

## *Responding to Oil Spills in the U.S. Arctic Marine Environment*

### Strategies for Response and Mitigation

**OIL SPILL RESPONSE COULD BE MADE MORE EFFECTIVE** by adopting decision process tools such as Net Environmental Benefit Analysis, developing response practices in advance of an event, and by enhancing resource availability for training, infrastructure, and monitoring.

**All pre-spill strategies emphasize** oil spill prevention above everything else. In the event of an oil spill, however, strategies for decision-making and response are critical to keep oil away from the shore and to minimize impacts on sensitive habitats, organisms, and people. No response method is completely effective or risk-free. Decision processes that evaluate options and response strategies are critical to an effective response. The Net Environmental Benefit Analysis (NEBA) process provides a framework to determine which oil spill countermeasures will be the most effective and will cause the least ecological damage, based on an analysis of environmental tradeoffs.

NEBA incorporates prioritization criteria for the protection of sensitive and important ecosystem components that could be impacted by oiling, cleanup operations, or residual oil—for example, marine mammals, coastal habitats, fishes, or areas of cultural significance. An Arctic NEBA would also include information on the transport, fate, and potential effects of the spilled oil; knowledge of operational limits, advantages, and disadvantages of each oil spill response countermeasure for the natural resources at risk; and consideration of logistical constraints and cleanup intensity.

Due to the range of conditions typically encountered within an area affected by an oil spill, a combination of countermeasures, rather than a single response option, would be most likely to provide optimal protection for all environmental resources. Controlling oil release and spread at the source



**Figure 1.** A worker conducts a shoreline survey to assess environmental damage following the *Selendang Ayu* grounding and oil spill near the Aleutian Islands, Alaska, in December 2004. Credit: NOAA Office of Response and Restoration.

of a spill, deterring animals from entering oiled areas, and capturing and rehabilitating oiled wildlife can help minimize the potential impact of oil spill response on wildlife, the broader ecosystem, and the food web. However, rehabilitation and release in the Arctic is complicated by remote locations, lack of response equipment, concerns over subsistence use of potentially oiled animals, and safety considerations when dealing with large animals like polar bears and walrus. Wildlife response plans will need to include key indicators of environmental health, and prioritize response strategies. This includes a “no response” strategy, which may be preferable for some species.

### **Strategies for Response and Mitigation**

#### **RECOMMENDATIONS**

- A decision process such as the Net Environmental Benefit Analysis should be used to select the response options that offer the greatest overall reduction of adverse environmental impacts. In the Arctic, areas of cultural and subsistence importance should be among the priority ecosystem components. In light of concerns regarding detrimental effects on ecosystems, further study should focus on the impact of oil spills on Arctic food webs and dynamics at different trophic levels. The process should involve regulators, resource managers, health authorities, technical specialists, scientific experts, and local experts.
- U.S. Fish and Wildlife Service, NOAA’s National Marine Fisheries Service, Alaska Fish and Game, co-management organizations, and local government and communities are the trustees for wildlife deterrence and rehabilitation. As appropriate, these agencies and groups should work together to explore and improve deterrent and rehabilitation methods for wildlife. Additional research and development for improved methods could benefit from the involvement of universities, non-governmental organizations, and others. Priorities should be set and regularly updated by the trustees for oil spill response based on the type of wildlife threatened, the season, other factors related to a spill, and updated research and methodology.

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The National Academies appointed the above committee of experts to address the specific task requested by the U.S. Arctic Research Commission; American Petroleum Institute; U.S. Coast Guard; U.S. Department of the Interior, Bureau of Ocean Energy Management and Bureau of Safety and Environmental Enforcement; Marine Mammal Commission; National Oceanic and Atmospheric Administration; Oil Spill Recovery Institute; National Academy of Sciences. The members volunteered their time for this activity; their report is peer-reviewed and the final product signed off by both the committee members and the National Academies. This report brief was prepared by the National Research Council based on the committee’s report.

For more information, contact the Ocean Science Board at (202) 334-2714 or visit <http://dels.nas.edu/osb>. Copies of *Responding to Oil Spills in the U.S. Arctic Marine Environment* are available from the National Academies Press, 500 Fifth Street, NW, Washington, D.C. 20001; (800) 624-6242; [www.nap.edu](http://www.nap.edu).

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