



Oil spills

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Abstract

Unless contained and treated oil spill can cause irreparable damage to the environment and a great loss of marine life as well. Chiefly as a result of intensified petroleum exploration and production of continental shelves and the use of supertankers capable of transporting more than 500,000 metric tons of oil. Spectacular oil spills for Wrecked or damaged supertankers shipping and environment regulations. Nevertheless thousands of minor and several major oil spills related to well discharge and tanker operations are reported each year with the total quantity of oil released annually into the world oceans. Exceeding one million metric tons the unintentional or negligent release of used gasoline Solvents and Crankcase lubricants by industrial and individuals greatly aggravates the overall environmental problem. Combined with natural seepage from the ocean floor these sources add oil to the world waterways at the rate of 3.5 million to 6 million metric tons a year.

Keywords: Emulsified oil is very difficult to clean up using standards (sorbents, dispersants, skimmers etc.) In addition to this, oil is toxic and harms the environment. Where it was spilled, affecting the wildlife. Cleanup oil spills quickly to limit the damage to the environment

Introduction

An oil spill is the release of a liquid petroleum hydrocarbon into the environment, especially marine areas due to human activity and is a form of pollution.

Oil spills may be due to release of crude oil from tankers, offshore heavier fuels used by large ships such as bunker fuel or the spill of any oily refuse or waste oil. Oil spills are the harmful release of oil into the environment, usually in the water, sometimes killing area flora and fauna. Oil is the most common pollutant in oceans. Ship cause about a third of the oil pollution in the oceans. When they wash out their tanks or damp their bilge water.

Oil spill and oil slick in marine environment were classified in three classes as following:

The first class, small oil spill and oil slick were related to berthing, ships or vessels operation in port, and discharges of oil-water-mixtures from machinery spaces.

The second class, oil spill and oil slick were associated with shipping incidents such as collisions, fires or other damage. The oil spills related to damage of oil tanker, offshore structures tend to occur on large area and result in damaging the ocean environmental.

The third class, oil spill and oil-slick were considered as the "unacceptable actions" or "degenerationers" who dump sneakily the waste oil into the marine environment aiming at saving their money. These intentional dumping actions of oil into marine environment were ultra-criminal ones and different from maritime accidents.

The major spills of crude oil and its products in the sea occur during their transport by oil tankers, loading and unloading operations, blowouts, etc.

Major oil spills in India Ennore oil spill Chennai, India Mumbai-urban pipeline spills Arabian-sea Mumbai, India. Mumbai oil spill/MV MSC Chitra and MV Khalijia 3 Arabian –sea Mumbai, India

AIM

To minimize damage and reduce the time for environmental recovery by removing an appropriate amount of oil from the area of concern and disposing of it responsibly.

Objectives

Partner with industry, government, academia to explore key factors to prevent future blowouts, oil spills and accidents and enhance safety culture.

Explore model of decision-support system for safe and environmentally sustainable offshore oil and gas development, disaster response and remediation options.

Provide research opportunities that improve understanding of how social economics and environmental factors influence community vulnerability, recovery and resilience.

Support research long term observations and monitoring and informative development to advance understanding of environmental conditions ecosystem services and community health and well-being in the in the Gulf of Mexico.

Support the development of future professional and leadership in science, industry, healthy, policy and education. Who apply across-boundary approaches to critical issues that span oil system safety human health, and environmental resources.

Identify opportunities for knowledge transfer between the Gulf of Mexico and other US outer continental shelf regions.

Support activities to improve understanding and use of scientific information by the public and policy makers in decisions related health improvement and responsible oil and gas production.

Impact

Oil spills have a number of effects on the environment and economy. On a basic level. Oil spill effects will damage

waterways, marine life and plants and animals on the land. The impact of oil spills can also rain infrastructure and economy of the particular area with the long term effects being felt for decades

Hypothesis

If we can use absorbent materials and skimming then skimming will be the more effective method because absorbent materials soak up more water than oil and skimming picks up only oil.

Effects of Oil Spills

Oil destroys the in sting ability of fur-bearing mammals, such as sea otters, and the water repellency of a birds feather, thus exposing these creatures to the harsh element without the ability to repel water and insulate from the cold water, birds and mammals will die from hypothermia.

1. Effects on the environment: When oils ring or machinery malfunction or break, thousands of tons of oil can seep into the environment. Habitats can be catastrophic. They can kill plants and animals, disturb salinity/PH level, and pollute air, water and more.

2. Effects on human: Studies of biomarkers have uncovered irreparable harm to human exposed to oil and gas from spills. These effects can be grouped into respiratory damage, liver damage, decreased immunity, increase cancer risk, reproductive damage, and higher-level of some toxic (hydrocarbons and heavy metals).

3. Effect on water itself: They can severely contaminate beaches and sediment and causes serious harm to marine wild life. It suffocates fish, get caught in the feathers of birds and mammals and block light from photosynthetic plants in water. Disturb food chain.

Suggestions

1. Fertilization the method of adding nutrients such as phosphorus and nitrogen.
2. Skimming can be used effectively recover most of the oil, so it is economically viable.
3. Bioremediation.
4. Using manual labor.
5. Natural recovery.
6. Oil dispersants work in the same way as dishwashing liquid. Both are made up mainly of surfactant molecules – these are molecules that have a hydrophilic (water-loving) head that is attracted to water molecules and a hydrophobic (water-hating) tail that repels water and simultaneously attaches itself to oil and grease. The result of these opposing forces is that the oil is broken up into tiny droplets suspended in water.
7. Breaking the oil at sea into oil droplets allows them to be dispersed into the underlying sea by wave action. It is hoped that naturally occurring bacteria would then consume the droplets and the dispersant would rapidly biodegrade.
8. Dispersants are usually applied to oil on water by spraying from surface vehicles or by applying from small fixed-wing aircraft or helicopters.

Effective Techniques

This graphic depicts workers responding to an oil spill along the coast using various tools. The following are different tools used for shoreline spill cleanup:

- 1. Shoreline Flushing/Washing:** Water hoses can rinse oil from the shoreline into the water, where it can be more easily collected.
- 2. Booms:** Long, floating, interconnected barriers are used to minimize the spread of spilled oil.
- 3. Vacuums:** Industrial-sized vacuum trucks can suction oil from the shoreline or on the water surface.
- 4. Sorbents:** Specialized absorbent materials act like a sponge to pick up oil but not water.
- 5. Shoreline Cleaners & Biodegradation Agents:** Chemical cleaners that act like soaps may be used to remove oil, but require special permission. Nutrients may be added to help microbes break down oil.
- 6. Burning:** Also referred to as "in situ burning," freshly spilled oil can be set on fire, usually when it's floating on the water surface and sometimes on oiled marsh vegetation, in order to effectively remove it.
- 7. Manual Removal:** Cleanup crews using shovels or other hand tools can pick up oil from the shoreline. This method is used especially when heavy machinery cannot reach an oiled shore.
- 8. Mechanical Removal:** When there is access, heavy machinery, such as backhoes or front-end loaders, may be used.

Conclusion

The tracking, containment and recovery of spills of non-floating oil pose challenging problems, principally because non-floating oils suspended in the water column because mixed with large volume of sea water and may interact with sediments in the water column or on the seabed.

Focusing on many techniques such as blowout preventer and well casting can contain the oil spills.

Chemical methods only were considered in small area such as bay without tourism or aquaculture because of unrecovered oil after treatment by chemicals. Moreover, the residual chemicals as after spraying into oil spill or oil slick were still exist with long time in the seawater and difficult decomposition. Thus, they affected the marine creatures and ecology system. The experience showed that, it should not use chemical methods for treating high viscosity or with stable emulsion oil spill, and oil slick. Using chemical methods after recovering by physical methods to restrict the negative effects on the marine environmental should be done. In case of oil spill occurred in open water such as very large area on the seawater surface, snow or ice, thermal or in-situ burning methods were only used because emission of many pollution components into air and marine environment threatened marine creatures, human life, other resources. The pollution level from thermal or in-situ burning methods was very serious. Although no any oil spill products recovered after treating by biodegradation methods, but this methods were considered as the most advanced and efficient

one because CO₂, H₂O was the last products of biodegradation process by multi-microorganisms. However, the specification of oil types was extremely necessary to choice the most suitable microorganisms due to each microorganisms only favoured one specific oil. This method might be the safest solution for oil spill, oil slick remediation though it took long time. Based on the level of oil spill and oil slick, kind of oils, weather conditions at each area, the reality condition of each countries, the choice of suitable methods, solution or remedies were necessary to recover the oil the most efficiently.

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