NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE

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Shorelines and Coastal Habitats in the Gulf of Mexico
FACT SHEET

The effects of the Deepwater Horizon oil spill on natural resources are dependent on multiple factors including oil composition, oil quantity, dispersal techniques, and contact with organisms.

Broadly speaking, when offshore, impacts may occur in the upper meter or so of the water column, mid-level mixing layer (through dispersal of oil and toxic components) and at the sea floor. When onshore, impacts may occur to shorelines, nearshore waters, and coastal habitat.

To help quantify the magnitude of impact and injures, modeling efforts will be supported through data collected during the spill.

Shorelines and coastal wetlands in the Gulf of Mexico

The Gulf of Mexico coastal areas have more than half of the coastal wetlands within the lower 48 states; Louisiana alone has approximately 40 percent of the total. Although coastal areas are vital for fish species and protection of human life and property ashore, the Gulf of Mexico has been losing coastal land at a very high rate over the last 50 years. Each year, we lose 25 square miles of coastal wetlands. In the past century, we have lost more than 1 million acres. Approximately 90 percent of the nation's coastal wetland losses occur in Louisiana. If the current rate of erosion continues, Louisiana alone could lose an addition 800,000 acres of wetlands by 2040, moving the shoreline inland by as much as 33 miles in some areas.

The effect of the Deepwater Horizon oil spill on coastal erosion will be determined by how much oil reaches these habitats, and how long it stays there. A lot of oil resting on vegetated coastal shorelines could cause the vegetation to become stressed and die; this could cause the roots to die, weakening marsh soils. Weakened marsh soils would then be at risk of accelerated erosion from waves and storms.

Habitat in the Gulf of Mexico

97% (by weight) of the commercial fish and shellfish landings from the Gulf of Mexico are species that depend on estuaries and their wetlands at some point in their life cycle. Landings from the coastal zone in Louisiana alone make up nearly one-third (by weight) of the fish harvested in the entire continental United States.

In such an incredibly productive area, important habitat in the Gulf covers nearly every part of the ecosystem. Some examples include the open water column, floating sargassum mats, deep-sea soft corals, hard coral reefs, rocky hard-bottom substrates, ledges and caves, limestone outcroppings, artificial reefs, mangroves, sandy bottom, muddy bottom, marshes, submerged aquatic vegetation, bays, lagoons and even the sandy beach, which turtles use for laying eggs.

In federal waters, species that use the surface would be most impacted by the early stages of the oil spill. As the crude oil sinks, the bottom-oriented fish community may be impacted.

In general, the 42 reef fish species managed in the Gulf of Mexico are often found in bottom areas with high relief, such as coral reefs, artificial reefs, and rocky hard-bottom surfaces. These areas are usually deeper than 100 meters. As long as the oil spill remains on the surface and offshore, the impacts to reef fish habitat should be minor. However, if the oil slick reaches the bottom or nearshore/inshore areas, the

majority of the reef fish species could be impacted. However, some reef fish spawn in spring, and their eggs and larvae are usually planktonic, carried by currents rather than through their own control. These larvae would not be able to avoid or escape the oil if currents brought them together. Sargassum mats are nursery habitat for some species, including gray triggerfish and amberjacks. Sargassum mats that intersect the oil could impact these species.

In state waters, all coastal species could be impacted if the oil spill reaches nearshore waters. In addition, shrimp larvae usually spend the early months of their life in inshore waters before migrating toward the ocean. Brown shrimp postlarvae migrate from February to April, and white shrimp being their migration from May through November.

During spring and summer months, several Gulf shark species use coastal habitats as nursery areas, so if oil reaches coastal areas they use, they would be affected.

How oil affects habitats and species

Dispersed and dissolved oil (comprised of polycyclic aromatic hydrocarbons, (PAHs)) in the water can result in exposure of aquatic resources to the toxicological effects of PAHs. This contact in the water column may be exacerbated by use of surfactants, weather conditions and other dispersal methods which increase mixing.

PAHs can cause direct toxicity (mortality) to marine mammals, fish, and aquatic invertebrates through smothering and other physical and chemical mechanisms. Besides direct mortality, PAHs can also cause sublethal effects such as: DNA damage, liver disease, cancer, and reproductive, developmental, and immune system impairment in fish and other organisms. PAHs can accumulate in invertebrates, which may be unable to efficiently metabolize the compounds. PAHs can then be passed to higher trophic levels, such as fish and marine mammals, when they consume prey.

The presence of discharged oil in the environment may cause decreased habitat use in the area, altered migration patterns, altered food availability, and disrupted life cycles.

During past oil spills in the Gulf of Mexico, NOAA has documented direct toxic impacts to commercially important aquatic fauna, including blue crabs, squid, shrimp and different finfish species.