



Ballast Water Management Enforcement

September 15, 2023

Fiscal Year 2023 Report to Congress



**Homeland
Security**

United States Coast Guard

Foreword

September 15, 2023

I am pleased to present the following report, “Ballast Water Management Enforcement,” prepared by the U.S. Coast Guard.

This report was compiled in response to the Fiscal Year 2023 Department of Homeland Security Appropriations Act (P.L. 117-328), which directs the Coast Guard to provide an update to the July 1, 2022, report on enforcement efforts on ballast water management.

Pursuant to congressional requirements, this report is provided to the following Members of Congress:



The Honorable David Joyce
Chairman, House Appropriations Subcommittee on Homeland Security

The Honorable Henry Cuellar
Ranking Member, House Appropriations Subcommittee on Homeland Security

The Honorable Chris Murphy
Chair, Senate Appropriations Subcommittee on Homeland Security

The Honorable Katie Britt
Ranking Member, Senate Appropriations Subcommittee on Homeland Security

I would be pleased to answer any questions you have, or your staff may contact my Senate Liaison Office at (202) 224-2913 or House Liaison Office at (202) 225-4775.

Sincerely,

A handwritten signature in blue ink that reads "L L Fagan".

Linda L. Fagan
Admiral, U.S. Coast Guard
Commandant



Ballast Water Management Enforcement

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I. Legislative Requirement

This report was compiled in response to direction in the House Report 117-396 accompanying the Fiscal Year (FY) 2023 Department of Homeland Security (DHS) Appropriations Act (P.L. 117-328), as well as direction in the House Report 116-458 accompanying the FY 2021 DHS Appropriations Act (P.L. 116-260):

House Report 117-396 states:

Ballast Water Management and Invasive Species.—The Committee encourages the Coast Guard to expand enforcement of its regulations on ballast water management to prevent the introduction and spread of invasive species, including through biological assessments and ballast water testing. The Committee is concerned that it has not yet received the report on this issue required by House Report 116-458 and directs the Coast Guard to immediately issue this report and to provide an updated report not later than 90 days after the date of enactment of this Act.

House Report 116-458 states:

Ballast Water.—The Committee is concerned by the spread of invasive species and other threats to marine and coastal ecosystems through ballast water discharge infecting reefs around Florida, the Caribbean Sea, and the Pacific Region. The Committee directs the Coast Guard to provide a report not later than 180 days after enactment of this Act on current enforcement efforts on ballast water management and discharge and additional resources needed to expand enforcement to include a requirement for owners and operators of vessels with ballast systems to conduct biological assessments and testing of ballast water discharge.

II. Background

The Coast Guard shares stated concerns of environmental and economic damage caused by invasive aquatic species and recognizes that vessel¹ ballast water (BW) discharge is one of the pathways for invasive species introduction into U.S. waters. The Coast Guard is committed to applying data-driven updates to its BW regulations and use of effective compliance measures to reduce the potential for invasive species to enter the marine environment.

The Coast Guard is statutorily charged with protecting America's marine environment and takes great pride in preserving and protecting our Nation's waters. In this regard, the Coast Guard provides leadership on Ballast Water Management (BWM), both domestically and internationally, and remains committed to working with all stakeholders to protect the United States waters from the introduction of invasive species.

Spurred by the negative environmental and societal impacts of the zebra mussel invasion of the Great Lakes, and by evidence of an increasing number of biological invasions of other aquatic ecosystems by nonindigenous species, Congress enacted the *Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990* (NANPCA) (P.L. 101-646), and later the *National Invasive Species Act of 1996* (NISA) (P.L. 104-332), which reauthorized and amended NANPCA. Together, these statutes are referred to as NANPCA/NISA, and their purpose is to prevent and control infestations of the U.S. coastal and inland waters by nonindigenous aquatic nuisance species (ANS).²

As directed by these two laws, the Secretary of Transportation,³ acting through the Coast Guard, established mandatory BWM regulations for the Great Lakes ecosystem, including the Hudson River north of the George Washington Bridge, and voluntary guidelines for the remainder of U.S. waters, which were used later as the basis for national mandatory BW reporting requirements⁴ and the BWM practices⁵ established in 2004. Subsequently, the Coast Guard, under DHS, published the BW Discharge Standard Final Rule (Final Rule) in March 2012.⁶ The Final Rule set forth requirements for BWM by ships in Title 33 of the Code of Federal Regulations (CFR) part 151, subparts C and D, which include requirements for seagoing vessels operating in U.S. waters (i.e., waters within 12 nautical miles (NM) of the baseline).⁷ Additionally, the Final Rule includes requirements for type approval of ballast water management systems (BWMS) used to achieve the discharge standard in Title 46 CFR.

¹ For purposes of this report, the term "ship" is interchangeable with "vessel."

² ANS are defined in P.L. 101-646 as: "a nonindigenous species that threatens the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural or recreational activities dependent on such waters."

³ The Coast Guard operated under the U.S. Department of Transportation from 1967 until March 2003, at which time the Coast Guard began operations under DHS.

⁴ Final rule titled "Penalties for Non-submission of BW Management Reports." 69 Federal Register (FR) 32864. June 14, 2004.

⁵ Final rule titled "Mandatory BW management program for U.S. Waters." 69 FR 44952. July 28, 2004.

⁶ Final rule titled "Standards for living organisms in ships' BW discharged in U.S. Waters." 77 FR 17253. March 23, 2012.

⁷ See definition of "waters of the United States" in 33 CFR part 151.1504.

The BWM requirements mandate using one or more accepted options to manage BW:

- Use a Coast Guard-approved BWMS to meet the BW discharge standard;
- Use water exclusively from a U.S. Public Water System (PWS) as BW;
- Discharge of untreated BW to a reception facility;
- Prohibited discharge of untreated BW inside 12 NM; and
- Temporary use of a Coast Guard accepted Alternate Management System (AMS).

The requirement to use one of these options was implemented in a phased-in compliance scheme as follows:

- New ships constructed on or after December 1, 2013 – on delivery.
- Existing ships – first scheduled dry dock after:
 - January 1, 2014, for ships with BW capacity of 1500 - 5000 cubic meters (m³).
 - January 1, 2016, for ships with BW capacity of less than 1500 or greater than 5000 m³.

Prior to its compliance date, an existing ship entering U.S. waters from outside the Exclusive Economic Zone, or the Canadian equivalent, is required to comply with requirements to conduct a mid-ocean ballast water exchange (BWE) at least 200 NM from any shore. There are safety and route exemptions for some ships because of stability concerns or because the voyages either do not exceed 200 NM from shore or do not do so for enough time to conduct a BWE. Section 1102(f)(1) of NANPCA/NISA directed the Secretary of Transportation to develop and maintain, in consultation and cooperation with the Aquatic Nuisance Species Task Force (ANSTF)⁸ and the Smithsonian Environmental Research Center (SERC), a data clearinghouse for:

- Ballasting practices;
- Compliance with guidelines issued pursuant to section 1101(c); and
- Any other information obtained by the ANSTF under subsection 1102(b).

Section 1101(c) of NANPCA/NISA included statutory requirements to issue voluntary national guidelines for BWM practices by ships. These guidelines and regulations that followed set forth requirements for ships to submit reports, prior to arrival at a U.S. port or place, that provide details about the ship, its BW, and its BWM practices used to prevent the introduction and spread of ANS in U.S. waters. These reports are required to be submitted to the National Ballast Information Clearinghouse (NBIC).⁹ Section 1101 of NANPCA/NISA was repealed by the Vessel Incidental Discharge Act (VIDA) in 2018, but our regulations continue in effect until VIDA regulations promulgated by the Secretary of Homeland Security enter into force.

VIDA also amended section 1102(f) of the NANPCA/NISA and requires the Coast Guard, in consultation and cooperation with the ANSTF and SERC, to submit an annual report to Congress synthesizing and analyzing data submitted to the NBIC for the preceding 2-year period, and evaluating nationwide status and trends relating to a) BW delivery and management and b) invasions of ANS resulting from BW. The first annual report, covering calendar years 2017-2020, was submitted to Congress on September 30, 2022. The second submission, covering calendar years 2020-2021, was submitted to Congress on July 7, 2023.

⁸ Under NANPCA/NISA (Section 1201), the ANSTF is comprised of the Director of the U.S. Fish & Wildlife Service; the Under Secretary of Commerce for Oceans and Atmosphere; the Administrator of the Environmental Protection Agency; the Commandant of the Coast Guard; the Assistant Secretary of the Army (Civil Works); the Secretary of Agriculture; and the head of any other Federal agency that the Chairpersons deem appropriate. The Director and Under Secretary serve as co-chairpersons.

⁹ The SERC manages the NBIC database of information regarding BW management and discharge by vessels in the United States. Webpage: <https://nbic.si.edu/>

III. Report

A. BWM Compliance and Enforcement

1. Compliance and Enforcement Data for Calendar Years (CY) 2021-2022

The Coast Guard verifies compliance on board vessels through existing safety and environmental compliance inspections, which generally occur once a year. Inspections begin with a check of the ship's documents, including BWM plans, NBIC Report, and ship's BW recordkeeping. If a BWMS is on board, inspectors check to ensure that it is functioning and that the crew knows how to maintain and use it. If there is evidence of noncompliance, the Coast Guard will issue deficiencies and enforcement actions such as a Letter of Warning, Notice of Violation, and/or Civil Penalty for failure to comply with BWM regulations.

There were 204 BW deficiencies in 2021 and 273 in 2022 identified on board foreign and domestic ships visiting ports in the United States (see Table 1 and Table 2 for more details). Most of the deficiencies resulted from ships arriving with inoperable BWMS. There was also an increase in the number of ships arriving with incomplete plans and failures to report BWM practices to NBIC as recorded by Coast Guard Port State Control (PSC) examiners. In most cases where the discharge of BW could pose a threat to the marine environment, ships were required to modify their cargo plans to facilitate safe and compliant BW discharges. A Coast Guard Enhanced Exam Program conducted in 2021 and 2022 contributed to an increase in the number of BW deficiency items recorded. BW compliance was one of several components of the Enhanced Exam Program.

Table 1: CY 2021 - 2022 BW Deficiencies – Foreign Vessels

Type	2021	2022
NBIC Reporting	25	29
BWMS	77	104
Exchange	0	6
Structural	4	2
Discharge	4	8
Recordkeeping	4	11
BWM Plan	39	22
Captain of the Port (COTP) Reporting	1	44
Mandatory Practices	11	10
Sediments	2	2
Alternative Management Method	0	1
Training	3	1
Implementation Schedule	11	5
Total	181	245

Table 2: CY 2021 - 2022 BW Deficiencies – Domestic Vessels

Type	2021	2022
NBIC Reporting	2	1
BWMS	9	14
Exchange	0	0
Structural	2	0
Discharge	2	4
Recordkeeping	1	4
BWM Plan	5	5
COTP Reporting	1	0
Mandatory Practices	0	0
Sediments	1	0
Alternative Management Method	0	0
Training	0	0
Implementation Schedule	0	0
Total	23	28

2. Findings & Trends

Compliance by vessels with the BW reporting requirement continued to be high for 2020 and 2021 as compared to 2019 and 2020.

Note: At time of drafting this report, SERC has not completed validating its 2022 data.

The NBIC received 84,347 and 86,939 BWM reports of record in 2020 and 2021, respectively, for a national 2-year average of 85,643 reports per year. Overseas arrivals accounted for approximately 42 to 43 percent of arrivals in both years. The East and Gulf Coasts received the most reported overseas arrivals, with 2-year averages of 13,410/year and 12,786/year, respectively, followed in order by the West Coast (5,827/year), Caribbean territories (3,166/year), Pacific Islands (1,044/year), and Alaska (191/year). The drop in arrivals related to COVID-19 resulted in a decrease in the 2-year averages for all regions compared to 2019-2020. When compared to National Vessel Movement Center arrivals, these overseas reports reflect greater than 95 percent compliance with the BW reporting requirement, nationally, over the 2-year period 2020-2021. The Gulf Coast (98.9 percent) and the West Coast (98.0 percent) had the highest 2-year averages for compliance with reporting requirements, followed by the East Coast (95.5 percent), Alaska (89.7 percent), Hawaii (89.3 percent), Guam (82.4 percent), Caribbean territories (81.6 percent), and the Great Lakes (69.7 percent).

A comparison of 2020-2021 coastwise BWM reports to National Vessel Movement Center coastwise arrivals for applicable locations and vessel traffic reflects greater than 95 percent compliance with the reporting requirement nationally. The East, Gulf, and West Coasts received the most coastwise arrivals, with 2-year averages of 17,264/year, 14,147/year, and 8,074/year, respectively. Compliance with the reporting requirements during the 2020-2021 period was highest on the West Coast (98.5 percent), followed by the Gulf Coast (97.5 percent), the East Coast (93.9 percent), and Alaska (87.4 percent).

Total volume of BW discharged to the United States continued to increase for 2020 and 2021 as compared to 2019 and 2020.

Cumulatively, vessels arriving to U.S. ports and places reported a cumulative discharge of 189.5 and 204.0 million m³ of overseas BW in 2020 and 2021, respectively, and 178.9 and 188.7 million m³ of coastwise BW in 2020 and 2021, respectively. This reflects an average yearly discharge increase of 15.2 percent for overseas discharges, as compared to the prior 2-year period (2018-2019). Although increases in coastwise reporting compliance account for a small part of this increase, the majority represents an increase in BW discharge arising from larger ships and changes in trade patterns (e.g., increases in bulk grain and petroleum exports) resulting in an increase in the per capita discharge volume of both overseas and coastwise arrivals that discharge BW. This change was particularly noticeable in 2020-2021, when the per capita discharge volume increased while overseas arrivals decreased due to the COVID-19 related economic slowdown, resulting in a peak in overseas discharges.

Of the total coastwise discharge, the percentage discharged to coastal regions increased from 48.1 percent in 2005 to 73.1 percent in 2020 and 71.0 percent in 2021. At the same time, the volume of coastwise discharge into the Great Lakes and Inland waterways has remained relatively stable, averaging 54.2 ± 1.4 million m³ per year.¹⁰ This discharge is dominated by vessels operating on the Great Lakes and oscillates seasonally as shipping on the Great Lakes declines greatly during the winter.

Increases in national BW discharge continue to be driven by increases in BW discharge on the Gulf Coast. The percentage of overseas BW discharge received by the Gulf Coast increased from 65.8 percent of reported overseas discharge in 2018, to approximately 74 percent by 2021, increasing from 52.5 to 55.1 percent in 2020 before dropping to 53.0 percent of all coastwise discharges in 2021.

Managed overseas BW discharge was high and increased; managed coastwise BW discharge increased at a slower rate from 2019 to 2020.

Among seagoing vessels, the proportion of discharging arrivals that report managing their BW discharge by use of an approved method (BWE, BWMS, AMS, or PWS) was much greater for overseas arrivals in 2020 and 2021 (92 percent and 95.7 percent) than for coastwise arrivals (60.5 percent and 71.1 percent). The reduction of BWE as the dominant reported BWM type (dropping from 39.0 percent in 2020 to 23.3 percent in 2021) and the rise of ballast water treatment (BWT) (either BWMS or AMS) is of particular importance. Since 2018, the percentage (and overall volume) of overseas BW discharge reported as undergoing onboard BWT increased from 24.8 percent to 56.7 percent in 2020 and 74.2 percent in 2021. The long-term decrease in the percentage of coastwise BW discharge that was unmanaged continued (46.2 percent in 2020 and 32.2 percent in 2021). The use of BWT by seagoing vessels to manage coastwise BW has continued to increase, rising from 37.5 percent in 2020 to 55.7 percent in 2021. The adoption of BWT appears to drive much of the increase in management of coastwise BWE. Coastwise BW discharge by seagoing vessels using BWE decreased precipitously from 96.5 percent of managed discharge in 2015 to 29.7 percent in 2020, and 17.7 percent in 2021.

¹⁰ Mean ± standard error of the mean; 16 years

Coastwise ship transits do not travel beyond the exclusive economic zone, and, therefore, have no opportunity to conduct proper BWE beyond 200 NM, as required by federal regulations in 33 CFR part 151, subparts C and D. Nevertheless, despite absence of mandatory BWE for coastwise BW discharge under current Coast Guard regulations, other regulatory authorities do require BWE in some instances. For example, California regulations and the Environmental Protection Agency (EPA) Vessel General Permit require BWE beyond 50 NM along the North American West Coast by certain vessels. Furthermore, the Coast Guard requires vessels to report all uptake and discharge of BW, regardless of transit type or whether some sort of BWM has been undertaken.

The most common reason provided for discharge of unmanaged BW to the Gulf Coast and the Caribbean was a route exemption (i.e., the vessel did not transit at least 200 NM from shore for long enough to conduct BWE). The most frequent reason claimed on the East and West Coasts was a mid-ocean exchange of BW, and in Alaska and Hawaii, safety exemptions were significant responses. Non-management of coastwise BW discharge is also prevalent throughout the Nation, with regulatory, route, and safety exemptions provided as the primary reasons for not conducting BWM. The disparity between the amounts of regulated overseas BW and coastwise BW being managed prior to discharge will remain significant until BWM methods, other than conducting BWE beyond 200 NM, become available for vessels carrying coastwise BW. BW carried by non-seagoing vessels (approximately 28 percent of all coastwise discharge), and those vessels that operate exclusively among the Great Lakes (i.e., Lakers), is likely to continue to be unmanaged until practicable methods become available for such vessels to meet BWM requirements. The 2012 Final Rule¹¹ exempted non-seagoing vessels from the requirement to manage BW prior to discharge. Information and evidence on the availability of technology that can be practicably installed, the cost of such technology, and the benefit of requiring such vessels to manage BW may inform new regulations under VIDA. Notably, VIDA includes a provision for the Great Lakes and Lake Champlain Invasive Species Program to investigate this issue.

Use of onboard BWMS continued to increase rapidly from 2020 to 2021.

The volume and percentage of overseas BW discharge reported as undergoing management by use of an onboard BWMS increased from 40.4 million m³ (24.8 percent) in 2018 to 107.5 million m³ (56.7 percent) in 2020, reaching 151.4 million m³ (74.2 percent) in 2021. Although at a slower pace, the use of onboard BWMS for coastwise BW discharge from seagoing vessels increased from 24.6 million m³ (17.1 percent) in 2018 to 49.1 million m³ (37.5 percent) in 2020, and 74.6 million m³ (55.7 percent) in 2021.

The number of unique vessels submitting BWM reports to the NBIC remained relatively stable in 2020 (10,469 vessels) and 2021 (10,916 vessels). Yet, the proportion of vessels with an onboard BWMS increased from 51.2 percent to 66.8 percent. The number of vessels with Coast Guard type-approved (CGTA) BWMSs installed increased from 1,658 to 5,697 from the beginning of 2020 to the end of 2021. The number of vessels with an AMS decreased from 1,888 to 1,591 during this same 2-year period. These increases demonstrate a significant shift towards installing CGTA BWMS (78.2 percent) rather than AMS (21.8 percent) during this period compared to the prior 2-year period. Given the substantial increases in overseas BW discharge, and therefore increased potential for invasion, the expanding use of onboard BWMS is particularly noteworthy.

¹¹ Standards for Living Organisms in Ships' BW Discharged in U.S. Waters, 77 FR 17253 (March 23, 2012).

PWS water was used infrequently as a method of BWM (399 BWM reports and 0.002 percent of total volume) during the 2020-2021 period. Vessels using this method were primarily discharging coastwise BW to the U.S. Gulf Coast. No vessels reported discharge to a BW treatment facility during the 2-year period.

Coast Guard continued to conduct BWM compliance and enforcement activities for 2020 and 2021.

In 2020, there was a noticeable decrease in vessel arrivals to the United States, which correlated to an overall decrease in PSC exams compared to prior years. In 2020, the Coast Guard conducted 7,383 PSC exams, which include exams for vessel compliance with BWM requirements. Exams decreased by 9.3 percent from 2018 to 2020, reflecting the impacts of the COVID-19 pandemic on international shipping. In 2020, the Coast Guard identified 108 BWM deficiencies onboard foreign vessels visiting ports in the United States, which amounts to a 9 percent decrease from 2018, the most recent prior year for which data are available. Most of the deficiencies resulted from vessels arriving with inoperable BWMS (42 percent). Incomplete BWM plans (16 percent) and failures to report BWM practices to the NBIC (13 percent) also ranked high among deficiencies noted by Coast Guard PSC Examiners.

In 2020, most enforcement actions were issued to vessel operators for illegal discharge of untreated BW, failing to report inoperable systems to the nearest COTP or District Commander, and failing to make complete, accurate, and timely BW reports to the NBIC. In 2020, 8 Letters of Warning, 11 Notices of Violation, and 4 Civil Penalties were issued.

In 2021, the Coast Guard conducted 8,663 PSC exams, an increase of 17 percent from 2020, which include exams of vessel compliance with BWM requirements. The Coast Guard identified 181 BWM deficiencies on board foreign vessels visiting ports in the United States. As in 2020, most of the deficiencies (42 percent) resulted from vessels arriving with inoperable BWMSs. Incomplete BWM plans (22 percent) and failures to report BWM practices to the NBIC (13 percent) also ranked high among deficiencies noted by Coast Guard PSC Examiners.

In most cases where the discharge of BW could pose a threat to the marine environment, vessels were required to modify their cargo plans to facilitate safe and compliant BW discharges, leading to costly, unforeseen port scheduling conflicts. By incorporating BWMSs into their company safety management system, vessel operators can maintain their crewmembers' BW training and competencies more effectively to ensure that the vessel complies when it arrives in port. Enforcement actions may be used by the Coast Guard to ensure compliance with the mandatory BW requirements to safeguard the waters of the United States.

B. Florida, Caribbean Sea, and Pacific 2021 - 2022

Coast Guard BWM regulations do not provide separate requirements for these regions. However, the regulations include a statutory exemption from NANPCA/NISA for crude oil tankers engaged in coastwise trade, which generally applies to the West Coast, and is the basis for a Coast Guard BWM regulatory exemption in 33 CFR 151.2015(b).

There were no deficiencies issued in 2021 or 2022, in the Pacific Region for a vessel failing to report an inoperable BWMS to the nearest COTP or District Commander. Table 3 provides the number of deficiencies in 2021 and 2022, for District 7 (Florida and the Caribbean region).

Table 3: CY 2021 - 2022 BW Deficiencies – District 7

Type	2021	2022
NBIC Reporting	7	11
BWMS	9	5
Exchange	0	0
Structural	0	2
Discharge	3	0
Recordkeeping	6	3
BWM Plan	8	5
COTP Reporting	0	1
Mandatory Practices	0	3
Sediments	0	2
Alternative Management Method	0	0
Training	0	0
Implementation Schedule	1	6
Total	34	38

Additionally, the Coast Guard participated in the Caribbean Coral Reef Partnership to investigate the causes and spread of Stony Coral Tissue Loss Disease (SCTLD) in Florida and the Caribbean Sea.

SCTLD was first detected in the vicinity of Miami, Florida, in 2014, and spread throughout the greater Caribbean region. The disease devastated many species of stony coral in the region, including some that are considered threatened. While there is no definitive identification of a causal source, evidence suggests that one or more bacteria may be involved. The disease can be transmitted through water and, direct contact between corals. Ship BW was suggested as one possible mechanism for disease spread. The Coast Guard and EPA (participants of the Caribbean Coral Reef Partnership) were provided information regarding the rapid spread of SCTLD in 2019. On September 6, 2019, at the request of the National Oceanic and Atmospheric Administration, the Coast Guard’s Office of Operating and Environmental Standards (OES) issued Marine Safety Information Bulletin (MSIB) - OES-MSIB: 07-19, advising mariners of the disease outbreak, reminding them of BWM regulations, and recommending voluntary BWE practices that would help to reduce the potential for spreading the disease via BW.

Following release of the MSIB, NBIC conducted an analysis of BWM reports submitted by vessels arriving to ports in the region before and after the MSIB to see if there was a change in vessel BWM that might be attributed to the MSIB. Over the 12 months following the MSIB, the number of vessels discharging unmanaged BW within 12 NM was lower than the average number doing so for the 6 years prior to the MSIB. However, it is not possible to determine whether this resulted from adherence to the MSIB guidance. There was not a correlating increase in the number or proportion of BWE events, which would have been expected if recommendations in the MSIB were being followed. The increase in the number of vessels using BWMS over the same period may account a decrease in the number of vessels discharging unmanaged BW. Additionally, the global COVID-19 pandemic resulted in a noticeable decline in the number of vessel arrivals in the region during the year following issuance of the MSIB.

The MSIB 07-19 follow-up analysis is available at (<https://nbic.si.edu/publications/>).

Potential for Expansion of Enforcement Activities

VIDA requires the Coast Guard to promulgate new regulations for implementation and enforcement of vessel discharges incidental to normal operations, including BW, within 2 years of the EPA's publication of national performance standards. The Coast Guard continues to assess existing regulatory authority to require biological assessments or testing of BW from vessels.

The Coast Guard is assessing technology necessary to enable the creation of a BW sampling and analysis program to support enforcement activities however, there are technical challenges to overcome. Sampling and analysis methods for assessing compliance of BW with current discharge standard do not exist at this time.

The Coast Guard is assessing emerging technologies to enable onboard sampling and analysis. Coast Guard research and development projects on BWM and data collection are progressing within available budgetary resources and are coordinated with other federal agencies in the Great Lakes region to ensure an aligned approach and to avoid duplicative efforts.

IV. Conclusion

Over the past 30 years, since Congress passed initial BW legislation for commercial vessels in 1990, U.S. regulations and management shifted dramatically. Before 1990, there were no requirements for BWM or reporting, and vessels discharged primarily unmanaged BW. Today, the situation is very different:

- The vast majority of arriving ships submit a BWM report to the NBIC, and overseas and coastwise vessels exceeded 95 percent compliance with the reporting requirements during 2020 and 2021.
- Most vessel arrivals report BWM, including no discharge upon arrival, use of BWE, or use of BWT (AMS or CGTA).
- Of the total volume of overseas BW discharge reported in 2021, over 97 percent was managed by either BWE or BWT.
- The total volume of overseas BW discharge reported as treated, using an onboard BWMS, increased from 1 percent to greater than 74 percent in the past 7 years (2015-2021), underscoring the rapid adoption and use of BW treatment technologies.

By virtue of its completeness (representing a near census of arriving vessels at the national level), the NBIC database of vessel BWM reports provides extensive power for tracking trends and detecting changes in BWM and delivery.

Despite the rapid expansion and use of BWM for overseas vessel arrivals, most of the BW discharge by coastwise arrivals is still reported as unmanaged, with the Great Lakes and the Gulf Coast regions receiving most of this unmanaged BW discharge. This pattern reflects the limited use of BWE by these vessels, which do not transit open oceans (as required for BWE), or are exempt from BWM by regulation (i.e., non-seagoing vessels and other vessels per 33 CFR part 151.2015). While BWE is an allowable BWM option (33 CFR parts 151.2025 and 151.2035), vessels are not required to divert transit beyond 200 NM or delay voyages to conduct BWE, unless required by the COTP pursuant to 33 CFR part 151.2040(b). Additionally, under another current exemption, some vessels do not conduct BWE due to safety considerations, either in general (i.e., vessel is not designed to enable safe BWE), or due to voyage-specific circumstances (i.e., when safe BWE is not possible due to sea conditions). Fewer geographic and safety limitations are expected as BWMSs are adopted by vessels operating on these routes.

While BWM increased, the volume of overseas and coastwise BW delivery to the U.S. has also increased, especially since 2005. In 2005, overseas BW delivery equaled 41.9 million m³ compared with 204.0 million m³ in 2021 (a 387-percent increase). This increase is associated primarily with changes in traffic to the Gulf Coast, with shifts in commerce patterns, and expansion of the Panama Canal to provide greater capacity to handle more and larger ships. Likewise, volumes of coastwise BW discharge in the United States have also expanded, but to a lesser extent, from 120.3 million m³ in 2005 to 210.3 million m³ in 2019 (74.8 percent increase), before dropping in 2020 because of COVID-19-related shipping slowdowns. In 2021, coastwise BW discharge volumes began to rebound to pre-COVID rates.

Current upward trajectories in the adoption and usage of BWT suggests organism concentrations (numbers of living organisms per unit volume of BW at discharge) will continue to decrease in

overseas vessel BW discharge. Increasing implementation of BWT on more ships will address many of the BWM gaps that exist for coastwise BW discharges, further decreasing organism concentrations in discharges from these vessels. However, the increase in total BW discharge will have some compensatory effect in total propagules (i.e., eggs, larvae, juvenile/adult life stages of biota) delivered, since this discharge is the product of the total BW volume discharged and the concentration of organisms.

Overall, the Coast Guard BWM program is predicted to reduce new ANS invasions by continuing to reduce the delivery of coastal organisms in BW. However, uncertainty remains about the residual risk of new invasions or secondary coastwise spread under different discharge standards (National Research Council 2011¹²). The rate of each is expected to be ameliorated by BWM but is also expected to be related to increases in BW volume discharge over time.

¹² <https://nap.nationalacademies.org/catalog/13184/assessing-the-relationship-between-propagule-pressure-and-invasion-risk-in-ballast-water>

Appendix: Abbreviations

Abbreviation	Definition
AMS	Alternate Management System
ANS	Aquatic Nuisance Species
ANSTF	Aquatic Nuisance Species Task Force
BW	Ballast Water
BWE	Ballast Water Exchange
BWM	Ballast Water Management
BWMS	Ballast Water Management System
BWT	Ballast Water Treatment
CFR	Code of Federal Regulations
CGTA	Coast Guard Type-Approved
COTP	Captain of the Port
DHS	Department of Homeland Security
Final Rule	BW Discharge Standard Final Rule
FR	Federal Register
EPA	Environmental Protection Agency
m ³	Cubic Meters
MSIB	Marine Safety Information Bulletin
NANPCA	Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990
NBIC	National Ballast Information Clearinghouse
NISA	National Invasive Species Act of 1996
NM	Nautical Mile
OES	Coast Guard's Office of Operating and Environmental Standards
PSC	Port State Control
PWS	U.S. Public Water System
SCTLD	Stony Coral Tissue Loss Disease
SERC	Smithsonian Environmental Research Center
VIDA	Vessel Incidental Discharge Act