



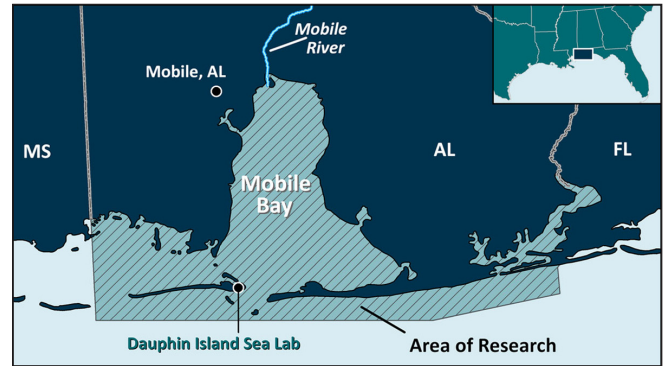
NGI
NORTHERN GULF INSTITUTE
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Discovery Porthole

Sharing Research with Educators and the Public

Residents and visitors of Mobile Bay: oil spill impacts

In Mobile Bay, two key species were at risk for contamination as oil entered the surrounding waters after the Deepwater Horizon disaster; the commercially important eastern oyster and the endangered West Indian manatee. These very different species were closely monitored to study effects of oil exposure not only because of their special interest throughout the northern Gulf, but because they represent two distinct habitat niches and lifestyles typical of species in local waters (stationary bottom-dwelling residents and mobile ocean-going visitors).



Oysters in Grand Bay, AL. Photo credit: DISL

Oysters are efficient biological filters, able to take in everything from microscopic algae, their primary food source, to harmful microbes and pollutants from surrounding waters. Prior to the Deepwater Horizon oil spill, Dr. Ruth Carmichael and the Marine Organism and Ecosystem Response Lab at the Dauphin Island Sea Lab, researched ways to use oysters as indicators of pollution from wastewater treatment plants and other sources. With funding from NGI, lessons learned from that research are being applied to determine how oil from the spill might have directly contaminated local oyster stocks, or indirectly impacted them by triggering or magnifying hypoxic (low-oxygen) conditions. Their work includes measuring concentrations of PAHs (polycyclic aromatic hydrocarbons; one of the main carcinogenic components of oil)

in the sediments and water column, as well as in the oysters themselves. Laboratory techniques, including *stable isotope* and protein analyses, are being used to answer critical questions about oyster stress and whether the stress is related to the oil spill or another environmental factor. Used together, Dr. Carmichael hopes to determine the long-term effects of oil on oyster function, growth and survival.



Researchers measure the health of a Florida manatee captured in Mobile Bay, AL before fitting it with a satellite tag. Photo credit: DISL

Dr. Carmichael has also conducted surveys of *Florida manatees* in Alabama, Mississippi and Louisiana. She is looking for and recording the presence or absence of oil in the water and on aquatic plants in areas visited by manatees. She and her team will document changes in the habitat and compare their findings to records from before the oil spill. Three manatees were tagged after the spill to follow their movement patterns in Alabama waters and during their *seasonal migration*. These animals are currently being tracked and compared with two other manatees that were tagged before the spill. The data collected before the oil spill on manatee habitat, distribution and movement patterns, and surveys allow scientists to make accurate comparisons. The DISL Mobile Manatee Sighting Network is dedicated to mapping and tracking manatee sightings in all Alabama and Mississippi waters.

Education Extension

Key Terms: manatee, habitat, endangered species, migration

Classroom Activity: Migrating Manatees

Some animals stay in one general area their entire life while others migrate, sometimes very long distances. Animals may migrate to another area to mate, find food, because of a change of season or other environmental or behavioral cues. Florida manatees spend the winter in Florida near the warmth of springs that remain at a constant temperature year round but during the warmer months travel long distances in search of aquatic plants to eat. In the US they travel as far west as Texas and as far north as Virginia.

Supplies: computer with internet access, maps

Directions: 1) Discuss manatees, their role in the marine environment, current endangered status and their seasonal migration. 2) Visit www.learner.org/jnorth/ and <http://manatee.disl.org/> to learn more about Florida manatees and how scientists use satellite tracking to record their movements. 3) Use archived latitude and longitude data from Journey North to map manatee migration. 4) Visit <http://topp.org/> to learn about tagging programs that track animal migrations in the Pacific Ocean.

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!

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

National Science Standards: A. Science as Inquiry: Abilities necessary to do scientific inquiry; C. Life Science: Organisms and environments; E. Science and Technology: Understandings about science and technology; G. History and Nature of Science: Science as a human endeavor

Did You Know...

The eastern *oyster* (*Crassostrea virginica*) can filter up to 1.3 gallons of water per hour as it feeds and can live for up to 20 years. Once a larval oyster settles onto a hard surface it will stay there the rest of its life. These traits make oysters vulnerable to contamination.

Isotopes are atoms of elements with different numbers of neutrons. **Stable isotopes** do not decay rapidly and isotopes of oxygen, carbon, nitrogen, hydrogen and sulfur, are commonly used in scientific studies because they occur in abundance in living tissue.

Florida manatees, a subspecies of the West Indian manatee, are large marine mammals commonly found in warm coastal waters of Alabama, Florida, Georgia and South Carolina.

Seasonal migration is the movement of a group of animals, triggered by changing seasons, in search of habitat, breeding opportunities, food or more suitable temperatures. While widely distributed during the summer, manatees must return to Florida's warm springs when water temperatures fall below 70°.

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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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