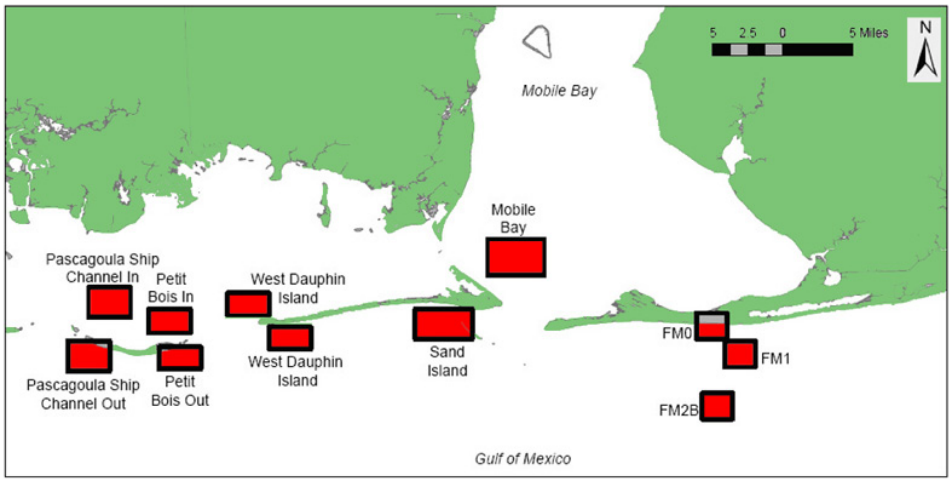
NGI
Northern Gulf Institute
a NOAA cooperative institute

Discovery Porthole

Sharing Research with Educators and the Public

Coastal Alabama and Mississippi Fish Communities

The explosion of the Deepwater Horizon oil rig was of extreme concern to research scientists, environmental managers, and conservationists. Because of public health concerns, state and federal authorities quickly closed many areas of the northern Gulf of Mexico to recreational and commercial fishing. NGI researchers at the Dauphin Island Sea Lab immediately began studying the oil spill including what effect the closures and subsequent lack of fishing pressure had on fish populations.



DISL sampling sites in coastal Mississippi and Alabama. Image credit: DISL

Almost immediately after the failure of the Deepwater Horizon (DwH), scientists at the Dauphin Island Sea Lab began collecting ***baseline data*** to assess the make-up and abundances of commercial and recreational fishes in the nearshore waters of Mississippi and Alabama. The nutrient rich ***estuaries*** in the northern Gulf of Mexico (NGOM) contain a number of critical habitats including oyster reefs, seagrass beds and saltmarshes. These habitats provide protection and feeding grounds for ecologically and economically important species of fish, crabs and shrimp. Soon after the DwH rig collapse, oil began impacting some of these coastal environments. Tar balls and oil slicks washed ashore in a number of nursery areas in the NGOM. During this time, the federal government mandated the immediate closure of all commercial and recreational fisheries in the affected area, resulting in a dramatic decrease in fishing. The closure of these areas effectively created a large marine protected area and allowed scientists to measure the impact of fishing on marine food webs. The DwH oil spill also provided researchers an opportunity to gain important knowledge about the ecology of nearshore ecosystems including how they respond to toxic contaminants, such as ***hydrocarbons*** and ***dispersants***.

Sample from a trawl net collected in Mobile Bay after the oil spill. Photo credit: DISL

Initial results of an environmental assessment, using comparisons of fishing data before and after the spill, show changes in coastal and offshore fish communities. The number of species caught in the study areas significantly increased as well as the total fish abundance and weight. Although continued research is needed to address other potential influences (i.e. variability from one year or season to the next), results show the abundances and biomass dramatically increased for many species. Scientists believe the increase may be due to indirect effects of the oil spill, primarily through the lack of fishing. This project has provided information about fish, shrimp and crabs in coastal Alabama both before and after the spill and contributes significantly not only to scientists' knowledge of how these groups respond to disturbances such as the oil spill, but also how these communities respond to more chronic pressures such as recreational and commercial fishing.

Education Extension

Key Terms: *ecosystem, habitat, conservation, biodiversity, marine protected area*

Classroom Activity: Marine Protected Areas

During the oil spill, fishing bans created a temporary sanctuary (similar to a Marine Protected Area) across a large portion of the northern Gulf of Mexico. Marine Protected Areas (MPAs) are environments that have been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources contained within. The level of protection varies from site to site depending on the desired management and conservation strategies. Information about the National MPA system can be found at **www.mpa.gov**.

Supplies: *computers with internet access*

Directions: 1) After learning about the marine environment or a specific marine habitat, discuss with students how and why people protect these areas. 2) Introduce the National MPA system and the different types of MPA's that exist. 3) Ask the students (or groups of students) to research an MPA of their choice on the web and present their findings to the class. A name, location, management agency, conservation and protection focus and level of protection should be included.

Ocean Literacy Principles:
1. The Earth has one big ocean with many features, 5. The ocean supports a great diversity of life and ecosystems, 6. The ocean and humans are inextricably interconnected, 7. The ocean is largely unexplored

National Science Standards:
A. Science as Inquiry: Abilities necessary to do scientific inquiry; C. Life Science: Populations and ecosystems; G. History and Nature of Science: Science as a human endeavor

Visit **http://dhp.disl.org/resources.html** for lesson plans and additional marine-related activities.

****Use the key terms above to search for additional lesson plans on the web!***

Did You Know...

Baseline data is information gathered before a change occurs. In the case of the Deepwater Horizon disaster, data collected immediately following the explosion but prior to the presence of oil provided a comparison to data collected after sites were impacted. In some cases, baseline data was available for comparison from more than a decade ago.

Estuaries, in the form of bays, sounds and lagoons, occur where rivers meet the sea. These transitional areas are characterized by protected, brackish waters, receiving input from both fresh and saltwater environments. Estuaries are nursery grounds for many ecologically and economically important species of crabs, shrimp and fish.

Hydrocarbons are organic compounds made of hydrogen and carbon found naturally in oil and petroleum products.

Dispersants, like Corexit, are solvents used to break oil up into smaller globules. It was used during the Deepwater Horizon oil spill and was dispensed from the air and deep below the surface of the water near the well-head.

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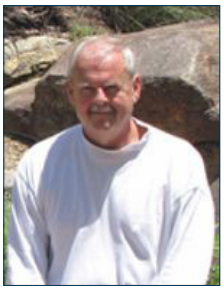

Marine Conservation Lab
http://marineconservationlab.disl.org/

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The Northern Gulf Institute (NGI) is a National Oceanic and Atmospheric Administration (NOAA) Cooperative Institute addressing the research needs of the northern Gulf of Mexico. Mississippi State University leads this collaboration of the University of Southern Mississippi, Louisiana State University, Florida State University, Alabama's Dauphin Island Sea Lab, and NOAA scientists at laboratories and operational centers.

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