

HALTING THE HITCHHIKERS: CHALLENGES AND OPPORTUNITIES FOR CONTROLLING BALLAST WATER DISCHARGES AND AQUATIC INVASIVE SPECIES

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Ballast water discharges are responsible for many of the most damaging aquatic invasive species introductions around the world. Despite the costs, environmental harm, and tremendous threat posed by aquatic invasive species introductions, no binding federal or international regime exists that requires the adoption of treatment technologies for ballast water discharges. Recently, however, in Northwest Environmental Advocates v. U.S. Environmental Protection Agency, the Ninth Circuit held that the U.S. Environmental Protection Agency must regulate ballast water discharges under the Clean Water Act. In light of the implications of Northwest Environmental Advocates, this Chapter examines the efficacy of existing and proposed federal, state, and international ballast water controls, and explores whether the United States could drive the adoption of treatment technologies that exceed the proposed international standard. The Chapter concludes with suggestions on how the United States might resolve the conflicts between federal, state, and international ballast water controls.

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I. INTRODUCTION

In January 1991, the Ministry of Health in Lima, Peru, started receiving reports of an illness later identified as cholera.¹ Over the course of the next several years, the epidemic spread to all but one Latin American country, infecting at least 100,000 and killing approximately 10,000 individuals.² Evidence indicates ballast water from ships moving between Asia and South America was the most likely source of the outbreak—the first in the Western hemisphere in over a century.³ Ultimately, the cholera outbreak cost Peru \$770 million, primarily as a result of trade embargoes on food and decreased tourism.⁴

Unfortunately, the cholera epidemic in Peru is just one example of a non-native species causing harm internationally to the environment, human health, and the economy. Non-native species are species of plants, animals,

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¹ See Centers for Disease Control, *Cholera—Peru, 1991*, MORBIDITY & MORTALITY WKLY. REP., Feb. 15, 1991, at 108, 108–9.

² See Robert V. Tauxe, Eric D. Mintz & Robert E. Quick, *Epidemic Cholera in the New World: Translating Epidemiology into New Prevention Strategies*, EMERGING INFECTIOUS DISEASES, Oct.–Dec. 1995, 141 (stating that these figures “represent only a small fraction of the actual number of infections”).

³ YVONNE BASKIN, A PLAGUE OF RATS AND RUBBERVINES 70 (2002); see also Brent C. Foster, *Pollutants Without Half-Lives: The Role of Federal Environmental Laws in Controlling Ballast Water Discharges of Exotic Species*, 30 ENVTL. L. 99, 106 (2000).

⁴ World Health Org., Global Epidemics and Impact of Cholera, <http://www.who.int/topics/cholera/impact/en/index.html> (last visited July 19, 2009).

and microbes that do not occur naturally in a particular habitat.⁵ Approximately 50,000 non-native species are located in the United States.⁶ Some non-native species, including corn, wheat, rice, poultry, and cattle, are utilized for agriculture and other purposes in the United States.⁷ However, when the species are introduced into new environments, their natural predators are often absent and the species “can compete with native biota; displace them; predate upon them; parasitize and transmit or cause diseases; reduce growth and survival rates; cause decline, extirpation (local extinction) of populations, or extinction.”⁸ These invasive species are a destructive subset of non-native species that cause environmental damage and lead to adverse economic consequences in agriculture, forestry, and other industries.⁹ Internationally, governments and other entities have already spent billions of dollars to remove and control invasive species.¹⁰ Invasive species also cause damage to the environment and other species, with “[a]pproximately 35–46 percent of the species on the endangered species list [present either] partly or entirely because of the effects of invasive species.”¹¹

The International Maritime Organization (IMO)¹² considers invasive marine species to be one of the four greatest threats to the world’s oceans.¹³ However, “[u]nlike other forms of marine pollution, such as oil spills, where ameliorative action can be taken and from which the environment will eventually recover, the impacts of invasive marine species are most often irreversible.”¹⁴ In marine environments, ballast water from ships is the primary mechanism for distribution of species between aquatic

⁵ Sarah McGee, *Proposals for Ballast Water Regulation: Biosecurity in an Insecure World*, 13 COLO. J. INT’L ENVTL. L. & POL’Y 141, 142 (2002).

⁶ David Pimentel et al., *Environmental and Economic Costs of Nonindigenous Species in the United States*, 50 BIOSCIENCE 53, 53 (2000).

⁷ *Id.* Overall, non-native species introduced as food crops and livestock account for more than 98% of the food system in the United States. *Id.*

⁸ U.N. Env’t Programme [UNEP], Subsidiary Body on Scientific, Technical and Technological Advice, *Invasive Alien Species: Status, Impacts, and Trends of Alien Species That Threaten Ecosystems, Habitats and Species*, at 7, U.N. Doc. UNEP/CBD/SBSTTA/6/INF/11 (Feb. 26, 2001).

⁹ Pimentel et al., *supra* note 6, at 53.

¹⁰ See McGee, *supra* note 5, at 146–47 (“Internationally, the problem is even larger [than the problems in the United States]. One rough extrapolation found that annual losses to agriculture due to invasive species worldwide may be between \$55 billion and \$247.5 billion.”).

¹¹ Susan Jewell, *A Unified Defense Against Invasive Species*, ENDANGERED SPECIES BULL., Sept.–Oct. 2000, at 8, 8–9.

¹² The IMO is a United Nations agency that focuses on regulating matters related to “the safety of navigation, including maritime security, the prevention of marine pollution from ships, and related legal matters.” MARIA HELENA FONSECA DE SOUZA ROLIM, *THE INTERNATIONAL LAW ON BALLAST WATER* 2 n.6 (2008) [hereinafter ROLIM].

¹³ Global Ballast Water Mgmt. Programme, Int’l Mar. Org., *The Problem*, <http://globallast.imo.org/index.asp?page=problem.htm&menu=true> (last visited July 19, 2009) [hereinafter IMO Problem]. The other three vectors identified as one of the four greatest threats to the world’s oceans “are land-based sources of marine pollution, overexploitation of living marine resources and physical alteration/destruction of marine habitat.” *Id.*

¹⁴ *Id.*

ecosystems.¹⁵ Ships often introduce invasive species into new habitats when releasing ballast water, which vessels take on for balance and stability.¹⁶ Despite the tremendous risk posed internationally to the economy, public health, and the environment, current regulations for ballast water are limited in scope and effectiveness.¹⁷

Recently, in *Northwest Environmental Advocates v. U.S. Environmental Protection Agency*,¹⁸ the Ninth Circuit invalidated a long-standing Environmental Protection Agency (EPA) regulation that exempted all vessel discharges from permitting requirements under the Clean Water Act (CWA).¹⁹ In light of the potential repercussions from *Northwest Environmental Advocates*, this Chapter argues that the reactions by EPA, Congress, and the states to the Ninth Circuit's decision have the potential to trigger the adoption of ballast water treatment technologies on an international scale. Further, this Chapter proposes that the responses to *Northwest Environmental Advocates* could bolster efforts to ratify the International Convention for the Control and Management of Ships' Ballast Water and Sediments, a binding international framework adopted in 2004 by the IMO, by driving the adoption of treatment technologies.²⁰

Part II begins with an explanation of the problems created by untreated ballast water and provides an overview of the current status of treatment technologies. Part III describes the current international regimes that address invasive species and ballast water discharges, and argues that current, binding standards are insufficient to drive adoption of the technology necessary to prevent introductions of aquatic invasive species.

¹⁵ ROLIM, *supra* note 12, at 8; *see also* NAT'L INVASIVE SPECIES COUNCIL, MANAGEMENT PLAN: MEETING THE INVASIVE SPECIES CHALLENGE 13 (2001), *available at* <http://www.invasivespeciesinfo.gov/council/mp.pdf> (noting that the "major pathway" for the introduction of aquatic invasive species "has been the discharge of ballast water from large ships").

¹⁶ *See* MARINE BD. COMM'N ON ENG'G & TECHNICAL SYS., NAT'L RESEARCH COUNCIL, STEMMING THE TIDE: CONTROLLING INTRODUCTIONS OF NONINDIGENOUS SPECIES BY SHIPS' BALLAST WATER 11 (1996) [hereinafter STEMMING THE TIDE].

¹⁷ *See* Marc L. Miller & Lance H. Gunderson, *Biological and Cultural Camouflage: The Challenges of Seeing the Harmful Invasive Species Problem and Doing Something About It*, in HARMFUL INVASIVE SPECIES: LEGAL RESPONSES 1 (Marc L. Miller & Robert N. Fabian eds., 2004) ("Despite the increasing public and indeed global recognition of the problem of harmful non-indigenous species, actual changes to national laws have been quite limited."); *see also* ROLIM, *supra* note 12, at 3 ("Compared to other more visible forms of marine pollution such as oil pollution, the media, scholars and governments have paid relatively little attention to the issue of transfer of invasive aquatic organisms and pathogens through vectors such as the discharge of ballast water or sediments.").

¹⁸ 537 F.3d 1006 (9th Cir. 2008).

¹⁹ Federal Water Pollution Control Act, 33 U.S.C. §§ 1251–1387 (2006). The regulation challenged in *Northwest Environmental Advocates* provides an exemption for "[a]ny discharge of sewage from vessels, effluent from properly functioning marine engines, laundry, shower, and galley sink wastes, or any other discharge incidental to the normal operation of a vessel," with some limited exceptions. 40 C.F.R. § 122.3(a) (2006).

²⁰ Int'l Mar. Org. [IMO], *Adoption of the Final Act and Any Instruments, Recommendations and Resolutions Resulting from the Work of the Conference: International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004*, IMO Doc. BWM/CONF/36 (Feb. 16, 2004) [hereinafter Ballast Water Convention].

Part IV further analyzes the lack of effective controls for ballast water in the United States and asserts that EPA's ineffective response to the decision in *Northwest Environmental Advocates* could spur states to adopt individual and regional frameworks that require ships to install effective ballast water treatment systems. The Chapter claims that because individual states in the United States are taking the initiative to develop technology requirements that are as stringent, if not more stringent, than the IMO convention, the United States could still trigger the adoption of effective treatment technologies on an international scale. Finally, the Chapter offers suggestions on how the United States could reconcile the conflicts between state, federal, and international regulatory mechanisms.

II. BALLAST WATER AS A CONDUIT FOR INVASIVE SPECIES TRANSFERS

Ships use ballast to ensure safe operation at sea. Ballast is "any solid or liquid placed in a ship to increase the draft, to change the trim, to regulate the stability, or to maintain stress loads within acceptable limits."²¹ The uptake and discharge of ballast water leads to the inadvertent transport of thousands of organisms around the globe on a daily basis.²² This Part begins with an overview of the harm caused by aquatic invasive species and ballast water discharges and ends with a review of the current status of ballast water treatment technologies.

A. Dispersal of Invasive Species Through Ballast Water Discharges

Before the late 1800s, ships typically carried heavy materials such as rocks and sand as ballast.²³ Today, ships pump water into holds to maintain balance, to relieve stress on the ship, and to fulfill other functions required for safe operation of the vessel.²⁴ Ships typically load ballast water when discharging their cargo, carry the ballast water while their cargo holds are empty or low, and discharge the water when filling the cargo hold.²⁵ The loading and unloading of the ballast water in relation to ship cargo allows the ship to maintain equilibrium in the vessel's stability.²⁶

The shipping industry oversees the transport of over 90% of the world's goods and commodities²⁷ and is the primary distributor of aquatic invasive

²¹ See *STEMMING THE TIDE*, *supra* note 16, at 23.

²² See *infra* notes 27–34 and accompanying text.

²³ See *STEMMING THE TIDE*, *supra* note 16, at 22.

²⁴ See *id.*

²⁵ See BRIONY MACPHEE, *ALIEN FLOTILLAS: THE EXPANSION OF INVASIVE SPECIES THROUGH SHIP BALLAST WATER* 1 (2006), available at http://earthtrends.wri.org/pdf_library/feature/bio_fea_alienflotillas.pdf.

²⁶ *Id.*

²⁷ INT'L MAR. ORG., *ALIEN INVADERS: PUTTING A STOP TO THE BALLAST WATER HITCHHIKERS* (1999), available at http://www.imo.org/includes/blastDataOnly.asp/data_id%3D6006/Ballastinvaders.pdf [hereinafter IMO FOCUS PAPER].

species around the world.²⁸ Overall, experts estimate that shipping is responsible for approximately 80% of the invertebrate and algae introductions into North America, with ballast water and hull fouling accounting for 90% of the introductions.²⁹ As such, ballast water “is widely regarded as the leading modern-day vector of marine bioinvasions.”³⁰ Shipping vessels transport over ten billion tons of ballast water each year, with each vessel containing anywhere from “[s]everal hundred litres to more than 100,000 tons, depending on the size and purpose of the vessel.”³¹ While the use of water for ballast is efficient and convenient for ships, the water typically carries a wide variety of small species, “including bacteria, microbes, small invertebrates, and the eggs and larvae of larger species.”³² Ballast water carries an estimated 7000 different species of animals and plants around the world each day.³³ Although the majority of these hitchhiking species do not survive the harsh conditions during their ballast water journey, those species that do survive can “become invasive, out-competing native species and multiplying into pest proportions.”³⁴

Ballast water discharges are the source of many of the most damaging invasive species problems around the world.³⁵ One famous example of the threat posed by invasive species in ballast water is the damage caused by the zebra mussel in the Great Lakes.³⁶ Although scientists do not know the exact time and place of the first zebra mussel establishment, evidence indicates that ballast water discharges caused the first zebra mussel introduction into Lake St. Clair and the Great Lakes in the 1980s.³⁷ By 1993, zebra mussel populations stretched from Quebec to Louisiana.³⁸ Recently, states discovered zebra mussels as far west as Lake Mead in Nevada.³⁹ Additionally,

²⁸ ROLIM, *supra* note 12, at 18 (“Today, shipping (including that connected with inland waterways) is the most common vector affecting the spread of aquatic species throughout the world.”).

²⁹ Paul W. Fofonoff et al., *In Ships or on Ships? Mechanisms of Transfer and Invasion for Nonnative Species to the Coasts of North America*, in *INVASIVE SPECIES: VECTORS AND MANAGEMENT STRATEGIES* 152, 162, 169 (Gregory M. Ruiz & James T. Carlton eds., 2003) (noting that “[s]hipping was considered a possible vector” for all but 20.5% of the “nonnative species of invertebrates and algae established in North America,” while “ballast water and fouling alone accounted for 90% of the 168 species attributed solely to shipping”).

³⁰ JAMES T. CARLTON, PEW OCEANS COMM’N, *INTRODUCED SPECIES IN U.S. COASTAL WATERS: ENVIRONMENTAL IMPACTS AND MANAGEMENT PRIORITIES* 16–17 (2001), *available at* http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting_ocean_life/env_oceans_species.pdf.

³¹ IMO FOCUS PAPER, *supra* note 27.

³² McGee, *supra* note 5, at 148.

³³ IMO Problem, *supra* note 13.

³⁴ *Id.*

³⁵ *See, e.g.*, IMO FOCUS PAPER, *supra* note 27.

³⁶ *See, e.g.*, CHRIS BRIGHT, *LIFE OUT OF BOUNDS: BIOINVASION IN A BORDERLESS WORLD* 96–98 (Linda Starke ed., 1998).

³⁷ Ladd E. Johnson & James T. Carlton, *Post-Establishment Spread in Large-Scale Invasions: Dispersal Mechanisms of the Zebra Mussel* *Dreissena Polymorpha*, 77 *ECOLOGY* 1686, 1687 (1996).

³⁸ *Id.*

³⁹ Cal. Dep’t of Fish & Game, *Quagga and Zebra Mussels: Incident Description*, <http://www.dfg.ca.gov/invasives/quaggamussel/incidentdescription.html> (last visited July 19, 2009).

the first confirmed zebra mussel in California appeared in early 2008.⁴⁰ Within twenty years, scientists expect the zebra mussel to infest most freshwater habitats throughout the nation,⁴¹ thereby reducing native mussel populations by over fifty percent and causing the extinction of up to 140 species.⁴² The “cost of Zebra mussel prevention and remediation just in the Great Lakes is estimated to be between \$100 million and \$400 million per year.”⁴³

The zebra mussel is only one example of the many harmful species that ships have transferred into new ecosystems through ballast water. Other examples of non-native species invasions caused by ballast water abound.⁴⁴ For example, in the Black Sea, Leidy’s comb jellies—a native to the East Coast of North and South America—invaded the water in densities as high as 500 jellies per cubic meter, and scientists expect the species to spread to areas outside of the Black Sea.⁴⁵ With a voracious appetite, a lack of predators, and a reproductive system that could produce 8000 eggs in a day, the comb jelly “takeover” caused the collapse, and sometimes elimination, of fish stocks in the Black Sea; the comb jelly assault “is thought to have cost Black Sea fisheries \$30 million a year directly and is the critical factor in a crisis that has deprived some 2 million people of their livelihood, either in the fishing fleets or in the businesses that served them.”⁴⁶

Attempts to eradicate aquatic invasive species are both expensive and relatively ineffective. Typically, once an aquatic invasive species establishes a population in a new environment, the species becomes nearly impossible to remove and there are few international examples that demonstrate successful eradication of aquatic invasive species.⁴⁷ The costs associated with eradicating an aquatic invasive species are tremendous, even when the species has yet to spread to unconfined areas. For example, over the course of five years, California spent roughly \$7 million to remove the Mediterranean green seaweed from two areas in Southern California, despite the fact that “the

⁴⁰ *Id.*

⁴¹ Pimentel et al., *supra* note 6, at 58.

⁴² NANCY B. BENTON ET AL., NATURE CONSERVANCY, AMERICA’S LEAST WANTED: ALIEN SPECIES INVASIONS OF U.S. ECOSYSTEMS 10 (Bruce A. Stein & Stephanie R. Flack eds., 1996), *available at* <http://www.natureserve.org/library/americasleastwanted2003.pdf>.

⁴³ *Ballast Water Management: New International Standards and National Invasive Species Act Reauthorization: J. Hearing Before the Subcomms. on Coast Guard and Maritime Transportation and Water Resources and Environment of the H. Comm. on Transportation and Infrastructure*, 108th Cong. 14 (2004) (statement of Rep. John J. Duncan, Jr., Chairman, H. Subcomm. on Water Resources and Environment), *available at* <http://purl.access.gpo.gov/GPO/LPS62382>.

⁴⁴ IMO FOCUS PAPER, *supra* note 27 (noting the problems created from ballast water discharges, which are the likely source of European zebra mussel, round goby, ruffe, European shore crab, tropical green algae, comb jelly, Northern Pacific kelp, giant fan worm, and Northeastern Pacific sea star introductions).

⁴⁵ BRIGHT, *supra* note 36, at 157–58.

⁴⁶ *Id.* at 179–80; Ocean Actions, The Recovery of the Black Sea, http://www.oceanactions.com/?page_id=129 (last visited July 19, 2009).

⁴⁷ ROLIM, *supra* note 12, at 19–20.

infestations were detected while they were still confined.”⁴⁸ Because of the costs and difficulty in removing introduced aquatic species, a proactive—rather than reactive—stance is vital to preventing species introductions.

However, since ballasting is necessary for safe operation of ships, “the only effective way to stop the spread of unwanted organisms is to prevent them [from] being dumped in foreign ports.”⁴⁹ As global trade increases, invasions by non-native species are also likely to increase, since the rate of invasion in coastal ecosystems correlates with the volume of ship traffic.⁵⁰ To date, however, industry has not adopted treatment technologies on a widespread basis.⁵¹ This Part continues with an overview of the current state of ballast water controls and technologies.

B. The Technology Gap

Despite the problems with ballast water and aquatic species introductions, a gap remains between the development and the adoption of economically viable, effective treatment technologies. The majority of commercial vessels currently use ballast water exchange as a means of minimizing the distribution of viable aquatic species.⁵² Ballast water exchange involves the replacement of ballast water taken on during port or coastal visits with open ocean water, or vice versa.⁵³ Ballast water exchange relies on the biological principle that the ocean environment is generally inhospitable for species adapted to living in coastal regions, and oceanic organisms are unlikely to survive if discharged into freshwater, estuarine, or in-shore coastal waters.⁵⁴

Ballast water exchange provides an incomplete solution, however, to the problems with ballast water. Studies of ballast water exchange indicate that its effectiveness is “highly variable,” and ballast water exchange “as currently practiced probably has little effect in reducing the introduction of planktonic non-indigenous species.”⁵⁵ For example, in one study, even after three tank exchanges, only ninety-five percent of the original ballast water had been replaced.⁵⁶ As a result, ballast water exchange “can rarely, if ever, remove all original organisms from ballast water.”⁵⁷ Additionally, ballast water exchange may pose a threat to the ship and the safety of the crew by creating

⁴⁸ Rachel Woodfield, *Invasive Seaweed Threatens California's Coastline—An Update*, BALLAST EXCHANGE, Spring-Summer 2006, at 10, 10, available at http://groups.ucanr.org/Ballast_Outreach/documents/Newsletter9228.pdf.

⁴⁹ IMO FOCUS PAPER, *supra* note 27.

⁵⁰ John M. Drake & David M. Lodge, *Global Hot Spots of Biological Invasions: Evaluating Options for Ballast-Water Management*, 271 PROC. ROYAL SOC'Y B 575, 575 (2004).

⁵¹ See discussion *infra* Part II.B.

⁵² N. DOBROSKI ET AL., 2009 ASSESSMENT OF THE EFFICACY, AVAILABILITY AND ENVIRONMENTAL IMPACTS OF BALLAST WATER TREATMENT SYSTEMS FOR USE IN CALIFORNIA WATERS 3 (2009).

⁵³ STEMMING THE TIDE, *supra* note 16, at 36–37.

⁵⁴ *Id.*

⁵⁵ KEVIN ANDERSON ET AL., PUGET SOUND ACTION TEAM, BALLAST WATER MANAGEMENT IN WASHINGTON STATE: RECOMMENDATIONS FOR IMPROVEMENT 18 (Kevin Anderson ed., 2007).

⁵⁶ STEMMING THE TIDE, *supra* note 16, at 37 fig.3-2.

⁵⁷ *Id.* at 38.

instability and other dangerous forces on the hull of the ship.⁵⁸ Due to the lack of effectiveness and the overall safety threats, national and international governments should view ballast water exchange as an interim measure that is unsuitable in the long term for eliminating ballast water introductions.

In light of the problems with ballast water exchange, companies are exploring a wide range of treatment options for ballast water discharges. Yet, “until recently, financial investment in the research and development of ballast water treatment systems has been limited and the advancement of ballast water treatment technologies slow.”⁵⁹ Companies have explored the possibility of implementing both shoreside and ship-based treatment facilities. Although experts have examined options for shore-based treatment of ballast water, which involves transfer of water from a ship to a treatment facility or vessel, the option presents several challenges.⁶⁰ Among other problems, new treatment facilities are necessary for shoreside treatment because “[c]urrent shoreside wastewater treatment plants are not equipped to treat saline water,” ports and ships would need to retrofit their facilities to allow shoreside discharges, and, while technically feasible, shoreside facilities or vessels would be costly.⁶¹ Moreover, “[t]he sheer number of ships entering large port cities daily prevents major ports from instituting effective shore-based solutions.”⁶²

Thus, the focus over the last several years has been on shipboard treatment systems, which are likely to result in greater flexibility for vessels and fewer delays than shoreside treatment facilities.⁶³ Shipboard treatment options generally fall into one of five categories: 1) mechanical operations, such as filtration or cyclonic separation; 2) chemical treatment with substances such as biocides, chlorine, hydrogen peroxide, and sodium; 3) physical treatment through heat, ultraviolet, ultrasonic, or deoxygenation technologies; 4) biological treatment, which involves the introduction of organisms, such as yeast, that kill or create conditions that kill other species; or 5) a combination of these technologies.⁶⁴ In a recent evaluation by California of the current state of shipboard treatment systems, the results for these technologies appeared promising.⁶⁵ For a wide range of tested organism sizes, the results indicated that over half of the technologies met California’s performance standards for ballast water discharges—the most stringent in the world.⁶⁶ Additionally, two of these technologies, which

⁵⁸ *Id.* at 25–26, 37.

⁵⁹ DOBROSKI ET AL., *supra* note 52, at 5.

⁶⁰ *Id.* at 23.

⁶¹ *Id.*

⁶² McGee, *supra* note 5, at 157.

⁶³ DOBROSKI ET AL., *supra* note 52, at 24.

⁶⁴ *See id.* at 25–29; *see also* LLOYD’S REGISTER, BALLAST WATER TREATMENT TECHNOLOGY: CURRENT STATUS 7–10 (2007); ANDERSON ET AL., *supra* note 55, at 17.

⁶⁵ DOBROSKI ET AL., *supra* note 52, at 23.

⁶⁶ *See id.* at 40; *see also infra* Part IV.C.1 (discussing California’s stringent performance standards, which are 1000 times more stringent than the proposed international standard).

complied with every California performance standard, are already considered “commercially available.”⁶⁷

Despite the current potential of shipboard technologies to reduce or eliminate introductions of aquatic invasive species, the shipping industry has yet to move away from ballast water exchange and toward treatment technologies.⁶⁸ Historically, several barriers hindered the development and adoption of new technologies for commercial vessels. Some of the major barriers included “equipment design limitations, the costs of technology development, and the lack of guidelines for testing and evaluating performance.”⁶⁹ However, the primary deterrent for investors, the shipping industry, and technology developers to invest in new technologies has been “the absence of a specific set of ballast water performance standards.”⁷⁰ Without a specific set of standards, both developers and industry representatives risk spending large sums of money to implement technologies that may later prove obsolete due to new or conflicting federal, state, or international requirements.⁷¹

The resulting dynamic between the availability of technology and the creation of binding performance standards appears to create a circular “chicken and the egg” dilemma—industry refuses to adopt existing technology because of the lack of regulatory certainty,⁷² while international and domestic governments avoid adopting rigid timelines for standards because of concerns about the technologies’ availability.⁷³ The dilemma begs the question of what, if anything, can break the current dynamic between

⁶⁷ DOBROSKI ET AL., *supra* note 52, at 37, 46. The two systems that are already commercially available are OceanSaver, a system that employs filtration, cavitation, nitrogen supersaturation, and electrodialysis; and OptiMarin, a system that utilizes filtration and ultraviolet technology. *Id.* at 32 tbl.V-1, 46.

⁶⁸ See *supra* note 52 and accompanying text.

⁶⁹ DOBROSKI ET AL., *supra* note 52, at 5.

⁷⁰ *Id.*; see also R.G. Edmonson, *Ballast Water Bottleneck*, J. COM., Sept. 8, 2008, at 36, 38 (describing how “[t]echnology exists to clean contaminated discharges, but politics stalls progress” and investors will not “put up money” because there are no official performance standards).

⁷¹ See generally ROYAL HASKONING, GLOBAL MARKET ANALYSIS OF BALLAST WATER TREATMENT TECHNOLOGY 5 (2001) (stating that shipping industry experts “identified the lack of current performance standards as the major reason that ship owners are hesitant to invest more in BWT [ballast water treatment technologies]”). According to one expert, technologies will remain “experimental” until there is a set of performance standards that allows for full implementation of treatment technologies:

There is a danger here that the shipping industry will end up spending large sums of money on ballast water treatment systems that do not really do anything useful in terms of killing organisms and which may become redundant as soon as IMO agrees [on] an international standard for such systems.

... While shipping companies should be strongly encouraged to fit and test alternative systems in real-life operational situations, but [sic] it must be made clear that until these systems are proven effective and approved by a relevant jurisdiction, they [are] experimental only.

Id. app. 1, at 7.

⁷² See *supra* notes 68–71 and accompanying text.

⁷³ See *infra* Parts III, IV.

industry and various governments. Parts III and IV examine the current efforts internationally and in the United States to implement ballast water performance standards. Specifically, Parts III and IV analyze whether current regimes have the potential to drive the adoption of treatment technologies and break the stalemate between the shipping industry and the government.

III. THE INTERNATIONAL FRAMEWORK FOR ADDRESSING BALLAST WATER DISCHARGES

The distribution of invasive species through ballast water has local, national, and international ramifications. Because the prevention of species transfers is the only viable solution for halting future aquatic invasions,⁷⁴ this Chapter asserts that a federal and international regulatory framework is necessary to control and minimize introductions of aquatic invasive species. Despite the economic and ecological risk posed by ballast water discharges, however, there are few regulations internationally or in the United States that directly and comprehensively address the threat.⁷⁵ Thus, a gap remains between the development and implementation of ballast water technologies. Part III begins with a discussion of the current international framework for addressing ballast water discharges and analyzes whether the International Convention for the Control and Management of Ships' Ballast Water and Sediments—the Ballast Water Convention—could trigger the adoption of effective ballast water treatment technologies.

A. Deficiencies in Current International Law for Addressing Ballast Discharges

A basic understanding of the deficiencies in current international law is necessary to understand the need for the adoption of the Ballast Water Convention, the first international framework for addressing ballast water discharges through binding performance standards.⁷⁶ No binding international treaty currently exists that directly addresses the problem of invasive species in a comprehensive manner, and few countries have created domestic policies.⁷⁷ Although at least a dozen treaties mention invasive species introductions,⁷⁸ the treaties do not provide the specific enforcement or regulatory mechanisms necessary to implement effective invasive species controls.⁷⁹ Additionally, the majority of treaties only “focus on a specific dimension of alien-related issues, with regard to a particular protection objective (e.g. migratory species), kind of activity (e.g. introductions for

⁷⁴ Drake & Lodge, *supra* note 50.

⁷⁵ See *infra* Parts III.A, IV.

⁷⁶ Albert G. McCarraher, IV, Comment, *The Phantom Menace: Invasive Species*, 14 N.Y.U. ENVTL. L.J. 736, 744 (2006).

⁷⁷ McGee, *supra* note 5, at 154.

⁷⁸ *Id.*

⁷⁹ Briony MacPhee, Comment, *Hitchhikers' Guide to the Ballast Water Management Convention: An Analysis of Legal Mechanisms to Address the Issue of Alien Invasive Species*, 10 J. INT'L WILDLIFE L. & POL'Y 29, 36 (2007).

aquaculture) or potentially damaging organism (e.g. pest).⁸⁰ Because many of these treaties and conventions are binding upon their signatories, “it is [the parties’] duty to adhere to [treaty] provisions to the best of their ability.”⁸¹ Nevertheless, a “fundamental conundrum” is created by the gap between the party’s duty to adhere to the agreement, and the presence of an effective mechanism for implementing specific obligations.⁸² The following discussion reviews the gaps in international regulation left by the two most important binding legal instruments currently in force for addressing invasive species—the Convention on Biological Diversity⁸³ and the United Nations Convention on the Law of the Sea⁸⁴—and illustrates the need for a binding international agreement to deal specifically with ballast water discharges.

1. *The Convention on Biological Diversity*

One of the most important binding international instruments to address invasive species problems is the Convention on Biological Diversity (CBD).⁸⁵ The CBD is “the only globally applicable, legally binding instrument to address generally alien species introduction, control and eradication across all biological taxa and ecosystems.”⁸⁶ There are currently 191 parties to the treaty, which does not include the United States.⁸⁷ Of key importance is Article 8(h) of the CBD, which requires that “as far as possible and appropriate,” each contracting state should “[p]revent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.”⁸⁸ The Convention lists Article 8 as part of a list of “in-situ

⁸⁰ CLARE SHINE ET AL., A GUIDE TO DESIGNING LEGAL AND INSTITUTIONAL FRAMEWORKS ON ALIEN INVASIVE SPECIES 30 (2000).

⁸¹ MacPhee, *supra* note 79.

⁸² *Id.*

⁸³ Convention on Biological Diversity, Dec. 29, 1993, 1760 U.N.T.S. 143.

⁸⁴ United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS]. Although it goes beyond the scope of this Chapter, it is worth noting that the World Trade Organization’s Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) might also arguably apply to regulations pertaining to ballast water discharges. See Agreement on the Application of Sanitary and Phytosanitary Measures, Apr. 15, 1994, 1867 U.N.T.S. 493. Article 1 of the SPS Agreement indicates the agreement applies to “all sanitary and phytosanitary measures which may, directly or indirectly, affect international trade.” *Id.* art. 1. The definition of sanitary and phytosanitary measures includes, amongst other things, measures applied “to prevent or limit other damage . . . from the entry, establishment or spread of pests.” *Id.* Annex A, § 1(d). Invasive species, which have the potential to cause extensive damage to the environment, appear to fall squarely under section 1(d) of Annex A, if not another provision of the SPS Agreement. See Part II.A (discussing the damage caused by aquatic invasive species). Further, since any regulatory mechanism that controls ballast water discharges is likely to have an impact on the activities of shipping vessels, the regulation of ballast water is likely to indirectly impact international trade, as required under the SPS Agreement.

⁸⁵ McGee, *supra* note 5, at 154.

⁸⁶ SHINE ET AL., *supra* note 80, at 14.

⁸⁷ Convention on Biological Diversity, List of Parties, <http://www.cbd.int/convention/parties/list/> (last visited July 19, 2009) [hereinafter CBD Parties]. The United States signed but did not ratify the treaty. See OFFICE OF TECH. ASSESSMENT, U.S. CONG., HARMFUL NON-INDIGENOUS SPECIES IN THE UNITED STATES 296 (1993).

⁸⁸ Convention on Biological Diversity, *supra* note 83, art. 8(h).

conservation” measures, which are defined in the CBD as “the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.”⁸⁹

Although the CBD is binding upon signatories and indicates that parties should both prevent and eradicate threatening alien species,⁹⁰ the Convention’s broad language gives little guidance to parties on how to implement or enforce the provisions of the Article. In addition, the broad “as possible and appropriate” language of Article 8⁹¹ creates a loophole that might allow states to avoid implementation of effective invasive species policies; based on the text, a state hoping to avoid any obligation to prevent or eradicate an alien species could deem the action inappropriate or impossible, and thereby avoid implementing key measures. As a result, Article 8 alone provides a weak foundation for building a consistent and comprehensive international policy on aquatic invasive species.

In recognition of the “gaps and inconsistencies in the international framework” for dealing with invasive species,⁹² the contracting parties to the CBD asked the Subsidiary Body on Scientific, Technical, and Technological Advice (SBSTTA) to develop guiding principles for the effective implementation of Article 8.⁹³ In 2000, the SBSTTA issued interim guiding principles,⁹⁴ and the Conference of the Parties (COP)⁹⁵ requested that the international community implement the principles.⁹⁶ In March 2001, the SBSTTA finalized the guidelines—Guiding Principles for the Implementation of 8(h)⁹⁷—and in 2002, the COP endorsed the guidelines.⁹⁸

The COP intended to provide “guidance for developing effective strategies to minimize the spread and impact of invasive alien species,” and

⁸⁹ *Id.* art. 2.

⁹⁰ See *supra* notes 85–88 and accompanying text.

⁹¹ See *supra* note 88 and accompanying text.

⁹² Conference of the Parties to the Convention on Biological Diversity, The Hague, Neth., Apr. 8–19, 2002, *Report of the Sixth Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice*, at Recommendation VI/4, § A.3, U.N. Doc. UNEP/CBD/COP/6/3 (Mar. 27, 2001) [hereinafter SBSTTA Report].

⁹³ MacPhee, *supra* note 79, at 37.

⁹⁴ See Conference of the Parties to the Convention on Biological Diversity, Nairobi, Kenya, May 15–26, 2000, *Report of the Fifth Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice*, at Recommendation V/4, § 1, U.N. Doc. UNEP/CBD/COP/5/3 (Feb. 25, 2000).

⁹⁵ The “Conference of the Parties is the governing body of the [CBD], and advances implementation of the Convention through the decisions it takes at its periodic meetings.” Convention on Biological Diversity, Conference of the Parties (COP), <http://www.cbd.int/convention/cops.shtml> (last visited July 19, 2009).

⁹⁶ See Conference of the Parties to the Convention on Biological Diversity, Nairobi, Kenya, May 15–26, 2000, *Report of the Fifth Meeting of the Conference of the Parties to the Convention on Biological Diversity*, at Decision V/8, § 1, U.N. Doc. UNEP/CBD/COP/5/23 (June 22, 2000).

⁹⁷ SBSTTA Report, *supra* note 92, at Recommendation VI/4, § A.2.

⁹⁸ Conference of the Parties to the Convention on Biological Diversity, The Hague, Neth., Apr. 7–19, 2002, *Report of the Sixth Meeting of the Conference of the Parties to the Convention on Biological Diversity*, at Decision VI/23, § II.4, U.N. Doc. UNEP/CBD/COP/6/20 (May 27, 2002).

to “give Governments clear direction and a set of goals to aim toward.”⁹⁹ The SBSTTA guidelines consist of fifteen guiding principles, which address application of the precautionary approach,¹⁰⁰ research and public education efforts, prevention, and mitigation.¹⁰¹ The guidelines also outline the factors countries should consider when addressing invasive species problems and provide examples of how individuals can introduce invasive species.¹⁰²

Although the SBSTTA guidelines touch on various aspects of a comprehensive invasive species policy, the guidelines do not provide substantive standards, nor are they binding on CBD parties.¹⁰³ As a result, the guidelines provide only a broad overview of the elements a state could address in an invasive species framework. Because of the lack of detailed implementation and enforcement mechanisms for ballast water discharges, the guidelines are likely to lead to inconsistencies in how various countries implement controls on ballast water discharges. Without additional, detailed policy requirements under the CBD, or a binding framework to guide substantive aspects of an aquatic invasive species policy, the CBD provides a weak foundation for driving the adoption of treatment technologies and effective performance standards.

2. *The United Nations Convention on the Law of the Sea*

More specific to introductions in marine and coastal ecosystems is the United Nations Convention on the Law of the Sea (UNCLOS).¹⁰⁴ UNCLOS “provides the most comprehensive and significant document to date dealing with the prevention of marine pollution, among other matters concerning the world’s oceans.”¹⁰⁵ Enough countries have signed and ratified the treaty that even countries that have not ratified the treaty, including the United States, comply with UNCLOS.¹⁰⁶ The treaty specifically addresses invasive species in Article 196, which indicates:

⁹⁹ SBSTTA Report, *supra* note 92, at Recommendation VI/4, Annex, intro (version 1).

¹⁰⁰ Under Guiding Principle 1, the phrase “precautionary approach” refers to the principle that a “lack of scientific certainty about the various long-term implications of an invasion should not be used as a reason for postponing or failing to take appropriate eradication, containment and control measures.” *Id.* Annex, princ. 1.

¹⁰¹ *Id.* Annex, §§ A–B, D.

¹⁰² *Id.* Annex, § C.

¹⁰³ See *id.* Annex, intro. (version 2) (“Because these 15 Principles [Guidelines] are non-binding, they can be more readily amended and expanded through the Convention on Biological Diversity’s processes as we learn more about this problem and its effective solutions.”).

¹⁰⁴ See generally UNCLOS, *supra* note 84, art. 194 (describing “[m]easures to prevent, reduce and control pollution of the marine environment”).

¹⁰⁵ MacPhee, *supra* note 79, at 38.

¹⁰⁶ Wendy M. Jastremski, *A Proposed International Framework Convention on Bioinvasive Species*, in TRANSBOUNDARY ENVIRONMENTAL NEGOTIATION: NEW APPROACHES TO GLOBAL COOPERATION 361, 367 (Lawrence Susskind et al. eds., 2002); Div. for Ocean Affairs and the Law of the Sea, United Nations, Chronological Lists of Ratifications of, Accessions and Successions to the Convention and the Related Agreements as at 16 March 2009, http://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm (last visited July 19, 2009).

States shall take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from the use of technologies under their jurisdiction or control, or *the intentional or accidental introduction of species, alien or new*, to a particular part of the marine environment, which may cause significant and harmful changes thereto.¹⁰⁷

Although the Article invokes the requirement for states to “take all measures necessary” to prevent species introductions, the Article lacks details on how states are to achieve or enforce this objective.¹⁰⁸

Standing alone, Article 196 appears to classify invasive species as a type of pollution. By including a reference that ties together pollution and invasive species—namely, that states are to “control pollution of the marine environment resulting from . . . the intentional or accidental introduction of alien, species or new”—Article 196 on its face indicates that invasive species could be a type of pollution under UNCLOS.¹⁰⁹ Despite this implied inclusion of invasive species in the definition of pollution in Article 196, there is no indication that invasive species fall under other articles of UNCLOS that expressly address pollution from vessels and provide enforcement authority to states.¹¹⁰ For example, Article 211, Pollution from Vessels, outlines provisions for addressing operational pollution caused by ships.¹¹¹ Article 211 requires states to “adopt laws and regulations for the prevention, reduction and control of pollution of the marine environment” from vessels and authorizes states to adopt laws within their exclusive economic zone (EEZ) for enforcement purposes.¹¹² Ideally, Article 196 would link ballast water and invasive species discharges to the provisions in Article 211 for vessel pollution, or would provide similar details on enforcement and legal authority over vessel discharges. Unfortunately, although Article 211 plays an important role in allowing states to implement and enforce vessel pollution controls within their EEZ, there does not appear to be a clear link between Article 196’s discussion of alien invasive species and Article 211’s discussion of vessel pollution. Had Article 196’s invasive species provision been clearly linked to Article 211’s vessel pollution provisions, UNCLOS might have provided a basis for the adoption of ballast water controls and enforcement mechanisms to address invasive species introductions.

¹⁰⁷ UNCLOS, *supra* note 84, art. 196(1) (emphasis added).

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ MacPhee, *supra* note 79, at 39 (“Since vessels are the major pathway of alien species introduction, it would appear that [Article 196] would or should fall under Article 211: Pollution from Vessels. However, it apparently does not. This is unfortunate.”).

¹¹¹ See UNCLOS, *supra* note 84, art. 211.

¹¹² *Id.* art. 209(2); see also MacPhee, *supra* note 79, at 39 (“In comparison to Article 196, the provisions under Article 211 contain far more comprehensive guidelines for the prevention of pollution by vessels, including the authorization for Coastal States to adopt laws within their Exclusive Economic Zone (EEZ) to facilitate enforcement.”). The EEZ is “a zone of the high seas contiguous to the high seas over which a coastal state may assert certain sovereign rights over natural resources” and “is 200 [nautical miles] from the baseline from which the breadth of the territorial sea is measured.” Charles E. Harrington, *A History of Maritime Boundaries on National Ocean Service Nautical Charts*, in MARITIME BOUNDARIES 41, 42 (Gerald H. Blake ed., 1994).

Because Article 196 is not linked to Article 211's vessel pollution provisions, and because UNCLOS contains few, if any, details on states' obligations and powers for preventing the introduction of alien species, UNCLOS is unlikely to serve as a strong catalyst for the adoption of stringent or uniform international controls for ballast water. The lack of enforceable details in Article 196 is also likely to provide a loophole for countries that want to avoid their obligations under UNCLOS. Further, the lack of specific mandates under UNCLOS for ballast water discharges is likely to lead to inconsistencies in how countries adopt regulatory mechanisms. Ultimately, without greater regulatory certainty for the shipping industry, and without additional mechanisms that force countries to adopt effective treatment standards, it is doubtful that UNCLOS could serve as a catalyst for adoption of treatment technologies on an international scale.

B. The Ballast Water Convention as a Binding Regulatory Mechanism

Over the past decade, the IMO developed mechanisms to address the introduction of invasive species through ballast water. In 1992, the United Nations Conference on Environment and Development called on the IMO to address the transfer of organisms by ships.¹¹³ Although the IMO initially adopted guidelines for minimizing the transfer of harmful aquatic organisms in 1993, it was not until 1997 that the IMO Assembly adopted by resolution the Guidelines for the Control and Management of Ships' Ballast Water, to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens (IMO Guidelines).¹¹⁴

The IMO Guidelines replaced earlier, less comprehensive guidelines¹¹⁵ and included provisions to assist interested parties "in minimizing the risk of introducing harmful aquatic organisms and pathogens from ships' ballast water and associated sediments while protecting ships' safety."¹¹⁶ Measures recommended by the IMO Guidelines include minimizing the uptake of organisms during ballasting by avoiding areas known to contain harmful organisms,¹¹⁷ cleaning ballast tanks,¹¹⁸ and avoiding unnecessary discharges of ballast water.¹¹⁹ Additionally, the Guidelines suggest ballast water management procedures; the procedures involve either exchanging ballast water as far away from shore as possible while complying with regional requirements,¹²⁰ avoiding release of ballast water,¹²¹ or discharging the water into onshore facilities.¹²²

¹¹³ Global Ballast Water Mgmt. Programme, Int'l Mar. Org., The International Response, http://globallast.imo.org/index.asp?page=internat_response.htm&menu=true (last visited July 19, 2009) [hereinafter IMO Response].

¹¹⁴ IMO, *Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens*, IMO Assemb. Res. A. 868, IMO Doc. A20/Res.868 (Dec. 1, 1997) [hereinafter IMO Guidelines]; see also IMO Response, *supra* note 113.

¹¹⁵ IMO Response, *supra* note 113.

¹¹⁶ IMO Guidelines, *supra* note 114, para. 4.1.

¹¹⁷ *Id.* para. 9.1.1.

¹¹⁸ *Id.* para. 9.1.2.

¹¹⁹ *Id.* para. 9.1.3.

¹²⁰ *Id.* para. 9.2.1.

Because the IMO Guidelines were only voluntary, compliance was low for the specific, recommended practices.¹²³ As a result, the “voluntary guidelines resulted in differing rules among jurisdictions, complicating the shipping industry’s efforts at compliance.”¹²⁴ Additionally, there were limitations on the approaches listed under the IMO Guidelines. For example, although ballast water exchange is currently one of the primary measures to minimize the risk of invasive species, ship safety often precludes the use of ballast exchange practices at sea.¹²⁵ Further, because even repeated ballast water exchange does not remove all organisms from ballast water tanks, ballast water exchange is limited and variable in its effectiveness.¹²⁶ Since ballast water exchange is only a step above a complete lack of management techniques, the IMO Guidelines are an incomplete and nonbinding attempt by the IMO to reduce aquatic species introductions.

Recognizing the limitations of the IMO Guidelines, the continuing problems with aquatic invasive species, and the need for binding targets for ballast water regulation, the IMO member countries agreed to develop a binding international framework to control ballast water discharges.¹²⁷ In 2003, the IMO’s Marine Environmental Protection Committee developed and finalized the draft text for the International Convention for the Control and Management of Ship’s Ballast Water and Sediments (Ballast Water Convention).¹²⁸ The IMO subsequently adopted the Ballast Water Convention by consensus at the IMO International Conference on Ballast Water Management for Ships in February of 2004.¹²⁹ The Ballast Water Convention will enter into force twelve months after ratification by thirty states, representing 35% of the world merchant shipping tonnage. As of February 2009, there were

¹²¹ *Id.* para. 9.2.2.

¹²² *Id.* para. 9.2.3.

¹²³ McGee, *supra* note 5, at 156.

¹²⁴ McCarraher, *supra* note 76, at 743.

¹²⁵ STEMMING THE TIDE, *supra* note 16, at 37 (“Depending on sea conditions, the ship may become unstable or the allowable forces on the hull may be exceeded, with catastrophic results [if the ship pumps out ballast water until the tank is empty before refilling the ballast water tank.]” (citation omitted)). Studies of continuous ballast water exchange, which involves the continuous flushing of ballast water tanks with new seawater, indicate that after three tank “exchanges,” the ballast tank still contains approximately 5% of the water and materials from before the exchange. *Id.* Thus, because of the low efficacy of ballast water exchange practices, treatment technologies that eliminate or destroy organisms in ballast water are necessary to prevent species introductions.

¹²⁶ See *supra* Part II.B (discussing the inadequacy of ballast water exchange for preventing species introductions).

¹²⁷ IMO Response, *supra* note 113 (“In recognition of the limitations of the A.868(20) Guidelines, the current lack of a totally effective solution and the serious threats still posed by invasive marine species, IMO member countries also agreed to develop a mandatory international legal regime to regulate and control ballast water.”).

¹²⁸ David Ciesla, Comment, *Developments in Vessel-Based Pollution: The International Maritime Organization’s Ballast Water Convention and the European Union’s Regulation to Phase Out Single-Hull Oil Tankers*, 15 COLO. J. INT’L ENVTL. L. & POL’Y 107, 108 (2004).

¹²⁹ See Ballast Water Convention, *supra* note 20 (indicating that the Conference adopted the Ballast Water Convention on February 16, 2004).

eighteen ratifying parties, representing 15.36% of the world's shipping tonnage.¹³⁰ Australia, Brazil, Finland, and the Netherlands are among the countries that signed, but have yet to ratify, the Convention as of March 2009.¹³¹

1. Key Provisions of the Ballast Water Convention

The Ballast Water Convention is the first treaty seeking to “prevent, minimize and ultimately eliminate the risks to the environment, human health, property and resources arising from the transfer of harmful Aquatic Organisms and Pathogens through the control and management of ships’ Ballast Water and Sediments.”¹³² The Ballast Water Convention contains twenty-two articles, regulations for implementation of the Convention’s goals, and two appendices with sample reporting and certification forms.¹³³ The Convention applies to flag ships of contracting parties, as well as ships “which operate under the authority of a Party.”¹³⁴ This provision allows for “passive conformity as an increasing number of countries are forced to have their ships abide by the regulations for fear of financial losses.”¹³⁵ Additionally, “[h]aving the Convention apply to those states under whose jurisdiction the ship operates can also be useful, in that this provision would require countries that may not even be signatories to the document to meet its requirements.”¹³⁶ Ultimately, universal compliance with the Ballast Water Convention could be achieved through port state jurisdiction, simply because the Convention’s parties have the power to impose the Ballast Water Convention’s discharge requirements within their jurisdictional waters, regardless of whether the flag country ratified the Convention.¹³⁷

¹³⁰ Int’l. Mar. Org., Summary of Status of Conventions as of 31 March 2009, http://www.imo.org/conventions/mainframe.asp?topic_id=247 (last visited July 19, 2009). Contracting states as of March 2009 include Albania, Antigua and Barbuda, Barbados, Egypt, France, Kenya, Kiribati, Liberia, Maldives, Mexico, Nigeria, Norway, Saint Kitts and Nevis, Sierra Leone, South Africa, Spain, the Syrian Arab Republic, and Tuvalu. INT’L MAR. ORG., STATUS OF CONVENTIONS BY COUNTRY, *available at* http://www.imo.org/includes/blastData.asp/doc_id=693/status-x.xls [hereinafter IMO COUNTRY STATUS]. The United States has yet to ratify the Convention. *Id.*

¹³¹ Int’l. Mar. Org., International Convention for the Control and Management of Ships’ Ballast Water and Sediments Adopted in 2004, http://www.imo.org/environment/mainframe.asp?topic_id=548 (last visited July 19, 2009) (“At July 2005, eight countries (Argentina, Australia, Brazil, Finland, Maldives, The Netherlands, Spain and Syrian Arab Republic) have signed the Ballast Water Management Convention, subject to ratification.”). Since that time, Spain ratified the Convention. *See* IMO COUNTRY STATUS, *supra* note 130.

¹³² *See* Ballast Water Convention, *supra* note 20, pmb.; McCarraher, *supra* note 76, at 744 (“The Ballast Water Convention is the first treaty seeking to establish binding standards for the minimization and eventual elimination of the threats posed by untreated ballast water.”).

¹³³ *See generally* Ballast Water Convention, *supra* note 20.

¹³⁴ *Id.* art. 3(1). Ships that “operate under the authority of a Party” are “those vessels that are operating within the territorial waters of a state and are therefore subject to its laws.” MacPhee, *supra* note 79, at 48.

¹³⁵ MacPhee, *supra* note 79, at 48.

¹³⁶ *Id.*

¹³⁷ *See id.*

Relying on Article 196(1) of UNCLOS,¹³⁸ the precautionary principle, and sustainable use principles, the Ballast Water Convention delineates a mandatory regime for ballast water management with the ultimate goal of eliminating ballast water's risks to the environment, avoiding "unwanted side-effects from that control and [encouraging] developments in related knowledge and technology."¹³⁹ To implement the parties' ultimate goal, the Ballast Water Convention provides specific requirements for discharges of ballast water, including dates of compliance and ballast water exchange procedures.¹⁴⁰ For the ballast water exchange requirements, known as Regulation D-1 requirements, the Ballast Water Convention requires ships to conduct a ballast water exchange with at least a ninety-five percent rate of effectiveness.¹⁴¹ Whenever possible, this exchange must be conducted at least two hundred miles from shore in water at least two hundred meters deep.¹⁴² Exceptions to this discharge requirement include situations where the discharge is a threat to the safety or stability of the ship, or the operation would delay or deviate the ship.¹⁴³

Most importantly, the Ballast Water Convention sets binding performance standards, known as Regulation D-2 requirements, which limit the number of viable organisms allowed in ballast water discharges and ultimately replace the D-1 exchange requirements starting in 2011.¹⁴⁴ Regulation D-2 limits the number of viable organisms per cubic meter that ships can discharge:

Ships conducting Ballast Water Management in accordance with this regulation shall discharge less than 10 viable organisms per cubic metre greater than or equal to 50 micrometres in minimum dimension and less than 10 viable organisms per millilitre less than 50 micrometres in minimum dimension and greater than or equal to 10 micrometres in minimum dimension; and discharge of the indicator microbes shall not exceed specified concentrations.¹⁴⁵

Additionally, Regulation D-2 limits the concentrations of "human health related" microbes, or indicator microbes, present in the discharge.¹⁴⁶ The

¹³⁸ See *supra* note 107 and accompanying text.

¹³⁹ Ballast Water Convention, *supra* note 20, pmbl.

¹⁴⁰ See *id.* Annex, reg. B-3, B-4.

¹⁴¹ See *id.* Annex, reg. D-1 para. 1.

¹⁴² See *id.* Annex, reg. B-4 para. 1.1.

¹⁴³ See *id.* para. 4.

¹⁴⁴ See *id.* Annex, regs. B-3, D-2; IMO, *Application of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004*, IMO Assemb. Res. A. 585 (14) (Dec. 4, 2007) [hereinafter IMO Assembly Resolution 585]. Regulation B-3 originally phased in the D-2 performance standards between 2009 and 2016. Ballast Water Convention, *supra* note 20, Annex, reg. B-3. However, due to concerns of the IMO that treatment technologies would not be immediately available in 2009, the IMO adopted a resolution that extended the deadline from 2009 to as late as 2011 for new vessels. See IMO Assembly Resolution 585, *supra*.

¹⁴⁵ Ballast Water Convention, *supra* note 20, Annex, reg. D-2 para. 1.

¹⁴⁶ See *id.* para. 2.

indicator microbes include cholera (*Vibrio cholerae*), E. coli (*Escherichia coli*), and intestinal enterococci.¹⁴⁷

Regulation D-3 further indicates that all treatment technologies utilized by vessels are subject to approval by the IMO, and must meet IMO standards.¹⁴⁸ The Convention distinguishes between technologies that employ or do not employ an “active substance,”¹⁴⁹ which the Convention defines as “a substance or organism, including a virus or a fungus, that has a general or specific action on or against Harmful Aquatic Organisms and Pathogens.”¹⁵⁰ To obtain approval, systems that do not use active substances must go through land-based testing and shipboard trials; once the trials are complete, the flag state issues a “type approval certificate,” which indicates the technology meets the approval requirements of Regulation D-3 and can be utilized by flag states to meet the D-2 performance standards.¹⁵¹ Systems using active substances must clear additional hurdles to receive type approval. First, the system must receive basic approval from an advisory committee prior to beginning land-based testing and shipboard trials; this additional step is to ensure “that the use of the [active substance] poses no harm to the environment” and prevents companies from needlessly wasting research dollars on systems that damage the environment.¹⁵² Additionally, active substance technologies must receive final approval from the advisory body before a flag state can issue a type approval certificate.¹⁵³ Typically, the approval process takes up to two years.¹⁵⁴ As of 2008, only three systems hold type approval certificates, two of which utilize active substances.¹⁵⁵

The Convention provides a timetable for implementation of Regulation D-2 that depends on ship size and construction dates, and ultimately requires all ships to meet the D-2 performance standards by 2016.¹⁵⁶ The performance standards do not provide a grandfathering clause for older vessels, which thereby “forc[es] the entire fleet to shift technologies or practices” by the prescribed dates.¹⁵⁷ Originally, the Convention required ships constructed in

¹⁴⁷ See *id.*

¹⁴⁸ See *id.* Annex, reg. D-3 para. 1.

¹⁴⁹ See *id.* para. 2.

¹⁵⁰ See *id.* Annex, reg. A-1 para. 7.

¹⁵¹ See LLOYD'S REGISTER, BALLAST WATER TREATMENT TECHNOLOGY: CURRENT STATUS 5 fig.1 (2008) [hereinafter 2008 LLOYD'S REGISTER STATUS]. The flag state is the “administration or the government of the state whose flag the ship is entitled to fly.” MAR. INT'L SECRETARIAT SERVS. LTD., SHIPPING INDUSTRY GUIDELINES ON FLAG STATE PERFORMANCE 5 n.1 (2d ed. 2006), available at <http://www.marisec.org/flag-performance/flag-performance.pdf>. Conversely, port state control is “the range of control powers that may be exercised by the competent authorities of a given port on ships flying a flag that is foreign in respect of the State of the visited port.” Lorenzo Schiano di Pepe, *Port State Control as an Instrument to Ensure Compliance with International Marine Environmental Obligations*, in INTERNATIONAL MARINE ENVIRONMENTAL LAW: INSTITUTIONS, IMPLEMENTATION AND INNOVATIONS 137, 137 (Andree Kirchner ed., 2003).

¹⁵² 2008 LLOYD'S REGISTER STATUS, *supra* note 151.

¹⁵³ See *id.* at 6.

¹⁵⁴ See *id.*

¹⁵⁵ See *id.*

¹⁵⁶ See Ballast Water Convention, *supra* note 20, Annex, reg. B-3.

¹⁵⁷ See McCarraher, *supra* note 76, at 749.

or after 2009 with a ballast water capacity of less than five thousand cubic meters to comply with D-2 requirements.¹⁵⁸ However, because the Convention had yet to enter into force, the IMO General Assembly adopted a resolution that effectively delayed the requirements to no later than 2011 for ships built in 2009.¹⁵⁹

To ensure compliance with the Ballast Water Convention's requirements, the Convention creates a binding obligation on vessels to keep detailed records of the ship's ballast water operations,¹⁶⁰ and for each ship to develop a Ballast Water Management plan detailing how the ship will implement the Convention's provisions.¹⁶¹ The Convention also authorizes parties to inspect the ship's ballast water certificate and record book, and to sample the ship's ballast water.¹⁶² When a state finds a ship is in violation of the Convention's requirements, the Ballast Water Convention authorizes the state to take multiple actions.¹⁶³ First, the state under whose authority the ship is operating must establish sanctions for violations.¹⁶⁴ If a state finds a ship in its waters to be in violation of the Convention, the state may then bring proceedings in its own court, or may furnish information and evidence to the flag state to show how the ship violated the Convention.¹⁶⁵ Any sanctions imposed "shall be adequate in severity to discourage violations of this Convention wherever they occur."¹⁶⁶ In addition to sanctions, the flag or port state may "warn, detain, or exclude the ship,"¹⁶⁷ and may prohibit the ship from discharging ballast water until the removal of any threats.¹⁶⁸ By authorizing states to test ballast water and bring enforcement actions for violations of the Convention, the Ballast Water Convention has the potential to maintain compliance among vessels.

In addition to vessel controls, the Convention also encourages parties to promote and facilitate research on ballast water controls.¹⁶⁹ The Ballast Water Convention asks parties to make relevant information available for other parties who request information; parties can request information on other parties' scientific and technology programs, or on the development of ballast water technologies.¹⁷⁰ To further the effectiveness of the program, the IMO, United Nations Development Programme (UNDP), member governments, and the shipping industry created a joint initiative known as

¹⁵⁸ See Ballast Water Convention, *supra* note 20, Annex, reg. B-3 para. 3.

¹⁵⁹ See LLOYD'S REGISTER, IMO MEPC 58 REPORT 8 (2008), *available at* <http://www.lr.org/NR/rdonlyres/D071AC4E-BABA-4F5D-B913-45D9DC0DABF3/86406/LRIMOMEPC58Report1.pdf> [hereinafter IMO MEPC 58 REPORT]; see also IMO Assembly Resolution 585, *supra* note 144.

¹⁶⁰ See Ballast Water Convention, *supra* note 20, Annex, reg. B-2.

¹⁶¹ See *id.* Annex, reg. B-1.

¹⁶² See *id.* art. 9(1).

¹⁶³ See *id.* art. 10.

¹⁶⁴ See *id.* art. 8(1).

¹⁶⁵ See *id.* art. 8(2).

¹⁶⁶ *Id.* art. 8(3).

¹⁶⁷ *Id.* art. 10(2).

¹⁶⁸ See *id.* art. 10(3).

¹⁶⁹ See *id.* art. 6(1).

¹⁷⁰ See *id.* art. 6(2).

the GloBallast Program.¹⁷¹ The primary purpose of the program is to assist less-industrialized countries with the adoption of ballast water controls and technologies.¹⁷² With a \$10.2 million budget,¹⁷³ the program has the potential to spur the adoption of a regulatory framework for ballast discharges in countries that might otherwise choose not to implement the provisions of the Convention. Overall, the “program is yet another example of the international cooperation and the determination of the international community to work together to achieve the Convention’s objectives.”¹⁷⁴

Finally, of key importance is a provision that allows states to adopt more stringent measures than those outlined in the Convention. As an active participant in the Convention’s negotiations, the United States suggested that the Ballast Water Convention include a provision to preserve the sovereign right of a party to enforce more stringent measures than those adopted in the Convention.¹⁷⁵ As written, Article 2 of the Ballast Water Convention preserves countries’ sovereign right to adopt more stringent measures than those in the Convention:

Nothing in this Convention shall be interpreted as preventing a Party from taking, individually or jointly with other Parties, more stringent measures with respect to the prevention, reduction or elimination of the transfer of Harmful Aquatic Organisms and Pathogens through the control and management of ships’ Ballast Water and Sediments, consistent with international law.¹⁷⁶

Although the United States might want more stringent performance standards in the Ballast Water Convention, the ultimate inclusion of this provision in the Convention should have the power to alleviate some of the concerns of parties who want to impose more stringent measures to protect their waters.

2. Moving Forward with the Ballast Water Convention

Overall, the Ballast Water Convention has the power to drive technology adoption by setting clear, unambiguous goals for adoption of ballast water treatment technologies. The Convention would also be a marked improvement from current international regulatory regimes, which are not comprehensive or clear with regard to ballast water and aquatic invasive species prevention, technology implementation, or enforcement.¹⁷⁷

¹⁷¹ See Global Ballast Water Mgmt. Programme, Int’l Mar. Org., The GloBallast Programme, http://globallast.imo.org/index.asp?page=gef_interw_project.htm&menu=true (last visited July 19, 2009) [hereinafter GloBallast Programme].

¹⁷² See *id.*

¹⁷³ *Id.*

¹⁷⁴ MacPhee, *supra* note 79, at 51.

¹⁷⁵ See IMO, *Harmful Aquatic Organisms in Ballast Water: Additional Outstanding Issues*, at 1, IMO Doc. MEPC 49/2/18 (May 23, 2003).

¹⁷⁶ Ballast Water Convention, *supra* note 20, art. 2(3).

¹⁷⁷ See generally *supra* Part III.A–B (discussing the problems with the current international regulatory regime for addressing ballast water discharges and aquatic species introductions).

Ultimately, as a binding legal instrument, the Ballast Water Convention could provide an international floor for regulation and establish technology targets for the shipping industry. Further, since there is no grandfathering clause in the Ballast Water Convention,¹⁷⁸ the Convention would force entire fleets of ships to adopt necessary treatment technologies.

The Convention, however, also has some significant problems. First, given the billions of tons of ballast water that ships discharge on an annual basis,¹⁷⁹ the D-2 treatment requirements are unlikely to eliminate invasive species introductions. As purely a mathematical estimate, with a discharge rate that allows for up to ten viable organisms per cubic meter, and with individual ships containing as much as—if not more than—five thousand cubic meters of ballast water,¹⁸⁰ vessels still could discharge tens of thousands of viable organisms during ballast water operations. Although it is difficult to predict which organisms will successfully establish invasive species populations,¹⁸¹ a high risk remains that species introductions will continue if countries adopt the Ballast Water Convention's performance requirements over more stringent requirements.

Some might also argue that the Convention's deadlines for adopting treatment technologies could be more stringent. Specifically, the Convention's deadlines treatment technology implementation could phase in technology requirements in fewer years than under the current deadlines. For example, ships built before 2009 with ballast water capacities of more than five thousand cubic meters do not need to meet the D-2 performance standards until 2016, but this performance standard could be tightened to 2012 or another year that is closer in time than 2016.¹⁸² Additionally, the Convention allows for the reexamination of treatment technologies and the timeframes located in Regulation B-3; just as the IMO previously extended the deadline for new vessels, the IMO could also extend the implementation dates for other ships.¹⁸³ Through the Convention's review process, an IMO committee must periodically undertake a review to determine whether "appropriate technologies" are available for implementation of the D-2 standard and to examine all other aspects of the regulations.¹⁸⁴ During the review of available technologies, the IMO must take into account safety issues, environmental impacts, compatibility of the technologies with ship designs, cost and economics, and the effectiveness of the treatment

¹⁷⁸ See *supra* note 157 and accompanying text.

¹⁷⁹ See *supra* note 31 and accompanying text.

¹⁸⁰ See *generally* Ballast Water Convention, *supra* note 20, Annex, regs. B-3, D-2 (describing the various levels of treatment required for ships with ballast water capacities of more or less than 5000 cubic meters).

¹⁸¹ ROLIM, *supra* note 12, at 8.

¹⁸² See Ballast Water Convention, *supra* note 20, Annex, reg. B-3 para. 1.2; IMO Assembly Resolution 585, *supra* note 144, para. 2 (extending the regulation D-2 implementation date for vessels constructed in or after 2009 with a Ballast Water Capacity of less than 5000 cubic meters to no later than December 2011).

¹⁸³ See *id.* Annex, reg. D-5 para. 1.

¹⁸⁴ See *id.*

technologies in removing organisms and pathogens.¹⁸⁵ Following the review, the committee can make recommendations for proposed amendments to the Convention's regulations.¹⁸⁶ Through the review process, and under the broad language of the Convention, the IMO has the power to loosen the deadlines and other aspects of the Convention that drive technology adoption. As a result, although the mechanism could arguably be used to strengthen the performance standards, there is also the possibility that the IMO might weaken the performance standards by undermining the performance standards or the adoption timeline. By potentially allowing the IMO to delay or loosen treatment requirements, the review mechanism could also compromise the credibility of the Convention as a tool for forcing the adoption of treatment technologies.

Another key question is whether the Ballast Water Convention's enforcement provisions are sufficient to overcome the historical problems with enforcement under other international treaties. As exemplified by the International Convention for the Prevention of Pollution from Ships (MARPOL) and UNCLOS, international law tends to favor flag state enforcement over port state powers, resulting in imbalances in the implementation of enforcement provisions.¹⁸⁷ Under MARPOL, port states and other parties are to provide the flag state with evidence that the ship violated the provisions of the Convention.¹⁸⁸ The flag state is then obligated to investigate the violation and, if there is sufficient evidence, commence proceedings under the flag state's laws.¹⁸⁹ Similarly, UNCLOS indicates that, except in exceptional circumstances or other situations specified under UNCLOS, ships are subject to the "exclusive jurisdiction" of their flag state on the high seas¹⁹⁰ and the flag state has the power to preempt criminal proceedings of port states.¹⁹¹ Although "[f]lag state jurisdiction is not essentially wrong," problems have arisen internationally because "flag states appear reluctant to enforce standards against their ships."¹⁹² In one study, out of three hundred violations reported by port states, flag states took action in only seventeen percent of the cases, potentially because the multinational corporations that own the vessels are often "more powerful than many flag states" and because flag states do not suffer from the direct environmental consequences of the vessels' actions.¹⁹³

¹⁸⁵ See *id.* para. 2.

¹⁸⁶ See *id.* paras. 3, 4.

¹⁸⁷ International Convention for the Prevention of Pollution from Ships, Nov. 2, 1973, 12 I.L.M. 1319 [hereinafter MARPOL]; UNCLOS, *supra* note 84.

¹⁸⁸ MARPOL, *supra* note 187, art. 6(3).

¹⁸⁹ *Id.* art. 6(4).

¹⁹⁰ UNCLOS, *supra* note 84, art. 92(1).

¹⁹¹ UNCLOS, *supra* note 84, art. 228(1). The flag state may not suspend the proceedings if "those proceedings relate to a case of major damage to the coastal State or the flag State in question has repeatedly disregarded its obligation to enforce effectively the applicable international rules and standards in respect of violations committed by its vessels." *Id.*

¹⁹² Emeka Duruigbo, *Multinational Corporations and Compliance with International Regulations Relating to the Petroleum Industry*, 7 ANN. SURV. INT'L & COMP. L. 101, 108 (2001).

¹⁹³ *Id.*

Conversely, breaking with the frameworks adopted under MARPOL and UNCLOS, the Ballast Water Convention sets up a system that allows for both port and flag state enforcement. Unlike MARPOL's provisions for flag state enforcement and port state referrals, Article 8 of the Ballast Water Convention indicates port states can either initiate proceedings against the violating party using the port state's laws or may furnish information to the flag state; by allowing port states to initiate their own proceedings and pursue their own penalties, the Ballast Water Convention departs significantly from MARPOL and UNCLOS and has the power to alter some of the historical problems with enforcement. Additionally, port states have the power under the Ballast Water Convention, in addition to imposing sanctions, to "take steps to warn, detain, or exclude the ship."¹⁹⁴ The Ballast Water Convention also goes beyond MARPOL by providing authority not only for inspections, but also for sampling of the ship's ballast water to determine if the vessel is in compliance with the performance standards or other regulatory requirements.¹⁹⁵ Finally, because the Ballast Water Convention allows parties to "develop national policies, strategies or programmes" for ballast water management "with due regard to [the state's] particular conditions and capabilities," the Ballast Water Convention empowers port states with wide discretion to adopt frameworks to address the state's unique needs while complying with the provisions of the Convention.

In the past, individuals criticized UNCLOS and MARPOL because port states lacked regulatory powers in waters beyond two hundred miles from shore.¹⁹⁶ Because "it is possible that an incident in those waters might pollute the coastal state itself or, more likely, its EEZ and continental shelf resources," powers extending beyond the EEZ could be crucial for a port state addressing a pollution problem.¹⁹⁷ Despite this issue, the Ballast Water Convention does not expressly extend the port state's enforcement powers to the area outside of the port state's EEZ.¹⁹⁸ Additionally, although the Ballast Water Convention does not include a provision that allows the flag state to supersede port state proceedings, the Ballast Water Convention indicates that "[a]ll possible efforts shall be made to avoid a ship being unduly detained or delayed" under the Convention, or the ship will be "entitled to compensation for any loss or damage suffered."¹⁹⁹ Although it is unclear what the scope of the undue delay requirement is, the provision has the potential to undermine the port state's ability to board the vessel and enforce the provisions of the Convention.

Overall, the Convention, if ratified, represents a significant step forward in the attempt to address ballast water discharges and aquatic species

¹⁹⁴ Ballast Water Convention, *supra* note 20, art. 10(2).

¹⁹⁵ *Id.* art. 9(1)(c).

¹⁹⁶ See, e.g., Daniel Bodansky, *Protecting the Marine Environment from Vessel-Source Pollution: UNCLOS III and Beyond*, 18 *ECOLOGY L.Q.* 719, 768 (1991).

¹⁹⁷ *Id.*

¹⁹⁸ See Ballast Water Convention, *supra* note 20.

¹⁹⁹ *Id.* art. 12.

introductions on an international scale. However, the Convention does not appear to go far enough, particularly without more stringent technology requirements, to force the adoption of effective treatment technologies. In the absence of a ratified treaty and the adoption of stringent technology requirements by individual countries, potentially within the Ballast Water Convention's structure, questions remain over what might force the adoption of effective treatment technologies. As Part IV will next examine, although the United States has yet to adopt stringent performance standards for ballast water treatment technologies, developments at the national, regional, and state level may still have the power to trigger the shipping industry's adoption of effective treatment technologies, even in the absence of more stringent requirements at the international level.

IV. THE MANAGEMENT OF BALLAST WATER DISCHARGES IN THE UNITED STATES

The United States has the power to provide leadership for the global community in the adoption of ballast water treatment technologies, but several challenges remain. The United States has yet to ratify the Ballast Water Convention²⁰⁰ or adopt comparable, aggressive domestic legislation with treatment technology performance standards.²⁰¹ Most recently, in 2008, the Ninth Circuit held that EPA must regulate ballast water and other vessel discharges under the Clean Water Act (CWA).²⁰² Despite the potential for adoption of performance standards under the CWA, EPA's ineffective response to the Ninth Circuit's holding has done little to advance the adoption of treatment technologies in the United States.²⁰³ Even in the absence of a national solution to ballast water discharges, however, this Part asserts that state and regional efforts may still have the power to drive the adoption of treatment technologies that are more stringent than those required under the Ballast Water Convention.²⁰⁴

A. Federal Responses to Aquatic Invasive Species

Currently, the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA),²⁰⁵ as amended by the National Invasive Species Act of 1996 (NISA),²⁰⁶ controls the Coast Guard's authority over ballast water discharges in the United States.²⁰⁷ Through NISA, which reauthorized and

²⁰⁰ See *supra* note 130 and accompanying text.

²⁰¹ See *infra* Part IV.A.

²⁰² See *infra* Part IV.B.2.

²⁰³ See *infra* Part IV.B.4.

²⁰⁴ See *infra* Part IV.C.

²⁰⁵ Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, 16 U.S.C. §§ 4701–4751 (2006).

²⁰⁶ National Invasive Species Act of 1996, Pub. L. No. 104-332, 110 Stat. 4073 (codified at 16 U.S.C. §§ 4701–4751).

²⁰⁷ CLAUDIA COPELAND, CONG. RESEARCH SERV., REGULATING BALLAST WATER DISCHARGES: CURRENT LEGISLATIVE ISSUES, at CRS-1 (2008) (“Federal authority to address ballast water concerns in the United States is contained in the Nonindigenous Aquatic Nuisance Prevention

expanded NANPCA, Congress “provided ships entering U.S. ports from outside the [EEZ] a three-year window of opportunity to undertake a voluntary open-ocean exchange program with a mandatory reporting requirement.”²⁰⁸ NISA also required that the Secretary of Transportation make the ballast water exchange requirements mandatory if the voluntary program is not “satisfactory.”²⁰⁹ Under the Coast Guard’s original regulations for implementing NISA, the Coast Guard required each ship holding ballast water to file a report twenty-four hours before entering U.S. waters and to have a ballast water management plan.²¹⁰ During the “first 12 months of the program, only 12,170 of the 58,000 vessels arriving in U.S. ports filed a mandatory reporting form.”²¹¹ Of the estimated 3500 vessels that declared an intention to discharge ballast water, only twenty-one percent of the vessels reported a full mid-ocean exchange of ballast water.²¹² Because the voluntary compliance with the ballast exchange requirements was too low, the Secretary imposed mandatory requirements for all incoming ships.²¹³

Current Coast Guard regulations require any ship with ballast water entering U.S. waters from outside the U.S. EEZ to either 1) conduct a mid-ocean ballast water exchange at least two hundred nautical miles from shore, in a location where the depth is at least two thousand meters, 2) retain the vessel’s ballast water, or 3) utilize an alternative, environmentally sound method of ballast water control, as approved by the Coast Guard.²¹⁴ The Coast Guard does not require vessels traveling only coastally, or within the two hundred mile EEZ, to conduct a mid-ocean ballast water exchange.²¹⁵ The regulations also do not require vessels to shift their course solely for performing a ballast water exchange.²¹⁶ Finally, the federal ballast regulations provide a safety exemption from the ballast water exchange requirement if weather or other limitations place the crew or vessel at risk.²¹⁷

The Coast Guard regulations require vessel operators arriving in U.S. ports or from locations outside the U.S. EEZ to submit ballast water reporting forms.²¹⁸ The Coast Guard enforces ballast water management regulations and regularly boards vessels to check for compliance with the

and Control Act of 1990 (NANPCA), as amended by the National Invasive Species Act of 1996 (NISA), and is administered by the U.S. Coast Guard.”).

²⁰⁸ CARLTON, *supra* note 30, at 16–17.

²⁰⁹ *Id.*

²¹⁰ See 33 C.F.R. §§ 151.2035(a)(7), 151.2041(b) (2008).

²¹¹ CARLTON, *supra* note 30, at 17.

²¹² *Id.*

²¹³ Mandatory Ballast Water Management Program for U.S. Waters, 69 Fed. Reg. 44,952, 44,953 (July 28, 2004) (codified at 33 C.F.R. pt. 151).

²¹⁴ 33 C.F.R. § 151.1510 (2008).

²¹⁵ *Id.* § 151.2015.

²¹⁶ *Id.* § 151.2036.

²¹⁷ *Id.* § 151.1514.

²¹⁸ *Id.* § 151.2041.

regulations.²¹⁹ Additionally, if inspectors have reason to believe a vessel did not comply with the ballast water requirements, the Coast Guard can examine ballast water samples and assess criminal penalties or civil penalties of up to \$27,500 per violation.²²⁰

As described in Part II, ballast water exchange is an incomplete solution to the problems with invasive species; ballast water exchange, without the technology to destroy or remove pathogens and other aquatic species, is only partially effective.²²¹ Additionally, ships often circumvent exchange requirements due to safety considerations.²²² As such, “[t]he current federal program has been criticized as inadequate,” and individuals have criticized the Coast Guard for delays in adopting performance standards for ballast water discharges.²²³

Although “there is wide agreement on the need for stronger measures to control ballast water discharges,” there are differing views on how the government should implement controls.²²⁴ Over the last several years, differences in opinions stalled several proposed pieces of federal ballast water legislation.²²⁵ One of the bills that came closest to making it through Congress was House Resolution 2830, the Coast Guard Authorization Act of 2007 (CGAA),²²⁶ which passed the House in April of 2008.²²⁷ The CGAA “would strengthen the existing provisions of law by amending NANPCA section 1101 to require that such vessels have a ballast water management plan, maintain record books, comply with ballast water exchange requirements, and comply with ballast water treatment requirements.”²²⁸ Congress modeled the ballast water provisions of the CGAA after the provisions of the Ballast Water Convention,²²⁹ but imposed performance standards that are 100 times more stringent than the IMO standards; the CGAA, as passed by the House, limits discharged organisms to 0.1 living organisms greater than 50 micrometers in size per cubic meter, and to 0.1 living organisms per milliliter for organisms between 10 and 50 micrometers in

²¹⁹ OR. TASK FORCE ON SHIPPING TRANSP. OF AQUATIC INVASIVE SPECIES, MANAGEMENT OF AQUATIC INVASIVE SPECIES RISKS FROM SHIPPING TRANSPORT PATHWAYS 16 (2008) [hereinafter OREGON TASK FORCE REPORT].

²²⁰ 33 C.F.R. § 151.61 (2008); OREGON TASK FORCE REPORT, *supra* note 219, at 16.

²²¹ See *supra* notes 55–57 and accompanying text.

²²² COPELAND, *supra* note 207, at CRS-1.

²²³ *Id.*

²²⁴ *Id.* at CRS-2.

²²⁵ See, e.g., Ballast Water Management Act of 2005, S. 363, 109th Cong. (2005); Ballast Water Management Act of 2007, S. 1578, 110th Cong. (2007); National Aquatic Invasive Species Act of 2007, S. 725, 110th Cong. (2007).

²²⁶ Coast Guard Authorization Act of 2007, H.R. 2830, 110th Cong. (2007).

²²⁷ *Id.*; see also COPELAND, *supra* note 207, at CRS-2 n.3 (“Ballast water management is also the subject of S. 1578 The provisions of that legislation are similar but not identical to Title V of H.R. 2830. They are not discussed in this report, because recent discussion among interested parties has focused on H.R. 2830.”).

²²⁸ COPELAND, *supra* note 207, at CRS-2.

²²⁹ See *id.* at CRS-3.

dimension.²³⁰ Under the CGAA, the Coast Guard retains jurisdiction to develop regulations and monitor ballast water discharges.²³¹

Despite Congress' inclusion of more stringent performance standards than those of the Ballast Water Convention, political controversy remained over whether the bill should preempt more stringent state standards and whether EPA should retain regulatory power over ballast water discharges under the CWA.²³² The potential preemption of state regulatory controls over ballast water, regardless of whether they are more or less stringent, is one of the primary reasons why states and others opposed the CGAA's approach.²³³ To resolve issues over federal preemption of state ballast water regulations, Senator Boxer circulated a compromise that would set either 1) California's ballast water standard, 2) any future CWA standard promulgated by EPA, or 3) a different standard set by the Secretary of Homeland Security, whichever is strictest, as the national standard when the technology requirement takes effect in 2012.²³⁴ This proposal would allow states to retain their current ballast water programs until 2012, and to participate in enforcement and technology certifications.²³⁵ Senator Boxer's draft also included a rigid 2012 deadline for ships to install treatment technologies.²³⁶ Despite Boxer's attempted compromise, H.R. 2830 did not pass before the adjournment of the 110th Congress in 2008.²³⁷

*B. Northwest Environmental Advocates—Potential for Change or
More of the Same?*

Although Congress has yet to pass comprehensive ballast water legislation or discharge performance standards,²³⁸ this Chapter asserts that the recent decision by the Ninth Circuit in *Northwest Environmental Advocates* has the potential to alter the regulatory scheme for ballast water discharges in the United States by bringing ballast water regulation under the purview of the CWA. This Part continues with an overview of the CWA's ability to act as a tool for regulating ballast water discharges, the Ninth

²³⁰ H.R. 2830, 110th Cong. § 503(a) (as passed by the House, Mar. 4, 2008). The Ballast Water Convention requires there be less than 10 viable organisms greater than 50 micrometers in dimension per cubic meter. Ballast Water Convention, *supra* note 20, Annex, reg. D-2 para. 1. The Ballast Water Convention further requires that there be less than 10 viable organisms per milliliter that are between 10 to 50 micrometers in dimension. *Id.*

²³¹ H.R. 2830, 110th Cong. § 503(a) (as passed by House, Mar. 4, 2008) (directing the Secretary to approve a program for ensuring compliance with required performance standards).

²³² *Boxer Seeks 11th-Hour Deal to Retain EPA, State Role Over Ships' Ballast*, INSIDE E.P.A. WKLY. REP., Sept. 12, 2008, at 3 [hereinafter *Boxer Seeks 11th-Hour Deal*] ("EPA and states' role in regulating ballast discharges is one of the key issues delaying the [enactment of H.R. 2830].").

²³³ See COPELAND, *supra* note 207, at CRS-6.

²³⁴ *Boxer Seeks 11th-Hour Deal*, *supra* note 232, at 4.

²³⁵ *Id.*

²³⁶ *Id.*

²³⁷ See Library of Cong. THOMAS, H.R. 2830, <http://thomas.loc.gov/cgi-bin/bdquery/z?d110:h.r.02830>: (last visited July 19, 2009) (indicating that the last major action on H.R. 2830 was the Senate's receipt and reading of the bill).

²³⁸ See *supra* Part IV.A.

Circuit's decision in *Northwest Environmental Advocates*, and EPA's response to the court's order.

1. *The Clean Water Act as a Tool for Controlling Ballast Water Discharges*

One debated issue is whether the permitting and standard-setting requirements of the CWA are the appropriate tools for managing ballast water discharges.²³⁹ Sections 301 and 402 of the CWA expressly prohibit any unpermitted "discharge of any pollutant" from a point source into navigable waters of the United States.²⁴⁰ The CWA defines "discharge of a pollutant" as "any addition of any pollutant to navigable waters from any point source."²⁴¹ Congress further defined "point source" as "any . . . vessel or other floating craft."²⁴² The definition of pollutant expressly excludes "sewage from vessels" and "discharge[s] incidental to the normal operation of a vessel of the Armed Forces," but includes "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water."²⁴³

In 1973, EPA issued a regulation that exempted several categories of vessel discharges from the permitting requirements under the CWA.²⁴⁴ Under the exemption, EPA did not require a permit for "[a]ny discharge of sewage from vessels, effluent from properly functioning marine engines, laundry, shower, and galley sink wastes, or any other discharge incidental to the normal operation of a vessel."²⁴⁵ At the time, EPA justified the vessel exemption on the basis that "[t]his type of discharge generally causes little pollution and exclusion of vessel wastes from the permit requirements will reduce administrative costs drastically."²⁴⁶

2. *The Ninth Circuit's Holding in Northwest Environmental Advocates*

In 1999, a coalition of environmental organizations, including Northwest Environmental Advocates (collectively NWEA),²⁴⁷ petitioned EPA

²³⁹ See, e.g., *Boxer Seeks 11th-Hour Deal*, *supra* note 232, ("Environmentalists have long argued that the [CWA] requires EPA to regulate vessel discharges under the National Pollutant Discharge Elimination System (NPDES), while the agency and industry officials have argued Congress never intended the [CWA] requirements to extend to vessels.").

²⁴⁰ Federal Water Pollution Control Act, 33 U.S.C. §§ 1311(a), 1342 (2006).

²⁴¹ *Id.* § 1362(12)(A).

²⁴² *Id.* § 1362(14).

²⁴³ *Id.* § 1362(6)(A).

²⁴⁴ See National Pollutant Discharge Elimination System, 38 Fed. Reg. 13,528, 13,528 (May 22, 1973) (to be codified at 40 C.F.R. pt. 125).

²⁴⁵ *Id.* at 13,530.

²⁴⁶ *Id.* at 13,528.

²⁴⁷ The environmental organizations that filed the petition with EPA and later went on to challenge EPA's decision in federal district court included Northwest Environmental Advocates, the Ocean Conservancy, and Waterkeepers Northern California. *Nw. Env'tl Advocates v. U.S. Env'tl. Prot. Agency*, No. CV 03-05760, 2005 WL 756614 (N.D. Cal. Mar. 30, 2005).

to repeal the vessel discharge exemption in 40 C.F.R. § 122.3(a), claiming the CWA did not authorize the regulation.²⁴⁸ Ultimately, EPA denied NWEA's petition.²⁴⁹ NWEA subsequently filed a complaint in federal district court, asserting that EPA's refusal to rescind the regulation was "arbitrary, capricious, an abuse of discretion and otherwise not in accordance with the law . . . and in excess of statutory jurisdiction, authority, or limitations."²⁵⁰ In 2005, the district court granted NWEA's motion for summary judgment and ordered EPA to repeal 40 C.F.R. § 122.3(a).²⁵¹ During further proceedings in 2006 on the appropriate remedy, six states joined as plaintiffs and the Shipping Industry Ballast Water Coalition intervened as a defendant.²⁵² As a result of the 2006 proceedings, the district court granted NWEA's motion for a permanent injunction, remanded the regulation to EPA, and set a deadline of September 30, 2008, for vacatur of the regulation.²⁵³ EPA and the Shipping Industry Ballast Water Coalition appealed to the Ninth Circuit Court of Appeals.²⁵⁴

On appeal, the Ninth Circuit reviewed de novo the question of subject matter jurisdiction and the district court's grant of summary judgment.²⁵⁵ Because the decision involved a question over an agency's interpretation of a statute, the court applied the two-step inquiry articulated in *Chevron, U.S.A., Inc. v. Natural Resources Defense Council, Inc.*²⁵⁶ After concluding that the district court had subject matter jurisdiction and the statute of limitations did not bar NWEA's claim, the court turned to NWEA's ultra vires claim.²⁵⁷ EPA asserted three arguments. First, EPA argued that the court should only vacate 40 C.F.R. § 122.3(a) as it relates to ballast water discharges because NWEA did not discuss other discharges, such as gray water or discharges incidental to the normal operation of a vessel, in the 1999 petition to repeal the regulation.²⁵⁸ Second, EPA argued that either the CWA authorized the vessel exemption or, alternatively, the CWA is ambiguous on the subject and the court should defer to EPA's interpretation.²⁵⁹ Third, EPA asserted that

²⁴⁸ *Nw. Env'tl Advocates v. EPA*, 537 F.3d 1006, 1013 (9th Cir. 2008).

²⁴⁹ *See* Availability of Decision on Petition for Rulemaking to Repeal Regulation Related to Ballast Water, 68 Fed. Reg. 53,165, 53,165 (Sept. 9, 2003) (noting EPA's decision to deny the rulemaking petition).

²⁵⁰ Complaint for Declaratory Judgment and Injunctive Relief at 2, *Nw. Env'tl. Advocates v. U.S. Env'tl. Prot. Agency*, No. CV 03-05760, 2003 WL 23795666 (N.D. Cal. Mar. 30, 2005).

²⁵¹ *Nw. Env'tl. Advocates v. EPA*, No. CV 03-05760, 2005 WL 756614, at *12 (N.D. Cal. Mar. 30, 2005).

²⁵² *See* *Nw. Env'tl. Advocates v. EPA*, No. CV 03-05760, 2006 WL 2669042, at *7 nn.7–8 (N.D. Cal. Sept. 18, 2006). The state-intervenors included New York, Illinois, Michigan, Minnesota, Wisconsin, and Pennsylvania. *Id.*

²⁵³ *Id.* at 15.

²⁵⁴ *Nw. Env'tl. Advocates v. EPA*, 537 F.3d 1006, 1014 (9th Cir. 2008).

²⁵⁵ *Id.*

²⁵⁶ 467 U.S. 837, 842–43 (1984); *see Nw. Env'tl. Advocates*, 537 F.3d at 1014.

²⁵⁷ *Nw. Env'tl. Advocates*, 537 F.3d at 1015, 1019.

²⁵⁸ *Id.* at 1020.

²⁵⁹ *Id.*

Congress acquiesced to EPA's interpretation, even if the regulation was originally beyond the scope of the CWA.²⁶⁰

In response to EPA's first argument, the court concluded NWEA challenged all three exemptions in the regulation, including gray water, ballast water, and discharges incidental to the normal operation of a vessel.²⁶¹ Turning next to EPA's second argument, the Ninth Circuit considered whether the text of the CWA authorizes EPA's exemption, or whether the court should defer to EPA's interpretation because of an ambiguity in the statute.²⁶² In reviewing the plain meaning of the text, the court determined that "Congress expressed 'a plain . . . intent to require permits in any situation of pollution from point sources.'"²⁶³ The court reasoned that because section 402 uses the word "may," section 402 "allows the Administrator to issue a permit, but does not provide that the Administrator may entirely exempt certain categories of discharges from the permitting requirement."²⁶⁴ EPA did not "seriously contest" the court's holding on the second claim, and instead focused on the congressional acquiescence argument.²⁶⁵

Next, the Ninth Circuit turned to EPA's third claim, which asserted that Congress subsequently acquiesced to EPA's regulation.²⁶⁶ Noting the high standard for finding congressional acquiescence, the Ninth Circuit analyzed a number of statutes, including NISA and the NANPCA, in which Congress addressed the types of pollution covered in 40 C.F.R. § 122.3(a).²⁶⁷ However, the court concluded that the statutes did not contain the "overwhelming evidence" necessary to find congressional acquiescence.²⁶⁸ Accordingly, the court affirmed the decision of the district court and held that EPA acted beyond the scope of the agency's authority under the CWA in promulgating the regulatory exemption.²⁶⁹

3. *Significance of the Ninth Circuit Holding*

The CWA's various provisions have the potential to be a powerful tool for controlling ballast water discharges. Because of the lack of binding performance standards for treatment technologies,²⁷⁰ the Ninth Circuit's holding in *Northwest Environmental Advocates* could have large repercussions for ballast water regulations in the United States. First, under the provisions of the CWA, shippers visiting waters of the United States

²⁶⁰ *Id.*

²⁶¹ *Id.*

²⁶² *Id.*

²⁶³ *Id.* at 1022 (quoting *Natural Res. Def. Council v. Costle*, 568 F.2d 1369, 1383 (D.C. Cir. 1977)).

²⁶⁴ *Id.* at 1021.

²⁶⁵ *Id.* at 1022.

²⁶⁶ *Id.*

²⁶⁷ *Id.* at 1022–25.

²⁶⁸ *Id.* at 1024 (citing *Solid Waste Agency of N. Cook County v. U.S. Army Corps of Eng'rs*, 531 U.S. 159, 169–70 n.5 (2001)).

²⁶⁹ *Id.* at 1027.

²⁷⁰ See *supra* Part IV.A.

would need to obtain a permit under section 402 of the CWA.²⁷¹ Second, all discharges would need to comply with section 301, which requires the application of the best available technology that is economically achievable for vessels.²⁷² The technology requirements could establish a uniform minimum level of treatment that is based on technology, which would go beyond ballast water exchange in terms of effectiveness. Finally, amongst other features, the CWA's criminal penalties and citizen suit provision would provide a strong enforcement mechanism to ensure that vessels comply with mandatory technology requirements.²⁷³

Overall, the decision in *Northwest Environmental Advocates* could provide a trigger for the adoption of effective treatment technologies on a national scale by bringing ballast water discharges within the purview of the CWA. Further, to the extent that politicians, other individuals, or the shipping industry dislike the CWA as a mechanism for controlling ballast water discharges or are concerned about overlapping jurisdiction between EPA and the Coast Guard, the Ninth Circuit's holding could serve as the catalyst that drives Congress to adopt a statute that specifically addresses ballast water discharges and implements performance standards.

4. EPA's Response to Northwest Environmental Advocates

Following the Ninth Circuit's ruling in *Northwest Environmental Advocates*, EPA issued a national general permit to cover vessel discharges under the CWA.²⁷⁴ The ballast water provisions of the Vessel General Permit (VGP)²⁷⁵ are essentially a codification of existing Coast Guard regulations. The permit states "[a]ll discharges of ballast water may not contain oil,

²⁷¹ See Federal Water Pollution Control Act, 33 U.S.C. § 1342(a) (2006).

²⁷² See *id.* § 1311(b)(2)(A) (requiring the best available technology economically achievable for individual classes of point sources).

²⁷³ *Id.* §§ 1319(c), 1365.

²⁷⁴ See U.S. ENVTL. PROT. AGENCY, 2008 FINAL ISSUANCE OF NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) VESSEL GENERAL PERMIT (VGP) FOR DISCHARGES INCIDENTAL TO THE NORMAL OPERATION OF VESSELS: FACT SHEET (2008) [hereinafter VGP FACT SHEET]. In July 2008, Congress passed two pieces of legislation to exempt discharges from certain types of vessels from the NPDES permit requirements. *Id.* § 2.5. The first piece of legislation amended the CWA to create a new regulatory regime for operation of recreational vessels. Clean Boating Act of 2008, Pub. L. No. 110-288, 122 Stat. 2650. The second piece of legislation placed a two-year moratorium on NPDES permitting requirements for commercial fishing vessels and other nonrecreational vessels less than 79 feet in length. Pub. L. No. 110-299, 122 Stat. 2995. The two enactments are significant because recreational vessels and commercial fishing vessels can be a significant vector for the transport of invasive species between water bodies in the United States. See, e.g., Tyler W. Wickman, *The Battle Against Invasive Species: The Clean Water Act and Environmental Protection Agency Regulation of Recreational Boats*, 91 MARQ. L. REV. 605, 619-20 (2007).

²⁷⁵ U.S. ENVTL. PROT. AGENCY, VESSEL GENERAL PERMIT FOR DISCHARGES INCIDENTAL TO THE NORMAL OPERATION OF VESSELS (VGP) (2008), available at http://www.epa.gov/npdes/pubs/vessel_vgp_permit.pdf [hereinafter VESSEL GENERAL PERMIT]; see also Final National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges Incidental to the Normal Operation of a Vessel, 73 Fed. Reg. 79,473 (Dec. 29, 2008) (announcing the availability of the general permit).

noxious liquid substances (NLSs), or hazardous substances in a manner prohibited by U.S. laws, including section 311 of the Clean Water Act.²⁷⁶ However, with regard to alien species, the VGP only requires that vessels “[m]inimize or avoid uptake of ballast water” in areas known to have populations of harmful organisms or pathogens, and provides suggested control measures for minimizing the spread of aquatic invasive species, such as the use of gray or potable water for ballast.²⁷⁷

Similar to the Coast Guard regulations, the permit also requires that any vessels with ballast water taken on in areas less than two hundred nautical miles from shore, and that subsequently operate beyond the EEZ, must carry out an exchange of ballast water in an area more than two hundred nautical miles from shore.²⁷⁸ The permit also includes exemptions from the ballast exchange requirements; the master of the vessel can elect not to exchange the ballast water when necessary for safety reasons, when the ship uses other alternative ballast water management systems, or when the ship retains all ballast water for the duration of the vessel’s voyage in U.S. waters.²⁷⁹ The permit does not require “any numeric treatment standards for the discharge of living organisms as part of this permit issuance and . . . instead requir[es] management practices (e.g. ballast water exchange) that decrease the risk of [aquatic nuisance species] introduction.”²⁸⁰

Several state regulators, environmental organizations, and others are dissatisfied with the terms of the VGP. For example, state officials from Oregon’s Department of Environmental Quality told EPA “the permit ‘perpetuates federal regulations that are insufficient for protecting Oregon’s waterways.’”²⁸¹ In certifying that the VGP complied with state water quality requirements pursuant to section 401 of the CWA, states such as California and New York, believing the VGP was not protective enough of state waters, “almost put a whole ballast program on top of the permit.”²⁸² In addition, industry and environmental groups filed lawsuits in several courts challenging EPA’s general permit, with environmental groups claiming the permit is far too lenient and industry officials focusing on the extensive number of state requirements imposed on the permit through the state certification process.²⁸³

²⁷⁶ VESSEL GENERAL PERMIT, *supra* note 275, § 2.2.3.

²⁷⁷ *Id.* § 2.2.3.3.

²⁷⁸ *Id.* § 2.2.3.5.

²⁷⁹ *Id.* § 2.2.3.11.

²⁸⁰ VGP FACT SHEET, *supra* note 274, § 4.4.3.5.

²⁸¹ Michael Milstein, *Invasive Species Go Unchecked*, OREGONIAN, Oct. 27, 2008, at A1 (quoting state officials).

²⁸² *Obama Position May Boost Nascent Senate Bid for CWA Ballast Bill*, INSIDE E.P.A. WKLY. REP., Jan. 23, 2009, at 1, 8 (quoting an industry official) [hereinafter *Obama Position*]. Under the CWA, states certify the discharge permit to ensure that the activity meets the requirements of the CWA and state water quality standards. See Federal Water Pollution Control Act, 33 U.S.C. § 1341 (2006). For a discussion of the conditions imposed by New York through the state certification process, see *infra* Part IV.D.3.

²⁸³ *Contentious EPA Ship Permit Draws Multiple Appellate Challenges*, INSIDE E.P.A. WKLY. REP., Jan. 23, 2009, at 20. Following the issuance of the VGP, Northwest Environmental Advocates, Michigan, and several other groups, including industry representatives, filed

Overall, EPA's response to *Northwest Environmental Advocates* has done little to change the regulatory framework already implemented by the Coast Guard in the United States. Although EPA acknowledges ballast water exchange helps reduce the risk of aquatic nuisance species, albeit with variable effectiveness,²⁸⁴ EPA chose not to impose any treatment requirements in the VGP.²⁸⁵ Without the imposition of mandatory treatment requirements, it is possible that the shipping industry will not spend the money to develop and implement the technologies necessary to control species introductions by ballast water, particularly since the shipping industry would run the risk of adopting technologies that might later be declared obsolete by the IMO or another governmental entity.²⁸⁶ Nevertheless, there is hope; although the federal government has continued to delay implementation of a solution to drive technology, states—refusing to wait for federal action—have already set or have begun setting their own technology requirements for ballast water discharges.²⁸⁷ Additionally, although it is unclear whether EPA will take action through settlement negotiations, litigation, or another administrative decision, EPA Administrator Lisa Jackson recently signaled that the agency might reconsider the permit, which “doesn’t begin to address some of the concerns

petitions for review of the VGP in various circuits. *See, e.g.*, Petition for Review, Natural Res. Def. Council, Inc. v. EPA, No. 09-0244 (2d Cir. Jan. 16, 2009); Petition for Review, State of Michigan v. EPA, No. 09-3445 (6th Cir. Apr. 20, 2009); Petition for Review, Nw. Env'tl. Advocates v. EPA, No. 09-70115 (9th Cir. Jan. 12, 2009); Petition for Review, Lake Carriers Ass'n v. Johnson, No. 09-1001 (D.C. Cir. Jan. 5, 2009). Because various organizations filed lawsuits challenging the VGP, EPA, pursuant to 28 U.S.C. § 2112, notified the U.S. Judicial Panel on Multidistrict Litigation (JPML) about the cases since the JPML “determines by a lottery which circuit will review the challenges, with other suits being consolidated into the selected circuit.” 28 U.S.C. § 2112 (2006); *Activists Scramble to Keep Suit on EPA Ship Permit in Preferred Court*, INSIDE E.P.A. WKLY. REP., Feb. 20, 2009, at 16, 17. Ultimately, because EPA disputed NWEA's method of service on EPA, the 9th Circuit was not included in the circuit selection process and the JPML selected the D.C. Circuit as the location for the consolidated cases. *In re EPA, Final General Permit*, MCP No. 103 (J.P.M.L. Apr. 8, 2009) (order denying motion for reconsideration); *Activists Scramble to Keep Suit on EPA Ship Permit in Preferred Court*, *supra*, at 17; *EPA Ship Permit Discussions with Critics Hint at Possible Settlement*, INSIDE E.P.A. WKLY. REP., Apr. 17, 2009, at 8. EPA recently began meeting with the plaintiffs in settlement negotiations and an EPA official indicated that “the agency is ‘working through obviously what the next iteration [of the VGP] might look like and trying to help people understand how to implement it.’” *See id.* at 8; *Regulators Eye General Permits to Address Growing CWA “Universe”*, INSIDE E.P.A. WKLY. REP., May 1, 2009, at 5, 6 (quoting Linda Boornazian, Dir., EPA Water Permits Div.). To provide time for the settlement negotiations, the court stayed the proceedings until October 15, 2009. Joint Status Report and Joint Motion to Continue Existing Stay of Proceedings at 3, Lake Carriers Ass'n v. Johnson, No. 09-1001 (D.C. Cir. June 11, 2009); Lake Carriers Ass'n v. Johnson, No. 09-1001 (D.C. Cir. July 10, 2009) (order granting the joint motion to extend abeyance).

²⁸⁴ VGP FACT SHEET, *supra* note 274, § 4.4.3.5.

²⁸⁵ *Id.* § 4.4.3.5 (describing EPA's decision not to impose treatment requirements “because treatment technologies that effectively reduce viable living organisms in a manner that is safe, reliable, and demonstrated to work onboard vessels are not yet commercially available”).

²⁸⁶ *See supra* Part II.B (discussing the barriers and problems with the adoption of treatment technologies for ballast water).

²⁸⁷ *See infra* Part IV.C.

that are still out there.”²⁸⁸ This Part continues with a discussion of how the ineffective VGP, as well as the lack of a federal statutory regime, could drive the adoption of treatment technologies that are more stringent than those required under the Ballast Water Convention.

C. State Action in the Absence of Federal Action

Motivated by delay in the development of international and domestic laws, several states created, or are in the process of developing, legislation to control ballast water discharges. Although California is on the forefront of implementing stringent discharge requirements, Oregon and Washington are close behind, and there is a high probability that the West Coast states, excluding Alaska, will implement a regional treatment standard if the federal government does not define a treatment standard in the near future.²⁸⁹ This Part discusses actions currently underway in various states, and argues that the state-driven regulation of ballast water could drive international adoption of effective treatment technologies for ballast water.

1. California on the Frontline

Responding to concerns over the lack of performance standards for ballast water discharges, the California State Land Commission (CSLC) developed and submitted ballast water standards to the California legislature in 2006.²⁹⁰ The California legislature incorporated the standards into the Coastal Ecosystems Protection Act of 2006 and passed the CSLC’s recommendations into law.²⁹¹ The CSLC based the performance standards on organism size and developed a phased implementation schedule based on vessel size class and construction date, which is similar to the IMO guidelines.²⁹² California’s standards require that there be no detectable living organisms greater than fifty micrometers in dimension, and less than 0.01 living organisms per milliliter that are between ten and fifty micrometers in dimension.²⁹³ In other words, California’s technology requirements overall are one thousand times more stringent than the Ballast Water Convention

²⁸⁸ *Jackson Signals Possible Revisions to Ship Ballast Discharge Permit*, INSIDE E.P.A. WKLY. REP., Feb. 27, 2009, at 24, 24 (internal quotation marks omitted). Although it is unclear as of now how EPA will alter the terms of the VGP, Obama’s stance as of last year hints at how he might approach ballast water issues. During the presidential campaign, President Obama indicated his preference for regulation of ballast water is under the CWA: “[T]he [CWA] should be the controlling authority for the governance of ballast water discharges, in close consultation with the Coast Guard.” *Obama Position*, *supra* note 282, at 1. (alteration in original) (internal quotation marks omitted) (quoting Letter from Barack Obama to Lisa Madigan, Attorney Gen. of Ill. (Feb. 2008)).

²⁸⁹ *See infra* Parts IV.C.1–2.

²⁹⁰ *See* OREGON TASK FORCE REPORT, *supra* note 219, at 19.

²⁹¹ *Id.*

²⁹² *Id.* app. D, at 85.

²⁹³ COPELAND, *supra* note 207, at CRS-3 tbl.1 (providing a chart comparing the treatment performance standards in the IMO regulations, H.R. 2830, and California regulations).

requirements and ten times more stringent than proposed requirements considered recently in Congress.²⁹⁴

2. West Coast Alliances as a Catalyst for Change

Although Oregon's current regulatory program is similar to the Coast Guard's program, the state's Shipping Transport of Aquatic Invasive Species Task Force (Task Force) is encouraging the state to enact more stringent protections for Oregon waters in 2009.²⁹⁵ The purpose of the Task Force, which the legislature created in 2007, is to make recommendations for future amendments to Oregon's ballast management regulations.²⁹⁶ In recommendations to the 2009 Oregon Legislature, the Task Force indicated that "[i]f sufficiently protective Federal standards [are] not in place by 2009," the state should pursue "an Oregon standard that is complementary to neighboring states."²⁹⁷ Additionally, "[i]f Washington and California adopt comparable treatment standards, the Oregon Department of Environmental Quality will adopt a common west coast treatment standard."²⁹⁸

In Washington, similar efforts to create a regional treatment standard are underway. The Washington Department of Fish and Wildlife (WDFW), in tandem with a Ballast Water Work Group, is rewriting Washington's laws to replace the state's current laws with concentration requirements that are comparable to California's laws.²⁹⁹ Additionally, "WDFW will no longer independently approve treatment systems for use in state waters and will instead rely on regional, national or international approvals."³⁰⁰

3. Great Lakes Developments

The Great Lakes states have either enacted or are in the process of examining strict ballast water treatment requirements. For example, in Michigan, state law indicates that without a permit or another form of permission, "the discharge into the waters of the state from an oceangoing vessel of any ballast water is prima facie evidence" that a person discharged an injurious substance into Michigan's waters.³⁰¹ Under the general permit that implements Michigan's ballast water law, if a ship wants to discharge ballast water, the vessel must use approved, "environmentally sound and effective technology" for "preventing the discharge of aquatic nuisance species" and must ensure aquatic species are not discharged "at levels which

²⁹⁴ See *supra* note 230 and accompanying text.

²⁹⁵ See OREGON TASK FORCE REPORT, *supra* note 219, at 24.

²⁹⁶ STATE OF OR. DEPT OF ENVTL. QUALITY, OREGON BALLAST WATER MANAGEMENT: FACT SHEET 1 (2007), available at <http://www.deq.state.or.us/lq/pubs/factsheets/cu/OregonBallastWaterManagement.pdf> [hereinafter ODEQ FACT SHEET].

²⁹⁷ OREGON TASK FORCE REPORT, *supra* note 219, at 24.

²⁹⁸ *Id.* at viii.

²⁹⁹ DOBROSKI ET AL., *supra* note 52, at 15.

³⁰⁰ *Id.*

³⁰¹ MICH. COMP. LAWS SERV. § 324.3109(5) (LexisNexis 2008).

are injurious to the designated uses of the waters of the state.”³⁰² In other words, Michigan’s standards do not allow for the discharge of any aquatic invasive species that could harm the environment. Minnesota followed Michigan’s lead and adopted ballast water regulations, but Minnesota’s requirements are less stringent than those in California or Michigan; under Minnesota’s vessel general permit, ships must meet treatment requirements that are comparable to those under the Ballast Water Convention.³⁰³ Although none of the other Great Lakes states have permitting regimes as of yet, several states in the region are examining options for ballast water legislation.³⁰⁴

In New York, recent developments related to the state’s certification of EPA’s VGP illustrate how the state is taking action in the absence of effective federal controls for ballast water. Relying on the state’s narrative water quality standards and antidegradation policy, New York imposed performance standards and an implementation schedule for treatment technologies as part of the VGP certification.³⁰⁵ Under New York’s conditions, with certain limited exceptions, each vessel, by no later than January 1, 2012, must have a ballast water treatment system that discharges less than one living organism that is fifty or more micrometers in dimension per ten cubic meters and less than one living organism that is less than fifty micrometers in dimension per ten milliliters.³⁰⁶ Despite the fact that New York did not have a regulatory or statutory version of the certification’s performance standards, a New York Supreme Court upheld the conditions as “rationally derived from the authority of the [New York Department of Environmental Quality] to control ballast water pollution.”³⁰⁷ Ultimately, whether other states follow Michigan, Minnesota, and New York’s lead in the Great Lakes region, and whether the states will work toward regional uniformity has yet to be seen. However, as demonstrated by the Great Lakes

³⁰² MICH. DEPT. OF ENVTL. QUALITY, BALLAST WATER CONTROL GENERAL PERMIT: PORT OPERATIONS AND BALLAST WATER DISCHARGE 1 (2006), *available at* http://www.michigan.gov/documents/deq/wb-npdes-generalpermit-MIG140000_247256_7.pdf.

³⁰³ MINN. POLLUTION CONTROL AGENCY, BALLAST WATER DISCHARGE GENERAL PERMIT 4, 7 tbl.A (2008). Under Minnesota’s permitting system, ships built before 2012 must meet the state’s performance standards by 2016 and ships built after 2012 must meet the performance standards by their operation date. *Id.* at 4. For the performance standards, there must be less than 10 organisms that are greater than 50 millimeters per cubic meter, less than 10 organisms that are between 10 and 50 millimeters per milliliter, less than 250 colony forming units of *E. coli* per 100 milliliters, and less than 100 colony forming units of intestinal enterococci per 100 milliliters. *Id.* at 7 tbl.A.

³⁰⁴ *See* GREAT LAKES COMM’N, SUMMARY OF GREAT LAKES STATE BALLAST WATER LEGISLATION (2008), *available at* <http://www.glc.org/advocacy/documents/08-07-18-GL-state-bw-leg-summary.pdf>.

³⁰⁵ Letter from William R. Adriance, Chief Permit Adm’r, N.Y. State Dep’t of Envtl. Conservation, to Barbara Finazzo, Dir., Div. of Envtl. Planning and Prot., U.S. Envtl. Prot. Agency (Nov. 3, 2008), *available at* http://www.klgates.com/FCWSite/ballast_water/Legislation/States/new_york.pdf (outlining the conditions for the state’s Clean Water Act section 401 certification of the VGP).

³⁰⁶ *Id.* at 5. The certification also indicates that ballast water must contain less than 126 colony-forming units of *E. coli* and less than 33 colony forming units of intestinal enterococci per 100 milliliters. *Id.*

³⁰⁷ *Port of Oswego v. Grannis*, No. 10296-08, slip op. at 9 (N.Y. Sup. Ct. May 21, 2009), *available at* <http://nyis.info/Tools/Newsroom%20Files/Port%20of%20Oswego%20Decision.pdf>.

states thus far, the states are concerned about aquatic invasive species introductions and are likely to continue working towards the implementation of ballast water controls.

4. State Attempts to Spur the Adoption of Treatment Technologies

There is significant support for the proposition that environmental regulations can induce industries to adopt environmental technologies.³⁰⁸ For example, under the Clean Air Act (CAA),³⁰⁹ Congress granted California the authority to regulate motor vehicle emissions and preempted the vehicle emission standards of all other states.³¹⁰ Although there were concerns that California's exemption "would undermine the efficiency of uniform federal product standards by imposing a parallel set of conflicting standards on industry," the "concerns have proven to be unwarranted."³¹¹ California, through its CAA exemption, led the way in creating rigorous standards and in promoting the development and adoption of new technologies.³¹² Ultimately, California's example in the CAA context demonstrates that states can lead the way in adopting standards and promoting new technologies.

With California, Oregon, and Washington moving toward regional uniformity with ballast water regulations, and with developments in the Great Lakes region, state action may have the power to trigger the adoption of treatment technologies, even in the absence of binding federal or international ballast water controls. In total, over one third of the value of U.S. waterborne foreign trade comes through West Coast ports and another 16% comes through the states bordering the Great Lakes, which totals to over half the value of U.S. waterborne foreign trade.³¹³ Additionally, in terms of sheer volume, approximately 30% of the total number of metric tons imported and exported from the United States goes through the West Coast and another 14% through the Great Lakes region.³¹⁴ As a rough estimate of the number of vessels that enter West Coast waters, California's arrival statistics provide some insight into the number of vessels that enter West Coast waters and would need to meet the stringent performance standards. For example, between 2000 and 2008, 5682 unique vessels with ballast water capacities of greater than 5000 metric tons entered California's ports.³¹⁵

³⁰⁸ David E. Adelman & Kirsten H. Engel, *Reorienting State Climate Change Policies to Induce Technological Change*, 50 ARIZ. L. REV. 835, 855 (2008).

³⁰⁹ 42 U.S.C. §§ 7401–7671q (2000).

³¹⁰ *Id.* §§ 7507, 7543.

³¹¹ Adelman & Engel, *supra* note 308, at 871.

³¹² *Id.*

³¹³ MAR. ADMIN., U.S. DEP'T OF TRANSP., U.S. WATERBORNE FOREIGN TRADE BY CUSTOM DISTRICT, http://www.marad.dot.gov/documents/U.S._Waterborne_Foreign_Trade_by_Custom_District.XLS (last visited July 19, 2009). The author completed the calculation for the West Coast statistic by adding the values of U.S. waterborne trade for the custom districts of Los Angeles, Seattle, San Francisco, the Columbia and Snake Rivers, and San Diego. *See id.* For the Great Lakes statistic, the author added the total values for U.S. waterborne trade for all the customs districts of New York, Pennsylvania, Ohio, Michigan, Indiana, Illinois, Wisconsin, and Minnesota. *Id.*

³¹⁴ *Id.*

³¹⁵ DOBROSKI ET AL., *supra* note 52, at 43.

Just as California was able to promote more rigorous vehicle emissions technologies through the adoption of stringent standards, the regional coalition of California, Oregon, and Washington may likewise be able to drive the adoption of technologies that are more stringent than those required under the Ballast Water Convention. With Great Lakes states moving towards the adoption of performance standards, and potentially towards regional cooperation or uniformity in the future, the Great Lakes region may also have the power to drive the adoption of treatment technologies. Although the shipping industry might have concerns over the potential for several countries and states to issue regulations independently, the fact that California's treatment standards are more stringent than the Regulation D-2 requirements under the IMO should not deter the shipping industry since the standards in California, Minnesota, Michigan, and New York are equal to or go beyond the Ballast Water Convention's baseline performance standards. Further, since the Ballast Water Convention allows countries to enact more stringent performance standards, a West Coast or Great Lakes standard is unlikely to create complications that go beyond the complications already likely to be present from variations allowed under the Ballast Water Convention and would sync the requirements for a large area of the United States, thereby reducing at least some difficulties for the shipping industry.

Another legitimate concern by the shipping industry might be the potential conflicts between technologies approved by the IMO and technologies that meet the discharge standards in California or other states. Because the IMO must approve treatment technologies to comply with the terms of the Ballast Water Convention,³¹⁶ vessel owners anxious to meet California's treatment requirements run the risk of adopting technologies that will ultimately be disapproved by the IMO. However, as illustrated by Washington, states recognize the potential conflicts between technology approval processes and are working to reduce the barriers to the adoption of treatment technologies by allowing vessels to utilize technologies approved through regional, national, or international mechanisms—so long as the technologies meet the states' performance standards, which exceed and are compatible with the Ballast Water Convention.³¹⁷ Ultimately, the state provisions could force the adoption of treatment technologies that meet the stringent state performance standards, but also comply with the IMO's technology approval procedures.

V. LOOKING TOWARD A BRIGHTER FUTURE FOR BALLAST WATER CONTROLS

With the increasing number of problems arising from ballast water discharges and aquatic invasive species introductions, the United States will need to decide how to best implement performance standards for ballast water. This Part analyzes the various options for the United States in

³¹⁶ Ballast Water Convention, *supra* note 20, Annex, reg. D-3.

³¹⁷ See *supra* Part IV.C.2.

adopting a comprehensive ballast water framework and offers suggestions on how the United States might reconcile the differences between federal, state, and international regulatory options.

A. Choosing Between Policy Options

One of the largest, looming issues that the United States will need to address in the near future is how to regulate ballast water discharges. The United States has three main options for implementing ballast water controls: 1) ratify the Ballast Water Convention, 2) allow states to develop and impose performance standards under the CWA or their own regulatory mechanism, or 3) utilize a federal program for implementing performance standards, whether under the CWA or a standalone program.

With regard to whether the United States should adopt the Ballast Water Convention over other options, there are a number of policy issues the United States should consider. The Ballast Water Convention would provide an international floor for regulation of ballast water discharges, and the United States' ratification of the treaty would bolster current international efforts to implement treatment technologies. The United States should also keep in mind a number of conflicting tensions between state, federal, and international regulatory mechanisms, which could impact the effectiveness of the adopted framework. First, as described earlier, the United States will need to adopt significantly more stringent treatment requirements than those contained in Regulation D-2 to ensure the protection of the country's coastal waters since the Ballast Water Convention's treatment standard is potentially too low to eliminate species introductions.³¹⁸ Second, the Ballast Water Convention's timelines are potentially too relaxed and should be tightened if the United States hopes to spur the adoption of treatment technologies in the near future. Additionally, under the broad language of Article 4 of the Ballast Water Convention, the United States may be able to utilize the provisions in the Ballast Water Convention to adopt national policies that take into consideration the "particular conditions" of the United States and harmonize the domestic and international regulatory frameworks.³¹⁹

With state controls for ballast water discharges, one concern voiced is that "[a]n increasing number of state-by-state regulations can lead to a complex patchwork of potentially disparate regulations, leading to inherent challenges in consistency, enforceability, and workability in foreign trade."³²⁰ However, as shown by California, Oregon, and Washington, states are working to implement uniform standards at the regional level, which will alleviate the burdens of trans-jurisdictional regulation on the shipping industry. Additionally, although Congress has yet to pass a federal statute setting mandatory treatment requirements for ballast water discharges, the current efforts for compromise

³¹⁸ See *supra* Part III.B.2.

³¹⁹ See *infra* Part V.B (discussing how the United States might employ Article 4 of the Ballast Water Convention to harmonize the provisions of the CWA and the Ballast Water Convention).

³²⁰ CARLTON, *supra* note 30, at 17.

in the U.S. Senate indicate that California's stringent standards may ultimately have the power to drive the selection of the federal standards.

Third, there are also numerous policy benefits to implementing controls under the CWA. One reason why advocates prefer the CWA to other regulatory mechanisms is that the statute allows states to adopt more stringent requirements than those required under the CWA.³²¹ Although the preservation of state sovereign power could lead to the adoption of more stringent treatment requirements, there is arguably a large difference between the regulation of stationary sources and the regulation of the shipping industry. Unlike industries typically regulated under the CWA, which are fixed in a particular location, the movement of vessels across various jurisdictions presents a unique challenge for regulating discharges since vessels would need to comply with variations in discharge requirements as they move from port to port. Because the shipping industry travels across international lines and waters, the shipping industry is likely to have difficulty in meeting a wide range of individualized, state-by-state treatment requirements. Conversely, as California demonstrated under the CAA,³²² federal preemption may not be the best solution; by giving states a limited amount of regulatory authority, as under the CWA, where states can adopt more stringent, but not less stringent, standards, the regulatory mechanism could promote and lead to the adoption of more rigorous technologies and standards. Although state controls may sometimes be more effective than federal controls at spurring the development of new technologies, as shown by California under the CAA, there are also likely to be additional costs and complexities if the shipping industry needs to comply with performance standards that vary from state to state. Thus, it will be important for Congress to address whether federal preemption is the best solution for dealing with ballast water problems.

Another policy choice related to the CWA is over which agency should have jurisdiction to administer vessel discharge permitting and monitoring. Some critics argue that it would be preferable for EPA to control vessel discharges "because EPA's primary mission is to protect public health and welfare," whereas the Coast Guard "has shown insufficient interest in pollution control generally, and ballast water management specifically."³²³ Additionally, overlapping jurisdiction between the two agencies is likely to lead to problems, as "overlapping regulation can lead to confusion, high compliance costs, and a drag on otherwise beneficial activities."³²⁴

Finally, in addition to dealing with the technology-based performance standards under the CWA, Congress also faces the challenge of whether to preempt state water quality standards, which are distinct from performance

³²¹ Federal Water Pollution Control Act, 33 U.S.C. § 1370 (2006); COPELAND, *supra* note 207, at CRS-6.

³²² See *supra* Part IV.C.3.

³²³ COPELAND, *supra* note 207, at CRS-7.

³²⁴ William W. Buzbee, *Asymmetrical Regulation: Risk, Preemption and the Floor/Ceiling Distinction*, 82 N.Y.U. L. REV. 1547, 1610 (2007) (emphasis omitted).

standards under the CWA.³²⁵ As illustrated by New York's certification of the VGP, which relied upon state water quality standards when imposing technology-based performance standards, water quality standards are an important state check on potentially unprotective performance standards.³²⁶ Section 303 of the CWA requires states to develop water quality standards for waters within the states' borders.³²⁷ For state water quality standards, the state must first define "the water quality goals of a water body, or portion thereof, by designating the use or uses."³²⁸ Second, the state must determine the level of water quality needed to protect the designated uses and develop criteria for protecting the designated uses.³²⁹ Thus, water quality standards set a "floor" for water quality and EPA must alter the technology-based performance standards to achieve the state's water quality standards.³³⁰ Although water quality standards can play an important role for states in protecting their waters, because the imposition of the criteria could lead to diverse, state-by-state inconsistencies in ballast water controls, Congress will need to decide whether states should retain their ability to impose additional treatment requirements for ballast water using state water quality standards.

B. A New Federal Framework

Although the three main options for controlling ballast water discharges in the United States—ratifying the Ballast Water Convention, continuing state-led programs, or pursuing a federal program—appear distinct, there are ways to potentially harmonize the seemingly conflicting policies and laws behind each option. In light of the current debates in Congress over the Ballast Water Convention, it appears unlikely that the United States would comply with the provisions of the Convention verbatim. As such, in the absence of a ballast water bill, it appears likely that the United States could end up with a framework that either implements ballast water controls under the CWA or through an alternate program. This Chapter suggests that

³²⁵ Water quality standards "focus on the overall water quality of a particular water body, unlike [performance standards, or] effluent limitations, which focus on particular kinds of dischargers and the pollutants they discharge." Robin Kundis Craig & Sarah Miller, *Ocean Discharge Criteria and Marine Protected Areas: Ocean Water Quality Protection Under the Clean Water Act*, 29 B.C. ENVTL. AFF. L. REV. 1, 17 (2001).

³²⁶ See *supra* Part IV.C.3.

³²⁷ Federal Water Pollution Control Act, 33 U.S.C. § 1313 (2006); see also Craig & Miller, *supra* note 325.

³²⁸ Water Quality Standards, 40 C.F.R. § 130.3 (2008). Water quality standards protect several uses of the waters:

[W]herever attainable, [water quality standards should] provide water quality for the protection and propagation of fish, shellfish and wildlife and for the recreation in and on the water and take into consideration their use and value for public water supplies, propagation of fish, shellfish, wildlife, recreation in and on the water, and agricultural, industrial and other purposes including navigation.

Id.

³²⁹ *Id.*

³³⁰ See Craig & Miller, *supra* note 325, at 18.

the appropriate federal framework should build upon the CWA as the vehicle for ballast water controls, but enact certain provisions that adjust the CWA to account for differences between the shipping industry and other point sources regulated under the CWA.

First, the United States needs to implement performance standards that dictate the number of viable organisms allowed per liter or milliliter of ballast water. Implementing an effective standard for the technology requirements is essential to ensuring the elimination of viable species from ballast water and the elimination of aquatic invasive species introductions from waters of the United States. Additionally, the United States, regardless of whether it ratifies the Ballast Water Convention, should implement a system that provides for use of treatment technologies approved by the IMO. Although the United States could retain the power to reject unsafe or unacceptable treatment technologies, the United States should move towards uniformity with the IMO in the technology approval process to ensure vessels plying U.S. waters do not run the risk of adopting technologies that are later rejected under the IMO framework. By providing a degree of certainty for vessels and by reducing the risk that they will install the “wrong” technology, the United States might increase compliance amongst vessels.

Second, because vessels are mobile, and therefore subject to changing jurisdictional requirements, the United States should ensure the performance standard will create greater consistency and predictability for the shipping industry to comply with regulations. Thus, the federal government should allow states to adopt more stringent performance standards, but allow this decision to take place within the confines of a model similar to that employed under the CAA. In general, the CAA preempts state standards “relating to the control of emissions from new motor vehicles and new motor engines.”³³¹ Since California had significant problems with mobile source pollution and was the only state with vehicle emissions standards in place prior to the enactment of the CAA, Congress provided an exemption from the prohibition for California, provided the state meets certain criteria.³³² EPA, following notice and comment, must grant a waiver for California if 1) the state determines that the “standards will be, in the aggregate, at least as protective of public health and welfare as applicable [f]ederal standards” and 2) EPA does not find that California’s determination is arbitrary and capricious, that California does not need the standards “to meet compelling and extraordinary conditions,” or that California’s standards and enforcement procedures are inconsistent with section 202 of the CAA.³³³ Additionally, Congress allowed other states to adopt California’s more stringent standards subject to certain conditions, including a requirement that states must utilize standards that are identical to California standards and for which EPA issued a waiver.³³⁴

³³¹ Clean Air Act, 42 U.S.C. § 7543(b) (2000).

³³² *Id.*; THE CLEAN AIR ACT HANDBOOK 324 (Robert J. Martineau, Jr. & David P. Novello eds., 2d ed. 2004).

³³³ 42 U.S.C. § 7543(b) (2000).

³³⁴ *Id.* § 7507.

Using the CAA as a model, the federal government could enact a provision that sets California's performance standards, the most stringent in the nation, as an alternate to the federal regime. The system could also utilize the waiver provisions of the CAA in the CWA context; the system would allow states interested in adopting more stringent performance standards to apply for a waiver and justify their need for the higher standard. EPA could then consider the merits of the application and issue a waiver to the state, thereby allowing the state to adopt the more stringent performance standard. Ultimately, if the federal government also implements national water quality standards, as described below, the United States could wind up with only two different standards—the federal standard and the more stringent state standard. Although this would not create total uniformity for the shipping industry, the solution could minimize the industry's difficulty in dealing with multiple states, each with a unique regulatory system, while still allowing states to be protective of their waters. Overall, the process would create national uniformity and a predictable system for adjusting the standards, while providing a mechanism for creating greater regulatory certainty. The public process involved in the waiver procedures would also place the shipping industry on notice about future changes in state standards.

Third, Congress will need to address whether to preempt the states' authority to develop and impose water quality standards. Unlike the CAA, where the statute establishes national air quality standards, the CWA requires states to develop and implement state water quality standards.³³⁵ Although technology-based performance standards play a vital role in spurring the adoption of treatment technologies, Congress must also address water quality standards since state water quality standards have the potential to undermine the consistency and predictability of the national framework; in other words, although California might have the power to drive the technology-based standards under the CWA, without national water quality standards, states would still be able to impose more stringent requirements through state water quality standards, thereby exceeding California's standards and creating inconsistencies in the regulatory framework. Because variations in state water quality standards could lead to continued inconsistencies in the implementation of ballast water controls, and would do little to remedy the problems faced by the shipping industry in complying with a wide variety of state-by-state frameworks, Congress should preempt individualized state water quality criteria and implement a national water quality criteria system akin to that under the CAA. In determining a uniform water quality standard, the United States should model the provision on the most stringent state water quality standard in the United States as the national standard. Adopting the most protective state water quality standard in the nation would ensure that states are able to protect the quality of their waters, would provide greater consistency on a national scale, and could continue to drive the adoption of treatment technologies. Overall, a

³³⁵ Compare *id.* § 7409, with Federal Water Pollution Control Act, 33 U.S.C. § 1313(a) (2006).

uniform, but stringent, set of national water quality standards could balance the needs of vessels with the desire of states to protect the quality of their waters.

Fourth, the United States should ratify the Ballast Water Convention and integrate the Convention's requirements into the CWA. As illustrated by the integration of the Montreal Protocol into Title VI of the CAA, the United States could ratify and integrate provisions of the Ballast Water Convention into existing U.S. laws.³³⁶ Under Title VI of the CAA, Congress codified many of the goals of the Montreal Protocol and, in several areas, went beyond the requirements of the Protocol.³³⁷ Similar to Article 2 of the Ballast Water Convention, which allows states to adopt more stringent standards to prevent, minimize, and eliminate the transfer of invasive species, the Montreal Protocol contains a provision allowing states to adopt more stringent performance standards than those required under the treaty.³³⁸ Thus, in integrating the Montreal Protocol into the CAA, Congress was able to make a number of alterations to the international regime, while remaining within the confines of the Protocol. For example, Title VI contained a more aggressive schedule for phasing out harmful substances, imposed recycling requirements that were not in the Protocol, and adopted a program for phasing out less harmful, but still destructive chemicals, while the Protocol did not include a provision dealing with less harmful substances.³³⁹ Title VI also includes several provisions to facilitate the United States' compliance with the Protocol. For example, Congress directed EPA to fully implement the United States' obligations under the Protocol³⁴⁰ and instructed the President to take actions such as banning the export of technologies used to produce substances harmful to the ozone layer.³⁴¹

The ability of the United States to integrate the Montreal Protocol into the CAA exemplifies how the United States could integrate the provisions of the Ballast Water Convention into the CWA. Relying on the provisions in the Ballast Water Convention that preserve the United States' right to enact more stringent ballast water measures, the United States could ratify the

³³⁶ ROY S. BELDEN, AM. BAR ASS'N, CLEAN AIR ACT 121 (2001). The Montreal Protocol is "an international agreement to limit the production and use of chemicals that harm the ozone layer, with provisions that several chlorofluorocarbons be phased out of use." LINDA A. MALONE, ENVIRONMENTAL LAW 71 (2d ed. 2007); Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, 1522 U.N.T.S. 3, 26 I.L.M. 1541, 1550 [hereinafter Montreal Protocol].

³³⁷ BELDEN, *supra* note 336, at 119.

³³⁸ Compare Ballast Water Convention, *supra* note 20, art. 2 para. 5 ("Nothing in this Convention shall be interpreted as preventing a Party from taking, individually or jointly with other Parties, more stringent measures with respect to the prevention, reduction or elimination of the transfer of Harmful Aquatic Organisms and Pathogens through the control and management of ships' Ballast Water and Sediments, consistent with international law."), with Montreal Protocol, *supra* note 336, art. 2 para. 11 ("Notwithstanding the provisions contained in this Article, parties may take more stringent measures than those required by this Article.").

³³⁹ See Henry A. Waxman, *An Overview of the Clean Air Act Amendments of 1990*, 21 *Env'tl. L.* 1721, 1800 n.379 (2001); Saleem S. Saab, Comment, *Move Over Drugs, There's Something Cooler on the Black Market—Freon: Can the New Licensing System Stop Illegal CFC Trafficking?*, 16 *DICK. J. INT'L L.* 633, 645 (1998).

³⁴⁰ Clean Air Act, 42 U.S.C. § 7671m(b) (2000).

³⁴¹ *Id.* § 7671m(c)(1)–(2).

Ballast Water Convention, enact dual performance standards that follow the CAA's framework, and utilize the provisions in Article 4 that allow the United States to adopt national policies for achieving the objectives of the Ballast Water Convention. Utilizing Articles 2 and 4 of the Ballast Water Convention,³⁴² the United States could expressly adopt the Convention, but also ensure the protection of U.S. waters by enacting performance standards and other measures that go beyond the international standard. Ultimately, if the United States were to integrate the Ballast Water Convention into the CWA, the United States could demonstrate critical leadership on a serious environmental threat, protect the waters of the United States, and spur the industry to adopt effective treatment technologies.

IV. CONCLUSION

Ballast water discharges are one of the primary vectors for inadvertent introductions of invasive species into aquatic ecosystems, yet to date there are few binding, effective legal regimes in place to prevent species introductions or to force the adoption of treatment technologies. At the federal and international levels, there is growing support for the IMO's Ballast Water Convention. Despite the fact that the Ballast Water Convention is not yet in force, countries and states, such as California, are already modeling binding legislation after provisions of the Convention,³⁴³ thereby increasing the efficacy of international regulation of ballast water.

Although the Convention may not be as stringent as desired by the United States, the United States should ratify the convention in light of the country's ability to retain its sovereign power to enact more stringent legislation domestically. Ratification would bring the world one step closer to achieving international controls for reducing the impact of aquatic invasive species and would drive adoption of effective ballast water controls, while allowing the United States to adopt stringent performance and water quality standards. Nevertheless, in the absence of federal or international actions to implement ballast water controls, the adoption of stringent performance standards in California and across the West coast may still have the potential to drive the adoption of treatment technologies. There is hope, however, that in the wake of state actions and the decision in *Northwest Environmental Advocates*, the United States will enact a comprehensive ballast water framework and work towards halting the ballast water hitchhikers.

³⁴² See *supra* Parts III.B.1, V.B.

³⁴³ See *supra* Part IV.C.1.