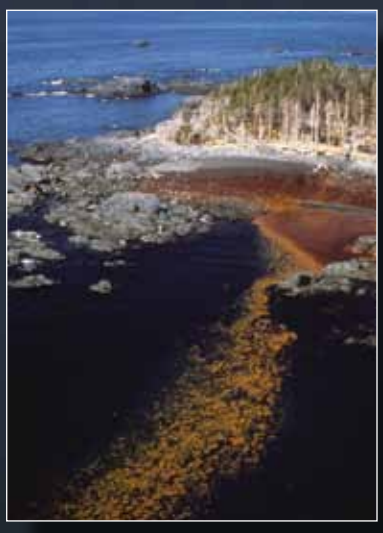
Lessons Not Learned



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20 Years After the *Exxon Valdez* Disaster

Little Has Changed in How We Respond to Oil Spills in the Arctic

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Were it to happen again today, a spill the size of the 1989 *Exxon Valdez* disaster would likely prove equally as devastating.

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20 Years After Spill, Ripples Still Felt

On March 23, 1989, the oil tanker *Exxon Valdez* departed Valdez, Alaska, loaded with more than a million barrels of crude oil. Shortly after midnight, having veered outside designated shipping lanes to avoid colliding with icebergs, the 300-meter-long tanker ran aground at Bligh Reef, a well-charted navigational hazard in Prince William Sound. Upon impact, eight of the vessel's 11 cargo tanks punctured, and more than 41 million liters (11 million gallons) of crude oil gushed into the frigid arctic waters.

At the time of the accident, the waters were flat and calm and remained so for the next 72 hours. However, almost none of the oil was skimmed or contained before it reached the rugged and pristine Alaskan shoreline. The local response barge was out of service at the time; even if it had been available, it lacked sufficient clean-up equipment to prevent the oil from reaching land. With nothing to stop the oil slick stretched a staggering 740 kilometers (460 miles) to the village of Chignik on the Alaskan Peninsula.

Today, 20 years after extensive clean-up efforts involving a team that at its peak included more than 10,000 workers and 100 airplanes and helicopters, oil can still be found on many Prince William Sound beaches and intertidal zones. In 2003 scientists estimated that more than 21,000 gallons (80,000 liters) remain. Additional surveys outside Prince William Sound have documented lingering oil on the Kenai Peninsula and the Katmai coast, over 450 miles away. It continues to harm local wildlife populations, commercial fishing activities, coastal community cultures and the recreation and tourism industries. Researchers predict the oil that seeped deep into the mussel beds and boulder beaches of Prince William Sound may continue to pollute the area for decades to come, since subsurface oil can remain dormant for years before winter storms or foraging animals reintroduce this "unweathered" and still-toxic oil into the environment.

Despite the catastrophic, long-lasting impacts of this spill on Alaska's people and marine resources, over the past two decades oil companies and governments have made relatively little progress in quickly and efficiently responding to oil spills in the Arctic region. Were it to happen again today, a spill the size of the 1989 *Exxon Valdez* disaster would likely prove equally as devastating.

This report summarizes what has changed, and what remains unchanged in the 20 years since the *Exxon Valdez* ran aground. It addresses the issues of spill prevention and safety, response and recovery, as well as the long-term consequences of oil spills to the environment, to indigenous populations and to the commercial fishing, recreation and tourism industries upon which many people within and beyond the Arctic depend. Finally, it offers WWF's recommendations on guidelines that should shape future offshore oil and gas exploration throughout the Arctic.

THE BILL FOR THE SPILL

The 1989 *Exxon Valdez* spill resulted in tremendous costs to life, livelihoods and cultures. In brief, some of the impacts include:

- 2,100 kilometers (1,300 miles) of shoreline fouled
- 250,000 seabirds killed
- nearly 4,000 sea otters killed
- 300 harbor seals killed
- 250 bald eagles killed
- more than 20 orcas killed
- billions of salmon and herring eggs destroyed
- $20 billion in subsistence harvest losses
- $19 million in lost visitor spending in the year following the spill
- at least $286.8 million in losses to local fishermen

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WWF STAFF AND VOLUNTEERS PRACTICING THE USE OF A BOOM TO CATCH OIL SPILLS ON WATER AT THE NORDNORSK BEREDSKAPSSENTER IN FISKEBOL, NORWAY, A TRAINING CENTRE WHERE PEOPLE LEARN HOW TO CLEAN UP OIL AND GAS SPILLS IN WATER AND ALONG THE COAST.

The Unique Challenges of the Arctic

High Environmental Sensitivity, Low Capacity for Response

The Arctic region is one of the most awe-inspiring places on our planet. It is defined in most people's imaginations by snow and ice. It is the ice that is the very engine of ocean productivity here, providing a nursery ground for plankton and other microscopic invertebrates that form the base of one of the planet's richest food chains. Additionally, each spring and summer the Arctic witnesses an explosion of life, as birds from thousands of kilometers away congregate to nest and feed here and massive migrations of caribou traverse the Arctic tundra.

This region is home to some of the last, truly undisturbed wilderness areas on Earth. From the iconic polar bear to the magnificent salmon runs, the region is a haven for wildlife. Numerous threatened and endangered species, including more than a dozen whales, rely on the Arctic for survival. The Arctic is also home to about 4 million people whose traditions, art and methods of survival have developed alongside the bounty of the region's resources. Indigenous cultures have prospered here for thousands of years. Currently eight nations -- the United States, Canada, Finland, Denmark, Russia, Iceland, Norway and Sweden -- govern this vast expanse of ice-covered sea and land.

The waters of the Arctic and sub-Arctic are critical economic resources as well. From the Barents Sea to the Bering Sea, northern waters provide some of the most globally important commercial fisheries in the world, supplying half the seafood consumed in the United States, and half of the fish harvested in Russia. Cod, pollock, crab, salmon and halibut are among the highly sought-after fish, providing thousands of jobs and generating billions of dollars in revenue.

Today, the Arctic is undergoing radical change. Due to rising greenhouse gas emissions, the Arctic is warming at twice the rate of the rest of the planet. Terrestrial and marine life are undergoing remarkable changes at unprecedented rates. Thus, the threats from offshore development and shipping – like the oil spills anticipated with these industries – are certain to exacerbate the pressures on already-stressed Arctic ecosystems. In the last half decade, the volume of the sea ice has shrunk to record low levels. The summer sea ice is on a trajectory to disappear completely in the summer months, perhaps within a decade.

The processes of rapid climate change and increased access to the Arctic, as well as the forces of globalization, have recently accelerated a geopolitical race among nations to stake a claim on

Arctic resources. Suddenly, previously un-navigable waterways are opening to shipping use. (In the summer of 2008, the Northwest Passage opened for the first time in recorded human history.) These factors, along with declining or uncertain sources of oil from traditional global supplies, have led to a push for greater oil and gas exploration in the Arctic, particularly in the offshore waters.

Increased oil and gas exploration bring a statistically unavoidable risk of dangerous spills, which can occur during any phase of extraction, storage or transportation. The unique conditions of the Arctic region both increase the probability of accidents and decrease the chances for timely and effective clean-up and rescue operations. The same environmental conditions that contribute to oil spill risks – lack of natural light, extreme cold, moving ice floes, high winds and low visibility – can also make spill response operations extremely difficult or totally ineffective.

Under the best of circumstances, containing and cleaning up an oil spill is no easy task. The Arctic provides the toughest of conditions. Helicopters and airplanes, necessary to oversee processes such as dispersing chemicals to break down the oil, may be grounded under poor weather conditions or when visibility is low. High winds and choppy waters, along with shifting ice floes, can render it virtually impossible to deploy the necessary workers and equipment to a spill area in a timely fashion. Once there, the machinery needed to contain a spill can malfunction due to extreme cold. Freezing temperatures also place rescue workers at risk.

Some areas of the Arctic are so distant that the nearest Coast Guard station or other resources may be hours away by air. Much of the Arctic shoreline lacks infrastructure or natural harbors large enough for boats to anchor in, making it difficult – if not impossible – to safely feed and house rescue crews or store the equipment needed to respond to a spill.

The cumulative impact of such limiting factors can make marine oil spill response operations nearly impossible for long periods of time in the Arctic realm, creating in effect a "response gap." Such a gap exists when activities that may cause an oil spill are conducted during times when an effective response cannot be achieved, either because the available technologies will not be effective or because their deployment is precluded due to environmental conditions or other safety issues.

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THE *EXXON VALDEZ* SPILL POSED UNPRECEDENTED CHALLENGES TO PEOPLE AND EQUIPMENT. STILL TODAY, WIND, ICE, AND WEATHER IN ARCTIC WATERS PROMISE TO COMPLICATE AND CONFOUND OUR BEST EFFORTS AT EFFECTIVE SPILL RESPONSE.

"One of the most stunning revelations of Trustee Council-funded monitoring over the last ten years is that *Exxon Valdez* oil persists in the environment and in places, is nearly as toxic as it was the first few weeks after the spill."

Source: www.evostc.state.ak.us/facts/lingeringoil.cfm

OILED ROCKS ARE STILL EASILY FOUND IN PRINCE WILLIAM SOUND, 20 YEARS AFTER THE SPILL. PHOTO TAKEN IN FEBRUARY, 2009

Long-Term Impacts

Before the Exxon Valdez disaster, little was known about the long-term impacts of oil contamination on the environment, particularly in extremely cold climates. Since this incident – arguably the most environmentally damaging spill in global history – researchers have used some of the $1 billion Exxon settlement to study the effects of oiling upon a complex web of fish and wildlife populations, as well as the impact upon indigenous cultures and local economies. This indepth research proves instructive for predicting the consequences of future spills in harsh Arctic conditions.

Lingering oil from the 1989 spill has persisted long past initial forecasts and can still be found on rocks and in small pools on 20 acres of beach in Prince William Sound. A 2003 survey of lingering oil estimated as much as 80,000 liters (21,000 gallons) of oil remained in the area, and additional surveys found Exxon Valdez oil lingering on the Kenai Peninsula and Katmal Coast, more than 450 miles away. Some of this oil remains toxic and biologically available, in virtually the same state it was in just days after the spill. Scientists believe it may persist for decades to come.

Even where oil can no longer be seen, its effects may still be felt. Recovery of wildlife populations can take years because many Arctic species have relatively long life spans and slower generational turnover. In Prince William Sound, Pacific herring were exposed in the midst of spawning and didn't suffer the full consequences of contamination until four years later, when the population collapsed. This commercially fished species is central to the marine food web in Prince William Sound and had been increasing in numbers prior to the spill. However, the fishery has been shuttered for 14 of the 20 years following the spill and remains closed today.

Likewise, a group of orcas – already in decline at the time of the spill – has never recovered from the added blow and is now believed headed for extinction as a result.

A 2006 report by the Exxon Valdez Oil Spill Trustee Council, which tracks the status of fish and wildlife and other resources affected by the spill, found numerous species still not fully recovered, as well as lingering negative impacts upon commercial fishing, subsistence cultures, and recreation and tourism.

Because so many species of fish were affected, the spill wreaked havoc on the commercial fishing industry in the region. Salmon, herring, crab, shrimp, rockfish and sablefish fisheries were shut down in 1989 throughout Prince William Sound, Cook Inlet, the outer Kenai coast, Kodiak and the Alaska Peninsula. Both shrimp and salmon commercial fisheries remained closed in parts of the Sound through 1990.

Despite restoration funds being focused heavily on aiding commercial fish populations, pink salmon populations did not reach pre-spill levels until 2002. Recreation and tourism are not considered recovered because the fish and wildlife resources on which they depend have not yet fully recovered.

Finally, the vast majority of people living in subsistence cultures continue to feel negative impacts from the spill. These cultures rely heavily upon the area's natural resources for food and traditional practices. Interruptions to traditional living mean families must shift to alternative food sources, radically – and sometimes permanently – changing their way of life. Shifting from subsistence harvesting to store-bought food can be financially difficult as well as socially and culturally damaging. According to the Exxon Valdez Oil Spill Trustee Council, food safety remains an issue for some due to concerns over lingering oil in shellfish.

A 2006 Report by the Exxon Valdez Oil Spill Trustee Council lists the status of species and human services affected by the oil.

NOT RECOVERED

Pacific Herring
Pigeon Guillemots

RECOVERING

Clams
Mussels
Sea Otters
Barrow's Goldeneye
Black Oystercatcher
Harlequin Ducks
Killer Whales (AB pod)
Designated Wilderness Areas
Intertidal Communities
Sediments
Commercial Fishing
Recreation and Tourism
Passive Use
Subsistence

WHILE ONE ORCA POD IN PRINCE WILLIAM SOUND APPEARS TO BE RECOVERING, ANOTHER HAS DECREASED FROM 22 TO SEVEN AND MAY BE HEADED FOR EXTINCTION.

Improvements in Safety and Prevention Since the Spill

As a direct result of the Exxon Valdez spill, the U.S. Congress enacted the Oil Pollution Act (OPA) of 1990, which included numerous provisions designed to improve our ability to prevent and respond to oil spills in U.S. waters. OPA included provisions that:

- Created an Oil Spill Liability Trust Fund, to compensate victims of oil spills; provide quick, efficient cleanup; and minimize damage to fisheries, wildlife and other natural resources. The fund serves to pay for containment and oil spill removal activities and prevent or mitigate substantial threats of oil discharge among its many functions.

- Required owners of oil tankers and localities where oil is extracted, stored or transported to develop detailed contingency spill response plans.

- Required the phase-in by 2015 of double hulls for new and existing tankers traveling in U.S. waters, a precaution some estimate could have reduced the Valdez spill by half, had it been in place at the time. The International Maritime Organization followed suit by adopting a double-hull requirement, through the MARPOL convention, that was agreed to by all member states.

- Required stockpiling of chemical dispersants and equipment for cleaning or containing spills to ensure adequate resources would be on hand to respond to emergencies.

In Prince William Sound specifically, the U.S. Coast Guard has expanded its satellite monitoring of fully laden tankers as they navigate out of the area. Experienced, specially trained marine pilots are required to board tankers at a new station at Bligh Reef and remain onboard for 25 miles. Two escort vessels are also required to accompany each tanker as it leaves the Sound, and weather criteria for safe navigation have been established. What's more, spill response drills are now held annually and equipment such as skimming systems and containment booms have been dramatically beefed up.

Indeed, improvements in safety have greatly reduced tanker spill rates over the past two decades in the U.S. and worldwide. Even so, no less than 1,334,000 tons of oil have accidentally spilled from oil tankers, carriers and barges around the world since 1990.

Improvements in technology have also helped to reduce the number of spills from oil platforms, by moving oil and gas handling from the surface to the ocean floor. However, it remains unclear how the noise created by this new technology may be affecting fish and wildlife, as studies have not yet been conducted to determine its environmental impacts.

What Hasn't Changed: The Spill Response Gap

Improved prevention and safety measures provide a critical first step in protecting the Arctic from the devastating consequences of oil contamination. But given the extreme conditions of the region, the many uncharted passages, the increased volume of shipping traffic, and the continued and growing presence of oil and gas extraction activities, the risk of oil spills cannot be completely eliminated.

This raises the stakes for providing an effective and reliable oil spill response in all areas where oil and gas extraction, storage and transportation occur. Unfortunately, the lack of experience of deploying and operating spill response equipment in the Arctic makes it exceedingly difficult to predict or understand the response capabilities and limitations of current spill response systems. It is in this area that we continue to fail dramatically.

Recent spills demonstrate the persistent challenges of the region:

- In December 2004, a Malaysian cargo vessel traveling through Alaska's Aleutian Islands lost engine power and ran aground. Six crew members perished. Poor weather conditions prevented any response for several days. Within two weeks, nearby response equipment supplies were deplete and continued bad weather kept dispersant supplies from arriving for three weeks. The spill killed more than 1,600 birds, closed a local crab fishery and contaminated local beaches. This accident discharged 335,000 gallons of heavy fuel as cargo. Following the spill the fishing industry had to implement extreme and costly measures to ensure that oil did not contaminate their harvested product.

- In March 2006, a Dominican cargo ship collided with another vessel off the coast of Estonia, where it sank. Because Estonia lacked the resources to mount an effective response in icy conditions, a week passed before response vessels could be brought in from Finland. By then, much of the oil had spread to shallow areas inaccessible to these boats, further hampering clean-up efforts. A spill a month earlier near Estonia resulted in the deaths of 35,000 birds.

- Also in March 2006, a fuel oil spill was discovered when the ice began to break up near a chemical plant in southeastern Norway. The oil had already traveled down the Glomma River to an ocean inlet near a bird sanctuary and vacation area before it was detected. Strong currents, ice and cold prevented the use of traditional response equipment, resulting in the oiling of 200 ducks and 80 swans.

- On November 11, 2007, a major storm hit the Kerch Strait, a narrow waterway connecting the Azov and Black Seas. Harsh weather conditions prevented any spill response for 24 hours and by the storm's end, 13 vessels had been stranded or damaged. Initial attempts to recover and prevent the leaking of 4,000 tons of heavy crude oil failed due to currents in the Kerch Strait. Experts estimate that 30,000 birds were killed in the two months following the spill. Researchers at the United Nations Environmental Program estimated the spill cost the region up to $4 million in annual losses to the fisheries and up to $21 million in losses to the tourism industry.

- In December 2007, approximately 250,000 barrels of oil poured into the North Sea as it was being piped from an offshore platform to a loading buoy operated by Nowegian oil giant Statoil-Hydro. Weather including near-gale conditions and wave heights of 7 meters prevented the use of traditional response equipment.

Within two weeks, nearby stores of response equipment were depleted. Continued bad weather kept dispersant supplies from arriving for three weeks.

SELENDANG AYU **WRECK, DECEMBER 2004, ALASKA'S ALEUTIAN ISLANDS**

To date, no improvements have been made that significantly improve the effectiveness of methods, tools and equipment for containing or removing spilled oil from frigid, dangerous waters. Most oil response technology is tested in more temperate climates. Until it is fully deployed in the Arctic, nobody really knows whether or how it will operate in extreme weather conditions.

The strict requirements outlined in the Oil Protection Act of 1990 for oil companies and state and local governments to develop and maintain contingency plans and to stockpile equipment mean localities stand a somewhat better chance of rapidly responding in optimal conditions, but have no better resources at their disposal when weather conditions are poor, and no better chance of establishing a foothold for rescue operations in areas that remain far from the necessary clean-up resources.

Although research is currently underway that examines the behavior of oil in cold water, and the state of technology for oil response in the Arctic, these studies have yet to be completed. The research is being supported by the Coastal Response Research Center (a joint project of the National Oceanic and Atmospheric Administration's Office of Response and Restoration and the University of New Hampshire) in collaboration with the Joint Industry Project on Oil-in-Ice, coordinated by SINTEF of Trondheim, Norway. However, this multi-year research, conducted through a partnership between the oil industry, research institutions, government agencies and response organizations, does not include input from the environmental community and may not address unintended impacts on fish and wildlife.

And so we remain as much at the mercy of the elements today as we did 20 years ago, should a spill occur. This continues to lead to situations in which oil spills are allowed to wash ashore, unimpeded.

A 2008 National Academy of Sciences Transportation Research Board report concluded, "The past 20 years of data on response to spills in the Aleutians has also shown that almost no oil has been recovered during events where attempts have been made by the responsible parties or government agencies, and that in many cases, weather and other conditions have prevented any response at all."

In January 2009, the Coastal Response Research Center released a report noting that the Aleutian experience should act as a cautionary tale to Arctic nations about what an increase in vessel traffic in the region might lead to. The report concluded that the Aleutians region, as a whole, was not well prepared for responding to disasters, and that great potential for disorganization existed in scenarios where more than one nation may be called upon to respond.

Spills that occur in international waters are subject to the differing priorities and resources of the closest nation at hand, a disparity likely to cause confusion during joint response efforts, the report concluded. It noted that even where agreements between nations exist, such as the U.S.-Russian bilateral agreement governing response efforts in the Bering and Chukchi Seas, test drills are rarely run and an effective response is in no way guaranteed.

Likewise, a recent study on oil and gas conducted by the Arctic Monitoring and Assessment Programme concluded that oil spills will be priority threats to the Arctic ecosystem in large measure because of the lack of clean-up capabilities, especially in waters where sea ice is present.

NO-GO ZONES

Some areas of the planet are simply too sensitive to put at risk. These remarkable places should be permanently protected from the risks of offshore oil and gas development.

Bristol Bay, Alaska

The U.S. Minerals Management Service is proposing to hold oil lease sales in 2011. With more than $2 billion in annual revenues, Bristol Bay is one of the most important commercial fisheries on Earth. Bristol Bay is home to the largest run of wild sockeye salmon on the planet, important nursery grounds for red king crab and Pacific halibut, staging and wintering areas for tens of millions of seabirds and a feeding ground migration corridor for five endangered species. It is also the only known summertime feeding ground of the endangered North Pacific right whale.

West Kamchatka Shelf, Russia

Oil companies are currently allowed to explore and develop the area along the west of the Kamchatka peninsula, the west Kamchatka shelf. An area of extremely high biological diversity, this region supplies fully one-quarter of all of the fish consumed in Russia. Allowing oil activities to continue here place Russian food security at risk.

Lofoten, Norway

The Norwegian government is due to make a decision in 2010 on whether or not to open the area. The waters around Lofoten are important for ground fish such as cod and haddock and species such as halibut, wolfish, ling, tusk and redfish. The last remaining cod stock in the world spawns every year in the sea around Lofoten Island. They are also important breeding and wintering grounds for huge numbers of seabirds, with 28 different species of seabirds nesting there. Along the continental brake there are coral reefs, sponges and a rich bottom fauna. Cold water coral reefs are among the richest habitats in European waters.

A BOOM TO CATCH SPILLED OIL ON WATER, LAID OUT BY WWF STAFF AND VOLUNTEERS PRACTICING AT THE NORDNORSK BEREDSKAPSSENTER IN FISKEBOL, NORWAY, A TRAINING CENTRE WHERE PEOPLE LEARN HOW TO CLEAN UP OIL AND GAS SPILLS IN WATER AND ALONG THE COAST.


West Kamchatka Shelf
© Tatjana Gerling
Lofoton Islands, Norway
© WWF-Norway
Bristol Bay, Alaska
© Robert Glenn Ketchum

WWF Recommendations

PROTECT "NO-GO" ZONES

The most sensitive or important areas of the Arctic must be deemed off-limits to oil and gas development. Such "no-go zones" and closure limits should be based on the sensitivity and productivity of special priority areas where a response gap exists and any spill would cause irreparable long-term damage. These areas include Bristol Bay in Alaska, known as "America's fish basket" and the most important fishery in the United States; the Lofoten Islands in Norway; and parts of the West Kamchatka shelf in Russia.

INSTITUTE A TIME-OUT ON NEW DEVELOPMENT

Arctic states should call for a moratorium on any new offshore oil development in the Arctic until adequate solutions are implemented to close the oil spill response gap.

ASSESS SPILL RESPONSE GAP

Response gap analyses should be performed throughout the Arctic to better understand the factors contributing to the lack of information and timing where local conditions exceed the limits of spill response systems. Response gap analyses should be integral components of feasibility and assessment studies for oil operations and part of any contingency planning. Regional and federal agencies must acknowledge, quantify and close oil spill response gaps before any oil and gas development proceeds.

CONDUCT COMPREHENSIVE RISK ASSESSMENT

All Arctic states should conduct comprehensive risk assessments that include industrial activities, shipping, petroleum development, and climate change-induced stressors. Arctic states should share information, data, and technologies that enhance Search and Rescue operations and spill response including protective measures such as forward operating stations, rescue tugs, satellite tracking, automatic information systems and vessel traffic systems. Arctic states should adopt a comprehensive agreement for any accident and spill response that is Arctic wide.

ENSURE LOCAL COMMUNITY AND STATEHOLDER INVOLVEMENT

Arctic states should upgrade investments to improve existing technologies and spill response mechanisms with enhanced involvement of local communities and stakeholder groups who have a vested interest in spill response outcomes. This would include upgrading local response capabilities and logistical requirements in Arctic areas.

IMPLEMENT COMPREHENSIVE CONSERVATION PLANNING

Arctic states should initiate a comprehensive conservation plan that assesses the health, biodiversity and functioning of Arctic ecosystems, including impacts of industrial activities. Adopting a precautionary approach, this plan would use extensive spatial planning to determine permanently protected areas as well as guiding decisions about whether, when, where and how industrial activities should take place.

ADOPT INTERNATIONALLY BINDING REGULATIONS

Arctic states should consider the adoption of internationally binding rules that govern the extraction, development and transportation of petroleum that factor in the impacts from oil spills, operational pollution and cumulative impacts on Arctic ecosystems, their peoples and the climate.

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www.worldwildlife.org/bristolbay

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