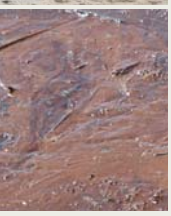


ISSUE 1 | VOLUME 1 | 2010

BTNEP *& the Deepwater Horizon Disaster*

DELIVERING COORDINATION, ASSESSMENT, AND UNDERSTANDING IN AN EVOLVING ENVIRONMENTAL CRISIS

BTNEP is deeply saddened by the massive oil spill impacting the Barataria-Terrebonne National Estuary. We are actively involved in efforts to safe-guard Louisiana's precious wetlands and are motivated to utilize partnerships to ensure the estuary is protected and restored.

All Hope is Not Lost

In the dark of night the offshore oil rig *Deepwater Horizon*, owned by Transocean Ltd. and operated by BP, exploded and caught on fire. The rig sank two days later, and 11 crew members were tragically killed. Shortly after the explosion, the worst environmental disaster in the United States began as a massive oil leak began spewing from the drilling rig's well head. The *Deepwater Horizon* was drilling 42 miles southeast of Venice, LA, beneath 5,000 feet of water and 13,000 feet under the seafloor.

While a monumental response, cleanup, and mitigation effort to the worst environmental disaster the United States has ever seen has been thrust onto Louisiana's shoulders, please know that we will prevail.

Unfortunately, Louisiana is not a stranger to disastrous events that test the very fiber of our being. Catastrophic events (wetland loss, the 2005 and 2009 Hurricane seasons, and the BP oil spill), have definitely impacted and changed our lives. However, we will continue to fight to restore our home, an ecological system that has been compromised and is collapsing around us before our eyes.

We do not ask why these events happen to us, we do not want a hand out, and we do not ask to live in an area where we should not, but we do demand reasonable protection and a restored coast. We have a right to expect reasonable protection from hurricanes and preventable environmental disasters.

Louisiana's wetlands must be restored now. The BP oil spill certainly underscores the need.

We also understand we can not do this alone and we ask for your help in preserving our past and protecting our future. Please join us in this fight.

Oil near Elmer's Island, LA. Sorbent boom can be seen in the oil.

BTNEP
BARATARIA-TERREBONNE NATIONAL ESTUARY PROGRAM

G.R.I.T.
GULF RESPONSE INVOLVEMENT TEAM

In the wake of the BP oil spill that is threatening our coast, local, regional and national conservation organizations are coordinating volunteers to assist in local, state and federal recovery efforts in Louisiana.

BTNEP, the Coalition to Restore Coastal Louisiana, the National Audubon Society, the National Wildlife Federation and The Nature Conservancy are established, active advocates for the preservation and restoration of coastal Louisiana.

With a history of on-the-ground work in Louisiana, these organizations combined efforts and experience will help to implement an effective volunteer response, and make a real difference in the BP oil spill recovery efforts.

G.R.I.T. (Gulf Response Involvement Team) lead volunteer efforts to cleanup the beach in the State Park on Grand Isle, LA on Saturday, May 14, 2010. Volunteers worked to protect the beaches of Grand Isle, and to improve the success rate of oil spill cleanup efforts. A proactive beach cleanup and debris removal helped to make cleanup easier and quicker because there would not be oil soaked debris to remove.

A beach clean-up was also held June 5, 2010 in Cameron Parish, LA in anticipation of oil moving westward. This project included the removal of debris, both natural and anthropogenic, from the shoreline to make the removal of oil less difficult and reduce the amount of hazardous material that will have to be disposed of once affected by the oil spill. Volunteers also raked and moved organic debris from the waterline to past the high tide line. Each of these volunteer events were successful in helping with oil spill cleanup, as well as providing an opportunity for concerned citizens to become involved in the cleanup.

www.lagulfresponse.org

FOR MORE INFORMATION OR TO REGISTER TO VOLUNTEER

Bird Rescue & Transport

BTNEP is assisting in the coordination of bird rescue response in Grand Isle by assisting in the organization of Vessels of Opportunity to transport oiled birds to Fort Jackson for cleaning and treatment. Instead of subjecting the birds to delayed treatment by driving 5 hours by land, BTNEP arranged through BP and its contractors to have boats transport the birds by water directly to Plaquemines Parish.

A royal turn that has been prepped for transport and is about to be loaded for its boat ride to a rehabiltation center in Port Sulphur.

Working with the Audubon Society, the US and LA Fish & Wildlife Service, the Louisiana State Animal Response Team, and the International Bird Rescue and Recovery Center, the stressed birds were given a better chance of survival. BTNEP also facilitated the donation of pet carriers of all sizes from Petmate to transport the birds safely to the cleaning facility. Along with boats and crews for transport, BTNEP secured additional boats to be used for scouting for injured and oiled birds.

BTNEP continues to work with corporate and private donors and the Louisiana Department of Wildlife & Fisheries to facilitate the donation of supplies needed in wildlife rescue and recovery.

Education

BTNEP Education Coordinator, Alma Robichaux, presented information on the Deepwater Horizon Tragedy to 14 Lafourche Parish Schools in the weeks following the explosion. "The children in South Lafourche needed to talk about the tragedy and have someone explain the facts in terms they could understand," said Robichaux.

BTNEP is working with several public and private educators to develop oil spill materials for teachers to be ready for the beginning of the school year. This curriculum will be available to all teachers in the Barataria-Terrebonne Estuary. Robichaux also intends to present the curriculum through teacher workshops and school visits.

Education Coordinator, Alma Robichaux speaks to school children about the oil spill.

Assessing Avian Communities

Documenting Impacts of the Deepwater Horizon Oil Spill on Coastal Avian Communities

Adult and junvenile brown pelicans on Queen Bess Island. Sorbent and containment boom can be seen in the foreground.

The Deepwater Horizon oil spill off the Louisiana coast is unprecedented. The negative impacts to coastal bird communities along the southeastern Louisiana coast are becoming increasingly evident: reports of oiled birds, dead, dying, or observed with differing degrees of oiling on plumage are a daily occurrence. Oil has thus far made landfall at different sites in differing degrees, some as isolated events, others more extensive and severe. It is imperative to document impacts of the spill on wildlife.

Prior to the oil spill, the Barataria-Terrebonne National Estuary Program (BTNEP) began planning for the second ground survey of nesting birds ever conducted along the entire Louisiana coast in the spring of 2010. Focal nesting species included Wilson's and Snowy Plover, American Oystercatcher, Least, Gull-billed, Caspian, Royal, and Sandwich Terns, Brown Pelican, and Black Skimmer. Data were also collected on Reddish Egret, Red Knot, and Piping Plover. Numerous individuals representing different agencies/organizations participated in the planning of the 2010 survey including the Barataria-Terrebonne National Estuary Program (BTNEP), Coastal Bird Conservation Program, Louisiana State University, National Audubon Society, and biologists with the Louisiana Department of Wildlife and Fisheries and U.S. Fish and Wildlife Service. The results of this survey can be compared to, and will build upon data collected during a similar survey in 2005 funded/coordinated by BTNEP.

The 2010 survey began in early May, shortly after the Deepwater Horizon accident occurred. In order to stay in front of potential impacts associated with the oil spill, the schedule was modified and our initial efforts included surveying those areas most at risk: islands from Grand Isle eastward to Sandy Point and then westward into Terrebonne and Timbalier Bay. Since then, we've also completed surveys of the Biloxi Marsh area from Lake Borgne to the islands south of the Mississippi River Gulf Outlet, the mouth of the Mississippi River, and from Rainey Refuge westward to the Texas State line. We also collected data for oiled birds including dead and dying birds and birds encountered during the surveys.

Bird assessment is performed on Queen Bess Island.

Whereas the 2005 and 2010 surveys mentioned above covered the entire Louisiana coast, BTNEP now seeks to cover only select locations within the Barataria-Terrebonne Basins, essentially the areas between the Mississippi and Atchafalaya Rivers.

OBJECTIVES

BTNEP plans to

- estimate avian numbers associated with the barrier island/headland beach habitats
- document dead, dying, and oiled birds versus un-oiled birds
- call in the lat/long of severely impacted birds to bird rescue teams
- conduct these surveys over time to track trends in oiled versus un-oiled birds
- and to develop a final report that presents the findings of the project.

To report oiled wildlife:
(866) 557-1401

A matrix will be developed/used to document oil on plumage and to assess behavior of individual oiled birds. There are now at least two protocols that exist in terms of data collection, one developed by the US Fish and Wildlife Service and one developed by LSU. BTNEP will pick one of those to conduct these surveys.

AVIAN ASSESSMENT METHODS

The project team will select specific beaches both on barrier islands and headland areas of the Barataria-Terrebonne area for which we have some baseline pre-spill data. Ground surveys of select beaches (both mainland beaches and barrier island beaches) within the Barataria-Terrebonne region will allow adequate regular coverage of the same areas. These select sites will be routinely surveyed for the project duration. The initial selection of sites will, in part, be determined by those areas impacted by oil events (intermittent contamination) or unaffected, and include those with and without oil spill emergency preparation (booms, dikes, etc). These ground surveys will allow for the needed scrutiny to detect smaller amounts of oil on a bird's plumage as well as in the environment.

These surveys would use trained /qualified observers who walk select beaches including dunes and overwash fans. All birds observed would be recorded: those exhibiting no signs of oil contamination, those with oil, those impaired by oil, or dead. This will allow determination of percent occurrence of oiled birds at different sites as well as information on mortality (or presumed mortality) at those sites. Based on experience from previous censuses, up to four two-person teams will be deployed for coverage of beach and adjacent habitats.

Consolidated Bird Collection Report

FROM US FISH & WILDLIFE SERVICE AS OF JULY 14, 2010*

Consolidated Numbers of Birds Collected ALIVE

	Visibly Oiled	No Visible Oil	Pending	Total
Alabama	69	0	0	69
Florida	156	0	0	156
Louisiana	837	0	0	837
Mississippi	58	0	0	58
Texas	0	0	0	0
Total	1120	0	0	1120

Consolidated Numbers of Birds Collected DEAD

	Visibly Oiled	No Visible Oil	Pending	Total
Alabama	52	251	1	304
Florida	137	394	0	531
Louisiana	373	345	0	718
Mississippi	122	183	8	313
Texas	0	0	0	0
Total	684	1173	9	1866

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

Field-level staff will document all injured or dead fish and wildlife encountered in the impact area. Not all of the injured or dead fish and wildlife reflected in these numbers were necessarily caused by the Deepwater Horizon/BP incident. Due to the increased number of trained people evaluating the spill impacted areas, it is also likely that we will recover more naturally injured or dead fish and wildlife than normal.

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

Consolidated Sea Turtle Collection Report

FROM US FISH & WILDLIFE SERVICE AS OF JULY 14, 2010*

Consolidated Numbers of Sea Turtles Collected ALIVE

	Visibly Oiled	No Visible Oil	Pending	Total
Alabama	5	2	0	7
Florida	2	12	0	14
Louisiana	3	6	0	9
Mississippi	0	28	0	28
Texas	0	0	0	0
On water	129	10	0	139
Total	139	58	0	197

Consolidated Numbers of Sea Turtles Collected DEAD

	Visibly Oiled	No Visible Oil	Pending	Total
Alabama	5	5	60	79
Florida	1	0	47	48
Louisiana	5	2	90	97
Mississippi	0	75	160	235
Texas	0	0	0	0
On water	3	0	1	4
Total	14	82	367	463

*Please see page 4 for more information

Mammals: Collected alive: 1 in AL and 1 in FL visibly oiled;
2 in FL and 1 in LA with no visible oil
Collected dead: 2 in LA and 1 in MS with visible oil;
32 in LA, 3 in AL, 14 in MS, and 1 in FL found with no visible oil;
Pending are: 2 in MS and 3 in AL
Reptiles: 1 pending found alive in LA

Other Large Oil Spills

IN THE GULF OF MEXICO*

Ixtoc I

- 200-foot-deep exploratory well blew out on June 3, 1979
- occurred in the Bay of Campeche, Mexico
- released 10,000 - 30,000 barrels (0.4 - 1.2 million gallons) per day for 9 months
- blowout preventor failed and the injection of metal and concrete balls into the well head slowed the release
- 2 relief wells brought the leak under control in March 1980
- a total of 300 million gallons of oil spilled (10 times the amount of *Exxon Valdez*)

Alvenus

- T/V *Burmah Alvenus* grounded in the Calcasieu River Bar Channel on July 30, 1984
- southeast of Cameron, LA
- 65,500 barrels (2.7 million gallons) of Venuzuelan crude oil spilled into the Gulf of Mexico
- a few of the thousands of birds on sand islands were injured
- large amount of oiled sand removed

Megaborg

- 5.1 million gallons
- lightering accident and subsequent fire on June 8, 1990
- 60 nautical miles south-southeast of Glaveston, TX
- little shoreline oiling
- off-shore skimming and dispersants used
- oil degraded into tarballs
- tar balls were not seen on beaches that were monitored

Burmah Agate

- M/V *Burmah Agate* collided with the freighter *Mimosa* on November 1, 1979
- resulting explosion and fire burned until January 8, 1980
- estimated 2.6 million gallons of oil spilled
- estimated 7.8 million gallons consumed by the fire
- marsh areas left to recover naturally because cleanup impacts would have exacerbated damage

Hurricane Katrina

- 250 oil-related pollution incidents
- estimated total of 8 million gallons
- many spills went unreported and/or unattributed; therefore, the amount of oil released will never be known
- in-situ burning, mechanical cleanup and manual recovery cleanup techniques used
- many marsh areas left to recover naturally because cleanup impacts would have exacerbated damage

* ADAPTED FROM NOAA'S OFFICE OF RESPONSE AND RESTORATION • EMERGENCY RESPONSE DIVISION'S "OTHER SIGNIFICANT OIL SPILLS IN THE GULF OF MEXICO

Chemical Dispersants

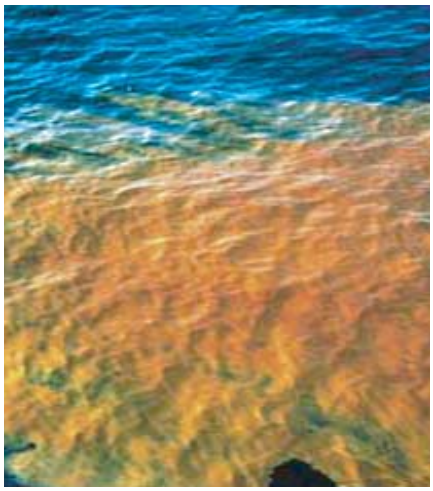
When faced with a spill, whether or not to apply chemical dispersants can present one of the most difficult choices response authorities make.

Since the 1980s, chemical dispersants have been available for oil spill clean-up. Typically, they are used in combination with more traditional techniques, such as oil containment booms and skimmer vessels that collect the corralled slick. Early dispersants were highly toxic solvents. Today's approved dispersants are far less toxic and **can** be beneficial when applied to oil slicks in deepwater and heavy seas.

The United States federal government has established some standards for decision-making regarding dispersant use, and throughout the U. S., certain zones are "pre-approved" for the use of chemical dispersants--usually at a distance of 3 nautical miles (approximately 5 km) from shore and a depth greater than 10 m (about 30 feet). When faced with a spill, whether or not to apply chemical dispersants can present one of the most difficult choices response authorities make. Dispersant use in shallow water is usually not an option. Fisheries organisms in the relatively shallow estuaries could be exposed by dispersed oil, as opposed to undispersed oil, which floats on the surface. The decision is a weighing of which alternatives will reduce, not eliminate the damage.

HOW DISPERSANTS WORK

Given the right conditions and adequate time, oil will naturally disperse in water through wave activity. Chemical dispersants are designed to accelerate that process by affecting the natural resistance of oil to mix with water. Dispersants do not reduce the amount of oil in the water; rather, they transform it into tiny droplets that can be suspended below the surface in deep water, preventing the droplets from reforming an oil slick. This greatly increases the area that natural microbes can access and "feed" on the oil, resulting in a quicker reduction of the more toxic fractions of petroleum. The effects of turbulence and wave actions can cause the droplets to spread rapidly and travel long distances.



Forty minutes after the dispersant application, the effects of the dispersant began to be visible. The observer aboard the helicopter noted, "The lighter areas seemed to dissipate quickly after spraying. The heavy orange area seemed to be holding its shape, but water could now be seen starting to cover the outer 20 feet [6 meters] or so around the perimeter."
Photo by NOAA

There are three main components in typical chemical dispersants-- surfactants, additives, and solvents. A surfactant is a surface-active chemical compound with molecules containing both watercompatible (hydrophilic) and oil-compatible (lipophilic or hydrophobic) groups. The surfactant molecules accumulate at the interface between oil and water, where the hydrophilic groups interact with water phase and the lipophylic groups interact with the oil phase, reducing the tension and helping form small oil droplets that are distributed in the water column (the vertical section of a body of water, from the surface to the bottom) through wave activity.

Additives can promote stability and longevity of the dispersant, and along with solvents can enhance its solubility in a spill. Solvents also help mix the additives with the surfactant and can affect how much water can be pre-mixed with the solution for application. Chemical dispersants have little effect on "weathered" oil (oil that has been in water for long periods of time) because it is more viscous from evaporation and emulsification. Therefore, application should take place as quickly as possible, within 48 hours.

DISPERSANT TOXICITY

In the past, some dispersants were linked to disorders in humans and animals, but in 2005, the National Research Council (NRC) released a report, Understanding Oil Spill Dispersants: Efficacy and Effects (National Academies Press) stating that today's dispersants are much less toxic than those used several decades ago. In fact, it cites numerous direct comparison studies in which dispersants themselves were found to be less toxic than oil or dispersed oil (although this finding was not universal). And in deep, open water, where dilution is rapid, the toxic impact of dispersants is likely to be lower. Nevertheless, many factors can cause wide variations in the sensitivity of organisms to dispersants and dispersed oil. These include species, age, stage of development, and previous exposure to toxins.

USE OF DISPERSANTS AND TRADE-OFF'S

Use of dispersants offshore is generally thought to be more effective and safer than use in or near shore (in less than 10 m of water). Offshore, the wave energy is higher which aids the dispersants in breaking the oil into individual droplets, surrounding the droplets with the dispersants, and spreading the oil droplets throughout the water column where it can better degrade and be digested by microorganisms. Once the oil is spread throughout the water column, currents will drive the direction the oil moves, which is usually lateral to the coastline, rather than toward the coast. If the oil remains as a slick on the surface of the water offshore, wind direction will influence the direction of the slick movement more than ocean currents. Also offshore, there is usually a lower density of fishes, birds, and marine life, many of which are adults that are less susceptible to toxins, therefore leading to overall lower impacts to fisheries, birds, and marine life.

Use of dispersants inshore has far more potential to impact fisheries in shallow waters and are usually restricted from use inside of 10 meter water depths. Fisheries inshore, within barrier islands, bays and marshes, are generally at higher densities and are younger in age than offshore fisheries. They are more susceptible to toxic effects than offshore fisheries. If dispersants are used inshore, then the toxicity of the oil and dispersant is spread throughout the water column, affecting benthic (bottom dwelling) organisms, such as oysters, and larvae and fishes in the water column. In this case, it is usually better to allow the oil to move as a surface slick over the top of these organisms in order to decrease the severity of impacts to these fisheries.

UNRESOLVED QUESTIONS

The decision of whether or not to use chemical dispersants is a particularly difficult because responders must consider the benefits vs. the risks of introducing dispersed oil to a variety of ecologies. The NRC report asserts that there is not even adequate research on the widely held assumption that chemically dispersed oil will have significantly less impact on aquatic animals and seabirds than untreated oil--one of the most critical decision points--and there is some indication from available data that the toxicity of dispersed and untreated oil to those animals is comparable (p. 255).

For example, there is the potential trade-off, frequently cited, of dispersant use reducing the impact of oil on aquatic animals and seabirds, but possibly increasing oil exposure to fish, corals and other organisms in the water column.

DISPERSANT USE FOR NEARSHORE SPILLS

Many oil spills occur within 3 nautical miles of the shoreline, but little assessment is available for spills in these waters. Dispersants can be effective on nearshore spills, because longer contact time is possible and conditions can allow better dispersant penetration. However, according to the NRC report, in these areas organisms may have significantly varying sensitivities to dispersed oil, which decision-makers would have to weigh carefully.

Clearly, the decision of whether or not to utilize chemical dispersants for an oil spill is a complex one and involves trade-offs that require careful impact assessment on nearby ecologies. Each spill is unique, and each ecology that it affects is unique. At present, the long-term, full effects of using chemical dispersants is simply not known.

The decision-making process can be improved by obtaining more reliable study results and information and by implementing more unified oversight. These, in turn, can help develop and improve standards, plans, and proactive strategies for making appropriate spill recovery choices in the future. Spill response is always a weighing of alternatives. Which alternative is least damaging? "The decision is a weighing of which alternative will reduce, not eliminate the damage caused by the oil," said Kerry St. Pé, director of the Barataria-Terrebonne National Estuary Program.

References:
Barataria-Terrebonne National Estuary Program.

Understanding Oil Spill Dispersants: Efficacy and Effects; Committee on Understanding Oil Spill Dispersants: Efficacy and Effects, National Research Council (National Acadamies Press, 2005).

The National Research Council (NRC) functions under the auspices of the National Academy of Sciences (NAS), the National Academy of Engineering (NAE), and the Institute of Medicine (IOM). The NAS, NAE, IOM, and NRC are part of a private, nonprofit institution that Provides science, technology and health policy advice under a congressional charter signed by President Abraham Lincoln that was originally granted to the NAS in 1863. Under this charter, the NRC was established in 1916, the NAE in 1964, and the IOM in 1970. The four organizations are collectively referred to as the National Academies.

Oil Spill Cleanup in a Marsh

Adapted from Oil spills in coastal marshes: The Fine Line Between Help and Hindrance

As Louisiana prepares for potential negative impacts to its wetlands from the BP oil leak that occurred on April, 20, 2010, it is important to understand what oil removal techniques are available, as well as the advantages and disadvantages of oil cleanup in a wetland environment. Maintaining the integrity of the impacted habitat is of the utmost importance when responding to an oil spill. Some cleanup techniques may remove oil, but the removal process may be too aggressive and cause more damage to the marsh than would have occurred if a passive approach was utilized. This habitat is where all future fisheries will be produced. It is important to remember that some fisheries may be lost initially, but maintaining the integrity of the habitat ensures that it can act as a nursery ground for next year's crop. Careful consideration must be exercised before oil cleanup techniques are utilized in a marsh environment.

NATURAL DEGRADATION/NO RESPONSE

- use when natural weathering and biodegradation are expected to occur quickly
- only way to eliminate physical impacts resulting from workers or mobilization of equipment if all other response equipment has not already impacted the wetland area
- natural degradation is often used as the last stage of a response since most physical removal methods reach a point where oil can no longer be effectively removed, leaving some level of residual oiling
- no-response option has an environmental cost when oiling is heavy and/or degradation is expected to be very slow (greater than one to two years)
- sorbents may be utilized to keep areas left to degrade naturally from contaminating other areas

Oil being vaccumed from a marsh area in Louisiana.

VACCUMING

- physical removal of pooled oil on marsh sediment or water surfaces using vacuum or pumping apparatus has been successful at a number of marsh spills
- two main environmental impacts from using this technique:
  - o physical impact of deploying the equipment and the workers to operate it can cause damage to the wetland habitat
  - o potential to inadvertently remove plants or sediment along with oil
- large quantities of oil can be removed, but at some point residual oiling will remain after most of the heavy oil is collected
- can be successful when combined with low-pressure flushing
- must be carefully monitored to minimize impacts
- access to remote sites may also be difficult, although vacuums can be deployed from barges

A shrimping boat skimming oil from the BP oil leak This boat would normally be trawling for shrimp.

SKIMMING

- used in conjunction with containment booms
- can be a very successful method for removing oil from inside a containment boom
- containment booms can be placed in open water adjacent to oiled marshes
- oil can be herded with low pressure hoses to containment booms from sensitive wetlands where oil can then be retrieved with skimmers

Black and blue snare boom on Elmer's Island, LA. Booming strategies will be in the next issue of this publicaiton.

LOW PRESSURE WASHING

- used to help move oil towards collection points where other removal equipment is operating
- may help lift oil off the sediment surface when the marsh is not flooded
- difficult to apply correctly because slight changes in water pressure can turn a low-impact technique into a high-impact one this may cause erosion of sediment as opposed to just lifting oil off the sediment surface
- foot traffic will negatively impact the marsh, and should be minimized, either by working from boats during high tide or by using board walkways

VEGETATION CUTTING

- clearing entire areas of vegetation by cutting plants near the base of the stem above the sediment
- should not be considered in the majority of marsh environments
- drastic consequences when used in the past (death of plants, increased erosion, and permanent loss of marsh)
- reserved for situations where erosion is not a risk, with plant species that are either very hardy, or with undesirable invasive species
- considered when oil is trapped in dense vegetation, making flushing and removal ineffective
- cutting near the base of the plant can permit oil penetration into the sediment and damage plant roots

BURNING OF MARSH

- practiced as a vegetation management technique for many years, but burning of oil soaked marshes can cause death of the plants, leading to erosion
- has not been well documented and many questions remain about the specific conditions under which burning can be successfully used in marshes without the loss of plants
- successful in removing large amount of oil, but studies of long-term impacts show there are impacts to the wetland habitat
- remaining questions about this technique include the conditions necessary to minimize burn impacts, such as water covering the marsh at the time of burning, how to deal with residues that may remain after the burn, and how to minimize impacts to plant roots and rhizomes that may result in slow recovery of vegetation

BIOREMEDIATION

- addition of organisms that degrade oil to non-toxic products (usually micro-organisms)
- positive data from laboratory studies, but little information on its successful use in oiled marshes
- may be a potential low-impact cleanup technique for residual oiling of marsh sediments
- may create eutrophic conditions in marsh environments from the addition of fertilizers
- may create low-oxygen conditions in marsh sediments that may limit biodegradation
- successful bioremediation requires mixing the oiled marsh with oxygen which destroys the wetland habitat

SEDIMENT REMOVAL/REPLANTING

- a technique of last resort to be used with great caution, if at all
- example of destroying the marsh to save it, since existing vegetation and roots are removed along with sediment
- potential for increased erosion and a danger if sediments are not replaced
- changes in elevation due to sediment removal will prevent plant regrowth or cause a change in species of plants colonizing the area.

Deciding how to respond in an oiled marsh is clearly a complex issue for which there can be no single answer. Cleanup in a marsh is justified when oil can be removed with minimal impact, when other resources are at high risk of being oiled (such as migrating birds), and when unassisted recovery is likely to be very slow (more than two or three years). Natural unassisted) recovery may be the best option in cases where oiling is light and natural recovery is likely to occur in a shorter time frame (one year or less), where cleanup activities would detrimentally impact the marsh, and where wildlife is at low risk of being oiled.

Barataria-Terrebonne National Estuary Program
Hoff, Rebecca Z. hazardous materials Response and Assessments Division, National Oceanic and Atmospheric Administration. Responding to Oil Spills in Coastal Marshes: The Fine Line Between Help and Hindrance. HAZMAT Report 96-1. Seattle Washington. 1995. Print.* Also available online: http://response.restoration.noaa.gov/book_shelf/965_HelpHind.pdf

Hurricanes & the BP Oil Spill

ADAPTED FROM NOAA'S "Hurricanes and the Oil Spill"

PAST EXPERIENCE

- Our experience has been primarily with oil spills that occurred because of the storm, not from an existing oil slick and an ongoing release of oil from the seafloor.
- The experience from hurricanes Katrina and Rita (2005) was that oil released during the storms became very widely dispersed.
- Dozens of signifi cant spills and hundreds of smaller spills occurred from offshore facilities, shoreside facilities, vessel sinkings, etc.

OILED RAIN

Will there be oil in the rain related to a hurricane?

- No. Hurricanes draw water vapor from a large area, much larger than the area covered by oil, and rain is produced in clouds circulating the hurricane.

INTENSITY, STORM TRACK, & STORM SURGE

- Most hurricanes span an enormous area of the ocean (200-300 miles) — far wider than the current size of the spill.
- If the slick remains small in comparison to a typical hurricane's general environment and size, the antici pated impact on the hurricane would be minimal.
- The oil is not expected to appreciably affect either the intensity or the track of a fully developed tropical storm or hurricane.
- The oil slick would have little effect on the storm surge or near-shore wave heights.

EFFECTS ON OIL

- The high winds and seas will mix and "weather" the oil which can help accelerate the biodegradation process.
- The high winds may distribute oil over a wider area, but it is difficult to model exactly where the oil may be transported.
- Movement of oil would depend greatly on the track and strength of the hurricane.
- Storms' surges may carry oil into the coastline and inland as far as the surge reaches. Debris resulting from the hurricane may be contaminated by oil from the Deepwater Horizon incident, but also from other oil releases that may occur during the storm.
- A hurricane's winds rotate counter-clockwise. Thus, in VERY GENERAL TERMS:
    - o A hurricane passing to the west of the oil slick could drive oil to the coast.
    - o A hurricane passing to the east of the slick could drive the oil away from the coast.
    - o However, the details of the evolution of the storm, the track, the wind speed, the size, the forward motion and the intensity are all unknowns at this point and may alter this general state ment.

STORM DEVELOPMENT

- Evaporation from the sea surface fuels tropical storms and hurricanes. Over relatively calm water (such as for a developing tropical depression or disturbance), in theory, an oil slick could suppress evaporation if the layer is thick enough, by not allowing contact of the water to the air.
- With less evaporation one might assume there would be less moisture available to fuel the hurricane and thus reduce its strength.
- However, except for immediately near the source, the slick is very patchy. At moderate wind speeds, such as those found in approaching tropical storms and hurricanes, a thin layer of oil such as is the case with the current slick (except in very limited areas near the well) would likely break into pools on the surface or mix as drops in the upper layers of the ocean. (The heaviest surface slicks, however, could re-coalesce at the surface after the storm passes.)
- This would allow much of the water to remain in touch with the overlying air and greatly reduce any effect the oil may have on evaporation.
- Therefore, the oil slick is not likely to have a significant impact on hurricane development.

POTENTIAL FOR DISPERSION

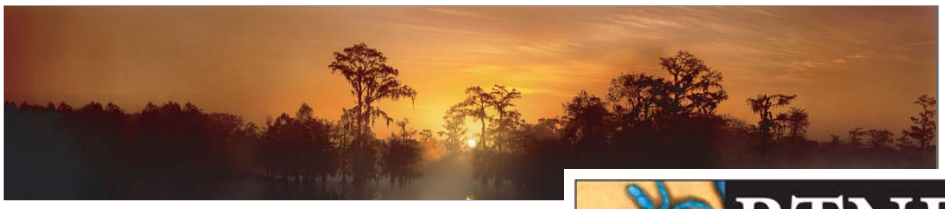
- All of the sampling to date shows that except near the leaking well, the subsurface dispersed oil is in parts per million levels or less. The hurricane will mix the waters of the Gulf and disperse the oil even further.

BTNEP

BARATARIA-TERREBONNE NATIONAL ESTUARY PROGRAM

is

a congressionally-mandated program established in 1991, charged with the preservation and restoration of the Barataria-Terrebonne estuarine system, the 4.2 million acre region between the Atchafalaya and Mississippi Rivers. The BTNEP strives to rebuild and protect the estuary for future generations through the implementation of a science-based, consensus-driven plan that utilizes partnerships focused on the estuary's rich cultural, economic, and natural resources.



BTNEP
BARATARIA-TERREBONNE
NATIONAL ESTUARY PROGRAM

THE BARATARIA-TERREBONNE MANAGEMENT CONFERENCE IS COMPRISED OF

American Sugar Cane League
Bayou Lafourche Freshwater District
Coalition to Restore Coastal Louisiana
Coastal Conservation Association of LA
Commercial Fisheries
Governor's Office of Coastal Activities
Greater Lafourche Port Commission
Iberville Parish
Jefferson Parish
LA Dept. of Agriculture & Forestry
LA Dept. of Culture, Recreation & Tourism
LA Dept. of Economic Development:
LA Dept. of Education
LA Dept. of Environmental Quality
LA Dept. of Health & Hospitals
LA Dept. of Natural Resources
LA Dept. of Wildlife & Fisheries
Lafourche Parish
Louisiana Association of Conservation Districts
Louisiana Association of Levee Boards
Louisiana Farm Bureau
Louisiana Forestry Association
Louisiana Independent Oil & Gas Association
Louisiana Landowners Association:
Louisiana Mid-Continent Oil & Gas Association
Louisiana Oil Spill Coordinators Office
Louisiana Science Teacher's Association
LUMCON
Louisiana Wildlife Federation
LSU Agricultural Center
National Park Service
Nicholls State University
Plaquemines Parish
Pointe Coupee Parish
South Central Planning & Development Commission
South Louisiana Economic Council
St. Charles Parish
Terrebonne Parish
The Nature Conservancy
US Army Corps of Engineers
US Coast Guard
US EPA
US Fish & Wildlife Service
US Geological Survey
US National Marine Fisheries Service
USDA/NRCS

BTEF

BARATARIA-TERREBONNE ESTUARY FOUNDATION

www.supportbtnep.org

BTEF supports the activities of BTNEP's goals and projects such as coastal restoration, volunteer program, outreach activities and research efforts. The Barataria-Terrebonne Estuary Foundation also supports BTNEP's tireless efforts in response to the Deepwater Horizon Oil Spill.

Visit www.supportbtnep.org to find out more about the BTEF and ways you can help with important response and recovery activities including wildlife rescue and transport, habitat restoration, volunteer response, the documentation of coastal impacts, and long-term research on damage and recovery.

BARATARIA - TERREBONNE ESTUARY FOUNDATION

BARATARIA-TERREBONNE
NATIONAL ESTUARY PROGRAM
P.O. BOX 2663, NSU
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THIBODAUX, LA 70301

BTNEP's monthly newsletter

BARATARIA-TERREBONNE NATIONAL ESTUARY PROGRAM

BTNEP has developed this monthly newsletter to provide you with accurate information during an evolving environmental crisis.Look inside for information about the Deepwater Horizon disaster response and relief efforts. Inside you can read about volunteer efforts, bird rescue, dispersants, hurricanes, and much more!

NEXT ISSUE:
avian nesting protection
booming strategies
sea turtle rehabilitation
& much more

SOMETHING YOU'D LIKE TO SEE IN THE BTNEP NEWSLETTER? PLEASE EMAIL SHELLEY@BTNEP.ORG

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NATIONAL ESTUARY PROGRAM

IMPORTANT NUMBERS

to report oiled wildlife:
(866) 557-1401

to report oiled shoreline:
(866) 448-5816

to file a claim:
(800) 440-0858

to volunteer or donate supplies:
www,lagulfresponse.org
or
http://volunteer.btnep.org