# NOAA's Office of Response and Restoration: Arctic Activities

Conditions in the Arctic are changing rapidly. It is estimated that by 2020-2030 the Arctic Ocean will be free of multi-year ice in the summer, increasing opportunities for maritime transportation, tourism, oil and gas exploration. In July 2008, the United States Geological Survey estimated that the Arctic contains 90,000 billion barrels of oil. With worldwide demand for oil growing rapidly and easier access, it is possible that oil extraction in the Arctic will increase. However, "ice-free" conditions will still present hazards to navigation including unpredictable ice conditions, moving ice-floes, unsettled weather and wave patterns. Vessels transiting the Arctic (at least at first) will have little or no emergency response infrastructure or support, inherently increasing the consequences of spills and creating difficulties for search and rescue missions. In addition, shoreline erosion and the melting of permafrost are dramatically affecting the stability and safety of communities in the Arctic region. Oil pipelines and other infrastructure located in permafrost will become less stable, also increasing the risk of spills.

*Cleanup following the* Exxon Valdez *oil spill of 1989.*

## NOAA's Responsibility and Experience

NOAA provides critical scientific and technical support to the U.S. Coast Guard for oil spill response. NOAA works with other natural resource trustee agencies and responsible parties to conduct assessments of ecological harm and losses to communities and to plan and implement appropriate restoration actions. With the increase in vessel traffic in the Arctic, the possibility of increased oil exploration, and the potential for melting permafrost to destabilize and break oil pipelines, spills are increasingly likely, and natural resource damage assessment will be a vital component of response to spills to ensure that the environment recovers.

*With worldwide demand for energy resources growing rapidly, increased access, and major prospects for natural resource availability, shipping and offshore activities in the Arctic will increase.*

The Arctic is far from existing logistical support services for salvage and emergency response, increasing the probability that even minor breakdowns will result in a spill. And while technological improvements have reduced the potential for oil spills from production platforms, spills resulting from the associated vessel traffic, pipelines, shore side facilities and other infrastructure are common.

The U.S. is not adequately prepared to respond to a large spill in broken ice conditions in the Arctic and sub- Arctic region. The 1989 Exxon Valdez spill of 11 million gallons represents the largest marine spill in the vicinity of the Arctic. This spill

occurred in calm seas and ice-free conditions, with response equipment and shore-based infrastructure available nearby. Active response efforts took over 3 years, and even twenty years later, the environment and communities are still recovering. The M/V Selendang Ayu in 2004 spilled more than 350,000 gallons into the Bering Sea during a storm. Attempts to recover oil during spills in Alaska have often failed, and in many cases, weather and other conditions prevented any response at all." Oil spills in Alaska have killed birds, tainted shellfish, and fouled shorelines, and have contributed to declines of fish populations.

*The* Selendang Ayu *oil spill in 2004.*

The challenges of geography, weather, and a sensitive and changing ecosystem compel us to improve our preparedness and response capabilities. The increasing likelihood of a major spill in the Arctic means that we must prepare now.

## NOAA Activities in the Arctic

NOAA is working with internal and external partners to increase our response and restoration capabilities. These capabilities include national and international coordination, contingency planning and preparedness, training, advising on response, geospatial analysis, modeling fate and transport of oil, injury assessment, and habitat restoration planning and implementation.

### Arctic Environmental Response Management Application (ERMA)

ERMA is a data management platform that integrates real-time (weather, currents, Automated Information System data, etc.) and static data sets with maps, resulting in high-impact, high-resolution visualization of geospatial output to the Internet. The platform allows users to collect, manipulate, analyze, and display spatially referenced data for solving complex resource issues. The Web delivery of the platform provides a common operational picture for all individuals involved in an incident, improves communication and coordination among responders and stakeholders, and provides resource managers with the information necessary to make faster and better informed decisions.

*An increase in activity and vessel traffic increases the risk for incidents to occur in locations that will limit response and rescue capabilities.*

This system is an important tool for preparing for spill response and other incidents in the Arctic. An Arctic ERMA would display disparate data sets and observations in a common framework to improve coordination, transparency and rapid and efficient communications. NOAA is working with other agencies and industry to develop an ERMA system for locations critical to Arctic development and transportation, like the Bering Straits and Unimak Pass.

### Scientific Support and Regional Expertise

The Scientific Support Coordinator (SSC) is located with the US Coast Guard in Anchorage and has close ties to many "communities" which have a stake in being prepared to address the risks to the Arctic. The SSC participates in Arctic preparedness activities and represents the U.S. Department of Commerce on the Regional Response Team. The SSC also works closely with the Navigational Response Team the National

Weather Service, the Alaska Ocean Observing System, and the University of Alaska System. The SSC has local knowledge of natural resources and contacts within the indigenous communities.

**Damage Assessment and Restoration**

NOAA is an active member of an interagency team to evaluate injury and plan restoration from the Selendang Ayu oil spill. The injury assessment is being conducted in cooperation with the responsible party and restoration planning is beginning.

NOAA funds several restoration projects in Alaska, mostly focusing on assessment and cleanup of debris. OR&R also led efforts to cleanup marine debris identified during the response to the *Selendang Ayu* spill. During the response, debris was identified and criteria were developed to prioritize removal. Later, NOAA and contractors returned to collect the debris.

**National and International Coordination**

NOAA participates in several coordination efforts for Arctic and Polar issues such as the International Affairs Office Polar Committee. NOAA maintains communications with the National Ice Center, and continue to be involved in Marine Transportation System (coordinating group) activities that relate to Arctic initiatives. NOAA also maintains international networks in Canada and Norway to participate in research and development activities and to maintain connection to best management practices for responding to spills in ice conditions. NOAA collaborates on issues ranging from sharing data on oil characteristics, fate and transport processes, modeling, oil toxicity, alternative response technologies, shoreline assessment methods and electronic tools, and contingency planning best practices.

**Research and Development**

NOAA is working with Norway, the University of Alaska, the Prince William Sound Oil Spill Recovery Institute, and the University of Rhode Island to understand and predict the transport/exposure and biodegradation processes affecting spills in the Arctic. This will improve oil-fate-effect predictive capabilities. This work is part of a larger joint industry program to improve response capabilities and contingency plans for responding to spills in the Arctic. The project will culminate in an experimental spill in the Barents Sea in May 2009.

NOAA also co-led an international workshop on accident threats to the arctic. The key recommendations from this workshop are forming OR&R's Arctic Preparedness and Response Strategy and include:

- enhance and add capacity for spill preparedness and response capabilities for the Arctic/Subarctic regions. Currently, response assets would come from Anchorage and the lower 48 states taking days to weeks to arrive on-scene;
- develop response strategies for using alternative countermeasures (e.g., dispersants, in-situ burning);
- update environmental sensitivity maps, improve baseline data for biological resources at risk and other planning tools for emergency responders;
- conduct critical research on Arctic response and restoration efforts including better understanding of behavior and effects of oil in cold water/ice conditions and the technologies for spill response in difficult environments;
- develop pollutant fate and effects models for ice conditions; and
- develop natural resource damage assessment and restoration guidelines/protocols for the Arctic.

**For more information on OR&R's Arctic Preparedness and Response Strategy , contact Amy Merten at Amy.Merten@noaa.gov or (206) 526-6829**

**For further information about NOAA's Office of Response and Restoration, please call (301) 713-2989 or visit our Web site at response.restoration.noaa.gov**