



National Commission on the
**BP DEEPWATER HORIZON OIL SPILL
AND OFFSHORE DRILLING**

Attachment 21

Written Statement of Mary Landrieu

U.S. Senator, Louisiana

Statement by Senator Mary Landrieu

Coastal Restoration and Protection – Long-Term Crisis

For more than a century, the federal government has mismanaged critical water-resource projects, placing delicate ecosystems like the Mississippi River Delta at extreme risk of complete and utter collapse.

In the decades since our federal government first pursued the channelization of the Mississippi River to promote trade and commerce, the world's seventh-largest delta has been largely deprived of nourishment from sediments carried by the river, which drains roughly two-thirds of the continental United States. Instead of rebuilding the delta, these sediments now are redirected and carried out to the Gulf of Mexico, where they are dispersed.

The effect on the delta is a constant and debilitating land loss. This strangulation of this natural process is compounded by the ravages of coastal erosion and further aggravated by regular storms and hurricanes that batter barrier islands and coastal plains.

Sustainability of life in the delta is under dire threat in coastal Louisiana—a rapidly eroding landscape that loses 25 to 35 square miles of wetlands each year. At the current rate of land loss, an area the size of Rhode Island will be underwater by 2050. We have already lost an area the size of Delaware in the last 50 years.

And with the loss of this unique area goes our nation's only true working energy coast—an economic engine that contributes 90 percent of America's offshore energy production, 30 percent of the nation's overall oil and gas supply, and 30 percent of the seafood produced in the lower 48 states. Our working energy coast also caters to one of the most unique and vibrant hospitality tourism industries in the nation. It is also

home to more than 2.5 million citizens who operate the great port systems of the Mississippi.

At the heart of this special coast is a massive river system stretching nearly 2,500 miles from the Great Plains to the Gulf of Mexico. The Mississippi River has the third-largest drainage basin in the world, exceeded only by the watersheds of the Amazon River and the Congo River.

Sitting at the mouth of this vast river system is my home of New Orleans—a city that was almost lost in 2005 and is still struggling to recover from Hurricane Katrina—one of the most devastating man-made disasters in history.

While it bears great strategic and cultural importance to the nation, New Orleans is not the only vulnerable area that requires protection. Across the entire Louisiana coast, from east to west, cities such as Lake Charles (population 71,757), Houma (population 32,393), New Iberia (population 32,623), Thibodeaux (population 14,431) and Lafayette (population 110,257) are threatened as well.

As we have seen during this current oil spill, these cities form the backbone of our nation's fisheries, port system, and offshore oil and gas industry.

All of these tremendous assets are at risk of being wiped off the map. With the persistent and rapid loss of land in Louisiana, communities are more vulnerable to the storm surge of massive storms and the inevitable impacts of sea-level rise.

The Solution: Justice for the Gulf

There is a solution; one that is do-able and affordable.

To help this region undo decades of coastal loss and respond to the effects of the current oil spill, it is critical to secure a permanent, robust and immediate source of revenue for coastal restoration.

This can be achieved in two ways, both of which are included in the RESPOND Act that I re-introduced in August:

1. Accelerate the Domenici-Landrieu Gulf of Mexico Energy Security Act of 2006, which finally dedicated 37.5% of new offshore oil and gas revenues to coastal protection and restoration in the four Gulf energy-producing states. Inland states have shared 50% of the revenues generated by drilling on federal lands since 1920. Historically the Gulf states carried all of the risk associated with drilling without the reward. Under the RESPOND Act, the flow of revenue would begin immediately instead of 2017.
2. No less than 80% of the civil and criminal penalties charged to BP under the Clean Water Act should be directed to the Gulf Coast for long-term economic and environmental recovery. The money should be invested where the injury was suffered - along the Gulf Coast.

In addition to a permanent source of funding, we must energize the sluggish and ill-equipped federal bureaucracy and establish a new more effective governance model for implementing coastal protection and restoration.

The current federal process for addressing coastal protection and restoration is woefully inadequate and painfully slow, held up by the interminable process of planning, irregular and unpredictable Federal authorizations, mind-numbing regulations and insufficient funding.

We need a new approach that will expedite coastal protection and restoration in Louisiana, and the Gulf Coast, by establishing a governing entity or institute with this singular focus.

I applaud the recommendations that Secretary Ray Mabus is making to the President today. In large measure, these recommendations follow the suggestions of the stakeholders in the region who are adamantly focused on protecting our coastal areas.

Specifically, this report will recommend:

- Congressional action to dedicate a significant amount of any obtained civil Clean Water Act penalties incurred to the Gulf Coast's recovery.
- Dedication of a portion of any obtained Clean Water Act civil penalties directly to the Gulf States.
- Congressional action to create a Gulf Coast Recovery Council to manage the dedicated Clean Water Act funds. The Council should coordinate closely with the ongoing Natural Resource Damage Assessment (NRDA) proceedings and should include representatives from the federal and state governments, and tribal organizations.
- Immediate appointment of a single federal lead for ecosystem restoration.
- Immediate creation of an administratively established Gulf Coast Ecosystem Restoration Task Force to manage the transition from response to recovery. The Task Force would be an advisory body that would include representatives from federal, state, and tribal organizations and would act in direct coordination with the NRDA process. It would also act to

coordinate non-NRDA ecosystem funds and projects. If the Recovery Council is established by Congress the Ecosystem Restoration Task Force could be modified or dissolved.

- Continuation of public health efforts.
- Continuation of the important economic recovery work.
- Support to nonprofit organizations working on the Gulf Coast.

Most of these recommendations will require Congressional action and I hope my colleagues will join me in fighting for these vital and necessary measures to put our coastal areas in better condition.

Conclusion – While a long-term plan is essential, we cannot restore the Gulf Coast until we get people back to work.

April 19th, America consumed about 20 million barrels of oil each day. Now, more than five months removed from the Deepwater Horizon explosion, our nation still consumes 20 million barrels of oil a day

Thanks in large measure to a robust oil and gas industry in the Gulf, the U.S. produces about 5 million barrels of oil here. We produce another 3 million barrels worth of biofuels.

While more needs to be done to reduce our dependence on oil and to transition to cleaner, renewable forms of energy, the fact remains that America will need oil well into the foreseeable future.

This point is critical and one this Commission should take leadership over. This country need oil and gas to run our

economy, but not one person in this Administration seems focused on the future of domestic oil and gas development.

This Administration continues to serve as a road block, threatening the viable future of the industry.

Here is just one example of the Administration's seeming lack of support for the quick return of the industry. According to the Federal register notice for this meeting:

"The President directed that the Commission be established to examine the relevant facts and circumstances concerning the root cause of the BP Deepwater Horizon explosion, fire, and oil spill and to develop options to guard against, and mitigate the impact of any spill associated with offshore drilling in the future."

There is a key piece missing to this directive – the fact that our economy is literally driven by oil and gas and will continue as such for the foreseeable future. There is no mention of the importance this industry and the vital jobs it supplies throughout our country. As such, I hope this Commission can help the Administration focus on this vital piece to our secure energy and economic future.

For decades, Louisiana and the 330,000 people who work in the oil and gas industry have delivered this fuel to our nation.

That energy fuels not just our cars, but a significant portion of our national economy.

But unfortunately, tens of thousands of jobs are at risk due to this Administration's ill-conceived and borderline reckless six-month deepwater drilling moratorium.

Of course, those of us familiar with the industry know that there is also a de facto moratorium on shallow water drilling as well. You may be surprised to know that before the BP spill, the Mineral Management Services (MMS) approved an average of three to six shallow water permits per week, or 12 to 24 permits on average per month. In contrast, since May, the Bureau of Ocean Energy Management (BOEM) has only issued seven shallow water permits for new wells.

This de facto moratorium threatens the viability of that entire industry. These companies cannot hold on to an empty promise that new permits will be issued. They need action to keep employees on their payrolls or be forced to lay-off workers. And for each day new permits are not issued, the economic crisis continues to grow.

I bring up these moratoria only to make this very critical point: a long-term plan to save our coast can only be effective with a short term strategy to save the thousands of jobs which are at grave risk. What good is saving our environment to only let the economy crumble around it?

The Gulf Coast needs quick and decisive action to lift the moratorium to save our businesses and our economy. That action coupled with a secure long-term plan to restore our coast is the only way to save our way of life long into the future.



National Commission on the
**BP DEEPWATER HORIZON OIL SPILL
AND OFFSHORE DRILLING**

Attachment 22

Written Statement of Haley Barbour

Governor of Mississippi

Testimony of Governor Haley Barbour to the National Commission on the
BP Deepwater Horizon Oil Spill and Offshore Drilling
September 28, 2010

While the total impact of this summer's oil spill on the Gulf of Mexico ecosystem may not be known for several years from now, there is much we already know about the Gulf and how to make it better, both environmentally and economically, for Mississippi and the region. Hopefully, scientists will find the spill has had a far smaller impact on the Gulf ecosystem than most feared and a far, far smaller impact than what's been reported by the cable news channels, as the daily sensational reports literally scared tourists away from Gulf vacation plans this summer. But the fact is, while the ecological impact seems small for now, we just won't know the total impact until all the data is in.

This doesn't mean we need to wait on the studies to conclude before we take action. There's much we know needs doing in the Gulf region, and as we move forward in the aftermath of the oil spill into restoration and improving the way we interface with the Gulf of Mexico, there are several areas that deserve our attention – hurricane protection, environmental restoration, fisheries improvements, commerce, and energy production – and all are interrelated and tied to the long term economic well-being of the region.

With Katrina we have learned the hard way our communities must be better prepared for hurricanes, and the natural barriers that better protected our shoreline decades ago need rebuilding, otherwise we will remain more vulnerable to storms than we've ever been. Seafood, and all of the commercial and recreational activity with it, is a huge part of this region's economy, and environmental restoration and fisheries enhancement are very much interconnected. Finally, this region is critically important to our nation's commerce and international trade through its seaports and to our nation's energy supply through production of its vast oil and natural gas resources.

Some of these issues, like oil and gas production, are policy issues that we must get right quickly, before more investment, infrastructure, and jobs go elsewhere while some issues, like the Port of Gulfport expansion project which is critically important to future job growth for South Mississippi, require Congressional action and Federal attention to expedite permitting

processes to free up money already appropriated while some efforts will require new funding, either through Congressional appropriations or monies derived from the Natural Resources Damage Assessment currently underway or proceeds from Clean Water Act fines.

Seemingly, the most important role of this Commission is to recommend policies to the President and to Congress that could have a long-lasting and enormous impact on offshore oil and gas production, on our economy, and on energy security. For decades now, for the obvious reasons of natural security and jobs creation, Americans have demanded more American energy and, election after election, have elected politicians that rhetorically used “energy independence” as a platform. With roughly 60% of oil consumed in the U.S. being imported, statistics show that we have done a very poor job of expanding American energy production over the years, and in fact, our federal energy policies, or lack thereof, of have resulted in restricted access and supply, more imported oil, and higher prices. At \$75 per barrel oil, this is over \$800 million U.S. dollars spent on imports per day and over \$300 billion spent per year. A little progress towards reducing imports would have a significant impact on the trade deficit. Americans want more domestic energy and understand that more supply means more jobs, more security, and affordability.

The President’s moratorium is a backwards step and needs to be reversed before more infrastructure, investment, jobs, and production is lost in the Gulf. Yes, we do need to understand how to prevent what caused the Deepwater Horizon explosion and spill, but the impact of stopping exploration and losing production is far too great. We need the energy. While the inter-agency report last week boasts that only 8000 to 12,000 jobs are estimated to be “temporarily” lost due to the deepwater drilling moratorium, this is no small number of jobs to our region, and the report only estimates job number losses, not individual income losses due to the drastic drop in drilling activity. And the lost production will surely be replaced by imported oil, so more American dollars will leave the country rather than staying here to create jobs in the Gulf.

Roughly 13% of U.S. natural gas production is derived from the Gulf and 30% of U.S. oil production comes from the Gulf with 80% of that coming from deepwater wells. So the deepwater drilling moratorium and the sharp decline in shallow water drilling permits will have a significant negative impact on U.S. energy production. Policy changes are needed now to

reverse the direction we're headed of making our country more dependent on foreign oil producers.

Aside from the negative impact on energy security and the economy, we must remember that of the 10 largest oil spills in U.S. history, 8 have been from tankers or barges, so by reducing production and necessitating more imported product, we are creating a higher risk of major spills. The Deepwater Horizon spill is now the largest by far, but tanker spills are typically nearshore, not easily contained, and do not get as much benefit of natural decomposition as we saw with the Deepwater Horizon oil this summer in the warm waters of the Gulf.

Your request today was for me to discuss the opportunities for funding long-term Gulf restoration through Clean Water Act fines, the Natural Resources Damage Assessment, and other mechanisms. Obviously, there remains much uncertainty over Clean Water Act fines to be paid by the responsible party, BP. Regardless of how much this will be or when it will be paid, those who live, work, know, and depend on the resources in the Gulf should decide how to restore the region. Much of this is science and most of the restoration needed is not related to the oil spill but various projects that were planned over time before this event even began.

Of course, the Natural Resources Damage Assessment (NRDA) process, prescribed under the Oil Pollution Act (OPA), will run its course and will tell us over the next several months and years environmental and economic damages as a result of natural resource losses due to the Deepwater Horizon spill. Assessments in Mississippi began in late April when our agencies – the Department of Environmental Quality and the Department of Marine Resources – stepped up water, air, sediment, and tissue sampling to collect sufficient background data, and assessments will continue as our various teams monitor all the different components of the MS Gulf ecosystem through next year and after.

Many of the environmental restoration needs near Mississippi's shore have been identified as part of the Mississippi Coastal Improvement Plan (MSCIP). After Hurricane Katrina, Congress asked the U.S. Army Corps of Engineers to determine projects that would provide greater protection against storm surge to the Mississippi Gulf Coast. The Corps recommended both near term improvements, which Congress funded at \$107 million in 2007, and long term improvements, which are estimated to cost around \$1.3

billion to complete. Of this, Congress has already appropriated \$439 million for the restoration of the Mississippi barrier islands to their pre-Hurricane Camille footprint. A series of tropical storms and hurricanes, capitalized by Hurricane Katrina, has resulted in the barrier islands being flatter with a smaller impact. This is bad for the Mississippi Gulf Coast because these islands, along with other natural shoreline barriers like wetlands and coastal forestlands, serve as Mississippi's defense against storms and storm surge. These natural structures, which are roughly 12 miles off our main shoreline, both reduce the intensity of hurricanes and decrease storm surge before shoreline impact. Without the barrier islands and other natural protective lands that absorb energy from hurricanes, the Mississippi Gulf Coast is left vulnerable. About \$800 million is needed to complete the MS Coastal Improvement Plan and restore the barrier islands and the thousands of acres of habitat and natural protection.

Regarding Clean Water Act fines, I know Senator Landrieu has proposed that 80% be provided to Gulf States in lieu of being deposited into the Oil Pollution Trust Fund or into the Federal treasury. I concur with this proposal and have proposed to both BP and Secretary Mabus that administration of dollars for the Gulf region be funneled through the Gulf of Mexico Alliance (GOMA) or a States-led council. GOMA has existed since 2004 and has planned for and carried out actions for habitat restoration, nutrient management, and water quality improvements. Each of the five Gulf States are equally represented on GOMA, and a host of Federal agencies and Gulf researchers are at the table as plans are made and carried out. What the Gulf region does not want is Federal agencies making decisions on how Gulf restoration dollars are spent.

In Mississippi, I have appointed a Commission made up of scientists, business leaders, conservationists, seafood industry representatives, and elected officials. This Commission is making recommendations in the areas of economic development, research, environmental restoration, and public health and safety to develop a long-term, comprehensive roadmap for things to be done to improve quality of life among coastal communities as it relates to the Gulf of Mexico. This plan will be the guiding document for administration of environmental or economic restoration dollars in Mississippi.



National Commission on the
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AND OFFSHORE DRILLING**

Attachment 23

Written Statement and Presentation of Dr. Steven Murawski

Director of Scientific Programs and Chief Science Advisor

National Oceanic and Atmospheric Administration

**WRITTEN STATEMENT OF
STEVEN A. MURAWSKI, PH.D.
DIRECTOR OF SCIENTIFIC PROGRAMS AND CHIEF SCIENCE ADVISOR
NATIONAL MARINE FISHERIES SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

PUBLIC HEARING BEFORE THE
NATIONAL COMMISSION ON THE BP DEEPWATER HORIZON
AND OFFSHORE DRILLING**

September 28, 2010

Thank you Governor Graham, Administrator Reilly, and all the members of the Commission and staff for inviting testimony from the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA). My name is Steven Murawski; I am the Director of Scientific Programs and Chief Science Advisor for NOAA's National Marine Fisheries Service. In addition to my normal duties I have been involved with a number of interagency groups that have been formed to coordinate spill-related science. I lead the National Incident Command's Joint Analysis Group (JAG) that

provides information and analysis of findings regarding the sub-surface monitoring of oil and oceanography. Additionally I am the lead for the interagency Executive Leadership group, which is coordinating the deployment of an enhanced sub-surface oil and dispersants monitoring program being developed through the Unified Area Command. My testimony today will discuss some scientific findings in the Gulf of Mexico related to the BP Deepwater Horizon oil spill, on-going impact research, and long-term monitoring plans, as well as the Administration's scientific coordination with industry, academia, and other state and Federal agencies.

THE ROLE OF SCIENCE

Science has been a critical component of all three major phases of this oil spill response and recovery effort: (1) the response to the presence of vast quantities of Deepwater Horizon oil with respect to the environment and human communities, (2) the Natural Resource Damage Assessment (NRDA) identifying direct and indirect impacts of the spill on the productivity, abundance, and use of ecosystem services in the Gulf, and (3) long-term recovery of the Gulf's ecosystems and communities dependent on natural resources. Early in this spill it was recognized that the scale and scope of the event would be so vast that it would touch virtually every aspect of life in and surrounding the Gulf. The challenges would be to document the quantity, movement, and fate of the oil;

the impacts of oil on ecosystems and people; and the success of any targeted recovery and mitigation efforts.

As the spill scenario had evolved, so too have the nature and emphasis areas for science supporting spill efforts. For example, initial sampling was aimed at quantifying surface oil and predicting its movements as an aid to the first responders and clean-up crews.

Within hours of the spill the first surface trajectory models were being run to predict where oil may be found. Over the course of the spill, modeling of oil trajectories became more complex and robust with the development of six independent surface tracking models, and the addition of models predicting the fate of oil particles in the sub-surface. –

Similarly, issues of seafood safety testing, impacts on salt marsh, beach, and deep ocean habitats, living marine resources, air quality, and socioeconomic impacts have emerged as priority areas for science related to the spill. Below I detail some of NOAA's science efforts, the importance of interagency collaborations and the role of independent scientists in the overall effort.

THE BREADTH OF NOAA'S SCIENCE SUPPORTING RESPONSE TO THE BP DEEPWATER HORIZON OIL SPILL

Over the course of the spill literally thousands of NOAA employees and contractors have been involved in various aspects of clean up and impact analysis. From providing daily

weather predictions and hurricane outlook forecasts, to conducting shoreline impact assessments, capturing and cleaning oiled sea turtles, and monitoring the Gulf's seafood supply, the spill has touched every aspect of NOAA's diverse mission set. To date, NOAA has conducted nearly 120 sampling missions using a total of seven of its ships and six aircraft. These missions have been as diverse as dropping oceanographic instruments into the loop current to study oil transport and conducting air quality sampling from NOAA's P-3s to using the new fisheries survey vessel PISCES and its state-of-the-art acoustics monitoring capabilities to provide surveillance in the area around the well head for oil and gas plumes once the well was shut in. While these efforts have strained NOAA's ability to respond to such a diverse and intensive use of its resources, NOAA personnel have done so, knowing the importance of timely and accurate scientific information supporting the response.

NOAA's scientific experts have been assisting with the response both on-scene and through NOAA's headquarters and regional offices. The efforts by NOAA include all of its line organizations, appropriate Cooperative Institutes and Sea Grant collaborations involving many academic institutions. Coordinating all these various activities within the Agency has been a challenge, and new structures were created to manage these efforts.

The development of interagency collaborations by the National Incident Command (NIC) and the Unified Area Command (UAC) has facilitated greatly the ability to collect and interpret critical information. One case in point is the coordination of sub-surface sampling to track the location, concentration and movement of sub-surface oil. Once it was apparent that oil was in subsurface waters, a coordination unit was established at the UAC, first in Houma and then in New Orleans, Louisiana. The Sub-surface monitoring group (SSM, comprised of many agencies) was charged with overseeing the collection of relevant data, communication with all vessels conducting sampling in the area of concern and development of appropriate data sets. Once data began to flow from ships and other assets deployed for sampling, the National Incident Commander set up the Joint Analysis Group (JAG) to conduct analyses and to inform the responders, scientific community and the public about relevant findings. Initially collaboration among agency scientists with input of data from the contractors for one of the responsible parties, the JAG ultimately established working relationships with more than a dozen academic researchers to assist in interpreting of data and with combining information from all available sources. Three substantial information reports and numerous online databases have resulted from this collaboration, which continues to document the concentration of oil and dispersants in the environment: <http://ecowatch.ncddc.noaa.gov/JAG/reports.html>. The first of the JAG reports documented the chemistry information, particle size composition, oxygen levels and evaluated instruments used to sample for likely oil signatures. The second report

evaluated instrument findings from special UV lights that fluoresce in the presence of oil (fluorometers), and the third such report compiled all available information on oxygen levels calculated for the sub-surface, concluding that “dead zones” or hypoxia events, once feared possible as a result of sub-surface microbial activity had not occurred and were unlikely. These reports relied extensively on data collected and exchanged among government, academic and private researchers.

To ensure that the public and agency partners have the data they need to understand what is happening and to contribute their own expertise, NOAA has undertaken substantial efforts to quality control and post data online as soon as soon as possible after collection. A website has been created to serve as a focal point for accessing NOAA’s data. NOAA continues to improve accessibility to data and is looking at ways, such as geoplatform.gov, to make information and visualization products available to everyone.

NOAA leadership continues to be briefed daily on emerging science activities, and close coordination with other federal agencies continues to occur at all levels.

At the onset of this oil spill, NOAA quickly mobilized staff from its Damage Assessment Remediation and Restoration Program to begin coordinating with federal and state co-trustees and the responsible parties to collect a variety of data that are critical to help

inform the NRDA. NOAA is working with the Department of the Interior (another federal co-trustee), as well as co-trustees in five states and representatives for at least one responsible party, BP on this effort. NOAA and the co-trustees are in the initial phase of this process and are currently gathering data on resources such as fish, shellfish, birds, turtles, and mammals; their supporting habitats such as wetlands, beaches, and corals; and human uses of affected resources, such as fishing and recreational uses across the Gulf of Mexico.

Plans are already under discussion for how agencies will continue to maintain the necessary level of coordination through the long-term recovery phase.

COORDINATION ON SEAFOOD SAFETY SAMPLING AND RESEARCH.

NOAA has been coordinating with Food and Drug Administration (FDA), Environmental Protection Agency (EPA), the states, and industry on seafood safety and research.

Fisheries closures remain in effect in some areas in the Gulf, and there is ongoing sampling to evaluate additional areas for potential re-openings. Seafood samples are derived from at-sea sampling and subjected to sensory and chemical testing for the presence of oil. NOAA is confident in the sensory and chemical testing currently being conducted to detect possible contamination in seafood. In response to ongoing public concerns about seafood safety and dispersants, we have been working together with our

scientific partners at FDA to develop a chemical test to detect dispersant in seafood. This test, once validated, will provide additional public confidence in the safety of Gulf seafood. All chemical samples obtained to date have tested below levels of concern identified by FDA and NOAA and the states.

The interagency science processes set up under the various commands have by and large worked well with a high degree of collaboration to assure the proper science is conducted to inform the response and NRDA phases and that the public is informed. We continue to look at ideas for more effective communication with stakeholders and the public.

COORDINATION WITH THE BROADER SCIENTIFIC COMMUNITY

While NOAA's efforts have involved collaborations with many academic researchers, there continues to be keen interest among the academic and private research communities for further involvement in oil spill efforts. There have been a few instances of apparent misunderstanding among academic researchers and agency information, leading to confusion among the public and the media about what is happening, particularly in the sub-surface. In order to address this issue, NOAA, along with EPA, OSTP, NSF, USGS, BOEMRE, and NIH recently convened a series of public discussion sessions with the external scientific community aimed at soliciting input to the goals, strategies, and implementation of the Unified Area Command (UAC)'s draft sub-surface oil and

dispersant monitoring plan, and discussing science collaborations more generally. The events, hosted by the University of South Florida, Mississippi State University (in partnership with Mississippi-Alabama Sea Grant and the Northern Gulf Institute), Tulane University, and Dillard University (in partnership with the NAACP) brought together a total over 300 people representing academic institutions, state agencies, private research consortia, non-governmental organizations, and private industry. The discussions covered a broad diversity of topics, including the need for continuing dialogue and enhancing the communication and flow of data and information, the need for a comprehensive plan that spans in-shore, near-shore, shelf, and deep-sea environments, the need for a robust integrated ocean observing system, and questions about the distinctions between the NRDA process, response efforts, and assessments of long-term ecosystem impacts.

NOAA is committed to continuing to engage with its scientific partners. As one example, NOAA and the other agencies that comprise the Joint Subcommittee on Ocean Science and Technology are planning a workshop on October 5-6, 2010, in St. Petersburg, Florida. This workshop is being designed to bring together scientists actively conducting research, sampling, and monitoring in response to the DWH oil spill. Input from the conference will be used to help federal agencies identify information needs and

plan short- and long-term research directions. Topics for the workshop will include: 1) oil/dispersant extent and fate; 2) oil/dispersant impacts and mitigation in coastal and offshore environments; 3) oil/dispersant impacts and mitigation on human health and socio-economic; 4) oil/dispersant impacts and mitigation of living marine resources; and, 5) use of *in situ* and remote sensors, sampling, and systems for assessing the extent, fates, impacts and mitigation of oil/dispersant.

We will also re-double efforts to communicate with and involve the external science community in oil spill science, to the extent we can.

ECOSYSTEM SERVICES STUDY

NOAA is under discussions with the National Academy of Sciences (NAS) regarding an NAS study of the long-term ecosystem service impacts of the BP Deepwater Horizon oil spill. Such a study would assess long-term costs to the public of lost water filtration, hunting, and fishing (commercial and recreational), and other ecosystem services associated with the Gulf of Mexico. Calculation of lost services in the Gulf will help inform the recovery goals and monitoring strategies likely to be developed.

LONG-TERM MONITORING PLANS

As NOAA transitions from response through the NRDA process to long-term restoration of the Gulf, it will be critical to monitor our restoration progress and adapt as necessary. NOAA, along with its agency and academic partners, has initiated a process to identify longer-term scientific needs so that recovery actions can be informed by the most comprehensive science possible.

INTERNATIONAL COOPERATION

There has been keen interest among the other regional international partners, as well as from other countries that support deep water drilling programs. NOAA and other agencies including the Department of State have engaged countries in the Gulf of Mexico region, particularly Mexico, the Bahamas, and Cuba. NOAA participated in meetings organized by the State Department with the Bahamian government, the Mexican government, and the Cuban Interest Section. All meetings have led to ongoing discussions and interest in more formal collaborations

In July, NOAA deployed the research vessel Nancy Foster on a two-week assessment mission in the eastern Gulf of Mexico and the Florida Straits to collect data critical to understanding the Loop Current system and its effect on the plume of the BP Deepwater Horizon oil spill. This mission was coordinated with Cuba and Mexico.

In addition, a Bahamian scientist spent four weeks at a NOAA laboratory, supported by the Department of Defense's NORTHCOM (Northern Command). It was a very successful visit, and an example of the benefits of collaboration among agencies within the U.S. and internationally.

CONCLUSION

Responding to the oil spill has necessitated an agile, robust and coordinated approach emphasizing inter-line office (within NOAA), inter-agency and broader government-academic/private partnerships. Coordinating the massive use of ships, satellites, laboratories, aircraft and personnel has required logistics on a scale rarely seen outside of war time. No one agency has had enough capacity to fulfill all the requirements necessitated by the response, and *ad hoc* mechanisms set up to coordinate among agencies have been extremely successful, resulting in more focused response efforts.

NOAA's science efforts are not winding down with the killing of the well, they are, rather transitioning into other stages of the assessment and recovery. The NRDA and long-term impacts assessment and monitoring activities will require substantial allocations of resources and personnel to adequately meet NOAA's trustee responsibilities with respect to the affected resources. The academic and private research communities have been and continue to make significant contributions. Results of

listening sessions and discussions among government, academic and private researchers have emphasized the importance of ongoing coordination of plans to take advantage of resources being deployed in the Gulf, and the expertise existing in all of these domains. We intend to continue these collaborations and there are ongoing and active discussions about how to best structure such collaborations.

Last, I want to acknowledge the enormous contributions that have been made by scientists in the various agencies, in universities and research institutes. Our understanding of the oil and dispersant fate and effects has increased greatly from the initial days of the spill, and the information, papers and studies completed, ongoing and yet to be deployed will significantly propel the science of oil spills forward as we search for ways to be better prepared for such disasters and in fact to decrease the probability of such events in the future.

Thank you.



Science & the

DW M 252 Oil Sp

Steven Murawski, Ph.D.
NOAA Science Lead – DWH
Oil Spill Commission Hearing
September 28, 2010





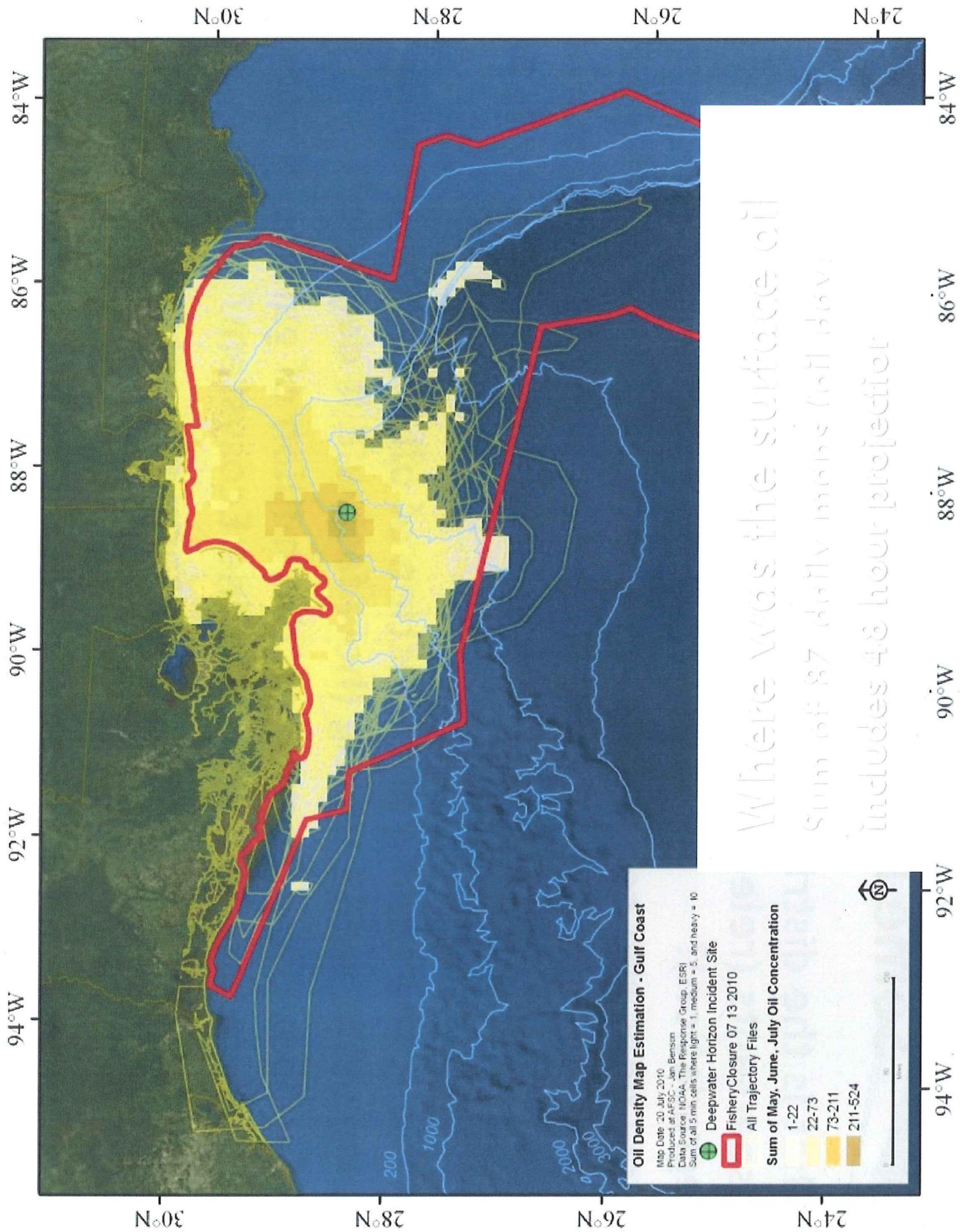
Outline –

selected aspects of the spill....

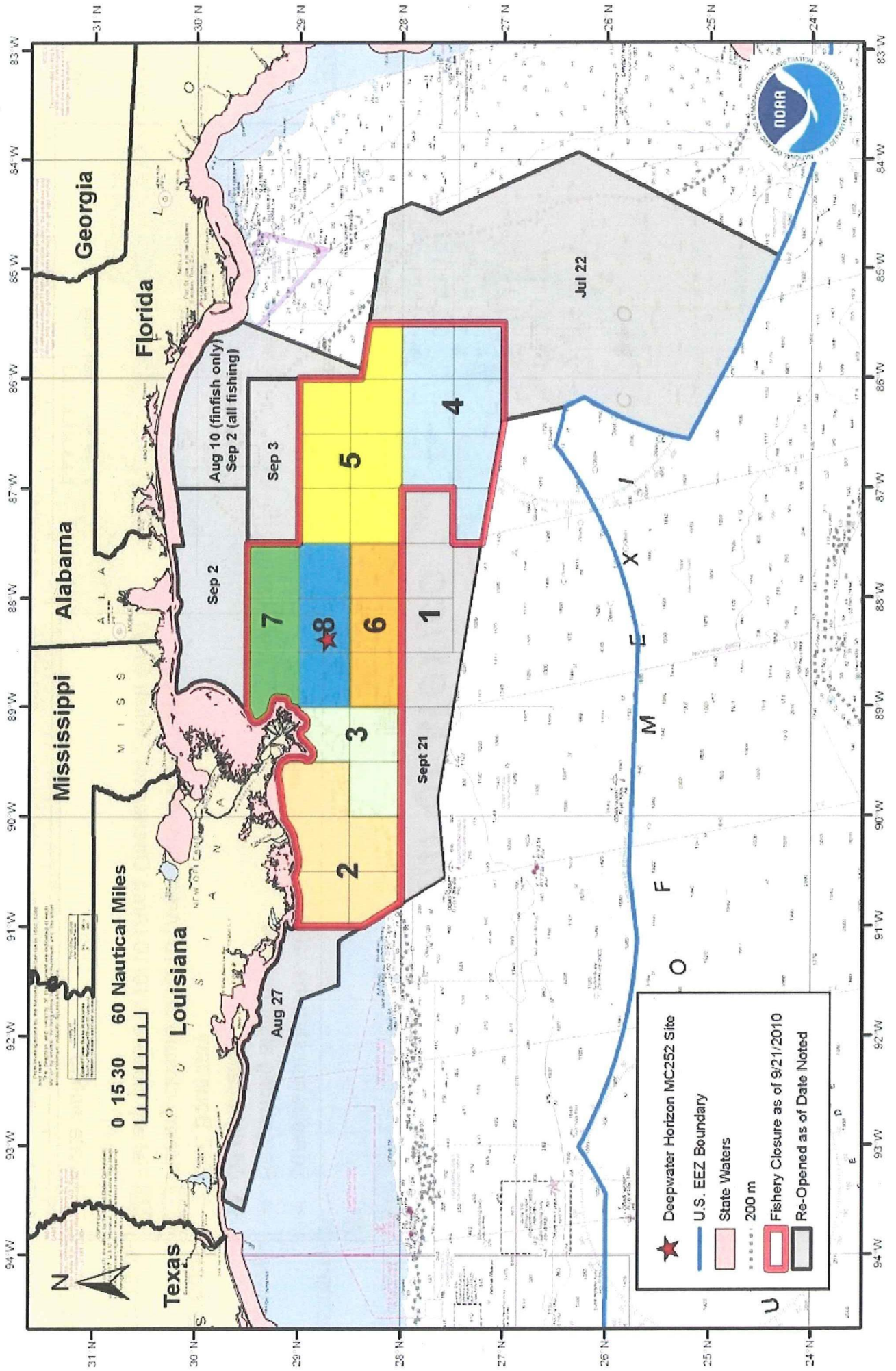
- Big Picture Science Questions
- Where was the surface oil?
- Seafood safety / LMRs
- Loop Current dynamics and importance
- Sub-surface oil & dispersant search
- Dissolved O₂
- Long-Term Science Support for the Gulf

Some DWH Science Questions

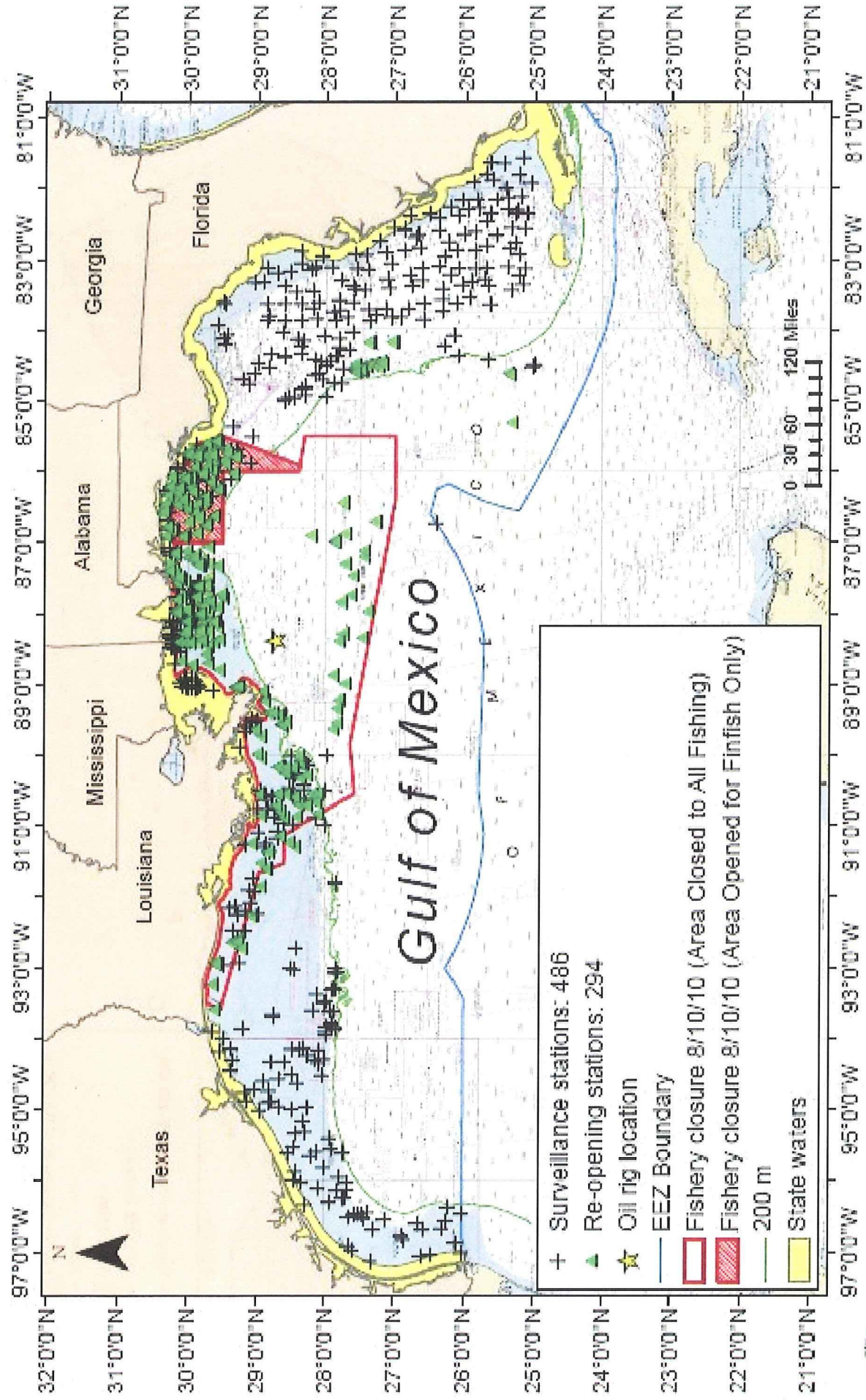
- What is the distribution, fate and impacts of oil & dispersants (release, distribution and movement, and degradation)?
- How does the concentration and distribution of oil impact the safety of seafood, and abundance/mortality of marine species such as fishes, turtles, dolphins, whales, birds and low trophic levels?
- What is the timing of reduction of oil impacts following permanent well capping (how fast will it degrade?)
- How does the presence of 200 million of gallons of reduced oil impact the GoM Large Marine Ecosystem?
- What are the short- and long-term impacts on coastal ecosystems and human dimensions?
- How and when will natural resource damages be restored, and how will science guide the process?



Tentative Sequence of Remaining Sampling Within the Federal Closed Area as of 09/22/2010

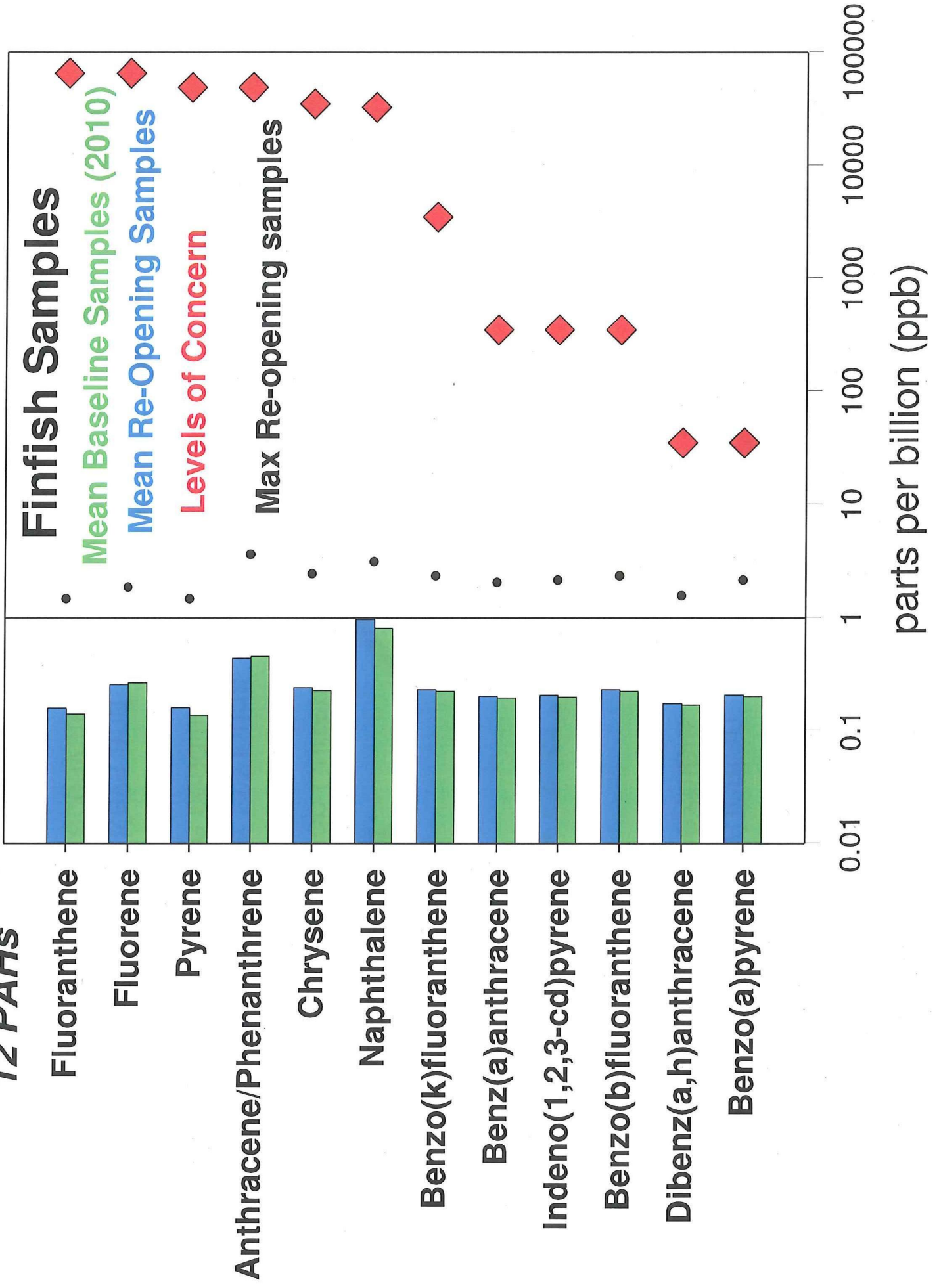


STATIONS SAMPLED FOR DEEPWATER HORIZON OIL SPILL RESPONSE FROM 4/28/2010 TO 8/16/2010: TOTAL 780 REPORTED STATIONS



For Internal Use Only - Please Do Not Distribute
 Note: Some stations may not have collected specimens for seafood inspection. Different reporting sources may account for number of stations differently. This is tallied based on the best available information.

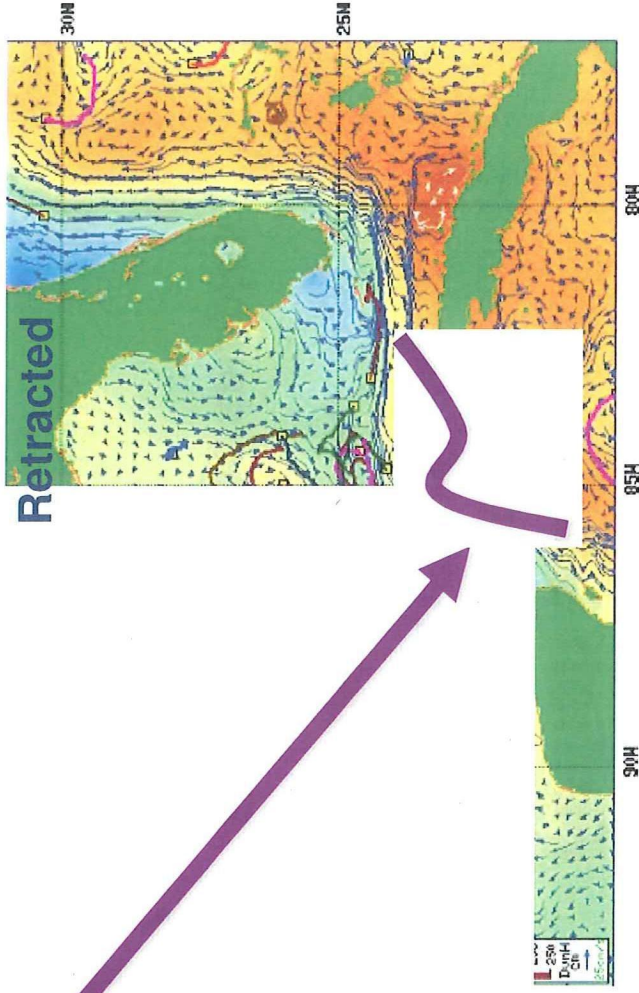
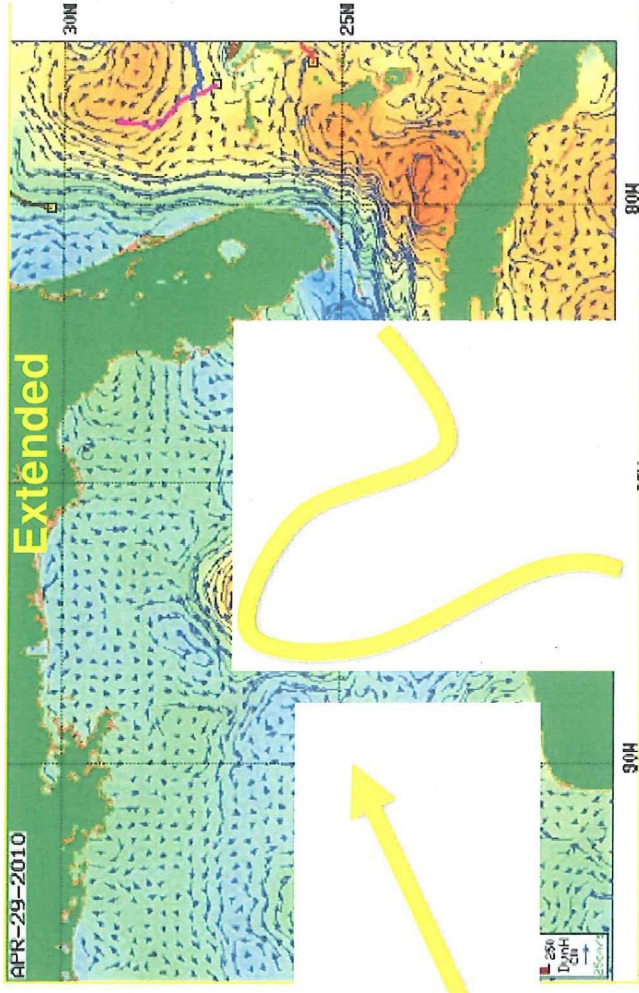
12 PAHs



The Loop Current:

A large scale ocean current that transports water from the Yucatan to the Florida Straits often exhibits two states:

1. **Extended into the Gulf of Mexico and**
2. **Retracted – short circuiting the Gulf.**



When extending north, the Loop Current can collect water from the Northern Gulf of Mexico and transport it quickly to Florida and the Gulfstream. The same conditions could easily transport oil and dispersant to sensitive areas of the Florida Keys and Florida East coast, impacting ecosystems and coastal populations.

Sub-Surface Sampling for Oil,

Dispersants & Impacts

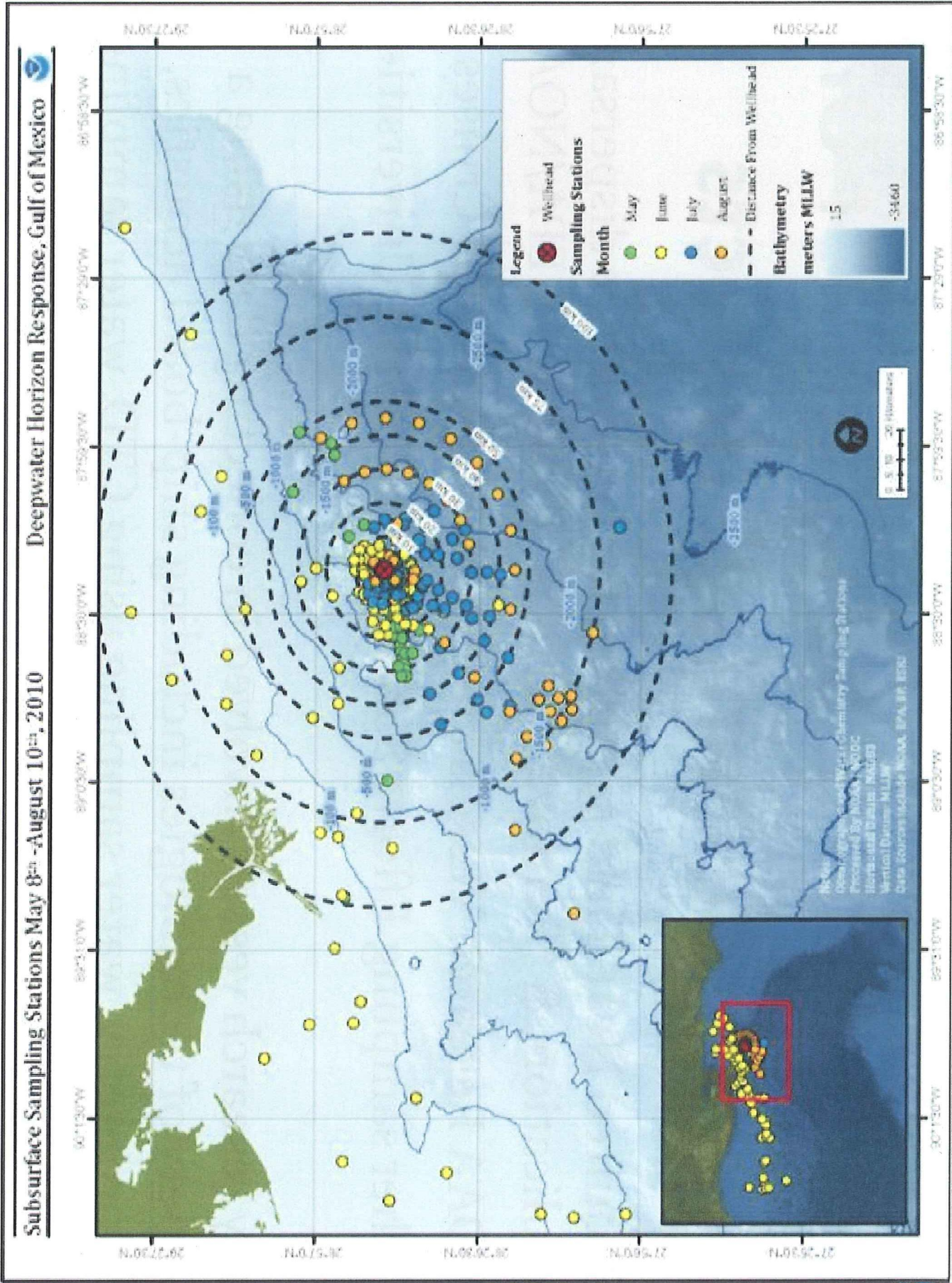
- Required Near-Field sampling for sub-surface dispersant application, & “Removal Actions” By RP with EPA/NOAA
- NOAA Research Vessels and NOAA-Sponsored Cruises
- Other sampling Efforts Sponsored by NSF & Universities

Many research vessels involved in collecting data using a variety of technologies including ship-board acoustics, fluorometry, water sampling using CTD, water sampling with AUVs, neuston, Moccness, trawling, and sediment samples – 28,000+ water samples so far.

Enhanced sampling announced by Dr. Lubchenco/Adm. Allen

Subsurface Monitoring Stations >100 km of the Well head

Detail of survey area and month of station occupation for monitoring for subsurface dispersed oil.



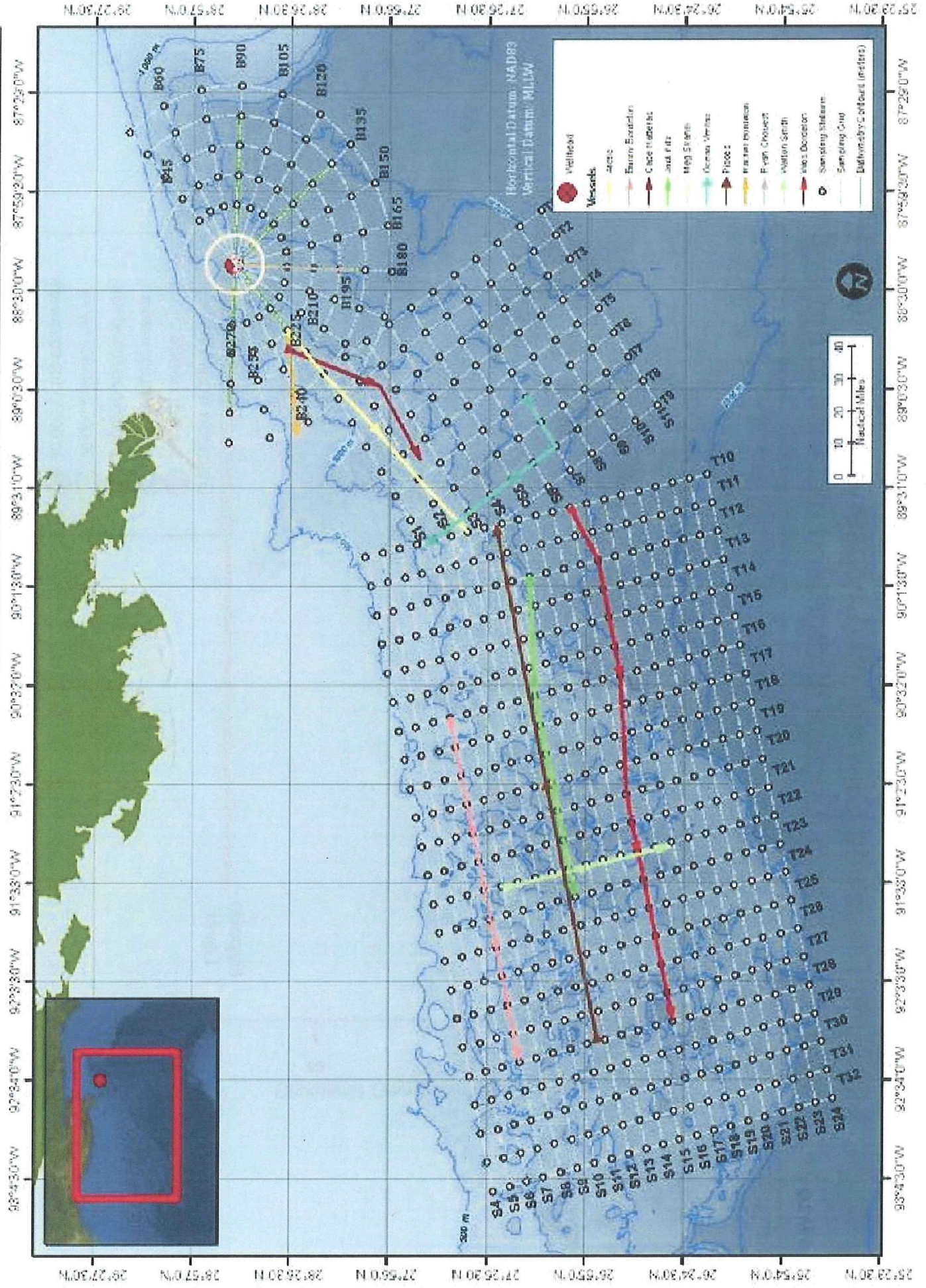
Date of map: 12-September-2010

Subsurface Monitoring: Mission Guidance for 09/13/2010

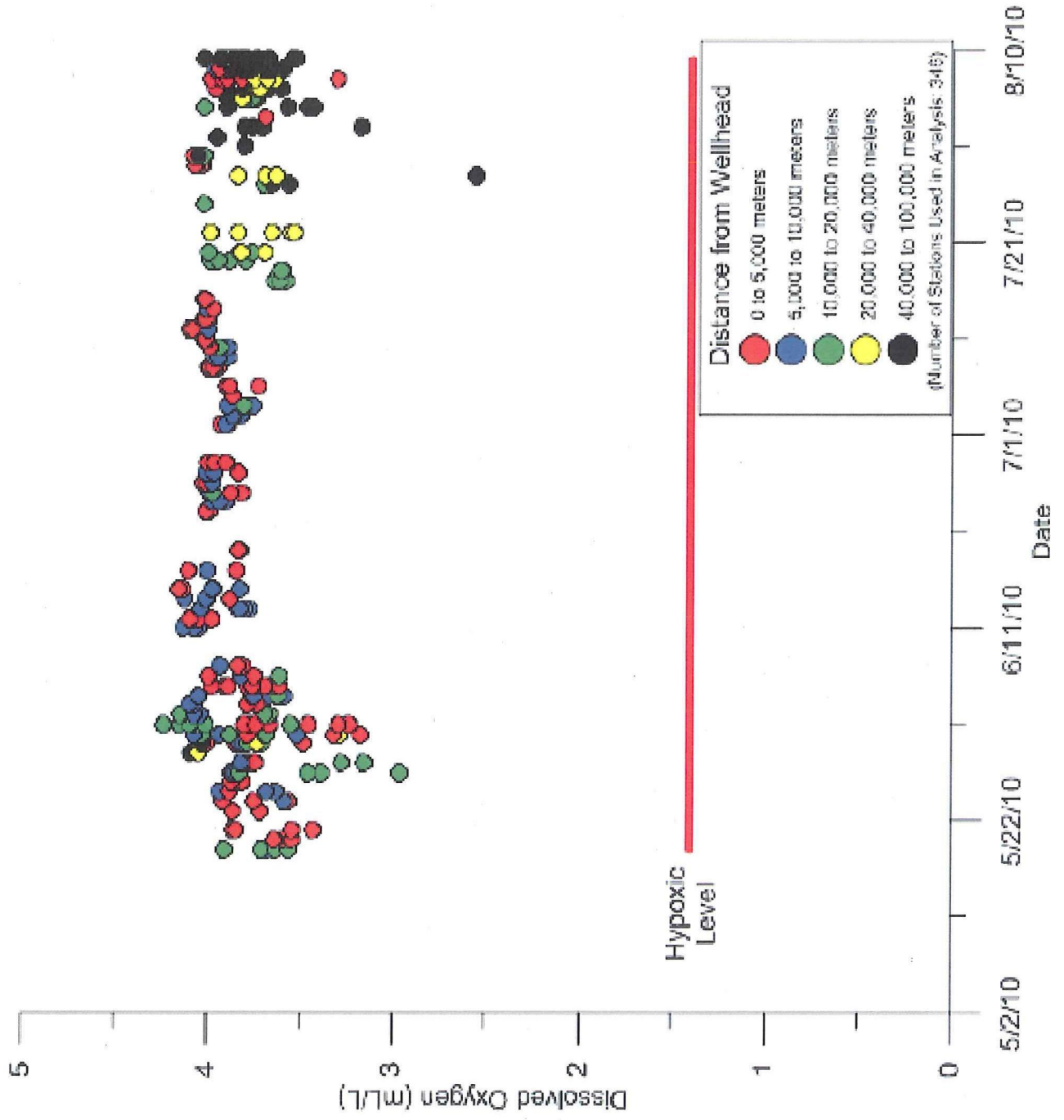


Mission Guidance

Deepwater Horizon Response, Gulf of Mexico



Minimum Dissolved Oxygen (mL/L) observed in the 1,000-1,300 m Depth stratum as a function of date and distance to the well head (m)



Science priorities (+Response & NRDA



of DWH on Gulf of Mexico ecosystems:

- Plankton assessments
- Microbial-driven oil biodegradation rates
- Lab exposure studies of oil and dispersants
- Protected species (turtles, birds, & mammals)
- Fisheries abundance and distribution
- Wetlands impacts & nursery areas
- Hypoxia & carbon loading
- Socio-economic impacts
- Integrated ecosystem assessments



Critical Science Collaborations

- Interagency groups under the authorities of the National Incident Command and Unified Area Command – Sub-Surface Monitoring Group and the Joint Analysis Group
- Enhanced scientific outreach and discussion sessions concerning sub-surface monitoring (multiple workshops)
- Continued dialog and conferences to share results
- Interest in a more permanent structure to facilitate agency/academic/private research collaborations (Gulf Science Council)
- Continuing efforts to make information more available and usable by the public and scientists



National Commission on the
**BP DEEPWATER HORIZON OIL SPILL
AND OFFSHORE DRILLING**

Attachment 24

Written Statement and Presentation of Dr. Bill Walker

Mississippi Department of Marine Resources

**A PARTNERSHIP RESPONSE TO THE
BP DEEPWATER HORIZON OIL SPILL EVENT**

Testimony Presented to

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

by

William W. Walker, Ph.D.
Executive Director
Mississippi Dept. of Marine Resources

September 28, 2010

Thank you Senator Graham and Dr. Reilly and commissioners for inviting me to present testimony today. Dr. Reilly, it's good to see you again and thank you for visiting Mississippi in July to visit with our fishermen, processors, and retailers.

When the BP Deepwater Horizon oil rig exploded on April 20, 2010 roughly 100 miles south and east of Mississippi's shoreline, Governor Haley Barbour went to work to create a partnership to develop a plan to first respond to the event and to protect Mississippi from the approaching oil and then to recover from any adverse effects and restore those damages. Partners in this effort included the MS Dept. of Environmental Quality (MDEQ), the MS Dept. of Marine Resources (MDMR), MS Department of Health (MDH), MS Emergency Management Agency (MEMA), MS National Guard (MNG), National Oceanic and Atmospheric Administration (NOAA), US Food and Drug Administration (FDA), US Environmental Protection Agency (EPA), the US Coast Guard, and BP, the responsible party.

That plan called for our team to fight the oil spill as far away from Mississippi's shoreline as possible. Heroic efforts at the spill site to collect, skim, and burn the leaking oil, together with using dispersants to make the crude oil more available to microbial metabolism, succeeded in keeping as much as 75 percent of crude and degraded oil from ever reaching Mississippi. As oil materials finally did approach our barrier islands some 30 days following the April 20 explosion, additional efforts to skim, corral, and collect the oil further reduced impacts to our shoreline.

Together we conducted many aerial inspections and collected and analyzed many water, tissue, and sediment samples. These activities did eventually result in precautionary closing of nearly all Mississippi waters to harvesting fish, crabs, shrimp, and oysters. While chemical analyses of tissues from these species failed to detect levels of concern

of any oil related organics, we voluntarily closed our waters according to closing protocols agreed to by all affected states and federal agencies.

As the threat from oil began to diminish, we began reopening our waters, again in accordance with a comprehensive reopening protocol to which all states and federal agencies agreed. This protocol required that:

1. The area to be opened must be free of visible oil.
2. There must be no threat to the area from approaching oil.
3. Extensive samples must be collected for each species to be harvested.
4. These samples must pass sensory evaluation and extensive analytical examination for all chemical components of the crude oil.

Only after passing all requirements of this rigorous reopening protocol could our waters be reopened. For the reopening process and for our routine sampling program, 73 shrimp samples, 49 crab samples, 85 finfish samples, and 40 oyster samples were collected and sent to NOAA and ultimately FDA for analysis. Samples were analyzed for naphthalene, fluorine, anthracene, phenanthrene, pyrene, fluoranthene, chrysene, benzo(k)fluoranthene, benzo(b)anthracene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, and benzo(a)pyrene. Of the 252 Mississippi samples provided, 181 of those samples have been processed, and I'm very proud to say that all tissue samples analyzed as part of the reopening requirements or collected at any other time tested negative for the above analytes or showed trace levels far, far below the levels of concern established by federal regulations. In other words, based on credible scientific data collected using federally-approved sampling and analytical techniques, Mississippi seafood has been safe and healthy to eat throughout the

entirety of this event. To ensure its continued safety, Mississippi will continue to sample and analyze fish, shrimp, crab, and oyster tissues at monthly intervals for the foreseeable future. As has been the case for all sampling activities to date, we will continue to engage NOAA and FDA and utilize protocols and sampling designs acceptable to those agencies.

Mississippi also coordinated with Unified Command in Mobile, NOAA, and FDA to develop and implement a sampling regime to look for submerged oil within 15 miles of the coastlines of MS and AL. This survey divided the entire area into grids (159 for MS waters). In each grid section, white sorbent pads were lowered to near the bottom and retrieved. If any of the retrieved pads showed suspicious discolored areas or other evidence of oil, water samples were collected throughout the water column and sediment samples were taken. Results of this survey showed one water sample collected due to the presence of sheen on the water tested positive for Diesel fuel. All other water samples tested non-detect on oil related organics. None of the sediments collected were determined to contain oil by Fourier Transform Infrared Spectroscopy (FTIR).

So, where are we now? No new oil is entering the Gulf of Mexico from this event. Certainly, there are isolated patches in hardest hit LA marshes, and there are credible reports that submerged oil product may remain in the vicinity of the spill site. Scientists from Mississippi and elsewhere are and will continue to study this area of the Gulf to determine exactly what if anything is there and, if oil material is present there, what actions to take. Weathered tar balls continue to impact our barrier islands and our coastline, and we can expect that to continue for many months. Clean-up activities on our islands and shoreline beaches continue and will continue until the tar balls stop. Short-term effects from this event in Mississippi, while serious, have been minimal. We are moving from response to recovery and

restoration, and BP has pledged \$500 million for academic research to quantify long-term effects and to monitor ecosystem recovery and the condition of populations of marine species. The resulting data will, in part, inform the Natural Resource Damage Assessment (NRDA), which will determine appropriate compensation levels for damages from this event.

So, the good news is that, based on credible scientific information, seafood from Mississippi and the Gulf in general, is safe to eat. In Mississippi and likely throughout the Gulf, populations of finfish, shrimp, and crabs are plentiful and healthy. Oysters in Mississippi have suffered above-normal mortalities, we think primarily due to extended periods of very hot (>90 degrees Fahrenheit) water and depressed dissolved oxygen levels. We have no scientific evidence to support oyster mortalities due to the presence of oil materials.

Unfortunately, with absolutely no credible science to support them, a small but vocal group of commercial fishermen continue to say that oil remains in Mississippi waters, that these waters are not safe for recreational purposes, and that seafood harvested from these waters is not safe to eat. While some of these protesters are actually shrimping commercially and catching nice, healthy shrimp and selling them to Mississippi processors or directly to consumers, they continue to declare their own product unsafe.

Such statements are irresponsible, untrue, and unsupported by credible scientific data. Unfortunately and in large part due to the actions of these few individuals and the press that continues to broadcast this inaccurate information, there is a perception in areas of our nation away from the Gulf that Gulf seafood may not be safe to eat. As a result of that perception, our seafood processors cannot sell to the buyers in Chicago, New York, Boston, and elsewhere that have historically regarded Mississippi and Gulf seafood as a safe, high quality

product. Clearly, all citizens of this great nation have the right to speak freely. I only ask that they base their statements on credible scientific information, which they certainly have not done to date.

The message that I would like to leave with you today is that the TEAM effort following this event has been a huge success, the best success story you'll never see on CNN.

Thank you.



Deepwater Horizon Event Seafood Safety



Partners

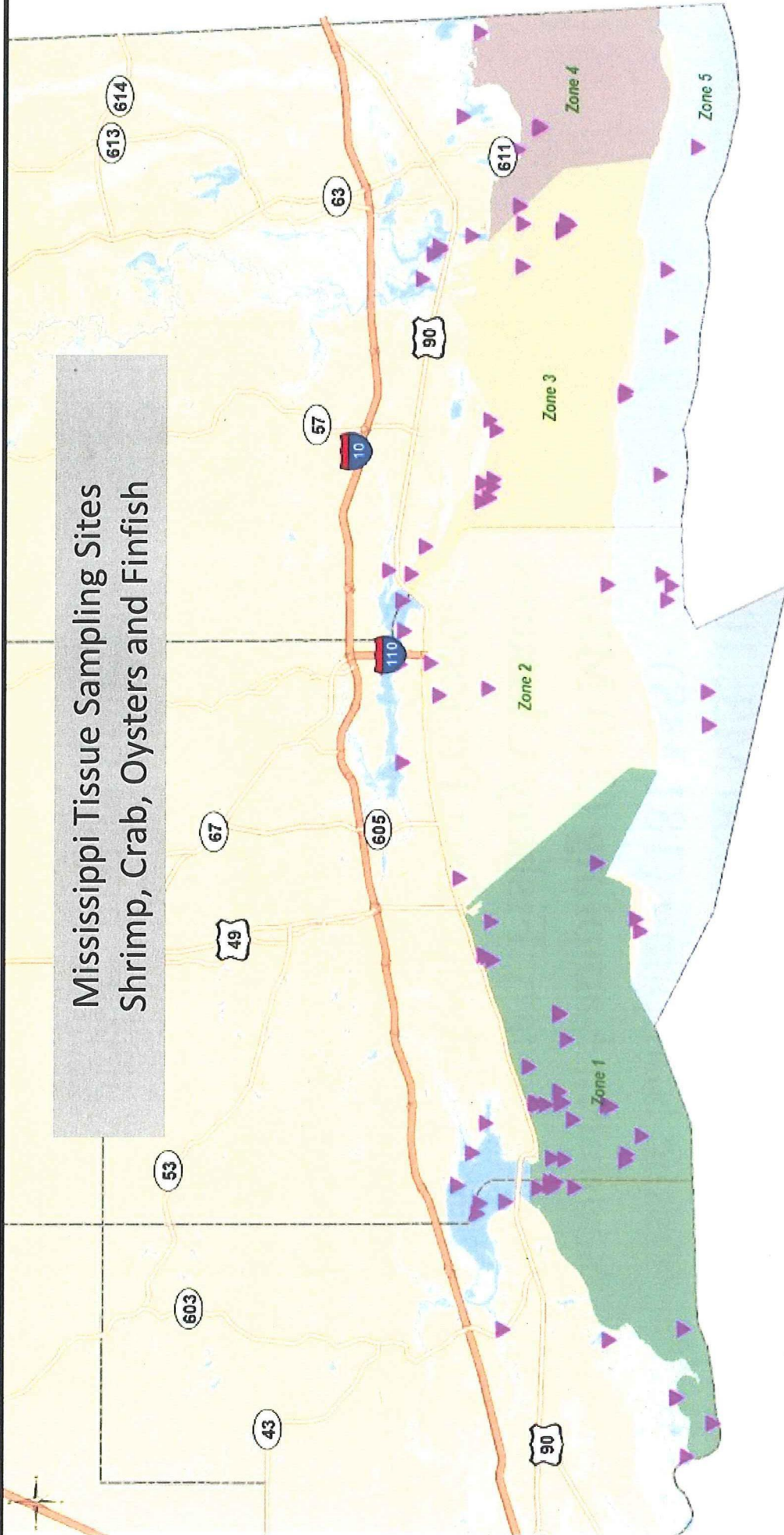
Mississippi Department of Environmental Quality (MDEQ)
Mississippi Department of Marine Resources (MDMR)
Mississippi State Department of Health (MSDH)
Mississippi Emergency Management Agency (MEMA)
Mississippi National Guard (MNG)
National Oceanic and Atmospheric Administration (NOAA)
US Food and Drug Administration (FDA)
US Environmental Protection Agency (EPA)
US Coast Guard (USCG)




Seafood Safety Efforts

1. Flight Inspections (130 MS; 200+ Federal)
2. Water Sampling (300 MS; 100s Federal)
3. Tissue Sampling (181 MS)
4. Sediment Sampling (210 MS)
5. Precautionary Fishery Closures
6. Fisheries Reopening Protocols
7. Seafood Testing
8. Dealers/Processors/Retailers Inspections.
9. Newsletter and Brochure
10. Public Meetings
11. Press Releases and Interviews


Mississippi Tissue Sampling Sites Shrimp, Crab, Oysters and Finfish



This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control.
 All map data are from MDMR and MDEQ.
 Map Projection: WGS1984
 The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose of the data contained on this map.

MDEQ **MDMR**



 Tissue Sampling Sites
 Map prepared on 27 Aug 2010

MS Had 11 Precautionary

Fisheries Closures

**Starting June 1, 2010 The Last
Closure Was On July 1, 2010
Resulting In 97% Of MS Marine**

**Waters Being Closed
(Seafood Has NEVER Been
Contaminated)**

Fisheries Reopening Protocol

- Comprehensive effort, extensive sampling and analysis
- Area must be free of visible oil
- Must be a low threat of oil exposure
- Sensory evaluation/chemical analysis
- If samples pass all above, area can be reopened

Seafood Sampling Results

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

Seafood Sampling Results

PAH Compounds Detected (ppm)=parts per million

	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

Seafood Monitoring Efforts

- Doubled the typical number of seafood inspections from May through August with 112.
- Increased fisheries monitoring to determine the health of populations in Mississippi.
- Tissue samples will be tested monthly to insure the continued safety of Mississippi seafood.

Where are We Now?

- No new oil flowing; isolated patches in marshes
- May be submerged product at spill site; scientists currently investigating
- Can expect tar balls for some time
- Clean-up actively ongoing
- Moving from response to recovery/restoration
- \$500 million GRI to investigate long-term effects

Seafood Safety

- Good news is that all scientific data indicates that GOM seafood is safe.
- Bad news is that small but vocal group continues to spread the story that seafood is not safe. No supporting evidence.
- Seafood industry depends on selling to national and international markets, and that demand is significantly down.
- Region will implement an aggressive seafood marketing program.

Take Home Message

- Partnership has been hugely successful:
MDEQ, MDMR, MEMA, MDH, Gov's Office,
Coast Guard, National Guard, BP, NOAA, FDA,
EPA.
- Best success story you'll never see on CNN.



National Commission on the
**BP DEEPWATER HORIZON OIL SPILL
AND OFFSHORE DRILLING**

Attachment 25

Written Statement of Timothy Fitzgerald

Marine Scientist, Oceans Program, Environmental Defense Fund

September 28, 2010

**National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, 3rd Meeting
Testimony of Tim Fitzgerald, Senior Policy Specialist, Oceans Program, Environmental Defense Fund**

Good afternoon. First, I'd like to thank the Commission for the opportunity to testify today on this critically important topic. I'm a Senior Policy Specialist in the Oceans Program of Environmental Defense Fund (EDF), with a scientific background in marine ecology and physiology. For the last seven years I've worked specifically on issues of seafood sustainability and health for EDF, and I was asked to testify today about the public perception of Gulf seafood safety and the work that we've begun with fishermen to address ongoing consumer concerns. For background, EDF is a leading national nonprofit organization representing more than 700,000 members that links science, economics and law to create innovative, equitable and cost-effective solutions to society's most urgent environmental problems.

As you may already know, the seafood market is inherently confusing for consumers. Most people have very little connection to, or understanding of, the fish they buy. More than 80% of fish that Americans eat is imported, coming from nearly every country on Earth and caught or farmed under dozens of different regulatory schemes and environmental conditions. Given this complexity, there are numerous opinions – often conflicting – over what seafood is “good” or “bad”. Regardless, opinion polls, focus groups, and other studies have consistently shown that quality and safety are two top concerns for consumers.

This might explain, at least partially, why seafood safety has remained such a prominent issue in the wake of the BP oil disaster. The 87-day event resulted in the release of almost 200 million gallons of crude oil into the Gulf ecosystem, and the use of almost 2 million gallons of Corexit™ dispersants to mitigate the damage. Despite the re-opening of state and federal waters to fishing, these are figures seafood consumers are not likely to soon forget.

Based on federal and state testing, the public has been repeatedly reassured that Gulf seafood is safe to eat. However sales remain depressed in the region and around the country, and some fishermen are hesitant to return to work given poor markets and concerns over lingering toxins in the water. An August 17th Associated Press poll showed that one month after the well was capped, more than half of survey respondents still lacked confidence in the safety of seafood from Gulf areas affected by the oil disaster. And as you have likely seen, we continue to see coverage in regional and national media that consumer skepticism remains high.

For Gulf fishermen and other members of the seafood industry, this lack of consumer confidence can be devastating. They not only face the pain of immediate financial losses, but must also struggle with the uncertainty of trying to regain the business they once had. That's why EDF is working closely with an association of snapper and grouper fishermen called the Gulf of Mexico Reef Fish Shareholders' Alliance to help them preserve their markets in the face of this disaster.

These fishermen have faced many challenges already. Years of overfishing and ineffective fishery management had brought the fishery to the brink of collapse. At its low point, their fishing season had shrunk to only 54 days, and regulations forced them to throw back dead much of the fish they caught. But by working together and with federal regulators, these fishermen led the charge in transitioning their fishery to an innovative management program called “catch shares”. Catch shares soon allowed

the fishermen to fish year round while fish populations recovered – bringing better prices to fishermen and more economic stability to fishing ports.

Low consumer confidence in Gulf seafood post oil-disaster threatens to undermine the progress to date made by these fishermen and others like them. Therefore our partnership seeks to do everything possible to ensure that the market supports them through the following four-part campaign:

- Continuing to strive for a more sustainable fishery with fewer ecological impacts;
- Development of a third-party seafood testing program that supplements that of NOAA and FDA;
- Implementation of a rigorous chain-of-custody to track fish throughout the supply chain;
- An aggressive public relations and marketing effort to highlight these efforts.

This approach can serve as a model as the Commission considers how federal and state agencies can restore confidence in Gulf of Mexico seafood. In closing, I will highlight a few key challenges and corresponding recommendations that can help this campaign and similar efforts to achieve success:

- Empower fishermen to conduct more targeted testing of their catch. The government alone can't solve this problem for the fishermen, nor are fishermen looking to them to do so. But what the government can do is work in partnership with fishermen to work towards their own solution. Making the financial and technical resources available to do this would go a long way towards complimenting existing traceability and marketing efforts;
- Articulate and make public the details of a long-term testing plan. Seafood consumers and buyers not only need to better understand what has been done and why it is sufficient, but they also need reassurances and specifics about how the government is in this for the long haul. Government testing is currently focused on toxic polycyclic aromatic hydrocarbons (PAHs), and to a lesser extent, dispersants. But there are other contaminants – such as heavy metals like arsenic, cadmium, or mercury – along with the potential for re-contamination from unfound sources oil, that may become a health risk further down the road, which we believe warrant formal evaluation;
- Provide updated information to the public about dispersants in seafood. This issue remains high on consumers' lists of concerns, despite continued assurances from FDA that they pose no health risks. However NOAA has recently developed a chemical test to detect them in seafood, so the agencies should provide clear guidance about their latest findings, and offer recommendations for future government and independent testing;
- Make a concerted effort to reach out to consumers to understand what is needed to regain their confidence in Gulf seafood. Bombarding consumers with marketing and dismissing their concerns only exacerbates the current situation. NOAA's recent series of 'dockside chats' provides a good example and could be expanded to educate local stakeholders on the issue of seafood safety;

Thank you very much for your time, and I am happy to answer any questions that the Commissioners might have.



National Commission on the
**BP DEEPWATER HORIZON OIL SPILL
AND OFFSHORE DRILLING**

Attachment 26

Written Statement of Richard Stewart

Professor of Law, New York University

The Oil Spill Commission
Statement of Richard B. Stewart
New York University School of Law
September 28, 2010

This statement provides an overview of the potential criminal and civil claims that the federal government and state and tribal natural resource trustees may assert against BP and other potential responsible parties for the Gulf oil spill. Drawing on my experience as Assistant Attorney General for Environment and Natural Resources with the prosecution and settlement of such claims against Exxon for the Exxon Valdez spill, I discuss some of the strategic issues that the government parties and the defendants face in dealing with such claims, the incentives for and potential structure of a global settlement, the legal and institutional challenges that the government parties face in assessing natural resource damages (NRD), and the need for an integrated approach and management structure for restoring the Gulf resources injured by the spill that is closely linked with other ongoing or future programs to protect and enhance those same resources.

Other than claims for removal costs and NRD, this statement does not address criminal or civil claims that states or tribes might assert or other claims for economic losses that governments, tribes or private parties may assert. The assertion of some of these other claims could further complicate the already difficult challenge of achieving a settlement of federal criminal and civil claims and federal, state, and tribal NRD claims in a way that will accommodate the basic interests of the various parties and advance restoration efforts without prolonged delay.

I. Potential Criminal and Civil Claims by the Federal Government and NRD Claims by Federal, State, and Tribal Trustees.

The federal government can assert criminal claims, claims for civil penalties, and NRD claims for injury to the natural resources of the Gulf and adjacent lands. The claims and the liabilities that they impose are cumulative. State and tribal natural resource trustee agencies can also assert NRD claims, which in many cases will concern the same natural resources as the federal NRD claims and overlap with them.

A. Criminal Violations

Depending on the facts, the Department of Justice could assert a variety of criminal violations against corporate and individual defendants.¹ These include the following:

Clean Water Act. 33 USC 1321(b)(3), prohibits the discharge of oil . . . in connection with activities under the Outer Continental Shelf Lands Act . . . which may affect natural resources belonging to . . . the United States . . . in such quantities as may be harmful . . . except . . . where permitted.” Negligent violations can be prosecuted under 33 USC 1319(c)(1); persons convicted are subject to a fine of \$25,000 per day or 1 year imprisonment or both. Knowing violations are

¹ Corporate defendants would not be subject to the imprisonment provisions of the criminal statutes discussed.

prosecutable under 33 USC 1319(c)(2); persons convicted are subject to a fine of \$50,000/day or three years imprisonment or both. Under 33 USC 1319(c)(3), a defendant who “knows at [the time of a violation] that he thereby places another person in imminent danger of death or serious bodily injury . . .” is subject to a fine of \$250,000 or 15 years imprisonment or both.²

Migratory Bird Treaty Act. 16 USC 703(a) makes it “unlawful at any time, by any means or in any manner, to . . . take [or] . . . kill . . . any migratory bird, any part, nest, or egg of any such bird . . .” This is a strict liability misdemeanor offense. The government need only show that the defendant committed an act that killed a migratory bird or its eggs. No negligence, knowledge, or purpose to kill a bird must be shown. Under 16 USC 707(a), persons convicted are subject to a fine of not more than \$ 15,000, imprisonment for not more than six months, or both.

Rivers & Harbors Act. 33 USC 407 prohibits the discharge without a permit from the Corps of Engineers “from or out of any ship, barge . . . or from the shore, wharf manufacturing establishment or mill of any kind . . . any refuse matter of any kind or description.” There may be some question whether an oil drilling rig falls within the statute, but the discharge of commercially valuable oil does. A mobile, semi-submersible offshore drilling unit such as the *Deepwater Horizon* would most likely be regarded as a “ship” for purposes of this provision. This is again a strict liability offense. 33 USC 411 provides that a person convicted is “guilty of a misdemeanor and subject to a fine of up to \$ 25,000 per day and imprisonment for not less than thirty days nor more than one year, or by both such fine and imprisonment . . .”

Endangered Species Act. 16 USC 1538(a)(1) and 50 CFR Part 17 make it unlawful to knowingly “take” any species listed by the federal government as endangered or threatened without a permit; “take” includes killing or otherwise harming a member of such a species. 16 USC 1540(b)(2) subjects a person convicted to fines of up to \$50,000 and imprisonment for up to one year.

Alternative Fines Act. 18 USC 3571 provides for enhancements of fines otherwise provided for by specific statutes such as those described above. Subsection (a) provides for fines, in the case of a felony, of not more than \$250,000; for a misdemeanor resulting in death, of not more than \$250,000; and for a Class A misdemeanor that does not result in death, of not more than \$100,000. Of greatest significance for the BP spill, subsection (d) provides:

“If any person derives pecuniary gain from the offense, or if the offense results in pecuniary loss to a person other than the defendant, the defendant may be fined not more than the greater of twice the gross gain or twice the gross loss, unless imposition of a fine under this subsection would unduly complicate or prolong the sentencing process.”

² Further, under 33 USC 1319(c)(4), a person knowingly making a false statement in connection with a violation is subject to a fine of \$10,000 or two years imprisonment or both. Other provisions of federal law also provide for criminal penalties for violations of record keeping, reporting, and other requirements, as well as making false statements to federal officials.

The background of this provision's enactment indicates it was aimed at financial fraud, manipulation, and similar crimes. There is a question, that has not been litigated and squarely resolved by the courts, whether this provision applies to environmental violations, and whether "pecuniary loss" would, in the context of this statute, include removal and restoration costs and economic losses stemming from damage to natural resources. The provision was, however, invoked by the federal government in the Exxon Valdez settlement and was invoked as a basis for a settlement of environmental violations against BP arising out of the explosion at its Texas City refinery.³ If the provision were held applicable, if removal, restoration, and other economic costs and losses stemming from injury to natural resources caused by the oil spill represent "pecuniary loss" within the statute, and if a court were to conclude that applying the provision would not "unduly complicate or prolong the sentencing process," the amount of fines imposed could increase dramatically.

B. Civil Penalties

Clean Water Act. Under 33 USC 1321(b)(7)(A), persons who discharge oil in violation of the Act are subject to a civil penalty of \$25,000 per day or \$1,100 per barrel; this is a strict liability provision. For violations resulting from "gross negligence or willful misconduct" a violator is subject to a civil penalty of not less than \$100,000 per day of the violation and not more than \$4,300 per barrel of oil. Prior to the 1991 amendment of this provision passed after the Exxon Valdez spill, it provided only for fines calculated on a per-day basis. The per-barrel penalties reflect adjustments for inflation as provided by later statute. Administrative penalties are also available under 33 USC 1321(b)(6), however such these are capped at \$125,000 and are therefore unlikely to play a role in this matter. Given the magnitude of the BP spill, the civil penalties are potentially very large.⁴

EPA authorizes civil judicial and administrative enforcement settlements under the laws that it administers, including the Clean Water Act, to include Supplemental Environmental Projects (SEPs), which must be approved by EPA with review by the Justice Department. SEPs are restoration projects conducted by the violator designed to improve resources affected by the environmental violation or that otherwise have an appropriate nexus to the violation. Civil penalties otherwise payable may be remitted in part by EPA in consideration of violators' funding of SEPs.

³ In *United States v. BP Products North America, Inc.*, a case arising from a deadly explosion at a BP refinery in Texas City, Texas BP pled guilty to a felony violation of the Clean Air Act. 610 F.Supp.2d 655 (S.D. Tex. 2009). The court approved the \$50 million plea agreement expressly on the basis of the Alternative Fines Act. The complexity of calculating the aggregate gross loss to the victims of the Texas refinery explosion persuaded the court to base the fine on BP's gain in savings consequent to the violation. *Id.* at 707. The Ninth Circuit, in evaluating the appropriateness of the jury award from the civil litigation of the *Exxon Valdez* spill, relied upon the defendant's potential liability under the Alternative Fines Act as a reference point. *In re Exxon Valdez*, 270 F.3d 1215, 1245 (9th Cir. 2001). When the Supreme Court ultimately vacated this jury award, it was silent on this use of the Alternative Fines Act. *United States v. Baker*, 128 S. Ct. 2605 (2009).

⁴ In addition to seeking civil penalties for a violation of 33 USC 1321(b)(3), the Federal government could assert a another Clean Water Act violation under 33 USC 1311(a): "Except in compliance with this section . . . the discharge of any pollutant . . . shall be unlawful." 33 USC 1319(d) allows the government to claim civil penalties of \$25,000 per day of the violation. See generally *United States v. Colonial Pipeline Co.*, 242 F. Supp. 2d 1365, 1379-72 (N.D. Ga. 2002) (allowing assessment of penalties resulting from an oil spill to proceed under both §1319 and §1321).

EPA has developed requirements about when and what kinds of SEPs can be utilized to offset civil penalty settlement payments. EPA has determined that the required nexus between SEP and violation may be established by satisfying one three criteria:

- “a) the project is designed to reduce the likelihood that similar violations is satisfied will occur in the future; or
- b) the project reduces the adverse impact to public health or the environment to which the violation at issue contributes; or
- c) the project reduces the overall risk to public health or the environment potentially affected by the violation at issue.⁵”

Another requirement is that the proposed SEP not augment or supplement the appropriations of the EPA or any other federal agency. SEPs must be independent of activities for which the EPA has received appropriated funds or is required by law to perform. Examples of past SEPs resulting from oil spill violations under the Clean Water Act include the donation of spill response equipment to local emergency response crews and the purchase and permanent protection of resources in the affected area.⁶

Endangered Species Act. 16 USC 1538(a)(1) and 50 CFR Part 17 make it unlawful to knowingly “take” any species listed by the federal government as endangered or threatened without a permit. “Take” includes killing or harming any member of such a species. 16 USC 1540(a)(1) authorizes a penalty of up to \$25,000 for each violation.

C. Removal Costs and Natural Resource Damages

The Oil Pollution Act (OPA), 33 USC 2702(a), imposes strict liability on “each responsible party” for removal costs and damages, including NRD, resulting from discharges of oil from a “vessel.” 33 USC 2701(18) defines “vessel” to include a “mobile offshore drilling unit” such as the Deepwater Horizon. 33 USC 2701(32) defines a “responsible party” as “any person owning, operating, or demise chartering” such a vessel. BP would be liable, having demise chartered the Deepwater Horizon. Transocean would also be liable since it owned and operated the Deepwater Horizon with the assistance of personnel from BP, Anadarko, Halliburton, and M-I Swarco, who might, depending on the facts, thereby be liable as “operators.”

“Removal costs” are defined under 33 USC 2702(b)(1) as any costs incurred by the United States, a State, or an Indian tribe consistent with the National Contingency Plan, the Clean Water Act, or the Intervention on the High Seas Act. “Removal costs” are defined under the Clean Water Act, 33 USC 1321(a)(25), as “the costs of removal of oil or a hazardous substance that are incurred after it is discharged . . .” 33 USC 1321(a)(8) further defines “removal” as “containment and removal of the oil or hazardous substances from the water and shorelines or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public

⁵ See Walker B. Smith, Importance of the Nexus Requirement in the Supplemental Environmental Projects Policy, EPA Memorandum, Oct. 31, 2002, available at

<http://www.epa.gov/compliance/resources/policies/civil/seps/sep-nexus-mem.pdf>.

⁶ EPA maintains an online database of past SEPs at http://www.epa-echo.gov/echo/compliance_report_sep.html.

health or welfare, including, but not limited to, fish, shellfish, wildlife, and public and private property, shorelines and beaches . . .”

“Damages” are defined under 33 USC 2702(b)(2) to include NRD; damages for injury to or economic losses resulting from destruction of real or personal property; loss of subsistence use of natural resources; loss of government taxes, royalties, rents, fees, or net profit shares due to injury to real or personal property or natural resources; lost profits and earning capacity resulting from the same, by any claimant; and the net costs of providing increased or additional public services as a result of a discharge.

Damages Liability Cap: Under OPA, the amount of liability for discharges from offshore facilities is capped at “the total of all removal costs plus \$75,000,000.” 33 USC 2704(a)(3). For the purposes of calculating the amount of liability, mobile offshore drilling units like the Deepwater Horizon are treated as offshore facilities. 33 USC 2704(b)(2). The cap does not apply if the discharge was “proximately caused by gross negligence or willful misconduct, or the violation of an applicable Federal safety, construction, or operating regulation . . .” 33 USC 2704(c)(1).

D. Natural Resource Damages

33 U.S.C. 2706(a) provides that the liability by a responsible party for NRD shall be to the federal government for natural resources belonging to, controlled by, or appertaining to the United States; to states for resources belonging to etc. a state or political subdivision thereof, and to Indian tribes for resources belonging to etc. them. Under 33 USC 2706(b), the federal and state governments designate trustees to present a claim for and to recover NRD. The President, by Executive Order and through the National Contingency Plan at 40 CFR 300.600, designated the following as among the trustees under OPA: the Secretary of Defense, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Energy, and “[f]or natural resources . . . not otherwise described . . . the head of the federal agency or agencies authorized to manage or control those resources.” OPA and the Executive Order leave entirely open what resources different trustees can claim for. In the context of the far-reaching BP spill, involving multiple states each with different resource management agencies and perhaps also tribes, the various federal, state, and any tribal NRD claims will all overlap to a considerable degree. Beyond precluding double recovery under 33 USC 2706(d)(3), OPA provides no mechanism for coordinating or directing the claims and NRD-related activities of different trustees.

The trustees assess NRD and “develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent, of the natural resources under their trusteeship.” 33 USC 2706(c). NRD are measured according to 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;” and the “reasonable cost of assessing those damages.” 33 USC 2706(d).

NRD recoveries must be spent exclusively to restore injured natural resources and for related activities. The trustees must retain NRD recoveries in a “revolving trust account, without further

appropriation, for use only to reimburse or pay costs incurred by the trustee . . . with respect to the damaged natural resources.” 33 USC 2706(f). This arrangement was designed to ensure that NRD recoveries go to restore the injured resources. The provision authorizing trustee expenditures without further appropriation is a notable exception to the general requirements, under the Miscellaneous Receipts Act and Anti-Deficiency Act, that any recoveries on behalf of the United States must be deposited in the Treasury and may not be expended except pursuant to appropriation as well as authorization by Congress. The availability of significant funds outside of the normal appropriations process could have a major impact on the operations of trustee agencies, including the Army Corps of Engineers, which is under the authority of the Secretary of Defense, a designated OPA trustee, and has long played a prominent in the Mississippi Delta and Gulf region.

II. Exxon Valdez Settlement

The October 1991 settlement between the United States, Alaska, Exxon Corp., and Exxon Shipping, a wholly owned subsidiary of Exxon and owner and operator of the Exxon Valdez, settled all civil and criminal claims (including federal claims for civil penalties) and was approved by the federal district court in Anchorage in the form of a plea agreement (federal criminal charges) and a consent decree (civil claims).⁷

A. Criminal Plea Agreement

Exxon pled guilty to violations of the Clean Water Act, the Refuse Act, and the Migratory Bird Treaty Act.⁸ A \$150 million fine was assessed against Exxon; \$125 million was forgiven 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; the North American Wetlands Conservation Act authorizes criminal penalties under the Migratory Bird Treaty Act to be paid into the Fund. 16 USC 4406(b).

The pleas agreement also provided \$100 million in criminal restitution to be divided evenly between the federal and state governments. The federal government’s \$50 million went into the Natural Resource Damage Assessment and Restoration Fund. Alaska’s \$50 million was appropriated by the state legislature for a variety of conservation projects including a recreation and marine mammal rehabilitation center and habitat acquisitions.

B. Civil Settlement

The consent decree settling the federal and state civil claims provided for a total of \$900 million in annual payments over 10 years. The monies have been disbursed as follows: \$216 million in reimbursements for cleanup and damage assessments to the US and Exxon; \$178 million for research, monitoring, and general restoration; \$375 million for habitat acquisition; \$45 million for program development and implementation; \$177 million remained in a joint federal-state

⁷ I had left the office some months before the final settlement was reached and judicially approved, but the basic contours were determined while I was still there.

⁸ Exxon Shipping pled to all three violations; Exxon Corp. to one.

NRD trust fund account as of September 2008.⁹ The civil settlement also included a “reopener window” that could be utilized at a later date to seek up to an additional \$100 million to address unforeseen impacts from the spill. The United States and the State of Alaska exercised this option in 2006, filing a claim seeking \$92 million to remove subsurface oil residues on shorelines. The claim is still pending and has not been resolved.

III. Issues and Challenges in Assessing NRD

The purpose of NRD assessment is to determine the character and extent of interim and ongoing injury pending and after completion of recovery. NRD recoveries are to be spent to achieve restoration of the injured resources to the condition that they would have been absent releases, to compensate the public for interim resource losses, and also for scientific studies, restoration planning, legal expenses, and other expenses incurred by trustees and government in connection with NRD assessment, recovery, and restoration activities.

The conceptual basis for restoration is further elaborated in the NRD assessment regulations issued by NOAA under OPA. While compliance with these regulations is optional with trustees, under 33 U.S.C 2706 (c)(2), trustees that conduct NRD assessments pursuant to the regulations enjoy a rebuttable presumption in favor of their assessment in litigation against responsible parties; accordingly trustees generally follow the regulations. The NOAA regulations, 15 CFR 990.30, define “baseline” as “the condition of the natural resources and services that would have existed had the incident not occurred.” The purpose of NRD assessment is to “evaluate the nature and extent of injuries resulting from an incident, and determine the restoration actions needed to bring injured natural resources and services back to baseline and make the environment and public whole for interim losses.” Restoration consists of actions to restore, rehabilitate, replace, or acquire the equivalent of injured natural resources and services. It includes “primary restoration,” which is any action, including natural recovery, that returns injured natural resources and services to baseline; and “compensatory restoration,” which is any action taken to compensate for interim losses of natural resources and services that occur from the date of the incident until recovery.

The theory is that trustees can determine a baseline and correlatively, the character and extent of injuries caused by discharges; that restoration measures can be selected and implemented to restore, sooner or later, injured resources to their baseline condition; that interim resource losses to the public pending full recovery can be determined; and that resource measures can be devised and implemented to provide additional resource benefits to the public as in kind compensation for interim losses. Actually applying these concepts and identifying baseline conditions (which require good pre-existing data), discharge effects, resource injuries, measures that will successfully restore resources to baseline, interim losses to the public, and additional resource measures to compensate for them therefore is an immensely challenging and difficult task in the case of a major spill such as Exxon Valdez, or the much bigger and geographically much more extensive BP spill. The difficulties include determining baselines; determining the extent of injury to dynamic biological populations; accounting for long term low level but potentially quite important effects; accounting for the effects of removal actions, including use of dispersants,

⁹ See Exxon Valdez Oil Spill Trustee Council, 2009 Status Report. Available at <http://www.evostc.state.ak.us/Universal/Documents/Publications/AnnualStatus/2009AnnualReport.pdf>.

which defendants may claim have enhanced rather than reduced injuries; and the feasibility of devising and successfully implementing restoration measures that will restore the wide range of resources exposed to oil in a vast marine environment. While localized, acute effects can be determined and perhaps remedied, more diffuse, complex, and long lasting effects pose far greater difficulties, as attested by the reports of the Exxon Valdez Spill Trustee Council.¹⁰

Determining interim losses to the public from injured resources pending full restoration (assuming that goal can actually be achieved) present additional challenges. The basic approach is to use economic valuation methodologies to put a dollar price tag on such losses and spend the equivalent on enhanced resource services to the affected public (e.g. additional protected wildlife habitat that will benefit those who fish, hunt, observe, or otherwise value wildlife). Fairly good valuation methodologies exist for lost resource services – for example, the losses that recreational fishers suffer if favored fishing grounds are closed or degraded. But the NRD conception also includes interim “non-use” losses – the loss in economic welfare suffered by member who places an economic value on the existence of undamaged nature for its own sake. The basic methodology for measuring such losses in dollars consists of contingent valuation methodology (CVM) surveys of a sample of individual members of the public to elicit their willingness to pay to protect a resource similar to that injured, apart from any use that they might make of it. The design of CVM studies (including identification of the relevant public and the framing of the questions, whether respondents are asked to value a range of other resources at the same time, etc.) is controversial, and critics have attacked the validity of the entire enterprise, pointing out that survey respondents do not have to back up their stated valuations with actual money payments. In the context of the BP spill, it would be very difficult to devise a study that was not influenced and probably biased by the immense and highly adverse publicity generated. There is also an unresolved question whether a court would, consistent with the Federal Rules of Evidence, allow CVM study results to be presented to a jury.¹¹ Potential NRD liabilities for non-use values determined through CVM are thus highly uncertain but potentially immense, an important factor driving a global settlement in the Exxon Valdez case.

IV. Global Settlement of Governmental Claims for the BP Spill and Integrated Restoration and Enhancement of the Gulf Ecosystems

It would be in the long run interests of the federal, state, and any tribal parties and of the defendants to achieve a global settlement in order to resolve risk and avoid potentially immense litigation delay and expense. Most importantly, a global settlement could deliver restoration resources to the Gulf more rapidly.

Given all the factual and legal complexities in determining and valuing injury to natural resources, including interim lost use and non-use values, full litigation of the NRD claims in Exxon Valdez or BP to final judgment, including massive discovery, endless motions, and appeals, could well take 20 years or more. Defendants could use litigation delay to wear down the plaintiffs and postpone the ultimate day of reckoning. A big factor in driving the Exxon

¹⁰ See *id.*

¹¹ See generally Richard B. Stewart, *Natural Resource Damages: A Legal, Economic and Policy Analysis*. (1995) (Editor and principal author).

Valdez settlement was the federal criminal case. There is little or no discovery in criminal trials, which proceed on a fast track. Defendants, especially major corporations, want to avoid the publicity of a criminal trial, uncertainty in the amount of fines that could be levied in light of the Alternative Fines Act, and the potential use by plaintiffs of a conviction following trial in private civil claims including claims for punitive damages. Thus, defendants have strong incentives to settle criminal charges, but in doing so they also want to resolve all government liabilities against them, rather than settling one set of claims while remaining open to indefinite and highly uncertain liability under the others, especially NRD claims. Governments also have incentives to pursue a global settlement in the context of a criminal settlement in order to avoid long delays, very high costs, and large uncertainties regarding recoveries in NRD claims.

Compared with the criminal case, the civil penalty claims in Exxon Valdez were not big enough to drive the settlement. But they are certainly large enough in the case of the BP spill to help drive settlement if they could be determined without significant factual and legal controversy and delay. Government assertion of penalties for negligent discharge and possible defenses based on partial government responsibility for the size of the spill could, however, complicate and delay the resolution of civil penalties claims and thereby reduce their efficacy as a settlement driver.¹²

As regards the elements of a global settlement and the allocation of settlement monies: because of tax deductibility, insurance, public relations, and other considerations, defendants have strong incentives to maximize the amount paid and spent as NRD and minimize the amounts paid and disposed of as fines or civil penalties. Trustee agencies also have strong incentives to maximize the NRD portion of the total, because they can expend them without further appropriation and, in the case of federal agencies, congressional control. Because of its concerns to ensure punishment and deterrence, the Justice Department sought to ensure that a substantial portion of any settlement in Exxon Valdez took the form of criminal fines and civil penalties, which ordinarily must be paid into the Treasury. In the ultimate Exxon Valdez settlement, substantial fines as well as criminal restitution were ordered, but most of the monies were allocated to cover removal and restoration costs. The civil penalty claims were rolled into an umbrella civil settlement, all of which was effectively allocated to restoration, removal, and related expenses.

The BP spill involves five states and the federal government, each with multiple NRD trustees, plus possible tribal NRD claims. There will also be multiple defendants. Thus, resolving the government claims in the BP spill will be far more complicated and difficult than in the Exxon Valdez case, involving only two governments and one (effectively) defendant. A big challenge for the government lawyers will be to maintain a united front in pursuing defendants and resolving claims, reaching any global settlement, and spending the monies. A united approach is essential because the resource claims of the various trustees will overlap. A united front is also important from the viewpoint of the governments in order to prevent the defendants from pursuing a divide and conquer strategy. Of course the defendants face similar challenges.

¹² I am skeptical about the use of a reopener clause like that in Exxon Valdez, especially in the context of the BP spill, where the resources affected by the spill have been subjected to many other stresses. It is highly unlikely that new evidence will be discovered in the future that will reveal types and magnitudes of injury to the resources that can be unambiguously attributed to the spill. In exchange for a reopener, defendants will demand a reduction in monies otherwise paid up front. I believe that the governments would be better advised to forgo the reopener to negotiate more up-front restoration recoveries.

In the Exxon Valdez case, NRD plans were developed and monies spent by a Trustee Council composed of three federal and three Alaska state trustees. Under the federal-state Memorandum of Understanding establishing the Council, decisions must be unanimous. In the event of persistent disagreement, the only remedy is to apply to federal court to resolve the matter. I am very concerned that any such arrangement would not be workable or wise in the BP spill context, with so many different trustee authorities. Even if a trustee council were established and could manage to function under a decision rule of unanimity, there would be a real danger that the many trustees would effectively divide up the recoveries for separate expenditure that would only be loosely coordinated. One step towards a solution would be for the President to provide by Executive Order for appointment of a supervisory or head federal "Super Trustee" to exercise final review and decisional authority over federal decisions on restoration and NRD expenditures, and strongly encourage the states to do likewise. The arrangement could provide for joint federal-state appointment of a third Super Trustee to decide restoration priorities, plans and expenditures, along with the other two. Alternatively, Congress could establish such an arrangement by legislation.

It will also be important in the BP spill context to mesh NRD restoration plans, expenditures, and activities with other ongoing or proposed efforts to restore and enhance the Gulf and coastal ecosystems and natural resources, especially those linked with the Mississippi Delta. These resources have suffered massive long-term degradation from navigation and flood control works, dredge and fill projects, oil and gas development, residential and commercial development, pollution runoff, and other activities. While it will be possible to identify some local or otherwise targeted and acute damage to specific resources and target restoration activities on them, it will in many cases as a practical matter be impossible to separate the effects of the spill from the effects of other activities, past and continuing, that have and will continue to adversely affect the Gulf. In such cases, it would be counterproductive and indeed futile to try to target all NRD restoration efforts exclusively on seeking to undo the adverse effects of the spill on specified resources, and nothing beyond that. A more systemic approach is required. The Exxon Valdez settlement recognized this reality by providing that NRD recoveries could be spent to "enhance" affected resources, thereby finessing the impossible task, in many cases, of determining resource baselines and ensuring that restoration achieves a return to baseline condition – not more or less. The difficulties in establishing a baseline and targeting restoration to achieve it are much greater in the BP spill context because the resources affected – unlike those involved in the Exxon Valdez spill, had already been subject to many other stresses. Any arrangement for restoration in the context of the BP spill should aim to enhance a broad range of the services provided by the various resources affected in some way by the spill. The law is flexible enough to permit this approach, which would allow spill restoration activities to be closely coordinated or nested with other similar programs, including those aimed at restoration and protection of the critical Mississippi deltaic ecosystem. The President and/or Congress could provide a management structure to ensure that NRD restoration proceeds hand in hand with activities under such other programs, such as the LCA programs being undertaken pursuant to the 2007 Water Resource Development Act.

Moreover, there are ways in which some portions of a global BP spill settlement could be allocated directly for expenditure under such other programs. One means that could be



National Commission on the
**BP DEEPWATER HORIZON OIL SPILL
AND OFFSHORE DRILLING**

Attachment 27

Written Statement and Presentation of James Tripp

Senior Counsel, Environmental Defense Fund

The Oil Spill Commission
Statement of James T. B. Tripp,
Senior Counsel, Environmental Defense Fund
September 20, 2010

Members and staff of President Obama's Oil Spill Commission, I am deeply honored to have been asked to join one of your Gulf coastal restoration panels. While I have worked on coastal wetland protection projects in all five Gulf states during my 37-years at the Environmental Defense Fund, my involvement has been most pronounced in the Mississippi River delta ecosystem of coastal Louisiana.

Background history. The Mississippi River delta ecosystem is one of the great deltas in the world and by far the most important contiguous coastal wetland ecosystem in the United States (#1 and 2). The loss of 2300 square miles of its 7000 square mile extent of a century ago represents by far the most devastating coastal biological loss for the entire country, including the northern Gulf, and is continuing (#3-5). It is therefore altogether appropriate, indeed, imperative, that this Commission address this acute national ecological tragedy in considering responses to the Gulf oil spill. It is my hope that, out this Gulf oil spill disaster, will come some good:

- broad public support for restoration of coastal Louisiana on an emergency basis,
- congressionally approved dedication of 80% of Clean Water civil penalties to a Gulf restoration fund with a major portion committed to coastal Louisiana restoration and establishment of a per barrel oil restoration fee,
- utilization of Natural Resource Damage Assessment funds for this purpose, and
- a Presidential executive order that sets aggressive restoration timelines and sediment reintroduction goals for coastal Louisiana restoration and, absent legislation, restructures the Breaux Act task force as an effective, high-level, multi-agency framework to carry out this critical mission and use these funds.

The primary man-made causes of the collapse of the Mississippi River delta ecosystem over the last century have been the management of the Mississippi River that has historically served national navigation and flood control missions as reflected in the Mississippi River and Tributaries (MR&T) program of the 1928 Flood Control and the impact of on-shore and OCS oil and gas infrastructure and operations (Boesch, D. et al, Scientific Assessment of Coastal Wetland Loss, Restoration and Management, Louisiana, Journal of Coastal Research Special Issue No. 20, May 1994, pp. 36-41). The

MR&T program resulted in the construction of a vast system of tributary dams that have reduced sediment supply, revetments, the Old River Control Structure, the Atchafalaya Basin floodway with its guide levees and Mississippi River navigation and flood control levees (#6). These levees in coastal Louisiana have deprived these coastal wetlands of the very riverine sediments that for 7000 years built, shaped and sustained the 7000-square mile delta ecosystem that existed a century ago. Oil and gas activities contributing to wetland loss have included pipeline canals, navigation channels to transport equipment, disposal of wastes and withdrawal of shallow on-shore oil and gas (#7 and 8).

My first contact with this remarkable delta ecosystem, the 7th largest coastal delta in the world and by far the largest in North America, dates back to early 1974 when we joined a law suit that Terrebonne Parish had brought against the Corps of Engineers challenging the adequacy of the EIS for the then proposed expansion of the Atchafalaya River navigation channel and Bayous Chene Boeuf and Black, a project designed to support the off-shore oil and gas industry. Then, as now, major off-shore rig fabrication yards were located in the vicinity of Morgan City and needed expanded navigation channels as the demand of the burgeoning OCS industry for ever larger pieces of equipment grew. After I received a call of assistance, what caught my attention was the glib statement in the EIS that the dredged materials were to be disposed of on 8000 acres of channel-adjointing wetlands and that this discharge would have a "de minimis" impact on this coastal ecosystem. As I sat in EDF's then East Setauket, Long Island farmhouse office, that statement dumbfounded me. Even if this delta ecosystem then had 80 to 90% of its 7000 square miles of marshes and swamp forests, 8000 acres was still substantial.

When I flew down to New Orleans in April 1974 for the first of two federal court trials of this case, I met Terrebonne Parish's coastal geology expert, Sherwood Gagliano, PhD, who had just set up his consulting firm Coastal Environments. He had also co-authored the first paper providing quantitative estimates of coastal land loss at 16.5 square miles per year over the preceding forty-year period (Chatry, Frederic M. and Sherwood M. Gagliano, Shaping & Re-shaping a Delta, Water Spectrum Magazine, Fall 1970). That paper also astounded me. How could the country be so ignorant of and not care to do something about this extraordinary amount of man-made coastal land loss? Subsequent studies by USGS and others showed that the rate of land loss accelerated in the 1960's-1980's reaching 30 to 40 square miles per year. I began to realize that very few Americans had any idea what a delta ecosystem of a major continental river is or looks like. It is just too vast. While citizens in the New York metropolitan area, for

example, can grasp what the annual loss of 45 acres of wetland islands in Jamaica Bay looks like, they can't get their arms around a loss 500 times that amount. In addition, while very distinctive culturally, coastal Louisiana is far away, and the state and the nation were addicted to exploitation of its massive coastal and OCS oil and gas resources.

In 1980, three years after the Secretary of the Army adopted the first comprehensive set of dredged and fill material disposal regulations under Section 404 of the Clean Water Act (CWA), the State of Louisiana adopted a coastal permitting program as part of its Department of Commerce-approved Coastal Zone Management Program (CZMA). While its implementation has been far from perfect, this program has led to a significant contraction in the total amount of canal construction and disposal of related dredged material in wetlands, and, insofar as the rate of wetland loss has been reduced in the last 25 years, this program deserves a good part of the credit.

In November 1985, John Day, a noted PhD wetland ecologist at LSU, asked me to speak at a coastal conference at LSU on the subject of citizen action. While I was familiar with at least one non-profit citizens organization with full-time staff working in most every major estuary along the nation's three coasts, the one big exception was coastal Louisiana. Although it is by far the largest, most productive and most important coastal ecosystem in North America, it had no staffed citizens group. Starting in early 1986, a group of Louisiana scientists and voluntary environmentalists in the state, with some urging from me, wrote a Citizens Action blueprint for Louisiana coastal restoration entitled "Here Today and Gone Tomorrow". We released the draft report in April 1987, after four "public" hearings in March, and then a final report two years later in 1989. This formed the genesis of the Coalition to Restore Coastal Louisiana.

In 1990, Congress enacted the Coastal Wetlands Planning Protection and Research Act ("CWPPRA" aka the "Breux Act"), 16 U.S.C. 1351, that with the Dingell-Johnson Act has provided a steady stream of \$80 million annually for coastal restoration. The Breux Act task force wrote COAST 2050 that the Corps adopted as the reconnaissance study for the Louisiana Coastal Area (LCA) feasibility study.

In the mid-1990's King Milling, then President of the Whitney National Bank, joined the board of the Coalition as he came to realize that the on-going collapse of the Mississippi delta ecosystem would have profound consequences for the economy of South Louisiana and the country, with the dependence of the on-shore and off-shore oil and

gas industry, the navigation industry and the structural integrity of New Orleans and other coastal urban communities on this vast wetland system. King knew former Governor Michael Foster (their grandfathers had started a law firm together) and was instrumental in persuading Governor Foster to host a Coastal Summit in August 2001. Out of this marshalling of State attention and resources came the Governor's Commission on Coastal Protection, Conservation and Restoration with Milling as chair (and of which I am a member) and the initiation of the Corps' LCA and State master planning processes. With the completion of the LCA delta ecosystem restoration Chief's report in January 2005 and in light of the devastation of Katrina, Congress authorized the LCA ecosystem restoration program in Title VII of the 2007 Water Resource Development Act. The State now has underway a revision of its Master Plan, due to be submitted to the State Legislature in 2012. I am serving on its Framework Development Team. Two noted coastal scientists Denise Reed, PhD geomorphologist, and Robert Twilley, PhD, wetland ecologist, are assisting the State with this undertaking.

Katrina and Deepwater Horizon. A century or more ago, New Orleans was buffered by 50 miles of dense coastal marsh, swamp forest and barrier islands to the south and 30 miles of such wetlands to the east. When Katrina hit in late August 2005, coastal Louisiana had lost about one-third of its historic wetland land mass. As a result, its urban communities and their levee systems and coastal oil and gas and transportation infrastructure were much more vulnerable to storm surge than would have been the case a century earlier (John W. Day, Jr. et al, Restoration of the Mississippi Delta: Lessons from Hurricanes Katrina and Rita, Science Vol. 315, March 23, 2007). This was brutally evident on the east side of New Orleans and St. Bernard Parish where a massive wall of storm surge, aided and abetted by the Mississippi River Gulf Outlet and the loss of tens of thousands of acres of cypress swamp forests, breached levees and opened these urban communities to the ravages of the storm. In response, Congress appropriated tens of billions of dollars to rebuild levees and other infrastructure and to provide restitution to homeowners and businesses. However, despite the banding together of numerous community groups such as the Lower Ninth Ward Center for Sustainable Engagement and Development that sought restoration of the swamp forests that had historically protected their communities, Congress provided scarcely a penny for wetland restoration. Indeed, Pam Dashiell, former director of the Center, sadly died as she was preparing a power point presentation for the Governor's Commission that was meeting in the Lower Ninth Ward on this subject last December.

In addition, private industry suffered losses. For example, ConocoPhillips, as a result of Katrina, had to spend \$250 million to

repair its Alliance Refinery that is close to the proposed location of the LCA authorized Mrytle Grove sediment diversion project, and, in the six months it took to do so, it suffered \$250 million in lost revenues - or a direct loss of \$0.5 billion at this one facility alone.

The Deepwater Horizon oil spill that commenced on April 20 and lasted for almost three months spewing some 5 million barrels of oil into the Gulf riveted the nation's attention on the biological richness of the Gulf with its vast fish, shellfish and wildlife resources, as well as its magnificent barrier islands, beaches and estuaries. This was a sudden, unexpected and intensive environmental as well as economic disaster. Fortunately the span of time of active spilling was limited although the impacts will be both temporary and long-lasting. However, the media focus on the oil spill and its consequences for Gulf resources also brought attention to the other, long-lasting, continuing and horrific disaster that is happening to the Gulf - the collapse of the Mississippi River delta ecosystem.

A comparison of the Mississippi delta ecosystem and other Gulf coastal resources. Although this ecologically and economically disastrous collapse is unfolding gradually, it constitutes, in my view, a far greater and more insidious calamity for Gulf biological resources than the oil spill. The coastal estuaries of the Gulf - including the mangrove swamps of southwestern Florida, the floodplain forests of great Gulf rivers such as the Suwannee, the Appalachicola and the Pearl, Mobile Bay and its Tensas deltaic wetlands, Galveston and Matagorda Bays and other major estuaries along the Texas coast - provide substantial biological energy and habitat for the fish and wildlife resources of the Gulf ecosystem. However, it is the vast wetland resources of the Mississippi River delta in southeastern Louisiana along with the River-shaped Chenier Plain that are the northern Gulf's crown jewel of the coastal wetlands, its beating heart and font of its extraordinary biological productivity. The evidence for this is simply the vastness of its salt water, brackish and fresh water marshes, its coastal swamp forests and the magnificent maze of wetlands and bayous that generate plant organic material and provide spawning, nursery and feeding habitat for fish, shellfish and wildlife that make up 60% of the marshes and estuaries in the Gulf.

The estuarine wetlands of Florida, Alabama, Mississippi and Texas have shrunk historically due mostly to residential and commercial development dredge and fill operations. Coastal Louisiana has also seen coastal wetlands dredged and filled for these reasons as well as for agriculture. Fortunately, the advent of the federal Clean Water Act Section 404 regulatory program coupled with state coastal

wetland protection initiatives has substantially retarded the rate of loss of coastal wetlands due to such activities.

However, the loss of Louisiana coastal wetlands has been proceeding at a prodigious rate even with federal and state coastal wetlands permitting programs in place. The reason is that so much of this loss is associated with the Mississippi River's navigation and flood control levees that restrict introduction of sediments into the compacting sediments of the delta and the historic and on-going infrastructure footprint of on-shore and OCS oil and gas operations. Indeed, by the mid-1980's some 10,000 miles of oil and gas pipeline and equipment navigation canals and their dredged spoil banks occupied almost 10% of the delta's wetland area (Jae-Young Ko and John W. Day, Wetlands Impacts of Energy Development in the Mississippi Delta, Encyclopedia of Energy, Vol. 6, 2004). So long as the Gulf, with its huge reserves, produces oil and gas (#9), the industry will need pipeline canals and navigation channels for equipment transport that traverse the delta's wetlands and coastal storage and refinery facilities.

While federal and State permitting programs have reduced the impacts of such infrastructure by conditioning permits on improved disposal of dredged material practices or required backfilling of new pipeline canals, these operations still have an extensive, on-going cumulative impact on Louisiana's coastal wetlands. Thus, even with truly effective enforcement of federal and state regulatory programs that could further reduce the rate of future wetland loss, they alone will not reverse the tragic rate of loss of these delta wetlands, let alone begin the process of rebuilding and restoring this amazing system.

Consequences of deltaic collapse for the Gulf. Scientists have defined a complex but positive relationship between the extent and quality of coastal and estuarine wetlands and Gulf biological productivity and health. As the Mississippi River delta ecosystem continues to collapse, Gulf fishery and wildlife resources will suffer. Some scientists have pointed out that wetland complex may provide long-stored organic energy to the Gulf, but as the collapse consumes that wetland capital it will increasingly depress Gulf biological well-being. In addition, the shunting of Mississippi River water to the Gulf, water that historically would have flowed through its floodplain and delta wetlands during high flow periods, has exacerbated the contribution of the nutrients from the central agricultural states to the Gulf's dead zone.

The continued collapse of Louisiana's coastal wetlands has mounting national and regional economic impacts. The loss of storm

buffering capacity is intensifying the vulnerability of the nationally vital Mississippi River navigation system and the GIWW and the on-shore oil and gas infrastructure of Gulf OCS operations, as well as the urban communities that support these economic activities to storm surge (#10).

The Coastal Louisiana wetland ecosystem restoration program. The power of riverine sediments to build land is evident in the Atchafalaya Basin and Bay with its new delta lobes (# 11 and 12) in contrast to the wasteful discharge of sediments at the mouth of the River (#13). Protection and restoration of coastal Louisiana's coastal wetlands entail four kinds of projects: 1) diversion projects that reintroduce sediment and fresh water from the Mississippi River into adjoining wetland basins and distribute Atchafalaya Basin sediments more broadly, 2) conveyance of dredged material, primarily from the River's mouth, via pipeline or barge for sustainable wetland creation, 3) rebuilding of Louisiana's eroding deltaic fragment barrier islands and 4) re-engineering of thousands of miles of oil and gas canals.

After years of work by the Corps, other federal agencies, such as USGS, the Fish and Wildlife Service, NOAA and EPA, the State, Louisiana's extraordinary coastal scientists and the NGO community, Congress authorized 17 near-term restoration projects for construction in Section 7006(c) and (e) in 2007 WRDA's LCA Title (#14), many initially investigated through the CWPPRA process. The State is also pursuing a number of projects, including a long-range sediment pipeline transport project in central Barataria Basin, funded through the Community Impact Assistance Program (an amendment to the Outer Continental Shelf Lands Act, 43 U.S.C. 1356a). In addition, these state and federal agencies and Louisiana's scientists have begun to investigate prospective large-scale sediment reintroduction projects of the sort described in Section 7002 of 2007 WRDA largely through the State 2012 Master Plan revision process.

In his February 2010 FY 11 budget, President Obama proposed that Congress approve the LCA program as a "new start" (one of two in the country) with \$19 million in construction funds as well as \$16 million in LCA planning funds. The Senate Energy and Water Subcommittee has endorsed this proposal, but its House counterpart has not. It is critical that this program move beyond the planning to the construction phase.

The 17 LCA near-term restoration projects constitute a program that is intended to help stabilize the delta's barrier islands, beneficially use dredged material for targeted areas, including those devastated by the now-blocked Mississippi River Gulf Outlet, modify existing

structures such as the Caernarvon and Davis Pond fresh water diversions, add other such diversions and provide for two sediment diversion projects that could take restoration to a whole new level. A rough estimate of the cost of these 17 projects is \$5 billion, although the full cost of the MRGO restoration project that includes no authorized cost cap may push that up.

Priority LCA restoration projects. Since the essence of restoration is conveyance and reintroduction of sediment, those LCA projects that do so are particularly critical. In the long-term the only sustainable way of reintroducing sediment is by using the natural energy of the Mississippi River during high River flow periods - what scientists describe as "replication of natural processes". The two LCA projects that could potentially be designed to convey and reintroduce sediment using the power of the Mississippi River to distribute those sediments are the Myrtle Grove sediment diversion project and the White's Ditch diversion project, respectively on the west and east banks of the River approximately mid-way between New Orleans and the mouth (#15 and 16).

While the Myrtle Grove project that would discharge into central Barataria Basin is described in Section 7006(c) of 2007 WRDA as a "medium" diversion, Congress authorized its modification (along with four others) in response to post-Katrina wetland loss subject to a 150% authorized cost cap. Two years ago, the State, with our support, retained a superb team of engineering firm and academic contractors to conduct detailed sediment data sampling and analysis, to investigate state-of-the-art hydrodynamic and morphological modeling of the River- and Basin-side impacts of the diversion with pulsing capacities of 15,000, 30,000 and 45,000 cfs and to undertake preliminary engineering design of the intake and diversion structure and conveyance channel. The idea of pulsing is to have the capacity to move extra amounts of water and sediment during rising and high River flow periods when the lower River can carry 12 times more suspended load compared to low discharge, with the sand loads making up 19% of high flow sediments compared to zero at low flow (Mead Allison and Ehab Meselhe, *The Use of Large Water and Sediment Diversions in the Lower Mississippi River (Louisiana) for Coastal Restoration*, Elsevier B.V., *Journal of Hydrology*, Vol. 367, June 2010).

The White's Ditch diversion is one of six projects to be included in a Chief's Report that the Corps expects to transmit to Congress by the end of this year. Pursuant to a suggestion from the Coalition to Restore Coastal Louisiana, the New Orleans District is proposing a project with pulsing capacity up to 35,000 cfs.

Both the Myrtle Grove and White's Ditch projects should not only contribute to land building but serve as demonstration projects for the larger-scale diversion projects that will be necessary to move towards serious landscape restitution. With the recent signing of the Myrtle Grove cost share agreement, the Corps is assuming major responsibility for moving this project forward. Unfortunately, the Corps has indicated that, even with the impressive technical work that the State has done, it may take up to three years to complete the project's feasibility study. Given the urgency of this project, the fact that Congress has already authorized it and the extent of the State contractors' technical work, this tedious schedule is unacceptable, and unnecessary.

In the wake of the Katrina disaster, the Corps has shown that it is capable, with CEQ and OMB support, of designing and constructing a project as huge and complex as the \$15 billion, 100-year upgrade of the massive greater New Orleans hurricane protection system in less than six years. Coastal restoration is equally urgent. It is high time that the Corps, indeed, the entire federal government, demonstrate that kind of energy in and commitment to the coastal restoration program. Otherwise, we must find some alternative structure that will facilitate a greatly expedited near-term and longer-term restoration program before another catastrophe strikes. After all, the collapse of the delta ecosystem is increasing the vulnerability of the Mississippi River and GIWW navigation systems, oil and gas infrastructure, freight rail and trucking infrastructure and urban communities. Conversely, the sustainability of these nationally vital economic assets depends on comprehensive and robust coastal restoration. Time is of the essence.

In addition to these two sediment diversion projects, other near-term LCA projects that are critical include the Barataria and Terrebonne Basin barrier island rebuilding projects, the re-engineering of the Davis Pond and Caernarvon freshwater diversions to convey more sediment and the restoration of cypress swamp forests in the MRGO-impacted area. The NGO community with the Lake Pontchartrain Basin Foundation as sponsor has also proposed a very cost-effective modification of the Bonnet Carre Spillway so that its sediment could rebuild the LaBlanche wetlands.

Coastal Land Rights Issues. Coastal restoration will have implications for privately-owned coastal underwater land and wetlands. Since 90% of the land in coastal Louisiana is privately owned, much of it by energy companies (with ConocoPhillips owning more than 500,000 acres), a restoration program that will reintroduce sediment, fill in shallow water, nourish sediment-starved wetlands, raise water elevations and change salinities, at least seasonally, will have

consequences for private land resources. The Myrtle Grove and White's Ditch diversion projects will help to determine the most effective, legal and fair way of addressing the private land impacts of restoration projects. The State has been addressing these land rights issues, but much more needs to be done.

The Louisiana Supreme Court's decision in Avenal v. State, 886 So. 2d 1085 (2004), dismissed a series of claims by oystermen for damages that they attributed to the Caernarvon diversion. It is the leading judicial decision concerning the legal capacity of the State to restore this coastal system. The Court found that the State was authorized, if not obliged, to protect and restore the State's coastal wetland zone through, among other ways, diversion of River water and sediment. Act 626, La. R.S. 41:1702 (2006), also authorizes the establishment of a not-for-profit land trust that could receive donations of surface rights with coastal landowners retaining subsurface mineral rights and a set seaward boundary to their claims, a boundary that could otherwise change as wetlands revert to open water. Among other things, the State and private interests are awaiting an opinion of the Attorney General that would clarify the legal capacity of the State administratively to guarantee a fixed boundary for subsurface rights. Effective implementation of this Act is imperative.

Restoration goals. What should our goals be for restoration of coastal Louisiana? What is our vision of the Mississippi River delta ecosystem 10, 20 or 50 years from now? The national importance of reversing land loss and starting the process of rebuilding wetlands calls for the setting of aggressive time goals for action.

Time goals. A suggested goal for completion (planning, detailed design and construction) of the 17 LCA-authorized near-term projects is five years. The goal for completion of the longer-term program - including potentially a major lower River realignment with redesign of the navigation channel at the mouth (the subject of the 2004 LSU Small Scale Physical Model report and the BP-America's Wetland June 2006 science report chaired by Denise Reed) and large-scale upper Barataria and Terrebonne Basin sediment diversions and canal closures - is 10 years. This is ambitious, but commensurate with the need to act immediately to reverse land loss, redress an open wound in the Gulf ecosystem, protect critical national economic assets and avoid further catastrophes of the sort that Paul Kemp, PhD, of the National Audubon Society describes. We can do it by taking full advantage of the resources of key federal agencies, the State, engagement of world-class private sector engineering firms through a large-scale diversion project design competition that my colleague Paul Harrison is pursuing, design-build concepts and help from the White

House to build support among energy firms active in the Gulf, the navigation industry and mid-western agricultural interests that depend on the Mississippi River to move half their agricultural exports.

Sediment reintroduction goals. If we adopt this 10-year goal, what is our physical vision of the restoration program that we will have implemented? Right now, very little sediment of the Mississippi River is reaching the delta's subsiding and eroding wetlands except incidentally. Distributary bayous close to the mouth of the River in the bird's foot delta convey sediment, but any benefit there is apt to be temporary since the mouth is rapidly subsiding. Since strategic and sustainable reintroduction of this sediment is a key to restoration, a physical goal is to have projects in place that will sustainably divert and reintroduce at a minimum 70%, and preferably 80 to 100%, of the sediment of the Mississippi River.

In addition, the Atchafalaya River system carries 30% of the flow and sediment of the combined Mississippi and Red Rivers. Confined by the Basin's east and west guide levees, the sediment of that River has achieved a stunning amount of land building within the Basin (#11). The River has also built up magnificent and rapidly growing new deltaic lobes in Atchafalaya Bay (#12) through the Lower Atchafalaya River and Wax Lake Outlet built by the Corps in 1941 as a second flood water relief value for Basin flood water. However, since the east guide levee retards the flow of that River's sediments into central Terrebonne Basin, another 10-year goal is the reintroduction of some amount of that sediment, perhaps one-quarter to one-third, into the Terrebonne Basin. The third leg of this physical goal is the reintroduction of dredged disposal piles of half of the oil and gas pipeline and equipment canals into those canals.

The long-term goal is formulated in this manner since it is measurable and reflects what we must do - move sediment in a useful way using predominantly the natural flows of the Mississippi and Atchafalaya Rivers while eliminating some of the barriers to that movement. While we seek significant land building and nurturing of existing wetlands as outcomes of the long-term restoration program, that will happen only gradually, depending on the frequency of large-scale flood events. Re-establishment of riverine processes and coastal hydrology is what we should aim for.

It is hard to estimate the cost of the large-scale program that will attain these sediment conveyance goals. A rough estimate may be \$15 billion if we can fully engage private sector firms, but it may exceed \$20 billion, particularly if we do not have an efficient management structure in place commensurate with a public works

project of this magnitude and complexity. If we envision completion of both the authorized near-term and longer-term programs within 10 years at a total cost of \$20, this would entail a funding stream that would gradually build up to an average \$2 billion per year. Absent new legislation establishing some new structure or authority, effective utilization of CWPPRA with its Breaux Act task force with its goals and mission defined in an executive order of the President and with participation by high level agency officials could provide an effective administrative framework.

NRDA Linkages between the Deep Water Horizon Oil Spill and Coastal Restoration. The three-month Deep Water Horizon oil spill has done significant temporary damage to Gulf environmental resources and untold longer-term damage to those resources despite heroic efforts to contain and remove surface oil. The federal trustee agencies are conducting a Natural Resource Damage Assessment (NRDA) under the Oil Pollution Act of 1990 (#17) to determine the quantitative scope of the oil spill's impact and damages relative to a pre-spill baseline and to develop and implement a plan for restoration, rehabilitation or replacement of damaged resources (33.U.S.C. 2706(c), 15 CFR 990.30 and 990.52, 40 CFR 300.615(c)).

It will be impossible for BP to undo some of this damage through direct oil removal efforts. Since the temporary damage to Gulf biological resources that was visible during the pendency of the spill cannot be undone, it will require some kind of program to replace and restore damaged resources. In addition, the continuing damage in the form of very low concentrations of oil in deep waters that could affect marine larvae and juveniles as well as expanses of thick oil on parts of the Gulf seabed provides little opportunity for direct cleanup and oil removal. Therefore, the trustee agencies will have to devise a plan to compensate for and replace the short- and long-term damages to Gulf resources that has a reasonable nexus to those damaged resources.

The lingering oil spill and the loss of Mississippi Delta wetlands affect the same biological resources, although in different degrees, places and ways. Both affect the Gulf food chain and Gulf biotic reproductive, nursery and feeding habitats. Both affect the larvae and juveniles of a wide range of biotic species. If very low concentration of highly dispersed oil in the Gulf might injure millions or billions of larvae and juveniles of many different species or oil on the bottom of the Gulf could suppress benthic biota reproduction and growth that would support fish and wildlife higher up in the food chain, then augmenting the flow of food energy by protecting or restoring Louisiana coastal wetlands could contribute to replacing or mitigating for the loss. Implementing barrier island projects that would enhance protection of

Barataria and Terrebonne Basin wetlands would also indirectly reinforce this effect. Deepwater Horizon oil that has gravitated to the Gulf's bottom suffocating biota there might be viewed as having a similar affect to the dead zone. Diverting Mississippi River nutrients would allow receiving basin wetlands to take up those nutrients thereby reducing the shunting of agricultural nutrients into the Gulf and the size of its dead zone. These are conceptual linkages between the compounding damages of the oil spill and coastal restoration.

Of the LCA authorized restoration projects, the ones that would most effectively restore or replace resources damaged by the oil spill would be the two sediment diversion projects and the Barataria and Terrebonne Basin barrier island rebuilding projects. These should be the nucleus of a NRDA early action program. Large-scale sediment reintroduction projects and canal closure projects could also serve this purpose. If NRDA damages were to be dedicated in part to funding any near-term LCA projects, including the sediment diversion or barrier island projects identified above, an administrative structure not requiring additional legislation that could effectively receive these funds with an appropriate directive from President Obama is the 1990 CWPPRA "Breaux Act Task Force". The federal and State trustee agencies and EPA are all represented on it.

The Clean Water Act and BP Funding for Coastal Restoration. The Department of Justice in the early weeks of the oil spill announced the initiation of a civil and criminal investigation. The civil penalty provisions of the Clean Water Act, 33 U.S.C. 1321(b)(7)(A) and (D) authorize the imposition of penalties up to \$1100 per barrel of spilled oil on a strict liability basis or up to \$4300 per barrel upon a finding of gross negligence (#18). Since the federal government has estimated the total discharge to be 4.9 million barrels of oil, a potential civil penalty could be several billions of dollars.

Executive settlement authority to dedicate BP oil spill funds to coastal restoration includes the EPA Supplemental Environmental Projects (SEPs) program (#19). Pursuant to its Final SEP Policy of April 10, 1998, SEPs are beneficial projects that a defendant agrees to undertake as part of a settlement of an EPA Clean Water Act civil penalty enforcement action. EPA has a five-step process to determine if a proposed project qualifies as a SEP. Environmental restoration is an eligible category. The defendant is responsible for implementing the SEP with EPA oversight. The EPA Policy incorporates legal and policy constraints to assure compliance with the Miscellaneous Receipts Act that requires transmittal of civil penalties to the federal treasury.

So as to avoid any possible overuse of such a restoration project mechanism, SEPs that EPA has negotiated have been of modest size. The Department of Justice has often looked askance on the program. With that said, it is hard to distinguish the legal as contrasted to policy constraints in the SEP Policy. If we were to envision a SEP that BP would voluntarily enter as part of an EPA settlement, it could be of a magnitude that dwarfs any other SEP, would be highly visible and should have broad support throughout the executive branch. Thus, it behooves us to determine what a robust SEP that complies with the Miscellaneous Receipts Act could look like if BP were so inclined to support it, and what role the Breaux Act task force could play in project oversight. Even with a robust coastal restoration project SEP, one could anticipate that BP might face quite a sizeable Clean Water Act civil penalty. Senator Mary Landrieu has proposed legislation that would dedicate 80% of any Clean Water Act civil penalties to Gulf coastal restoration. Congressman Steve Scalise has introduced a comparable bill. The entire Louisiana delegation and the national environmental community support these bills.

The Need for Long-Term Sustainable Funding for Coastal Restoration. While BP funds through the NRDA or any Clean Water Act SEP could provide significant funding for and kick start systemic coastal Louisiana restoration, the federal government will have to devise a sustainable and substantial source of funding to achieve the coastal restoration goals enunciated above. The Melancon amendment would provide some very important funding, but more is needed. An article that I authored for the July issue of USA Today magazine entitled "Doubling Down on Disaster" proposed as one funding option the imposition of a \$2 per barrel of oil or natural gas equivalent "restoration fee" on all OCS oil and gas produced in the Gulf. The historic involvement of the oil and gas industry in coastal Louisiana and the Gulf and the storm buffering benefits of a restored coast to coastal oil and gas infrastructure, industry employees and their communities could justify such a fee that could generate \$20 billion or more over a ten-year period.


Another option that would generate \$2 billion annually for Gulf coastal restoration could be a modest fee of \$0.28 per barrel on all imported and domestically produced oil, the equivalent of 0.7 cents per gallon of gasoline. The justification for such a broadly assessed restoration fee is the national economic and environmental benefit of a restored Mississippi River delta ecosystem. The energy infrastructure along and in the Gulf that has helped to power the US economy for the last century and led to the location of the Macondo well has played a major role in delta collapse. It would therefore be appropriate for the energy system to contribute such a fee to its restoration.

Gulf Coastal Restoration vs Coastal Louisiana Restoration.

This statement has focused on the national economic and environmental imperative of a comprehensive Mississippi Delta ecosystem restoration program in coastal Louisiana. BP funds that might become available under a NRDA or through a SEP or new federal law that imposes a restoration fee as suggested above would not be limited to coastal Louisiana restoration although that is where the need is by far the greatest. A suggestion for a restoration program in the other Gulf states would be enhanced protection and restoration of the floodplain forested wetlands of the multiple rivers that create estuaries in and flow into the Gulf. The floodplain forests of southern rivers have suffered enormously over the last century. However, the central focus of Gulf restoration must be restoration of the Mississippi River delta ecosystem (#20). The time for action is now.


Mississippi River Basin: Third-Largest Watershed in the World

- Mississippi-Missouri: Fourth-longest river on Earth
- Drains 41% of U.S.
- Parts of 31 states, 2 Canadian provinces in 1.84 million sq. mile watershed



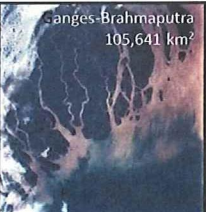





Source: National Park Service

7th Largest Delta

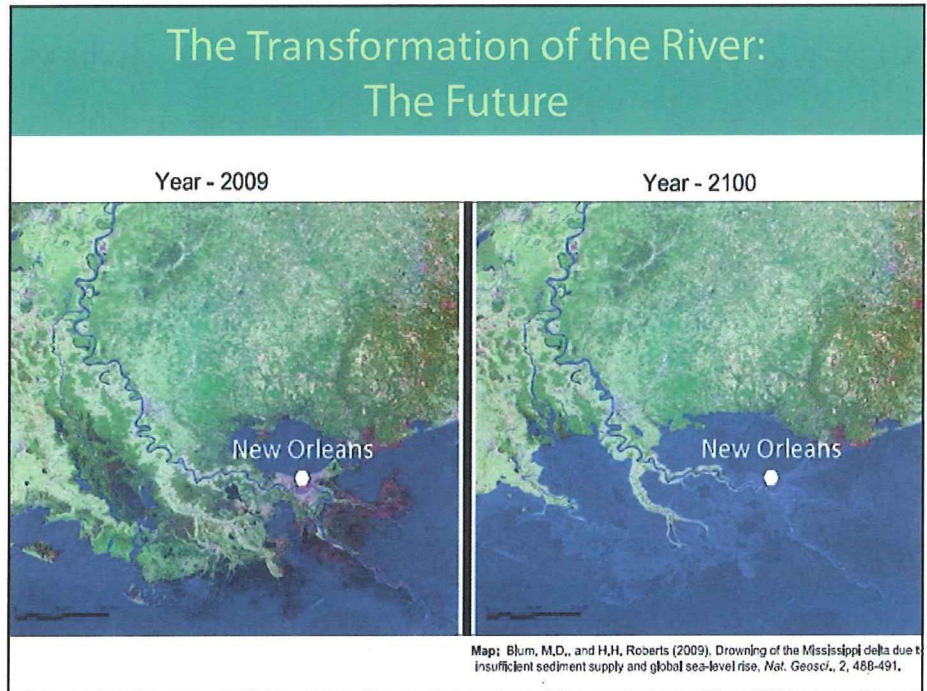


Mississippi
28,568 km²

Gulf of Mexico

 <p>Ganges-Brahmaputra 105,641 km²</p>	 <p>Mekong 93,781 km²</p>		
 <p>Yangtze-Kiang 66,669 km²</p>	 <p>Lena 43,563 km²</p>	 <p>Huang He (Yellow) 36,272 km²</p>	 <p>Indus 29,524 km²</p>





1927 Flood and MR&T Program

Mandate to Manage River for Flood Control and Navigation

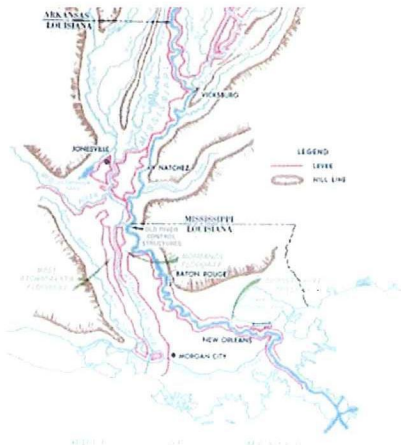
Flood Control Act of 1928

Components

- Tributary dams
- Locks and dams
- Main stem and backwater levees
- Navigational jetties into the Gulf
- Old River Control Structures

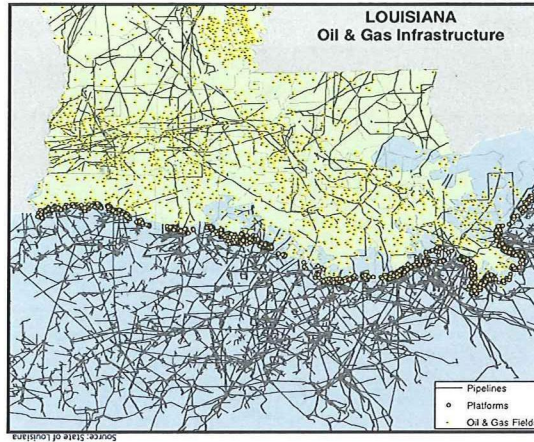
Consequences

- Severing of river from its flood plains and delta
- Sediment starvation and subsidence of the deltaic ecosystem
- Shunting of the River's nutrients and sediments into the Gulf



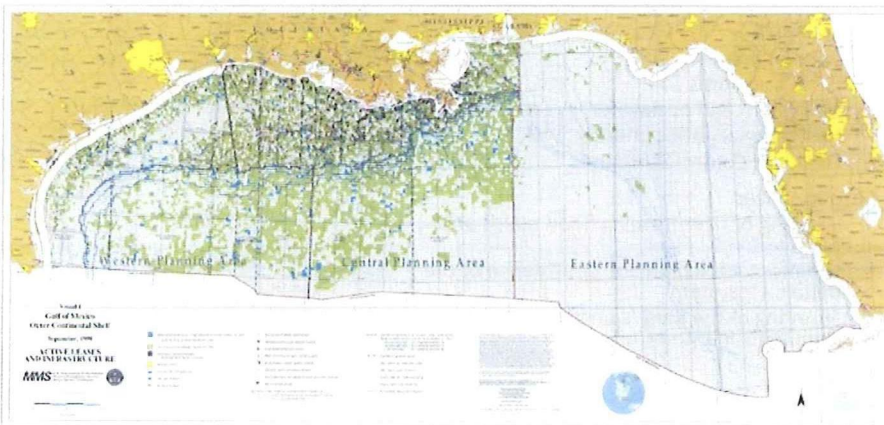
Sources: *Rising Tide: The Great Mississippi Flood of 1927 and How It Changed America*; U.S. Army Corps of Engineers

Oil & Gas Infrastructure



10,000 Miles of Coastal Oil and Gas Pipelines and Navigation Canals

Leasing in Gulf Outer Continental Shelf



Source: U.S. Department of the Interior

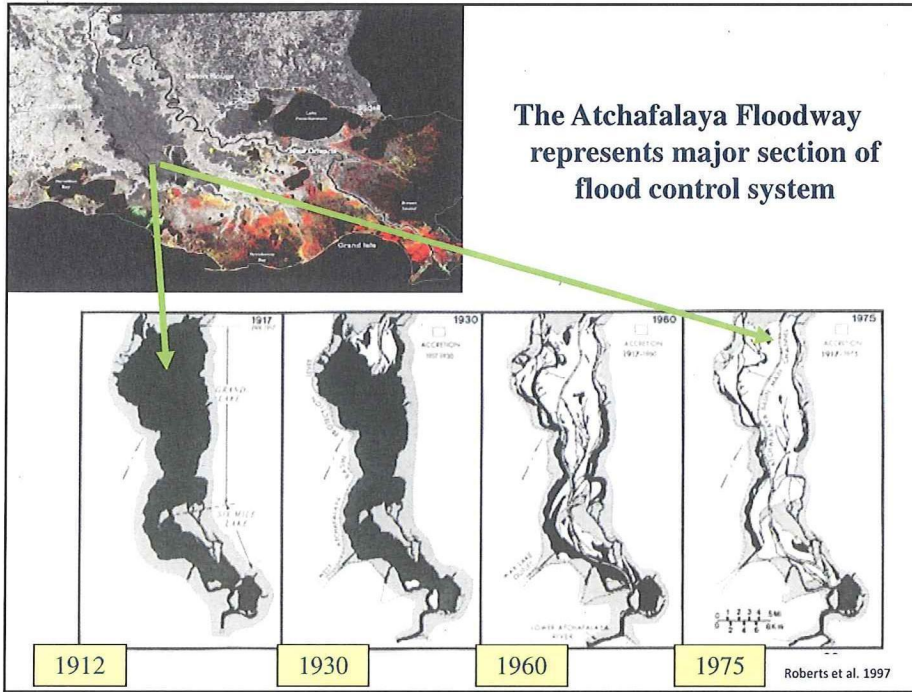
National Energy Implications

- 1st in offshore oil reserves
 - 2007 PADD reserves: 3.32 bln (1st)
- 2nd in natural gas production (land and OCS)
 - 2007 output: 1.36 mln cubic ft
- 3rd in aggregate oil reserves (land and OCS)
- 4th in domestic oil production
 - 2008 crude oil output: 73.01 mln barrels
- 1st in OCS revenues for US Treasury
 - 2007 federal revenues: ~ \$7 billion
- 41.7 BBOE recoverable at \$60/bbl

Notes: Domestic oil production excludes output from the Federal Offshore Petroleum Administration for Defense Districts (PADD) zones. 2007 Crude Oil Reserves include Federal Offshore. OCS refers to the Outer Continental Shelf.
Sources: Energy Information Administration (EIA); U.S. Department of the Interior

Coastal Louisiana: Critical Economic, Environmental Assets

- Critical route for bird migrations
 - World-class fisheries dependent on the delta
 - Strategic oil, gas resources
 - Important transportation infrastructure
 - Communities
- Deltaic Ecosystem Dependence

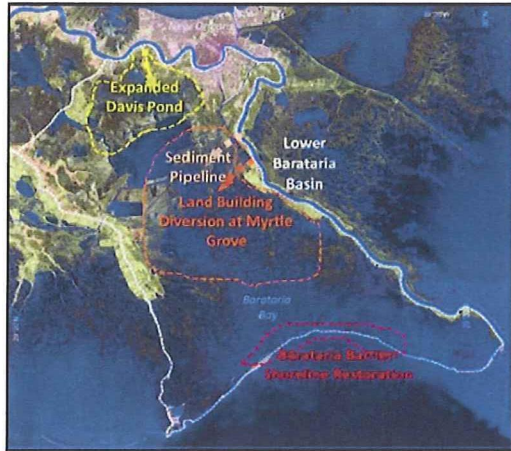




2007 WRDA Title VII Louisiana Coastal Area Authorization

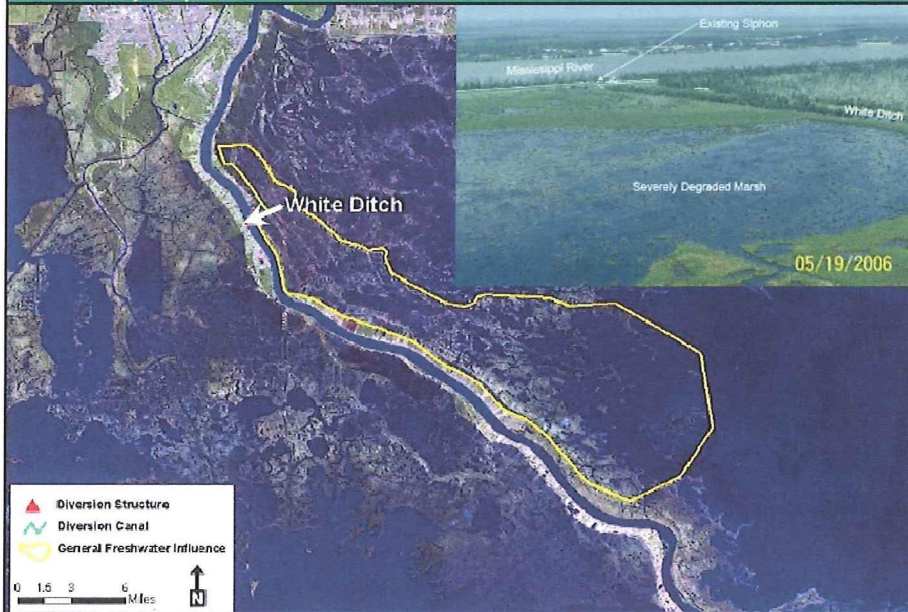
- Provides for Comprehensive Coastal Restoration Plan – Section 7002
- Establishes Federal Task Force – Section 7004
- Creates a Science and Technology Program and Demonstration Program – Section 7006(a) and (b)
- Authorizes five initial restoration projects with allowance for modifications to address Katrina and Rita impacts – 7006(c)
- Authorizes ten additional restoration projects – 7006(e)(1) and (3)
- Calls for the closure of the Mississippi River Gulf Outlet (completed) and a MRGO damage-offset restoration program

WRDA Authorized Restoration in Barataria Basin



- Davis Pond modification - 7006(e)(1)(D)
- Myrtle Grove medium diversion with dedicated dredging - 7006(c)(1)(E)
- Myrtle Grove sediment pipeline – CIAP
- Barataria Basin shoreline protection 7006(c)(1)(D)

Corps Accepts CRCL/LPBF Proposal for a 35,000 cfs Diversion Draft Feasibility Report released in June 2010



Oil Spill Act of 1990

- Liability capped at \$75M plus removal costs (NRDA costs) except in cases of gross negligence (bills would raise or eliminate cap)
- No preemption of liability under other federal or state laws
- Oil Spill Liability Trust Fund (proposals to increase per barrel dedicated tax)
- Natural Resource Damage Assessments by trustees with obligation to assess natural resource damages and develop and implement plan for restoration, rehabilitation or replacement of damaged resources – 33 U.S.C. 2706(c), 15 CFR 990.30, 40 CFR 300.615(c)
- Assessment includes quantifying the degree and spatial and temporal extent of injury relative to baseline – 15 CFR 990.52.

CWA Civil and Criminal Penalties

- General: penalty up to \$25,000/day/violation or up to \$1,000/barrel of oil discharged – 33 U.S.C. 1321(b)(7)(A)
- (D) Gross negligence: penalty not less than \$100,000 and not more than \$3,000/barrel of oil discharged – 33 U.S.C. 1321(b)(7)(D)
- Criminal penalties 33 U.S.C. 1319(c)

EPA Supplemental Environmental Projects

- SEPs are beneficial projects that a defendant agrees to undertake as part of a settlement of an EPA CWA civil penalty enforcement action
- EPA has a five-step process to determine if a proposed project qualifies as a SEP
- Environmental restoration is one of the SEP categories
- The SEP mitigation amount is subtracted from the civil penalty
- There must be a nexus between the violation and the SEP
- The defendant is responsible for completing the SEP with EPA oversight

Our Choice





National Commission on the
**BP DEEPWATER HORIZON OIL SPILL
AND OFFSHORE DRILLING**

Attachment 28

Written Statement of Stan Senner

Director of Conservation Science, Ocean Conservancy

**National Commission on the
BP Deepwater Horizon Oil Spill and Offshore Drilling
September 27-28, 2010**

**Testimony of
Stanley E. Senner, Director
Conservation Science
Ocean Conservancy**

Chairman Graham, Chairman Reilly, and Members of the Commission, thank you for the opportunity to present these remarks. I am Stan Senner, Director of Conservation Science, for Ocean Conservancy.

In this role, it is my responsibility to enhance the organization's science capacity and link that capacity to advocacy of policies that promote conservation and sustainable uses of the ocean. Since the BP oil disaster, I have spent most of my time trying to understand and interpret the impacts on natural resources of this oil spill, especially with respect to the Natural Resources Damage Assessment process, meeting with affected persons and decision-makers, and laying ground for Ocean Conservancy's engagement in the long-term restoration work that will follow in the Gulf coastal region. In doing so, I draw on nearly seven years of working on the *Exxon Valdez* oil spill, first as Restoration Program Manager for the State of Alaska prior to the settlement with Exxon and then as Science Coordinator for the state-federal *Exxon Valdez* Oil Spill Trustee Council following the settlement.

I have been asked to highlight several aspects of the *Exxon Valdez* experience that are relevant and useful with respect to restoration in the Gulf of Mexico following the BP oil disaster. I am pleased to be invited to be here today on this panel for that purpose. I offer these comments to you as a biologist and restoration planner, and not as an attorney.

As I discuss these *Exxon Valdez* examples, I will make reference to proposed legislation that pertains to restoration in the Gulf of Mexico, and I will close with Ocean Conservancy's vision for the key elements of a comprehensive restoration program in the Gulf of Mexico.

The President's Commitment

When President Obama addressed the nation from the Oval Office on June 15, he stated:

Beyond compensating the people of the Gulf in the short-term, it's also clear we need a long-term plan to restore the unique beauty and bounty of this region. The oil spill represents just the latest blow to a place that has already suffered multiple economic disasters and decades of environmental degradation that has led to disappearing wetlands and habitats. And the region still hasn't recovered from Hurricanes Katrina and Rita. That's why we must make a commitment to the Gulf Coast that goes beyond responding to the crisis of the moment.

Ocean Conservancy has worked for more than two decades to protect and restore depleted fish and wildlife resources in the Gulf of Mexico, and we enthusiastically support the President's call for a Gulf Coast Restoration Plan¹ that addresses decades of environmental degradation that have compromised the Gulf of Mexico coastal and marine ecosystem.

There are many physical and biological differences between the Gulf of Mexico and the northern Gulf of Alaska (including Prince William Sound), and there are great differences between the characteristics of the BP oil disaster in 2010 and the *Exxon Valdez* oil spill in 1989. The *Exxon Valdez* oil spill was the best studied spill event in the history of the United States, if not in the world. Although there was immediate and dramatic harm, the full story of impact and recovery from the *Exxon Valdez* played out over two decades and in some ways is not yet complete.

My expectation is that it will take several years before we have some clarity about the nature, scope, and severity of harm from the BP oil disaster and its impacts—especially given that so much of this story unfolded under water and out of sight. Now is an appropriate time to look ahead to a Gulf of Mexico restoration program. As you do so, I strongly encourage you to be mindful that, while restoration can and must begin now, many of the critical questions about the impacts of the BP oil disaster will not be answered for several years. Given the nature and scope of the BP disaster and the several states and multiple interests involved, conducting the Natural Resources Damage Assessment

¹ Throughout my statement, the "Gulf Coast Restoration Plan" refers to the plan called for by the President.

(NRDA) and developing and implementing a comprehensive Gulf Coast Restoration Plan will be every bit as challenging as capping the Macondo well in the Gulf of Mexico proved to be.

NRDA and the Restoration Plan

The goal set by the President goes beyond a typical NRDA-based restoration plan. As a result, development of a broader Gulf Coast Restoration Plan raises the question of the relationship between NRDA-based restoration and a broader program that seeks to reverse decades of environmental degradation. Ocean Conservancy's view is that NRDA-based restoration is nested within and essential to the larger plan. By defining the set of actions that respond to the short- and long-term damage done by the BP oil disaster, the NRDA is a key building block in development of a broader Gulf Coast Restoration Plan. In turn, by addressing decades of environmental degradation in the Gulf, implementation of the broader plan will improve the efficacy of efforts to restore what was injured and lost due to the BP oil disaster. For example, it will be most effective to both restore an oiled marsh and protect it from harmful erosion. Hence, it makes sense for a Gulf restoration program to address oil-spill injuries as well as the systemic degradation that compromises the whole ecosystem. Restoration funds should be applied where they can accomplish the most for the long-term productivity and resilience of the ecosystem, including the fish and wildlife resources on which so many people in the Gulf rely for their livelihoods.

Of course, the NRDA is only one avenue through which the broader suite of restoration projects needed to fully restore the Gulf will be identified, and there already exist various restoration, management, and research and monitoring plans for the Gulf region.² To be effective, the Gulf Coast Restoration Plan should outline mechanisms for integrating existing natural resource restoration and management plans, aligning and guiding agency programs, and securing funding to support implementation.

Bills in both the House and Senate would establish a Gulf Restoration Task Force to facilitate the needed coordination. I note, however, that the State of Texas is not currently represented on the task force in S. 3763, the Restoring Ecosystem Sustainability and Protection on the Delta Act. If there is to be a region-wide Gulf Coast Restoration Plan and program—addressing oil-spill injury and reversing

² For example, Louisiana's Comprehensive Master Plan for a Sustainable Coast, the federal Louisiana Coastal Protection and Restoration Plan, Mississippi Coastal Improvement Plan, to name only a few.

decades of degradation beyond oil-spill injury — Texas must be part of it. Texas fishery resources may well have been impacted by the spill,³ and the Texas coast is very much a part of the Gulf of Mexico ecosystem.

The Exxon Valdez Settlement and Restoration Program

The United States and State of Alaska settled their claims against Exxon for various criminal violations and recovery of civil damages resulting from the oil spill in October 1991.⁴ Prior to that settlement, the Federal Government and State of Alaska carried out a series of damage assessment studies under the authority and framework of the Federal Water Pollution Control Act and Comprehensive Environmental Response, Compensation, and Liability Act, as supplemented by the National Contingency Plan and NRDA regulations. Although the governments did not elect to conduct a formal NRDA following the *Exxon Valdez* oil spill, the approach of the early, pre-settlement restoration planning⁵ was generally guided by then current NRDA regulations which defined “restoration” or “rehabilitation” as “actions undertaken to return an injured resource to its baseline condition....”⁶ However, the August 1991 Memorandum of Agreement and Consent Decree⁷ resolving claims between the United States and the State of Alaska stipulated that the Trustees “...shall jointly use all natural resource damage assessment recoveries for purposes of restoring, replacing, *enhancing*, rehabilitating, or acquiring the equivalent of natural resources injured as a result of the Oil Spill and the reduced or lost services provided by such resources...” (emphasis added).

Enhancing Injured Natural Resources. — The late Governor Walter Hickel reportedly personally insisted on inclusion of “enhancing” in the definition of

³ For example, there is westward transport of red snapper larvae across the Mississippi Delta in May, September and October, and impacts on those larvae due to the BP oil disaster may ultimately be manifest in Texas. (Johnson, D.R., H.M. Perry, J. Lyczkowski-Shultz, and D. Hanisko. 2009. Red snapper larval transport in the northern Gulf of Mexico. *Transactions of the American Fisheries Society* 138:458–470.)

⁴ Memorandum of Agreement and Consent Decree, *United States and Alaska v. Exxon Corp.*, Nos. A91-082 CIV & A91-083 CIV (D. Alaska, filed Oct. 8, 1991).

⁵ Restoration Planning Work Group. 1990. *Restoration Planning Following the Exxon Valdez Oil Spill: August 1990 Progress Report*. Alaska Departments of Fish and Game, Natural Resources, and Environmental Conservation; U.S. Departments of Agriculture, Commerce, and Interior; and the U.S. Environmental Protection Agency. Anchorage, Alaska.

⁶ 43 CFR 11.14(11).

⁷ Memorandum of Agreement and Consent Decree, *United States v. State of Alaska*, No. A91-081 CIV (D. Alaska, filed Aug. 23, 1991).

how restoration funds could be spent,⁸ and I think this was a wise choice. In the case of the *Exxon Valdez*, baseline data were limited, which made it hard to prove harm definitively or establish benchmarks for evaluation of progress toward restoration. Inclusion of the word “enhancing” eliminated the potential argument that restoration funds could only be used to return injured natural resources (or lost or reduced services) to a poorly known pre-spill, baseline condition. Adding enhancement to settlement documents allowed the Trustees to focus on identifying and supporting actions that were beneficial to an injured natural resource—and the larger ecosystem—without having to invest significant energy splitting hairs about whether the proposed action would result in a return to, but not go beyond, an uncertain baseline condition for a specific resource in a dynamic environment.

Having the ability to enhance a resource in the tool kit also provided supplemental justification for a given restoration action and perhaps shortcircuited the need for difficult judgments concerning which of the standard restoration terms otherwise applied. For example, protection of forested upland habitats used by injured fish and wildlife could be justified as restoration measures to facilitate natural recovery from the effects of the spill. If that justification was not persuasive, however, those same actions also enhanced recreational opportunities for people who lived in or visited the spill-impacted region, and who perceived that the oil spill had compromised intangible values, such as wilderness qualities.

The concept of enhancement was especially useful as an underlying rationale for allocation of restoration funds to support long-term research and monitoring in the spill area. The Trustee Council found that such activities were necessary to support restoration and healthy functioning of the northern Gulf of Alaska-Prince William Sound ecosystem, which was injured by the spill. Although research and monitoring clearly can be justified as necessary to monitor the recovery of injured resources, the concept of enhancement obviated the need for arguments about whether there was continued justification to support research and monitoring activities as time after the spill event grew longer. One result of the Trustee Council’s focus on the larger ecosystem, in addition to specific resources, was the Gulf Ecosystem Monitoring Plan (GEM).⁹ GEM was

⁸ Hunt, Joe. 2002. *Mission Without a Map: The Politics and Policies of Restoration Following the Exxon Valdez Oil Spill*. Exxon Valdez Oil Spill Trustee Council, Anchorage, Alaska.

⁹ Mundy, P. M. McCammon, and R. Spies. 1992. *Gulf of Alaska Ecosystem Research and Monitoring Program (GEM): The GEM Program Document*. Exxon Valdez Oil Spill Trustee Council, Anchorage, AK.