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## ON THE BASIS FOR CREATION OF A NEW METHOD OF DEFINING INTERNATIONAL JURISDICTION IN THE ARCTIC OCEAN

(Dr.) Barry Hart Dubner\*

### I. INTRODUCTION

Can you picture the Arctic Ocean without ice? One cannot pick up a newspaper or magazine these days, without reading about global temperature warming. There are numerous statistics and examples of this phenomenon, and they are quite alarming. For example, your author was startled to learn that the Arctic Ocean was warming at such a rate that Denmark is claiming an extraordinary bid for ownership of the North Pole, which is supposed to be one of the last regions of the world with untapped oil and natural gas.<sup>1</sup> Scientists have estimated that ice in the Arctic Ocean is melting at three percent a year, which will in the future allow for economic exploitation of a region that is almost unexplored.<sup>2</sup> It is necessary when discussing this phenomenon to break down and show the problems related to both the Arctic Ocean and the surrounding region. The Arctic Ocean is covered by the 1982 United Nations Convention on the Law of the Sea (“UNCLOS” or “1982 Law of the Sea Convention”) while the Arctic environs is governed by various treaty laws and understandings among the eight States that border the Arctic region.<sup>3</sup> Denmark is basing its claim to the Continental Shelf lying off of Greenland (Greenland has been owned by Denmark since 1814)<sup>4</sup> on a 1240 kilometer underwater mountain range called the Lomonosov Ridge.<sup>5</sup> If Denmark can show that it has the right under the 1982 Law of the Sea Convention, it will be able to assert a claim to the waters that are up to 370 kilometers from its baseline.<sup>6</sup> Naturally Canada and Russia are upset about this claim.<sup>7</sup> They, too, will attempt to show that they have as much right as Denmark, if not more, to whatever resources are found on the Ridge.<sup>8</sup>

This dispute over resources is brought about by the fact that within 50-100 years the polar sheet will probably disappear.<sup>9</sup> Also, there will be a new north-west passage that would make for an excellent shipping route, due to the melting of the ice during summer months.<sup>10</sup> Assuming that Denmark’s claim is correct, the impending question is whether the international community will allow the Arctic to be spoiled by various mining activities and oil and gas extraction.

Other problems in the Arctic concern the fact that animals such as caribou and ringed seals are thinner, and their furs have become thin and patchy.<sup>11</sup> Nobody seems to understand why.<sup>12</sup> But climate changes

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<sup>1</sup> Julian Coman, *Denmark Causes International Chill by Claiming North Pole*, NEWS.TELEGRAPH, Oct. 17, 2004, <http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2004/10/17/wpole17.xml>.

<sup>2</sup> *Id.*

<sup>3</sup> ARCTIC COUNCIL, *Arctic Environmental Protection Strategy: Declaration on the Protection of Arctic Environment*, June 14, 1991, [http://www.arctic-council.org/files/infopage/74/artic\\_environment.pdf](http://www.arctic-council.org/files/infopage/74/artic_environment.pdf), at 1. (last visited Sept. 26, 2005).

<sup>4</sup> Coman, *supra* note 1.

<sup>5</sup> *Id.*

<sup>6</sup> *Id.* UNCLOS was ratified by Denmark on November 16, 2004. U.N. GAOR, *Chronological List of Ratifications/Accessions/Successions*, July 22, 2005, [http://www.un.org/Depts/los/reference\\_files/chronological\\_lists\\_of\\_ratifications.htm#The United Nations Convention on the Law of the Sea](http://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm#The United Nations Convention on the Law of the Sea) (last visited Sept. 26, 2005).

<sup>7</sup> Coman, *supra* note 1.

<sup>8</sup> *Id.*

<sup>9</sup> *Id.*

<sup>10</sup> *Id.*

<sup>11</sup> Clifford Krauss, *Pangnirtung Journal: Eskimos Fret as Climate shifts and Wildlife Changes*, N.Y. TIMES, Sept. 6, 2004, at A4.

<sup>12</sup> *Id.*

brought about by global warming “and the gradual increase in contaminants like pesticides and industrial compounds like mercury and PCBs that are transported by wind and currents from the industrialized south and accumulate in the fatty tissues of Arctic animals” are likely causes.<sup>13</sup> These are all reasons that may explain the contaminants found in the breast milk of Eskimo women.<sup>14</sup> In addition, scientists have gathered evidence that some Arctic char, ringed seals, and caribou have abnormally hard livers.<sup>15</sup> Scientists also have found caribou with worms in their joints and muscles.<sup>16</sup> The fat of many beluga whales has changed color.<sup>17</sup> Finally, hunters across northeastern Canada have reported “that an increasing number of polar bears look emaciated, probably because their hunting season has been shortened by the shrinking ice cover.”<sup>18</sup> If these findings are not bad enough, wildlife authorities point out that there are behavioral changes in the caribou, such as changing feeding areas and calving grounds, as well as a decrease in timidity around humans.<sup>19</sup>

If mining occurs on the continental shelf, the contaminants may seep into the Arctic food chain.<sup>20</sup> “The Stockholm Convention on Persistent Organic Pollutants, an international treaty binding on 150 countries including the United States, went into effect in May [2004] to prohibit the production of a dozen toxic chemicals and to bring about the destruction of existing stockpiles.”<sup>21</sup> Since its passage, there has been no further discussion of the treaty or its possible results.

Even though this article focuses on the problems with the Arctic Ocean and environs, other articles show that climate changes, demonstrated by the retreating glaciers, have also affected Antarctica.<sup>22</sup> By using “space-based laser and radar imaging to map and monitor the movement of its ice sheets,” scientists measure ice thickness.<sup>23</sup> Aircraft measurements complement these large-scale studies in regions experiencing the greatest change.<sup>24</sup> Satellite data suggest that the Pine Island Glacier, located in West Antarctica, is rapidly thinning.<sup>25</sup> Unlike the western ice sheet, the East Antarctic ice sheet spreads over land primarily at or above sea level.<sup>26</sup> As its environment changes, the western ice sheet, however, remains susceptible to an accelerated flow into the ocean.<sup>27</sup> “Although most of Antarctica has experienced cooling in the last 20 years, satellite data show warming along the coasts, which is believed to be weakening and thinning the ice.”<sup>28</sup> Further, the glaciers of the Amundsen Sea contain enough ice that, when melted, will raise the sea level by 1.3 meters, roughly four feet.<sup>29</sup> The glacier thinning in the Amundsen Sea attributed to a sea level rise of approximately 0.2 millimeters a year, representing 10 percent of the total increase globally. “Near the coast [of the Amundsen Sea] the process ha[s] accelerated and might continue to do so.”<sup>30</sup>

In fact, a recent *New York Times* article noted that, “[t]he eastern half of Antarctica is gaining weight, more than 45 billion tons a year, according to a new scientific study” and appears to be growing higher by

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<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

<sup>18</sup> *Id.*

<sup>19</sup> *Id.*

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

<sup>22</sup> *E.g.*, Larry Rohter, *Antarctica, Warming, Looks Ever More Vulnerable*, N.Y. TIMES, Jan. 25, 2005, at F1. For a discussion on the changing ice sheets in both the Arctic and Antarctic regions, see Kenneth Chang, *Warming is Blamed for Antarctica's Weight Gain*, N.Y. TIMES, May 20, 2005, at A22.

<sup>23</sup> Rohter, *supra* note 22, at F1.

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

<sup>30</sup> *Id.*

approximately 1.8 centimeters a year from the piling up of snow and ice.<sup>31</sup> “The gain in eastern Antarctica snow partly offsets the rise in sea level caused by the melting of ice and snow in other parts of the world.”<sup>32</sup> This finding matches the expectations that warming temperatures will likely increase moisture levels in the air, leading to greater snowfall over Antarctica.<sup>33</sup> “The accumulation [of ice and snow] occurring across 2.75 million square miles of eastern Antarctica corresponds to a gain of 45 billion tons of water a year or, equivalently, the removal of the top 0.12 millimeter of the world’s oceans.”<sup>34</sup> The mystery surrounding this accumulation is that satellite measurements show that the world’s oceans rise at a rate of approximately three millimeters per year, and scientists cannot discern where the excess water is coming from.<sup>35</sup> In any event, scientists agree that the ice sheets are dramatically changing.<sup>36</sup>

While the changes in Antarctica are alarming, this article concentrates on the problems in the Arctic region and discusses possible solutions. The purpose of this article is to set forth the possibility of creating a new jurisdictional boundary called an “Arctic indicator.” The boundary would encircle the Arctic Ocean, and, by utilizing the boundary (as will be explained later in this article), the Arctic could maintain its pristine nature and possibly limit mineral development to zero or to a sustainable yield that would take into account the environmental/humanitarian problems. The problems of the Arctic are contained both in the ocean itself as well as the surrounding areas. It will first be necessary to define the geographic region known as the Arctic, separating the Ocean from the environs. Your author will then discuss the applicable law of the sea measures in the latest treaties involving ocean law. In other words, it will be necessary to set forth and describe what a continental shelf actually is in terms of the 1982 Law of the Sea Treaty and compare the treaty terminology to that of a geological continental shelf. To accomplish this end, it will be necessary to review various articles written on the subject with the view of presenting the problems, as various scholars see them (e.g., in terms of how indigenous people are affected by what is going on in the Arctic Ocean and its environs as well as other data concerning human rights and environmental hazards).

## II. VITAL STATISTICS CONCERNING THE ARCTIC

The United Nations publishes a report by the General Assembly once a year on the status of the oceans.<sup>37</sup> Citing a report entitled “Impacts of a Warming Arctic,” it is obvious that the climate is warming rapidly.<sup>38</sup> It has warmed nearly twice as fast as the remainder of the world over the past twenty years.<sup>39</sup> Results of this warming trend (widespread melting sea ice, the thawing of permafrost, the shortening of the snow season) demonstrate the outward problems.<sup>40</sup> The report was published in November 2004, and according to the United Nations, it “synthesized the key findings of the Arctic Climate Impact Assessment [(“ACIA”)], an evaluation commissioned by the Arctic Council and the International Arctic Science Committee (an international scientific organization appointed by 18 national academies of science).”<sup>41</sup> The upshot of an “unprecedented four-year scientific study of the region conducted by an international team of 300 scientists” showed that, at a minimum, half the summer ice in the Arctic Ocean will melt by the end of the century, along

<sup>31</sup> Chang, *supra* note 22, at A22.

<sup>32</sup> *Id.*

<sup>33</sup> *Id.*

<sup>34</sup> *Id.*

<sup>35</sup> *Id.*

<sup>36</sup> *Id.*

<sup>37</sup> See The Secretary-General, *Oceans and Law of the Sea: Reports of the Secretary General*, available at [http://www.un.org/Depts/los/general\\_assembly/general\\_assembly\\_reports.htm](http://www.un.org/Depts/los/general_assembly/general_assembly_reports.htm) (last visited Oct. 2, 2005).

<sup>38</sup> The Secretary-General, *Oceans and Law of the Sea: Reports of the Secretary General*, at 41, delivered to the General Assembly, U.N. Doc. A/60/63 (Mar. 4, 2005).

<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> *Id.*

with a substantial portion of the Greenland Ice Sheet, because the region is expected to become warmer by 4-7 degrees centigrade (7-13 degrees Fahrenheit).<sup>42</sup>

The effects of a warmer Arctic for natural systems and society in the area are reported to be manifold. Since more than half of the Arctic region consists of oceans, climatic variations will have a large impact on marine environments and marine-related activities. These impacts would include rising sea levels; changes in ocean salinity, which could strongly affect regional climate; the decline or extinction of marine species due to habitat loss; expanding marine shipping; and the enhancement of some major Arctic fisheries together with the decline of others. Climate change is also projected to have effects outside the Arctic, such as global sea-level rise and intensifying global warming. The Arctic provides natural resources to the rest of the world, which are likely to be affected by climate change.<sup>43</sup>

In addition to climate change, the ACIA report, together with other studies, suggest that “many other stresses caused by human activities are affecting Arctic life, including pollution, over fishing, increasing levels of ultraviolet radiation due to ozone depletion and habitat alteration.”<sup>44</sup> The fourth Ministerial Meeting of the Arctic Council “issued a declaration noting with concern the findings and impacts documented by the [ACIA].”<sup>45</sup> The Council acknowledged that such findings and underlying scientific assessment help to provide governments with the information necessary to implement change and consider international cooperation to address future circumpolar challenges.<sup>46</sup> The Council further requested the Working Group on the Protection of the Arctic Marine Environment (“PAME”) to carry out a comprehensive Arctic shipping assessment, recognizing that many environmental changes have had significant impacts on the Arctic’s living resources, its environment, and its residents.<sup>47</sup> “[C]onservation of biodiversity [is] necessary for achieving sustainable development in the region.”<sup>48</sup>

The Antarctic is currently having similar problems:

The unique Antarctic environment continues to be under threat from a rapidly warming atmosphere, the thinning of the ozone layer, and increasing levels of fishing and tourism. According to recent studies, the Antarctic Peninsula is among the fastest-warming places on earth, with annual temperatures that have risen around 2.5° centigrade in the past 50 years. These warmer conditions have reportedly led to increased colonization by plants in certain areas and to a decline in sea ice, which could be responsible for a considerable drop in Antarctic krill. Since krill is at the heart of the food web, Antarctic whales, seals, fish and penguins could be threatened by food shortages in the Southern Ocean, as a consequence of this decline in krill stock. Disintegration of ice shelves and melting of glaciers due to regional warming may also cause sea levels to rise.<sup>49</sup>

At their twenty-seventh meeting, the parties to the Antarctic Treaty “endorsed the guidelines for ships operating in Arctic and Antarctic ice-covered waters.”<sup>50</sup> These Guidelines include provisions covering

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<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> *Id.* at 42.

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

<sup>48</sup> *Id.*

<sup>49</sup> *Id.*

<sup>50</sup> *Id.*

operational issues, construction, equipment, environmental protection, and damage control.<sup>51</sup> In addition, the parties also adopted measure 4 and resolution 4, which recommend that governments require businesses that organize or conduct tourist or other non-governmental activities in Antarctica “to have appropriate contingency plans and sufficient arrangements for health and safety, search and rescue and medical care, as well as adequate insurance, before undertaking any such activities . . . .”<sup>52</sup> Lastly, the treaty adopted resolution 1, which protects marine life from pollution caused by fishing activities.<sup>53</sup>

Although there are many similar problems in the Arctic and Antarctic regions, it is important to realize that the Arctic Ocean plays an integral role in processes that go far beyond the realms of the isolated North. For example, a paper, presented at a conference on “The Changing Circumpolar North: Opportunities for Academic Development” held in Finland in December of 1992, demonstrated that a reason behind the enhancement of research efforts in the Arctic is the realization of the Arctic’s importance in a global system.<sup>54</sup> The paper offered three alternative models, depicting the geographical distribution of expected changes in surface air temperatures (ten year means) for the months of December, January and February (1992-1993), caused by the sudden doubling of carbon dioxide (CO<sub>2</sub>) in the atmosphere.<sup>55</sup> Remember, this study was done in the early 1990s. The most intriguing feature of each model was “the pronounced warming north of 60° north.”<sup>56</sup> A predicted rise in temperature for this region ranged from 4° to 20°.<sup>57</sup> As a result, one could safely say that “no matter what the exact magnitude and geographical distribution of the predicted changes might be, a doubling of the atmospheric carbon dioxide content will undoubtedly lead to increased temperatures in the Arctic.”<sup>58</sup> In addition, one would have to add the effects of other “greenhouse gases” into the equation.<sup>59</sup> The concentrations of these gases (e.g., methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and the chloro-fluoro-carbons (CFC-11 and CFC-12)) were also on the rise.<sup>60</sup> The models predicted that greenhouse gases would cause an additional increase to the projected temperature rise from the heightened levels of CO<sub>2</sub>.<sup>61</sup>

The study also established that the atmospheric CO<sub>2</sub> content at the time had risen by about 26%: (i.e., from 280 ppmV to 353 ppmV) since pre-industrial times (1750-1800) with a current rate of annual atmospheric accumulation of 0.5%. Depending on the assumed rate of increase in the emissions of CO<sub>2</sub>, worst-case scenarios call for a doubling of atmospheric concentrations relative to the 1950 level already by the year 2050 or 2090. Whatever the real scenario of atmospheric CO<sub>2</sub> concentrations may be, even the presently reached rise in these concentrations relative to the pre-industrial levels gives ample reason for concerns.<sup>62</sup>

One problem likely to be caused by rising temperatures is that the Circumpolar North will receive less snow cover.<sup>63</sup> This “will lead to enhanced absorption of solar radiation by the snow-free ground and subsequently to a warming of the overlying air column.”<sup>64</sup> Warmer air results in more snow melting and,

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<sup>51</sup> *Id.*

<sup>52</sup> *Id.*

<sup>53</sup> *Id.*

<sup>54</sup> MANFRED A. LANGE, *The Arctic in a Changing World: New Challenges for Circumpolar Universities*, in THE CHANGING CIRCUMPOLAR NORTH: OPPORTUNITIES FOR ACADEMIC DEVELOPMENT 152 (Lassi Heininen, ed., 1994).

<sup>55</sup> *Id.* (offering a brief discussion of the intricacies of the three models).

<sup>56</sup> *Id.*

<sup>57</sup> *Id.* (the author leaves out whether this temperature differential is in Fahrenheit or Celsius, but this author believes it to be Fahrenheit).

<sup>58</sup> *Id.* at 153.

<sup>59</sup> *Id.*

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*

<sup>63</sup> *Id.*

<sup>64</sup> *Id.*

consequently, less area covered by snow.<sup>65</sup> This type of “feedback” will accelerate the results from initial warming “and will have consequences that reach far beyond the Arctic.”<sup>66</sup>

The article further explains many other predicted effects of this enhanced greenhouse warming:

- changes in the rate, extent and duration of sea ice growth;
- alterations in the mass balance of glaciers and of the Greenland ice sheet with subsequent effects on sea level;
- a possible thawing of permafrost areas and the release of stored carbon into the atmosphere;
- changes in the hydrological regime;
- disturbances of fragile balances in marine and terrestrial ecosystems.<sup>67</sup>

Because of the Arctic’s enhanced propensity towards a rise in surface temperatures as compared to other regions, it is necessary to monitor essential environmental parameters that may reveal change occurring earlier and more clearly in the Arctic than elsewhere.<sup>68</sup> “Pollution in the Arctic will have devastating effects because of the vulnerability of arctic ecosystems and their long recovery times.”<sup>69</sup> Any large-scale developments could also directly affect the livelihoods of indigenous people.<sup>70</sup> “The erection of large industrial complexes and extended infrastructural measures will immediately result in a ‘fight for land’ between the investors and the native people, with little opportunity for the latter to find any alternatives.”<sup>71</sup>

The Arctic region is also treasured for its oil reserves.<sup>72</sup> The known reservoirs of natural gas and oil in the Circumpolar North in 1989 are depicted in the report of 1992.<sup>73</sup> It is important to note that the oil and gas fields along the Greenland Coast and in the Russian Arctic were largely untouched at that time, while deposits off Alaska had been exploited for years.<sup>74</sup> Against that background, it is important to observe that exploitation of the Arctic’s natural resources meets with numerous obstacles:

- adverse conditions (cold, darkness, remoteness) make work extremely difficult and demanding and lead to high capital costs;
- the lack of infrastructure requires additional investments;
- offshore operations face additional threats such as damage of the equipment by sea ice or icebergs, which need extra precautionary measures;
- long and risky transport routes narrow the profit margin for operations in the Arctic.<sup>75</sup>

As far as the statistics are concerned, it is rather obvious that the polar ice cap is shrinking, and the growing attractiveness of polar routes for shipping and air traffic are once again drawing attention to fundamental legal questions of authority to control and regulate shipping access and activity in general in the Arctic:

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<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

<sup>67</sup> *Id.*

<sup>68</sup> *Id.* at 154.

<sup>69</sup> *Id.* at 156.

<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

<sup>72</sup> Your author has included a chart in the Appendix detailing the estimated oil and gas reserves in the Arctic. For more information on the location of the various Arctic basins, see LANGE, *supra* note 54, at 157.

<sup>73</sup> LANGE, *supra* note 54, at 156.

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

Canada has promulgated a Polar Code to regulate shipping north of the 60th parallel and also controls airspace in the area. While most shipping and air lines follow Canadian rules, the United States and major European shipping countries maintain that the relevant legal regime is transit passage through international straits, and that Canada has no authority to withhold consent to transit or to exercise broad unilateral regulatory jurisdiction for environmental or other reasons.<sup>76</sup>

In summary, therefore, it is important to note, that there are new technologies, which can attempt to satisfy the ever present hunger for resources and, in so doing, further exacerbate global warming. These factors alone have inspired Denmark, Canada and Russia to lay claims to the Circumpolar North by extending their continental shelf area. Apparently, the Circumpolar North is the last untapped area of resources of oil and natural gas.

### III. THE CURRENT LEGAL FRAMEWORK GOVERNING THE CIRCUMPOLAR NORTH

The eight States surrounding the Arctic Ocean (Canada, Denmark, Finland, Iceland, Norway, Sweden, Russia and the United States) adopted an Arctic Environmental Protection Strategy on June 14, 1991.<sup>77</sup> The objectives of the Strategy were to protect the Arctic environment and its indigenous peoples.<sup>78</sup> The idea behind this “strategy” was to have the eight States commit themselves to meet periodically and co-operate in achieving the objectives of the strategy.<sup>79</sup> In 1996, the Arctic States signed a Declaration on the Establishment of the Arctic Council to provide a permanent framework for overseeing activities in the Arctic.<sup>80</sup> They also attempted to have input from the indigenous peoples as part of this particular framework.<sup>81</sup> The strengths and weaknesses of this multilateral treaty will be discussed shortly.

Prior to this multilateral action, the Canadian government, in 1970, decided to enact the Arctic Waters Pollution Prevention Act.<sup>82</sup> The Canadian legislature, in a unilateral act, prohibited waste discharge and ordered extensive regulations within 100 miles from the northern coast of Canada.<sup>83</sup>

Naturally, there was a wave of international criticism, whereby Canada responded with a contiguous zone argument as follows: “[a] State may exercise special authority in areas of the sea adjacent to its territorial waters where functional controls of a continuing nature are necessary for the effective prevention of pollution which could cause damage or injury to the land or marine environment under its exclusive or sovereign authority.”<sup>84</sup> As was the case with the 12-mile zone<sup>85</sup> and the right of intervention on a case-by-case basis, recourse was “to the orthodoxy of objective territoriality: to protect territorial interests, it is essential to exercise extraterritorial jurisdiction.”<sup>86</sup>

The Canadian assertion, however, is further complicated by two factors.<sup>87</sup> First, the diplomatic and

<sup>76</sup> LORI F. DAMROSCH ET AL., INTERNATIONAL LAW: CASES AND MATERIALS 1570 (4th ed. 2001).

<sup>77</sup> See ARCTIC COUNCIL, *supra* note 3, at 1.

<sup>78</sup> *Id.* at 2-3.

<sup>79</sup> *Id.* at 3-4.

<sup>80</sup> ARCTIC COUNCIL, *Declaration on the Establishment of the Arctic Council*, Sept. 19, 1996, <http://www.arctic-council.org/en/main/infopage/190/>.

<sup>81</sup> *Id.*

<sup>82</sup> BRIAN D. SMITH, STATE RESPONSIBILITY AND THE MARINE ENVIRONMENT: THE RULES OF DECISION 223 (Ian Brownlie, ed., Oxford University Press 1988) (citing The Arctic Waters Pollution Prevention Act, R.S.C., ch. A-12, § 1 (1985)). At the same time Canada’s legislature passed this Act, it also amended its submission to the jurisdiction of the International Court of Justice to “except disputes relating to marine environmental jurisdiction.” See Letter of Notification to the United Nations from Ambassador Beaulne, as reprinted in 9 INT’L LEGAL MATERIALS 598 (1970). *Id.* at 223, n.47.

<sup>83</sup> *Id.* at 223 (citing the Arctic Waters Pollution Prevention Act, R.S.C., ch. A-12, § 2).

<sup>84</sup> *Id.* (citing Canadian Working Paper on the Preservation of the Marine Environment, U.N. Doc A/AC.138/C.III/L.26 (1972)).

<sup>85</sup> In 1970, Article 24 of the 1958 Geneva Convention called for the contiguous zone extending out 12 miles from the baseline. *Id.*

<sup>86</sup> *Id.*

<sup>87</sup> *Id.* at 223-224, n.50.



academic attempts by Canada to defend the Arctic Act assert the “unique vulnerability” of the Arctic Ocean and its surrounding environment.<sup>88</sup> Second, Canada may “claim territorial rights over much of the Arctic Ocean on the basis of an amalgam of archipelagic, historic waters and sector claims.”<sup>89</sup>

Many scholars have proposed that the pollution prevention zone is founded on the right and obligation of all states to act as custodians for the international community, an extraterritorial application of “dédoulement fonctionnel.”<sup>90</sup> The “dédoulement fonctionnel” concept arises when a state is vested with the authority to act in its own interest, but the state must also act to safeguard international interests.<sup>91</sup>

[T]he idea of a right of the coastal state is in the same moment linked with the idea of the responsibility of the coastal state to the international community generally; thus, the right of the coastal state to defend its own shores and territorial sea is made part and parcel of its responsibility, stemming from its proximity to the danger, to the international community to prevent pollution of the high seas.<sup>92</sup>

Many states, like Canada, have asserted their authority over the environment in “expansive contiguous zones.”<sup>93</sup> The main problem here is that “neither such limited practice nor ‘the reason of the thing,’ however, elevates pollution prevention zones to international law.”<sup>94</sup> International law simply has not incorporated coastal state claims over extensive zones to protect their security or environment.<sup>95</sup> At least, not yet!

Conversely, this dogmatic principle is confined to assertions of environmental authority that are unconnected to extraterritorial resource claims.<sup>96</sup> The important problem is that even though we have environmental discussions within the framework of the 1982 Law of the Sea Convention, there seem to be few enforcement mechanisms available to prevent environmental pollution.

#### IV. JURISDICTION ON THE CONTINENTAL SHELF<sup>97</sup>

In order to understand the extent of the jurisdictional claim on the alleged Continental Shelf of Greenland, it is important to first review the concepts regarding this matter as defined in the 1982 Law of the Sea Convention. The most important feature of UNCLOS was that much of the discussion leading up to its final preparation was in regard to the theme: the common heritage of mankind.<sup>98</sup> Consideration of landlocked states and their access to waters, the development of special authority to overlook resource development on the seabed, and various other measures were included within the 1982 Convention, all with the hope of achieving the goal of developing a framework for future law of the sea problems.<sup>99</sup> As usual, the environment took a backseat, as there were many items upon which the parties to the Convention could not initially agree.

However, development of the Continental Shelf Doctrine was not an idea new to the 1982

<sup>88</sup> *Id.* at 224, n.50.

<sup>89</sup> *Id.*

<sup>90</sup> *Id.* at 224.

<sup>91</sup> *Id.*

<sup>92</sup> *Id.* (citing R.Y. Jennings, *A Changing International Law of the Sea*, 31 CAMBRIDGE L.J. 32, 44 (1972)).

<sup>93</sup> *Id.*

<sup>94</sup> *Id.* (citing Jennings, *supra* note 92, at 44).

<sup>95</sup> *Id.* at 225. See RESTATEMENT (THIRD) OF THE FOREIGN RELATIONS LAW OF THE UNITED STATES: COASTAL STATE AUTHORITY IN ZONE OF ADJACENT SEA § 511 (2004) (discussing exercise of jurisdiction in coastal zones).

<sup>96</sup> *Id.*

<sup>97</sup> For a schematic jurisdictional diagram, see LANGE, *supra* note 54, at 157.

<sup>98</sup> See generally United Nations Law of the Sea Convention, A Historical Perspective, at [www.un.org](http://www.un.org) (choose language, then follow hyperlinks: International Law/Law of the Sea/United Nations Convention on the Law of the Sea/The Convention-A Historical Perspective).

<sup>99</sup> See *id.*

Convention.<sup>100</sup> In 1945, President Truman pronounced “that the exercise of jurisdiction over natural resources of the subsoil and seabed of the continental shelf by the contiguous nation is reasonable and just.”<sup>101</sup> The accompanying press release stated that the “continental shelf” was submerged land covered by no greater than 100 fathoms, or 600 feet, of water and was, thus, referring primarily “to the inner part of the continental margin, the geomorphic continental shelf.”<sup>102</sup> In the 1958 Convention on the Continental Shelf, which is sometimes referred to as the 1958 Geneva Convention, the parties developed a concept of a “legal” continental shelf, which was defined by different rules or formulas “quite distinct and different from the morphologically defined continental shelf of a geographer.”<sup>103</sup> The 1958 Convention on the Continental Shelf defined “continental shelf” as “the seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 metres or, beyond that limit, to where the superjacent waters admits of the exploitation of the natural resources of the said areas.”<sup>104</sup> Although the 1958 Geneva Convention retained “the concept of a 200-meter-deep geomorphic shelf, it introduced the notion that a coastal State may claim continental shelf rights into the deeper waters beyond this to whatever depth it is capable of exploiting the resource.”<sup>105</sup> The 1958 Convention, however, did not define the outer limits of the continental shelf.<sup>106</sup> Therefore, the precise definition of the shelf remained in question following the Geneva Convention of 1958.<sup>107</sup>

The concept regarding the continental shelf has remained largely unchanged over the years. Basically, a coastal state has sovereign rights over its legal shelf for the purposes of exploring and exploiting the natural resources of its seabed and subsoil.<sup>108</sup> The inner land limit of the continental shelf has long been regarded as the outer limit of the territorial sea, but the definition of the outer limit has been considerably more contentious.<sup>109</sup> Negotiations regarding the outer shelf limit were strenuous leading up to the codified resolution in UNCLOS.<sup>110</sup> “Subject to certain limits applicable to unusual physical circumstances, Article 76 defines the state’s shelf as extending to the more distant of ‘the natural prolongation of its land territory to the outer edge of the continental margin, or . . . a distance of 200 nautical miles’ from the territorial baseline.”<sup>111</sup>

Between the 1958 Geneva Convention and the 1982 Law of the Sea Convention, the International Court of Justice (“ICJ”) decided the *North Sea Continental Shelf* cases.<sup>112</sup> The ICJ “referred to the continental shelf as ‘the natural prolongation’ of the land domain of a coastal state and said that this natural prolongation was a continuation of the land domain under the sea, so that the continental shelf is ‘actually part of the territory over which the coastal State already has dominion.’”<sup>113</sup> This statement may indicate that the ICJ perceived the continental shelf as a “three-dimensional geological province,” rather than simply a geographical or geomorphological entity.<sup>114</sup> Of course, the definition of the shelf in a jurisdictional sense differed from the

<sup>100</sup> PHILIP A. SYMONDS, ET AL., *Characteristics of Continental Margins*, in CONTINENTAL SHELF LIMITS: THE SCIENTIFIC AND LEGAL INTERFACE 25, 26 (Peter J. Cook & Chris M. Carleton eds., 2000).

<sup>101</sup> *Id.* (citing *Truman Proclamation on the Continental Shelf*, Proclamation No. 2667, 10 Fed. Reg. 12,303 (Sept. 28, 1945), available at <http://www.oceanlaw.net/texts/truman1.htm>).

<sup>102</sup> *Id.*

<sup>103</sup> *Id.*

<sup>104</sup> INTERNATIONAL LAW COMMISSION, *Convention on the Continental Shelf*, 1958 art. I.

<sup>105</sup> SYMONDS, *supra* note 100, at 26.

<sup>106</sup> *Id.*

<sup>107</sup> SMITH, *supra* note 82, at 225.

<sup>108</sup> *Id.*

<sup>109</sup> *Id.*

<sup>110</sup> *Id.*

<sup>111</sup> *Id.* (citing United Nations Convention on the Law of the Sea, Art. 76(1) (Dec. 10 1982)) available at [http://www.globelaw.com/LawSea/ls82\\_2.htm#article\\_76\\_definition\\_of\\_the\\_contin](http://www.globelaw.com/LawSea/ls82_2.htm#article_76_definition_of_the_contin) (last visited October 9, 2005). “The continental margin ends at the reach of the slope and rise of the shelf, excluding the deep floor.” *Id.* at 225, n.63.

<sup>112</sup> *North Sea Continental Shelf*, 1969 I.C.J. 3 (Feb. 20), available at <http://www.icj-cij.org/icjwww/idecisions/isummaries/icsummary690220.htm>. In the *North Sea Continental Shelf* case, the ICJ analyzed the issue of delimitation of the continental shelf in the North Sea in a dispute between the Federal Republic of Germany and Denmark on one hand and the Federal Republic of Germany and the Netherlands on the other. 1969 I.C.J. at 6.

<sup>113</sup> SYMONDS, *supra* note 100, at 26 (citing *North Sea Continental Shelf*, 1969 I.C.J. at 31).

<sup>114</sup> *Id.*

definition in a geophysical sense at that time.<sup>115</sup>

Turning to the current definition of the continental shelf, given in Article 76.1 of the Law of the Sea Convention, it:

[C]omprises the seabed and subsoil of the submarine area that extend . . . throughout *the natural prolongation* of its land territory to *the outer edge of the continental margin*, or to a distance of 200 nautical miles . . . where the outer edge of the continental margin does not extend up to that distance.<sup>116</sup>

Article 76.3 further defines “continental margin” as “the submerged prolongation of the land mass of the coastal state, and consists of *the seabed and subsoil of the shelf, the slope and the rise.*”<sup>117</sup> It does not include the deep ocean floor with its oceanic ridges. Unequivocally, the shelf regime progressed from encompassing merely a “geomorphic shelf” in President Truman’s 1945 Proclamation to the “natural prolongation” of land domain up to the edge of the continental margin in the 1982 Law of the Sea Convention.<sup>118</sup>

Another aspect of the continental shelf doctrine deflects the question of a state’s sovereign rights as opposed to “sovereignty” over the shelf. For legal purposes, there are a number of factors suggesting that the shelf and state territory might be indistinguishable:

(a) the term sovereignty seems to have been avoided only to emphasize the absence of territorial authority over superadjacent waters; (b) the concept of shelf rights adopted was premised upon the continuity or natural prolongation of land territory; (c) continental shelf rights are inherent, i.e. they do not depend upon the affirmative claim of the coastal state as do lesser ‘jurisdictional’ contiguous rights; and (d) the rights granted compare in scope with territorial rights--the fact of subjection to limitations inherent in the location below high seas no more precludes territorial status than does innocent passage with respect to the territorial sea.<sup>119</sup>

Authority over the continental shelf is *sui generis*; use of the term “sovereign rights” makes clear that authority over the shelf is neither territorial nor simply jurisdictional.<sup>120</sup>

In summation, States clearly possess jurisdiction over conduct taking place on the shelf equivalent to the States’ rights over territorial activity.<sup>121</sup> Excluding others from exploitation of the shelf’s resources is an essential element of a State’s jurisdiction over conduct on the shelf.<sup>122</sup> The presence of a shelf regime does not prevent application of general extraterritorial prescriptive rights.<sup>123</sup>

If Denmark can show the extension of Greenland’s landmass to the Lutonov Ridge, it is rather obvious that it would be entitled to exploit the shelf area for natural resources legally. That, however, does not resolve the issue as to whether they *should* develop this area.

One important problem with developing the area involves rising sea levels. As stated earlier in this article, the increase in temperature will eventually lead to a rise in sea levels.<sup>124</sup> Although there have been continuous fluctuations in sea level over time, some experts view rising sea levels as a result of global warming

<sup>115</sup> *Id.*

<sup>116</sup> *Id.* (citing UNCLOS, Art. 76(1)).

<sup>117</sup> *Id.* (citing UNCLOS, Art. 76(1)).

<sup>118</sup> *Id.*

<sup>119</sup> SMITH, *supra* note 82, at 225-26.

<sup>120</sup> *Id.* at 226.

<sup>121</sup> *Id.*

<sup>122</sup> *Id.* at 226, n.67.

<sup>123</sup> *Id.*

<sup>124</sup> *See supra* notes 22-36.

(possibly the “greenhouse” effect).<sup>125</sup> As a result of the increasing amount of CO<sub>2</sub> in the atmosphere the world’s oceans could experience major changes.<sup>126</sup>

Many scientists expect the sea level to rise 2 to 6 feet in the next century as CO<sub>2</sub> and other gases blanket the atmosphere, warming oceans and melting polar ice. Netherlanders, after fighting the sea for seven centuries to reclaim two fifths of their land, now must live with predictions that rising waters could flood half of their nation. A 3-foot rise in the sea level would drown 10 percent of Bangladesh and one fifth of Egypt’s arable land. Under the worst-case scenario, many small island nations would cease to exist. The United Nations Environmental Program (UNEP) warns that 1 billion people, nearly a fifth of the world’s population, could become greenhouse refugees in the 21<sup>st</sup> century.<sup>127</sup>

So far, your author has noted that the need for natural gas, oil, and other resources, coupled with the rise in sea levels resulting from global warming, have inspired Denmark, Canada, and Russia, to lay claim to the territory under the Arctic Ocean, which supposedly contains the world’s last untapped oil and gas resources. The problem presented, therefore, concerns whether the international community should allow the eight States that border the Arctic Ocean to either develop their shelves or unilaterally regulate the environment by preventing oil spillage and other despoliation of the Arctic Ocean. To fully understand the scope of the environmental problems in the Arctic Ocean and the surrounding areas, one cannot look at the problems in a vacuum, but rather, one should consider the problems in a global context.

To resolve the jurisdictional issues in the Arctic, one possible solution would be to create a jurisdictional boundary around the Ocean itself using the baselines of the eight surrounding countries as a starting point. This jurisdictional boundary could be called “an Arctic indicator,” which could be used to create a new form of jurisdiction/legal regime within the Arctic Ocean area. Undoubtedly, something must be done to address the environmental concerns in the Arctic region, and, perhaps, having no development in the region would be the best way to maintain the very fragile eco-system.

Another possible solution to the Arctic’s environmental problems would be for the international community to create a comprehensive treaty.<sup>128</sup> As part of the international treaty, the parties could create an international sector or an international park system, encompassing the Arctic Ocean using the baselines of the eight surrounding States.<sup>129</sup>

There is nothing new about the concept of an international world park that is controlled by more than one State.<sup>130</sup> One example is the park known as Pico de Neblina, which is “a mountain range located in the Amazonian national forest that extends into both Venezuela and Brazil encompassing approximately 3.6 million hectares.”<sup>131</sup> The two South American countries created the park to protect virgin forest.<sup>132</sup> Also, the Glacier National Park in Montana and its adjacent compliment, Waterton Lakes National Park in Canada, are two more

<sup>125</sup> Samuel Pyeatt Menefee, “*Half Seas Over*”: *The Impact of Sea Level Rise on International Law and Policy*, 9 UCLA J. ENVTL. L. & POL’Y 175, 178 (1991).

<sup>126</sup> *Id.*

<sup>127</sup> *Id.* (citing 107 U.S. NEWS & WORLD REP. 12 (Nov. 20, 1989)).

<sup>128</sup> At least one commentator has suggested that the international community should form a comprehensive treaty to address the region’s environmental problems. See Melissa A. Verhaag, Note, *It Is Not Too Late: The Need for a Comprehensive International Treaty to Protect the Arctic Environment*, 15 GEO. INT’L ENVTL. L. REV. 555 (2003).

<sup>129</sup> See generally Melissa Lloyd, Student Author, *The Race Is On: The Boundaries Within the Arctic Ocean Are Up for Grabs: A Solution: A Multi-State Sovereign Owning a World or Transfrontier Park* (Spring 2005) (unpublished manuscript, on file with Barry Law School, directed research paper for Prof. Barry Hart Dubner).

<sup>130</sup> *Id.*

<sup>131</sup> *Id.* at 11.

<sup>132</sup> *Id.*

examples.<sup>133</sup> “In 1932, the Parliament of Canada and the US Congress passed legislation representing the need for ‘cooperation between nations . . . where the sharing of resources and ecosystems is a reality.’”<sup>134</sup> “Signifying peace and goodwill between the two countries and exemplified by the world[']s longest undefended border, Waterton-Glacier International Peace Park is the world’s first transboundary park.”<sup>135</sup>

The Great Limpopo Transfrontier Park serves as another example of a prototypical transfrontier park.<sup>136</sup> Each country maintains its sovereignty over pre-treaty lands, but Mozambique, Zimbabwe, and South Africa all have interests in the park itself.<sup>137</sup> The mission of the park is to foster conservation through collaboration while promoting cross-border socio-economic development, and the vision is to “promot[e] sustainable use of natural resources to improve the quality of life of the peoples of Mozambique, South Africa and Zimbabwe.”<sup>138</sup>

As part of the Arctic transnational park, the countries bordering the Arctic Ocean could impose a moratorium on resource extraction or development in the ocean, using the “Arctic indicator” as a boundary. Since there is an ample framework within the 1982 Law of the Sea Convention for the creation of an international zone in the Arctic Ocean, the international park zone could either parallel the type of arrangement found in the Antarctic or could create an “authority” to prevent despoilation or development of Arctic Ocean. The concept of an “Arctic indicator” and international park region within the indicator would replace certain terminology in the 1982 Law of the Sea Convention.

The overriding problem with the notion of an international transboundary park is that environmental degradation was not considered a major problem by the drafting States in the 1982 Law of the Sea Convention. True, there was some call for coastal States to assist in protecting the environment, but there really was no effort or enforcement mechanism within the treaty. Although the common theme of the 1982 Law of the Sea Convention was the “common heritage of mankind,” many cynics believe that the treaty basically allocated the riches of the oceans and waters under jurisdiction of the treaty to the coastal States (with the exception of part XI concerning the deep sea bed and the allocation of resources based upon formulas contained therein).<sup>139</sup> The Arctic region needs enforcement mechanisms in place in order to protect the environment. An effective way to achieve the needed enforcement mechanisms is to create an international park.

## V. THE ARCTIC ENVIRONS

Thus far, the thrust of this article has been to discuss problems concerning the Arctic Ocean (which is basically governed by the 1982 Law of the Sea Treaty). However, no discussion of the Arctic Ocean is complete without a discussion of the region surrounding the Ocean itself. The entire region plays an important role in protecting the environment. The methodology in this part of the article is to set forth relevant humanitarian and environmental problems that have been discussed over the years, as well as their effects on indigenous peoples of the region.

The Arctic environment is a very vulnerable and fragile ecosystem. In order to discuss the area surrounding the Arctic Ocean, it is essential to define the term “Arctic region,” although there is no clear definition of the term. Some commentators refer to the area as “the cold polar region comprised of islands, oceans, and land north of the Arctic Circle,”<sup>140</sup> while others “rely on the treeline or the ten-degrees Summer Celsius isotherm line as the southern boundary of the Arctic region.”<sup>141</sup> Another commentator adopts the sixty-

<sup>133</sup> *Id.*

<sup>134</sup> *Id.* (citing Canadian Rockies Homepage, <http://www.canadianrockies.net/Waterton/peace.html>).

<sup>135</sup> *Id.* at 11-12.

<sup>136</sup> *Id.* at 12.

<sup>137</sup> *Id.*

<sup>138</sup> Peace Parks Homepage, <http://www.peaceparks.org/> (follow the “Great Limpopo” hyperlink; then click on the “Overview” hyperlink).

<sup>139</sup> See *infra* note 256 and accompanying text.

<sup>140</sup> Verhaag, *supra* note 128, at 557-58.

<sup>141</sup> *Id.* at 558.

degrees North line as the outer southern limits of the Arctic region.<sup>142</sup> The varying approaches to defining the Arctic region could lead to further discourse amongst those vying for its resources.

While some may say that the Arctic region is a desolate hinterland, it is rich in both resources and wildlife.<sup>143</sup> The Arctic contains both onshore and offshore oil and gas reserves as well as large coal reserves.<sup>144</sup> While the average temperatures in the Arctic's southern counterpart, the central Antarctic,<sup>145</sup> range from -55 to -56 degrees Celsius, the average Arctic temperature rarely drops that low.<sup>146</sup> The Arctic also differs from the Antarctic in that the Arctic is not a continent but an ocean almost entirely encompassed by land.<sup>147</sup> It can be described as "a region based around an ocean surrounded by continents."<sup>148</sup> A very old ice layer permanently covers the North Pole, which, over time, has consolidated into large frozen packs.<sup>149</sup> Its ecosystem has been referred to as "more finely tuned and acutely sensitive to environmental impact than . . . any other part of the globe."<sup>150</sup> Although there are several differences in the Arctic and Antarctic regions, the two polar regions have four issues in common: "science, territorial sovereignty, national security and environment."<sup>151</sup>

According to one commentator, the problems facing the Arctic region are created by six different factors.<sup>152</sup> The first factor is the low temperature of the region, which enables the "slow decomposition of natural and synthetic substances and pollutants."<sup>153</sup> The commentator points out that centuries may pass before metal objects corrode and vanish; spilled oil may take years to degrade.<sup>154</sup> While organic pollutants found in the water sources of temperate zones normally break down after only a few hundred kilometers, the organic pollutants in the Arctic may travel vast distances before completely dissipating.<sup>155</sup>

The second factor is that Arctic flora regeneration is slow and drawn out by cold air temperatures, frozen earth, and limited sunlight.<sup>156</sup> Arctic flora only has an opportunity to grow during the short summer months, and regrowth of disturbed vegetation or tundra can take centuries.<sup>157</sup> The limited growing period profoundly affects the rest of the Arctic food chain.<sup>158</sup> In addition, "massive erosion can occur when destruction of insulating vegetative ground cover exposes the ground to warmer temperatures, causing abnormal thawing of permafrost."<sup>159</sup>

The third factor is the lack of wildlife diversity resulting from the climatic conditions found in high latitudes.<sup>160</sup> Although there is less diversity in the Arctic the climate allows for higher concentrations and numbers of the species present.<sup>161</sup> For example:

[T]he George River caribou herd in northern Quebec numbers between 600,000 and 900,000.

<sup>142</sup> *Id.*  
<sup>143</sup> *Id.*  
<sup>144</sup> *Id.*  
<sup>145</sup> The Antarctic region contains more than 70% of the world's fresh water and has abundant oil and mineral resources. *Id.*

<sup>146</sup> *Id.* The average Arctic temperature in February, its coldest month, is -27 degrees Fahrenheit. Weatherbase Home Page, <http://www.weatherbase.com/> (follow the "Arctic" hyperlink).

<sup>147</sup> Verhaag, *supra* note 128, at 559.

<sup>148</sup> *Id.* (citing DONALD R. ROTHWELL, *THE POLAR REGIONS AND THE DEVELOPMENT OF INTERNATIONAL LAW* 46 (Cambridge University Press 1996)).

<sup>149</sup> *Id.*  
<sup>150</sup> *Id.* (citing Jennifer McIver, *Environmental Protection, Indigenous Rights and the Arctic Council: Rock, Paper, Scissors on the Ice?*, 10 GEO. INT'L ENVTL. L. REV. 147, 148 (1997)).

<sup>151</sup> *Id.* at 558-59 (citing ROTHWELL, *supra* note 148, at 42).

<sup>152</sup> McIver, *supra* note 150, at 148.

<sup>153</sup> *Id.*

<sup>154</sup> *Id.*

<sup>155</sup> *Id.*

<sup>156</sup> *Id.*

<sup>157</sup> *Id.* at 148-49.

<sup>158</sup> *Id.* at 149.

<sup>159</sup> *Id.*

<sup>160</sup> *Id.*

<sup>161</sup> *Id.* at 149.

The Bering Sea pollock fishery is the largest single species fishery in the world. These huge numbers of animals remain relatively concentrated in their distribution because of their need for protection from predators and the availability of food supply.<sup>162</sup>

The fourth factor is that marine areas, both as habitats and feeding grounds, play a more significant role in the Arctic than those found elsewhere.<sup>163</sup> Many species, including humans, live in Arctic coastal areas and depend on the environment for food.<sup>164</sup>

The fifth factor concerns the Arctic climate and its high susceptibility to global warming trends caused by “low precipitation, a relatively stagnant low air mass over the region and the ice’s high reflectivity of radiation.”<sup>165</sup> Regional warming may have various effects, such as warmer air and ground temperatures, lower water levels in rivers and lakes, more melting of sea ice, increased numbers of insect infestations and forest fires, more winter snow, and increased coastal erosion.<sup>166</sup> When ground and air conditions warm, it can lead to a thawing of the permafrost.<sup>167</sup> “Once solid ground turns to marshland, the tundra begins to release enormous quantities of methane gas.”<sup>168</sup> When winter arrives, wetlands will freeze over, and flora that previously constituted the staple diet of the migrating caribou will become inaccessible.<sup>169</sup> The sixth, and final, factor is the increased difficulty in cleaning-up the Arctic environment due to the frigid, icy weather conditions.<sup>170</sup>

In addition to the six factors creating problems in the Arctic region, the economies of warmer countries also negatively impact the Arctic region.<sup>171</sup> “Heavy metal pollutants in the world’s oceans are transported north by ocean currents coming from the equator, ‘and there is very little mechanism to move them south again.’”<sup>172</sup> Contaminants, including DDT, PCB, carbon dioxide, radionuclides, sulfur dioxide, soot, CFCs, heavy metals and pesticides, enter the bottom of the food chain from both the air and water and subsequently take decades to reach analyzable levels in larger organisms.<sup>173</sup> A recent *New York Times* article, explaining the deterioration of the caribou and ringed seals of the Arctic, reaffirms this contamination process.<sup>174</sup> The chemicals may enter the bodies of large mammals, such as polar bears, and can also be found in the breast milk of indigenous human mothers.<sup>175</sup>

As a result of the pollution in the Arctic, there is a phenomenon known as the “Arctic Haze.” The “Arctic Haze” is a brown haze that “is visible air pollution made up of suspended particulate matter that scatters solar radiation.”<sup>176</sup> Since the 1950s, the “Arctic Haze” has been visible and acts as an early warning system of the emission levels of long-range pollutants.<sup>177</sup>

Furthermore, there are other threats to the fragile ecosystem, such as the proposed diamond mine in an

<sup>162</sup> *Id.*

<sup>163</sup> *Id.*

<sup>164</sup> *Id.*

<sup>165</sup> *Id.*

<sup>166</sup> *Id.* (citing Kevin Jardine & John Willis, Editorial, *Our Fragile North: Climate Change Should Be Top Issue for Fledgling International Arctic Council*, MONTREAL GAZETTE, Sept. 19, 1996, at B3).

<sup>167</sup> *Id.*

<sup>168</sup> *Id.* “Methane’s effect as a greenhouse gas is twenty times greater than carbon dioxide.” Wikipedia, Methane, [http://en.wikipedia.org/wiki/Methane#Reactions\\_of\\_Methane](http://en.wikipedia.org/wiki/Methane#Reactions_of_Methane) (last visited Oct. 11, 2005). “It is possible that major extinction in the history of the earth is due to methane.” *Id.*

<sup>169</sup> McIver, *supra* note 150, at 149.

<sup>170</sup> *Id.*

<sup>171</sup> *Id.* at 150.

<sup>172</sup> *Id.* (citing Dr. Fred Roots, scientist and Arctic expert for Environment Canada, *quoted in* Stephen Dale, *New Arctic Body, Grapples with External Pressures*, INTER PRESS, Sept. 26, 1996).

<sup>173</sup> *Id.*

<sup>174</sup> See Krauss, *supra* note 11.

<sup>175</sup> *Id.*

<sup>176</sup> McIver, *supra* note 150, at 150.

<sup>177</sup> *Id.*

area of the Canadian Arctic.<sup>178</sup> Also, Soviet naval vessels dumped sixteen nuclear reactors into the Kara Sea, located north of the Russian Arctic coast.<sup>179</sup> As recently as 1992, liquid nuclear waste was dumped in the same area.<sup>180</sup> Many believe that radioactive contamination is one of the greatest threats facing the Arctic region today.<sup>181</sup> Finally, some argue that there is an over-harvesting of the Arctic's wildlife resources.<sup>182</sup>

Added to the above problems is oil pollution in the waters of the Arctic. While an oil spill has a direct adverse impact on the fish, birds, and mammals that depend on the Ocean for survival, the effects of the spill are felt far into the depths of the Arctic food chain and economy. The Exxon Valdez disaster in Prince William Sound, Alaska illustrates the far-reaching impacts of an oil spill in the Arctic region:

On March 24, 1989 the tanker Exxon Valdez ruptured its tank causing the largest oil spill in the history of the United States. The environmental effects were devastating. About eleven million gallons of crude oil spilled into an extremely sensitive ecosystem. Almost five months later, the oil had navigated so that more than twelve hundred miles of shoreline were affected. The effects of the spill were instantaneous, killing countless birds, fish and marine mammals. Serious damage was done to many of the natural resources of the area. The scene was a plethora of ecosystem destruction. "Dead fish lay on the shore, birds were covered . . . in oil and unable to fly." Sea birds by the thousands were killed, as well as "300 harbor seals, and 250 bald eagles." Killer whales were also killed.

Even after costly and massive clean up efforts, and along with the passage of years, the negative environmental impact lingers. Because an ecosystem is a synergistic dependent system, where one living thing depends on another, the long lasting effects of this type of impact are gargantuan. When fish are covered in oil and die, other species are influenced. For example, dead fish result in less food for the seals that eat them. As the seals diminish in quantity there is less food for orcas that eat seals to survive. One could continue up the food chain to humans who eat seal meat for sustenance. In addition to the physical harm, humans were also victim to adverse economic consequences by environmental disasters. Many who were fishermen suffered a loss of income in the aftermath of this catastrophic oil spill. Thus the consequences were both environmental and economic in nature.<sup>183</sup>

The cold water prevents oil from breaking up as easily and increases the sensitivity of the Arctic ecosystem.<sup>184</sup>

The Arctic region is also adversely affected by chemicals and toxins occurring from either intentional or unintentional ocean dumping.<sup>185</sup> Heavy metals and other toxins have properties that cause bio-accumulation in many marine species.<sup>186</sup> Those not killed by toxic bio-accumulation may be killed by oxygen depletion.<sup>187</sup> "Those who survive may be diseased: an impact felt by humans as well as the habitat."<sup>188</sup>

<sup>178</sup> *Id.* at 151. The proposed mine would put certain fishing areas at risk, as it would open at the headwaters of the Coppermine River. *Id.*

<sup>179</sup> *Id.*

<sup>180</sup> *Id.*

<sup>181</sup> *Id.*

<sup>182</sup> *Id.*

<sup>183</sup> Leticia Diaz & Barry Hart Dubner, *On the Problem of Utilizing Unilateral Action to Prevent Acts of Sea Piracy and Terrorism: A Proactive Approach to the Evolution of International Law*, 32 SYRACUSE J. INT'L L. & COM. 1, 33-34 (2004) (quoting *Exxon Valdez Oil Spill: The Aftermath*, [http://nj.essortment.com/exxonvaldezoil\\_regp.htm](http://nj.essortment.com/exxonvaldezoil_regp.htm) (last visited Oct. 11, 2005)).

<sup>184</sup> *Exxon Valdez Oil Spill: The Aftermath*, [http://nj.essortment.com/exxonvaldezoil\\_regp.htm](http://nj.essortment.com/exxonvaldezoil_regp.htm) (last visited Oct. 11, 2005).

<sup>185</sup> Diaz & Dubner, *supra* note 183, at 34.

<sup>186</sup> *Id.* at 34-35. Bioaccumulation is a general term for the accumulation of substances, like pesticides, or other organic chemicals in an organism. U.S. Geological Survey, <http://toxics.usgs.gov/definitions/bioaccumulation.html> (last visited Oct. 11, 2005).

<sup>187</sup> Diaz & Dubner, *supra* note 183, at 35.

<sup>188</sup> *Id.*



The Arctic is very susceptible to pollution for several reasons:

- (1) Low temperatures retard the decomposition of natural and manmade substances and the breakdown of pollutants;
- (2) Regeneration is a protracted process because of the short growing season;
- (3) Large concentrations of animals heighten vulnerability to catastrophes;
- (4) Marine areas are particularly important in the Arctic in comparison with other regions of the globe;
- (5) Climatic conditions are likely to produce a more pronounced carbon dioxide-induced warming trend in the Arctic than in temperate regions and are already leading to high concentrations of air pollutants that threaten vegetation as well as human and animal health; and
- (6) Severe weather and ice dynamics make environmental protection and cleanup extremely difficult.<sup>189</sup>

Therefore, one of the main problems with the Arctic region, as well as the Arctic Ocean, is that the environmental degradation is flowing into that area from afar. Another major problem is determining whether there is a global consensus that this fragile area must be protected; some believe the Arctic region may be suitable for sustainable development (which really cannot co-exist with the amount of protection that will be needed to help the Arctic region survive). Society must decide: is it more important to mine for diamonds and gold or drill for oil and natural gas than it is to protect the wildlife and the pristine area of the Arctic region and Ocean?

#### VI. THE ARCTIC REGIMES

Legal regimes play an important role in the Arctic region for two reasons. First, a regime is necessary to protect the Arctic Ocean itself, which is the force that motivates your author to suggest the creation of a new environmental jurisdictional tool called the "Arctic indicator." Within the "Arctic indicator," the bordering states can create either a national park or some other type of regime that would protect the Arctic Ocean. If the Danes, Canadians, and Russians agree to a transnational park or other form of protection, perhaps other regions with more plentiful natural resources, and less fragile ecosystems, would be willing to swap oil and natural gas with the States bordering the "Arctic indicator" in exchange for the preservation of the pristine Arctic region. In any event, it is easy to work out a solution if there is a consensus among the international community. All of these problems concerning the Arctic Ocean can be discussed and resolved through the use of the 1982 Law of the Sea Convention and other humanitarian treaties that can serve as a framework for the evolution of international consensus. The regional cooperation of the eight States that border the Arctic is absolutely necessary.

Second, the rest of the international community must help to protect the Arctic region from environmental devastation. Several of the Arctic's environmental problems can be traced to outside sources, including "acidifying pollutants, oil pollution, radioactive pollution, heavy metals, and noise pollution,"<sup>190</sup> as well as persistent organic pollutants ("POPs") defined as "chemical substances that persist in the environment, bio-accumulate through the food web, and pose a risk of causing adverse effects to human health and the environment."<sup>191</sup> "There are twelve POPs that are especially dangerous and they have been labeled the 'dirty

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<sup>189</sup> Verhaag, *supra* note 128, at 559.

<sup>190</sup> *Id.* at 560.

<sup>191</sup> *Id.* (citing United Nations Environment Programme, *Chemicals: Persistent Organic Pollutants*, at <http://www.chem.unep.ch/pops/>).

dozen.”<sup>192</sup>

Why are POPs a threat? Because POPs generally have low water solubility and high lipid solubility, it makes them “prone to bio-accumulate in fatty tissues” of Arctic mammals such as whales and seals.<sup>193</sup> POPs move through air quite easily, and they are extremely difficult to remove from organisms due to their tendency to bio-accumulate.<sup>194</sup>

A new international legal regime is necessary in order to protect the fragile Arctic environment.<sup>195</sup> This international legal regime should be modeled after the successful international treaty system that governs Antarctica known as the Antarctic Treaty System.<sup>196</sup> This new regime is necessary because, currently, there are many piece-meal treaties, but no single treaty offers the protection necessary to guard the environment from the various pollutants originating outside the Arctic area.

The eight Arctic States employed a cooperative type of strategy in 1991.<sup>197</sup> The Arctic Environmental Protection Strategy (“AEPS”) is not binding but merely identifies environmental problems in the Arctic and offers potential responses to those problems.<sup>198</sup> The five main objectives of the AEPS are:

- (1) To protect the Arctic ecosystem, including humans;
- (2) To provide for the protection, enhancement and restoration of environmental quality and the sustainable utilization of natural resources, including their use by local populations and indigenous peoples in the Arctic;
- (3) To recognize and, to the extent possible, seek to accommodate the traditional and cultural needs, values and practices of the indigenous peoples as determined by themselves, related to the protection of the Arctic environment;
- (4) To review regularly the state of the Arctic environment; and
- (5) To identify, reduce and, as a final goal, eliminate pollution.<sup>199</sup>

In 1996, the Arctic Council was designed in order to promote cooperation between the Arctic States.<sup>200</sup> The goal of the Arctic Council is “to protect the Arctic’s pristine environment through a ‘quasi-legislative intergovernmental forum charged with recommending, implementing, and developing environmental policies’ instead of a patchwork quilt of eight legal regimes trying to protect one extremely fragile area.”<sup>201</sup> The two objectives of the Arctic Council—the promotion of protection for the environment and the implementation of sustainable development—are inconsistent in the Arctic’s fragile ecosystem.<sup>202</sup>

Contrasting with the measures taken by the eight States bordering the Arctic Ocean is the Protocol on Environmental Protection to the Antarctic Treaty, which came into effect in 1998.<sup>203</sup> The Protocol raised the environment to a primary concern of the Antarctic Treaty System (“ATS”), and one of the most important

<sup>192</sup> *Id.* The “dirty dozen” includes aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, toxaphene, polychlorinated biphenyls (“PCBs”) hexachlorobenzene, dioxins and furans. Environment News Service, *The World Bans the Dirty Dozen Most Dangerous Chemicals* (May 22, 2001), [http://dioxin.abag.ca.gov/pdf/dangerous\\_chemicals.pdf](http://dioxin.abag.ca.gov/pdf/dangerous_chemicals.pdf).

<sup>193</sup> Verhaag, *supra* note 128, at 561 (quoting David VanderZwaag, *International Law and Arctic Marine Conservation and Protection: A Slushy, Shifting Seascape*, 9 GEO. INT’L ENVTL. L. REV. 303, 325 (1997)).

<sup>194</sup> *Id.*

<sup>195</sup> *Id.* at 574-75.

<sup>196</sup> *Id.* at 576-77.

<sup>197</sup> *Id.* at 566.

<sup>198</sup> *Id.* at 567.

<sup>199</sup> *Id.*

<sup>200</sup> *Id.* at 569.

<sup>201</sup> *Id.* at 569-570 (citing Richard J. Ansson, Jr., *The North American Agreement on Environmental Protection and the Arctic Council Agreement: Will These Multinational Agreements Adequately Protect the Environment?*, 29 CAL. W. INT’L L. J. 101, 103 (1998)).

<sup>202</sup> *See id.* at 570.

<sup>203</sup> *Id.* at 572.

aspects of this Protocol was the ban on all mining activities in the Antarctic for a minimum of fifty years.<sup>204</sup> In addition, “three other smaller, yet important treaties that are components of the ATS are the Agreed Measures for the Conservation of Antarctic Fauna and Flora (Agreed Measures), the Convention for the Conservation of Antarctic Seals (CCAS), and the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR).”<sup>205</sup> Each of the three treaties is linked to the Antarctic Treaty, which is the core of the ATS.<sup>206</sup>

Thus, it is imperative to develop a regional approach in dealing with the Arctic. While some would use the Arctic Council as a foundation to combat and prevent environmental pollution in the Arctic region, the Arctic Council’s inadequate membership and inability to completely fight and prevent pollution would cause an adverse effect on the Arctic environment.<sup>207</sup> A proposed international regime designed to protect the future of the Arctic region will be impossible to create unless States are willing to give up sovereignty to their natural resources, such as oil and minerals.<sup>208</sup> The States must shift their focus away from voluntary actions to a binding regional regime and, in the future, to an international regime.<sup>209</sup>

One question remains: is the international community willing to give up a certain amount of sovereignty in order to protect the Arctic Ocean as well as the Arctic region?

Under Part XII of the 1982 Law of the Sea Convention, language regarding the protection and preservation of marine environment, including the water column, the seabed, and the subsoil, is set forth.<sup>210</sup> The various measures deal mainly with types of pollution rather than their influence on the water column of the seabed.<sup>211</sup> Part XII also enumerates the responsibilities of States to reduce and control pollutants from all sources that may have an adverse effect on the marine environment.<sup>212</sup> These responsibilities include:

[T]he preparation of measures to control and monitor activities on land or sea that create pollution; procedures to ensure that pollutants do not travel beyond the State’s sovereign area to those of adjoining States; prompt warnings to neighboring States of sudden pollution threats; the preparation and publication of scientific studies that measure, evaluate, and analyze the effects of pollution in the marine environment; and cooperation in antipollution measures with other States in the region.<sup>213</sup>

Even with the greatest of efforts, it may be impossible for a State to stop pollution generated in its off-shore zones from entering into the marine domains of neighboring States.<sup>214</sup> Marine pollution travels from the marine environment of one country to that of another. For instance:

[M]ine tailings discharged into the Fly River of Papua New Guinea have contributed to the distribution of very fine sediments to the Torres Strait and the Great Barrier Reef that are believed to have adversely affected corals. In some areas such as the Mediterranean Sea, the

<sup>204</sup> *Id.* at 572-73.

<sup>205</sup> *Id.* at 573. “Agreed Measures for the Conservation of Antarctic Fauna and Flora, June 13, 1964, 17 U.S.T. 992, T.I.A.S. No. 6058.” *Id.* at 573, n.132. “Convention for the Conservation of Antarctic Seals, *opened for signature* Feb. 11, 1972, 29 U.S.T. 441, 11 I.L.M. 251 (entered into force Mar. 11, 1978).” *Id.* at 573, n.133. “Convention on the Conservation of Antarctic Marine Living Resources, *opened for signature* May 20, 1980, 33 U.S.T. 3476, 1329 U.N.T.S. 47.” *Id.* at 573, n.134.

<sup>206</sup> *Id.* at 573.

<sup>207</sup> *Id.* at 578-79.

<sup>208</sup> *Id.* at 579.

<sup>209</sup> *Id.*

<sup>210</sup> VICTOR PRESCOTT, *Resources of the Continental Margin and International Law*, in CONTINENTAL SHELF LIMITS: THE SCIENTIFIC AND LEGAL INTERFACE 64, 74 (Peter J. Cook & Chris M. Carleton eds., 2000).

<sup>211</sup> *Id.*

<sup>212</sup> *Id.*

<sup>213</sup> *Id.*

<sup>214</sup> *Id.*

effects of land-derived pollution are so pervasive that all countries can be held responsible to varying degrees. Pollutants carried by the River Rhine spread through much of the North Sea after reaching the Netherlands coast. However, the Netherlands is only responsible for a small part of the pollution from that river. Countries in upstream parts of the Rhine valley are responsible for most of the pollution. In such a case, it is difficult to apportion blame, but it is unreasonable that the country where the river enters the sea is held wholly responsible.<sup>215</sup>

In addition, Article 196 of the 1982 Law of the Sea Convention addresses pollution caused by technology and the introduction of new species that might cause harmful and substantial changes to the environment.<sup>216</sup> As such, the requirements of Article 196 deal with the risks associated with the discharging of ballast waters at major ports, which has attracted much attention over the last few decades.<sup>217</sup> In short, the 1982 Law of the Sea Convention, by itself, is inadequate to deal with the current or future environmental/humanitarian problems facing the international community.

## VII. CONCLUSION

In 1960, the sea ice of the Arctic Ocean was approximately six feet thick.<sup>218</sup> “In stark contrast and as recent as 2001, it was measured at a little less than 3 feet thick and the ice mass is half of what it was four decades ago.”<sup>219</sup> By 2050, the Arctic Ocean will likely be ice-free during summer months.<sup>220</sup> “Scientists estimate that Greenland’s ice sheet is melting at a rate of 51 billion cubic meters along the eastern and southern coasts each year . . . .”<sup>221</sup> What is causing the retracting ice sheets? Global warming is the likely culprit.<sup>222</sup>

Specifically, carbon dioxide and other heat-trapping gases are to blame.<sup>223</sup> Deforestation and the burning of fossil fuels are largely responsible for the increases in carbon dioxide, and further increases seem a foregone conclusion.<sup>224</sup> “Scientists conclude that global temperatures have risen almost one degree Celsius since 1860.”<sup>225</sup> More accelerated elevations inevitably will come.<sup>226</sup>

And these elevations will not be distributed evenly.<sup>227</sup> “Larger and higher land masses and oceans will be the most adversely affected.”<sup>228</sup> As the permafrost disappears, marshlands are created, which then freeze over, effectively eliminating the food source of regional wildlife.<sup>229</sup> Perhaps most importantly, the climatic changes will enhance any negative environmental intrusions or, at the least, make clean-up near impossible.<sup>230</sup>

“[D]espite a geographical situs thousands of miles away from the world’s industrial centers,” transboundary pollution, a process by which toxic pollutants transcend political borders, compounds the

<sup>215</sup> *Id.*

<sup>216</sup> *Id.*

<sup>217</sup> *Id.*

<sup>218</sup> Lloyd, *supra* note 129, at 5. (citing Lisa Mastny, *Melting of the Earth’s Ice Cover Reaches New High*, Worldwatch News Brief, (Washington, D.C., March 6, 2000) available at <http://www.worldwatch.org/press/news/2000/03/06/> (last visited Oct. 12, 2005)).

<sup>219</sup> *Id.*

<sup>220</sup> *Id.*

<sup>221</sup> *Id.* (citing W. Krabill et al., *Greenland Ice Sheet: High Elevations Balance and Peripheral Thinning*, SCIENCE, July 21, 2000).

<sup>222</sup> *Id.* (citing LESTER R. BROWN, *ECO-ECONOMY: BUILDING AN ECONOMY FOR THE EARTH* 29 (W.W. Norton Company 2001)).

<sup>223</sup> *Id.*

<sup>224</sup> *Id.*

<sup>225</sup> *Id.* at 5-6.

<sup>226</sup> *Id.* at 6.

<sup>227</sup> *Id.*

<sup>228</sup> *Id.*

<sup>229</sup> *Id.* For more on “transboundary pollution,” see Richard J. Ansson, Jr., *The North American Agreement on Environmental Protection and the Arctic Council Agreement: Will These Multinational Agreements Adequately Protect the Environment?*, 29 CAL. W. INT’L L.J. 101, 114-16 (1998).

<sup>230</sup> Lloyd, *supra* note 129, at 6.

inherent fragility of the Arctic Region.<sup>231</sup> The continuous onslaught of pollutants poses six environmental issues acknowledged by the Arctic States:

- 1) POPs (persistent organic contaminants)
- 2) Oil pollution
- 3) Heavy metals
- 4) Noise
- 5) Radioactivity
- 6) Acidification.<sup>232</sup>

Heightened concentrations of POPs have already been discovered in the indigenous Inuit population of the Arctic region, caused by the ingestion of seal and whale meat.<sup>233</sup> Scientists' recent discovery of polar bears with both male and female sex organs in the Arctic have led them to believe such mutations are likely caused by PCBs and other toxins.<sup>234</sup> Further, birds, arctic foxes, and harbor porpoises are suffering from high levels of POPs, causing damage to the animals' nervous systems, hindering their normal development and contributing to premature death.<sup>235</sup>

Nunavut, a town in Arctic Canada, has also been the subject of recent studies.<sup>236</sup> Utilizing mathematical and meteorological models, The Center of Biology of Natural Systems for Queens College of New York found that U.S. sources contribute approximately eighty percent of the POPs found in the town.<sup>237</sup> The majority of these pollutants are "derived from municipal and medical waste incinerators, cement kilns, iron sintering, and copper smelting plants."<sup>238</sup> Canada and Mexico also share in the responsibility.<sup>239</sup>

The devastation caused by oil spills has also had an enormous impact on the region.<sup>240</sup> Because of extreme cold, oil concentrates under the ice, eliminating the habitats and feeding grounds of wildlife.<sup>241</sup> The impact becomes more detrimental when the Arctic's frigid temperatures cause the oil to breakdown much more slowly.<sup>242</sup>

Oil spills, however, are not the Arctic's only threat of pervasive pollution. In addition, [r]adioactive waste is brought to the region via air and oceanic currents. Nuclear reactors from Russia, France and the United Kingdom emit pollutants that find their way into the area causing destruction of the flora and fauna. Heavy metals, originating from the lower industrialized nations, flow upwards to the Arctic Circle with no way to wash back due [to the] overpowering northern pull of the ocean. Smelters and other noxious industrial plants spanning the globe emit acidifying pollutants that find their way to the region resulting in phenomena known as "Arctic Haze." Again, wreaking havoc on the wildlife and the indigenous people.<sup>243</sup>

<sup>231</sup> *Id.*

<sup>232</sup> *Id.*

<sup>233</sup> *Id.*

<sup>234</sup> *Id.* at 6-7. (citing Charles Arthur, *Arctic Pollution Causing Polar Bears to Change Sex*, THE INDEPENDENT (London), Oct. 2, 2002).

<sup>235</sup> *Id.* at 7.

<sup>236</sup> *Id.*

<sup>237</sup> *Id.* (citing Danielle Knight, *Canada: Arctic Pollution Linked to Industrial Plants and Incinerators*, INTERPRESS SERVICE, Oct 3, 2000, <http://www.corpwatch.org/article.php?id=510>).

<sup>238</sup> *Id.*

<sup>239</sup> *Id.*

<sup>240</sup> *Id.* See generally Christopher P. Mooradian, *Protecting "Sovereign Rights:" The Case for Increased Coastal State Jurisdiction Over Vessel-Source Pollution in the Exclusive Economic Zone*, 82 B.U. L. Rev. 767 (2002) (discussing jurisdiction in relation to oil spills).

<sup>241</sup> *Id.*

<sup>242</sup> *Id.*

<sup>243</sup> *Id.* at 8.

Eight sovereign nations currently reign over the Arctic region.<sup>244</sup> However, only one binding treaty – the 1973 Agreement on the Conservation of Polar Bears – exists that specifically protects the Arctic environment.<sup>245</sup> Others do, however, cover specific aspects of the Arctic region (e.g. UNCLOS, the London Dumping Convention<sup>246</sup> and the Stockholm Convention on Persistent Organic Pollutants<sup>247</sup>).<sup>248</sup> With the AEPS, the Arctic States took a substantial step towards a multilateral commitment for cooperation.<sup>249</sup> “Notwithstanding instillation of enthusiasm, its bite is illusive because it is a non-binding aspirational instrument with merely an aim at ‘ensuring the protection of the Arctic environment and its sustainable and equitable development . . . .’”<sup>250</sup>

Even if the eight Arctic States fully cooperate and voluntarily adhere to AEPS mandates without a binding treaty in place, no hard law is in place that would effectively prevent other countries from polluting the Arctic region.<sup>251</sup>

Recent aspirational statements such as the Rio and Stockholm Declarations reflecting persuasive soft law could be pressed. Embracing the competing principles of International responsibility and international sovereignty, these declarations stand in recognition of sovereign states’ rights to exploit their own natural resources, but not at the expense of damage to the environment of other states.<sup>252</sup>

How is the International Community going to resolve these problems? Your author has suggested throughout this article that there are two overlapping problems: one problem concerns the Arctic Ocean itself, and the second concerns the environment surrounding the Arctic Ocean. One suggested solution is to create a new jurisdictional boundary called an “Arctic indicator.” This boundary would start from the baselines of the countries surrounding the Arctic. Within the “Arctic indicator” would be a form of a national refuge or park for the Arctic Ocean itself. There would be a moratorium on mineral development, in recognition of the fact that sustainable yield does not really solve the problem but may create new problems as time goes on.

The second suggested solution is not a new one. Your author proposes a creation of a legal regime that would have the sole responsibility of protecting the fragile environment surrounding the Arctic Ocean from pollutants and other forms of degradation affecting that area.

The 1982 Law of the Sea Convention can be used as a framework for the creation of the “Arctic indicator” and the responsibilities of the surrounding States in that region. The concept of a territorial sea is really no longer needed in the Arctic Ocean (and it is questionable whether such “protection” is needed for any coastal region). The “Arctic indicator” can serve as a point of delimitation. The concept of sustainable yield should not be permitted in the Arctic Ocean.

Additionally, the unilateral intervention in the Arctic Ocean by the Canadian government was an excellent idea.<sup>253</sup> When first making its claim, Canada argued that the preservation of the Arctic Ocean was for

<sup>244</sup> ARCTIC COUNCIL, *supra* note 3, at 1.

<sup>245</sup> Lloyd, *supra* note 129, at 9.

<sup>246</sup> See Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, *opened for signature* Dec. 19, 1972, 26 U.S.T. 2403 (entered into force Aug. 30, 1975) (establishing regulations to control the intentional dumping of wastes into the oceans).

<sup>247</sup> See United Nations Environment Programme (UNEP): Stockholm Convention on Persistent Organic Pollutants, *opened for signature* May 22, 2001, 40 I.L.M. 532 (banning the use of POPs and helping prevent new chemicals from harming the environment).

<sup>248</sup> Lloyd, *supra* note 129, at 9.

<sup>249</sup> *Id.* at 9-10.

<sup>250</sup> *Id.* at 10 (citing Arctic Environment Protection Strategy (Scott A. Hajost & John G. Lemmers, eds.) 1991 Y.B. INT’L ENVTL. L. 585, 588 (2001)).

<sup>251</sup> *Id.*

<sup>252</sup> *Id.*

<sup>253</sup> SMITH, *supra* note 82, at 223-225.

the benefit of mankind with Canada serving as a form of fiduciary (trustee) for the benefit of mankind.<sup>254</sup> Later, Canada adopted a protective principle (i.e. that the Arctic Ocean was a fragile ecosystem that needed to be protected from pollution by certain practices of vessels), by attempting to protect the surface waters and prevent mining on the shelf and elsewhere.<sup>255</sup> This would be a step towards the protection of the pristine nature of the Arctic Ocean and the environs.

Finally, all States must share the responsibility of protecting the Antarctic region. A mineral moratorium in the Arctic Ocean is essential. Preventing pollutants from entering that area is essential. Protecting the lives of the indigenous people of the Arctic region is essential. Creating a legal regime that will be binding on the entire international community is essential. Even for those cynics who argue that greed was the motivating factor of the 1982 Law of the Sea Convention, the necessity for protecting these fragile areas can be seen.<sup>256</sup> Even if greed was the essential ingredient, rather than the common heritage of mankind, greedy people would understand that allowing the degradation of the Arctic region to continue would only result in less natural resource production over time. It all boils down to what one wants their grandchildren to have available to them in the future.

By prescribing an international boundary line (thereby creating an international park out of the Arctic Ocean), the eight States bordering the Arctic Ocean and the international community will introduce a new form of humanitarian/environmentalism intervention. World consensus will be necessary in order to avoid destruction of the frail wilderness of the Arctic region.

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<sup>254</sup> *Id.*

<sup>255</sup> *Id.*

<sup>256</sup> To see the greed of nations, all one needs to do is look to at how the territorial sea widened from three to twelve miles, the Exclusive Economic Zone extended to 200 miles from the baseline, the Contiguous Zone went from twelve to twenty-four miles, and the Continental Shelf went from a depth of 200 meters (with exception) to an extension outwards of 200 miles. UNITED NATIONS, 1982 Convention on the Law of the Sea, *available at* <http://www.un.org>.

## Appendix

**Chart 1: Estimated Recoverable Oil and Gas of the Arctic Region  
(50% Recovery Chance)**

<b>Basin</b>	<b>Oil (billion barrels)</b>	<b>Gas (trillion cubic meters)</b>
Finnmark Trough	5.00	3.68
Central Basin	-	-
Sorkapp, Olga, Victoria	0.80	0.25
South Barents	4.60	10.00
Novaya Zemlya	0.40	0.42
Pechora Offshore	2.30	1.47
Pechora Onshore	6.00	2.10
West Siberian Offshore	5.70	30.0
West Siberian Onshore	> 30.00	>26.25
Uydeneiya, Shmidt	1.10	0.63
Yenisey-Lena	7.40	3.33
West Laptev, South Laptev, Ust-Lena	1.00	0.04
North-West-Laptev	0.20	0.04
Novosibirsk	0.20	0.10
De Long	0.20	0.10
East Siberian	6.00	3.33
Chaun	-	0.04
Hope/Chukchi	5.96	0.70
Beaufort Offshore	1.66	2.12
North Slope	28.00	1.70
Mackenzie	11.60	2.30
Svedrrup	15.00	4.38
Wandel	-	-
North-East Greenland	3.00	0.53

MANFRED A. LANGE, *The Arctic in a Changing World: New Challenges for Circumpolar Universities*, in *THE CHANGING CIRCUMPOLAR NORTH: OPPORTUNITIES FOR ACADEMIC DEVELOPMENT* 157 (Lassi Heininen, ed., 1994).