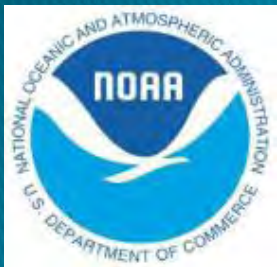




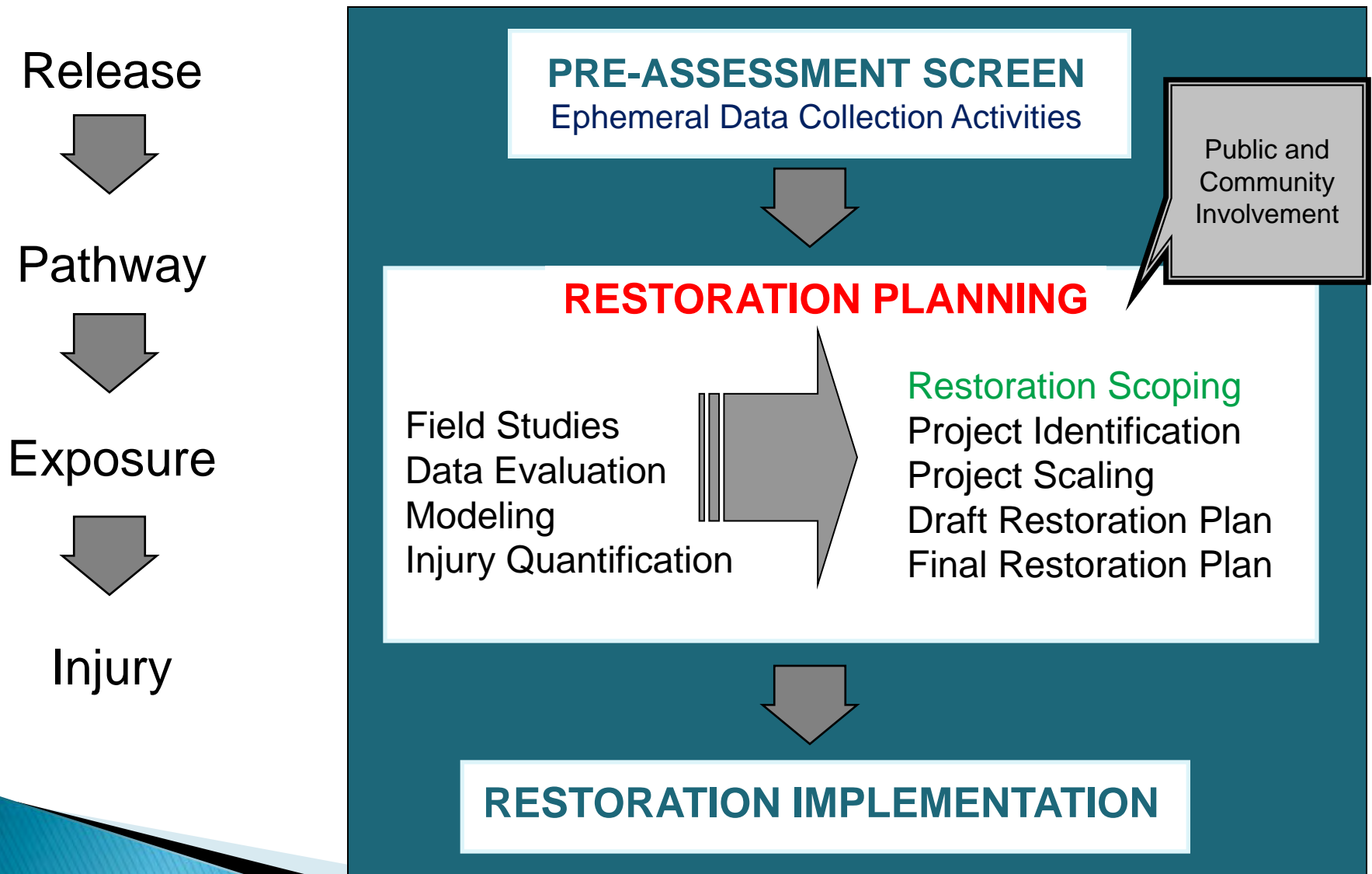
Overview of the DWH Natural Resource Damage Assessment

*SOST Workshop
October 25, 2011*

Lisa DiPinto, Ph.D.
NOAA Office of Response and Restoration



Oil Pollution Act NRDA Framework



In Summary, Three Things...

▶ **NRDA is Restoration-Focused**

- Restoration is considered early and throughout the NRDA process

▶ **NRDA is a Cooperative Process**

- Getting to restoration requires a common vision & coordination with:
 - Co-Trustees and the public
 - Moves more quickly if Responsible Party shares the same vision and works cooperatively with the Trustees

▶ **NRDA is a Legal Process**

- Trustees are required to demonstrate causality between the release & resource injury/lost use
- The polluter pays for assessment and restoration



NRDA for the DWH/BP Oil Spill



NRDA Assessment Activities

OIL IN THE OPEN WATER

Oil in the open water may affect the health of microscopic plants and animals that form the basis of the oceanic food web. The eggs and larvae of shrimp, fish, and other commercially and recreationally important species are at risk, as are adult fish, sea turtles, marine mammals, and ocean-going birds. Far beneath the surface, corals and other deepwater communities also may be affected.

WATER COLUMN AND SEDIMENTS

- Water quality surveys
- Transect surveys to detect submerged oil
- Oil plume modeling
- Sediment sampling

TURTLES AND MARINE MAMMALS

- Aerial surveys
- Tissue sampling
- Acoustic monitoring
- Satellite tagging

FISHERIES

- Plankton surveys
- Invertebrate surveys
- Adult fish surveys
- Larval fish surveys

OIL IN NEARSHORE HABITATS

Sensitive nearshore communities such as oyster beds and shallow-water corals may lie directly in the path of underwater oil and surface mousse riding the waves to shore. When the oil does hit land, it can severely impact coastal habitats including marshes, mudflats, mangrove stands, and sandy beaches. Organisms that use these habitats, such as birds, crabs, turtles, crocodiles and other aquatic and terrestrial species also are at risk.

SHORELINES

- Aerial surveys
- Ground surveys
- Observations of the quality of habitat
- Measurements of subsurface oil near the shore

TERRESTRIAL AND AQUATIC SPECIES

- Ground surveys
- Observations of the quality of habitat

AQUATIC VEGETATION

- Aerial surveys
- Field surveys in large beds of aquatic vegetation

BIRDS

- Aerial surveys
- Ground surveys
- Nearshore boat surveys
- Offshore boat surveys
- Radio telemetry

SHELLFISH

- Oyster surveys
- Tissue and sediment sampling
- Mussel collection
- Shrimp collection

OIL AND HUMAN USE

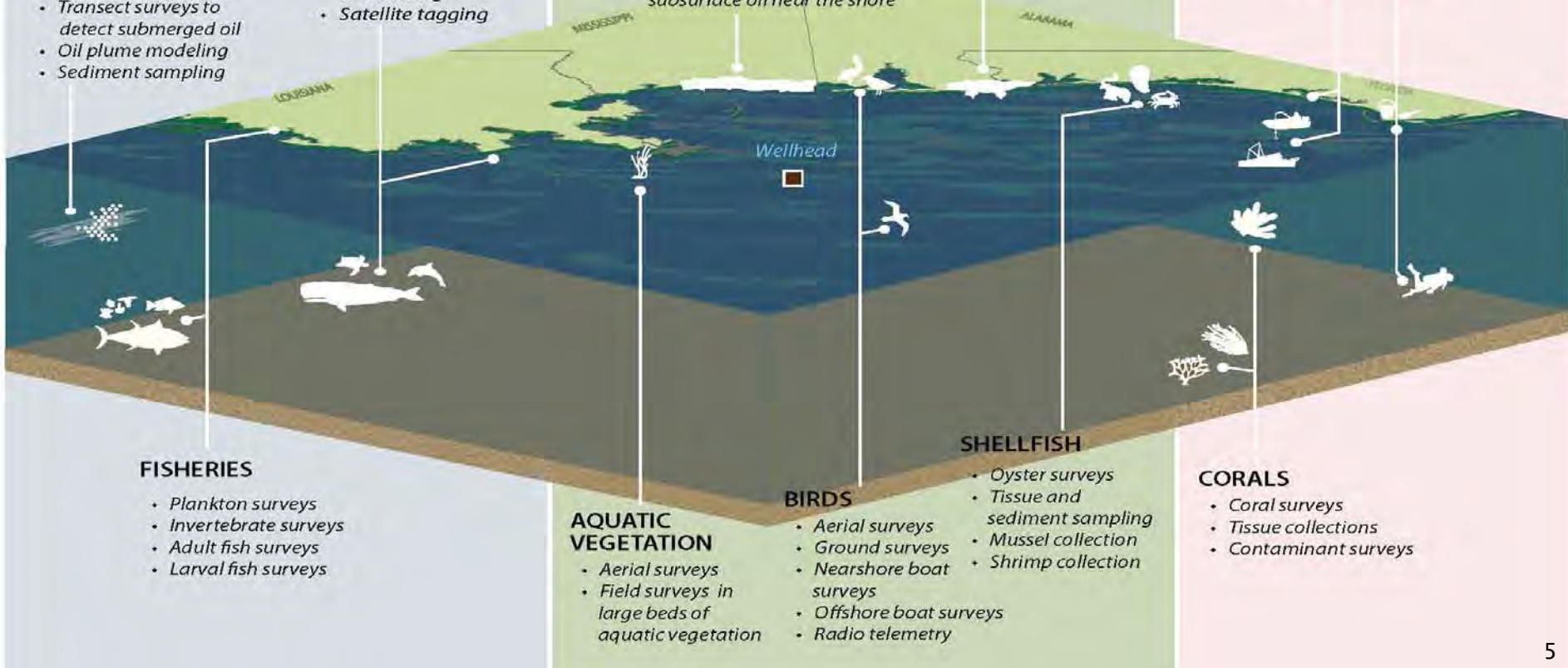
Humans, like wildlife, also rely on the ocean and coasts. From fishing to water sports and sunbathing to birdwatching, humans enjoy and rely on Gulf Coast waters and nearshore environments in many ways.

HUMAN USE

- Aerial surveys
- Ground surveys

CORALS

- Coral surveys
- Tissue collections
- Contaminant surveys



Technical Working Groups (TWGs)

- ▶ State and Federal resource trustees
- ▶ Working with (and without) the Responsible Party to implement studies
 - Baseline + post impact
 - Field and laboratory
 - Response impacts
- ▶ Includes water, sediment, tissue sampling and observations from planes, ships and shore
 - Water Column – fate and transport
 - Fisheries and Plankton
 - Submerged Aquatic Vegetation
 - Subtidal Habitats
 - Shallow and Deepwater Corals
 - Shoreline Habitats: beaches, wetlands, mudflats
 - Birds
 - Marine Mammals and Turtles
 - Oysters
 - Terrestrial Wildlife
 - Human Use: Fishing, hunting, and beach recreational closures
 - Aerial Imagery
 - Data Management
 - Chemistry



CAGE
THR: 0

Maxx 3

30

45

60

75

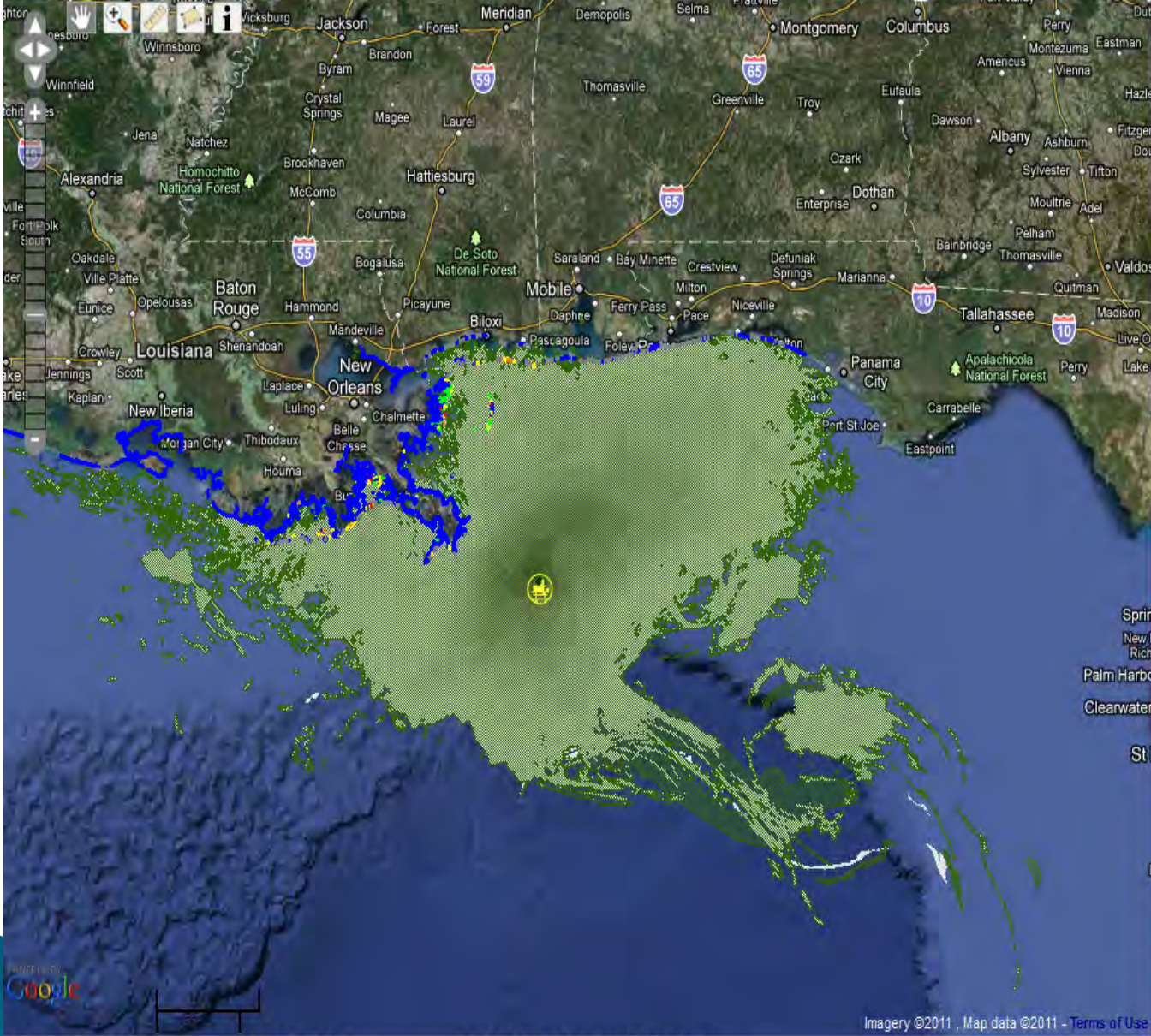
105





Release

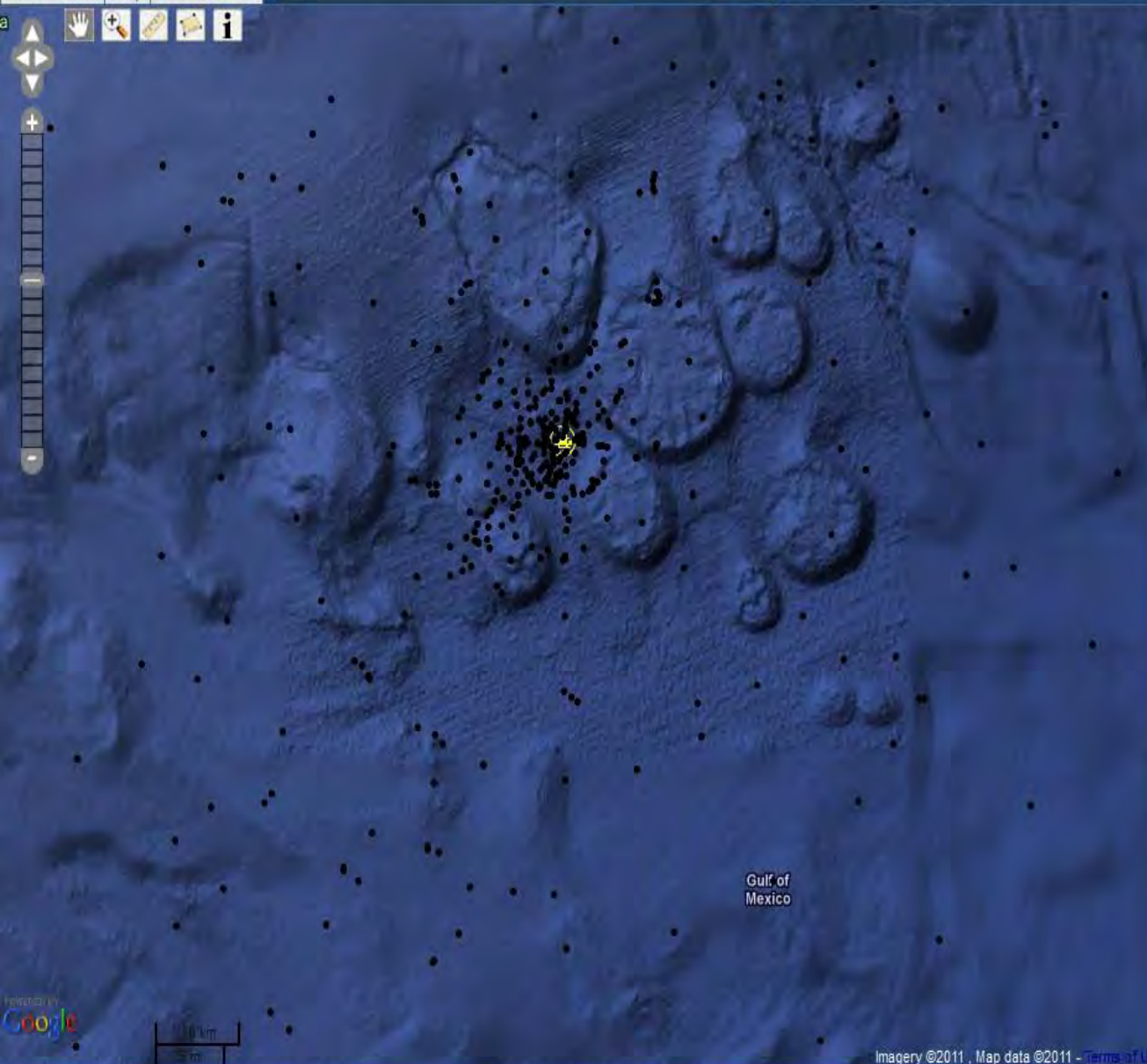
Photos, underwater video, ROV data
BP records
Flow rate data
Source oil chemistry

Pathway

Modeling fate and transport
Aerial imagery (satellite, aircraft)
Environmental media sampling
(water column, tissues, sediments)
Underwater photos (ROVs, images)
Acoustic, sonar (LISST, SIPPER)






- Layers clear all
- Background
- BP Deepwater Horizon Oil Spill
 - Wellhead Surface Location
 - Deepwater Horizon Wreckage
- Areas of Operation
- BP Community Support
- Satellite, Radar, and Aerial Images of the Spill
- NRDA Workgroup Data
 - Cumulative Oiling
 - Cumulative Oiling Index - %days of oiling (West Inc.)
 - Cumulative Oiling - days of oiling (TNC)
 - Cumulative NESDIS Anomaly Analysis (April-August 2010)
 - Analytical Data (Validated)
 - Overflight Observations and Photos
 - Response Sampling and Monitoring
 - Fishery Closures
 - SCAT
 - SCAT Grids
 - Louisiana
 - 17-Oct-11 SCAT Oiling Ground Observations 
 - 16-Oct-11 SCAT Oiling Ground Observations 
 - LA SCAT Photos
 - Sector Mobile
 - 18-Oct-11 SCAT Oiling Ground Observations 
 - 17-Oct-11 SCAT Oiling Ground Observations 
 - Mobile SCAT Photos
 - Maximum Oiling Observed
 - Trajectories
 - Wildlife Observations
 - OSAT Ecotoxicity Addendum
 - Subsurface Oil and Dispersant Detection (OSAT 1 - Analysis)



Layers Legend Query Tool Zoom

Layers clear all reload

- Cumulative Oiling Index - %days of oiling (West Inc.)
- Cumulative Oiling - days of oiling (TNC)
- Cumulative NESDIS Anomaly Analysis (April-August 2010)
- Analytical Data (Validated)
 - All NRDA Sample Stations With Analytical Results Available as of 2011-10-17 
 - Oil Chemistry
 - Sediment Chemistry
 - Tissue Chemistry
 - Water Chemistry
- Overflight Observations and Photos
- Response Sampling and Monitoring
- Fishery Closures
- SCAT
 - SCAT Grids
 - Louisiana
 - LA SCAT Photos
 - Sector Mobile
 - Mobile SCAT Photos
 - Maximum Oiling Observed
- Trajectories
- Wildlife Observations
 - Bird Observations (USFWS)
 - Turtle & Marine Mammal Observations (NMFS)
- OSAT Ecotoxicity Addendum
- Subsurface Oil and Dispersant Detection (OSAT 1 - Analysis)
- Fate and Effects of Oil on Beaches (OSAT 2 - Analysis)
- Joint Analysis Group (JAG) Reports
- Response Planning clear
- Bioresources clear
 - Gulf of Mexico Salinity Zones (NOAA) 
 - US Salinity Zones (NOAA) 



BP Deepwater Horizon

Deepwater Horizon Wreck

- Deepwater Horizon Wreck

11-Nov-10 Mobile SCAT Max

- Heavy
- Moderate
- Light
- Very Light
- No Oil Observed
- Trace < 1%

23-Jan-11 Houma SCAT Max

- Heavy
- Moderate
- Light
- Very Light
- No Oil Observed
- Trace < 1%

Bathymetry

Gulf of Mexico Bathymetry

- Gulf of Mexico Bathymetry

Maximum shoreline oiling observed
<http://gomex.erma.noaa.gov/erma.html#x=-89.37378&y=29.68328&z=8&layers=7706+5355+14958+14957>

Exposure

Wildlife response records
Overflights, videos
Shoreline surveys and maps
Plankton tows, biological surveys
Chemistry (water, sediment, tissue)

Injury

Physical degradation of habitat
Body counts, necropsies
Tagging and tracking studies
Toxicity studies (lethal, sub-lethal)
Modeling
Human use (beach , fishery closures_

Marine Mammal NRDA Studies

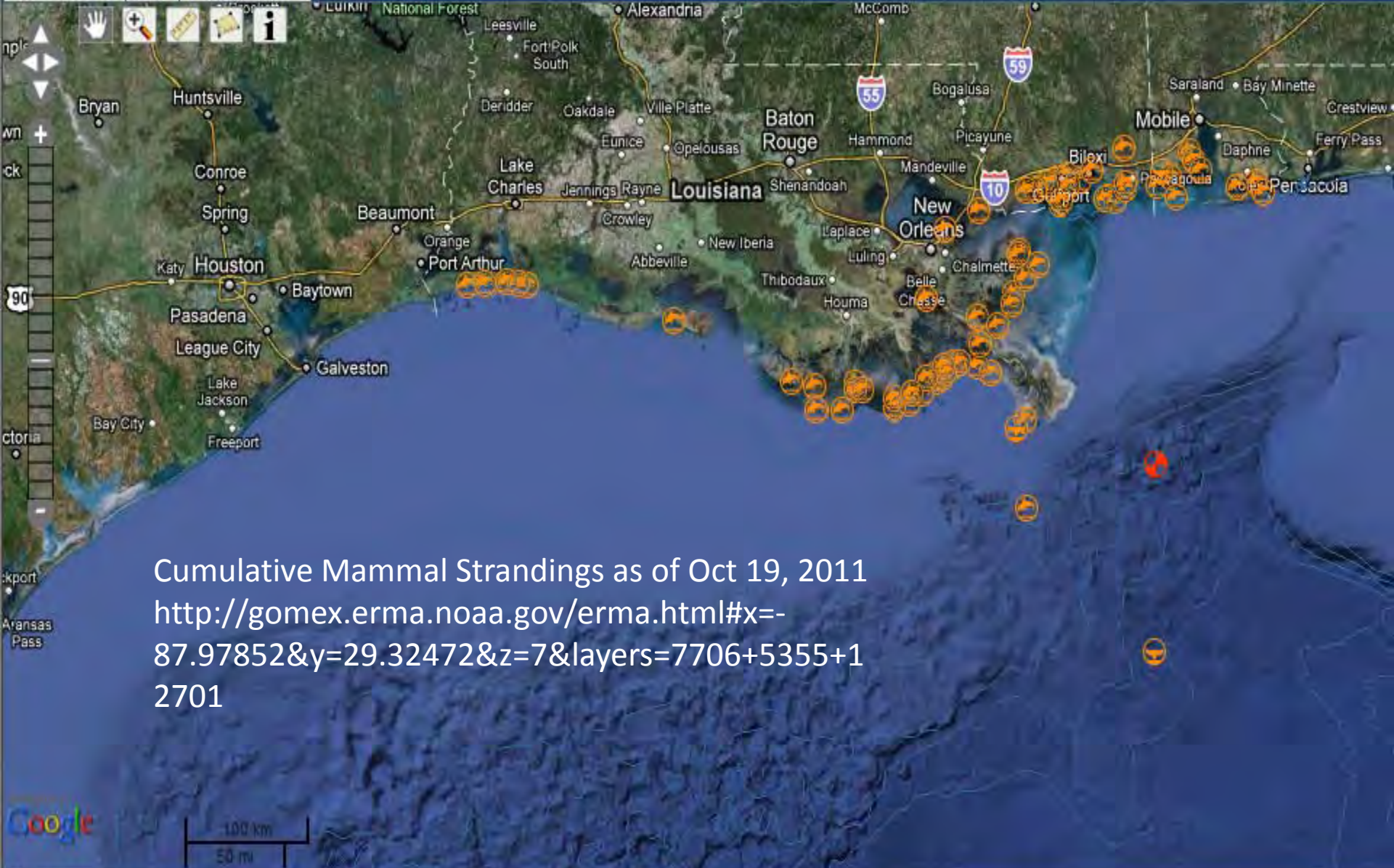
- ▶ **Oceanic mammal cruises:** exposure, distribution related to oil (visuals and passive acoustic monitoring over time), prey species, habitat info, and biopsy for population demographics.
- ▶ **Acoustics (HARPS, MARUS):** deployed arrays to help estimate species abundance
- ▶ **Aerial Surveys:** to detect abundance, spatial distribution and exposure
- ▶ **Satellite Tagging:** sperm whale tracking for distribution, movement, behavior
- ▶ **Assessing Impacts on LA and MI Estuarine Dolphin Stocks:** exposure and changes in fecundity, survival, abundance via sampling tissue, photo-ID mark recapture surveys for baseline abundance in four areas
- ▶ **Prey Plan:** Inshore prey collection in LA for prey species of importance of mammals and turtles for PAH (exposure)

Turtle NRDA Studies

- ▶ **Aerial Surveys:** Measure abundance, spatial distribution, exposure
- ▶ **Nesting Studies (DOI lead):** female physical condition, movement, egg/hatchling success
- ▶ **Sargassum and associated fauna:** (for neonates). Measure abundance/distribution
- ▶ **Entanglement netting surveys:** Species composition, distribution, CPUE, size/age structure, telemetry, sex ratio, tissues



Cumulative Turtles, Oct 19, 2011
<http://gomex.erma.noaa.gov/erma.html#x=-87.97852&y=29.32472&z=7&layers=7706+5355+12702> (yellow=alive, orange = dead)



Cumulative Mammal Strandings as of Oct 19, 2011
<http://gomex.erma.noaa.gov/erma.html#x=-87.97852&y=29.32472&z=7&layers=7706+5355+12701>

NRDA Sampling Snapshot

- ▶ As of Oct. 2011, the co-trustees have collected **70,302 samples**.
- ▶ Our laboratories have completed **42,354 contaminant analyses** on these samples. This includes:
 - 13,729 Water Column Analyses
 - 12,534 Fish Analyses
 - 5,493 Shoreline Analyses
 - 3,824 Deepwater Benthic Analyses
 - 1,469 Chemistry/Sampling Analyses
 - 1,404 SAV Analyses
 - 1,279 Marine Mammal & Turtle Analyses
 - 1,253 Nearshore Sediment & Water Analyses
 - 264 Shallow Coral Analyses
- ▶ ~ 100 offshore cruises
- ▶ 4,200 miles shoreline surveys
- ▶ Wildlife observations (live and dead)
- ▶ Several hundred transmitters on wide-ranging species







NRDA Workplans

Below you will find study plans for each phase of the Natural Resource Damage Assessment, and other documents related to the legal case NOAA and co-trustees are building on the Deepwater Horizon oil spill. The study plans reflect **input and advice from experienced scientists and resource managers** as well as leading experts who specialize in studying oil spills and natural resources in the Gulf of Mexico. As data from the studies become available, the trustees may adapt study approaches or methods, or consider conducting additional studies, to ensure that the impacts of the oil spill can be fully identified and measured.

Note: the following summaries and objectives for each workplan below are often paraphrased from the plans.








Legend

Icon	Definition	Term	Definition
	Analytical Data	NODC	National Oceanographic Data Center
	Map Data	Metadata	Information about the dataset including the purpose of data
	Observation Data	Data Dictionary	Description of the fields and information in the dataset
	Oceanographic Data		

NRDA Workplans and Data

[Additional Datasets](#)
[Help](#)

Filters: Has Data

Type	Category	Workplan	Date	Data
Aquatic	Coral and Deepwater Communities	Addendum to Deepwater Coral Tier 1 Plan  74.2kb. pdf	07/24/2010	
This amendment is due to a tropical storm delay and changes to the original plan.				
Aquatic	Coral and Deepwater Communities	Deepwater Coral Plan for Detection of Hydrocarbons in Water Column  36.8mb. pdf	07/09/2010	
Objective: To document the presence of oil (PAHs), if any, in the near bottom habitat of the deep reef community during the early potential impacts stage of the DWH oil spill event.				
Aquatic	Coral and Deepwater Communities	Mississippi Canyon 252: NRDA Tier I for Deepwater Communities  2.04mb. pdf	07/10/2010	
Objectives:				
<ol style="list-style-type: none"> 1. systematic photo-surveys of previously surveyed sites of mesophotic reefs, deep water corals, and chemosynthetic communities; 2. increase pre-exposure baseline data for biota at non-oil exposed sites, if any; 3. obtain tissue samples to document exposure, abnormalities, further NRDA assessments; 4. document and measure other initial injuries; 5. deploy two new sediment trap moorings at sites; and 6. retrieve passive oil samplers (SPMDs), deployed previously. 				
Aquatic	Coral and Deepwater Communities	Reconnaissance Survey of Hard-Ground Megafauna Communities in the Vicinity of	10/19/2010	

Over 90 NRDA workplans publicly posted

Background Information

The Oil Pollution Act authorizes certain federal agencies, states and Indian tribes, collectively known as the Natural Resource Trustees (trustees) to evaluate the

NRDA: Public Notice and Involvement

1. Pre/-assessment workplans and data released (ongoing)
2. NOI to Conduct Restoration Planning: (10/01/2010)
3. Public Information Meetings (Oct.–Dec. 2010)
4. Restoration/PEIS Scoping Meetings (3/16 – 4/6/2011, comments period completed 5/18/2011.)
 - > 7,000 public comments received from 320 submissions
5. Draft PEIS issued for comment: 2012
6. Final PEIS issued (6–12 mos)
7. Draft Restoration Plan –public meetings and public comment
8. Final Restoration Plan
9. Implement Restoration Projects



Where are we now?

- ▶ Early restoration compensation
 - \$1B among Trustees
 - Variety of projects under discussion among Trustees and BP
- ▶ Finishing fall field sampling activities (largely)
- ▶ Primary focus during next several months on data analysis and interpretation (independent)
- ▶ Restoration planning continues with public input

www.gulfspillrestoration.noaa.gov

NOAA Deepwater Information Resources

NOAA GULF SPILL RESTORATION
UNOIL RESTORATION, RECOVERY, AND RESTORATION PROGRAM

HOME ABOUT US DAMAGE ASSESSMENT BP OIL SPILL RESTORATION WHAT YOU CAN DO NEWS & MEDIA Search Here

refuge area for juvenile fish and birds, nursery area for crab, shrimp, oysters

Nearshore Benthos
Oyster beds, seagrass beds, and mudflats.
Production area for crabs, shrimp, fish

Photic Zone
Layer of Gulf waters that sunlight can penetrate -- generally 200-300 feet from the surface

Top Predators
Marine mammals, tuna, birds

Visualizing the Deepwater Horizon Oil Spill
Using graphics to understand the potential impacts from the spill

Keep Reading

PUBLIC'S COMMENTS VISUALIZING THE SPILL WANTED: DEEP THOUGHTS NRDA IN THE NEWS

Latest News

Deepwater Horizon NRDA Trustees Comment Gulf Task Force Efforts
[Read More...](#)

What We Heard from the Public on Restoration Types to Restore the Gulf
[Read More...](#)

Visualizing the Deepwater Horizon Oil Spill
[Read More...](#)

Wanted: Deep Thoughts - Your Ideas on Restoring Deepwater Resources
[Read More...](#)

[View the News Archive](#)

Recent Publications

September 22, 2011
[PEIS Public Scoping Comment Summary \(pdf, 593 KB\)](#)

August 31, 2011
[Trustee Council Fact Sheet: Emergency Restoration \(pdf, 327 KB\)](#)

August 31, 2011
[Trustee Council Fact Sheet: Early Restoration \(pdf, 294 KB\)](#)

August 31, 2011
[Trustee Council Fact Sheet: Damage Assessment \(pdf, 2.23 MB\)](#)

August 1, 2011
[Environmental Assessment \(EA\) for Emergency Restoration of Seagrass Impacts from the Deepwater Horizon Oil Spill Response \(pdf, 422 KB\)](#)

[View the Publications Archive](#)

Restoration Planning

Participate in the restoration planning process taking place following the Deepwater Horizon oil spill.

- ✓ Suggest a Project
- ✓ View Early Restoration Project Ideas
- ✓ Learn More About Early Restoration
- ✓ Learn More about the Programmatic Environmental Impact Statement (PEIS)

Events Calendar

October 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					
«Sep						Nov»

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Office of Response and Restoration
Office of Habitat Conservation

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▶ Assessment/Restoration

- www.gulfspillrestoration.noaa.gov

▶ Response Information

- <http://deepwaterhorizon.noaa.gov>

- Trajectories

- Closures

- Tools

▶ NOAA Deepwater Library

- www.noaa.gov/deepwaterhorizon

▶ Federal DWH Web Portal

- www.restorethegulf.gov

▶ Gulf of Mexico Sea Grant:

- <http://gulfseagrant.tamu.edu/oilspill/index.html>

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Or call: 1-888-547-0174