

GAO@100 Highlights

Highlights of [GAO-22-104153](#), a report to congressional requesters

Why GAO Did This Study

In April 2010, an explosion onboard the *Deepwater Horizon* drilling rig in the Gulf of Mexico resulted in 11 deaths and the release of approximately 206 million gallons of oil. During the *Deepwater Horizon* oil spill, responders applied dispersants to the oil slick at the ocean surface as well as at the wellhead more than 1,500 meters below the surface. The subsurface use of dispersants was unprecedented and controversial.

GAO was asked to review what is known about the use of chemical dispersants. This report examines, among other things, what is known about the effectiveness of dispersants, what is known about the effects of chemically dispersed oil on the environment, and the extent to which federal agencies have taken action to help ensure decision makers have quality information to support decisions on dispersant use. GAO reviewed scientific studies, laws, regulations, and policies. GAO also interviewed agency officials and stakeholders from academia and industry.

What GAO Recommends

GAO is making four recommendations, including that the Coast Guard and EPA assess the potential environmental effects of the subsurface use of dispersants. The Department of Homeland Security agreed with the three recommendations GAO made to the Coast Guard, and EPA agreed with the one recommendation to the agency.

View [GAO-22-104153](#). For more information, contact Frank Rusco at (202) 512-3841 or RuscoF@gao.gov or Karen L. Howard at 202-512-6888 or HowardK@gao.gov.

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OFFSHORE OIL SPILLS

Additional Information Is Needed to Better Understand the Environmental Tradeoffs of Using Chemical Dispersants

What GAO Found

When an oil spill occurs, responders have several options to manage the environmental effects, including using chemical dispersants (see figure). Chemical dispersants used on a surface oil slick can be effective at breaking up floating oil, which can help prevent the oil from reaching shore and harming sensitive ecosystems, according to studies GAO reviewed and stakeholders GAO interviewed. However, the effectiveness of applying dispersants below the ocean surface—such as in response to an uncontrolled release of oil from a subsurface wellhead—is not well understood for various reasons. For example, measurements for assessing effectiveness of dispersants applied at the subsurface wellhead during the *Deepwater Horizon* oil spill had limitations and were inconclusive. In addition, there are limited experimental data on the effectiveness of subsurface dispersants that reflect conditions found in the deep ocean.

Application of Chemical Dispersants at the Surface by Aircraft and Boat



Sources: U.S. Coast Guard (left image); SINTEF (right image). | GAO-22-104153

Chemically dispersed oil is known to be toxic to some ocean organisms, but broader environmental effects are not well understood. Dispersants themselves are considered significantly less toxic than oil, but chemically dispersing oil can increase exposure to the toxic compounds in oil for some ocean organisms, such as early life stages of fish and coral. Other potentially harmful effects of chemically dispersed oil, especially in the deep ocean, are not well understood due to various factors. These factors include laboratory experiments about the toxicity of chemically dispersed oil that use inconsistent test designs and yield conflicting results, experiments that do not reflect ocean conditions, and limited information on organisms and natural processes that exist in the deep ocean.

Since the *Deepwater Horizon* oil spill, the U.S. Coast Guard, the Environmental Protection Agency (EPA), and other agencies have taken some actions to help ensure decision makers have quality information to support decisions on dispersant use. For example, the Coast Guard and EPA have assessed the environmental effects of using dispersants on a surface slick. However, they have not assessed the environmental effects of the subsurface use of dispersants. By assessing the potential environmental effects of the subsurface use of dispersants, the Coast Guard and EPA could help ensure that decision makers are equipped with quality information about the environmental tradeoffs associated with decisions to use dispersants in the deep ocean.