



Putting a Freeze on Arctic Ocean Drilling

America's Inability to Respond to an Oil Spill in the Arctic

Kiley Kroh, Michael Conathan, and Emma Huvos February 2012



Putting a Freeze on Arctic Ocean Drilling

America's Inability to Respond
to an Oil Spill in the Arctic

Kiley Kroh, Michael Conathan, and Emma Huvos February 2012

COVER: The Coast Guard Cutter Healy escorts the Russian-flagged tanker Renda 250 miles south of Nome on January 6. The vessels are transiting through ice up to five-feet thick in this area. The 370-foot tanker Renda will have to go through more than 300 miles of sea ice to get to Nome, a city of about 3,500 people on the western Alaska coastline that did not get its last pre-winter fuel delivery because of a massive storm. If the delivery of diesel fuel and unleaded gasoline is not made, the city likely will run short of fuel supplies before another barge delivery can be made in spring.

AP Photo/US Coast Guard - Petty Officer 1st Class Sara Francis

Contents

vii MAP: Oil spill response capacity in the Arctic and Gulf of Mexico:
Resources within 500 miles of BP spill site and Shell's
proposed Arctic exploration

1 Introduction and summary

5 The Deepwater Horizon response and aftermath

11 The realities of the Arctic

16 **MAP:** Arctic oil spill response capacity:
Resources within 500 miles of Shell's proposed drilling sites

23 Shell's plans and emergency preparations

27 Recommendations

31 Conclusion

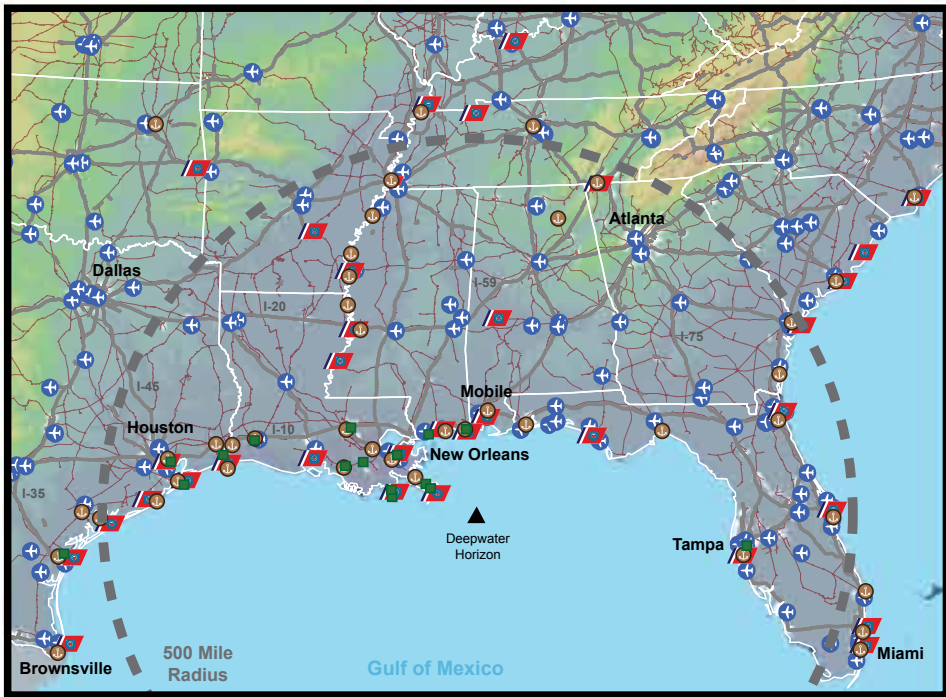
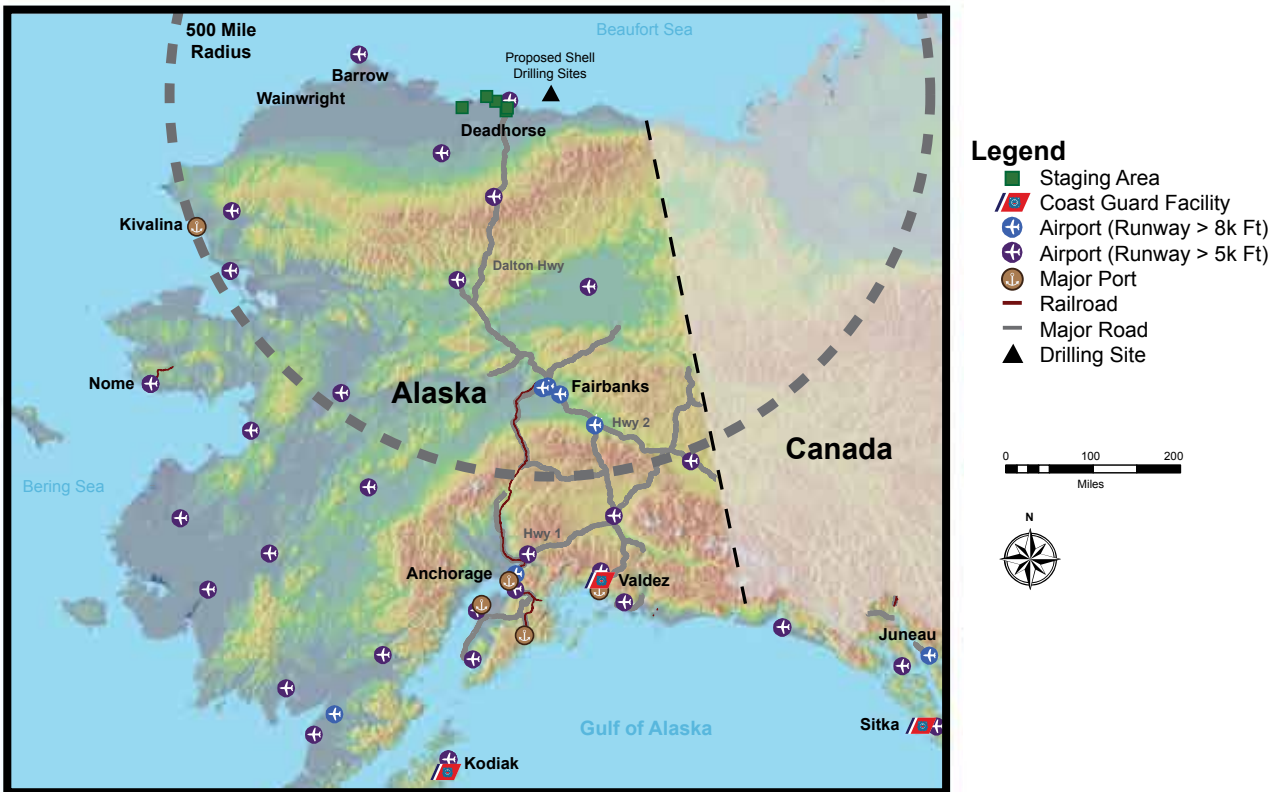
32 About the authors and acknowledgements

33 Additional resources

34 Endnotes

Oil spill response capacity in the Arctic and Gulf of Mexico

Resources within 500 miles of BP spill site and Shell's proposed Arctic exploration



Sources: Center for American Progress, ESRI, Army Corp of Engineers 2011, NTAD 2011, Alaska DOT

Staging areas were located by the Center for American Progress. Coast Guard Facilities were selected from a 2011 Army Corp of Engineers ports dataset located within the National Transportation Atlas Database (NTAD). Airport runways over 8,000 feet can land a Military C-130 in any condition while 5,000 foot runways can land in good weather. Runway length is available from the Federal Aviation Administration dataset in the NTAD. Major ports are those with over 633 million tons and gathered from the Army Corp of Engineers.

Introduction and summary

When the Deepwater Horizon oil rig exploded in the Gulf of Mexico in the early morning hours of April 20, 2010 it spawned one of the worst environmental disasters in U.S. history. BP Plc's Macondo well blowout lasted 89 days, spewing nearly 5 million barrels of oil into the Gulf of Mexico, and taking the lives of 11 men. The catastrophe showed the clear need for a massive, well-coordinated response when disaster strikes.

Though the refrain “never again” was echoed time and again in the wake of the BP oil catastrophe, we are now facing a new oil spill threat. After spending over five years and \$4 billion on the process, the Royal Dutch Shell Group is on the cusp of receiving the green light to begin exploratory drilling in Alaska's Beaufort and Chukchi Seas this summer.¹ Though Shell emphasizes it would drill exploratory wells in shallow water rather than establishing deep-water production wells like Macondo, the fundamental characteristics of the vastly unexplored and uninhabited Arctic coastline may increase the likelihood of a spill and will certainly hamper emergency response capability.²

The decision to move forward with drilling in some of the most extreme conditions on Earth has deeply divided Alaska Native communities, drawn stark criticism from environmental groups, and caused other federal agencies such as the U.S. Coast Guard and the National Oceanic and Atmospheric Administration, or NOAA, to raise concerns about the glaring absence of sound science in the region. This is highlighted in a recent letter to the Obama administration, signed by nearly 600 scientists from around the world, calling on the president and Secretary of the Interior Ken Salazar to follow through on their commitment to science and enact recommendations made by the U.S. Geological Survey before approving any drilling activity in the Arctic.³ In addition to the lack of a scientific foundation, the Arctic has inadequate infrastructure to deal with an oil spill, and response technologies in such extreme environmental conditions remain untested.

As we detail in this report, the resources and existing infrastructure that facilitated a grand-scale response to the BP disaster differ immensely from what could be brought to bear in a similar situation off Alaska's North Slope. Even the well-developed infrastructure and abundance of trained personnel in the Gulf of Mexico didn't prevent the Deepwater Horizon tragedy. Our Arctic response capabilities pale by comparison.

There are no U.S. Coast Guard stations north of the Arctic Circle, and we currently operate just one functional icebreaking vessel. Alaska's tiny ports and airports are incapable of supporting an extensive and sustained airlift effort. The region even lacks such basics as paved roads and railroads. This dearth of infrastructure would severely hamper the ability to transport the supplies and personnel required for any large-scale emergency response effort. Furthermore, the extreme and unpredictable weather conditions complicate transportation, preparedness, and cleanup of spilled oil to an even greater degree.

Much of the Arctic region quite simply remains a mystery, largely untouched by human activity. Yet other Arctic countries are moving forward with oil and gas exploration—Russia signed a \$7.9 billion exploration deal with BP last year and Exxon Mobil Corp. and Chevron Corp. are both expected to drill off Greenland over the next few years.^{4,5} Last year Norway rejected plans to drill in some areas north of the Arctic Circle, but has indicated it intends to ramp up production in the Barents Sea, a region it shares with neighboring Russia.^{6,7}

Due to the need for specially designed equipment, long supply lines, and limited transportation, a recent analysis from the nonpartisan U.S. Energy Information Administration found that “studies on the economics of onshore oil and natural gas projects in Arctic Alaska estimate costs to develop reserves in the region can be 50 to 100 percent more than similar projects undertaken in Texas.”⁸ Despite these hurdles, some in the United States are eager to keep pace with other Arctic nations by tapping into the “great opportunity” for economic gain they believe lies beneath the pristine Arctic waters. Drilling for oil in this fragile region, however, should not be pursued without adequate safeguards in place. If we've learned anything from the Deepwater Horizon tragedy, it's that the importance of preparedness cannot be overstated. That is why we strongly recommend specific actions be taken by the federal government, by Congress, and by Shell and other companies before beginning exploratory drilling in the Arctic.

For Shell:

- Develop a credible worst-case scenario and have a well-designed and vetted emergency plan in place that includes proof of the ability to respond to a worst-case blowout/oil spill
- Demonstrate that a blowout can be contained, including the required installation of redundant emergency shut-off systems
- Ensure adequate response capabilities are in place before drilling operations commence

For the federal government:

- Require and oversee oil spill response drills in the Arctic that prove the assertions made in company drilling plans prior to plan approval
- Improve weather and ocean prediction and monitoring capabilities to ensure a safe and effective oil spill response
- Engage other Arctic nations in developing an international oil spill response agreement that includes an Arctic Ocean drilling management plan

For Congress:

- Appropriate adequate funds for the Coast Guard to carry out its mission in the Arctic, including increasing our icebreaking capability
- Significantly increase the liability cap (currently \$75 million) for oil companies in violation of drilling safety rules
- Appropriate additional funds for NOAA research and development to increase oil spill response capacity in the Arctic

Certainly, meeting our nation's energy needs in the near term means maintaining access to domestic offshore oil and gas resources, but it is imperative that we do so in the most prudent, responsible, and environmentally safe manner. And while we applaud the critical reforms implemented by the Obama administration in the aftermath of the Deepwater Horizon tragedy, more must be done.

Until the oil and gas industry and its federal partners meet the recommendations we lay out in this report and demonstrate the ability to identify and immediately respond to a blowout or oil spill, the Arctic region of the United States should remain off-limits to exploration and drilling.

The Deepwater Horizon response and aftermath

While devastating, the images of the Deepwater Horizon tragedy available to the public—oiled birds and sea turtles, dead fish, crude-covered beaches, distraught residents, multiple failed attempts to stop the gush of oil into the Gulf of Mexico—didn’t tell the whole story. Behind the scenes, the Coast Guard-led response was a well-orchestrated logistical feat and an unprecedented mobilization of people, supplies, vessels, and aircraft. Given the size and scope of the spill it’s difficult to imagine how it could have been much worse. But in many ways the Gulf of Mexico is the ideal setting for oil spill response with its warm weather, highly developed roads, rail lines, and numerous major port cities.

Despite the favorable conditions in the Gulf, it still took three months, billions of dollars, and tens of thousands of responders to cap the well. At peak response, there were 9,700 vessels, 127 aircraft, and 47,829 people responding to the disaster.⁹ Facilitating all of this was the well-developed infrastructure in place at the time of the spill. The abundance of ports, docks, airfields, Coast Guard facilities, and road and rail lines enabled a coordinated mobilization of people and equipment that streamed through the entire Gulf Coast during the response effort.

Within a 500-mile radius of the blowout site, responders benefitted from access to 95 airports with runways 8,000 feet or longer (and 442 with runways 5,000 feet or longer), and 3,217 total ports. That area also includes multiple large cities replete with hotels, restaurants, gas stations, hospitals, and other facilities and equipment to support and sustain the largest environmental disaster response effort in U.S. history.

Oil spill response capacity in the Gulf of Mexico and Arctic

Resources within 500-mile radius	BP Macondo well drilling site	Shell's proposed Chukchi/Beaufort drilling sites
Airports with runways 8,000 feet or longer	95	4
Airports with runways 5,000 feet or longer	347	13
Equipment staging locations (oil spill response cooperatives)	15	5
Coast Guard permanent facilities	30	0
Major public ports	35	0

Sources: Center for American Progress, ESRI, Army Corp of Engineers 2011, NTAD 2011, Alaska DOT

As a result of decades of oil and gas exploration in the Gulf and extensive experience dealing with oil spills, responders also had the benefit of a pre-existing network of oil spill-response resources in place when the Macondo well blowout occurred. These were mobilized immediately. Clean Gulf Associates—the largest oil spill response cooperative in North America—has served the Gulf of Mexico offshore oil industry for nearly 40 years.¹⁰ In 1997, it partnered with the Marine Spill Response Corporation, an independent, nonprofit spill response company, to offer superior response capabilities in the Gulf region.¹¹

In the aftermath of Deepwater Horizon, these two companies provided services including mechanical recovery, dispersant application, in-situ burning of oil on the ocean's surface, emergency communications, aircraft support, and hiring of subcontractors. They operate a combined total of 16 strategically positioned staging areas within a 500-mile radius of the Macondo well site, consisting of equipment and responders on call at all times.

Though oil companies and their contractors are designated the responsible parties for oil spill response, cleanup, and restoration, it's the U.S. Coast Guard that manages, directs, and coordinates response efforts when a spill occurs. The Coast Guard boasts a strong network of resources and personnel along the Gulf coast, including 30 facilities within a 500-mile radius of the spill site. In addition to providing crucial logistical support, the Coast Guard contributed 7,000 active and reserve personnel, 60 vessels, and 22 aircraft to the response effort.¹²

Even with the resources and infrastructure in place at the time of the spill, plus the extraordinary mobilization of people and equipment to the region, the damage to the Gulf Coast was catastrophic. Nearly 5 million barrels of oil leaked from the Macondo well, contaminating 665 miles of coastline and necessitating the use of 1.8 million gallons of dispersant, 13.5 million feet of boom, and 411 in-situ burns to contain the spill.^{13, 14} The final price tag will be astronomical. BP has said the total bill for the oil spill will be \$42 billion, while some analysts have projected a worst-case scenario price tag in excess of \$70 billion.¹⁵ The spill came at a cost to the unsuspecting American taxpayer, as well. The oil giant was able to cut its 2010 tax bill by almost \$13 billion by writing off its losses due to the spill.¹⁶

Recovery from the Deepwater Horizon oil spill is ongoing, and restoration will likely take decades to complete. Its long-term effects on the ecosystem, the economy, and health of Gulf Coast residents won't be known for years to come. In the case of the 1989 Exxon Valdez oil spill, for instance, it took several years for the herring population to collapse and it has yet to recover.^{17, 18}

While Deepwater Horizon is an extreme example, it is critical to note that despite decades of experience drilling in the Gulf of Mexico, BP and all of the other major operators were unprepared for the possibility of a blowout of this magnitude. Any oil company applying to drill is required by law to identify a worst-case scenario oil spill and demonstrate an ability to respond to such an incident.¹⁹ The Deepwater Horizon spill greatly exceeded the worst-case scenario BP had outlined in its oil spill response plan.

The bipartisan National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling stated unequivocally in its final report that while BP was certainly guilty of a "failure of management," the same issues were pervasive throughout the entire industry. "The root causes are systemic," the report concluded, "and, absent significant reform in both industry practices and government policies, might well recur."²⁰ Indeed, in the immediate aftermath of the spill, top executives from other major oil companies testified before Congress that they weren't prepared to handle a major blowout, admitting aspects of their spill plans were "an embarrassment."²¹ This permissive treatment of oil companies by regulators created what commission co-chairman Bob Graham, the former senator from Florida, recently referred to as "a culture of complacency."²²

“On-the-ground shortcomings in the joint public-private response to an overwhelming spill like that resulting from the blowout of the Macondo well are now evident, and demand public and private investment. So do the weaknesses in local, state, and federal coordination revealed by the emergency. Both government and industry failed to anticipate and prevent this catastrophe, and failed again to be prepared to respond to it.”

— *National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, final report.*

In the aftermath of the BP spill, Michael Bromwich, former director of the Bureau of Ocean Energy, Management, Regulation and Enforcement at the Department of the Interior took great strides to clean up his agency, which prior to the spill had been known as the Minerals Management Service. This agency, which regulates drilling activities, is now split into two components within the Department of the Interior, the Bureau of Ocean Energy Management and the Bureau of Safety and Environmental Enforcement.

Bromwich also led the Obama administration’s efforts to institute new safety standards and reforms in oversight and accountability for the industry and for the federal government. These include two key rulemakings and several Notices to Lessees, including a new section on safety and environmental management and another addressing various aspects of drilling safety and preparedness.²³ While these reforms are certainly a step in the right direction, as licensed engineer Lois Epstein of The Wilderness Society points out, there remain several recommendations made by both the Commission and the National Academy of Engineering that have not been implemented.²⁴

In a recent report, co-authored by the National Research Council, the National Academy of Engineering found that the oil industry and the federal government have a “misplaced trust” in the functionality of blowout preventers, designed to

seal an oil well in the event of an emergency.²⁵ Since their invention in 1922, “the evolution of this expensive and long-lived piece of equipment appears to have been limited,” and was neither designed nor tested for the conditions that likely occurred at the time of the Macondo well blowout.

Though drilling overseers have made progress in expunging the “failure of supervision and accountability” that led to the Macondo well blowout, the Arctic, as the Commission emphasized, “requires the utmost care, given the special challenges and risks associated with this frontier.”^{26, 27} If we learned anything from Deepwater Horizon it’s that the importance of preparedness cannot be overstated and that caution should be exercised to an even greater degree given the unique variables that will dramatically increase the degree of difficulty of responding to an oil spill in a high-risk environment such as the Arctic.

“As one WWF staffer has put it, an oil spill occurring in the Gulf is like a heart attack happening in a hospital — you have everything you need to be treated. A spill in the Arctic is like having a heart attack on the North Pole — you’re on your own.”

—*TIME* 5/12/2010²⁸

The realities of the Arctic

The Arctic is often referred to as the world's last wild frontier, bordered by eight countries over the northernmost portion of the Earth. The U.S. Arctic shoreline extends more than 2,250 miles and serves as home to numerous indigenous communities that have subsisted for centuries in the harshest surroundings our planet has to offer. It also serves as habitat for some of the rarest and most fragile species on the planet. Any drilling activity in the region would be operating without sufficient scientific knowledge to determine the potential effects of operations. A report released earlier this year by the U.S. Geological Survey identified major gaps in Arctic science and research, emphasizing that “significant questions” remain regarding the scientific and technical information needed to adequately prepare for drilling in the challenging Arctic environment.²⁹

A subsequent review by the Pew Environment Group and Ocean Conservancy reiterated those deficiencies, outlining further steps that should be taken prior to drilling approval.³⁰ Upon releasing the report, Marilyn Heiman, director of Pew's U.S. Arctic Program, stated that “if we are to avoid irreparable harm to an ecosystem found nowhere else in U.S. waters, we need to develop a comprehensive research and monitoring plan and set aside significant areas for protection.”

In addition to echoing the deficiencies in science and technology identified in the U.S. Geological Survey report, the Obama administration's National Ocean Policy Draft Implementation Plan, released in January 2011, specifically cites the need to “improve oil spill prevention, containment, and response infrastructure, plans, and technology for use in ice-covered seas.”³¹ The plan also calls for a strategy “to address the significant logistical issues (e.g., housing and feeding personnel, staging and deploying equipment, and managing waste) that would be involved in a large-scale oil spill response in the Arctic during any season.”

Weather conditions

Weather conditions have a dramatic effect on the tools and tactics available for oil spill response and cleanup, determining what types of recovery methods and equipment can be used and their effectiveness. Temperate weather can greatly expedite oil spill response, while cold, storms, and ice can contribute to a range of problems such as equipment failure and human injury that can greatly prolong the cleanup process and result in increased costs and environmental damage.

The Deepwater Horizon oil spill occurred in weather conditions that were ideal for cleanup and recovery. During May 2010, the first full month of the oil spill, NOAA weather data for the region shows balmy conditions, with an average temperature of 80.2 °F and an average wind speed of 7.8 miles per hour.³² Responders were also fortunate that the prevailing wind direction helped push surface oil away from the shore, and that a lucky bend in the Gulf’s Loop Current prevented the oil from being carried into the fragile ecosystems of the Florida Keys.

Arctic to Gulf Coast weather comparisons

Weather	August—Arctic (Shell’s “worst case scenario”)	October—Arctic (Shell’s proposed end date)	May—Deepwater Horizon, New Orleans
Max. Temp.	67 °F ²	39 °F ²	94 °F ³
Min. Temp.	26 °F ²	-4 °F ²	63 °F ³
Avg. Temp.	40.9 °F ²	23.6 °F ²	80.2 °F ³
Avg. Wind	12.7 MPH ²	17.0 MPH ²	7.8 MPH ³
Daylight Hours	Aug. 1: 24 hrs. ¹	Oct. 31: 6 hrs., 4 min. ¹	May 1: 13 hrs., 20 min.
Avg. Total Snowfall	0.0 inches ²	14.3 inches ²	0.0 inches ³

Source: NOAA, U.S. Navy ^{33, 34, 35, 36}

¹ Barrow, AK, 2011

² Barrow, AK, 2006-2011

³ New Orleans, LA, May 2010

Obviously the Beaufort Sea and Chukchi Sea—located on the edge of the Arctic Ocean—are home to weather conditions that differ dramatically from the Gulf of Mexico. As the commission’s final report illustrated, “The Alaskan Arctic is characterized by extreme cold, extended seasons of darkness, hurricane-strength storms, and pervasive fog—all affecting access and working conditions. The Chukchi and

Beaufort Seas are covered by varying forms of ice for eight to nine months a year. These conditions limit exploratory drilling and many other activities to the summer months. The icy conditions during the rest of the year pose severe challenges for oil and gas operations and scientific research. And oil spill response efforts are complicated year-round by the remote location and the presence of ice, at all phases of exploration and possible production.”³⁷

Making matters worse, Shell submitted an exploration plan that includes a drilling season running through October 31, yet describes as its “worst case scenario,” a spill occurring in August. As shown in the chart on page 12, the weather conditions are significantly worse in October than August, with dramatically colder temperatures, higher wind, and nearly 75 percent fewer hours of daylight. Clearly a spill in August would be anything but a “worst-case scenario.”

The colder temperatures, stronger winds, darkness, snow, and ice characteristic of Arctic climates can greatly inhibit the containment and recovery equipment necessary for successful oil spill response.³⁸ A major component of any containment effort is the deployment of floating barriers called booms used to limit the spread of oil. Once collected, as much of the oil as possible is either recovered from the surface of the water using devices called skimmers, or when it collects in extremely high concentrations, it can be burned off using a process known as in-situ burning. Throughout the course of the Deepwater Horizon response, nearly 900 skimmers and 13.5 million feet of boom were used as part of the mechanical recovery process, and the Coast Guard conducted 411 in-situ burns.^{39, 40} Cold temperatures can cause skimmers, boom, and pumps to freeze, hindering mechanical recovery.

Additionally, nearly 2 million gallons of the dispersant Corexit were injected directly into the Macondo wellhead to help break up the oil as it gushed out so less of it would rise to the surface and reach the shore. Dispersants are not preapproved for use in Arctic conditions and likely wouldn’t be a feasible option even if they were, as they’ve shown reduced effectiveness in cold waters.⁴¹

High winds like those found at times in the Arctic can also make it unsafe for response vessels to operate and prevent aircraft from flying, impeding clean up techniques and delivery of supplies. Vessel and aircraft responses are also limited by darkness. During the month of October there is less than half the amount of daylight in the Arctic than there was in the Gulf of Mexico in May during the Deepwater Horizon cleanup. Snow can further diminish response capabilities by interfering with onshore mobilization efforts.

As temperatures drop, the potential for hypothermia among responders rises and they must limit the length of their shifts, decreasing the efficiency of response operations. As Rob Powell of the World Wildlife Fund explains, this is especially significant because “if a major spill were to occur in Arctic waters, cleanup crews would have to spend, on average, three to five days of each week simply standing by, watching helplessly as the blowout or spill continued to foul fragile Arctic ecosystems.”⁴² All these environmental challenges would make responding to an oil spill deeply challenging in the best of times—never mind during frequent storms. (see sidebar)

Arctic weather in the extreme

The “monster storm” that hit Alaska in early November—and has since prompted Gov. Sean Parnell to declare a state disaster—offered a stark reminder of the type of extreme weather event that can strike unexpectedly in Arctic regions.⁴³ The brutal storm covered an area twice the size of Texas, produced hurricane-force winds, blizzard conditions, and coastal flooding, and spurred evacuations of many coastal communities.⁴⁴ Frighteningly, the storm hit just more than a week after Shell’s proposed drill season end date.

Despite weather like November’s storm, the most powerful since 1974, drilling proponents continue to argue that climate change may actually benefit Arctic drilling.⁴⁵ They claim that milder conditions and decreased ice cover caused by global warming will improve conditions for exploration and drilling off the coast of Alaska. This analysis fails, however, to account for the unpredictable weather extremes that also result from climate change. Additionally, the increasing lack of Arctic sea ice due to climate change actually magnifies the damage caused by severe weather events.⁴⁶ Without sea ice as a buffer, storm surges can move further inland and wreak havoc on previously protected areas.

Limited infrastructure

Despite its vast area, 663,268 square miles, the state of Alaska has only 4,857 miles of paved roads, an average of 0.007 miles of paved road per-square-mile.⁴⁷ Nearly all of these paved roads are concentrated in the southern part of the state. The 414-mile, partially paved Dalton Highway is the only overland route to the U.S. Arctic coast, connecting Deadhorse on the North Slope with Livengood in the interior region.⁴⁸ There are no roads whatsoever connecting communities along the North Slope of Alaska. As a result, residents of the North Slope rely primarily on snow machines or all terrain vehicles for overland transportation. While parts of southern and interior Alaska are served by the Alaska Railroad, which operates more than 500 miles of track extending as far north as Fairbanks, there is no rail service from there to the North Slope.⁴⁹

Overland transportation infrastructure is far more developed in the Gulf region. All five of the Gulf Coast states have well-established public road and rail systems that facilitated the transportation of supplies and responders during the Deepwater Horizon spill. In Louisiana alone, a state one-thirteenth the size of Alaska, there are over 60,000 miles of paved roads, an average of 1.157 miles of paved road per-square-mile, 2,699 route miles of rail for freight service, and three Amtrak passenger rail lines.⁵⁰

NOAA's United States Coast Pilot notes that "there are few harbors, port facilities, or aids to navigation along the Arctic coast."⁵¹ While there are no major ports on the North Slope of Alaska, there are small boat anchorages in both Prudhoe Bay and Wainwright, as well as docking facilities associated with the existing drilling operations in Prudhoe Bay.⁵² Additional small boat ramps can be found in some North Slope communities, but these would be inadequate for a large-scale spill response.

The closest major public port, Dutch Harbor, is 1,167 nautical miles away from Barrow in Unalaska.⁵³ Other Alaskan ports of significance are located in Anchorage, Valdez, and Homer. As the accompanying map indicates, there is a shallow-water port in Kivalina, but it is privately owned and operated by Red Dog zinc mine.^{54,55} Alaska has no deep-water offshore port or harbor along its western coastline or North Slope.

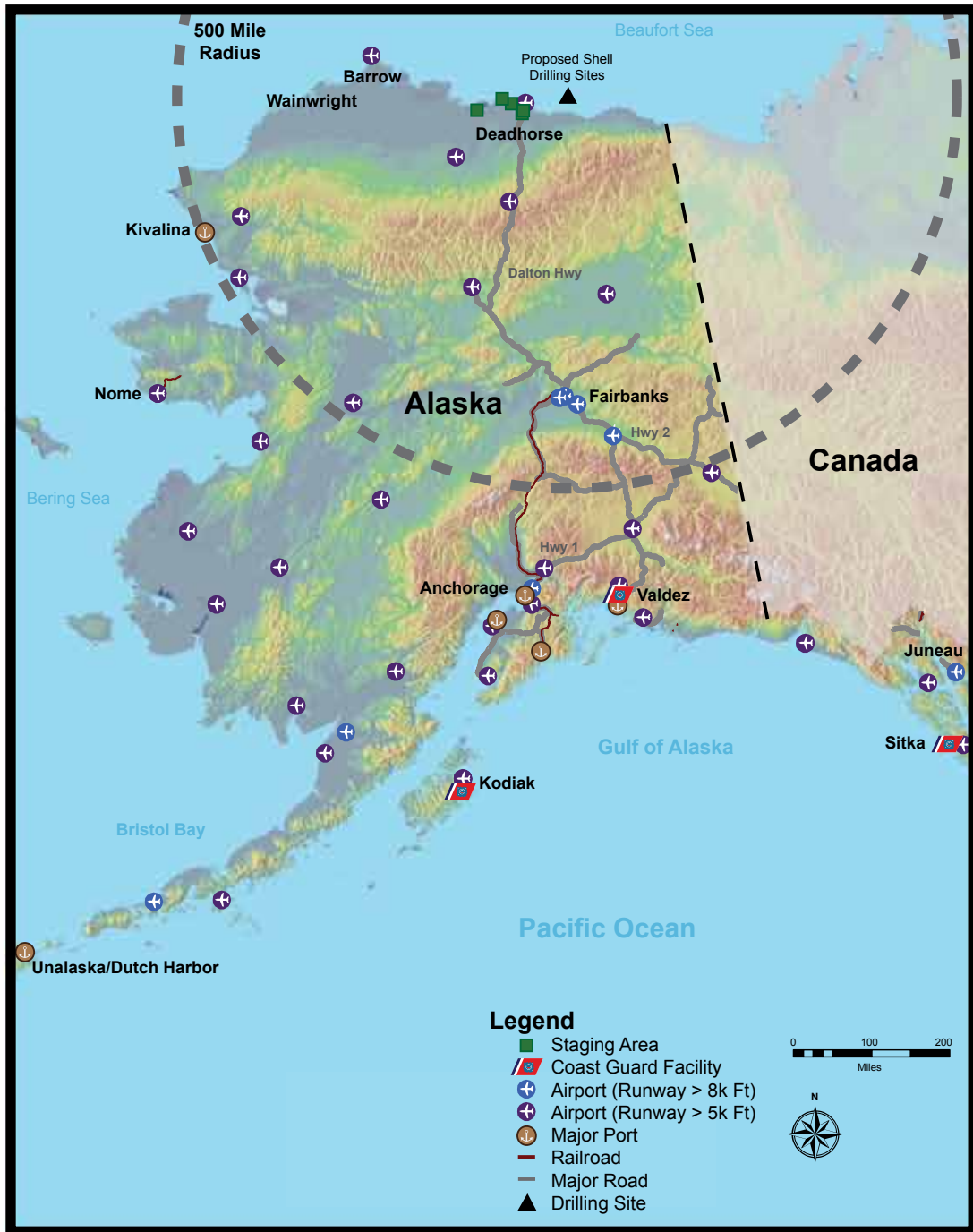
In comparison, Louisiana alone has 26 public ports, including the Port of South Louisiana, the largest port by tonnage in the United States, as well as numerous private harbors and marinas.^{56,57} Thirty-five of the 150 principal ports by tonnage in the United States are located within a 500-mile radius of the Deepwater Horizon spill site.⁵⁸ There are none along the North Slope. The Gulf Coast's highly developed port infrastructure played a crucial role in facilitating cleanup and recovery following the BP blowout, a massive mobilization effort that utilized 9,700 vessels at peak response.⁵⁹

Facilities such as ports, fueling stations, offloading equipment, and infrastructure support such as roads and rail systems on a comparable scale simply do not exist on Alaska's North Slope. (See sidebar on page 17)

The Arctic region has its own oil spill response cooperative, similar to those that exist in the Gulf. Founded in 1979, Alaska Clean Seas runs an emergency operations center at its base in Deadhorse.⁶³ Four additional emergency operations centers in the North Slope region are available to members through a mutual aid agreement.

Arctic oil spill response capacity

Resources within 500 miles of Shell's proposed drilling site



Few ports in a storm

Residents of Nome, a city located on the western coast of Alaska 520 miles south of Barrow, rely on tanker barges to deliver home heating fuel, gasoline, and diesel for the winter months. November's "monster storm" disrupted this delivery, however, and thick ice prevented the barge from reaching port. In a bid to avoid the \$9-a-gallon gasoline that would likely result from flying fuel into the isolated city by plane, the Nome-based Sitnasuak Native Corporation signed a contract to have a double-hulled Ice Classed Russian tanker deliver the 1.3 million gallons of fuel.⁶⁰

The trip required a 10-day journey from the Aleutian Islands, with the nation's only operating icebreaker forging a path for the Russian

ship, with progress continually impeded by wind, brutal cold, and ice. The mission, which was ultimately successful, will shield Nome residents from extreme fuel price spikes for the winter season. Yet it's also a stark illustration of the unpredictable weather conditions characteristic of the Arctic region, the difficulties in transporting critical supplies to isolated areas, and the shortcomings of the United States' woefully inadequate icebreaking capacity.⁶¹

The unprecedented effort also raises serious questions about the lack of infrastructure necessary for managing increased activity in the Arctic.⁶²

While Alaska Clean Seas owns and operates a large inventory of response equipment, much of this technology is compromised in ice-covered waters, and the region's unpredictable weather makes rapid response much more difficult.⁶⁴

With overland transportation infrastructure lacking, a large-scale response effort in the Beaufort or Chukchi Seas would have to rely heavily on aerial transport of people and equipment. Most airports in Northern Alaska have only small gravel airstrips and therefore are ill suited for many types of commercial and emergency response aircrafts.⁶⁵ In order to land a C-130, the military's workhorse four-engine, turboprop transport aircraft, in favorable weather conditions, pilots require a runway of at least 5,000 feet.⁶⁶ Within a 500-mile radius of proposed drill sites, there are only 21 runways that meet this criterion (and only four with runways of 8,000 feet or longer—the ideal length to land a C-130 in bad weather). Of those, only 10 have year-round access to the Dalton Highway.

Additionally, many of Alaska's airports lack the electronic navigation support, field lighting, and on the ground facilities needed to facilitate a massive aerial mobilization. Given the limited daylight during the winter months and the inclement weather characteristic of the region, aircraft would have to rely on approach lighting and instrument landing systems rather than relying on visual navigation to ensure a safe landing. This equipment is not widely available on the North Slope. What's more, with temperatures frequently dropping well below freezing, hangars

would be needed to prevent aircraft icing. The North Slope lacks sufficient tarmac and hangar space to accommodate an aerial mobilization on the same scale as the Deepwater Horizon response effort.

Overstretched Coast Guard resources

In the event of an oil spill, the Coast Guard would be called upon to coordinate the federal response. Testifying before the Senate Committee on Commerce, Science, and Transportation last July, Coast Guard Commandant Robert Papp expressed grave concern about the lack of support and infrastructure in the Arctic, stating, “If this were to happen off the North Slope of Alaska, we’d have nothing. We’re starting from ground zero today. ... We have zero to operate with at present.”⁶⁷

In December testimony before the House Transportation and Infrastructure Subcommittee, Papp also said his agency “will work to ensure its force structure is appropriately sized, trained, equipped and postured to meet its Arctic mission requirements.”⁶⁸ But in order to carry out this mission in a changing Arctic, the commandant emphasized that “The Coast Guard’s most immediate operational requirement is infrastructure.”

The nearest Coast Guard air station to the North Slope is located in Kodiak—more than 1,000 miles to the south, and the sea route from Kodiak is more than twice that distance.⁶⁹ The brave men and women serving in Kodiak continually risk their lives to carry out search and rescue operations in some of the harshest conditions on the planet (to the point that their harrowing missions are chronicled in a reality television series on The Weather Channel called “Coast Guard Alaska”).⁷⁰ In addition, there is a facility in Valdez—closer than Kodiak over land but it lacks aviation response capability, and the 25-foot response boats it possesses aren’t capable of carrying out many of the missions that would be required in the event of an incident off the North Slope.⁷¹

A C-130 dispatched from Kodiak would take three to four hours to reach the North Slope—and potentially longer in unfavorable conditions—which means the Coast Guard frequently relies on search-and-rescue assistance from local municipalities.⁷² The North Slope Borough, however, seems similarly unprepared for the increased activity and risks Arctic oil exploration will bring. When Coast Guard Rear Admiral Thomas Ostebo visited Barrow this summer and met with the borough’s search and rescue division, he was “surprised at how limited

their capability was.” Neither of the division’s two helicopters, for example, has deicing capability.⁷³

In terms of response equipment on hand, the Coast Guard has exercised the Vessel of Opportunity Skimming System, or VOSS, a portable side-skimming oil recovery system, and the Spilled Oil Recovery System, or SORS, a single-ship recovery system designed to be used on a Coast Guard buoy tender, but as Admiral Papp testified in December, “These systems have limited capacity and are only effective in ice-free conditions.”^{74, 75} The Coast Guard also has three Strike Teams, one each in the Atlantic, Gulf, and Pacific regions. These mobile units (see sidebar) can be mobilized to areas of need, but none exists in the Arctic.

Another matter of serious concern for the Coast Guard, and one referenced repeatedly by the agency’s top officials, is the nation’s inadequate fleet of icebreaking vessels. The Coast Guard has two heavy-duty polar icebreakers currently located in Seattle, roughly 2,000 miles from Barrow, and as Admiral Papp outlined in his July testimony, they “are not operational. The 34 year-old *Polar Sea* has been out of commission due to a major engineering casualty, and is now in the process of being decommissioned. The 35 year-old *Polar Star*, which has been in a caretaker status since 2006, is currently undergoing a major reactivation project... and is expected to be ready for operations in 2013.”⁷⁸

The only working icebreaker is the medium-duty *Healy*, which is mainly deployed on scientific missions and can only break through thinner ice. By comparison, Russia currently operates 20 icebreakers, including seven nuclear-powered vessels, and China is in the process of building its second icebreaker.^{79, 80, 81}

In an era of budgetary woes, the cost of updating our icebreaking capabilities will be difficult to swallow. A recent GAO analysis found that, “Given the challenges that

“You never know the full spectrum of things that can go wrong... And if the Coast Guard has no resources, we have no backup, we have no way to execute a plan. So we’ve got to have some infrastructure up there.”⁷⁶

— U.S. Coast Guard Commandant Robert Papp

“We are trying to be there ahead of the issue, but there’s no infrastructure... We have to develop the infrastructure so we can respond.”⁷⁷

— Captain Adam Shaw, Chief of Prevention for the Coast Guard in Alaska

the Coast Guard already faces in funding its Deepwater acquisition program, it is unlikely that the agency's budget could accommodate the level of additional funding (estimated by the High Latitude Study to range from \$4.14 billion to \$6.9 billion) needed to acquire new icebreakers or reconstruct existing ones."⁸²

Even though Shell announced plans to construct its own customized icebreaking ship, icebreaking capacity in the Arctic would still be well below the amount recommended by the 2010 High Latitude Study, which projects that the Coast Guard needs three heavy and three medium icebreaking vessels in order to fulfill its statutory mission requirements in the Arctic.^{83,84}

Coast Guard Strike Teams

U.S. Coast Guard Strike Teams "provide rapid response support in incident management, site safety, contractor performance monitoring, resource documentation, response strategies, hazard assessment, oil spill dispersant and in-situ burn use, operational effectiveness monitoring, and high-capacity lightering and offshore skimming capabilities. The Strike Teams also train Coast Guard units in environmental pollution response, test and evaluate pollution

response equipment, and operate as liaisons with response agencies within their areas of responsibility."⁸⁵

The Gulf Strike Team is located in Mobile, Alabama—roughly 130 miles away from the site of the Macondo well blowout. The closest strike team to the North Slope of Alaska is the Pacific Strike Team in Novato, California—approximately 2,395 miles away.

Vulnerable indigenous communities

As the Arctic melts at an alarming rate and maritime industries from cruise lines and shipping companies to oil and gas developers and mining operations lick their chops at the opportunity to cash in on the previously-inaccessible Arctic, the Alaska Native communities that have populated the region for centuries are faced with a difficult decision: embrace development for the economic opportunity it may bring or protect their way of life from potentially devastating fallout.⁸⁶ Shell's impending exploration off the North Slope has deeply divided the communities that stand to be impacted the most.

In the Native Village of Point Hope, for example, residents are "torn apart between development and sustaining our lifestyle." Those opposed fear the development threatens their culture and that an oil spill could destroy the

already endangered bowhead whale population they depend on. But because the region has yet to discover a viable economic activity on par with oil, many others “think their continued survival will depend on trying to profit from oil.”⁸⁷

Whatever the case, the long-term effects of oil spills on public health require significant scientific attention and because certain factors disproportionately impact Alaska Native tribes and villages, should be taken into consideration when weighing Arctic drilling. As the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling emphasized in its report, “a survey conducted one year after Exxon Valdez found that cleanup workers classified as being subjected to ‘high exposure’ were 3.6 times as likely to have a generalized anxiety disorder and 2.9 times as likely to have post-traumatic stress disorder as members of an unexposed group. Alaska Natives were particularly prone to effects of chemical exposure and, for cultural reasons, less likely to seek mental health services.”⁸⁸ In addition, subsistence hunting and fishing remains a significant source of food for these communities. An oil spill could threaten the populations of fish and game that literally sustain these populations.

“Approving Shell drilling in the Beaufort Sea is irresponsible and risks disaster. We have a right to life, to physical integrity, to security, and the right to enjoy the benefits of our culture. For this, we will fight, and this is why we have gone to court today. Our culture can never be bought or repaired with money. It is priceless.”⁸⁹

— Caroline Cannon, former President of the Native Village of Point Hope

Shell's plans and emergency preparations

In recent years, Shell has spent over five years and close to \$4 billion on analysis, equipment, and efforts to convince the federal government and people of Alaska that they are prepared to drill in the Arctic.⁹⁰ The oil giant's various permit applications have been rejected multiple times for failing to adequately account for emissions from drill ships and in order to comply with stricter safety standards implemented in the wake of Deepwater Horizon.⁹¹

It is also worth noting that while the oil company touts its “safety culture,” Shell's international safety record is far from unblemished:⁹²

- As the Center for American Progress Action Fund's Climate Progress notes, “An investigation from a Scottish newspaper, the *Sunday Herald*, shows that Royal Dutch Shell has been censured for breaking safety rules 25 times in six years, giving it the second-worst safety record in the United Kingdom.”⁹³ The company's August spill in the North Sea, caused by multiple leaks at an offshore platform, quickly became the worst spill in the United Kingdom in over a decade.⁹⁴
- After being accused for years of covering up countless oil spills in Nigeria, a landmark study released in 2011 by the United Nations Environment Program found that cleaning up five decades of spills in the region could require “the world's most wide-ranging and long term oil cleanup exercise ever undertaken.” The report estimated that the damage wrought by Shell, by far the largest operator in the region, and other companies in the Niger Delta will cost an initial \$1 billion and could take up to 30 years to complete.⁹⁵
- In December, Shell was responsible for another major spill in Nigeria—this time offshore. The spill sent approximately 40,000 barrels of oil into the ocean and is the country's largest oil spill in 13 years.⁹⁶

Several aspects of Shell's plans for both the Beaufort and Chukchi Seas have drawn the criticism of multiple environmental organizations and some Alaska Native villages and tribes. Here are a few of the most egregious assumptions that Shell should be required to address before exploratory drilling can commence:

- Plans fail to account for a true worst-case scenario oil spill. In both the Beaufort and Chukchi Seas, the plans describe a blowout occurring in August, in open water, while their proposed drilling season extends through October 31st. As described earlier, the external conditions in August and the end of October differ greatly and could have a significant impact on oil spill response.
- Plans contain overly optimistic containment and recovery estimates. Shell's plans state that only 10 percent of a worst-case scenario discharge would escape its "primary offshore recovery efforts" and then claims it could subsequently recover half of the remaining 10 percent.⁹⁷ This has led environmental groups to point out that a 95 percent recovery rate for an offshore oil spill is unprecedented and unrealistic, insisting "BSEE must not accept a 95 percent mechanical recovery estimate, known to be technically invalid."⁹⁸ By comparison, in the Deepwater Horizon spill, the mechanical recovery rate was close to 3 percent and with the Exxon Valdez, it was 8 percent.⁹⁹
- Shell's response plan relies on technologies such as skimming, burning, and dispersant use, which have not been proved to successfully work in icy Arctic conditions.
- If a major spill isn't cleaned before the area becomes iced over, Shell would leave unrecovered oil under the ice—possibly for several months—until warmer weather allows for skimming and burning the pools of oil. The impact of leaving oil for an extended period of time in the marine environment has not been tested. Recently upheld Canadian Arctic drilling rules require operators to demonstrate how they would kill an out-of-control well in the same season to minimize environmental impact.¹⁰⁰

In an attempt to reduce these risks, the Department of the Interior conditionally approved Shell's Exploration Plan for the Chukchi Sea—stipulating they shorten the proposed drilling season by 38 days. Shell, however, has stated they will seek to modify this and return to the original end date of October 31st.¹⁰¹

As was demonstrated all too painfully in the Gulf, BP was wholly unprepared for the possibility of a major blowout and the large-scale response effort required to address it. Their plans were inadequate, outdated, and appallingly out of touch—their spill response plan filed in 2009 famously included walruses as critical species in the Gulf of Mexico, and listed contact information for a “national wildlife expert” who had been dead for four years.¹⁰² The stakes are even higher in the untested, unpredictable, and undeveloped Arctic, and Shell’s plans should reflect a full comprehension of what could happen and how they would respond.

Recommendations

While the oil-and-gas industry is eager to tap into the “great opportunity” it believe lies beneath the pristine Arctic waters, there are several measures that must be taken to ensure oil companies and federal agencies are prepared for the potentially devastating consequences and have the necessary resources and personnel to respond. If we’ve learned anything from the Deepwater Horizon tragedy, it’s that the importance of preparedness can’t be overstated—and this increases tenfold in the Arctic. Below are recommendations for specific actions to be taken before Shell, or any other company, begins exploratory drilling in the Arctic.

For Shell

- **Develop a credible worst-case scenario.** Any company preparing to drill in the Arctic must describe a real worst-case blowout and demonstrate an ability to respond to such a disaster in the increasingly harsh and unpredictable conditions that follow the final day of the prescribed drilling season. Additionally, the process and methodology for developing the worst-case estimates should be transparent.
- **Demonstrate that a blowout can be contained.** Any company intending to drill in the Arctic should be required to have redundant emergency shut-off systems that meet all new post-Deepwater Horizon requirements and have been tested and inspected. The National Academy of Engineering and National Research Council “called for major changes to the way emergency equipment known as blowout preventers are designed and used to help control surges of oil and gas at wells.”¹⁰³ Acoustic triggers are remote-controlled and, in the case of an uncontrollable blowout, can be used to collapse and kill the gushing well if access to the blowout preventer is compromised, as was the case in the Macondo well blowout.^{104, 105}
- **Build and prove the effectiveness of proposed capping and containment system.** At a recent public hearing in Kotzebue, residents expressed concern that Shell’s proposed cap and containment system has not been built or tested.

Tommy Beaudreau, BOEM Director, responded that “You have to have a capping system online and you have to demonstrate it works. It is a concern to me that this system hasn’t been built yet. I told them every time I met with them that they aren’t going to drill until they do so.”¹⁰⁶

- **Ensure all required response capabilities are in place before operations commence.** These requirements should be developed by the federal government.

For the federal government

- **Develop Arctic-specific standards for what constitutes adequate response capabilities.** No permits should be issued for additional Arctic exploration until the Department of Interior, in consultation with the National Oceanic and Atmospheric Administration, and the U.S. Coast Guard, promulgates regulations stipulating the minimum response capabilities that must be in place before drilling operations can commence. Such standards must account for the fierce environmental conditions detailed in this report and include response capabilities proven to be feasible throughout the entirety of the drilling season and approved for any given permit.
- **Require and oversee spill response drills in the Arctic.** As the National Ocean Policy Draft Implementation Plan identified, “research, development, and testing of oil spill response and containment in Arctic conditions is another area in need of attention.”¹⁰⁷ The Bureau of Safety and Environmental Enforcement must oversee drills carried out by Shell in the Arctic that prove the assertions made in the drilling plan and identify potential gaps in response that must be addressed prior to plan approval.
- **Improve weather and ocean prediction capabilities.** The fine scale tools needed to monitor and predict weather to ensure a safe and effective oil spill response in the Arctic (scientific instruments, models) are not available. This is especially true for a late-season or over-winter spill. This capacity could also be increased by improving sharing of data between oil spill responders, industry, and the U.S. government.
- **Engage in developing an international oil spill response agreement.** With the rush to drill in the Arctic Ocean, it is critical to note that an oil spill anywhere could quickly become catastrophic for the entire region. At the most recent

Arctic Council Ministerial Meeting, the eight Arctic States (Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the United States) agreed to their first legally binding agreement to set up a protocol for search and rescue missions, but did not establish a contingency plan to manage the onslaught of drilling in the Arctic Ocean, despite the support of Secretary of State Hillary Clinton for such action.¹⁰⁸

For Congress

- **Appropriate adequate funds for the Coast Guard to carry out its mission in the Arctic.**¹⁰⁹ The acceleration of human activity in the region means “increased risk of maritime accidents, oil spills, illegal fishing and harvesting of other natural resources from U.S. waters, and threats to U.S. sovereignty”—new concerns that will require facilities, equipment, and personnel, especially in the North Slope where today they have nothing.
- **Increase the liability cap and civil penalties for oil companies in violation of drilling safety rules.** Held at an absurdly low \$75 million, many have argued the cap on economic damages caused by oil companies is not a sufficient deterrent.¹¹⁰ Additionally, at an October hearing before the House Natural Resources Committee, then-BSEE Director Michael Bromwich said, “I don’t think the current civil penalty authorization is a deterrent. I don’t even think it’s close.”¹¹¹
- **Appropriate additional funds for NOAA research and development to increase oil spill response capacity in the Arctic.** NOAA is the only federal agency with oil spill preparedness, response, and restoration responsibilities under the Oil Pollution Act that does not receive an appropriation from the Oil Spill Liability Trust Fund to support oil spill preparedness, including research and development. It is also important to note that BP restoration funds from the Deepwater Horizon spill do not support improving oil spill response capacity.

Conclusion

Maintaining access to domestic offshore oil and gas resources must remain an integral part of our nation's energy portfolio for the near term. In the aftermath of the worst accidental offshore oil spill the world has ever experienced the Obama administration implemented critical reforms to regulations that will allow drilling to continue with a higher degree of safety and oversight. Yet more must be done. We have seen firsthand the threats these activities pose under the best of circumstances in a region where response is readily accessible and well rehearsed. There are too many unknowns to allow them to occur in pristine, remote, unknown areas.

This report outlines the specific shortcomings in both Shell's response plans and the private- and public-sector response capabilities to a devastating oil spill in the Arctic region of the United States. Failing to meet the targets laid out here will expose the residents and natural resources of one of the last unspoiled places on the planet to an unacceptable level of risk. Until the oil and gas industry and its federal partners can demonstrate with certainty that it can identify and respond to a true worst-case scenario incident, the Arctic should remain off-limits to exploration and drilling.

About the authors

Kiley Kroh is the Associate Director for Ocean Communications at the Center for American Progress. Prior to joining American Progress, she served as a media consultant and strategic advisor to Democratic candidates and committees at the federal, state, and municipal levels, including multiple campaigns in coastal states and districts. Past employment also includes working as a member of the executive production team for the 2008 Democratic National Convention and serving as a U.S. Peace Corps volunteer in Ukraine. Kiley is a Colorado native and graduate of Regis University in Denver.

Michael Conathan is the Director of Ocean Policy at the Center for American Progress. His work focuses on driving progressive solutions to the multitude of problems facing the world's oceans. Prior to joining American Progress, Conathan spent five years staffing the Senate Committee on Commerce, Science, and Transportation's Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard. He oversaw enactment of multiple key pieces of ocean legislation, including the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act, the Integrated Coastal and Ocean Observing Act, the Federal Ocean Acidification Research and Monitoring Act, and the Shark Conservation Act.

Emma Huvos is an intern with the Energy team at the Center for American Progress. A political science major at Johns Hopkins University, she completed an Aitchison Public Service Fellowship in Government last year. Huvos is a Massachusetts native and prior work experience includes the Massachusetts League of Environmental Voters.

Acknowledgements

The authors would like to thank Kate Gordon, Vice President of Energy at the Center for American Progress, Jeff Wood of Reconnecting America, Lois Epstein of The Wilderness Society, Melissa Prior of Pew Environment Group, The Gordon and Betty Moore Foundation, The Heising-Simons Foundation, The Kingfisher Foundation, The Walton Family Foundation, and the anonymous contributors who made this report possible.

Additional resources

- Bureau of Ocean Energy Management: www.boem.gov
- Bureau of Safety and Environmental Enforcement: www.bsee.gov
- NOAA Office of Response and Restoration: www.noaa.gov
- Pew Environment Group: Oceans North: www.pewenvironment.org
- United States Coast Guard: www.uscg.mil
- Royal Dutch Shell: www.shell.com
- EarthJustice: www.earthjustice.org
- Alaska Wilderness League: www.alaskawild.org

Endnotes

- 1 Bryan Walsh, "Why Oil Exploration in the Arctic Is Another Sign of the Drive for Extreme Energy," *Time Science*, August 5, 2011, available at <http://ecocentric.blogs.time.com/2011/08/05/why-oil-exploration-in-the-arctic-is-another-sign-of-the-drive-for-extreme-energy/>.
- 2 Lisa Demer, "Shell gambles billions in Arctic Alaska push," *Alaska Daily News*, December 4, 2011, available at <http://www.adn.com/2011/12/03/2201550/shell-gambles-billions-in-arctic.html#storylink=twitter>.
- 3 Letter from F. Stuart Chapin III and others to President Obama and Secretary Salazar, January 23, 2012, available at http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Other_Resource/ScientistsLetter-OCSDDevelopment.pdf.
- 4 Julia Werdigier, "BP Forms Partnership to Explore in Russia," *The New York Times*, January 14, 2011, available at http://www.nytimes.com/2011/01/15/business/global/15oil.html?_r=3.
- 5 Andrew E. Kramer and Clifford Krauss, "Russia Embraces Offshore Drilling," *The New York Times*, February 15, 2011, available at <http://www.nytimes.com/2011/02/16/business/global/16arctic.html?pagewanted=all>.
- 6 Bjoern H. Amland, "Norway Rejects Offshore Oil Drilling Over Spill Concerns," *The Huffington Post*, March 11, 2011, available at http://www.huffingtonpost.com/2011/03/14/norway-oil-drilling-rejected_n_834537.html.
- 7 Marianne Stigset, "Norway Expects More Arctic Oil Drilling After Barents Sea Strike," *Bloomberg*, April 5, 2011, available at <http://www.bloomberg.com/news/2011-04-05/norway-expects-more-arctic-oil-drilling-after-barents-sea-strike.html>.
- 8 U.S. Energy Information Administration, "Arctic oil and natural gas resources," January 20, 2012, available at <http://www.eia.gov/today-in-energy/detail.cfm?id=4650?src=email>.
- 9 Gulf Coast Incident Management Team, "One Year Later Press Pack," Press release, April 2011, available at <http://www.restorethegulf.gov/release/2011/04/10/one-year-later-press-pack>.
- 10 "Clean Gulf Associates," available at <http://www.cleangulfassoc.com/news.html> (last accessed November 2011).
- 11 "Marine Spill Response Corporation," available at <http://www.msrg.org/> (last accessed November 2011).
- 12 U.S. Coast Guard, *Final Action Memorandum-Incident Specific Preparedness Review (ISPR) Deepwater Horizon Oil Spill* (Department of Homeland Security, 2010), available at <http://www.uscg.mil/foia/docs/DWH/BPDWH.pdf>.
- 13 Jeremy Repanich, "The Deepwater Horizon Spill by the Numbers," *Popular Mechanics*, August 10, 2010, available at <http://www.popularmechanics.com/science/energy/coal-oil-gas/bp-oil-spill-statistics>.
- 14 Gulf Coast Incident Management Team, "One Year Later Press Pack."
- 15 Reuters, "BP gets \$4billion from Anadarko for oil spill costs," *MSNBC.com*, January 17, 2012, available at http://www.msnbc.msn.com/id/44927602/ns/business-oil_and_energy/t/bp-gets-billion-anadarko-oil-spill-costs/#.Tw7fPlf5o.
- 16 Judson Berger, "BP Cut Tax Bill by \$13B Due to Losses From Spill," *FoxNews.com*, April 22, 2011, available at <http://www.foxnews.com/politics/2011/04/22/bp-cut-tax-13b-losses-spill/>.
- 17 Mathew Tresaugue, "Demise of herring after Valdez spill raises questions on Gulf," *Chron.com*, July 18, 2010, available at <http://www.chron.com/business/energy/article/Demise-of-herring-after-Valdez-spill-raises-1704999.php>.
- 18 Exxon Valdez Oil Spill Trustee Council, "Pacific Herring" (Status of Restoration), available at http://www.evostc.state.ak.us/recovery/status_herring.cfm.
- 19 Minerals Management Service, Department of the Interior, available at http://edocket.access.gpo.gov/cfr_2007/jul/tr/pdf/30cfr254.26.pdf (last accessed February 2011).
- 20 National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, "Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling, Report to the President" (2011), available at http://www.oilspillcommission.gov/sites/default/files/documents/DEEPWATER_ReporttothePresident_FINAL.pdf.
- 21 Media Matters for America, "As oil execs admit their spill plans are 'embarrassing,' right-wingers slam moratorium," *MediaMatters.org*, June 16, 2010, available at <http://mediamatters.org/research/201006160049>.
- 22 Dan X. McGraw, "U.S. 'wildcat culture' risks Macondo oil spill repeat, official says," *Fuel Fix*, October 10, 2011, available at <http://fuelfix.com/blog/2011/10/10/u-s-wildcat-culture-risks-macondo-oil-spill-repeat-official-says/>.
- 23 "Notices to Lessees and Operators," available at <http://www.bsee.gov/Regulations-and-Guidance/Notices-to-Lessees-and-Operators.aspx> (last accessed February 2012).
- 24 Lois N. Epstein, P.E., "Effective Offshore Drilling Oversight Requires Key Legislative, Regulatory, Enforcement and Transparency Upgrades" (Washington: The Wilderness Society, 2012), available at <http://wilderness.org/files/2012-17ref1211.pdf>.
- 25 National Academy of Engineering and National Research Council, "Macondo Well-Deepwater Horizon Blowout: Lessons for Offshore Drilling Safety" (2011), available at http://www.nap.edu/openbook.php?record_id=13273&page=1.
- 26 Bureau of Ocean Energy, Regulation, and Enforcement, *Report Regarding the Causes of the April 20, 2010 Macondo Well Blowout* (Department of the Interior, 2011), available at <http://www.boemre.gov/pdfs/maps/DWHFINAL.pdf>.
- 27 National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, "Deep Water."
- 28 Bryan Walsh, "Will the Gulf Accident Stymie Alaska Drilling Plans?," *Time*, May 12, 2010, available at <http://www.time.com/time/health/article/0,8599,1988431,00.html#ixzz1c0lqGwqE>.
- 29 Leslie Holland-Bartels and Brenda Pierce, eds., "An Evaluation of the Science Needs to Inform Decisions on Outer Continental Shelf Energy Development in the Chukchi and Beaufort Seas, Alaska" (Washington: U.S. Geological Survey, 2011), available at <http://pubs.usgs.gov/circ/1370/>.
- 30 Robert B. Spies, ed., "An Evaluation of the Science Needs to Inform Decisions on Outer Continental Shelf Energy Development in the Chukchi and Beaufort Seas, Alaska" (Washington: Pew Environment Group and Ocean Conservancy, 2011), available at <http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Report/USGS-Report-Review-Sept2011.pdf>.
- 31 National Ocean Council, "National Ocean Policy Draft Implementation Plan" (2012), available at <http://www.whitehouse.gov/administration/eop/oceans/implementationplan>.
- 32 "NOAA's National Weather Service - National Climate," available at <http://www.nws.noaa.gov/climate/> (last accessed November 2011).
- 33 "National Weather Service, Alaska Regional Headquarters," available at <http://www.arh.noaa.gov/clim/climDataSearch.php?stnid=PABR> (last accessed November 2011).

- 34 "Naval Oceanography Portal," available at <http://www.usno.navy.mil/USNO/astronomical-applications/data-services/rs-one-day-us> (last accessed November 2011).
- 35 "National Weather Service Forecast Office, New Orleans/Baton Rouge, LA," available at <http://www.nws.noaa.gov/climate/index.php?wfo=lix> (last accessed November 2011).
- 36 "Naval Oceanography Portal," available at <http://www.usno.navy.mil/USNO/astronomical-applications/data-services/rs-one-day-us> (last accessed November 2011).
- 37 National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, "Deep Water."
- 38 "Environmental Protection Agency Office of Emergency and Remedial Response," available at http://www.epa.gov/oem/docs/oil/edu/oilspill_book/chap2.pdf (last accessed November 2011).
- 39 Pew Environment Group, "Oil Spill Prevention and Response in the U.S. Arctic Ocean: Unexamined Risks, Unacceptable Consequences" (2010), available at http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting_ocean_life/PEW-1010_ARCTIC_Report.pdf.
- 40 Gulf Coast Incident Management Team, "One Year Later Press Pack."
- 41 Pew Environment Group, "Oil Spill Prevention and Response in the U.S. Arctic Ocean."
- 42 Rob Powell, "No easy solutions for cleaning up Arctic oil spills, environmental group says," *Alaska Dispatch*, September 11, 2011, available at <http://www.alaskadispatch.com/article/no-easy-solutions-cleaning-arctic-oil-spills-environmental-group-says>.
- 43 Claims Journal, "Alaska Governor Declares State Disaster After Storm," December 8, 2011, available at <http://www.claimsjournal.com/news/west/2011/12/08/196437.htm>.
- 44 Jason Samenow, "Alaska storm brings epic wind, waves, coastal flooding and snow," *The Washington Post*, November 9, 2011, available at http://www.washingtonpost.com/blogs/capital-weather-gang/post/alaska-storm-brings-epic-wind-waves-coastal-flooding-and-snow/2011/11/09/gIA8gNb5M_blog.html.
- 45 "Monster storm bears down on rural western Alaska," *Los Angeles Times*, November 8, 2011, available at <http://latimesblogs.latimes.com/nationnow/2011/11/alaska-monster-storm-bering-sea.html>.
- 46 Yereth Rosen, "Nome, Alaska braces for rare, monster storm," *Csmonitor.com*, November 9, 2011, available at <http://www.csmonitor.com/USA/Latest-News-Wires/2011/1109/Nome-Alaska-braces-for-rare-monster-storm>.
- 47 "DOT&PF Frequently Asked Questions," available at <http://www.dot.state.ak.us/FAQ.shtml#i> (last accessed November 2011).
- 48 Bureau of Land Management, "Dalton Highway Visitor's Guide" (2009), available at <http://www.alaskageographic.org/uploads/pdf/dalton-vg2009.pdf>.
- 49 "Frequently Asked Questions," available at <http://alaskarailroad.com/travel/FrequentlyAskedQuestions/tabid/298/Default.aspx>.
- 50 Louisiana Statewide Transportation Plan, "Existing Conditions," available at: <http://www.dotd.la.gov/study/pdf/08%20Chapter%205%20-%20Existing%20Conditions.pdf>
- 51 National Oceanic and Atmospheric Administration, *United States Coast Pilot 9* (Department of Commerce, 2011), available at http://www.nauticalcharts.noaa.gov/nsd/coastpilot/files/cp9/CPB9_E29_20110803_1812_WEB.pdf.
- 52 Pew Environment Group, "Oil Spill Prevention and Response in the U.S. Arctic Ocean."
- 53 National Oceanic and Atmospheric Administration, *Distances Between United States Ports* (Department of Commerce, 2009), available at <http://www.nauticalcharts.noaa.gov/nsd/distances-ports/distances.pdf>.
- 54 Margaret Kriz Hobson, "ARCTIC: Aging infrastructure adds to woes of Alaska-bound fuel tanker," *Energy & Environment*, January 10, 2012, available at <http://www.eenews.net/public/Green-wire/2012/01/10/1>.
- 55 "Red Dog Mine," available at <http://www.groundtruthtrekking.org/Issues/MetalsMining/RedDogMine.html> (last accessed February 2012).
- 56 Louisiana Department of Transportation and Development, "Statewide Transportation Plan" (2008), available at <http://www.dotd.la.gov/study/pdf/08%20Chapter%205%20-%20Existing%20Conditions.pdf>.
- 57 "Port of South Louisiana - Transportation Center of the Americas, Overview," available at <http://www.portsl.com/overview.htm> (last accessed November 2011).
- 58 "U.S. Water Way Data; Principal Ports of the United States," (2009) available at <http://www.ndc.iwr.usace.army.mil/data/datapport.htm>.
- 59 Gulf Coast Incident Management Team, "One Year Later Press Pack."
- 60 Associated Press, "Russian Tanker to Bring Fuel to Iced-in Alaska City," *FoxNews.com*, December 5, 2011, available at <http://www.foxnews.com/us/2011/12/05/russian-tanker-to-bring-fuel-to-iced-in-alaska-city/>.
- 61 Alex DeMarban, "Russian icebreaker to deliver fuel to Nome, highlighting shortage of U.S. icebreakers," *Alaska Dispatch*, December 5, 2011, available at <http://www.alaskadispatch.com/article/russian-icebreaker-deliver-fuel-nome-highlighting-shortage-us-icebreakers?page=0,1>.
- 62 Margaret Kriz Hobson, "ARCTIC: Aging infrastructure adds to woes of Alaska-bound fuel tanker."
- 63 Alaska Clean Seas North Slope Spill Response, "Alaska Clean Seas Yearbook 2011" (2011), available at <http://www.alaskacleanseas.org/wp-content/uploads/2011/02/new-year-book-info-1-28.pdf>.
- 64 Pew Environment Group, "Oil Spill Prevention and Response in the U.S. Arctic Ocean."
- 65 "State Owned Public Airports - Northern Region," available at http://dot.alaska.gov/stwdav/airports_public_northern.shtml (last accessed November 2011).
- 66 John T. Bennet, "New Airlifter Could Become C-130 Surrogate," *Military.com*, March 29, 2006, available at <http://www.military.com/features/0,15240,92492,00.html>.
- 67 Meghan Gordon, "US not ready to respond to Arctic oil spills: Coast Guard chief," *Platts.com*, July 27, 2011, available at <http://www.platts.com/RSSFeedDetailedNews/RSSFeed/Oil/6320097>.
- 68 Adm. Robert Papp, "U.S. Coast Guard on Coast Guard Operations in the Arctic," *Testimony before the House Transportation and Infrastructure Subcommittee on Coast Guard and Maritime Transportation*, December 1, 2011, available at <http://www.dhs.gov/ynews/testimony/20111201-papp-coast-guard-operations-in-the-arctic.shtm>.

- 69 "Air Station Kodiak," available at <http://www.uscg.mil/d17/airstakodiak/> (last accessed January 2012).
- 70 "Coast Guard Alaska," available at <http://www.weather.com/tv/tvshows/coast-guard-alaska> (last accessed February 2012).
- 71 "Station Valdez," available at <http://www.uscg.mil/d17/stavaldez/> (last accessed February 2012).
- 72 William Yardley, "A Coast Guard Challenge: Arctic Drilling," *The New York Times*, October 26, 2011, available at <http://green.blogs.nytimes.com/2011/10/26/a-coast-guard-challenge-arctic-drilling/?smid=tw-nytimesgreen&seid=auto>.
- 73 Alex DeMarban, "Coast Guard Alaska commander notes North Slope's search and rescue limitations," *The Arctic Sounder*, June 1, 2011, available at http://www.thearcticsounder.com/article/1122coast_guard_alaska_commander_notes_north.
- 74 "Vessel of Opportunity Skimming System (VOSS)," available at <http://www.uscg.mil/d1/response/voss.html> (last accessed February 2012).
- 75 Adm. Robert Papp, "U.S. Coast Guard on Coast Guard Operations in the Arctic."
- 76 Dan Joling, "Coast Guard: Arctic Response Capability Lacking," Associated Press, August 13, 2011, available at <http://abcnews.go.com/Business/wireStory?id=14294756#.T2jhFdnfXs>.
- 77 William Yardley, "A Coast Guard Challenge: Arctic Drilling."
- 78 Adm. Robert Papp, "Defending U.S. Economic Interests in the Changing Arctic: Is There a Strategy?," Testimony before the Senate Committee on Commerce, Science, and Transportation, Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard, July 27, 2011, available at <http://www.dhs.gov/ynews/testimony/20110727-papp-us-economic-interests-in-arctic.shtm>.
- 79 Kyung M. Song, "Lawmakers confronting cold reality for pricey icebreakers," *Seattle Times*, October 11, 2011, available at http://seattletimes.nwsource.com/html/localnews/2016456549_icebreaker10m.html.
- 80 Mike M. Ahlers, "Polar icebreaker dispute ties up Coast Guard appropriations," CNN.com, November 3, 2011, available at http://articles.cnn.com/2011-11-03/politics/politics_congress-polar-icebreakers_1_icebreakers-polar-star-polar-sea?_s=PM:POLITICS.
- 81 Mia Bennett, "Can U.S. lawmakers stomach the cost of new icebreakers?," *Alaska Dispatch*, December 10, 2011, available at <http://www.alaskadispatch.com/article/can-us-lawmakers-stomach-cost-new-icebreakers>.
- 82 Stephen L. Caldwell, "Observations on Arctic Requirements, Icebreakers, and Coordination with Stakeholders," Testimony before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives, Government Accountability Office, Coast Guard, December 1, 2011, available at <http://www.gao.gov/new.items/d12254t.pdf>.
- 83 Lisa Demer, "Shell to unveil icebreaker for Arctic Alaska offshore drilling," *Alaska Daily News*, December 6, 2011, available at <http://www.adn.com/2011/12/05/2204274/shell-about-to-unveil-200-million.html>.
- 84 Ibid.
- 85 "Services We Provide," available at <http://www.uscg.mil/hq/nsfweb/nsf/nsfservices.asp>.
- 86 Agence France-Presse, "Arctic changing 'at record pace': study," December 2, 2011, available at <http://www.google.com/hostednews/afp/article/ALeqM5hKb5OJAcmoNgKV7oYQoqK7MRacVA?docId=CN.G.43134735a60999f853fb9dd244c49cc.271>.
- 87 William Yardley and Erik Olsen, "Arctic Village Is Torn by Plan for Oil Drilling," *The New York Times*, October 25, 2011, available at http://www.nytimes.com/2011/10/26/us/arctic-village-split-by-oil-drilling-plan.html?_r=1&pagewanted=all.
- 88 National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, "Deep Water."
- 89 Caroline Cannon, "Arctic Shell game: No spill plan, no problem – feds say just drill," Defenders.org, September 29, 2011, available at http://www.defenders.org/newsroom/press_releases_folder/2011/09_29_2011_no_spill_plan_no_problem_feds_say_just_drill.php.
- 90 Bryan Walsh, "Why Oil Exploration in the Arctic Is Another Sign of the Drive for Extreme Energy."
- 91 Richard Mauer, "Shell wins tentative approval for offshore Arctic drilling," *Alaska Daily News*, August 5, 2011, available at <http://www.adn.com/2011/08/04/2000526/shell-wins-tentative-ok-for-arctic.html>.
- 92 Lisa Demer, "Shell gambles billions in Arctic Alaska push," *Alaska Daily News*, December 4, 2011, available at <http://www.adn.com/2011/12/03/2201550/shell-gambles-billions-in-arctic.html>.
- 93 Stephen Lacey, "Investigation Finds Shell Has Dreadful Safety Record in North Sea. Now It Wants to Drill in Arctic," Think Progress, August 24, 2011, available at <http://thinkprogress.org/romm/2011/08/24/302474/oil-investigation-shell-has-dreadful-safety-record-in-north-sea-now-it-wants-to-drill-in-arctic/>.
- 94 Fiona Harvey, "North sea oil spill 'worst for a decade,'" *The Guardian*, August 15, 2011, available at <http://www.guardian.co.uk/environment/2011/aug/15/north-sea-oil-spill>.
- 95 Camillus Eboh and Felix Onuah, "U.N. slams Shell as Nigeria needs biggest ever oil clean-up," Reuters, August 4, 2011, available at <http://ca.reuters.com/article/topNews/idCATRE7734MQ20110804>.
- 96 Alex Lawler, "Shell's Nigeria oil spill gets muted response," Reuters, December 24, 2011, available at <http://af.reuters.com/article/topNews/idAFJOE7BN00B020111224>.
- 97 Shell Offshore, Inc., "Beaufort Sea Regional Exploration Oil Discharge Prevention and Contingency Plan" (2010), available at http://boem.gov/uploadedFiles/BOEM/Oil_and_Gas_Energy_Program/Plans/Regional_Plans/Alaska_Exploration_Plans/2012_Shell_Beaufort_EP/2010_BF_rev1.pdf.
- 98 Pew Environment Group, "Comments on Shell Offshore Inc's 2012 OCS Lease Exploration Plan, Chukchi Sea, Alaska, and 2012 Chukchi Sea, Regional Exploration Oil Discharge Prevention and Contingency Plan" (2011), available at http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Other_Resource/Pew-Comments-Shell-Chukchi-2012-EPandODPCP.pdf.
- 99 Emilie Surrusco, "Drilling for oil in Arctic Ocean is fraught with danger," CS Monitor, August 17, 2011, available at <http://www.csmonitor.com/Commentary/Opinion/2011/0817/Drilling-for-oil-in-Arctic-Ocean-is-fraught-with-danger>.
- 100 CBC News, "New Arctic offshore drilling rules require full disclosure," December 15, 2011, available at <http://www.cbc.ca/news/canada/north/story/2011/12/15/north-neb-arctic-drilling.html?cmp=rss>.
- 101 Tim Bradner, "Shell will try to modify Chukchi exploration plan," *Alaska Journal of Commerce*, December 21, 2011, available at <http://www.alaskajournal.com/Alaska-Journal-of-Commerce/AJOC-December-25-2011/Shell-will-try-to-modify-Chukchi-exploration-plan/>.
- 102 Deborah Zabarenko, "Walrus in Louisiana? Eyebrow-raising details of BP's spill response plan," Reuters, May 27, 2010, available at <http://blogs.reuters.com/environment/2010/05/27/walrus-in-louisiana-eyebrow-raising-details-of-bps-spill-response-plan/>.

- 103 National Academy of Engineering and National Research Council, "Macondo Well-Deepwater Horizon Blowout: Lessons for Offshore Drilling Safety."
- 104 Shannyn Moore, "Oil companies need rules before drilling," *Alaska Daily News*, November 12, 2011, available at <http://www.adn.com/2011/11/12/2167977/oil-companies-need-rules-before.html>.
- 105 Bureau of Ocean Energy, Regulation, and Enforcement, "Report Regarding the Causes of the April 20, 2010 Macondo Well Blowout."
- 106 Carey Restino, "We are not ready': Oil and gas lease draft draws concern in Kotzebue," *The Arctic Sounder*, December 16, 2011, available at http://www.thearcticsounder.com/article/1150we_are_not_ready_oil_and_gas_lease_draft.
- 107 National Ocean Council, "Draft National Ocean Policy Implementation Plan" (2012), available at http://www.whitehouse.gov/sites/default/files/microsites/ceq/national_ocean_policy_draft_implementation_plan_01-12-12.pdf.
- 108 Marianne Stigset and Nicole Gauvette, "Clinton Seeks U.S. Arctic Spill Policy as Drilling in Greenland Resumes," *Bloomberg*, May 10, 2011, available at <http://www.bloomberg.com/news/2011-05-10/clinton-seeks-arctic-spill-policy-as-greenland-drilling-resumes.html>.
- 109 Adm. Robert J. Papp, Jr., "The Arctic: Emerging Maritime Frontier," *Defense Media Network*, November 29, 2011, available at <http://www.defensemedianetwork.com/stories/the-arctic-emerging-maritime-frontier/>.
- 110 Steve Hargreaves, "Cap on oil spill damages under fire," *CNN Money*, May 25, 2010, available at http://money.cnn.com/2010/05/25/news/economy/BP_liability/index.htm.
- 111 C-SPAN Networks, House Natural Resources Committee Hearing on Gulf Coast Oil Spill, October 13, 2011, available at <http://www.c-span.org/Events/House-Natural-Resources-Committee-Hearing-on-Gulf-Coast-Oil-Spill/10737424761/>.

The Center for American Progress is a nonpartisan research and educational institute dedicated to promoting a strong, just, and free America that ensures opportunity for all. We believe that Americans are bound together by a common commitment to these values and we aspire to ensure that our national policies reflect these values. We work to find progressive and pragmatic solutions to significant domestic and international problems and develop policy proposals that foster a government that is “of the people, by the people, and for the people.”

