

# Oil Spill Solutions



## Student Resource: What is an Oil Spill?

An oil spill is an accidental release of liquid petroleum hydrocarbons (usually during transportation of oil) into the environment. Oil spills usually refer to the release of oils into water, but of course an oil spill can take place on land as well. While spills can take place quickly, as when a ship sinks, or a leak occurs in a pipeline, the cleanup can be a long term project. And, the longer the oil sits in the water, the greater the impact on the environment.

### ◆ Impact on the Environment

Birds are one of the creatures impacted by oil spills. Oil can sink into and reduce the functionality of bird feathers. A bird's feathers provide insulation, so a bird exposed to oil will be exposed to temperatures they are not used to. It also makes it difficult for a bird to float or fly...so the bird will be more vulnerable to animals of prey, or the bird may not be able to move to find food or clean water. Birds try to clean themselves, and if they do they are likely to ingest some of the oil which can cause damage to internal organs. Most birds impacted by an oil spill die unless humans step in and help clean them. Many organizations work to save these animals. More information is at the "Oiled Wildlife Care Network" at the University of California, Davis ([www.vetmed.ucdavis.edu/owcn](http://www.vetmed.ucdavis.edu/owcn)) or the International Bird Rescue Research Center ([www.ibrrc.org](http://www.ibrrc.org)). Birds are not the only creatures put at risk by oil spills. Marine mammals such as seals and otters gain insulation benefits from their fur. As oil permeates the fur, they are potentially exposed to temperatures beyond their normal range. It is important to act quickly when a spill occurs to lessen the impact of the spill on the natural environment. Environmental engineers are often called upon to come up with planned solutions in advance of a spill, or to customize systems bases on a specific event.

### ◆ Engineering Trade-offs

In order to reduce the chances of an oil spill, engineers have developed new ship designs with double -- and even triple hulls. The oil is stored in the most interior hull, so that if there was a leak, it would be captured in the next outer hull. Of course, these multiple hulled ships are more expensive to build and operate, so a company will have to weigh the advantages and disadvantages of ship engineering in order to come up with a plan that meets safety requirements, but also does not increase the cost of the shipped product more than the market can bear.

### ◆ Clean-up Methods

There are many types of cleaning methods used for spills, including:

- Bioremediation: using microorganisms or biological agents to break down or remove oil
- Dredging: some oils are actually denser than water, and would sink. These would require cleaning below the surface of the impacted water.
- Skimming: can be effective areas where the water is calm.
- Dispersion: materials such as some detergents can disperse oil into smaller clusters that may be easier to remove than larger areas. However, the detergents can sink deeper into the water than oil does, so it may cause harm deeper in the water while reducing negative environmental impact on the surface.
- Burning: controlled burning can often eliminate a large proportion of oil in water, but of course requires great care to avoid having the fire spread. The burning oil can also cause air pollution.