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ICEBERG HARVESTING: SUGGESTING A FEDERAL REGULATORY REGIME FOR A NEW FRESHWATER SOURCE

CORY LEWIS*

Abstract: The global freshwater shortage has already reached crisis levels. The World Health Organization and UNICEF estimate that there are over 700 million people in the world without access to clean drinking water. While this crisis continues to intensify, a massive, game changing source of freshwater is floating in the Arctic and Antarctic oceans, slowly melting away: icebergs. This Note analyzes the potential for harvesting icebergs as a freshwater source on a global scale. By focusing on and illustrating the legal status of icebergs on the high seas, this Note seeks to demonstrate why icebergs are *res nullius*—existing in a legal vacuum. Proceeding under the substantiated assumption that icebergs are *res nullius*, this Note suggests that unilateral action by the United States is the most effective way to ascertain whether iceberg harvesting is, in fact, a practical solution to the global freshwater shortage. Further, if iceberg harvesting is established as such a solution, this Note suggests that unilateral U.S. action is also the most effective way to jumpstart an international iceberg harvesting industry. Finally, this Note proposes two regulatory options for how the U.S. Government can promulgate a legal regime to regulate a future iceberg harvesting industry.

INTRODUCTION

The World Health Organization and UNICEF estimate that there are over 700 million people in the world without access to clean drinking water.¹ This disastrous situation is likely to become even more dire, as the world is already experiencing the severe effects of freshwater shortages and drought.² Drinking water shortages are not a problem unique to developing nations or third world countries; several western states in the United States have already experienced,

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¹ WORLD HEALTH ORG. & UNICEF, PROGRESS ON DRINKING WATER AND SANITATION—2014 UPDATE 6–8 (2014), available at http://apps.who.int/iris/bitstream/10665/112727/1/9789241507240_eng.pdf?ua=1, archived at <http://perma.cc/4GKM-H5KT>.

² See DEF. INTELLIGENCE AGENCY ET AL., GLOBAL WATER SECURITY, INTELLIGENCE COMMUNITY ASSESSMENT, at iii (2012), available at http://www.dni.gov/files/documents/Special%20Report_ICA%20Global%20Water%20Security.pdf, archived at <http://perma.cc/LW4A-PTCE>; *Millions Lack Safe Water*, WATER.ORG, <http://water.org/water-crisis/water-facts/water/> (last visited Feb. 5, 2014), archived at <http://perma.cc/PA5G-Y33K>.

or are still experiencing, severe water shortages.³ The State Department released a report on World Water Day 2012 that brought the severity of the issue on a global basis into sharp focus.⁴ According to the report, the global demand for fresh water will exceed the available supply by forty percent by the year 2030.⁵

Icebergs might literally hold the solution to this endemic problem.⁶ An iceberg is a massive chunk of ice that has calved⁷ off of a continental glacier due to wave action and sub-glacial stress.⁸ Icebergs represent a substantial, constantly renewable,⁹ and potentially environmentally neutral untapped freshwater source.¹⁰ Approximately 75% of the world's fresh water is held in ice, and of that volume, approximately 90% sits in the Antarctic.¹¹ From its

³ See Norimitsu Onishi & Malia Wollan, *California Watches Bad Drought Grow Worse*, N.Y. TIMES, Jan. 18, 2014, at A12, available at <http://www.nytimes.com/2014/01/18/us/as-californias-drought-deepens-a-sense-of-dread-grows.html>, archived at <http://perma.cc/4EFU-EZAT>; U.S. Drought Monitor, NAT'L DROUGHT MITIGATION CTR., <http://droughtmonitor.unl.edu/> (last updated Feb. 3, 2015), archived at <http://perma.cc/29EV-4KKU>.

⁴ Steve Tracton, *World Water Day: A Forceful Reminder That the U.S. Is Running Out of Fresh Water*, WASH. POST (Mar. 22, 2013), <http://www.washingtonpost.com/blogs/capital-weather-gang/wp/2013/03/22/world-water-day-a-forceful-reminder-that-the-u-s-is-running-out-of-fresh-water/>, archived at <http://perma.cc/535Q-BDE8>.

⁵ See DEF. INTELLIGENCE AGENCY ET AL., *supra* note 2, at iii; Tracton, *supra* note 4.

⁶ See Cédric Simard, *Turning Icebergs into Drinking Water?*, DASSAULT SYSTÈMES: 3D PERSPECTIVES, (Oct. 15, 2010, 12:12 PM), <http://perspectives.3ds.com/environment/turning-icebergs-into-drinking-water/>, archived at <http://perma.cc/XAW2-KN65>.

⁷ “[T]o separate or break so that a part becomes detached.” MIRIAM WEBSTER’S COLLEGIATE DICTIONARY 163 (10th ed. 2001).

⁸ Christopher C. Joyner, *Ice-Covered Regions in International Law*, 31 NAT. RESOURCES J. 213, 231 (1991). As of 1991, the largest iceberg ever sighted was 208 miles long and sixty miles wide. *Id.* at 231–32.

⁹ Thomas R. Lundquist, *The Iceberg Cometh?: International Law Relating to Antarctic Iceberg Exploitation*, 17 NAT. RESOURCES J. 1, 2 (1977); see JOHN L. HULT & NEILL C. OSTRANDER, ANT-ARCTIC ICEBERGS AS A GLOBAL FRESH WATER RESOURCE 5–7 (1973), available at <http://www.rand.org/content/dam/rand/pubs/reports/2008/R1255.pdf>, archived at <http://perma.cc/3BTN-QC4P>. *But see* Press Release, Univ. of Leeds, Melting Icebergs Causing Sea Level Rise (Apr. 29, 2010) [hereinafter Leeds Press Release] (noting that a University of Leeds study has found that global warming is causing rapid melting of icebergs), available at http://www.leeds.ac.uk/news/article/793/melting_icebergs_causing_sea_level_rise, archived at <http://perma.cc/8DDE-VRHD>. Because icebergs calve off of the Antarctic ice shelves at a consistent annual rate, they would be a renewable source of fresh water if harvested. Lundquist, *supra*, at 2.

¹⁰ Bryan S. Geon, Note, *A Right to Ice?: The Application of International and National Water Laws to the Acquisition of Iceberg Rights*, 19 MICH. J. INT’L L. 277, 279 (1997); see Lundquist, *supra* note 9, at 6–7.

¹¹ HULT & OSTRANDER, *supra* note 9, at 5. The continent of Antarctica covers approximately 5.4 million square miles, and on top of that land, approximately 29 quadrillion gallons of fresh water ice is generated annually, making the estimated total volume of ice in Antarctica 290 quintillion gallons, and counting. *Id.* By comparison, the area of the United States is approximately 3.8 million square miles—1.6 million square miles smaller than the area of Antarctica. *Id.*; *State Area Measurements and Internal Point Coordinates*, U.S. CENSUS BUREAU, <http://www.census.gov/geo/reference/state-area.html> (last revised Dec. 5, 2012), archived at <http://perma.cc/E2C4-RHBG>.

total volume of ice, Antarctica annually calves approximately 93% of the world's total iceberg mass—an estimated 326 quadrillion gallons of freshwater in the form of icebergs.¹² Further, nearly 5 quadrillion gallons of icebergs calve from the polar icecap annually; an amount which alone, if harvested, could satisfy the annual water needs of 5 billion people.¹³

Towing an iceberg from one of the polar icecaps to a country in need might seem more like science fiction than a practical solution to water shortages, but scientists, scholars and politicians have been talking about iceberg-harvesting as a potentially viable fresh water source since the 1950s.¹⁴ Although it has not yet been done, the increasing need for freshwater around the world, the continued abundance of icebergs¹⁵ and the advancing state of the technology and science¹⁶ that would be necessary to make iceberg harvesting possible, might soon expedite the practice.¹⁷ In fact, in 2011 French engineer Georges Mougin—the leader of the iceberg harvesting movement since the 1970s—partnered with the design firm Dassault Systèmes to create a 3-D simulation of towing an iceberg from Newfoundland, nearly 3000 miles across the Atlantic Ocean, to the Canary Islands.¹⁸ The simulation suggests that it is en-

¹² HULT & OSTRANDER, *supra* note 9, at v; Joyner, *supra* note 8, at 231; *see infra* note 47 and accompanying text. The United States uses an estimated 12 trillion gallons of water per day, which is over 4 quadrillion gallons of water per year. HULT & OSTRANDER, *supra* note 9, at 3.

¹³ Geon, *supra* note 10, at 279. Although not all icebergs can be utilized, this number is substantial when considering that polar icebergs account for only seven percent of the world's total concentration. *See id.*

¹⁴ *Id.* at 279–80. Talks reached a high-point in 1977 when Saudi prince Mohammad al-Faisal funded a conference at Iowa State University—led by French engineer Georges Mougin—seeking to bring icebergs to Saudi Arabia. *Id.*

¹⁵ *See* Leeds Press Release, *supra* note 9. Global warming has actually led to more, not fewer, icebergs in the polar regions. *Id.* Despite the continued abundance, however, Professor Andrew Shepherd of the University of Leeds, who conducted the 2010 study, concluded that the overall global volume of floating ice is receding because icebergs are melting at a much faster pace. *Id.*

¹⁶ *See infra* notes 54–70 and accompanying text.

¹⁷ *See* Geon, *supra* note 10, at 281–82; Cédric Simard, *How To: Tow an Iceberg Pt. 1*, DASSAULT SYSTÈMES: 3D PERSPECTIVES (Apr. 18, 2011, 11:58 AM), <http://perspectives.3ds.com/environment/how-to-tow-an-iceberg-pt-1/>, archived at <http://perma.cc/X5Z8-QGVE>; Cédric Simard, *How To: Tow an Iceberg Pt. 2*, DASSAULT SYSTÈMES: 3D PERSPECTIVES (May 9, 2011, 12:50 PM), <http://perspectives.3ds.com/environment/how-to-tow-an-iceberg-part-2/>, archived at <http://perma.cc/F3DA-Z9BB>; Cédric Simard, *How To: Tow an Iceberg Part 3*, DASSAULT SYSTÈMES: 3D PERSPECTIVES (May 16, 2011, 1:14 PM), <http://perspectives.3ds.com/environment/how-to-tow-an-iceberg-part-3/>, archived at <http://perma.cc/7TFM-ATWR>.

¹⁸ David Zax, *Watch a Tugboat Drag an Arctic Iceberg to Parched People Half a World Away*, FAST COMPANY (May 31 2011, 1:15 AM), <http://www.fastcompany.com/1755444/watch-tugboat-drag-arctic-iceberg-parched-people-half-world-away-video>, archived at <http://perma.cc/F7MA-Q44J>; *Interactive Map*, UNITED NATIONS EDUC., SCIENTIFIC & CULTURAL ORG., <http://whc.unesco.org/en/interactive-map/> (last visited Feb. 5, 2015), archived at <http://perma.cc/Q82F-R83Z>.

tirely possible.¹⁹ Based on the successful computer simulation, Mougins's team hopes to attempt a real-world tow in the very near future.²⁰

If iceberg harvesting became a reality tomorrow, the practice would operate in a legal vacuum.²¹ In all likelihood, because of the lack of a current iceberg harvesting market, neither the international community nor any individual nation has promulgated laws or regulations expressly designed to regulate the process.²² Several legal scholars have addressed this potential legal vacuum within the context of towing and harvesting Antarctic icebergs.²³ Due to the volume of icebergs in Antarctica, and the scientifically based prediction that Antarctic waters are the most likely source of tabular, harvestable icebergs, this Note will continue with the same practical approach.²⁴ Unlike prior legal scholarship, however, this Note acknowledges the potential legal vacuum that has already been identified, and then considers how to avoid it, or at least minimize its effect on the growth of iceberg harvesting as a new natural resource industry.²⁵

If the U.S. Government were to take the view that icebergs are legally free for the taking, it would be free to proceed with iceberg harvesting operations and regulation thereof, without interference from any national or international regulatory body.²⁶ Further, if the United States were to get involved, the resulting regulation might protect U.S. interests.²⁷ This Note seeks to identify the optimal regulatory necessities of a comprehensive federal iceberg harvesting legal regime.²⁸ Further, it explores existing federal laws and bodies that could incorporate such a regime, and suggests two regulatory approaches for facilitating, continually supporting, and controlling a robust iceberg harvesting industry.²⁹

¹⁹ Simard, *How To: Tow an Iceberg, Part 3*, *supra* note 17; Zax, *supra* note 18.

²⁰ Zax, *supra* note 18. The Dassault Systèmes three dimensional model was run in 2011, but a real tow has yet to occur on a large scale. *See id.*

²¹ Geon, *supra* note 10, at 282; *see* Joyner, *supra* note 8, at 232.

²² *See* Joyner, *supra* note 8, at 232; Geon, *supra* note 10, at 281–82.

²³ *See* Joyner, *supra* note 8, at 232; Lundquist, *supra* note 9, at 7–26; Geon, *supra* note 10, at 281. The focus on Antarctica is due to the fact that Antarctic icebergs possess the largest potential source of harvestable freshwater. *See* Joyner, *supra* note 8, at 232; Lundquist, *supra* note 9, at 7–26; Geon, *supra* note 10, at 281.

²⁴ *See* WILLIAM F. WEEKS & WILLIAM JOSEPH CAMPBELL, U.S. ARMY CORPS OF ENGINEERS, ICEBERGS AS A FRESH WATER SOURCE: AN APPRAISAL 1–2 (1973); Joyner, *supra* note 8, at 231.

²⁵ *See infra* notes 109–300 and accompanying text.

²⁶ *See* Joyner, *supra* note 8, at 232–34; Lundquist, *supra* note 9, at 23.

²⁷ *See* Joyner, *supra* note 8, at 232–34; Lundquist, *supra* note 9, at 23.

²⁸ *See infra* notes 30–321 and accompanying text.

²⁹ *See infra* notes 109–300 and accompanying text.

I. HISTORICAL BACKGROUND

The idea of towing an iceberg across the world to bring freshwater to places in need has been around for approximately sixty years.³⁰ In 1977, Prince Mohammad al-Faisal of Saudi Arabia sponsored the first large-scale conference on iceberg utilization, which was named the First International Conference and Workshops on Iceberg Utilization for Fresh Water Production, Weather Modification and Other Applications.³¹ Led by French engineer Georges Mougin—who is still working towards his dream of towing an iceberg—the conference sought to identify and discuss the technological, economic, political, legal and practical obstacles of iceberg harvesting, with the goal of turning the arid desert lands of Saudi Arabia into arable, fertile lands.³² Although the conference ended in disagreement over the eventual possibility of towing an iceberg and was overshadowed by the specter of the massive projected cost,³³ the concept remained alive.³⁴

In 2011 Mougin partnered with the French firm Dassault Systèmes to utilize its advanced 3D modeling systems.³⁵ Using the Dassault Systèmes modeling technology, declassified satellite data and the relatively new science of oceanic forecasting, Mougin's team ran a successful computer simulation, suggesting that iceberg harvesting is now a real possibility.³⁶ The simulation even gave rise to a national commercial advertising campaign by Dassault Systèmes, which prominently features visual graphics of the simulation.³⁷

As of the date of this publication, an iceberg has yet to be towed and harvested.³⁸ Mougin's successful simulation and the ever growing global need for

³⁰ Geon, *supra* note 10, at 279. See generally Jerry Rosenberg, *An Overview of the Organizational, Management, Economic and Socio-Political Aspects of Transporting Icebergs from Antarctica to the United States*, in ICEBERG UTILIZATION: PROCEEDINGS OF THE FIRST INTERNATIONAL CONFERENCE HELD AT AMES, IOWA 616 (Abdo Husseiny ed., 1978) (providing an overview of the substantive concepts discussed at the conference, and more broadly, of the issues that were identified by people thinking about iceberg harvesting in the 1970s).

³¹ Geon, *supra* note 10, at 279–80.

³² See *id.*; Zax, *supra* note 18.

³³ See Lundquist, *supra* note 9, at 5–6.

³⁴ Iceberg harvesting ideas have been floated several times since the conference, such as in 1980, when an inventor from California proposed a self-propelled iceberg, and in 1992, when the British National Rivers Authority considered, but ultimately rejected, a towing plan. See Geon, *supra* note 10, at 280–81.

³⁵ Zax, *supra* note 18.

³⁶ By utilizing advanced technologies and a sophisticated understanding of tides and currents, the simulation would be generally successful under a wide variety of conditions. *Id.*

³⁷ Digital Frontier, *IceDream - IFWE by Dassault Systèmes*, YOUTUBE.COM (May 9, 2012), <http://www.youtube.com/watch?v=PL5blnAH9xw>, archived at <http://perma.cc/W874-JTNW>.

³⁸ See Zax, *supra* note 18. This article was published in 2011, but no new evidence of a successful tow exists to date.

freshwater, however, point to the increasing possibility that iceberg harvesting could become a common practice in the near future.³⁹

II. TECHNICAL AND ECONOMIC BACKGROUND

Icebergs are the world's largest untapped freshwater source.⁴⁰ Because it is estimated that the Antarctic waters contain up to ninety-three percent of the planet's iceberg concentration, a technical and economic analysis of iceberg harvesting operations in the Antarctic is the most practical model to explore.⁴¹ In order to conceptualize this approach, it is helpful to first understand what icebergs are.⁴²

Much of the land in both the Arctic and in Antarctica is covered with massive continental glaciers.⁴³ As snow falls on these ice sheets, it compounds onto itself and eventually compresses the underlying snow into an ice-like form.⁴⁴ Concurrently, the continental glaciers perpetually move outward towards water, where the compacted snow eventually calves from the ice shelf and floats out to sea.⁴⁵ When the icebergs calve off, they slowly drift out towards the open ocean and melt over an average span of ten years.⁴⁶ Antarctica alone calves an estimated 326 quadrillion gallons per year—equal to approximately 500 million average-sized Olympic swimming pools, or approximately 92 billion Boeing 747-400 Freighter jets full of water.⁴⁷ Where the average human being consumes approximately 52,834 to 79,251 gallons of water per year, Antarctic icebergs contain enough fresh water to supply four to six billion people per year.⁴⁸ It is estimated that the total annual yield of icebergs calved off of Antarctica would be sufficient to irrigate 250 million or more acres of land.⁴⁹

³⁹ Geon, *supra* note 10, 281; *Millions Lack Safe Water*, *supra* note 2; Zax, *supra* note 18.

⁴⁰ See Mass. Inst. Tech., *Glacial Icebergs: Sources of Freshwater*, MISSION 2012 CLEAN WATER, <http://web.mit.edu/12.000/www/m2012/finalwebsite/solution/glaciers.shtml> (last visited Feb. 5, 2015), archived at <http://perma.cc/V9KT-FYZ5>.

⁴¹ See Joyner, *supra* note 8, at 231.

⁴² See HULT & OSTRANDER, *supra* note 9, at 7; Lundquist, *supra* note 9, at 2.

⁴³ Joyner, *supra* note 8, at 213–14.

⁴⁴ Lundquist, *supra* note 9, at 2.

⁴⁵ *Id.*

⁴⁶ HULT & OSTRANDER, *supra* note 9, at 5–7. Drifting icebergs have an average melt rate of one to ten meters of volume per year, which indicates the potential longevity and durability of an iceberg being towed across the world. See *id.*; *infra* notes 54–70 and accompanying text. But see *supra* note 9 and accompanying text (discussing the effect of global warming on transitory iceberg's melt rate).

⁴⁷ HULT & OSTRANDER, *supra* note 9, at 7. The number presented by Hult & Ostrander, 1.2 x 10¹⁵ kg, is the equivalent of 3,170,064,614,900,000 U.S. gallons of water. See *id.* To provide a point of reference, the average Olympic sized swimming pool is 660,000 U.S. gallons, and a Boeing 747's cabin can fit approximately 3456 U.S. gallons of fluid.

⁴⁸ *Id.* at 8–9.

⁴⁹ *Id.* at 5–7.

The following outline of the technical, economic, and environmental implications of iceberg harvesting provides the basic, non-legal contextual information that will need to be further explored if iceberg harvesting operations ever begin.⁵⁰ Although these issues are critical considerations for any future iceberg harvesting legal regime, they are addressed in this Note in a very basic way, and would have to be addressed comprehensively by appropriate experts in the future.⁵¹ Further, it is unlikely that iceberg harvesting will ever become a common practice unless a substantial amount of startup investment, research, and analysis is done.⁵² As such, this Note proceeds under the assumption that the legal regime suggested would be able to adequately address these issues.⁵³

A. Is Towing an Iceberg Thousands of Miles Actually Possible?

Through the use of modern science and technology, it appears that towing an iceberg from one of the polar-regions to a warmer climate across the ocean is possible right now.⁵⁴ The issue of the technical practicability of towing an iceberg can be broken down into four parts: (1) locating a suitable source and supply; (2) calculating the necessary towing power requirements; (3) accurately predicting and accounting for in-transit melt; and (4) estimating the economic feasibility of the entire endeavor.⁵⁵ Not just any iceberg can be towed and harvested.⁵⁶ Due to the massive size, weight, and density of an iceberg, there is a great risk of one rolling over while being towed.⁵⁷ As such, rectangular icebergs with tabular⁵⁸ shapes—that have a similar draft, or underwater shape, to that of a ship—are the most desirable.⁵⁹ The Arctic tends to produce fewer tab-

⁵⁰ See WEEKS & CAMPBELL, *supra* note 24, at 1. Weeks & Campbell's study was conducted in 1973, and thus it is likely that the scientific and economic data relied on would need to be revisited. *See id.*

⁵¹ *See generally infra* notes 54–108 and accompanying text (identifying the issues that will need to be addressed).

⁵² See Lauren E. Shaw, *Asteroids, the New Western Frontier: Applying Principles of the General Mining Law of 1872 to Incentivize Asteroid Mining*, 78 J. AIR L. & COM. 121, 133–36 (2013) (discussing the prefatory factors that are necessary to incentivize a natural resource industry where one does not yet exist).

⁵³ *See infra* notes 240–300 and accompanying text. Such issues are crucial to the potential creation and success of an iceberg harvesting industry and will need to be properly addressed before any operation can proceed. *See infra* notes 240–300 and accompanying text.

⁵⁴ *See Zax, supra* note 18.

⁵⁵ WEEKS & CAMPBELL, *supra* note 24, at 1.

⁵⁶ *See id.*

⁵⁷ *See generally id.* (discussing the science behind towing an iceberg).

⁵⁸ MIRIAM WEBSTER'S DICTIONARY, *supra* note 7, at 1195 (defining tabular as “having a flat surface”).

⁵⁹ WEEKS & CAMPBELL, *supra* note 24, at 1–4.

ular icebergs, and thus the primary source of suitable specimens is projected to be the Antarctic.⁶⁰

Once a suitable iceberg is chosen,⁶¹ one must confront the great logistical challenges presented by transporting a massive block of ice across an ocean.⁶² In a study done in 1973 by John Hult and Neill Ostrander (“Hult & Ostrander”), the feasibility of towing an iceberg from the Ross Ice Shelf in Antarctica to Southern California was considered.⁶³ Their concept was to herd multiple icebergs into a procession that would use a combination of propulsion and the ocean currents to tow icebergs from Antarctica to California without experiencing so much melting that the purpose would be defeated.⁶⁴ They proposed using a sophisticated array of propulsion methods, including attaching shrouded propellers onto the icebergs themselves and wrapping the icebergs in wafled plastic covering the entire underside to prevent excessive melting.⁶⁵

More recently, Georges Mougin’s team used innovative technology and science⁶⁶ to capitalize on the Hult & Ostrander study’s basic concepts, leading to a successful 3-D computer simulation of a large-scale tow.⁶⁷ Mougin’s team also accounted for the previously unaddressed issues of the traction force generated by the tugboat, fuel consumption, air and water drag against the iceberg and the tug, and even the Earth’s rotation.⁶⁸ Although the issue of melt-rate is

⁶⁰ *Id.* at 1. By using declassified satellite data and information gathered by the International Ice Patrol of the U.S. Coast Guard, locating suitable icebergs and reaching their location is more practical now than it has ever been. See *About International Ice Patrol (IIP)*, U.S. COAST GUARD NAVIGATION CTR., <http://www.navcen.uscg.gov/?pageName=IIPHome> (last updated Dec. 23, 2014), archived at <http://perma.cc/HJ4B-WH4R>. Antarctic icebergs become an even more attractive source when the U.S. Coast Guard’s well-established presence in Antarctica is taken into consideration. *Id.*

⁶¹ See JOHN L. HULT & NEILL C. OSTRANDER, *APPLICABILITY OF ERTS FOR SURVEYING ANTARCTIC ICEBERG RESOURCES 1* (1973), available at <http://www.rand.org/content/dam/rand/pubs/reports/2008/R1354.pdf>, archived at <http://perma.cc/S2KQ-8Z4P>. This more advanced Hult & Ostrander study proposed using Earth Resources Technology Satellites to locate and capture suitable tabular icebergs. *Id.*

⁶² See Lundquist, *supra* note 9, at 3.

⁶³ HULT & OSTRANDER, *supra* note 9, at 16.

⁶⁴ *Id.* at 10–16; Lundquist, *supra* note 9, at 3–4.

⁶⁵ HULT & OSTRANDER, *supra* note 9, at 10–12. Further, the wrapping might be able to contain and insulate the water that did melt from the salt water. *Id.*

⁶⁶ Zax, *supra* note 18 (noting that the study utilized declassified advanced satellite imagery, progressive meteorological and oceanographical techniques, and a sophisticated, modern understanding of ocean currents, swells, winds and bottom topography to design its successful simulated tow); see also Simard, *How To: Tow an Iceberg, Pt. 2*, *supra* note 17; Simard, *How To: Tow an Iceberg, Part 3*, *supra* note 17. Compare Zax, *supra* note 18 (demonstrating the modern science and technology used in Mougin’s study), with HULT & OSTRANDER, *supra* note 9, at 10–16 (demonstrating the state of the art technology in the late 1970s).

⁶⁷ Zax, *supra* note 18; see also *supra* note 17 and accompanying text (illustrating the advanced technology that made Mougin’s simulation possible).

⁶⁸ Simard, *How To: Tow an Iceberg, Pt. 1*, *supra* note 17.

still in question,⁶⁹ climatologists and engineers believe that the modern technological and scientific advances available today have made iceberg towing a realistic option.⁷⁰

B. How Much Will It Cost to Tow an Iceberg Thousands of Miles?

The projected costs of iceberg harvesting can be broken down into four components: (1) technological innovation; (2) iceberg identification and retrieval; (3) transportation; and (4) arrival site processing and distribution.⁷¹ These costs must be competitive with those of alternative freshwater supply technologies for iceberg harvesting to be viable.⁷² Further, despite the massive global need for fresh water,⁷³ there must be a market for the water in the region where the iceberg is delivered or the entire concept will be economically and practically unsustainable.⁷⁴

Although a recent financial analysis of the estimated yearly amortized capital investment necessary to run a harvesting operation has not been done,⁷⁵ the numbers arrived at by Hult & Ostrander, and by a similar study done by William F. Weeks and William Joseph Campbell (“Weeks & Campbell”) in the 1970s, are worth noting.⁷⁶ Using Weeks & Campbell’s more basic study, Hult & Ostrander ran a more comprehensive financial analysis.⁷⁷ Based on their projections, an iceberg could be delivered at a cost of approximately \$20 per acre-foot.⁷⁸ Compared to the estimates for other options such as long-range inter-basin water transfer, at \$50 to \$60 per acre-foot range,⁷⁹ or desalination at

⁶⁹ See generally John J. Helly et al., *Cooling, Dilution and Mixing of Ocean Water by Free-Drifting Icebergs in the Weddel Sea*, 58 DEEP-SEA RESEARCH II 1346 (2011), available at http://ac.els-cdn.com/S0967064510003668/1-s2.0-S0967064510003668-main.pdf?_tid=4aab770c-ad5c-11e4-bcae-00000aabb0f02&acdnat=1423157443_99e24d550dd47a3120daf7900b4df07d, archived at <http://perma.cc/X5BX-LXQY>. Professor Helly is currently conducting an in-depth scientific study of ice melting rates in order to ascertain whether towing an iceberg from Antarctica is possible. *Id.*

⁷⁰ Simard, *How To: Tow an Iceberg, Part 3*, *supra* note 17; Zax, *supra* note 18.

⁷¹ See Lundquist, *supra* note 9, at 3–5.

⁷² See WEEKS & CAMPBELL, *supra* note 24, at 15–16; Lundquist, *supra* note 9, at 3–5.

⁷³ See DEF. INTELLIGENCE AGENCY ET AL., *supra* note 2, at iii.

⁷⁴ See Lundquist, *supra* note 9, at 5–6.

⁷⁵ See *id.* at 4–5. Lundquist foresaw that these numbers would need to be computed again in light of the economic circumstances present at the time when iceberg harvesting became a reality. See *id.* It is thus a distinct possibility that iceberg harvesting is no longer the cheapest and most efficient option to solve fresh water shortages. See *id.*; *infra* note 79–80 and accompanying text (discussing current cost estimates of inter-basin water transfer and desalination).

⁷⁶ See HULT & OSTRANDER, *supra* note 9, at 38; WEEKS & CAMPBELL, *supra* note 24, at 15–16; Lundquist, *supra* note 9, at 4–5.

⁷⁷ HULT & OSTRANDER, *supra* note 9, at 37–38; Lundquist, *supra* note 9, at 5.

⁷⁸ Lundquist, *supra* note 9, at 5.

⁷⁹ *Id.* at 6 (citing C. HOWE & K. EASTER, INTERBASIN TRANSFERS OF WATER 169 (1971)). Inter-basin water transfer is “the diversion of water from one water source basin to another.” BARBARA COSENS, THE WATER REPORT, NEW ERA OF INTERBASIN WATER TRANSFERS 21 (2010), available at <http://www.infrastructureusa.org/wp-content/uploads/2010/03/twr-waterxfers.pdf>, archived at <http://>

an even greater cost of approximately \$100 per acre-foot,⁸⁰ iceberg harvesting would be a relative bargain.⁸¹ Further, it carries the potential for significant profit.⁸²

C. Potential Environmental Implications

Fresh water is needed in all aspects of life.⁸³ Along with being a necessity for human survival, fresh water plays a critical role in countless businesses and other commercial endeavors and in the continued survival of the planet's diverse ecosystems.⁸⁴ If iceberg harvesting were to prove successful, the environmental benefits would be extensive.⁸⁵ One could imagine the effect that an abundance of freshwater would have had on the state of Texas in 2011 when it experienced devastating drought, or in California, where severe drought and wildfires abound.⁸⁶ Even more recently, if there had been an iceberg conveniently parked off the Atlantic coast, the effects of the chemical pollution of West Virginia's water supply in late 2013 could have been significantly mitigated.⁸⁷ Further, by introducing non-watershed-dependent sources of freshwater as an alternative to domestically situated freshwater, overly used domestic

perma.cc/S6SE-ZLQ5. According to the Environmental Protection Agency (EPA), inter-basin water transfer is used to bring water to areas in need across the United States, and further, the practice is facilitated at the federal level through the Bureau of Reclamation and the Army Corps of Engineers. *See id.* In 2006, a study conducted by the Texas Water Development Board estimated the cost to deliver water through inter-basin water transfer in the Bedias Reservoir Interbasin Transfer to be \$125 per acre-foot. R. W. BECK, INC., SOCIOECONOMIC ANALYSIS OF SELECTED INTERBASIN TRANSFERS IN TEXAS 4-2 tbl.4-1 (2006), available at https://www.twdb.texas.gov/publications/reports/contracted_reports/doc/InterbasinTransfers_draft.pdf, archived at <https://perma.cc/48CQ-TJ9H>.

⁸⁰ Lundquist, *supra* note 9, at 6. In 2012, over forty years after Hult & Ostrander conducted their study, the Texas Water Development Board estimated that the delivery costs of desalinated water were anywhere between \$357 to \$1400 per acre-foot depending on the type and source of the saltwater. *Desalination Facts*, TEX. WATER DEV. BD., <http://www.twdb.texas.gov/innovativewater/desal/facts.asp> (last visited Feb. 5, 2015), archived at <http://perma.cc/8PS4-99AU>.

⁸¹ Lundquist, *supra* note 9, at 6.

⁸² *See id.* at v.

⁸³ *Protection of the Quality and Supply of Freshwater Resources: Application of Integrated Approaches to the Development, Management and Use of Water Resources*, UNITED NATIONS ENV'T PROGRAMME, <http://www.unep.org/Documents/Multilingual/Default.asp?documentid=52&articleid=66> (last visited Feb. 5, 2015), archived at <http://perma.cc/S2BU-YXSV>.

⁸⁴ Said benefits would not just be due to the availability of a massive, renewable source of freshwater, but also to the existing sources of freshwater that would no longer need to suffer such pervasive and damaging overuse. *See id.*

⁸⁵ *See id.*; *Water Resources*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/learn-issues/water-resources> (last updated Oct. 17, 2014), archived at <http://perma.cc/A4GN-TPEU>.

⁸⁶ *See* Onishi & Wollan, *supra* note 3; Dan Huber, *The 2011 Texas Drought in a Historical Context*, CTR. FOR CLIMATE & ENERGY SOLUTIONS (Aug. 26, 2011, 1:15 PM), <http://www.c2es.org/print/blog/huber/2011-texas-drought-historical-context>, archived at <http://perma.cc/ZD8F-CFDH>.

⁸⁷ *See* Kiley Kroh, *The Complete Guide to Everything That's Happened Since the Massive Chemical Spill in West Virginia*, THINKPROGRESS.ORG (Feb. 9, 2014, 12:15 PM), <http://thinkprogress.org/climate/2014/02/09/3196981/chemical-spill-timeline/>, archived at <http://perma.cc/2MBJ-Z26E>.

sources like the Colorado River, which is in danger of running dry because of overuse, could be relieved and rehabilitated.⁸⁸

There has been scant analysis of the potential adverse environmental effects during any phase of the iceberg harvesting process.⁸⁹ As Thomas Lundquist pointed out, both the Weeks & Campbell study and the Hult & Ostrander study “stressed the need for further environmental analysis before large scale operations are initiated.”⁹⁰ Both studies posited that the most effective way to conduct such studies would be from the point of an iceberg’s origin to its point of destination.⁹¹ Thus, any future study should contain a consideration of (1) the impacts to the region of origin, (2) the transit-related impacts to the ocean and the climate, and (3) the delivery site impacts, from offshore processing, to onshore processing and domestic distribution.⁹²

Both Weeks & Campbell and Hult & Ostrander predicted that the adverse environmental impacts in Antarctica would be minimal.⁹³ As both of the studies were conducted in the 1970s however, the current accuracy of their assumptions may be questionable.⁹⁴ A more recent—albeit brief—commentary done by the National Oceanic and Atmospheric Administration (NOAA), for example, suggested that pulling large quantities of icebergs out of the Antarctic has the potential to cause significant harm to Antarctic wildlife and ecosystems.⁹⁵ Further environmental impact analyses⁹⁶ of the early stages of iceberg harvesting are plainly necessary.⁹⁷

⁸⁸ See LOWER COLO. RIVER AUTH., INTENSE DROUGHT RIVALS WORST IN HISTORY (2014), available at <http://www.lcra.org/water/water-supply/drought-update/Documents/IntensityofDrought.pdf>, archived at <http://perma.cc/R7JG-4AY3>; Press Release, Coop. Inst. for Research in Env'tl. Scis., Today's Worst Watershed Stresses May Become the New Normal, Study Finds (Sept. 18, 2013), available at <http://www.colorado.edu/news/releases/2013/09/18/today%E2%80%99s-worst-watershed-stresses-may-become-new-normal-study-finds>, archived at <http://perma.cc/EQE9-NCGC>.

⁸⁹ In large part due to iceberg harvesting not yet being practiced. Lundquist, *supra* note 9, at 6.

⁹⁰ *Id.*

⁹¹ *Id.*

⁹² See *id.*

⁹³ See *id.* at 6–7. Despite the logical presumption that removing icebergs from an area would cause that area to warm, which in turn could lead to rising sea-levels and the attendant destruction that brings, Hult & Ostrander maintained that the predominant cooling factors in the Antarctic are the vast area of the sea and the continental ice mass, and not icebergs. See *id.* at 8. As such, as long as the appropriation process is controlled and regulated, towing icebergs—which have already separated from the primary continental shelf—out of the Antarctic should not have a warming effect on the area. See *id.*

⁹⁴ See *id.* at 6.

⁹⁵ *Water from Icebergs*, NAT'L. OCEANIC & ATMOSPHERIC ADMIN., <http://oceanexplorer.noaa.gov/edu/learning/player/lesson12/1121a1.html> (last visited Feb. 5, 2015), archived at <http://perma.cc/PR8R-NVW3>.

⁹⁶ See National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. § 4332(C) (2012). The type of analysis suggested should generally be the type required by NEPA. See *id.*

⁹⁷ See Lundquist, *supra* note 9, at 6. In fact, a team of researchers lead by Professor John Helly at the University of California, San Diego and Scripps Institution of Oceanography concluded that the fresh water that drifting icebergs leave behind as they float north plays a significant role in the carbon

The most significant risks of adverse environmental impacts appear to be at the point of destination.⁹⁸ Weeks & Campbell anticipated several temperature-induced effects such as increased fogging and rain from the thermal-plume condensation coming off of a massive iceberg parked just off a coastal region.⁹⁹ They further posited that the effect on local ecosystems and tides might be harmful.¹⁰⁰ The more recent NOAA analysis suggested that the large amounts of very cold water melting off an iceberg could cause significant damage to the ecosystems it passes through.¹⁰¹ Further, when an iceberg reaches shallow enough water near its point of destination, the bottom could start to drag against the sea floor, crushing living communities there, stirring up massive amounts of dirt and debris and fundamentally and permanently altering the sea floor's topography.¹⁰² At present, no study has adequately considered the primary and secondary impacts that iceberg harvesting would have once the ice reaches its onshore destination and is then distributed domestically.¹⁰³ Although Weeks & Campbell and the NOAA study are a start, neither is a sufficiently detailed scientific analysis of the potential environmental effects of iceberg harvesting.¹⁰⁴

Due to the dearth of available information, any legal regime that purports to control and regulate iceberg harvesting in the future must thoroughly and exhaustively study the environmental impacts of the practice.¹⁰⁵ The legal vacuum in which iceberg harvesting currently exists, however, has the potential to prevent a sufficient environmental analysis—such as an Environmental Impact Statement¹⁰⁶—from being done.¹⁰⁷ To the extent that iceberg harvesting becomes a common practice in the future, it is thus all the more important that such a regime be created.¹⁰⁸

cycle of the Southern Ocean, suggesting significant environmental impacts that should be accounted for. See Press Release 11-059, Nat'l Sci. Found., Antarctic Icebergs Play a Previously Unknown Role in Global Carbon Cycle, Climate (Mar. 25, 2011), available at http://www.nsf.gov/news/news_summ.jsp?cntn_id=119058, archived at <http://perma.cc/6ALJ-Z4KU>.

⁹⁸ The point of destination is the place where the iceberg is delivered, melted down, and distributed inland. See Lundquist, *supra* note 9, at 7.

⁹⁹ See *id.*

¹⁰⁰ See *id.*

¹⁰¹ *Water from Icebergs*, *supra* note 95.

¹⁰² *Id.*

¹⁰³ See *supra* notes 83–102 and accompanying text.

¹⁰⁴ Lundquist, *supra* note 9, at 6.

¹⁰⁵ See *id.*

¹⁰⁶ 42 U.S.C. § 4332(C) (2012). NEPA requires an Environmental Impact Statement for a federal action with the potential to harm the environment. *Id.*

¹⁰⁷ See Lundquist, *supra* note 9, at 6; *infra* notes 193–212 and accompanying text.

¹⁰⁸ See Lundquist, *supra* note 9, at 6.

III. LEGAL BACKGROUND

Antarctic iceberg harvesting presents a unique legal issue: there is no country, treaty, or law that controls it.¹⁰⁹ Despite the widespread global need for fresh water,¹¹⁰ and a dwindling supply of available on-land resources,¹¹¹ there are presently no national or international legal schemes that expressly or implicitly control and regulate iceberg acquisition or harvesting.¹¹² Although certain international conventions would probably have a significant influence on the operations of an iceberg harvester, the legal status of the practice remains ambiguous and uncertain.¹¹³ Further, because icebergs are ultimately a limited resource that naturally occur in only a handful of ecosystems,¹¹⁴ the legal regimes that control the polar regions of the planet should be carefully considered.¹¹⁵ This Note will focus on Antarctic icebergs, as over ninety three percent of the world's concentration of icebergs exists in the Antarctic region.¹¹⁶

A. The Laws That Make Antarctic Icebergs *Res Nullius*

There are two international agreements currently in force that may have legal implications regarding a nation's or a private party's right to obtain, tow and harvest an Antarctic iceberg.¹¹⁷ First, there is the Antarctic Treaty System ("ATS"), an international agreement that serves as the principal governing instrument over Antarctica.¹¹⁸ Second, there is the Law of the Sea: a centuries-old concept that was codified into international law by the United Nations in 1982 in the United Nations Convention on the Law of the Sea ("UN-

¹⁰⁹ Joyner, *supra* note 8, at 232; Geon, *supra* note 10, at 282.

¹¹⁰ See *Millions Lack Safe Water*, *supra* note 2.

¹¹¹ See DEF. INTELLIGENCE AGENCY ET AL., *supra* note 2, at 1–3; Sarah Zielinski, *The Colorado River Runs Dry*, SMITHSONIAN.COM (Oct. 2010), <http://www.smithsonianmag.com/science-nature/the-colorado-river-runs-dry-61427169/?all&no-ist>, archived at <http://perma.cc/AW7L-CQ3Z>. The Colorado River—the seventh longest in America—is at risk of drying up due to overuse and the adverse effects of climate change. Zielinski, *supra*.

¹¹² Joyner, *supra* note 8, at 232; Geon, *supra* note 10, at 282.

¹¹³ Joyner, *supra* note 8, at 232; Geon, *supra* note 10, at 282.

¹¹⁴ See Geon, *supra* note 10, at 282. Although icebergs are *ultimately* a limited resource, there appears to be more than enough of them calved on an annual basis to serve the needs of an iceberg harvesting industry without reaching that limit. *Id.*

¹¹⁵ See Joyner, *supra* note 8, at 232–37; Geon, *supra* note 10, at 282–87.

¹¹⁶ See *supra* notes 40–82 and accompanying text. This limited focus, however, should not preclude the applicability of the general principles discussed here to any operation, in any geography. See Geon, *supra* note 10, at 283.

¹¹⁷ Joyner, *supra* note 8, at 232–37; Lundquist, *supra* note 9, at 7–26; Geon, *supra* note 10, at 282–87.

¹¹⁸ Antarctic Treaty, Dec. 1, 1959, 12 U.S.T. 794, 402 U.N.T.S. 42; see Joyner, *supra* note 8, at 232–34; Lundquist, *supra* note 9, at 9–13; Geon, *supra* note 10, at 284–85.

CLOS¹¹⁹). The UNCLOS has been ratified by over 150 countries and the European community, and only a small group of nations, including the United States, have refused to do so.¹²⁰

Collectively, the scholars who have addressed the legal vacuum in which iceberg harvesting exists agree that there are several potential ways to treat iceberg acquisition at the source within a legal context: as *res nullius*¹²¹ in light of the ATS and the UNCLOS; as private property under a national-sovereignty-claim regime organized by recognized sovereign rights to Antarctic territory;¹²² or as community property under a common-heritage-of-mankind scheme, thus treating icebergs as *res communis*,¹²³ which would prompt the international community to appoint a steward such as the United Nations to control the industry.¹²⁴

Although each of these approaches might have merit, this Note will assume that the first approach—legally defining Antarctic icebergs as *res nullius*, and thus ripe for the taking by any party—is currently the most legally sound.¹²⁵ In so doing, it adheres to the prevailing notion that the legal interaction between the ATS and the UNCLOS results in icebergs being *res nullius* because Antarctica has no territorial waters.¹²⁶ Under the *res nullius* understanding of the legal status of icebergs, unless and until the international community creates a multilateral body to regulate iceberg harvesting, icebergs floating on the high seas are free for the taking.¹²⁷ Defining icebergs as *res nullius*, in turn, makes it possible for insular national regimes to regulate an industry that appropriates them without offending other countries or international

¹¹⁹ United Nations Conventions on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS], available at <https://treaties.un.org/doc/publication/UNTS/Volume%201833/v1833.pdf>, archived at <https://perma.cc/AG9C-KKJK>; Joyner, *supra* note 8, at 234–35; Lundquist, *supra* note 9, at 21–26; Geon, *supra* note 10, at 283–84.

¹²⁰ *United States v. Hasan*, 747 F. Supp. 2d 599, 619 (D. Va. 2010) (noting that the United States has not signed or ratified the UNCLOS because of a disagreement over the deep seabed mining provisions of Part XI of the treaty); SCOTT G. BORGERSON, COUNCIL ON FOREIGN RELATIONS, THE NATIONAL INTEREST AND THE LAW OF THE SEA 1, 3 (2009), available at <http://www.cfr.org/oceans/national-interest-law-sea/p19156>, archived at <http://perma.cc/57FN-FB3R>.

¹²¹ *Res nullius* is “[a] thing that can belong to no one; an ownerless chattel.” BLACK’S LAW DICTIONARY 16c (10th ed. 2014).

¹²² See Antarctic Treaty, *supra* note 118, art. IV. There are no recognized sovereignty claims to Antarctica, making this system impractical. *Id.*

¹²³ Joyner, *supra* note 8, at 235–37; see Brandon C. Gruner, Comment, *A New Hope for International Space Law: Incorporating Nineteenth Century First Possession Principles into the 1967 Space Treaty for the Colonization of Outer Space in the Twenty-First Century*, 35 SETON HALL L. REV. 299, 305–06 (2004).

¹²⁴ Joyner, *supra* note 8, at 236; Lundquist, *supra* note 9, at 20–21.

¹²⁵ See Joyner, *supra* note 8, at 234–35; Lundquist, *supra* note 9, at 21–26.

¹²⁶ See Joyner, *supra* note 8, at 234–35 (noting that because the UNCLOS only recognizes territorial waters for land that is recognized as sovereign territory, the ATS freeze on any claims of sovereignty precludes Antarctica from having territorial waters).

¹²⁷ See Joyner, *supra* note 8, at 234–35; Lundquist, *supra* note 9, at 21–26.

laws.¹²⁸ Such national regimes would also give the international community time to develop and institute a multilateral regulatory body.¹²⁹ Unlike the other legal understandings, applying the concept of *res nullius* would require minimal, or even no, new legislation.¹³⁰ Further, because the effect of the confluence of the ATS and the UNCLOS is that there are no territorial waters surrounding Antarctica, all of the water touching Antarctica's coastline is legally high seas.¹³¹ Therefore, because icebergs are legally *res nullius*—not even the ATS and the UNCLOS control the appropriation of icebergs—iceberg harvesting exists in a legal vacuum.¹³²

1. The Antarctic Treaty System (“ATS”)

The Antarctic Treaty of 1959, which governs the area south of sixty degrees South Latitude,¹³³ was created primarily to stem the discord caused by competing sovereignty claims over Antarctica's territory.¹³⁴ It has been signed and ratified by fifty countries to date,¹³⁵ although it was originally comprised of the twelve nations with geographic sector claims or historic interests in Antarctica.¹³⁶ The parties to the treaty—referred to as the Antarctic Treaty Consultative Parties (“ATCPs”)—meet biennially to maintain the ATS and to address any new or evolving issues.¹³⁷

The Antarctic Treaty consists of fourteen articles addressing various issues,¹³⁸ such as maintaining the territory for peaceful purposes,¹³⁹ guaranteeing scientific research freedom and an open exchange of information,¹⁴⁰ and

¹²⁸ See Joyner, *supra* note 8, at 234–35; Lundquist, *supra* note 9, at 21–26.

¹²⁹ See Joyner, *supra* note 8, at 234–35; John G. Laylin, *The Law to Govern Deepsea Mining Until Superseded by International Agreement*, 10 SAN DIEGO L. REV. 433, 435 (1973); Lundquist, *supra* note 9, at 21; Matthew Johnshoy, Note, *The Final Frontier and a Guano Islands Act for the Twenty-First Century: Reaching for the Stars Without Reaching for the Stars*, 37 J. CORP. L. 717, 722 (2012).

¹³⁰ See Joyner, *supra* note 8, at 234–35; Lundquist, *supra* note 9, at 21–26.

¹³¹ See *infra* notes 133–187 and accompanying text.

¹³² See Joyner, *supra* note 8, at 234–35; Lundquist, *supra* note 9, at 21–26.

¹³³ An area south of all continental land masses, including the southern-most tip of South America—Cape Horn, Chile—other than Antarctica. Joyner, *supra* note 8, at 214.

¹³⁴ The sovereign claims of Argentina, Chile, and the United Kingdom overlap in substantial part, and no single claim is recognized as legally valid by any other country. *Id.* at 216; Lundquist, *supra* note 9, at 8–9.

¹³⁵ SECRETARIAT OF THE ANTARCTIC TREATY, RULES OF PROCEDURE OF THE ANTARCTIC TREATY CONSULTATIVE MEETING AND THE COMMITTEE FOR ENVIRONMENTAL PROTECTION 31–32 (2014).

¹³⁶ Those twelve nations are Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, Russia, the United Kingdom and the United States. Lundquist, *supra* note 9, at 8.

¹³⁷ Joyner, *supra* note 8, at 214–15.

¹³⁸ Antarctic Treaty, *supra* note 118, arts. I–IV.

¹³⁹ *Id.* art. I.

¹⁴⁰ *Id.* art. II, III.

freezing the status quo of territorial claims so that they remain in limbo—perpetually undecided, and precluded from influencing any subsequent decision-making of the ATCPs.¹⁴¹ As such, as long as a nation is a signatory to the ATS, it cannot possibly have a legally recognized sovereign territorial claim to a discreet area on the Antarctic continent.¹⁴² Despite the relative success of the regime, several deficiencies prevent it from clarifying the legal status of icebergs.¹⁴³ First and foremost, the ATS does not contain any express provision regarding the exploitation of Antarctic resources.¹⁴⁴ Further, pertaining to the competing, and in some cases overlapping, sovereignty claims, Article IV of the ATS freezes “the problem of sovereignty in the region by suspending determination of the legal validity of any national jurisdictional claims to Antarctica,” indefinitely.¹⁴⁵

The resulting combination of the original treaty ignoring resource exploitation and the freeze on territorial sovereignty claims precludes seaward territorial claims.¹⁴⁶ As a result, some experts believe that there are no settled territorial waters surrounding the coast of Antarctica, as defined by the UNCLOS.¹⁴⁷ Because no nation can claim territorial sovereignty over any part of Antarctica, the UNCLOS defines the water touching Antarctica’s coastline as high seas.¹⁴⁸ This Note will proceed under the presumption that this theory is sound.¹⁴⁹ As such, icebergs should legally be considered *res nullius*, and thus free for the taking, without offending the ATS.¹⁵⁰

¹⁴¹ *Id.* art. IV.

¹⁴² *See id.*

¹⁴³ *See* Joyner, *supra* note 8, at 233.

¹⁴⁴ *See* Andrew N. Davis, Note, *Protecting Antarctica: Will a Minerals Agreement Guard the Door or Open the Door to Commercial Exploitation?*, 23 GEO. WASH. J. INT’L L. & ECON. 733, 733 (1990). Due to increased interest in various industrial concerns—especially those towards petroleum—and a major global interest in Antarctica’s mineral resource potential in the 1970s, the ATCPs embarked on a six-year negotiation process that led to the 1988 agreement on a mineral resource control regime called the Convention on the Regulation of Antarctic Mineral Resource Activities (“CRAMRA”), designed to supplement the 1959 Treaty (along with several other supplemental conventions, which collectively constitute the ATS). *Id.* at 739–40. Despite the agreement, the CRAMRA never went into effect. *Id.*; *see infra* note 312 and accompanying text.

¹⁴⁵ Joyner, *supra* note 8, at 216.

¹⁴⁶ *Id.* at 233.

¹⁴⁷ *Id.* at 234; *see* Lundquist, *supra* note 9, at 22–23.

¹⁴⁸ *See* UNCLOS, *supra* note 119, arts. 87, 136; Joyner, *supra* note 8, at 234. This issue will be addressed in greater detail in the following section, covering the Law of the Seas. *See infra* notes 155–187 and accompanying text.

¹⁴⁹ *See infra* notes 150–300 and accompanying text. It is the only legal treatment that can be applied presently without amending the ATS articles and thawing the freeze on territorial claims, which is highly unlikely to happen. *See infra* notes 150–300 and accompanying text.

¹⁵⁰ *See* Joyner, *supra* note 8, at 234. This presumption will be relied on for the remainder of this Note and will be justified in the following subsection. *See, e.g., infra* notes 151–321 and accompanying text; *see infra* notes 155–187 and accompanying text.

Because the ATS collectively contains no express or implicit legal scheme that clarifies the legal status of icebergs,¹⁵¹ it does not, in its current form, legally control the status of icebergs floating off the coast of Antarctica, at any distance.¹⁵² This means that icebergs are a mineral resource¹⁵³ beyond the authority of the ATS, and thus outside the purview of any currently applicable restrictions the treaty might otherwise be able to place on an iceberg harvesting operation.¹⁵⁴

2. The Law of the Sea and the United Nations Convention on the Law of the Sea (“UNCLOS”)

The Law of the Sea dates back to sixteenth-century European imperialism.¹⁵⁵ For more than three centuries, Dutch jurist Hugo Grotius’ concept that the seas are free to all mankind has been almost universally accepted.¹⁵⁶ In 1945, despite such widespread acceptance of Grotius’ concept, President Harry Truman—largely in response to increased exploration for natural resources and extraordinary increases in the general uses of the ocean at the outset of the twentieth century—issued a proclamation (“The Truman Proclamation”) that the United States had the exclusive right to the mineral resources of its continental shelf.¹⁵⁷ The Truman Proclamation led to nearly three decades of unilateral national proclamations by countries other than the United States, which mimicked the United States in making exclusive sovereign claims to extra-territorial, sub-surface property.¹⁵⁸ In 1958, responding to the confusion and tension these claims caused, the major maritime powers of the world began the process of creating an international treaty to reestablish and codify the ancient law of the sea.¹⁵⁹ Over the subsequent three decades, approximately 160 countries negotiated the Law of the Sea, and finally, in 1982, after four major U.N. conventions and countless negotiations, the UNCLOS was created.¹⁶⁰

The UNCLOS does not expressly control icebergs or iceberg harvesting.¹⁶¹ The UNCLOS is, however, likely to have an effect on iceberg harvest-

¹⁵¹ See Joyner, *supra* note 8, at 232–34.

¹⁵² See *id.*

¹⁵³ See FRANCISCO ORREGO VICUÑA, *ANTARCTIC MINERAL EXPLOITATION: THE EMERGING LEGAL FRAMEWORK* 160 (1988).

¹⁵⁴ See Joyner, *supra* note 8, at 232–34.

¹⁵⁵ BORGERSON, *supra* note 120, at 6. Led by Dutch jurist Hugo Grotius, the notion that the seas were the common heritage of all mankind beat out the competing claims of national ownership of vast swaths of the ocean by Spain and Portugal. *Id.*

¹⁵⁶ *Id.* at 7.

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ *Id.*

¹⁶⁰ *Id.* at 3.

¹⁶¹ See UNCLOS, *supra* note 119, art. 136; Geon, *supra* note 10, at 283. It is likely that the ATCPs have simply not addressed the issue yet. See VICUÑA, *supra* note 153, at 159–60. The UNCLOS did not

ing.¹⁶² The most significant effect that it would have—specifically on the acquisition of icebergs on the high seas¹⁶³—is its recognition of territorial waters and the legitimacy of national sovereignty within them.¹⁶⁴ The UNCLOS territorial water regime creates four contiguous zones: Territorial Water; the Contiguous Zone; the Exclusive Economic Zone; and the high sea.¹⁶⁵ The UNCLOS has promulgated The Enterprise and the International Seabed Authority (the “EISA”) to control and manage the high seas.¹⁶⁶ Although the EISA does not expressly cover icebergs, it abides by the principle that the high seas, and their contents, are the common heritage of mankind.¹⁶⁷ As such, and in conjunction with the freedom of the high seas doctrine that pervades the entirety of the UNCLOS, icebergs floating in the high seas may, under the UNCLOS, be freely harvested by any state or private party that wishes to do so.¹⁶⁸

In the specific case of Antarctic icebergs, the law of territorial waters¹⁶⁹ is of particular importance, as it represents a critical intersection of the ATS and the UNCLOS.¹⁷⁰ Article IV of the ATS freezes all sovereignty claims in Antarctica.¹⁷¹ Because no territorial claims were officially resolved or recognized at the time the ATS went into force, the ATS Article IV sovereignty freeze ef-

address iceberg harvesting for much the same reason that the ATS does not cover iceberg harvesting: no harvesting is currently being done, and thus that there is no immediate need for such a regime. *See id.*

¹⁶² *See* UNCLOS, *supra* note 119, at pts. II, V, VII, X, XII.

¹⁶³ *See id.* arts. 87, 136. Article 87 establishes the freedom of the high seas, and Article 136 establishes that the high seas are the common heritage of mankind. *Id.*

¹⁶⁴ *See id.* pt. II, arts. 3, 4, 33, pt. V, art. 55; JOSEPH F. C. DIMENTO & ALEXIS JACLYN HICKMAN, ENVIRONMENTAL GOVERNANCE OF THE GREAT SEAS: LAW AND EFFECT 17 (2012).

¹⁶⁵ UNCLOS, *supra* note 119, pt. II, art. 136; *see* DIMENTO & HICKMAN, *supra* note 164, at 10. First, there is Territorial Water, which extends twelve miles out from a nation’s coastline. UNCLOS, *supra* note 119, pt. II, art. 4. Within a nation’s Territorial Water, it has absolute sovereignty, including complete legal jurisdiction. *Id.* pt. II, art. 2. Second is the Contiguous Zone, which extends another twelve miles beyond Territorial Waters, and thus twenty-four miles off the coast. *Id.* pt. II, § 4 art. 33. In the Contiguous Zone, the coastal state’s regulatory authorities for customs, fiscal transactions, immigration, management of wastes, and shipwrecks continue to govern. *Id.* Third is the Exclusive Economic Zone, which extends 176 miles beyond the Contiguous Zone, and thus 200 miles out from a Nation’s coastline. *Id.* pt. V, arts. 55–57. Should a nation chose to declare an Exclusive Economic Zone, it will have “sovereign rights for the purpose of . . . exploiting . . . the natural resources . . . of the waters superadjacent to the seabed . . . and with regard to other activities for the economic exploitation and exploration of the zone . . .” *Id.* pt. V, art. 56. Although icebergs are not explicitly mentioned in the Exclusive Economic Zone provision, they are natural mineral resources, and are thus generally considered to fall within the range of resources reserved to a state within its Exclusive Economic Zone. *See* Geon, *supra* note 10, at 283. Beyond Exclusive Economic Zone waters is the high sea, which is accessible to all mankind. UNCLOS, *supra* note 119, arts. 1.1(1), 87, 136 (illustrating the treaty’s underlying principle of the sea being the common heritage of all mankind).

¹⁶⁶ UNCLOS, *supra* note 119, pt. XI, § 4, art. 156; *see* DIMENTO & HICKMAN, *supra* note 164, at 17.

¹⁶⁷ *See* DIMENTO & HICKMAN, *supra* note 164, at 17.

¹⁶⁸ *See* Joyner, *supra* note 8, at 232–34.

¹⁶⁹ *See* UNCLOS, *supra* note 119, pt. II, § 1, art. 2.

¹⁷⁰ *See* Joyner, *supra* note 8, at 233–34; Lundquist, *supra* note 9, at 22–23.

¹⁷¹ Antarctic Treaty, *supra* note 118, art. IV.

fectively precludes any nation from claiming or enforcing territorial waters.¹⁷² Otherwise stated, because no nation is technically the undisputed sovereign of any part of Antarctica, it is impossible for any nation to assert territorial sea rights.¹⁷³ Based on this ambiguity at the intersection of the UNCLOS and the ATS, there are no territorial waters surrounding Antarctica, and thus icebergs floating therein are within the high seas.¹⁷⁴ Accordingly, unlike the contents of the surrounding waters of any other claimed landmass in the world, the contents of the unfrozen waters that touch the Antarctic coastline, which includes the Antarctic ice shelves, are *res nullius*.¹⁷⁵

The second pertinent aspect of the UNCLOS that would affect iceberg harvesting is a set of general principles called the freedoms of the high seas.¹⁷⁶ Among others, the freedoms of the high seas comprise the freedoms of navigation, fishing, laying submarine cables and pipelines and overflight.¹⁷⁷ The freedoms of the high seas are recognized general principles of international law and are subject to the fundamental test of rational use.¹⁷⁸ This test guarantees the well-established high seas freedoms to all nations and people, and conversely prohibits all nations and persons from restricting the freedoms of other nations or persons.¹⁷⁹

These principles, although not expressly or directly controlling iceberg harvesting, serve as a limitation to any activity undertaken on the high seas.¹⁸⁰ For that reason, iceberg harvesting should be free to proceed under the UNCLOS, as long as it does not unreasonably interfere with other activities encompassed by the freedom of the seas.¹⁸¹ Under the reasonable use analysis,¹⁸² iceberg harvesting operations would have to comply with international environmental legal standards meant to preserve the ocean's ecological health and to deter marine pollution, because not doing so is deemed an interference with reasonable use of the high seas.¹⁸³ For example, the UNCLOS contains strict

¹⁷² Joyner, *supra* note 8, at 233–34.

¹⁷³ See Antarctic Treaty, *supra* note 118, art. IV; Joyner, *supra* note 8, at 233–34.

¹⁷⁴ See *infra* notes 176–187 and accompanying text. Some commentators take a contrary position: that all activities conducted on the high seas are only permissible if they are explicitly allowed under international law or custom. See Geon, *supra* note 10, at 284.

¹⁷⁵ Joyner, *supra* note 8, at 233–34.

¹⁷⁶ Lundquist, *supra* note 9, at 24; see Joyner, *supra* note 8, at 234–35; see also Geon, *supra* note 10, at 286–87 (discussing the establishment and evolution of general principles of international law).

¹⁷⁷ UNCLOS, *supra* note 119, pt. VII, § 1, art. 87; Lundquist, *supra* note 9, at 24, n.125.

¹⁷⁸ UNCLOS, *supra* note 119, pt. VII, § 1, art. 87; Lundquist, *supra* note 9, at 24, n.125.

¹⁷⁹ See Joyner, *supra* note 8, at 234–35; Lundquist, *supra* note 9, at 25.

¹⁸⁰ See Joyner, *supra* note 8, at 234–35; Geon, *supra* note 10, at 286–87.

¹⁸¹ See *supra* notes 176–179 and accompanying text.

¹⁸² See *supra* note 181 and accompanying text.

¹⁸³ Joyner, *supra* note 8, at 234–35; see UNCLOS, *supra* note 119, pt. XII. The UNCLOS protection and preservation provisions codify the obligation of signatory states to ensure the protection and preservation of the marine environment and more specifically, control exploitation of natural resources, prevention, reduction and control of pollution of the marine environment, prevention of the

environmental protection standards that could be enforced on iceberg harvesting operations under the guise of the laws of reasonable use.¹⁸⁴ Should iceberg harvesting operations be able to proceed without violating the fundamental test of reasonable use and the UNCLOS environmental provisions, it follows that iceberg harvesting would not offend the UNCLOS.¹⁸⁵

Finally, the iceberg harvesting activities of one country or private party “must be reasonable in relation to the harvesting needs and capabilities of other countries.”¹⁸⁶ Although this will not be an issue for the foreseeable future, as not even one iceberg has been successfully towed and harvested, it is possible to foresee an over-exploitation problem arising if, and once, iceberg harvesting becomes common practice.¹⁸⁷

B. U.S. Federal Laws and Bodies That May Apply to Iceberg Harvesting

The United States has three generally recognized rights with regard to internationally situated natural resources.¹⁸⁸ It can (1) define and tailor the rights of its citizens,¹⁸⁹ (2) enact legislation to regulate the industry, while also promoting conservation and orderly development,¹⁹⁰ and (3) act unilaterally in the absence of a previously established international regime.¹⁹¹ With these rights in mind, there are two practicable ways for the United States to act unilaterally to create and institute a national iceberg harvesting regime: it can either enact an entirely new law or it can incorporate such a regime into an existing federal legal scheme.¹⁹²

transfer damage or hazards and the use of technology in the marine environment. *See* UNCLOS, *supra* note 119, pt. XII.

¹⁸⁴ *See* UNCLOS, *supra* note 119, at pts. XI, §§ 1, 2 (presenting the principles governing the area of the high seas that is the common heritage of all mankind), XII (presenting the provisions for the protection and preservation of the marine environment).

¹⁸⁵ *See id.* pts. XI, §§ 1, 2, XII.

¹⁸⁶ Lundquist, *supra* note 9, at 25.

¹⁸⁷ *See id.* Although this issue is thus beyond the scope of this Note, it is something that must be addressed by any future international law or treaty.

¹⁸⁸ *See* Laylin, *supra* note 129, at 433–34; *see also* Lauritzen v. Larsen, 345 U.S. 571, 584–85 (1953) (acknowledging the well-established, universally accepted Law of the Flag).

¹⁸⁹ U.S. CONST. art. 1, § 8 (granting Congress and state governments the power to create and enforce laws that restrict citizens).

¹⁹⁰ *See id.* art. 1, § 8, cl. 3 (containing the Commerce Clause, which grants the government the power to promote and facilitate industry across the country).

¹⁹¹ *See* Jones v. United States, 137 U.S. 202, 212 (1890) (acknowledging the right of the United States to acquire jurisdiction over previously unencumbered territory); Laylin, *supra* note 129, at 433–34.

¹⁹² *See* Regular Coast Guard, 14 U.S.C. § 2 (2012); Deep Seabed Hard Mineral Resources Act, 30 U.S.C. §§ 1401–1473 (2012). Instead of using existing law, the U.S. Government chose to legislate an entirely new deep seabed mining statute. 30 U.S.C. §§ 1401–1473.

1. The Model of the Deep Seabed Hard Mineral Resources Act

It is possible that Congress—if and when it addresses the legal vacuum in which iceberg harvesting currently exists—will choose to enact new, comprehensive legislation to regulate the industry.¹⁹³ Should that be the case, the Deep Seabed Hard Mineral Resources Act (“DSHMRA”) provides a uniquely analogous model of a U.S. federal law meant to control and regulate the exploitation of natural resources on the high seas.¹⁹⁴

Congress enacted the DSHMRA in response to the legal uncertainty surrounding deep seabed mineral mining.¹⁹⁵ At the time, the UNCLOS was in its infancy, and it was unclear how it would incorporate deep seabed mining.¹⁹⁶ Congress decided that the need for the minerals in the seabed was too great and immediate to wait for the international process to evolve.¹⁹⁷ It enacted the DSHMRA, a comprehensive law that regulates deep seabed mining, including permitting, environmental protection and enforcement, and expressly qualifies the law as a temporary measure.¹⁹⁸

In the late 1970s, deep seabed mining was a popular idea.¹⁹⁹ Much like iceberg harvesting, it was not entirely clear that it was possible in a way that would have made it both technically and economically feasible, and there was a great deal of legal uncertainty as to who had a right to mine the minerals, or if anyone did at all.²⁰⁰ American companies were seeking to extract deep seabed minerals, and made it clear to Congress that the legal uncertainty surrounding the practice was a cause for great concern.²⁰¹ In response, the government first tried to jumpstart an international treaty.²⁰² As the pressure from private industry continued to increase, however, the government decided to act unilaterally by adopting the DSHMRA.²⁰³ In addition to its operative provisions, the DSHMRA was explicitly meant to be a temporary measure that

¹⁹³ See Laylin, *supra* note 129, at 437 n.7; Johnshoy, *supra* note 129, at 722 n.49.

¹⁹⁴ See, e.g., 30 U.S.C. §§ 1401–1473 (illustrating a new and uncertain natural resource statute).

¹⁹⁵ See *id.*; Johnshoy, *supra* note 129, at 722.

¹⁹⁶ See 30 U.S.C. §§ 1401(a)(13), (14); Johnshoy, *supra* note 129, at 722.

¹⁹⁷ See 30 U.S.C. §§ 1401(a)(13), (14); Johnshoy, *supra* note 129, at 722; see also Laylin, *supra* note 129, at 437 (acknowledging the immediacy of the situation in the 1970s and laying out a proposed deep seabed mining statute).

¹⁹⁸ 30 U.S.C. § 1401(a)(8), (13)–(14), (b) (2012). The DSHMRA is still in force because the UNCLOS inserted language that contradicts the DSHMRA on the rights of sovereignty over mining claims. *Id.* The law was, however, meant to be temporary; it was meant to fill the legal void until the UNCLOS could sufficiently cover the industry, consistent with U.S. interests. See 30 U.S.C. § 1401(a)(10)–(14).

¹⁹⁹ Johnshoy, *supra* note 129, at 722.

²⁰⁰ See *id.*

²⁰¹ *Id.*

²⁰² *Id.*

²⁰³ 30 U.S.C. § 1401; Johnshoy, *supra* note 129, at 721–22. The law authorized U.S. nationals to mine deep seabed minerals and gave them enforceable rights to protect their claim areas. Johnshoy, *supra* note 129, at 722.

would facilitate an emerging natural resource industry until a multilateral treaty could be created and promulgated.²⁰⁴ Based on the situational similarities between deep seabed mining and iceberg harvesting—namely the exploitation of a natural resource resting beyond U.S. territory—the DSHMRA could be a model for iceberg harvesting.²⁰⁵

Even though the DSHMRA was enacted as a temporary measure, it is, thirty-five years later, currently still in force.²⁰⁶ The DSHMRA and the UNCLOS treat mining claims in contradictory ways, which has caused significant apprehension among prospective miners.²⁰⁷ The legal uncertainty that resulted from mining operators' lack of confidence in the legal security of their territorial claims prevented significant investment, which then stunted the development of the industry.²⁰⁸ But the harvesting of icebergs—floating on the high seas, unattached to any land and destined to melt into nothing—should not suffer the same fate.²⁰⁹ This is so because the UNCLOS can only view icebergs as *res nullius*,²¹⁰ which means there is no potential for the contradictory legal treatment that plagued the deep seabed mining industry.²¹¹ Further, as unattached, drifting pieces of ice, which will eventually melt into the ocean, a claim to an iceberg is limited in duration and therefore not subject to another pitfall of the DSHMRA.²¹²

2. U.S. Coast Guard

The U.S. Coast Guard is one of the five branches of the U.S. Armed Forces, and the only branch that is within the Department of Homeland Security.

²⁰⁴ 30 U.S.C. § 1401(a)(8) (2012) (clarifying that the act is a temporary measure, meant to be reconciled with the UNCLOS eventually).

²⁰⁵ See Gruner, *supra* note 123, at 331 (noting that legal uncertainty over the security and permanence of mining claims effectively blocked financial investment by making it overly risky); Johnshoy, *supra* note 129, at 735 (suggesting a unilateral bill from Congress, similar to the DSHMRA, to incentivize the exploitation of extraterrestrial minerals).

²⁰⁶ Johnshoy, *supra* note 129, at 722, 729. By making deep seabed minerals the property of all mankind, the UNCLOS precludes U.S. mining claims established under the DSHMRA, which is the primary reason the United States has not ratified the treaty. UNCLOS, *supra* note 119, art. 136; see Johnshoy, *supra* note 129, at 729.

²⁰⁷ See Johnshoy, *supra* note 129, at 729 (noting that the DSHMRA recognizes a miner's right to stake private territorial claims on the seabed, whereas the UNCLOS treats the seabed as *res communis*—the community property of all mankind—and thus makes it unclaimable).

²⁰⁸ See *id.* at 722, 729.

²⁰⁹ See *id.*

²¹⁰ See UNCLOS, *supra* note 119, pt. II, § 1, art. 2 (illustrating that there cannot be any sovereign territorial waters off of Antarctica when Article IV of the ATS precludes any on-land claims of sovereignty from being recognized); *supra* notes 117–187 and accompanying text.

²¹¹ See *supra* notes 117–187 and accompanying text.

²¹² See *supra* notes 117–187, 194–211 and accompanying text (illustrating the issue of the uncertain temporal longevity of deep seabed mining claims).

ty.²¹³ The Coast Guard's primary mission is to protect the maritime and environmental interests of the United States.²¹⁴ It is a unique body because its "broad legal authorities, capable assets, geographic diversity and expansive partnerships provide a persistent presence along our rivers, in the ports, littoral regions and on the high seas."²¹⁵ The Coast Guard has eleven legally assigned official missions.²¹⁶ Four of these missions would be critical to integrating an iceberg harvesting regulatory scheme into the Coast Guard: the duties of aiding navigation; promoting marine safety; marine environmental protection; and ice operations.²¹⁷ Under the purview of these missions, the Coast Guard is granted a broad scope of authority and a flexible range of interpretive power.²¹⁸

Congress codified the primary duties of the Coast Guard.²¹⁹ Through its congressionally mandated authority, the Coast Guard is meant to pursue and accomplish its aforementioned legal missions.²²⁰ Of these duties, three in particular grant the Coast Guard a broad range of enforcement and regulatory authority.²²¹ The Coast Guard is responsible for enforcing laws on the high seas, administering and promulgating laws on the high seas and generally facilitating and supporting activities that occur on the high seas.²²² In particular, the catch-all provision in 14 U.S.C. § 2(3) enables the Coast Guard to devise and implement novel regulatory schemes quickly and without the need for the passage of a new law or an executive order.²²³

Along with its primary duties, the Coast Guard has been congressionally assigned secondary duties.²²⁴ Of particular importance to iceberg harvesting is

²¹³ *About Us*, U.S. COAST GUARD, <http://www.uscg.mil/top/about/> (last modified Feb. 2, 2015), archived at <http://perma.cc/27VS-4DDL>.

²¹⁴ *See id.*

²¹⁵ *Id.*

²¹⁶ *Missions*, U.S. COAST GUARD, <http://www.uscg.mil/top/missions/> (last modified Mar. 20, 2014), archived at <http://perma.cc/HSZ4-7SKW>. Those missions are (1) ports, waterways, and coastal security; (2) drug interdiction; (3) aids to navigation; (4) search and rescue; (5) living marine resources; (6) marine safety; (7) defense readiness; (8) migrant interdiction; (9) marine environmental protection; (10) ice operations; (11) other law enforcement. *Id.*

²¹⁷ *See id.*

²¹⁸ 14 U.S.C. § 2 (2012); *see Missions*, *supra* note 216.

²¹⁹ 14 U.S.C. § 2.

²²⁰ *See id.*; U.S. COAST GUARD, OCEAN GUARDIAN: FISHERIES ENFORCEMENT STRATEGIC PLAN, at C-1 (2004), available at http://www.uscg.mil/hq/cg5/cg531/LMR/OceanG/OG_AppC.pdf, archived at <http://perma.cc/6WHH-V47R>.

²²¹ *See* 14 U.S.C. § 2(1), (3), (4).

²²² *See id.* § 2(1)–(3) (“[E]nforce . . . all applicable Federal laws on, under, and over the high seas . . .”, “administer laws and promulgate and enforce regulations for the promotion of safety of life and property on and under the high seas . . . covering all matters not specifically delegated by law to some other executive department . . .”, “develop, establish, maintain, and operate, . . . aids to maritime navigation, icebreaking facilities, and rescue facilities for the promotion of safety on, under, and over the high seas . . .”) (emphasis added).

²²³ *Id.* at § 2(3).

²²⁴ *See* U.S. COAST GUARD, *supra* note 220, at C-1.

its duty to enforce the Antarctica Conservation Act (“ACA”).²²⁵ In conjunction with the National Science Foundation (“NSF”), the Coast Guard is expected to broadly conserve and protect Antarctica in a manner consistent with the ATS.²²⁶ Under that mandate, the Coast Guard can theoretically invoke its responsibility with respect to the ATS to embark upon novel endeavors, as long as they are consistent with the general thrust of the treaty and particularly its environmental protection protocols.²²⁷ Further, in conjunction with the more general statutory grant of power, the ACA enables the Coast Guard to enact a permitting program to control any takings of moveable property in Antarctica.²²⁸

Another critically important aspect of the Coast Guard’s role in enforcing the ACA is that any action taken in furtherance of its duty—domestically or internationally—must be done in compliance with the National Environmental Policy Act of 1969 (“NEPA”).²²⁹ As a result, the Coast Guard is required to comply with the Environmental Impact Statement (“EIS”) requirements of NEPA with regard to ACA enforcement.²³⁰ If the Coast Guard were to create and implement a permitting scheme that controlled the actual, physical act of taking of icebergs from the Antarctic Sea, it could do so without offending any international laws because the legal concept of icebergs being *res nullius* means that there are no such laws to offend.²³¹ By seeking to control the environmental impact that towing an iceberg out of the Antarctic might have on the ecosystem, the Coast Guard would not offend the notion that icebergs are free for the taking.²³² Instead, it could recognize and accept the law of *res nullius*, but nonetheless require permitting to account for the effects the taking might have, but not for the taking itself.²³³

²²⁵ Antarctica Conservation Act, 16 U.S.C. § 2405(b) (2012).

²²⁶ See *id.* §§ 2401(a), (b), 2405(b).

²²⁷ See *id.* §§ 2401(b), 2402(17), 2405(b).

²²⁸ *Id.* § 2403(b)(4). Although the ATS does not technically control icebergs floating in mid-water—which is of critical importance to an assumption of icebergs as being *res nullius*—a reading of the definition of Antarctica in the ATS as being anything south of sixty degrees South Latitude, in conjunction with the ACA’s grant to maintain consistency, but not necessarily compliance with the ATS, theoretically enables the Coast Guard to enact a permitting scheme without offending either law or upsetting the delicate political balance of the ATS’s freeze on territorial claims. See *id.* § 2401(b); Antarctic Treaty, *supra* note 118, art. VI.

²²⁹ 16 U.S.C. § 2403a(a)(1)(A); 42 U.S.C. § 4332 (2012).

²³⁰ 42 U.S.C. § 4332.

²³¹ See Joyner, *supra* note 8, at 232. In essence, the Coast Guard would be regulating the acts of U.S.-based iceberg harvesters and operators who wish to utilize U.S. markets and thus subject themselves to the U.S. regulatory scheme voluntarily. See 14 U.S.C. § 2 (2012); 16 U.S.C. § 2405(b) (2012); Joyner, *supra* note 8, at 232.

²³² See 14 U.S.C. § 2; 16 U.S.C. §§ 2403(b)(4), 2405(b); Joyner, *supra* note 8, at 232–34.

²³³ See 16 U.S.C. § 2403a(a)(1)(A); 42 U.S.C. § 4332.

The Coast Guard has a standardized method for enacting new regulations.²³⁴ When a rulemaking concept comes to the Coast Guard, it must be sponsored by a Program Technical Office (“PTO”) to eventually become a law.²³⁵ Once the decision has been made to sponsor a rulemaking, the chief of the sponsoring office submits a scoping document to the Coast Guard Regulatory Coordinator (“RegCo”).²³⁶ When the project has been accepted by RegCo, the process begins with the assignment of a team consisting of the following members: Regulations Development Manager; Technical Expert; Project Counsel; Economist; Environmental Analyst; Technical Writer; and additional experts as needed.²³⁷ The project team then formalizes a planned approach to the regulatory scheme and goes through an intensive research and preparation process that eventually results in a Notice of Proposed Rulemaking, several periods of public notice, a Final Rule and finally, after the Coast Guard Office of Management and Budget gives final approval, a Direct Final Rule.²³⁸ After a thirty-day phase-in period, the rulemaking becomes an enforced federal law.²³⁹

IV. THE BENEFIT OF THE UNITED STATES ACTING UNILATERALLY INSTEAD OF WAITING FOR AN INTERNATIONAL TREATY

The history of the Deep Seabed Hard Mineral Resources Act (“DSHMRA”) shows that a stable legal environment is an important aspect of successfully developing a new natural resource industry.²⁴⁰ For that reason, and because icebergs are *res nullius*, if the global need for freshwater reaches the point where it justifies the initial investment necessary to launch an iceberg harvesting industry, there should be a legal scheme in place that will facilitate, control, regulate and continuously monitor it.²⁴¹ Although icebergs present a potentially massive, sustainable and lucrative source of freshwater, the entire process—from appropriation to delivery—is rife with environmental, legal and political dangers.²⁴² As this Note has discussed, iceberg harvesting presents environmental risks from the point of appropriation to the point of destina-

²³⁴ See ROGER BUTTURINI, THE COAST GUARD RULEMAKING PROCESS: A SIX-ACT DRAMA 9 (2010) available at http://www.uscg.mil/proceedings/spring2010/articles/9_Butturini_TheCoastGuardRulemakingProcess.pdf, archived at <http://perma.cc/HLT5-9MKK>.

²³⁵ *Id.* at 10. There are many such PTOs, though an iceberg harvesting law would likely be sponsored by one of the environmental protection units, or by the homeland security unit. See *id.*

²³⁶ *Id.*

²³⁷ *Id.*

²³⁸ *Id.* at 10–14

²³⁹ *Id.* at 14.

²⁴⁰ Johnshoy, *supra* note 129, at 720; see *supra* notes 194–212 and accompanying text (illustrating the destabilizing, anti-growth effect of an unstable legal environment on the DSHMRA).

²⁴¹ See Geon, *supra* note 10, at 295; Johnshoy, *supra* note 129, at 735–37.

²⁴² See *supra* notes 40–108 and accompanying text (illustrating the technical and environmental backgrounds of iceberg harvesting).

tion.²⁴³ In conjunction with these potentially harmful environmental effects, the legal uncertainty about how icebergs would be treated under the Antarctica Treaty System (“ATS”) and the United Nations Convention on the Law of the Sea (“UNCLOS”)²⁴⁴ makes appropriation, transportation and delivery delicate subjects that might have a chilling effect on the development of the industry.²⁴⁵

But iceberg harvesting presents a prospect for success that deep seabed mining did not have.²⁴⁶ The debate about deep seabed mining existed within the well-established and oft-used legal application of real property and international sovereignty laws to *terra firma* claims.²⁴⁷ Iceberg harvesting, alternatively, requires a novel application of those laws, and is therefore legally unsettled and open to various legal interpretations.²⁴⁸ Alternatively, no existing law controls iceberg harvesting and there is no present prospect for an international law—be it the ATS, the UNCLOS, or a new multilateral treaty—to incorporate the industry in the foreseeable future.²⁴⁹ For that reason, the United States should act to fill the void—much as it did with the DSHMRA—to meet the challenge of an iceberg harvesting industry head on.²⁵⁰

A. An International Treaty Would Not Be Sufficient in the Immediate Future

Although international negotiations represent a critical component of the ever-evolving body of international law, international treaties are slow in the making, cumbersome in their development and often ineffective once in force.²⁵¹ The UNCLOS and the ATS demonstrate how complex, politically tangled and slow-moving international treaties can be.²⁵² The legal uncertainty that could be created by waiting for an international treaty will likely have a chilling effect on the potential for iceberg harvesting to emerge as a viable industry.²⁵³ The pressing need for access to more freshwater²⁵⁴ makes taking this

²⁴³ See *supra* notes 40–108 and accompanying text.

²⁴⁴ See *supra* notes 109–239 and accompanying text.

²⁴⁵ See *supra* notes 109–239 and accompanying text.

²⁴⁶ See Johnshoy, *supra* note 129, at 729–30. The legal void that existed in the 1970s with respect to deep seabed mining was comparatively less uncertain than the void exists today with respect to iceberg harvesting. Compare Johnshoy, *supra* note 129, at 729–30 (citing uncertainty about the status of *terra firma* sea floor mining claims), with Joyner, *supra* note 8, at 732 (explaining that the legal status of icebergs is unsettled because no law expressly or inferentially touches on them).

²⁴⁷ See Joyner, *supra* note 8, at 732; Johnshoy, *supra* note 129, at 729–30.

²⁴⁸ See Joyner, *supra* note 8, at 732; Johnshoy, *supra* note 129, at 729–30.

²⁴⁹ See *supra* notes 109–239 and accompanying text.

²⁵⁰ See *supra* notes 109–239 and accompanying text.

²⁵¹ See Deep Seabed Hard Mineral Resources Act, 30 U.S.C. § 1401(a)(8)–(11) (2012); Johnshoy, *supra* note 129, at 720–22.

²⁵² See *supra* notes 109–239 and accompanying text.

²⁵³ See 30 U.S.C. § 1401(a)(10), (11); Johnshoy, *supra* note 129, at 720–22.

²⁵⁴ See Zielinski, *supra* note 111. Overuse of the Colorado River by multiple southwestern states demonstrates the level of desperation that currently exists today. See *id.*

risk imprudent.²⁵⁵ It would therefore be unwise for the United States to rely on either the ATS or the UNCLOS to incorporate iceberg harvesting—if and when it becomes a common practice²⁵⁶—or to hope that the international community will come together to create an entirely new treaty.²⁵⁷

The United States should act now, as a stop-gap measure, and then, as it did with the DSHMRA, seek to promote a well-reasoned, un-rushed international treaty that could eventually negate the need for the temporary law.²⁵⁸ The legal vacuum that would occur if the United States chooses to wait for an international treaty, instead of acting affirmatively in lieu of one, might not only prevent iceberg harvesting from ever taking off,²⁵⁹ but also lead to damaging environmental consequences.²⁶⁰

If iceberg harvesting were to happen tomorrow, for example, there would be substantial confusion about who could control it.²⁶¹ Harvesters could grab icebergs with impunity and without regard to the damage they might cause through uncontrolled techniques.²⁶² This could lead to unnecessary harm to wildlife, damage to other tabular icebergs that could have otherwise been used and many other unforeseen environmental consequences in the Antarctic.²⁶³ Further, once in transit, international enforcement authorities such as the Coast Guard would be unprepared to handle a super tugboat dragging a massive piece of ice in established shipping lanes.²⁶⁴ Finally, when the iceberg neared its destination, coastal authorities would be unprepared to receive it.²⁶⁵ Harvesters could then inadvertently drag icebergs to places that are not suitable destinations, causing severe and permanent environmental consequences.²⁶⁶ Along with the environmental dangers, there would be other, equally ominous,

²⁵⁵ See Candace L. Bates, Comment, *U.S. Ratification of the U.N. Convention on the Law of the Sea: Passive Acceptance Is Not Enough to Protect U.S. Property Interests*, 31 N.C. J. INT'L L. & COM. REG. 745, 790–91 (2006); Johnshoy, *supra* note 129, at 729 n.133.

²⁵⁶ See *supra* notes 40–82 and accompanying text. Further, especially in the case of the UNCLOS, since the United States has not ratified the treaty, relying on its incorporation of iceberg harvesting would fail to solve the control issues that give rise to the need for a regulatory scheme that governs U.S. operations and imports. Bates, *supra* note 255, at 790–91.

²⁵⁷ See Rosanna Sattler, *Transporting a Legal System for Property Rights: From the Earth to the Stars*, 6 CHI. J. INT'L L. 23, 37 (2005); Johnshoy, *supra* note 129, at 720–22.

²⁵⁸ See Johnshoy, *supra* note 129, at 735.

²⁵⁹ See Peter Prows, *Tough Love: The Dramatic Birth and Looming Demise of UNCLOS Property Law (and What Is to Be Done About It)*, 42 TEX. INT'L L.J. 241, 245–48, 264–69 (2007).

²⁶⁰ See Bates, *supra* note 255, at 790–91.

²⁶¹ See *supra* notes 109–239 and accompanying text.

²⁶² See *Water from Icebergs*, *supra* note 95.

²⁶³ See *id.*

²⁶⁴ See Lundquist, *supra* note 9, at 36–37.

²⁶⁵ See Lundquist, *supra* note 9, at 6, 21–26; *Water from Icebergs*, *supra* note 95. This could lead to topographical destruction, ecosystem destruction and fundamental alterations to the local climate. See *Water from Icebergs*, *supra* note 95.

²⁶⁶ See Lundquist, *supra* note 9, at 6; *Water from Icebergs*, *supra* note 95.

dangers in the absence of a coherent legal scheme, such as the political responses attempting to deflect accountability for gross unpreparedness and international political responses.²⁶⁷

B. *The Case for Unilateral U.S. Action*

The United States should not passively wait to see if iceberg harvesting starts to occur.²⁶⁸ As global warming continues to accelerate, the already strained fresh water resources on which the United States relies are going to cease to exist sooner rather than later.²⁶⁹ Icebergs present a potentially viable and sustainable solution to this looming problem, but the overarching issue is whether that potential can be harnessed.²⁷⁰ Georges Mougins' efforts over the past forty years demonstrate how difficult it is to make something seemingly far-fetched into something common and prevalent.²⁷¹ Federal involvement appears to be the most reasonable way to determine whether iceberg harvesting is possible, and if it is, whether it is really a good idea.²⁷² As the domestic and international need for new sources of fresh water accelerates, it becomes progressively more clear that the United States and the international community cannot wait to see if iceberg harvesting is a viable solution—we must find out now.²⁷³

As the most powerful and influential nation in the world, U.S. intervention carries the potential to incite a broader international conversation.²⁷⁴ Further, if the United States chooses a wait-and-see strategy, it risks allowing legal uncertainty to prevent the emergence and development of a potentially rich natural resource industry.²⁷⁵ Instead, the United States should force the conversation now—with foreign governments, private industry and technical and sci-

²⁶⁷ See Lundquist, *supra* note 9, at 6, 21–26. Other such dangers might be uncontrolled use and resource exhaustion, inequitable appropriation practices and non-compliance with the law of the high seas. See *id.* Political tempers could flare at the interruption of the well-established international high seas status quo when there is no one to answer for interruption but the iceberg harvesters themselves. See *id.* Of course, the adoption of a unilateral legal scheme has the potential to incite the same response. See *id.*

²⁶⁸ See Prows, *supra* note 259, at 245–48, 264–69; Johnshoy, *supra* note 129, at 735.

²⁶⁹ See Press Release, Coop. Inst. for Research in Envtl. Scis., *supra* note 88.

²⁷⁰ See *supra* notes 40–82 and accompanying text (discussing the technical, economic, and environmental complexities of iceberg towing and harvesting).

²⁷¹ See Shaw, *supra* note 52, at 133–36 (addressing the difficulties of incentivizing a new resources industry); Zax, *supra* note 18.

²⁷² Shaw, *supra* note 52, at 133–36.

²⁷³ See *supra* notes 1–29 and accompanying text.

²⁷⁴ See Shaw, *supra* note 52, at 133–36; Johnshoy, *supra* note 129, at 735–36.

²⁷⁵ See Shaw, *supra* note 52, at 133–36; Johnshoy, *supra* note 129, at 735–36. This is not to suggest that the United States alone can eliminate uncertainty—it cannot—but instead that the United States can break the seal on a conversation that likely will not otherwise happen. See Shaw, *supra* note 52, at 133–36; Johnshoy, *supra* note 129, at 735–36.

entific parties.²⁷⁶ Although the United States can only control its own citizens and sovereign jurisdictions, its international reach and its existing presence in Antarctica are already so extensive that a federal law controlling iceberg harvesting would have a significant impact on the global stage.²⁷⁷ More simply stated, if the United States were to act now, unilaterally, it could stimulate answers to the legal, technical, scientific and practical uncertainties that currently stand in the way of iceberg harvesting.²⁷⁸

A national iceberg harvesting regime would also enable the United States to control the development of the industry.²⁷⁹ The basic functions of such a regime would be the establishment of permitting and licensing requirements, enforceable restrictions to licensure, enforceable environmental standards that are at least as robust as the environmental standards of the ATS and the UNCLOS and an enforcement mechanism.²⁸⁰ Within those broad categories, the regime would also need to clarify the requirements for renewal of permits and licenses over time, grounds for revocation and available legal action and remedies in the event of violative acts.²⁸¹ Such a regime could closely guide and monitor the industry to ensure that U.S. operators are fully supported, that there is uninterrupted delivery of this new water source and that the operations under its control are complying with international laws.²⁸²

In conjunction with the control that such a scheme would create, are the incentivizing effects it would have.²⁸³ A federal law can ignite the initial stages of the industry's development and the initial stages of an international treaty.²⁸⁴ If the United States, with its role as a global leader, demonstrated to the rest of the international community that it took iceberg harvesting seriously, it could possibly generate international involvement and jumpstart an iceberg harvesting industry.²⁸⁵ Further, as has been the case with deep seabed mining and space exploration, federal support—both legal and financial—can provide the impetus for technological development and increased private investment.²⁸⁶

²⁷⁶ See DEF. INTELLIGENCE AGENCY ET AL., *supra* note 2, at iii; Lundquist, *supra* note 9, at 4–6 (explaining the need for capitol investment).

²⁷⁷ See Laylin, *supra* note 129, at 433–34; Shaw, *supra* note 52, at 133–36 (explaining how government backing changes the parameters of the conversation).

²⁷⁸ See Laylin, *supra* note 129, at 433–34; Shaw, *supra* note 52, at 133–36.

²⁷⁹ See Gruner, *supra* note 123, at 345; Johnshoy, *supra* note 129, at 735 n.218.

²⁸⁰ See Laylin, *supra* note 129, at 437; Sattler, *supra* note 257, at 36.

²⁸¹ See Sattler, *supra* note 257, at 36.

²⁸² See Geon, *supra* note 10, at 295; Johnshoy, *supra* note 129, at 735.

²⁸³ See Laylin, *supra* note 129, at 435–36; Shaw, *supra* note 52, at 133–36.

²⁸⁴ See Laylin, *supra* note 129, at 435–36; see also 30 U.S.C. § 1401(a)(8)–(11) (2012) (exemplifying what a federal law—the DSHMRA—can ignite).

²⁸⁵ See Laylin, *supra* note 129, at 435–36; see also 30 U.S.C. § 1401(a)(8)–(11) (codifying an explicit federal interest in encouraging a multilateral Law of the Sea treaty and outlining a federal strategy to promote such a treaty).

²⁸⁶ See Shaw, *supra* note 52, at 139. U.S. governmental involvement, although potentially onerous at times, brings a level of legitimacy to a project that is highly desirable, and further, represents a

A proactive approach would also enable the government to utilize its vast wealth of resources to ascertain more expeditiously whether or not iceberg harvesting is a realistic and practical endeavor.²⁸⁷ Further, if the United States gets out ahead of this industry, it stands to position itself as the global leader, which can create financially lucrative opportunities for private industry and enable the government to shape the international conversation, if and when that time comes.²⁸⁸ The government could then control the establishment of industry best-practice standards, ensure compliance with permitting requirements and environmental safeguards, generate tax revenue and otherwise facilitate the development, legitimacy and practicality of an industry that could have substantial effects on the well-being of humanity and the environment.²⁸⁹

1. A New Federal Iceberg Harvesting Law

One regulatory option for creating a federal iceberg harvesting regime would be for Congress to pass a new law that is specifically tailored to iceberg harvesting.²⁹⁰ In enacting such a law, Congress would be wise to use its experience with the DSHMRA as a model to design and implement a novel iceberg harvesting regime.²⁹¹ A law modeled after the DSHMRA, which also accounts for its shortcomings, would enable the United States to act unilaterally, while concurrently promoting an international iceberg harvesting treaty.²⁹²

There are several benefits to enacting a new law instead of folding iceberg harvesting into an existing law or federal agency.²⁹³ At the outset, Congress would be able to tailor the law.²⁹⁴ The process would also yield a great deal of research, which, regardless of the outcome, would be valuable.²⁹⁵ It

financial safety net. *See id.* Even though the DSHMRA did not achieve the goal of creating a vibrant seabed mining industry, it did legitimize the practice in a way that prompted the UNCLOS to respond. *See* Johnshoy, *supra* note 129, at 729–30.

²⁸⁷ Shaw, *supra* note 52, at 133–36, 139.

²⁸⁸ *See* Laylin, *supra* note 129, at 435–36; Sattler, *supra* note 257, at 136.

²⁸⁹ *See supra* notes 268–288 and accompanying text.

²⁹⁰ *See, e.g.*, 30 U.S.C. § 1401 (2012) (codifying the DSHMRA).

²⁹¹ The DSHMRA, although eventually unsuccessful because of the United States's refusal to ratify the UNCLOS, presents a legally sound model for a unilateral law. *See supra* notes 109–239 and accompanying text. Further, it empowers a federal actor—the Secretary of State—to implement a regulatory permitting and licensure scheme, contains strong environmental protection provisions and, critically, explicitly states that it is meant to work in conjunction with international law, to the extent that it runs up against it. 30 U.S.C. §§ 1401–1473.

²⁹² *See supra* notes 193–213 and accompanying text (discussing the DSHMRA).

²⁹³ *See supra* notes 109–239 and accompanying text.

²⁹⁴ U.S. CONST. art 1, § 8.

²⁹⁵ *See* Lundquist, *supra* note 9, at 6–7 (noting that it would prompt significant technical and legal studies). The Congressional Research Service, which is known as Congress' think tank, conducts exhaustive studies meant to assist and inform the congressional legislative process. *See About CRS, LIBRARY OF CONG.*, <http://www.loc.gov/crsinfo/about/> (last updated May 1, 2013), archived at <http://perma.cc/7WL3-GU33>.

would provide a much deeper wealth of information and knowledge about iceberg harvesting than what currently exists.²⁹⁶ Further, whereas incorporating iceberg harvesting regulation into an existing law would likely involve a relatively quiet, uneventful administrative process, passing a new natural resources law could generate a large amount of domestic and international attention.²⁹⁷

Although there are laudable advantages to the enactment of a new, narrowly tailored iceberg harvesting law, there are nonetheless political realities that might make it impractical.²⁹⁸ Over the past several years, Congress has suffered from such severe partisan brinksmanship that it has required at least two last minute budget deals and even shut down the federal government for sixteen days.²⁹⁹ As such, it appears impractical to expect either party in either house to gather the resolve to research, negotiate and pass a law to facilitate and control a natural resource industry that does not yet exist.³⁰⁰

2. A U.S. Coast Guard Iceberg Harvesting Authority

In light of the practical impediments that stand in the way of the passage of a new iceberg harvesting law by Congress, the most logical and practical approach to regulating iceberg harvesting unilaterally—and perhaps the most efficient and expedient way—would be to incorporate it into existing federal laws and agencies, thereby using existing grants of statutory power to create the regime.³⁰¹ Although there are several potential destinations, the most fitting appears to be the U.S. Coast Guard.³⁰² The Coast Guard is the nation’s “leading maritime law enforcement agency”³⁰³ It is deployed all over the world, including its well-established presence in Antarctica, has the statutory

²⁹⁶ See *About CRS*, *supra* note 295.

²⁹⁷ See Laylin, *supra* note 129, at 435. This could also have a stunting effect if the international community misinterprets the intent of a unilateral act. See *id.*

²⁹⁸ See Johnshoy, *supra* note 129, at 735. The hyper-partisan climate in Congress at present suggests that even politically pressing, fundamental issues will be difficult to resolve constructively. See Jonathan Weisman, *Rattled Congress Seeks Way Out of Its Standoff*, N.Y. TIMES, Oct. 4, 2013, at A27, available at http://www.nytimes.com/2013/10/04/us/politics/congress-budget-battle.html?_r=0&pagewanted=print, archived at <http://perma.cc/TBG5-WV94>.

²⁹⁹ Weisman, *supra* note 298; Kate Sheppard, *Government Shutdown Cost Communities Near National Parks \$414 Million*, HUFFINGTON POST (Mar. 3, 2014), http://www.huffingtonpost.com/2014/03/03/government-shutdown-cost-_n_4892036.html?view=print&comm_ref=false, archived at <http://perma.cc/5MEJ-DQCS> (noting that the government shutdown lasted sixteen days).

³⁰⁰ See Weisman, *supra* note 298; Sheppard, *supra* note 299.

³⁰¹ See Regular Coast Guard, 14 U.S.C. § 2 (2012); *supra* notes 1–289 and accompanying text. The U.S. Coast Guard’s statutory grant of power and responsibility already cognizes of the authority to enact the required technical aspects of an iceberg harvesting regime and contains a catchall provision that burdens it with the responsibility of regulating novel activities on the high seas that relate to the United States. 14 U.S.C. § 2.

³⁰² See 14 U.S.C. § 2; *supra* notes 213–239 and accompanying text.

³⁰³ U.S. COAST GUARD, *supra* note 220, at C-1.

authority to incorporate and run an iceberg harvesting regime³⁰⁴ and has a long track record of working in conjunction with other public agencies and the private sector to create positive environmental change.³⁰⁵

The Coast Guard has the power and the responsibility to administer and enforce “all . . . [f]ederal laws on, under, and over the high seas . . .” and the power to promulgate and enforce regulations that promote the safety of life and property on the high seas.³⁰⁶ It is charged with developing, establishing, maintaining and operating aids to maritime navigation, icebreaking facilities and rescue facilities.³⁰⁷ Further, it has a more specific statutory duty to maintain and enforce the Antarctica Conservation Act (“ACA”)—a responsibility it shares with the National Science Foundation and the National Oceanic and Atmospheric Administration.³⁰⁸

The regulation of iceberg appropriation would seem to be the type of situation—an issue unforeseen by Congress or the ATS that nonetheless needs to be dealt with constructively—that led to Congress’ broad grant of statutory authority to the Coast Guard.³⁰⁹ The ATS purports to apply to anything below sixty degrees South Latitude,³¹⁰ yet, because of the combination of the sovereignty claim freeze under Article IV of the ATS and the UNCLOS territorial water law,³¹¹ it appears impossible for the ATS to enact an iceberg harvesting regime.³¹² That would not, however, foreclose the Coast Guard from enacting the proposed regulation, because Congress used the language “consistent with,” in the ACA.³¹³ The Coast Guard thus has the legal authority to institute and operate an iceberg acquisition and control program in Antarctic waters as part of a larger iceberg harvesting regulatory scheme, and although it would

³⁰⁴ See *supra* notes 213–239 and accompanying text. Although there is no explicit mention of iceberg harvesting in any of the Coast Guard’s statutory authority, 14 U.S.C. § 2 contains several provisions that could encapsulate the practice with relative theoretical ease. See 14 U.S.C. § 2(1), (3), (4); see also 16 U.S.C. §§ 2401–2413 (2012) (codification of the Antarctic Conservation Act).

³⁰⁵ See BUTTURINI, *supra* note 234, at 9–14; U.S. COAST GUARD, *supra* note 220, at C-1.

³⁰⁶ 14 U.S.C. § 2(1), (3).

³⁰⁷ *Id.* § 2(4) (2012).

³⁰⁸ 16 U.S.C. §§ 2401–2413. By merely requiring that the ACA be used to provide for conservation and protection *consistent with* the ATS, Congress left open the possibility that the agencies that promulgate the law could go beyond the four corners of the ATS. See *id.* § 2401(b). In light of the tense political precipice on which the ATS rests—twelve powerful nations agreeing to disagree about their claims to sovereignty, for the time being—it makes sense that Congress would not have wanted to hamstring the enforcement of the ACA in furtherance of the ATS. See *id.*

³⁰⁹ See *id.*; Joyner, *supra* note 8, at 214.

³¹⁰ Joyner, *supra* note 8, at 214.

³¹¹ See *supra* notes 117–187 and accompanying text.

³¹² See, e.g., Davis, *supra* note 144, at 733 (noting that the Convention on the Regulation of Antarctic Mineral Resource Activities was a failed attempt at a broad natural resource exploitation regime that did not have to deal with the theoretical road block that a specific iceberg harvesting regime would have to mount); *supra* notes 117–187 and accompanying text.

³¹³ 16 U.S.C. § 2401(b) (2012).

not directly fall within the scope of the ATS, it would be consistent with the general policy thrust of the ATS to preserve Antarctica as a natural resource.³¹⁴

Beyond Antarctic waters, the Coast Guard can take advantage of its international maritime presence and its continuing global operations to protect the marine environment, keep a watchful eye on any tows in progress, enforce operational requirements and respond to mid-ocean problems that might arise.³¹⁵ In fact, the Coast Guard already performs similar monitoring activities in furtherance of its enforcement duties under the High Seas Driftnet Fishing Moratorium Protection Act³¹⁶ and the High Seas Fishing Compliance Act of 1995.³¹⁷ Thus, it should not be overly complex, logistically, for the Coast Guard to monitor the shipping lanes and to enforce the permits that it grants to any towing operation licensed out of the United States, seeking U.S. sanction or protection, or hoping to do business domestically.³¹⁸ This presence will also enable the Coast Guard to ensure that tows in progress do not interfere with any other international high seas laws.³¹⁹

Within these various and diverse grants of statutory authority, the Coast Guard appears to have the legal flexibility to design and develop a regulatory scheme for iceberg harvesting that could address the most pressing needs presented by the current legal vacuum—achieving facilitative progress, providing continued support, instituting regulatory control and enforcing restrictions and punishments.³²⁰ In conjunction with its large maritime fleet and its well-established presence in Antarctica, the Coast Guard should be considered the obvious choice as the governmental agency to regulate iceberg harvesting.³²¹

CONCLUSION

The conventional sources of freshwater that modern society has relied on for the past centuries will soon become insufficient to support the global need. The world is facing a serious water crisis and it is time for the most advanced nations to address the situation proactively. Icebergs might hold one of the so-

³¹⁴ See *id.* Further, the Coast Guard already has the physical presence in Antarctica—because of its support of the scientific missions on land and because of its world-famous icebreaking operations—to get such a program, which would continuously monitor and patrol ripe waters, off the ground. See *Missions*, *supra* note 216.

³¹⁵ See 14 U.S.C. § 2(3) (2012).

³¹⁶ 16 U.S.C. § 1826(d)–(k) (2012).

³¹⁷ 16 U.S.C. §§ 5501–5509 (2012).

³¹⁸ See *Jones v. United States*, 137 U.S. 202, 212 (1890) (acknowledging federal authority to acquire jurisdiction over previously unencumbered territory); Laylin, *supra* note 129, at 433–34.

³¹⁹ See Laylin, *supra* note 129, at 437.

³²⁰ See *supra* notes 109–239 and accompanying text.

³²¹ See, e.g., Shaw, *supra* note 52, at 141 (explaining why NASA's unique combination of statutory powers and physical infrastructure make it the presumptive lead agency for deep space mineral mining); *supra* notes 109–239 and accompanying text.

lutions. Unfortunately, the potential for harvesting icebergs as a freshwater source has not yet been adequately explored: technically; scientifically; environmentally; or economically. The seemingly farfetched notion of towing massive pieces of ice across the ocean presents its own challenges in terms of persuading nations, entrepreneurs, scientists, and individuals that it is an idea worth pursuing. It is also the case that, as this Note demonstrates, icebergs and iceberg harvesting exist in a legal vacuum, and that the vacuum itself could be a significant deterrent to the development of an iceberg harvesting industry.

The United States should act unilaterally to create and implement a federal iceberg harvesting scheme. A reasoned analysis of the international laws that could touch on iceberg appropriation and towing—two critical components of any iceberg harvesting operation—leads to the conclusion that icebergs are *res nullius*, and thus free for the taking. The United States stands in the unique position of having the legal freedom to act unilaterally without offending the global community, and in a way that potentially motivates a broader multilateral treaty encompassing iceberg harvesting. The United States should thus act unilaterally, and in so doing, breathe life into the dormant conversation about iceberg harvesting. At this time, the most logical approach would be for the U.S. Coast Guard to institute and promulgate a regulatory scheme because a novel federal law is unrealistic in the current political environment. It is not clear that iceberg harvesting is either possible or viable, but unless a major super power like the United States acts, we will not soon find out.