

# DISPERSANT USE IN ARCTIC CONDITIONS

## WHAT ARE DISPERSANTS?

Dispersants are an oil-spill response tool that facilitates removal of oil from the environment by enhancing the process of natural biodegradation. They consist of solutions of biodegradable compounds dissolved in low-toxicity solvents.

## ABOUT THE PROJECTS:

### Fate of Dispersed Oil Under Ice

Industry subject matter experts have defined a research project that will measure the mixing energy under ice in the Arctic and then use this information to run models that predict when or if dispersed oil will resurface. The model results will help determine under what conditions dispersed oil will remain dispersed.

### Dispersant Testing Under Realistic Conditions

Industry subject matter experts have defined a large set of wave-basin tests that will study important parameters that control dispersant effectiveness in ice conditions. These tests will more fully define the operational boundaries for dispersant use in ice and can help to develop comprehensive rules for deployment in the Arctic.

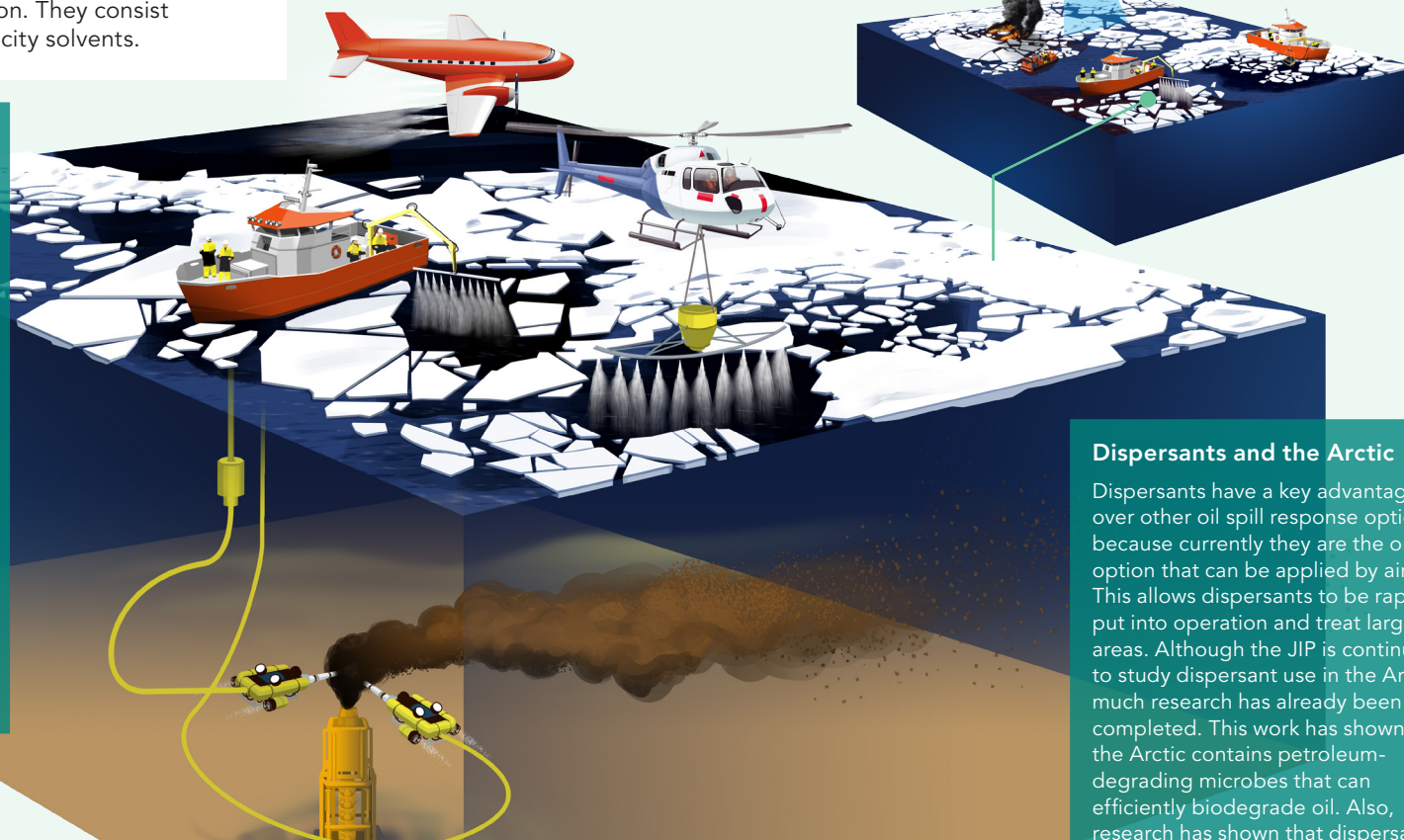
### How dispersants work

Dispersants work in the same way that soaps work to remove oil and grease from clothing. That is, they break down the oil slick into tiny droplets. These droplets become essentially neutrally buoyant in the water column. Breaking down the oil into tiny droplets causes the formation of clouds of dispersed oil that rapidly dilute. This facilitates natural biodegradation by increasing the amount of oil surface area available for microbial consumption. It also allows the oil to dilute to concentrations low enough to avoid exhausting available oxygen and nutrients needed for aerobic biodegradation.

### How dispersants are applied?

Dispersants can be applied in several ways depending on the type of spill and the ambient conditions. For a well-control event where oil could be released from a point-source, dispersants can be applied directly at the source. For large oil slicks in low concentrations of ice or no ice, dispersants

can be applied from large, specially outfitted planes. For oil slicks in higher ice concentrations, dispersants can be more precisely applied to the oil without overspraying onto the ice using boat or helicopter delivery systems.



### Dispersants and the Arctic

Dispersants have a key advantage over other oil spill response options because currently they are the only option that can be applied by aircraft. This allows dispersants to be rapidly put into operation and treat large areas. Although the JIP is continuing to study dispersant use in the Arctic, much research has already been completed. This work has shown that the Arctic contains petroleum-degrading microbes that can efficiently biodegrade oil. Also, research has shown that dispersants are effective under cold, icy conditions. There is enough existing information on dispersant use and its use in the Arctic to guide operations. Thus, dispersants should be a key component of an Arctic oil spill response strategy.

## ABOUT THE JIP

Nine oil and gas companies have established the Arctic Oil Spill Response Technology Joint Industry Programme (JIP) to further build on more than 40 years of existing research into technologies and methodologies for Arctic oil spill response. The goal of the JIP is to advance response strategies and equipment and to increase understanding of potential impacts of oil on the Arctic marine environment.

The Arctic Oil Spill Response Technology JIP is sponsored by nine oil and gas companies:



ConocoPhillips



ExxonMobil



<http://www.arcticresponsetechnology.org>

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