

# OIL IMPACTS ON SHORELINES AND COASTAL HABITATS IN THE GULF OF MEXICO



Credit:NPS

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 injuries, 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.



Nesting terns. Credit: Drew Wirwa, USFWS

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 additional 800,000 acres of wetlands by 2040, moving the shoreline inland by as much as 33 miles in some areas.

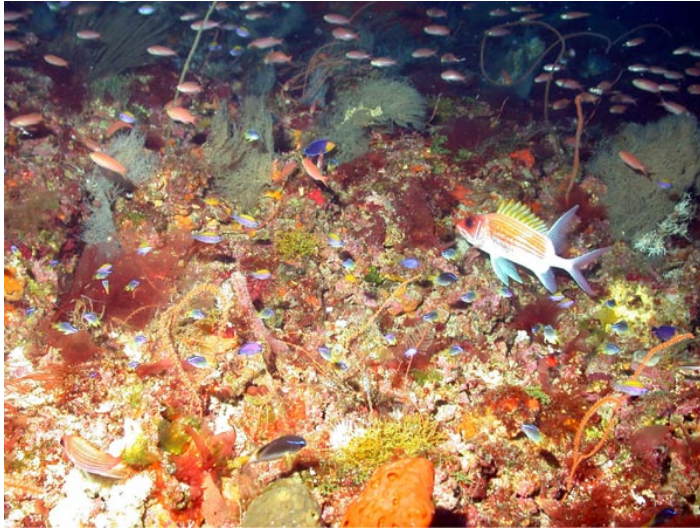
The effect of the [Deepwater Horizon oil spill](#) on [coastal erosion](#) will be determined by how much oil reaches these [habitats](#), and how long it stays there.

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

Ninety-seven percent (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.



Over 200 species of coral reef fish occur in the northwestern Gulf of Mexico. Credit: NOAA 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.

If the oil slick reaches the bottom or nearshore/inshore areas, the majority of the reef fish species could be affected. 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 affect these species.

In state waters, all coastal species could be affected 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 that increase mixing.



Brown pelicans. Credit: Drew Wirwa,

[USFWS](#) [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 immunosystem 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.

Source : <http://www.eoearth.org/view/article/51cbefaf7896bb431f69e953/?topic=51cbfc7ef702fc2ba812ad27>