

A Unified Approach to Data Management and Perspectives from a Northern Gulf of Mexico Marine and Coastal Research Laboratory

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THE UNIVERSITY OF
SOUTHERN MISSISSIPPI

GULF COAST RESEARCH LABORATORY



Deepwater Horizon

- Contracted by BP for well drilling in Mississippi Canyon Block 252
- April 20, 2010 –
Rig exploded from backflow of material in its wellbore, killing 11 workers
- April 22, 2010 –
Rig sank, breaking off its well pipe near the ocean floor (1,522 m depth)
- Subsequent to the sinking, oil flowed into northern Gulf of Mexico waters continually for a period of 84 days.

Oil Containment Attempts

- May 14 – 4-inch Riser Insertion Tool Tube attempts to siphon leaking oil to surface ship
- May 7 – large containment dome fails due to methane forming in the top of the dome
- May 26 – “top kill” procedure to pump drilling mud into well is attempted but fails
- July 12 – Lower Marine Riser Package attached to wellhead and halts the oil flow
- August 4 – “static condition” achieved with the pumping of drilling mud into the well

Oil Leak Estimates

U.S. Government estimate of total oil leakage:

**4.9M barrels (205,800,000 gal)
- 0.8M barrels collected**

**4,100,000 barrels
leaked into nGOM waters
(172,200,000 US gallons)**



BACKGROUND

Dispersants

- surface application to fragment oil slicks into finer droplets for more rapid dilution
- subsurface application to prevent oil from reaching surface waters
- EPA directed BP to scale back dispersant use on May 26 due to uncertainty about potential environmental impacts.
- EPA tests had shown Corexit 9500 to be “slightly toxic” in lab tests on mysid shrimp and silverside minnows

PURPOSE OF THIS PRESENTATION

- NOT to debate specific events of or the subsequent response to the DWH disaster
- NOT to present scientific findings of ecological impacts
- BUT, to provide a general overview of the GCR response to the DWH disaster from an institutional perspective
 - inter-agency coordination
 - scientific sampling
 - funding mechanisms
 - media relations & outreach
- To suggest a general framework for future events



GCRL RESPONSE

Gulf Coast Research Laboratory

- academic research institution in Ocean Springs, MS; a USM campus
- established in 1947
- broad expertise in coastal and marine science
- historical datasets of biological communities spanning multiple decades
- located approximately 100 miles north of the DWH site

GCRL RESPONSE

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Oil Spill Operations Team

- GCRL Director
- Chair Department of Coastal Sciences
- Lead Professor
- Fisheries Center Director
- Fisheries Center Senior Scientist
- Marine Education Center Director
- Fisheries Center Asst Director

INTER-AGENCY COORDINATION



INTER-AGENCY COORDINATION

Employee Health and Safety

- HAZWOPER 24-hour training required for field personnel working in oil-impacted waters
- HAZMAT 6-hour training required for lab personnel handling oiled samples
- GCRL offered its meeting spaces to hold training sessions; multiple classes held for state, federal and university employees

INTER-AGENCY COORDINATION

Protective Booms

- intent to prevent passage of surface oil into bays/bayous and critical habitats
- on occasion, also prevented passage of research vessels into sampling areas

Vessel Decontamination

- sites established to decontaminate vessels before entering 'clean' waters
- GCRL made plans for offsite vessel launching and potential alternate port usage by larger vessels.

INTER-AGENCY COORDINATION

Reimbursement of Costs

- Use of GCRL resources for oil-related matters was substantial and outside of its normal budgetary scope
 - *time/effort for management, sampling, lab analyses & training*
 - *vessel usage for sample collection*
 - *expenses for gear, supplies and oil sample analyses*
- Requirement to follow protocols developed by state/federal agencies and BP to be eligible for reimbursement
- GCRL established internal accounting system for time/effort, vessel usage and expenses

SCIENTIFIC SAMPLING



SCIENTIFIC SAMPLING

Baseline Sample Acquisition

- GCRL conducts research as part of long-term studies on ecological conditions of MS coastal waters, including:
 - *all life-stages of estuarine and marine organisms*
 - *water quality, meteorological & physical data*
- Due to potential oil impacts, directed surveys were self-funded to obtain baseline data for:
 - *toxicology*
 - *histology*
 - *parasitology*
 - *benthos (biological, chemical, microbial)*
 - *water quality (chemical, microbial)*

SCIENTIFIC SAMPLING

Impacts to Ongoing Research

- No interruption to inshore monitoring activities
- Summer SEAMAP trawl survey stations shifted to the east (away from DWH site) due to likelihood of encountering oil
- Some projects postponed due to oil spill
 - *area closures*
 - *potential impacts to sampling equipment*
 - *shifts in personnel effort from research to oil-related responsibilities*
 - *however, PIs received support from funding agencies through no-cost extensions*

SCIENTIFIC SAMPLING

- Numerous instances of suspected oil (discolored surface water) reported by public
- GCRL scientists were asked to analyze those samples as being possible algal blooms
- Expedited processing due to public concern
- All samples analyzed by GCRL had high phytoplankton levels, not uncommon for that time of year
- Subsamples sent by the state for chemical analyses also showed no elevated hydrocarbon levels



EXTERNAL FUNDING

Project Development

- Primary response by faculty & scientific staff
- Developed comprehensive plans for ecosystem response/recovery and fishery monitoring, used in whole or part to respond to funding announcements
- Initial investigative funding acquired through:
 - *NSF RAPID*
 - *NGI-administered release of preliminary BP Ocean Trust Fund monies*

EXTERNAL FUNDING

Current Supported Research

- inshore/nearshore plankton communities
- deep-sea (*Geryon*) crabs
- inshore and deep-sea benthos
- larval blue crab recruitment
- potential impacts to saltmarsh habitats
- oil and dispersant effects on bacterial respiration
- dispersed oil exposure effects to molecular biomarkers
- microbial response to oil and dispersants
- parasitological parameters as indicators of oil exposure
- dispersed oil effects based on histological conditions
- juvenile fishes associated with pelagic *Sargassum* habitat
- multi-media outreach and education

EXTERNAL FUNDING

Natural Resources Damage Assessment

- 3-step NOAA-managed process to:
 - *assess impacts to resources*
 - *quantify those impacts (or “injuries”)*
 - *restore affected resources*
- involves resource “trustees” (states/feds) and the “responsible party” (BP)
- GCRL = part of Technical Working Groups
 - *identify baseline data sources*
 - *prioritize potentially impacted resources*
 - *develop sampling plans to quantify resource injury*
- GCRL = component of the whale shark, Gulf sturgeon, and *Sargassum* sampling plans

MEDIA RELATIONS & OUTREACH

The Science of the Spill | Using Science to Understand the Deepwater Horizon Oil Spill - Windows Internet Explorer

http://www.spillscience.com/blog/

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Episode 2 Available for Online Viewing

Posted on [October 6, 2010](#) by [admin](#)

Episode 2 is available for online viewing. Episode 2 aired on September 30 on Mississippi Public Broadcasting.

- [Episode 2 on SpillScience.com](#)
- [Episode 2 on YouTube.com](#) (part 1 of four)

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MEDIA RELATIONS & OUTREACH

- DWH disaster = world-wide news event
- numerous media requests to GCRL Public Information office
- approximately 780 print and video interviews given to date
- reporters permitted to accompany scientists aboard research vessels
- “town hall” meeting held with an estimated 250 citizens in attendance
- *Science of the Spill* – NSF-funded multimedia outreach program (www.spillscience.com)

MEDIA RELATIONS & OUTREACH

Outreach Strategy

- Scientists interpreting spill-related processes
- Mindful of public concern about potential environmental impacts
- Maintain scientific independence by not speculating beyond what has been proven
- Focused on general concerns based on GCRL knowledge of local ecosystems and scientific findings resulting from prior spills
- Mindful of social and economic consequences of DWH and the media coverage

● LUMCON

● Louisiana Fish and Wildlife

● LSU

● Southern Miss

● Stennis Space Center

● GCRL

○ NOAA Fisheries

● Dauphin Island Sea Lab

● USA

○ Alabama Department of Conservation and Natural Resources



Gulf of Mexico



Current Monitoring Programs

Mississippi Coastal Sport Fish Studies

- SEAMAP Mississippi Coastal Sport Fish Studies
- SEAMAP – Shrimp/Groundfish
- SEAMAP-Longline
- SEAMAP – Inshore Trawl
- Spotted Seatrout Spawning Habitat
- Habitat Use of Reef Fishes at Artificial Reef Habitats in Mississippi Coastal Waters
- Habitat Use of Bull Sharks in Mississippi Coastal Waters
- Juvenile Tarpon Occurrence and Habitat
- Mississippi Blue Crab Fishery – CPUE
- Broad-Scale Trawl Monitoring
- Fishery Assessment and Monitoring (IJ)

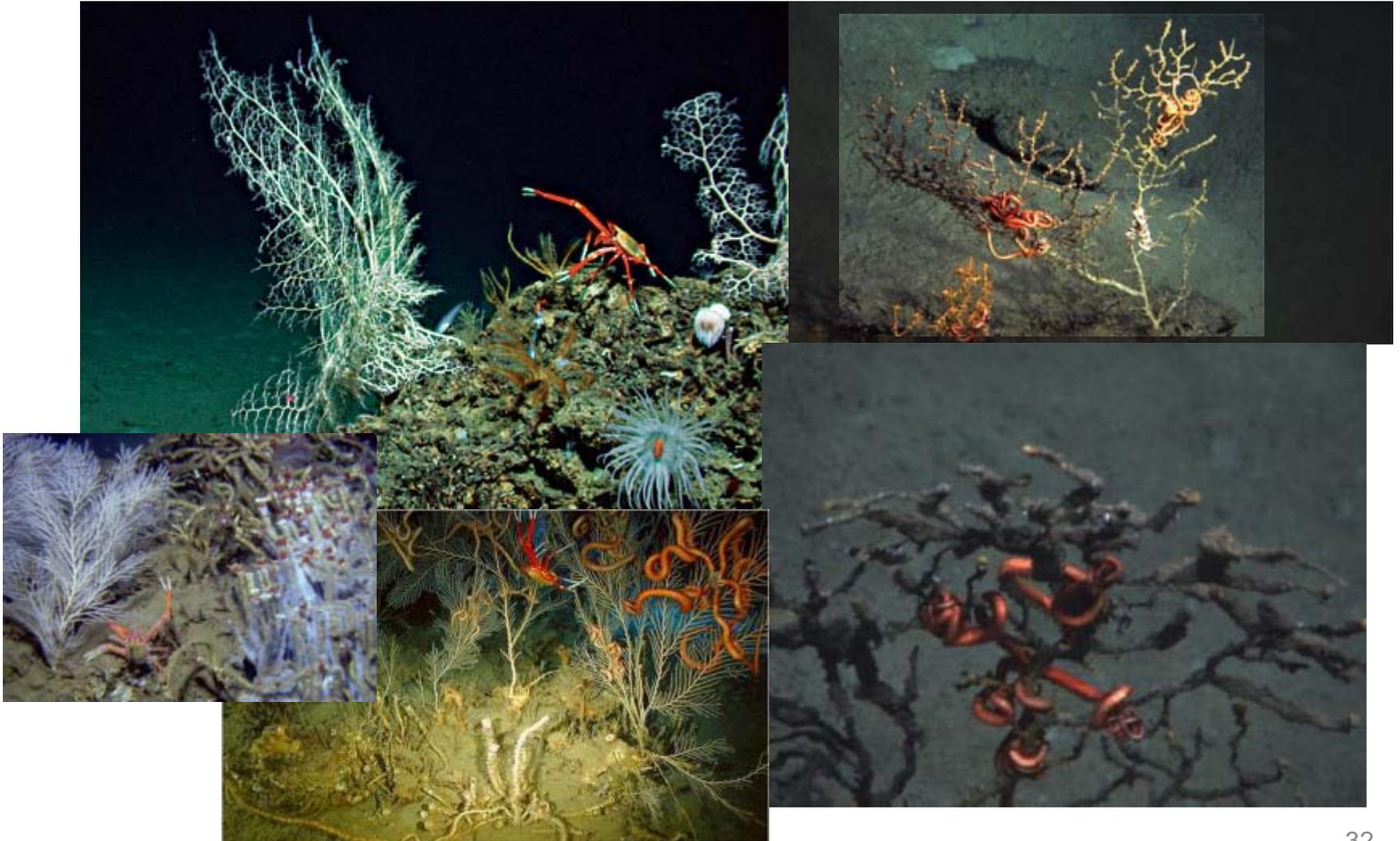
Salt Marshes and Grassbeds



Beaches and Barrier Islands



Offshore Deepwater



CONCLUSION

- Largest marine oil spill in U.S. history
- Multitude of logistical issues associated with the disaster
- Ecosystem impacts are being — and will continue to be — investigated, but it will be a long-term process to identify those.
- Provides the opportunity to set forth broad collaborations among state agencies, federal agencies and academia to be better prepared for the next environmental disaster