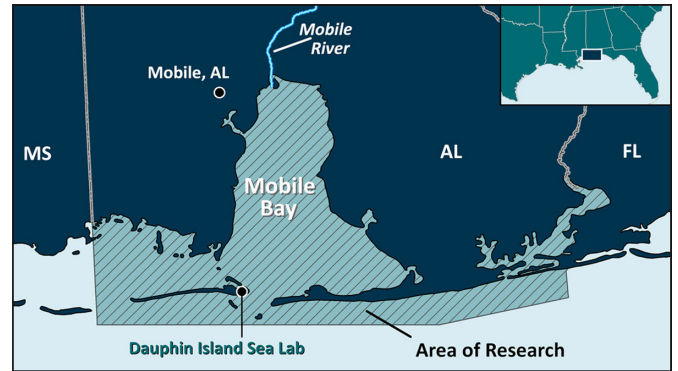# *Monitoring nursery habitats after the oil spill*

Salt marshes and seagrass meadows, common across the northern Gulf of Mexico, are highly productive ecosystems that provide critical habitat to many ecologically and economically important species of finfish and shellfish. Juvenile crabs, shrimp and fish that seek refuge in these habitats were threatened during the Deepwater Horizon disaster. Fortunately, scientists are finding no significant changes in Alabama's marsh and seagrass habitats.

The coasts of Alabama and Mississippi were not as severely impacted as those of Louisiana following the Deepwater Horizon disaster, receiving only light and patchy oiling; however, many of the organisms that live in the marsh spend a portion of their early lives offshore amongst the plankton, putting them in harm's way of oil in the open Gulf. Scientists at the Dauphin Island Sea Lab are currently monitoring populations of animals that take refuge in the **salt marshes** and **seagrass meadows** of coastal Alabama to determine whether they have been significantly impacted by the disaster. In particular, researchers are closely monitoring species that spend their early years in coastal habitats but breed offshore, such as blue crab and brown and white shrimp. These juvenile transients are being compared to resident species like grass shrimp and killifish that spend their entire **life cycles** in coastal habitats. If off shore oil impacts are causing a decline in larvae and juveniles before they reach coastal waters, their numbers are expected to decline relative to species that breed, grow and reproduce in nearshore habitats.

Blue crabs and speckled trout spend a portion of their lives in salt marshes and grass shrimp live there permanently. Credit: Ryan Moody

The potentially harmful effects of dispersed oil on plankton, including larval saltmarsh and seagrass species, in coastal habitats are unknown but likely widespread. Long-term monitoring of coastal marsh-seagrass systems is required to determine if the Deepwater Horizon accident has resulted in decreased finfish and shellfish populations in coastal nursery habitats. Coastal nurseries, therefore, have the potential to serve as indicators of change for the Gulf of Mexico. Over the coming months and years, scientists will continue using random sampling methods (i.e., trawling, coring and quadrat sampling) to gather abundance and biodiversity data from study areas to better understand if coastal habitats have been impacted.

Researchers use a specially designed net to trap animals that use the marsh during high tide. Credit: Ryan Moody

Education Extension

Key Terms: *ecosystem, habitat, population, life cycle, species, random, estimate*

Classroom Activity: Random Sampling

Random sampling methods are used by scientists to estimate species abundance or species diversity in a given area. These methods can easily be adapted for classroom or at-home activities.

Supplies: *quarter meter quadrat (50 cm x 50 cm), field guide, data sheet, pencil*

Directions: 1) Choose a habitat close to your home or school and discuss the plants and animals commonly found there (e.g., field, forest, garden, etc.). 2) Visit the habitat and randomly choose a study site. 3) Choose a plant or animal population you want to estimate (e.g. clovers). 4) Randomly toss a quadrat in the study site. 5) Record how many clovers are in the quadrat. 5) Estimate how large the entire habitat is. 6) Multiply the number of clovers in the quadrat by the number of square meters in the habitat to calculate the population. 7) To improve the accuracy of your estimate, count more than one quadrat sample.

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, 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

Did You Know...

Salt marshes occur in the intertidal zone (area exposed at low tide) and are home to a narrow range of plants and animals. Animals must move to deeper water as the tide falls or tolerate being exposed. Salinity and temperature changes are common and few are able to survive such harsh extremes.

Seagrasses are submerged flowering plants found in shallow bays and lagoons across the northern Gulf of Mexico. Seagrasses require a lot of light and are therefore only found in clear marine waters.

Seagrass meadows provide food, habitat and nursery areas for marine life such as sea turtles, manatees, stingrays and shrimp. Seagrasses also help stabilize sediments and maintain water quality.

The *life cycle* for one animal living in the salt marsh can vary greatly from another. Killifish spend their entire lives in the marsh while blue crabs breed and develop offshore and spend most of their adolescent years in the marsh.

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