

Changes in Latitudes Call for Changes in Attitudes: Towards Recognition of a Global Imperative for Stewardship, Not Exploitation, in the Arctic

*Taylor Simpson-Wood**

The ice was here, the ice was there,
The ice was all around:
It cracked and growled, and roared and howled,
Like noises in a swound!¹

-Samuel Taylor Coleridge, Rime of the Ancient Mariner - Part I

I. INTRODUCTION

For more than two centuries, the imagination of mariners has been captured by visions of a trade route across the Arctic Sea allowing vessels to travel from the Atlantic to the Pacific Ocean.² Known as the Northwest Passage, this fabled route is a time- and money-saving sea lane running from “the Atlantic Ocean Arctic Circle to the Pacific Ocean Arctic Circle (Latitude 66.5622°N).”³ Historically, “[t]he Northwest Passage did not exist until Europeans invented it.”⁴ And as the ill-fated at-

* Taylor Simpson-Wood is a professor of law at Barry University, Dwight O. Andreas School of Law in Orlando, Florida where she teaches in the areas of Civil Procedure, Conflict of Laws, Federal Jurisdiction, Popular Culture & the Law, and Admiralty & Maritime Law. She is an academic member of the Maritime Law Association of the United States and serves on the Advisory Editorial Committee for the *Journal of Transportation Law, Logistics and Policy*.

1. Samuel Taylor Coleridge, Rime of the Ancient Mariner (text 1834), <http://www.poetryfoundation.org/poem/173253> (last visited Sept. 28, 2014).

2. For an excellent account of the historic quest for the Northwest Passage, see OF MAPS AND MEN: IN PURSUIT OF A NORTHWEST PASSAGE, http://libweb5.princeton.edu/visual_materials/maps/websites/northwest-passage/contents.htm (last visited Sept. 26, 2014).

3. *Id.* See also, *Welcome to the MV Grey Goose Northwest Passage Expedition Website*, GREY GOOSE ADVENTURES, <http://www.greygooseadventures.com/nwp/index.html> (last visited Feb. 2, 2014).

4. *Welcome to the MV Grey Goose Northwest Passage Expedition Website*, *supra* note 3 (quoting Ken McGoogan, author of FATAL PASSAGE (2002)). This Article focuses on the impact of increased vessel activity in the geographic area of the Arctic known as the Northwest Passage. It is important to recognize that the “the Arctic” is a much more expansive physical area. The global maritime shipping industry also envisions greater accessibility to what been called the “Golden Waterway,” also known as the Northeast or the Northern Sea Route, which runs between north Russia and the North Pole. See Bill Savadore, *New Shipping Route Shows China’s Arctic Ambitions*,

tempts to discover the elusive route confirmed, historically the passage has consistently been ice-blocked. In 1845, when Sir John Franklin set out to find the elusive Northwest Passage, he and his crew paid the ultimate price for the dream: their lives.⁵ Now, however, the thinning of the ice in the Arctic may transform what was once only a dream into a reality.

Currently, any efforts by mariners or merchants to traverse the Northwest Passage with any regularity are still foiled by ice.⁶ However, on March 4, 2013, the Proceedings of the National Academy of Sciences Plus published a paper that “estimated that new shipping lanes linking the Atlantic and Pacific oceans are likely to open between 2040 and 2059.”⁷ If loss in ice extent continues, it is predicted that by 2050, “the

FOXNEWS.COM (Aug. 16, 2013), <http://www.foxnews.com/world/2013/08/16/new-shipping-route-shows-china-arctic-ambitions/>. It is called the “Golden Waterway” because “[t]he Arctic route can cut 12–15 days from traditional routes . . .” *Id.* As the ice extent continues to decrease, it is predicted that “[s]hipping along the Arctic northern sea route is set to grow more than 30-fold over the next eight years and could account for a quarter of the cargo traffic between Europe and Asia by 2030 . . .” Balazs Koranyi, *Ice Levels, Rule Changes to Boost Arctic Northern Sea Route*, REUTERS (May 29, 2013, 5:50 AM), <http://www.reuters.com/article/2013/05/29/shipping-arctic-idUSL5N0EAORF20130529>.

5. Pete Evans, *Arctic Thaw Heats Up Northwest Passage Dreams*, CBC News (Sept. 13, 2012), <http://www.cbc.ca/news/business/arctic-thaw-heats-up-northwest-passage-dreams-1.1230437> (last visited Sept. 13, 2012).

6. Brad Plumber, *Climate Change Will Open Up Surprising New Arctic Shipping Routes*, WASHINGTON POST (Mar. 5, 2013), <http://www.washingtonpost.com/blogs/wonkblog/wp/2013/03/05/climate-change-will-open-up-surprising-new-arctic-shipping-routes/>.

7. Laurence C. Smith & Scott R. Stephenson, *New Trans-Arctic Shipping Routes Navigable by Midcentury*, 110 PNAS E1191 (2013), available at <http://www.pnas.org/content/110/13/E1191.full.pdf>. See also, Monte Morin, *Ice Melt to Expand Arctic Shipping by Midcentury*, Los Angeles Times (Mar. 4, 2013), <http://articles.latimes.com/2013/mar/04/science/la-sci-sn-arctic-shipping-lanes-20130304>. While “mid-century projections may seem distant when measured against the lifespan of adults living today, . . . the period falls well within the long lead times of commercial and governmental planning efforts.” Meg Sullivan, *Global Warming Will Open Unexpected New Shipping Routes in Arctic, UCLA Researchers Find*, UCLA NEWSROOM (Mar. 4, 2013), <http://newsroom.ucla.edu/releases/new-unexpected-shipping-route-243485> (citing Smith & Stephenson, *supra*). Consequently, the projections of increased vessel traffic in the Arctic by mid-century “have implications for port construction, acquisition of natural resources and the establishment of shipping lanes.” *Id.*

It is interesting to note that while global warming is resulting in greater access to the coastal regions of the Arctic, the ice melt will prevent access to many of the interior riches of the Arctic region, such as “timber, diamonds and minerals.” Timothy Gardner, *Ice Melt to Close Off Arctic’s Interior Riches*, MOTHER NATURE NETWORK (May 30, 2011, 9:23 PM), <http://www.mnn.com/earth-matters/climate-weather/stories/ice-melt-to-close-off-arctics-interior-riches>. A number of scientists contributed to the paper, including UCLA professor Laurence Smith, who teaches in the area of Earth and space sciences. *Id.* Another indicator that increased vessel traffic in the Arctic is no longer simply theoretical is the interest of the U.S. Navy in the area. In an interview conducted on February 1, 2014, Admiral Jonathan Greenert, Chief of Naval Operations, spoke about the issues that were “topping his agenda.” Jeanette Steele, *Navy in 2014: Undersea Drones, Arctic, Marines on New Ships*, SAN DIEGO UNION-TRIBUNE (Feb. 1, 2014, 4:19 PM), <http://www.utsandiego.com/news/>

Northwest Passage will be sufficiently navigable to make the trip from the North American east coast to the Bering Strait in 15 days.”⁸

What makes the new shipping lanes so attractive is that they may be navigated not only by Polar Class 6 ice-breaking ships,⁹ but by “normal ocean-going vessels”¹⁰ without requiring an escort of an ice-breaker.¹¹ In addition, by mid-century, shipping may be the only real viable method of transportation in the Arctic. The Arctic is a land of vast distances where “the landscape is boggy and wet and covered with lakes.”¹² According to modeling, “as Arctic shipping lanes open up, land transportation in the

2014/feb/01/chief-nava-operations-greenert-agenda-2014/. Among those of key concern was “the Arctic.” *Id.*

8. Deborah Zabarenko, *Warmer Climate to Open New Arctic Shipping Routes by 2050*, REUTERS (Mar. 4, 2013), <http://sustainability.thomsonreuters.com/2013/03/11/warmer-climate-to-open-new-arctic-shipping-routes-by-2050/>. The fifteen day travel time is much less than the Northern Sea Route (*see supra* note 4), which takes 23 days to complete. *Id.* Thus, being able to use the Northwest Passage is “about a 30 percent time savings.” *Id.* In addition to the Northwest Passage, it is also predicted that an “across-the-pole route, which had never before been considered, would be available . . . to light ice-breakers.” *Id.*

Evidence that the new trade routes in the Arctic are viable is seen by the interest the U.S. Navy has recently shown in the area. In February 2014, the Navy released “an ‘aggressive’ update to its 2009 Arctic road map after a detailed analysis of data from a variety of sources showed that seasonal ice is disappearing faster than had been expected even three years ago.” Andrea Shalal, *U.S. Navy Eyes Greater Presence in Arctic from 2025*, REUTERS (Feb. 27, 2014, 6:44 PM), <http://www.reuters.com/article/2014/02/27/us-usa-arctic-navy-idUSBREA1Q2DU20140227>. According to the data, “the Bering Strait was expected to see open conditions about 160 days a year by 2020, with the deep ocean routes of the Transpolar transit route forecast to be open up for up to 45 days annually by 2025.” *Id.* The new update “includes dozens of specific tasks and deadlines for Navy offices, including calling for better research on rising sea levels and the ability to predict ice thickness, assessment of satellite communications and surveillance needs, [and] evaluation of existing ports, airfields and hangars.” *Id.* Rear Admiral Jonathan White, cited as “the top oceanographer and navigator and director of the Navy’s climate change task force,” said “the Navy’s new road map was aimed at ‘answering the billion dollar question’ of how much it would cost to prepare for an increased naval presence in the Arctic, and trying to determine what investments were needed and when.” *Id.* In addition, the “updated road map noted that the Arctic has significant oil, gas and mineral resources, including some rare earth minerals now supplied mainly by China, and estimated hydrocarbon resources of over \$1 trillion.” *Id.*

9. The Polar-Class 6 Icebreaker is designed for “Summer-Fall operations in medium first year ice with old ice inclusions.” *See* THOMAS H. GILMOUR, ARCTIC SHIPPING & CLASS 12 (2008), available at http://www.marad.dot.gov/documents/Arctic_Presentation_Gilmour.pdf (defining various Polar-Class vessels); *Ice-Capable Ships*, GLOBALSECURITY.ORG, <http://www.globalsecurity.org/military/world/russia/ice-capable.htm> (last visited Sept. 26, 2014).

10. Normal ocean going ships may be defined as ones “without specially reinforced ice-breaking hulls.” Joseph Stromberg, *Climate Change Could Allow Ships to Cross the North Pole by 2040*, SMITHSONIAN MAGAZINE (Mar. 4, 2013), <http://www.smithsonianmag.com/ist/?next=/science-nature/climate-change-could-allow-ships-to-cross-the-north-pole-by-2040-371538/>.

11. Rebecca Penty & Katia Dmitrieva, *Canada Needs More Escorts for Plan to Boost Arctic Ships*, BLOOMBERG BUSINESSWEEK (Oct. 30, 2013), <http://www.businessweek.com/news/2013-10-30/canada-ice-breaker-escort-services-key-for-more-arctic-shipping>.

12. *Id.* (quoting Laurence Smith, co-author of *New Trans-Arctic Shipping Routes Navigable By Midcentury*. *See supra* note 7 and accompanying text).

far north is expected to suffer, as winter roads deteriorate.”¹³ Consequently, as “human access on land” is “shutdown,” there will be “an increase of human access in the ocean.”¹⁴

The projected navigability of the Northwest Passage does assume a continuing rise in global carbon emissions.¹⁵ Under one scenario, the projections employ a ten percent increase in emissions.¹⁶ In another, the assumption is twenty-five percent.¹⁷ According to one of the authors of the study, “[n]o matter which carbon emission scenario is considered, by mid-century we will have passed a crucial tipping point—sufficiently thin sea ice” permitting the opening of new arctic shipping lanes.¹⁸

Notwithstanding passing “the crucial tipping point,”¹⁹ there is no forecast that the Arctic trade route would be open year-round. Rather, the envisioned usage time frame will “likely be restricted to late summer,” when sea ice extent “is lowest.”²⁰ Consequently the Arctic shipping trade route would remain seasonal, basically limited to late summer, when the ice extent is at its lowest.²¹ Such a limited time frame raises the question of why this particular sea route is so coveted. The answer is that the trans-Arctic voyage would consume far less time and money. For example, in September 2013, the Danish-operated bulk carrier, *Nordic Orion*, navigated the Northwest Passage, “trim[ming] about 1,000 nautical miles, which translates to four days, from its usual route through the Panama Canal. It was also able to carry about 25 per cent more coal, given how shallow the [Panama] [C]anal is. These benefits have resulted in savings of nearly \$200,000”²² The Northwest Passage may also become a destination in its own right. The worldwide dwindling of supplies

13. *Id.*

14. *Id.*

15. See Stromberg, *supra* note 10. See also, *Global Warming To Open New Arctic Sea Lanes*, MONGABAY.COM (Mar. 5, 2013), <http://news.mongabay.com/2013/0304-arctic-sea-lanes.html> (citing the study by Smith & Stephenson, *supra* note 7).

16. *Id.*

17. *Id.*

18. *Id.* (quoting Laurence C. Smith).

19. *Id.*

20. Smith & Stephenson, *supra* note 7, at E1192.

21. Zabarenko, *supra* note 8.

22. *Cargo Ship Sails Through Northwest Passage and into History Books*, MACLEAN'S (Sept. 27, 2013), <http://www.macleans.ca/news/world/cargo-ship-sails-through-northwest-passage-and-into-history-books/>. See also *The Emerging Arctic*, COUNCIL ON FOREIGN RELATIONS, [http://www.cfr.org/arctic/emerging-arctic/p32620#/#/](http://www.cfr.org/arctic/emerging-arctic/p32620#/) (last visited Sept. 26, 2014); Nathan Vanderklippe, *Study Predicts Arctic Shipping Quickly Becoming a Reality*, GLOBE & MAIL (Mar. 4, 2013, 2:53 PM), <http://www.theglobeandmail.com/report-on-business/international-business/study-predicts-arctic-shipping-quickly-becoming-a-reality/article9264672/> (“The reason comes down to distance. . . . a Shanghai-to-Rotterdam voyage is 25,588 kilometres through the Panama Canal, 19,550 through the Suez Canal, 15,793 through the Northern Sea Route, 16,100 through the Northwest Passage and 13,630 across the North Pole.”).

of fossil fuel and the increasing prices for such commodities, “known and suspected fields of oil and natural gas beneath the Arctic are becoming increasingly coveted. How the energy situation plays out in the coming decades may very well determine how soon ships begin plying the Northwest Passage.”²³

While there are certainly monetary and logistical positives for the global shipping with a new shortcut that saves two weeks of travel time,²⁴ scientists fear that increased vessel traffic may also be “opening a Pandora’s box of safety, environmental and legal issues”²⁵ Of course, ice is still the major obstacle to navigating the Northwest Passage, particularly “multiyear sea ice.”²⁶ “Unlike seasonal ice, which melts every spring, multiyear ice sticks around and hardens into . . . the equivalent of floating steel.”²⁷ Even icebreakers can have a hard time under such conditions.²⁸ Although completing the route in mid-July 2005, “the Swedish icebreaker *Oden* had trouble negotiating the Northwest Passage,” managing a speed of only one knot due to the ice.²⁹ “If an icebreaker is doing one knot, let me tell you, a thin-skinned container ship is going to go nowhere except to the bottom.”³⁰ In addition to the difficulties of navigating the Northwest Passage with its “scatter if ice-choked islands,”³¹ other key concerns facing the maritime community include “dearth of services and infrastructure,”³² and if a vessel suffers “a mechanical breakdown,” there is no assistance in sight³³—no port to limp into, no dry-docking facilities, no mechanics to make the repairs. Basically, the sources needed to support shipping, “such as aids to navigation, [and] search and rescue,” are nonexistent.³⁴ Further, “much of the Arctic, including long stretches of the Northwest Passage, remains poorly chart-

23. Peter Tyson, *Opening the Northwest Passage*, NOVA (Feb. 28, 2006), <http://www.pbs.org/wgbh/nova/earth/opening-the-northwest-passage.html>.

24. Evans, *supra* note 5.

25. Morin, *supra* note 7.

26. See Tyson, *supra* note 23.

27. *Id.*

28. *Id.*

29. *Id.*

30. *Id.* (quoting Franklyn Griffiths, an Arctic expert at the University of Toronto). Consequently, “a ship will have to be ice-strengthened” to navigate the Northwest Passage. *Id.* The question arises as to whether “shipping companies will . . . be able to amortize the cost of ice-strengthening in a way that makes it practical for them to use the Northwest Passage for intercontinental voyages.” *Id.* If not, “they’ll use Suez and Panama.” *Id.*

31. *Id.*

32. See Smith & Stephenson, *supra* note 7, at E1192 (high insurance and escort fees and the unknown competitive response of the Suez and Panama Canals are also issues that raise concerns).

33. See Tyson, *supra* note 23.

34. *Id.*

ed”³⁵ Captains navigating the passage “must rely on charts made during searches from the lost Franklin expedition in the mid-1800s,³⁶ and major new subsurface features turn up regularly.”³⁷

In the past, however, such obstacles have not daunted governments or businesses from pressing ahead to discover with the goal of commercializing new trade routes.³⁸ Neither Christopher Columbus³⁹ nor Captain James Cook⁴⁰ had charts, services, or infrastructure when they set out on their voyages of discovery. Rather, Cook’s discovery of the Hawaiian Islands resulted from the British fixation with discovering a Northwest Passage.⁴¹ To paraphrase George Santayana, it is almost inconceivable

35. *Id.*

36. See *supra* note 5 and accompanying text.

37. See Tyson, *supra* note 23. For example, Larry Mayer, director of the Center for Coastal and Ocean Mapping at the University of New Hampshire has conducted “undersea mapping for the U.S. along the western portion of the Northwest Passage, in part to help resolve international boundary issues.” *Id.* According to Mayer, on his “very first trip up there [they] found a seamount that rose 4,000 meters up to less than 900 meters, and all the existing charts showed nothing there at all.” *Id.*

38. See, e.g., *The Spanish Quest for the Great South Land*, NEW SOUTH WALES STATE LIBRARY, http://www.sl.nsw.gov.au/discover_collections/history_nation/voyages/spanish/voya_spanishQuest.html (last updated May 27, 2014) (discussing the 1606 expedition by Spain seeking the Great South Land (Australia) “to secure its fabulous wealth for Spain”); *In Search of Rich Lands: The Dutch*, NEW SOUTH WALES STATE LIBRARY, http://www.sl.nsw.gov.au/discover_collections/history_nation/voyages/rich_lands/voya_richLands.html (last updated May 27, 2014) (discussing the 1642–1644 voyages of Dutch navigator Abel Tasman who was commissioned by the Dutch East-India Company “to explore the southern oceans and find profitable new trading markets”); *Spice Islands (Moluccas): 250 Years of Maps (1521–1760)*, http://libweb5.princeton.edu/visual_materials/maps/websites/pacific/spice-islands/spice-islands-maps.html (last visited Sept. 26, 2014) (“Arab traders introduced cloves to Europeans around the fourth century but sought to keep their sources secret. Their monopoly was broken by the Portuguese after Vasco da Gama’s voyage to India around the Cape of Good Hope in 1497. The Portuguese strengthened their stranglehold on the spice trade during the sixteenth century, when they found the central locus of the spices to be these islands.”).

39. For an interesting discussion of a book challenging the view that Columbus “discovered” America, see Eric Weiner, *Coming to America: Who Was First?*, NAT’L PUBLIC RADIO (Oct. 8, 2007, 2:22 PM), <http://www.npr.org/templates/story/story.php?storyId=15040888>. The author discusses how “five hundred years before Columbus, a daring band of Vikings led by Leif Eriksson set foot in North America and established a settlement. And long before that, some scholars say, the Americas seem to have been visited by seafaring travelers from China, and possibly by visitors from Africa and even Ice Age Europe.” *Id.* The author also shares “[a] popular legend” that “suggests an additional event: According to an ancient manuscript, a band of Irish monks led by Saint Brendan sailed an ox-hide boat westward in the sixth century in search of new lands. After seven years they returned home and reported that they had discovered a land covered with luxuriant vegetation, believed by some people today to have been Newfoundland.” *Id.*

40. See *Captain James Cook’s Voyages of Discovery*, NEW SOUTH WALES STATE LIBRARY, http://www.sl.nsw.gov.au/discover_collections/history_nation/voyages/discovery/index.html (last updated June 11, 2010).

41. See *Act II: The Third Voyage*, http://libweb5.princeton.edu/visual_materials/maps/websites/pacific/cook3/cook3.html (last visited Sept. 26, 2014).

The Northwest Passage—a northern navigable route linking the Atlantic and Pacific Oceans, hence a shorter path to the riches of the East Indies by avoiding the two capes

that the history of nations striving for lucrative trade routes will not be repeated⁴² and the future see an increase in vessel traffic in the Arctic.

After providing a brief overview of the Arctic Council, Part II of this Article sets the stage for the remainder of the piece by recounting a scenario that highlights the potential dangers for the Arctic if nations embrace “a race for resources” approach to developing the area rather than one of stewardship. Part III will serve as a microcosm to illustrate the many concerns surrounding a future including a dramatic increase in vessel traffic in the area.⁴³ Specifically, this Part will focus on the unique

(Horn and Good Hope)—had been an off-and-on obsession of the British government and merchant community for several hundred years, dating back to the multiple voyages of John Cabot (d. 1498), Sir Martin Frobisher (ca. 1535–1594), and John Davis (1550?–1605). In 1775, the government offered a prize of £20,000 for its discovery, to be shared among the crew of the successful ship. . . . Cook was party, only in an advisory role, to the [British] Admiralty’s confidential plans to send a two-ship expedition to search for such a passage from the northern Pacific.

Id. In January 1778, during his voyage to discover the route between the Atlantic and the Pacific, Cook made the major discovery of the Hawaiian Islands. *Id.*

42. “Those who cannot remember the past are condemned to repeat it.” GEORGE SANTAYANA, *Reason in Common Sense*, in *THE LIFE OF REASON OR THE PHASES OF HUMAN PROGRESS* 284 (2d ed. 1922).

43. The most obvious concerns surround the risks of oil spills and other vessel emissions. *See, e.g.*, Juliet Eilperin, *Report: Shipping Emissions to Rise in Arctic*, WASHINGTON POST (July 4, 2011), http://www.washingtonpost.com/national/health-science/report-shipping-emissions-to-rise-in-arctic/2011/07/01/gHQAhkG6xH_story.html.

One of the key problems is that “oil spills in ice are more complicated to address than oil spills in open waters.” Karl Magnus Eger, *Effects of Oil Spills in Arctic Waters* (2010), <http://www.articsearch.com/Effects+of+Oil+Spills+in+Arctic+Waters>. In addition to the “the normally long distances from existing infrastructure, the oil is less accessible in ice-covered waters” and “[t]he slow rate of biological degradation of oil at near-zero temperatures has led biologists to suggest that oil spills in the Arctic Ocean might remain there for periods of 50 years or more.” *Id.* While the polluting of the Arctic marine ecosystem can certainly originate with “drilling activity,” oil spills can also occur “during transportation.” *Id.* For example, the Deep Water Horizon spill was the result of offshore drilling, while the 1989 tragedy of the Exxon Valdez occurred while the vessel was navigating the Prince William Sound in Alaska. Nature, however, makes no differentiation between effect as a result of source. Irrespective of whether “the oil products” originate “from shipping activities or drilling activity, destroy all aspects of the environmental integrity of the marine ecosystems including fisheries, marine mammals, corals, ocean and shore birds, and the coastal wildlife and thus lead to changes in e.g. behavior (feeding, activity and motility, avoidance reactions etc.), growth, and reproduction.” *Id.* The ultimate results of a spill could therefore “have a catastrophic impact on one of the most pristine, unique and beautiful landscapes on earth.” *The Dangers of Arctic Oil*, GREENPEACE, <http://www.greenpeace.org/international/en/campaigns/climate-change/arctic-impacts/The-dangers-of-Arctic-oil/> (last visited Sept. 26, 2014). Unfortunately, “the risks of such an accident are ever present and the oil industry’s response plans remain wholly inadequate.” *Id.*

As Rebecca Noblin, the Alaska director of the Center for Biological Diversity, observed in response to Shell receiving approval to continue in preliminary drilling off Alaska, “Letting Shell do top-hole drilling and other preparatory activities when they are clearly not ready to respond to an oil spill is like telling a drunk driver that as long as he stays off the freeway everything should be OK.” *Environmental Risk of Drilling in Arctic Too High, CEO of Oil Giant Total Says*, NBC NEWS (Sept. 26, 2012), http://worldnews.nbcnews.com/_news/2012/09/26/14107150-environmental-risk-of-drilling-in-arctic-too-high-ceo-of-oil-giant-total-says. “The risk of accidental release of oil and other

contaminants increases with any increase in shipping activity that involves the use of oil or other chemicals.” Eger, *supra*. Unfortunately, there is also a strong possibility that the Arctic ecosystem may be fouled by intentional dumping. “As a part of normal operations, ships produce a range of substances that must eventually be eliminated from the ship through discharge into the ocean, incineration or transfer to port based reception facilities.” *Id.*

Concerns about pollution from dumping have been addressed internationally by a Convention for the Prevention of Pollution from Ships (MARPOL). See *History of MARPOL*, INT’L MARITIME ORG., <http://www.imo.org/KnowledgeCentre/ReferencesAndArchives/HistoryofMARPOL/Pages/default.aspx> (last visited Sept. 26, 2014). MARPOL is the combination of two treaties adopted during the 1970s and subsequent amendments and covers the “prevention of pollution of the marine environment by ships from operational or accidental causes” by regulating the amount of regular discharges. *Id.*

In accordance with MARPOL, discharged “oil should not pose a significant threat to the local [Arctic] ecosystem as long as the laws are strictly followed.” Eger, *supra*. However, the current lack of “port reception facilities to dispose oily sludge along the main shipping routes in Arctic . . . as well as the cost of disposing of waste using port reception facilities provide incentive for illegal dumping of wastes produced on board ships.” *Id.*

The news in this area is not all bleak with the rise of Liquefied Natural Gas (“LNG”). Tom Guldner, *LNG—Who Cares?* (Jan. 29, 2014), <http://www.marinelink.com/news/cares-who-lng363576.aspx>. “LNG is the cleanest burning fossil fuel,” which means it may extend “engine life” and increase “engine performance.” *Id.* In addition, this alternative fuel will “reduce green house gas emissions” and assist vessel owners in complying with “upcoming air pollution requirements.” *DVN Asks: What Will the Alternative Fuel Mix for Shipping Be?*, MARITIME REPORTER (Jan. 28, 2014), <http://www.marinelink.com/news/alternative-asks-what363478.aspx>. According to a position paper by DNV GL, the world’s largest classification society “responsible for classing a combined tonnage of 265 million gross tons of ships and rigs,” Rob Almeida, *DNV and Germanischer Lloyd Announce Merger*, FORBES (Dec. 20, 2012), <http://www.forbes.com/sites/gcaptain/2012/12/20/dnv-and-germanischer-lloyd-announce-merger/print/>, LNG is a strong front-runner in “the future alternative fuel mix for global shipping.” *DVN Asks: What Will the Alternative Fuel Mix for Shipping Be?*, *supra*. With time, “the picture becomes more diversified . . . as more than 20 per cent of shipping could adopt hybrid propulsion solutions, featuring batteries or other energy storage technologies.” *Id.* While it currently “suffers from public perception problems,” nuclear energy “may come to the fore sometime in the future if it will be perceived as a safe alternative.” *Id.* “[T]he global merchant fleet currently consumes around 330 million tonnes of fuel annually, 80–85 per cent of which is residual fuel with high sulphur content.” *Id.* (quoting Christos Chryssakis, a senior researcher and position paper project manager for DNV GL). While transitioning to new technologies will be challenging for vessel owners, the industry is moving “towards a more sustainable future for shipping.” *Id.*

With LNG vessels on the horizon, “[i]t is an unprecedentedly exciting time to be in the maritime industry.” Greg Trauthwein, *Another Milestone for LNG Powered Ships in the U.S.*, MARITIME REPORTER & MARINE NEWS MAGAZINE (Feb. 18, 2014), <http://www.marinelink.com/news/milestone-another-powered364365.aspx> (quoting Bjorn Rosengren, President and CEO of Wartsila Corporation).

For example in January 2014, it was announced that new icebreakers are to be built for the Finnish Transportation Agency. *Finnish Transportation Agency Orders Ice Breakers*, MARITIME REPORTER & MARINE NEWS MAGAZINE (Jan. 22, 2014, 1:53 PM), <http://www.marinelink.com/news/icebreaker-transport363305.aspx> (“The new icebreaker of the Finnish Transport Agency features the highest technology and has been designed especially for the demanding icebreaking operations in the Baltic Sea. The vessel will be able to move continuously through about 1.6 m thick level ice, to break a 25 meter wide channel in 1.2 meter thick ice at speed of 6 knots, as well as to reach 9...11 knots of average assistance speed in the Baltic Sea. In open water the service speed will be minimum 16 knots.”) (last visited February 3, 2014). Exemplifying new attitudes toward protecting the environment, “[t]he icebreaker will use both diesel and LNG as its fuel, which diminishes its emissions

problems associated with the exchange of ballast water. It will also consider how a change in the attitudes and perceptions of those involved in the global maritime industry may lead to global solutions for the Arctic. Finally, in Part IV, an international consensus model will be compared to a more litigious, state-by-state approach to see which is most likely to serve as the more effective mechanism for achieving Arctic solutions. The nascent Polar Code emanating from the combined efforts of a num-

and operating costs.” *Id.* The new vessels will also address concerns about lack of infrastructure and potential oil pollution by being “equipped for oil spill response operations and emergency towing missions.” *Id.* In San Diego, construction has also begun on the first LNG containerships which “will be the most advanced, environmentally progressive vessels of their kind” Eric Haun, *Construction Begins on First LNG Containership*, MARITIME REPORTER AND MARINE NEWS MAGAZINE (Feb. 25, 2014), <http://www.marinelink.com/news/containership-begins364646.aspx> (quoting state Representative Duncan Hunter (R-Calif.), who chairs the House Subcommittee on Coast Guard and Maritime Transportation). And in 2013, near Istanbul, Turkey, “the world’s first LNG fuelled escort tugs became a reality.” *Borgoy: the World’s First LNG-Fueled Tug*, MARITIME REPORTER & MARINE NEWS MAGAZINE (Feb. 28, 2014), <http://www.marinelink.com/news/lngfuelled-worlds-first364856.aspx>. The successful sea trial of the vessel “heralds a new era for tug boat propulsion. Gas is gaining in popularity as a maritime fuel, and its environmental credentials, combined with lower costs are seeing many operators select [LNG] over traditional fuels, across a range of ship types.” *Id.* (quoting Neil Gilliver, president of Rolls Royce). It is expected that as LNG becomes more widely available, “major ports will also opt for the clean, lower cost and smoke free fuel to power their tugs . . . which are expected to have improved fuel consumption, lower maintenance costs, reduced lube oil consumption and a much-improved working environment for ships’ crews.” *Id.*

Another area of key concern stemming from an increase in vessel traffic in the Arctic is the risk to marine mammals, including the bowhead whale. As vessel traffic increases in the Arctic, the co-occurrence between ships and whales will increase. SUB-COMMITTEE ON SHIP DESIGN AND EQUIPMENT, INT’L MARITIME ORG., DEVELOPMENT OF A MANDATORY CODE FOR SHIPS OPERATING IN POLAR WATERS (2011) [hereinafter IMO SHIP DESIGN REPORT], available at http://www.asoc.org/storage/documents/IMO/jan_2011_DE_submissions/eNGO_FINAL_Cetaceans_and_Voyage_Planning_Jan_28_2011.pdf. As interaction increases, so too do the risks of ship strikes and interference with migratory patterns. *Id.* Vessel noise and entanglement with commercial fishing gear also constitute serious threats. Randall Reeves et al., *Implications of Arctic Industrial Growth and Strategies to Mitigate Future Vessel and Fishing Gear Impacts on Bowhead Whales*, 36 *Marine Pol’y* 454, 455 (2009) (discussing the threat to the bowhead whales “in a rapidly changing Arctic where volumes of industrial vessel traffic and commercial fishing gear are expected to increase.”). Such dangers from co-occurrence are exacerbated in areas such as the Northwest Passage where vessels must navigate “in narrow and geographically restrictive areas.” *Id.* Of all the whales at risk, the Bowhead is of particular importance due to continued reliance on subsistence hunting by the indigenous peoples of the Arctic to feed their communities and retain their cultural identity. COMMENTS OF THE ALASKA ESKIMO WHALING COMMISSION TO THE ALASKA OFFICE OF PROGRAM MANAGEMENT AND PERMITTING ON THE ALASKA DEPARTMENT OF NATURAL RESOURCES’ PRELIMINARY RECOMMENDATIONS FOR THE AMENDED NORTH SLOPE BOROUGH COASTAL MANAGEMENT PLAN (2006), available at http://dnr.alaska.gov/coastal/acmp/District/Tables/NorthSlope/AEWC_Comments_NSBCMP_FINAL.pdf. See also Phil Taylor, *With Drillship En Route, Shell Awaits End of Beaufort Whale Hunt*, GREENWIRE (Aug. 22, 2012), <http://www.eenews.net/stories/1059969115>; *Whales Stressed By Shipping Noise*, SHIP MGMT. INT’L (Feb. 8, 2012), <http://shipmanagementinternational.com/whales-stressed-by-shipping-noise>; IMO SHIP DESIGN REPORT, *supra*. Suggested solutions in this area include zones of no vessel traffic and agreement to no vessel activity during migration and hunting periods. *Id.*

ber of nations will be endorsed, contending that such a code is the requisite cornerstone of any strategic plan to solve the dilemma of reconciling the goal of increased maritime commercial activity with that of protecting the delicate balance of the Arctic environment and the culture of its indigenous peoples. Part V concludes.

I. AN APOCALYPTIC TALE OF THE FUTURE OF THE ARCTIC

“The Arctic is a bellwether. The risk there should warn our whole world.”⁴⁴

Ban Ki-moon, Secretary-General of the United Nations

While the topics of ice extent or the need for a mandatory international Arctic convention are often the focus of discussion concerning the future of the Arctic, the evolution of international human relationships has equal ramifications for the destiny of the far north. A key player in this saga is the Arctic Council.

A. Structure of the Arctic Council

Established in 1966,⁴⁵ the Arctic Council is a high level intergovernmental forum whose purpose is to “provide a means for promoting cooperation, coordination and interaction among the Arctic States, with the involvement of the Arctic indigenous communities and other Arctic inhabitants on common Arctic issues, in particular issues of sustainable development and environmental protection in the Arctic.”⁴⁶

The Council is composed of eight member states: “Canada, Denmark (including Greenland and the Faroe Islands), Finland, Iceland, Norway, Russian Federation, Sweden, and the United States of America.”⁴⁷

In addition to the Member States, the Council also has permanent participants to include organizations of indigenous peoples.⁴⁸ “Out of a total of 4 million inhabitants of the Arctic, approximately 500,000 belong to indigenous peoples.”⁴⁹ As Permanent Participants, these organizations “have full consultation rights in connection with the Council’s negotia-

44. *The Emerging Arctic*, *supra* note 22.

45. THE DECLARATION ON THE ESTABLISHMENT OF THE ARCTIC COUNCIL (1966), available at <http://www.arctic-council.org/index.php/en/about-us/arctic-council/history> (click on “Ottawa Declaration”).

46. *Id.* § 1(a).

47. *Id.* § 2; see also *About the Arctic Council*, ARCTIC COUNCIL (Apr. 7, 2011), <http://www.arctic-council.org/index.php/en/about-us/arctic-council/about-arctic-council>.

48. *Permanent Participants*, ARCTIC COUNCIL (Apr. 27, 2011), <http://www.arctic-council.org/index.php/en/about-us/permanent-participants>.

49. *Id.*

tions and decisions.”⁵⁰ They “represent a unique feature of the Arctic Council, and they make valuable contributions to its activities in all areas.”⁵¹

Finally, “non-arctic states, inter-governmental and inter-parliamentary organizations, global and regional”, and “non-governmental organizations” may have what is known as “observer status.”⁵² As the title implies, while Observers are invited to attend Arctic Council meetings, their “primary role . . . is to observe the work of the Arctic Council.”⁵³ At all levels, actual decisions remain solely the domain of the eight Member States, with the input of the Permanent Participants. However, Observers are encouraged to “continue to make relevant contributions through their engagement in the Arctic Council primarily at the level of Working Groups.”⁵⁴

B. Working Groups of the Arctic Council

The Council’s activities are conducted by employing six working groups.⁵⁵ “[C]omposed of representatives at expert level from sectoral ministries, government agencies, and researchers, the working groups tackle a broad spectrum of areas from “climate change to emergency response.”⁵⁶ The key working group in terms of the ramifications of increased vessel traffic in maritime commerce is the Protection of Arctic Marine Environment group (“PAME”).

50. *Id.*

51. *Id.* The Permanent Participants of the Arctic Council are: Arctic Athabaskan Council (AAC), Aleut International Association (AIA), Gwich’in Council International (GCI), Inuit Circumpolar Council (ICC), Russian Association of Indigenous Peoples of the North (RAIPON), and Saami Council (SC). *Id.* For more detailed information about Permanent Participants, see *Permanent Participants*, ARCTIC COUNCIL (Apr. 27, 2011), <http://www.arctic-council.org/index.php/en/about-us/permanent-participants>.

52. *Observers*, ARCTIC COUNCIL (Apr. 27, 2011), <http://www.arctic-council.org/index.php/en/about-us/arctic-council/observers>.

53. *Id.*

54. *Id.* For a complete list of Observers, see *Observers*, ARCTIC COUNCIL (Apr. 27, 2011), <http://www.arctic-council.org/index.php/en/about-us/arctic-council/observers>.

55. *Working Groups*, ARCTIC COUNCIL (Apr. 15, 2011), <http://www.arctic-council.org/index.php/en/about-us/working-groups>. There are six working groups within the Arctic Council: Arctic Contaminants Action Program (ACAP), Arctic Monitoring and Assessment Programme (AMAP), Conservation of Arctic Flora and Fauna (CAFF), Emergency Prevention, Preparedness and Response (EPPR), Protection of the Arctic Marine Environment (PAME), and Sustainable Development Working Group (SDWG). *Id.*

56. *Id.*

C. Setting the Stage

In April of 2007, PAME conducted a workshop focusing on “The Future of Arctic Marine Navigation in Mid-Century.”⁵⁷ This brainstorming event resulted in the identification of two seminal factors which will play key roles in the future of maritime activity in the Arctic: “the stability of governance and the demand for Arctic Resources.”⁵⁸

Four scenarios were set out demonstrating how an international community that fails to work together and recognize a global economy can lead to nothing but disaster for the delicate ecosphere and indigenous peoples of the polar zone. Each of these possible futures bears upon the potential ramifications for the region resulting from an increase in vessel traffic. The alternative future painted, in which the world remains divided and focuses upon marine transportation as a key to resource dominance and control, provides a perfect backdrop against which the issues and concerns in this Article will be addressed. This tale might be entitled the “race for the resources.” This “plausible stor[y] about the future,”⁵⁹ is almost an apocalyptic tale in which the high demand for resources coupled with territorialism set the stage for a no-holds-barred “race for resources in the north.”⁶⁰ These resources included not only oil and gas, but also an increase in vessels engaged in commercial fishing. “As the sea ice melted more quickly, it took with it important aspects of local Arctic indigenous sustainable marine hunting use, while simultaneously

57. GLOBAL BUSINESS NETWORK, THE FUTURE OF ARCTIC MARINE NAVIGATION IN MID-CENTURY: SCENARIO CREATION WORKSHOP NOTES (2007) [hereinafter AMSA WORKSHOP NOTES], http://www.northslope.org/media/doc/2014/Feb/AMSA_Scenarios_Workshop_San_Francisco_Apr_07.pdf.

The Arctic Marine Shipping Assessment resulted a 2004 Arctic Marine Strategic Plan pursuant to which the Arctic Council requested that PAME:

conduct a comprehensive Arctic marine shipping assessment as outlined in the Arctic Marine Strategic Plan under the guidance of Canada, Finland, and the United States as lead countries and in collaboration with the EPPR (Emergency, Prevention, Preparedness and Response) working group and other working groups of the Arctic Council and Permanent Participants as relevant.

Id. The AMSA is also a direct result of another 2004 release, *Key Finding #6 of the Arctic Climate Impact Assessment*, which predicted that “[r]educed sea ice is very likely to increase marine transport and access to resources.” *Id.*

58. See also *What Does the Future Hold?*, ARCTIC ECONOMICS (May 21, 2008), http://benmuse.typepad.com/arctic_economics/2008/05/what-does-the-future-hold.html.

59. GLOBAL BUSINESS NETWORK, THE FUTURE OF ARCTIC MARINE NAVIGATION IN MID-CENTURY: SCENARIO NARRATIVES 3 (2008) [hereinafter AMSA SCENARIO NARRATIVES], available at http://www.institutenorth.org/assets/images/uploads/articles/GBN-AMSA_Scenario_Narratives_Report_FINAL_May08_v1May.pdf.

60. *Id.* at 7–9. For an excellent discussion of factors affecting supply and demand in the Arctic, see *Supply and Demand for Arctic Sea Transportation*, ARCTIC ECONOMICS (May 22, 2008), http://benmuse.typepad.com/arctic_economics/2008/05/supply-and-demand-for-arctic-sea-transportation.html.

providing for extended fishing seasons.”⁶¹ In this alternative world, fresh water is a “valuable global commodity.”⁶² A “shuttle system of tankers and terminals” are created “to supply climate-induced drought areas” with Arctic water.⁶³ Ultimately, by 2050, there is general agreement between “military and intelligence experts” that a “Great Arctic War had narrowly been avoided several times in recent years—and that if there were going to be a real world war of the 21st Century, it would most likely be sparked in the open summer waters of the Arctic Ocean.”⁶⁴

III. A UNIQUE PROBLEM INHERENT TO VESSEL ACTIVITY: BALLAST WATER DISCHARGE

A plethora of apprehensions flood the mind when envisioning increased maritime activity in the Arctic. These include the potential for oil spills,⁶⁵ concerns over the safety seafarers working in extreme conditions,⁶⁶ and the lack of infrastructure for search and rescue missions.⁶⁷

There are also hot political issues over which nations will have input in creating maritime regulations for the area,⁶⁸ maritime jurisdiction concerns,⁶⁹ and military issues surrounding what some have characterized as the “new cold war.”⁷⁰ Finally, there are other risks uniquely asso-

61. AMSA SCENARIO NARRATIVES, *supra* note 59, at 8.

62. *Id.* at 9.

63. *Id.*

64. *Id.*

65. *International Council Agrees to Cooperate on Marine Pollution Issues in the Arctic*, NOAA OFFICE OF RESPONSE & RESTORATION (Jan. 18, 2012), <http://response.restoration.noaa.gov/about/media/international-council-agrees-cooperate-marine-oil-pollution-issues-arctic.html>.

66. *Standards for Seafarers in the Arctic and Maritime Labor Law Issues*, AMSA REPORT 2009, available at <http://www.arctis-search.com/Standards+for+Seafarers+in+the+Arctic+and+Maritime+Labor+Law+Issues> (last visited Sept. 26, 2014).

67. *Id.* See also Morin, *supra* note 7 (“Although sea ice currently represents the single greatest obstacle to trans-Arctic shipping, numerous additional factors, including dearth of services and infrastructure, high insurance, escort fees, unknown competitive response of the Suez and Panama Canals, poor charts and other socioeconomic considerations, remain significant impediments to maritime activity in the region.”)

68. Anup Shah, *Dominance in the Arctic* (June 6, 2010), <http://www.globalissues.org/article/740/dominance-in-the-arctic>

69. See Morin, *supra* note 7. For excellent maps and charts, see *Maritime Jurisdiction and Boundaries in the Arctic Region*, DURHAM UNIV., <https://www.dur.ac.uk/ibru/resources/arctic/> (last visited Feb. 4, 2014). Jurisdictional issues will also arise. A prime example of a jurisdictional issue is the tension between the Canadian view and that of the United States over how the Northwest Passage should be characterized. Canada “has long maintained that the Northwest Passage falls under Canadian sovereignty, while the U.S. maintains it is an international straight. As long as the passage was essentially unnavigable, the issue was moot, but increasing accessibility could bring the U.S. into dispute with its northern neighbor . . .” Sullivan, *supra* note 7 (citing to Smith & Stephenson, *supra* note 7).

70. Eric Talmadge, *Arctic Climate Change Opening Region to New Military Activity*, Huffington Post (Apr. 16, 2012), http://www.huffingtonpost.com/2012/04/16/arctic-climate-change-military-activity_n_1427565.html.

ciated with increased vessel traffic due to the inherent nature of commercial vessels. A key illustration is the danger from ballast water discharges.

*A. Problem: Water Ballast & Deadly Maritime Stowaways:
Bio-invasions*

Since the introduction of steel hulled vessels well over a century ago,⁷¹ the holding tanks of a vessel are filled with what is known as “ballast water” by “using pumps, flooding, or gravity feed lines.”⁷² Ballast water helps “to reduce stress on the hull of the ship, increase stability, aid propulsion and maneuverability, and compensate for weight loss from fuel and water consumption or cargo load changes.”⁷³ It is “essential to the safe and efficient operation of ocean going shipping.”⁷⁴

Basically, ballast water is taken on board as the vessel’s cargo is unloaded and discharged as cargo is taken aboard to decrease the weight of the ship.⁷⁵ Once such activity is completed, the ship moves on to the next port. While vessels are engaged in transporting over “80% of the world’s commodities,” they are also transferring somewhere between three to ten billion tons of ballast water annually between oceans.⁷⁶ Consequently, when the ship at issue is an oceangoing vessel engaged in world trade, the result is often that ballast water from one part of the world is discharged in another. The problem is that ballast water usually contains a variety of biological organisms, including animals, plants, and pathogens.⁷⁷ As the untreated ballast water is released, so are the organisms. The “expansion of volume and density of international shipping”⁷⁸ in conjunction with “the increased speed and capacity of [modern]

71. *Ballast Water Management*, INT’L MARITIME ORG., <http://www.imo.org/OurWork/Environment/BallastWaterManagement/Pages/Default.aspx> (last visited Feb. 4, 2014).

72. *Id.*

73. *Id.*

74. AM. ASS’N OF PORT AUTHS., *BALLAST WATER MANAGEMENT: FEDERAL ACTION SHOULD PREVENT THE INTRODUCTION OF NON-INDIGENOUS AQUATIC SPECIES FROM BALLAST WATER* (2013), available at <http://www.aapa-ports.org/files/Ballast%20Water%20Management%202013.pdf>.

75. *Id.*

76. *BWM Regulations*, BIO-SEA, <http://www.ballast-water-treatment.com/reglementation> (last visited Sept. 26, 2014) (estimating the transfer of 3–5 billion tons of ballast water); Lucie Maranda et al., *Chlorine Dioxide As a Treatment for Ballast Water to Control Invasive Species*, 75 MARINE POLLUTION BULLETIN 76 (2013) (estimating “the volume of ballast water being transported around the globe at 10 billion metric tons” per year).

77. AM. ASS’N OF PORT AUTHS., *supra* note 74.

78. *Ballast Water: Background of the Issue*, EUROPEAN MARITIME SAFETY AGENCY, <http://www.emsa.europa.eu/implementation-tasks/environment/ballast-water.html> (last visited Sept. 26, 2014).

ocean-going vessels”⁷⁹ has made the vessel the most significant vehicle for the “unintentional introductions of invasive alien species into marine ecosystems,”⁸⁰ which may then “survive, . . . thrive and propagate in receiving coastal waters.”⁸¹ When such an event occurs, the effects can be devastating both environmentally and economically for a vulnerable marine ecosystem.⁸² Such a disastrous outcome has already been predicted for the Arctic.

In 2013, a team of international researchers “calculated the risk of bringing in a new species to Arctic waters” as a result of emptying water ballast tanks.⁸³ The Red King Crab was used to illustrate the harm foreign species could precipitate. “This crab has the potential to invade and thrive in the Arctic, becoming very dominant in the fragile environment and changing the balance between current species.”⁸⁴ Consequently, increased maritime traffic could mean a bleak future for the delicate and fragile ecosystem of the Arctic.

79. See Maranda et al., *supra* note 76, at 76.

80. *Ballast Water: Background of the Issue*, *supra* note 78.

81. See Maranda et al., *supra* note 76, at 76. See also, Stephen Gollasch, Jurgen Lenz & Mark Dammer, *Survival of Tropical Ballast Water Organisms During a Cruise from the Indian Ocean to the North Sea*, 22 J. PLANKTON RES. 923 (2000).

82. AM. ASS’N OF PORT AUTHS., *supra* note 73. The risks posed by the invasive species include “[e]cological threat to the native biodiversity and/or ecological processes,” “the [risk] to human health as toxic organisms and pathogens may be introduced, potentially causing illness to fauna, flora and humans,” and “[e]conomic impact for fisheries, coastal industry, and other commercial activities and resources that can be disrupted.” *BWM Regulation*, *supra* note 76. The ten most dangerous species are “the Cladoceran Water Flea, the Mitten Crab, Toxic algae (red/brown/green tides), Cholera, the Round Goby, the North American Comb Jelly, the North Pacific Seastar, the Zebra Mussel, the Asian Kelp, and the European Green Crab.” *Id.*

In addition to ballast water discharges, hull fouling can also result in the transfer of invasive species. Steven McGee, Robert Piorkowski & Gregory Ruiz, *Analysis of Recent Vessel Arrivals and Ballast Water Discharge in Alaska: Toward Assessing Ship Mediated Invasion Risks*, 52 MARINE POLLUTION BULLETIN 1636–1645 (2006). Hull fouling occurs when “[o]rganisms attach to the underwater surface of the vessel while in port.” *Id.* Similar to ballast water, “a diverse range of organisms” are involved in fouling the hull of a vessel. *Id.* at 1634. These organisms “can colonize other ships or harbor infrastructures at subsequent ports of call.” *Id.* Unfortunately, “relatively little is known about the biota associated with the hulls of modern commercial vessel . . .” *Id.*

83. *Id.* The non-native species that may be carried in ballast water “include[] anything that is small enough to pass through a ship’s ballast water intake ports and pumps, such as small invertebrates and the eggs, cysts and larvae of various species, as well as bacteria and other microbes.” *Ballast Water Management*, MARINE ENGINES & FUELS (July 4, 2014), <http://marineenginesandfuels.com/ballast-water-management/>. See also, Lee Rannals, *Hitchhiking Marine Species Invading Arctic Waters*, REDORBIT.COM (Nov. 4, 2013), <http://www.redorbit.com/news/science/1112993291/hitchhiking-marine-species-invading-the-arctic-110413/>.

84. *Id.*

B. Suggested Solutions: Science, Technology & Cooperation

Not surprisingly, science and technology are joining together to provide answers to stem the tide of the threat to the Arctic posed by invasive species traveling by ballast water.

1. DNA Sequencing and Bar Coding

A technique for screening ballast water is now being employed that relies upon DNA sequencing and bar coding.⁸⁵ Basically, the process for screening begins with “separating the living organisms from the water, then concentrating the tissue to extract the DNA and get a representative sample of the genetic material in the ballast water.”⁸⁶ Such DNA sequencing identifies “genetic bar codes,” which in turn are examined to identify “what species were in the ballast water, perhaps transported from far-off ports of call by the traveling ship.”⁸⁷ After “sequences are analyzed, they can be compared to existing DNA barcode databases” for a particular marine environment, such as the Arctic.⁸⁸ This provides “scientists a far more comprehensive picture of organisms in the water.”⁸⁹ While not preventing the release of an invasive species, bar coding may play an important role in the early identification of non-indigenous organisms into a particular marine environment.⁹⁰

2. Models for Establishing Ballast Water Discharge Standards

(a). The International Consensus Approach: The Convention for the Control and Management of Ships' Ballast Water and Sediments

As long as vessels ply the seas, the transportation of ballast water and its attendant problems will continue. However, the transfer of invasive aquatic organisms and pathogens can be minimized by a variety of

85. *New Ballast Water Protocols Designed to Stop Invasive Species*, ENVTL. PROT. AGENCY, <http://www.epa.gov/sciencematters/sept2012/ballast.htm> (last updated Sept. 3, 2013) (“DNA bar coding relies on identifying short, species-specific sequences of a standard gene” allowing “scientists to use the method to differentiate between many more species in water samples than they can with traditional lab methods.”). See also *Safe Harbors*, ENVTL. PROT. AGENCY, http://www.epa.gov/ord/gems/scinews_safeharbors.htm (last updated Feb. 10, 2011) (discussing the work of Michael Blum, a molecular biologist with the EPA who is “searching for high-tech ways” to develop “DNA-based techniques to screen for potentially troublesome exotics in ballast water.”).

86. *Safe Harbors*, *supra* note 85.

87. *Id.*

88. *New Ballast Water Protocols Designed to Stop Invasive Species*, *supra* note 85.

89. *Id.*

90. *Id.*

regulations.⁹¹ One of the best approaches to date is an international treaty emanating from the International Maritime Organization (“IMO”).

The IMO is “a specialized agency of the United Nations” with the authority to set global standards “for the safety, security and environmental performance of international shipping.”⁹² Its primary purpose is “to create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented.”⁹³ In 2004, “recognizing the risks and damages associated with alien species introductions by ballast water discharge,”⁹⁴ the IMO adopted the International Convention for the Control and Management of Ships’ Ballast Water and Sediments (“BWMC”).⁹⁵

The goal of the BWMC is to provide “guidance to ensure safe handling and storage of chemicals and preparations used to treat ballast water and the development of safety procedures for risks to the ship and crew resulting from the treatment process.”⁹⁶ Specifically, all ships “must have an approved plan for managing ballast water.”⁹⁷ Each vessel is responsible for designing a plan uniquely tailored for the individual ship that sets out a “detailed description of the actions to be taken in order to

91. At present, the legislative framework applicable to ballast water discharges is patchwork, including both an international convention and a number of local and national regulations. WARTSILA, BALLAST WATER MANAGEMENT SYSTEMS Q&A BOOKLET (2012), available at <http://www.wartsila.com/cs/static/flash/studio/assets/content/ss4/ballast-qa-booklet.pdf>. In addition, the Baltic and the Arabian Gulf also have regulations pertaining to ballast water discharge, *Id.*, as does the European Union. *Ballast Water: Background of the Issue*, EUROPEAN MARITIME SAFETY AGENCY, <http://www.emsa.europa.eu/implementation-tasks/environment/ballast-water.html> (last visited Sept. 26, 2014).

92. *Introduction to IMO*, INT’L MARITIME ORG., <http://www.imo.org/About/Pages/Default.aspx> (last visited Sept. 26, 2014). “The IMO measures cover all aspects of international shipping—including ship design, construction, equipment, manning, operation and disposal—to ensure that this vital sector remains safe, environmentally sound, energy efficient and secure.” *Id.*

93. *Id.* “In other words, its role is to create a level playing-field so that ship operators cannot address their financial issues by simply cutting corners and compromising on safety, security and environmental performance.” *Id.*

94. See Maranda et al., *supra* note 76, at 76.

95. For an overview of the history and key provisions of the BWMC, see *Ballast Water Management*, INT’L MARITIME ORG., <http://www.imo.org/OurWork/Environment/BallastWaterManagement/Pages/Default.aspx> (last visited Sept. 26, 2014). For additional background leading up to the final adoption of the BWMC, see *Ballast Water: Background of the Issue*, EUROPEAN MARITIME SAFETY AGENCY, <http://www.emsa.europa.eu/implementation-tasks/environment/ballast-water.html> (last visited Sept. 26, 2014). The BWMC addresses three main types of ballast water management: “ports and terminals, vessel operations, and enforcement.” Paul Bruni, *IMO Ballast Water Convention Summary*, <http://maritime.about.com/od/Ports/a/Imo-Ballast-Water-Convention-Summary.htm> (last visited Sept. 26, 2014) (discussing the main points of all three regulation areas).

96. *International Convention for the Control and Management of Ships’ Ballast Water and Sediments*, COUNCIL ON FOREIGN RELATIONS, <http://www.cfr.org/border-and-port-security/international-convention-control-management-ships-ballast-water-sediments/p20775> (last visited Sept. 26, 2014).

97. Bruni, *supra* note 95.

comply with the BWM convention.”⁹⁸ “A log book recording all “water ballast transactions” must be kept, recording “[a]ny ballast water taken on board, circulated, treated, transferred, or discharged in normal or exceptional circumstances”⁹⁹ Where not recorded in the master log, a second log is also required, devoted to “detailing ballast water equipment inspection and maintenance”¹⁰⁰

Taking into consideration a vessel’s “ballast water capacity” and her age,¹⁰¹ the BWMC also mandates “performance standards,” which limit “the concentrations of live organisms allowed to be released” during ballast water discharge.¹⁰²

As set in 2004, the BWMC will enter into force “12 months after ratification by 30 States, representing 35 per cent of world merchant shipping tonnage.”¹⁰³ Unfortunately, it has yet to be ratified. Although the requisite minimum of number of thirty signatory countries has been met, the tonnage requirement has not been surpassed.¹⁰⁴ The problem appears to lie in the requirements for Ballast Water Management Systems, particularly in terms of retrofitting.¹⁰⁵ The BWMC requires “that ballast water must be treated—to specific standards—before it is discharged. Vessels built *during or after 2009* have to install [an approved ballast water treatment system] immediately. Vessels *built before 2009*, must install . . . [an] approved system by 2014 or 2016 (depending on ballast water capacity of the vessel).”¹⁰⁶ Ultimately, under the BWMC,

98. *Id.*

99. *Id.*

100. *Id.*

101. *Id.*

102. See Maranda et al., *supra* note 76, at 76; See also, Henry Lee II, Deborah A. Reusser & Melanie Frazier, *Approaches to Setting Organism-based Ballast Water Discharge Standards*, 23(2) ECOLOGICAL APPLICATIONS 301 (2013). The BWMC also regulates Ballast Water Exchange, which occurs when a vessel replaces coastal water with ocean water while at sea. *Mid-Ocean Ballast Water Exchange*, SMITHSONIAN ENVTL. RESEARCH CTR., http://www.serc.si.edu/labs/marine_invasions/vector_ecology/bw_exchange.aspx (last visited Sept. 26, 2014); *IMO Ballast Water Management Convention*, TROJAN MARINEX, <http://www.trojanmarinex.com/imo/> (last visited Sept. 26, 2014); *Ballast Water Management*, INT’L MARITIME ORG., <http://www.imo.org/OurWork/Environment/BallastWaterManagement/Pages/Default.aspx> (last visited Sept. 26, 2014).

103. Maranda et al., *supra* note 76, at 76 (“as of January 31, 2013 - 29% of world shipping tonnage had been reached of the necessary 35%.”).

104. See Maranda et al., *supra* note 76, at 76.

105. Bruni, *supra* note 95.

106. *IMO Ballast Water Management Convention*, TROJAN MARINEX, <http://www.trojanmarinex.com/imo/> (last visited Sept. 26, 2014) (emphasis in the original). IMO Regulation D-2 sets the standards for ballast water discharges, “which establishes numerical limits for different size classes of organisms that may be released in specific volumes of water.” *Id.* See also *Ballast Water Management*, INT’L MARITIME ORG., <http://www.imo.org/OurWork/Environment/BallastWaterManagement/Pages/Default.aspx> (last visited Sept. 26, 2014).

all qualifying vessels will be required to fit a ballast water treatment system.¹⁰⁷

Consequently, one of the challenging aspects of implementing the BWMC will be updating the “thousands of vessels which will fall under the rules of the ballast water convention,” which have “antiquated” ballast systems that must be updated.¹⁰⁸ One problem is whether there will be sufficient shipyards available to carry out the required updates.¹⁰⁹ Another is purely economical.

The International Chamber of Shipping (“ICS”) is currently requesting alterations to the BWMC to encourage “additional IMO member states to decide to ratify the Convention.”¹¹⁰ It has proposed that a “grandfather clause” be incorporated into the BWMC, which would specify that “[f]irst generation’ type-approved equipment, installed in good faith prior to the Convention entering force . . . should be grandfathered for the life of the ship, and a new category of ‘gross non-compliance’ be defined and applied to these systems to allow for some

107. The WBMC applies to “two groups of vessels discharging ballast water into waters of the U.S.[:]”

The first group is comprised of those vessels currently required to conduct exchange. The second group, which previously was not required to conduct exchange, is comprised of seagoing vessels that do not operate beyond the U.S. EEZ [Exclusive Economic Zone], that take on and discharge ballast water in more than one Captain of the Port (COTP) Zone, and are greater than 1,600 gross register tons (GRT) (3,000 gross tons (GT) International Tonnage Convention (ITC)).

U.S. COAST GUARD, BALLAST WATER MANAGEMENT: FREQUENTLY ASKED QUESTIONS, VOLUME I APRIL 5, 2013 (2013), available at http://www.uscg.mil/hq/cg5/cg522/cg5224/docs/BWM_FAQs_Vol%20I_05April2013.pdf.

In addition, as mandated by Congress in NISA [National Invasive Species Act of 1996, *see infra* note 132], “certain vessels will continue to be exempt from requirements to install and operate Coast Guard approved ballast water management systems:

- Crude oil tankers engaged in coastwise trade
- Any vessel of the U.S. Armed Forces (as defined in the Federal Water Pollution Control Act) that is subject to the Uniform National Discharge Standards for Vessels of the Armed Forces
- Any warship, naval auxiliary, or other vessel owned or operated by a foreign state and used, for the time being, only on government and non-commercial service.”

Id.

108. Bruni, *supra* note 95.

109. *Id.* Another key challenge will be meeting the training requirements of the BWMC. “Training for the thousands of crew members, shore personnel, and regulatory workers must be completed in time for the convention to come into force one year from ratification.” *Id.* Further, the challenge of implementing the new rules globally will present a number of challenges, particularly for “[a]reas which have little or no regulatory enforcement” and “will struggle to add another layer of resources and administration to their operations.” *Id.*

110. *ICS Suggests Changes to Ballast Water Convention*, MARITIME GLOBAL NEWS (Mar. 27, 2014), <http://maritimeglobalnews.com/news/suggests-changes-ballast-water-ax2mwd>. See also, Charlie Bartlett, *ICS Urges Alterations to IMO Ballast Water Convention*, SEATRADE GLOBAL (Mar. 28, 2014), <http://www.seatrade-global.com/news/americas/ics-urges-alterations-to-imo-ballast-water-convention.html>.

variation in treatment efficacy during normal operation.”¹¹¹ The goal of the ICS is to try and “avert the stalemate experienced in shipping thus far, where ship owners have held off investing in first generation Ballast Water Treatment Systems (BWTS) on the grounds they may be found to be non-compliant later.”¹¹² ICS is taking the position that it cannot support the ratification of the BWMC by other IMO Member States “until there is confidence that the new treatment equipment will actually work, or that when in operational use it will comply with the standards that IMO has set for controlling unwanted marine micro-organisms.”¹¹³

*(b). The Litigious, State-by-State Approach:
The Road to U.S. Regulations*

Although not yet a signatory to the BWMC, the United States has regulations in place to address the damaging environmental effects that may result from the discharge of ballast water from ships. The road to the establishment of these requirements was not a smooth one.

In the United States, the area of ballast water discharges is regulated by both the Environmental Protection Agency (the “EPA”) and the United States Coast Guard (the “USCG”). The EPA has the authority to regulate the area of water ballast discharges via the Clean Water Act (“CWA”).¹¹⁴ The purpose of the CWA is the “[r]estoration and maintenance of chemical, physical, and biological integrity of the Nation’s waters”¹¹⁵ In order to accomplish these goals, the CWA “establishes a comprehensive statutory system for controlling water pollution,” the cornerstone of which is a permit system, the National Pollution Discharge Elimination System (“NPDES”), which regulates the amount of vessel discharges into U.S. waters.¹¹⁶ The NPDES permit “governs implementation of both technology-based requirements and water quality standards.”¹¹⁷ “[T]echnology-based regulations reduce levels of pollution by requiring a discharger to make equipment or process changes, without reference to the effect on the receiving water. Water quality standards set the permissible level of pollution in a specific body of water without direct regula-

111. Bartlett, *supra* note 110.

112. *Id.*

113. *Id.* (According to Peter Hinchcliffe, the secretary general of ICS, the “Resolution would provide greater confidence for owners and operators installing treatment equipment, and could help end the current impasse.”).

114. 33 U.S.C. §§ 1251–1387 (2014).

115. 33 U.S.C. § 1251(a) (2014).

116. *Nw. Env'tl. Advocates v. U.S. Env'tl. Prot. Agency*, 2006 WL 2669042, at *1 (N.D. Cal. Sept. 18, 2006).

117. *Id.* at *2 (citing 33 U.S.C. §§ 1311(b)(1)(C), 1342(a)(1); 40 C.F.R. § 122.44(a), (d)(1)).

tion of the individual source of the pollution.”¹¹⁸ An NPDES permit establishes the “specific limits that apply to individual polluters.”¹¹⁹

Historically, the agency chose to exempt ballast water discharges and other “incidental discharges” resulting from the normal operation of vessels from regulation under the NPDES.¹²⁰ Under the EPA exemption, discharges included “sewage from vessels, effluent from properly functioning marine engines, laundry, shower, and galley sink wastes”¹²¹

After more than thirty years, this deplorable state of affairs began to change when a group of environmental advocates challenged the exemption in a case “involv[ing] the significant impact of aquatic nuisance species introduced by ballast water discharges from ships making transoceanic voyages”¹²² In 2005, the U.S. District Court for the Northern District of California ruled that the EPA exemption exceeded the statutory authority granted to the agency pursuant to the CWA.¹²³ In 2008, the lower court decision was upheld by the Ninth Circuit Court of Appeals.¹²⁴ Having found the regulation *ultra vires* to the CWA, the district court subsequently vacated the exemption as of September 30, 2008.¹²⁵

In the aftermath of its unsuccessful appeal, the EPA developed a vessel general permit (“VGP”) to regulate the vessel discharges previously exempted.¹²⁶ Under the regulations, certain vessels are not only “re-

118. *City of Arcadia v. U.S. Env'tl. Prot. Agency*, 411 F.3d 1103, 1105 (9th Cir. 2005).

119. *Id.*

120. 40 C.F.R. § 122.3(a).

121. 40 C.F.R. § 122.3(a).

122. *Maritime Transportation Regulations: Impacts on Safety, Security, Jobs and the Environment, Part II: Hearing Before the Subcomm. on Coast Guard and Maritime Transportation of the H. Comm. on Transportation and Infrastructure*, 113th Cong. 56 (2014) (statement of Michael H. Shapiro, Principal Deputy Assistant Administrator, Office of Water, U.S. Environmental Protection Agency) [hereinafter Shapiro Testimony], available at http://transportation.house.gov/uploaded_files/2014-03-04-shapiro.pdf.

123. *Nw. Env't Advocates v. U.S. Env'tl. Prot. Agency*, 2005 WL 756614 *13 (N.D. Cal. 2005) (Order Granting Plaintiffs' Motion for Summary Judgment Denying Defendant's Motion for Summary Judgment). Although the challenged exemption covered a wide range of discharges, *see supra* note 108 and accompanying text, the court noted that the “plaintiffs make no secret that the type of discharge they are primarily concerned with is ballast water.” *Nw. Env't Advocates v. U.S. Env'tl. Prot. Agency*, 2006 WL 2669042, at *3 (N.D. Cal. Sept. 18, 2006).

124. *Nw. Env't Advocates v. U.S. Env'tl. Prot. Agency*, 537 F.3d 1006, 1026 (9th Cir. 2008) (admonishing that “[t]he district court's order requires the EPA to perform a substantial task—to bring the discharges previously exempted by § 122.3(a) within the permitting process of the CWA. Neither the district court nor this court underestimates the magnitude of the task. But ‘this ambitious statute is not hospitable to the concept that the appropriate response to a difficult pollution problem is not to try at all.’” (internal citation omitted)).

125. *Nw. Env't Advocates v. U.S. Env'tl. Prot. Agency*, 2006 WL 2669042, at *1 (N.D. Cal. Sept. 18, 2006) (Order Granting Plaintiffs' Motion for Permanent Injunctive Relief).

126. *Nw. Env't Advocates v. U.S. Env'tl. Prot. Agency*, 652 F.3d 1 (D.C. Cir. 2011). *See also*, Final National Pollutant Discharge Elimination system (NPDES) General Permit for Discharges Incidental to Normal Operation of a Vessel, 73 Fed. Reg. 79,473 (Dec. 29, 2008).

quired to discharge ballast water 200 miles from a U.S. shoreline,” they must also treat the ballast water” to “limit the number of living organisms in particular volumes of water.”¹²⁷ The 2013 VGP regulates “discharges from approximately 70,000 domestic and foreign vessels . . . while in waters of the U.S., including territorial sea out to three miles and inland waters”¹²⁸ The permit “applies to all non-military, non-recreational vessels greater than or equal to 79 feet in length.”¹²⁹ The VGP also applies to any ballast water discharges of commercial fishing vessels irrespective of size.¹³⁰

In contrast to the EPA, which regulates pursuant to the CWA, the USCG is responsible for the implementation of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990,¹³¹ as amended by the National Invasive Species Act of 1996 (“NISA”).¹³² Prior to 2012, the USCG’s Ballast Water Management (“BWM”) basically consisted of a ballast water exchange requirement¹³³ to be performed in an area 200 nautical miles from any shore of the United States, and suggested BWM practices such as avoiding “uptake or discharge in sensitive areas, [and] areas with infestations,” as well as “clean[ing] tanks, rin[sing] anchors & chains, etc.”¹³⁴

127. John Flesher, *EPA Issues New Ballast Rules: Environmental Groups Say Regulations Do Not Go Far Enough* (Mar. 29, 2013), <http://dailyreporter.com/2013/03/29/epa-issues-new-ballast-rules/>.

128. Shapiro Testimony, *supra* note 122, at 2.

129. *Id.*

130. *Id.* It should be noted that the VGP does not apply to vessels plying the Great Lakes. Environmentalists have criticized this decision “as leaving the door open for ships to ferry invasive species around the lakes.” *Id.*

131. 16 U.S.C. §§ 4701–4751 (1996).

132. 16 U.S.C. §§ 4701–4751 (1996).

133. Until quite recently, “the only approved ballast water strategy” that could be employed to meet U.S. federal regulations was “mid-ocean ballast water exchange,” where “ships flush their ballast tanks in the open ocean, thereby replacing ballasted coastal water with ocean water.” *Mid Ocean Ballast Water Exchange*, SMITHSONIAN ENVTL. RESEARCH CTR., http://serc.si.edu/labs/marine_invasions/vector_ecology/bw_exchange.aspx (last visited Sept. 26, 2014). A mid-ocean ballast exchange “can replace up to 99% of the volume of initial coastal waters with ocean waters,” thereby removing “over 90% of the coastal zooplankton trapped within the ballast tank” *Id.* Because such an exchange “replaces most of the coastal water with open ocean water, it also removes most of the coastal organisms.” *Id.* While “oceanic organisms can be captured in the ballast water tanks during this exchange, these organisms are considered less likely to become established than biota of coastal origin when discharged in a coastal ecosystem, due to a mismatch among open ocean and coastal habitats.” *Id.* (citations omitted). Consequently, a mid-ocean ballast exchange can be very effective in preventing or mitigating the invasive organisms. *Id.*

134. U.S. COAST GUARD ENVTL. STANDARDS DIV., US COAST GUARD BALLAST WATER STANDARD FINAL RULE (2013), *available at* <http://www.psmfc.org/ballast/wordpress/wp-content/uploads/2013/06/US-Coast-Guard-Ballast-Water-Discharge-Standard-Final-Rule-USCG-ESD.pdf>; See, for example, the requirements and voluntary guidelines at 33 C.F.R. Part 151 and 46 C.F.R. Part 162 (2004), which gave the master several options when engaging in ballast water management: “(1) Carry out an exchange of ballast water on the waters . . . area more than 200 nautical

Prior to issuing the new 2012 rule, the USCG considered the results of a number of studies which “indicated that the effectiveness of the current BWM regime . . . varies greatly depending on the design of the vessel, the exchange method, and the configuration of the Ballasting system.”¹³⁵ As a result of these variations, the Coast Guard concluded that while it was a “useful interim management practice, ballast water exchange is not the best means to the requirements of the NISA.”¹³⁶ Following the lead of the IMO,¹³⁷ the agency also established a BWM standard for the concentration of living organisms that can be discharged per volume of ballast water.¹³⁸ This standard also simplifies USCG approval of BWM systems.¹³⁹ The ballast water discharge standard ultimately adopted by the USCG is currently identical to the relevant IMO discharge standard.¹⁴⁰

On March 23, 2012, the USCG issued its Final Rule for Ballast Water Discharges in U.S. Waters.¹⁴¹ Under the Rule, a covered vessel¹⁴² has five options in terms of how to regulate its discharges.¹⁴³ First, a vessel

miles from any shore . . . (2) Retain the vessel’s ballast water on board the vessel . . . or (3) Use an alternative environmentally sound method of ballast water management that has been submitted to, and approved by, the Commandant prior to the vessel’s voyage.” See also, Alex J. Sagady & Associates, *Coast Guard Ballast Water Standards*, GREAT LAKES INFO. NETWORK (Sept. 26, 2003), <http://www.great-lakes.net/lists/glin-announce/2003-09/msg00044.html> (discussing new proposed rule in 2003 regarding ballast water management).

135. Jonathan K. Waldron et al., *Coast Guard Issues Final Rule on Ballast Water Management*, BLANK ROME LLP (Apr. 2012), <http://www.blankrome.com/index.cfm?contentID=37&itemID=2787>; U.S. COAST GUARD ENVTL. STANDARDS DIV., *supra* note 134.

136. Waldron et al., *supra* note 135.

137. See *supra* note 92 and accompanying text.

138. Waldron et al., *supra* note 135.

139. *Id.*

140. The biological discharge standards are identical to the International Maritime Organization (IMO) Ballast Water Convention’s D-2 standard. See *Ballast Water Management Regulations*, N.E.I. Treatment Sys., <http://www.nei-marine.com/en/regulatory> (last visited Apr. 19, 2014) (setting out the regulations, timetables, and charts for meeting the regulations of the IMO, USCG, and the EPA (VGP)).

141. 33 C.F.R. 151 (2012); 46 C.F.R. 162 (2012).

142. The new BWM regulations apply

to non-recreational US and foreign flagged vessels equipped with ballast tanks within US territorial waters and bound for a port or place in the United States, or that are due to navigate within the US internally. The regulations will not apply to foreign flag vessels solely navigating through US territorial waters on passage to another country.

USA—Ballast Water Discharge Rule, WEST OF ENGLAND (May 22, 2012), <http://www.westpandi.com/Publications/News/Archive/USA---Ballast-Water-Discharge-Rule/>.

Certain vessels are exempt from all or a portion of BWM regulations. Exempted vessel include “Department of Defense and Coast Guard vessels, vessels of the Armed Forces, and vessels owned or operated by a foreign state and used for government non-commercial service” and “[c]rude oil tankers engaged in coastwise trade and vessels that operate exclusively in one Captain of the Port Zone.” Waldron et al., *supra* note 135.

143. See 33 C.F.R. 151 (2012); 46 C.F.R. 162 (2012); U.S. COAST GUARD MARINE SAFETY DETACHMENT, US COAST GUARD BALLAST WATER DISCHARGE STANDARD FINAL RULE

may elect no discharge at all. Second, ballast exchange is permitted, but only where tanks are filled with local water, and vessels using water from a U.S. public water system must meet certain tank cleanliness requirements and use such water exclusively. Third, a vessel may discharge all her ballast water to an onshore facility or to another vessel for the purpose of treatment. Finally, a vessel may use an on board Coast Guard approved Ballast Water Management System (BWMS).¹⁴⁴

Whatever problems flow from the discharge of ballast water are tenfold for the Arctic due to the delicate nature of its environment, the subsistence hunting of its indigenous peoples, and the geography of the Northwest Passage.¹⁴⁵ Solutions for vessels navigating the Northwest Passage are limited. The lack of infrastructure would prevent vessels from utilizing an onshore facility. Transfer from ship to ship might also be difficult due to the archipelagic nature of the passage and the ice flow itself.¹⁴⁶ The best solution is an onboard BWMS.¹⁴⁷

BROCHURE, available at <https://homeport.uscg.mil/ballastwater> (click on “Brochure—Ballast Water Management (BWM) under “General Information”). See also, *Ballast Water Regulations*, HYDE MARINE, INC., http://www.hydemarine.com/ballast_water/regulations (last visited Sept. 26, 2014). The USCG has clarified that under the Final Rule, “discharge of ballast water into waters of the U.S. is a threshold requirement for installation of a BWMS and not simply the presence of ballast tanks on a vessel.” Waldron et al., *supra* note 135. The compliance date for individual ships varies based upon the date of construction and ballast water capacity. *Id.* Further, “[a]ll new vessels constructed on or after December 1, 2013, regardless of ballast water capacity, must comply on delivery. Existing vessels with a ballast water capacity between 1500 and 5000 cubic meters must comply by the first scheduled drydocking after January 1, 2014.” *Id.* Finally, “[e]xisting vessels with a ballast water capacity less than 1500 cubic meters or greater than 5000 cubic meters must comply by the first scheduled drydocking after January 1, 2016.” *Id.* The phase-in schedule for the required installation of ballast water treatment technologies required to comply with the BWM discharge standards began on January 1, 2014.

144. See *supra* note 142. Older vessels, which will need refitting to meet the BWMS requirements, have “the option to perform a complete ballast water exchange in an area 200 nautical miles from any shore prior to discharging ballast water, consistent with existing requirements” prior to the date they must comply with the BWM regulations. Waldron et al., *supra* note 135.

Currently, an alternative management system (AMS) may also be used in lieu of an approved BWMS as long as it was installed on the vessel prior to the date the vessel is required to comply with the BWDS. See *Coast Guard Accepts Ballast Water Treatment Systems as Alternative Management Systems*, U.S. COAST GUARD (Apr. 16, 2013), <http://www.uscgnews.com/go/doc/4007/1749835/Coast-Guard-accepts-ballast-water-treatment-systems-as-Alternate-Management-Systems>. An AMS is a temporary designation assigned to a ballast water treatment system approved by a foreign administration. *Id.* An AMS may be used as an alternative to ballast water exchange for up to five-years while the treatment system is tested to see if it meets USCG standards for a BWMS. To date, nine AMS systems have been recognized by the USCG. *Id.*

145. Karl Magnus Eger, *Comparison of Marine Insurance for Arctic Route*, ARCTIS (Aug. 14, 2012, 6:26 PM), <http://www.arctis-search.com/Comparison+of+Marine+Insurance+for+Arctic+Routes> (discussing how marine insurance premiums will be determined for vessels plying the Northwest Passage noting that significant risks include “draft restrictions, narrow straights, severe ice conditions and lack of infrastructure . . .”).

146. See Tyson, *supra* note 23 and accompanying text.

(c). “*Argh, Matey, There’s the Rub*”: *The Problem of Dueling Agencies*

Even prior to 2012, when the USCG endorsed the limited ballast water exchange approach to BWM,¹⁴⁸ there was clearly conflict as the two agencies administered (or the EPA failed to administer) their respective authorities. However, in February 2011, the EPA and the USCG entered into a “Memorandum of Understanding . . . to better coordinate efforts to prevent illegal discharges of pollutants” into U.S. waters.¹⁴⁹ The Memorandum of Understanding provided “a framework for improving EPA and USCG cooperation on data tracking, training, monitoring, verifying compliance, and industry outreach.”¹⁵⁰

According to the EPA, it has joined forces with the USCG in an effort to “to develop a strong federal ballast water management program” to reduce “the risks of new introductions” of invasive species.¹⁵¹ The USCG and the EPA have also purportedly “joined forces to develop new performance verification protocols” to ensure that the devices ships elect to use to treat ballast water will comply with U.S. regulations.¹⁵² The result is that the BWMS and the VGP both require covered vessels to comply with the same ballast water discharge numeric effluent limits by installing USCG approved technology following the same installation schedule.¹⁵³ At first glance, it may appear that the two agencies are final-

147. It must be remembered, however, that in contrast to land-based water treatment facilities, which often “take many hours or days to pass water through their treatment system,” vessels “must be able to discharge ballast water as quickly as cargo is loaded.” Paul Bruno, *What is Ballast Water?: Understand Ballast Water Systems, Environmental Effects, and Emerging Technology*, ABOUT.COM, <http://maritime.about.com/od/Ports/a/What-Is-Ballast-Water.htm?p=1> (last visited Apr. 19, 2014). Thus, even a vessel with an on-board water ballast treatment system may not be able to kill the invasive species on board. A quick pass through the treatment system may still result in the “more robust” of the non-native species surviving voyage and being “discharged into new environments.” *Id.* Frequently, the invading species “often out-compete native species for food and shelter, and their populations explode resulting in widespread ecological imbalance.” *New Ballast Water Protocols Designed to Stop Invasive Species: EPA Partners with Coast Guard to Develop Ship Treatment Protocols*, ENVTL. PROT. AGENCY, <http://www.epa.gov/sciencematters/sept2012/ballast.htm> (last updated Sept. 3, 2013); *See also Safe Harbors*, ENVTL. PROT. AGENCY, http://www.epa.gov/ord/gems/scinews_safeharbors.htm (last updated Feb. 10, 2011) (“A single liter of ballast water might contain dozens of different species and thousands of organisms. Since the majority of those can be larvae, a ship releasing ballast . . . is like blowing 10,000 ripe dandelion (another introduced species) seeds across your newly-seeded lawn.”).

148. *See supra* notes 131–34 and accompanying text.

149. U.S. COAST GUARD, STANDARDS FOR LIVING ORGANISMS IN SHIPS’ BALLAST WATER DISCHARGED IN U.S. WATERS, 33 CFR PART 151 AND 46 CFR PART 162, MARCH 23, 2012. FREQUENTLY ASKED QUESTIONS at Question #19 (2012), *available at* <http://www.uscg.mil/hq/cg5/cg522/cg5224/docs/BWDSAUG012012ApprovedforRelease.pdf>.

150. *Id.*

151. Shapiro Testimony, *supra* note 122, at 2.

152. *New Ballast Water Protocols Designed to Stop Invasive Species*, *supra* note 147.

153. Barry M. Hartman et al., *Going Ballistic Over Ballast Water Regulations* (Jan. 23, 2014), <http://www.law360.com/articles/500892/going-ballistic-over-ballast-water-regulations>.

ly working in harmony to synchronize the regulations for water ballast discharges. Unfortunately, that is not yet the case.

To curb the threat of the introduction of invasive species via ballast water, the past decade has seen “significant efforts . . . to find effective, environmentally sound, but also practical and affordable measures to manage and/or treat ballast water”¹⁵⁴ These efforts are ongoing. Currently, a number of ballast water treatment technology options are available. Generally, a two-step process is employed “involving mechanical separation (1st stage) followed by physical/chemical treatment (2nd stage).”¹⁵⁵ According to a comprehensive study conducted by BCC, “[t]he global ballast water treatment equipment market reached nearly \$1.4 billion in 2012. This market is expected to grow to nearly \$2.1 billion in 2013 and \$8.5 billion in 2018 with a [projected] compound annual growth rate (CAGR) of 32.9% for the five-year period 2013 to 2018.”¹⁵⁶ Current technologies for the treatment of ballast water include “solid-liquid separations, with and without coagulation and flocculation; chemical treatment, such as chlorination and ozonation; and physical treatment such as ultraviolet irradiation, gas injection, and ultrasonic processes.”¹⁵⁷ To be valid, the technology employed must not only be “be effective for a broad range of species and biomass, it must also be safe for use aboard a ship, and must degrade or be neutralized to a non-harmful entity by the time of the ballast water discharge to protect local species.”¹⁵⁸

The problem is that the USCG had not yet approved the technology necessary to meet its own standards for a BWMS or the comparable standards set out by the EPA’s VGP.¹⁵⁹ Due to the lack of approved BWMS options, in September 2013, the USCG “issued a letter containing provisions for the Coast Guard to grant an application for an extension” to the BWMS implementation schedule.¹⁶⁰ In addition, an alternative management system (AMS) may also be used in lieu of an approved

154. See Maranda et al., *supra* note 76, at 77. The authors of this article endorse the use of biocides, such as chlorine dioxide, which, according to test result, is “an effective means of eliminating potentially invasive species.” *Id.* at 87.

155. WARTSILA, *supra* note 91.

156. SUSAN HANFT, BALLAST WATER TREATMENT: TECHNOLOGIES AND GLOBAL MARKETS (2013), available at <http://www.bccresearch.com/report/download/report/mst061a> (a copy of the complete study can be ordered at http://www.reportlinker.com/p01923025/Ballast-Water-Treatment-Technologies-and-Global-Markets.html#utm_source=prnewswire&utm_medium=pr&utm_campaign=Water_distribution_and_treatment).

157. *Id.*

158. See Maranda et al., *supra* note 76, at 77.

159. See Hartman et al., *supra* note 153.

160. *Latest Briefing on USCG and EPA Extension Issue—Ballast Water Discharge*, UK P&I CLUB, (Mar. 19, 2014), <http://www.ukpandi.com/knowledge/article/latest-briefing-on-uscg-and-epa-extension-issue-ballast-water-discharge-129902/>.

BWMS as long as it was installed on the vessel prior to the date the vessel is required to comply with the BWDS. An AMS “is a temporary designation given to a ballast water treatment system approved by a foreign administration.”¹⁶¹ The system may be used as an alternative to ballast water exchange for up to five years while the treatment system is tested to see if it meets USCG standards for a BWMS. To date, nine AMS systems have been recognized by the USCG.¹⁶²

The EPA, however, has left the maritime industry adrift as to whether failure to install an approved BWMS within the required time frame will subject a vessel owner/operator to “massive administrative, civil and even criminal fines” for the failure to meet the current VGP time requirements for installing USCG approved technology irrespective of the fact that the no BWMS has been approved.¹⁶³ Consequently, despite receiving an extension from the USCG, the EPA could still find that a vessel has failed to comply with the VGP.¹⁶⁴

Under pressure from the industry and the USCG, the EPA issued two letters at the end of 2013.¹⁶⁵ In the joint letter, the EPA attempts to “reassure the industry that it will adopt a unified approach with the USCG to address the industry’s ballast water management issues, and that it is working with the USCG to ensure the earliest availability of USCG type approved technology.”¹⁶⁶ The second letter sets out the EPA’s “Enforcement Response Policy,” and attempts to explain how the agency will view a USCG extension for the implementation of a approved BWBS.¹⁶⁷ First, the Enforcement Response Policy only applies in situations where: (1) a vessel has applied for and received an extension from the USCG (as above); (2) a vessel is not in compliance with its ballast water numeric discharge limit under the 2013 VGP; and (3) a vessel is otherwise in compliance with all other provisions of the 2013 VGP,

161. *Coast Guard Accepts Ballast Water Treatment Systems as Alternative Management Systems*, *supra* note 144.

162. *Id.*

163. See Hartman et al., *supra* note 153.

164. *Latest Briefing on USCG and EPA Extension Issue—Ballast Water Discharge*, *supra* note 160.

165. A joint EPA/USCG letter was issued on December 24, 2013. *Id.* Three days later, the EPA issued a memorandum to the “Regional Vessel General Permit Enforcement and Program Director” entitled “Enforcement Response Policy for EPA’s 2013 Vessel General Permit: Ballast Water Discharges and U.S. Coast Guard Extensions under 33 C.F.R. Part 151.” Memorandum from Cynthia Giles, Assistant Adm’r for Enforcement and Compliance Assurance, to Reg’l Vessel Gen. Permit Enforcement and Program Dirs. (Dec. 27, 2013) [hereinafter Cynthia Giles Memo], available at <http://www2.epa.gov/sites/production/files/2013-12/documents/vesselgeneralpermit-erp.pdf>.

166. *Latest Briefing on USCG and EPA Extension Issue—Ballast Water Discharge*, *supra* note 160.

167. See Cynthia Giles Memo, *supra* note 165.

including the submission of a valid Notice of Intent.¹⁶⁸ Under such circumstances, “EPA will consider such violations of the 2013 VGP ballast water numeric discharge limit *a low enforcement priority*.”¹⁶⁹

The industry response to the Enforcement Response Policy has not been positive.¹⁷⁰ According to the Chamber of Shipping of America, the Enforcement Response Policy is unsatisfactory for a number of reasons. Bottom line, despite its admonishment to treat non-compliance with the VGP where the USCG has issued an extension as “a low enforcement priority,” there is no guarantee of non-enforcement by the EPA. Technically, such a vessel remaining non-compliant “may have insurance, commercial and contractual implications”¹⁷¹ Further, the EPA Memorandum concludes with the caveat that the Agency reserves the right to change its policy at any time.¹⁷²

IV. THE NEED FOR COOPERATION AND CONSENSUS: AN INTERNATIONAL POLAR CODE

The fate of the Arctic will hinge in large measure on the decisions that statesmen and industrialists make in the coming years. Those converging on the region must balance the pursuit of wealth and power with the protection of a fragile ecosystem. While the present trend of multilateralism bodes well for the region, experts say that much policy work remains if there is to be a stable and sustainable future in the Arctic.¹⁷³

Ultimately, the United States has moved ahead in its regulation of ballast water discharges. The voyage to this destination, however, has been anything but smooth sailing. Initially, it required extensive litigation,¹⁷⁴ and even now, the uncertain state of affairs regarding the regulations of ballast water discharges created by the differing approaches embraced by the USCG and the EPA illustrate the dilemma that can result in situations where more than one federal agency has the authority to regulate an area. When the agencies fail to reconcile their differing regulations, the end result is a lack of guidance or consistency for those attempting to comply.¹⁷⁵

168. *Id.*

169. *Id.* (emphasis added).

170. See, e.g., Jonathan K. Waldron, Jeanne M. Grasso & Patricia M. O’Neill, *The Evolving Ballast Water Conundrum*, LEXOLOGY (Mar. 5, 2014), <http://www.lexology.com/library/detail.aspx?g=50c3ef8d-51d2-497b-9863-60255d412158>.

171. *Latest Briefing on USCG and EPA Extension Issue—Ballast Water Discharge*, *supra* note 160.

172. See Cynthia Giles Memo, *supra* note 165.

173. *The Emerging Arctic*, *supra* note 22.

174. See *supra* notes 120–25 and accompanying text.

175. See Hartman et al., *supra* note 153.

The history behind U.S. regulations for ballast water discharges is a parable for the international community, which raises the pressing question that must be answered: what is the best course to be set for the Arctic? Should it be one of grueling storms of lengthy and expensive antagonism between nations as adversaries, one of dueling countries in lieu of dueling agencies, or one where a negotiated compromise prevails? At present, “[t]here are no international conventions which regulate Arctic shipping operations, so in principle the same rules apply for sunny sailing in the Mediterranean as for the Arctic”¹⁷⁶ In this author’s view, what is needed to safeguard the environment and indigenous peoples of the Arctic is a Comprehensive Polar Code, and the best organization to draft such a code is the IMO.

In January 2014, the Secretary-General for the IMO gave a speech, which “must have resonated among the Arctic counties, shipping industry, the indigenous communities,” urgently calling for the adoption of the Polar Code, an ongoing project of the IMO.¹⁷⁷ The Polar Code would tackle shipping problems in the far north and be “a mandatory International Code of safety for ships operating in polar waters.”¹⁷⁸ The standards and guidelines set out in the Polar Code regulate “ship design, construction, equipment, operations, crew manning and training, protection of mariners and passengers, search and rescue, safety of cargo, [and] environmental protection matters for ships operating in the Polar Regions.”¹⁷⁹ Finally, after years of delay, it is now being predicted that

176. Balazs Koranyi, *Expanding Arctic Ocean to Get Its Own Shipping Rules*, REUTERS (Jan. 21, 2014), <http://uk.reuters.com/article/2014/01/21/arctic-shipping-idUKL3N0KU3QO20140121> (quoting Sturla Henriksen, the director general of Norwegian Shipowners’ Association).

177. Vijay Sakhuja, *Polar Code: IMO Exhibits Urgency* (Feb. 1, 2014), <http://asiachangingarctic.com/2014/02/01/polar-code-imo-exhibits-urgency/>. The IMO Polar Code would “build[] on the existing framework of a number of internationally accepted Conventions and Protocols” including “the 1982 United Nations Convention of the Law of the Sea (UNCLOS); 1974 International Convention on the SOLAS; the 1973 International Convention for the Prevention of Pollution from Ships, as modified by the Protocol of 1978 relating thereto (MARPOL); the 1978 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW); and the Torremolinos International Convention for the Safety of Fishing Vessels, 1977” *Id.*

178. *Shipping In Polar Waters: Development of an International Code of Safety for Ships Operating in Polar Waters (Polar Code)*, INT’L MARITIME ORG., <http://www.imo.org/MediaCentre/HotTopics/polar/Pages/default.aspx> (last visited Apr. 20, 2014) (containing code updates). *See also IMO Tackles Shipping in Polar Waters*, MARITIME REPORTER & MARINE NEWS MAGAZINE (Jan. 23, 2014), <http://www.marinelink.com/news/shipping-tackles-waters363330.aspx>. (“The Polar Code is intended to cover the full range of shipping-related matters relevant to navigation in waters surrounding the two poles—ship design, construction and equipment; operational and training concerns; search and rescue; and, equally important, the protection of the unique environment and eco-systems of the polar regions.”)

179. *See* Sakhuja, *supra* note 177.

“[m]aritime nations are close to a landmark deal on the Polar Code,”¹⁸⁰ and it is anticipated that a finalized draft could go into force by 2016.¹⁸¹

Certainly the draft Polar Code is not without its critics. Environmental organizations have warned that the Polar Code fails “to address the looming danger of having non ice-strengthened and poorly prepared ships in supposedly ‘ice-free’ polar waters.”¹⁸² Once ratified, the Polar Code will set forth the rules for vessels “which will increasingly include oil tankers, container ships and cruise ships potentially operated by crew” unaccustomed to the harsh conditions of the Arctic.¹⁸³ “Blinded by the prospect of ‘ice-free’ operations enabled by the sea ice melt, the IMO makes the fateful assumption that these ships can safely operate without special hull protection or restrictions such as reduced speed.”¹⁸⁴

Moreover, while the Polar Code does prescribe ship properties including required ice class and set uniform rules for all vessels in all of the polar countries, it fails to address several key issues, such as “[b]lack carbon emissions—widely recognized as the second most important agent of climate change after CO₂ . . . and oil spills.”¹⁸⁵ In addition, the current draft of the Polar Code fails to specifically “address the impact of ballast water discharge in the Arctic.”¹⁸⁶ The IMO would be wise to include provisions in the Polar Code to directly regulate these additional environmental concerns. In particular, it should look to the “guidelines for ballast water exchange in the Antarctic Treaty” as a model for regulation in ice filled waters.¹⁸⁷ Clearly, the issue of ballast water discharges in the area warrants “urgency and should also be given priority in the list of challenges facing the Arctic region.”¹⁸⁸

180. See Koranyi, *supra* note 176.

181. *Id.*

182. *IMO's 'Polar Code' Ignores Environmental Dangers of Increased Arctic and Antarctic Shipping*, WORLD MARITIME NEWS (Jan. 27, 2014), <http://worldmaritimeneeds.com/archives/102820/imos-polar-code-ignores-environmental-dangers-of-increased-arctic-and-antarctic-shipping>. Bill Hemmings, speaking on behalf of a number of environmental groups, commented that “[a] Polar Code which fails to address the major environmental dangers of increased shipping opens the door to potentially catastrophic consequences should a disaster happen. Environmental protection has essentially been put on the back-burner through the active lobbying of the shipping and cruise industry which consistently dismisses ecological concerns.” *Id.* He further opined that that the Polar Code “is a disgraceful illustration of big business working behind closed doors to advance its own corporate interests before those of mankind and the unique polar environment. When the next big incident happens in polar waters the public will know where responsibility lies.” *Id.*

183. *Environmentalists Critical of Draft IMO Polar Code*, MARITIME REPORTER & MARINE NEWS MAGAZINE (Jan. 30, 2014), <http://www.marinelink.com/news/environmentalists-draft363642.aspx>.

184. *Id.*

185. *Id.*

186. *Id.*

187. Sakhuja, *supra* note 177.

188. *Id.*

Despite its imperfections, a comprehensive Polar Code is not just a good idea, nor should it be merely optional. It is a necessity if the future of the area and its indigenous peoples is to be secure. While the opening of new Arctic shipping lanes is “attractive to business, the lack of regulations” in the high north “poses safety, environmental and legal issues that have yet to be resolved”¹⁸⁹ With the imminent viability of “open-water ships entering the Arctic Ocean in late summer,” there is a heightened “urgency for comprehensive international regulations that provide adequate environmental protections, vessel safety standards and search-and-rescue capability.”¹⁹⁰ It must always be remembered that “[t]he Arctic is a fragile and dangerous place.”¹⁹¹ While ultimately, an IMO Polar Code will represent a compromise, what is needed for the Arctic is immediate perception, not ultimate perfection.

V. CONCLUSION

This paper resulted from the intersection of two unassailable facts. First, maritime shipping is the most efficient and cost effective means by which to move cargo.¹⁹² It is much more environmentally friendly than transporting cargo via truck or train.¹⁹³ Second, shortcuts through the Arctic are no longer simply entertaining fictions of the silver screen.¹⁹⁴ Due to the continued melting of the Arctic Ocean ice cap, increased vessel traffic in the region is no longer a prediction, it is a given. There are many positives about a future where vessels ply the Northwest Passage. The route will save not only time and money, but also use less fuel, resulting in fewer carbon dioxide emissions, and, at least for the foreseeable future, protect seafarers from encountering pirates.¹⁹⁵ More importantly, the future of the Arctic is also a test for humankind.

189. Sullivan, *supra* note 7.

190. *Id.* (quoting Laurence C. Smith). The reality of new shipping lanes in the Arctic “is also likely to increase the pressure on the U.S. to ratify the United Nations Convention on the Law of the Sea.” *Id.* Certain of the “newly accessible shipping lanes would pass through waters over which the U.S. could make internationally accepted sovereignty claims” *Id.* If the treaty were ratified, as a sovereign nation, the United States would have the power to regulate any vessels passing through its waters. *Id.* For example, “Russia, which controls the Northern Sea Route, currently requires shipping companies to pay steep fees for escort vessels to accompany their fleets.” *Id.*

191. *Id.*

192. See, e.g., Jeff Alexander, *Study: Shipping Goods on the Great Lakes Still the Best Way*, MUSKEGON CHRONICLE (Mar. 20, 2009), http://www.mlive.com/news/muskegon/index.ssf/2009/03/sat_transporting_goods_by_ship.html (discussing a study by the Army corps of Engineers finding that ships which haul cargo on the Great Lakes “move freight at much less cost than trucks or trains and generate far less air pollution . . .”).

193. *Id.*

194. See, e.g., NORTHWEST PASSAGE (MGM 1940).

195. Terry Macalister, *Thawing Arctic Opens up New Shipping Routes on the ‘Roof of the World’*, THE GUARDIAN (July 5, 2011, 10:50 PM), <http://www.theguardian.com/environment/2011/>

The Arctic is “one of our planet’s last great frontiers.”¹⁹⁶ In the past, relying upon the old adage “possession is nine-tenths of the law,” nations have chosen to cross the seas and conquer the land and destroy cultures.¹⁹⁷ As vessel traffic increases, nation-states must realize that a race for resources will only result in exploitation of the far north. What must be avoided is allowing exploration to become synonymous with exploitation. What is needed “is a conversation involving human beings who want to learn together.”¹⁹⁸ If nations can “act responsibly in a spirit of trust and cooperation,” the future scenario for the Arctic will not be an apocalyptic tale, but will demonstrate how valuable resources can be “developed in a sustainable manner that also respects the fragile environment and the interests and cultures of indigenous peoples.”¹⁹⁹ As shipping lanes open up allowing vessels to navigate the new latitudes of the Arctic, the international maritime community must embrace a new attitude. Instead of a nationalistic race for resources and the control of new shipping lanes, an unknown course must be charted towards a future of sustainable shipping from a global perspective of cooperation and responsibility for the world environment. It is time to hoist anchor and set sail on a conflict-free voyage of cooperative stewardship.

jul/05/arctic-shipping-trade-routes. In contrast, when traveling from Europe to Asia via the Suez Canal, the likelihood of encountering pirates is quite high. See *Egypt’s Suez Canal Feels the Heat as Piracy Spikes*, USA TODAY (Nov. 25, 2008), http://usatoday30.usatoday.com/news/world/2008-11-25-suez-piracy_N.htm.

196. THE WHITE HOUSE, NATIONAL STRATEGY FOR THE ARCTIC REGION (May 10, 2013), available at http://www.whitehouse.gov/sites/default/files/docs/nat_arctic_strategy.pdf. See also Jonathan S. Spaner, *The Arctic: Emerging Maritime Frontier*, MARITIME REPORTER & MARINE NEWS MAGAZINE (Jan. 28, 2014), <http://www.marinelink.com/news/emerging-maritime363501.aspx> (quoting Admiral Bob Papp, Jr., the commandant of the U.S. Coast Guard, who noted that “one example of what our future holds can be seen in the emerging frontier of the Arctic, where there is a new ocean appearing . . .”).

197. Richard H. Robbins, *The Fate Of Indigenous Peoples in the Modern World* (Feb. 15, 1999), http://faculty.plattsburgh.edu/richard.robby/legacy/editors_choice/indigenous.htm (“In the United States, for example, Indigenous peoples were killed off by disease, slavery, forced labor, or war, the remnants confined to reservations whose boundaries shrank as more and more people desired their land; indigenous peoples in South and central America, Africa, Asia, Europe and Australia faced much the same fate. Few, if any, remaining indigenous peoples are able to maintain fully the culture of their ancestors.”).

198. GLOBAL BUSINESS NETWORK, THE FUTURE OF ARCTIC MARINE NAVIGATION IN MID-CENTURY: SCENARIO CREATION WORKSHOP NOTES (2007), available at http://www.northslope.org/media/doc/2014/Feb/AMSA_Scenarios_Workshop_San_Francisco_Apr_07.pdf.

199. THE WHITE HOUSE, *supra* note 196, at 4.