

The effects of oil spill in the marine ecosystem

[Environment](#), [Ecology](#)



These components affect living organisms in many ways. Some of the soluble components and emulsions are poisonous, particularly to small organisms that do not have protective coverings or shells- Fish larvae, single celled algae and many kinds of plankton are vulnerable and these are the basic foundation of the marine food chain. In shallow water these toxic substances may directly kill algae, coral and sea grasses.

These components may also be passed in the food chain or directly ingested or absorbed through the gills of fish and other larger marine organisms. The effect may be to kill the animal or contaminate its tissues. A thick film of oil on the sea surface may reduce sunlight penetration and reduce photosynthesis. Small particles and emulsions may be ingested or block the feeding mechanisms of invertebrates such as oysters, starfish, sponges and corals.

These particles also may have toxic components, so the effects can be physical, chemical or both. The most dramatic impact of oil spills is the coating of larger animals with oil. Animals that breathe at the surface like dolphins, sea turtles and manatees may inhale oil and toxic vapors. Sticky oil may also coat their bodies. Coating with oil is particularly devastating to birds. Even a thin coat of oil compromises the waterproof quality of feathers, causing the bird to become water logged and lose heat. Animals, like some sea turtles, that feed at or near the surface may ingest tar balls and particles that then physically block their intestines and may be toxic as well.

At the shoreline, shallow waters and coastal estuaries and marshes, the impact of the layer of oil, floating and suspended emulsion and particles can

be devastating, coating plants and benthic animals like corals, crabs and shell fish, preventing photosynthesis and breathing and blocking filter feeding mechanisms. These materials become mixed into shoreline sediments and remain in the system for years. ' Dispersants' are detergent like substances that can be applied to an oil slick and accelerate the emulsification, break-up into particles and dispersion of the thick oil. This limits the spread and the distance that a slick moves.

However it is important to recognize that the oil does not go away- its all still there, just in the form of smaller particles and emulsion that is less mobile. In addition, dispersants may also be toxic or have deleterious effects on the natural environment, particularly on small single celled organisms. System recovery.

Despite these gloomy predictions, the effects of oil spills are not permanent and complete. Marine systems show remarkable resiliency and as the oil becomes sequestered in less active forms (tarballs, buried oil etc.) and is broken down by sunlight and bacterial action, the systems recover. Survivors reproduce and recolonize habitats. Some creatures adapt to tar and oil covered substrates and some crabs and mollusks actually eat the tar and the bacteria and fungi growing upon it, and aid its degradation. The oil in its several forms is dispersed, diluted and broken down until only small pockets and particles remain.

Marine systems are by their very nature open- that is connected by the sea, wind and currents to distant uncontaminated regions. Many marine organisms have mobile life phases(floating eggs, larvae) that recolonize and re-establish populations. Some of the creatures affected by a spill also

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routinely suffer catastrophic mortality from other causes (e. g. some colonial nesting seabirds) and are well adapted to recover. Large mobile animals like sharks, sea turtles, large fish and whales that moved away from the spill move back. Although there may be significant mortality of some of these animals, overall the impact on their populations is usually not permanent.

In the well studied cases in the Arabian gulf, Alaska (Exxon Valdez) and English Channel (Torrey Canyon), the appearance of the system returned close to normal within a few years. Although there was still oil and tar present in the sediments, and continuing effects among the organisms there was visible recovery of major parts of the system (seagrass beds, rocky intertidal habitats, coral reefs).

With the passage of time, approximately a decade or so, and rebalancing of ecosystem and the creatures living in it, the system continues to function and returns to productivity, fisheries recover and many of the organisms are restored to their previous abundance. While such widespread intense disruption may causes changes in the balance of nature- which species are present and how numerous they are- nature itself survives. Although such catastrophic events are very damaging and economically expensive at a human scale, on an ecological time scale they are passing disruptions and on an evolutionary timescale, barely perceptible.

Ecosystem effects

Clean up efforts have included unprecedented amounts of chemical dispersants, which are used to break up oil slicks. Although detailed effects of the chemical dispersants on wildlife and ecosystems are not well studied,

the chemicals used are toxic to a variety of organisms, and they have never been previously used on this wide a scale. Because dispersants break oil up into tiny droplets, marine biologists fear that fish larvae, zooplankton and filter feeders (such as oysters), will be at risk from eating the large quantities of “ non-visible” oil.

Chemical dispersants are likely to impact deep-water animals downstream of the well. Oil will likely reduce the amount and health of all prey species, reducing the food available for marine mammals, seabirds and sea turtles. Plankton is the foundation for nearly all life in the Gulf of Mexico (and the ocean), and they will most likely be affected. Contaminants from the spill and the dispersants are likely to concentrate in the upper food chain, affecting whales, dolphins, birds and sharks. Fishes

Scientists have observed fish species moving into near-shore areas with less oil contamination, indicating that they may be fleeing significant habitat impacts in deeper waters. The Gulf is a breeding ground for bluefin tuna, and the oil spill coincides with egg production. Larvae of tuna and other fishes eat anything they see in the water, including oil droplets. Studies on a variety of fish larvae suggests that ingestion of both oil droplets and dispersants causes adverse effects, including mutations, physiological problems and increased mortality.

Birds

Seabirds get covered with oil while diving into oily waters to fish. The birds may ingest oil when they eat prey that is covered in or has ingested oil. Once birds are covered with oil, they have difficulty flying, or are completely

unable to fly, making feeding and getting away from predators impossible. Many species of birds, including the brown pelican (just taken off the endangered list) face threats from the oil spill on the coastal islands and wetlands of the Gulf that they use as rookeries. Birds' eggs are getting covered in oil, and the birds are deserting their oiled habitat, leaving their eggs behind.

Oil pollution is one of the most serious environmental problems in the marine environment. Episodic pollution events, such as catastrophic oil spills; in particular, threaten water quality and habitat with a suddenness and severity rarely matched by other pollutants. Catastrophic spills typically result from transportation accidents such as collisions or groundings of oil tankers. Most oil pollution stems from non-catastrophic events, however, and occurs most frequently during cargo transfer operations. In fact, of the 3.5 million tons of oil that ends up in the ocean every year worldwide, only a small percent is a consequence of tanker spills. About 70 percent of oil pollution is due to chronic pollution from municipal and industrial wastes or run off, dumping of waste oil, release of oily bilge water, and from other-than-tanker transportation.

What's an oil spill?

Oil spills happen when people make mistakes or are careless and cause an oil tanker to leak oil into the ocean. There are a few more ways an oil spill can occur. Equipment breaking down may cause an oil spill. If the equipment breaks down, the tanker may get stuck on shallow land. When they start to drive the tanker again, they can put a hole in the tanker causing it to leak oil