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Drilling for Arctic Oil: Is it Worth the Risk?

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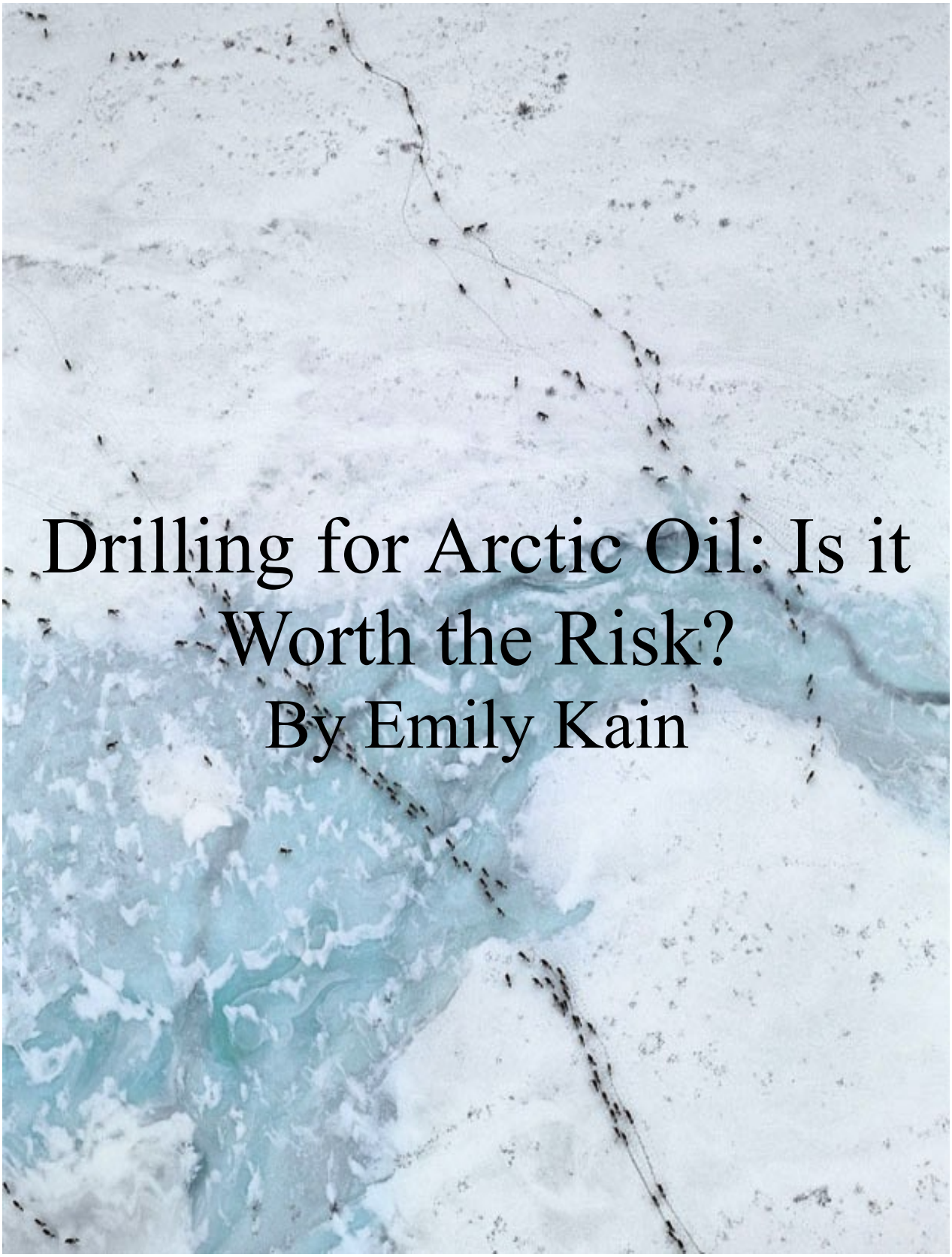

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By Emily Kain

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Abstract

For many decades, Americans have been relying on fossil fuels to run our cars and to heat our houses. It has come to a point where our apparent need for this oil is more important than the environment and the natural world that we have tried so hard to preserve. The Arctic National Wildlife Refuge, commonly know as ANWR, in Alaska is the center of much debate surrounding potential drillings in order to lessen Americas dependence on foreign oil. This paper will refute this idea and prove that by not drilling in the Arctic we will not only lessen our dependence on foreign oil but we will also lessen our dependence on toxic fossil fuels all together. Focusing on three main topics; history, economics and ethics and applying them to the environment, it can be proved that senselessly drilling in one of the last pure environments this country has to offer is not the right choice for our future. Environmental history takes a look back at our past mistakes which warn us not to repeat them in the future. Environmental economics shows that our current economic crisis cannot be solved with an nonrenewable resource. Lastly environmental ethics helps us to look to our future and hopefully see a prosperous one filled with better and safer ways of obtaining energy and creating energy.

Introduction

American's ongoing use and intense reliance on oil is by far the most prominent environmental problem that is facing our country and the whole world in current years. With America's growing population and increasing use of oil since the start of the industrial revolution we have quickly strained this resource. This leads us to the Arctic National Wildlife Refuge, which in recent years has been a site of much discussion. Surveys have found possible oil reserves underground, and debate has been raised about whether or not to open this wildlife refuge, full of precious natural habitat, to offshore oil drilling. The standpoint that I will be supporting in my paper is that it is in the countries better interest to not drill for oil in Alaska. I would like to prove in my paper that not only is it better for the environment of the Arctic to not drill but it will also be better for the economy if drilling is banned from these areas, and then eventually banned from everywhere in the country. I will focus on the harsh affects the environment will endure during drilling and if a spill takes place. I will also look at the alternatives to drilling and fossil fuels as a whole because if drilling is not the best option there needs to be another way for Americans to power their cars and heat their houses. The three disciplines I will use to support my thesis are Environmental History, Environmental Economics, and Environmental Ethics. The environmental history section of my paper will be a look back at the history of public land protection in America and layout a framework of the drilling debate taking place in ANWR. I will also look at the governmental history pertaining to the area of ANWR and the protections the government has put on this specific area of land. With environmental economics I will asses the current use of the cost-benefit analysis and its lack of sustainable practices. Then I will look at the estimates of how much oil would actually come from the potential drillings in the Arctic and if the devastation to the environment would be worth the cost of the oil production. I will look at how much damage has been done by previous oil spills and how much money they have cost our country. Lastly I will focus in on environmental ethics, and look at how people view nature and its importance. I will prove that

biodiversity is something that is necessary and valuable for humans, and that oil is a short term good that will not fulfill our moral responsibilities to future generations.

Drilling: A Two Part Problem

Drilling for oil in the Arctic National Wildlife Refuge is a two part problem. The first issue is that the actual drilling process where the oil is extracted from the ground is an operation that is extremely detrimental to any natural environment that is involved. More specifically, the natural environment that could be potentially put in jeopardy is the Arctic National Wildlife Refuge on the Northern Coast of Alaska. This is an area that many people believe would be a good place to drill because firstly it is on American soil which would help to diminish our reliance on foreign oil and secondly it seems like a deserted wasteland that would not be affected greatly by the drilling process. Many people do not realize that this refuge is home to many different tribes of people and a wide assortment of wildlife that would be greatly harmed if drilling were to happen in this area. There are very few places left in America that have been untouched by the industrialization that runs our society, and when all of these natural places are demolished it will be much more difficult for humans to survive on this planet. Many people do not realize that the Arctic is such a delicate place, a place in which is warming twice as fast as the rest of the world. As global warming takes its toll, the Arctic will eventually be the first place in the country where people are no longer able to survive, and drilling in the Arctic will only speed up this process.

The second issue is that once the fossil fuel is extracted from the ground it is burned in order to create energy. The energy produced from the oil is used to run cars or in homes for heat and energy. This mass amount of fossil fuel that is being burned is one of the main causes of global warming. When burnt this fuel releases large amounts of carbon dioxide, the most popular green house gas, that

is released into the atmosphere. It has been proven by many different scientific studies, and illustrated by Figure 1 and Figure 2 below, that ever since the industrial revolution the worlds surface temperature has gradually increased with the help of carbon dioxide.

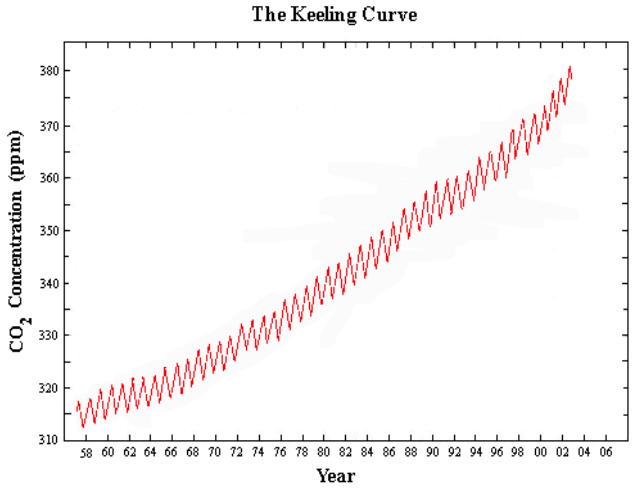

Fig. 1: The Keeling Curve (www.wunderground.com)

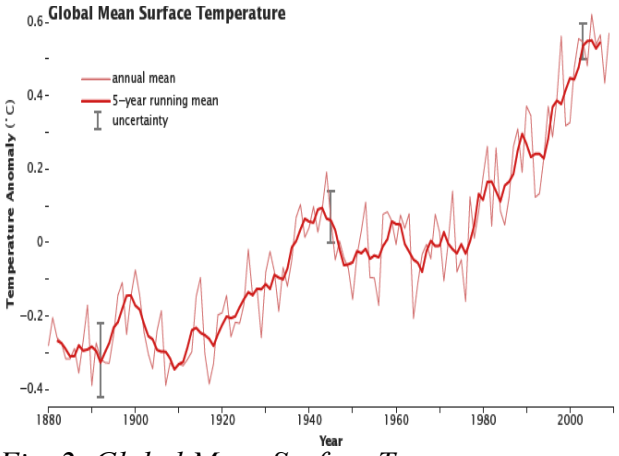

Fig. 2: Global Mean Surface Temperature (http://earthobservatory.nasa.gov/Features/GlobalWarming/page2.php)

The United States population only accounts for less than 5% of the worlds population, but because we are highly developed we use more than 25% of the worlds fossil fuels. Many people in America live in large homes and own multiple cars and most every action we take involves the burning of some type of fossil fuel. The actual process of drilling and then transporting the oil to where it needs to be in itself is a huge use of burning fossil fuels. The anaerobic decomposition of buried dead organisms is the process in which produces these oils that we find deeply buried into the ground. This process takes millions of years to happen, making these fossil fuels a nonrenewable resource. At this time we have a finite amount of fossil fuel in the Earth and once we have exhausted our supply of it there will be nothing left to support the lavish lifestyles of Americans. It becomes a question of which will happen first; we run out of fossil fuel or the burning of fossil fuel wreaks so much havoc on our environment that humans are no longer physically capable to survive on our heated planet.

Natural History of ANWR

The Arctic National Wildlife Refuge is one of many wildlife refuges in Alaska, and might possibly be the most important. It is located in the northeastern corner of Alaska and contains 19.3 million acres of land, with no roads or marked trails, just untouched wilderness. Because of Alaska's northern location, sunlight is constant in the heart of the summer and nonexistent in the dead of winter. The animals of the region have adapted to these circumstances by feeding on specific animals and plants that will help them absorb the sun rays through digestion. Other organisms have adapted by using very low levels of energy in order to conserve. Another unique aspect of the climate that comes along with its northern location is the permafrost which is the ground below the surface that stays frozen all year round. This leaves the ground unfit for any growth during the winter months. During the warmer summer months an active layer appears, which is the top layer of the soil that defrosts and permits plants to grow and insects to live (*A Sense of the Refuge: Arctic National Wildlife Refuge*).

ANWR stands apart from the other refuges in Alaska because it encompasses five different ecological regions; coastal marine, coastal plain tundra, alpine, forest-tundra transition, and boreal forest. Each zone produces unique wilderness, supports various wildlife species and produces different recreational worth. The boreal forest is the main forest land in this refuge and is filled with a mix of spruce, birch and aspen trees. The animals that dwell this region are mainly the lynx, moose, weasel and a wide assortment of bird species. The forest-tundra transition is where the trees begin to meet the low lying tundra plants. It is the main roaming land for the moose and wolves and during the winter this is where the caribou come to feed. The alpine region is known for the Brooks Range mountains. The mountains are home to the dall sheep, grizzly bears, wolves and ground squirrels. The coastal plain tundra and the coastal marine are the most important regions in relation to the issue of drilling. The coastal plain is the mostly flat land that caribou and birds use to raise their young during the

summer months, and also where the polar bears live during the winter. The coastal marine borders the Arctic Ocean and contains the main water habitats of this refuge, including salt marshes, lagoons, beaches and river deltas. This is where the polar bears feed on the vast fish species and is also important for migratory birds (*A Sense of the Refuge: Arctic National Wildlife Refuge*). "The coastal plain is the focus of land use conflicts because it is both the location of potentially vast hydrocarbon deposits as well as the most productive habitat for an impressive assemblage of large mammals and waterfowl (Fischman, 189)."

The human population of the Arctic National Wildlife Refuge is also a big part of the history and the current condition of this region. Mainly, there are two types of people that inhabit this part of Alaska; the Inupiat Eskimos and the Gwich'in Athabaskan Indians. These two groups of people live in different locations of ANWR but have a lot in common. Both are tribes that live solely off the land, and use hunting as their primary way of life. Many people live in huts and do not have access to electricity. These groups have inhabited the Arctic region for thousands of years and throughout this time have handed down their traditions that are still very much intact today. What sets these two groups apart is their location and their main source of food. The Inupiat Eskimos mainly focus on whaling because they live near the water and it is an act that brings their community together. The responsibilities of each member varies, from catching the whale to butchering it and cooking the meat. Throughout the year the people of this community can survive on three whales that they have caught themselves. This tradition of hunting the bowhead whale has been passed down by their ancestors, and they believe is the reason why there community has lasted as long as it has in the Alaskan habitat (Banerjee, 337). The Gwich'in Indians on the contrary, live more inland and rely more on the caribou population for their survival. The caribou is a part of their culture and their spirituality, and throughout the years of this groups existence they have followed the caribou around to wherever it would take

them. They use every piece of the caribou to help sustain their lives; clothing, tools and even shelter. Similarly to the Eskimos, without the caribou this group of people would not exist in this arctic region (Banerjee, 262). It is clear from studying the people of ANWR that the land and its natural inhabitants are extremely important to their survival which is why the population of ANWR is actively fighting to protect it's resources.

Environmental History and Politics

To better understand the current circumstance and the danger that ANWR is facing, it is best to look back at America's history and political findings. First outlining the history of the National Wildlife Refuge system, then get into more specific politics surrounding drilling in the Arctic and then lastly looking at the affects of past oil spills.

Public Lands in America

Protecting public land in order to conserve precious habitat, resources and animal species is something that dates back to the 19th century in America. The land that the federal government owns is managed by four different agencies; the National Park Service, the Forest Service, the Bureau of Land Management and the Fish and Wildlife Service. The National Park System encompasses over 50 parks throughout the country with the goal of conserving habitats for species and absorbing pollution. The Park system plays an important role in providing the public with the intrinsic value of nature because many of these parks have become tourist attractions. The National Forest System contains about 200 million acres of forests and grassland that are preserved for activities such as livestock grazing, timber harvesting and protection of fish and wildlife habitats. The Forest systems main goal is to find a level of timber harvesting that is economically and environmentally safe and sustainable. The Bureau of Land Management has control over about 260 million acres of mostly rangeland in the western United

States. These federal lands receive more economic activity than the previous systems, such as energy development, timber harvesting, mining and fishing. This land also generates revenue for states, local entities and the federal government by the sale of permits for grazing, sale of timber and leases for mineral development. Lastly is the Fish and Wildlife Service which includes over 90 million acres of wildlife that is primarily dedicated to preservation. The FWS mainly focuses on endangered species and migratory animals (*Management of National Parks and Public Lands*). Within the FWS is the National Wildlife Refuge system which has a vast history that is important in the case of the Arctic National Wildlife Refuge.

The first president to set the precedent for the National Wildlife Refuge system was Theodore Roosevelt in 1903. His first action of conservation was for Pelican Island in Florida, where many different bird species were being hunted for their feathers with no regulation and these bird populations were quickly being depleted. Two years later, in 1905, a new section of the Department of Agriculture, the Bureau of Biological Survey, was created in order to manage and be responsible for these newly found protected lands. After Pelican Island the Refuge system grew exponentially throughout its first decade, and lands were mainly chosen in order to protect certain migratory bird species from over hunting. "By the end of his administration in l909, Roosevelt had issued a total of 5l Executive Orders that established wildlife reservations in l7 states and three territories (*NWRS History*)." Two legislations were passed throughout the 1920's in an effort to protect the migratory bird species and to create a more concrete "refuge system." These two acts, the Migratory Bird Treaty Act and the Migratory Bird Conservation Act, struggled to achieve everything they were hoping for and were stripped as they went up against congress (*NWRS History)*.

The next big break for the National Wildlife Refuge System came in 1934 with the passage of

the Migratory Bird Hunting and Conservation Stamp Act. Before this time, the funds to buy refuges came from appropriated federal funds. During the Great Depression these funds became scarce and a new way to afford these refuges were needed. This act, also known as the Duck Stamp Act, was created in order to fund refuges for waterfowl conservation. The federal stamp was something that all hunters had to buy and place on their state hunting licenses. "Ninety percent of the Duck Stamp fund revenues were earmarked for acquisition of habitat and the remainder for refuge management (Fischman, 37)." Following these new found funds, in 1935, the refuge system acquired new management. J. Clark Salyer was appointed by the head of the Bureau of Biological Survey to take control and manage this new program. He headed the Refuge system for the next 31 years, and was able to successfully choose refuge lands where they were needed and was able make sure these lands were cared for the best that they could be, a lot of the time taking on that duty himself. In 1939 the Bureau of Biological Survey was moved to the Department of the Interior, and within the next year it was combined with the Bureau of Fisheries to create the Fish and Wildlife Service. From that point on the FWS was in charge of the refuge system, but in the 1956 Fish and Wildlife Act a comprehensive policy was laid out to give them the authority to create new and develop existing the refuges across the country (*NWRS History)*.

The next step for the National Wildlife Refuge system was recreation. In 1962, the Refuge Recreation Act was passed and it allowed recreational services in the refuges as long as it would not interfere with development of that refuge and if funds allowed. This act began the public use of refuges for recreation that encouraged environmentally friendly activities. The next big act for the refuge system was the 1966 National Wildlife Refuge System Administration Act. "Congress, in 1966, designated as the National Wildlife Refuge System "all lands, waters, and interests therein administered by the Secretary as wildlife refuges, areas for the protection and conservation of fish and wildlife that

are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas (Fischman,46)." This act was the beginning of the bond between refuges and endangered species which is an important aspect because many endangered species habitats are protected by refuges. This 1966 act was amended in 1977 by the National Wildlife Refuge System Improvement Act by clarifying some duties and supplying guidance of the system but overall the essence of the system was not altered (*NWRS History)*.

Throughout the years, the National Wildlife Refuge System has made tremendous strides in the area of conservation and protection of America's resources. Today the NWRS contains more than 540 different land areas equalling more than 100 million acres and cross through all 50 states. The system is still dedicated to preserving the homes to many different species and protecting America's natural land so that people can enjoy them for all the years to come (*NWRS History)*.

The Drilling Debate in ANWR

A huge part of the National Wildlife Refuge system are the refuges that are located in Alaska. More specifically, the largest refuge in the system is the Arctic National Wildlife Refuge that runs 19.6 million acres and encompasses a mass amount of species and even various ecosystems as a whole. Because of the enormity of the Alaskan refuges and the pristine landscapes that it protects, there are many laws and acts that apply only to these refuges. In more recent years, the most popular argument that has surrounded the fate of ANWR is the idea of oil and gas development in the coastal plain.

It began in the 1960's, when the Prudhoe Bay field, land owned by Alaska, was leased to oil companies to drill. This land is just west of ANWR and produced 11 to 13 billion barrels of oil, and was transported by the Trans-Alaska Pipeline that was built in 1970. "Alaska derives most of its state

revenue, close to 80 percent for the 2002-2003 fiscal year, from oil royalties (Fischman, 189)." Soon, questions arose about the coastal plain of ANWR and about possible drilling in this area. It is believed that the coastal plain contains approximately the same amount of oil as that of Prudhoe Bay (Fischman, 189). Since then, it has been a constant struggle between preserving the wilderness of the refuge or exploiting it for oil.

Alaska became part of the American union in 1959 as the 49th state of America. In Alaska's early years as a state, many local institutions took it upon themselves to protect the lands in the northeastern part of the state. Organizations such as the Tanana Valley Sportsmen's Association and the Fairbanks Chamber of Commerce advocated for wildlife protection while opposing groups felt that preservation would hinder Alaska's development. Then in May of 1959, Fred Seaton, the US Secretary of the Interior created a draft of legislation that planned to create a 9 million acre "range" in the northern slope of Alaska. Seaton had the help of Ted Stevens, who was a former prosecutor in Alaska, in drafting up this legislation. The work of these two men payed off in 1960 when Public Land Order 2214 was designating, officially granting 8.9 million acres of land in northern Alaska a national wildlife range (McMonagle, 24-25). Two legislations were passed during the 1970's that attributed or began the debate about drilling. The first being the Alaska Native Claims Settlement Act of 1971 (ANSCA) which "distributed roughly 44 million acres across the state to indigenous Eskimos and Indians (McMonagle, 6)." Secondly there is The Alaska National Interest Lands Conservation Act of 1980 was when the addition of the 9.2 million acres were added to the original ANWR and it transformed the once wildlife range into a new refuge. "ANILCA prohibited oil and gas leasing, production, and development unless authorized by a subsequent act of Congress (Fischman, 190)." This law did not include the coastal plain as part of ANWR. A vote occurred twice in the House of Representatives about whether or not to name the coastal plain wilderness which would save it from oil

exploration (McMonagle, 7). With both votes failing, this area was named a “special zone” or the “1002 area” where seismic exploration but not drilling could occur, and Congress when the time came would be in charge of making the decision of whether or not to drill (McMonagle, 7).

The Interior Department in 1987, during Reagan's presidency, studied the effects a drilling in the coastal plain might take place and this included an environmental impact statement. The Interior suggested that the land should be fully leased and opened to oil and gas development throughout the entire coastal plain of ANWR. Many conservationists disagreed with recommendation and throughout the years following there was many ups and downs surrounding the potential drilling. No bills were able to get passed by Congress in order to allow the leasing of the land. Every since this, drilling in the Arctic has been a topic that all politicians have taken a stance on. President George W. Bush was very much for drilling in the Arctic because he believed it would lower the rising prices of gas in America. The decisions on whether or not to allow drilling have constantly fluctuated and oil companies have gotten their hopes up but had yet to actually begin drilling until the Obama administration.

The most recent news came on March 31st, 2010 when President Obama spoke about the new energy proposal that would allow drilling for oil in the Beaufort and Chukchi seas. Many environmental organizations and communities that lived along these water ways then tried suing Shell and the Interior Department's Mineral Management Service unsuccessfully. Shell had spent $2.1 billion to buy leases and the MMS approved Shell's plan to drill five wells in both the Beaufort and Chukchi seas in the coming years. In February of this year, it became clear to everyone that Shell was not ready for what drilling in the Arctic would entail. With big plans and a lot of money invested in the project, Shell announced that they would suspending the Arctic drilling for the year of 2013. Two of their main drill ships were involved in numerous accidents while traveling to and from the drill sites

and Shel is also finding difficulty operating at the sites. On top of the difficulties these ships faced, they also did not pass inspections done by the Coast Guard and maintenance must be done before these ships are allowed on the seas. Many environmentalist groups and native people of Alaska are happy about the current stall in drilling, but many fear what the future holds because Shell is not backing down completely and still have full intentions to extract the oil from ANWR's coastal plain (*With 2 Ships Damaged, Shell Suspends Arctic Drilling*).

Environmental Economics

Economics plays a big factor in the potential drilling for oil in Alaska. Many people believe that the fate of America lies in the amount of oil we can find in the future. Without oil, it is believed, that the economy of America would be demolished. But what would happen if America suddenly found itself without any natural environments, like the one set aside in ANWR. It is hard to compare actual economic money and profit to that of an environmental asset because one does not have a clear monetary value. In this section, I will compare the amount of money that could potentially be made by drilling the Arctic to the amount of harm that the environment could be put in.

Shortcomings of the Cost-Benefit Analysis

Today, in the area of environmental economics the main tool used to make decisions about environmental uses is the cost-benefit analysis. Basically this process entails a comparison of how much value the environmental good will provide currently and in the future, in terms of money versus the value of preserving the same environmental good. The good would be preserved if the value of preserving is higher than the cost of using the good (Heal, 6). This process is something that is used by the government, economists and many other groups when analyzing whether or not drilling should occur in ANWR. The current use of this process clearly has its weaknesses because very few environmental goods are being preserved in a sustainable fashion. Using the analysis of Geoffrey Heal, I will show that the cost-benefit analysis system that is currently in use is flawed and needs an overhaul in order to create actual sustainable practices in our country.

The current system of cost-benefit analysis has many issues that hinder its ability to make positive environmental decisions. The first and biggest drawback is rooted in the fact that the cost-benefit analysis uses the discounted utilitarian framework. It is believed that "the best path is said to be

with that which provides the greatest present discounted value of net benefits (Heal, 8)." This is an issue for many environmentalists because it neglects the future, which is when many of these troubling environmental issues will resurface. For example, species extinction is something that may not directly affect the current population but could cause more of a harm to people in the distant future. Discounting the values of these environmental resources of the future is highly neglecting their actual value and in turn making the cost-benefit analysis less accurate. The reason for the negligence is because time lines of scientists and economists vary greatly, whereas scientists see centuries as a short term and economists see decades as long term (Heal, 8-9). A second issue that prevents the cost-benefit analysis from success is the under valuing of the environmental assets. Many people underestimate how much value aspects of the environment bring to our every day lives. For example, basic human life is sustained by naturally occurring species such as green plants, bacteria, soil and insects (Heal, 14). People who are removed from their natural environments have a hard time realizing that we rely so heavily on these natural systems for survival, and if this concept was more widely known these assets would definitely be protected more efficiently.

After looking at what is currently wrong with the cost-benefit analysis, the next step is finding a way to change it. To compensate for the two main issues outlined above, there needs to be a larger stress on future benefits of certain actions as well as a higher valuation for preserving certain environmental assets. An alternative to the discounted utilitarian framework, is called the "green golden rule" which ranks "alternative strategies by their maximum sustainable utility levels (Heal, 17)." This approach puts almost complete emphasis on the future, so to mix that with the discounted utilitarian approach to find a happy medium could potentially be the best solution. A way to do this would be by "ranking paths which place positive weight on the limiting properties of a path and positive weight on its properties in the near term (Heal, 17)." A better balance between the future and

the present would help to create a more sustainable cost-benefit analysis. With the underestimating of the environmental assets, awareness would potentially be able to change the norm. The mind set would have to stray from seeing environmental goods as something that could be consumed or changed into some kind of product for consumption. People need to start seeing the environment as a good itself without being touched. Our environmental assets bring us utility without human interference, for example a forest standing alone brings us the utility of clean oxygen and if people could see that as a good instead of the forest being a source of paper then the cost-benefit analysis would be more successful (Heal, 15). Currently the environment is not something that is being represented fairly by economists, and a better integration of environmentalism and economics would create a much steadier and financially secure future.

Oil in ANWR; A Guessing Game

Throughout the world, we have found many oil reserves that have been able to supply each country with its needed gas. It has come to a point where the need for gas and oil has almost exceeded the supply of it. Many of the worlds largest oil reserves have been depleted and search for the next best thing has led to the interest in Alaska. The human population has already used up the oil from sites that were found to be the easiest access making them the best economical choices. With no decline of demand for oil or energy security, the time has come where politicians, scientists and everyday people have found themselves trying to weigh the pros and cons of drilling in less accessible places, and trying to decide is it economically worth it. It is estimated by the US Geological Survey that 25 percent of the worlds remaining oil reserves are located throughout the Arctic circle, which includes Alaska, Canada, Norway and Russia. "The total estimate for the world is 268 billion Sm^3 o.e., or 1690 billion barrels o/e/ of the 70 billion Sm^3 that is stipulated to be in the Arctic. The major reserves seem to be in Western Siberia on land, North Slope of Alaska offshore and East Greenland offshore (*Arctic Oil and*

Gas: Sustainability at Risk?)." These numbers fluctuate higher and lower throughout time and with different sources because there is no concrete evidence of actually how much oil would be found. The reports have differed on exactly how much oil is underground beneath the coastal plain of ANWR and no one will really know for sure until drilling actually occurs. The most used estimate of oil under ANWR is from the U.S. Geological Survey who "estimated in 2000 that, assuming a price of $24 per barrel, there is a 95% chance of finding 1.9 billion barrels (BBO) of economically recoverable oil in the Arctic Refuge's 1002 Area; a 5% chance of finding 9.4 BBO; and a 50% chance of finding 5.3 BBO. [...] Americans use 19 million barrels of oil each day, or 7 billion barrels of oil per year. There is, therefore, a 50% chance of finding a 9 month's supply of oil in the 1002 Area, at $24 per barrel (*Arctic Refuge: Oil and Gas Issues*)."

The best way to speculate about how a potential drilling would work in ANWR is to look back at the drilling in a near by area with the same ecosystems, that of Prudhoe Bay. This oil field was discovered in 1968 on state-owned land, but did not start actual production until 1977. Since the inception of this site it has grown to encompass "23 producing reservoirs, with 115 gravel drill sites and 20 processing facilities, 960 km of permanent roads and trails, 725 km of pipeline corridors, and 353 km of transmission lines (*Arctic Oil and Gas: Sustainability at Risk?)*." Before the drilling in this area began, there were no permanent residents in this area but there is communities near by and hunters have been known to use this land. In 1969 the state of Alaska was granted with $900 million in lease sales, an amount that highly increased the states total revenues from years earlier. After this, the companies then had to produce a pipeline in order to transport the oil to an ice-free port. In 1971 , the Alaska Native Claims Settlement Act awarded $1 billion in cash to benefit the native people of Alaska in return for the allowance of a 44 million acre pipeline. The pipeline, which was constructed in 1974, stretched for 800 miles and costed the United States $8 billion dollars. During this time period, the

population of Alaska rose 25 percent. From this oil development, $280 billion worth of oil was produced and stimulated the economy of the Alaskan people. Since Prudhoe bay the material standard of being has improved in Alaska, where before this most communities did not have running water, flushing toilets or telephones and after now all communities of Alaska have houses and schools with modern plumbing and access to the internet. With these new technologies though, a good majority of the people living in Alaska still rely on the natural environment for their food and their cultural traditions. It would seem like the oil industry coming to this area would open up job opportunities for the native people but that is not that case. About 60 percent of the people native to Alaska have jobs, either full or part time but it is a very little amount of these people who work for the oil industry. The oil field provides jobs to about 5,000 people who are not residents of Alaska (*Arctic Oil and Gas: Sustainability at Risk?)*. It is clear that the oil industry has brought a large amount of money into Alaska and helped to jump start their economy.

Environmental Costs

Economics of this situation, and of many situations arising in America, are not fully analyzed unless you take into consideration the effect it will have on the environment. The main concept to use when assessing the pros and cons of drilling in the Arctic is sustainable development. This basically means to keep in mind the environment when making laws or decisions so that we as humans are able to fulfill the basic needs of people, improve the standard of living and protect ecosystems to the point where the resources future people need to survive will be guaranteed to them. Drilling in the Arctic brings about a plethora of concern and many signs of unsustainable development. For example, drilling will be very likely to displace wildlife which would decrease the standard of life for the native people in these communities who rely on hunting. If the animals that they hunt are misplaced it will prove harder for the people to survive. A potential oil spill, and the noise pollution that comes along

with drilling will also create issues for marine life. Many of the tribe along the shores of Alaska rely on the whales as a huge part of their entire existence. It is also believed that if drilling were to grow in the North it would eventually lead to a modernization of this area and begin a type of Western style living. Influence from outside sources, such as the media will create an economy that relies on money like the rest of America. Alaska is known for its traditional ways and this kind of influence can greatly change their lifestyles and ruin their traditions that have prevailed for thousands of years. It is a fact that in order to run one of these oil facilities, it will cause an increase in air and road traffic which leads to air pollution. This also leads to an increase of population in this area which could potentially harm the land that is not used to supplying for an influx amount of people. The greatest concern could possibly be the fact that global warming has already taken a great toll on the north, from its ice conditions to the changes in food chains. With an already changing landscape, due to the behaviors of the other American citizens, it is hard to predict how the Arctic region will react to intensive drilling activity.

Data from the Prudhoe Bay fields can help us see what kind of environmental effects may occur if this were to expand on a larger scale. In reference to air pollution, it has been found that emissions from Prudhoe Bay have been found 200 miles away in another part of Alaska. This fact goes to show that the pollution is not going to be contained to a small space, it is inevitable that the harmful effects will travel to unknown locations. The oil industry on the Northern Slope has been found to emit thousands of nitrogen oxides that contribute to smog and acid rain, thousands of tons of sulfur dioxide, particulate matter, carbon monoxide, and volatile organic compounds are emitted each year. "North Slope oil facilities release large quantities of greenhouse gases, including 24,000 metric tons of methane and 7.3 to 40 million metric tons of carbon dioxide annually (Banerjee, 182)." The amount of air pollution created by the drilling process will no doubt have harmful affects on Alaska that will need further repairs which cost money. Another major finding from the current oil industry in the North

Slope is the spills that happen on a day to day basis continuously. “By 2009, ADEC reported over 6,000 spills of toxic substance totaling over 2.7 million gallons for the 14-year period (Banerjee, 182).” The substances of these spills span from all different types of toxics, from acids to oils, and they happen throughout the everyday operations of the job. It is impossible for this job of drilling to get done without any of the materials seeping their way into the natural environment.

Another important fact that must be taken into consideration is the climate of this region. Because of Alaska's arctic temperatures and other unique aspects of its landscapes, it makes predictions really difficult on how certain failures will affect it. For example, if a serious oil spill were to occur in the Arctic Ocean the process for cleaning would be completely different from that of when the spill happened in the Gulf of Mexico. The habitat is completely different and the animal species are also completely unique to this area. No one would know how to handle that situation until it happened and at that point it would be too late. The environmental degradation from an oil spill would lead to an enormous amount of economic distress for America and the people of Alaska.

Learning From the Past: The BP Oil Spill

Drilling in the Arctic has its risks and the most obvious risk is a potential oil spill. The BP Deepwater Horizon oil spill in the Gulf of Mexico that occurred in 2010 was one of the most devastating environmental disasters to ever occur in the history of America. Looking into the causes and the outcome of the BP oil spill help to put into perspective what could potentially happen if drilling were allowed in the ANWR. Granted the ecosystems and the temperature are highly opposite from the Arctic, it still can set a decent precedent for what could occur. The BP oil spill began on April 15th of 2010 when an explosion occurred due to methane gas reached one of the oil rigs. Many attempts to put out the fire failed and it ended up burning for about a day and a half. Many of the workers on the rig

were able to escape but 11 were killed from the explosion. Because many of the safety equipment had failed because it had not been properly maintained, and this lead to the failure causing the oil to spill straight into the Gulf. Many estimates were released about how much oil was being released, and the most accurate of them all claimed that there were 50,000 to 60,000 barrels a day leaking into the water (Rolston, 2). Efforts were made to capture the oil that was engulfing the ocean with little prevail and it took three months for anyone to figure out how to stop the leak. It was not until July 15th that the spill was stopped, and by this point there was an estimated 4.4 million barrels of gas in the Gulf of Mexico. The BP oil spill was "the largest spill in the history of the petroleum industry, ten times that of the Exxon Valdez spill (Rolston, 3)."

The aftermath of this tragedy is where most of the information comes from. The oil from this three month extravaganza was able to spread immensely to the point where oil was found washed up on the beaches of Louisiana, Alabama and Florida. There were many economical issues that were faced after this disaster. For example, the fishing and tourism industries that were once strong in the Gulf of Mexico took a big hit during this time period. Ships of all sorts were in need to help stop the oil from spreading to areas and causing even more damage. Thousands of people helped to clean up the oil in the water and on land, most of them being volunteers. The amount of damage that happened underwater is still this day immeasurable. Many jobs were lost after this happened because there was a 6 month ban on offshore drilling. The biggest issue was then who to place the blame on, and how would they repay for all the damages. BP ended up taking the responsibility for the spill, admitting that they had made mistakes that had led up to the spill, and they would be the ones responsible for paying for all of the damages. Obama, the President at the time, was able to get a 20 billion dollar response fund created by BP for the overall damages, which was a complete guesstimate of the actual cost (Rolston, 3). With issues such as oil spills it is quite difficult to create a complete and accurate cost of

damages. The animal species that were put at risk is also a serious aspect of the spill. It was estimated that 400 species in this region were as risk from the oil spill, including some endangered species. "Nearly seven thousand dead animals were collected. Nearly eighty-seven thousand square miles, or about 36% of Gulf of Mexico federal waters, were at one time closed to fishing (Rolston, 4)." The spill had caused a large time period of chaos throughout America and was an eye opening experience for many people around the country watching this environmental tragedy occur right before their eyes while watching the news. The media coverage was a big part of the incident and helped many people begin to realize that our environment would constantly be in danger of this type of thing happening again if we continue to let oil companies drill in our oceans and waterways.

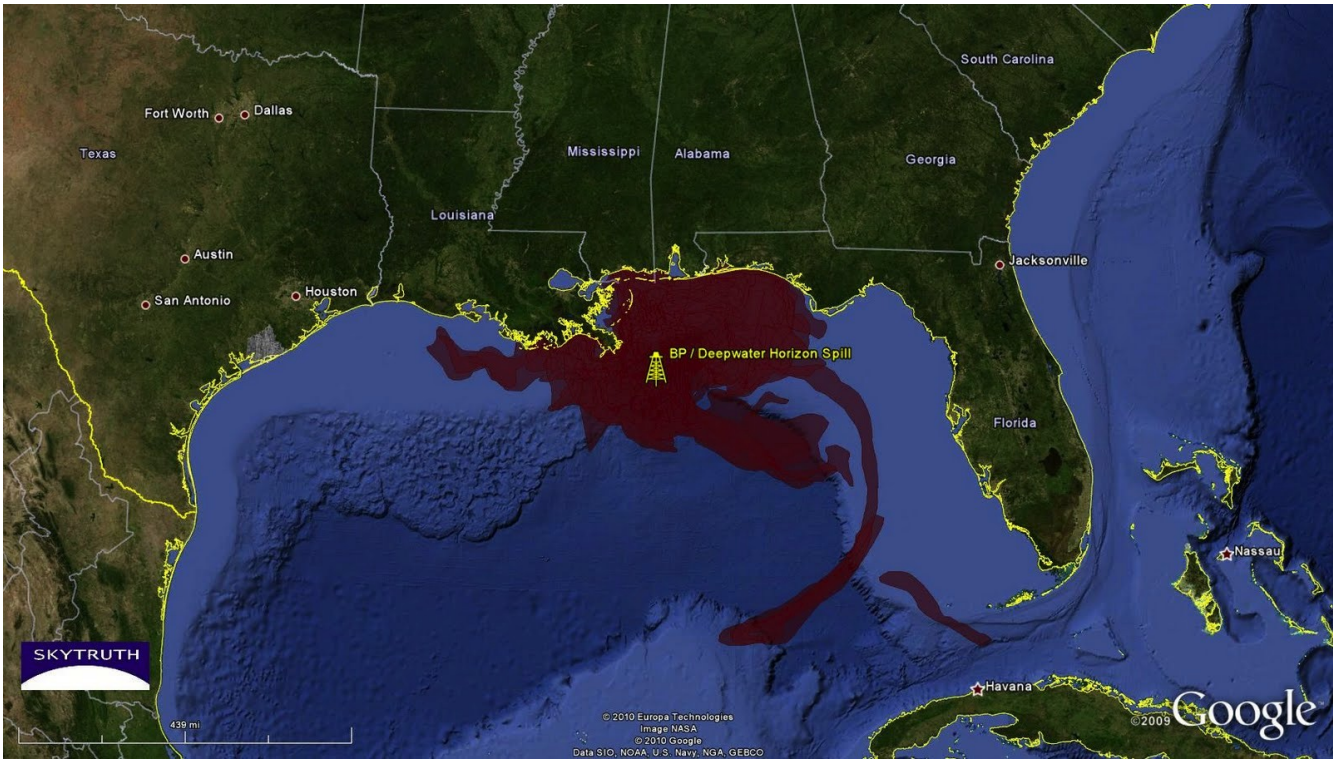

Fig. 3: Range of BP Oil Spill (http://www.worldviewofglobalwarming.org/gulfoil/intro.php)

Environmental Ethics

Lastly I will look at drilling in ANWR from an ethical standpoint. It is clear that drilling will have an effect on animal populations as well as the human populations that inhabit these Alaskan areas. When looking at the intrinsic value of nature, rights of animals, and the duty the current generation has to its future generations it is clear that drilling in ANWR would be morally incorrect.

The Intrinsic Value of Nature

When discussing the matter of extracting natural resources for human use, it is most important to look at how people view nature. There are two main opposing views to what nature is and how humans should act toward it, and they are called the homocentric outlook and the ecocentric outlook. The homocentric party believes that when there is an issue or concern the only thing to be put into consideration is the interest of humans. On the opposing side is the ecocentric's who believe that humans have a "moral responsibility to a fragile, vulnerable nature (Worster, 44)." The first group of people think that men have a right to over power nature and do not need to take in consideration the natural environment when the outcome would be the best option for humans. On the contrary, ecocentric's argue that it is of utmost importance for civilization to consider the environment because nature deserves the right to freedom from being taken advantage of.

In his article, "The Intrinsic Value of Nature", Donald Worster argues for the ecocentric point of view and shows that with the worlds current circumstances this point of view will be necessary in order to sustain life on this planet. The ideology that humans can take nature solely for its natural resources and manipulate it only to benefit the final means of humans is something that has fueled the success of industrialization throughout American history. The rights of nature were put aside in order to dominate nature and gain wealth and power, leaving our current environment in peril. Worster believes that the

way in which we can refute the homocentric view is “to recognize that nature has certain specific rights while affirming equally valid human rights to a fair share of earth's resources (Worster, 46).” Mainly, humans need to recognize that nature is entitled to many of the same types of rights that are laid out for humans in the Bill of Rights. Many of these rights have already been laid out in various environmental legislations such as the protection of endangered species and the banning of harmful chemicals. When giving nature these rights humans are basically putting restrictions on their own actions in order to fulfill these rights. In an effort to better understand and establish the rights of nature, humans need to start looking inward at their own actions and decide limits for our economical needs and our moral limits. Men have used nature and its natural resources as a means to his economic gain for many years, much like a man will use other humans for his economic gain. Humans are dependent on other humans for success in their lives and nature falls into that same category, yet nature is not given the same rights that humans are. The entire world runs off of an interdependent system where we all rely on each other for life, and humans rely just as much on other humans as they do on nature (Worster, 44-48). Due to this fact, it is clear that humans need to make a change and begin to see nature as an equal and not something that we can over power and take advantage of. Bringing these ecocentric beliefs into the ANWR drilling debate would make huge strides in order to save the natural environment.

Valuing Biodiversity

Next to looking at the value of actual natural wildlife it is also vital to assess the importance of animal and plant species, and the biodiversity that is inhabiting these natural spaces. ANWR is known for its diverse array of species that have adapted to living in this unique climate. One of the main reasons for creating natural wildlife refuges throughout America is to preserve the habitats of plant and animal species and to promote biodiversity. With the proposal of drilling on the north slope of Alaska it unknown what kind of harm the animals of the region will be put in but it is clear that some kind of

burden will be placed on these animals. This brings about the question of what kind of moral obligation do we as humans have to protect animal as a species and the biodiversity that we have been given.

To prove that we should save and protect species it is first important to show that species are good for something. For example, many plant species are used as medicine to cure deadly diseases. Plants also create fruits and vegetables that are sold around the world to make profits. Plant species are also commonly used in scientific experiments and to advance scientific techniques. Each different species is also vital for the role it plays in the ecosystem. Humans rely on all types of ecosystems for every day support, and the interdependent system will always be adversely affected by the absence of an entire species. People who argue that rare species have no value to humans are not taking into consideration that many rare species hold keys to natural history. Killing off a rare species could potentially be equivalent to burning down a museum full of ancient artifacts. Using a more philosophical ideology, it can be argued that connections with nature and animals will enhance the life of humans. The philosopher Holmes Rolston believes that "human well-being depends on relationships not only with other humans, but with life on Earth (Rolston, 131)." People of virtue would not deliberately choose to kill off an endangered species. A person lives a more fulfilled life when they care about things outside themselves, including other humans and the natural environment (Rolston, 130-134).

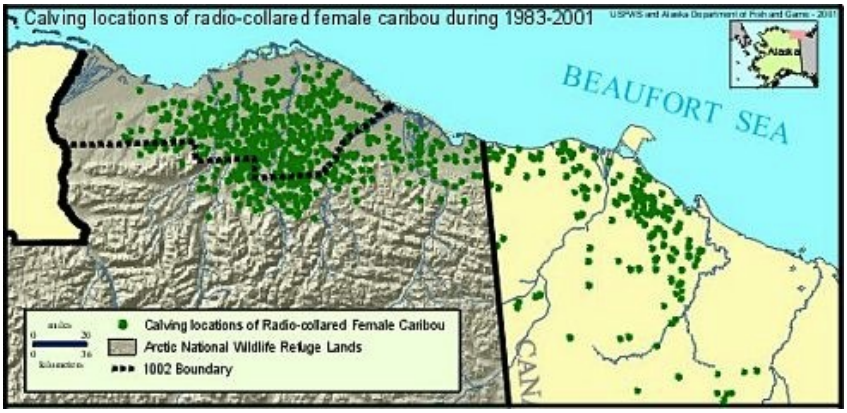

Fig. 4: Calving Locations of Caribou (http://arctic.fws.gov/issues1.htm)

Fig. 5: Polar Bear Den Locations (http://arctic.fws.gov/issues1.htm)

The above two maps illustrate two main issues surrounding the animal rights issue within ANWR. The first map is focused on the caribou, who travel to the coastal plain in the spring in order to birth their young. During this season the female caribou's need more nutrition, just like any human that is giving birth. The caribou herds come to this area to find the more abundant food resources. This map, in Figure 4, shows that the area in which the caribou's come to produce healthy offspring overlaps the area in which drilling is proposed to occur. Human disturbance, which will occur if the

drilling were to take place here, would scare off these caribou herds, making it difficult for them to freely find the food that they need for sustenance. The next map looks at the polar bear den locations, which is a similar problem to the caribou. The female polar bears that plan to give birth build dens for their cubs in the winter. The polar bears prefer to do this on ocean ice, or on the shorelines, as shown in Figure 5. If drilling were to occur in this area, the noise, vibration and human presence will be likely to also scare off these mother polar bears. The uprooting of these polar bears could lead to more infant deaths, because they cannot survive the harsher climate that the polar bears will experience inland. (*Arctic Refuge: Oil and Gas Issues*) Just looking at these two, of many more, issues that animal species may face if drilling were to be allowed it can clearly be seen that humans would be directly causing harm to these populations that are already so fragile.

Future Generations and Oil

Another main issue that surrounds the use of coal and oil for energy in the United States is the fact that it is now known that these fossil fuels will not last us for the long term. The main sources of our fuel has come from outside the country and those reserves have almost been completely depleted at this point. The American government is desperately surveying more and more lands to try and find substantial fossil fuel reserves that could supply the American people. This process has led them to ANWR, an area that may or may not have a substantial amount of oil below its surface. The reports have differed on exactly how much oil is underground beneath the coastal plain of ANWR and no one will really know for sure until drilling actually occurs. The most used estimate of oil under ANWR is from the U.S. Geological Survey who "estimated in 2000 that, assuming a price of $24 per barrel, there is a 95% chance of finding 1.9 billion barrels (BBO) of economically recoverable oil in the Arctic Refuge's 1002 Area; a 5% chance of finding 9.4 BBO; and a 50% chance of finding 5.3 BBO. [...]

Americans use 19 million barrels of oil each day, or 7 billion barrels of oil per year. There is, therefore, a 50% chance of finding a 9 month's supply of oil in the 1002 Area, at $24 per barrel (*Arctic Refuge: Oil and Gas Issues*)." It is clear from this estimate that drilling in the northern slope of ANWR would not have a long term benefit for the people of the United States. On the contrary it would cost our government a lot of money to go through with this and it would most definitely cause and unpredictable amount of environmental harms. This leads us to the ethical question of do we have a moral responsibilities to the future human race and, if so, what kind of responsibilities. By drilling in the Arctic are we acting irresponsibly and not leaving the future population an Earth they could survive with?

First, it must be proven that we, as humans, do have a responsibility to the future generations. To do so, DesJardins refutes the three most popular arguments against having responsibilities to future generations. The first is the "argument for ignorance" which states that we do not know these future people or what they would want or need to survive so therefore we have no duty to help them or protect them. This judgment of the future people is not entirely correct, because it is true that we will not know them intimately but we can judge, from being humans ourselves, what they will need to live a fairly good life, similar to the one current humans are living now. Minimally they would need fresh air to breathe and clean water to drink if they wish to survive. Also, we are well aware that humans in the future require a climate of a certain temperature in order to sustain life (DesJardins, 72). All of these things could and most likely will be put in jeopardy if drilling in ANWR were to occur. Our fresh air is being slowly contaminated with carbon dioxide and other fossil fuels and our waters are also at risk for danger by allowing offshore drilling. Climate change will also undoubtedly speed up if we spend more time on extracting fossil fuels to eventually burn, potentially leaving the future generations an injured planet unfit for a minimally satisfactory life.

The next is the argument for "disappearing beneficiaries" which states that if we do have a obligation to our future generation then we have to alter our current actions, and if we do that then we are only creating a completely new future generation. Because every action we make today alters the kind of future generation we have, there is no way that we have a moral responsibility to this group of people. Mary Anne Warren challenges this argument by showing the difference between a "possible person" and "future people". She agrees that it is impossible to have an obligation to "possible people" because they are limitless, but we do have an obligation to "future people" because we can recognize the difference between a good and bad life. She states that just because one "possible person" may disappear with a differing decision that does not mean that this persons overall happiness or sadness disappears (DesJardins, 74). It is still our responsibility as current humans to maximize happiness in the future if we are the ones planning on bringing these people into the world. There is no reason to cause suffering for these future humans that in time will be just as real as the humans who walk the planet today. Overall, it should be our responsibility to supply the future generations with the means they need to live a relatively happy life because we are the ones creating these future people. This can easily be related to the topic of natural resource destruction, and if this belief were to be accepted by all humans we could successfully restrict our use of natural resources in order to supply a potentially prosperous future for the next generation.

The last argument against the responsibilities to future generations is called the "argument for temporal location" which declares that we do not have responsibilities to a group of people who will not even exist for many years. They believe that we only have a responsibility to the people who we are currently located on earth with and interdependent on. The rebuttal against this argument can plainly be seen in the fact that people are reprimanded and condemned for actions that may have

happened in the past but harm people later on. The main example of this is the storing of nuclear waste, which is something humans are creating and sending into the future without concrete knowledge of what kind of harm it will have on people. Many people would agree that a person should be punished if they take an action that causes harm to another even if the wrongdoer did not foresee the harm (DesJardins, 74-75). Another example of this could potentially be lack of natural areas or natural resources we are going to leave the future generation. Humans today do not know what the future holds for people if all of the fossil fuel reserves are drained or if all of the current natural areas are converted to industrialized areas. The current humans need to recognize that we are putting a burden on the future generations when we take rash actions without knowing the consequences. Just because the consequences may not affect us in our current lives, we need to remember that the people of the future have just as much right to live a successful life as we do.

After proving that we do have responsibilities to future generations we then need to decide what kind of responsibilities we have. The most powerful argument against drilling for oil in the Arctic is based in the idea of sustainable development, which can stem from the utilitarian view point. More specifically, the utilitarian states that "minimally we have an obligation to reduce the suffering and optimally to maximize the happiness of future generations (DesJardins, 76)." Although, some utilitarians argue against duties to future generations by saying that the current peoples happiness outweighs future people, Mary Williams makes a compelling argument showing utilitarianism as sustainable development. Williams states that discounting the value of the future people's resources is acceptable if the resources will still be able to provide value in the future. If humans were to use a resource so much so that it no longer was available for use in the future that would not be aligning with utilitarian goals by failing to maximize the overall good. This case directly relates to non-renewable resources or renewable resources that are being used unsustainably. Williams believes that overuse of

our natural resources today to the point where it is non-existent for the future, is going against utilitarian ideas. Currently, in America, most of the time policies in regards to environmental cases often do not take into account the value or needs of the future people which is why many of our resources are being depleted at an unsustainable rate. We are basically investing our money into something that does not have a long term future. Williams' idea to fixing this problem is to "maximize the return on our investments (for example, our environmental and agricultural resources) without jeopardizing the investments themselves (DesJardins, 79)." In environmental terms, she is basically advising that we use our natural resources in a manner in which we are guaranteed to be able to use these resources for the indefinite future, and that would be the key to sustainable development.

For skeptics of sustainable development, another philosopher by the name of Brian Barry, lays out another response pertaining to the rights of future people. The question of where is the line drawn when it comes to the use of our natural resources is a concern for many people. The concern is basically how much oil could we use without infringing on future peoples rights to use the same oil. Barry lays out a clear answer to this problem by stating that we are allowed to use the current oil supply as much as we would like as long as we leave the future people with an alternative resource. If we plan to use up all of the oil in the world we have the obligation to invest in other technologies in order to supply for the future people. Barry makes the claim that "justice requires equal treatment (DesJardins, 81) ." This basically means that if we take away the future people's opportunity to use the non-renewable resources we need to compensate them with something different but equally as helpful. This model clearly is in support of the investment in alternative energies in order to supply the future generations a life that equal to our current life.

The facts about potential drilling are not certain, but it is quite clear that the use of fossil fuel in

the unsustainable manner that we are currently is not a long term solution. American government has been looking for short term solutions to an long term issue. In the foreseeable future there will still be a need for energy, and probably an increased need for energy with the population growth that is likely to occur. Drilling for oil would have a better argument for going through with it, if it were able to promise a long term solution for our energy issue. The uncertainty surrounding the amount of oil that is likely to be discovered and extracted weakens that argument greatly. The concrete negative affects that are surrounding the drilling definitely outweigh the slight chance of recovering useful amounts of oil.

Overall, from the ethical perspective, it does not seem morally right to proceed with the idea of drilling in the Arctic National Wildlife Refuge. An ecocentric ideology should begin to be taught and accepted throughout the country and around the world. Not only would the environment itself benefit from receiving more well known rights but humans would also be benefiting as well. Nature is something that we currently take for granted but if it were ever to be completely gone, it would leave humans in a very dark and hopeless place. It is obvious that the natural world could survive without humans but human life without nature is uncharted territory that should remain that way. Sustainability is something that needs to be taken seriously when it comes to law making and also something that everyone should take into consideration when making decisions. Our time and money would be better spent on new alternative energies that have the power to supply us in a long term future without harming environments that we could possibly never get back. The protection of ANWR is a crucial step in the right direction, and would be proof of acceptance and utilization of an environmentally ethical standpoint by the people of America.

Policy Suggestions : Alternative Energies

The above three disciplines support my thesis that Arctic drilling is not the right answer for any of the questions that America is facing. It is not only good for the environment, it will not be good for the long run of our economy. The solution to the problem of our reliance on fossil fuels is research and development of clean energy sources, such as wind, solar and geothermal energies. In my policy proposal, I will prove that these alternative energies will produce a much brighter future for the people of America and people all around the world. An alternative energy is anything that creates electricity without the use of oil, natural gas, coal and nuclear power. Our reliance on a finite source of energy is not safe and will not be able to sustain exponential growth in the future, so the solution brings us to renewable and clean energies.

The first, and one of the more talked about form of alternative energy is solar energy. This form is the process of taking sunlight and turning it into electricity through photovoltaic cells. A PV cell is considered a semiconductor which means that they are capable of carrying a current. An electrical current is created by the input of energy, sun light, that evokes a reaction in the electrons of the PV cells. The actual solar panel, containing silicon PV cells and metal strips, work to collect the electrons moving around, making a current that is collected from the panel through the metal strip. The energy from the solar panel is not in charge of making the actual energy, it is actually used to produce heat and heating things up to a point where they are at a temperature that is useful for making energy. The energy that is produced from this process is called direct current and is stored in batteries most of the time (Simon, 43) .

The danger to humans and environment with this source of energy is almost nonexistent. PV Solar energy can be used on households or in industries but is currently underutilized in America. The

two countries in which the most solar energy is used and efficiently collected is in Arizona and California. Currently the main drawback to solar energy is the large initial price to obtain the solar panels. There are state and federal incentives for renewable energy in place that help to convince people to purchase solar panels and there are also economic benefits in place for power producers. Many studies have also shown that a large scale of solar energy use can substantially cause positive economic impacts. For example, communities that are striving to be sustainable by using solar energy plants, have an increase in employment opportunities and an expectant growth in gross state product in the long-term future with the use of solar energy (Simon, 95). In order for solar energy to become more popular, people need to be more informed about its abilities and its benefits. Solar energy could potentially be an energy that we slowly move toward to replace the oil. "The technology behind solar energy policy is solid and continues to improve as efficiency ratings approach 40 percent, which means smaller systems effectively meeting load demands (Simon, 99)." Overall, with the scarcity of oil and coal that will inevitably cause an increase in their prices, solar energy will soon be more beneficial to the consumer and to the environment.

Next, there is wind energy, which has been around for a while, with the use of windmills in agricultural communities for thousands of years. The modern wind turbine consists of three parts; the propeller blades, the rotor and the support tower. The nacelle, which is a part of the rotor, is one of the most important parts of the turbine, because it contains the generator that produces the electricity. The way in which these turbines are created makes it so that even at lighter wind moments the turbine is still capable of creating significant amounts of energy. The towers are usually made up of a solid metal, and are between 150 and 200 feet tall by 10 feet in diameter (Simon, 106). More recently, beginning in 1973, America has put more energy into the windmill system for producing electricity. There are currently national and public-private centers that are working on making wind energy cheap

and efficient. “Sandia National Laboratory and its private-sector partners are currently developing systems that will eventually reduce low wind speed energy production costs to 3 cents/kWh (the number of kW generated on an hourly basis) (Simon, 47).” Technological advances in this industry are frequent and current especially in the area of what the actual turbine is made out of and how it should operate. Experiments and findings have been made about which type of material will create the most energy and which is most durable. For the best turbine to be created, money needs to be invested into these experimental companies who are working to find the most efficient way of using wind energy. When the technology is improved to its best ability is when the cost of this energy will be the most affordable.

Though the cost might be cheaper than that of solar, wind energy has more experience with environmental damages. The two main issues with wind energy is noise and visual pollution of the large wind turbines. These issues have been widely disputed by many differing people. The noise pollution is a more detrimental problem, with the fact that large wind generation systems that are located in remote areas produce enough noise to potentially dislocate certain animals. The noise pollution could also potentially reach human populations near by which many people are not happy with. The visual pollution of the wind turbines is something that varies with people, and is very much opinion based. There is an increased occurrence of wind turbines being placed in out-of-the-way locations, such as offshore and in mountain terrain, in order to prevent the visual pollution argument (Simon, 48). For people who believe that wind is not constant, making wind energy dangerous to rely on, there are ideas to solve this. Mainly, a system at wind-farms must be put in place to store surplus energy in batteries to be used when the wind is not meeting its quota (Simon, 113). The wind energy production is growing and learning and adapting to fit the American standard. The future of wind energy could be positive with the correct investments and growth.

The country may have already found clean energy, such as sun or wind, that can be successfully used as a replacement to fossil fuels. The alternative energies are new but have a solid history of invention, are economically capable of supporting Americans, and contain little to no ethical harm for humans, animals and nature. It is now in the hands of the government, with help from the citizens of this country, to shift our attention to these new energy resources. The less emphasis we put on fossil fuel the easier the transition will be. It has to be made clear to everyone that fossil fuels are a nonrenewable energy resource that are depleted and will eventually completely be gone. It is better to plan ahead for the day there is no more fossil fuels than to ignorantly hope that the day never comes. It is time to look ahead and stop planning for the near future but look further into our timeline. In order to for the human civilization to survive in the long run we need to steer away from fossil fuels. They are a situation filled with negatives because not only do they produce negative emissions that are ruining our atmosphere at an alarming rate but also they way in which we extract them from the ground is slowly ruining every ecosystem they invade. A clean future for America is one that does not include fossil fuels.

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