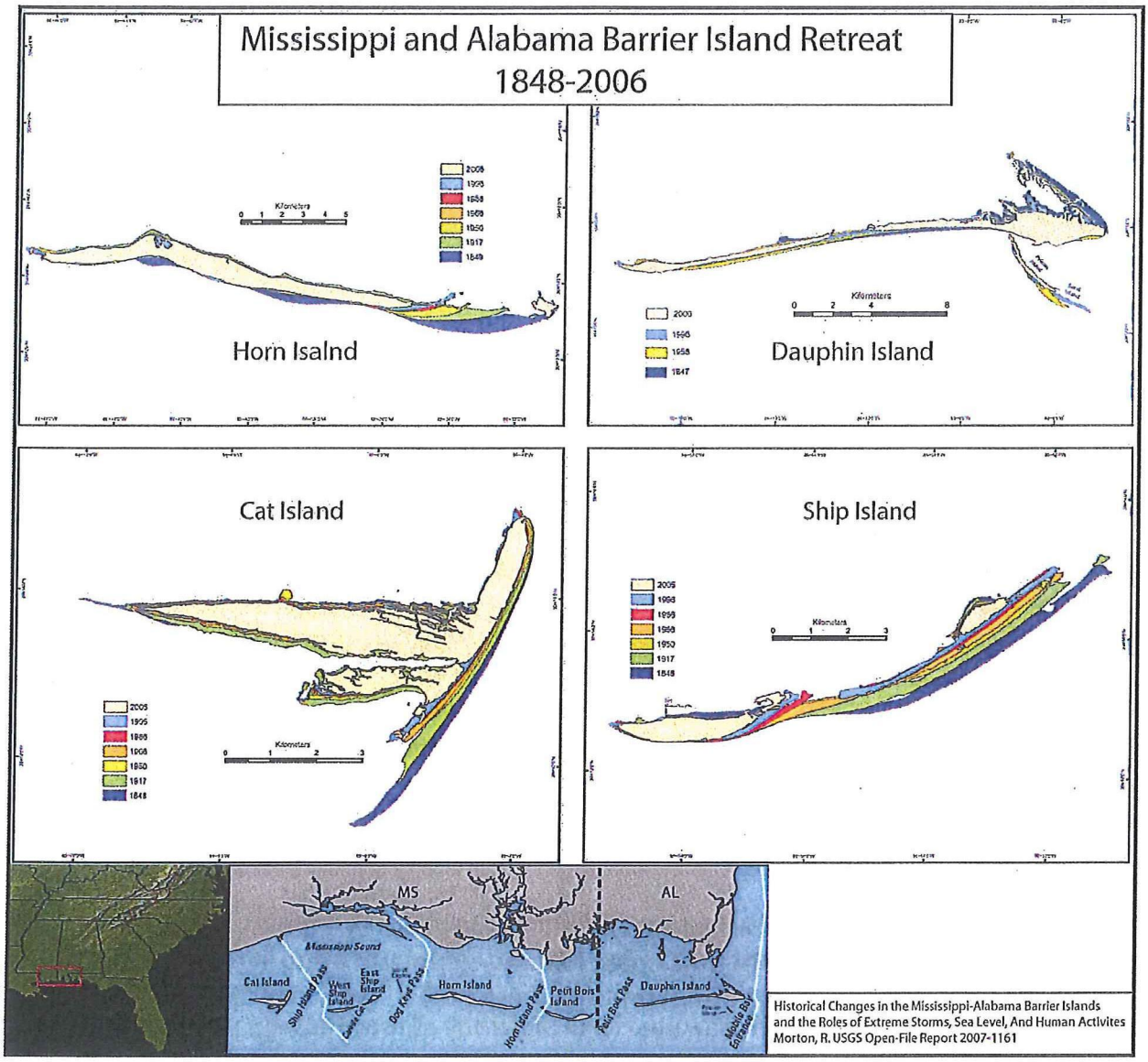


**Figure 6.** The large barrier islands which protect the coast of Mississippi and Alabama from storms have been eroding rapidly.

The Corps is now in the final stages of preparing a counterpart, the **Louisiana Coastal Protection and Restoration Final Technical Report**, a 3,280-page plan that awaits congressional authorization. The plan prioritizes high-risk areas, such as the Deltaic Plain, the eastern half of the Louisiana coast. West of there, the Atchafalaya River spills its sediment across growing wetlands, and western Chenier Plain is relatively stable. The Corps presents in the report a "final array" of plans for decision-makers to consider and evaluate, including conceptual maps that show how different combinations of proposals might work together.

*2007*

Louisiana further consolidated its attention on flood control and restoration matters in 2007, when the new Coastal Protection and Restoration Authority authored **Louisiana's Comprehensive Master Plan for a Sustainable Coast**. The framework introduced itself as the "first cut" of an evolving and adaptive process to keep the coast healthy. The state has issued annual updates in preparation for the first major revision of the Master Plan in 2012. Its fiscal year 2011 implementation plan describes a new modeling tool to help decision-makers prioritize projects. There are 51 projects in construction in FY 2011.[14]

Around the time Louisiana rolled out its plan, an earlier iteration of Corps planning led to a list of high-priority restoration projects ultimately authorized by Congress in 2007. In January 2005, the Chief of Engineers' report identified 15 projects that together would reduce wetland loss and embolden the ecosystem. The individual projects represent a spectrum of tactics: freshwater diversions to reintroduce sediment; barrier island restoration; strategic dredging to capture sediment; and funding for scientific research. These projects became the backbone of Title VII of the **2007 Water Resources Development Act**, devoted to the **Louisiana Coastal Area**. The law directs the Corps to come up with a plan consistent with the state Master Plan that harnesses river diversions, wetland restoration, and sediment capture to slow current decay. President Obama's fiscal year 2011 budget proposes $19 million for construction, sediment use, and river diversions. Another $16.6 million would further studies of eventual restoration projects. A key Senate subcommittee supported the measure in July.

*2009-2010*

The Obama administration last fall asked several federal agencies to support state efforts by creating a **Louisiana-Mississippi Gulf Coast Ecosystem Restoration Working Group**. Six months later, in early March, the group reported back with a "road map" for federal-state collaboration. The plan includes an overview of exiting authorities and programs and establishes strategic goals: Develop a federal-state long-term vision; ensure scientific observations appropriately inform decision-making; identify and remove immediate barriers to progress. The Working Group also set out 2010-2011 deadlines for advancing policymaking.

President Obama asked Secretary of the Army Ray Mabus to conduct an investigation of how restore the Gulf after the spill, a report that is due publicly any day, and likely to inform further Commission efforts to synthesize analysis of the spill's aftermath, Gulf or Mexico productivity, and coastal restoration.

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[14] Coastal Protection and Restoration Authority of Louisiana. *Fiscal Year 2011 Annual Plan*. Office of Coastal Protection and Restoration. April 2010. http://www.lacpra.org/assets/docs/FY2011Annualplanfinal.pdf

**THE HONORABLE THOMAS L. STRICKLAND**

**Assistant U.S. Secretary of the Interior for Fish, Wildlife and Parks**

*Day 2, Panel 6: The States & The Federal Government: Defining a Shared Path for Gulf Restoration*

Anticipated Focus:

The Interior Department belongs to the administration's Louisiana-Mississippi Gulf Coast Ecosystem Working Group, which in March issued a "road map" for building a resilient Gulf coast. The spill illustrates the need for regional cooperation but also the complexity of establishing it.

Biography:

Thomas Strickland was confirmed Assistant Secretary for Fish and Wildlife and Parks on April 30, 2009. President Obama nominated him for the position on March 12, 2009. In this capacity, he oversees and coordinates policy decisions for the National Park Service and U.S. Fish and Wildlife Service. He also serves as chief of staff to Secretary of the Interior Ken Salazar.

Before joining Interior, Strickland was executive vice president and chief legal officer of UnitedHealth Group from May 2007. Before that he was a partner of the Hogan & Hartson law firm, serving as Managing Partner for the firm's Colorado offices. He was also a member of Hogan & Hartson's executive committee. At Hogan & Hartson, Strickland represented clients on a wide range of litigation, business and regulatory matters. Before joining Hogan & Hartson, Strickland served as United States Attorney for the District of Colorado from 1999 through 2001. Prior to his appointment as the top Justice Department official for Colorado, he spent 15 years with another law firm where he was a senior partner in charge of the regulatory, administrative and public law practice. In 1996 and 2002, he was the Democratic nominee for the United States Senate in Colorado.

From 1982 to 1984 he served as the chief policy advisor for Colorado Governor Richard D. Lamm, advising the governor on all policy and intergovernmental issues. From 1985 to 1989, he served on and chaired the Colorado Transportation Commission. Strickland also served as legal counsel to the Denver Metro Chamber of Commerce and was a founder and board member of Great Outdoors Colorado, the lottery-funded program which has invested over $600 million into parks, wildlife and open space programs in Colorado. Strickland received his bachelor's in English literature with honors from Louisiana State University, where he was an All-SEC Academic Football Selection. He received his J.D. with honors from the University of Texas School of Law. He is a member of the Colorado, Minnesota and Texas Bars.

**GARRET GRAVES**

**Director, Louisiana Office of Coastal Activities**

*Day 2, Panel 6: The States & The Federal Government: Defining a Shared Path for Gulf Restoration*

Anticipated Focus:

After Hurricanes Katrina and Rita, Louisiana merged their storm protection and coastal restoration initiatives into one entity. The Coastal Protection and Restoration Authority authors the state's Comprehensive Master Plan, an evolving management program for state restoration goals and a major driver of the federal-state planning process.

Biography:

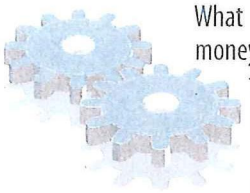
In his current position, Garret Graves is responsible for coordinating the efforts and activities of all state agencies related to work in coastal Louisiana. This includes hurricane protection, coastal restoration, fisheries, maritime, energy, environmental policies and many other areas. He also serves as chair of the Louisiana Coastal Protection and Restoration Authority (CPRA). The CPRA was established after Hurricane Katrina (2005) to oversee efforts to implement the state's master plan for the restoration and protection of coastal Louisiana. This cumulative effort constitutes one of the world's largest public works projects, currently estimated to be $100 billion. Over $17 billion in efforts are underway.

Prior to joining Governor Jindal's team, Graves worked in Congress for nearly 13 years, serving under Senator John Breaux, the House Energy and Commerce Committee and Congressman Billy Tauzin. During this time, he advised members of Congress on energy, environment, water resources, transportation, maritime, defense, trade, foreign affairs and budget issues. Most recently, he was staff director for the U.S. Senate subcommittee on Climate Change and Impacts. Following Hurricane Katrina, Graves was tapped to work on recovery issues, which included repairs and improvements to the New Orleans area hurricane protection system.

# What Drives The Alaska Economy?

*By Scott Goldsmith*

UA Research Summary No. 13 • December 2008
Institute of Social and Economic Research • University of Alaska Anchorage



What drives Alaska's economy is new money: money coming in from outside the state. How big the economy is, and how much it grows, depends on how much new money comes in.

New money comes from "basic" sectors—the sectors that are the basis for all jobs and income across Alaska. They are, in effect, the gears driving the economy.

Alaska has eight main basic sectors, but the number of Alaskans they employ directly is small, compared with the number of jobs they support indirectly. Figure 1 shows numbers and shares of jobs for Alaskans that the federal government, the petroleum sector, and the other basic sectors generated on average between 2004 and 2006. The numbers for any specific period aren't as important as the percentages, which don't change much from year to year.

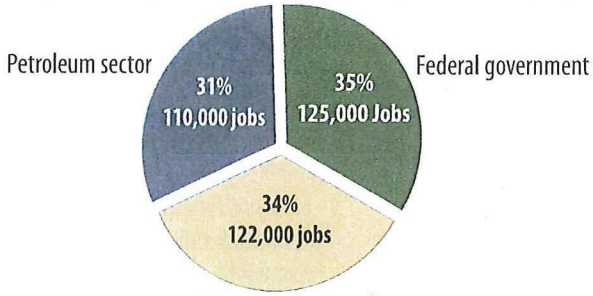
- *If the flow of federal and petroleum money disappeared overnight, two-thirds of the jobs for Alaskans would also disappear*, because each of them supports a third of those jobs.
- *Alaska's other basic sectors combined support about a third of jobs for Alaskans.* The seafood, mining, and timber sectors produce commodities that are exported. The tourism and international air cargo sectors sell services to people from outside Alaska. Federal retirement checks and investment income Alaskans collect from outside sources also generate jobs.

How is it that the federal government and the petroleum sector support most jobs for residents, and several other sectors support the rest? This summary, based on a longer paper (see back page), is a unique analysis of how the basic sectors drive the economy. Instead of looking just at jobs in a specific activity—seafood processing, for instance—we allocate all the jobs throughout the economy to the basic sectors that support them. This method gives a clearer picture of the structure of the economy, but it may produce different numbers than other methods.

Here we use jobs for residents to measure economic contributions—a reasonable measure but not the only one, as we discuss in the full paper. We analyze just jobs for Alaska residents, even though many non-residents also work here. They don't typically spend their paychecks in Alaska, so they don't add as much to the economy.

To compare across sectors, we've converted all jobs to an annual average number. That means for industries like commercial fishing and tourism, which have a lot of seasonal jobs, we've translated the larger number of seasonal jobs into a smaller number of year-round jobs. Still, keep in mind that not all jobs are equal; some pay much more than others.

**Figure1. What Generates Jobs for Alaska Residents[a]?**
(Annual Average Number of Jobs for Residents, 2004-2006: 357,000)




[a]Excludes jobs held by non-residents. [b]Seafood, tourism, mining, timber, international air cargo, and personal assets from outside Alaska (primarily federal retirement benefits).

**Note:** This analysis shows that the petroleum sector reaches across Alaska's economy, supporting jobs in almost every industry. But petroleum's effects go even deeper, as a follow-up ISER study will show. Without the support and stability petroleum has provided since the 1960s, Alaska's economy might be only half the size it is today. Look for the new study in early 2009.

## Why Does Alaska's Economy Look Like This?

Before we talk more about how the basic sectors generate jobs, it's useful to look at the big picture. Why does the federal government play such a big role in Alaska, and why are most basic sectors ones that produce natural resources? Why don't we have, say, more in-state manufacturing or large high-tech businesses?

Federal spending in Alaska is high, relative to the population, for several reasons—including a large military presence; huge federal land holdings; federal health-care and other programs for Alaska Natives; and continuing construction of basic infrastructure that the federal government helps pay for.

Alaska's economy has also historically been shaped by characteristics that increase the costs of doing business and make development difficult—including huge size, harsh climate, and distance from markets and suppliers. Economic growth and technological advances have reduced but not eliminated such disadvantages, especially in remote areas.

## Why is new money important?

Why is it important for new money to come into the state? That's because no economy—in Alaska or anywhere—is self-sufficient. All economies have to buy goods and services that aren't produced locally, which means money flows out of the local economy to economies somewhere else. That loss has to be offset by new money flowing in, or the local economy would eventually go broke.

**This summary is part of a new ISER initiative, *Investing for Alaska's Future*, underwritten by a grant from Northrim Bank and in partnership with the University of Alaska Foundation. Go to www.iser.uaa.alaska.edu for more information.**

## How Basic Industries Work

The new money every economy needs comes from selling goods or services to companies or people from somewhere else. Several of Alaska's basic sectors produce commodities for export to world markets—oil and gas, seafood, minerals, and timber. The tourism and air cargo sectors provide services to consumers from outside Alaska—visitors from other places who spend money in the state, and international cargo carriers that spend money locally for refueling and other services.

Money also arrives via the mailboxes of retirees, who collect Social Security, federal retirement benefits, and pensions. Other Alaskans also collect earnings from investments outside the state. The federal government doesn't produce commodities or services for sale in the market, but it's a basic sector because all federal money coming into Alaska is new money.

Keep in mind that the number of Alaskans the basic sectors employ directly is only a small fraction of the total jobs they generate. The best example of small direct employment but huge indirect employment is in the petroleum sector. Only about 5,000 Alaskans work directly in producing oil and gas, but the petroleum sector supports more than 100,000 jobs.

The oil companies spend a lot of money hiring other businesses to work for them, and they pay good wages. They also pay billions of dollars in taxes and royalties to the state government. In these and other ways, the petroleum sector supports jobs in almost all Alaska's industries. As Figure 2 shows, the petroleum sector supports 75% of state government jobs and more than half of local government jobs. A quarter to a third of all jobs in finance, utilities, retail and wholesale trade, and construction can be traced in some way to the petroleum sector.

For two of Alaska's basic sectors—tourism and retirement income—it's impossible to identify any specific direct jobs, because tourists and retirees spend their money at the same businesses where all Alaskans do. But these sectors nonetheless indirectly support thousands of jobs .

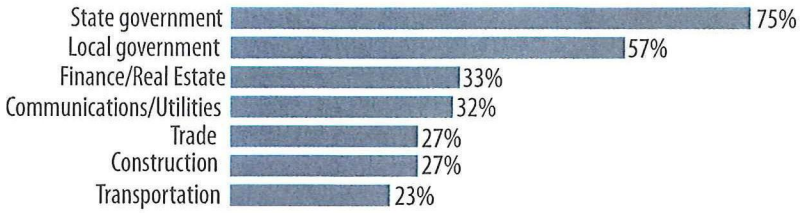
## Non-Basic Sectors: Serving Alaskans

Besides the basic sectors, there are other parts of the economy that don't sell anything to people from outside Alaska but instead provide goods and services for Alaska households and businesses. These non-basic sectors depend on money generated by the basic sectors— but they are also essential to the economy, because they circulate money inside Alaska.

Money from the basic sectors circulates through the economy as households and businesses make local purchases—and as the money circulates, it generates additional jobs and income. That's known as the multiplier effect. The larger the non-basic sectors are, the more times the money turns over in the economy and the bigger the multiplier effect.

A big change in the Alaska economy since statehood has been the growth of industries providing local goods and services. As recently as the 1960s, Alaskans couldn't buy a lot of things locally, and they often traveled Outside for specialized medical care and other services. But in Alaska's urban areas the non-basic sectors now provide virtually the same goods and services found nationwide, and Alaska businesses are also able to get support services locally. Because the non-basic sectors are larger now, more money stays in the local economy longer.

**Figure 2. What Shares of Jobs in Various Industries Depend on Petroleum?**




## Petroleum Industry


About 17% of U.S. oil production is from Alaska, and petroleum is the state's most important natural resource sector. Oil production is concentrated on the North Slope, with a small amount from Cook Inlet, which also produces natural gas. The petroleum industry creates jobs directly and indirectly through production; through revenues for state and local governments; and through special state savings accounts created with oil revenues. (A number of other studies, including a 2008 study by the Alaska Oil and Gas Association, have estimated the economic importance of petroleum. But because those studies use different methods, the results differ somewhat.)

- *Only a small share of the 52,000 jobs for Alaskans that depend on petroleum production are direct production jobs.* Petroleum production, exploration, and development activities also create jobs in oil-field support, construction, and other industries. The trans-Alaska pipeline, which carries North Slope oil to the port at Valdez, generates jobs in transportation and other industries. In-state oil refineries create jobs in manufacturing, transportation, and other industries. Jobs in many other Alaska businesses also depend on spending by households and businesses with income related to petroleum production.

- *State and local petroleum revenues support about 50,000 jobs for Alaskans.* That includes roughly 30,000 state and local government jobs and 20,000 private jobs generated by state and local spending of oil revenues. Petroleum revenues essentially finance the entire state General Fund operating budget, and about 40% of local government revenues come either through local taxes on petroleum property or state aid. No other state depends so much on a single sector to support state and local activities.

- *Permanent Fund dividends and the Constitutional Budget Reserve also support about 7,000 jobs for Alaskans.* These jobs are indirectly generated by the petroleum industry, because the state's big savings accounts—the Permanent Fund and the Constitutional Budget Reserve—were established with petroleum revenues.

The Permanent Fund is a multi-billion-dollar savings account. The state constitution prohibits spending the principal of the Permanent Fund, but every year since the early 1980s the legislature has used a share of the fund's earnings to make payments to all Alaska residents. When Alaskans spend these dividends, they generate private jobs throughout the economy.

The Constitutional Budget Reserve was established as a savings account to be used when the state faces budget deficits—as it did several times in the 1990s, when oil prices and state oil revenues were low. Spending from this reserve generates jobs in the same way as other state spending of petroleum revenues.

## Traditional Resources Industries

Seafood 37,600 jobs | Mining 11,700 jobs | Timber 5,900 jobs

Alaska's traditional resource industries—which supported the private economy before oil was discovered—are the seafood, mining, and timber industries. Alaska's first salmon cannery opened in 1878, and the Gold Rush brought mining to Alaska toward the end of the 1800s. Large-scale timber harvesting began in the 1950s.

These resource industries remain important to the economy, but their contributions are often obscured by the prominence of the petroleum industry. Alaska is among the world's top seafood producers; only eight countries produce more wild seafood. The value of minerals from Alaska—especially zinc—climbed in recent years, as metal prices rose. The timber industry has shrunk since the 1990s.

- *The seafood industry supports almost 38,000 jobs for Alaskans,* on an annual average basis. Besides direct fishing and processing jobs, this includes jobs in boat repair, fuel supply, and air transportation, as well as jobs in stores, banks, and other businesses where Alaska households and businesses spend their income from seafood.
- *Mining supports nearly 12,000 jobs for Alaskans,* including about 2,500 direct jobs in production, exploration, and development, as well as a number of self-employed miners. Mining indirectly supports jobs in businesses that sell supplies to the mines and in construction companies working on mine development. Alaska Native corporations own land where several producing or planned mines are located—and royalties they receive from mining companies indirectly support some Native corporation jobs.
- *Alaska's timber industry supports about 6,000 jobs.* Timber was a big part of Southeast Alaska's economy from the 1950s to the 1980s. But it shrank as the federal government reduced the timber supply from the Tongass National Forest, as harvests on Alaska Native corporation lands declined, and as world markets became more competitive.
- *Alaska's small agriculture industry* produces mostly for local markets. The fur industry, which was important historically, is also small today.

## Newer Basic Industries


Tourism | Air Cargo

Two of Alaska's basic industries have developed largely since Alaska became a state: the tourism and international air cargo industries. Tourism has been increasing since the 1960s, but the number of tourists has grown sharply in more recent times. Between 1990 and 2006 the number of tourists visiting Alaska in the summer more than doubled—from under 700 thousand to about 1.6 million.

Almost all the international cargo activity is at Anchorage's Ted Stevens International Airport, ranked third worldwide for volume of cargo handled in 2006. For decades, air carriers flying between the U.S. and the Far East have stopped to refuel, change crews, and do routine maintenance. Many jets now have a range that would allow them to overfly Alaska, but most carriers still find it economical to carry a heavier payload and less fuel.

Three major carriers have also now established package-sorting facilities at Anchorage's airport, and a number of carriers move cargo between planes to consolidate shipments for different destinations.

- *Tourism supports about 40,000 jobs for Alaskans,* on an annual average basis. Perhaps half of these jobs are in restaurants, hotels, lodges, bars, sightseeing businesses, and other establishments that provide services to tourists. Additional jobs are indirectly generated when Alaska households and businesses spend their tourism-related income in the economy.

This estimate of jobs generated by tourism is calculated indirectly. That's because Alaskans also spend their money at the same businesses where tourists do—making it impossible to associate particular jobs with spending by tourists. Instead, we use available information on tourist spending and other factors to estimate jobs generated.

- *International air cargo activities at Anchorage's airport directly generate an estimated 3,500 jobs for Alaskans,* including cargo handlers, couriers, cargo pilots who live in Anchorage, and others involved in cargo activities. Those activities also indirectly support about 4,000 more jobs in other industries. Virtually all these jobs are in Anchorage.

## Personal Assets

Retirees 14,700 jobs | Other 3,500 jobs

Another source of money flowing into the state is one Alaskans don't typically think of: personal assets. These are mainly retirement checks (sometimes called the "mailbox economy") for older Alaskans, as well as health-care spending for older people through Medicare, Medicaid, and private insurance. It also includes Alaskans' investment income from Outside.

Like tourists, retired Alaskans spend their money at the same stores, restaurants, and other businesses as all Alaskans do. That makes it impossible to associate particular jobs with spending by retirees. Our estimate of jobs generated by retirement income is calculated indirectly, based on the limited information about retirees in Alaska.

- *Retirement checks and health-care spending for older Alaskans generate nearly 15,000 jobs for residents.* Income from investments outside the state and other non-earned income flowing into Alaska generate about 3,500 more jobs.
- *Spending by older Alaskans is a growing source of jobs in the state.* Until recently, few people stayed in Alaska when they retired. But the number of Alaskans 65 and older quadrupled between 1980 and 2007, growing to 47,000—and that number is expected to reach 134,000 by 2030.

## Federal Government


Defense | Civilian

The federal government supports more jobs for Alaskans than any private industry—including even the petroleum industry. Just over a third of Alaskans with jobs depend in some way on federal spending.

Federal spending in Alaska generates jobs in many ways and through both military and civilian activities. A lot of federal money flows into Alaska, relative to the number of Alaskans—an estimated $9.25 billion in 2006, for a population of around 670,000. At the beginning of this summary we touched on some of the reasons why. Those include a large military presence, big federal land ownership, health and other programs for Alaska Natives, and the continuing need to build basic infrastructure in much of Alaska.

## How Do Special Characteristics Shape the Alaska Economy?

*Alaska is a long way from markets and suppliers; it's huge and 90% has no roads; it has severe winters and a lot of permafrost.*

- Resource development is difficult and very expensive. Even rich resources (like North Slope natural gas) face big economic barriers.
- The costs of doing business are high, especially in remote areas. It's very hard to start new businesses or maintain existing ones.

*The population is small—only three states have fewer people—and the people and the jobs are concentrated in relatively small areas.*

- Only a few urban areas are large enough to benefit from economies of scale and support year-round businesses providing local services.
- Hundreds of remote communities are accessible only by air or water, have few jobs, and depend heavily on subsistence hunting and fishing.

*Alaska has the highest seasonal variation in jobs nationwide. The number of private jobs is about 25% higher in summer.*

- Communities that depend heavily on seasonal jobs in seafood and tourism have trouble supporting year-round local businesses.

*Non-residents hold nearly one quarter of Alaska's private jobs. Many but not all these jobs are in industries that ramp up in summer.*

- There aren't enough residents with the necessary technical skills to fill all the jobs in petroleum production and other non-seasonal industries.

*No other state depends on a single, non-renewable resource as much as Alaska depends on oil production—which is declining.*

- Oil revenues make up most of the state's general income and about 40% of local government revenues (largely through state aid).

*Most resource development is in enclaves, in remote locations without an adequate skilled local labor supply or local support services.*

- Developers supply their own workers and services, so regional economies get limited benefit from such jobs and business activity.

*The resource industries that drive Alaska's economy are dominated by large national or international companies.*

- That's partly because it requires so much money to develop and produce Alaska's resources, especially petroleum and minerals.

*The federal and state governments together own 89% of Alaska land, compared with 35% nationwide.*

- This limits potential local property tax bases, but offers opportunities (like state-owned oil fields) for revenues from resource development.

*Nearly one-quarter of Alaska jobs are in government—compared with a U.S. average of 13%—largely because of federal jobs.*

- Having so many public jobs makes Alaska's economy somewhat more stable in the face of changing market conditions.

- *About 11,000 Alaskans work for civilian federal agencies and another 53,000 Alaskans indirectly depend* on civilian activities for their jobs. Federal grants to state and local governments for operations and capital projects, to Alaska Native non-profit corporations, and to other non-profits generate some of those indirect jobs. Other jobs are generated by payments to individuals (excluding the retirement income discussed earlier) and spending for food stamps, unemployment insurance, and other programs. These flows of federal dollars generate more jobs throughout the economy. For example, federal employees generate jobs when they spend their wages, and federal agencies create jobs when they buy from local businesses.
- *More than 22,000 direct military jobs and 6,000 civilian jobs in the Department of Defense are in Alaska, and military activities generate another 32,000 jobs around the state.* Those jobs are generated in many ways—for instance, when military personnel spend their wages; when the military hires construction companies to build facilities or contracts with local businesses to provide various services; or when the military buys from local businesses.

## Conclusions

As Alaska celebrates 50 years as a state, the size and structure of its economy is dramatically different from what it once was. A mix of basic sectors—public and private, large and small—combine to drive the economy. The federal government and the petroleum sector dominate the picture: the health of the economy really depends on their health, even though the number of Alaskans they employ directly is small, compared with their big indirect contributions.

Basic sectors that traditionally supported the economy—particularly seafood and mining—still make important contributions. Other sectors, especially tourism, have grown significantly since statehood. A growing number of retirees also contribute to Alaska's well-being. (Here we used jobs as a measure of contributions, but as the full report discusses, there are other measures—payroll, income, sales, and gross state product.)

The contributions each sector makes depend on its specific characteristics, but the most important factors ar purchases from other Alaska businesses and payroll generated for Alaska households. As the economy has grown, the basic sectors have been able to rely more on purchases from local Alaska businesses, and their employees have been able to find more goods and services provided locally. This expansion of businesses serving the local economy enhances the contribution of the basic sectors.

The snapshot of the Alaska economy provided here is the first step in understanding how Alaska's economy has changed over the past 50 years. We need to understand these changes, so we can continue to have a strong and resilient economy in the decades to come. The next paper in this series will look in more depth at how the petroleum sector has provided the resources and stability behind Alaska's economic transformation.

This summary is based on a report by Scott Goldsmith, *Structural Analysis of the Alaska Economy: What are the Drivers?* It's the first in a series of reports in the new ISER program, *Investing for Alaska's Future*. That program is studying the importance of investing for Alaska's future. But to plan for the future, Alaskans need to understand how their economy works. The program is underwritten by a grant from Northrim Bank, in partnership with the University of Alaska Foundation.

To see the full report and to learn more about the research program, go to:

**www.iser.uaa.alaska.edu**

Editor: Linda Leask Graphics: Clemencia Merrill

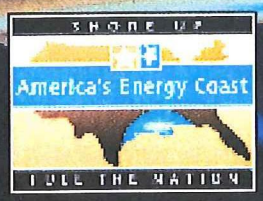
# SECURE GULF PROJECT

## Sustaining Natural Resources and the Communities of America's Energy Coast

*A Response, Recovery and Resiliency Report*

September 21, 2010

America's WETLAND FOUNDATION



# SECURE GULF PROJECT

SHORE UP
America's Energy Coast
FUEL THE NATION

"The real protection for New Orleans and the coast are wetlands. The oil spill is a new opportunity for us to take a look comprehensively and ask how do we do things better and how do we do things smarter than we've done before."

President Barack Obama
NBC Brian Williams, 08.29.10

America's WETLAND FOUNDATION

America's WETLAND FOUNDATION

SHORE UP America's Energy Coast FUEL THE NATION

# SECURE GULF PROJECT

## Sustaining Natural Resources and the Communities of America's Energy Coast

A Response, Recovery and Resiliency Report

September 21, 2010

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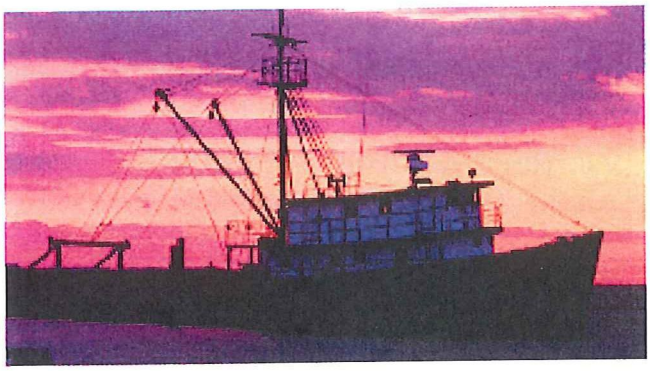
# I. EXECUTIVE SUMMARY

This report represents consensus opinion of the America's Energy Coast initiative of the America's WETLAND Foundation and participants in the process represent varied stakeholders and interests of the energy producing states of Texas, Louisiana, Mississippi and Alabama. The Secure Gulf Project report is the culmination of ideas to sustain one of the world's most prolific ecosystems and its economic and natural resource benefits to the U.S. The report seeks to raise the authentic voice of the region and to shine light on its vulnerabilities in the context of climate, energy and coastal restoration and protection.

As this report was developed through consensus by participants with diverse interests, no one recommendation represents the views, mission or legislative agenda of any specific organization participating in the process, nor should the report, in any way, presume to redefine stated purposes or policy positions of any of its participating organizations or industries.

## Key Findings

- America's WETLAND, along the coast of Louisiana, is a prolific ecosystem that serves as the nursery ground for the Gulf of Mexico and its loss - the greatest rate of land loss on the planet - is a national tragedy that requires a national solution and commitment.
- The Mississippi River delta was built by the annual overflow of the river's fresh water and nutrients, enabling the wetlands to regenerate. Reconnecting this delta to its source is key to saving the deteriorating landscape.
- According to scientists throughout the world, reconnecting the delta with its source, the Mississippi River, is the most important action that could be taken to rehabilitate this deteriorating system since being severed by leveeing the river in the 1930s. This channeling of fresh water, nutrients and sediment off the continental shelf prevents the annual replenishment of the wetlands and their ability to regenerate.
- America's Energy Coast of Texas, Louisiana, Mississippi, and Alabama is a unique working coastal region at great risk, providing the U.S. with 30% of its total oil and natural gas supply (90% of its offshore supply), a third of the nation's seafood and commerce transported in and out of the U.S. through the largest port system by tonnage in the world. The economies of the energy coast rely heavily on the transportation and oil and gas industries. The transportation and material moving industry, including the port systems, directly employs approximately 1,100,000 people, while the oil and gas extraction industry directly employs almost 131,500 people. The combination of annual state and local tax revenues associated with this payroll is $3.7B and $1.1B, respectively. Additional economic impacts are associated with these industries, including federal and state royalty revenues, indirect job creation, and taxable purchases for operations.
- Coastal communities and their cultures throughout the region are vulnerable; the people who live and support the economic activities that take place there, along with hundreds of billions of dollars in critical economic and energy infrastructure, depended upon by the entire nation, are at risk.
- As the landscape changes, there is a greater risk of losing unique and historic cultures along the Gulf Coast; these cultures and their people are tied to the land and their value cannot be replaced.
- Coastal landscapes all along the energy coast are jeopardized; some have high rates of erosion and severe water quality issues, with no concerted policy addressing these challenges.



- Loss of the landscape will lead to the demise of the Gulf Intracoastal Waterway (GIWW) and the services it provides the shipping, fishing, and energy industries, along with the Mississippi River system, which is the prime feeder for goods, services and commodities. This central transportation junction is the reason for industries locating there. Losing the land will result in the loss of this critical industrial and commercial base.

- The consequences of natural and man-made disasters will cost the nation billions of dollars as Gulf coastlines continue to erode and deteriorate.

- Conservative estimates suggest that America's Energy Coast will be shouldered with the responsibility of providing secure conventional energy resources to the nation at current rates or more for at least 25 years. (Source: US Dept of Energy, Energy Information Administration)

- High performance of the energy sector that provides domestic oil and gas exploration and production is threatened by federal regulatory uncertainties and exploration and production disruptions that prevent secure operation in the Gulf of Mexico.

- Cost benefit analyses support immediate and sustained investment in restoring the coast to hedge against disasters as climate impacts of sea level rise, along with subsidence, and the starving of wetlands of sediments, ravage the region and jeopardize its ecological and commercial viability.

- The region is suited to lead the nation in new energy technologies and practices, including enhanced natural gas production, innovative use and re-use of carbon bi-products, and carbon sequestration.

- The nation could benefit by establishing a water resources institute in the region from which best practices and products could emerge to respond to challenges facing the world's deltas.

- The scale of challenges facing the region present opportunities to create new jobs for sustaining ecosystem, energy, and economic assets and for building community resiliency.

## RECOMMENDATIONS

### Coastal Restoration Should be a Priority

- Immediately establish a Federal Trust Fund for Gulf Coast Restoration. Such a fund will be initially financed through federal penalties, initiated by 80% of penalty monies resulting from the Deepwater Horizon oil spill. The fund will be shared among the five Gulf of Mexico states of Texas, Louisiana, Mississippi, Alabama and Florida. The fund is to be spent in compliance with approved state and federal restoration plans.

- Aggressively fund restoration and protection projects already authorized by Congress in time to build on the existing landscape and to restore values of the coast being lost.

- Reconcile conflicting federal policies that impede coastal restoration and delay efforts of the states.

- Accelerate the Federal process with agency collaboration through a comprehensive approach and a governance structure that streamlines decisions and actions and the setting of priorities to comply with executive order of "no net loss of wetlands."

- Assess and evaluate energy transportation systems for vulnerabilities due to coastal land loss.

- Design adaptive strategies to reduce risk for climate impacts, such as sea level rise and intensified storm events.

- Accelerate Outer Continental Shelf oil and gas revenue sharing with the producing coastal states now slated to begin in 2017; begin sharing funds from sale in March 2011, for Gulf Coast restoration. OCS revenue sharing funds will be considered as state sourced revenues.

- Cut red tape preventing distribution of Coastal Impact Assistance (CIAP) funds for projects in coastal states.

- Invest in a water institute to build intellectual capital and restoration solutions.

## Managing a Region in Crisis

- Oil and gas exploration and production activities that have been ordered suspended by the federal government as a result of the Deepwater Horizon oil spill should be evaluated by the U.S. Bureau of Ocean Energy (formerly MMS) and new procedures and requirements clarified and implemented with a sense of urgency in order to offset impacts to the region's economy and to ensure continued operational capacity.

- Upon the Administration's lifting of the moratorium, facilities deemed to be safe and in compliance with federal regulations should be allowed to resume operations immediately.

- Tax revenues from the Harbor Maintenance Trust Fund (HMTF) should be made available at the onset of each annual Congressional budget cycle to the U.S. Army Corps of Engineers and be used for the original purpose intended by the creation of the fund - the operation and maintenance of ports and harbors. The necessary equipment should be assigned to areas of most critical need and treated as priority by the Corps, along with beneficial use of dredged materials, when fulfilling HMTF mandates.

## Investing in Energy Development & Safety Technology

- Industry innovation, research and product development to contain oil spills and control exploration incidents will help guide new standards.

- Industry funded R&D for innovation should continue to inform procedures to secure the exploration, production and distribution of oil and gas. The industry should invest in safety technology to match expertise in deep water drilling technology. Support should be enhanced for cross-disciplinary partnerships with industry, research, community and government leaders in adding expertise and capacity needed for safe oil and gas production while sustaining the ecological assets of the region.

- To maintain oversight, the Bureau of Ocean Energy, must build functional capacity, both in personnel and through technologies brought on line for advanced mineral exploration and development.

- Advance Electric Power Research Institute (EPRI) and National Energy Technology Laboratory (DOE/NETL) carbon capture research programs to accelerate widespread commercial availability of Carbon Capture Sequestration (CCS) technology and federally fund CCS research that would assist America's Energy Coast in becoming a carbon reduction leader.

- Through policy and public/private partnerships, create a viable CO2 market with incentives and investment in carbon sequestration and reuse. Policy initiatives should be advanced to create new market mechanisms and to establish protocols for wetland use in carbon sequestration.. (See Addendum)

- Establish cooperative centers of academic excellence to grow intellectual capital and develop venues for exporting the region's coastal expertise and knowledge throughout the world.

- Through government, academic and private partnerships, build both human and technological maritime capacity by enhancing professional workforce skills.

### Growing Alternative Energy From A Conventional Foundation

The region should maintain its energy leadership and enhance natural gas production along with maintaining safe conventional E&P to meet demand as a bridge to the nation's energy future. Broader understanding of the role coastal wetlands can play in carbon abatement, securing pilot projects and programs to advance the region as a leader in energy transition for the nation and for the re-use of carbon should be a focus.

- Secure safe operations in the Gulf of Mexico for oil and natural gas exploration, production and distribution.
- Immediately enhance knowledge and expertise in reorganized government agencies that regulate the industry.
- Swiftly implement new procedures and standards and avoid lengthy delays that can cripple the regional economy and adversely impact the nation.
- Building a larger natural gas portfolio for the region as a strategy for bridging to a cleaner energy future should be a priority, while meeting needs for greater capacity in domestic oil production.
- Establish coordination among federal and state governments, the academic community, and the private sector to use the Gulf region as a pilot for methods, technology, and skills development as the nation determines its energy future and to retrofit the region for the expansion of natural gas production and increased availability to consumers, along with carbon re-use and the viability of wetlands in carbon sequestration
- Establish partnerships among industry, state and federal agencies and the region's academic community for research, pilot programs and projects to help define transitional energy methods and delivery.
- Prioritize regional economic and workforce development programs to support new technologies in conventional and transitional energy development.

### Building Resilient Communities

- Ensure an adequate fresh water supply to meet future demands for conventional and transitional energy development and to sustain ecosystem services.
- Communities along the Energy Coast must assess vulnerabilities and plan for resiliency, identifying and defining what constitutes resiliency in their individual areas.
- There must be recognition at all levels of government that cultures along the energy coast region are at risk of being lost and commitments must be made to ensure that community plans and national and state policies and regulations be developed to address land loss and the threat of natural disasters, incorporating the principle of "no net loss of culture".
- Resiliency planning must take into account the added costs to reside securely in historic and cultural communities that are vulnerable to disasters, lack of insurability, strict building codes, added taxes, insecure economies and workforce challenges. Diversifying local economies and workforces will support community resiliency.

## II. MANAGING A REGION IN CRISIS

This is clearly a region in crisis – the world's seventh largest delta is eroding at the greatest rate of land loss on the planet. A healthy delta is built by the replenishment of fresh water, nutrients and sediments that enable wetlands to regenerate.

At the heart of the matter is the urgent need to reconnect the Mississippi River to the ecosystem, rebuild barrier islands, and find beneficial uses for dredge materials to rehabilitate and, where possible, restore the system. Ultimately, we must rely on best science in reconnecting the delta to its life source, the Mississippi River, and must view the region as a system that includes the Atchafalaya.

Vulnerable coastal communities throughout the Gulf region face resiliency challenges due to erosion of coastal landscapes and wetlands, climate change, subsidence, sea level rise, salt water intrusion and destructive weather events.

The rich Mississippi River Delta is experiencing the greatest land loss on the planet in a place called America's WETLAND, the highly productive and sensitive Louisiana marshes that are disappearing. With the wetland loss, the nation is in jeopardy of losing critical assets - environmental, commercial and recreational fishing, wildlife, estuary, maritime and energy - including more than $500 billion in infrastructure and the largest port system in the world.

This fragile coastline supports some 30% of domestic and foreign oil and gas consumed in the U.S., including 90% of domestic offshore production. The seafood catch is 30% of the nation's total in the in the contiguous U.S., and tourism is a mainstay of the Gulf Coast economy.

While the central concern lies with restoring the Mississippi River delta, the entire Gulf coastline is in jeopardy. The mounting losses from disasters have cost upwards of $200 billion in less than six years and every economic sector and local community along the gulf coast is looking toward retrofitting for the future – a process for both survival and renewal during a time of economic hardships. Reducing the recurring costs to federal, state, and local treasuries, individuals and industry is essential now by rebuilding the natural environment that sustains the region's economy.

Although a region in crisis, the area's importance to the nation as an economic driver and significant environmental resource demands these natural and manmade assets be saved and protected in the national interest.

Sustaining a working wetland and Gulf Coast communities is further challenged by its complexity. A unique culture, dependent on the area's abundant natural resources, has found the estuaries and marshes of south Louisiana to be the fountainhead of a both a lifestyle and diverse livelihoods.

The environment is challenged by growth, progress and a national demand for petrochemical products. Good jobs have been plentiful in the energy sector and grown along with the need for conservation and environmental stewardship.

The Mississippi River has been engineered for flood protection and navigation in a way that has starved the Mississippi Delta of the nutrients and sediments needed to survive. Although the plight of America's WETLAND may be an unintended consequence, it demonstrates that missions of individual federal agencies are not adequate for solving the complex water resource challenges that differ from region to region. Though immense, our federal system is not presently designed to address the scope and scale of water resource problems we face at the onset of this century.

Policies to mitigate the impacts to this region for producing the nation's energy receive scant support by leaders from consuming states who find advantage in charging the Energy Coast with hampering national conservation and environmental objectives. In fact, the offshore revenues actually shared with coastal producing states are miniscule compared to federal royalties shared with on-shore producing states, in spite of the impacts they sustain.

## III. COASTAL RESTORATION SHOULD BE A PRIORITY

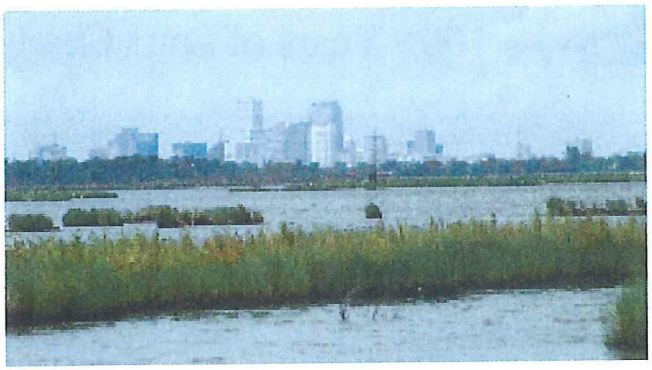
The uniqueness of the Gulf region as a working coast brings with it both opportunities and challenges as diverse interests share this strategic and productive landscape. Balance is the order of the day for both environmental and economic interests.

Our energy security and, in great measure, the economic well being of the nation, from fisheries to navigation to tourism, depend on the soundness of this region's environmental landscape.

It will take everyone at the table and strong political will to set priorities and to address the task at hand. Restoration will mean that the landscape will change and the users of that landscape will incur impacts from those changes; as fresh water is introduced, fisheries will move; all areas of the coast cannot be addressed simultaneously and some coastal projects will be built years before others; tradeoffs among restoration, flood protection, navigation, fisheries and protection of communities and other interests must be made. Any and all actions will have consequences. This must be a systems approach, with science at the helm to forecast those consequences and how to adapt to them.

### A CALL FOR RESTORATION NOW

The need for coastal restoration is urgent. Some scientists say significant action must be taken within a critical 10-year window to make meaningful restoration progress in the Mississippi Delta and on the Gulf Coast, sustain and restore the landscape and habitats, and avoid further loss. Key elements must be put in place: steady and significant streams of revenue; a federal/state governance structure with authority and capacity to reconcile policy conflicts and remove red tape that impedes complex programs; strong public/private research and implementation partnerships; a multi-disciplinary, comprehensive approach guided by science and engineering to drive outcomes at an urgent pace.

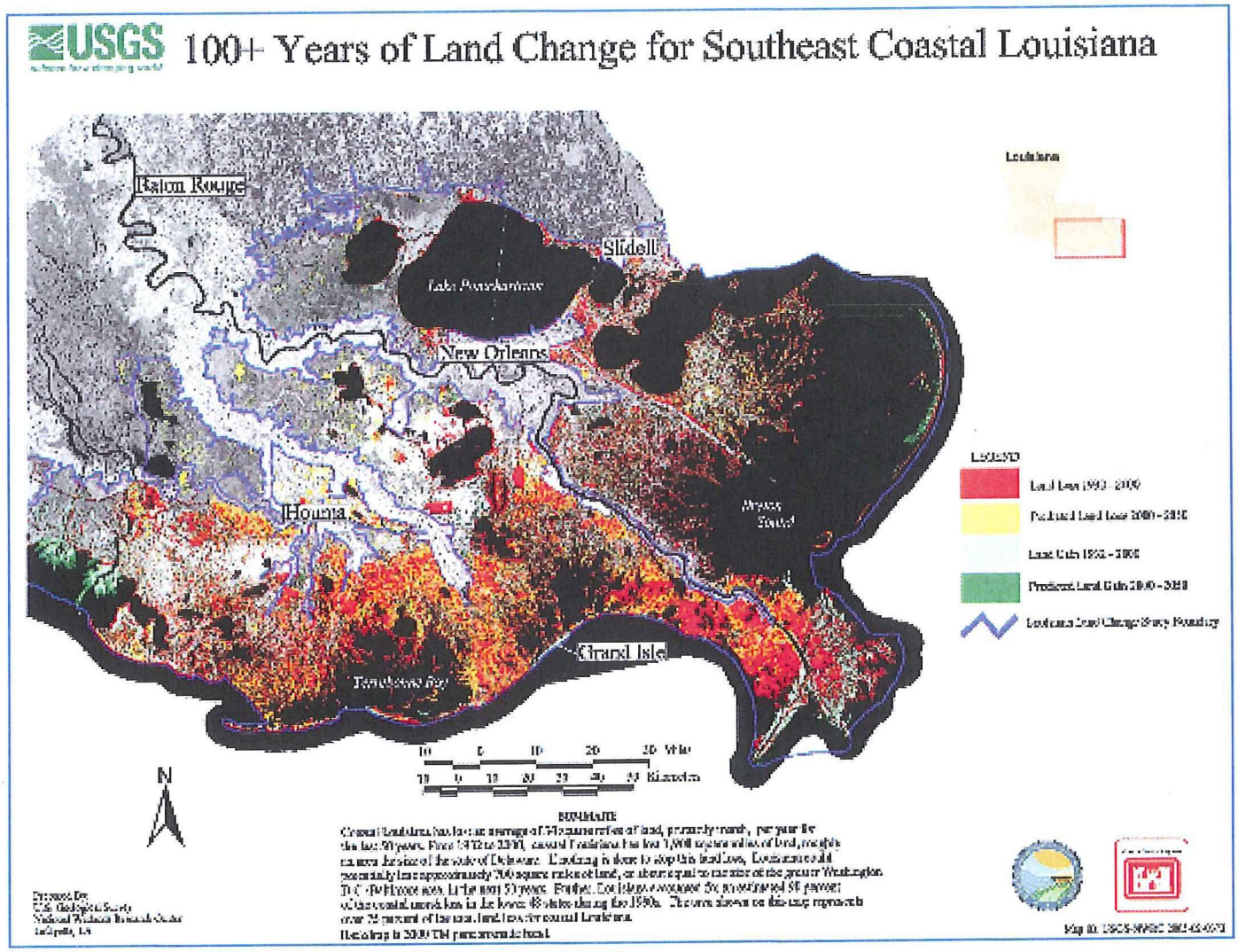


**Louisiana: A Case in Point**

The state of Louisiana has developed a master plan for coastal restoration and protection and created science and engineering collaborations that continually revise projections nd approaches that take into account new concepts and theories. The process also takes into account stakeholder feedback from those most impacted by change, weighing the risks that must be assumed by competing interests to gain information and build trust. In addition, several science initiatives resulting from the BP spill have potential to feed into Gulf Coast restoration efforts.

Nothing is simple about comprehensive solutions, but the alternative is unthinkable. Louisiana Governor Bobby Jindal recently issued a report calling for an investment in Louisiana's coast and eliminating conflicting federal policies that hinder coastal restoration efforts. An earlier report by the AWF's America's Energy Coast initiative, "A Region at Risk," also calls for reconciling conflicting Federal policies.

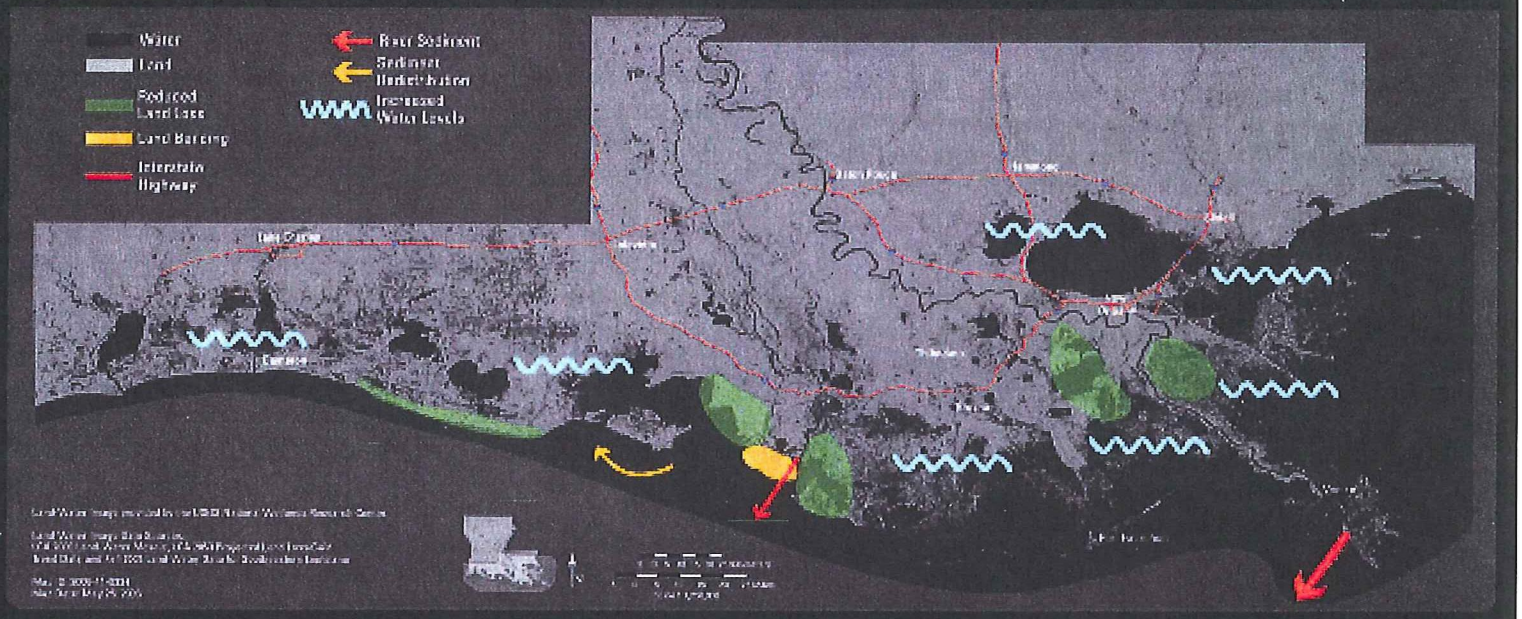
For example, each year, the Army Corps of Engineers spends hundreds of millions of dollars dredging navigation channels in south Louisiana in order to facilitate maritime commerce that benefits more than 30 states. The material dredged from these channels is then dumped in the deep waters of the Gulf of Mexico rather than placed back in our coastal area where wetlands could be built and habitat restored.



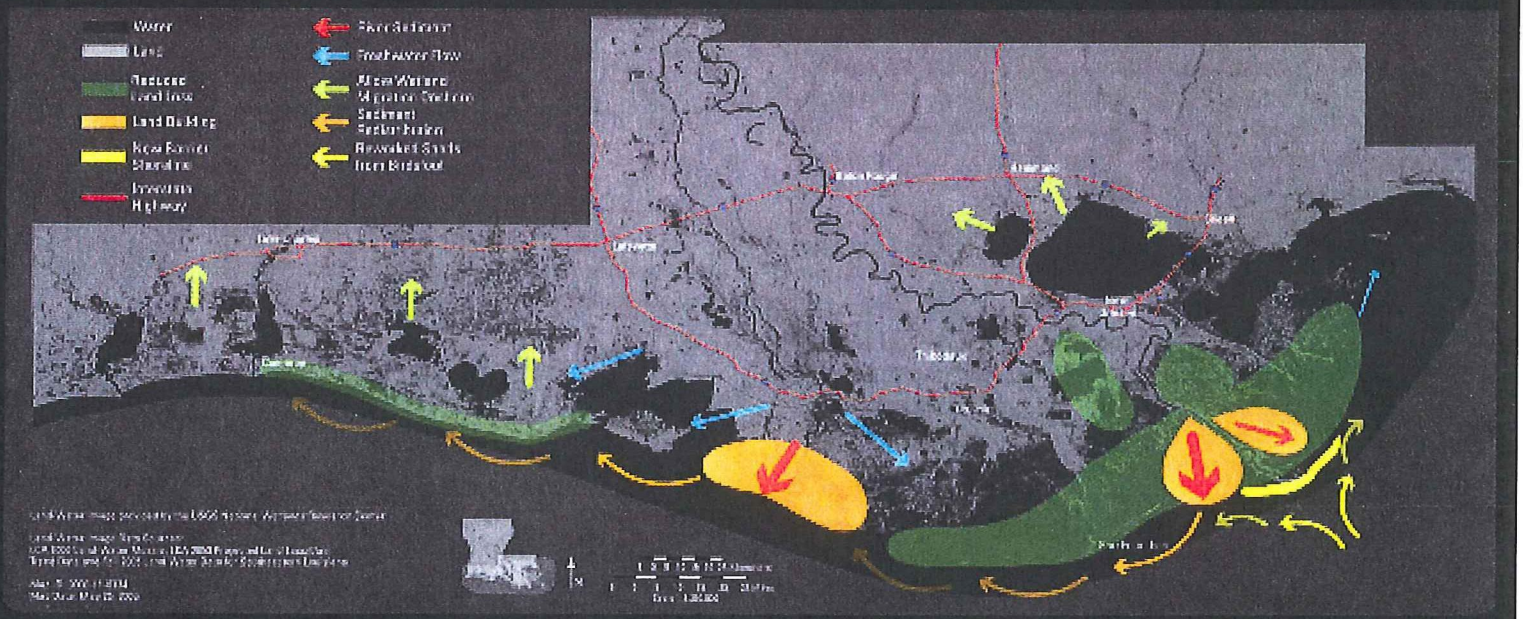

In the last five years, coastal Louisiana lost an estimated 225,000 to 250,000 acres of land – which is equivalent to six and a half times the size of Washington, D.C. Since the 1930s, when levees were built on the lower Mississippi River, Louisiana has lost up to 29 square miles of coastal lands annually.

In 2006, Louisiana citizens overwhelmingly passed a constitutional amendment to place any federal dollars from offshore revenue sharing in a restoration trust fund. Over the past few years, the state has contributed more than $700 million to that fund. These actions demonstrate the commitment of the state to coming to grips with the harsh realities that face the region. But protecting assets that serve the entire nation cannot fall to one state or even a region.

## Continuing Current Management




## Achieving Sustainability




USGS

America's Wetland Foundation

## FUNDING

Members of the Congressional delegations and governors of both parties who represent coastal energy producing states continue to call for an acceleration of the Gulf Of Mexico Energy Security Act (GOMESA) of 2005 that authorizes the sharing of Federal OCS revenues with the producing states beginning in 2017.

A bipartisan group of 24 U.S. Senators, led by Sen. Mary L. Landrieu (D-LA) and Ranking Member of the Senate Energy Committee, Lisa Murkowski, (R-AK), have expressed their support for allowing coastal states to share in a portion of the revenues from energy production in the outer Continental Shelf (OCS). In a letter to all 100 Senators, these 24 Senators urged their colleagues to support a revenue sharing plan that recognizes the role coastal states play in hosting offshore oil and gas exploration.

In addition to Sen. Landrieu and Sen. Murkowski, were Senators Richard Burr (R-NC), Mark Begich (D-AK), Saxby Chambliss (R-GA), Jeff Sessions (R-AL), Kay Hagan (D-NC), Jim Webb (D-VA), Robert Bennett (R-UT), Lamar Alexander (RSC), David Vitter (R-LA), John Cornyn (R-TX), George Voinovich (R-OH), John McCain (R-AZ), Kay Bailey Hutchison (R-TX), Richard Shelby (R-AL), Jim Inhofe (R-OK), Lindsey Graham (R-SC), Tom Coburn (R-OK), Thad Cochran (R-MS), Roger Wicker (R-MS), Sam Brownback (R-KS), and George Lemieux (R-FL). The senators in an open letter to colleagues stated, "We make no collective statement on such production – some of us would favor it and some of us would not necessarily favor it. We are united, however, in our position that any such production in federal waters must include a program in which affected coastal states and coastal political subdivisions are entitled to a share of the federal revenues resulting from such production."

Since 1933, offshore oil and gas production has generated over $165 billion in revenue for the federal treasury – the second largest source of federal revenue after income taxes. A majority of this revenue currently bypasses coastal states and goes directly to the Federal Treasury, even as the coastal environment is severely impacted by energy development. However, states that host onshore energy production on federal lands receive 50 percent of the revenues as compensation for the impacts, and have since 1920.

All of our states are shouldered with fiscal challenges similar to those of the federal government," the Senators wrote. "States also face hard choices regarding the balance between local costs and national benefits. Should Congress enact laws that would have coastal states host more production of the OCS, it is important to consider the local impacts. OCS production places vastly heightened demands on transportation services, ports, fuel supplies, pipeline corridors, public health and safety, and other infrastructural and social resources. There are also associated risks, actual and perceived, to coastal economies in terms of fisheries, tourism, recreation, and wildlife habitat. As the Gulf Spill shows, production in federal waters beyond three miles from shore can have even greater impacts than production in near-shore state waters."

AWF and its environmental allies have also voiced the need for multiple funding sources for coastal restoration, including the appropriations process, the establishment of a dedicated funding stream for restoration, and the acceleration of OCS revenue sharing for coastal restoration. Here are immediate steps to be taken:

- Ensure that 80 percent of the penalty monies to be paid by BP be dedicated to Gulf coastal restoration.
- Accelerate OCS revenue sharing slated to begin in 2017 so that energy-producing states can fund coastal conservation and restoration plans now.
- Immediately fund construction of already-authorized projects to reconnect the Mississippi River with its wetlands and restore critical barrier islands.
- Cut red tape to allow immediate distribution for existing Federal appropriations for restoration, including more than $1 billion in Coastal Impact Assistance Funds for coastal states.
- Establish a Federal-State authority with the capacity, the will, and the resources to get the job of restoration done in time to build on existing land and prevent land loss that will exponentially increase without actions.

Perhaps the most important element to protect the investments described above is the recommended establishment of a dedicated long-term funding stream sufficient for coastal restoration in the near term. To secure the Gulf Coast, it is reasonable to create a trust fund derived from a portion of revenues from the sale of oil and gas leases on the Outer Continental Shelf.

Although the sharing of revenues with the coastal producing states is deferred in most part until 2017, providing a percentage of shared revenues from the annual sales of OCS leases would provide critical "now" funding. Encouraging Gulf Coast states to support provisions of an independently established Trust Fund for Coastal Restoration, funded from the lease sales starting in March 2011 and filling the gap of critically necessary funds that will not arrive until 2017, will encourage states to finance important restoration measures.

Along with revenues derived from the BP oil spill penalties, the trust fund would have a healthy start to begin work on approved projects. Without the provisions proposed or a similar steady source of revenue not subject to annual appropriations processes, the Gulf Coast will continue to deteriorate and its wetlands, barrier islands, beaches, estuaries, flora fauna and culture will be lost or further diminished.

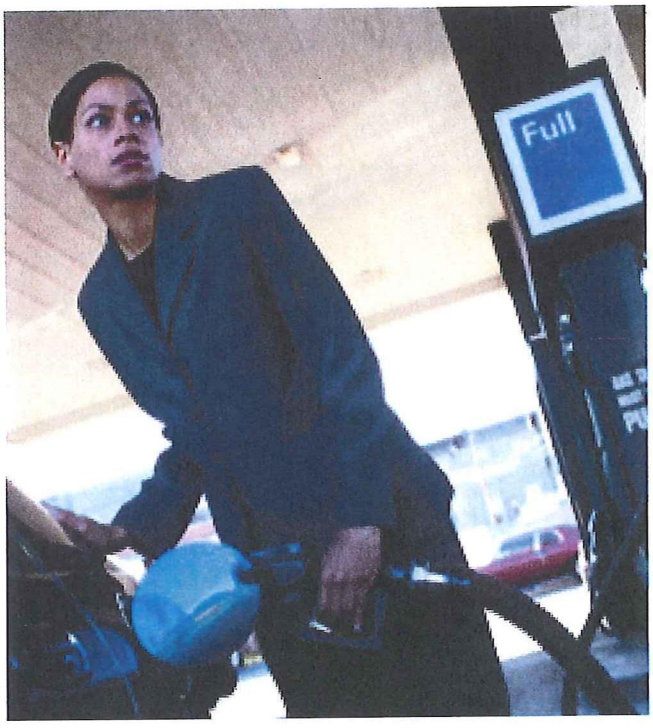
## IV. INVESTING IN ENERGY DEVELOPMENT & SAFETY TECHNOLOGY

While the safety record of the energy industry in the U.S. is exemplary, the BP oil spill raised serious concerns about the capacity of domestic oil and gas companies to handle a major spill in deep water. The BP incident made oil exploration and production operations public, as well as the need to invest in safety technology to match the expertise in deep water drilling technology.

Exxon Mobil Corp., Royal Dutch Shell Plc, Chevron Corp. and ConocoPhillips will spend $1 billion to research and build a containment system to handle deep-water oil spills in the Gulf of Mexico. The Marine Well Containment Co. will produce and manage the equipment. The system will be designed and built over the next 12 to 18 months to handle spills of 100,000 barrels a day in waters as deep as 10,000 feet (3,048 meters).

This system offers key advantages to the current response equipment in that it will be pre-engineered, constructed, tested and ready for rapid deployment in the deepwater Gulf of Mexico. Its primary objective is to fully contain the oil with no flow to the sea. The system will be flexible and adaptable. It will be responsive to a wide range of potential scenarios, deepwater depths up to 10,000 feet, weather conditions and flow rates exceeding the size and scope of the current spill.

Once constructed, the system components will be fully tested to ensure functionality and will be maintained in




a state of continuous operational readiness. In the event of a future incident, mobilization to the field will start within days and the system will be fully operational within weeks.

For an incident in deeper waters with higher production levels, the response capability of containment and spill response is proven by this incident to be inadequate. Following conversations with the government, the four companies announced the project saying that other companies would be welcome to join the group or purchase containment equipment and services. It is likely that the containment project will become a standard for the U.S. industries.

Various segments of the oil and gas industry should benefit from the creation of this new non-profit company by enhancing safety product development and sales. The three-legged stool of exploration, production and security will add greatly to the confidence eroded by the spill incident and be a pivotal strategy of the Secure Gulf Project.

Numerous disasters in the gulf region have caused enormous economic dislocation. The way clear after a disaster is often complicated by soiled environments, destroyed infrastructure and a maze of regulations, mitigation and compliance with temporary rule changes from all levels of government.

## THE RATIONALE FOR MOVING FORWARD NOW

In light of the tragic deaths from the incident, The BP Deepwater Horizon disaster brought with it a sense of urgency for government to act. Within a month of the oil spill the Department of Interior issued a regulations assessment and a six-month moratorium on oil and gas activities in the deep Gulf of Mexico.

These actions, however, have economic ramifications that could cause a loss of jobs and create negative perceptions that could linger and harm the economy long into the future. Additionally, the Gulf seafood industry and tourism are suffering from impacts related to the spill.

The Gulf Horizon Oil Spill has highlighted how immediate and significant enhancement in the decision making process and an urgent, rapid response is required to solve problems of this size and magnitude. A clear chain of authority and single point of accountability for taking immediate action on any given problem related to oil removal from the Gulf and protecting our shoreline is critical. All national and international resources must be deployed immediately; delays due to a lack of readiness and a protracted assessment of ideas and innovations for cleanup are costly.

Innovation is always critical and important but it should not wait for a major incident to be assessed. Credible parties should have a process to evaluate and prove innovations in the field, not in the conference room. To encourage new solutions, adequate time should be given for proving their effectiveness.

## V. GROWING ALTERNATIVE ENERGY FROM A CONVENTIONAL FOUNDATION

The Gulf offshore oil and gas producing states of Texas, Louisiana, Mississippi, and Alabama – America's Energy Coast – have a long history of providing much of the energy for the U.S. Two-thirds of the oil and natural gas consumed by our nation – foreign and domestic – comes through this coastline by tanker, barge or pipeline and connects to 50% of the refining capacity in the U.S.

Coastal communities along the Gulf of Mexico provide the workforce that supports the offshore industry and the coastal infrastructure that enables water and land transportation, storage, distribution and production of oil and gas, valued in the hundreds of billions. All is at risk to hurricanes, sea level rise, subsidence, and manmade disasters. All is crucial to the economic wellbeing of the U.S. and, if compromised, will severely impact the nation and all who live here. Each time a natural or manmade incident interrupts these economic activities, consumers throughout the nation pay a price.

The national discussion continues about the on-going demand for fossil fuels, the need to transition to alternatives, and how to wean from foreign oil and gas. All indications are that U.S. demand for fossil fuels is increasing and there is yet no national, concerted outcry for conservation. Even if the nation had a clean energy transition strategy, fossil fuels will be part of the energy mix for many years to come. To fully make the transition to alternatives, there must be a concentrated effort to re-tool and build capacity. Most importantly, availability and price will play key roles in our ability as a nation to transition.

Securing safe operations in the Gulf of Mexico for exploration, production and distribution of conventional energy is paramount. Although exploration and production in the Gulf has been done with a strong safety record for many years, the Deepwater Horizon disaster has called into question both industry and government practices.

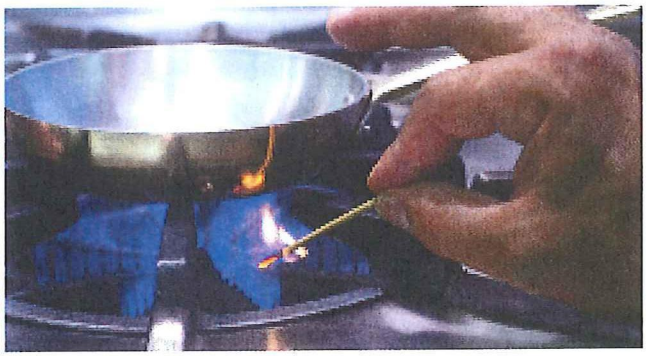
As a result, change on many fronts is inevitable and this region, inextricably tied to the energy industry, must be a positive part of the changes.

What role does this working coast with its critical infrastructure and workforce play in leading this country through an energy transition? Does it make sense for the gulf region to be the pilot for the retrofitting, research, and re-tooling needed to move into a clean energy future? Could we be the proving ground for change?

The following are AEC recommendations for growing alternative energy from a conventional foundation, using America's Energy Coast as that proving ground:

- Secure safe operations in the Gulf of Mexico for oil and natural gas exploration, production, and distribution.
- Swiftly build knowledge and expertise in newly reorganized government agencies that regulate the industry.
- Immediately implement new procedures and standards, avoiding lengthy delays that could cripple the economy of the region and adversely impact the nation.
- Opportunity is ripe for industry to build larger natural gas portfolios as strategy for bridging into a clean energy future, even as needs are met for greater domestic oil production capacity.
- Establish public-private partnerships among industry, state and federal governments and the region's academic institutions for research and pilot programs and projects in transitional energy methods and delivery.
- Establish regional workforce development programs to facilitate a transitional energy future.
- Diversifying economy and workforce of the region will help ensure resiliency.

The Gulf region should play to its strengths and concentrate on natural gas production as a bridge, as well as the use of coastal wetlands as a carbon sink, securing pilot projects and programs that could advance our role as a leader in energy transition for the nation and for the re-use of carbon.



## VI. A KNOWLEDGE-BASED RESTORATION ECONOMY

### INVESTMENT IN INNOVATION AND COOPERATION

Perhaps no greater opportuni y can be imagined in the face of coastal challenges than a new era of intellectual growth that helps to solve common challenges that face the world's deltas. Building capacity in coastal sciences and engineering in Gulf States, through higher education and workforce development, incorporating skill sets needed in implementation of coastal restoration and protection projects all hold promise for the region. In addition, evolving opportunities for green jobs should be explored and cultivated.

To guard against importing all expertise to design solutions, the region's research and higher education institutions should create structures that align with the size and dimensions of a coastal restoration economy. The sheer size and cost of responding to the challenge could mean that local institutions can organize usable solutions in the region and elsewhere. Establishing multi-disciplinary approaches to restoration, such as the newly created LSU Coastal Sustainability Studio as a model, helps to envision the diverse interests necessary to reach comprehensive systemic solutions.

### PUBLIC/PRIVATE/ACADEMIC PARTNERSHIP FOR NATIONAL WATER & COASTAL RESTORATION INSTITUTE LOCATED IN THE GULF REGION

Over the course of the past year, in sessions convened by U.S. Senator Mary Landrieu, a diverse group of stakeholders and NGOs from local, state and national interests have met to conceive a robust system for research required and solutions to broad water resource issues that are growing national concerns and to re-organize federal government to better comprehensively and efficiently address coastal restoration. The State of Louisiana is also engaging cooperative ventures across Gulf States whose landscapes and ecosystems are subject to erosion and coastal hazards. Some of the formative ideas include:

- A research/implementation hub for Federal, state and regional initiatives
- Academic and private sectors working together on mission-driven science that informs restoration projects and that enables exportation of coastal restoration technology to rest of world
- Comprehensive, systems approach to restoration with all Federal and state agencies at the table in the prioritization and implementation of projects.

An example of the potential benefit of such an institute is Deltares in the Netherlands. Deltares, formed in a public/private/academic partnership, and has helped make the Dutch a water management leader. The world continues to look to Dutch expertise and products in approaching large-scale water management challenges.

## VII. A WAY FORWARD

### Beyond a Region at Risk: A Region with Voice & Vision for Tomorrow

In November 2009, AWF issued the benchmark report from investigations and hearings by its America's Energy Coast (AEC) initiative, A Region at Risk. The document pointed out the correlation of delays in coastal restoration to conflicting federal policy and rule making.

With the assistance of the U.S. Fish and Wildlife Service, conflicting policies were outlined and presented at an AEC policy forum. Representatives of AEC states expressed frustration that subjective policy interpretations were causing unnecessary delays and even stopping restoration progress.

In the case of Louisiana and Texas, officials noted that delays are often due to overlapping federal jurisdiction that can mean a minimum of 20 years for projects to be completed for critical restoration. In light of the urgency of sustaining coastal areas and communities, the "risk " report sounded a necessary alarm.

The announcement of the White House Council on Environmental Quality's Roadmap for Sustainability was a welcomed sign that the Obama Administration was on a positive course to understand and act to sustain valuable Gulf Coast assets. Announced in March 2010, the eighteen-month course for recommended action for Louisiana and Mississippi was recognition that the federal agencies need better coordination in expediting implementation of coastal restoration.

The BP Oil Rig incident interrupted the progress of the White House "road map" working group as limited agency resources were re-directed to oil spill response and recovery. Secretary of the Navy Ray Mabus was appointed to react to the economic and environmental needs of the Gulf Coast impacted by the oil spill. In a national address, The President announced the need for large-scale restoration of the Gulf Coast and Louisiana's wetlands. It was an additional sign that the federal government would be a partner in moving the region beyond its current state of risk and vulnerability.

America's Energy Coast has emerged with diverse interests working together to give the four state energy-producing region an authentic voice in policy and actions that will have a lasting impact on their future. A group of leaders from government at all levels, industry, NGOs, science, engineering, culture and tourism work in task groups to identify and establish common ground for cooperation.

The spirited debate and growing importance of a balanced forum in a world of partisanship and parochialism is building a successful record of breaking down barriers and creating solutions to complex challenges.

## BUILDING RESILIENT COMMUNITIES

Hearings in Mobile, AL, held by the AEC in Spring 2010 on climate, energy and coastal issues, recommended that a process be established to plan strategies to address resiliency to vulnerabilities facing the region. This recommendation has led to a broad initiative in 2011 for the America's WETLAND Foundation, through its AEC initiative. Patterned after How Resilient is Your Coastal Community? A Guide for Evaluating Coastal Community Resilience to Tsunamis and other Hazards and Gulf of Mexico programs on climate action planning, a demonstration project is scheduled for Lake Charles, Louisiana, followed by a series of actions across the America's Energy Coast region. After disaster in the region, communities are more attuned to the need for resiliency planning and action agendas to protect citizens and assets alike.

## A WORLD COMMUNITY OF DELTAS (DELTAS2010, DELTAS2012)

To broaden the network of expertise needed to address deteriorating deltaic and coastal landscapes, the AWF will convene the DELTAS2010: World Delta Dialogues including coastal experts, governments, NGOs, and the science and engineering community from across the globe, as well as local and regional authorities on the world's great deltas. DELTAS2010 builds on the work of a 2006 summit of scientists, Envisioning the Future of the Gulf Coast, who uniformly advocated for reconnecting the Mississippi River with surrounding wetlands to save the Mississippi Delta. The October DELTAS2010 assembly of diverse interests from world deltaic regions, will set the stage for advancing knowledge and action, using the Mississippi River deltaic region as a case study - a place where political will must align with funding and good science to bring life again to America's WETLAND.

DELTAS2010
WORLD • DELTA • DIALOGUES

*This report was constructed following a search of literature and research projects, with results taken together to begin to illustrate a portfolio for integrated and interdisciplinary response, recovery and resiliency for all interests of America's Energy Coast.*

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# ADDENDUM

# The Hurdles to Implementing Carbon Capture and Storage

Safety & Environment White Paper Series

November 1, 2009

Summary

The capture of carbon dioxide ($CO_2$) at the point of emission from coal-burning power plants is an attractive route to reducing $CO_2$ emissions into the atmosphere. Many technological, commercial, and political hurdles remain to be overcome to commercialize carbon capture, transport of liquefied $CO_2$, and storage in exploited oil fields or other deep geologic formations. Urgent action is required if carbon capture and storage is to play a large role in limiting climate change. This white paper explores the many hurdles currently facing carbon capture and storage and summarizes the U.S. CCS research program goals.

Access to energy at a reasonable cost is the basis of much of the world economy. Eighty percent of this energy is derived from fossil fuel. The world has abundant fossil fuel reserves, particularly coal. The United States possesses one-quarter of the known coal supply, and the U.S., Russia, China, and India together account for two-thirds of the reserves. As seen in Figure 1, coal currently accounts for roughly 25% of the annual world energy supply and 40% of the carbon emissions.[1] It is highly unlikely that any of these countries will turn their back on coal any time soon, and for this reason, carbon capture and storage (CCS) from fossil fuel power plants must be aggressively pursued. This Safety and Environment white paper summarizes a recent Science magazine analysis[2] of the technical challenges associated with capture, transport, and storage of $CO_2$ and what needs to be done to create a viable CCS industry by the 2020-2030 time frame.

Carbon capture and storage is already operating in trials, with 3 million tons of $CO_2$ (Mt $CO_2$) per year from power plants or natural gas cleanup being captured and stored worldwide. CCS technologies are now in a scale-up period. Worldwide, large demonstrations are planned on 36 power plants. However, there is a serious lack of financial commitment to real construction. If design and construction of these demonstration plants does not start now, they will not operate by 2014, and learning from these to provide commercial credibility will drift beyond 2020. The worldwide construction of many tens to hundreds of large CCS plants--necessary for a substantial impact on climate mitigation--will then be delayed beyond the timeframe set by climate change scientists to stabilize atmospheric $CO_2$ at relatively safe levels.

CCS strips out, purifies, and concentrates $CO_2$ emissions from fossil fuel combustion at large sources such as power plants. Three methods of $CO_2$ capture are currently being investigated. Post-combustion capture separates the $CO_2$ with the use of chemical solvents, pre-combustion capture chemically strips off the carbon, leaving hydrogen to burn, and oxy-fuel combustion burns coal or gas in an oxygen-rich environment to yield only $CO_2$ and water. After leaving the power plant, the captured $CO_2$ is pressurized, forming a liquid that can be transported to a storage site, where the fluid is injected into rock pores deeper than 2600 feet below the surface where the geologic pressure is sufficient to maintain the $CO_2$ in a liquid state. Good choices of storage sites will retain $CO_2$ without appreciable seepage for tens of thousands of years. Monitoring will be required for decades into the future, combined with techniques to remediate $CO_2$ leakage from deficient storage sites.

[1] U.S. Department of Energy, http://www.energy.gov/sciencetech/carbongraph.htm .

[2] Haszeldine, R. Stuart, *Carbon Capture and Storage: How Green Can Black Be?*, Science, Vol. 325, p. 1647, September 25, 2009.

**Technical Challenges – Carbon Capture**

The developments currently under way should result in tangible improvements toward a 10 to 20% energy penalty versus 30 to 40% currently. For commercialization, it is normal practice to construct progressively larger equipment from pilot to demonstration plants, allowing learning to increase reliability and reduce cost. At least two learning cycles are needed to demonstrate operation and enable commercial guarantees for construction (see Figure 2). This is technically possible by 2020, but politically optimistic.

Post-combustion $CO_2$ capture has some major disadvantages: The equipment will be very large, comparable to the footprint of a coal-fired power plant, large volumes of solvent are needed, heating to regenerate the solvent can produce toxic byproducts, emissions of solvents from recovery columns need to be scrubbed and eliminated, consumption of water needs to be reduced, and expired solvent needs to be disposed. However, post-combustion capture also has distinct advantages. It can be applied to existing power plants, operated with the plant to capture $CO_2$, or disconnected to provide maximum power output at times of peak electricity demand. Furthermore, components in the non-integrated equipment can be replaced, developed, and upgraded without fundamental impact on the power plant. The challenges are to scale up by a factor of 50 from the largest current operation while protecting the solvent from degradation by flue-gas impurities. Modified and new amine solvents are being tested in the European Union that aim to halve energy penalties. Pilot plants up to 5 MW in the U.S. are investigating new ammonia-based processes, and in 2009, the U.S. Department of Energy awarded $100 million to support a 1.0 Mt per year demonstration. The U.K. will fund a 400-MW commercial retrofit on coal plant for completion in 2014. Future developments may increase efficiency through closer integration of capture with the host plant, and novel membranes or micro-porous solids may help to separate nitrogen and other minor gases from $CO_2$.

Oxyfuel combustion has not yet been demonstrated on a large-scale. Burners for oxyfuel have been demonstrated at 1-MW scale, and the world's largest experiments are developing 40-MW burners, intended to be commercially available by 2015. Two pilot plants are in operation: Schwarze Pumpe in Germany has burned lignite or bituminous coal since 2008, and Lacq in southwest France has burned natural gas since 2009. Attractions of oxyfuel combustion are the much easier separation of $CO_2$ with no solvent, smaller physical size, and the potential to retrofit on existing plants (if the boilers are also re-constructed). Drawbacks are the very low SOx required on leaving burners, as well as the higher-temperature materials that are also required. Future developments could improve high-temperature operation and reduce the energy costs of oxygen separation from air.

Pre-combustion capture involves constructing plants to gasify coal to produce hydrogen and $CO_2$, then remove the $CO_2$ before burning the hydrogen as fuel. Using this process, $CO_2$ capture is already proven to work at the megaton-per-year scale but has not been fitted to an operational power plant. The challenge here lies less in the basic technology and more in the reliability of all components for total continuous integration. In China, the GreenGen 250-MW project southeast of Beijing will potentially be the world's first Integrated Gasification Combined Cycle (IGCC) power plant with CCS, projected to be operating in 2011. The U.S. FutureGen project will develop a 275-MW pre-combustion plant with CCS in Illinois; this project was reactivated in 2009, with $1.7 billion from the DOE and commercial partners. Several commercial IGCC plants seem likely to operate before 2015 in the U.S., Canada, Australia, U.K., and the Middle East. Advantages of pre-combustion capture are that multiple fuels can be used and multiple products produced, from electricity to hydrogen. The process is technically elegant, with efficiency gains from the integration. This could become a technology of choice for new-build plants supplying solely base load electricity. Disadvantages are high construction costs and decreased short-term flexibility. Future gains may come from the development of high-temperature membranes that allow syngas to be catalytically reformed into $CO_2$ at the same time as hydrogen is separated.

### Technical Challenges – $CO_2$ Transportation

$CO_2$ has been transported in pipelines since the 1970s in the U.S. and Canada, where nearly 2000 miles of operational $CO_2$ pipelines exist, transporting 30 Mt $CO_2$ per year. $CO_2$ captured from power plants will contain small amounts of water, nitrogen, oxygen, sulfides and other impurities that will increase the operational pressure needed to avoid condensation and pipe corrosion. To avoid costs of over-compression, a pipeline purity standard will be needed. If continental-scale transport is envisioned (e.g., across the E.U. or U.S.), standards need to be set early. $CO_2$ can be gathered from multiple power plants, transported through a shared system to individual storage sites. Commercial innovation is required if pipe operators function as the contractual links between operators of $CO_2$ capture (where risks are low and return on investment is also low) and subsurface storage operators (where risks are high, but return on investment is potentially very high). Diverse commercial solutions have been proposed. Norway will form a state company, but the U.K. expects a commercial pipeline operation. The U.S. has not proposed a commercial structure to date.

### Technical Challenges – Injection and Geologic Storage

Injection of $CO_2$ for storage into microscopic pore space of sedimentary rocks is based on oilfield experience since the 1970s with injection into hydrocarbon fields for enhanced oil recovery (EOR). $CO_2$ EOR is established and viable in several countries. The American Recovery and Re-investment Act of 2009 provides $3.4 billion for CCS demonstration and tax incentives for $CO_2$ EOR already existing in several U.S. states. An assessment of EOR in the U.S. optimistically calculated that an additional 88 billion barrels of oil could be recovered, even though in 2004, $CO_2$ EOR production was only 75 million barrels per year.

Aside from EOR, non-oil bearing saline aquifers have been calculated to provide, by far, the greatest storage volumes worldwide, equivalent to hundreds of years of present day power plant emissions. However, these calculations are probably too optimistic because they do not take into account practical limits due to reservoir inefficiencies, fluid pressure limitations, and $CO_2$ migration. Worldwide, the original static estimates of storage capacity are now being substantially downgraded to many decades rather than hundreds of years of emissions. Only after dynamic demonstrations are carried out in aquifers will the true capacity values become apparent, to determine if CCS can support a major long-term mitigation of $CO_2$ or only a lesser short-term niche.

### Aspiration versus Reality

A minimum of two cycles of demonstration plants are needed to improve subsequent constructions before attempting to build commercial plants by the "climate deadline" of 2020. As Figure 2 demonstrates, the overlap of learning into the next phase of construction will disappear if the first full-scale demonstration plants are not operational by 2015; thus, work on their design needs to start in 2009. Delay does not negate the utility of CCS, but it means that reductions of $CO_2$ emissions will not occur until after greenhouse gas forcing of climate progresses beyond the point of predictability. For the aspirations of CCS to become real by 2020, funding and immediate building of real projects is needed.

The largest hurdle is not technological, but rather the lack of a market to provide revenue that justifies large project investment. Each demonstration capture plant requires a system for price support for many years to recover up to $1.5 billion in extra capital and operational cost of generating de-carbonized electricity. The pricing provided by the current carbon market is far too low and erratic, or non-existent. Price support systems are needed to introduce CCS, just as price support has been given to introduce renewable energy. But this critical commercial help has been announced only for very few CCS projects.

A second hurdle concerns information sharing. For insights from operating demonstration plants to be transmitted from the first to the second generation of plants, and to further generations (Figure 2), detailed commercial information will have to be shared rapidly between companies. In a period of competitive development, such information is normally very tightly controlled by the owners.

A third hurdle is standardization. For rapid learning to help cost reduction, successive generations of equipment have to evolve and improve from the same design. For CCS, there are at least seven different

combinations of fuel with the three primary capture technologies. Each demonstration project may have distinct transportation systems and individual geological storage sites. Consequently, learning progress in one technology has limited relevance to that of another, and the progress of the "CCS Fleet" could be slowed and de-optimized as a result. One has only to look at the evolution of commercial nuclear power technology to witness the retarding effects of competing and non-standard designs.

With no price support or communication and a lack of standardization, CCS will remain limited to interesting but isolated demonstrations. A coherent national and international approach is required to create a new industry that disrupts the status quo.

**Outlook**

There are many hurdles to making CCS a reality, but none appear insurmountable. Capture R&D holds good promise of 20-60% improvements in energy efficiency and cost. $CO_2$ transport by pipeline can be undertaken now, with significant cost reductions if clusters of plants feed $CO_2$ into shared pipelines. Injection into hydrocarbon reservoirs or aquifers uses established methods and can commence immediately, although the total worldwide storage capacity is highly uncertain.

According to U.S. Secretary of Energy Steven Chu, the DOE has set a goal for widespread deployment of CCS beginning in 8-10 years.[3] On the 10-year time scale, it is not technology, but legal permission, business development, and public opinion that will determine whether CCS experiments and demonstration plants are built sufficiently rapidly for CCS to begin widespread deployment by 2020. On the 20-year time scale, these initial demonstrations must enable the birth of a new CCS industry. Low-cost reliable capture at clusters of CCS power plants must emerge, national pipeline networks must be developed, and aquifer storage capacity must be validated. CCS also needs to be built and operated in developing economies with high national but low per capita emissions. If CCS is difficult to afford in Western economies, then it will be even more so in India and China. Additional payments for CCS demonstrations will be required to accelerate the above-mentioned actions.

Much is being done here in the U.S. to help accelerate research development and deployment of CCS that is needed to achieve widespread, affordable commercial availability for this technology.

- *Entergy has been at the forefront providing leadership and pointing out the importance of accelerating the deployment of an affordable retrofit carbon capture technology for existing coal fired units.*[4] In opening remarks at the MIT Symposium on retrofit CCS, Wayne Leonard said, "The impetus for this symposium was our conviction that an effective, sustainable response to climate change must include retrofit technologies to reduce $CO_2$ emissions from existing coal-fired electric power generating plants. Once built, coal plants are, in most cases, the cheapest source of base load power generation and will not be phased out absent very high $CO_2$ prices. Thus, our view is that an effective strategy for achieving significant and cost effective reductions in $CO_2$ emissions requires the deployment of new technologies to retrofit existing coal plants and reduce their $CO_2$ emissions. If we are to sustain an effective climate program and grow our economy, we can't kill coal; we have to save it. Not enough is being done to commercialize this technology on a timeframe consistent with the climate change goals. That is why we asked the MIT Energy Initiative (MITEI) to bring together the nation's leading experts in this field to assess the current issues surrounding retrofit technologies and to formulate a concrete action plan to move forward quickly. In my view, the symposium fills a major void in the climate change policy debate. This report provides the most comprehensive and up-to-date analysis of retrofit technology issues. Now it is up to policy makers to provide the requisite focus and sense of urgency to get this technology developed."

[3] Chu, Steven, *Carbon Capture and Sequestration*, an editorial, Science, Vol. 325, p. 1599, September 25, 2009.
[4] Retrofitting of Coal-fired power plants for CO2 Capture, MIT, Mar '09 http://web.mit.edu/mitei/docs/reports/coal-paper.pdf

- *Regional Sequestration Partnerships that are underway will demonstrate that secure, safe and verifiable geologic sequestration can be accomplished.*[5] DOE has formed a nationwide network of regional partnerships to help determine the best approaches for capturing and permanently storing greenhouse gases. These are seven regional public private partnerships tasked with determining the most suitable technologies, regulations, and infrastructure needs for carbon capture, storage, and sequestration in different areas of the country. The information from the regional partnerships is being integrated into a geographic information system to provide a national view of the carbon sequestration potential in the United States and Canada and to allow users to estimate the amount of $CO_2$ emitted by sources (such as power plants and refineries) in relation to geologic formations that can provide safe, secure sequestration sites.

- *EPRI and DOE/NETL have launched carbon capture research programs to help accelerate the timeline to achieve widespread commercial availability of CCS technology*. EPRI recently announced a successful completion of a 1.7 Mw pilot capture project of Alstom' s chilled ammonia capture technology at We Energies Pleasant Prairie Power Plant in Wisconsin demonstrating 90% capture had been achieved. A pre-commercial scale up of this technology to a 20Mw (120,000 ton/yr ) has been announced at AEP's Mountaineer Plant. AEP will inject $CO_2$ into two distinct geologic formations and measure underground movement of CO2. Another 25 Mw project (150,000 tons CO2/r) at a Southern Co plant will evaluate an advanced amine $CO_2$ capture technology. $CO_2$ will be injected into an underground geologic formation and underground movement within the storage reservoir will be measured.[6]

  DOE/NETL's CCS program goals are to by 2020 have available for commercial deployment technologies and best practices for achieving 90% $CO_2$ capture and 99%+ storage permanence with cost of energy increases <10% for pre-combustion capture and <35% for post combustion capture. DOE/NETL's RD&D Timeline to commercial deployment is shown in Figure 3.[7]

- *Vehicles for increasing funding for CCS research are being considered in Congress.* In 2009 DOE/ NETL budgeted $44 million for $CO_2$ capture research[8]. Most agree that CCS research is currently under funded to achieve DOE/NETL's program goals and the sense of urgency we believe is needed. Secretary Chu announced $2.4 billion in funding from the American Recovery and Reinvestment Act will be used to expand and accelerate the commercial deployment of carbon capture technology for power plants and $50 million will fund a competitive solicitation to characterize a minimum of 10 geologic formations throughout the United States.[9]

  Rep. Boucher introduced a bill that would raise $1 billion per year for CCS development and deployment from a wires charge. The climate legislation passed in the House and being considered in the Senate this year has provisions to fund research and reward early action for deploying CCS technologies. However it remains to seen whether these funding vehicles will be enacted.

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[5] Carbon Sequestration – Regional Carbon Sequestration Partnerships, http://www.netl.doe.gov/technologies/carbon_seq/partnerships/partnerships.html

[6] Large Scale Post-Combustion $CO_2$ Capture and Storage Demonstrations, EPRI, March 2009

[7] Annual NETL Existing Power Plant $CO_2$ Capture Technology R&D Overview, Jared Ciferno, March 2009

[8] ibid

[9] http://www.netl.doe.gov/publications/press/2009/09029-DOE_Announces_Stimulus_Funding.html

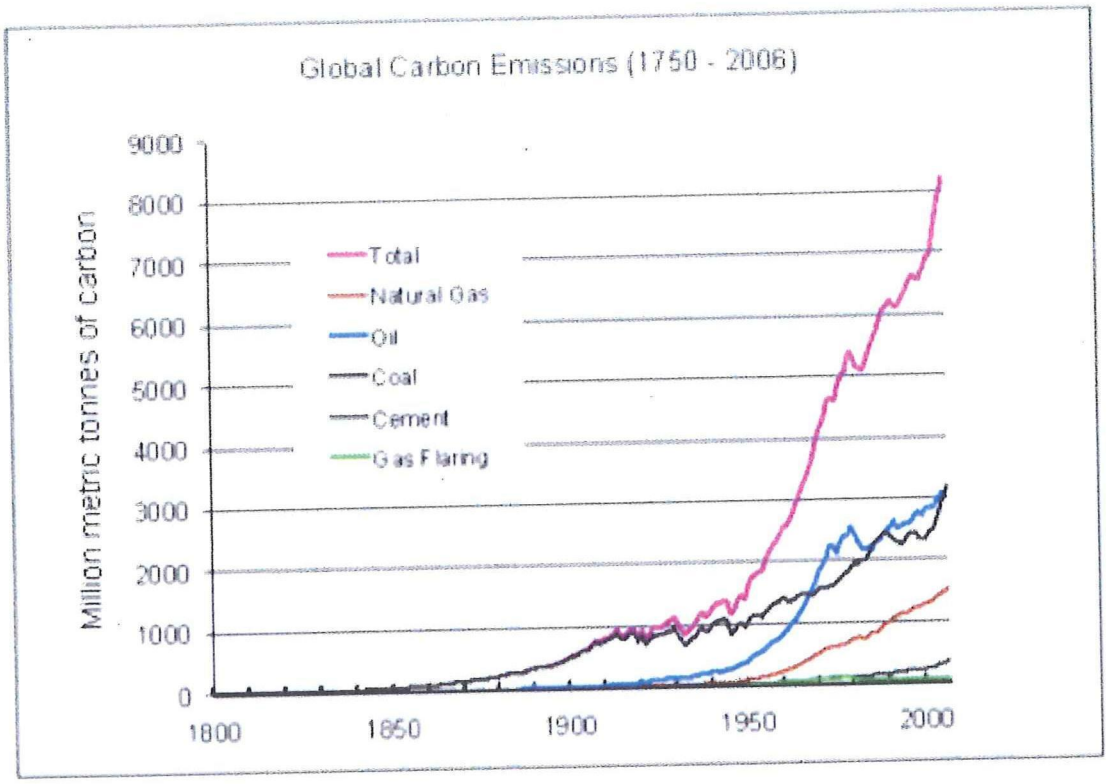


**Figure 1**

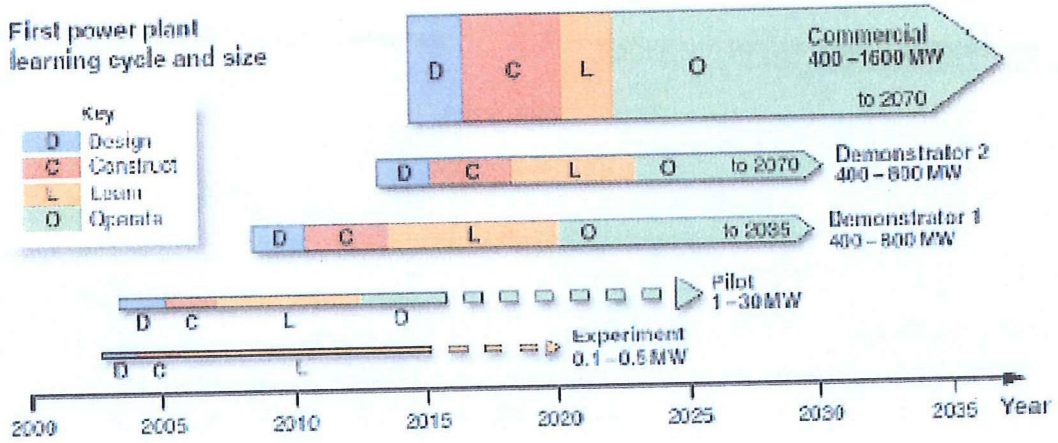


**Fig. 2.** Time chart showing how a CCS power plant can be increased to reliable and cost-effective commercial size by 2020, by means of progressively larger experimental equipment. Rapid information flow on the vertical axis is important from learning to subsequent design. This depends on industrialized nations providing financial support for CCS plant during the pilot and demonstration phases. Tens of large CCS demonstrators need to be built worldwide from 2009. Incentive systems (for instance, premium payments for decarbonized electricity) are needed to enable introduction, operation, and establishment from 2014 to 2020.

**Figure 2**

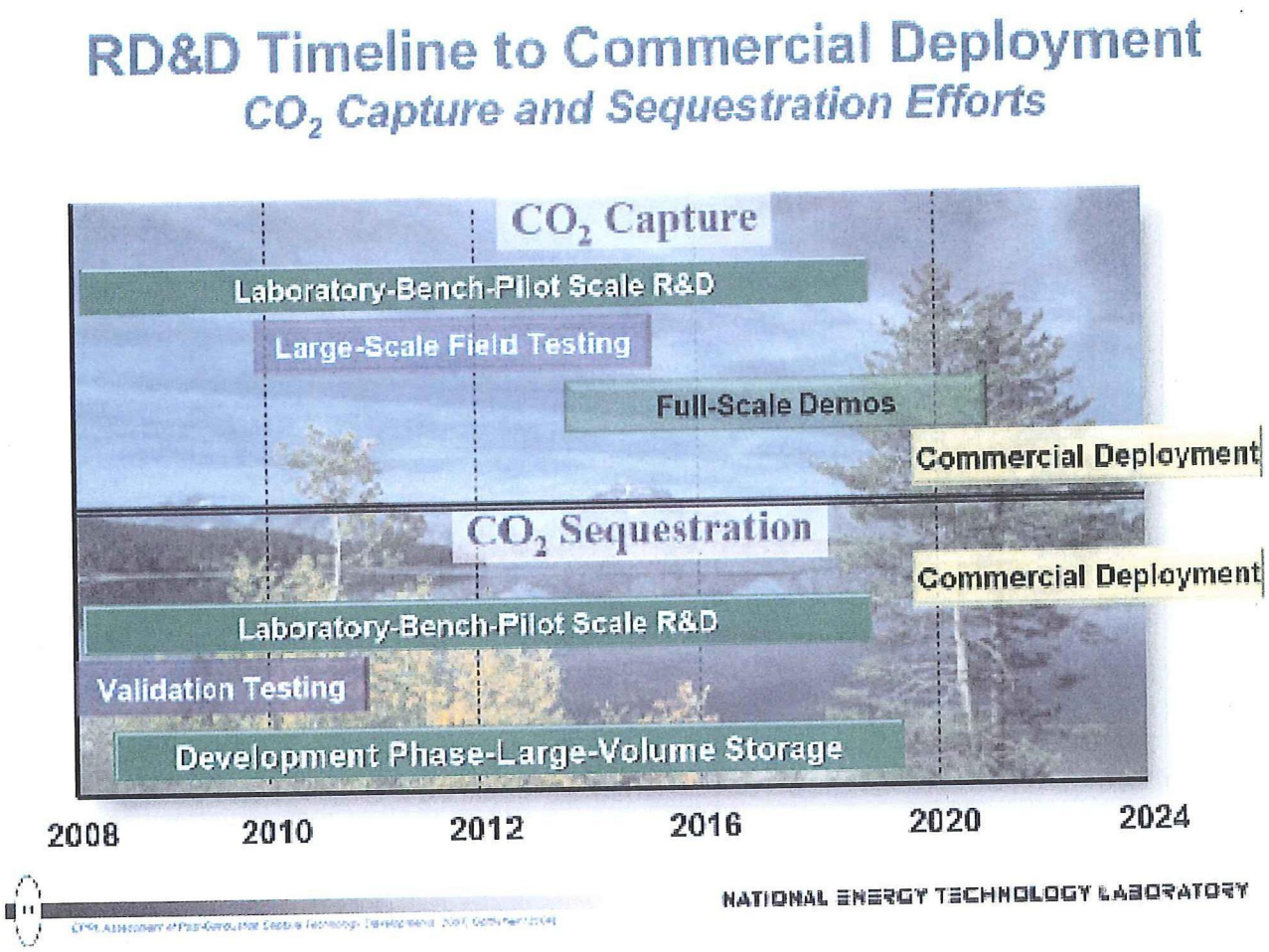
RD&D Timeline to Commercial Deployment
$CO_2$ Capture and Sequestration Efforts
$CO_2$ Capture
Laboratory-Bench-Pilot Scale R&D
Large-Scale Field Testing
Full-Scale Demos
Commercial Deployment
$CO_2$ Sequestration
Commercial Deployment
Laboratory-Bench-Pilot Scale R&D
Validation Testing
Development Phase-Large-Volume Storage
2008
2010
2012
2016
2020
2024
NATIONAL ENERGY TECHNOLOGY LABORATORY

**Figure 3**

# AMERICA'S WETLAND FOUNDATION BACKGROUND

America's WETLAND Foundation is a non-partisan, non-profit organization that has acted as a neutral arbiter for coastal interests since its inception in 2002, elevating issues facing the Gulf Coast, specifically those of coastal land loss, to regional and national attention. Originally responding to dramatic land loss in coastal Louisiana, the organization has built cooperative programs with Gulf Coast states, NGOs and local, state, national and international leaders focused on issues of environmental and economic sustainability.

Through its America's Energy Coast (AEC) initiative, the Foundation has brought together a diverse group of major U.S. - based businesses and industries, national environmental organizations, renowned scientists and researchers, and coastal interests from across the four energy-producing states of Texas, Louisiana, Mississippi and Alabama.

AEC provides a balanced forum for coastal interests to work together to develop comprehensive solutions to sustain this vital economic region and the environment on which it depends.

Since beginning its work in 2007, the AEC has issued an "Accord for a New Sustainability" and an "Action Framework" and the "Region at Risk: Preventing the Loss of Vital National Assets".

The Accord is a dynamic, living document that addresses issues of climate, energy and the coast in a format that will yield technology and solutions, best practices and policy recommendations at all levels of government.

"The Action Framework", which was delivered to policymakers in Washington, DC in 2008, outlines immediate steps that must be taken to address major energy and environmental challenges in the region. The principles and policy goals laid out in these documents guide the ongoing work of the AEC.

"Region at Risk: Preventing the Loss of Vital National Assets", describes the significance and uniqueness of the Gulf Coast, identifies major threats facing the region and outlines steps that must be taken to protect and restore this invaluable landscape. The report was presented to policymakers in Washington, D.C. in 2009.

America's WETLAND FOUNDATION

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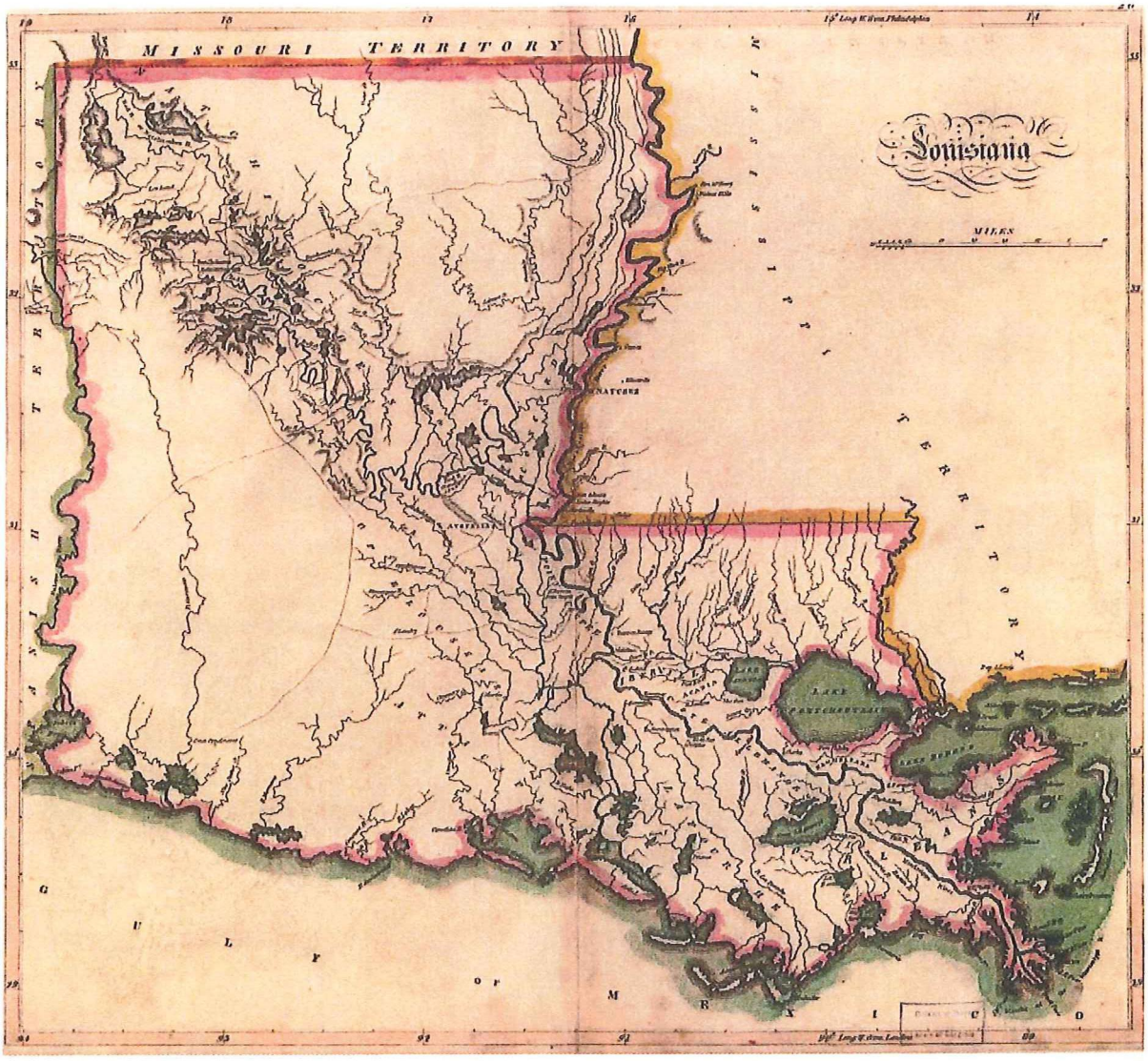
# Executive Summary

## Coastal Protection and Restoration Authority
## Fiscal Year 2011 Annual Plan

# Louisiana has initiated a bold new direction for protecting and restoring the largest expanse of coastal wetlands in the lower 48 states.




Source: Library of Congress

## Since the 1930s, approximately 2,300 square miles of wetlands in coastal Louisiana have been lost.

# Integrated Solutions

The Louisiana coast is a significant component of our overall national security, economy, and natural resources. In addition to being home to approximately half of the state's population, it supports a vibrant array of nationally significant commercial and industrial activities, and provides habitat for diverse fish and wildlife species. Yet long-term sustainability of Louisiana's precious coastal resources is greatly threatened. Approximately 2,300 square miles of wetlands in coastal Louisiana have converted to open water, exposing coastal Louisiana to increased flood risk from hurricane-related flood damage. With more land lost each year, Louisiana is under increased pressure to develop sustainable solutions to expand and expedite its efforts to restore the coast and protect communities. In 2008, the State of Louisiana (State) initiated the integration of flood protection and coastal restoration efforts under the Office of Coastal Protection and Restoration (OCPR), which serves as the implementation arm of the Coastal Protection and Restoration Authority of Louisiana (CPRA). In addition to overseeing development of existing projects, OCPR is addressing other planning, engineering, and scientific needs through its Louisiana Applied Coastal Engineering and Science (LACES) Division, which coordinates science and engineering activities of State and Federal agencies, academia, and coastal communities. Through LACES, the State will ensure that research is conducted in the areas of greatest need and that the best possible technical information is used for decision making.

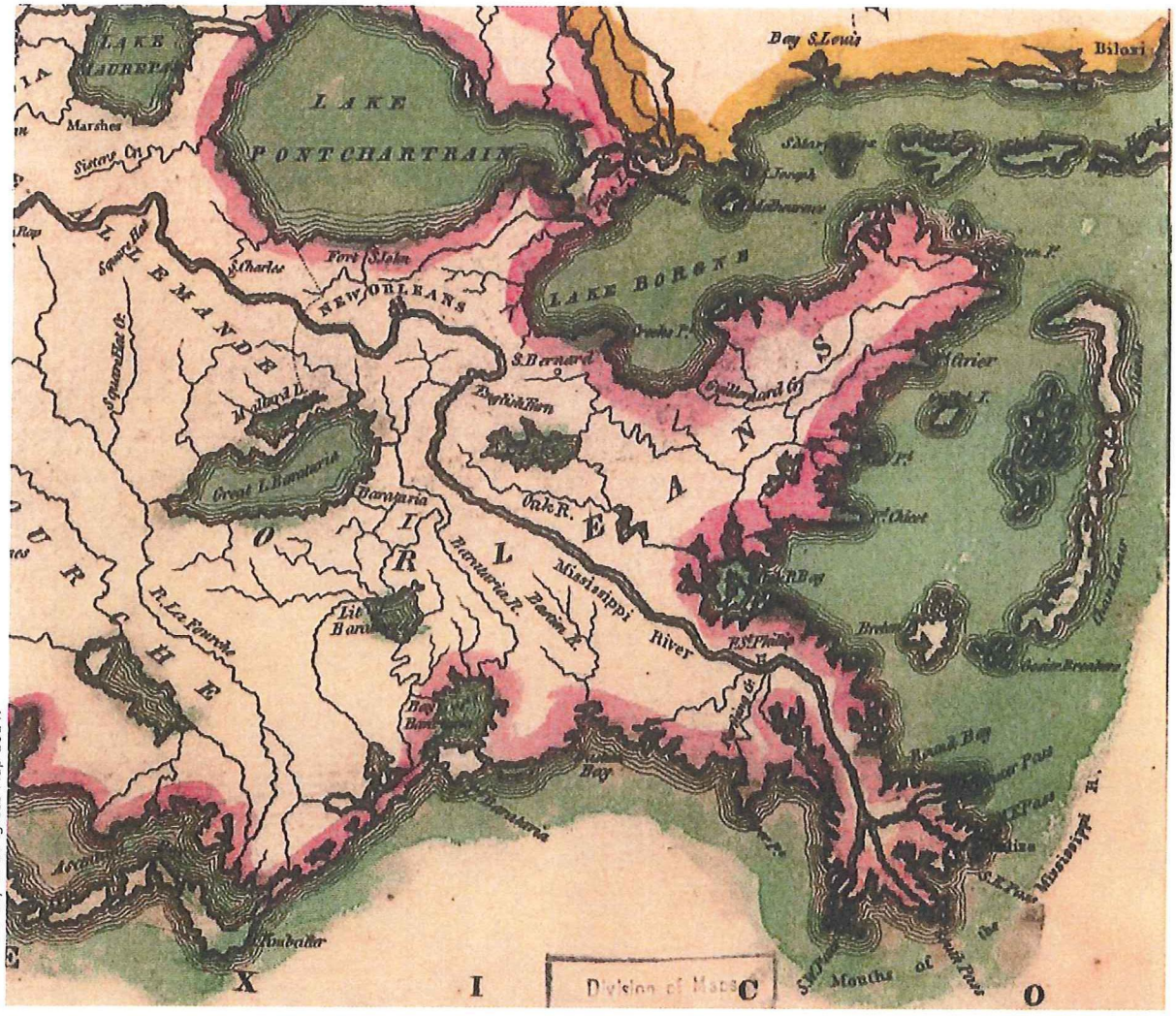
## Breaking New Ground

The CPRA is directed by the Legislature to develop an annual coastal plan containing an inventory of ongoing and future coastal projects and schedules by which these projects will be implemented. This document fulfills that requirement, but also breaks new ground by providing a discussion of progress in project implementation during Fiscal Year (FY) 2010, and presenting new efforts to improve the State's planning process. These changes were made to improve transparency and increase the amount of useful information that the Annual Plan offers to stakeholders and the public.

# Progress in the Coastal Program

While coastal Louisiana's challenges remain formidable, the State has made tremendous progress in protecting Louisiana's citizens and restoring its coast. In 2009, the Louisiana Legislature granted the coastal program $290 million in funding from the 2009 surplus and Tax Amnesty Act revenues. Together with other sources of funding, including $500 million from the 2007 and 2008 surpluses, these allocations represent the largest investment in coastal protection and restoration efforts in Louisiana history. Including other State funds and Federal dollars leveraged by these funds, nearly $17 billion in projects are fully financed and underway, with billions of dollars in additional projects authorized for construction by Congress.

The State has utilized this funding to move quickly, funding construction of existing protection projects throughout the coast and exploring protection and restoration plans for regions that are currently without appreciable hurricane protection. The State also allocated budget funds to 15 coastal restoration projects, many of which have now progressed ahead of their original schedules because of this funding. In FY 2010, the State began or continued construction on 30 large-scale coastal protection and restoration projects, of which nine were completed. In addition to on-the-ground progress in constructing projects, the State has made significant progress with its ongoing programs that further research, management,




Source: Library of Congress Map 1814.

training, monitoring, and assessment. Many of these efforts were spearheaded by LACES.

### Innovative Initiatives

The State has explored innovative concepts and initiatives to both improve efficiency within the coastal program and streamline future efforts. These efforts include initiatives to reform the Federal water resource project planning process, market carbon and water quality credits from State projects to fund the coastal program, implement a single project database system to address all project management needs, and identify ways to streamline the coastal program to improve efficiency while reducing expenditures. Chapter 2 presents additional information on these and other efforts.

## Prioritization Tool

Although significant progress has been made in the coastal program in recent years, the State acknowledges that it cannot address all protection and restoration concerns throughout coastal Louisiana. Additionally, the State acknowledges that sufficient resources (either financial or natural) will never be available to implement every conceivable protection and restoration activity within coastal Louisiana. It is imperative, therefore, that the State's coastal program operates as efficiently as possible to maximize benefits through the highest and best use of available resources. To improve the planning process, the State has developed a tool that will prioritize and sequence projects into portfolios that will provide the most progress toward restoring coastal ecosystems and protecting coastal Louisiana's citizens, homes, and businesses from hurricane and storm flood damages. This prioritization tool is designed to take into account state-of-the-art science and engineering, uncertainties, and other factors to identify the best uses of limited resources. The tool will be guided by the concepts and objectives described in the State's Master Plan and will be driven by inputs that include a vision of a sustainable coast. Computer models will produce data outputs that relate to quantifiable targets, which will help to measure the degree to which projects meet the vision. Although many of the inputs for the prioritization tool are still under development, the planning team was able to utilize existing models and data to perform a proof-of-concept (POC) analysis, which demonstrated how the tool can be used to evaluate and prioritize projects. Chapter 3 describes the development of the tool and presents the results of the POC analysis.

The tool shows great potential for expanding and enhancing the State's planning capacity by providing a decision process based on coastal needs and on tax dollar value, rather than one that allows politics to intrude or that merely funds projects with the most vocal advocates.

### Stakeholder Participation

To respond to the public's request for increased engagement in its planning process, the State established three Regional Stakeholder Workgroups (RSWs), each of which represents a major geographic region of Louisiana's coast. The State first met with the RSWs in September 2009 to ensure solidarity of mission, solicit feedback on proposed planning efforts, and provide updates on project implementation. RSW members could then report back to their communities. RSW engagement with the State will significantly improve the Annual Plan's responsiveness to dynamic regional forces and concerns within the affected coastal communities.

# FY 2011 Implementation Plan

Development of the FY 2011 implementation plan required an intensive data collection effort. The initial step in this effort was to update the inventory of State coastal projects created for the FY 2010 Annual Plan from State in-house coastal project databases. The planning team updated the database by reviewing various State databases and compiling information on project size, cost, projected benefits, and the timeframe for each phase.

To develop FY 2011 project implementation schedules and expenditure projections, the State expanded and refined its database of coastal projects first developed for the FY 2010 Annual Plan. The database currently contains only State projects and projects in which the State is a partner. However, in an effort to fulfill Act 523's mandate that State Annual Plans include descriptions of all projects and programs relating to hurricane protection, restoration, and infrastructure in coastal Louisiana, the FY 2011 Annual Plan team conducted outreach to coastal parishes and levee districts to obtain information on local, non-State coastal projects. Appendix C contains an inventory of local and Federal coastal projects identified through this outreach effort. The planning team will continue to expand and refine its inventory of non-State projects in future Annual Plans.

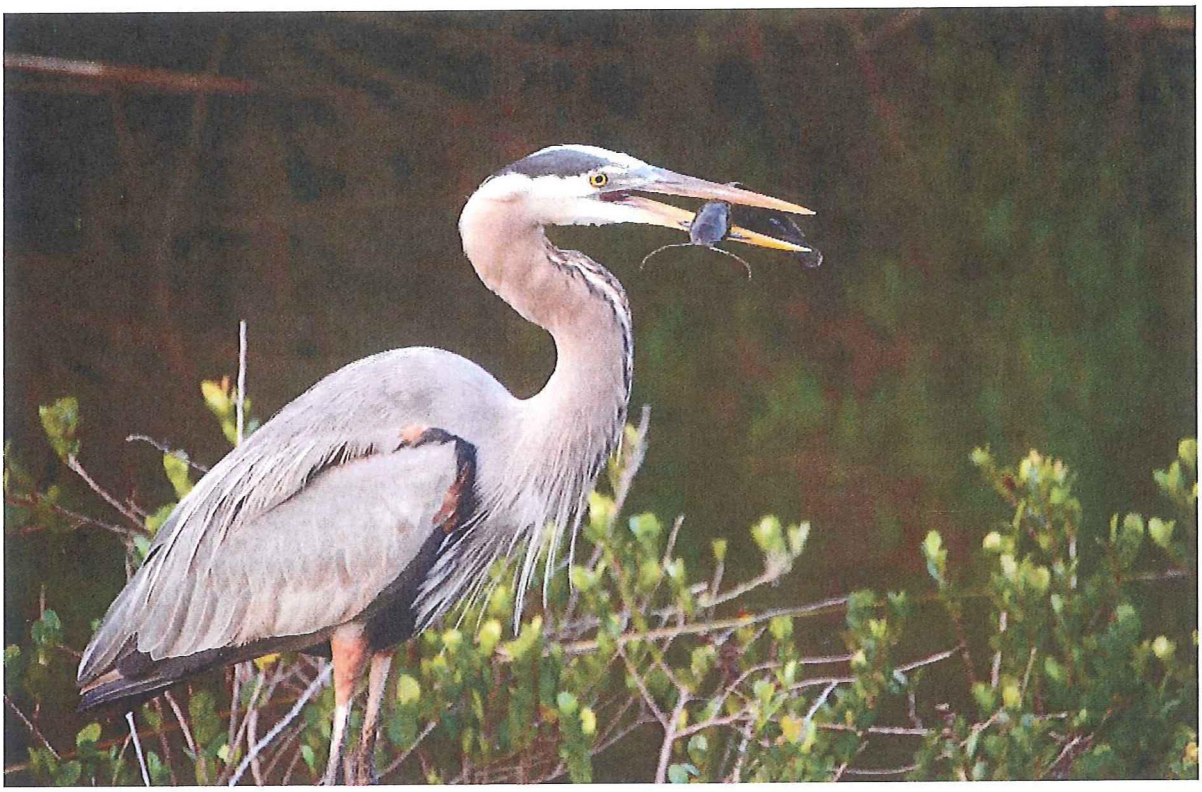
## Fund Allocations

The FY 2011 Annual Plan contains budget projections (Tables ES-1 and ES-2) that show the amount of State funds that would actually be needed to accomplish the proposed implementation plan for the next three fiscal years. These budget projections improve further on previous projections by more closely reflecting actual expenditures and the amount of work to be performed, allowing citizens and legislators to track progress on individual projects more accurately. Funding projections take into account State budget surplus funds allocated for coastal protection and restoration projects. The funding projections presented in this Annual Plan represent a forecast based on a snapshot in time. However, the coastal program needs some degree of funding flexibility to enable the State to respond appropriately to the issues discussed above. Reprogramming of existing and new funds will likely occur, with approval from the CPRA, to protect the lives, livelihoods, and heritage of the people of coastal Louisiana and restore its ecosystems.

| Table ES-1. Projected 3-Year Revenues FY 2011–FY 2013. | | | | |
|---|---|---|---|---|
| Revenue Sources | FY 2011 | FY 2012 | FY 2013 | Program Total FY 2011- FY 2013 |
| CPR Trust Fund | $36,934,275 | $35,000,000 | $35,000,000 | $106,934,275 |
| CIAP | $91,704,790 | $28,203,992 | $32,136,368 | $152,045,150 |
| Surplus '07 | $137,834,985 | $13,689,356 | $12,633,000 | $164,157,341 |
| Surplus '08 | $99,399,444 | $42,033,333 | $3,053,333 | $144,486,110 |
| Surplus '09 | $139,452,875 | $7,239,631 | $355,689 | $147,048,195 |
| GOMESA | $699,757 | $326,400 | $326,400 | $1,352,557 |
| Hazard Mitigation Grant Program | $47,200,000 | $0 | $0 | $47,200,000 |
| Community Development Block Grants | $27,400,000 | $0 | $0 | $27,400,000 |
| FEMA | $10,000,000 | $0 | $0 | $10,000,000 |
| Reimbursement for Federal In-Kind Credit | $6,140,000 | $6,385,600 | $6,641,024 | $19,166,624 |
| Carry Over From Previous Year (Trust Fund) | $21,460,660 | $0 | $0 | $0 |
| **Total** | **$618,226,786** | **$132,878,312** | **$90,145,814** | **$819,790,252** |

| Table ES-2. Projected 3-Year Expenditures[1] FY 2011–FY 2013. | | | | |
|---|---|---|---|---|
| Program/ Funding Source | FY 2011 | FY 2012 | FY 2013 | Program Total FY 2011–FY 2013 |
| CIAP Projects | $91,704,790 | $28,203,992 | $32,136,368 | $152,045,150 |
| CWPPRA Projects[2] | $19,442,815 | $16,000,000 | $16,000,000 | $51,442,815 |
| Remaining Surplus '07 Projects[3] | $125,334,985 | $8,689,356 | $8,133,000 | $142,157,341 |
| Remaining Surplus '08 Projects[3] | $87,683,334 | $41,683,333 | $2,773,333 | $132,140,000 |
| Remaining Surplus '09 Projects[3] | $30,772,875 | $6,864,631 | $355,689 | $37,993,195 |
| WRDA Projects | $26,368,147 | $92,856,726 | $244,207,551 | $363,432,424 |
| Beneficial Use Program | $7,000,000 | $7,000,000 | $7,000,000 | $21,000,000 |
| Project OM&M | $19,844,586 | $7,349,644 | $6,154,661 | $33,348,891 |
| Hazard Mitigation Grant Program | $47,200,000 | $0 | $0 | $47,200,000 |
| Community Development Block Grants | $27,400,000 | $0 | $0 | $27,400,000 |
| Lake Pontchartrain Debris Removal (FEMA) | $10,000,000 | $0 | $0 | $10,000,000 |
| Barrier Island Maintenance Program | $3,500,000 | $3,500,000 | $3,500,000 | $10,500,000 |
| Ongoing Programs | $16,625,000 | $16,775,000 | $16,900,000 | $50,300,000 |
| Support/Emergency Response/Reserve | $25,891,110 | $17,725,000 | $17,725,000 | $61,341,110 |
| Operating Costs | $22,314,706 | $23,203,858 | $24,133,169 | $69,651,733 |
| HSDRRS 30 year payback | $0 | $62,200,000 | $62,200,000 | $124,400,000 |
| HSDRRS LERRDS | $76,300,000 | $0 | $0 | $76,300,000 |
| **Total Planned Expenditures** | **$637,382,348** | **$332,051,540** | **$441,218,771** | **$1,410,652,659** |

Notes:
1–Represents proposed expenditures provided that commensurate level of funding is received.
2–Because CWPPRA projects compete for funding annually, CWPPRA expenditures as presented in Appendix C (which include projected expenditures for approved projects only) do not adequately capture likely CWPPRA expenditures in outlying years. The State's estimated CWPPRA expenditures for FY 2012–FY 2013 are therefore based on prior years' expenditures.
3–Represents only expenditures not otherwise captured in this table.



Based on these projections, the State has developed a three-year implementation plan that envisions the following activities for the interval FY 2011–2013:

- FY 2011 Projects in planning: 12
- FY 2011 Projects in design: 35
- FY 2011 Projects waiting for construction funding: 4
- FY 2011 Projects in construction: 51
- FY 2011 Projects that will complete construction: 23
- FY 2012 and 2013 Projects that will complete construction: 25
- FY 2011 Projects requiring operation and maintenance expenditures: 83
- FY 2011 Projects with monitoring expenditures: 33

As these figures indicate, the State will focus resources over the next three years on constructing coastal projects that have already been planned and/or designed (Figure ES-1). The State is constructing projects at a faster rate than ever before. Consequently, the State must be ready to meet the costs associated with operations, maintenance, and monitoring of these constructed projects.

Although the current funding climate is extremely uncertain, new funding sources may become available in FY 2011. For example, if Federal partners gain Congressional approval and funding for major new coastal projects in Louisiana, the State might need to contribute a percentage of the projects' costs (cost share), or risk losing the opportunity to maximize Federal investment in our coast. The CPRA has been granted authority to reprogram dollars from approved funding streams and allocate the dollars to best meet new opportunities or needs. Such flexibility ensures that the coastal program can respond effectively to unforeseen events that take place outside the legislatively-mandated planning cycle.

## Adapting to the Future

New developments in science and engineering may cause the State to change its approach to project design and construction; in this event, shifts in funding would also be needed. As more data are collected about how constructed projects work, the State will adjust priorities to focus on the most effective project concepts. In this way, the State can allocate its limited funds to projects with high rates of return. These projects will be refined continually based on input from engineers, scientists, and regional and technical stakeholders.

## Transparency and Accountability

The FY 2011 Annual Plan breaks new ground in providing updates on progress and technical challenges faced by the coastal program by comparing current implementation schedules with those from the FY 2010 Annual Plan. Although the State made significant progress in project implementation during FY 2010, 43 projects have experienced delays in design or construction since the FY 2010 Annual Plan was approved. Many of the delays were caused by issues outside of the State's control, such as cost-share or coordination delays associated with the U.S. Army Corps of Engineers and other Federal agencies (12 projects). Other causes include design issues (eight) projects, landrights issues (four projects), contracting issues (four projects), and additional funding requirements (three projects).

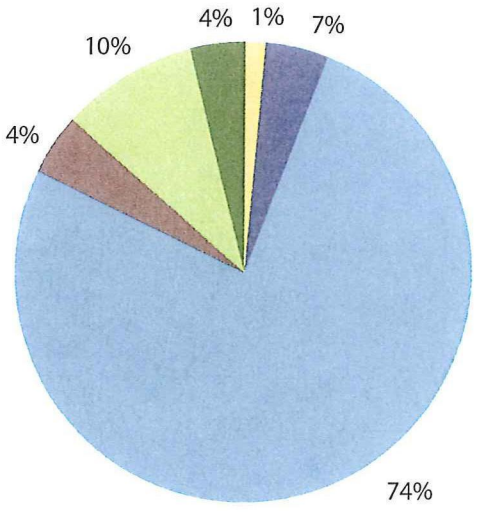
## Year-Round Effort

The State's Annual Plan process is now a year-round effort. Consequently, the planning team will begin work on the FY 2012 Annual Plan as soon as the FY 2011 plan has been approved by the State Legislature. Specific actions to be undertaken during the FY 2012 Annual Plan effort include refining the prioritization tool to improve tool functionality, expanding public participation in State planning efforts by continuing to hold RSW meetings, beginning work on predictive models to evaluate project performance, continuing to expand and improve the project database to collect better data to feed the prioritization tool, and continuing to collect data on non-State projects to input into the project database.

## Meeting Objectives

The FY 2011 Annual Plan brings the State's coastal program one step closer to meeting the objectives set forth in the Master Plan. The refined prioritization tool presented in this Plan integrates coastal protection and restoration activities, bringing the State closer to achieving complete integration of these efforts. The FY 2011 Annual Plan also improves upon past Annual Plans by providing a more accurate estimate of the funds available for the coastal program and a clear description of how these funds will be spent. The FY 2011 Annual Plan thus builds on past efforts, while directing new progress in the development of a comprehensive planning framework that allows the State, for the first time, to truly integrate coastal protection and restoration activities and engage in performance-based planning. The State will continue to work closely with its partners at all levels of government and with communities throughout the coast to protect Louisiana's citizens and restore its precious coastal heritage and resources.

**Figure ES-1. Projected FY 2011 Expenditures by Project Phase.**




| FY 2011 Total Expenditures | $563 million |
|---|---|
| Planning | $7.8 million |
| Engineering and Design | $38.7 million |
| Construction | $417.5 million |
| Operation, Maintenance & Monitoring | $23.3 million |
| Ongoing Programs | $53.1 million |
| Operating Costs | $22.3 million |
| OM&M includes BIMP | $3.5 million |
| Construction includes: | |
| Beneficial Use | $7.0 million |
| Lake Pontchartrain Debris Removal | $10.0 million |
| Ongoing Programs includes: | |
| Emergency Reserve | $25.9 million |
| Total excludes: | |
| CDBG | $27.4 million |
| HMGP | $47.2 million |