

Testimony of Deborah L. Williams
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House Select Committee on Energy Independence and Global Warming
“On Thin Ice: The Future of the Polar Bear”
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It is an honor to testify before the House Select Committee on Energy Independence and Global Warming about the status of polar bears in Alaska and critically related issues. Polar bears are, indeed, on thin ice. As described more fully below, global warming is eliminating polar bear habitat, while certain other actions, like the proposed Chukchi lease sale, represent unacceptable additional risks to the future of this nationally treasured species.

Polar bears are bellwethers for the nation and the world. Their fate reflects our fate, in the face of the greatest challenge confronting mankind: global warming. As Dr. Mark Serreze with the National Snow and Ice Data Center has stated, “the Arctic is screaming,”ⁱ and, unquestionably, polar bears are suffering as a result. There are actions that we as a nation can and must take to protect this species; and these actions are also necessary and beneficial for our nation’s future.

In this testimony, after providing a summary of three needed actions and a brief personal background, I will:

- 1) discuss the impacts from global warming on our nation’s polar bear populations and habitat;
- 2) highlight the unacceptable paucity of information that we have about the Chukchi Sea, especially regarding the Chukchi population of polar bears;
- 3) describe the impacts that oil activities on the North Slope have had on the Arctic environment;
- 4) discuss the impacts that future oil drilling could have on polar bears, polar bear habitat, and other Arctic species, with a focus on the proposed Chukchi lease sale;
- 5) examine what actions should be taken to protect polar bear populations; and
- 6) explore some of the positive broader implications of taking actions to protect polar bears.

Needed Actions – A Summary

This testimony supports the importance of taking the following actions to protect our nation’s polar bears and their habitat:

A. Postpone the Chukchi Sea Lease Sale 193 planned for February 6, 2008 until adequate information regarding polar bears and other key species and analysis of cumulative impacts of global warming and oil activities including major spills is available.

B. Provide critically needed funding for polar bear research and management, especially for the Chukchi population.

C. Take legislative actions to reduce greenhouse gas emissions, including funding renewable energy research and demonstration projects, passing economy-wide cap and trade

legislation, enacting a renewable electricity standard, and extending the production tax credits for renewable energy projects.

Personal Background

A resident of Alaska for thirty years, I currently serve as President of Alaska Conservation Solutions, located in Anchorage, Alaska. Founded in 2005, Alaska Conservation Solution (AkCS) exclusively addresses the impacts of and solutions to global warming.

In the past, I have had the privilege of working for the Department of Interior on two occasions, and have been extensively engaged in marine mammal, oil and gas, and public land issues. Upon graduating from Harvard Law School in 1978, I participated in the Department of Interior's Solicitor's Honors Program in Washington DC. After the completion of that program, I transferred to Alaska to represent the National Park Service and the Fish and Wildlife Service in the Department of Interior's Regional Solicitor's Office in Anchorage.

Subsequently, in 1995 I received a Presidential Appointment as the Special Assistant to the Secretary of Interior for Alaska. In this position, I managed the Secretary's office in Alaska, the only such office outside of Washington DC, and assisted the Secretary in overseeing the Department's extensive legislative mandates in the 49th state. Among my many responsibilities, I was actively engaged in oil and gas leasing issues, the Exxon Valdez oil spill (serving on the Exxon Valdez Trustee Council), subsistence matters, fish and wildlife management issues, and climate change. I also worked with the outstanding employees of the Department of Interior who study and manage polar bears.

In addition to my relevant employment with the Department of Interior (DOI), I practiced oil and gas law, having represented the State of Alaska in *State vs. Amerada Hess, et al.*, involving the substantial underpayment of royalties by North Slope producers.

With this testimony, I am speaking on behalf of both Alaska Conservation Solutions and the Alaska Wilderness League.ⁱⁱ

I. Global Warming has had Significant Impacts on Alaska's Polar Bear Habitat and Our Nation's Polar Bears

The facts are clear: Alaska and the Arctic have warmed considerably, and at a rate faster than the rest of the world. Sea ice has reduced dramatically in Arctic waters and sea ice is essential for the survival of the polar bear. Alaska polar bears literally are feeling the heat right now. This section expands on these facts.

A. Alaska and the Arctic Ocean Have Warmed Substantially. While the earth as a whole has warmed approximately 1°F in the last 50 years, Alaska has warmed approximately 4°F during this same time period, according to the National Assessment Synthesis Team. Between 1949 and 2006, Barrow Alaska, which borders the Arctic Ocean, has warmed on average 3.8°F, while winter temperatures have increased 6.1°F.ⁱⁱⁱ For Kotzebue, adjacent to the Chukchi Sea, the temperature increases have been 3.2°F and 6.8°F respectively. Most recently, at the end of 2007,

“the northwest coast (of Alaska) had the strongest positive temperature anomalies with average monthly temperatures more than 6°F above normal.”^{iv}

Recent University of Washington data shows the warmest surface temperatures in the Arctic Ocean ever recorded. In some locations, temperatures were 5°C above normal.^v The ocean north of Alaska and Eastern Siberia experienced the greatest summer warming, generally 3.5°C warmer than historical averages and 1.5°C warmer than ever recorded.

B. There have been Dramatic Reductions in Sea Ice. According to the National Snow and Ice Data Center (NSIDC), the Arctic Ice Cap has shrunk approximately 10% per decade between 1979 and 2007, or 28,000 square miles per year.^{vi} Much of that shrinkage has occurred off the coast of Alaska and Eastern Russia. In 2007, the decline of the Arctic Ice Cap shattered all records. The Arctic Ice Cap melted to 4.28 million square kilometers, 23% less than the previous minimum set in September 2005. The loss is equivalent to the area of California and Texas combined. This was also 39% smaller than the long term average between 1979 and 2000. Notably, an area the size of Florida melted away in just 6 days.

The statistics cited above are based on highly accurate satellite images. As NSIDC notes, however: “If ship and aircraft records from before the satellite era are taken into account, sea ice may have fallen by as much as 50 percent from the 1950’s.”^{vii}

The Arctic Ice Cap has shrunk not only in size, but also in thickness. Using satellite data, the NSIDC found that while most of the Arctic sea ice in the 1980’s was around 5 years old and 2-3 meters thick, the oldest ice that can be found now is only 2-3 years old and “much more of the Arctic is about 1 meter thick.”^{viii} This evidence is being confirmed by field results, which show a 50% thinning as compared to 2001. Because of losses in both thickness and surface area, the volume of ice in the Arctic ice cap in 2007 was approximately 50% less than in 2004.^{ix} Ice that is 9 or more years old has “essentially disappeared.”^x

In a comprehensive, prospective study, United States Geological Survey (USGS) scientists predict a 40% decline in summer ice in the Beaufort Sea by 2050, as well as a 40% decline in Bering Sea winter ice.^{xi} While in the 1980’s sea ice receded 30 to 50 miles off the north coast of Alaska, the projections indicate a 300 to 500 mile retreat by 2050.

Recent modeling of the future of the Arctic Ice Cap supports the importance of taking meaningful action now to reduce greenhouse gas emissions. The modeling shows that if we continue to increase emissions of greenhouse gases, the Arctic Ice Cap, and the entire critical (essential) habitat that it fosters, could be eliminated as early as 2040. However, that same modeling shows that if we substantially reduce emissions, we can save the Arctic Ice Cap and even expect some recovery. In other words, according to Dr. Marika Holland with the National Center for Atmospheric Research (NCAR), their modeling “indicates that society can still minimize the impacts on Arctic ice.”^{xii}

C. Alaska Polar Bears Are Being Adversely Affected by Global Warming Now. The Arctic sea ice [Note: not only the pack ice is critical to the bears...] is essential habitat for polar bears. Polar bears rely on sea ice for their survival, including feeding, mating, and resting. As the

U.S. Fish and Wildlife Service^{xiii} repeatedly states, polar bears “depend upon sea ice habitats for their key life functions.”^{xiv} Because there has been less sea ice, Alaskan polar bears have experienced drownings, dislocation, shifting denning, cannibalism, starvation, smaller skull size, and higher cub mortality (discussed in more detail in the following subsection I.C). Similar ice conditions and trends in the Western Hudson Bay population in Canada have resulted in a 22% population decline in 17 years.^{xv}

The decreases in sea ice in the Arctic Ocean and Bering Sea jeopardize our nation’s two populations of polar bears: the Southern Beaufort Sea population (which is shared with Canada) and the Chukchi-Bering Sea population (which is shared with Russia). Very simply, as a recent, authoritative study concludes: “Polar bears depend on sea ice^{xvi} and our analysis shows evidence of an association between declining sea ice and reduced survival.”^{xvii} A series of USGS studies further demonstrate that this iconic national species is at risk of elimination from Alaska as a result of global warming.^{xviii} Indeed, by mid-century the USGS analyses show the loss of all Alaska polar bears and the reduction of world-wide polar bears by two-thirds, due to diminished sea ice from global warming.

It is important to recognize that at most – truly, at most – there are only 3,500 polar bears within the jurisdiction of the United States and Alaska. This is, indeed, a very small number of animals.

Scientists have already witnessed and documented many adverse effects to polar bears from global warming and retreating sea ice. These impacts include a statistically significant decline in the survival rate for first year polar bear cubs in the Southern Beaufort Sea from 61 cubs per 100 adult females between 1967-1989 to 25 cubs per 100 adult females between 1990-2006.^{xix}

Furthermore, skull measurements of both first year cubs and adult males were also statistically significantly smaller than in previous years.^{xx}

And, there are now documented cases of polar bears dying from starvation.^{xxi} As the Final Environmental Impact Statement (FEIS) for the Chukchi Lease sale states, “an unprecedented number of adult female polar bears have been found starved to death in recent years.”^{xxii}

Previously, between 1979 and 1991, when there was more ice, 87% of Alaska polar bears surveyed were found on sea ice. This percentage fell to 33% from 1992 to 2004.^{xxiii} This, and increased storm intensity, have contributed to documented drownings.

Similarly, between 1985 and 1994, 62% of Alaska polar bears denned on ice. Between 1998 and 2004, only 37% denned on ice, the rest denned on land.^{xxiv} This is a dramatic shift in denning habits.

In the last fifteen years, the population of Southern Beaufort Sea polar bears has been estimated to be as high as 2,500 bears, and then 1,800 bears. Recently, using the most rigorous surveying methodology to date, the population is believed to be only 1,526 bears.^{xxv}

Alarmingly, accurate population counts for the Chukchi population are completely unavailable (see further discussion under section II).

Notes Dr. Andrew Derocher, head of the Polar Bear Specialist group, “Without stabilizing the climate by taking serious and urgent action on climate change, I don’t see a future for polar bears at all.”^{xxvi} Similarly, as leading USGS polar bear researcher, Dr. Steven Amstrup has stated, “Our results have demonstrated that as the sea ice goes, so goes the polar bear.”^{xxvii} In essence, our generation has the ability to write a death sentence for the polar bear, or to take action to assure that the species survives.

Before completing this section, it is important to observe that other Alaska ice dependent species are also showing signs of global warming stress. As ice pulls away from the continental shelf there are observations of walrus mothers abandoning their calves. Also, in the summer of 2007, thousands of walrus hauled out on shore. Further out on the ice, the snow cavities for some ring seals and other ice seals are collapsing with warming temperatures, exposing their young to predation or freezing. The decline of ice seals will impact polar bear populations.

And importantly, global warming is having adverse impacts on coastal indigenous cultures, infrastructure, communities, subsistence activities, archeological resources, shorelines, birds, fish, and more.^{xxviii} With respect to indigenous cultures, the Arctic Climate Impact Assessment (ACIA) states, “Climate change is occurring faster than people can adapt. [It] is strongly affecting people in many communities, in some cases threatening their cultural survival.” The ACIA further notes: “...the Arctic is becoming an environment at risk... sea ice is less stable, unusual and highly variable weather patterns are occurring, vegetation cover is changing, and particular animals are no longer found in traditional hunting areas during specific seasons. Local landscapes, seascapes, and icescapes are becoming unfamiliar, making people feel like strangers in their own land.”

Finally, the acidification of our oceans represents an additive, dire consequence associated with human emissions of carbon dioxide. Since the Industrial Revolution, humans have increased the acidity of our oceans by over 30% as we have augmented the amount of CO₂ in our atmosphere from approximately 270 ppm to 380 ppm. Scientists are just beginning to study the effects of current and projected acidification. Alaska’s waters, and associated public lands and resources, will probably be the most negatively effected. For example, acidification dissolves food chain building blocks like the plankton known as pteropods, which are critical food sources for Alaska salmon fry and other species. Acidification also reduces the saturation of carbonate ions, which especially represents a very serious problem for deep water corals found offshore of many of Alaska’s lands. The potential impact of ocean acidification on polar bears deserves attention.

II. There is an Unacceptable Paucity of Information about the Chukchi Sea, Especially Regarding the Chukchi Population of Polar Bears

A. *The Chukchi Sea.* The Chukchi Sea of the Arctic Ocean sits between Russia’s East Siberian coast and the Northwestern coast of Alaska. Pacific waters enter the Chukchi through the Bering Strait. It is known for its extreme environment, and for major seasonal and annual changes in ocean climate. These changes include the annual formation and deformation of sea ice, which drives the biological productivity of the Chukchi Sea.^{xxix} Alaska Native communities exist on the shore of the Chukchi Sea, relying heavily on the marine wildlife of the region for their subsistence, spiritual and cultural health.^{xxx}

The Chukchi Sea, including the Oil and Gas Lease Sale 193 area, provides important habitat for a myriad of wildlife, including the Chukchi-Bering Sea population of polar bears (hereinafter referred to as the Chukchi population).

B. There is an Alarming Lack of Information about the Chukchi Sea Population of Polar Bears.

Overview. How many polar bears are there in the Chukchi Sea population? We don't know. What is their condition? We don't really know. Have any comprehensive surveys or distribution studies been completed in the last 10 years on this polar bear population? No. Do we have the factual basis to impose greater risks on this population from oil and gas development in a substantial portion of their range? Absolutely not.

This absence of information about the Chukchi population is truly disturbing and alarming. Congress and the American people should be deeply concerned.

Analysis. Authoritative documents from the US government repeatedly conclude that we do not have reliable population data for the Chukchi stock of polar bears and that any estimates are of little value for management. In the US Fish and Wildlife Service's (USFWS or the Service) Status Assessment, revised in August 2002, the USFWS concluded simply: "A reliable population estimate for the Chukchi/Bering seas population currently does not exist."^{xxxix} As a result, the USFWS did not even calculate a minimum population estimate, noting "since a reliable estimate for the size of this stock is currently unavailable, a minimum population estimate (N_{min}) was not calculated." In the Fish and Wildlife Service's Range Wide Status Review, the USFWS similarly states that "estimates of the size of the population...have wide ranges...and are considered to be of little value for management."^{xxxix}

In 2006 and in 2007, USFWS acknowledged, once again, the absence of a reliable population estimate for Chukchi polar bears. The Service stated, "Currently a reliable population estimate is not available for the Bering-Chukchi Sea [CS] polar bear stock."^{xxxix} And, the Service noted that existing population estimates "are to be considered to be of little value for management. Reliable estimates of population size based upon mark and recapture are not available for this region. The status of the CS population...is now thought to be uncertain or declining."

It "bears" repeating, using the Fish and Wildlife Service's own words, that existing estimates regarding the population size for Chukchi polar bears are "considered to be of little value for management" and that the status of this population is "uncertain or declining."

With candor, and reflecting the most recent information, the Minerals Management Service (MMS), in its 2007 FEIS on the Chukchi lease sale states, "Although no recent population estimate is available for the CBS (Chukchi-Bering Sea) population, all available data indicate that it is already in decline."^{xxxix}

The United States is a signatory to the International Agreement on the Conservation of Polar Bears.^{xxxv} With respect to the Southern Beaufort Sea population of polar bears, the Polar Bear Specialist Group (PBSG) stated that: the population is 1,500, based on 2006 survey results; that

the trend for this population is “declining;” and that the status is “reduced.”^{xxxvi} This is consistent with all of the data discussed in section I.C above.

However, with respect to the Chukchi population of polar bears, the PBSG states that the data is “deficient” to describe the status of these bears. More specifically, the PBSG states, “Abundance estimates with measurable levels of precision are not available.”^{xxxvii} Furthermore, the PBSG has concluded that “the subpopulation trend is believed to be declining and the status relative to historical levels is believed to be reduced...”

In short, in 2008 scientists know or believe that the populations of the Southern Beaufort Sea stock and the Chukchi stock are in decline, but with respect to the Chukchi stock our knowledge is appallingly limited.

None of the testimony above is meant to denigrate the Alaska office of the USFWS or the Alaska office of the USGS. These scientists and line managers are doing their best. They simply have not been provided with necessary funding and other resources to do their job for the benefit of polar bears or the American public. Congress needs to fund these necessary survey, monitoring, and management activities immediately.

C. We Know Very Little about the Other Species in the Chukchi Sea, or the Ecosystem as a Whole. In addition to polar bears, numerous whales species, walrus, seals, birds and fish exist in the Chukchi Sea. For example, bowhead whales, including mothers and calves, migrate through the Chukchi lease sale area.^{xxxviii} Gray whales summer in the lease sale area, parts of which (e.g. the Hanna Shoal) contain important feeding habitat.^{xxxix} Gray whale use of the Chukchi Sea is increasing, likely as a result of changing prey regimes due to climate change.^{xl}

The Chukchi Sea provides the “main feeding grounds” for walrus, which are a “species of special concern.”^{xli} This is due to “the importance of offshore habitats within the Chukchi, the documented sensitivity of walruses to anthropogenic disturbances, and the significance of walrus hunting to the economy and culture of indigenous communities in Alaska and Chukotka.”^{xlii}

The sea is also home to the Stellar and spectacled eider, both of which are protected under the Endangered Species Act (ESA). A portion of the Chukchi Sea, Ledyard Bay, is so important to continued survival of the North Slope breeding population of spectacled eider – the majority of which molt in the bay each summer – that it has been designated as critical habitat under the ESA.^{xliii}

At the same time, as expert and ocean management agencies admit, there is a void of basic biological information about the wildlife in the Chukchi Sea. For example, in reviewing MMS’s Sale 193 plans, the National Marine Fisheries Service (NMFS) stated that “the information necessary to properly assess the biological effects of Sale 193 ... is not available.”^{xliv} NMFS is an agency cooperating with MMS for purposes of MMS’s Sale 193 compliance with the National Environmental Policy Act (NEPA)^{xlv} and has particular expertise on the marine environment, and includes marine mammals and fisheries within its jurisdiction under various environmental laws.^{xlvi}

The United States Environmental Protection Agency (EPA) is also a cooperating agency with MMS for Sale 193 NEPA compliance.^{xlvii} In its input to MMS on Lease Sale 193, EPA also stated that there is a “lack of data” about the key biological and subsistence resources in the Chukchi Sea.^{xlviii}

In its comments on Sale 193, the Fish and Wildlife Service also acknowledged the lack of fundamental information, and stated that “MMS should work cooperatively with the Service to initiate studies to determine the number, status, and distribution of polar bears and walrus in the Chukchi Sea.”^{xlix}

Finally, MMS itself acknowledges critical gaps in knowledge for many species that inhabit the Chukchi Sea. For example, MMS states that there is a “paucity of information available on marine mammal ecology in the Chukchi Sea....,”^l including historical information about the “distribution and abundance” of marine mammals.^{li}

MMS also notes that “current data are not available” on summer use of the Chukchi by bowhead whales, and that the data that does exist “should not be interpreted as indicating current patterns of bowhead use of the Chukchi Sea.”^{lii} With respect to beluga whales, which migrate through the Sale 193 area in the late summer and fall, MMS states that “[l]ate-summer distribution and fall-migration patterns are poorly known, ... and areas that are particularly important for feeding have not been identified.”^{liii} Basic biological data about gray whales is also missing.^{liv}

MMS also knows “[l]ittle ... about the biology or population dynamics of ice seals Accurate population estimates for ice seals are not available and are not easily attainable due to their wide distribution and problems associated with research in remote, ice-covered waters.”^{lv}

Most data about marine and coastal birds are also quite old, including site-specific data on habitat-use patterns, routes, and timing.^{lvi} This, as MMS admits, makes “accurate analysis difficult.”^{lvii}

Finally, there is very little information on fish in the Chukchi:

Robust population estimates or trends for marine fishes of the region are unavailable. Distribution or abundance data for marine fish species are known only generally at the coarsest grain of resolution (for example, common, uncommon, rare) ... Detailed information generally is lacking concerning the spread, density, or patchiness of their distribution in the overall Chukchi Sea region. Data concerning habitat-related densities; growth, reproduction, or survival rates within regional or local habitats; or productivity rates by habitat, essentially are unknown for fishes inhabiting waters seaward of the nearshore, brackish-water ecotone.^{lviii}

III. There have been Substantial Cumulative Impacts from Oil and Gas Development in Arctic Alaska

There have been major cumulative impacts to wildlife, wildlife habitats, human cultures and the environment from oil and gas exploration and development across Alaska’s North Slope. This

has occurred from expanding industrial sprawl, thousands of spills, extensive industrial activities, and air pollution generated by the oil industry.

There are also special risks posed by offshore oil and gas exploration and development in the Arctic Ocean. During the Bush Administration there has been a massive increase in industrial oil and gas activities, including the Chukchi Sea in Lease Sale 193 planned for February 6, 2008.

A. A Profile of The North Slope Oil Industry. At present, the oil industry spreads across more than 1,000 square miles of the North Slope. It includes the following components:

- over 4,800 exploration and production wells;
- over 320 gravel pads for production, exploratory drilling, living quarters and other support facilities;
- over 500 miles of roads;
- over 1,800 miles of pipelines;
- 2 refineries;
- at least 20 airports;
- 36 gravel mines;
- 28 production plants, gas processing facilities, and water treatment and power plants.^{lix}

B. There have been Thousands of Spills on the North Slope. According to the Alaska Department of Environmental Conservation, there is an average of over 500 spills of oil or other substances from the North Slope oil industry each year. Over 4,000 spills totaling 1.9 million gallons of toxic substances occurred during a nine-year period.^{lx}

The largest crude oil spill in the North Slope oil fields in March 2006 released over 200,000 gallons on the tundra and was followed by another in August 2006 which resulted in a shutdown of most of the Prudhoe Bay oil fields. These spills exposed serious problems with corrosion and lack of adequate government and industry monitoring in the oil fields. In November, 2007, BP was ordered to pay \$21 million in criminal penalties for violating the Clean Water Act, and will be on criminal probation for three years due to its negligence regarding the Prudhoe Bay pipeline maintenance. For eight years prior to the spill, BP had not pigged the pipeline where the major spill took place.^{lxi}

C. The Exxon Valdez Oil Spill Underscores the Fact that Human Error Can Cause Massive Oil Spill Damage. The March 24, 1989 grounding of the Exxon Valdez spilled over 11 million gallons of Alaska North Slope crude oil into Alaska's Prince William Sound, becoming one of the most significant man-made environmental disasters in human history.

The resulting spill covered over 10,000 square miles of Alaska's coastal ocean, and oiled some 1,500 miles of some of the nation's most productive and ecologically sensitive shoreline - three national parks, four national wildlife refuges, a national forest, five state parks, four state critical habitat areas, one state game sanctuary, and many ancestral lands for Alaska Natives.^{lxii} Americans were outraged and saddened by the Exxon Valdez spill. A study of the lost aesthetic

and intrinsic values derived simply from knowing that the resources exist (“passive use”) estimated the damage to Americans at \$2.8 billion.^{lxiii}

Exxon Valdez oil spill studies show petroleum hydrocarbons pose higher risks to fish and wildlife than previously known and that there is long-lasting ecological damage. Nearly 19 years later, the ecosystem still suffers and oil can still be found buried in beaches. Over a dozen species of fish and wildlife, designated wilderness, subsistence, commercial fishing, recreation and tourism, passive uses, and intertidal communities injured by the oil spill have not fully recovered.^{lxiv}

Many scientific studies show the long-term chronic effects of the Exxon Valdez spill on the ecosystem.^{lxv} Substantial contamination of mussel beds persists and the remarkably unweathered oil is a continuing source of toxic hydrocarbons.^{lxvi} Sea otters, Barrow’s goldeneyes, and harlequin ducks showed evidence of continued hydrocarbon exposure through 2002, and Pigeon Guillemots and Pacific herring populations still are not recovering as of 2007.^{lxvii} Transient Orcas (killer whales) suffered an unprecedented decline since the spill,^{lxviii} and the National Marine Fisheries Service formally listed a killer whale family group living in Prince William Sound and Kenai Fjords as depleted under the Marine Mammal Protection Act.^{lxix}

Crude oil is more toxic than previously thought. Recent studies by the National Marine Fisheries Service show that even very low levels of weathered Exxon Valdez oil (0.5 to 1 part per billion PAH’s) are toxic at the early life stages of salmon and herring and current Alaska water quality standards allow hydrocarbon levels that can impair reproduction to salmon eggs.^{lxx}

The Exxon Valdez oil spill occurred 19 years ago and ExxonMobil still refuses to pay the \$2.5 billion punitive damages ordered by the courts to fishermen and local residents harmed by the spill (its appeal is currently pending in the U.S. Supreme Court).^{lxxi} On August 31, 2006, the State and Federal governments petitioned ExxonMobil for an additional \$92 million, under the ‘reopener’ clause in their 1991 settlement in order to restore current and unexpected damage caused by lingering oil that was unexpected at the time of the settlement.^{lxxii}

D. North Slope Oil Production Produces Extensive Air Pollution including Greenhouse Gas Emissions. The oil industry on the North Slope annually emits approximately 70,000 tons of nitrogen oxides, which contribute to smog and acid rain.^{lxxiii} Nitrous oxides are also greenhouse gas pollutants. Other regulated pollutants include 1,470 tons of sulfur dioxide, 6,199 tons of particulate matter, 11,560 tons of carbon monoxide, and 2,647 tons of volatile organic compounds annually.^{lxxiv} Prudhoe Bay air emissions have been detected nearly 200 miles away in Barrow, Alaska.^{lxxv} According to the National Academy of Sciences, it is not clear that existing air quality standards are sufficient to protect arctic vegetation, and monitoring of such ecological effects is not taking place.^{lxxvi}

North Slope oil facilities release other greenhouse gases, including 24,000 metric tons of methane, and 7 to 40 million metric tons of carbon dioxide, annually.^{lxxvii} In January, 2008, the Alaska Department of Environmental Conservation (ADEC) reported that Alaska’s oil and gas industry (primarily at Prudhoe Bay) is the single largest contributor of greenhouse gas emissions accounting for 29% of all statewide emissions (totaling 15.26 Million Metric Tons of CO₂ equivalents, for only CO₂, CH₄, and N₂O).^{lxxviii} The oil industry is the single largest sector of

Title V (Clean Air Act stationary major source operating permits), comprising 73% of those emissions in Alaska. These are largely due to the largest concentration of natural gas turbines in the world existing at Prudhoe Bay which power oil field production.^{lxxix} An earlier inventory also quantified 4.9 Million Metric Tons of CO₂ equivalents released as methane from the extraction of fossil fuel resources from the earth.^{lxxx} Methane, the main constituent of natural gas, enters the atmosphere from leaking pipelines, venting and flaring, and from drilling—and oil and gas development generally comprises the fourth largest methane source worldwide.^{lxxxi}

E. Footprints Continue to Expand, Accidents Continue to Happen, and Impacts Continue to Accumulate. In order to assess whether new technologies and techniques will eliminate the problems discussed above, it is illustrative to examine the Alpine oil field – considered “the most advanced energy development on the North Slope.”^{lxxxii} The Alpine oil field lies in the floodplain of the Colville River Delta to the west of Prudhoe Bay and other North Slope oil fields. As ARCO (now ConocoPhillips) stated in the beginning planning stage for Alpine, “we’ll develop Alpine from just two drill sites of less than 115 acre;” it will have the “smallest footprint ever.”^{lxxxiii}

The original Alpine development site consisted of two drilling pads, a runway for jet airplanes, three miles of in-field roads and other facilities that directly cover 100 acres of tundra.^{lxxxiv} It also included 3-miles of in-field gathering pipeline,^{lxxxv} 34-miles of common carrier pipeline from Alpine to the Kuparuk oil field,^{lxxxvi} and a 150-acre gravel mine.^{lxxxvii} The area in the Delta impacted by this development, based on a four-kilometer zone of influence around such developments,^{lxxxviii} is over 80 square miles. This area calculation does not take into account the land impacted by the over 30 miles of pipeline to the east of the Colville Delta.

For Alpine, during construction in June and July 2001, as many as 1,980 flight take-offs and landings in 45 days during the migratory bird nesting season^{lxxxix} compared with the 13 round trips per month presented in 1997 project descriptions and impact analyses.^{xc} The noise associated with such constant heavy aircraft use has negative impacts on the subsistence hunting success of local residents.^{xc1}

And Alpine is not without its accidents. During Alpine’s construction, the field operator lost 2.3 million gallons of drilling muds while tunneling under the Colville River. ARCO stated that this huge, unanticipated, loss of this lubricant did not harm the environment. Yet, ARCO “didn’t do anything” to determine if the drilling muds filtered up from beneath the river and actually seeped into the river itself,^{xcii} and neither did government regulators.

Gas flaring episodes at the Alpine oil field lasting longer than one hour exceeded quantities released in such upsets at all the other North Slope oil fields combined in 2000.^{xciii} Alpine is located only 7 miles from the village of Nuiqsut. Adverse human health effects from chronic exposure to air pollution caused by repeated flaring discharges have been observed for people living or working near flaring in Canada and from offshore development near Los Angeles,^{xciv} and have been reported in Nuiqsut.^{xcv} According to a Canadian study, adverse impacts may occur at distances ranging from 0.2 – 35 km from the flaring.^{xcvi}

In permitting Alpine to proceed, federal regulators and others dismissed future major expansion as “speculative,” “conjectural,” and “not reasonably foreseeable.”^{xcvii} This view of Alpine was supported by then-Senator Frank Murkowski as well:

You can see that is a whole oilfield. That is it... You know there is one thing you see and you see a little airstrip and that is all. There is no road out of there. There is a[n] ice road in the wintertime, but in the summertime you have to fly to get in and out of there. . . . That is the technology we have. So it is an entirely different set of circumstances. To suggest that somehow this would be an expanse covering hundreds of miles, with airports and so forth, is totally inaccurate...^{xcviii}

Less than two years after Senator Murkowski made this statement, ConocoPhillips, which took over the Alpine field from ARCO in 2000, received approval for five more drill sites at Alpine, bringing the Alpine field to seven drill sites, 33 miles of permanent gravel roads, two airstrips, two gravel mines, and 72 miles of pipeline.^{xcix}

The community of Nuiqsut complained to BLM that the “industry touted roadless development as the way of the future, and is now abandoning the concept.”^{xc} In response, BLM stated that the “‘roadless’ concept... has not been abandoned... ‘Roadless’ development never meant no roads only that the construction of permanent roads would be minimized.”^{xi}

Residents from Nuiqsut, the community adjacent to the Alpine field have stated the following about that development:

Development has increased the smog and haze in our air and sky, affecting our health as well as the beauty of our land, sea, and air.^{cii}

How many wells are out there pumping away already? How many blowoffs, the flares, do we have to watch every year? They say they’re only going to be there 30 days out of the year. But that’s what they say for these statements. In actuality, we see it. You can count the flares from here... What is put out from those flares comes back to us. We have to see it. Our air has changed. The health of our people has changed. We have a lot more health problems than years ago... Day after day I have to see asthma patients.... Let’s see how many of our young children are going to be sick, having trouble breathing, when we’ve got 12 flares blowing all at once... Rosemary Ahtuanguak, Health Aide, Nuiqsut, 1998.^{ciii}

The cumulative impacts of all the developments leading to the surrounding or “boxing in” of the community by oil and gas development on all sides is devastating to the hopes and aspirations of our community members... Prudhoe Bay oil development has caused Nuiqsut residents to cease virtually all subsistence activities to the east of the community.^{civ}

Medical experts, hampered by the lack of federal assessments of the impact of North Slope oil and gas activities on the health of local people, have made the following observations:

- a) Local oil development produces large amounts of pollutants such as HAP;
- b) Some pollutants commonly produced by oil and gas development activities bioaccumulate in fish and game animals exposed to them;
- c) Fish and game in the vicinity of oil and gas exploration and development facilities may be exposed to these pollutants through air, water, or foraging on local plants;
- d) The North Slope villages consume extraordinarily high quantities of locally harvested fish and game; and
- e) North Slope villages have had a marked increase in cancer and asthma over the last 30 years, and now have among the highest rates in Alaska and the U.S. North Slope villages have also experienced marked increases in pulmonary diseases, and now experience nearly twice the mortality rate from pulmonary disease as the general U.S. population.^{cv}

In short, the Alpine field, like all other fields on the North Slope, no matter the technology employed, results in environmental degradation.

F. Offshore Impacts from Past and Current Developments. The oil industry often points to offshore developments such as Endicott and Northstar located immediately north of Prudhoe Bay as examples of “new technology” with limited environmental impact. An examination of some of the significant problems that have taken place there is warranted.

Endicott Oil Field. BP and its drilling contractor, Doyon Drilling, paid \$25 million in criminal fines and civil penalties for deliberate and chronic re-injection of hazardous drilling wastes down oil wells at the Endicott field over a three-year period between 1992 and 1995. Workers were instructed to violate environmental regulations and inject hazardous waste oil and solvents into unsealed outer well shafts.^{cv} For violating its operating permit, BP was placed on criminal probation for five years.^{cvii} An employee of Doyon Drilling brought the problem to light in 1995 – the same year that Doyon’s General Manager testified to the Senate Energy Committee that along with safety, “environmental protection is an equally critical part of [North Slope] daily operations... improvements in drilling and production technology can support orderly future Arctic oil development in a safe and environmentally sound manner.”^{cviii}

Northstar Offshore field Clean Air Act fines. Since it began producing oil, the Northstar field operated much of the time under compliance orders that has allowed it to operate in violation of the standards of the state of Alaska’s Clean Air Act permit conditions. This has resulted in higher emissions of carbon monoxide, nitrogen oxides, and other air pollutants.

This first true offshore oil development in the Alaskan Beaufort Sea began oil production in October 2001.^{cix} By the end of its first year of production, BP was fined by ADEC \$75,000 in penalties and damages for operating in violation of its air quality permit pertaining to release of carbon monoxide emissions, exceeding daily flaring limits, and operating equipment that had not been permitted. ADEC allowed it to operate in violation of its permit conditions under a Compliance Order by Consent until February 15, 2003, whereupon ADEC issued another compliance order and another \$75,000 fine.^{cx} As of April 2005, BP still operated under ADEC’s 2003 compliance order and reported emissions and flaring levels that exceed permitted levels.^{cx}

Significant impacts from seismic exploration and drilling to bowhead whales have been reported. The National Research Council (NRC) concluded, “Bowhead whale migrations have been

displaced by the intense noise of offshore seismic exploration and exploratory drilling. Though limited development offshore has taken place to date, full scale industrial development offshore would displace polar bears and ringed seals from their habitats, increase mortality, and decrease their reproductive success.”^{cxii} According to Inupiat subsistence hunters in Barrow, “pods of migrating bowhead whales are displaced from their normal migratory path by as much as 30 miles” and one study found that once a seismic boat stopped operations at 65 miles away, bowhead whale calling rates increased, but little monitoring has been done at distances far from rigs or surveys.^{cxiii} Sound from seismic exploration can be detected out to 100 nautical miles.^{cxiv}

Spills. Even though there was poor reporting of spills during the peak of Outer Continental Shelf (OCS) exploratory drilling the 1980, there is evidence of spills. Furthermore, there have been substantial spills of petroleum products in the Beaufort Sea from industry activities and from barging (an activity required for offshore drilling and other activities).

- 77 offshore spills were reported in just two years during offshore drilling, ice road transportation, and other exploratory and development activities (1989-1990).^{cxv}
- A 200-gallon crude oil spill from a flow line took place at the Endicott oil field on July 1, 2001.^{cxvi}
- A spill near the offshore drilling platform for ARCO’s Stinson well off the coast of the Arctic Refuge caused a sheen on the water that appeared to be coming from either under the ice or from oil in the melting ice, but neither the nature nor amount spilled was recorded.^{cxvii}
- A barge tanker struck an iceberg near the western boundary of the Arctic Refuge enroute to Kaktovik and lost 68,000 gallons of fuel oil; no response was mounted despite oily sheen on the water near the coast and the presence of migrating birds.^{cxviii} While it is unclear whether this barge supported industrial or village fuel needs, it points to the risks of barge tankers.
- In 1982, an exploratory drilling hydrocarbon spill into the Beaufort Sea was reported as 5-gallons, yet biologists found surface oiling and “bathtub rings” circling two barrier islands.^{cxix}

Most exploratory wells drilled from artificial islands, drillships, ice islands, or other structures in the Beaufort Sea have dumped drilling muds and cuttings directly into the coastal waters. As recently as the winter of 2003, drilling wastes were dumped directly into the Beaufort Sea for the McCovey well drilled by a consortium including ConocoPhillips.^{cxx} In 1997, drill muds and cuttings for ARCO’s Warthog exploratory well were dumped into the Beaufort Sea into a productive boulder patch area located just three-miles offshore from the Arctic National Wildlife Refuge.^{cxxi}

A study of shallow arctic marine sediments found barium, chromium, lead and zinc at elevated levels two to four years after exploratory drilling wastes were discharged into low energy environments of coastal lagoons in the Beaufort Sea.^{cxxii} Although the Northstar offshore

production island re-injects drilling wastes, there are still spills, such as 18,000 gallons of drilling muds that escaped containment in January 2001, according to the ADEC (2005).

The oil industry resisted “zero discharge” requirements – the best available technology – during EPA consideration of past National Pollution Discharge Elimination System general permits for the Beaufort and Chukchi Seas so that wastes still may be dumped into water deeper than 5 meters.^{cxxiii} The cost of transporting drilling wastes for re-injection from exploratory wells or production sites even further offshore or drilled in remote parts of the North Slope may be a factor in future proposed practices.

The Wall Street Journal and *Financial Times* disclosed that the EPA had initiated a criminal investigation into intentional dumping of drilling wastes contaminated with hazardous material from an ice pad into the Beaufort Sea. Supervisors ordered that thousands of gallons of toxic drilling mud at the Oooguruk exploratory well be dumped into the sensitive coastal waters near Prudhoe Bay to save costs of proper disposal in March 2003, according to workers.^{cxxiv}

G. Past Impacts on Polar Bears from Oil Development and Other Development on the North Slope. Indeed, “spilled oil can have dramatic and lethal effects on marine mammals, as has been shown in numerous studies, and a large oil spill could have major effects on polar bears and seals, their main prey.”^{cxxv cxxvi} Unfortunately, it is well known that polar bears are especially vulnerable to oil spills for at least three reasons. Polar bears groom their fur when it is fouled; polar bears and oil concentrate and accumulate in leads and openings that occur during winter as well as spring breakup and autumn freeze-up periods (Amstrup, Durner and McDonald, 2000; Durner et al., 2004); and bears are attracted to petroleum products and consume foods fouled with oil (Derocher and Stirling, 1991).

How do polar bears die from oil? They die from acute inflammation of their nasal passages, renal impairment, anemia, anorexia, stress, skin damage hair loss, and serious thermoregulatory problems (Ortland et al., 1981, a lethal study involving oiled polar bears).

Their natural curiosity and keen sense of smell often place polar bears in harm's way from oil development activities, such as being attracted to drill rigs, garbage dumps, and contaminants. In 1990, a bear that approached an offshore rig in Camden Bay off the Arctic National Wildlife Refuge was killed. The oil industry reported over 250 encounters between polar bears and their operations along the coast over a seven-year period with over 100 of these involving conflicts.^{cxxvii} In many cases, polar bears were harassed and chased away from oil operations with cracker shells and rubber bullets, herded with trucks, snowmachines, helicopters, and sirens.

Even relatively small spills, involving substances such as ethylene glycol, can have serious effects on polar bears. In 1988, a mother polar bear died from a mixture of ethylene glycol and Rhodamine B dye. Though the exact source of the antifreeze was unknown, such chemicals were commonly used to mark runways and ice roads on the North Slope. After this bear's fluorescent pink carcass was found, a hazard notice issued in 1988 said, “use of non-toxic propylene glycol rather than the toxic ethylene glycol might have saved the lives of these bears.”^{cxxviii} Yet, ADEC records show that since 1996 there have been 187 spills (16,693 gallons total) of *ethylene* glycol compared to 21 spills (1051 gallons total) of *propylene* glycol, indicating that use of the

poisonous substance is still prevalent. Six ethylene glycol spills were larger than 1,000 gallons and one also contained crude oil. There were also two large spills in 1995, including one of 5,700 gallons at Prudhoe Bay Gathering Center 1, the site of another large spill in 2001.

As the oil industry has grown on the North Slope, its footprint has continued to expand into polar bear habitats. The Agreement on the Conservation of Polar Bears committed the US and the other four arctic nations to "protect the ecosystems of which polar bears are a part, with special attention to habitat components such as denning and feeding sites and migration patterns." Polar bears are especially sensitive to disturbance during denning.^{cxxxix} Females may abandon their dens if disturbed, and early den abandonment can be fatal to cubs unable to fend for themselves.

There is simply no question that oil spills are lethal to polar bears. In an experimental study in Canada, polar bears died from the toxic effects of ingesting oil after grooming, and high levels of absorbed hydrocarbons were stored in blood, brains, and other tissues.^{cxxx}

IV. The Potential for Oil Spills and Other Problems Associated with Offshore Oil and Gas Activities is Great.

Offshore Oil and gas exploration and development involve myriad activities.

For example, according to MMS assumptions, oil development resulting from Chukchi Sea Lease Sale 193 will result in up to 174 exploratory, production and service wells; up to 200 miles of offshore pipelines; 300 miles of onshore pipeline to reach the Trans-Alaska Pipeline; onshore shorebase; processing center; and a landfill.^{cxxxix} Based on the Alpine field example discussed above, and other examples, this is likely an underestimate. Nevertheless, even given this modest scenario, the projected impacts from the Chukchi lease sale would be very significant, especially with respect to a major oil spill.

Similarly, Shell has proposed a multi-year Beaufort Sea exploration that involves a flotilla of 16 marine vessels, including two huge drill rigs, tugs, icebreakers, and supply ships, as well as aircraft.^{cxxxii} Exploration in the Chukchi would be similar. Lease-related activity also involves areas outside of the lease boundaries themselves. MMS predicts that support vessels for seismic surveys will make two trips per week through the coastal zone to refuel. In addition, there will be regular air traffic over the coastal zone, as well as significant coastal infrastructure, including pipelines connecting an offshore platform to a new shore base.^{cxxxiii}

More broadly, existing North Slope oil development, though primarily onshore, provides an example of the intensity of oil development activities.

A. There is a Substantial Risk of a Major Oil Spill from Oil Leasing in the Chukchi Sea. In its own public documents, MMS estimates a 40% chance of a large crude oil spill (26% for pipeline spill, 19% for platform spill) from development associated with Chukchi Lease Sale 193. That's right: 40%. The chance of one or more large spills would be 27-54% at the 95% confidence interval.^{cxxxiv} MMS also estimates 179 small crude oil spills totaling 1,214 barrels (50,988 gallons).^{cxxxv}

Depending on the site of the hypothetical spill from offshore platforms or pipelines, MMS's own oil spill resource analysis showed spill risks as high as:^{cxxxvi}

- 34% chance Kasegaluk Lagoon could be oiled
- 50% chance of land being oiled
- 51% chance of large oil spill contacting Cape Thompson bird colonies during open water period
- 58% chance of large oil spill contacting Cape Lisburne murre breeding colony (within the Ann Stevens Unit of the Alaska Maritime National Wildlife Refuge).
- 56% chance Peard Bay a special area north of Wainwright could be oiled
- 58% chance that an area within Hannah Shoal could be oiled (this is Pacific Walrus and Gray Whale feeding habitat, although MMS's analysis fails to note this)
- 68% chance that the Chukchi Polynya from Icy Cape to Barrow (part of the spring Bowhead Whale migration route though MMS does not note this) could be oiled
- 72% chance Ledyard Bay Spectacled Eider Critical Habitat Area could be oiled^{cxxxvii}
- 60% chance of oiling in the Wainwright Subsistence area

When the cumulative risks of North Slope and offshore oil developments are considered, the Corps of Engineers has projected a 95% chance of a major spill. Since pipelines contribute 97% of all oil spilled from Outer Continental Shelf operations, according to the MMS, concerns about integrity of the subsea oil pipelines are well justified.

B. There are Many Potential Sources for an Oil Spill Notably, in its analysis, MMS has overlooked many key sources of potential major spills which could significantly harm polar bears and other wildlife. Their spill analysis failed to assess the potential effects of a well blowout, or from other large potential spills such as from barge or tankers used to refuel drill ships, bottom-founded rigs, etc. or to transport oil.

The North Slope Borough has noted that a crude oil spill from exploratory drilling could be 6,930,000 gallons and a fuel oil spill as large as 10,000,000 gallons could result from an accident with the fuel tanker that Shell Oil Inc. plans to bring to the Beaufort Sea for its exploratory drilling operation.^{cxxxviii} This spill potential from these two types of spills is far greater than MMS assumed in its Chukchi Sea analysis.^{cxxxix}

MMS also failed to assess the impacts of a crude oil tanker spill; tankers may be needed for both well flow testing and potentially for transportation. In November, 2007, MMS presented different transportation scenarios in Barrow including oil tankering from production sites far out into the Chukchi Sea, and long sub-sea pipelines to landfall near Wainwright or Point Lay, with tanker port at Kivalina for shipment south. Yet nowhere in the Chukchi Sea EIS did MMS address these risks.

MMS acknowledged that "Arctic warming could change the feasibility of marine transportation through the Arctic," yet excused its lack of tanker analysis by saying that the "most practical way

to transport oil from the Chukchi Sea OCS would be by pipeline across NPR-A and then through the established TAPS and tanker route.”^{cxli}

Furthermore, the cumulative effects of potential increased trans-shipment through the Chukchi Sea from Russia and through the Northwest Passage from Canada need to be considered as such activities are likely to occur during the same time frame as potential Chukchi Sea oil production from this lease sale.^{cxli} The Chair of the Arctic Marine Shipping Assessment gave a presentation last year showing potential shipping routes possibly by 2025 from the Russian arctic over the North Pole to the Chukchi Sea as well as the possibility of increased ice breakers, LNG tankers, etc.^{cxlii}

MMS also failed to conduct a cumulative impacts analysis of the impacts of oil spills from the combined Beaufort and Chukchi Sea lease sales, exploration, and development to critical wildlife species and their habitats, including polar bears, bowhead whales, Spectacled and Steller’s eiders, and availability and access to subsistence resources by Alaska Natives.

C. There is No Proven Ability to Clean up Oil in Broken Sea Ice and Remote Open Waters like those of the Chukchi Sea. The National Academy of Sciences has determined that “No current cleanup methods remove more than a small fraction of oil spilled in marine waters, especially in the presence of broken ice.”^{cxliii}

The oil industry has failed spill exercises required for approval by the offshore Northstar oil field development oil spill response plans. The ADEC found BP had violated state oil response plan requirements for the Northstar field because it was unable to effectively mobilize booms, deploy skimmers and other equipment and was ill-prepared to even test equipment during drills conducted in 1999 and 2000.^{cxliv} Full field test drills with all mechanical equipment are rarely done in Beaufort Sea and have not been done in the Chukchi Sea. Further analysis of the lack of spill response and clean up measures for broken ice conditions has been provided based on experience in Russia’s Sakhalin Island as well as throughout the Arctic.^{cxliv}

Recent offshore and marine spills show the reality of poor spill response and cleanup 19 years after the Exxon Valdez disaster. Just last month, a significant spill, estimated at about one quarter of the Exxon Valdez’s 11 million gallons, occurred off of the coast of South Korea. The newspaper report stated:

Thousands of fishermen, soldiers and volunteers struggled to clean up an oil spill that has caused an environmental disaster in South Korea. It has blackened once scenic beaches, coated birds and oysters in sludge and driven away tourists with its stomach-churning stench. But the 7,000 people mobilized were too few to clean up the oil slick, which has been washing up since Saturday along a 12-mile-long shoreline of the nation’s west coast. Strong tides, which dragged the sludge before pushing it ashore again, hampered the cleanup operations by villagers, who complained of headaches and nausea from the stench... The spill came a week after the South Korean port town of Yosu won the right to be the host in 2012 for an international event called Expo. Bidding for the event, South Korea championed the theme of the living ocean and coast, a slogan it hoped would bolster environmental awareness in Asia.

“Everyone is out there fighting. . .there is so much oil we have to use buckets to scoop it up,” Moon Hong-chol, a resident in the village of Wonbuk in Taean, said by telephone. “The dark brown slime is all over our oyster and abalone and clam beds. Tourists are canceling resort reservations. I think we are finished.” The provincial government appealed to people to donate used clothes for soldiers who were collecting the sludge in the freezing cold. . . “The oil stuck to the shore or sank to the sea bottom, causing serious damage to the maritime biology and ecosystem in the region,” Mr. Kang said. “Even if some maritime organisms survive, they won’t be marketable for quite a while.”

Coast guard vessels hurried to establish floating oil fences, but high waves left them useless. “All day, people have been scrubbing boulders coated with oil and scooping up sand soaked with oil,” said Lee Hyun-jin, a resident in the village of Sowon in Taean. “But now they are retreating because the sea is in high tide again. We feel hopelessly outnumbered.”

“This is getting worse, and we have 260 villagers out there today with buckets, cans and whatnot, compared with 57 yesterday,” Ms. Kim added.^{cxlvi}

Less than a week later 25,000 barrels of oil spilled at an oil field in the North Sea. As admitted by the oil company involved, the weather prevented it from even deploying spill clean up equipment: “Four vessels are on the way out with skimming equipment but unfortunately because of the weather we cannot collect the oil right now,” StatoilHydro's spokesman Kai Nielsen said. “There is too much wind, too high waves.”^{cxlvii}

V. Future, Extensive New Oil Drilling Such as the Proposed Chukchi Lease Sale 193, Could Have Significant Adverse Impacts on Polar Bears, Polar Bear Habitat, and Other Arctic Species

A. Summary. As discussed in the previous section, oil development in Alaska and elsewhere in the world has resulted in numerous oil spills and other adverse environmental impacts. Accidents happen; mistakes happen; infrastructure ages; and species suffer. Oil spills are lethal to polar bears. As MMS estimates a 40% chance of a significant oil spill associated with the Chukchi lease sale, yet remarkably still plans to proceed with the lease sale. We know that numerous other activities associated with oil development have the potential to harm polar bears. Therefore, it is reasonable to conclude that the Chukchi Lease sale, in particular, represents a substantial threat to polar bears, especially given our lack of knowledge about the numbers and behaviors of these bears. It also represents a substantial threat to other species and subsistence hunting and fishing.

B. Analysis. In General, MMS has inadequate information to accurately determine effects of oil development in the Chukchi Sea. One of the most fundamental points to understand about the likely impacts of oil and gas activities on polar bears and other Arctic wildlife, especially in the Chukchi Sea lease sale area, is the astounding lack of data about the fundamental biology of the Chukchi, how it is impacted by global warming, and, importantly, how it is likely to be impacted by oil and gas activities. These are not the well-charted waters of the Gulf of Mexico, where environmental research and oil activity have occurred for decades. It is a remote and wild

sea about which little is known except, perhaps, for a common understanding that it's largely sea ice-driven biology is going through drastic changes due to global warming.

MMS specifically acknowledges this problem:

Unfortunately, it has not been possible to predict the type and magnitude of marine mammal responses to the variety of disturbances caused by oil and gas operations and industrial developments in the Arctic. More importantly, it has not been possible to evaluate the potential effects on populations.^{cxlvi}

[W]ithout historical data on distribution and abundance, it is not possible to measure the impacts of an oil spill on marine mammals. Population-monitoring studies for key species need to be implemented in areas where significant industrial activities are likely to occur, so that it will be possible to compare future impacts with historical patterns and thus determine the magnitude of any potential effects.^{cxlix}

Indeed, with respect to the ecosystem as a whole, MMS admits that: “Based on the paucity of information available on marine mammal ecology in the Chukchi Sea and on specific locations of future developments, we are unable to determine at this time if significant impacts will or will not occur.”^{cl}

With respect to walrus, MMS admits that “without current population estimates, it will be very difficult to evaluate the impacts of development on the Pacific walrus population.”^{cli} MMS is required to conduct adequate baseline studies (pre-leasing) and post-lease monitoring studies to determine impacts under OCSLA (43 U.S.C. 1332, 1336 20(b), 1346(b)).^{clii} Clearly, these required studies have not been done for Pacific Walrus.

Unacceptably, MMS is currently scheduled to proceed with the lease sale before spill response and cleanup technologies have been proven or baseline studies have been done, thus creating the very situation that it knows makes impacts certain and so hard to gauge in advance.

C. Nevertheless, There is Sufficient Information to Understand that there will be Dramatic, Adverse Effects from Oil Development on Polar Bears and Other Species. The U.S. Fish and Wildlife Service has stated the following regarding oil spill effects:

“Due to the lack of effective techniques for containing, recovering and cleaning up oil spills in Arctic Marine environments, particularly during poor weather and broken ice conditions, a large spill could have significant impacts on a variety of Service trust resources. Although the extent of impacts would depend on the size, location and timing of spills relative to seasonal concentrations of fish and wildlife and on the effectiveness of spill response and clean-up efforts, under some scenarios, population-level impacts to some species could be expected.”^{cliii}

In terms of polar bears, MMS itself has stated that “due to the magnitude of potential mortality as a result of an oil spill, [Sale 193] could result in significant adverse impacts to polar bears.”^{cliv}

This admission is in the context of MMS's framework statement that "impacts to polar bears are an increasing concern due to ongoing changes in their sea-ice habitat, their distribution, and the uncertain status of their populations."^{clv} And, "Impacts to polar bears from oil and waste-product spills as a result of industrial activities in the Chukchi Sea are a major concern."^{clvi} Once again, it is critical to remember that according to MMS, "for the Proposed Action, the chance of one or more large spills occurring, based on OSRA analysis, is 40%."^{clvii}

Thus, as MMS concludes, "the impact of a large spill, particularly during the broken-ice period, could be significant to the polar bear population (65 FR 16833)."^{clviii} "And, as discussed above, everyone knows, including MMS, "there are difficulties in effective oil-spill response in broken-ice conditions."^{clix} It simply has never been accomplished, in tests or otherwise. Similarly, MMS concedes, "some OCS operations might pose a relatively high spill risk to polar bear aggregations and, there, to the polar bear population as a whole."^{clx}

And the threats are cumulative. The analysis above focuses primarily on the Chukchi Sea, but those threats are in addition to the risks of an oil spill in the Beaufort Sea. As the National Research Council has stated: "A major Beaufort Sea oil spill would have major effects on polar bears and ringed seals."^{clxi} The Council's study concluded that The effects of a major oil spill in coastal or marine waters could be devastating to migrating bowhead whales, waterfowl flocks in lagoons, ringed seals, polar bears, sensitive coastal wetlands, and protected area shorelines due to the difficulty of cleaning up crude.

Previous analyses show that as many as 60 to 108 polar bears could die in the event of a major spill from the offshore Liberty or Northstar fields, respectively, according to models that integrated oil spill trajectories and bear densities. An oil spill modeling study of the offshore Northstar development project estimated .4 to 78 bears would be oiled during the open water season and 0.1 to 108 potentially oiled during October's broken ice season with an average of 21 were predicted to be bears oiled, and therefore killed.^{clxii} A second study for the proposed Liberty offshore development estimated 0-61 bears could be oiled and die.^{clxiii} The models may have understated risks as they only tracked spills for 4 to 10 day periods, only looked at one oil field at a time, did not evaluate worse-case spill size, and did not model cumulative effects of many offshore developments. Similar detailed trajectory analyses of impacts to bowhead whales, Pacific walrus or polar bears in the Chukchi Sea have not been done.

For those few polar bears that do not die immediately, or that are subject to smaller concentrations of oil, they "would be very susceptible to the effects of bioaccumulation of contaminant associated with spilled oil, which would affect the bears' reproduction, survival, and immune systems ...and suppress the recovery of polar bear populations due to reduced fitness of surviving animals."^{clxiv}

Oil spills, of course, can occur suddenly or can occur slowly. As MMS observes: "We note that 200,000 gal of oil...spilled onto the tundra as a result of an undetected leak in a corroded pipeline in March 2006....As vividly demonstrated by these events, small, chronic leaks in underwater pipelines could result in large volumes of oil being released underwater and under the ice cover without detection. The effects of a large oil spill, particularly during the broken-ice period, could pose significant risks to the polar bear population."^{clxv}

In addition to oil spills, oil development has other prospective adverse impacts on polar bears. MMS also acknowledges that some potential impacts (i.e. from seismic activities in open water), “have not been studied....”^{clxvi} While MMS claims that such impacts are likely to be minimal, it does concede that for bears which are energetically stressed, avoiding seismic activity “could prove fatal.”^{clxvii}

MMS also admits that developments along the Alaskan arctic coast “undoubtedly will increase the number of polar bear – human conflicts that occur” and that “even with the best mitigation measures in place, it is certain that some bears will be harassed or killed as a result of industrial activities in their habitat.”^{clxviii}

The State of Alaska, through its Department of Fish and Game explains the likely impacts of oil and gas activities on polar bears as follows: “Human activities, especially those associated with oil and gas exploration and extraction, pose the greatest immediate threat. Oil exploration and drilling activities in denning areas could cause bears to den in less suitable areas. Oil spills from offshore drilling and transportation of oil through ice covered waters could contaminate bears and reduce the insulating value of their fur, or adversely affect animals in the food chain below them. Severe environmental conditions would hinder or prevent containment of a spill, and currents and ice movement could distribute oil over large areas.”^{clxix}

These likely impacts, potentially significant in their own right, are exacerbated by stresses to polar bears from global warming. As noted previously, just four months ago, the USGS provided USFWS with nine reports concerning polar bears. These reports prompted USFWS to reopen the public comment period to allow the public to comment on the new analyses contained in these reports and their implications for the USFWS polar bear listing determination.^{clxx} These reports depict a dire future for polar bear populations, including the polar bears that inhabit the Chukchi Sea.^{clxxi}

For example, the reports indicate that nutritional limitations caused by the diminished extent of consolidated sea ice, greater duration of the open water period, and the increased distance between polar bears’ sea ice hunting grounds and terrestrial denning areas have and will increasingly result in declining physical condition and reduced cub survival.^{clxxii} The reports single out Wrangel Island as a denning area that will be especially distant from the retreating summer sea ice, causing females from the Chukchi Sea population, which utilize the island for denning, to suffer increased energetic stress.^{clxxiii} Continuing the theme of lack of fundamental biological information on the Chukchi, these reports also note that the polar bear findings with respect to the Southern Beaufort Sea polar bear population provide useful insight into the fate of other, less studied populations that inhabit the same eco-region, such as the Chukchi Sea population.^{clxxiv}

Essentially all other Arctic wildlife is vulnerable to adverse impacts from oil and gas activities, especially oil spills. The World Wildlife Fund recently published a report on whales in the Bering Sea and adjacent waters such as the Chukchi.^{clxxv} Referencing myriad scientific reports, the WWF report notes that the threats posed to whales by offshore oil activities include physical harm and behavioral impacts from seismic surveys, the drilling of wells, construction associated with oil and gas activities, vessel and aircraft traffic, and accidents such as oil spills.^{clxxvi}

With respect to walrus, their increasing use of Alaska coastal haulouts, and their inability to use traditional feeding grounds along the summer ice-pack, leave them increasingly vulnerable to disturbance from oil and gas activity such as that which can flow from Sale 193. A recent USFWS report detailed walrus use of new habitat in the Chukchi Sea this past summer as the sea-ice retreated from the continental shelf.^{clxxvii} As explained in that report, walrus are normally associated with drifting pack ice in the offshore environment during summer months. Because sea ice retreated over water too deep to allow walrus to reach the sea bottom to feed during the summer of 2007, thousands of walrus hauled out on the Alaskan coast of the Chukchi Sea starting in late July.^{clxxviii}

A USFWS walrus expert noted that the haulouts occurred a month earlier than usual and were “raising a bunch of conservation issues for us,” including disturbance of the hauled out walruses from human activity,^{clxxix} such as a low-flying airplane.^{clxxx} This concern is well-founded, as evidenced by recent tragic events where 3,000 to 4,000 walrus died in stampedes while hauled out on the Russian coast of the Bering Sea. Notably, they were hauled out on shore due to low sea ice conditions in the Chukchi Sea.^{clxxxi} As noted above, oil and gas activities are substantially more intensive than low-flying aircraft. Indeed, MMS itself states that “[o]il and gas activities that occur during ice minimum conditions in summer in the Chukchi Sea are likely to come into direct contact with adult females and subadult walruses.”^{clxxxii}

Finally, subsistence activities by local communities could also be adversely impacted by oil and gas activities. For example, “seismic noise and associated vessel movements could affect whaling, sealing, bird hunting, and fishing in the open-water season. Access to subsistence resources, subsistence hunting, and the use of subsistence resources also could be affected by reductions in subsistence resources and changes in the distribution patterns of subsistence resources.”^{clxxxiii}

EPA itself raised significant environmental justice concerns with Sale 193:

EPA’s primary concerns with the treatment of environmental justice during the Lease Sale 193 NEPA process and in discussions in the Draft EIS focus on the effects of multiple, overlapping and fast-tracked planning processes that have occurred over the past several months, and increasing concerns from local residents regarding human health impacts from proposed oil and gas exploration, development and production activities in the area.

The public review and comment periods have at times occurred during critical whaling and other subsistence activity seasons when many of the key individuals in the communities were likely unavailable, and they have all occurred in such rapid succession that thoughtful and meaningful reviews, which the agencies ask for and expect, have undoubtedly been constrained. More importantly, it is understandable that the pressure to review, comment on and ultimately live with the rapid pace of industrial activities creates stress and other adverse impacts to individuals living in the area.

[Another] concern relative to environmental justice results from EPA’s review of the Draft EIS and also from our understanding of the recurring comments from local

residents and North Slope Borough officials about recognized and potential human health impacts from onshore and offshore oil and gas activities on the North Slope.^{clxxxiv}

Given the weight of this evidence, it is no surprise that MMS itself has acknowledged that:

- Significant impacts could occur to belugas and walrus in the event of a large oil spill.^{clxxxv}
- A large spill could impact common and thick-billed murres in late summer and early fall, when juveniles and attendant males are floating throughout the Chukchi Sea. During this period, juveniles have not yet developed the ability to fly and attendant males are flightless for several weeks while molting. This inability to move quickly out of the area coupled with the potential for affecting large numbers of birds could sharply decrease murre abundance at the Cape Thompson and Cape Lisburne colonies [Alaska Maritime National Wildlife Refuge].^{clxxxvi}
- Because walrus are long-lived animals at the top of the food chain, and thus, subject to the upward biomagnifications of contaminants, the effects from contaminants on the Pacific walrus population from a large oil spill are likely to persist for decades.^{clxxxvii}
- The effects of a large spill on subsistence are expected to be significant in the Chukchi Sea Sale 193 Proposed Action area... There has been little experience with under-ice or broken ice oil spills, and local residents have little confidence in industry's current capability to successfully clean them up... Large spills could affect subsistence patterns by reducing populations of subsistence species, contaminating subsistence species or their habitats, or rendering resources unfit to eat.^{clxxxviii}

To minimize potential impacts MMS relies in part on a Sale 193 coastal area setback buffer zone. Yet, there is simply too little known about the Chukchi Sea, the wildlife that inhabits it, and the effects of oil and gas activities on that wildlife to rely on the coastal buffer MMS proposes to mitigate impacts. As NMFS stated, "MMS's view and analysis supporting [the] setback, did not present a strong enough case to NMFS that marine resources would be adequately protected."^{clxxxix}

VI. Actions That Should be Taken to Protect Polar Bear Populations. To protect our nation's polar bear populations, three categories of actions need to be taken:

- 1) cease major disruptive and risky activities until we have essential information about polar bears, their habitats and cumulative effects of global warming and oil industry activities particularly the Chukchi Lease Sale 193;
- 2) provide necessary funding to determine the population size of the Chukchi stock and monitor it, as well as provide the necessary funding to implement the Bi-lateral Polar Bear Agreement with Russia; and
- 3) reduce greenhouse gas emissions quickly and significantly.

A. Cease Major Disruptive and Risky Activities, Particularly the Chukchi Lease Sale, Until We Have Essential Information About Polar Bears. As numerous experts have stated, the Interior Department does not have sufficient information about the wildlife and other natural resources of the Chukchi Sea, the impact of global warming on those resources, or what the additional impact of oil and gas activities would be on such resources. This lack of information pointedly involves polar bears, though it is by no means limited to polar bears. It also includes other Arctic wildlife and the Inupiat culture and the subsistence way of life.

Based on these concerns NMFS recommended that MMS remove the Chukchi Sea entirely from its proposed 5-year plan due to this critical lack of science:

The NMFS Alaska Region believes the proposed leasing schedule is unrealistically ambitious and would not allow for necessary environmental research . . . *This is particularly true for the North Aleutian Basin (Bristol Bay) and Chukchi Sea proposed sales. The NMFS Alaska Region recommends deletion of these areas and initiation of a comprehensive research program to support future plans subsequent to the 2007-2012 plan . . . For instance, MMS states repeatedly that little is known about the distribution, abundance, behavior, and habitat use of marine mammals in the Chukchi Sea, and the few existing studies are very dated. It is extremely important to gain a better understanding of these issues prior to any exploration, leasing, or development. The need for baseline data on the distribution of marine mammals in the Chukchi Sea is particularly urgent.*^{cxv}

MMS disregarded NMFS's recommendation to withdraw the Chukchi Sea from the plan, simply stating, without elaboration, that it "disagreed" with NMFS's views.^{cxvi}

In its comments on Sale 193, NMFS continued to raise concerns about MMS's lack of scientific understanding of the potential impacts of Sale 193 on polar bears, whales, walrus, sea lions and other wildlife, as well as on Native cultures and traditional ways of life from drilling in the Chukchi Sea:

We remain very concerned about potential impacts to living marine resources and their habitats, fisheries, and subsistence uses of marine resources as a result of lease sales, exploration, and development in the Chukchi Sea Planning Area. The individual and cumulative effects of development in these relatively pristine environments could be significant . . . [Yet MMS's] data to describe marine mammals within the sale area and their habitat use are lacking or inadequate . . . Some of these [scientific data] gaps are striking given the ecological, social and cultural importance of the marine mammals in question.^{cxvii}

EPA was also critical of including the Chukchi Sea in the Five Year Program:

[W]e have some concerns relating to the EIS's analysis of potential impacts and possible mitigation measures in leasing areas that were previously excluded from leasing in the 2002-2007 Lease Program and the cumulative impacts analysis. In the Chukchi Sea program area, the preferred alternative includes an area that was previously excluded

from leasing in the 2002-2007 Lease Program due to the area's biological, cultural and subsistence resource values. . . .EPA has rated this EIS EC-2 (Environmental Concerns/Insufficient Information). EPA's review has identified concerns with potential mitigation to impacts of developing previously excluded areas and cumulative impacts issues.^{cxci}

In its Sale 193 comments, EPA repeated its EC-2 rating and recommended that:

MMS reconsider the proposed schedule for the lease sale, the accompanying NEPA process requirements, and the myriad of other overlapping resource development planning processes that are currently underway in the area and strive to achieve more balance in the both the planning schedules and in the impacts to residents' daily lives.^{cxci}

MMS also disregarded these expert recommendations, as evidenced by its intent to proceed with the lease sale.

One of the most important things that can happen for the polar bear is that Sale 193 not go forward. It is simply contrary to the best interests of our nation for MMS to hold Sale 193. Common sense and scientifically-supported prerequisites to holding a Chukchi Sea lease sale would include a final decision on whether to list polar bears under the Endangered Species Act and to designate critical habitat for polar bears. Assuming, as an objective look at the science seemingly would compel, that the USFWS lists the bear and designates critical habitat, the full ESA protections must proactively be applied to any proposed Chukchi Sea lease sale.

More fundamentally, before holding a Chukchi Sea lease sale the Interior Department needs significantly more basic baseline information on the Chukchi Sea, impacts from global warming, and the likely impacts on local communities from oil and gas development. Without gathering and analyzing such information, the Interior Department would unacceptably risk significant environmental and human harm if it held the lease sale.

To the extent that MMS says that it can lease now and take care of the problems later, is simply incorrect. First of all, once leases are let, flexibility as to geography is lost. The leases are tied to specific areas within the Sale 193 boundaries. If information gathered after the lease sale identifies biologically important areas, the federal government has lost significant discretion to react in a precautionary manner toward that information. Meaning that, as the process proceeds the opportunity for comprehensive review is no longer allowed. As courts have noted, the government cannot engage in comprehensive review of leasing "if the object of the review is a single exploratory plan or a single development and production plan." The government does not review a plan of operation and then determine that an adjacent tract should not be leased. "Thus the importance of the lease sale is not the physical activities lessees will be able to conduct without further approvals. The importance of the sale is directly linked to the comprehensiveness of the review and planning that can occur."^{cxci}

Furthermore, the existence of leases increases the practical momentum toward oil and gas activities. This means that later regulatory approvals are more likely to be granted than denied.^{cxci}

For example, the Bristol Bay lease sale and ultimate buy back demonstrates the difficulty in returning to a pre-lease status quo. Below is a summary of that buyback's long history. Note that it included significant activity in all three branches of government over many years. In contrast, one person at the Interior Department today can make the decision not to hold Sale 193.

In 1986 MMS held Lease Sale 92, offering over 5.6 million acres in the North Aleutian Sale #92 (Bristol Bay). Twenty three lease blocks were sold for a price of more than \$95,000,000.^{cxvii} After the Exxon Valdez Oil Spill Congress included annual moratoria in the Interior Appropriations bill, the federal government was prohibited from any leasing activity in OCS waters in Bristol Bay. As well, Bristol Bay was included in the Presidential moratoria by executive withdrawal of President Clinton in 1998, to be remaining until 2012.

Industry understandably was upset that it had purchased leases on which it could not operate. In 1992, the National Energy Policy Act (H.R. 776) passed by the U.S. House included language requiring buy backs of Bristol Bay oil leases by the federal government, but this provision was dropped during conference with the Senate and was not included in the final bill signed by President Bush on October 24, 1992 (P.L. 102-486). That same year, Conoco, Inc. sued the federal government for breach of contract and sought compensation for its Bristol Bay leases, as well as others offshore the Everglades in Florida, and offshore North Carolina.^{cxviii} Later that year, other companies joined the suit. In 1995, Interior Secretary Babbitt announced settlements with industry wherein they agreed to drop their claims and surrender all leases in Bristol Bay and southwest Florida. Earlier, the MMS had settled claims with other companies on claims in all three areas.^{cxix}

Bristol Bay buyback costs are difficult to ascertain, as the settlement was combined with the Florida leases. According to the Congressional Research Service, "the settlements involved an amount roughly equal to the bonuses paid by the leaseholders."^{cc} The Anchorage Daily News reported that oil companies had paid about \$300 million for the Bristol Bay and SW Florida lease tracts and that industry had sought \$1 billion in damages with their assertion that the congressional moratoriums were a breach of contract and property right taking.^{cci} The bottom line is: as a nation, we must not proceed with the Chukchi Lease Sale at this time.

B. Provide Necessary Funding for Polar Bear Science and Management. As discussed earlier, we do not have reliable information about Chukchi polar bears upon which management decisions can be accurately based. This can and must be remedied. Congress needs to fund the necessary surveying and monitoring research for these bears.

Fish and Wildlife Service also needs funding to implement the "Agreement between the Government of the United States of America and the Government of the Russian Federation on the Conservation and Management of the Alaska-Chukotka Polar Bear Population." Russia and the U.S. signed this bilateral agreement in 2000 and the Senate approved it in 2003. Unfortunately, the Service has not had the resources to implement this treaty. The Alaska Office of the Fish and Wildlife Service has outlined these research and management needs, and has provided funding projections. These critical needs deserve to be funded by Congress immediately.

In announcing the ratification of the Agreement, the Fish and Wildlife Service stated: “Today, habitat loss, illegal hunting, and, in particular, the diminishing extent, thickness and seasonal persistence of sea ice pose the most serious threats to polar bears.”^{ccii} This reinforces the need to also address the reduction of greenhouse gases, as described below.

C. Reduce Greenhouse Gas Emissions Quickly and Significantly. First of all, we want to thank Congress and this Select Committee for the passage of the Energy Independence and Security Act of 2007. This is an excellent start to reducing our greenhouse gas emissions, but clearly much more needs to be done.

Congress needs to enact the tax package provisions and the Renewable Electricity Standard provisions that were stripped out of the Energy Bill. And, Congress needs to enact comprehensive economy-wide cap and trade legislation that will reduce greenhouse gases by 80% from existing levels by 2050.

VII. There are Many Positive Broader Implications of Taking Actions to Protect Polar Bears, Including Increasing Our Use of Renewable Energy

There are so many positive, broader implications associated with reducing greenhouse gas emissions and taking other actions to protect our nation’s polar bears. For purposes of this testimony, I will focus on expanding the use of renewable energy because Alaska can make such significant contributions in this regard.

Indeed, Alaska has a positive role to play in the reduction of greenhouse gas emissions. As described fully in the Renewable Energy Atlas of Alaska,^{cciii} America’s northernmost state has outstanding and inexhaustible geothermal, wind, biomass, wave, tidal, and hydroelectric energy supplies.^{cciv} As the Renewable Energy Atlas states, “With some of the best renewable energy resources in the country, Alaska has an opportunity to be a leader in their development...” We also have great potential for improving energy efficiency in our homes and buildings, both retrofits that could save our rural and low-income residents money quickly and also reduce emissions, and by setting stronger standards for our buildings.

There are some early, exciting renewable energy developments in Alaska that can benefit the entire nation. But there needs to be much more Congressional assistance to achieve Alaska’s renewable energy potential.

A. Wind. Alaska has tremendous wind resources that are highly suitable for the generation of electricity and hydrogen in both urban and rural locations. Alaska’s first wind farm, located on the Northwest coast of Alaska at Kotzebue, adjacent to the Chukchi Sea, has been displacing a significant portion of the utility’s diesel fuel since 1997. To the south, a recently installed wind project in Toksook Bay is providing renewable energy to three remote communities. Wind power is economic, clean, local, and inexhaustible, and deserves considerable support as a major energy producer of the future. Congress should support the work of the Denali Commission and others in the installation of wind generation capacity, and also research the potential for wind to create hydrogen for local use, and ultimately for export.

B. Geothermal. Alaska has tremendous geothermal potential, both for direct use (including district heating, greenhouses, hydrogen production, absorption chilling, process heating in the seafood industry) and for electricity production. Currently, there is an exciting example of geothermal use at Chena Hot Springs Resort^{ccv} that can serve as a model for many locations in Alaska as well as the nation and the world. Other large scale plants are also being investigated in Alaska. Recently, MIT issued a report declaring that geothermal power has tremendous potential for the United States, and needs more research and investment. Congress should quickly and decisively support expanded geothermal research and power production.

C. Ocean Power (Wave and Tidal). With our 34,000 miles of coastline (more than the entire nation), Alaska offers exciting opportunities for testing and implementing wave and tidal power. According to the Atlas of Renewable Energy, “Alaska has one of the best wave resources in the world, with parts of its Southcentral and Southeast coastlines averaging 60kW per meter of wave front. The total wave power flux on southern Alaska’s coast alone is estimated at 1,250 TWh per year, or almost 300 times the amount of electricity Alaskans use every year!” Congress needs to support the research and financial assistance associated with developing our renewable wave energy as soon as possible.

D. Biomass. Two exciting biomass fuels in Alaska are fish byproducts and municipal waste. Recently, with government assistance, a major processor conducted successful tests of raw fish oil/diesel blends, and now uses approximately one million gallons of up to 70% fish oil for power production each year. There is much more potential. According to the Atlas, “currently state, federal and university groups are working together to assess the potential for recovering a portion of the estimated 12 million gallons of fish oil returned to the ocean each year as fish processing waste”. This research and analysis deserve to be supported, and other biofuel opportunities studied and implemented. With respect to waste product, Eielson Air Force Base densifies paper separated from the Fairbanks area waste stream and then uses the paper “cubes” at the base’s coal-fired power plant. Between 600 to 3,000 tons of this fuel have been produced per year in 1997. This possibility should be explored throughout the nation.

There is a similar renewable energy potential in many places in the United States. A renewable energy atlas of the Western United States, which was created by a number of non-governmental organizations, underscores this potential.^{ccvi}

VIII. The Recommendations, A Recap:

A. Postpone the Chukchi Lease Sale Until Adequate Information Regarding Polar Bears and Other Key Species Is Available. As numerous experts have stated and as discussed above, the Interior Department does not have sufficient information about the wildlife and other natural resources of the Chukchi Sea, the impact of global warming on those resources, or what the additional impacts would be on such resources from oil and gas activities. This lack of information pointedly involves polar bears, though it is by no means limited to polar bears and also includes pacific walrus, seals, bowhead and other whales, migratory birds, and the Inupiat culture and subsistence way of life.

Consequently, it is contrary to the best interests of our nation for the Interior Department’s Minerals Management Service to hold the Chukchi Sea Oil and Gas Lease Sale 193. Common

sense and scientifically-supported prerequisites to holding a Chukchi Sea lease sale would include a final decision on whether to list polar bears under the ESA and to designate critical habitat for polar bears. Assuming that the Interior Department's Fish and Wildlife Service does in fact list the bear and designates critical habitat, full ESA protections must be applied proactively to any proposed Chukchi Sea lease sale.

More fundamentally, before holding a Chukchi Sea lease sale the Interior Department needs significantly more basic baseline information on the Chukchi Sea, the impacts on it of global warming, and the likely impacts on it of oil and gas development. Without gathering and analyzing such information, the Interior Department would unacceptably risk significant environmental harm if it held the lease sale.

B. Provide Critically Needed Funding for Polar Bear Research and Management, Especially for the Chukchi Population. Congress should specifically request from the USFWS a list of needed survey, monitoring and management measures for the protection of our nation's polar bears. This request should emphasize the need for new funding to implement the Bi-lateral Treaty for the protection of the Chukchi population.

C. Take Legislative Actions to Reduce Greenhouse Gas Emissions, Including Funding Renewable Energy Research and Demonstration Projects, Passing Economy-Wide Cap and Trade Legislation, Enacting a Renewable Electricity Standard, and Extending the Production Tax Credits for Renewable Energy Projects.

IX. Conclusion

Thank you.

Our nation is truly at a crossroads in terms of our ability to protect our treasured polar bears for current and future generations. To do so, we must protect them from short-sighted and inadequately informed actions, such as Sale 193; provide necessary science and management funding for their protection; and pass legislation to reduce our nation's greenhouse gas emissions. The fate of America's polar bears, and our fate, is in our hands.

ⁱ Associated Press. Ominous Arctic Melt Worries Experts, (Dec. 11, 2007).

ⁱⁱ I want to acknowledge the contributions to this testimony of Peter Van Tuyn of Besseney & Van Tuyn Law Firm and Pamela A. Miller, Arctic Coordinator with Northern Alaska Environmental Center.

ⁱⁱⁱ The Alaska Climate Research Center, Temperature Changes in Alaska, <http://climate.gi.alaska.edu/ClimTrends/Change/TempChange.html> (Feb. 28, 2007).

^{iv} The Alaska Climate Research Center, Monthly Weather Summaries http://climate.gi.alaska.edu/Summary/current_sum.html (Jan. 9, 2008).

^v Sandra Hines, Without its insulating ice cap, Arctic surface waters warm to as much as 5 C above average, University of Washington <http://uwnews.washington.edu/ni/article.asp?articleID=38531> (December 12, 2007).

^{vi} Stephanie Renfrow, "Arctic Sea Ice Shatters All Previous Record Lows," National Snow and Ice Data Center, http://nsidc.org/news/press/2007_seaiceminimum/20071001_pressrelease.html, Oct. 1 2007

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^{viii} Thompson, Andrea. "Two new Arctic sea ice signals: Winter ice declining and ice becoming thinner, adding to summer decline." MSNBC, <http://www.msnbc.msn.com/id/20959884/print/1/displaymode/1098> (Sep. 24, 2007).

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- xx Ibid
- xxi Ibid
- xxii Final Environmental Impact Statement for Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea ("FEIS") at III-51 (the full FEIS is available at http://www.mms.gov/alaska/ref/EIS%20EA/Chukchi_feis_Sale193/feis_193.htm.)
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- xxxv Following a meeting at the University of Alaska Fairbanks, the IUCN Polar Bear Specialist Group was formed. It consists of 16 scientists from the five nations that are signatories to the International Agreement, including the US. Every 3 to 4 years, this group convenes to carefully assess the status of polar bear populations, given the available data. The last meeting was held in 2005. This is the most authoritative group on polar bears in the world.
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- xliiii Biological Evaluation of Spectacled Eider, Steller’s Eider, and Kittlitz’s Murrelet, available at http://www.mms.gov/alaska/ref/Biological_opinions_evaluations.htm The FEIS incorporates the biological evaluation by reference and relies upon the document to for its analysis of eiders. FEIS III-61, IV-125.
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- xlvi E.g., Marine Mammal Protection Act; Endangered Species Act; Magnuson-Stevens Fishery Conservation and Management Act.
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- xlviii December 2006 EPA letter at 2.
- xlx Memo from Thomas O. Melius, USFWS Regional Director to John Goll, MMS Regional Director (Dec. 19, 2006). This letter is included as Document 17 in FEIS, Vol. II, Section VII, Comments and Responses. See http://www.mms.gov/alaska/ref/EIS%20EA/Chukchi_feis_Sale193/Vol%20II%20Sec%205%20WEB.pdf.
- l FEIS II-37.
- li FEIS IV-156.
- lii FEIS IV-101; see also FEIS IV-103 (“Insufficient data exists to determine the current migration paths or the numbers of whales that might be deflected from those paths. Data are also not available to determine how intensely bowheads feed during the autumn migration in the Chukchi Sea or whether large aggregations exist in certain places due to prey resources.”); FEIS IV-121 (same).
- liii FEIS III-76.
- liv FEIS AC 019-076 (“existing information is insufficient to understand the dynamics of gray whales and offshore Chukchi Sea habitat relationships, quality and quantity dynamics and distribution of prey resources, or the capability of habitat to support (carrying capacity) long- and short-term whale use.”)
- lv FEIS III-71.
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- ^{xxxvi} For spills that would occur during summer within 360 days to a variety of resources, including, Hannah Shoal (ERA 47); spring bowhead migration route in the Chukchi Polynya from Icy Cape to Barrow (ERA 6); Minerals Management Service, 2007, Chukchi Sea Planning Area, Oil and gas lease sale 193 and seismic surveying activities in the Chukchi Sea, FEIS Appendix A.2, Table A.2-30; Cape Thompson FEIS IV-135, Cape Lisburne, FEIS IV-139.
- ^{xxxvii} An oil spill that reaches the LBCH when spectacled eiders are present and molting, and thus unable to fly away, may appreciably affect the continued survival and recovery of spectacled eiders, according to the USFWS biological opinion. USFWS Biological Opinion for Chukchi Sea Planning Area Oil and Gas Lease Sale 193, 50, available at http://www.mms.gov/alaska/ref/Biological_opinions_evaluations.htm. If oil reaches the spring lead system, which Steller’s eiders use to migrate up to their nesting areas in spring, the majority of Alaska-breeding Steller’s eiders could be contacted and killed, which would be a “catastrophic population-level mortality event for this listed species.” According to MMS’s analysis, depending on where a large oil spill occurs, it has up to a 26% chance of contacting the spring lead system if it does occur.
- ^{xxxviii} North Slope Borough, June 5, 2007, Letter from Johnny Aiken, Director, Planning Department to Gary Mendivil, Alaska Department of Environmental Conservation and Ben A. Greene, Office of Project Management and Permitting, ADNRP, on ACMP review comments, Oil Spill Prevention and Response Comments, p. 1.
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- cliii U.S. Fish and Wildlife Service. Memo from Thomas O. Melius, Regional Director USFWS to John Goll, Regional Director MMS on DEIS Chukchi Sea Sale 193. FEIS, Vol. II, Document 17, (Dec. 19, 2006).
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- cciii Accessible online at www.akenergyauthority.org
- cciv Alaska Renewable Energy Atlas, Renewable Energy Alaska Project (July 2007), <http://www.akenergyauthority.org/Reports%20and%20Presentations/EnergyAtlas2007.pdf> (visited Dec. 6, 2007). A summary of the Alaska Atlas is available on-line at <http://rredc.nrel.gov/wind/pubs/atlas/chp3.html#alaska> (visited December 6, 2007).
- ccv See <http://www.yourownpower.com/>
- ccvi See Renewable Energy Atlas of the West <http://www.energyatlas.org/> (visited Dec. 6, 2007). The Hewlett Foundation and The Energy Foundation sponsored the atlas, and the following organizations joined together to create it: the Land and Water Fund of the Rockies, Northwest Sustainable Energy for Economic Development, Green Info Network and Integral GIS. There is a wind resource atlas of the entire United States. See Wind Energy Atlas of the United States, <http://rredc.nrel.gov/wind/pubs/atlas/chp1.html> (visited Dec. 6, 2007).