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How To Effectively Manage the Oil Spills?



Nataliia Stempkovska · Sep 10, 2019 · 5 min read

The number of oil spills in the ocean is growing exponentially, while the effectiveness of spills management measures remains far behind. The most famous recent cases of oil spills are Deepwater Horizon, Great Barrier Reef, Lambro and Po rivers, Port Arthur oil spill, etc. The year 2019 also did not pass without one more major oil spill case. On 5th February 2019, due to an accident 75 tonnes of oil has leaked in the Solomon Islands.



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Oil spills management is a complicated and expensive process. The latest case caused damage estimated at 5 million dollars. The legal instrument which regulates the control of oil pollution is the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC). This Convention states in its Article 6 part 1, that:

Each Party shall establish a national system for responding promptly and effectively to oil pollution incidents.

But, this international treaty does not namely determine the methods of oil pollution management.

Why is it important to clean oil spills in the ocean? The answer is simple: the oil spills are harmful to marine life. For fur-bearing animals, oil is dangerous, because it harms their heat exchange. The cetaceans are affected by oil when they swim to the surface to breathe or jump. The most vulnerable species are sea turtles and other amphibians during the nesting. Besides, especially sensitive to oil spills are seaweed and corals in case the oil is mixed with coastal waters. However, all these species could be more affected by the cleaning process rather than by oil itself. Therefore, the cleaning methods should be carefully selected not to destroy an already sensitive marine environment.

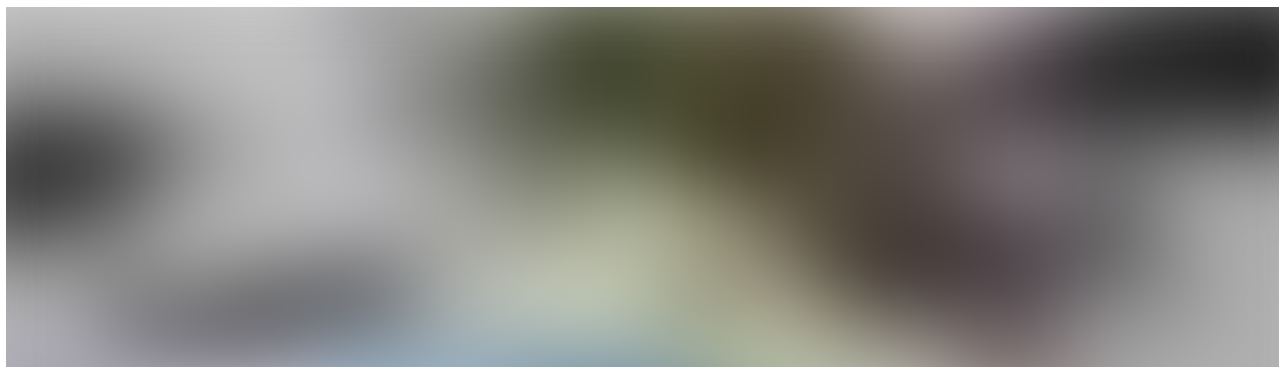




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The most popular methods used to react and clean oil spills in the Sea are oil booms, skimmers, sorbents, dispersants, bioremediation. ***Oil booms*** work as a barrier for oil spills. They are placed on the water surface to catch the liquid oil, which then could be collected with skimmers, vacuums, etc. The booms concentrate the oil in one place so that she can't flow across the oceans. But they are useful just in calm water because if there are waves in the Sea, the oil can overflow. Using booms gets more effective in combination with other cleaning methods, for example, with skimmers and bioremediation.

Skimmers are different mechanical equipment used to remove the oil spills from the water surface physically. Like booms, they should be used in calm water, to prevent oil from fragmenting and dispersing. Skimmers are more

useful in conjunction with booms: the booms limit the area and create a close-circuit for oil spills, while skimmers gather the oil within this area. The combination of booms and skimmers was used to deal with the consequences of Deepwater Horizon disaster.

One of the examples of **bioremediation** is OSE II- a biological enzyme that converts the waste into a natural food source for the bacteria. Oil Spill Eater International, Corp positions their product as the world's most environmentally safe and cost-effective bioremediation process for the mitigation of hazardous waste, spills and contamination virtually anywhere of any size, large or small. The OSE II was successfully used in response to the Nigeria Agip Brass Terminal oil spill, where more than 550,000 liters of crude oil were spilled into the ocean. According to the report of the Company, it was more useful to combine two cleaning methods — oil booms and OSE II — to clean up the waters.

One more group of cleaning methods are **sorbents** and **dispersants**. There are a lot of sorbent types, including organic and synthetic products. To choose the appropriate sorbent type, it is important to take into account the characteristics of the oil, such as absorption/adsorption rate, oil retention, and ease of application.

Despite the successful use of *sorbents* in nearshore and onshore clean-up operations, the use of sorbents in large amounts to clean the oil spills in the ocean may cause some safety problems and should be avoided. The wind, for example, could spread sorbent and cause additional pollution. Besides, If the sorbent isn't properly mixed with the oil, it will be useless just flowing on the surface of the oil spill. As a response to large oil spills, sorbents are less effective than other methods. Moreover, sorbents are not capable of being used in combination with other clean-up techniques.

Dispersants are also widely used in clean-up operations. It is the most controversial clean-up technique because of the number of conditions that should be taken into account. They can quickly remove the significant amount of oil by changing its chemical and physical properties, which makes them the best practical choice in oil spills management. Dispersants were used in response to the Great Barrier Reef oil spill and the Montara oil spill.

However, the process of chemical dispersion should be appropriately supervised and finished as soon as no longer needed. The environmental risk assessment should also be undertaken before the application of dispersants.

In many cases, dispersants may be toxic for marine life, especially for corals. In reaction to dispersants, corals produce a lot of mucus — it is their mechanism of self-defense. After that, if the effect of dispersants continues, the polyps start to fall and are not likely to recover.

Oil spills are dangerous for the environment, but the oil spills clean-up techniques could be even worse. The response to the oil spill must be quick and effective, but those methods which are quickly and could cover a large amount of oil could be dangerous to the environment. There is always a choice between effectiveness and safety.

The *oil booms* are safe for the environment, but they can't be used separately. They don't absorb oil; they concentrate oil in a specific area and are used as the first response to oil pollution. The skimmers don't harm marine habitat, but they are slowly and cannot cover large areas. Sorbents are very useful in small spills, but in large spills, they are likely to cause secondary pollution. Besides, they are expensive.

Dispersants are very effective in oil spills clean-up, they can cover large amounts of oil, but they are toxic and harmful for the marine environment. Bioremediation is a good choice as a clean-up method, it is less expensive, and it became environmentally friendly. However, it requires a lot of time and knowledge as a first response method. Every single case of oil pollution

needs an in-depth examination to choose the right bacteria to be introduced to the polluted site.

Given the above, each case of oil pollution requires a separate approach. In some cases, it is necessary to combine oil booms with skimmers, in other — use bioremediation. When it is appropriate, sorbents and dispersants should be used. It is necessary to assess the environmental impact of each clean-up technique before implementation. The best balance lies between effectiveness and safety.

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