

The BP Oil Disaster at One Year:

A Straightforward Assessment of What We Know, What We Don't, and What Questions Need to be Answered



April 2011

www.nrdc.org/gulfspill

About NRDC

The Natural Resources Defense Council is an international nonprofit environmental organization with more than 1.3 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Montana, and Beijing. Visit us at www.nrdc.org

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Introduction



This month we mark the passing of one year since the *Deepwater Horizon* drilling rig exploded over a BP well, killing 11 workers and opening a gusher that spewed some 170 million gallons of toxic crude oil and 200,000 metric tons of methane gas into the Gulf of Mexico.

The harm has been widespread. The people of the region have suffered many ill health effects and lost billions of dollars of income as a result of the spill.

The short-term effects to the region's wildlife were

heartbreaking. And we are only beginning to understand what the medium- and long-term effects may be. The slow pace of scientific research and even slower release of findings to the public leave us with many unanswered questions about the fate of the oil and its impacts on the Gulf ecosystem.

Throughout the last year we have read media reports reporting on many aspects of this disaster, some appearing to contradict one another and others seemingly overlooking important findings emanating from scientists and communities in the Gulf. As we pass the one-year mark following the beginning of the BP oil disaster—with no end yet in sight—this short paper offers a straightforward analysis of key issues surrounding the health of the Gulf, its wildlife, and the communities that depend on both for their own survival.

Our government and the oil and gas industry with whom we have entrusted a precious natural resource have both fallen short of delivering what our nation—and particularly the people of the Gulf—deserve. But it is within our power to change, to restore the Gulf, to make its people whole, and to make deepwater drilling safer and more environmentally sound for the time being, while we work to reduce the need to put workers at risk drilling in deeper and more dangerous waters.

UNDERSTANDING THE SCIENCE

AN UNPRECEDENTED SPILL

Determining the ecological impacts of even relatively small oil spills is tricky business. The scale, duration, and location of the *Deepwater Horizon* oil spill makes this ecological assessment one of the most challenging in history. Oil, gas, and chemical dispersants contaminated an unprecedented array of marine and coastal habitats—from the sea floor to the surface, far offshore and onshore at beaches and in marshlands. Research to date on the oil spill and its aftermath has shed some light on the level of complexity within Gulf ecosystems and how they respond to environmental assaults. Gaining a real understanding of those systems and responses, however, will take scientists many years. In the wake of the *Exxon Valdez* disaster, for instance, ecological studies were not published until three years after the spill, while research on chronic harm took 10 years.

THE SCIENCE OF DETERMINING ECOLOGICAL HARM

The basic approach to identifying the ecological harm caused by an oil spill includes tracking the oil, determining its toxicity and longevity in the environment, observing what it encounters, and then determining harm to organisms and habitats. The initial phase of the research is concerned primarily with chemistry and the latter phases focus on the biological and ecological impacts to key species and habitats.

Impacts from oil spills occur in two waves: acute and chronic. The first wave captures the attention of the public, because the destruction is conspicuous. The oiling of habitats and wildlife causes acute mortality or debilitating injury. This is the initial ‘body count’ phase of oil spill research. However, as the oil disperses and weathers, the acute effects fade and the less visible—though still harmful—long-term processes begin. Scientists learned from the *Exxon Valdez* oil spill that relatively small amounts of sequestered oil can have lingering impacts on the health and composition of the ecological community. Repeated exposure to buried oil caused chronic contamination to sea otters and seaducks during foraging and to fish during egg-laying. These chronic exposures caused delayed harm to populations and postponed recoveries.

To fully assess the harm of the *Deepwater Horizon* oil spill, an army of scientists, across a spectrum of science (chemistry, oceanography, biology, and ecology) will be needed. Each study will reveal a small piece of the puzzle and considerable synthesis from teams of experts will be required. The entire process will likely take decades.

WHAT WE CURRENTLY KNOW

One year following the spill, a series of stories about the chemistry (oil, gases, and dispersants) of the oil spill are emerging, though they remain incomplete. For example, we know that approximately 170 million gallons (plus or minus 10 percent) of oil and 200,000 metric tons of methane gas entered the Gulf of Mexico. Eight percent of that oil was recovered via burning and skimming (leaving 156 million gallons in the environment). A large proportion of the unrecovered oil traveled to the surface, and some smaller amount formed subsurface plumes at depths between 800 and 1300 meters in the water column. Of the fraction that remained in deep water, some amount was deposited on the seafloor and some amount was degraded by oil-eating bacteria. Of the oil that made it to the surface, approximately 25 percent evaporated, and unknown amounts traveled to land, were deposited on the sea floor in shallow waters, were dispersed or degraded, and formed tar mats that remain floating in the Gulf of Mexico. Altogether the oil affected from the bottom to the top, including floating *Sargassum* communities, shallow sub-tidal bottoms, sea grass beds, wetlands, oyster-flats, and sandy beaches. Impacts to deep-sea ecosystems illustrate the unique challenges of the *Deepwater Horizon* oil spill.

We are still lacking a critically important, refined quantitative oil budget accounting for how much oil went where. Furthermore, it is too soon to calculate the longevity of the oil in some of these habitats (e.g., the sea floor and the coastal zone).

Even less information is available on the biological and ecological impacts. From the initial ‘body-count’ phase of oil spill research, we know that approximately 650 miles of coastline was oiled (126 miles moderately to heavily), and that the carcasses of 6000 birds, 600 sea turtles, and 100 marine mammals were collected in and around the oil spill. However, the true mortality suffered by wildlife as a result of this oil spill remains unknown. Necropsy results remain unavailable and the appropriate multipliers to determine true mortality have not been determined for birds and turtles. The carcasses found following an oil spill do not represent the full death toll because dead organisms—particularly in the marine environment—are difficult to find. For example, a recent study on the true impacts to marine mammals from the *Deepwater Horizon* oil spill estimated that the mortality levels in marine mammals were actually 16 to 50 times higher than the collected count, depending on the species. There is currently no information available on the population

or ecological-level impacts to fisheries, wetlands, deep sea ecosystems, sub-tidal bottom communities, sea grass beds, and sandy beaches.

WHY WE KNOW SO LITTLE

Two parallel lines of research are simultaneously being conducted: 1) independent research by state and academic scientists and 2) the Natural Resources Damage Assessment (NRDA) by federal and state ‘Trustees’, as is required by the Oil Pollution Act of 1990 and described in more detail in NRDA section of this paper.

While the pace of discovery following the *Deepwater Horizon* disaster has been much higher than following other disasters like the *Exxon Valdez* spill, only a few dozen studies have been published by independent researchers in the peer-review literature. To date, nearly all of this research focuses on the chemistry of the spill. Impacts to the ecosystems of the Gulf have been mainly limited to responses of the marine microbial community to oil and methane. The data available so far represent tiny pixels of information; we will need many, many more to see the full picture.

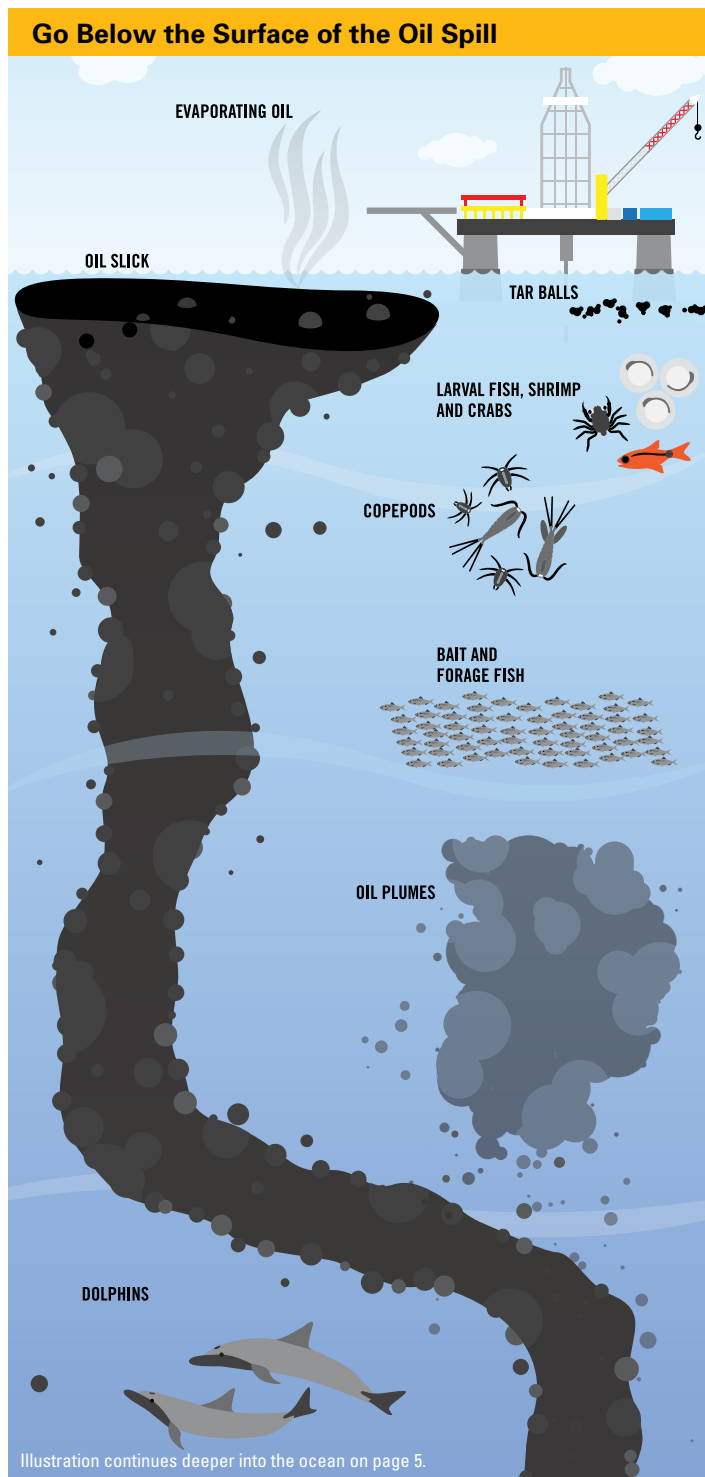
THE NEED FOR GREATER RESEARCH AND TRANSPARENCY

We need to be patient and support the science and the process. Yet we also have to make sure the government is doing everything it can to research critical questions. As the basis for the government’s legal case against BP to determine necessary ecological damages and restoration needs, the research associated with the NRDA has been closed to the public. The Trustees attribute this lack of transparency to the need to protect their legal case against BP and the other responsible parties. This strategy, however, runs the risk that the lack of information will be interpreted as a lack of harm.

We must ensure that the government oversees a full synthesis of existing government and academic data, conducts a more refined oil budget—such as the one performed following the *Exxon Valdez* oil spill—and oversees thorough monitoring of the long-term effects of the disaster. The central lesson from the *Exxon Valdez* is that spill impacts can be manifested for decades.

Did the dispersants work? Studies on government websites do not provide the answers. The early ‘oil budget’ provided by NOAA should not serve as the final word on this matter.

Where has the oil still in the environment gone? How much oil remains underwater? What amount rests on the Gulf’s deep and shallow seafloors? What quantity washed onto beaches and into marshes? How much oil is being buried?



These questions remain unanswered, but they must not remain unexamined. That is why it is critical that interest in oil spill research does not fade with the headlines—not with the ever-growing demand for hard-to-get-to oil. What's at stake is nothing less than the quality of the restoration effort, our ability to respond to future oil disasters, and the fate of Gulf Coast communities.

Exploring the Deep Sea Impacts of the Oil Spill

The deep seafloor is generally a dark and cold habitat where the extent and diversity of the biological communities are determined largely by available food supplies. In this delicately balanced environment the discharge of oil and gas from the BP well presented three main categories of threats: interaction with oil- and gas-rich plumes; sedimentation of oil-containing aggregates; and contact with the oil content (toxicity) of sedimented material.

Interaction with Oil and Gas Plumes

While the deepwater plumes were identified well above the ocean bottom where they were emitted from the wellhead (around 1500 meters), their subsequent motion through the complex deep ocean environment almost certainly resulted in interaction of plumes with deep ocean organisms. While oxygen depletion within the plumes is unlikely to have been so severe as to negatively affect deep sea organisms, the impact of dispersants on deep sea fauna and the interactive affects of oil and dispersant exposure on these organisms remains unclear.

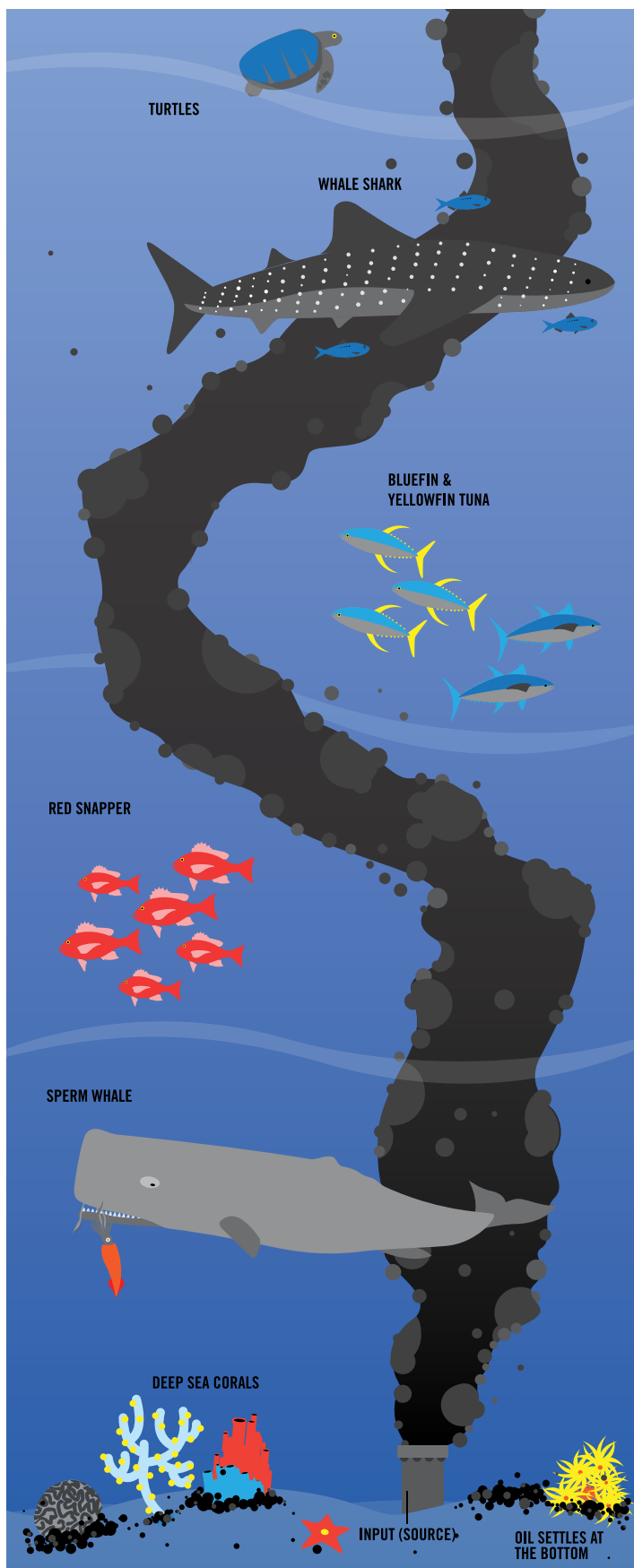
Blanketing with Sedimentation

Like other parts of the ocean system, deep sea habitats are in a delicate state of balance. An increase in sedimentation could represent a significant hazard to small, immobile filter feeding fauna because these organisms are prone to rapid burial and suffocation; even mobile filter feeding fauna could be overwhelmed by a blanket of sediment. Sedimentation can also affect large filter-feeding fauna, like corals and pogonophorons, by fouling or clogging filtration systems. And even species that are well adapted to natural oil exposure could be threatened by rapid sedimentation.

Another impact related to sedimentation of oil is potential toxicity related to polycyclic aromatic hydrocarbon (PAH) exposure. Findings of the Operational Science Advisory Team suggest that any known toxicity impacts would be limited to an area focused around the wellhead (2 to 5 kilometer diameter sphere of toxicity).¹ However, because no data exists regarding toxicity of oil and oil/dispersant mixtures of non-cold seep Gulf of Mexico specific benthic fauna, it is difficult to link observed mortality to toxicity versus suffocation due to rapid sedimentation.

Gaining a Better Understanding of the Deep Sea Floor

A clear understanding of the potential deep sea floor impacts of an oil discharge in the Gulf of Mexico requires that we document the impacts of oil, dispersant, and oil/dispersant exposure to the variety of organisms that inhabit the deep sea floor. Understanding the cascade of impacts that may result from loss of a keystone habitat-generating or habitat-molding species is also critical for understanding the long term impacts along the seafloor.



To view an interactive version of this graphic visit www.nrdc.org/energy/gulfspill/belowsurface.asp

ASSESSING IMPACTS ON MARINE MAMMALS

For marine mammals, the most immediate danger from the oil spill was from physical oiling and inhaling toxic fumes, which can cause brain lesions, disorientation, and death. Going forward, the mechanisms of harm have been and will continue to be more subtle. As we have seen from the *Exxon Valdez*, oil can work up the food chain, accumulate in body tissue, induce cascade effects across an ecosystem, and impact wildlife populations for decades afterwards.² For now, concern for marine mammals has centered on three particularly vulnerable species: bottlenose dolphins, sperm whales, and Bryde's whales.

RECOVERED CARCASSES REPRESENT THE TIP OF THE ICEBERG

Historically, oil spill response efforts have understandably focused on impacts to coastal wildlife and ecosystems since the surface destruction is the most visible. But animals whose bodies are recovered in a die-off are sometimes said to represent the tip of the iceberg—simply the ones that, by chance, have become stranded and been discovered and then reported to authorities. In the *Exxon Valdez* case, where serious impacts on killer whales, sea otters, and shorebirds took years to manifest themselves, the government came up with a multiplier to account for the numbers of undiscovered dead animals that the oil giant was liable for.³ In the Gulf of Mexico, the multiplier for some marine mammal species could be very high. According to a recent study, on average, only one in fifty whales and dolphins that die at sea are recovered on the Gulf's shores.⁴

BOTTLENOSE DOLPHINS



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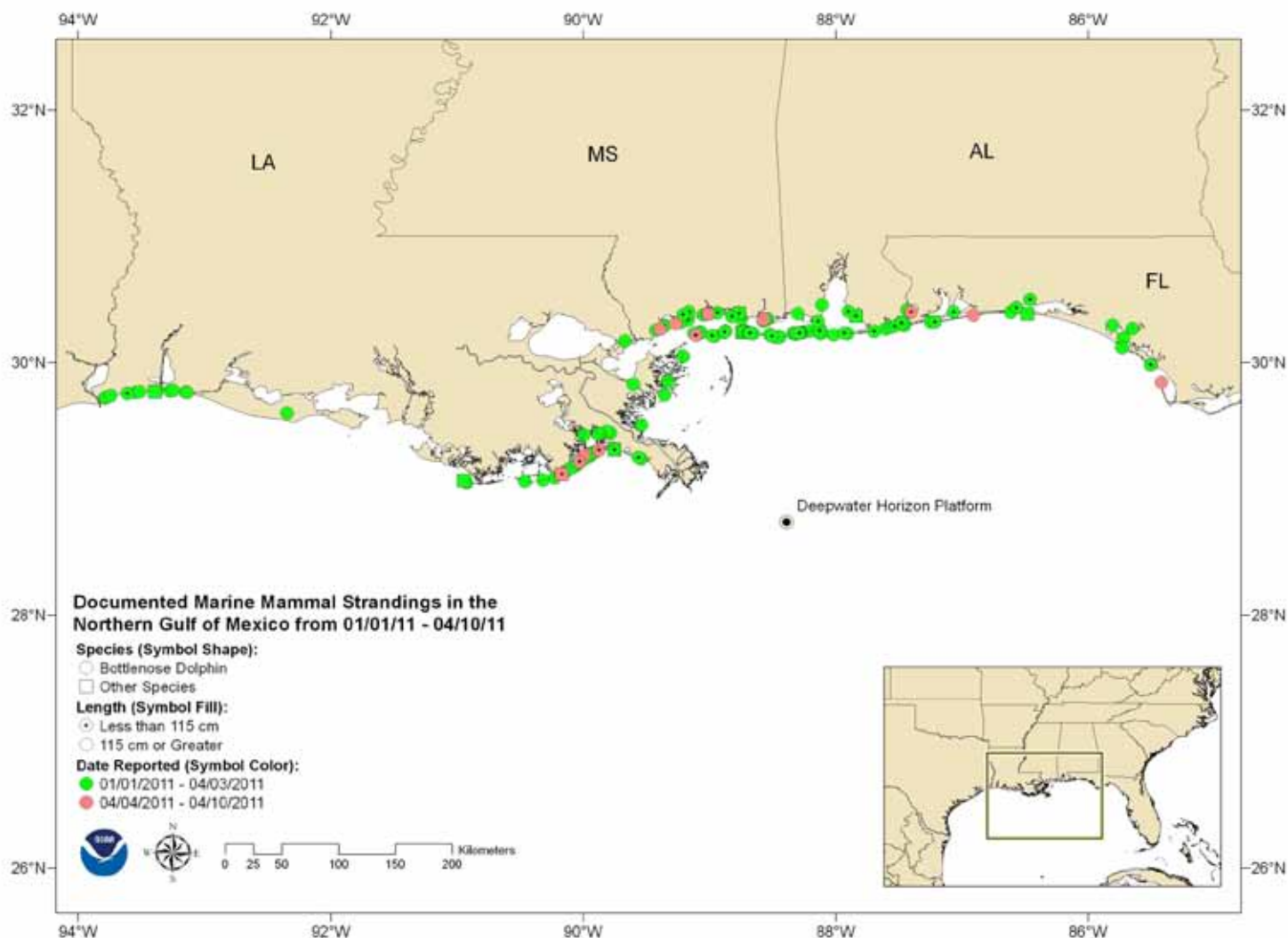
The BP oil disaster happened at a terrible time for the Gulf's bottlenose dolphins, at the beginning of their reproductive cycle when the coastal population comes nearer to shore. Many observers witnessed them swimming in and around the spill, demonstrating their inability (observed during previous spills) to avoid sheens and emulsified oil.⁵ More than one hundred bottlenose dolphins were found dead in the months following the blowout.⁶ A second die-off has plagued this year's calving season, with more than 150 additional animals stranded—nearly half of them stillborns or neonates who seem to have been unable to take their first breath.⁷ Though some of these animals were visibly marked with Macondo oil, it is not clear what role the spill may have played in the recent strandings, and demonstrating a link is likely to be difficult in any case.⁸ Regardless, the latest die-off is extremely concerning to residents and biologists alike. The dolphin communities that have made their homes in the Gulf's bays, sounds, and estuaries are small and semi-isolated, and the death of even a few babies can have outsized effects on the group.⁹



Young adult dolphin stranded in Orange Beach, Alabama.

© Jerry Cope

2011 Die-offs of Bottlenose Dolphins



The green and red circles indicate strandings of dead bottlenose dolphins from January 1, 2011 through April 10, 2011, a die-off that includes a disturbingly high number of stillbirths and neonates.

SPERM WHALES



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Sperm whales have long been attracted to the underwater canyons that extend into the Gulf of Mexico, south of the Mississippi Delta. The waters there are both deep and nutrient-rich, and for the

Gulf's small sperm whale population they constitute a sort of nursery, inhabited by groups of breeding females and calves and immature males who are seldom seen outside of it.^{10,11} Unfortunately, the same waters, which ten years ago became one of the principal targets of deepwater drilling, also played host to the Macondo well. In the wake of the spill, a juvenile was found floating dead in the water—a rare find suggesting the loss of many other whales.¹² Acoustic monitoring confirms that at least some sperm whales remained in the Mississippi Canyon last summer.¹³ It is unclear what long-term effects the oil and dispersants may have on these deep-foraging, endangered animals.

BRYDE'S WHALES



© NOAA

Bryde's (pronounced "Brutus") whales are by far the Gulf's most commonly occurring baleen whale species, but their numbers are surpassingly small. According to NOAA's stock assessments, fewer than fifty of the whales

were thought to remain even before the spill.¹⁴ These few have been sighted almost exclusively within a single location, the DeSoto Canyon, which lies offshore between Mobile, Alabama and Panama City, Florida.¹⁵ Bryde's whales rely on their baleen to filter food, putting them at substantial risk of oil ingestion. No one knows how the whales weathered the spill; indeed, they stand as poster children for our astonishing lack of knowledge about the Gulf's offshore species. Remarkably, we lack even the basic genetic information needed to determine whether they are indeed, as several biologists have theorized, a desperately small, distinct, and isolated population—information that is plainly critical to their conservation.^{16,17}

OIL AND GAS EXPLORATION PRESENTS ADDITIONAL THREATS FOR MARINE MAMMALS

The northern Gulf is one of the most industrialized stretches of ocean on the planet. Its waters are dense with shallow and, increasingly, deepwater platforms, some with undersea structures that themselves can extend dozens of miles around a central hub. Ships and helicopters traverse the area to service them, and a variety of activities potentially disruptive to wildlife, from drilling to explosive platform decommissioning, take place daily.¹⁸

According to most biologists, the most disruptive of these activities are probably seismic surveys, the industry's primary tool for offshore exploration in the Gulf and elsewhere, whose high-powered airguns regularly pound the water with sound louder than virtually any other man-made source save explosives. These surveys have a vast environmental footprint, disrupting feeding, breeding, and communication of some marine mammal and fish species over vast distances.¹⁹ For the Gulf's sperm whales, they mean less food: even moderate levels of airgun noise appear to seriously compromise the whales' ability to forage.²⁰ In an average year, BOEMRE approves more than 60 seismic surveys in the northern Gulf, none of which has undergone review under the Marine Mammal Protection Act.²¹ No one knows how the cumulative impacts of this nearly constant disruptive activity will affect wildlife already compromise by the spill.

RECOMMENDATIONS FOR ADDRESSING THE PLIGHT OF MARINE MAMMALS

- Congress and the administration should adopt the recommendations of the National Commission on the BP *Deepwater Horizon* Oil Spill and Offshore Drilling.
 - Congress should establish a research fund to ensure that vital research on Gulf marine mammals continues once NRDA funds expire.
 - The administration should strengthen mitigation requirements for seismic surveys and other activities that are currently threatening the same vulnerable species affected by the spill.
-

MAKING THE MOST OF THE NATURAL RESOURCE DAMAGE ASSESSMENT

Under the Oil Pollution Act of 1990, BP and other responsible parties are required to pay for assessing the damage to natural resources and for restoring injured ecosystems to their pre-spill conditions. This process, called the Natural Resource Damage Assessment (NRDA) is managed by government agencies with expertise and oversight in natural resource management, including the National Oceanic and Atmospheric Administration (NOAA) and the Department of the Interior (DOI). These federal agencies and their state counterparts are “Trustees” designated to work on behalf of the public to restore the damage done to publicly owned resources.

The NRDA process has four distinct phases:

- **Pre-Assessment:** the fate of the oil is tracked and baseline natural resource data is collected.
- **Injury Assessment:** in-depth scientific studies are undertaken to ascertain specific impacts to wildlife, habitats, ecosystems, and the services provided by these resources.
- **Restoration Planning:** the cost of restoration is determined and a restoration plan developed.
- **Restoration Implementation:** specific restoration projects are implemented, monitored, and adapted over time until natural resources are returned to their pre-spill condition.

The Trustees are currently engaged in the injury assessment phase and have begun collecting public comments on the scope of the upcoming draft restoration plan and associated environmental impact statement. The *Deepwater Horizon* NRDA is by far the largest and most complex ever undertaken.

Unfortunately, very little information has been released to date on the status of the assessment and possible approaches for restoration—information that is vital for meaningful public participation. The Trustees attribute this lack of transparency to the need to protect their legal case against BP and the other responsible parties. However, it is possible to preserve necessary confidentiality while also reporting on the current status of the assessment and sharing the same level of information with the public that BP has had access to.



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THE TRUSTEES MUST RELEASE A NRDA STATUS REPORT TO ENABLE MEANINGFUL PUBLIC PARTICIPATION

Public participation helps increase the legitimacy and credibility of the process and contributes to the comprehensiveness of the injury assessment and restoration planning. There is enormous interest in the scientific analyses currently being conducted by the Trustees on behalf of the public. There is also a great deal of knowledge and expertise among those outside of government—scientists, academics, environmental groups, fishing interests, and community members—that can play an important role in contributing to a complete assessment of injury and an effective and widely supported restoration plan.

Through a series of meetings and letters, NRDC and others have been calling on the Trustees to take specific actions to improve public participation in the NRDA process since soon after the well was plugged last July. In particular, we requested the Trustees release a comprehensive NRDA report similar to the one released five months after the *Exxon Valdez* oil spill in 1989, and annually thereafter.²² This report would provide the public with a fuller understanding of the scope of the government’s NRDA efforts.

In November, the Trustees told us they would release a summary NRDA report of about 25 pages by the end of 2010 (the first *Exxon Valdez* NRDA Report was 258 pages). In January, we were informed the report had been reduced to 6 to 10 pages and would be released by the beginning of February. No such report has yet been issued. The public cannot comment meaningfully on the scope of an incomplete restoration plan without a fuller understanding of the current status of the assessment and its preliminary findings.



THE TRUSTEES MUST DISCLOSE ALL AGREEMENTS AND COMMUNICATIONS WITH BP

The NRDA regulations require the Trustees to invite responsible parties to participate early in the process and, when possible, to enter into formal agreements to conduct crucial parts of the damage assessment cooperatively. The scope of the relationship is left to the discretion of the Trustees, depending on the willingness of responsible parties to participate and provide up-front funding. Although the Trustees maintain the final authority in the process and may terminate the participation of a responsible party for interfering with the process, there are ample opportunities for responsible parties to influence the process.

In May of 2010, BP committed to providing funding for “reasonable assessment costs” of pre-assessment and assessment activities, including an initial payment of nearly \$45 million to the Trustees. BP also offered to enter into a “formal cooperative framework that would provide a mechanism for coordinating assessment work and provide for ongoing reimbursement of Trustee assessment costs.” It is unclear whether such a formal agreement has been established and to what degree the scope and type of damage assessments being carried out by the Trustees have been influenced by financial dependency on BP. The Trustees have said that they are conducting some assessments independent of BP and that they have some discretionary agency funding to carry them out. The full scope of this relationship, including the release of all cooperative agreements and communications between the Trustees and BP, must be made public to allay concerns of BP’s influence over the independence of the damage assessment and restoration process.

THE TRUSTEES MUST HAVE INDEPENDENT FUNDING SOURCES WHILE BUILDING THEIR CASE AGAINST BP

The Trustees must have financial independence to carry out a comprehensive and unbiased NRDA process. To facilitate this, Congress established an Oil Spill Liability Trust Fund (OSLTF) that can be used for damage assessments and restoration activities. The Fund contains a limit of \$1 billion per incident, with a maximum of \$500 million that can go toward NRDA-related activities. The limit is based on gross expenditures regardless of any reimbursements back to the Fund. For example, if the Trustees spend \$500 million from the Fund on NRDA activities and BP reimburses \$450 million, the Trustees are still precluded from accessing any additional funds for that NRDA incident.

Although an official accounting of OSLTF expenditures has not been released for the *Deepwater Horizon* oil spill, it is estimated that total expenditures for response and restoration activities are fast approaching the \$1 billion limit. If this occurs before NRDA claims are resolved, the Trustees risk becoming more financially dependent on the very party they are building a legal case against. Congress must ensure that independent funding mechanisms, whether by way of lifting the Fund cap or by some other means, are available to the Trustees to implement a complete damage assessment process.

THE TRUSTEES MUST NOT SETTLE TOO EARLY AND MUST HAVE A MECHANISM TO RECOVER UNFORESEEN DAMAGES

Limited funding to carry out an independent damage assessment could induce the Trustees to settle with BP before a comprehensive assessment has been completed. This could lead to substantial damage not being accounted for in the restoration plan. The Trustees must avoid a premature settlement before the scope of the damage is fully understood and must include a mechanism for recovering unforeseen damages even after claims have been settled. An explicit “reopener” provision is a commonly used device in such situations. Any such reopener should provide the government the option for post-settlement claims with no limit on the timing or amount of future claims and a broad definition of the type of “new information” that can trigger future recovery.

IDENTIFYING AND ADDRESSING PUBLIC HEALTH CONCERNS

For the communities whose lives are inextricably linked to the health of the Gulf, the ecological and environmental destruction that occurred as a result of the BP oil disaster brought—and continues to bring—significant public health consequences that have not been fully investigated. Comprehensive studies and long-term monitoring and surveillance efforts are needed to fill the gaps and guide policies to protect vulnerable communities.

The BP oil disaster was unprecedented in its size, duration, location, and use of chemical dispersants. Taken together these factors contribute to a huge amount of unknowns and uncertainties about the impacts of the oil spill on ecosystems and coastal communities. One year later, the oil is not all gone, many communities are continuing to struggle, and there are significant questions about health impacts that need to be addressed.

Scientists need to work with communities to develop comprehensive and transparent studies related to air quality, seafood safety, and community and worker health that can shed light on public health threats.

AIR QUALITY

During the oil spill there were ongoing complaints of odors in coastal communities and respiratory symptoms dominated a health survey conducted in the aftermath of the spill.²⁴ In addition, a recent study documented an additional air pollutant, aerosols (tiny particles) that formed over the oil slick that threatened clean-up workers and may have affected onshore communities.²⁵ Scientists who collected air quality samples and agencies who conducted day to day air quality monitoring need to pool all their data to see if they can get to the bottom of the following questions:

1. What was the source of the odors?

A comprehensive assessment of wind patterns, odor complaints, and measured concentrations of the full suite of hydrocarbon compounds detected by coastal monitoring stations should help shed some light on this question. Further toxicological assessments may be needed to understand the link between these compounds and health impacts because the health risks associated with the full soup of chemical compounds found in oil is not well characterized.

2. To what degree did the aerosols make it onshore and at what levels?

Unfortunately, the limitations in the U.S. Environmental Protection Agency's particulate monitoring in coastal Louisiana hampers the ability to definitively answer this question. Air pollution models, or data gathered by other means, should be pursued to help understand coastal air quality threats experienced during the spill.

3. What levels of aerosols were clean-up workers exposed to out on the slick?

Analyses should be pursued to link offshore air quality monitoring conducted from airplanes to any available surface level data to estimate what workers may have experienced. Regrettably, worker level monitoring for particulates was sparse and not capable of detecting the small particles created by the oil spill.

SEAFOOD SAFETY



Contaminants in oil, such as polycyclic aromatic hydrocarbons (PAHs) and metals, can accumulate in the food chain contaminating seafood and leading to health risks, particularly for people

who eat a lot of seafood. The large volume of oil that spewed into this productive fishery, the use of subsurface dispersant chemicals to breakdown the oil into smaller particles, and the findings of plumes of oil-spill related contaminants in the subsurface raise questions about the extent and duration of potential seafood contamination. A long-term monitoring program is needed that includes the following:

1. Continued testing of major seafood harvesting areas

The Food and Drug Administration (FDA) relied on a total of 67 samples of shrimp to certify the safety of shrimp harvested in coastal waters from Louisiana to Florida. The last of this dedicated sampling was conducted at the end of October. Since then, the FDA has not gone back and actually re-sampled these areas. Instead, the FDA has relied on a surveillance program that does not provide specific information about where the samples were collected and does not provide for comprehensive ongoing tracking of contaminant levels in coastal waters.²⁶ For example, only five

shrimp surveillance samples indicate that there were collected in Mississippi (two in October and three in November). We do not know where these shrimp were actually harvested or what contaminant levels are like now, almost five months after the last samples were taken. This testing is not sufficient to determine contaminant levels over time or to certify the ongoing safety of these seafood harvesting areas. The National Oceanic and Atmospheric Administration (NOAA) has shown that this can be done. NOAA's belated release of "post opening surveillance data" reflects samples that were taken to monitor offshore areas (in federal waters) that have been re-opened, enabling comparison of contaminant levels over time.²⁷

2. Testing for heavy metals

Metals, such as cadmium, lead, and mercury, are found in crude oil and can accumulate in marine food chains resulting in health hazards for seafood consumers. Long-term monitoring at multiple levels of the food chain (including oysters, other shellfish, and fish) is needed to evaluate the ongoing impacts of this contamination on the Gulf Coast.

3. An evaluation of threats posed by non-Polycyclic Aromatic Hydrocarbon (PAH) hydrocarbons

Independent testing of seafood in Louisiana, by the Louisiana Environmental Action Network (LEAN) uncovered evidence of contamination with petroleum hydrocarbons that is not currently covered in either FDA or NOAA testing.²⁸ In addition, FDA scientists concluded in their report following the *Exxon Valdez* oil spill that further study is needed to characterize the full toxicity of oil-related hydrocarbons—beyond PAHs—in seafood. Despite this recommendation, a comprehensive assessment was not completed and the degree to which this contamination poses a human or ecosystem health threat should be investigated.

WORKER AND COMMUNITY HEALTH



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The spill resulted in an onslaught of health threats ranging from environmental exposures, particularly for clean-up workers, to increased anxiety and depression stemming from community disruption and economic meltdown. A woefully inadequate healthcare system, with a shortage of clinics and a large fraction of the population uninsured, was a recipe for the kind of suffering experienced by Gulf communities, that still continues today.²⁹ Studies that track and evaluate the health status of clean-up workers and coastal communities are urgently needed, including:

- 1. Tracking oil-spill related symptoms and illnesses through state and federal registries to collect reports of oil-spill related symptoms from healthcare providers.*
- 2. Community health surveys that identify health issues and impacted areas.*
- 3. Comprehensive evaluation of health impacts experienced by clean-up workers participating in the National Institute of Environmental Health Sciences (NIEHS) Gulf Long-term Follow-up (GuLF) study.*
- 4. A companion study to track long-term health impacts in coastal communities.*

ANSWERING THE UNANSWERED QUESTIONS IN GULF COMMUNITIES

They say that time heals, but unaddressed health threats can fester. In addition, what we learn from this disaster can make us better prepared and better able to prevent some of the types of devastation being experienced on the Gulf Coast. One year later, questions have piled up and the communities at the frontline of this disaster are demanding answers. We ought to mark this anniversary by committing to pursue the science needed to ensure public health threats are identified and addressed and that the communities of the Gulf are provided with the answers and care they deserve.

GRASPING THE REGIONAL ECONOMIC IMPACTS

In addition, and in relation to the environmental destruction, the BP oil disaster left an economy in shambles. Once-lucrative fishing and tourism businesses were devastated by the spill, and some Gulf residents are still struggling to feed their families. New data has revealed the economic toll taken by the BP disaster. The numbers remind us that the true cost of oil is not just what we pay at the pump. It must also be factored in terms of lost jobs, lost income, and lost opportunities.

The real victims here are those whose livelihood was robbed as a result of the oil industry's culture of recklessness and the federal government's failure of oversight. The number of people in need of restitution is staggering.

CLAIMS PROCESS

The Gulf Restoration and Protection Foundation Fund has paid claims to 343 oil rig workers affected by a temporary moratorium on new drilling in the Gulf. That's not an insignificant figure, but the number of people outside of the oil industry is much, much larger. The Gulf Coast Claims Facility paid 176,540 claims to individuals and businesses who have suffered damages and costs related to the spill. That's more than 500 times the oil industry claims.³⁰

COMMERCIAL FISHING DECLINE

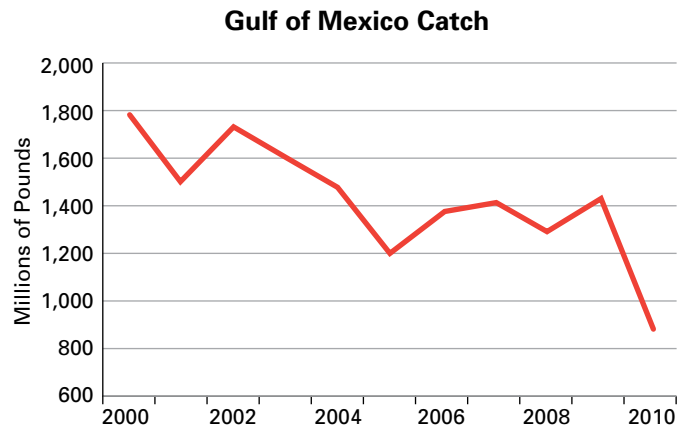


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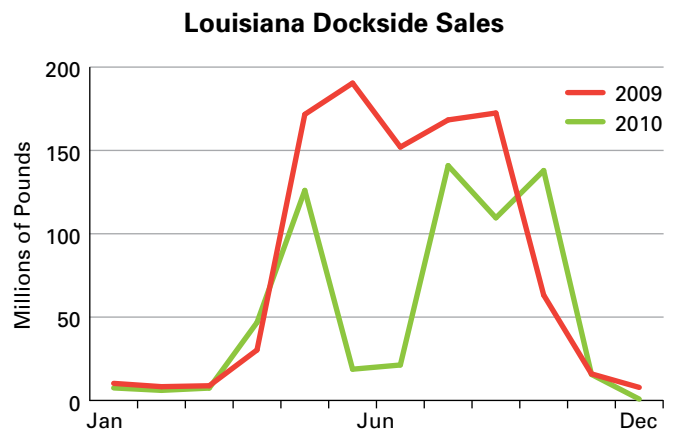
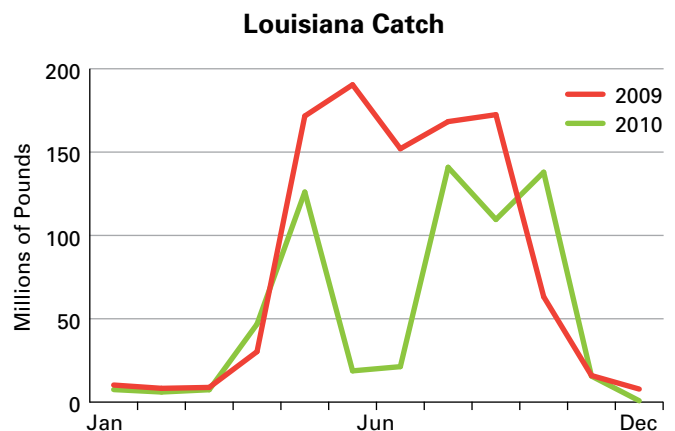
Fishermen are still reeling. The Gulf of Mexico saw a 39 percent decline in commercial fishing catches overall between 2009 and 2010. This represents a \$62 million loss in dockside sales.

Statewide catch losses reached 52 percent in Mississippi, 50 percent in Alabama, 37 percent in Texas, 36 percent in Louisiana, and 24 percent in Florida.

Gulf of Mexico Fishing Catch, 2000 through 2010³¹



Focus on Louisiana³²



Louisiana accounts for 70 percent of all Gulf landings. The state's seafood industry is worth more than \$2 billion. After the Gulf oil disaster Louisiana experienced a 36 percent decline in landings, and a 34 percent decline in dockside sales.

FAMILY HARDSHIPS



© Craig Fritz

This disaster precipitated real hardship for Gulf families. In a new documentary produced by NRDC called *Stories from the Gulf*, residents describe their financial struggles. Captain

Darla Rooks says she and her husband must now live on their boat because they can't afford to rent a home anymore. Others worry about keeping their businesses alive. Captain George Barisich says: "I was bred to be a fisherman. My boat survived Hurricanes Katrina and Gustav, but it may not survive this oil spill."³³

BLOW TO TOURISM

Many tourism businesses are also on the brink. The Gulf Coast Claims Facility has paid \$1.5 billion in lost earnings claims from individuals and businesses in the hotel, food, rental properties, and tourism industries. According to a national survey, 29 percent of people with plans to visit Louisiana canceled or postponed their trip because of the oil spill.³⁴

Ryan Lambert from Buras, Louisiana wonders how he can persuade visitors to return to the region. "After 30 years of building the largest guide business on the Gulf Coast, here we are down 90-something percent, we're going to have to rebrand and put the perception that everything is fine. But how do you do that if you don't know that it's fine?"

The challenge of attracting tourists back to the region could impact thousands of workers. The oil industry may wield a lot of power in the Gulf, but recreation employs far more people: for every one job in the oil and gas sector there are 84 jobs in the region's leisure and hospitality industries.³⁵

UNCERTAINTY IS THE ONLY CONSTANT IN THE GULF



© Cary Conover

What does the next tourist season hold for these workers? What will this spring mean for Gulf fishermen? Can residents keep up with their bills while they wait to see the long-term impacts of the spill?

These are daunting and painful questions for Gulf residents to confront. But these uncertainties will hover over coastal communities until America both strengthens the safeguards for offshore drilling and cuts back on the oil use that drives energy companies into ever riskier conditions.

We need to protect everyone—including the fishermen, restaurant owners, and tourism industry workers that rely on a clean, healthy Gulf to bring home dinner for their children and billions of dollars each year for the economy.

RIISING TO MEET THE CHALLENGE

Last June, President Obama impaneled the National Commission on the Deepwater Horizon Oil Spill and Offshore Drilling—upon which NRDC President Frances Beinecke was called to serve—to investigate the causes of the blowout and to make recommendations on what might be done to prevent such a disaster from happening again.

In its final report, issued in January, the Commission found that the risks of deepwater drilling have far outstripped the technology and safeguards we rely upon to keep our workers, our waters and our wildlife safe.³⁶ Moreover, the ability of the industry and the government to respond to a catastrophic spill has not kept pace with developments in offshore drilling. And the science we rely on to make decisions about oil activities is inadequate in light of the challenges and risks of deepwater drilling.

We need to strengthen the safeguards to better protect our workers and waters. We need to require those who profit from oil in deep water to operate there safely—or not at all. And we need to provide the people entrusted with enforcing protections with the resources they need to do the job right.

INDUSTRY MUST ACT TO IMPROVE SAFETY

Industry must put safety first. Per the recommendation of the National Commission, a separate institute supported by oil and gas companies and mandated with instilling a culture of safety within the industry should be created. Such an institute should exist separately and independently of any lobbying arm of the oil and gas industry, including the American Petroleum Institute.

The model for this is the Institute for Nuclear Power Operations, or INPO, created by the nuclear power industry after the 1979 partial core meltdown at the Three Mile Island nuclear plant in Pennsylvania. INPO sets high standards for nuclear plant safety, regularly audits facilities and operations, then shares its findings with the companies that insure these plants. That helps hold owners and operators accountable for safe operations, equipment, and procedures. The offshore oil industry should follow that lead.



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CONGRESS MUST ACT TO PURSUE LONG-TERM RESTORATION AND INDUSTRIAL ACCOUNTABILITY

Gulf restoration will require a long-term commitment to a comprehensive plan that addresses the immediate harm done by the oil and the systemic problems resulting from decades of industrial overdevelopment in the Gulf. Under current law, fines incurred under the Clean Water Act by BP and its partners would go into the Oil Spill Liability Trust Fund, a pool of money set aside to address future oil spills. Funds beyond the existing limit of this fund would then go to the U.S. General Treasury. Whatever benefits this approach might provide, they are trumped by the urgent need to treat the region that has suffered the most harm. We urge Congress to make at least 80 percent of the money from these fines available for Gulf restoration.

Similarly, under the Oil Pollution Act as now written, companies that pollute our waters or lands with oil spills are required to cover only \$75 million in damages. That figure is absurdly low. The liability limit and financial responsibility limits should be raised significantly so that polluters, not victims or taxpayers, are responsible for spill damages.



REGULATORY AGENCIES MUST IMPROVE OVERSIGHT

The BP oil disaster made clear the need to strengthen safeguards and to make sure the people we count on to enforce those safeguards have the tools they need to do the job. That means adequate funding, training, equipment and support.

The abolishment of the mission-conflicted Minerals Management Service and creation of the Bureau of Ocean Energy Management, Regulation, and Enforcement is an important first step. But adequate funding, training, equipment, and support are essential to ensuring proper oversight is conducted.

The agency has already written new regulations, some of which mirror the oil spill commission's recommendations and strengthen essential protections. However, further steps are needed. The Department of the Interior should further separate inspection and enforcement duties from leasing responsibilities by establishing an offshore safety authority to oversee offshore energy operations. The Department should also work with the White House Council on Environmental Quality to strengthen the National Environmental Policy Act to require environmental impact statements for activities on sites with complex geology or those in ultra-deepwater, the Arctic, and other frontier areas. And the department should enhance the role of science in decisions about offshore energy activities by creating a distinct environmental science division and increasing interagency consultations with the nation's lead civilian ocean agency, the National Oceanic and Atmospheric Administration.

HEEDING THE WAKE-UP CALL

The explosion aboard the Deepwater Horizon, the loss of life that resulted, and subsequent oil disaster was a terrifying and calamitous wake-up call to our nation about the dangers of allowing an insatiable appetite for oil to trump the enforcement of needed safeguards when carrying out complicated drilling operations in the middle of one of the world's most precious and productive ecosystems.

On the scale of history, one year is a short time. But in this past year, the people and wildlife of the Gulf have endured threats to their health and wellbeing that may result in effects they will carry for their lifetimes. Restoring the Gulf, making its people whole again, and taking the steps to prevent such a disaster in the future are no small challenges, but as a nation we can and must rise to meet them.

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