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The Arctic Game

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THE ARCTIC GAME

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Abstract

Since outsiders first visited the Arctic, they have believed in man's ability to conquer the region. Today's Arctic conquest is not one of heroic exploration, but rather one of ownership and exploitation. This paper illustrates contestation in the Arctic through the metaphor of a game, with attendant prizes, players, and rules. It focuses on how to prevent the future destruction of the Arctic given the interactions of the Arctic's landscape, prizes, players, and current management frameworks. In the wake of renewed resource exploitation and escalating climate change impacts, the current frameworks and mindsets are inadequate to support the precarious balance of cooperation and competition in the region. The presence of an indigenous population is a defining characteristic of the Arctic landscape, requiring a change from traditional policy methods as an appropriate management tool. Turning toward leadership from northern indigenous populations and following the example of cooperation initiated by the natural science community may be the best way forward to prevent a dystopian future for the Arctic.

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Chapter One: Introduction

The stories of Arctic exploration are dark, full of failure and defeat. With its subzero temperatures and brutal winds, the Arctic challenged even the toughest, most experienced explorers. At the same time, the Arctic is a place of incomparable beauty. In the summer months, the sun does not set, reflecting off the pristine white ice cap as far as the eye can see. In the winter, when the sun does not rise, the aurora borealis dances across the dark sky. This intriguing, yet injurious, environment brings its own idiosyncrasies. For centuries, indigenous survival techniques have prevailed over the influx of modern technologies. Long-distance travel via dogsled is preferred to snowmobile and reindeer skin parkas over synthetic fabrics for warmth.

But, two intertwined forces are challenging this stability. Global climate change and technological advances have altered the landscape, leading to the growth of natural resource development. This increased activity brings a time of growing competition in the Arctic, pitting the interests of humans against the environment, countries against each other, and indigenous populations against national governments. These pressures are breaking down the Arctic's natural defense system, requiring regulations for Arctic activity.

This paper manifests the idea of contestation in the Arctic through the metaphor of a game, although it does not necessarily adopt the formal game theoretical approach.

Like other games, the Arctic game has a landscape, prizes, players, and rules – outlined in each of the following chapters. The components of Arctic activity discussed in this paper are not innovative; a vast amount of literature concerns itself with individual players' goals and the trends of Arctic resource extraction. Where this paper differs is in its holistic approach, analyzing the combined interaction of all of the elements of the game. The ultimate focus is on sustainability and attempts to prevent the destruction of the landscape and prizes so that the game can continue to be played. This is contingent upon addressing shortcomings in the current international frameworks serving as the rules of the game in a way that meets these goals.

This topic is particularly timely, as environmental challenges are changing the way the game needs to be played. Some of the current impacts of climate change and global pollution in the Arctic are irreversible. In the past, reactive steps have been taken at signs of depleting resources, often too late to preserve gameplay. Whaling and sealing conventions were put in place only after the species neared extinction, dramatically reducing the harvesting of these profitable marine animals. Assuming the goal moving forward is to manage Arctic resources in a way that does not deplete them and allows for continued responsible extraction, then preventative, rather than reactionary, steps are required. Heavily unregulated Arctic activity will not only eliminate the resources, but also disrupt and pollute local environments.

While these changes to the landscape – particularly the melting of the ice cap – make the Arctic more fragile, they have also facilitated easy access to Arctic resources. Thus, there has been a renewed interest in profiting from the Arctic resources expanding

beyond the littoral states – the United States, Russia, Canada, Denmark, and Norway – to include other nation-states and non-state actors. The Arctic also serves as a pillar in the global ecosystem. Depletion of Arctic resources and destruction of the landscape have consequences reaching far beyond the boundaries of the Arctic, drawing global interest to the region. The frameworks currently governing the Arctic operate at the nation-state level. The Arctic players need to reevaluate their policies of exclusivity to take into account the rising role of indigenous populations, international organizations, and non-governmental organizations. The inclusion of indigenous people in this age-old ecosystem brings opportunities to carefully craft a goal of sustainability.

Chapter Two: History

History Before There Was History

Accounts of the history of the Arctic often begin when the first outsiders ventured north to discover the unknown. When outsiders began exploring the North, trying to uncover the mystery of what lay above the Arctic Circle, the Arctic had been inhabited by an indigenous population for thousands of years. They lived off the land, developing patterns of survival that prospered in the Arctic region.

An old Inuit legend tells the story of a girl who was thrown into the sea by a man. She tried to hold onto the boat, but he cut off her fingers to keep the kayak from capsizing. She sank to the bottom of the ocean and made her home there. She became the mother of all life in the sea, and her fingers grew into seals and walruses. She continues to send these animals to the Inuit people to prevent them from freezing and starving to death (National Film Board of Canada).

The ringed seal is the most abundant seal species in the Greenlandic waters, and the indigenous perfected their hunting technique to adapt to the difficulties of hunting this species. The ringed seal opens breathing holes through the pack ice just large enough for its head, but not its entire body to surface. The seals covered each breathing hole with a cone of snow. If a hunter tampered with this cone while waiting for the seal to breath, the seal would cease to use that specific hole. Therefore, the indigenous hunter would wait patiently next to the snow cone at night for hours, waiting for a seal to catch a quick

breath and harpoon the seal through the snow cone, without being able to see it. As the impaled seal swam off, the hunter would pull on a rope attached to the harpoon until the seal became too tired to fight and drug the seal ashore (Diamond 2005, 259).

Indigenous foreshadowing warned of a time when another group of people would arrive. The name for these people, translated from Inuktitut, roughly means "people who jump to conclusions" or "do not have any patience." These people would be difficult to resist. Even if the indigenous were able to resist them, they would come back in greater numbers with deadly weapons (National Film Board of Canada).

While outsiders continued to bring new technologies to the region to help them overcome the harsh conditions, these innovations continued to fail in comparison to the traditional methods of shelter, transportation, hunting, and warm clothing. No outsider survived long without the help of the indigenous. Those too proud to ask for assistance from the ones who knew the land best died.

Early Exploration

The first generally accepted voyage by an outsider to the North was by a Greek merchant named Pytheas around 330 B.C. Pytheas was in pursuit of the source of the tin, amber, and gold that had been traded to the Greeks. During his six-year expedition, he sailed to a place he called Thule, where the summer sun never set and the winter sun was never seen. A day's sail north of Thule, he came upon a "congealed sea," referring to the characteristic pack ice of the Arctic. Great debate exists as to the exact location of Thule. While some believe Thule to be in present-day Iceland, it is more likely that Pytheas sailed to the coast of Norway or the Shetland or Faroe Islands. Although Pytheas'

original transcript of his voyage, *On the Ocean*, has been lost, secondary sources have confirmed Pytheas to be the first to describe the midnight sun, the aurora borealis, and the existence of the polar pack ice.

The most popular stories of early Arctic exploration – the Vikings – date to one thousand years after Pytheas. The Viking ships were technologically advanced for their time in their ability to make long open-sea crossings, but they lacked reliable navigation systems. The lack of navigational capabilities led to the accidental discovery of many Arctic areas and islands by the Vikings (McGhee 2005, 76-78). In approximately 870 AD, when the Norwegian Viking, Floki, set sail in search of new lands to the northwest, he brought three ravens as his navigation system. Legend has it that Floki would periodically release the ravens during his trip. The first two ravens flew back to Norway, signaling that Floki had not sailed far enough. The third raven flew straight forward. Floki followed the path of the raven and came to Iceland, where the Vikings established a colony that kept in close trade contact with Norway (Mirsky 1943, 19-24).

Erik the Red was one of the eventual Norwegian colonists to inhabit Iceland. Allegedly, after murdering two men, Erik the Red was declared an outlaw, causing him to flee west. This voyage led Erik the Red to discover an island he called Greenland. Although much of the island was far from green, he named it this to encourage further inhabitation. For the next three centuries, the settlements of Greenland flourished. By 1000 AD, Greenland had a total population of approximately 5,000 Norse between two settlements. In total, these settlements were comprised of 250 farms, with an average of 20 people per farm organized into communities (Diamond 2005, 235). By 1490, the

thriving Greenlandic and Icelandic Norse settlements reached a demise that many scholars still struggle to understand.

Most of the Vikings' tools were made from iron, which requires large quantities of wood for charcoal to fuel smelting fires. They also used wood to build their houses and ships and cleared forests to create pastures and farmland. When Vikings first settled Iceland, one-fourth of the island was covered in forest. Within the first few decades of colonization, eighty percent of that forest was cleared, and today, only one percent of Iceland is covered by wooded forest. The lack of wood became a limiting factor to the continuation of Norse Arctic life, as they did not adapt their traditional lifestyle to the Arctic conditions. Similarly, the Vikings used their traditional farming methods, as the soil in Iceland looked similar to the fertile soil of Norway. However, the Icelandic soil was formed much more slowly and eroded much more quickly. By the time the settlers realized the fragile state of the Arctic environment, their corrective efforts were useless, and they were unable to sustain their Arctic settlement. Furthermore, the climate in Greenland and Iceland at this time was relatively mild, allowing for Arctic settlement. In the early 1400s, the planet entered the Little Ice Age, and the colder climate prohibited Viking settlement in the far north (Diamond 2005, 185-202).

The voyage of Pytheas and the Viking era represent two major reoccurring Arctic themes. The first, through Pytheas, is the notion that outsiders have looked at the Arctic as a means to gain economic and commercial advancement. Pytheas was looking for the source of valued trade goods – whether they came from the Arctic region or if the Arctic could serve as a trading route to more efficiently reach these goods. Second, the

environmental damage caused by the northern Viking settlement demonstrates that a lack of concern for environmental stewardship and overexploitation limits successful Arctic activity. In this case, destruction of the landscape ended gameplay in the Arctic region for the Vikings. Further interest in the Arctic waned after the Viking era, until European states learned more about the earth's geography. The idea that the planet was indeed round revived interest in the Arctic as a potential new and shorter trade route to advance the growing European commercial capabilities.

The Hunt for the Northwest Passage and Northern Sea Route

Regular Arctic expeditions began in the late sixteenth century. At this point in time, Europeans knew very little about the Arctic, unsure as to whether there was an open polar sea or if it was fully covered by pack ice. Each expedition yielded more knowledge about the physiology, marine animals, and inhabitants of the unknown region. Most of these expeditions were faced with defeat. Expedition journal entries regularly report starving men stealing small rations from their equally starving comrades and men dying or killing each other for survival. After wintering in the harsh climate, explorers retreated, unable to reach their goal. If they survived, the men returned to their home countries weakened by scurvy, missing appendages from frostbite, and psychologically affected by the time spent in isolation in the ice. Yet, something about the Arctic captivated these men. No sooner had they returned home, they were already scheming and planning for their next expedition north.

In 1576, Martin Frobisher and his crew set off to find a passage to the northwest. While he failed to find this waterway, Frobisher found a black stone that appeared to

contain gold, which he brought back to England. Excitement in England over the discovery led Frobisher to take two subsequent trips to the north, abandoning attempts to locate the Northwest Passage to mine more of the gold-bearing rock. In 1579, he brought over two tons of the black rock back to England. Upon his return, the rock was proven worthless, and the legacy of his voyage would be failure. However, the great interest people, including the Queen of England, expressed in his expedition demonstrates the eagerness of nations to profit from the resources the Arctic had to offer (Mirsky, 1934, 33-35).

After Frobisher, a series of explorers continued to search for a waterway to the west or east that would serve as a faster and shorter trading route with China. The Norwegian Captain Jens Munk set sail to find the Northern Sea Route, the waterway running north of Russia. His expedition was disastrous; of the 64 original men, only three returned to Norway alive (Sponheim 1999, 17). This was the general story for other explorers including John Davis, Willem Barents, William Parry, and James Ross. Their ships were trapped by the sea ice, forcing them to winter in the harsh conditions without adequate supplies. Still these passageways could not be found.

On May 19, 1845, Sir John Franklin and 129 men set off on the *Erebus* and *Terror* in search of the Northwest Passage, an expedition the success of which England was especially optimistic. His ships were specifically designed for Arctic use, and Franklin was a long-time Arctic veteran. Compiling information from previous voyages, Franklin's route was carefully created, and he was given strict order to not veer from this route (Mirsky 1943, 147). The *Erebus* and *Terror* had a smooth sail to the west coast of

Greenland, where crew members sent letters home, confident that they would reach the Bering Strait. By late July, a whaling captain saw the two ships enter Lancaster Sound. After that, the two ships were never seen again.

The tragedy of the Franklin expedition greatly impacted the next phase of Arctic exploration. While expeditions before had lost their way and crew members had died, the Franklin expedition represented a new pinnacle in Arctic mystery and defeat. The great mystery surrounding Franklin's disappearance troubled the Western world. Over the next decade, forty search expeditions were sent out to look for the missing Franklin party. With time, the hope of finding the men alive and stranded was replaced with the hope of finding a clue as to how their expedition went wrong. The search method was methodical, treating the Arctic as an enemy. Search expeditions were "based on the simplest and most effective military maneuver. The enemy was to be surrounded and its captive freed" (Mirsky 1943, 156). Westerners now saw a reason to conquer the Arctic and prove their superiority over nature's power. Most of the search expeditions were outfitted by the government, but several voyages were privately financed. Lady Jane Franklin sponsored four different ships in search of clues to her husband's disappearance. The last of these ships, led by Francis Leopold McClintock, would finally reveal relics from the fallen expedition and end the great search. McClintock came across a group of indigenous people who had silverware from the expedition and later found several skeletons of crew members who died of starvation and disease (Mirsky 1943, 147-178). These findings were sufficient in piecing together the failures of the Franklin voyage, and focus turned back to how the Arctic could shorten shipping routes.

Despite the failures of three centuries of expeditions to traverse either passageway, explorers continued to risk their lives to bring trade benefits to their home nations. In 1878, Adolf Erik Nordenskiöld completed the first successful navigation of the Northeast Passage with his steam-powered whaling ship, the *Vega*. In 1905, after spending three winters trapped in the pack ice, Norwegian Roald Amundsen completed the first successful navigation of the Northwest Passage. Instead of outfitting a massive vessel with a large crew like many of his predecessors, Amundsen travelled in a fishing boat called the *Gjøa* with only seven crew members. Additionally, during his three winters in the ice, Amundsen learned about Arctic survival from the local indigenous population. These two differences led to Amundsen's success where so many other expeditions had failed. Although large emphasis was placed on finding these routes, it would be another twenty-four years until the Northwest Passage was traversed again. The dense pack ice limited the realistic regular use of these waterways for international shipping and travel.

The Race to the North Pole

Until this point, Arctic exploration had been focused on finding a more direct trade route via northern waterways. While some expeditions anticipated crossing the North Pole along the way, reaching the North Pole was never the primary objective. The successful navigation of the passageways further whet explorers' desire to continue to conquer the north, and they turned their attention toward reaching the North Pole. The race to the Pole yielded no economic benefit for home countries, and thus, this era of

Arctic exploration was driven by adventure and pure competition rather than national gain.

There had been several previous failed attempts to reach the North Pole including Phipps in 1773, Scoresby in 1806, Buchan in 1818, and Parry in 1827. The geographic North Pole sits upon the large shifting ice sheet covering the Arctic Ocean, making access difficult as one cannot merely sail to the Pole. William Parry realized these constraints and proposed a new method of Arctic exploration, using both a ship and sledge. A ship would take the expedition party north to the edge of the pack ice. From there, sledges pulled by dogs would be used to advance over the ice. This method prevented the ship from becoming trapped in the pack ice and allowed for faster travel over the pack ice rather than attempting to penetrate through it with the ship's bow. While he was not successful in reaching the Pole, Parry did make a significant contribution toward Arctic discovery. His intuitive, yet innovative, approach became the common method thereafter. Although this was a new exploration technique for outsiders, Parry merely copied the method that he had seen the indigenous people using for years to traverse across the ice sheet.

Robert Peary and Frederick Cook vied for the first attainment of the North Pole. Without instant communication capabilities, once these expeditions departed for the Arctic no one knew of their progress. Similarly, the expedition teams did not know about the status of the other's attempt or if they had been defeated in their race. History has not even been able to declare a definite "winner" in the race, and scholars continue to support the case of either Peary or Cook.

Robert Peary was ambitious and trained for his trek to the Pole as any other athlete would train for a race (Mirsky 1943, 237). Through his quest, Peary wanted to prove that "man can conquer the planet he inhabits." On April 6, 1909, Peary allegedly reached the North Pole and recorded in his journal, "The Pole at last. The prize of three centuries. My dreams and goal for twenty years. Mine at last!" (Mirsky 1943, 329). Scholars struggle, however, to believe that Peary actually made it all of the way to 90 degrees North. His expedition photos, the given ice condition, and the calculated distance travelled by a tired dog team all point to failure.

Similarly, Frederick Cook was experienced in the Polar Regions, serving as an ethnologist on a Greenland expedition and a surgeon on an Antarctic expedition. In his memoir of the expedition, *My Attainment of the Pole*, Cook tells the story of travelling 500 miles north of an Inuit camp to reach the Pole on April 21, 1908. He allegedly stayed at the Pole for twenty-four hours before rushing to return to land with the coming summer and warming of the ice. However, he writes that during this trek back to land, the team's food supply ran low, they were misguided by fog, and were lost for twenty days before finding land again. This story is full of great adventure, but its likelihood is slim.

Cook's credibility has been formally challenged. In regard to his polar expedition, Cook's Inuit companions' account differs from the story in Cook's book. The Inuit claim that the team never travelled to a point where there were out of sight of land. Secondly, Cook's chronology contradicts itself. Cook took a photo of the North Pole camp, where his team is wearing pants made of musk-ox skins. However, Cook

writes that his team did not acquire any musk-ox skins until after their attainment of the Pole. Finally, if one were to retrace the supposed path of Cook's lost twenty days, it would seem impossible that he did not stumble upon land.

Both Peary and Cook relied heavily on Inuit support for their expeditions. They used Inuit methods of travel, shelter, and clothing. Several Inuit men even accompanied the explorers on their journeys. Without a doubt, these men's survival in the Arctic is credited to the adoption of Inuit techniques. Even with these techniques, most Arctic experts agree that Peary's raw polar talent and story credibility would suggest that he had a better chance of reaching the Pole first. But no one can make this claim for sure.

Cold War Strategy

The Arctic became a key geostrategic location during the Cold War era, as it was the shortest route between the two superpowers. The Bering Strait separates Russia and Alaska by only 57 miles (Luck 2009). The United States viewed the large white ice cap as the only barrier to contain communism in the North. To this extent, the United States' many missions to the region took on names fitting of the Arctic environment, including Project Snowman, Operation Frostbite, Project Icicle, Task Force Frigid, and Project Ski Jump (Grant 2010, 287).

Operation Blue Jay's mission was to secretly construct Thule Air Base in northern Greenland as a key part of the United States' Arctic offense strategy. By 1953, the base covered 2,600 acres and had eighty-two miles of roads to connect all of its facilities, including a hospital, bowling alley, and movie theater for its 10,000 residents (Grant 2010, 315). Canada, Denmark, and the United States jointly created the American

Distant Early Warning Line. As its name suggests, this chain of 63 radar and communication stations stretched over 4,800 kilometers inside the Arctic Circle provided early warning of missile attacks from the Soviet Union. When it came into use in 1957, the system was perhaps one of the most expensive military developments in the world (Thomas et al. 2008).

Western activity in the Arctic during the Cold War was significantly less destructive than Soviet activities. In total, the Soviet Union carried out 130 bomb tests between 1955 and 1990 at three main locations between 71 degrees and 74 degrees North. These tests involved 224 separate explosive devices, which included the largest nuclear bomb tests in the history of the earth. In 1961, the Soviet Union exploded a bomb that weighed 26 tons. The most powerful tests happened in September and October 1973 and produced very different results. In one case four small ridges were created, while in the other, a huge landslide caused 80 million cubic meters of material to be destroyed (Glbasby and Voytekhovsky 2009).

While the Arctic was a zone for the superpowers to compete militarily, it was also a place for the Soviet Union and the United States to compete technologically. In October 1957, the Soviet Union launched Sputnik, the first satellite to orbit the Earth, an action demonstrating the technological superiority of the Soviet Union. In response, President Eisenhower showcased the United States' capacity to operate in the Arctic barrier. He approved *Operation Sunshine*, a secret mission that would travel from the Pacific to Atlantic Ocean, via the North Pole, underneath the polar ice cap in a nuclear powered submarine. Three years prior, the United States had launched the world's first

nuclear submarine, *Nautilus*. The nuclear power allowed for the submarine to stay submerged far longer than the traditional submarine, which would allow for under ice travel. Even with this advanced power system, an under-ice expedition was no easy feat for the *Nautilus*; the magnetic and gyroscopic compasses were unreliable at high latitudes. A slight miscalculation in direction of travel would disorient the submarine, trapping it underneath the icecap. With the pack ice blocking out sunlight and stars, alternative navigation methods were impossible. If anything went wrong inside the ship, the submarine would be unable to surface to troubleshoot these issues. Additionally, the majority of the Arctic Ocean was uncharted, and no one knew how far below the surface the ice pack extended. This meant that the *Nautilus* was venturing into the unknown, occasionally encountering tight passes, with only a few feet of clearance between the vessel, the sea floor, and the ice cap.

On August 3, 1958, the *Nautilus* became the first vessel to traverse below the geographic North Pole. When it surfaced near the coast of Greenland, the *Nautilus* had been submerged for ninety-six straight hours and traveled 1,590 nautical miles. It had charted the ocean floor as it traveled, adding significant volume to the United States' Arctic data and transforming the unknown into the known. In the words of Captain William Anderson, the commanding officer of the *Nautilus* during Operation Sunshine, the mission's success showed "the Soviets, their friends, and our allies that we had the equipment, the desire, the knowledge, and – most important – the resolve to operate there [in the Arctic]" (2008, 119). It demonstrated that nuclear submarines could successfully operate in the Arctic, increasing the military strategic importance of the region

throughout the rest of the Cold War. With knowledge of the region and the confidence to operate there, the strength of the Arctic as an impenetrable barrier gave way to the notion of the Arctic as a Cold War theatre.

Modern Day

The legacy of these explorers lives on in the Arctic, with many geological features bearing their names or their supporters' names. One of Greenland's islands is even named Geographical Society Island. These names serve as subtle reminders of the outsider's perceived dominance over the region and the importance of defining territorial claims to these countries. Today, these underlying goals of conquering and self-interest have not changed. We are entering a period of exploitation and contestation. Throughout the history of outsiders' activity in the Arctic, there has always been a prize or a gain. The Arctic has been something that needs to be won. Activity in the Arctic is approached like a game. The changing landscape in the Arctic as a result of climate change and melting ice has revealed new resources and prizes for the competitors. However, the challenge the competitors face today is balancing their own self-interest with preserving the resources for future development and preservation of the area.

Chapter Three: Landscape of the Game

The Greeks first named the Arctic *Arktos*, after the constellation of the Great Bear in the northern sky. They noticed some stars were constantly visible in the night sky and some changed with the seasons. These groups of stars could be divided by drawing a circle through the Arktos constellation at night. During the day, this same circle indicates the position where the disk of the sun is not visible above the horizon at the winter solstice nor sets at the summer solstice. This line is the Arctic Circle, at 66°33'N, and it bisects the United States, Canada, Russia, Greenland, Iceland, Norway, Sweden, and Finland. All eight of these countries are considered Arctic states, but only five directly border the Arctic Ocean – the United States, Canada, Russia, Denmark, and Norway.

Other defining characteristics of the Arctic are not confined to the Arctic Circle. The tree line, a latitude above which trees are physically unable to grow, is more of a broad ecological zone ranging between 50 and 100 kilometers in width rather than an actual line (Keskitalo 2004, 30). Similarly, the 10 degrees Celsius July isotherm, a measurement where the mean temperatures for all months of the year is less than ten degrees, often coincides with the tree line (Keskitalo 2004, 30). These definitions are not all-encompassing, excluding Sweden, Finland, and significant parts of Russia. The map below depicts the Arctic region and the discrepancies between these different border definitions. As the map shows, the borders alter the set of Arctic states, the prizes available, and the region to which the rules apply. This paper will identify the Arctic as

the region lying north of the Arctic Circle; however, the distinction between those states that do and do not directly border the Arctic Ocean will be a contributing factor in this analysis.

Figure 1 - Arctic Circle and July Isotherm Boundaries

The Arctic can generally be divided into two regions. The High Arctic, the core northern area covering the Arctic Ocean, is characterized by its large amount of ice. The Arctic Ocean is the smallest of all the earth's oceans. Its deepest area reaches 18,050 feet, but its average depth is only 3,240 feet. The ocean floor has several submerged mountains ranges, including the Lomonosov Ridge, which varies in width from forty to 120 miles. Features like this complicate navigation and limit our ability to gain a complete understanding of the physiography of the Arctic's ocean floor. On the surface,

the Arctic Ocean is covered by a large ice cap, created over 15 million years ago. While the ice cap stays frozen year round, it grows significantly in size each winter and shrinks each summer as the surrounding pack ice joins the larger mass. In the winter, temperatures in the Arctic drop below -58 degrees Fahrenheit, and the coldest recorded temperature in the Arctic is approximately -90 degrees Fahrenheit. Most areas of the Arctic receive less than twenty inches of precipitation a year.

The lower-latitude sub-Arctic region is covered in permafrost and rock or soil. Permafrost is a groundcover with a temperature below freezing continuously for two or more years (Pewe 1979, 333). Permafrost covers about twenty-five percent of the Northern Hemisphere's land area. Over half of Russia and Canada and eighty-two percent of Alaska are covered in permafrost (Pewe 1979, 335). Permafrost thickness can vary from just a few meters to a few kilometers in some parts of Siberia (Lange 2000, 536). It plays an important role in the Arctic ecosystem, holding streams and lakes in place and providing a firm foundation for infrastructure, including pipelines, highways, railroads, and buildings. As the permafrost melts, soil stability degrades, eroding streams. A study by the University of Alaska at Fairbanks indicates that a decrease in permafrost temperature from -4° C to -1° C decreases the load capacity of the permafrost by as much as 70 percent (Kister 2005, 33-38). In its frozen state, permafrost also holds large methane deposits, originally from the decomposition of organic matter in ancient wetlands. Globally, permafrost is estimated to hold at least two trillion tons of CO_2, the equivalent to a century of fossil fuel emissions. In West Siberia alone, thereare 70 billion tons of methane. As long as this methane stays trapped in the permafrost, there are no

negative consequences. However, as the planet warms, the methane escapes into the atmosphere. There, it traps more heat, causing more permafrost to melt, further speeding up the methane escaping process (Lemonick 2010).

The Arctic's unique and fragile ecosystem offers many important services to its flora, fauna, and indigenous inhabitants. It provides oxygen, nutrient cycling, albedo, and methane retention. For the indigenous, the Arctic offers a food source, health (provided through the food), culture, community bonding, and economic revenue. For outsiders, it supplies a means of transport, sea lanes, commercial fisheries, and oil and gas resources. The complexities and interconnectedness of this system are deep.

Rapid and Accelerating Change

The Arctic is extreme and highly variable, and is currently facing rapid and accelerating change. These changes include an obvious downward trend of melting ice and snow over recent years. The Arctic Ice Cap expands each winter and reaches its minimum extent at the end of the summer in September. In September 1980, the ice cap measured 7,272,190,181 square kilometers. By September 2011, it measured only 4,397,499,940 square kilometers, a forty percent decrease in just three decades. The graph below depicts this decrease in ice extent.

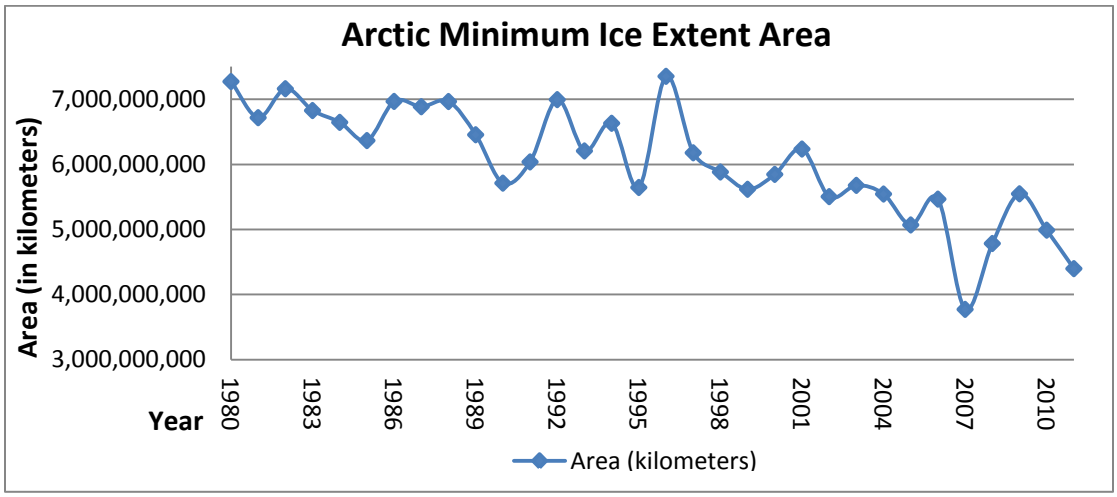

Figure 2 - Arctic Ice Cap Minimum September Extent Area (in km) from 1980 to 2011

While there are fluctuations, the general trend is clearly decreasing. Accompanying a decrease in extent, the Arctic Ice Cap and Greenland ice sheet are becoming thinner.

The Arctic ice not only provides a clear signal of recent change; it also has preserved information about the earth's climate dating back over one million years. Cores drilled by scientists from these ice caps reveal that over the past 850,000 years, the atmosphere has never had carbon dioxide levels above 300 parts per million (ppm), generally fluctuating between 200 and 300 pm over time frames of several thousand years. That is, until the late 1800s, when carbon dioxide levels rose at an unprecedented rate of more than 100 parts per million in a century and are currently approaching 400 parts per million. Most researchers attribute this recent increase to anthropogenic activities.

It is not only in the form of greenhouse gases that human activity has altered the atmosphere globally and in the Arctic. The first observation of atmospheric contamination in the Arctic was by airplane pilots in the mid-1950s. These pilots called

this reddish-brown discoloration Arctic Haze. Indigenous populations had also noticed the mysterious presence of Arctic Haze along the horizon, but were unable to identify its source. In 1980, scientists determined that this haze was caused by the aerosols of sulfate, black carbon, and other persistent organic pollutants transported to the Arctic from industrialized countries (Reiersen 2000, 575).

Persistent organic pollutants (POPs) are of particular concern. They come from pesticides and industrial chemicals and are transported to the Arctic primarily though air and ocean currents (Downie and Genge 2003 ed, 4). POPs' carbon-based chemical properties and the cold Arctic climate enable them to remain intact for an exceptionally long time. POPs accumulate in the fatty tissues of animals and increase in concentration at higher levels of the food chain, a process called biomagnification. By the top of the food chain, concentrations can be magnified by up to 70,000 times the initial level. POPs in the Arctic are especially worrisome, as the activities that generate them take place outside the region. Thus, rules specifically designed for Arctic activity cannot regulate the trans-boundary contamination of the region. The Stockholm Convention, adopted in 2001 and entered into force in 2004, requires parties to take measures to eliminate or reduce the release of POPs into the environment. Although the initial twelve known POPs are banned, these chemicals are still present in the Arctic (Byren 2005, 6).

In addition to remote pollution, the Arctic has also been victim to high levels of localized pollution as a result of mining and military activities, particularly on the Kola Peninsula in western Russia. About 250 nuclear reactors produced by the Soviet military during the Cold War era remain on the peninsula. Though these reactors are no longer in

use, they still leak radioactive waste (Glasby and Voytekhovsky 2009). Similarly, the Norilsk nickel plant, also on the Kola Peninsula, was considered one of the world's top ten most polluted places and shut down in 2008. Still today, the thirty kilometers of land surrounding the plant remain barren from the pollution given off by the mine (Glasby and Voytekhovsky 2009).

Local Impacts

The changes to the Arctic landscape are having profound impacts on the Arctic wildlife. Walrus rest on the pack ice between dives to the ocean floor to feed on clams. Along the southern edge of the pack ice, the Arctic Ocean is fairly shallow, but its depth increases farther north. The pack ice is forcing the walrus population to feed in water too deep for them to reach their food source on the ocean floor. It is expected that the walrus population will halve in size in the coming years. Polar bears have suffered a fifteen percent decrease in their number of offspring and a similar decline in weight over the past twenty-five years (Kister 2005, 51-58). Scientists predict that polar bears will likely be extinct in the wild by 2100. With warmer northern temperatures, red foxes are pushing their habitat farther north, displacing the smaller Arctic fox (Ebinger and Zambetakis 2009, 1216).

These changes also impact the indigenous people. Coastal communities are at risk of collapsing into the ocean due to erosion. Currently, 185 Alaskan communities face this risk (Herbert 2012). The indigenous lifestyle is reliant on strong thick ice. Weak sea ice increases drowning incidents among hunters and limits safe mobility in the north.

Indigenous people in the Arctic rely on a traditional diet with a high consumption of fish and marine mammals. This diet is valued culturally, as it focuses on traditional hunting activities and systems of community sharing (Caufield 2000, 490). Because POPs are most concentrated in fatty tissues of animals, such as narwhal blubber, beluga oil, and walrus blubber, indigenous Arctic people ingest a high level of POPs. Studies have shown that this high level of POPs in the Inuit diet affect their immune system, ability to conceive children, and mental development (Caufield 200, 491).

Animals and people who call the Arctic home are learning to adapt to this change. But Aqqaluk Lyne, the chairman of the Inuit Circumpolar Council is still concerned. He expresses "a sadness of my people who don't know how to cope" (2012). Adaptation strategies, as found among Arctic life, will need to be mirrored in the rules of the game moving forward.

Global Impacts

As a cornerstone of the global ecosystem, changes to the Arctic landscape are not confined to the north. Global climate is largely controlled by three key factors – the amount of energy received from the sun, how much of that energy the earth is able to reflect back to space, and the amount of greenhouse gases in the atmosphere. The Arctic plays a significant role in these processes. Science has proven a strong correlation between carbon dioxide levels and global temperature (White 2012). The increase of greenhouse gases warms the earth's air temperature. This, in turn, melts the land ice and sea ice. As the ice melts, it reduces the planet's ability to reflect energy back to space, known as the albedo effect. Ice and snow have high albedos meaning they reflect twenty-

five to eighty-five percent of the solar energy that reaches it. Conversely, vegetation and water have low albedos, reflecting back less than ten percent of the energy and absorbing this heat (Kaiser et al 2010, 40). As the ice melts or grays as black carbon lodges itself into the snow, more sunlight is absorbed by land and water. This creates a positive feedback loop, where warming perpetuates more warming.

As the ocean water heats, it expands. This thermal expansion coupled with the melting of the land ice into the ocean leads to an increase in sea levels. The Greenland ice sheet contains enough water that if it were to completely melt, it would raise the global sea level by more than fifteen feet (Kaiser et al 2010, 40). This global sea level rise has potentially devastating impacts for small island states and low lying coastal areas from Bangladesh to Florida.

A further impact of warming oceans and melting ice is the alteration of global ocean circulation. The strong North Atlantic current feeds dense, cold saltwater and spreads oxygen along the ocean floor to the rest of the planet's oceans. When the Arctic water warms, it can no longer provide this cold water to the earth's ocean systems. With a less extreme temperature difference, the Gulf Stream slows down, creating slower moving and more intense storms and pushing cold weather further south (Galbraith 2012; White 2012).

With unprecedented levels of change, we are moving even closer to a tipping point in the Arctic landscape, if we have not already passed it, with cascading impacts across the globe. Continuation of this "business as usual approach" will not allow us to adapt to and mitigate these effects.

Chapter Four: Prizes of the Game

As a result of climate change, previously inaccessible resources are being uncovered with substantial potential to yield economic profits. The woolly mammoth has been extinct for over 4,000 years. However, in the early 2000s, the local people in the Siberian town Yakutsk began to unearth large quantities of mammoth tusks, previously frozen in the earth. In the spring of 2005, the town auctioned off fifty tons of husks, earning over $20,000 (Howard 2009, 30). With increased technological capabilities and greater world market demand, many of the Arctic's resources are being extracted at a much larger scale than these mammoth tusks in Yakutsk. This renewed interest in resource development is the second major game-changing force in the Arctic.

Living Marine Resources

In 1596, Willem Barents discovered the Svalbard archipelago north of Norway and reported its abundance of whales. Whale oil was particularly useful for lighting in Europe at this time and it became the first majorly traded Arctic commodity. Whaling stations were established across the Arctic to facilitate this trade, including the Dutch settlement of Smeerenburg, which literally translates to "blubber town." Smeerenburg, founded in 1619, occupied the northwest part of the Svalbard archipelago. For six weeks each summer, when the ice conditions allowed, hundreds of ships would bring more than fifteen thousand men to the region to hunt the whales and operate the station (Mirsky 1934, 52). Whalers primarily hunted the bowhead whale and the northern right whale.

By the early eighteenth century, whales had become so scarce around Svalbard, that whaling efforts were pushed toward the west coast of Greenland. As a result of excessive whaling in the region, only a few hundred bowhead whales remain in the eastern Canadian Arctic from an original population of over 10,000 (Caufield 2000, 488). Technological advances in the mid-nineteenth century including the invention of the harpoon gun and the steam-powered whale catcher allowed for an even wider range of whale species to be caught and led to an even more rapid decline of the whale population in the Arctic.

As the whale population continued to decrease, commercial whaling became prohibited by many countries. Whaling laws have been a topic of great debate among the Scandinavian countries and the European Union. Sealing laws created a similar end to the harvesting of seals with the North Pacific Fur Seal Convention in 1911 (Thomas et al. 2008).

As whales became scarce, seals and walruses were seen as economically important. Throughout this period, harp, hooded, and bearded seals were hunted on a regular basis for their skins. The northern fur seal, with a population of 2.5 million in 1786 was reduced to a population of 300,000 by the early twentieth century.

Similarly, fishing has always been a part of the subsistence economy in the Arctic. The Arctic Ocean has a rich range of fish species, most importantly cod, herring, capelin, and salmon. At the subsistence level, fishing was not a threat to the stocks in the Arctic Ocean. In the last fifty years, however, there has been significant concern over possible crashes of Arctic fishing populations as a result of commercial harvesting

(Thomas et al. 2008). The Bering Sea is famous for its harvest of salmon, crab, Pollock, halibut, and groundfish. Every year, US commercial fisheries take approximately $1 billion worth of seafood from these waters, comprising about half of America's national catch, while Russia's Bering Sea fisheries are worth approximately $600 million (Howard 2009, 95). The most likely scenario for fish stocks as a result of climate change is that colonies are likely to move farther north as waters become warmer. There have also been concerns that fish will migrate into waters where there are no fishing quotas at all, leading to their exploitation and depletion (Howard 2009, 98).

Increases in technology and uncontrolled resource exploitation led to the decline of the whale, seal, and some fish populations in the Arctic. These resources declined at a rate fast enough that frameworks had to be put in place to prevent or severely limit the playing of the game. Today, the Arctic offers different prizes, most notably minerals, fossil fuels, more efficient shipping routes, and scientific knowledge. The players need to be aware of these prizes and the limitations of non-renewable resources in order to continue to have an incentive to play the Arctic game.

Minerals

The Swedish town of Kiruna and its 22,000 residents sit 90 miles north of the Arctic Circle. Underneath the town there is a precious deposit of iron ore, which can only be harvested by fracturing the land under Kiruna. The increasing value of raw mineral resources from the Arctic has caused the state-owned mining company Luossavaara-Kirrunavaara AB (LKAB) to propose to move the parts of the town that currently prevent mineral extraction. While it is not uncommon for mining companies to

remove a couple of buildings when starting an operation, the scale of the Kiruna move is unprecedented. LKAB has already spent $460 million buying land and moving, knocking down, and reconstructing buildings over 49 acres of privately-owned residential land and 49 acres of public land. The company has even agreed to carefully preserve and move over one dozen historic buildings to new locations. Throughout this process, 3,000 people will be forced to move to new locations that will not disrupt the current mining process. However, the presence of LKAB in Kiruna will perpetuate the growth of the mining operations and lead to the inevitable move of more of the population (Miller 2011). Previously, barriers of inaccessibility and large costs prevented widespread mineral extraction, but today companies are seizing the opportunities available in the Arctic region and re-exploring widespread exploitation at a high environmental and social cost.

Interest in mining in the Arctic dates back to Martin Frobisher's voyages in the 1570s when he thought he had discovered gold in the region. Although Frobisher's discovery turned out to be worthless, gold was later discovered in Alaska and Canada, triggering a gold rush in 1897. The Alaska, or Klondike, Gold Rush brought 30,000 prospectors to the region in 1897 and 1898. Many of these newcomers failed to strike it rich and did not stay past the turn of the century. Still, prospectors built mining towns along the creeks feeding the Klondike River. The sudden influx of outsiders disrupted the indigenous way of life, and the run-down remnants of the operation clutter the region today as a reminder that greed has been a driver in increased Arctic activity (Klein and Magomedova 2002; Wharton 1972).

More than a century later, miners turned toward Alaska's mineral resources again, this time hoping to profit from large zinc deposits. Zinc accounted for over sixty percent of the value of mineral production in the region in 2007, equaling 696,115 tons. After zinc came gold (at 15.2 percent) and lead (at 11.6 percent). Zinc deposits in Alaska have employed more than 450 workers, many of whom are Inupiat people residing in the region (Klein 2000, 94). Alaska's largest zinc mine is the Red Dog Mine in the northwest part of the state.

Mining requires a good, solid, long-term relationship with the indigenous communities, as the benefits are long-term. Mining operations require a large upfront investment on the part of the company; therefore the company must weigh local resistance to anticipated benefits before beginning an operation. The job creation for indigenous workers draws a large indigenous interest to the mines, and many indigenous communities rely on the economic benefits brought from the mines. By working in the mines, the indigenous can take advantage of learning skills that can be applied elsewhere and the businesses created around the mines. Yet, people do not want to see activities taking place that damage something important to them.

While Tom Paddon, the CEO of Baffinland Iron Mines Corporation believes that his company is "doing everything and even more" to make sure mining activities are not damaging traditional ways of life, reality suggests otherwise. Mining operations are incredibly susceptible to uncertainty and price volatility. Companies will abandon mines once they become unprofitable. There is also a large problem with bankruptcy of mining

companies, which also results in the abandonment of mines. These leave a terrible legacy once the mining company is gone.

In addition to impacting the traditional Arctic way of life, mining operations leave a large environmental footprint. Not only are there air pollution effects, but there are also large infrastructure developments necessary to sustain operations. Canada's Mary River iron ore project on Northern Baffin Island, more than 300 miles above the Arctic Circle, is one of the largest mining developments currently planned in Canada. The mine is expected to yield 19 million tons of iron ore per year. To create those yields, the project has a development plan of $4.1 billion, with half of the funds earmarked for construction of an 87 mile railroad to connect the mine to a seaport (Thomas White International 2011). Thawing permafrost, as previously discussed, could inhibit stable infrastructure creation.

Of all Arctic mining operations, Russia has the highest levels of pollution. In 2006, there were 25 mines operating in the Russia Arctic, the majority for nickel and copper, mining almost 20 million tons of ore annually. Mining is heavily concentrated on the Kola Peninsula, in western Russia neighboring Norway. During the last ice age, the topmost soil layer was removed with the moving glaciers across this 129,500 square kilometer area, exposing these minerals and precious stones for easy extraction (Glasby and Voytekhovsky 2009).

Mining has the potential to spur economic development and create wealth, but also harms the environment (Haley, Klick, Szymoniak, and Crow 2011, 38). Each country's mining sector is regulated by its own framework, presenting no international

regulation norms. While it is easy to criticize the mining companies as being outsiders decimating traditional lands, many people working within the mining companies are Northern residents and do value the Northern landscape.

Oil and Natural Gas

As early as 1789, Alexander Mackenzie observed the presence of oil in northern Canada. A century later, a report to the Canadian Senate concluded that this area was the site of "the most extensive petroleum field in America, if not the world" (Emmerson 2010, 173). The harvesting of this oil was soon abandoned, as there was no way of transporting the oil to viable markets and no confirmation of the actual measure of the large predicted quantities. Even as oil consumption increased, it was cheaper to pursue other sources than to drill in the Arctic. The harsh conditions of the region also provided a barrier to natural gas development throughout most of the Arctic. Only in the Soviet Union was oil produced on any scale before the 1960s (Emmerson 2010, 173).

This all changed in 1968 when the major discovery of oil at Prudhoe Bay on Alaska's North Slope was announced. The initial estimates suggested that Prudhoe Bay held up to ten billion barrels of oil, making it the largest known oil field in North America. With this large potential for oil, the United States began to look at options to transport this oil from the far north. In February 1969, plans to build the Trans-Alaskan pipeline were announced. The pipeline would be able to carry 500,000 barrels per day from Prudhoe Bay to the port of Valdez on the southern edge of Alaska. The suggested pipeline ran into political and legal obstacles until the 1973 oil crisis. On November 13, 1973, the Senate passed the Trans-Alaska Pipeline Authorization Bill, and the pipeline

was operational in June 1977. By the mid-1980s, the price of oil fell and Arctic production began to slow. In 1985, the price of oil was $27.56. A year later, it had fallen to $14.43. With increased production in Saudi Arabia, oil production in the Arctic was once again forgotten (Caufield 2000).

That is, until recently. With the increasing price of oil and the United States' desire to reduce its energy dependency, the Arctic has once again become an area of interest for oil production. Furthermore, melting ice in the Arctic has reduced the technological barriers to oil development under extreme weather conditions. In a 2009 report, the United States Geological Survey suggested that the Arctic has the potential for the production of over 90 billion barrels of oil, 1,669 trillion cubic feet of natural gas, and 44 billion barrels of natural gas liquids (Anderson 2009, 121). The USGS has described the Arctic as "the largest unexplored prospective area for petroleum remaining on the earth." It is estimated that thirteen percent of the world's oil and thirty percent of its natural gas are in the Arctic region (Anderson 2009, 121). The oil and gas already found above the Arctic Circle is said to equal nearly as much as the entire proven oil reserves of Saudi Arabia.

The largest oil deposits in the Arctic are off the coast of Russia (Borgerson 2008, 67). Russia's state-controlled oil company is already developing 113 trillion cubic feet of gas in the Barents Sea (Borgerson 2008, 67). One of the country's deepest boreholes reaches a depth of 12,261 meters. Furthermore, it is estimated that 44.4% of Russia' oil fields are located in the Kara Sea, 25.6% in the Barents Sea, 8.8% in the Okhotsk Sea, and 5.1% in the Pechora Sea (Glasby and Voytekhovsky 2009). Additionally, if the

United Nations Convention on the Law of the Sea approves Russia' claim extension request, Russia's territory could contain as much as 586 billion barrels of oil (Borgerson 2008, 68). Securing these oil claims is an important step in Russia's economic strategy in the Arctic.

Shipping Routes

In order to profit from the extraction of these resources, there needs to be a reliable transportation route to take them to market. Open shipping routes in the Arctic would also bring widespread benefits beyond the transportation of Arctic resources. There are two defined routes in the Arctic – the Northwest Passage and the Northern Sea Route. Early explorers spent centuries discovering that these routes were permanently covered with ice. This has recently changed. As a result of large seasonal melting, these passageways are traversable by ship in the Arctic summer. The image below shows the Northwest Passage and the Northern Sea Routes and the change in their accessibility over the last thirty years.

The use of these routes has the potential to significantly reduce global travel distances. The Northwest Passage route would reduce the route from Seattle to Rotterdam by 2,000 nautical miles, making it nearly twenty-five percent shorter than the current route that passes through the Panama Canal (Borgerson 2008, 69). The use of the Northern Sea Route would reduce the sailing distance between Rotterdam and Yokhoma, Japan from 11,200 nautical miles to only 6,500 nautical miles. The voyage, which originally used the Suez Canal, would be cut by forty percent (Borgerson 2008, 69).

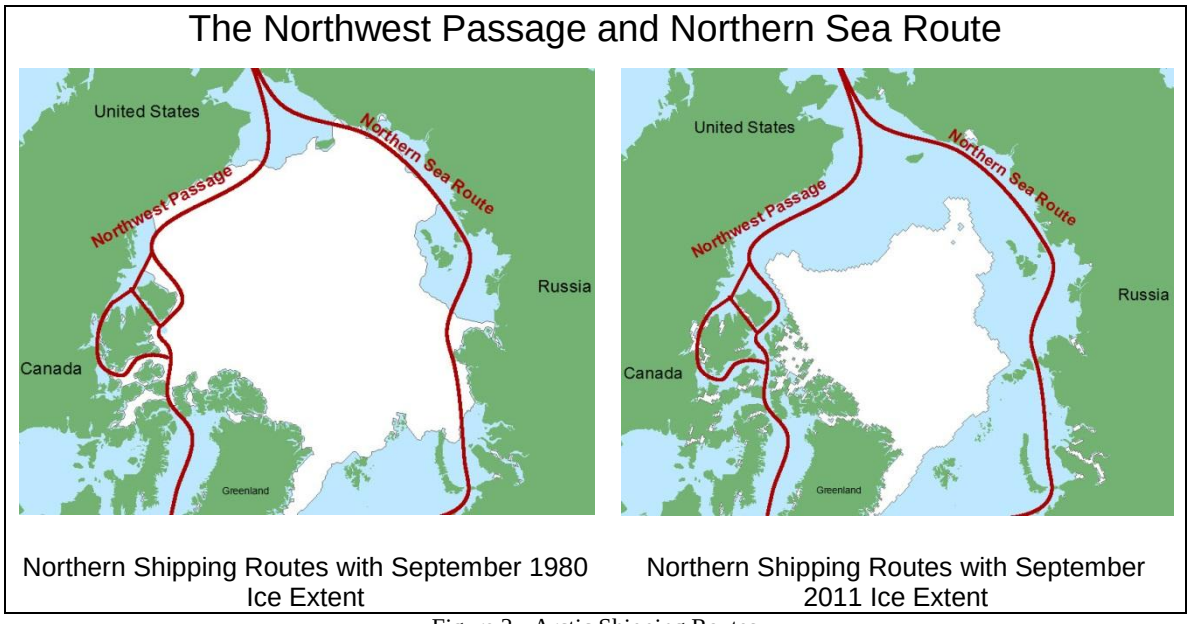

Figure 3 - Arctic Shipping Routes

Arctic shipping significantly reduces shipping time and avoids global chokepoints, such as the Middle East. However, the potential risks foil these benefits. Arctic shipping is not necessarily more efficient. In order to safely travel in the Arctic, ice-breaker class ships are needed. These ships are more expensive to manufacture and require much more fuel to operate. The Arctic also has a greater potential for unexpected and dangerous weather patterns. Combined with the free floating ice fragments, this makes Arctic waters more difficult to navigate. Ice conditions are also not annually consistent. While the passageways may be open one year, they could be closed the next. There is also currently a lack of adequate maritime management and search and rescue capabilities to support increased maritime Arctic activity.

Ice patterns have shown that it is more likely the Northern Sea Route will be consistently ice free before the Northwest Passage. Until 1991, the Northern Sea Route

was off-limits to non-Soviet vessels. On July 1, 1991, Soviet authorities opened the passage to foreign vessels (Ragner 1000, xxix). After this, the Russian-Norwegian-Japanese International Northern Sea Route Programme (INSROP) was founded. The program started in 1993 and ended in 1999. During this time, 390 researchers from 14 countries published 170 reports. The main conclusion of INSROP was that there is a potential for increased international use of the Northern Sea Route. Technological and environmental challenges that discouraged the use of the passage are no longer a barrier (Sponheim in 1999, 15).

Tourism

200 kilometers north of the Arctic Circle is a small Swedish town called Lapland. During the summer, tourists come to Lapland for white water rafting, fishing, canoeing, and to see the midnight sun. Much of the economy of the town relies on this tourist industry. However, this town was unable to attract any winter visitors. That was, until the building of the world's first and largest ice hotel. Sculpted completely out of ice each winter, this hotel draws visitors to Lapland during the coldest, most brutal time of year. For approximately $200 per night, visitors can stay in ice rooms and receive a certificate claiming they survived a night at -5 degrees. The rooms are outfitted with thermal sleeping bags and reindeer skins, guaranteeing the comfort of the guests. Additionally, guests are offered northern lights tours, snow mobile driving lessons, and guided tours of the surrounding barren Arctic. Somehow, Lapland was able to turn the most unbearable conditions in the world into a popular and luxury tourist destination.

While tourism is not an activity that extracts resources from the Arctic, it still uses the Arctic for an economic gain. The notion of the Arctic wilderness as pristine and untouched provides great potential for recreation, adventure, and leisure (Mason, Johnston, and Twynam 2010, 306). By 1807, there was already a tourist guide book available for travelers to the Scandinavian Arctic (Stonehouse and Snyder 2010, 26). By the 1880s, Arctic tourism had become a viable business.

However, while tourism yields economic benefits, it also has damaging impacts on the environment. Most tourism in the region is cruise ship activities. Many cruise ships are not equipped with the thicker hull that icebreakers have, presenting a higher level of oil spill risk. Oil spills are especially difficult to clean up in the cold, icy conditions of Arctic water. Between 1993 and 2009, cruise ships on polar voyages were involved in more than 40 fuel spill incidents. Secondly, with uncertain weather patterns, there is also a higher incidence of ship disasters. Between 1979 and 2009, eight polar cruise ships sank, five since 2000 (Stonehouse and Snyder 2010, 103). These impacts, though, are miniscule compared to those caused by industrial activity in the region.

With these risks, Arctic states need to have adequate search-and-rescue procedures and capabilities in order to sustain or grow responsible tourism in the area. To this degree, the Association of Arctic Expedition Cruise Operators (AECO) was founded in 2003 with a purpose of managing "respectable, environmentally-friendly, and safe expeditions in the Arctic." Similarly, non-governmental organizations and environmental groups, such as the World Wide Fund for Nature, have launched specific

Arctic programs to develop their own guidelines for Arctic tourism (Mason, Johnston, and Twynam 2010, 305).

Chapter Five: Players of the Game I – State Actors

There are different levels of players in the Arctic, with those states closest to the region excluding states geographically distant from the Arctic. The five littoral states are known as the "Arctic Five" and consist of the United States, Russia, Canada, Denmark, and Norway. While each state has its own self-interest strategy, cooperation will be necessary for achievement of these goals. Thus, gameplay in the Arctic is a precarious balance between limited cooperation and competition. While each state is working to maximize its own self-interests, their Arctic strategies have common themes. These themes are sovereignty, scientific research, resource development, shipping issues, and environmental issues. Much of the Arctic players' strategies are aimed at maximizing the available prizes the Arctic offers. Actors must collaborate to attain an optimal outcome that is not the outcome that would result if each state pursued its own interests.

Security

Militarization has been a long-standing practice in the Arctic. Hard security was the Cold War trend in the Arctic. There were legitimate concerns of invasion and the need for a buffer zone between the two superpowers. The Arctic provided this barrier. While these concerns waned with the end of the Cold War, strong military presence in the Arctic continues to be seen as a solution to combating terrorism, illegal migration, and illegal maritime activities. Security is the rhetoric that states use to secure stability. Without stability in the Arctic, they would be unable to reap the benefits of resource

extraction. This chapter will look at nation-states' strategies in obtaining security in the Arctic region, as these underlying strategies and values dictate policy and action.

Arctic States

Russia.

At 1:36 pm Moscow time on August 2, 2007, a Russian submarine expedition planted a rust-proof titanium flag on the seabed 14,000 feet below the North Pole. The Russian team, lead by Parliamentarian Artur Chilingarov, arrived at the North Pole by icebreaker. Once there, they descended in two mini-submarines, one of which had a robotic arm that planted the flag and took sediment samples from the seabed. Upon surfacing, Chilingarov claimed that, "If a hundred or thousand years from now someone goes down to where we were, they will see the Russian flag" (BBC News). Although Russia denied that the mission was a land grab, their actions raised international debate concerning the aggressiveness of Russian policy in the Arctic. In an interview after the Russian mission, Canadian Foreign Minister Peter MacKay commented, "This isn't the 15th century. You can't go around the world and just plant flags and say 'We're claiming this territory.'" In response, Anatoli Sagalevich, the operator of one of the mini-submarines, commented, "The Americans placed their flag on the moon, and it doesn't mean the moon became theirs." While international norms and laws have expostulated the flag-planting claims process, acknowledgement of territorial claims are inherent to exercising sovereignty in the region.

In 2001, Russia submitted a formal claim under the United Nations Convention on the Law of the Sea that would expand its Arctic jurisdiction by 460,000 square miles.

The role of the Commission in determining maritime sovereignty and the complications with the Russian claim will be discussed later. Here it only necessary to note that Russia emphasized the importance of determining sovereignty over resource-rich regions of the Arctic, and for the time being, it has been working within the international frameworks to pursue its Arctic interests. Complete sovereignty allows for independent decision-making and self-gain. All of the Arctic states are concerned with how they maintain and display this power, and increased military presence in northern regions is a common tactic to do so.

Russia's Arctic land spans over 4,000 miles and 11 time zones (Anderson 2009, 13). Historically, Russia has been one of the most active and aggressive states in the Arctic. Its first hydrographic survey of the region dates back to 1933. The Russian Admiral S.O. Makarov first proposed the idea to design ships with reinforced and strengthened hulls, and the icebreaker has been crucial in the opening of the Russian Arctic (Peresypkin 1999, 24). In 1916, the world's first icebreaker, the *Krasin*, was built by Russia to support regular navigation along its northern coast. This vessel remained the leading icebreaker in the world until the late 1950s. In 1977, a Russian nuclear-powered icebreaker *Artika* became the first ship to reach the surface of the North Pole. Between then and 2009, only 80 surface ships have reached the North Pole; sixty-seven of these expeditions were Russian (Smith 2010, 55). Currently, Russia has a fleet of twenty ice-breakers, the largest of any nation.

Russia's former Arctic strategy, created in 2001, emphasized Russia's hard security approach toward the region. Although the updated 2008 "Arctic Strategy"

diverges from the traditional Russian rhetoric of assertion and belligerence, Russia still maintains a strong military presence in the Arctic. The "Arctic Strategy" specifically acknowledges military activity in the north as necessary to combat terrorism, smuggling, and illegal migration at sea.

Russia's Northern Fleet has been based on the Kola Peninsula, on the southwest shore of the Barents Sea since 1933. The fleet is the largest component of the Russian Navy and is well-situated to deploy year-round to the Northern Atlantic Ocean. Russia has also resumed regular aircraft surveillance patrols. Its long-range strategic bombers have been identified flying along the Norwegian coast more often over time – 14 times in 2006, 88 times in 2007, and 97 in 2008 (Zysk 2011, 86).

Russia's current strategy emphasizes the importance of resource extraction in the Arctic for greater economic development. Beginning during the tsarist era and renewed under Stalin, the Russians built towns across its frozen tundra in search of minerals and other resources (Anderson 2009, 14). Although only two percent of Russia's population lives in the Arctic, the region generates fourteen percent of the country's GDP (Zysk 2011, 95). Twenty-two percent of Russian exports are generated north of the Arctic Circle (Conley and Kraut 2010, 23). According to Russian research, up to ninety percent of the hydrocarbons found on the Russian continental shelf are in the Arctic.

Profitability from this resource extraction relies on the development of the Northern Sea Route as a transportation link across Russia and globally. By 2015, Russia aims to have established and developed a transportation system for the Northern Sea Route to secure Euro-Asiatic transit. Second, the Russian strategy emphasizes the

importance of determining sovereignty over the resource-rich areas of the Arctic, as complete sovereignty allows for independent decision-making and self-gain.

United States.

The United States was not an Arctic state until it purchased Alaska from Russia in 1867. At the time, many people questioned the benefits of the northern land, calling the $7.2 million purchase "Seward's Folly." The region was practically ignored by the United States until gold was discovered there twenty years later. By 1908, Alaska had generated nearly $300 million in resource wealth, invalidating previous concerns about Alaska's contribution to the United States' economy (Zellen 2008b, 28-24). Since then, Alaska and its resources have served as the United States' gateway to the Arctic. In addition to acknowledging Alaska's resource endowment, the United States began to see the Arctic as strategically important during the Cold War when mapping the Arctic seabed became important in staying ahead of the Russians (Dodds 2010, 65).

The United States updated its Arctic Region Policy in January of 2009, replacing the 1994 document in the last days of President George W. Bush's presidency. The strategy outlines the United States' priorities to: 1) meet national security and homeland security needs relevant to the Arctic, 2) protect the environment, 3) continue sustainable economic development in the Arctic, 4) strengthen cooperation among the Arctic nations, 5) encourage continued involvement of indigenous populations, and 6) enhance scientific monitoring and research of global environmental issues. The context of the document is purposely vague, allowing for loose interpretation and flexible implementation in the future. This strategy does require the United States to assert a more active and influential

national presence in the Arctic. In fact, the United States has elevated its commitment to the Arctic Council. In 2011, Secretary of State Hillary Clinton became the first US Secretary of State to attend an Arctic Council ministerial meeting. In the past, the United States has sent lower-ranking ministerial officials as representatives to this meeting. The National Security Presidential Directive stated that "The United States has broad and fundamental national security interests in the Arctic region and it is prepared to operate either independently or in conjunction with other states to safeguard these interests." In order to guarantee this security, the United States funds a Navy as large as the next seventeen in the world combined; however, it has only one seaworthy icebreaker (Borgerson 2008, 64). Thus, the strategy suggests that the United States build its capacity to operate in the Arctic.

A second step that the United States should take, as laid out in the strategy, is to ratify the United Nations Convention on the Law of the Sea, a document considered the current leading framework for Arctic governance. The United States Senate has not ratified the treaty out of fear of ceding too much sovereignty to an international organization and the possibility of unfavorable resource allocation (Ebinger and Zambetakis 2009, 1224). Without signing this treaty, however, the United States is limited in its power in the Arctic. It cannot formally assert any rights beyond its Exclusive Economic Zone. The updated Arctic strategy recognizes these limitations and recommends that the United States work toward the ratification of the treaty.

Although the United States has not ratified the treaty, it is still taking actions necessary to establish the outer limit of its continental shelf. Establishing this boundary

would allow the United States conservation and management of natural resources in this region. Though, resource extraction may be limited, as the United States Geological Survey has determined the majority of these resources fall outside U.S. jurisdiction.

Canada.

The Canadian Arctic is comprised of three separate territories – Nunavut, which covers 750,000 square miles, the Yukon Territory, and the Northwest Territory. Its 36,000 islands create a total Arctic coastline of 162,000 kilometers, the longest of any Arctic nation (Anderson 2009, 14). The famed Northwest Passage runs through this archipelago. Although other Arctic states have attempted to declare this waterway as an international strait, in December 2009, Canada's House of Commons unanimously passed a bill to rename the route the "Canadian Northwest Passage." While not as aggressive as Russia's flag planting, this action symbolically asserts Canadian authority over the Northwest Passage as internal waters (Conley and Kraut 2010, 16). Canada has named its leading research icebreaker *CGCS Amundsen* after the Norwegian who was the first to successfully traverse the Northwest Passage. This icebreaker is also on the back of the Canadian $50 bill, a sign of Canada's passion for and commitment to Arctic research.

The designation of the Northwest Passage as an international strait would allow for the innocent passage of foreign vessels in the waterway, while Canada would have complete jurisdiction over travel in internal waters. Canada has invested $109 million to be spent by 2014 to research the extent of its continental shelf to support its actions. By contrast, the United States claims that the Northwest Passage is an "international strait." Evidence to support this claim is weak. Between 1904 and 1984, only eleven foreign

transits sailed across the entirety of the passage, falsifying the idea that the passage has a history of being used for international shipping at a significant scale (Howard 2009, 50).

Canada's "Northern Strategy" has four main priority areas: 1) exercising Arctic sovereignty, 2) protecting environmental heritage, 3) promoting social and economic development, and 4) improving Northern governance. In August 2007, Canadian Prime Minister Stephen Harper launched Canada's Far North campaign. He claimed that "Canada has a choice when it comes to defending our sovereignty over the Arctic. We either use it or lose it. And make no mistake, this government intends to use it." Harper traveled across the Canadian Arctic in 2007, visiting research stations and drawing attention to the Canadian North (Coates et. al 2008, 180). In 2010, the Canadian government announced a series of projects to bring broadband internet access to an estimated 169,000 households in Canada. These 52 projects with a combined federal contribution of $76.7 million were specifically targeted at Canadians living in underserved areas, specifically the Arctic regions (Industry Canada 2010). Canada also made a $156 million investment in research projects during the latest International Polar Year, the most significant investment Canada has made to Northern research (Duncan 2012).

Like other nations, Canada has increased its military presence in the Arctic. The Canadian Forces continue to demonstrate and improve their capabilities to respond to challenges in the Arctic. Canada also plans to add eight more ice breakers to its fleet of twelve (Conley and Kraut 2010, 18). Finally, Canada has strongly supported the participation of indigenous groups at the Arctic Council. The Canadian government has

negotiated land claims agreements with several indigenous groups, transferring province-like responsibilities to these territories, which will be discussed later.

Denmark.

Although Denmark as a land mass is far removed from the Arctic, its possession of Greenland makes it an Arctic nation. In 1605, a Danish expedition claimed Greenland for Denmark. In 1721, a Danish-sponsored missionary, Hans Egede, travelled to Greenland in hopes of re-Christianizing the presumed Viking descendents living there. When he arrived, he learned that the only inhabitants of the island were Inuit descendents (Hamilton, Lyster, and Otterstad 2000, 196).

Denmark took on a traditional paternalistic role in its relationship with its colony, establishing a Danish-led administration. Dependence on Denmark dates back to the first settlement on the island. The settlers could not support themselves, as the island had no timber for building boats or houses and the settlers were unable to grow grain for food (Howarth 1957, 5). Today, eighty percent of Greenland's population is of Inuit descent. Their economy is based on subsistence hunting and fishing activities, commercial fishing, and block grants from Denmark. Denmark continues its obligation of supporting Greenland by providing a 2.5 billion Danish Kroner annual grant, comprising sixty percent of Greenland's revenue (Nuttall 2008, 65).

Greenland's Premier Hans Enoksen has expressed a desire for Greenland to be independent by 2021. Although this is unlikely, as its population of 57,000 does not have the resources to establish an independent infrastructure (Conley and Kraut 2010, 19). However, over time, Greenland has gained more autonomy. The first step was the

creation of "Home Rule" in 1979. The idea of Home Rule was advanced by the emergence of a young and radicalized Greenlandic elite (Caulfield 1997, 37). As part of this agreement, Greenlanders gained a large share of the revenues from the natural resources extracted from it. The Home Rule government has gradually assumed control over nearly all internal matters, including fisheries management, education, health services, and the development of infrastructure. In 1985, Greenland made the decision to leave the European Community in contention over living marine resource laws. In November 2008, 75.5% of the electorate voted in favor of even greater autonomy than "Home Rule," and in June 2009, a policy of "Self-Rule" was implemented.

The Kingdom of Denmark's "Arctic Strategy," created in 2008, is thus based on balancing Greenland's increasing independence with maintaining a role for Denmark in Arctic affairs. It outlines four main priorities: 1) a peaceful and secure Arctic, 2) self-sustaining growth, 3) respect for the Arctic environment, and 4) close cooperation with international partners.

Norway.

The Svalbard archipelago is a group of islands that lie approximately halfway between Norway and the North Pole. During the early days of exploration, this archipelago was known as the Spitsbergen Islands. With their unique mix of flora and fauna and an abundance of natural resources, they have long served as the starting base for expeditions, a station for whalers and fishermen, and a popular tourist destination. By 1871, Sweden, Norway, and Russia officially established the status of the islands as "no man's land," which had been the de-facto situation until that time. By the twentieth

century, mineral deposit rights and entitlement posed a conflict among these nations, creating the need for a governance structure. During the Versailles Treaty negotiations following World War I, Norway requested that the issue of Spitsbergen be taken up and that sovereignty be granted exclusively to Norway. The Spitsbergen Treaty was signed in Paris in February 1920, designating the archipelago a part of Norway with equal rights of access to resources for the signatory parties. Shortly thereafter, the Soviet Union protested the treaty, claiming it void, as it was negotiated without Soviet presence. The Soviet Union did formally sign the treaty in 1935.

Today, the archipelago is named Svalbard, although the largest island is still named Spitsbergen. Upholding sovereignty over Svalbard and managing relations with the Russians continue to be two major parts of Norwegian activities in the Arctic. Norway's Arctic territory consists of three counties in Norland, Troms and Finnmark on the mainland, the Svalbard archipelago, and the island of Jan Mayen. Together, these areas make up almost half of the Norwegian land mass and serve as home to 470,000 people, which constitute one-tenth of the Norwegian population (Arctic Council website).

Norway's Arctic policy, the "High North Strategy," was signed in December 2006. Although it is the oldest of the five nations' strategies, it remains very relevant. In this strategy, Norway considers the High North to be its most important strategic priority area. The underlying theme to Norway's strategy is predictability in its Arctic actions. They strive to "exercise authority in the High north in a credible, consistent, and predictable way." Norway's main political priorities in the Arctic are 1) to be at the forefront of international efforts to develop knowledge about the Arctic, 2) to be the best

steward of the environment, 3) to provide a framework for further development of petroleum in the Arctic, 4) to safeguard the livelihoods and cultures of the indigenous people, and 5) strengthen cooperation with international actors.

Similar to Russia, Norway relies heavily on the Arctic for the basis of its economic activity (Tamnes 2011, 56-57). The Norwegian Arctic has great potential for the oil and gas industry, which generated 22 percent of Norway's GDP in 2009 (Conley and Kraut 2010, 21). Norway is currently the second largest natural gas exporter in the world (Tamnes 2011, 57). In order to continue to use the Arctic in this way, Norway intends to provide a sustainable framework for the development of oil and gas in the Barents Sea and to ensure that these activities benefit Norway in general and specifically northern Norway. Additionally, Norway hopes to strengthen cooperation with Russia over resource development. For over thirty years, Norway and Russia have been cooperating over fisheries, and Norway sees this cooperation as an opportunity to expand oil and gas production in the Barents Sea.

Norway is not a member of the European Union, but the European Union relies heavily on Norway for energy security. No European Union state, other than Denmark, is an Arctic littoral state. Thus, the EU has a strong interest in aligning itself with Norway for energy security and to enhance Arctic activity. Norway has held two referendums on the issue of EU membership – first in 1972 and again in 1994. On both occasions, a narrow majority of the voting population rejected EU membership. Because Norway is not a member state, its relationship with the EU is based on other forms of cooperation. This cooperation enables Norway to maintain a high level of economic

integration with the EU and its member states through the European Economic Area (EEA) and other avenues. Because Norway uses its Arctic territory for strategic leveraging with the European Union, it is important for Norway to secure sustainable development practices and sovereignty over the region.

Finland, Iceland, and Sweden.

The Arctic Five use geographical excludability to prevent other states from becoming more involved in the Arctic decision-making process. Although Finland, Iceland, and Sweden do not have land masses that border the Arctic Ocean, the Arctic Circle does run through them. This puts these states in a unique position in Arctic politics. They are member states of the Arctic Council, but are still kept at a distance by the Arctic Five. These three states also have Arctic polices, all particularly aimed at external relations and building the capacity of the Arctic Council as the key decision-maker in the region.

Finland was the first state to organize a ministerial meeting on the Arctic in Rovaniemi in 1991. This meeting catalyzed the efforts to create the Arctic Environmental Protection Strategy and eventually the Arctic Council, which will be discussed later. Today, Finland's strategy focuses on drawing attention to the environmental issues that are unique to the Arctic region and pushing for stronger support for Arctic research. Finland also aims to strengthen its role and use its expertise in the region, particularly in regard to winter shipping and Arctic technology (Prime Minister's Office 2010). Sweden is the current chair of the Arctic Council, a position that rotates among member states every two years. It intends to use the Arctic Council as the vehicle

in which to accomplish its Arctic strategy. Sweden's primary concerns are climate and the environment, economic development, and living conditions for the people of the region.

Iceland's Arctic strategy also focuses on the Arctic Council as the most important forum on Arctic issues. Unlike Sweden and Finland, however, Iceland is strongly focusing on securing its position as an Arctic coastal state. Iceland claims that the northern part of its Exclusive Economic Zone, a 200-mile area off the island's coast, falls within the Arctic Ocean. Furthermore, Iceland is focused on expanding the definition of the Arctic to not be limited to a narrow geographical definition. Instead, Iceland sees it as a broad ecological, economic, and political area. These views are designed to increase Iceland's ability to participate in Arctic activities and decisions.

The European Union

When the European Union released its Arctic Strategy in 2008, a joke in Canada was that the best response would be a strategy document on Canada's plan for the Mediterranean (Anderson 2009, 119). With Greenland's departure from the European Union in 1985 over its fishing regulations, no Arctic Five state is a member of the EU (Anderson 2009, 119). Additionally, the EU's application for observer status at the Arctic Council was not approved at the council's biannual ministerial meeting in April 2009 with a veto from Canada. Exclusion of the European Union in Arctic affairs is based on the viewpoint of the Arctic as a regional management area.

Regardless, the EU's main Arctic objectives are to 1) promote and preserve the Arctic in unison with population, 2) promote sustainable use of resources, and 3)

contribute to enhanced multilateral governance (Commission of the European Communities 2008). The European Union has created the European Polar Board to maximize the impact of European polar research, particularly in closing knowledge gaps in the area of climate change and assessing future anthropogenic impacts. Additionally, the EU believes it could benefit from open Arctic shipping routes and is pushing to guarantee the freedom of travel for anyone through these passages. The EU continues to ally itself with Norway to secure Arctic oil and gas supplies for the continent (Anderson 2009, 120). Finally, the EU is campaigning for more multilateral governance in the Arctic region. The EU recognizes the presence of a few Arctic States controlling all activities in the Arctic and wishes to push for more global interaction in the region.

One area of contention between the European Union and several Arctic states is the EU's policy on hunting marine mammals. While the EU recognizes that hunting marine mammals has been crucial for the subsistence survival of Arctic populations, there is a growing concern within the EU about animal welfare. The European Union will continue to protect marine mammals by supporting the framework of the International Whaling Commission. Additionally, the EU is considering banning the marketing, import, transit and export of any seal products (Commission of the European Communities 2008).

Other States

The European Union's concerns about an Arctic monopoly of states are reinforced by the interests of other states. Chinese Rear Admiral Yin Zhuo claimed, "The Arctic belongs to all people around the world as no nation has sovereignty over it."

China sees great benefits from the Arctic. China supports the UNCLOS and other international frameworks currently governing the Arctic; however, it acknowledges the constraints of the current system to address some of the arising issues. China believes that Arctic governance should focus more on navigation safety and environmental protection, and China will play a critical role given its interests in Arctic research, environmental protection, resource exploration, and navigation. China has recently released its plan for a polar expedition from 2011 to 2015 (Baozhi 2011, Ryan 2011). It currently has one operational icebreaker, the *Xuelong*, but a new 8,000 ton icebreaker is planned to be completed in 2014 (Erickson and Collins 2012). The general Chinese population has also expressed an increased interest in the Polar Regions, with the Arctic becoming a popular tourist destination and the Arctic appearing as a theme in some Chinese literature and pop songs (Yang 2012).

Denmark has prioritized its economic relationship with China and supports its application as a permanent member of the Arctic Council. The Danish ambassador to China explains that China has "natural and legitimate economic and scientific interests in the Arctic." Denmark is already making plans with China to allow it to begin developing mineral resources in Greenland. This is an ideal entry point for the Chinese in the Arctic, as the Greenland government and population lacks the ability to develop mineral resources independently. Because of Greenland's small population, China also anticipates importing a substantial number of workers to Greenland to build the power plants, transmission lines, and infrastructure for the mining process (Erickson and Collins 2012).

While there is concern among non-Arctic states over exclusion from the benefits of Arctic resources, the real fears and interest lie in the Arctic's role in global climate change. Recently, small island developing states have aligned their strengths and vulnerabilities with Arctic communities. At first, these two areas of the world seem to have little in common, but the linkages are deep. Simply put, Ronie Jumeau, the Seychelles Ambassador to the UN and US explains, "As the poles melt, we drown." Yet, there is no outlet for participation for these states in the current Arctic framework. Many Strong Voices, an alliance of Arctic communities and over twenty small island developing states in the Caribbean and Indian, Atlantic, and Pacific Oceans, was developed to build the capacity of these communities and raise awareness about the effects of climate change. Lessons learned through the Many Strong Voices network can support successful policy development; the challenge will be finding means of participation for global issues in a pre-existing exclusive forum.

Chapter Six: Players of the Game II – Non-State Actors

"The North is my home – the place I was born to and the place I have chosen." – Kyla Kakfwi Scott, Jane Glassco Arctic Fellow

If Arctic gameplay were restricted to only nation-states, an integral player and inhabitant – the indigenous – would be excluded. The Arctic is home to over four million people, of which ten percent are indigenous. The indigenous groups are often a multi-state nation, meaning that one indigenous group spans several political boundaries, and states have multiple indigenous groups within these boundaries. For all of these groups, the Arctic provides a basis for survival, social identity, and spiritual life. Many native people view themselves as participants in the Arctic ecosystem, rather than managers or observers. The changes to this system, through increases in industrial development, oil and gas exploitation, environmental concerns, and tourism all pose threats to their traditional way of life and require the development of adaptation strategies. David Serkoak, an Inuit elder from Nunavut, was born in an igloo. Today, David surfs the internet, is a regular Facebook user, and calls his friends with his cell phone. As David can attest, times clearly are changing for the indigenous people, leading to the need for increased indigenous autonomy and involvement in the institutional frameworks in place.

To this degree, the Arctic Council, a high-level forum for cooperation in the Arctic, has recognized six indigenous groups as permanent participants. While the Arctic Council will be discussed in more detail later, here it is important to note that the status of

permanent participant gives indigenous communities a unique place to be a part of Arctic policy formation. As the longest residents of the region, the indigenous do have rights and should be included in the decision-making process.

Indigenous People's Groups

Approximately 155,000 Inuit live in Greenland, Canada, the United States and Russia (Wilson 2007, 77). In 1977, Eben Hopson founded the Inuit Circumpolar Conference (ICC) to represent this multi-state nation with a common voice. The reasons for its formation thirty-five years ago are just as relevant today as they were then. The ICC aims to strengthen unity among Inuit, promote Inuit rights on an international level, encourage policies that protect the Arctic environment, and be an active partner in the development of Arctic policies. To do this, the ICC holds a General Assembly every four years, where they elect a new Chair and executive council, develop policies, and adopt resolutions to guide activities for the coming term (ICC). Although the ICC has a limited budget, the organization has particularly been strengthened through the individuals that have led the organization (Wilson 2007, 67).

At the time of its creation in 2000, the Arctic Athabaskan Council represented approximately 32,000 people of Athabaskan descent. This international treaty organization was created to defend the rights and further the interests of the Athabaskan nation. Today, the ACC members in Alaska, the Yukon, and Northwest Territories span across 76 communities and represent approximately 45,000 people.

The Aluet International Association represents the Aleut in Russia and the United States. Registered in 1998, it was one of several groups that benefited from the Alaska

Native Settlement Claims Act, which will be discussed later. Established in 1999 by the Gwich'in Tribal Council in Inuvik in Canada's Northwest Territory, the Gwich'in Council International focuses on the Gwich'in in Canada and the United States. The Saami Council is the oldest of all of these groups, founded in 1956 to protect the rights of the Saami people of northern Scandinavia.

The Russian Association of Indigenous Peoples of the North (RAIPON) was founded in 1990 at the First Congress of Indigenous Peoples of the North of USSR. Now, RAIPON is the overarching organization for 35 regional and ethnic groups in Russia. It represents more than 270,000 people living in sixty percent of Russia's territory. Similar to the other organizations, RAIPON was created to protect indigenous peoples' rights and interests.

National Policy toward the Indigenous and Increased Autonomy

Although the international organizations representing these indigenous populations span multiple countries, each state has developed their own national policies to increase indigenous participation.

Greenland.

On April 9, 1940, Nazi Germany invaded Denmark, forcing all Danish citizens to submit to German occupation. Although this order did not directly address the Danish colonies, it was expected that the colonies would also come under German control. Instead of following these orders, the Governor of Greenland at the time, Eske Brun, decided that the occupation of Denmark by the Nazis initiated the rule that if

communications with the mother country were interrupted, the administration of the colony should assume ruling authority.

Eske Brun became immediately concerned about the possibility of German occupation of Greenland. Greenland could provide the Nazis with a strategic launching point for either a North American or European invasion. More importantly, however, weather observations from Greenland were crucial in forecasting the Atlantic weather. The Allies had already established a station that transmitted coded reports to Europe. It was only a matter of time before the Nazis would establish a Greenlandic base as well. While the Eastern coast of Greenland was well protected from such an invasion, the Western coast of Greenland was a vulnerable target. The area was desolate, with only a few hundred hunters and Inuit populating the coast. Brun, with guidance from the Americans and British, requested that everyone gather in the southern villages on the island. Here, the Greenlandic population could be protected. He then created the sledge patrol, a small group to patrol Greenland's western coast. With the coast evacuated, any person the sledge patrol would come upon was assumed to be an invader.

The sledge patrol monitored 500 miles of coastline by dogsled, relying on the proven Inuit method of travelling across the frozen tundra. Most of the members felt that Nazi occupation was a highly unlikely scenario, and they enjoyed the luxury of continuing their previous hunting, isolated Arctic lifestyle. During a routine patrol trip, three members of the sledge patrol came across a Nazi camp at Sabine Island. Subsequent months were spent tracking the Nazis and preventing them from inflicting

harm upon peaceful Greenland. This task proved difficult, as the Nazis had machine guns and advanced technology, and the sledge patrol had only hunting rifles.

More important to the sledge patrol than protecting the land was protecting the Inuit population from Nazi invasion. The Inuit lived a peaceful life and were unable to even imagine the concept of war. While the Danes had an understanding of what the war was about, German presence led to apprehension among the Inuit. The Christianity adapted by the Inuit emphasized the commandment of "thou shall not kill." The Inuit, regardless of the situation, would not fight. The Danes respected this belief system. Danish policy toward the Inuit was one of protection from the unfamiliar and preservation of traditional culture (Howarth 2001).

After World War II, modernization was valued above all else, and large infrastructural improvements were implemented. One of the direct results of this was the emergence of Inuit political parties and a heightened sense of Inuit culture and identity (Nuttall 2000, 385). These groups initiated the "Home Rule" process, the first act of greater autonomy among northern indigenous groups. Today, the Inuit majority – though many refer to themselves as Greenlanders – control the government under the "Self-Rule" system.

Canada.

Since the 1950s in Canada, the prevailing Canadian government attitude was to incorporate the indigenous into mainstream Canadian life. Similar to other state-indigenous relationships, the Canadian government strongly believed that through education and training, the indigenous' way of life would be significantly improved.

These policies relocated Inuit communities, brought contagious diseases to the people, and destroyed their confidence. The purpose of education was to "civilize" the indigenous people, but civilization only made them more dependent on the national system. While today, many indigenous groups enjoy the benefits of modern technology, they still heavily rely on their traditional customs, including drumming, throat singing, and the playing of Northern games, for cultural identity. The Canadian government supports the participation of indigenous groups in the Arctic Council, and it has also been involved in several land claim agreements, devolving province-like responsibilities from the federal government to indigenous populated territories.

Given the variety of indigenous groups inhabiting northern Canada and the different circumstances of each, there is no unified land claim policy. By 2006, Canada had negotiated four different land claims agreements, beginning a new era of using the tools of land claims to improve indigenous social conditions. The first comprehensive land claims agreement in Canada established Nunavik, a 507,000 square mile region in northern Quebec. Ninety percent of Nunavik's population are indigenous, and in 2006, they negotiated a further agreement to cover the rights to the offshore region adjacent to Nunavik. Covering 91,000 square kilometers of land and including 13,000 square kilometers of subsurface oil, gas, and mineral rights in the Northwest Territories, the Inuvialuit agreement was settled in 1984. Nunatsiavut, the most recent of the four land claims, covers 72,520 square kilometers of land and 44,030 kilometers of adjacent sea, and in October 2006, the Nunatsiavut Government held its first election (Inuit Tapiriit Kanatami 2011, 6-13).

These three land areas are all still a part of other Canadian provinces, whereas the 1992 Nunavut agreement established an entirely new Canadian territory. This territory, translated to "our land," was inaugurated in April 1999 and comprises 750,000 square miles – roughly one-fifth of Canada's total landmass – of the Canadian Arctic stretching from the Northwest Territory to Greenland (Nuttall 2000, 384).

The vision for Nunavut was to create a territory that would allow for the Inuit people to exercise their own political autonomy. While great in theory, this plan has not materialized in practice, and the Inuit face many challenges absent from the lives of other Canadians. Fifty-six percent of the Inuit population is under the age of twenty-five, and the median age is twenty-two (Simon 2012). Less than twenty percent of Inuit children in Nunavut graduate from high school. High living expenses, a lack of job skills, and rising costs are a reality in Nunavut, and the Inuit population suffers from the highest suicide rate in all of Canada (Simon 2012). The Nunavut government requires $650 million per year from the federal government to support a population of 22,000 Inuit. Besides, two mines, the territory has no economic base (Howard and Widdowson 1999). While the gesture for an Inuit state is promising, in practice, there remains much to be improved. In the times of rapid change in the Arctic, the young indigenous leaders in Canada are doing what the older Inuit generations were known for – creating innovated solutions – and connecting these solutions into mainstream Canadian policy.

United States.

The Arctic is an important part of Canadian identity, and Inuit populations live across a large area of Canada's landmass. Conversely, the Northern indigenous people in the United States are confined to Alaska. Overall, general American knowledge about the indigenous lifestyle is lacking. In fact, in the General Social Survey in 2010, only half of the respondents knew that the Inuit lived north of the Arctic Circle (Hamilton et al, 2012). The isolation of the Alaskan native people from the rest of the country has put their success in autonomy and participation behind that of Greenland and Canada.

Following the discovery of oil at Prudhoe Bay in the 1960s, the Alaskan Federation of Natives lobbied the United States Congress for a land settlement claim. The indigenous people felt that this act would safeguard their traditional way of life in the wake of increased Arctic activity. However, the Act's pay-out structure has limited its effectiveness. The Alaska Native Claims Settlement Act was passed in 1971 and required a particular organizational structure to administer the benefits. It subdivided one-ninth of Alaska into twelve geographic regions. Each region was required to create a profit-making corporation to receive the federal benefits on behalf of the indigenous people living in Alaska. The claim extinguished the indigenous rights to the rest of the Alaska and gave the native people $962.5 million in compensation (Nuttall 2000, 381).

Russia.

Russia's Arctic and subarctic zones are home to over two dozen distinct groups. The Soviet state identified the indigenous as a primitive people needing special assistance in their transition to socialism. Overall, the indigenous people of the north endured lower

levels of well-being than the majority of the population. They suffered from higher rates of infant mortality and greater incidences of diseases like tuberculosis. The key of Soviet policy toward northern populations was one of the destruction of cultural identity. They were removed from their traditional territories and forcibly assimilated into mainstream Soviet life (Fondahl 1997, 71). As a result, today, the Russian indigenous populations are facing a steady population decline. Much of the younger generation does not identify with the traditional culture of their elders. Alcoholism and depression are still persistent problems. Many of the Russian indigenous are now faced with the challenges of balancing mineral and oil resource development with the preservation of traditional ways of life.

Scandinavia.

The Saami people are an indigenous group living in northern Norway, Sweden, and Finland and parts of Russia. Reindeer are central to Saami culture. In the fifteenth and sixteenth centuries, the Saami transitioned from hunting wild reindeer to herding domesticated reindeer. Herding transformed the Saami people into a nomadic group. With the establishment of the nation borders between countries, like the Norway-Sweden border in 1751, Saami movement across traditional grazing lands became more difficult. Formal cooperation among the Saami in Scandinavia was initiated in 1953, and the Nordic Saami Council was established in 1956. In 1992 it was renamed to the Saami Council to include Saami representatives from Russia (Minority Rights Group).

Norway has long emphasized that the Saami culture has value in itself and should be maintained as a part of the state's overall cultural image. The 1988 Norwegian

Constitution states that "it is the responsibility of the authorities of the State to create conditions enabling the Saami people to preserve and develop its language, culture, and way of life" (Josefen 2007). However, times have changed for Norway's Saami people. With strong land-use regulations, Norway's Saami are confined to herding in fenced areas and are assigned to specific parcels of grazing territories depending on the time of year (Benko 2011).

Sweden's Saami have faced similar struggles. Sweden is placing pressure on its Saami communities to sign an agreement forcing the indigenous community to resign the rights to land they have inherited. This pressure comes from a lawsuit where 780 Swedish land-owners sued the Saami, claiming that no grazing rights existed on land to which the Swedish population held a title. The lawsuit concluded in 2004, with the court ruling that the Saami had not been able to prove rights to their pasture. These landowners are currently negotiating a land leasing agreement with the Saami herders. Despite Sweden's formal recognition of the Saami and their culture, in practice, Sweden has portrayed the Saami as an intruding population having to prove its rights to exist. The United Nations has even repeatedly criticized Sweden for placing the entire responsibility of proving land rights on the Saami (Saami Council 2011).

Chapter Seven: Current Rules of the Game

Now that we have outlined the landscape, prizes, and players in the "Arctic game," we can turn to the rules of the game, specifically how the Arctic is managed in the international sphere. We begin by laying out the premises underpinning these rules. This is followed by a review of the past and current rules in light of these premises. We conclude with thoughts and recommendations for modifying the rules to bring them more in line with these premises. Along the way, we take a detour to consider the rules of the parallel "Antarctic game." It has been suggested that these could apply equally well for the Arctic, but upon closer examination, we will see that there are limits to this possibility.

In 1968, Garrett Hardin popularized the idea of the "tragedy of the commons." Hardin looked at herders in medieval England, all sharing the same common land. He noted that each individual of the group has an incentive to increase his herd, because they reap all of the benefits, but all members of the group bear the cost of the additional livestock. However, if each person of the group works in his own self-interest, the common land will eventually be depleted. But, no individual is going to reduce his usage, as there is no personal benefit (Hardin 1968). This same concept can be applied to the Arctic.

The Arctic is not under a common management system. Land is divided according to national boundaries and sovereignty over water areas is determined by the

United Nations Law on the Convention of the Sea. Each state has control over the resources in their jurisdiction. In cases where resources can cross national boundaries, such as fish, nations have the incentive to extract as much as possible while the resources are in their control to reap the greatest economic benefit. No individual country will reduce their usage of these resources, because their restraint yields no benefits to that country. Similarly, if a nation regulates its own resource extraction process, for example, emissions from mining operations, while no other nation does, it constrains a nation's ability to profit from its natural resource endowment. This leads to overexploitation and the need for rules to control the game.

The lack of objectivity in national policies allows for international institutions to become the rule makers for Arctic activity. However, all Arctic states are particularly concerned with maintaining their sovereignty, causing them to be hesitant when creating regulations for the region. Their caution has created voluntary international frameworks with no authority to guarantee compliance and institutions whose mandates explicitly exclude the pressing concerns and conflicts in the region. These constraints limit the effectiveness of the rules, which need to adequately address the challenges in the region that may destroy the prizes or landscape. These rules also need to be fair, clear, defensible, and legitimate.

Sovereignty of Marine Areas and the United Nations Convention on the Law of the Sea

Seventy-five percent of the earth is covered by oceans. Since the seventeenth century, the ocean has been subject to the freedom of the seas doctrine, where coastal

nations have jurisdiction over a narrow belt of sea along the coastline. The rest of the ocean was free and belonging to no one. Once nations had laid claims to and began to exploit the resources of the twenty-five percent of the earth covered in land, their focus shifted to the seas. Demands for more lucrative fishing, oil exploration, and stronger maritime presence drove countries to disregard the freedom of the seas doctrine. In 1945, President Harry Truman became the first to challenge the freedom of the seas doctrine and unilaterally extended the United States' jurisdiction beyond this narrow strip of ocean to include the entire area over its continental shelf. Other countries, including Argentina in 1946, Chile and Peru in 1947, and Egypt, Ethiopia, Saudi Arabia, Libya, and Venezuela after WWII, followed suit. Indonesia and the Philippines both asserted claims to the water that separated their archipelagos.

The story of the ocean is the same as many other previously unowned and untouched regions of the world. With plentiful oil, diamonds, metals, and fish, the resources of the ocean are enormous. Modern technological advances allowed for the accelerated exploitation of these resources. As a consequence, the human impact on nature – through pollution and extinct species – found its way into the ocean. On November 1, 1967, Malta's Ambassador to the United Nations, Arvid Pardo, verbalized these consequences. He described a super-power rivalry that spread into the ocean and pollution that poisoned the seas. He ended his speech with a call for "an effective international regime over the seabed and the ocean floor beyond a clearly defined national jurisdiction." Pardo's concerns set in motion the process that would create the United Nations Convention on the Law of the Sea (United Nations website).

The United Nations Convention on the Law of the Sea (UNCLOS) was negotiated over a nine-year period from 1973 to 1982 (Smith 2010, 152). As the law generally does not distinguish between frozen and liquid waters, UNCLOS is the commonly accepted form of governance of the Arctic Ocean. UNCLOS outlines different zones of water and the rights of the state within these zones. The first zone is internal waters, such as canals or rivers. These waters are within a state's national boundaries and are not subject to any international jurisdiction. The next zone, the territorial sea, is directly adjacent to a state's national boundary. This zone has a maximum width of twelve nautical miles from the baseline of the landmass. Unlike internal waters, the innocent passage of foreign vessels is allowed in the territorial sea. The distinction between internal waters and territorial sea has been one of the key concerns in defining the Northwest Passage, as previously discussed. Past the territorial sea is the Exclusive Economic Zone (EEZ), which was established by the UNCLOS. The EEZ extends 200 nautical miles from the state's baseline. Nations have functional jurisdiction over the exploration, exploitation, and management of resources in the EEZ. While the territorial sea is inherently established, states must declare their EEZ through an application to the Commission in the Limits of the Continental Shelf. Regardless of the qualities of the continental shelf, states are entitled to an EEZ. Beyond the EEZ are the high seas, which are open to all states with no ownership or resource exploitation rights. The image below shows the extent of these zones from a state's baseline.

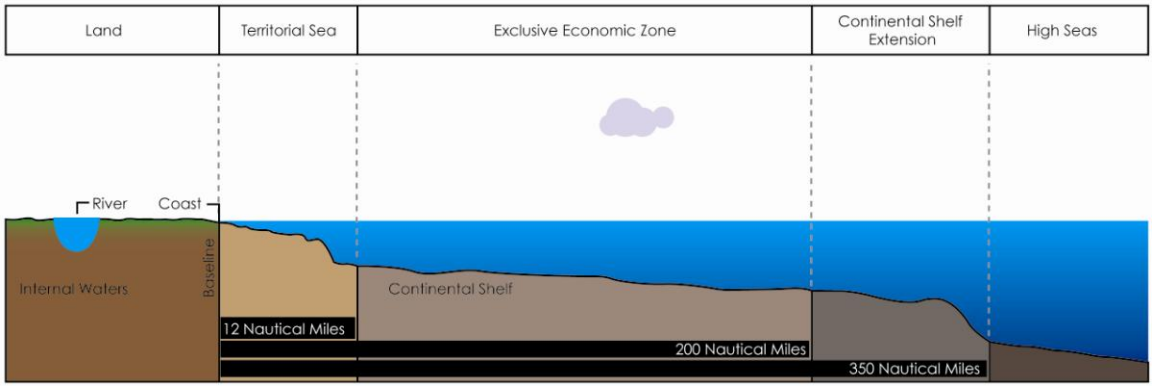

Figure 4 - Marine Zones, graphic created by Chris Nuernberger

In addition to establishing the EEZ, UNCLOS's Article 76 also allows coastal states to extend their jurisdiction based on the delineation of the continental shelf. The continental shelf, as seen in the image above, is the seabed and sediment that makes up the underwater extension of a nation's landmass. Unlike the EEZ, there is no need for a state to claim its continental shelf (Koivurova 2002, 51). If a state's continental shelf extends beyond the 200 nautical mile EEZ, the state can make a further claim to the edge of the continental shelf or to an absolute maximum of 350 nautical miles from the baseline. For this claim to be valid, the continental shelf must be a "natural prolongation" of their land, meaning that it is not just physically joined, but that is also shares the same geological history as the nation's landmass. The law allows for two different methods to define the edge of the continental shelf. The first is the use of the Hedberg Line, which puts the edge at sixty nautical miles past the steep drop at the shelf edge along the ocean floor. The second, the Gradiner Line, measures where the thickness of the sediment on the seabed is at least one percent of the distance back to the foot of the slope. For example, the edge would be one hundred miles from the foot of the slope if

the sediment there were one mile thick (Dodds 2010, 68). A state may use whichever method yields the largest benefits.

Important in the discussion of natural prolongations of the continental shelf are underwater ridges. There is no general consensus as to whether or not the ridges are extensions of the landmass, but if they are, there is the potential for large claim extensions in the Arctic. The Gakkel Ridge is the northern end of the Mid-Atlantic Ridge, which runs from Iceland to beyond the tip of Africa. Article 76 of UNCLOS is straightforward about the Gakkel Ridge; because it is "oceanic," no one can claim is as a natural prolongation (Anderson 2009, 110). Significantly less is known about the Mendeleyev Ridge. When Russia claimed this ridge as an extension of its land, the United States objected, claiming the ridge is a "volcanic feature of oceanic origin," attempted to classify it similarly to the Gakkel Ridge. Geological evidence is leaning in favor of the Russians. The most contested Arctic ridge is the Lomonosov Ridge, an underwater mountain range stretching 1,100 mile from Russia to Greenland and Canada's Ellesmere Island. Depending on which end of the ridge you begin your measurements from, arguments could be made that this ridge is the natural prolongation of Russia, Greenland, or Canada. Scientists, question, however, whether or not there are morphological breaks in the ridge that would suggest it is disconnected from any landmass (Anderson 2009, 110).

Data pertaining to depth is found by using sonar to ping the bottom of the ocean and recording the returning echo. Sediment measurements require seismic profiling. Both of these methods are very costly and time consuming, with costs ranging from $5

million to $50 million (Anderson 2009, 108). Definition of the continental shelf is particularly important to states, as oil and gas is often found in these thick sediments. The rules in UNCLOS provide a framework for coastal states to have a large enough area to drill and profit while at the same time providing a cutoff point for the rights to this potential source of wealth (Anderson 2009, 108). However, the majority of these resources are thought to be within the EEZ, suggesting minimal gains for the expensive extension declaration research project, especially considering the current technological constraints. However, with the shallowness of the Arctic ocean, these extensions could be very large. The current urgency in defining these limits is the deadline for filing claims established by UNCLOS.

A country has ten years from the date it ratifies the convention to make the land claims (Anderson 2009, 107). Canada and Denmark's ten year deadlines end in 2013 and 2014, respectively. The claim is then reviewed by the Commission on the Limits of the Continental Shelf. The Commission is composed of 21 delegates, mainly scientists. These members are elected for a five year term. All members are from coastal states, and thirteen of the members are drawn from the global south. The Commission has two working sessions each year at the United Nations' headquarters in New York that last for five to six weeks each. The member states are responsible for financially supporting the work of the individual delegates (Dodds 2010, 66).

The Commission is not able to reject a claim. However, they can send the claim back for more information. Russia submitted its claim into the Commission in 2001. If approved, their claim would entitle Russia to ownership of half the Arctic, including the

North Pole. The Commission sent back Russia's claim, stating that "more geological evidence needed" before confirming the claim (Anderson 2009, 107). The endorsement of the Commission on a country's claim establishes "final and binding" limits and boundaries (Dodds 2010, 67). Critics of the Commission claim that the United Nations lacks the institutional capacity to streamline this lengthy process (Ebinger and Zambetakis 2009, 1224). The Commission currently has fifty claims to review, and it is estimated that it will take the Commission thirty-five years to review all of them.

Even more limiting, the Commission has no jurisdiction over handling maritime area disputes (Luck 2009, 247). In 2006, Norway submitted its continental shelf extension to the Barents Sea Loop Hole and the Western Hansen Bay. Both of these regions were also claimed by Russia. In March 2009, the Commission confirmed that these areas were a natural prolongation of the Norwegian continental shelf, however the exact boundaries must be agreed upon bilaterally between Norway and Russia (Luck 2009, 252).

There are additional disputes between countries concerning how the boundary with respect to political borders. Canada, for example, extends its borders as a straight line while the United States draws its lines at a right angle. This creates overlapping claims in a 6,250 square mile area in the Beufort Sea. Moving forward, it seems that states will work through these territorial disputes as to prevent the involvement of further outside entities to gain any hold on sovereignty in the Arctic region.

Although 156 nations have ratified the UNCLOS, including all the other Arctic nations, the United States has yet to sign the treaty out of fear of ceding sovereignty.

UNCLOS deals only with sovereignty over marine areas for nation-states. In no way does UNCLOS deal with environmental issues, indigenous populations, or multi-lateral cooperation. While the Arctic states subscribe to the policies outlined in UNCLOS, it lacks potential to become an overarching framework for expansive future Arctic governance.

Disputes over Land Areas

While most land areas in the Arctic are undisputed areas clearly within a state's boundaries, a few land dispute areas exist in the Arctic. Currently, there is no international framework to reconcile these disputes, and the Arctic states have dealt with these conflicts bilaterally. This was the case with the Svalbard archipelago with Norway and Russia. Hans Island in the Kennedy Channel measures barely one mile across. It is basically an uninhabitable rock between Canada and Greenland. The only political significance to this rock is that both Canada and Greenland have laid claim to it, and neither intends to give it up (Howard 2009, 101).

Arctic Cooperation

One of the first gestures toward multi-lateral cooperation in the Arctic was the 1st Scientific Meeting on the Polar Bear in 1965. The five countries with polar bear populations, the Arctic Five, declared polar bears to be international circumpolar resources. Thus, each nation pledged to take steps toward the conservation of the polar bear, eventually leading to the International Agreement on Conservation of Polar Bears and Their Habitat in 1973 (Polar Bear Specialist Group 2009). Under this act, states

agreed to protect polar bear feeding areas and migratory routes, ban the large-scale hunting of polar pears, and coordinate research and monitoring efforts on polar bears.

In October 1987, Mikhail Gorbachev delivered a speech in Murmansk, Russia that first proposed international collaboration in the Arctic. His speech called upon the Arctic states to create a "genuine zone of peace and fruitful cooperation." Gorbachev suggested the cooperation could be achieved in military disarmament, energy development, scientific information exchange, and environmental protection efforts. While Gorbachev advocated for a nuclear-free Nordic zone, his speech omitted references to much of Russia's large concentration of Arctic military power, leading other Arctic states to approach his proposal with a large degree of skepticism. However, his declaration to "let the North of the globe, the Arctic, become a zone of peace. Let the North pole be a pole of peace" initiated efforts for multi-lateral cooperation in the Arctic region (Gorbachev 1987). This speech also transitioned thinking away from the Arctic as a strategic hold in the Cold War to a more global initiative.

Arctic Environmental Protection Strategy (AEPS).

In 1989, Finland initiated a conference of the eight Arctic states in Rovaniemi. The changed relations between the US and Russia as a result of the end of the Cold war and the lack of international initiatives to address trans-boundary environmental deterioration concerns drove these states to convene and cooperate. With subsequent preparatory meetings in Yellowknife, Canada and Kiruna Sweden, the eight states met again in 1991 in Rovaniemi to sign the Rovaniemi Declaration, by which they adopted the Arctic Environmental Protection Strategy (AEPS). Along with the eight member

states, several countries, including Germany, Poland, the UK, and Netherlands, and indigenous groups served as observers to the process.

The strategy was designed to initiate a process to address Arctic-wide environmental issues (Bloom 1999, 713). The strategy has five objectives – to protect the Arctic ecosystem, to protect the quality of the environment, to accommodate the needs and values of indigenous people, to regularly review the state of the Arctic environment, and to "identify, reduce, and as a final goal, eliminate pollution" (AEPS 1991). After these objectives are laid out, the strategy identified six high priority environmental concerns – persistent organic pollutants, radio activity, heavy metals, noise, acidification, and oil pollution. It then established four environmental protection working groups to assess these problems and offer possible remedies. Currently, these working groups – Conservation of Arctic Flora and Fauna, Protection of the Arctic Marine Environment, Emergency Prevention, Preparedness and Response, and Arctic Monitoring and Assessment Program – operate under the Arctic Council and will be discussed below.

Arctic Council.

In September 1996, the eight Arctic states met in Ottawa, Canada to sign the Declaration Establishing the Arctic Council. This declaration amended the cooperation founded under the AEPS and created the Arctic Council as an international forum, not an international organization. This distinction significantly limits the authority and jurisdiction of the Arctic Council. The Council has no authority to make laws or set regulations. Rather, it is mandated to deal with "common Arctic issues, in particular issues of sustainable development and environmental protection" (Ottawa Declaration).

A footnote to this mandate explicitly prohibits the Council from dealing with "matters related to military security" (Ottawa Declaration).

There are three levels of participation in the Arctic Council. The member states – Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the United States – are the only voting parties in the forum. Decisions are made by consensus of these eight states after full consultation with the permanent participants. Six indigenous groups – Arctic Athabaskan Council, Aleut International Association, Gwich'in Council International, Inuit Circumpolar Council, Russian Arctic Indigenous Peoples of the North, and the Saami Council – have the designation of permanent participants. Permanent participants are active with all Arctic negotiations, but have no voting privileges. Support to these permanent participants is provided by the Indigenous Peoples' Secretariat in Copenhagen, Denmark. Finally, several non-Arctic states, intergovernmental organization, and non-governmental organizations are observers to the Arctic Council.

The Arctic Council has routinely been criticized for its exclusionary behavior. Justification for this exclusion by Arctic states is full of contradictions. If, as the Arctic states claim, the Arctic region is an enclosed sea, then the Arctic Council should serve as a forum for littoral states to protect their own self interests. In this case, there would be no space for dialogue or concern from non-Arctic states, as the Arctic Council would addresses matters of security. But the Arctic Council does not address security issues. In fact, much of the work done by the Arctic Council concerns environmental issues. The viewpoint of the Arctic then seems to be not as an enclosed sea, but rather the

cornerstone of the global ecosystem. If this is the case, the exclusion of other nations, who both add to Arctic contamination and are impacted by its melting, from the Arctic Council is an unnecessary exercise of sovereignty and restriction. Arctic states claim that too many players reduces the ability of the Arctic Council to make decisions by consensus. Rather than being involved in the negotiations process, Arctic states encourage non-Arctic states to be more engaged scientifically to address their Arctic concerns.

The Council's chairmanship rotates among the eight member states for two-year terms. Sweden holds the chair for the 2011 to 2013 term. The work of the Council is strongly guided by the priorities of the chair state. The highest level of interaction within the Council occurs at biannual ministerial meetings. In between those meetings, Senior Arctic Officials meet regularly. However, the bulk of the work of the Council is carried out by the six working groups, four of which were carried over from the AEPS. These six working groups and their mandates are outlined in the table below:

Working Group		**Mandate**	**Current Chair**
ACAP ARCTIC CONTAMINANTS ACTION PROGRAM	Arctic Contaminants Action Program	Reduce pollutant emissions	Russia
		Encourage states to take preventative action relating to contaminants	
AMAP Arctic Monitoring and Assessment Programme	Arctic Monitoring and Assessment Programme	Provides information on status of and threats to Arctic environment	Canada
		Measures levels of anthropogenic pollutants	
		Assess pollution impacts on Arctic flora and fauna	
		Provides scientific advice to states for remedial and preventative action for contaminants	

CAFF Conservation of Arctic Flora and Fauna	Conservation of Arctic Flora and Fauna	Address the conservation of Arctic biodiversity	Russia
		Communicate findings to governments and residents of the Arctic	
		Promote practices to ensure sustainability of Arctic's living resources	
EPPR Emergency Prevention, Preparedness and Response	Emergency Prevention, Preparedness and Response	Exchange information on best practices and guide methods for risk assessment, emergency response, and training	Norway
		Protect Arctic environment from the threat of an accidental release of pollutants	
		Liaise with the oil industry and other relevant organizations to enhance oil spill prevention and preparedness	
PAME	Protection of the Arctic Marine Environment	Address policy and non-emergency pollution prevention from land and sea-based activities	Iceland
		Coordinate action programs and guidelines to complement existing legal frameworks	
Sustainable Development Working Group	Sustainable Development Working Group	Advance sustainable development in the Arctic	Sweden
		Protect and enhance environment, culture, economy, and health of indigenous people	
		Improve conditions of Arctic communities	

Figure 5 - Arctic Council Working Groups

The mandates of these working groups are redundant, in part due to the limiting scope of the Arctic Council to address concerns outside of the environmental protection realm. Often multiple working groups are undertaking similar projects with little to no interaction between them. These uncoordinated efforts, the voluntary funding structure

of the Council, and its weak institutional structure limit the effectiveness and authority of the Council.

The Arctic Council is currently addressing some of its weaknesses through the work of task forces, temporary bodies working on a specific issue. Through the Nuuk Declaration, signed on May 12, 2011, the Task Force for Institutional Issues is establishing an Arctic Council Secretariat in Tromsø, Norway. The Secretariat, scheduled to commence in 2013, will strengthen the capacity of the Council and better streamline the Council's activities.

Secondly, the Arctic Council members have recently signed their first legally binding agreement. The agreement, created by the Task Force on Search and Rescue, created an international instrument for cooperation on search and rescue operations in the Arctic. The agreement defines a specific area that each Arctic state is held responsible for leading search and rescue operations and requires that states participate in these efforts as requested. The legally binding nature of this agreement shows the overwhelming support of the Arctic states for managing accidents in the region, a priority issue in each of the individual states' Arctic strategies. The final task force is focusing on oil spill preparedness and response to develop recommendations and best practices for the prevention of marine oil pollution. This agreement has the potential to become the second legally binding agreement of the Arctic Council.

Fifteen years after its creation, the Arctic Council is indeed in a time of change. The legally binding negotiations and the establishment of the Secretariat do strengthen the institutional capacity of the Council. Canada will serve as the next chair of the Arctic

Council and has already identified three priorities for its chairmanship term – to engage in greater policy dialogue in the Council, to raise the international profile of the Arctic Council, and to strengthen the Council so it continues to meet the growing needs (Duncan 2012). Cooperation in regards to commonly agreeable topics – such as search and rescue and oil spill prevention – is easy to negotiate. The success of the Arctic Council will be tested when more controversial subjects make their way to the negotiating table. If the Arctic Council expects to be the dominate framework for Arctic cooperation, it will need to find a way to incorporate a wider variety of players as the International Polar Year has done.

A Role for Science - The International Polar Year

In the past, the highest levels of collaboration and action in the Polar Regions have been a result of the International Polar Year. The idea of the International Polar Year was inspired by Austrian explorer and naval officer Karl Weyprecht, a scientist and co-commander of the Austro-Hungarian 1872-1874 Polar Expedition. From his time in the Polar Regions, Weyprecht realized that the answers to many questions about the earth's meteorology and geophysics could be found by studying the Poles. He also understood that polar research would be a massive undertaking, and the information could not be collected by one individual country. Rather, it would require the cooperation of multiple countries. The first International Polar Year took place from 1882 to 1883, when 700 researchers from eleven countries carried out fifteen polar expeditions – thirteen to the Arctic and two to the Antarctic. Much of the data collected

during this time was hand-written, and the communication capabilities limited the widespread sharing of this data.

Three subsequent International Polar Years have taken place since then, following the first's precedent for cooperation. The second International Polar Year, from 1932 to 1933, led to advances in meteorology and atmospheric science with the cooperation of forty nations. The onset of World War II halted data analysis and part of the collected data was lost as a result of the war. From 1957 to 1958, the third International Polar Year took place as part of the International Geophysical Year. Sixty-seven nations came together and produced some of the first measurements of ice thickness, expanded understanding of solar processes, and began to observe circulation system in the earth's oceans. These efforts led to the formation of several international scientific communities to preserve the data and progress made and initiated the formation of the Antarctic Treaty System, discussed below (Kaiser et al 2010, 7-8).

The most recent International Polar Year, from 2007 to 2009, was organized by the International Council for Science and the World Meteorological Organization and brought together approximately 10,000 scientists from sixty-three nations to study the atmosphere, ice, oceans, land, people, and space. Particularly interesting to nation-states is the extraction of ice cores that give information about the earth's past climate. For example, the North Greenland Eemian Ice Drilling (NEEM), which ran from 2008 to 2011, was an international research project involving researchers from fourteen different countries across three continents. The project's goal was to retrieve an ice core reaching

the Eemian period, which ended approximately 115,000 years ago. In July 2010, NEEM reached bedrock in Greenland at a depth of 2,537.36 meters (Kingdom of Denmark).

While this International Polar Year built on the cooperation initiated by its predecessors, three major components elevate the success and continuation of its efforts. This Polar Year was driven by a sense of urgency and a need to understand the large rapid environmental changes happening in the Polar Regions. Advances in remote sensing and data gathering technologies have allowed us to gather more information than ever before about the unknowns at the poles. The second strength of the current International Polar Year has been the focus on education and outreach. Particularly in polar research, there has always been a large disconnect between scientists and public audiences (Kaiser et al 2010, 7-8). The efforts of this International Polar Year have pushed to make scientific research available to diverse audiences, allowing for policy-makers to use science to make sound decisions moving forward. David Hayes, the Deputy Secretary for the United States Department of the Interior recognizes the "need for science to face the tough questions…and the need to get the answers to these questions right" (2012). Finally, this most recent International Polar Year was the first to include a human dimension. This Polar Year was not all about physics and chemistry; it was about people. An understanding of the Arctic requires the inclusion of indigenous perceptions of the region and an integration of their knowledge into the key findings. Additionally, an understanding of the impacts of climate change in the Polar Regions requires a knowledge of how human activities, including resource development, tourism, and pollution, affect the region. This insight into the workings of the planet in general,

and particularly the Poles, will help us to develop systems and frameworks that yield sustainable, rather than destructive, results.

The synthesis of the projects undertaken during the fourth International Polar Year was highlighted at an international conference in Montreal, Canada at the end of April 2012. The information gathered during the International Polar Year requires action to be taken. The goal of the conference was to bring over 2,000 scientists, indigenous people, policy-makers, industry owners, and academics together to integrate their strengths and to take an interdisciplinary approach to sustainable development in the Polar Regions. The conference's title, "From Knowledge to Action," could not be clearer in its message to the international community in addressing the forces of climate change and resource development in the Arctic.

Chapter Eight: The Rules Going Forward

One of the greatest challenges moving forward is the lack of a common vision for future governance in the region. A large number of players, including academics, NGOs, international organizations, and non-Arctic states, are strong supporters to negotiate a new overarching Arctic treaty or transform the Arctic Council into a treaty-based organization. Many point to the successful Antarctic Treaty System as a model for its northern relative, so it is worth exploring this system at some length before proposing alternatives for the Arctic. While there are indeed similarities between the two Poles, the inherent differences and the surrounding international context of the time reduce the probability of adoption of a similar treaty for the Arctic. The largest difference is that there are indigenous people living in the Arctic, elevating the dimension of gameplay and the involved players. Arctic regimes, thus, must not only take into account conservation of the physical landscape, but also the deep indigenous culture.

The Antarctic Treaty System – A Flawed Model for the Arctic

In 1920, after almost 150 years of exploration in the Antarctic, Great Britain asserted that the entire Antarctic continent should be included as part of the British Empire. This claim triggered fear of exclusion from other nation-states, leading them to make claims on the continent based on discovery, exploration, or geographical proximity. By 1942, seven countries – Great Britain, New Zealand, France, Norway, Australia, Chile, and Argentina – had laid formal territorial claims on the continent (Peterson 1988,

34-35). The claims of Great Britain, Argentina, and Chile overlapped, which would later challenge some of the early Antarctic Treaty negotiations. Notably, the United States and Soviet Union were absent from the claim-staking process. Following the formal claims statements, these states permanently established their sovereignty on the continent through the creation of research bases. These bases provided the logistical support needed for cooperation during the International Geophysical Year, which led to the creation of the Antarctic Treaty.

In the fall of 1959, the United States hosted the twelve countries active in Antarctica during the International Geophysical Year for the Antarctic Treaty Conference, and the treaty was signed at the commencement of this conference. Without a formal territorial claim, the United States was limited in its access to and continued involvement in Antarctica. Thus, it stressed an approach that focused on the wide-spread benefits of scientific internationalism and downplayed the importance of the existing territorial claims. Although hesitant about losing sovereignty on the continent, other states supported partial governance of the continent by an international body as a means to control Russian military activity in the Southern Hemisphere (Turchelli et al 2008, 360). The treaty ultimately addressed three main goals – to continue the scientific cooperation that was prevalent during the International Geophysical Year, to avoid territorial claim disputes, and to demilitarize the continent.

Article I of the treaty states that "Antarctica shall be used for peaceful purposes only," which frames all other goals, decisions, and challenges for the continent. This statement prohibits military establishments or weapon testing on the continent. Article V

specifically bans nuclear explosions and the disposal of radioactive waste material. Initially, this ban seems impressive at the height of the Cold War. However, the remoteness and inaccessibility of the Antarctic discouraged the Soviet Union in particular from carrying out extensive nuclear tests as it had in the Arctic. Thus, agreeing to ban an activity in which no state had a strong interest or capacity in pursuing was a simple task (Conference on Antarctica 1959).

Articles II and III of the treaty outline the commitment to continue cooperation in scientific research as initiated by the International Geophysical Year. Each government has its own national Antarctic science and research program, which sponsors various expeditions and projects on the continent. The openness of scientific research encouraged by the treaty allows for multi-lateral research projects to happen at any base, the exchange of scientists between bases to best use individuals' expertise, and checks and balances on the ethics and practices of projects. The information uncovered in the Antarctic relating to global weather and historic climate patterns was useful, but not strategically important to keep confidential during the Cold War. Once again, general consensus on scientific cooperation was simple (Conference on Antarctica 1959).

The territorial claims debate, however, was the most perplexing of all the treaty's components. The seven countries with territorial claims were very reluctant to give up their establishments on the continent. If the treaty discredited these claims, it would lose the support of these states; similarly, if the treaty recognized these claims as relevant and valid, it would lose the support of non-claimant actors, like the United States and Soviet Union (Turnchetti et al 2008, 359). To respond to both sets of concerns, Article IV of the

Antarctic Treaty freezes these territorial claims. It states that no part of the treaty "shall be interpreted as a renunciation of previous claims," yet under the treaty system, these claims cannot be developed in any way, nor can any claims be added. In essence, by signing the treaty, states simply agree to disagree. Under the current conditions, Antarctic states have no urgency to exercise their territorial sovereignty, temporarily solving the claims dispute (Conference on Antarctica 1959).

The creation of the Antarctic Treaty is credited to several factors that are absent from today's Arctic debates. First, territorial claims are recognized in the Arctic while they are not recognized in the Antarctic. Second, the treaty played off the fears of the impacts a Soviet stronghold in Antarctica could have on the Southern Hemisphere in the context of Cold War politics. Third, the Antarctic Treaty was beneficial to the United States and had the support of the global superpower from the beginning. While the United States gained access to and involvement in the Antarctic through the treaty, an Arctic treaty would restrict the United States' influence and power in the Arctic. Finally, the Antarctic is far removed from major trade routes and global activity. In practice, an Antarctic territorial claim would have little impact on the day-to-day operations of claimant states, lending to the success of the frozen claims approach. Conversely, the close proximity of territorial sovereigns to, the anticipated economic benefits of, and the presence of an indigenous population in the Arctic make a territorial freeze impossible.

The Antarctic Treaty is only one component of the larger Antarctic Treaty System. This system incorporates three other international agreements on the Antarctic – The Convention for the Conservation of Antarctic Seals, The Convention on the

Conservation of Antarctic Marine Living Resources, and the Protocol on Environmental Protection to the Antarctic Treaty – and over two hundred measures and recommendations. The Antarctic Treaty System is arguably one of the most successful international treaties. The agreements made over fifty years ago are still applicable to the current conditions and the members continue to be committed to the original goals of the regime (Secretariat of the Antarctic Treaty). The Antarctic remains an example of global cooperation for preservation. Even with these successes, the Antarctic Treaty System comes with its restraints. There continues to be concerns about the exclusivity among Antarctic Treaty parties and disagreements over a mineral extraction framework. The shortcomings of the Antarctic Treaty System to address these two themes, which are also heavily prevalent in the Arctic, limit its application as a framework for an Arctic Treaty System.

Antarctic Treaty Membership and Exclusivity.

The Antarctic Treaty System currently has twelve original signatories, sixteen additional Consultative Parties, eighteen non-consultative members, and a variety of observers and experts who all meet yearly to update, review, and improve the system. The Consultative Parties, including the twelve original signatory members, are the only voting members of the Antarctic Treaty System, most closely representing the member states of the Arctic Council. While the Arctic Council reserves member state status for only the eight countries north of the Arctic Circle, Consultative Party status to the Antarctic Treaty can be obtained by operating a full-time research program in the Antarctic and acceptance by all existing Consultative Parties. Although the selection

process is rigorous, it has allowed sixteen additional nations to vote in the Antarctic Treaty System.

All resolutions are adopted through consensus, and each Consultative Party has the ability to veto. Twenty-eight veto opportunities make decisions difficult to pass, but the system was designed to maintain state sovereignty over the international body. Each country is responsible for abiding by the treaty under a self-policing policy, and there are no legal repercussions for non-compliance. Generally, non-compliance in the Antarctic has not been a problem; in the rare case of non-compliance, political pressure from other treaty parties quickly resolves the issue. Conversely, in the Arctic, states are responsible for creating their own policies and guidelines for northern activity. They are also encouraged to handle disputes bilaterally. Thus, the self-regulated guidelines set forth in the Antarctic Treaty add no value as a future model for the Arctic.

Non-consultative parties are nation-states that have a large interest in the Antarctic, but do not fulfill the permanent research project requirement to be considered a Consultative Party. While they have no vote, the distinction of non-consultative party does allow for an increased and more wide-spread level of participation in the system (Secretariat of the Antarctic Treaty). Conversely, the Arctic Council member states limit all non-Arctic states to observer status, a much larger segregation than between Consultative and non-consultative parties. Like the Arctic Council, the Antarctic Treaty system has a series of observers and experts who regularly attend meetings to provide information to guide decision-making, but are unable to participate directly in the decision-making process.

Eighty percent of the world's population is represented under the Antarctic Treaty System (Rubin 2000, 60). Although the breadth of participation in the Antarctic Treaty System is much wider than that of the Arctic Council, there are still concerns about the exclusivity among Consultative Party states, with the strongest discontent from developing countries. In 1982, Malaysia raised the issues of fairness of the Antarctic Treaty System to the United Nations General Assembly, driving a large divide between the international community and the Antarctic Treaty System parties. Malaysia claimed that developing countries had no access to the resources Antarctica had to offer. Furthermore, Malaysia believed that the Antarctic should be considered a global commons, and the United Nations was the best vehicle to govern this commons. In 1983, Antarctica began to be placed on the General Assembly's annual agenda. At this time, non-party states were particularly concerned about their exclusion from negotiations for Antarctic mineral extraction regulations and the possibility of Consultative Parties barring other nations from the benefits of the continent's natural resources, the specifics of which will be discussed below. However, these criticisms generally stopped when the Convention on the Regulation of Antarctic Mineral Resources did not pass and negotiations for the Environmental Protocol were underway. By 2005 the United Nations General Assembly no longer regularly discussed Antarctica, but United Nations agencies have increased their roles on the continent (Jacobsson 1007, 2; Shusterich 1984, 818).

Both the Antarctic and the Arctic have a select group of states trying to hold power and exercise sovereignty and a group of states that feel excluded from this process. Greater participation in the governing system can only happen if those currently in

control agree to it. The current reluctance of the Arctic states to relinquish any control creates a dismal outlook for non-Arctic states and players. Additionally, the limitations of the United Nations as an institution prevent it from becoming a governing vehicle, as Malaysia suggested for Antarctica. Even the United Nations Commission on the Limits of the Continental Shelf does not have the authority to weigh in or settle maritime boundary disputes. Rather, it encourages Arctic states to solve these issues bilaterally, a method that Arctic states will continue to use.

Mineral Resources.

The Antarctic Treaty System's challenges in creating a framework for mineral extraction also limit its effectiveness as a model for the Arctic. The original Antarctic Treaty document made no reference to activities regarding mineral resources on the continent. With this harsh climate, there was originally little interest in exploiting these resources. Similar to the Arctic, discovery of gas traces in the southern waters and improving technology caused mineral resource extraction to become a major issue in Antarctic debates. In the early 1970s, Australia, New Zealand, and the United States governments were approached by various mining companies interested in harvesting Antarctic resources. The issue began to be raised at the Consultative Party meetings, and the Convention on the Regulation of Antarctic Mineral Activities (CRAMRA) was drafted.

As the Consultative Parties began to draft CRAMRA, many developing countries expressed their frustrations with their exclusion from the process. They pushed for the United Nations General Assembly to pass Resolution 41/88, which asked the

Consultative Parties to postpone any mineral resource negotiations until all members of the international community could take part in the debate. This way, the treaty parties would not be able to maintain a monopoly on the region's resources or use the treaty as a means to propel their own self-interest. Additionally, there was a school of thought that mineral harvesting and environmental conservation were mutually exclusive concepts and could not happen simultaneously. Believing that the United Nations had no jurisdiction over the Antarctic, the Consultative Parties disregarded the resolution and continued to draft a document that would balance the interests of both ecological preservation and mineral activities. However, CRAMRA was vetoed by France and Australia, who expressed dissatisfaction with the level of sovereignty and economic benefits they would receive (Osmanczyk 2003, 99).

With the defeat of CRAMRA, negotiations for the 1991 Environmental Protocol began. Instead of specifically focusing on mineral extraction, the Protocol on Environmental Protection to the Antarctic Treaty outlines a commitment of the signatory parties to protect the environment of Antarctica and limit environmental impacts caused by humans. To address mining, Article 7 of the Protocol explicitly states that any mineral activities that do not directly relate to scientific research are banned for the next fifty years. Like the territorial claims disputes, this short-term moratorium on mining only temporarily solves the problem. The debate will be reopened in 2041, when climate conditions, technological advancements, and resource overexploitation in other areas of the planet could make Antarctic mineral mining a reality (ATCM XI 1991).

Similar contempt about the self-benefit of resource extraction has been expressed toward Arctic states. Unlike the Antarctic, the Arctic states do not have the luxury of delaying their decision for fifty years, as mining operations are already underway in the Arctic. Resource development in the Arctic is taking place within nation borders, meaning that state policies are responsible for providing a monitoring framework. Given the more immediate conditions of Arctic resource extraction, the Antarctic Treaty once again falls short as an example.

Arctic Treaty Opposition and the Ilulissat Declaration.

The main opposition to an Arctic Treaty System comes from the Arctic states, who have been continuously concerned about maintaining their sovereignty. The steps they have taken to guarantee control include designating the Arctic Council as an international forum, the exclusive membership system of the Arctic Council, the refusal of the United States to sign UNCLOS, and increased military presence in northern regions. More directly, the Arctic Five have denounced their support of any legally binding international regime through the Ilulissat Declaration.

In May 2008, the Arctic Five, purposely omitting Finland, Sweden, and Iceland, met in Illulissat, Greenland and adopted the Ilulissat Declaration. In this two-page document, the Arctic Five emphasize their unique relationship to the Arctic, making it clear that there is "no need to develop a new comprehensive international legal regime to govern the Arctic Ocean" (Iluulissat Declaration). The Arctic Five showed their commitment to the United Nations Convention on the Law of the Sea as a key governing document for territorial claims in the Arctic and to settling any disputes among

themselves. These statements make it clear that the Arctic Five were unwilling to give up any sovereignty they have over the Arctic region.

In addition to their exclusive sovereignty claims, the Arctic Five acknowledged their role in the Arctic as outlined in many of their Arctic strategies, including protecting the Arctic ecosystem, strengthening their capacity to respond to maritime accidents in the region, and cooperating to collect scientific data.

Alternatives

The unwillingness of the Arctic states to cede sovereignty initially seems to block any efforts of change to Arctic governance. However, two major forces in the Arctic – the impacts of climate change and renewed interest in resource development – are significantly altering the landscape and require adoptions to the current framework to prevent future game destruction.

The Norwegian company Turbo Tape Games recently developed a computer game called "Naval War: Arctic Circle." Set in 2030, the game's voiceover begins,

> "The Arctic is now the most strategically important area in the world. Everyone wants access to the vast resources of gas, oil, and minerals. The war for dominance has begun. Choose sides, and rule the world."

The game depicts a bi-factional power struggle between the NATO alliance and Russia; players battle enemy naval and aerial forces for Arctic control (Alaska Dispatch 2012). In a zero-sum game or a winner-take-all scenario, the untapped oil and gas reserves could be a prize worth fighting for.

The likelihood of the Arctic reaching a scenario with this degree of severity, especially by 2030, is improbable. Technological and transportation barriers still prohibit

wide-spread resource harvesting. Furthermore, the majority of the Arctic's valuable gas and hydrocarbon resources are in areas already under national jurisdiction. For the time being, the Arctic states are playing by the current international frameworks. Their continued commitment to these frameworks suggests non-violent actions will continue to dominate Arctic policy. Although Arctic states are playing a role as resource extractor, they are also aware of their need to play the role of environment protector. Efforts to increase the capacity for search and rescue operations and the mandates of the Arctic Council's working groups are evidence of this commitment. Finally, the indigenous groups of the north have formed institutions that give them a stronger voice in Arctic governance. While indigenous societies do yield some economic benefit from mineral extraction, their value of the land, wildlife, and accompanying culture builds a strong barrier against extreme violence and widespread destruction.

Still, the scenario depicted does paint a picture of the dangers of not addressing the issues of Arctic governance. We cannot romanticize cooperation around Arctic activity. States are operating in their own self-interest and are investing in the Arctic and the protection of its environment for the economic return it will provide. Thus, Arctic relations today rely on a precarious balance between cooperation and competition. While potential climate change impacts may be alarming, they have yet to materialize to a degree where the Arctic states feel that preservation to the degree of the Antarctic Treaty is necessary. This is likely to change, though, as the added pressures from climate change and resource greed place greater pressure on the current system.

An old Inuit proverb states that "only when the ice breaks will you truly know who is your friend and who is your enemy." It may very well be the case that, in anticipation of a system break in the Arctic, or an actual system break, it will not be nation-states, but rather two other actors that will emerge as leaders in devising the necessary changes to the rules of the game.

The first is the indigenous population. Trends show increased support globally for indigenous groups. Their land negotiations and increasing autonomy show every indication that the indigenous desire to play a leading role in determining the future of their homeland. It took Arctic explorers hundreds of years to realize that indigenous practices led to the greatest levels of survival in the north. A unique feature of the Arctic is the continued dominance of indigenous techniques for survival. The wisdom of indigenous people in areas outside basic survival skills has been acknowledged through their position of permanent participant to the Arctic Council. The indigenous life is based on a strong set of values, including respect for nature, humility, sharing, and conflict avoidance. These values are in part what qualify the indigenous to play a leading role. The indigenous knowledge is also not merely a historical knowledge; it is a current knowledge of the Arctic and the changes taking place. To the indigenous, the Arctic is not just a scientific lab or a resource bank. It is their home and they experience the Arctic daily. Allowing for increased indigenous leadership at the international level will bring some of the most rational voices and opinions to the forefront of decision-making. The International Polar Year Conference began to capture the value of indigenous knowledge

through its indigenous knowledge exchange, with programs specifically designed by indigenous people, but open to all conference attendees.

The second is the scientific community. The scientific community has proven superior levels of cooperation through the International Polar Year. Much of the research has taken an ecosystems approach to understand how the Arctic fits into a more global picture. Science-driven policy, rather than national interest-driven policy, has the potential to address the relevant and necessary components needed to preserve the Arctic playing field. One of the key issues that the most recent International Polar Year has addressed is the transformation of scientific information into a form that the general public can understand and use. Scientists are now asking how they can transfer their knowledge to the people who need it to make decisions. Dr. Louis Fortier, a leader in Canadian Arctic research, jokingly advises scientists to make their information available to policy-makers by "using lots of pictures and small words" (2012). But, Dr. Fortier's humor has some validity. The scientific community has studied everything from zooplankton to glacier movements in the Polar Regions. Their work can bring value into creating relevant, timely, and successful mitigation and adaptation strategies.

Thus, a more optimistic, and in many ways a more likely alternative to the future of the Arctic depicted in Naval War: Arctic Circle is a slow transition to more cooperation among the Arctic states. This cooperation will likely begin with the management of resources with little commercial value, such as polar bears, and will grow in accordance with international climate change mitigation efforts. We have already seen this with the adoption of the Stockholm Convention prohibiting persistent organic

pollutants. While not an Arctic-targeted agreement, this Convention does serve to improve the health of northern indigenous populations. Similarly, the adoption of the Montreal Protocol on Substances that Deplete the Ozone Layer in 1987 has reduced the amount of greenhouse gases emitted into the atmosphere. This also does not directly relate to Arctic activities, but lower greenhouse gas emissions serve to slow rising temperatures that melt the ice. While each agreement alone does not seem to have an overwhelming impact on the Arctic, the combination of various efforts will indirectly work towards preservation. The concern is whether or not these policies will be implemented quickly and efficiently to match the speed and large enough to match the scope of impending climate change impacts.

Chapter Nine: Conclusion

"When those most responsible for the pollution and stewardship of the Polar Regions drag your feet about doing something, or REFUSE to do what is necessary, to save or at least mitigate the harm being done to the Arctic and the Antarctic, you deserve, and will be richly delivered, the condemnation of all the peoples of the Earth…for you harm us all."- H.E. Ronnie Jumeau, Seychelles Ambassador to the UN and US

Since outsiders have begun to visit the Arctic, we have gone through eras of exploration, strategic utilization, and exploitation. We used to view the earth as limitless. Now we are at a turning point. In moving forward, we must recognize that the situation is not the same as in the past. Climate change has significantly altered the playing field, and our relationship with the Arctic has changed through the desire to harvest the abundant resources the area has to offer. Our goal moving forward must be sustainability in the wake of these forces. This paper has given a broad outline status of the challenges, interests, and players in the region. The way we have approached the Arctic in the past and the current governing frameworks are no longer a viable means to prevent a dystopian future for the region.

The Arctic states have proven their inability to be the leaders in paving an agreeable and effective global strategy to address these changes at the policy level. The issues they choose to address are often symptoms of the actual problem rather than the actual root challenges. While small successes have come out of these narrow initiatives, climate change is moving at a rate too fast and has implications too broad to be addressed using these same methods.

At the same time, stronger interest has emerged among non-state Arctic actors, including the indigenous populations and the scientific community. We should turn to these rising leaders to fill the void left by the Arctic states in creating sustainable policies and institutions. Indigenous knowledge is a science as well, and there is a lot of overlap in these two knowledge bases. To separate the two would be counterproductive. In moving forward, these merged decisions must balance the needs of a wide range of players and the needs of entities like the environment and global ecosystem that cannot express their own voice at the negotiation table. The energy and desires of the recent International Polar Year conference in Montreal reflect the rising opportunity for these groups to change the way Arctic policy is made.

The challenge moving forward is to find compromises that are compatible with the goals of sustainable development. In all of the Arctic strategies, advancement of scientific knowledge and the support of indigenous groups have been two common themes. Therefore, it is likely that as a starting point, consensus can be formed around these two platforms and the knowledge that the combination of these platforms bring to the negotiation table. Collaboration will increase our power to detect and react to change. We are only at the beginning stages of understanding how to balance these two types of knowledge. There is still a long way to go, but the strengths of these players are evident.

These changes will not be easy. They will require passion, patience, and planning. They will require compromise from states who already demand unsustainable yields from the Arctic. We are at a critical time in Arctic governance, and the decisions made now will set up the Arctic for either success or demise in the coming years. The

consequences of action or inaction have global linkages. The additional pressures from the wider earth ecosystem and humanity as a whole put a greater responsibility on the Arctic's governance frameworks to deliver on the goals of a wide range of stakeholders and their legitimate interests. The understanding of the current pitfalls and the welcoming of new solutions from previously silenced viewpoints gives us the opportunity to change this era of Arctic activity away from contestation and dominion to one of global gratefulness and generosity.

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