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**From:** Hayes, Miriam (Nicole) <mnhayes@blm.gov>  
**Sent:** Thursday, March 14, 2019 8:52 AM  
**To:** coastalplainAR; Sean Cottle  
**Subject:** Fwd: [EXTERNAL] Comments on Coastal PLain O&G DEIS - references  
**Attachments:** Broken-Promises-Report2ndEdTWS2009.pdf; BrokenPromises-ReportMiller2003.pdf; PAMiller Ltr to BLM on Arctic NWR CP Seismic 8-17-2018.pdf

**Follow Up Flag:** Follow up  
**Flag Status:** Completed

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From: **Pam A. Miller** <[pammillerarctic@gmail.com](mailto:pammillerarctic@gmail.com)>  
Date: Wed, Mar 13, 2019 at 10:05 PM  
Subject: [EXTERNAL] Comments on Coastal PLain O&G DEIS - references  
To: <[mnhayes@blm.gov](mailto:mnhayes@blm.gov)>, <[blm\\_ak\\_coastalplain\\_EIS@blm.gov](mailto:blm_ak_coastalplain_EIS@blm.gov)>

Please find these references as attachments to my comments and my attached seismic comments.

***Pamela A Miller***

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**From:** Pam A. Miller [mailto:[pammillerarctic@gmail.com](mailto:pammillerarctic@gmail.com)]  
**Sent:** Wednesday, March 13, 2019 10:01 PM  
**To:** [mnhayes@blm.gov](mailto:mnhayes@blm.gov); [blm\\_ak\\_coastalplain\\_EIS@blm.gov](mailto:blm_ak_coastalplain_EIS@blm.gov)  
**Subject:** Comments on Coastal PLain O&G DEIS

Please find my comments

***Pamela A Miller***

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August 17, 2018

Shelly Jones, Acting District Manager  
Arctic Field Office  
Bureau of Land Management  
222 University Ave.  
Fairbanks, AK 99709  
Sent to: blm\_ak\_coastal\_plain\_seismic\_ea@blm.gov

Dear Ms Jones,

I find it inexplicable why and how BLM is rushing forward with a review of the 3D seismic permit application for the entire Coastal Plain “1002 area” of the Arctic National Wildlife Refuge proposed by SAE and partners Arctic Slope Regional Corporation and Kaktovik Inupiat Corporation.

BLM is already rushing the Coastal Plain oil and gas leasing EIS and now spins even faster by jumping ahead by preparing a separate EA for this 3-D seismic exploration. Such pre-leasing seismic will provide private information to corporations to advance their private interests for the broader program of oil and gas leasing and development in the refuge as authorized by the Tax Bill of 2017. BLM should reject the SAE application outright.

BLM has made public statements that it believes seismic exploration in the Arctic Refuge will not be significant and therefore an EIS is not necessary. This ungrounded statement belies common sense for many reasons especially that the Coastal Plain of the Arctic Refuge was protected for the purposes of preserving wilderness, wildlife, and recreation for more than 50 years. The Coastal Plain was recommended for Wilderness designation at the conclusion of a long public conservation plan and EIS process in 2015. The abrupt reversal of the national commitment for protection by the Tax Act with nary a hearing on its provisions in December 2017 requires true public involvement and consideration of the full range of impacts, not a slippery and opaque process like oil seeping on water.

BLM must not separate this NEPA review and potentially allow destructive activities like SAE’s proposal without first preparing an EIS that examines the full range of potential impacts from all phases of oil and gas activities. An EIS would need, among other things, to examine how the potential impacts of seismic exploration would combine with those of all other reasonably foreseeable oil and gas related activities in the Refuge—including leasing, exploration, development, production, transportation, and dismantling and restoration—in a single EIS to ensure that BLM will protect the resources of the Arctic Refuge.

In the Arctic Refuge Coastal Plain, significant, long-term impacts to vegetation, including changes in plant species diversity, and permafrost melt lasting decades were documented by the rigorous monitoring studies for the 2D seismic surveys in 1984-85 for the 1002h studies as summarized by the National Research Council (2003)<sup>1</sup> and subsequent scientific studies.

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<sup>1</sup> NRC 2003, Cumulative Environmental Effects of Oil and Gas Development on Alaska’s North Slope.

As a wildlife biologist and seismic monitor as part of the 1002 studies, I witnessed during winter and summer the seismic trails and “cattrain” camp and fuel hauling moves that pressed and rutted into the tundra. I measured snow at -50F in blowing snow and dark and observed and participated in the operational challenges out there and saw how next to impossible it is to avoid sensitive habitats when the program comprises straight lines going east to west across the dozens of rivers flowing from the foothills of the Brooks Range northward to the shorelines of the Beaufort Sea in a complex hydrology. If the mobile camps “cattrains” were routed around windswept Dryas River terraces, riparian willows, or creek and river bluffs by going through deep snow along rivers, they often got stuck. Moreover, the deep snowbanks of rivers, lakes, and the coastline are critical denning habitat for polar bears (despite technology for finding bear dens, not all bear dens will be found). The proposed 3D seismic grid will be far more intensive with the tight grid of 660’ wide sources lines on this intricate landscape.

Based on my experience, I am concerned about the impacts on overwintering fish and their habitats including lakes, streams, lagoons, rivers along with associated icings, springs, taliks, groundwater flows above or through permafrost and other hydrology; unique areas like the Sadlerochit Springs area; proposed activities on all fish and wildlife and their habitats, including migratory, resident, and overwintering species, and direct effects on those animals which may be present on or in the vicinity of the Coastal Plain during the timeframe of the proposed activities, including impacts that may result from damage to the Coastal Plain’s vegetation and hydrological systems. Major impacts could result to migratory birds, caribou and other wildlife, subsistence, recreation and the environment during the time period outside the window described for the actual seismic surveys (not addressed by SAE). This includes aircraft take-off and landings and overflights and ground work for associated activities such as trash removal “stick-picking,” spill response / cleanup, scientific baseline studies and monitoring, inspections, restoration and rehabilitation activities. BLM also should consider impacts to subsistence resources and users, human health, environmental justice, cultural resources, and archeological sites.

I am concerned about the impacts on existing and long-term scientific research including natural (undisturbed) study plots, inventory and monitoring; the impacts to recreation including long-term visual impacts from seismic lines; how rapidly increasing climate change influences seismic operations in the Coastal Plain area such as tundra travel period, snow cover, and heavy vehicle movements across tundra, rivers, and sea ice and the potential significant adverse impacts to fish, wildlife, and the environment, given that the last environmental impact analysis of 2D seismic in this region was done over 30 years ago.

At the onset of the surveys in 1984, inadequate snow cover was documented, but the surveys proceeded nonetheless. At this time, it is important to evaluate assumptions about the adequacy of protective snow. I offer some important considerations: What standards for determining adequate protective snow cover, and studies that document their effectiveness in preventing disturbance to vegetation, soils and permafrost?

- With criteria for opening and closing dates and standards for adequate protective snow cover in NPRA and State lands, what has been the outcome? What long-term studies show how well the standards work in protecting tundra vegetation, permafrost, river, lake and coastal banks? What real-time field monitoring has been done? When operating under the standards, there will always be some impact, was it acceptable or not?
- While there have been improvements in many seismic vehicle types and treads (e.g. from metal to rubber tracks), what tests have been done on vehicle and snow interactions, and for different slopes of terrain?

- In the Coastal Plain of the refuge there is generally thin snow cover-- this is not terrain like Prudhoe Bay or the NPRA - and it is very heterogeneous in this narrow band immediately North of the Brooks Range to the Beaufort Sea. The type of snow, density and hardness matters as much as the amount of snow. A stipulation based solely on snow depth not adequate, given that there can be significant differences in quality of protective cover given amount of air and ice.
- How will you determine if there is adequate protective snow cover? What is the protocol for sampling?
- How will the locations where snow measurements are taken be scientifically determined? What is the starting point, how many measurements, what is a sufficient number to get a reliable mean? What geographic unit of the Coastal Plain does each set of measurements cover?
- Depth criteria alone is insufficient, despite being convenient. Whether the snow is new or old affects the density which is a different factor for protection of the tundra. What is the mass of snow that will be between the tundra and the vehicles as it gets packed down? While density is easy to measure, there are not studies of depth and density.

In conclusion, the proposed SAE seismic permit should be rejected because the impacts from the proposed activities will be significant and the grid of heavy vehicles trails that will scar the tundra for my life time will forever degrade the integrity of this remarkable naturally intact ecosystem.

Sincerely,

Pamela A. Miller

# Broken Promises

The Reality of Oil Development in America's Arctic

— 2ND EDITION —

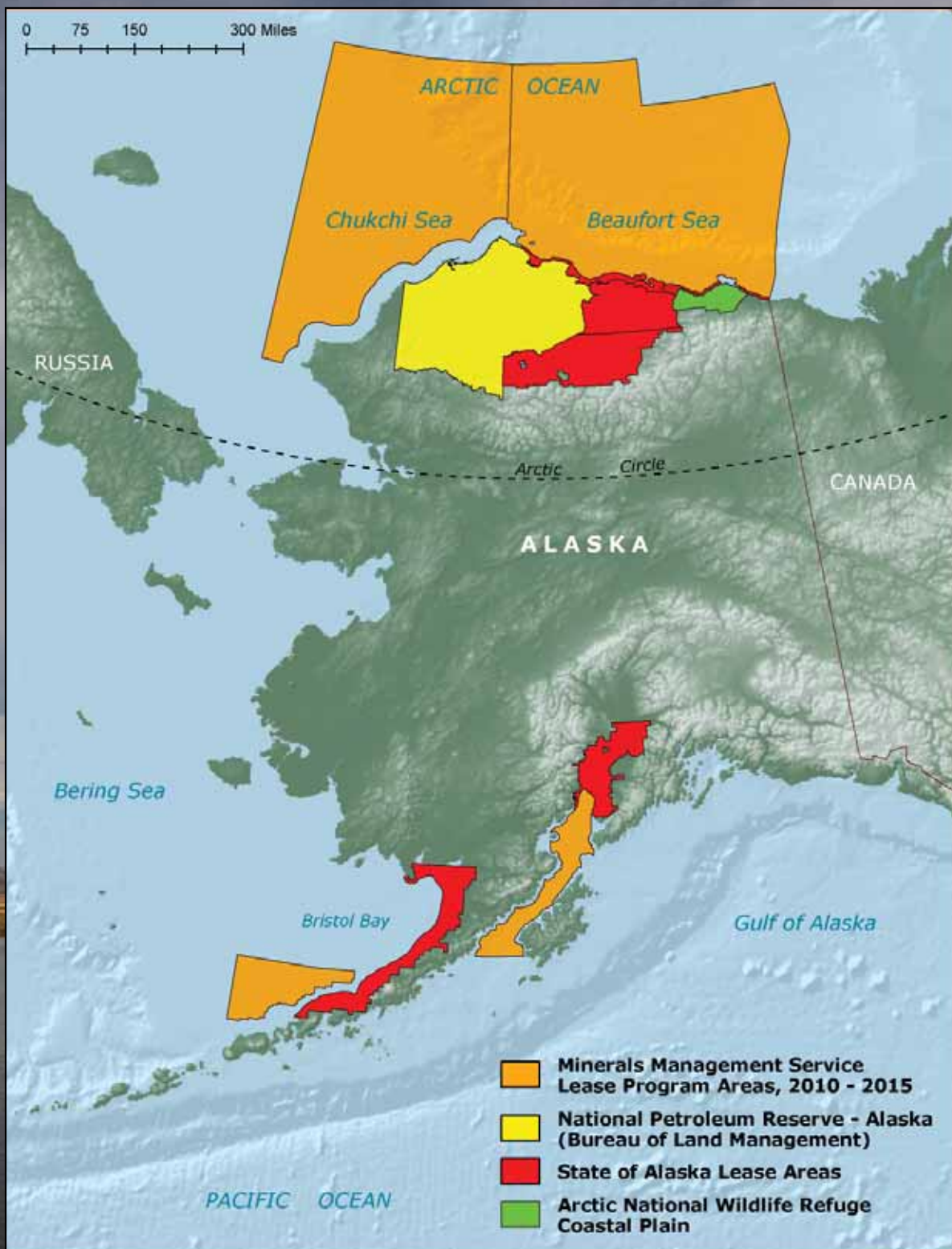


THE  
WILDERNESS  
SOCIETY



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Significant acreage in Alaska is open to or currently under consideration for oil and gas development, including places of environmental and cultural importance such as the Chukchi and Beaufort Seas, and Bristol Bay. The Arctic National Wildlife Refuge has also been a target for drilling, although it is protected by law from exploration and development.



# Introduction

Proponents of oil development in Alaska have been making promises, and breaking them, for decades.

To bolster the case for drilling, especially in environmentally sensitive areas, industry representatives and politicians argue that oil exploration, production and transport activities do not harm the environment. They promote Alaska's North Slope as the gold standard for "clean" oil development, asserting that new technology has shrunk industry's footprint and will make future development environmentally benign.

But the facts tell a different story. More than thirty years of industrial activity in Alaska have demonstrated that oil production is inherently a dirty business. Despite industry's best intentions to minimize impacts, environmental and social effects are accumulating and resulting in lasting harm to ecosystems and indigenous cultures. Opening new areas to drilling will not only add to these impacts but will also contribute to the Earth's warming climate, an increasingly serious concern, especially in Arctic regions.

This report calls attention to the many gaps between promise and reality, casting doubt on the reassurances being made by drilling proponents and their allies. The following chapters will demonstrate that

despite advances in some technology, oil and gas development has inherent risks, causes inevitable impacts and is, in fact, taking a toll on Alaska's environment and its people.

At stake are some of Alaska's most extraordinary wildlife values—habitat for migratory birds and fish, globally important marine food webs, hundreds of terrestrial species that are rare elsewhere in the world, and America's only arctic ecosystem. Oil development also threatens the subsistence way of life, which provides not just nutritious food, but also cultural affirmation and continuity.

Rhetoric contending that oil development can occur without harm to the environment and that drilling Alaska's oil will solve America's energy problems has distracted many decision-makers from thoughtful consideration of the facts. Continuing to ignore the realities of oil development in America's Arctic will only further distract from the urgent need to provide real solutions for our nation's energy and climate challenges.



U.S. Fish & Wildlife Service



AK Dept. Environmental Conservation



Subhankar Banerjee



Wayne Todd



AK Dept. Environmental Conservation



Ken Whitten

## BROKEN PROMISE #1

# The Extent of Environmental Impacts



## The Promise

Oil development has negligible impacts on the environment.

## The Reality

Environmental impacts of oil development are pervasive and lasting, occurring at every stage of oil development and accumulating over time.

Oil companies and politicians insist that it is possible to explore and develop oil fields in Alaska without harm to wildlife and the environment. But oil development is inherently a dirty business. At every stage from exploration to production to transportation, oil development negatively impacts the environment. Impacts occur both in the present and at the source, as in the case of oil spills, as well as in the future and distant from the source, as when oil is shipped overseas, burned, and converted to greenhouse gases.

Some impacts that are not yet manifest will occur as a result of past activity, even if all oil and gas development ceased today.<sup>1</sup> For example, thousands of acres of tundra have been damaged by gravel pads and fill, and much of that gravel has been contaminated by oil spills. These environmental impacts could persist for centuries, especially if vegetation and contaminated sites are not restored.<sup>2</sup>

If oil development continues and expands, existing impacts will be exacerbated and new ones will only compound the environmental damage.<sup>3</sup> If development expands offshore, infrastructure and traffic, noise and air pollution, and oil spills, will impact previously undisturbed ecosystems, interfering with coastal and marine ecosystems and wildlife. The cumulative effects of so many sources of strain, especially when coupled with climate change, are extensive.<sup>4</sup>

### Impacts at every stage of development

Environmental impacts of oil development occur at every stage of development and include both direct and indirect effects. During exploration, impacts occur from heavy trucks driving across the tundra, damaging plants and permafrost, and disturbing wildlife.<sup>5</sup> Offshore, exploration creates noise impacts that can harm whales and other marine life many miles away.<sup>6</sup>

- ▷ Environmental impacts occur at every stage of oil development.
- ▷ Past impacts combine with current impacts to produce significant cumulative effects.
- ▷ Future development and expansion will only further compound cumulative environmental impacts.

At the production phase, more equipment, infrastructure and personnel are required, and impacts derive from multiple sources, including air and vehicle traffic; gravel pits and water withdrawals; roads, wells, pipelines, and power lines; construction dust and noise; exhaust from combustion engines; and oil spills, toxic fumes, and drilling wastes. Environmental impacts, especially oil spills, are also a concern during oil storage and transportation, whether by pipeline or tanker.

**“Whether the benefits derived from oil and gas activities justify acceptance of the inevitable accumulated undesirable effects that have accompanied and will accompany them is an issue for society...to debate and judge.”<sup>7</sup>** National Research Council

Pamela A. Miller



Exxon Valdez Oil Spill Trustee Council



Oil development activities also contribute to climate change,<sup>8</sup> which is affecting the Arctic more quickly and profoundly than other areas of the world. Arctic ecosystems are highly sensitive to change and pollutants in the Arctic persist longer than they do in warmer climates,<sup>9</sup> further exacerbating the cumulative effects of oil development in America's Arctic.

**"...we can produce more energy from my state without harming wildlife or the environment."<sup>10</sup>**

Senator Lisa Murkowski, April 29, 2008



National Oceanic and Atmospheric Association

## Past and present impacts

The following list describes just some of the ways the oil industry in Alaska has already harmed and continues to harm the environment as a result of past and current development activity.<sup>11</sup>

- Seismic trucks and other off-road travel damage vegetation and affect scenic views
- Off-road vehicles disrupt wildlife, especially in winter when bears are denning and animals are already under nutritional stress
- The noise of trucks and airplanes, construction, and oil production disturbs wildlife, affecting migration and other behavior
- Buildings, powerlines, pipelines, and other structures disrupt the migration of fish, birds, and caribou, and disrupt scenic views
- Gravel roads alter natural water flow and create dust, affecting air quality and roadside vegetation
- Ice roads require drawing millions of gallons of water from lakes and rivers
- Heated buildings melt permafrost
- Hundreds of vehicles, generators, and industrial operations burn diesel and emit other pollutants, including greenhouse gases
- Predator numbers increase near oil fields leaving prey more vulnerable
- The presence of humans and physical structures contributes to direct wildlife mortality
- Hundreds of spills of oil and other toxic substances occur each year<sup>12</sup>
- Drilling waste is discharged directly into coastal waters<sup>13</sup>

## Future impacts

The following additional impacts could compound with past and current impacts if oil development is allowed to expand to offshore areas such as the Beaufort and Chukchi Seas:<sup>14</sup>

- Offshore seismic testing will harm bowhead whales and other marine life
- Increased marine traffic and noise will stress coastal and marine wildlife
- Offshore oil and chemical spills will occur

Many impacts of oil and gas development remain unknown. The following are just a few examples recommended by the National Academy of Sciences for further research and study:<sup>15</sup>

- The extent to which fish, wildlife, and plants are contaminated by toxins
- The effects of ice roads on aquatic species and tundra
- The consequences of water withdrawals
- Air contamination and its effects
- Offshore oil spills

To suggest that oil exploration and production can be done with only minimal impacts to the environment is clearly a false promise. According to the National Academy of Sciences, if oil activity expands, the continuing accumulation of effects is virtually certain. Even if development does not expand, the lingering effects of past development will persist for centuries.<sup>16</sup>

Subhankar Banerjee

<sup>1</sup> National Research Council. (2003). Cumulative environmental effects of oil and gas activities on Alaska's North Slope. Washington, DC: National Academies Press, P. 155.

<sup>2</sup> National Research Council. pp. 90, 158.

<sup>3</sup> National Research Council. P. 11.

<sup>4</sup> As goes the Arctic, so goes the planet: Petition for rulemaking under the Clean Air Act to regulate greenhouse gas emissions from mobile and stationary sources to protect the health and welfare of the Arctic and the world. (2008, November). p. 40. <http://www.oceana.org/fileadmin/oceana/uploads/pacific/ArcticPetition-FINAL-lowres.pdf>.

<sup>5</sup> National Research Council. pp. 76, 84, 96, 117, 157.

<sup>6</sup> Jasny, Michael, J. Reynolds, C. Horowitz, A. Wetzler. (2005, November). Sounding the depths II: the rising toll of sonar, shipping and industrial ocean noise on marine life. Natural Resources Defense Council. p. iv. Retrieved July 2009 from website: <http://www.nrdc.org/wildlife/marine/sound/contents.asp>; National Research Council. P. 156.

<sup>7</sup> National Research Council. P. 11.

<sup>8</sup> ACIA, Impacts of a Warming Arctic: Arctic Climate Impact Assessment (2004). Cambridge University Press. Overview report, executive Summary. p. 2. Retrieved August 25, 2009 from: <http://amap.no/acia>.

<sup>9</sup> Nuttall, Mark. 2000. The Arctic is changing. Stephansson Arctic Institute, Akureyri, Iceland, in partnership with the EU Raphael Programme. P. 1. Last retrieved July 22, 2009 from website: <http://www.thearctic.is>.

<sup>10</sup> Murkowski, Lisa. April 29, 2008. Higher Energy Taxes, ANWR One Solution (speech given on Senate floor). Retrieved August 19, 2009 from website: <http://murkowski.senate.gov/public/index.cfm?p=Speeches>.

<sup>11</sup> National Research Council. pp. 6, 36, 40-41, 47-49, 67-68, 78-80, 117-118.

<sup>12</sup> Alaska Department of Environmental Conservation spill database. (1996-2009). Analyzed and compiled by Pam Miller, Northern Alaska Environmental Center.

<sup>13</sup> Trustees for Alaska. (2008, December 15). Villages, fishermen, and Cook Inletkeeper challenge EPA for allowing oil companies' toxic discharges. Press release retrieved from website: <http://www.trustees.org/Supporting%20Documents/CIGP%20press%20release%2012-15-08.pdf>.

<sup>14</sup> Harrould-Kolieb, Ellycia, J. Savitz, J. Short, M. Veach. (2009). Toxic legacy: long-term effects of offshore oil on wildlife & public health. <http://www.oceana.org/climate>. p. 25; Jasny, M. et. al. (2005, November). p. v.

<sup>15</sup> National Research Council. pp. 9,10,150-153.

<sup>16</sup> Ibid. P. 158.



## BROKEN PROMISE #2

# The Oil Development Footprint



## The Promise

The oil development "footprint" is smaller than ever.

## The Reality

The full impact of oil development extends well beyond physical structures and its footprint is larger than ever.

For years, proponents of drilling in the Arctic National Wildlife Refuge have argued that the development "footprint" will impact only 2,000 acres. According to Sarah Palin, "this is like laying a 2-by-3-foot welcome mat on a basketball court."<sup>1</sup> In fact, oil development impacts are not limited to the area where drill pads and pipeline support beams touch the ground.

Alaska's North Slope industrial complex—a network of roads, pipelines, airstrips, and power lines—sprawls across 640,000 acres, fragmenting the landscape. The aggregate area and impact of this development simply cannot be measured by the physical structures alone. Although the size and number of drill pads required to extract oil may be getting smaller, the true development footprint, measured in the full scope of impacts, is getting larger.

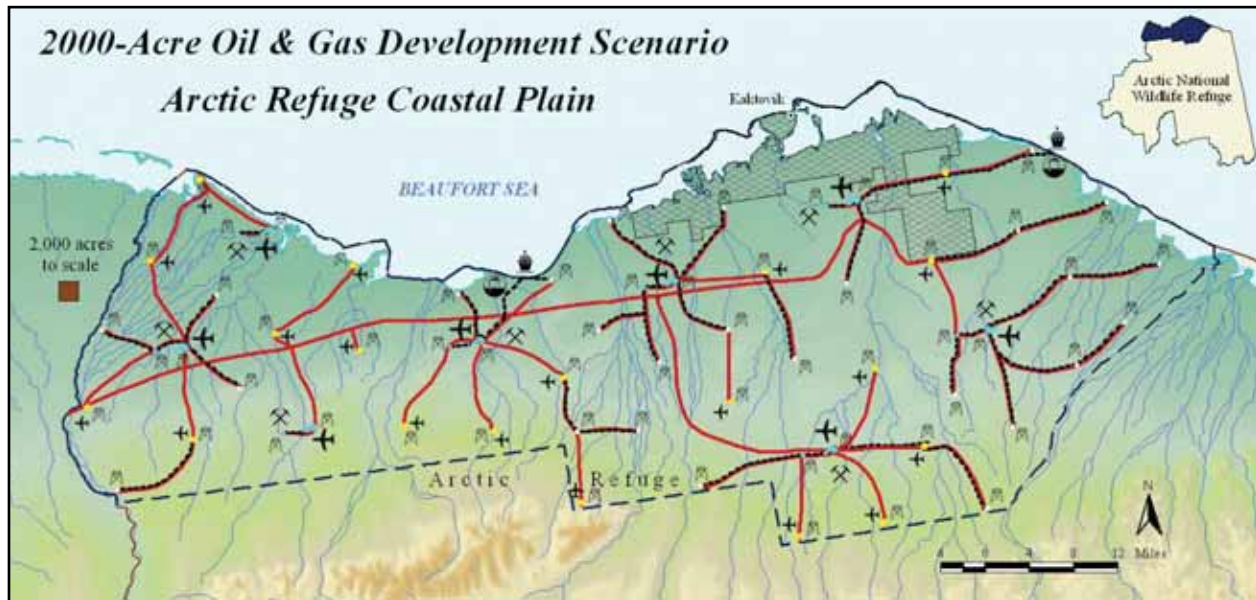
### Oil development's footprint spreads across the landscape

When oil is discovered, one or more production wells are drilled and permanent structures are built to support them. Eventually, development spreads like a web as wells are drilled to tap the full extent of the oil field, and roads and pipelines are built to connect the infrastructure and transport materials and services. According to the National Academy of Sciences, "the common practice of describing the effects of particular projects in terms of the area directly disturbed by roads, pads, pipelines, and other facilities ignores the spreading character of oil development on the North Slope and the consequences of this to wildland values over an area far exceeding the area directly affected."<sup>2</sup>

On Alaska's North Slope today there are 32<sup>3</sup> active oil fields spread across more than 1,000 square miles. Thousands of production wells have been drilled, and these are supported by a vast infrastructure of roads, pipelines and other facilities.

At Alpine, one of Arctic Alaska's newest onshore oil fields, industry initially claimed that directional drilling technology would enable development of this field with only two drill sites and 115 acres or less.<sup>4</sup> That promise was quickly replaced with the usual pattern of incremental sprawl seen elsewhere on the North Slope.

- The footprint of oil development spreads across the landscape.
- The footprint extends beyond drill pads and physical structures.
- The true footprint of oil development includes all of its direct and indirect impacts, as well as cumulative and long-term impacts.



Proponents of drilling the Arctic National Wildlife Refuge argue that development would be contained to a 2000-acre footprint. In reality, the aggregate footprint of drill pads, roads, and pipelines could sprawl across 1.5 million acres.

**“...the footprint that you put on the ground is a function of the geology of the reservoir that you discover. If that reservoir is spread out over 50 miles, obviously, your footprint is going to be spread out over 50 miles.”<sup>5</sup>**

Mr. Herrera (British Petroleum geologist)

In 2004 federal agencies approved industry plans to build five more drill sites connecting to the Alpine oil field. In total, Alpine plans now include seven drill sites, 33 miles of permanent gravel roads, two airstrips, two gravel mines, and 72 miles of pipeline covering some 570 acres.<sup>6</sup> To fully develop the oil field, the Bureau of Land Management projects the addition of 24 more production well pads, seven airports, 150 miles of pipeline, 122 miles of gravel roads, and another 1,262 acres of tundra covered by gravel fill or mines.<sup>7</sup>

### Oil development's footprint extends beyond physical structures

Oil development's footprint extends well beyond permanent physical structures such as drill pads and wells. On land industry's imprint begins with seismic testing. The marks from heavy vehicles travelling across fragile tundra creates visible lines extending for miles.<sup>8</sup> Other mobile vehicles, including airplanes are also part of the footprint, contributing noise and air pollution beyond stationary structures.

Oil development activities can interfere with hydrologic processes and affect animal populations as much as a few miles from any physical structure.<sup>9</sup> The air pollution generated by stationary sources in Alaska's North Slope oil fields and other emissions from Prudhoe Bay have been detected nearly 200 miles away in the village of Barrow.<sup>10</sup> Carbon dioxide emissions are contributing to climate change and ocean acidification at a global scale.<sup>11</sup>

Offshore, oil development's footprint also extends far beyond any physical structures.<sup>12</sup> Exploratory drills can affect benthic communities for up to a mile.<sup>13</sup> Spilled oil can spread across hundreds of miles<sup>14</sup> and low frequency sonar can travel hundreds of miles through the ocean at considerable intensities.<sup>15</sup> Sound generated by seismic exploration, drilling, and marine vessel traffic can harm whales and other marine animals and drive them away from migration routes and feeding grounds.<sup>16</sup>



## The true development footprint

Figure 2.1 lists the physical structures associated with oil development on the North Slope, but these are just one small piece of the overall footprint of oil development. To fully account for oil development's footprint, one must also consider air and noise pollution, water extraction, oil spills and other toxic discharges, gravel pits, habitat fragmentation, and the numerous direct, indirect, and cumulative impacts to wildlife and human populations. These impacts are significant and only growing more so as development continues and expands.

**FIGURE 2.1: Oil development's footprint on the North Slope**

- ▼ **5,549** exploration and production wells<sup>17</sup>
- ▼ More than **390** gravel pads<sup>18</sup>
- ▼ More than **500** miles of roads<sup>19</sup>
- ▼ More than **600** miles of pipelines<sup>20</sup>
- ▼ **2** refineries<sup>21</sup>
- ▼ **20** airstrips<sup>22</sup>
- ▼ **6** docks and gravel causeways<sup>23</sup>
- ▼ More than **6,000** acres of gravel mines<sup>24</sup>
- ▼ **27** production plants and processing facilities<sup>25</sup>
- ▼ The **800** mile-long Trans Alaska Pipeline
- ▼ **219** miles of power transmission lines<sup>26</sup>

<sup>1</sup> Palin, Sarah. (2009, February 1). Sarah Palin: The case for drilling in ANWR. Minneapolis Star Tribune editorial.

<sup>2</sup> National Research Council. (2003). Cumulative environmental effects of oil and gas activities on Alaska's North Slope. Washington, DC: National Academies Press. p. 148.

<sup>3</sup> Minerals Management Service. (2008, November). Arctic Multiple-Sale Draft EIS. Beaufort and Chukchi Sea Planning Areas. MMS OCS EIS/EA 2008-0055. Table 3.1.1-1. Vol. IV. Appendix K-Tables.

<sup>4</sup> Anadarko Petroleum Corporation. (2000, November 16). Production begins from Alpine field on Alaska's North Slope. Press release. Retrieved August 19, 2009 from website: [www.anadarko.com/Investor/Pages/News Releases; Resource Review](http://www.anadarko.com/Investor/Pages/News_Releases; Resource Review). (1998, June). State backs ARCO in lawsuit, Knowles says company "doing it right."

<sup>5</sup> U.S. Congress, House of Representatives, Committee on Merchant Marine and Fisheries, 102d Cong., 1st Session, Arctic National Wildlife Refuge, Part 1- Consideration of several proposals to authorize oil and gas leasing within the Arctic National Wildlife Refuge. May 1, June 11, and July 16, 1991. Serial No. 102-26, p. 39. Cited in: Trustees for Alaska. 1998. Under the influence: Oil and the industrialization of America's Arctic. p. 34.

<sup>6</sup> U.S. Bureau of Land Management. (2004, November). Alpine Satellite Development Plan Record of Decision. Website: <http://www.blm.gov/eis/AK/alpine/rod.pdf>.

<sup>7</sup> U.S. Bureau of Land Management. (2004, September). Alpine Satellite Development Plan Final Environmental Impact Statement. Vol. 1, Sec. 2. Alternative A-Full Field Development. Tables 2.4.1-6, 7, 8. pp. 69,71. Website: <http://www.blm.gov/eis/AK/alpine/dspfeisdoc.html>; Trustees for Alaska. (2007, June). Sectional Analysis, Stevens/Murkowski Arctic refuge drilling amendment to S.1419. p. 8.

<sup>8</sup> U.S. Fish and Wildlife Service. Seismic trails. Retrieved July 20, 2009 from Arctic National Wildlife Refuge website: <http://alaska.fws.gov/nwr/arctic/seismic.htm>. Jones, B., R. Rykhus, Z. Lu, C. Arp and D. Selkowitz. (2008). Radar imaging of winter seismic survey activity in the National Petroleum Reserve-Alaska. Polar Record 44 (230): 227-231.

<sup>9</sup> National Research Council. p. 5.

<sup>10</sup> Trustees for Alaska. Air pollution fact sheet. Retrieved July 24, 2009 from Trustees website: [http://138group.com/alaska/oil\\_in\\_the\\_arctic/FSAirPollution.htm](http://138group.com/alaska/oil_in_the_arctic/FSAirPollution.htm); Jaffe, D., R. Honrath, D. Furness, T. Conway, E. Dlugokencky, and L. Steele. (1995). A determination of the DH4, NOx and CO2 emissions from the Prudhoe Bay, Alaska oil development. Journal of Atmospheric Chemistry 20: 213-227.

<sup>11</sup> Caldeira, K. and M. Wickett. (2003). Anthropogenic carbon and ocean pH. Nature, 425: 365, p. 365.

<sup>12</sup> National Research Council. P.5.

<sup>13</sup> Currie, D.R. and L. Isaacs. 2005. Impact of exploratory offshore drilling on benthic communities in the Minerva gas field, Port Campbell, Australia. Marine Environmental Research. 59:3, 217-233.

<sup>14</sup> The Exxon Valdez oil spill produced an oil slick that stretched across 460 miles. Source: World Wildlife Fund. (2009). Lessons not learned: 20 years after the Exxon Valdez disaster little has changed in how we respond to oil spills in the Arctic. WWF-US, Kamchatka/Bering Sea Ecoregion, Anchorage, Alaska.

<sup>15</sup> Marine Connection. Effects of sonar. Retrieved July 21, 2009 from website: [www.marineconnection.org/campaigns/sonar\\_sonar.html](http://www.marineconnection.org/campaigns/sonar_sonar.html).

<sup>16</sup> Siebert, Charles. (2009, July 12). Watching whales watching us. The New York Times; Schick, R., and D. Urban. (2000). Spatial components of bowhead whale distribution in the Alaskan Beaufort sea. 57 Can. J. Fisheries and Aquatic Sci. 2193.

<sup>17</sup> Alaska Oil and Gas Conservation Commission. 2009. <http://www.state.ak.us/local/akpages/ADMIN/ogc/publicdb.shtml>; Alaska Department of Natural Resources. 2009. <http://www.dog.dnr.state.ak.us/oil/products/data/wells/wells.htm>; Well data compiled by Doug Tosa, Alaska Center for the Environment. July 2009.

<sup>18</sup> National Research Council, Table 4-2. p. 43.

<sup>19</sup> BLM. (2004, September) Alpine Satellite Development Plan Final EIS. Vol. 2, Table 4G.4.4-2, p. 1246.

<sup>20</sup> National Research Council. P. 43.

<sup>21</sup> State of Alaska, Department of Natural Resources, Historical and Projected Oil and Gas Consumption, (1999). Appendix B, p.51.

<sup>22</sup> BLM. (2004, September). Alpine Satellite Development Plan Final EIS. Table 4G.4.4-2.

<sup>23</sup> U.S. Bureau of Land Management. (2003). Northwest National Petroleum Reserve-Alaska, Final Integrated Activity Plan/Environmental Impact Statement. Vol. 3. Table IV-09. Pp. 100-101.

<sup>24</sup> National Research Council. (2003). Table 4.4. p. 44.

<sup>25</sup> BLM. 2003. Northwest NPR-A, Final Integrated Activity Plan/EIS. Vol. 3. Table IV-09. Pp. 100-101.

<sup>26</sup> National Research Council. (2003). P. 44.

## BROKEN PROMISE #3

# Directional Drilling is no Panacea



## The Promise

New directional drilling technology enables drilling without any surface impacts.

## The Reality

Directional drilling is not new and requires the same infrastructure with the same impacts as all oil development, including surface impacts.

Proponents of oil and gas development in the Arctic National Wildlife Refuge and other sensitive areas of Alaska assert that new advances in directional drilling will reduce, and even eliminate, environmental impacts. In fact, directional drilling has limitations, and its impacts are no different than those of conventional drilling.



## "The industry touted roadless development as the way of the future, and is now abandoning the concept."

Community of Nuiqsit, 2004<sup>1</sup>

### Directional drilling is not a new practice

According to the U.S. Department of Energy, the first true horizontal well<sup>2</sup> was drilled in 1929 in Texas.<sup>3</sup> Since then, thousands of horizontal wells have been drilled across the world. But as of 1999 horizontal boreholes accounted for only five to eight percent of all U.S. land wells, and extended-reach horizontal drilling is still uncommon.<sup>4</sup> In Arctic Alaska, oil companies have rarely drilled horizontal distances of more than a few miles. Of the 5,549 wells drilled on Alaska's North Slope to date, only 41 have reached horizontal offset distances of three miles or more.<sup>5</sup>

### Exaggerated claims

Claims that directional drilling can reach eight to ten miles away are exaggerated.<sup>6</sup> Oil companies have drilled distances over seven miles, but such distances are still extremely rare in the industry.<sup>7</sup> On the North Slope, 94% of all existing wells extend less than two miles from the drill rig, and fewer than 2% extend more than three miles. As of August 2009 the maximum horizontal distance drilled was 4.025 miles. Even at ConocoPhillips' Alpine oil field, which is touted as a model of new directional drilling technology, the average horizontal drill distance is only 1.74 miles.<sup>8</sup>

### Longer-reach drilling is expensive and often presents geologic and engineering challenges

Truly state-of-the art practices are often impractical if not impossible for oil companies. Factors such as where the oil or gas deposit is in relation to the drilling rig, the size and depth of the mineral deposit, and the geology of the area, are all important elements in determining whether directional drilling is possible.<sup>9</sup> Drilling a horizontal or extended-reach well can cost two or three times more than drilling a vertical well in the same reservoir.<sup>10</sup> In 2000, British Petroleum "stopped drilling extended reach wells—those that reach out a long distance from the pad—after oil prices

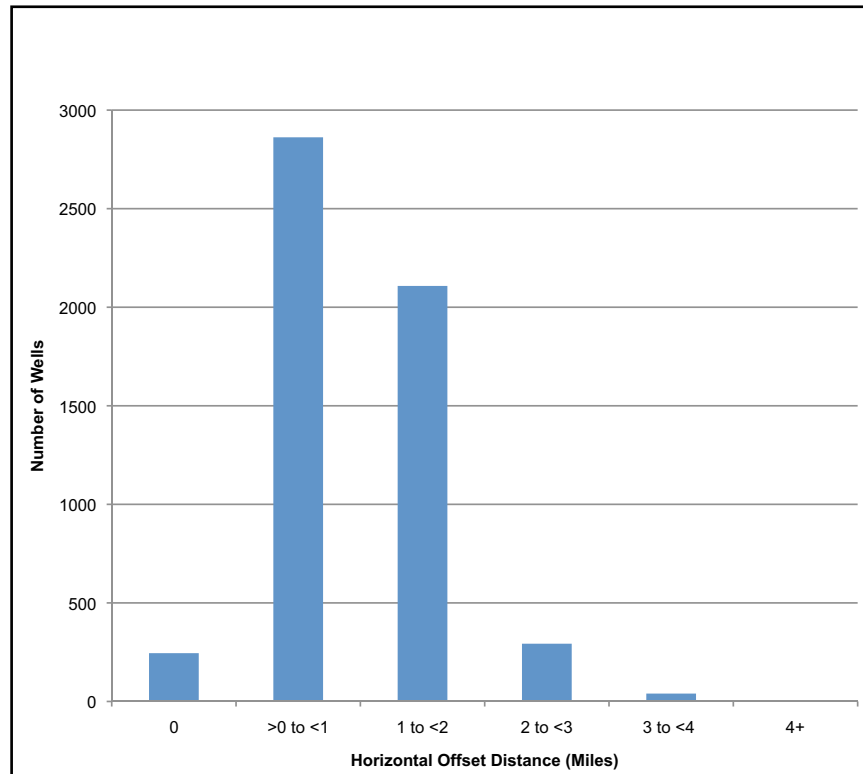
crashed in the late 1990s, because extended-reach drilling is expensive."<sup>11</sup> In a 2003 draft environmental impact statement for the National Petroleum Reserve-Alaska, the Bureau of Land Management (BLM) wrote:

*"The cost of extended-reach [ERD] wells is considerably higher than conventional wells because of greater distance drilled and problems involving well-bore stability. Alternative field designs must consider the cost tradeoffs between fewer pads with more extended-reach wells as opposed to more pads containing conventional wells. In most instances, it is more practical and cost effective to drill conventional wells from an optimum site, [than] it would be to drill ERD wells from an existing drill site."<sup>12</sup>*

ConocoPhillips' Alpine oil field is an example of how optimistic claims about directional drilling technology can quickly fall flat. Alpine was advertised in 1998 as a state-of-the-art roadless development. But the oil field already has several miles of permanent gravel road, and plans for expansion could add as much as 122 more miles.<sup>13</sup> In 2004 the federal government approved plans to expand Alpine from two to seven drill sites.<sup>14</sup> Also in 2004 the Bureau of Land Management granted ConocoPhillips an exemption from a lease stipulation that had previously prohibited the company from building a drill site in a 3-mile



Anne Gore



**Horizontal drilling distances of Alaska North Slope wells (1969-2009).** Source: Alaska Oil and Gas Conservation Commission well database. Data analyzed by Doug Tosa, Alaska Center for the Environment, using known tophole and bottomhole latitude/longitude locations of 5,549 completed wells.

buffer zone along Fish Creek.<sup>15</sup> The agency cited economic and geological limitations of directional drilling as the reason:

*"Drilling from outside the setback would require directional drilling for long distances through geologically unstable shale. This drilling approach is very problematic because shale in this area tends to collapse holes. Maintaining drill holes would be difficult and expensive."*<sup>16</sup>

In 2008 British Petroleum announced its plans to drill distances of seven miles or more to reach its offshore Liberty oil field. But the technology remains to be proven. It will also demand doubling the size of Endicott Island—an offshore, man-made island—to make room for extended pipe racks, the massive drilling rig, and a worker's camp.<sup>17</sup>

- Directional drilling is not a new practice.
- Claims about distances directional drilling can reach are exaggerated.
- Directional drilling is expensive and often limited by geology.
- Directionally drilled wells require the same infrastructure and have the same environmental impacts as conventional wells, including surface impacts.

## Claims that directional drilling will incur no surface impacts are misleading

Before production wells are drilled, seismic testing is conducted and exploration wells are drilled to refine the location of oil deposits. These activities have direct surface impacts.

Seismic exploration typically involves many vehicles driving across the tundra in a grid pattern. Sensitive tundra soil and plants are easily compressed under the weight of these heavy vehicles, even in winter.<sup>18</sup> Seismic lines are often visible on the Arctic tundra for years after exploration, and studies have shown that fragile tundra plants can take decades to recover.<sup>19</sup> Despite industry claims to the contrary, winter exploration can also disturb wildlife.<sup>20</sup>

## The notion that directional drilling allows for a smaller footprint is misleading

Although directional drilling may reduce the number of well pads required to access an oil deposit, it requires the same infrastructure and has the same environmental impacts as conventional drilling. Permanent gravel roads and air strips are still used for access, long pipelines are still required to connect the well sites, and pollution and toxic spills are still inevitable.

Oil production is a high-impact activity, regardless of how you drill. New technology has yet to demonstrate that it can minimize, mitigate, or eliminate the inevitable impacts of oil development to America's Arctic and other sensitive ecosystems.

<sup>1</sup> U.S. Bureau of Land Management. 2005, January. Final Amendment to the Northeast National Petroleum Reserve: Integrated Activity Plan/Environmental Impact Statement. Vol. 2, Response to comments. Kuupik Corporation, Native Village of Nuiqsut, City of Nuiqsut, and Kuupikmuit Subsistence Oversight Panel. Comment Letter No. 197616. P. 6-262.

<sup>2</sup> The terms horizontal and directional drilling are used interchangeably in this document to refer to non-vertical drilling.

<sup>3</sup> Horizontal and Multilateral Wells. *Frontiers of Technology*. (1999, July). *Journal of Petroleum Technology*. Retrieved March 18, 2009 from website: [http://www.spe.org/spe-app/spe/jpt/1999/07/frontiers\\_horiz\\_multilateral.htm#](http://www.spe.org/spe-app/spe/jpt/1999/07/frontiers_horiz_multilateral.htm#).

<sup>4</sup> Pratt, Sara, (2004, March). A Fresh Angle on Oil Drilling, *GeoTimes*.

<sup>5</sup> Horizontal offsets calculated by Doug Tosa, GIS Analyst, Alaska Center for the Environment. August 2009. Source data: Alaska Oil and Gas Conservation Commission well database, <http://www.state.ak.us/local/akpages/ADMIN/ogc/publicdb.shtml>.

<sup>6</sup> Senator Lisa Murkowski's website claims that her directional drilling bill will enable "oil wells to be drilled from the western Alaska state-owned lands, outside of the refuge's boundary, or from state waters to the north, and still to [sic] be able to tap oil and gas deposits located between eight and 10 miles inside the refuge. [http://murkowski.senate.gov/public/index.cfm?FuseAction=IssueStatements.View&Issue\\_id=8160a71d-9c6e-945d-f605-a8959dfbf80b](http://murkowski.senate.gov/public/index.cfm?FuseAction=IssueStatements.View&Issue_id=8160a71d-9c6e-945d-f605-a8959dfbf80b) (last visited April 8, 2009).

<sup>7</sup> British Petroleum's Wytch Farm set the current world extended reach drilling record in June of 1999 when its well M16 reached a "horizontal displacement distance of 10,728 m[eters] a total length of 11,278 m[eters] and a depth of 1638 m[eters]." <http://www.bpnsi.com/index.asp?id=7369643D312669643D313531> (last visited March 18, 2009).

<sup>8</sup> Directional drilling data analysis by Doug Tosa, GIS Analyst, Alaska Center for the Environment. August 2009. Source data: Alaska Oil and Gas Conservation Commission well database retrieved June 16, 2009 from <http://www.state.ak.us/local/akpages/ADMIN/ogc/publicdb.shtml>.

<sup>9</sup> Judzis, A., K. Jardaneh and C. Bowes. 1997. Extended-reach drilling: managing, networking, guidelines, and lessons learned. SPE Paper 37573 presented at the 1997 SPE/IADC Drilling Conference, Amsterdam. March 4-6, 1997.

<sup>10</sup> Horizontal and Multilateral Wells. (1999, July); Van Dyke, Bill, petroleum manager, Alaska Department of Natural Resources. Quoted in Pratt, Sara. (2004, March).

<sup>11</sup> *Petroleum News Alaska*. (2000, October). BP plans busy exploration season, both in NPR-A and satellites.

<sup>12</sup> U.S. Bureau of Land Management. (2003). Northwest National Petroleum Reserve-Alaska Draft Integrated Activity Plan/Environmental Impact Statement. Sec. IV, p. 20-21.

<sup>13</sup> U.S. Bureau of Land Management. September 2004. Alpine Satellite Development Plan Final Environmental Impact Statement. Vol. 1, Sec. 2. Pp. 69-71.

<sup>14</sup> U.S. Bureau of Land Management. (2004, November). Alpine satellite development plan Record of Decision.

<sup>15</sup> U.S. Bureau of Land Management. (2004, September). Alpine Satellite Development Plan. Final Environmental Impact Statement. Vol. 3. Appendix I, CPAI request for exception to stipulations. ConocoPhillips letter dated April 8, 2004 to BLM. Pp.3-4.

<sup>16</sup> BLM. November 8, 2004. Alpine Satellite Development Plan Record of Decision. p. 17.

<sup>17</sup> Delbridge, Rena, "BP begins development of Liberty oil field project on North Slope, Fairbanks Daily News Miner, July 14, 2008, <http://www.newsminer.com/news/2008/jul/14/bp-begin-developing-liberty-oil-field/> (last visited June 30, 2009).

[http://www.alaskajournal.com/stories/050109/oil\\_img\\_oil001.shtml](http://www.alaskajournal.com/stories/050109/oil_img_oil001.shtml) (last visited June 30, 2009)

[http://www.alaskajournal.com/stories/060509/oil\\_10\\_001.shtml](http://www.alaskajournal.com/stories/060509/oil_10_001.shtml) (last visited June 30, 2009)

<sup>18</sup> Jorgensen, J.C. 1998. Emers, M., J.C. Jorgenson, and M.K. Raynolds. 1995. Response of arctic tundra plant communities to winter vehicle disturbance. *Can. J. Bot.* 73: 905-917.

<sup>19</sup> U.S. Fish and Wildlife Service. 2001. Potential impacts of proposed oil and gas development on the Arctic Refuge's coastal plain: historical overview and issues of concern. Web page of the Arctic National Wildlife Refuge, Fairbanks, Alaska: <http://arctic.fws.gov/issues1.htm>.

<sup>20</sup> *Ibid.*

## BROKEN PROMISE #4

# The Winter-Only, Ice Road Fallacy



Anne Gore

## The Promise

Many oil development activities take place in winter months when animals are not around; roads and drill pads built from ice melt away in spring.

## The Reality

Oil development occurs year-round and winter exploration and ice roads are not without impacts.

A common misperception about oil development on Alaska's North Slope is that it takes place only in winter and therefore has no impact on wildlife. Ice roads are cited as an example of how oil companies conduct business without damaging the fragile Arctic tundra. These claims not only overlook the fact that oil production requires permanent installations that operate year-round, but they also ignore the full scope of impacts that the oil industry has on wildlife and the environment, even in winter.

## **“Tussock tundra can be quite easily disturbed by ice road construction techniques [and] disturbance can be of long duration.”<sup>1</sup>**

Alaska Department of Natural Resources, 2007

### **Year-round impacts**

Although oil exploration in Arctic Alaska is mostly restricted to winter months, once oil is discovered, efforts to recover it take place year-round. Construction, drilling and other operations carry on through every month and season,<sup>2</sup> with attendant vehicle and air traffic, noise and air pollution, and inevitable impacts to wildlife and the environment.

### **Ice roads**

Although touted as such, ice roads are no panacea for development in fragile Arctic environments. According to the Alaska Department of Natural Resources, North Slope oil exploration and development consumed 1.5 billion gallons of water in 2000, mostly for ice roads and pads.<sup>3</sup> Pumping such massive amounts of water not only affects water balance, chemistry, aquatic organisms and fish,<sup>4</sup> but can also limit the ability to use ice roads. Already, in areas where water supplies are scarce, ice roads are not a practical option. At the same time, warming temperatures have reduced the number of days that ice roads can be used.<sup>5</sup> Since 1970, ice road use on the North Slope has been shortened from 204 to 124 days.<sup>6</sup>

Permanent gravel roads already cover more than 8,000 acres of America’s Arctic,<sup>7</sup> including three miles and more planned at the Alpine oil field,<sup>8</sup> which industry promotes as a “roadless development.” Permanent gravel roads remain a standard fixture on Alaska’s North Slope and are likely to remain so as a result of water availability and climate change, which are making ice roads less practical.<sup>9</sup>

- ▶ Oil development activities take place year-round.
- ▶ Ice roads require massive water withdrawals.
- ▶ Most oil fields utilize permanent gravel roads.
- ▶ Seismic exploration disturbs fragile tundra, soil, and wildlife.





## Winter exploration

It is not feasible to use ice roads for 3-D seismic exploration,<sup>10</sup> which requires making multiple passes over land in a grid profile with a line spacing of a few hundred meters,<sup>11</sup> so large vehicles are driven directly across the tundra. Multiple trucks and a large crew of people are typically required to do this exploration work.<sup>12</sup> Fragile tundra soil and plants are easily compressed under the weight of these heavy vehicles, even in winter. Seismic lines are often visible on the Arctic tundra for years after exploration, and studies have shown that tundra plants can take decades to recover.<sup>13</sup>

During the spring of 2006 satellite images were used to monitor the Teshekpuk Lake Special Area for melting ice. During review of these images, scientists discovered that the satellite images could detect features on the landscape associated with winter oil exploration activity. "Focused analysis of the image time series revealed various aspects of the exploration process such as the grid profile associated with the seismic line survey as well as trails and campsites associated with the mobile survey crews."<sup>14</sup>

Oil spills are also a concern with seismic testing. According to WesternGeco, a seismic contracting company:

*"With so many vehicles on hand, special care must be taken to avoid contaminating the snow with...spills of hydrocarbon-based product during refueling, maintenance and ordinary operation. A vibroseis truck circulates hydraulic oil at pressures of thousands of psi to power the vibrator. If a hose breaks, up to 150 liters [40 gal] of oil may escape."<sup>15</sup>*

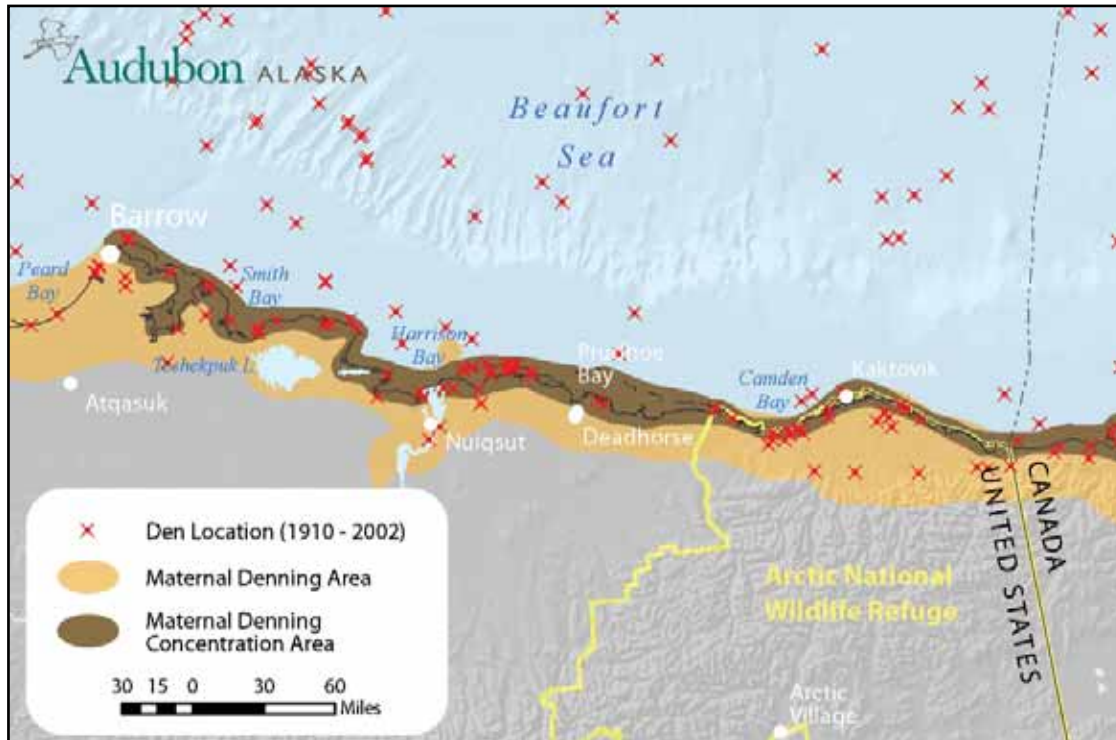
## Winter wildlife

Many species of fish and wildlife, including brown bears, polar bears, caribou, muskoxen, and Arctic cisco, remain in Alaska's Arctic all winter and are subject to impacts from exploration and other oil development activities.<sup>16</sup> Muskoxen, for example, frequently use habitats along or adjacent to rivers—locations that are likely to be gravel and water extraction sites for winter road construction.<sup>17</sup> When muskoxen encounter humans or vehicles, they may expend energy that they need to conserve during the long winter in order to successfully reproduce in spring.<sup>18</sup>



National Oceanic and Atmospheric Administration

**Seismic exploration involves caravans of heavy trucks making multiple passes directly across the tundra.**



**Polar bear denning habitat.** Source: Audubon Alaska. 2009. Draft atlas of Chukchi and Beaufort seas.

In 1985, a female polar bear, thought to be pregnant with her first litter, abandoned her den after seismic exploration vehicles tracked within 700 feet of it, although regulations required a half-mile buffer from known dens.<sup>19</sup> Onshore oil development impacts to polar bears in winter may become an increasing concern as sea ice habitat shrinks and these animals increasingly den onshore.<sup>20</sup>

As recently as February 2009, an ice road construction crew encountered a sleeping polar bear. While building the same 50-mile road, Exxon violated a water use permit when it extracted 28,000 gallons of fresh water from a river that is important to whitefish.<sup>21</sup> Less than 5% of stream habitat remains available to fish in winter,<sup>22</sup> making them especially vulnerable to water withdrawals and other oil development activities.

<sup>1</sup> Alaska Department of Natural Resources, 2007. North Slope Tundra Travel and Ice Road Construction. Presentation of the Alaska Climate Impact Assessment Commission. April 12, 2007. Anchorage, Alaska. [http://housemajority.org/coms/cli/dnr\\_menefee\\_schultz.pdf](http://housemajority.org/coms/cli/dnr_menefee_schultz.pdf)

<sup>2</sup> U.S. Bureau of Land Management. (2004). Alpine satellite development plan: Final Environmental Impact Statement, Vol. 1. Table 2.3.10-1. Sec. 2, p. 53.

<sup>3</sup> National Research Council. (2003). Cumulative environmental effects of oil and gas activities on Alaska's North Slope. National Academies Press, p. 65.

<sup>4</sup> University of Alaska, Fairbanks. Tundra lakes project, overview. Retrieved July 20, 2009 from Alaska Center for Climate Assessment & Policy web site: [http://www.uaf.edu/accap/research/tundra\\_lakes.htm](http://www.uaf.edu/accap/research/tundra_lakes.htm).

<sup>5</sup> Smith, O.P., and W. B. Tucker. (2003, January 24). Start to plan for Arctic warming. Anchorage Daily News editorial. P. B-6.

<sup>6</sup> U.S. Bureau of Land Management. (2002). Environmental Assessment: EA: AK-023-03-008. National Petroleum Reserve-Alaska (NPR-A) Exploration Drilling Program Puvik #1 and #2 Exploration wells. ConocoPhillips Alaska, Inc. p. 4-22.

<sup>7</sup> National Research Council, p. 156.

<sup>8</sup> U.S. Army Corps of Engineers Alaska District, Permit Evaluation and Decision Document, Alpine Development Project, Colville River 18 (2-960874), p. 2 (February 13, 1998); U.S. Army Corps of Engineers Alaska District, Colville River 17 (4-960869) to Nuiqsut Constructors (Alpine gravel pit) (June 24, 1997).

<sup>9</sup> U.S. Bureau of Land Management. (2008, November) Northeast National Petroleum Reserve-Alaska Final Environmental Impact Statement. Vol. 2, 4-463.

<sup>10</sup> Energy API. Updated march 10, 2009. New technology minimizes impact of arctic operations. Online article retrieved April 28, 2009 from: <http://www.api.org/aboutoilgas/sectors/explore/newtechnology.cfm>.

<sup>11</sup> National Research Council, p. 35.

<sup>12</sup> As one example, BP Exploration Alaska contracted WesternGeco to survey an area of 180 square miles and utilized a crew of 80 personnel and two fleets (5 trucks in each fleet) of rubber-tracked equipment. Source: Gibson and Rice, Oilfield Review p. 20. (Felix and Reynolds 1989; National Research Council, Jones et al).

<sup>13</sup> U.S. Fish and Wildlife Service. Seismic trails. Retrieved July 20, 2009 from Arctic National Wildlife Refuge website: <http://alaska.fws.gov/nwr/arctic/seismic.htm>.

<sup>14</sup> Jones, B., R. Rykhus, Z. Lu, C. Arp and D. Selkowitz. (2008). Radar imaging of winter seismic survey activity in the National Petroleum Reserve-Alaska. Polar Record 44 (230): 227-231.

<sup>15</sup> Gibson, D. and S. Rice. (2003, Summer). Promoting environmental responsibility in seismic operations. Oilfield Review: Schlumberger Oilfield Review magazine (p. 21).

<sup>16</sup> National Research Council. p. 98, 123, 117.

<sup>17</sup> Reynolds, P.E., K.J. Wildson, and D.R. Klein. 2002. Muskoxen. Pp. 54-64 in: U.S. Geological Survey. 2002. Arctic Refuge Coastal Plain Terrestrial Wildlife Research Summaries. Biological Science Report USGS/BRD/BSR-2002-0001. p. 60, 62-63; National Research Council. p. 117.

<sup>18</sup> Reynolds, et al. (2002). In USGS. (2002). p. 60.

<sup>19</sup> Garner, G.W. and P.E. Reynolds. 1986. Arctic National Wildlife Refuge Coastal Plain Resource Assessment: Final Report, Baseline Study of the Fish, Wildlife, and their habitats. Section 1002c, ANILCA. U.S. Fish & Wildlife Service, Anchorage, p. 518. U.S. Fish & Wildlife Service now recommends a 1-mile buffer zone from denning polar bears.

<sup>20</sup> DeMarban, Alex. (2009, June 24). Polar bear appearances grow on oil fields. The Arctic Sounder.

<sup>21</sup> Loy, Wesley. (2009, February 11). Exxon violates water-use permit on North Slope. Anchorage Daily News. P. A-3.

<sup>22</sup> National Research Council, p. 123.

## BROKEN PROMISE #5

# The Pervasiveness of Spills



Workers remove oil from the tundra following an August 2006 oil pipeline spill on Alaska's North Slope.

Al Grillo / Associated Press

## The Promise

Spills can be controlled through operational excellence, environmental safeguards, and spill response. Spills have short-term impacts but no lasting effects.

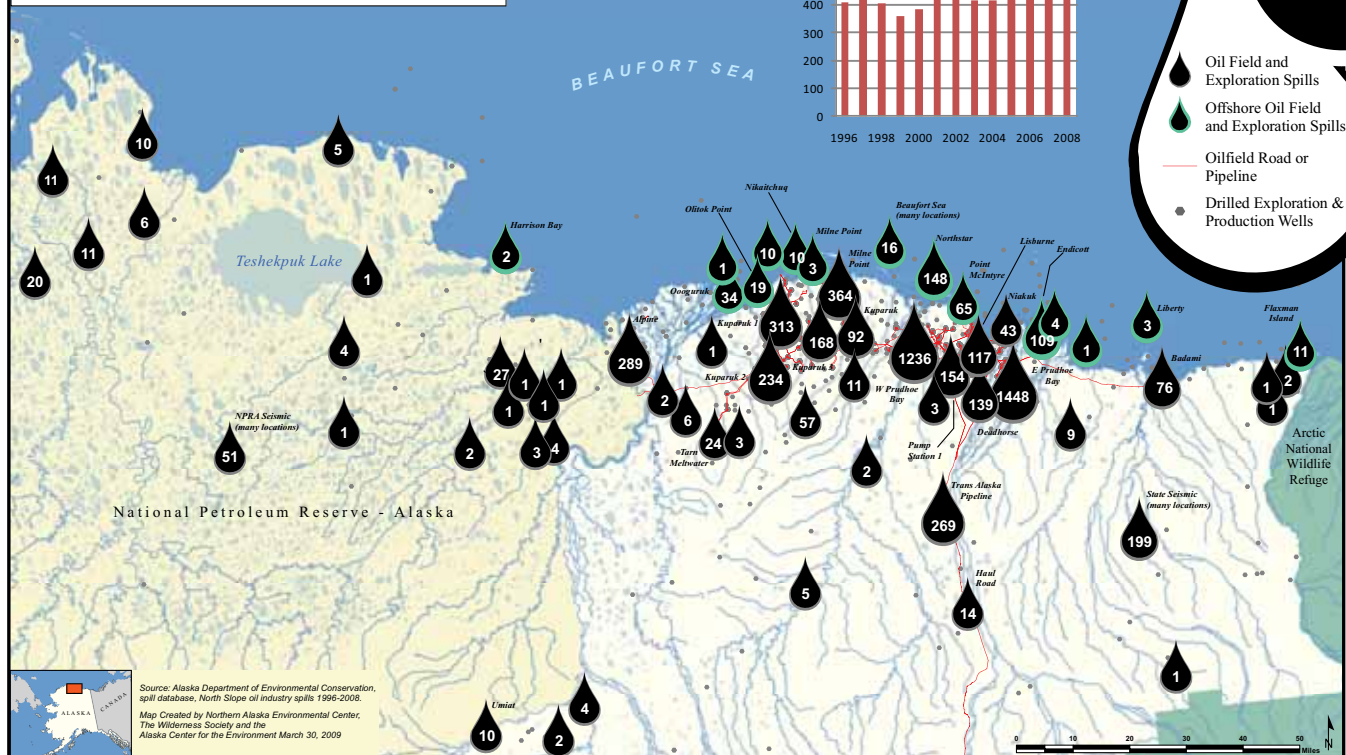
## The Reality

Spills occur frequently, and failures to detect and respond to spills are common. The impacts of oil spills are cumulative and persistent, sometimes lasting for decades.

Each year, an average of 450 oil and other toxic spills occur on Alaska's North Slope as a result of oil and gas activity. More than 45 different toxic substances, including acids classified as extremely hazardous substances, have been spilled during routine operations. Between 1996 and 2008, 5,895 spills occurred totaling more than 2.7 million gallons of toxic substances, more than 396,000 gallons of crude oil, 122,000 gallons of drilling muds, and more than 1 million gallons of process water.<sup>1</sup>



## OIL AND GAS INDUSTRY TOXIC SPILLS 1996-2008



**In the 12-year period between 1996-2008 5,895 toxic spills occurred as a result of oil and gas industry activity on Alaska's North Slope.** Source: Data compiled by Pam Miller, Northern Alaska Environmental Center. Mapping by Doug Tosa, Alaska Center for the Environment. Source data: Alaska Department of Environmental Conservation spill database.

### Spills are common

In March of 2006 the largest crude oil spill in the history of North Slope operations brought national attention to the chronic problem of spills and the glaring discrepancies between oil company promises and the reality of their practices. The spill went undetected for five days.

This spill and many others might have been prevented had the industry not neglected operational safeguards such as corrosion maintenance and leak detection procedures.<sup>2</sup>

Other oil company violations over the years serve to illustrate that neglect and non-compliance are common practice. Violations of federal and state air and water quality regulations, as well as criminal charges

for illegal dumping of hazardous wastes are just some of the ways oil companies have failed to live up to their promises.<sup>3</sup>

- Spills of oil and other toxins of the trade occur frequently.
- Oil spills can have lasting impacts.
- Oil spill risks are greater in the Arctic, especially offshore. No known technology exists to clean up offshore spills in broken ice.

**"[T]he fact of the matter is that sometimes leaks will occur."**<sup>4</sup>

Congressman Don Young, March 2006

## OIL COMPANY VIOLATIONS

**1998** Doyon Drilling was found guilty of 15 counts of violating the Oil Pollution Act of 1990 and fined \$3 million for dumping hazardous wastes.<sup>5</sup>

**2000** British Petroleum (BP) paid \$6.5 million in civil penalties and \$15.5 million in criminal fines, plus five years probation for late reporting of illegal hazardous dumping.<sup>6</sup>

**2001** When a vandal's bullet punctured the trans-Alaska oil pipeline, the spill response plans failed, leaving the leak uncontained for 36 hours and spilling 285,600 gallons of crude oil.<sup>7</sup>

**2002** Following a 60,000-gallon pipeline spill, BP paid \$675,000 in civil fines<sup>8</sup> and \$300,000 for delaying installation of leak detection systems for Prudhoe Bay crude oil transmission lines.<sup>9</sup>

**2004** ConocoPhillips incurred \$485,000 in fines for 470 Clean Water Act violations in five years.<sup>10</sup>

**2005** BP was fined \$1.3 million by the Alaska Oil and Gas Conservation Commission for safety violations after an explosion and fire at a Prudhoe Bay oil well.<sup>11</sup>

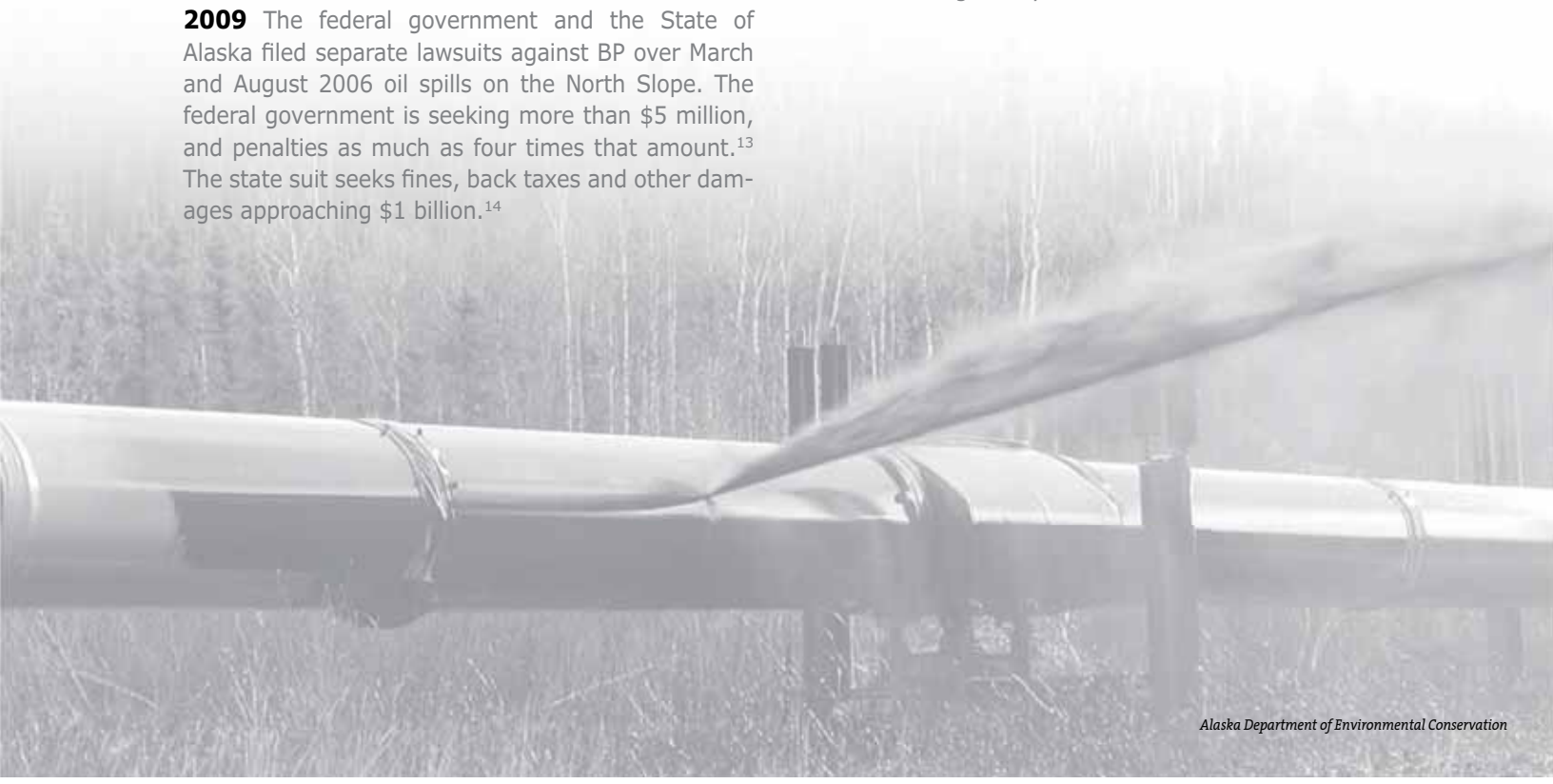
**2007** BP was fined \$20 million including criminal penalties and probation for knowingly neglecting corroded pipelines, which resulted in spills affecting fragile tundra and a lake.<sup>12</sup>

**2009** The federal government and the State of Alaska filed separate lawsuits against BP over March and August 2006 oil spills on the North Slope. The federal government is seeking more than \$5 million, and penalties as much as four times that amount.<sup>13</sup> The state suit seeks fines, back taxes and other damages approaching \$1 billion.<sup>14</sup>

## Spills have lasting impacts

In addition to exaggerating safeguards and controls over oil spills, oil companies often downplay the impact of spills. For example, a spokesperson for Exxon commented that oil spills may have short term impacts, but over the long term "there is full recovery."<sup>15</sup> In fact, the effect of an oil spill will depend on the amount and type of oil or other toxin spilled, where and when the spill occurs, and spill response. Spill impacts can persist for decades, as they have in Prince William Sound twenty years after the Exxon Valdez spill.<sup>16</sup> Scientific studies of the Exxon Valdez spill have also shown that oil is several hundred times more toxic than previously thought.<sup>17</sup>

Pollution in the Arctic has more severe and persistent effects than in temperate regions. Recovery from spills in the Arctic is slower due to cold temperatures, slower growth rates for plants, fewer species and less variety of prey, and longer life spans of animals.<sup>18</sup> Oil takes much longer to break down, in part due to fewer microorganisms, hence oil may persist for decades.<sup>19</sup> Many spills on the North Slope do not spread beyond the gravel drilling pads, but the sites themselves can become contaminated and pose long-term restoration problems.<sup>20</sup> The Alaska Department of Environmental Conservation (ADEC) lists 192 contaminated sites caused by the North Slope oil industry. Fewer than a quarter of these have been cleaned to a level that meets state regulatory standards.<sup>21</sup>





## No technology exists for cleaning spills in Arctic waters

The impacts of an oil spill in marine waters could prove to be much worse than spills on land, especially in the Arctic. No technology currently exists for cleaning oil in the presence of broken ice.<sup>22</sup> Traditional oil spill response methods are ineffective in dynamic sea ice conditions and the kinds of weather conditions that are common in Arctic waters.<sup>23</sup>

Industry leaders eager to begin drilling in the Chukchi and Beaufort Seas cite a December 2007 offshore oil spill in Norway as an example of how cleanups in Arctic waters are possible. But the comparison is misleading. For example, favorable weather conditions made it possible to contain that spill. Conditions in Arctic Ocean waters would be harsher and colder, making a spill harder to naturally dissolve or clean up.<sup>24</sup>

Oil spills can and do occur during any phase of oil development, from exploration to production to transportation. Increased oil and gas exploration in Alaska, especially offshore, will only add to accumulating impacts and increase the chances of a catastrophic spill.



Alaska Department of Environmental Conservation

<sup>1</sup> Alaska Department of Environmental Conservation spill database 1996-2004. Statewide oil spill data base for North Slope region (available from Camille Stephens). Compiled by Pam Miller, Northern Alaska Environmental Center. Village and Military DEWine spills removed for the analysis.

<sup>2</sup> R.A. Fineberg, March 15, 2006, BP North Slope Spill Reveals a history of substandard environmental performance.

<sup>3</sup> BP in Alaska: Beyond Propaganda, A Disturbing Decade of Poor Environmental Performance [http://www.northern.org/artman/uploads/bp\\_performance\\_060803\\_\\_rev\\_\\_pdf](http://www.northern.org/artman/uploads/bp_performance_060803_rev__pdf).

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<sup>17</sup> Heintz, R.A., J.W. Short, and S.D. Rice, 1999. Sensitivity of pink salmon to weathered crude oil, Environmental Toxicology and Chemistry 18(3).

<sup>18</sup> Arctic Monitoring and Assessment Programme (AMAP). 1997. Arctic Pollution Issues: A State of the Arctic Environment Report. Oslo, Norway. P. 157; Burger, Joanna. Oil Spills. Rutgers University Press. P. 88. 1997.

<sup>19</sup> Burger, Joanna. Oil Spills. Rutgers University Press. P. 88. 1997.

<sup>20</sup> National Research Council. 2003. P. 7.

<sup>21</sup> Alaska Department of Environmental Conservation. Contaminated sites database.

Downloaded March 14, 2009. Data analysis by Pam Miller, Northern Alaska Environmental Center. [http://www.dec.state.ak.us/spar/csp/db\\_search.htm](http://www.dec.state.ak.us/spar/csp/db_search.htm) Sorted for only North Slope cities; excluded non-oil industry sites, military and former defense sites, and village sites unless oil industry is responsible party. A total of 192 North Slope oil industry sites are listed in ADEC database; 62 are Open sites (not yet cleaned up); 86 are Cleanup Complete – Institutional Controls (active cleanup ended but contamination still exists and continued monitoring is required); 44 are Closed (however, records show for at least 10 there may be samples with range organics, benzene and other toxics at levels exceeding state regulatory standards).

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<sup>22</sup> Minerals Management Service. (2007, April). Outer Continental Shelf Oil and Gas Leasing Program: 2007-2012, Final Environmental Impact Statement. Vol. IV, p. 236.

<sup>23</sup> World Wildlife Fund. (2007). Oil spill response challenges in arctic waters. Oslo, Norway. [www.panda.org/arctic](http://www.panda.org/arctic).

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## BROKEN PROMISE #6

# Pollution



Pamela A. Miller

## The Promise

Pollution from oil and gas development is insignificant.

## The Reality

Oil development activities generate significant pollution.

**M**ore than 2,500 chemicals are used by the oil and gas industry.<sup>1</sup> These chemicals in liquid and gas form, together with dust and particulate matter, pollute the environment and can be harmful to people. Noise is also a significant source of oil industry pollution with impacts to wildlife and people. Although laws are in place to regulate hazardous substances found in oil and used in its production, these laws are often violated and the opportunities for accidents, spills and leaks are significant. Furthermore, the oil industry is exempt from many regulations and is not required to report all information about pollution and toxic waste management, making it difficult to document all the sources and full extent of pollutants.

## Many types and sources of pollution

In Arctic Alaska drill rigs, pump stations, refineries, compressor plants, production centers, seawater injection plants, sewage treatment plants, operation centers, power stations, turbines, generators, storage tanks, gravel pits, and gas flaring are all sources of pollution. Quantities of other pollution sources, including buses and trucks, bulldozers and seismic vehicles, small incinerators, fuel tanks, airplanes, and dust from gravel pits and roads, are unknown because they do not require permits. Some of the types, sources, and impacts of pollution that can occur throughout the oil development process, from construction to drilling to waste disposal, are described in Table 6.1.

## Drilling muds

Drilling muds are a mixture of water, oil, and chemicals, and are used to lubricate drill bits and prevent pressure blowouts during drilling.<sup>2</sup> When rock cuttings are brought up out of the drill hole they are contaminated with these muds, as well as with hazardous substances found naturally beneath the earth, such as arsenic, mercury, and radioactive materials.<sup>3</sup>

Seawater may also be used to enhance oil recovery, and it becomes what is known as produced water when it is drawn back up a well with the recovered oil and gas. It carries contaminants including radioactive compounds, carcinogens like benzene, naphthalene and toluene, ammonia and hydrogen sulfide.<sup>4</sup> Produced water accounts for up to 95% of waste generated in most oil fields.<sup>5</sup> When spilled on the tundra, produced water kills vegetation and creates long-lasting damage.<sup>6</sup>

In spite of these dangers, drilling muds, produced waters and other wastes resulting from oil and gas exploration or production are exempted from the hazardous waste requirements of the Resource Conservation and Recovery Act (RCRA).<sup>7</sup> If used by drycleaners, these same substances would be classified as hazardous.<sup>8</sup>

- ▷ The oil and gas industry generates many pollutants, not all of which are regulated.
- ▷ The oil industry enjoys special exceptions to rules regulating drilling wastes and air emissions.
- ▷ Oil industry Clean Air Act and Clean Water Act violations are not uncommon.



Exxon Valdez Oil Spill Trustee Council

Pollution	Impacts	Source
Dust	Can stunt vegetation growth, decrease air quality, and contribute to respiratory problems.	Construction activity, Vehicle traffic
Particulate Matter	Contributes to haze. Inhalation of particulates can cause respiratory ailments and cancer.	Vehicles, engines, machinery, gas venting and flaring
Diesel fuel	Fuel and exhaust contain carcinogenic substances.	Drilling muds, vehicles, engines and machinery
Toxic Metals	Toxic health effects.	Drilling muds, produced water, gas venting and flaring, diesel exhaust
Hydrogen Sulfide	Aggravates respiratory conditions, can cause central nervous system and cardiovascular problems.	Gas venting and flaring
BTEX (benzene, toluene, ethylbenzene, and xylenes)	Benzene is a carcinogen. Toluene may affect reproductive and central nervous systems. Ethylbenzene and xylenes have respiratory and neurological effects.	Gas venting, produced water, off-gassing from waste storage
Nitrogen oxides	React with other compounds to form ground level ozone and particulate pollution, and other toxins. Can affect lungs, heart, and central nervous system. May cause biological mutations.	Engine and vehicle exhaust, gas flaring
Polycyclic aromatic hydrocarbons	May be carcinogenic and cause reproductive problems in animals.	Diesel exhaust, gas flaring and off-gassing of stored waste
Methane	A greenhouse gas that contributes to climate change.	Gas venting
Sulfur dioxide	Reacts with other chemicals to form particulate pollution.	Engines, vehicles, gas flaring
Volatile organic compounds	Can combine with nitrogen oxides to form ground-level ozone, which can cause respiratory ailments such as asthma, and decreased lung function.	Gas venting and leaks, off-gassing from stored wastes, gas flaring, vehicles
Noise	Disrupts wildlife behavior and migration.	Air traffic, vehicles, machinery, all operations

**TABLE 6.1: Oil Industry Pollution and its Sources <sup>9</sup>**

## Air pollution

The oil industry in Alaska has permission from the state to extend the official boundaries of its polluting facilities by as much as 250 meters on each side, creating an “air quality exclusion zone.” This essentially increases the area that an oil company is allowed to pollute by nearly four times,<sup>10</sup> which allows air emissions to become diluted enough to meet federal standards.<sup>11</sup>

The oil industry on Alaska’s North Slope annually generates more than twice the amount of nitrogen oxides than Washington, D.C. and many other U.S. cities.<sup>12</sup> Thousands of tons of sulfur dioxide, particulate matter,

carbon monoxide and volatile organic compounds are also emitted annually, along with the greenhouse gases methane and carbon dioxide.<sup>13</sup> The Alaska Department of Environmental Conservation reported in January 2008 that Alaska’s oil and gas industry is the single largest contributor of greenhouse gas emissions in the state, accounting for 15.26 Million Metric Tons of carbon dioxide equivalents.<sup>14</sup>

**Of all contaminated sites in Alaska, 81% are polluted by petroleum products.<sup>15</sup>**



## Clean Air and Water Act violations

Clean Air and Clean Water Act violations by the oil industry in Alaska are not uncommon. For example, 470 Clean Water Act violations in five years were incurred by ConocoPhillips in Cook Inlet.<sup>16</sup> The same company violated the Clean Air Act at its Alpine oil field as a result of high carbon monoxide emissions exceeding what was permitted by the air quality permit for a year-long period.<sup>17</sup> British Petroleum is also facing millions of dollars in fines for both Clean Air and Clean Water Act violations associated with a series of oil spills that occurred in 2006 as a result of pipeline corrosion and maintenance problems.<sup>18</sup> And the Environmental Protection Agency is still investigating a 2003 incident where toxic drilling muds were dumped into coastal waters at Prudhoe Bay.<sup>19</sup>

These and many other examples highlight how pollution is a serious problem for the oil industry in Alaska and compliance remains an issue. Both state and federal agencies have resisted tightening rules<sup>20</sup> and oil companies have been permitted to operate with exceptions, exemptions, or in violation of standards.<sup>21</sup>

According to the National Academy of Sciences little research has been done to quantify the effects of air pollution on the North Slope.<sup>22</sup> Especially if oil development expands into new and previously undeveloped areas, it will be important to better understand the full scope and extent of pollution caused by oil and gas development activities and curb its impacts.

Exxon Valdez Oil Spill Trustees Council

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<sup>5</sup> Pacific Northwest Pollution Prevention Research Center. P. 3.

<sup>6</sup> Rosen, Yereh. (2001, April 17). Pipeline leaks oil on Alaska tundra. Reuters.

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<sup>11</sup> Trustees for Alaska. 2005. Air pollution. Fact sheet. Retrieved from website: [http://www.trustees.org/programs/Arctic/Oil\\_in\\_the\\_arctic/FS\\_Exemptions\\_index.html](http://www.trustees.org/programs/Arctic/Oil_in_the_arctic/FS_Exemptions_index.html).

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<sup>13</sup> U.S. Army Corps of Engineers. (1999, June). Final Environmental Impact Statement Beaufort Sea Oil and Gas development/Northstar project. Vol. III, Table 5.4-7.

<sup>14</sup> Alaska Department of Environmental Conservation. 2008. Alaska greenhouse gas emission inventory. Website: [http://www.climatechange.alaska.gov/docs/ghg\\_ei\\_rpt.pdf](http://www.climatechange.alaska.gov/docs/ghg_ei_rpt.pdf).

<sup>15</sup> Alaska Department of Environmental Conservation. (2007, January). Alaska's legacy of oil and hazardous substance pollution: cleanup and management of Alaska's contaminated sites. P. 17.

<sup>16</sup> U.S. Environmental Protection Agency. (2004, August 13). ConocoPhillips to pay \$485,000 for Cook Inlet wastewater violations. Press release.

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<sup>19</sup> Carlton, Jim. (2005, October 9). EPA pursues report that oil crew dumped polluted mud in Alaska. Wall Street Journal.

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## BROKEN PROMISE #7

# Not-so-strict Environmental Regulations



Workers test for weakness due to corrosion in a Prudhoe Bay oil pipeline.

Al Grillo / Associated Press

## The Promise

The oil industry in Alaska operates under the strictest environmental regulations.

## The Reality

Many rules regulating the oil industry in Alaska are already weak, and getting weaker.

Industry and government officials make promises time and again to hold oil development activities to the “strictest environmental standards,”<sup>1</sup> and assure the American people that proposed new development will only move forward in the most environmentally safe and responsible manner possible.<sup>2</sup> But state and federal agencies have actually weakened rules and given exemptions for oil development activities in Alaska.

## Oil spill prevention, planning, and preparedness standards weakened

After the Exxon Valdez oil spill the Alaska Legislature enacted laws that revised oil spill contingency plan requirements, specified oil spill response standards, and strengthened the Alaska Department of Environmental Conservation's (ADEC) ability to enforce those rules. Under Governor Frank Murkowski's administration, however, the Alaska legislature adopted amendments to the oil spill contingency plan requirements that weakened them in many respects. Since then, ADEC has been interpreting the regulations so as to further weaken contingency planning.<sup>3</sup> For example, multiple facilities may now be grouped under a single contingency plan;<sup>4</sup> and contingency plans are no longer required to include procedures for controlling a well blowout. Although well blowouts have rarely occurred in Alaska, as long as oil exploration and production facilities operate, they pose a risk for which responders may not be adequately prepared.<sup>5</sup>

## Hazardous wastes and toxic releases exempt from regulation

The Resource Conservation and Recovery Act (RCRA) is a federal law that governs the disposal of hazardous waste. But certain oil and gas extraction wastes, including drilling muds and cuttings, rig waste, and produced water, are exempt from regulation by RCRA<sup>6</sup> despite containing many hazardous compounds. Drilling muds may be composed from over 1,000 different chemical compounds, but the formulas are considered proprietary information and are not even made available to the Environmental Protection Agency.<sup>7</sup> If any other industry, such as dry cleaning, produced these same wastes, they would be regulated as hazardous and require special handling.<sup>8</sup>

- Laws regulating the oil industry in Alaska are weak and getting weaker.
- Oil spill plans are less stringent than in the past.
- The oil industry is exempt from some hazardous waste regulation, toxic release reporting, and air pollution controls.
- Laws protecting Alaska's wetlands and coasts favor industry interests.



The 1986 Emergency Planning and Community Right to Know Act requires many polluters to report annually their toxic releases for inclusion in a public database.<sup>9</sup> In 1996, the oil industry obtained exemption from this Act for most of their exploration and production facilities. No facilities on Alaska's North Slope are required to report their toxic releases.<sup>10</sup>

### Air Pollution Exemptions

Diesel exhaust contains pollutants that may increase asthma, respiratory problems, and cancer, and contribute to acid rain and ozone formation. The U.S. Environmental Protection Agency (EPA) passed new rules requiring very low levels of sulfur in diesel fuel.<sup>11</sup> In 2004, the state of Alaska asked for and received some temporary exemptions to the rules, including a 4-year delay for using low sulfur diesel in all on-road vehicles on the North Slope. As part of the agreement, British Petroleum and ConocoPhillips promised to retrofit their small refineries to produce low sulfur diesel starting January 1, 2008 and to use this cleaner

fuel more widely than federal regulations required. The companies have since announced that they will not be making low sulfur diesel on the North Slope after all.<sup>12</sup> It remains to be seen how industry will meet the requirement that all diesel powered vehicles use low sulfur by June 2010. Oil companies operating on Alaska's North Slope already have permission to pollute areas larger than normally allowed,<sup>13</sup> and hundreds of "minor" sources of pollution remain unregulated.<sup>14</sup>

### Reduced Protection for Wetlands and Coasts

While serving as Governor, Frank Murkowski weakened Alaska water law by eliminating requirements for public notice and comment on temporary water use permits. These 5-year permits enable the oil industry to use hundreds of millions of gallons of water for ice roads, drilling and other uses with potentially serious impacts for wetlands and lake ecology and fish habitat.<sup>15</sup>



Joel Sartore

Oil workers perform a 'work over' on a thirty-year-old well head in Prudoe Bay.



Since 1979, of the thousands of Clean Water Act Section 404 permit applications filed by North Slope operators seeking permission to discharge dredge material, fill, and other pollutants into waters and wetlands, only three had been denied as of 2002. Fewer than one percent of these permits contain specific restoration requirements, and the oil industry is also not required to mitigate any wetlands damage.<sup>16</sup>

Also at Governor Murkowski's request, the Alaska legislature gutted the local community role in its Alaska Coastal Management Program (ACMP), handing over that authority to the pro-development Alaska Department of Natural Resources.<sup>17</sup> The result could have profound impacts for offshore oil and gas development, for example by denying citizens the right to challenge consistency determinations<sup>18</sup> -- special certifications required to ensure that federal projects are in compliance with state coastal zone management programs.



Lincoln Else

<sup>1</sup> United States government Office of Management and Budget. U.S. Department of Interior budget description, FY2008. Retrieved from website: <http://www.whitehouse.gov/omb/rewrite/budget/fy2008/interior.html>; Brune, Jason. (2008, December). Finding ways to say yes. Resource Development Council, Resource Review Newsletter.

<sup>2</sup> Committee on Natural Resources, Republican Site, press release. <http://republicans.resourcescommittee.house.gov/PRArticle.aspx?NewsID=1639>; Begich, Mark. (2007, January 8). Letter to Congressman Ed Markey. Retrieved August 28, 2009 from <http://www.adn.com/static/includes/alaskapolitics/markeyletter.pdf>.

<sup>3</sup> Trustees for Alaska. (2006, February). A fair warning: diminished state oversight of oil spill contingency plans. Memo. P.1. Retrieved from: <http://www.trustees.org/Supporting%20Documents/C-Plan/A%20Fair%20Warning%20C-Plan%20FINAL%202-2006.pdf>.

<sup>4</sup> Trustees for Alaska. (February, 2006). A fair warning. P. 9-10.

<sup>5</sup> Ibid. pp. 4-6.

<sup>6</sup> Trustees for Alaska. (2005). Above the Law: Oil Industry Exemptions from Federal Regulations. Fact sheet. Retrieved from website: [http://138group.com/alaska/oil\\_in\\_the\\_artic/FSExemptions.htm](http://138group.com/alaska/oil_in_the_artic/FSExemptions.htm)

<sup>7</sup> Wills, Jonathan. (2000, May). Muddied waters: a survey of offshore drilling wastes and disposal techniques to reduce the ecological impact of sea dumping. Sakhalin Environmental Watch.

<sup>8</sup> Trustees for Alaska. See 40 CFR § 261.4(b) (5) (1990).

<sup>9</sup> Trustees for Alaska. (2005). Above the law.

<sup>10</sup> Emergency Planning and Community Right to Know Act, Section 313, Title III; Superfund Amendments and Reauthorization Act of 1986; 42 USC 11023; Offshore Magazine. (1997, May 1). Activity review of U.S. regulatory, legislative issues. 57(5).

<sup>11</sup> Alaska Department of Environmental Conservation, Division of Air Quality. <http://www.dec.state.ak.us/AIR/anpms/ulsd/ulsdhome.htm> (last visited June 7, 2009).

<sup>12</sup> Burke, Jill. (2007, November 25). ConocoPhillips cancels refinery upgrades on slope. <http://www.ktuu.com/global/story.asp?s=7407161>

<sup>13</sup> Air Quality Construction Permit No. 9973-AC015, section B.11.a-b, at 3.

<sup>14</sup> Trustees for Alaska. 2005. Air pollution. Fact Sheet.

<sup>15</sup> Alaska Legislature. 2002. House Bill 420; United Voices, Newsletter of Alaska Conservation Alliance, August 2002.

<sup>16</sup> U.S. General Accounting Office. (2002). Alaska's North Slope, requirements for restoring lands after oil production ceases. GAO-02-357. Washington DC: General Accounting Office. P. 41.

<sup>17</sup> Alaska State Legislature. 2003. House Bill 191. See also, Alaska Conservation Voters. August 2003. Conservation Vote newsletter.

<sup>18</sup> Email and telephone communication with Vicki Clark and Mike Frank, Trustees for Alaska. April 16, 2009.

## BROKEN PROMISE #8

# Impacts to Wildlife



Grizzly bears at Prudhoe Bay oilfield garbage dump.

Joel Sartore

## The Promise

Oil development takes place in harmony with healthy wildlife populations.

## The Reality

Oil and gas exploration and development harm wildlife and habitat.

Decades of research supports the conclusion that oil and gas development in Arctic Alaska has negative impacts on wildlife and habitat. As early as 1987, the Department of Interior studied potential impacts of oil development on the coastal plain of the Arctic National Wildlife Refuge (Arctic Refuge) and concluded there would be major impacts to the Porcupine Caribou Herd, muskox, water quality and quantity.<sup>1</sup> These conclusions were reiterated in a 1995 science review conducted by the U.S. Fish and Wildlife Service.<sup>2</sup> In 2002, U.S Geological Survey biologists released a report based on 12 years of studies that further substantiated the potential impacts of oil development in the Arctic Refuge on the Porcupine Caribou Herd, and other animals.<sup>3</sup> A year later, the National Academy of Sciences released a major study looking beyond the Arctic Refuge and documenting cumulative impacts of oil development on wildlife across an extensive area of Alaska's North Slope, including offshore areas.<sup>4</sup>

These studies make clear that oil and gas development negatively impacts wildlife through direct mortality and displacement, reduced reproductive rates, and better conditions for predators. Furthermore, significant effects to wildlife and habitat will accumulate as industry expands.<sup>5</sup> To suggest that wildlife and oil development can safely coexist not only ignores the prevailing science, but ignores the additional impacts of climate change, which alone could push wildlife beyond thresholds of survival.

### Caribou

Oil development proponents often support their assertion that industrial activity on Alaska's North Slope does no harm to wildlife by pointing to the Central Arctic Caribou Herd, whose calving grounds overlap with the Prudhoe Bay industrial complex. The herd has increased in size since about the time that North Slope development began.

- ▷ Wildlife, including caribou, are negatively impacted by oil development.
- ▷ Impacts to wildlife are direct, but also indirect as a result of impacts to habitat.
- ▷ Impacts from oil development are accumulating, and contributing to climate change, which further stresses wildlife.

**"Animals have been affected by industrial activities on the North Slope....It [is] unlikely that most disturbed wildlife habitat on the North Slope will ever be restored."**<sup>6</sup>

National Academy of Sciences, 2003





But many factors can affect the growth or decline of caribou numbers,<sup>7</sup> and focusing just on numbers, or one herd, fails to tell the whole story. In fact, decades of studies of the five different caribou herds in the Arctic show that:

- Caribou numbers have decreased in developed areas on the North Slope suggesting that they avoid developed areas, especially for calving and during summer months.<sup>8</sup>
- Caribou numbers have been found to decline exponentially as the density of roads increases.<sup>9</sup>
- Larger groups (100 or more caribou) have difficulty crossing roads and pipelines.<sup>10</sup>
- When caribou cows are displaced from preferred calving areas, their calves are smaller at birth and may not grow as fast or survive as well.<sup>11</sup>
- Caribou calves born in an area west of Prudhoe Bay that has seen increasing development since the late 1980s weighed less and were slightly smaller than calves studied in an area east of Prudhoe Bay that is mostly undeveloped.<sup>12</sup>
- Even small changes can have profound effects on caribou populations.<sup>13</sup>

For the Porcupine caribou, a 4.6% reduction in calf survival would be enough to stall the herd's growth.<sup>14</sup> Scientists predict that any development in caribou calving grounds would displace caribou and impact calf survival.<sup>15</sup>

## Bears, birds, and other wildlife

In addition to caribou, pictures of bears, foxes, and birds near oil fields are often misrepresented as evidence that wildlife can thrive in the midst of oil development. The real story such pictures tell is not so pleasant.

- Mortality rates for bears feeding on garbage in the oil fields are higher than for bears feeding on natural foods in an undisturbed habitat. Future development will result in destruction of additional grizzly bear habitat,<sup>16</sup> and increased defensive shooting of bears by humans.<sup>17</sup>
- Oil development activities have disturbed polar bears from maternity dens.<sup>18</sup> With sea ice loss, more polar bears are expected to den onshore,<sup>19</sup> thus increasing the likelihood of human-bear interactions and impacts similar to those observed with grizzly bears.
- Fox populations can increase when they establish dens near human settlements. Foxes prey on eggs, and artificially high fox numbers can in turn impact bird chick birth rates.<sup>20</sup>
- Nesting success of spectacled eiders is much lower in the oil fields than in other areas.<sup>21</sup>
- Important wetland habitat for birds has been filled by gravel.<sup>22</sup>
- Roads displace and interfere with wildlife movements, and kill animals in their path.<sup>23</sup>
- Birds are killed by powerlines and other infrastructure.<sup>24</sup>



Wayne Todd



U.S. Fish and Wildlife Service



U.S. Fish and Wildlife Service



## Marine life

Offshore development impacts to wildlife can be even more serious. Seismic testing produces sonic shockwaves that can interfere with the way marine mammals communicate and detect prey. In extreme cases seismic testing can damage hearing and even cause death of marine species.<sup>25</sup> Also, both incremental oil spills and catastrophic ones pose threats to seafloor benthic life, fish, walrus, seals, whales, seabirds, and potentially also coastal wildlife.<sup>26</sup> As one example, scientists estimate that if an oil spill were to occur from the Northstar oil field in the Beaufort sea, as many as 70 polar bears could be oiled.<sup>27</sup>

## Future development

These and many other impacts to wildlife continue to accumulate on Alaska's North Slope. As drilling proponents press to expand operations offshore, both marine and terrestrial species will face increased impacts from seismic testing, air, land, and marine

traffic, and the industrial infrastructure required to support oil development. Oil and gas development not only puts species at risk, but also affects the livelihoods of local people who depend on these animals for food, cultural traditions, and income.



National Oceanic and Atmospheric Administration

<sup>1</sup> U.S. Department of the Interior. 1987. Arctic National Wildlife Refuge Coastal Plain Resource Assessment: Report and Recommendation to the Congress of the United States and Final Legislative Environmental Impact Statement. P. 166.

<sup>2</sup> U.S. Fish and Wildlife Service. (1995). A preliminary review of the Arctic National Wildlife Refuge, Alaska coastal plain resource assessment: report and recommendation to the Congress of the United States and final legislative environmental impact statement.

<sup>3</sup> D.C. Douglas, P.E. Reynolds, and E.B. Rhode, editors. 2002. Arctic Refuge Coastal Plain Terrestrial Wildlife Research Summaries. Biological Science Report. U.S. Geological Survey, Biological Resources Division, Biological Science Report USGS/BRD/BSR-2002-0001.

<sup>4</sup> National Research Council. 2003. Cumulative environmental effects of oil and gas activities on Alaska's North Slope. National Academies Press. P. 148, 158.

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<sup>7</sup> Harper, Patti. (2007, June). Caribou calves and oil development: do they mix? Alaska Department of Fish and Game. Online article retrieved from: [http://www.wildlifeneews.alaska.gov/index.cfm?adfg=wildlife\\_news.view\\_article&articles\\_id=298&issue\\_id=51](http://www.wildlifeneews.alaska.gov/index.cfm?adfg=wildlife_news.view_article&articles_id=298&issue_id=51).

<sup>8</sup> Cameron, R.D., W.T. Smith, R.G. White, and B. Griffith. 2002. The Central Arctic Caribou Herd. Pp. 38-45 in: U.S. Geological Survey, Arctic Refuge Coastal Plain Terrestrial Wildlife Research Summaries. Biological Science Report USGS/BRD/BSR-2002-0001. P.38.

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<sup>12</sup> Ibid.

<sup>13</sup> Ibid.

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<sup>16</sup> National Research Council. 2003. P. 118; 157.

<sup>17</sup> Shideler, R. and J. Hechtel. 2000. Grizzly bear. Chapter 6 in: J. C. Truett and S. R. Johnson (eds.) The natural history of an arctic oil field. Development and the biota. Academic Press, San Diego. 422 pp.

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<sup>19</sup> A. S. Fischbach, S.C. Amstrup and D. C. Douglas. Landward and eastward shift of Alaskan polar bear denning associated with recent sea ice changes. Polar Biology. 30:1395-1405.

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<sup>27</sup> Amstrup, S.C., G.M. Durner, T.L. McDonald, and W.R. Johnson. 2006. Estimating potential effects of hypothetical oil spills on polar bears. Unpublished report. U.S. Geological Survey, Alaska Science Center, Anchorage, Alaska. P. 56. [http://alaska.usgs.gov/science/biology/polar\\_bears/contaminants.html](http://alaska.usgs.gov/science/biology/polar_bears/contaminants.html)

BROKEN PROMISE #9

# Human Health Impacts



Inupiat boys watch their elders in a seal skin boat.

Joel Sartore

## The Promise

Oil development impacts on subsistence are minor and should not affect human health.

## The Reality

Oil development has social, cultural and health effects that disproportionately impact Native people who depend on subsistence.

**A**laska Native people have sustained for generations a relationship with the land, water, and wildlife that permeates every aspect of their lives from basic survival, to social norms, to spiritual beliefs. Industrial scale development on Alaska's North Slope has affected this subsistence way of life and contributed to social and health problems. Although oil revenues have helped fund schools and medical clinics, adverse human impacts are accumulating and could further accrue as development threatens to move into the Beaufort and Chukchi Seas, and Bristol Bay.

## **“Our whole way of life as a people is tied to the Porcupine caribou. It is in our language, and our songs and stories.”**

Sarah James, Arctic Village<sup>1</sup>

### **Subsistence**

Subsistence activities are very important to Alaska Native people and communities. In Inupiaq villages along Alaska’s Arctic coast, “individual and community identity is tied closely to the procurement and distribution of bowhead whales.”<sup>2</sup> For the Gwich’in who live further inland, caribou are at the center of cultural traditions. In the Bristol Bay region, salmon are a mainstay for the Aleut, Athabaskan, and Yupik people, representing for some more than half of the wild food consumed.<sup>3</sup> A variety of fish, birds, berries, and other plants are important subsistence resources for all Alaska Native people.

Oil development can impact subsistence resources directly. For example, Native people have reported changes in the size, taste, quality and quantity of fish and caribou in industrial areas.<sup>4</sup> Scientific research supports these claims. For example, one study showed evidence that caribou that spent more time in or near oil fields gained less weight during the summer growing season and had lower pregnancy rates and calf survival than caribou of the same herd that seldom encountered development.<sup>5</sup> Nuiqsut residents have also reported how seismic exploration activities have damaged berries and other plants.<sup>6</sup>

With these direct impacts to subsistence plants and animals comes anxiety that food may not be safe to eat, that game is more difficult to find, and that hunters may not be able to provide for their families.<sup>7</sup> Already, subsistence activities have been affected by the reduction in areas available for hunting as a result of oil field closures, because the high density of roads and pipelines prohibits travel, or simply because hunters are reluctant to enter the oil fields.<sup>8</sup> As oil fields spread, the reduction of hunting grounds will increase.

- ▷ Oil development affects subsistence through direct impacts to wildlife and by interfering with hunters’ access to species.
- ▷ Oil development has brought with it pollution and social changes that have contributed to increased health problems.
- ▷ Impacts to people accumulate with increasing development.

Oil development can also affect migratory routes of caribou, whales, birds, and other species,<sup>9</sup> driving them further from historic ranges and traditional hunting grounds. At the same time, climate change is affecting species migration and hunting access. For example, hunters in search of seals, walrus and whales are encountering thinner sea ice.<sup>10</sup> Oil development impacts could easily compound these problems, forcing hunters to travel farther distances across already treacherous terrain.



Nicole Whittington-Evans

**"The Yupik people depend on seafood caught in Bristol Bay. It's not just our food, it's our livelihood, our way of life. It's everything to us."**

– Verner Wilson III<sup>18</sup>

## Health

When drilling was proposed just outside the town limits of Nuiqsut in the early 1990s, the oil companies told residents that drilling would not affect the environment or hunting. But residents say "the reality has not matched the promises."<sup>11</sup> Not only have residents observed and reported changes to subsistence resources and their access to these resources, but environmental impacts have also been affecting their health.

The Bureau of Land Management (BLM) reported in a recent environmental impact statement that cancer and chronic diseases such as diabetes, hypertension and asthma, are increasing among Alaska Natives especially on the North Slope.<sup>12</sup> Observations reported by a health aide working in Nuiqsut support this with reports of asthma increasing more than tenfold between 1985 and 1998.<sup>13</sup>

BLM has acknowledged that pollutants prevalent in oil fields, including nitrogen dioxide, sulphur dioxide, ozone, lead, and carbon monoxide are "causing and exacerbating respiratory illnesses" and "have been associated with...excess overall mortality rates among vulnerable groups."<sup>14</sup> The agency also noted that increased levels of oil development activity could result in substantial impacts to human health, primarily as a result of restrictions to subsistence.<sup>15</sup>

## Social effects and cumulative impacts

The National Academy of Sciences concluded in its extensive study of cumulative environmental effects of oil and gas development on the North Slope that there has not been adequate attention given to human health and "petroleum development has resulted in major, significant, and probably irreversible changes to the way of life on the North Slope."<sup>16</sup> The study noted that changes to subsistence resources "affects far more than food supplies."<sup>17</sup>



"Social and cultural changes inevitably have been accompanied by social and individual pathology,"<sup>19</sup> including increased problems with alcohol and drug abuse, and domestic violence. Those affects accumulate because they arise from several causes, which interact. The Exxon Valdez spill provides an example of what can happen:

*"Several studies documented that the social fabric of many communities essentially fell apart following the spill. There were well documented, often dramatic increases in post-spill anxiety disorders,*

*post-traumatic stress, depression, alcohol and drug abuse, domestic violence, conflict among friends and within families, divorce, and even suicides tied directly to the spill. These impacts came mostly from uncertainty about the ecosystem's future, fear of food contamination, the chaos of the cleanup, and the ongoing fish stock collapses. Many residents have moved elsewhere to avoid the ongoing stress and memory of the spill."*<sup>20</sup>

Perceived risks to culture are already accumulating sources of stress for the Inupiat and Gwich'in people.<sup>21</sup>

**"The central question when considering the cumulative human health effects of ... development is whether it will be possible for the North Slope Inupiat to maintain a culture and way of life based on subsistence. Residents fear that the combination of pressures they now face – modernization, acculturation, global warming and curtailment of subsistence through expanding development threatens the viability of this cornerstone of Inupiat life. Destabilization of the cultural and social systems would be expected to cause serious health consequences. As oil and gas development both on and off shore expands in the region, more villages may face impacts similar to those faced by Nuiqsut."**

U.S. Department of Interior, Bureau of Land Management<sup>22</sup>

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<sup>3</sup> World Wildlife Fund. (2008, May). Unprotected: Bristol Bay, Alaska - World's fish basket. Retrieved from website: <http://www.worldwildlife.org/who/media/press/2008/WWFPresitem8960.html>

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<sup>6</sup> U.S. Department of Interior, Marine Management Service. (2001, March 19). Official transcript, public hearing. Draft Environmental Impact Statement for Liberty development and production plan. OCS EIS/EA MMS 2001-001. Nuiqsut, Alaska.

<sup>7</sup> National Research Council. p. 139.

<sup>8</sup> Ibid. p. 156.

<sup>9</sup> Ibid. p. 49.

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<sup>11</sup> Coile, Zachary. (2006, February 3). Oil and 2 Ways of Life in Alaska. San Francisco Chronicle Washington Bureau.

<sup>12</sup> U.S. Bureau of Land Management. (2007). Northeast National Petroleum Reserve-Alaska Draft Integrated Activity Plan/Environmental Impact Statement. Vol. I. p. 3-185.

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<sup>15</sup> Ibid. p. 4-255.

<sup>16</sup> National Research Council, p. 156.

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<sup>20</sup> Steiner, Rick. (1999). Oil Spills: Lessons from Alaska for Sakhalin. Russian Regions: Economic Growth and Environment Symposium Proceedings. Slavic Research Center, University of Hokkaido, Sapporo, Japan. Pages 339-357. Last retrieved July 14, 2009 from website: <http://src-h.slav.hokudai.ac.jp/sakhalin/eng/71/steiner6.html>.

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<sup>22</sup> BLM. June 2007. Northeast NPR-A Draft Supplemental IAP/EIS. p. 4-856

## BROKEN PROMISE #10

# Fossil Fuels & Global Warming



## The Promise

Oil and gas can be developed safely and responsibly to provide a bridge to cleaner energy.

## The Reality

New oil and gas development will add more stress to a region already experiencing climate change impacts, and will exacerbate global warming.

Oil development interests insist that because “fossil fuels will continue to provide the majority of the world’s growing need for energy for decades to come,”<sup>1</sup> the continued development of new oil and gas resources is critical.<sup>2</sup> In fact, the continued expansion of oil and gas development, especially in environmentally sensitive places such as the Arctic Ocean, will only add to the threats Arctic ecosystems and cultures are facing and distract from the urgent need to address climate change.

## The primary source of greenhouse gas pollution is the burning of fossil fuels.

Petroleum consumption alone accounted for 44% of U.S. CO<sub>2</sub> emissions in 2006.<sup>3</sup> Scientists believe that to avoid catastrophic changes affecting climate and ultimately life on Earth, we must reduce CO<sub>2</sub> in the atmosphere to 350 ppm, down from current levels of 380 ppm.<sup>4</sup> Only by dramatically reducing the amount of fossil fuels we extract and burn for energy can we meet this goal. According to the Intergovernmental Panel on Climate Change this will require nations like the United States to reduce their carbon emissions by 20-35% below 1990 levels by 2020, and 80-95% below 1990 levels by 2050.<sup>5</sup>

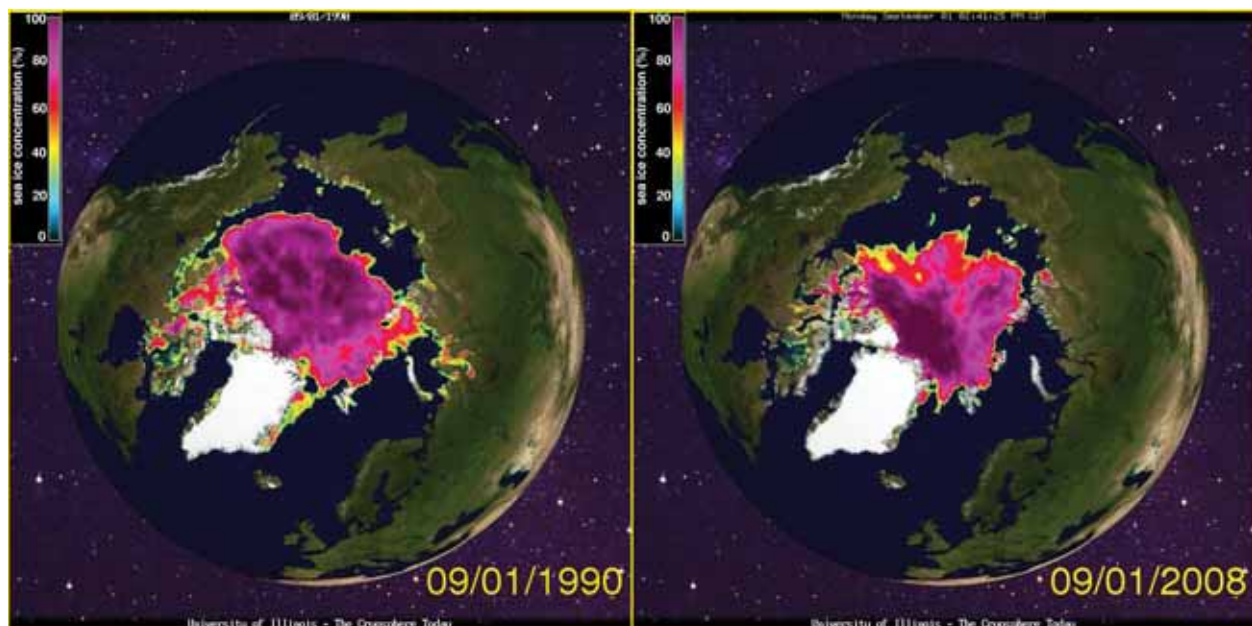
## Alaska is one of the top greenhouse gas-emitting states in the nation.<sup>6</sup>

Despite having one of the lowest populations, Alaska released in 2005 the equivalent of 79 tons of greenhouse gases per resident, which is more than three times the national average,<sup>7</sup> and fifteen times more pollution than the average passenger vehicle emits in one year.<sup>8</sup> More than half of Alaska's industrial source greenhouse gas emissions are generated by British Petroleum (BP Exploration Alaska), which operates most of the Prudhoe Bay oil fields.<sup>9</sup>

## Climate change is already impacting Alaska.

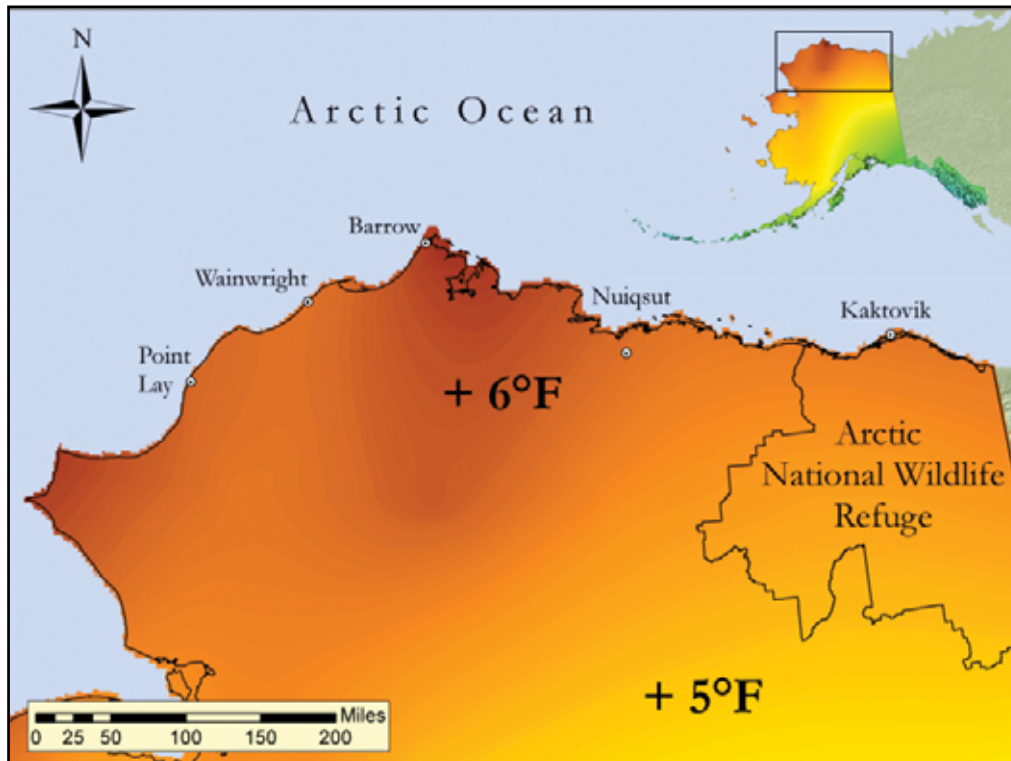
Arctic regions are warming at twice the rate of other places on Earth.<sup>10</sup> Such dramatic increases in temperature have resulted in profound and visible changes to Alaska's land, water, wildlife, and people.

- Oil and gas development is a major source of greenhouse gases and a significant cause of climate change.
- Climate change is already adversely impacting Arctic ecosystems and indigenous people in Alaska.
- Continuing to extract fossil fuels in the Arctic will only add stress to already vulnerable ecosystems and indigenous communities.



**Comparison satellite images of summer sea ice cover.**

Source: University of Illinois – The Cryosphere Today, <http://igloo.atmos.uiuc.edu/cgi-bin/test/print.sh>.



**Arctic Alaska is already warming faster than other places in the world, and climate models predict temperatures will increase by as much as 6 degrees by 2040.**

Among the more profound changes is the loss of sea ice, which is at the lowest levels in 800 years.<sup>11</sup> As a result of receding and thinning sea ice scientists have observed polar bears drowning and going hungry,<sup>12</sup> walrus forced onto land,<sup>13</sup> and sharp declines in numbers of ice-dependent sea birds.<sup>14</sup> Subsistence hunters have had to travel farther across thinner ice, and sometimes open seas, to access animals.<sup>15</sup> The loss of ice, coupled with melting permafrost, is accelerating coastal erosion, forcing communities to relocate, and threatening habitat for waterfowl, and caribou,<sup>16</sup> which are also important food sources for

indigenous people. Also due to coastal erosion, an emergency clean-up was required in 2007 to plug an old oil exploration well after more than 300 feet of shoreline was lost in a few months.<sup>17</sup>

As temperatures continue to rise and precipitation patterns change, scientists expect lakes and wetlands to dry, fires to increase, and plant and animal distributions to change.<sup>18</sup> These anticipated changes have significant health, social and economic implications for people living in the Arctic, and beyond.<sup>19</sup> What is happening in the Arctic affects not just the wildlife and

**According to current scientific consensus, it is the burning of oil (and other fossil fuels) that has contributed significantly to the Arctic's warming trend.<sup>20</sup>**



people living there, but also has implications for global weather patterns and the survival of species that migrate to the Arctic from other parts of the world.<sup>21</sup>

America's Arctic contains important onshore and off-shore feeding, denning, calving, nursery, nesting, staging, and molting habitats for hundreds of species and contains some of the world's last wholly intact ecosystems. If we do not address climate change in the Arctic, and elsewhere, 30 percent of the world's species and one-fifth of the world's ecosystems could be gone by 2050.<sup>22</sup> The result of such losses could affect agriculture, medicines and building materials sourced from plants, jobs, and ways of life that we now take for granted.<sup>23</sup> Even oil production on the North Slope could be impacted by warming temperatures, which have already reduced the number of days that ice roads can be used.<sup>24</sup>

Given what we know about the impacts of climate change to ecosystems, species, and cultures, it would be irresponsible to undertake new drilling activities that would accelerate such change and bring harm to wildlife and people.



U.S. Geological Survey

<sup>1</sup> <http://www.shell.com>. Online fact sheet. Our approach to climate change. Last visited May 22, 2009.

<sup>2</sup> Alaska Oil and Gas Association. (2009). OGA Straight Talk, Special Edition – Offshore Drilling. OCS Yes brochure. p. 2. [www.aoga.org](http://www.aoga.org).

<sup>3</sup> Energy Information Administration. Greenhouse gases, climate change, and energy. Retrieved August 29, 2009 from: <http://www.eia.doe.gov/bookshelf/brochures/greenhouse/Chapter1.htm>.

<sup>4</sup> <http://www.350.org/en/about/science>

<sup>5</sup> Intergovernmental Panel on Climate Change (IPCC). (2007). Summary for policymakers.

<sup>6</sup> Alaska Department of Environmental Conservation. (2008). Alaska greenhouse gas emission inventory. [http://www.climatechange.alaska.gov/docs/ghg\\_ei\\_rpt.pdf](http://www.climatechange.alaska.gov/docs/ghg_ei_rpt.pdf).

<sup>7</sup> Kizzia, Tom. (2008, January 22). Alaska plays significant role in world's warming. Anchorage Daily News.

<sup>8</sup> Driving one passenger vehicle 12,000 miles per year generates about 5.5 metric tons of carbon dioxide. Source: Environmental Protection Agency, Office of Transportation and Air Quality. (February 2005). Emissions Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle. EPA420-F-05-004. (<http://www.epa.gov/OMS/climate/420f05004.htm>).

<sup>9</sup> Kizzia, Tom. (2008, January 22). Alaska plays significant role in world's warming. Anchorage Daily News.

<sup>10</sup> United States Global Change Research Program. Global climate change impacts in the United States. Alaska region findings. <http://www.globalchange.gov>.

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<sup>12</sup> Carlton, Jim. (2005, December 14). Is global warming killing the polar bears? The Wall Street Journal.

<sup>13</sup> Joling, Dan. (2007, October 6). Melting ice pack displaces Alaska walrus. Associated Press, USA Today.

<sup>14</sup> The black guillemot colony on Cooper Island off the northern coast of Alaska has declined sharply apparently as a direct result of climate change. Source: Alaska Conservation Foundation. Global Warming: Alaska on the Front Line. (March 2007). Brochure.

<sup>15</sup> In 2002, more than 100 stranded hunters from Shishmaref had to be rescued when the ice they were hunting on drifted too far from shore. DeMarban, Alex. (2009, August 29). Webcam helps Barrow hunters find whales. Juneau Empire. Published in Anchorage Daily News.

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<sup>17</sup> Rosen, Yereth. (2007, July 25). Erosion may send Alaska oil wells into the ocean. Reuters.

<sup>18</sup> United States Global Change Research Program.

<sup>19</sup> Because of their deep concern for climate changes they have already observed, some Alaska Natives have joined indigenous people worldwide in a call for a moratorium on new oil and gas drilling through a declaration written and agreed to by participants in the Indigenous Peoples' Global Summit on Climate Change, April 2009, Anchorage, Alaska. <http://www.indigenoussummit.com/servlet/content/home.html>.

<sup>20</sup> Glick, Daniel. (2005). Degrees of Change. Nature Conservancy magazine. p. 45.

<sup>21</sup> As goes the Arctic so goes the planet. Petition for rulemaking under the clean air act to regulate greenhouse gas emissions from mobile and stationary sources to protect the health and welfare of the Arctic and the world. (2008, November). pp. 12-17.

<sup>22</sup> Intergovernmental Panel on Climate Change. (2007). Summary for policymakers. In: Climate change 2007: impacts, adaptation, and vulnerability. Working group II contribution to the fourth assessment report of the Intergovernmental panel on climate change. P. 792.

<sup>23</sup> United States Global Change Research Program.

<sup>24</sup> National Research Council. (2003). Cumulative environmental impacts of oil and gas activities on Alaska's North Slope. Washington, DC: National Academies Press. pp. 56-57.

# Conclusion

The realities of oil development in America's Arctic are impossible to ignore.

Millions of gallons of oil and other toxic substances have been spilled on Alaska's North Slope—on average, there is more than one spill per day. Seismic exploration leaves visible scars across the tundra. Significant hazardous waste and pollution is either legally permitted, or simply left unregulated and uncontrolled. And greenhouse gas emissions—the ultimate, unavoidable result of oil development—are now profoundly altering Arctic ecosystems and their ability to help cool the rest of the planet.

Still, oil development proponents continue to make the same promises that oil development will not harm Alaska's environment or its people, and continue to press for drilling in some of Alaska's most ecologically and culturally important places. Places like Bristol Bay and the Arctic Ocean have irreplaceable fisheries and wildlife values, which sustain cultural traditions and

local economies. The Arctic National Wildlife Refuge is a national treasure and one of the very few areas not open to oil leasing. As policy-makers consider if, when, where, and how to develop energy resources in the Arctic and elsewhere in Alaska, it is critical that they base decisions on the best available science, not on politically-motivated rhetoric.

Especially as the Arctic is facing dramatic transformation as a result of climate change, responsible leaders must protect these priceless places for the lasting benefit of future generations. Industry promises have been and will continue to be broken. But we can no longer afford to ignore the facts and make ill informed decisions or careless choices that place Alaska's—or the nation's—irreplaceable wildlife and cultural values at risk.



AK Dept. Environmental Conservation



NOAA



Lincoln Else



AK Dept. Environmental Conservation



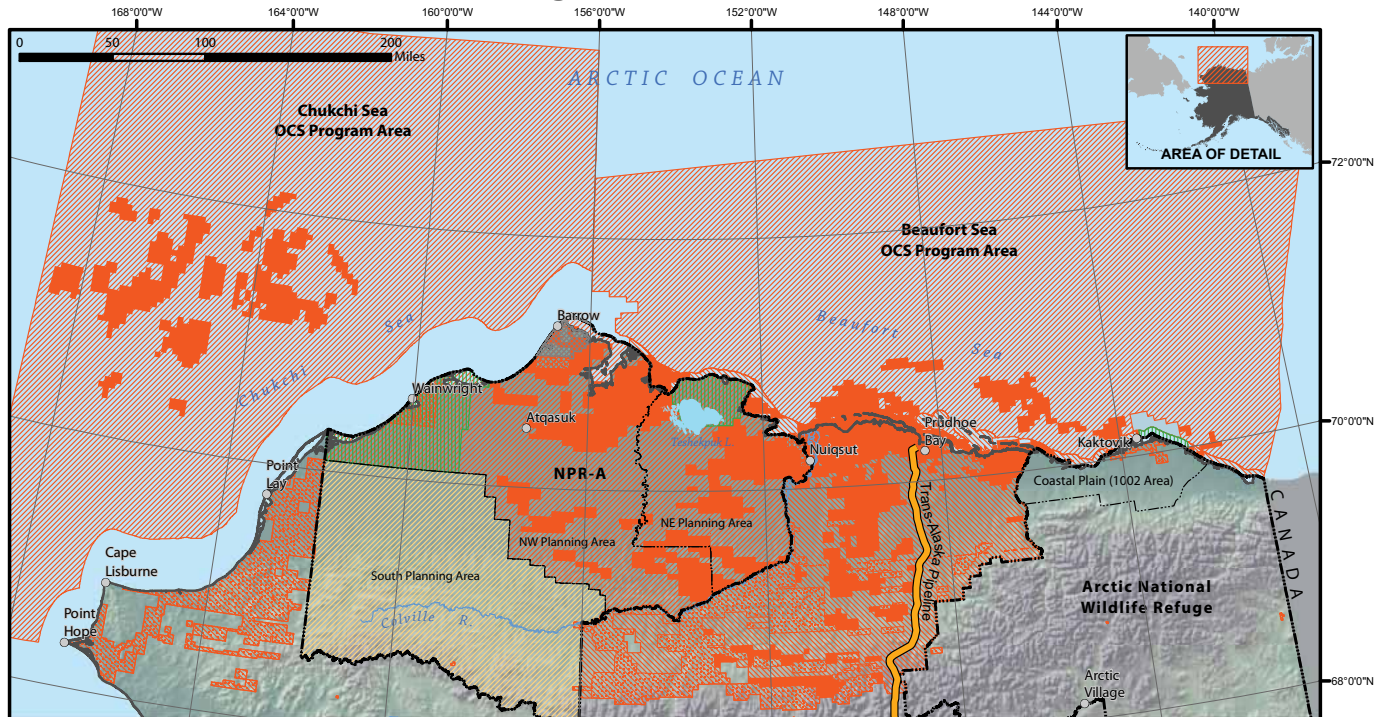
U.S. Fish & Wildlife Service



Pamela A. Miller



# Oil & Gas Leasing on Alaska's North Slope



\*Map composed by Alaska Center for the Environment, Northern Alaska Environmental Center, The Wilderness Society, and Audubon Alaska Map last updated August 11, 2009.

## Map Features

- Sold Federal and State Leases
- Active Federal Lease Area
- Potential Federal Lease Area
- Active State Lease Area
- Arctic Slope Regional Corporation (Surface &/or Subsurface Rights)
- Deferred Federal Lease Area (Temporary, Length of Time Varies)
- Barrow Native Lands

## National Petroleum Reserve - Alaska (Federal BLM)

- \* **Northeast Planning Area**  
4.6 million acres - 95% opened to lease  
430,000 acres deferred from leasing until 2018  
Next lease sale 2010
- \* **Northwest Planning Area**  
8.8 million acres - 100% opened to lease  
1.5 million acres deferred from leasing until 2014  
Next lease sale 2010
- \* **South Planning Area**  
9.2 million acres  
Scoping completed 2006

## Arctic Ocean (Federal MMS)

- \* **Beaufort Sea Program Area 2007 - 2012**  
33.2 million acres  
Lease Sale 202 - 97% offered for lease in 2007  
Next Lease Sale (209) in 2010
- \* **Chukchi Sea Program Area 2007 - 2012**  
39.3 million acres  
Lease Sale 193 - 75% offered in 2008  
Next Lease Sale (212) in 2010

## State

- \* **North Slope Areawide, Foothills, and Beaufort Sea**  
14.0 million acres in active lease areas  
3.7 million acres in existing leases

Well over 90 percent of Alaska's Arctic, including 70 million acres offshore, is available to oil and gas exploration, leasing, and development. Only the coastal plain of the Arctic National Wildlife Refuge is protected by law from oil development.





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