

Report

Oregon Task Force on the Shipping Transport of Aquatic Invasive Species



State of Oregon
Department of
Environmental
Quality

Report to the 2015 Legislature



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Task Force Members:

Mark Sytsma - Portland State University (*Task Force Chair*)
Jas Adams - OR Department of Justice
Jeff Bachman - OR Department of Environmental Quality (WQ/OCE)
Ralph Breitenstein - Volunteer, Hatfield Marine Science Center
Rick Boatner - Oregon Department of Fish & Wildlife
Robyn Draheim - US Fish & Wildlife
Jina Sagar - Lower Columbia R. Estuary Partnership (alt: Amanda Hanson)
Michelle Hollis - Port of Portland
Frank Holmes - Western States Petroleum Association
Nicole Dobroski - California State Lands Commission (alt: Chris Scianni)
Ross McDonald - Sause Brothers Ocean Towing, Inc.
Hans Meere - EGT LLC
Allen Pleus - Washington Department of Fish & Wildlife (alt: Gary Gertsen)
Michael Pearson - United States Coast Guard, Sector Portland
Mike Titone - Columbia River Steamship Operators
Brett VandenHeuvel - Columbia Riverkeepers
Dick Vanderschaaf - Nature Conservancy
Rian vandenHooff - DEQ (ex-officio)

Legislative Advisors:

Senator Arnie Roblan (Dist. 5)
Representative Caddy McKeown (Dist. 9)

Executive Summary

The Oregon Task Force on the Shipping Transport of Aquatic Invasive Species prepared this report for the 2015 Oregon Legislature as required by Senate Bill 116 (2013) and Oregon Revised Statute 783.625. The Oregon Department of Environmental Quality organizes the task force in order to study and make recommendations for combating the introduction of non-indigenous species associated with commercial shipping-related activities in Oregon. Members of the task force represent a diverse range of academic, maritime, regulatory and environmental perspectives, and include two advisory members from the Legislature. The group met four times between August 2013 and April 2014 to share concerns, debate various proposals, and develop the contents and resulting recommendations of this report.

Commercial shipping activities constitute an important, vital economic engine for Oregon. An unintentional consequence of trade, however, is the transport and introduction of species to ecosystems outside their historic ranges. These species, freed of the natural controls of their native range, can proliferate and become aquatic invasive species in Oregon's waterways, displacing native species and degrading ecosystem services critical to human economies and health. A sustainable economy requires effective monitoring and management to prevent the introduction of aquatic invasive species via shipping-related pathways such as ballast water discharge and vessel biofouling. Task force members unanimously agree that protecting Oregon waterways from threats posed by aquatic invasive species is necessary and that developing appropriate management strategies to prevent shipping-mediated introductions from ballast water discharges and biofouling pathways is critically important.

This report provides information and analysis on a) current ballast water regulations at international, federal and regional levels; b) shipping and ballast water discharge trends in Oregon waters; c) vessel compliance with Oregon law; and d) emerging issues that may affect Oregon's efforts to reduce invasive species threats associated with shipping activities. In addition, the task force has evaluated Oregon's ballast water program operations to determine appropriate funding levels to sustain program activities in the coming years.

The Oregon Department of Environmental Quality Ballast Water Program is responsible for developing and implementing aquatic invasive species prevention strategies related to commercial shipping in Oregon waters. Program responsibilities include screening of vessel arrivals and pre-arrival report monitoring; vessel inspections; compliance verification sampling; technical assistance and outreach with maritime industry stakeholders; enforcement actions; policy development and coordination with regional jurisdictions; and providing staff support to the task force. Since 2012, the program has operated at a 1.5 full-time equivalent staffing level; supported by a 50/50 cost share between ballast management fee revenue and General Fund allocations. The 1.5 FTE

funding level has allowed the program to inspect approximately 16 percent of vessel arrivals to Oregon per month.

Regulatory developments at the international, federal and state-specific levels have triggered a major transition in ballast water management policy that is imminent in the next two to five years. Oceanic ballast water exchange has been the predominant ballast management strategy for nearly two decades and is slated to be replaced with numerical discharge standards that will likely require the use of shipboard ballast treatment systems. This change clearly represents increased environmental protection for marine ports due to a dramatic reduction in the number of living organisms discharged in ballast water. However, the change in management requirements poses significant concerns for prevention efforts of freshwater or low-salinity ports. Although the new federal ballast discharge standards will reduce the total number of living organisms released, the absence of oceanic ballast water exchange could result in a greater number of high-risk organisms released into Oregon waterways than occurs under current practices. High-risk organisms are considered to be those that are sourced into ballast tanks from environments similar to the location where discharge will occur. Other jurisdictions have addressed these concerns by maintaining a ballast water exchange requirement in addition to the use of shipboard treatment systems for vessels discharging into freshwater or low salinity ecosystems.

The task force reached consensus on five recommendations to the Oregon Legislature – the first three of which encourage specific statutory amendments during the 2015 session. The rationale and details of each recommendation are outlined in the final section of this report, but generally involve:

1. An increase to the vessel arrival ballast management fee that will sustain current DEQ ballast program service levels through the 2017-19 biennium (pending comparable increases in General Fund allocations);
2. A change in the distribution of penalty funds collected on behalf of ballast management violations so that the funds are deposited to the statewide Invasive Species Control Account administered by the Oregon Invasive Species Council (OR Department of Agriculture) rather than the General Fund;
3. Adoption of a federally established management requirement for residual water and sediment in empty ballast tanks that would enable state inspector authority for technical assistance, compliance verification and enforcement purposes;
4. Assistance in promoting the need for periodic non-indigenous species survey efforts in coastal zone and freshwater habitats frequented by commercial shipping activities; and,
5. Increased awareness and ongoing monitoring of i) biofouling management policy developments in neighboring jurisdictions and ii)

proposed shipbreaking activities on Oregon shores that may require biofouling prevention measures for the State of Oregon.

One additional recommendation developed in response to pending changes in federal policy - is supported by a majority of task force members, but does not have support from members representing maritime industry interests. Specifically, this proposal would maintain an oceanic ballast water exchange requirement for a subset of high-risk vessels discharging into Oregon waterways that are using ballast water treatment systems certified to meet the federal discharge standard. The proposal would be comparable to the federal strategy already established by EPA for vessels discharging ballast into the Great Lakes, but includes additional exemptions specific to operations on the West Coast, and would be contingent on passage of similar measures in other West Coast jurisdictions. DEQ estimates that approximately 10 percent of vessel arrivals to Oregon could be affected by this proposal. It is this point that has task force members representing commercial shipping interests concerned about timing of this particular recommendation. A full description of this issue, the proposed recommendation, and a minority opinion from those in opposition is included in the final section of this report.

In addition to the above legislative recommendations, task force members also developed three consensus recommendations for ballast water program policy development actions for DEQ/Environmental Quality Commission consideration. These are detailed in the Recommendations section of the report and include:

- explicit enforcement guidance for non-compliant ballast exchange based on salinity values recorded during compliance verification ballast tank sampling;
- development of a more robust pre-arrival risk assessment system that will assist with prioritizing vessel inspection and compliance verification resources; and,
- evaluation of in-water vessel cleaning policies for commercial vessels in state waters and monitoring developments in neighboring jurisdictions to determine if further policy development for Oregon is necessary.

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Introduction

Aquatic non-indigenous species (NIS) - also known as introduced, exotic, or alien species - are transported to new marine, estuarine and freshwater regions through numerous human activities. Some of these species, if they become established, may become *invasive* to the receiving environment: causing serious harm to native biodiversity, nutrient cycling, ecosystem function and/or threatening human health and economies.

Multiple mechanisms, or vectors, are responsible for the global transfer and distribution of aquatic invasive species (AIS), including: aquaculture, live bait release, intentional sportfishing introductions, release of aquarium pet and live seafood specimens, transfer via recreational watercraft, association with marine debris, and accidental release from research institutions (Minchin et al. 2009). However, commercial shipping has historically been the most important vector for AIS, accounting for or contributing to roughly 3/4ths of all AIS introductions at local, regional and global scales (Fofonoff et al. 2003, Molnar 2008). Global commercial ships transport of AIS - via ballast water transfer and vessel biofouling - continues to play a critical role in human impacts on coastal ecosystems (Halpern 2008).

The risk of AIS becoming established is influenced by various factors, including propagule pressure (i.e., number of organisms being released), condition of the propagules upon release, timing of inoculation, the ecological stability of the receiving system, and the presence or absence of suitable resources to support colonization by specific taxa (Elton 1958, Ruiz et al. 2000, Kolar and Lodge 2000). The discharge of ballast water is a considerable risk because not only may it release an abundance of NIS individuals into the receiving environment, but it also results in the transfer of entire ecological communities, including viruses, bacteria, phytoplankton, zooplankton, fish, and macrophytes (Carlton and Geller 1993, Ruiz et al. 1997). For these reasons, regulatory management of ballast discharge has focused on vector management risk-reduction strategies rather than a species-specific approach to managing individual aquatic invasive species of greatest concern (Ruiz and Carlton 2003).

Ship surfaces subject to fouling and wood boring organism have been a probable AIS vector for thousands of years. However, since the advent of steel-hulled ships and particularly the application of anti-fouling paints, regulatory management of ballast mediated introductions has been more focused than fouling mediated concerns. Since January 2003, the application of organotin-based anti-fouling paint systems has been banned by the IMO because of harmful impacts of its active compounds on the marine environment. As new anti-fouling coatings are developed and vessels shift to different coatings with potentially lower efficacies at preventing biofouling, there are concerns that the risk of fouling mediated transport of AIS may increase (Nehring 2001).

Invasive species management involves a continuum of activities that are critical in the arsenal against NIS threats, including prevention, education, rapid response, control, eradication and/or mitigation. Evidence and case studies routinely demonstrate that the

most economical means of managing biosecurity is to focus on the prevention end of this continuum. Moreover, pathway focused prevention efforts – those that seek to manage a vector (e.g. ballast water or biofouling) rather than species-specific targeted approaches - are widely regarded as the most cost-effective strategies to invasive species management.

Overview of Current Ballast Management Practices

For more than a decade, oceanic ballast water exchange has been the predominant management strategy required by state (and federal) authorities to reduce the risk of transferring aquatic invasive species in ballast water. Ballast water exchange (BWE) aims to not only reduce the absolute quantity of organisms per unit volume of discharge but, through osmotic shock induced mortality, is also highly effective at removing - species that are of greatest risk for invading low-salinity environments. - . Vessel operators may meet ballast water exchange requirements by either ‘empty/refill’ method (i.e., pump out as much of ballast as is possible; then re-fill with mid-ocean water) or the ‘flow through’ method (i.e., flush out the tank by pumping in mid-ocean water at the bottom of the tank; continuously overflowing the tank from the top until the equivalent of three full-tank volumes have been pumped into the tank). Both methods aim to replace at least 95% of the original ballast volume contents, though research has shown that the empty/refill method tends to have greater efficacy than the flow-through method (Ruiz and Reid 2007). Oceanic ballast exchange has generally been identified as a moderately effective risk-reduction strategy; but has demonstrated a high degree of efficacy for protecting freshwater ecosystems; especially when accompanied by compliance verification and enforcement action resources (Bailey et al. 2011).

Oregon Ballast Water Program Development History

The 2001 Oregon Legislature established the Oregon Ballast Water Program (Oregon Revised Statute 783.620-992) in response to the threats posed by the shipping transport of aquatic non-indigenous species and has subsequently amended the program several times since 2003. Oregon DEQ implements the state ballast water program under Oregon Administrative Rule 340-143 and modifications to the program have been guided by the Task Force on Shipping Transport of Aquatic Invasive Species (TF), a legislatively mandated stakeholder advisory group charged with studying and making recommendations for preventing the shipping-related introduction of aquatic invasive species.

The risk of shipping-mediated AIS introduction to Oregon is influenced by port-specific vessel traffic patterns, operational conditions that affect de-ballasting patterns, and environmental conditions of source and receiving locations. Oregon ports – in contrast to many other regions – are predominantly situated in low-salinity and are therefore most at risk from ballast water that was originally sourced from distant ports with similar low-salinity conditions. Numerous aquatic non-indigenous species have become

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established in Oregon waterways (Sytsma et al. 2004, Cordell et al., 2008, Cordell et al. 2009, Bollens et al. 2012, Breckenridge et al. 2014), many of which are zooplankton species easily transported in ballast water and the ecological implications of their introduction are poorly understood (Winder and Jassby 2011, Breckenridge et al. 2014).

In contrast to Federal policies that intend to reduce the risk of AIS introductions broadly across all ports in the U.S., state regulations aim to supplement federal regulations, when necessary, with policies that take these local risk factors under consideration. Generally, state regulations have been established to fulfill local needs and to address management gaps present at Federal level. Initially, Oregon (and neighboring west coast states) established mandatory oceanic ballast exchange requirements for transoceanic voyages in response to the inadequate voluntary guidelines that were put forth by Federal and international programs. In recognizing the potential for secondary invasions between states via coastwise trade, the state programs also established coastal ocean exchange requirements that are still not recognized by the USCG.

West coast states, including Oregon, have also demonstrated a level of staffing and technical expertise for vessel arrival screening, inspections, compliance verification sampling, and enforcement follow-up that far exceeds any comparable efforts put forth by federal agencies for ports along the west coast. Regional coordination and stakeholder involvement has been critical in establishing and maintaining coastwise regulatory compatibility when regulations beyond the Federal baseline have been deemed necessary.

Most recent changes to the Oregon ballast management program include: i) a vessel arrival fee beginning in 2012 to help support expanded vessel inspection and compliance verification efforts, and ii) establishing Environmental Quality Commission authority to adopt ballast discharge standards sufficient to protect state waters from AIS threats. Although DEQ established a section in administrative rules for state-specific discharge standards in 2011, the agency opted to refrain pending final determination of federal discharge standard stringency.

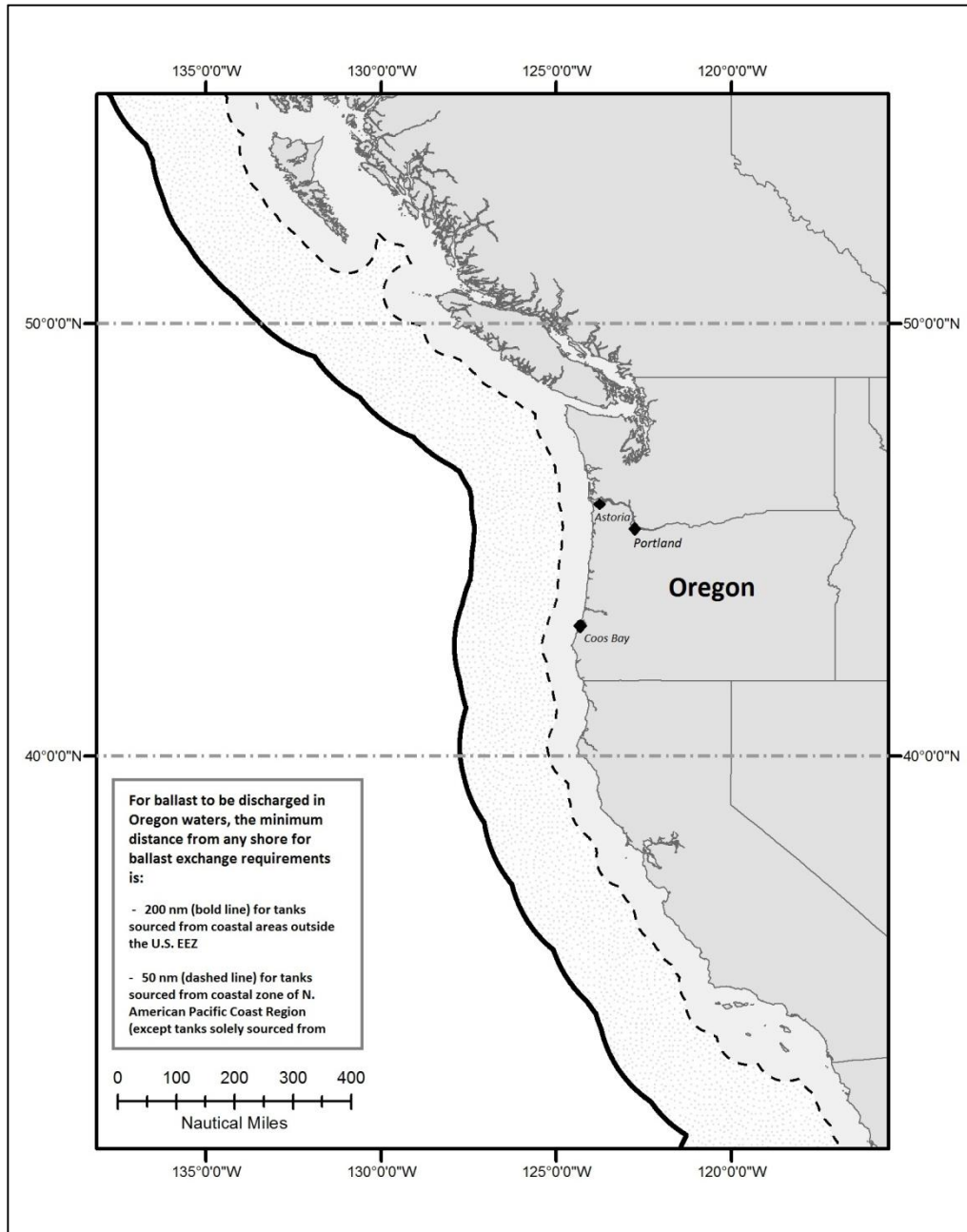


Figure 1. Map of Pacific Coast Region identifying mid-ocean ballast exchange (MOE – solid line 200 nm offshore), coastal ocean exchange (COE – 50 nm offshore), and ‘common-water zone’ demarcations.

Regulatory Landscape – Federal and other jurisdictions

Although BWE has been credited as a valuable risk reduction strategy ó especially for freshwater ports when adequate compliance verification measures are in place - it has long been regarded as a stop-gap measure that needs to be replaced with a more reliable, practicable, and broadly effective management strategy. The need for more robust management strategies, in general and particularly for the protection of marine ports, has driven the development of numeric discharge standards that would limit the number of

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living organisms per unit volume that may be released in ballast water. As a result of these efforts and recent regulatory developments at various levels of jurisdiction, a management paradigm shift in the making for the past two decades is now imminent within the next 2-5 years.

At the Federal level, the USCG and EPA both implement comparable regulations aimed at reducing the release of NIS from commercial vessel ballast discharges. The USCG regulates ballast water management under the National Invasive Species Act of 1996, while a 2008 court order has required EPA to manage all incidental vessel discharges (including ballast water) under the Clean Water Act. Although these two legislative authorities are independent of one another, the two agencies worked cooperatively to issue new regulatory requirements in 2012/13. The USCG 2012 Final Rule for Ballast Management ([CFR Title 33 Part 151 Subpart D](#)) and the EPA issuance of the 2013 Vessel General Permit ([EPA 2013](#)) have both established quantitative standards that limit the number of viable organisms allowed per unit volume of ballast discharge (Appendix E). Although two different discharge standards were originally under consideration (one standard approximately three order of magnitude more stringent than the other), both agencies have adopted the less stringent standard. There are multiple management practices available for meeting the standard, but for most large commercial vessels that need to be able to discharge ballast while in U.S. waters, the standards will require the installation and use of a shipboard ballast water treatment system (BWT). The implementation timeline for the new standards were originally set for 2013 - 2016 based on vessel size and build date, but may undergo some further extensions based upon delays for USCG certified type approval of BWT systems. With the exception of an additional EPA requirement for some high-risk vessels entering the Great Lakes (see Emerging Issues Section for further discussion) the new federal standards will initiate replacing oceanic ballast water exchange with shipboard ballast water treatment.

For the past decade, state specific regulations along the west coast have generally been more stringent than Federal requirements and interstate coordination with stakeholder involvement has ensured coastwise regulatory consistency. However, in response to policy development delays at the federal level and the slow progress of ballast water treatment system development, California established numerical discharge standards that it deemed sufficiently protective and appropriate for California waters (Falkner et al. 2006, CSLC 2013). In order to achieve the desired level of environmental protection and to achieve coastwise consistency Oregon and Washington State encouraged Federal authorities to adopt discharge standards comparable to those legislated in California, however, the decision to implement the less stringent discharge standards will result in ports along the west coast with differing levels of AIS prevention. In response to the Federal standards, Oregon DEQ and Washington DFW are actively considering policy options to

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ensure adequate environmental protection and promote coastwise compatibility.

The International Maritime Organization (IMO) adopted the *Convention for the Control and Management of Ships' Ballast Water and Sediments* in 2004, which first established the numerical discharge standards that were recently adopted into U.S. Federal policy. For signatory countries, the convention will go into effect 12 months after it has been ratified by 30 countries representing 35% of the world's shipping tonnage. As of May 2014, 37 countries - representing about 31% of the world shipping tonnage - have ratified the convention. Estimates suggest that the Convention will acquire sufficient signatories by January 2015 to result in implementation beginning January 2016. Although the U.S. has not yet become signatory to the Convention and doing so would have no affect on the implementation of USCG rules or the EPA Vessel General Permit and Canada ratified the Convention in 2010 and recently identified certain requirements more stringent than the Convention. Specifically, Transport Canada has proposed that vessels discharging to low-salinity ports continue to be required to conduct ballast water exchange (and saltwater flushing of empty tanks) even after transitioning to the Convention's discharge standard and implementation of ballast water treatment systems. This combination strategy uses immediately available existing technology and management practices; would achieve a greater reduction in the discharge of high-risk coastal species (due to osmotic shock of low-salinity organisms); would provide an integrated backup in case of undetected or unexpected BWT failure; and is consistent with the strategy adopted by EPA for vessels operating in the Great Lakes.

Oregon Vessel Activity and Ballast Management Trends

DEQ collects data from pre-arrival ballast water management reporting forms aimed at screening vessel arrivals and monitoring for regulatory compliance. These data also allow for analysis of shipping trends and ballast operation behavior patterns and ultimately, to enhance our risk-assessment capabilities aimed at preventing high-risk shipping activities that could result in transporting AIS into Oregon waterways.

Qualifying Voyages: Trends and Characteristics

In 2013, Oregon received 1563 qualifying voyages (QV ϕ) subject to state ballast water regulations. Sixty-two percent were transoceanic arrivals, while 38% were coastwise voyages from a last port of call within the Pacific Coast Region (CA, WA, AK, HI, or British Columbia). This number of QV ϕ was comparable to arrival numbers observed in the previous four years (Figure 2).

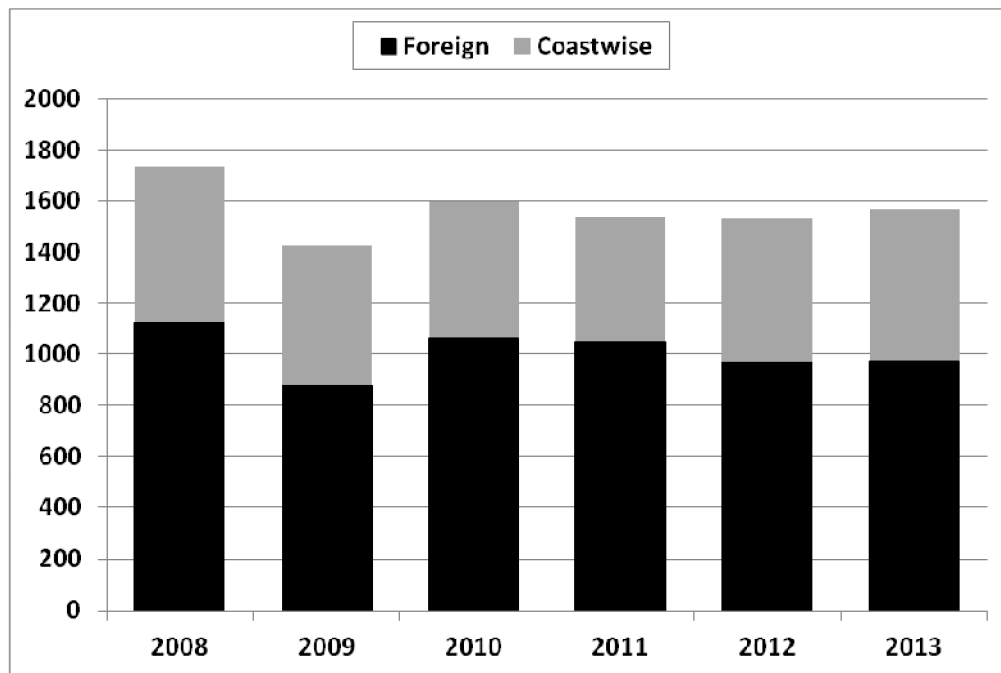


Figure 2. Annual arrivals of qualifying voyages (QV) to Oregon waters (2008-2013) based upon last port of call – voyages from foreign or coastwise ports within the Pacific Coast Region.

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A majority of vessels transiting into Oregon waters (66%) call upon port facilities on the Oregon shores of the Columbia River (Figure 3). Approximately 3% of arrivals to state waters call upon Coos Bay, while the remainder (31%) are vessels that transit through state waters of the Columbia River but only call upon facilities on the Columbia River shores of Washington State (e.g. Ports of Kalama, Longview and Vancouver). Seasonally, shipping activity on the Columbia River tends to be slightly greater during the autumn months, corresponding with a peak in the export of agricultural commodities.

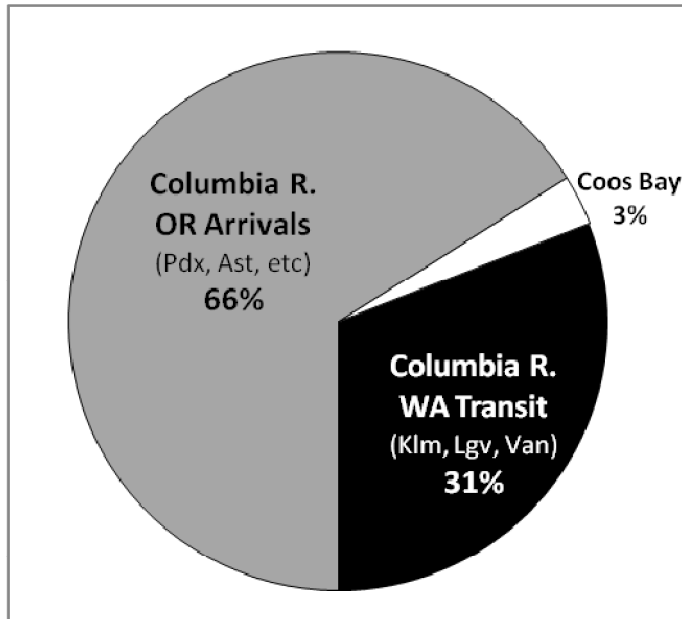


Figure 3: Qualifying voyages (QV's) to Oregon waters by destination port – 2012/13.

Retention of ballast water, or any operational practice that eliminates the need to discharge ballast into state waters, represents the most environmental protective management strategy available. For QV's operating in Oregon waters in 2013, 39% conducted operations without discharging any ballast water, according to information provided to the state on mandatory ballast water reporting forms (Figure 4). Ballast retention is not feasible for many vessel arrivals, however, due to cargo loading constraints and/or vessel design limitations. According to the reporting data, most vessels (48% of QV's) discharged ballast after conducting proper ballast management practices (i.e. mid-ocean exchange); 9% discharged ballast that did not fully meet ballast management requirements (e.g. oceanic exchange at insufficient distance from shore); and 4% met common waters zone or safety exemption and discharged ballast that had not undergone any risk-reduction management practices (Figure 4).

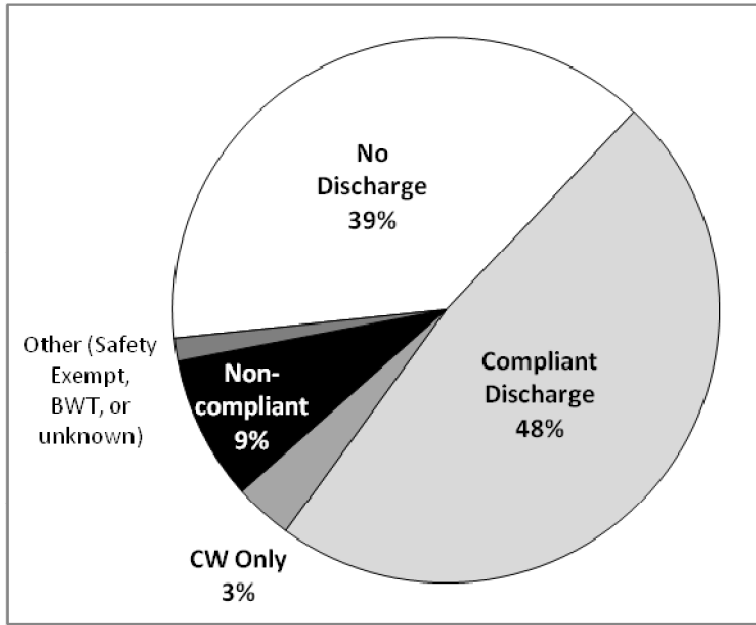


Figure 4. Ballast Water Discharge status for qualifying voyages to Oregon waters in 2013.

Ballast Discharge: Trends and Characteristics

Approximately 11.7 million m³ (or 3,104,021,615 gallons) of ballast water was reportedly discharged in Oregon waters during 2013. The volume discharged per QV has increased each year since DEQ began tracking ballast reporting data (from 4,744m³/vessel in 2008 to 7,510m³/vessel in 2013), but it may be a result of reporting accuracy, not necessarily more ballast discharge per arrival (Figure 5a). A vast majority of the ballast 686% - was originally sourced from coastal waters of East Asia (China, Japan and South Korea). The remaining ballast was originally sourced from: other foreign ports (7%), within the common waters zone of 40-50N along the west coast (4%), ports within the Pacific Coast Region (2%), or the open ocean (1%) (Figure 5b).

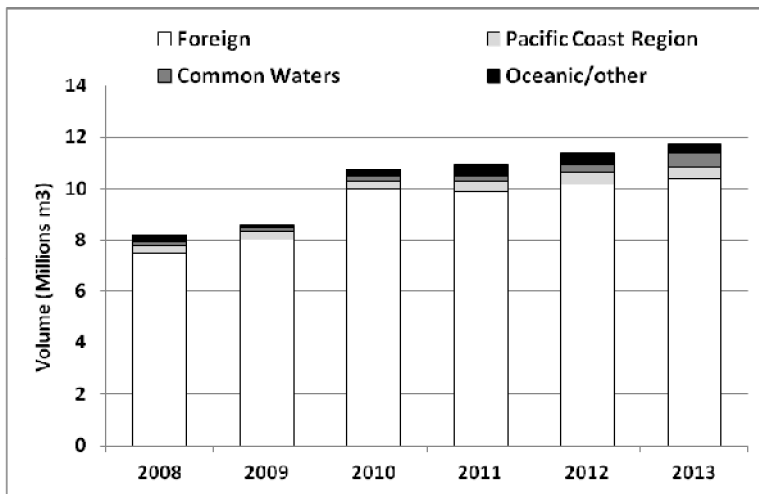


Figure 5a. Annual ballast water discharge reported in Oregon by original source region (2008 – 2013).

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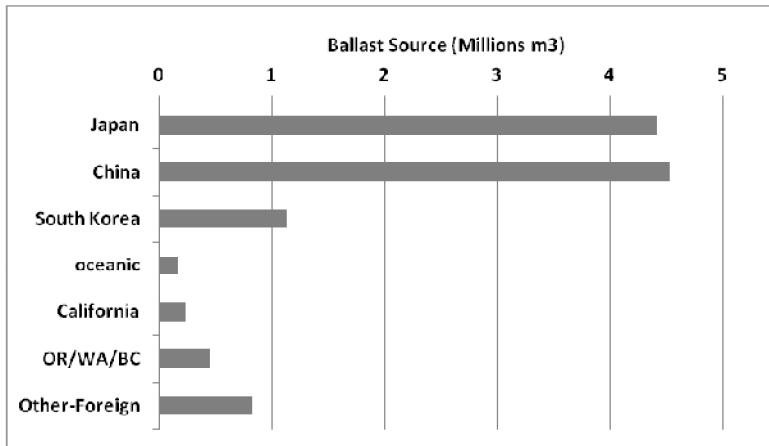


Figure 5b. Original source (pre-management) of ballast discharged to Oregon waters in 2013.

Vessel arrivals to Oregon waters during 2013 were largely comprised of bulk carriers (59%); with RO/RO (vehicle carriers), container ships, tankers, and others making up 12%, 9%, 4%, and 16%, respectively (Figure 6). Compared to vessel arrival proportion, bulk carrier vessels are responsible for an even larger proportion of the ballast volume discharged into state waters. Eighty-eight percent of ballast volume discharged into state waters is attributed to bulk carriers that primarily service export commodity terminals. General cargo vessels and ITBø/ATBø (Tug and barge units) are responsible for 4% and 3%, respectively, while RO/RO, container, tanker and passenger vessels, combined, are responsible for less than 4% of ballast volume discharged (Figure 6).

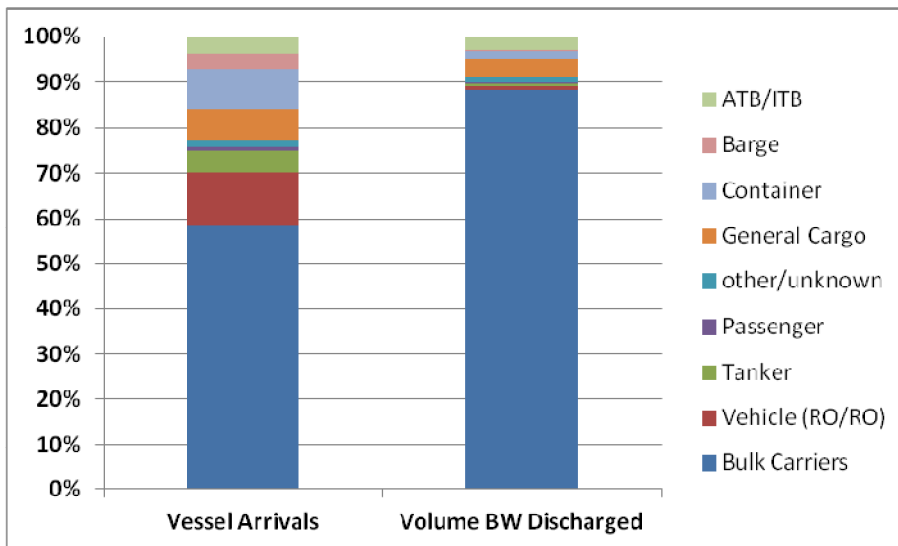


Figure 6. Proportion of vessel arrivals and proportion of ballast volume discharged, by vessel type, in 2013.

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A vast majority of the ballast discharged into state waters either undergoes oceanic ballast exchange management practices or is discharged under common water zone or other exemption criteria (ORS 783.635). Reporting data submitted to DEQ indicates that 85% (of 11.7 million m³) of discharged ballast underwent mid-ocean ballast exchange at least 200 nautical miles from any shore. Roughly 2/3rds of which had been managed using the flow-thru method and 1/3rd via the empty/refill method. Neither method achieves 100% efficacy for removal of high-risk (i.e., near shore) organisms, yet empty-refill is widely encouraged as a more environmentally protective strategy when available as an option to vessel operators. Just 1.5% of the ballast discharged underwent coastal ocean exchange (greater than 50 nautical miles from shore) en route to Oregon from another port within the Pacific Coast Region. Water sourced from within the 40-50N common waters zone and ballast sourced from open ocean locations comprised 4.5% and 2% of the discharged ballast, respectively, and did not require additional management practices. Less than 0.2% had been managed with a shipboard treatment system, sourced from a municipal water supply, or discharged under a safety exemption without employing alternative management strategies (Figure 7).

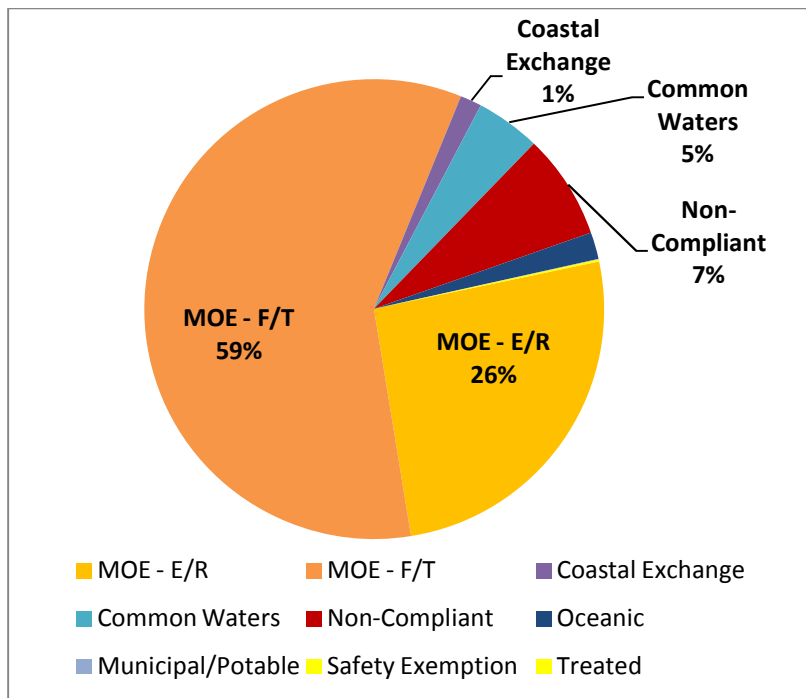


Figure 7. Management status of ballast discharged into Oregon waters during 2013 (MOE = mid-ocean exchange; F/T= flow-thru method; E/R= empty/refill method).

The remaining 7% (866,174 m³) of ballast volume discharged to state waters in 2013 was identified as non-compliant with state ballast management regulations (Figure 7). In all cases on non-compliant discharge during 2013, the ballast had undergone some degree of oceanic exchange, albeit at an insufficient distance from shore and/or at exchange volumes less than

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required. In comparison to prior years, the detected volume of non-compliant ballast discharged into state waters significantly increased (e.g. 4% in 2012), but this is directly related to a corresponding increasing in DEQ personnel resources directed at report screening and vessel inspections.

Reporting data indicates that bulk carrier vessels are responsible for a majority of the non-compliant discharge to Oregon watersó at a rate even greater than their contribution to total discharge volume (Figure 8a and b). Furthermore, it appears that vessels transiting from a last port of call in China or South Korea are more prone to compliance issues than vessels transiting from other regions. For example, ballast originally sourced in China and Japan contributes roughly equally to the total volume discharged into Oregon waters (about 37% each), yet for the subset of non-compliant ballast, about 50% had been originally sourced from China and only about 20% from Japan (Figure 8a and b). These data provide potentially important insights to help guide DEQ's resource-limited technical assistance, outreach and compliance monitoring efforts.

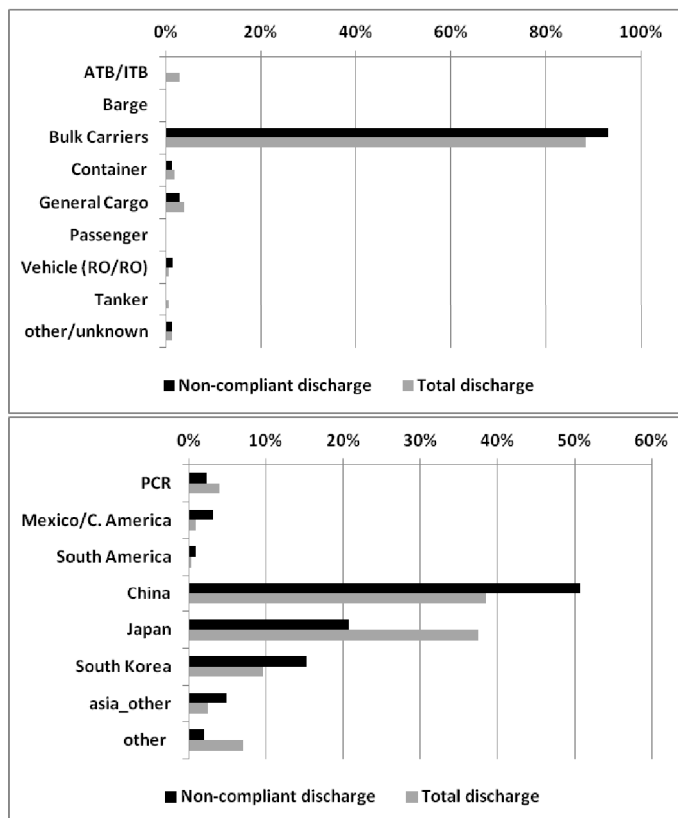


Figure 8. (A) Vessel type and (B) source characteristics attributed to non-compliant (gray bars) and total (black bars) ballast water discharge to Oregon – 2010-2013. Average annual total discharge and non-compliant discharge during 2010-2013 was 11.2 million m³ and 348,000 m³, respectively.

DEQ Ballast Program Activities

Since November 2007, the Legislature has dedicated resources for ballast water management program development and implementation at DEQ. Prior to 2007, pre-arrival reporting forms had been collected by various groups (including PSU-ABRPI, Washington Department of Fish and Wildlife, and Portland Merchants Exchange) and various data analysis and outreach activities had been conducted (Vinograd and Sytsma 2002, Noble 2007, Simkanin and Sytsma 2006). Resource allocation was originally established with General Fund (GF) support at a 1.0 FTE funding level. In 2012, an additional 0.5 FTE (plus supplemental operational funds) was dedicated following the implementation of a vessel arrival fee and a 50/50 cost share agreement (GF/fees) recommended by the 2010 Task Force (SB 81 ó 2011).

The programs limited resources are focused on outreach, technical assistance to mariners, screening of vessel arrivals and pre-arrival reporting forms, and targeted vessel inspections for compliance verification. In addition, DEQ staff are engaged in policy developments that seek enhanced environmental protection, compatibility with regional and federal partners, and greater program efficiency.

Report Monitoring

Regulated vessels are required to submit a ballast water reporting form (BWRF) to state and federal port state authorities at least 24 hours prior to transiting into Oregon waters. This declaration reporting form provides important information that port-state authorities use as a screening tool for compliance with ballast management regulations and for risk-based prioritization of limited vessel inspection resources. In addition, the data provides the opportunity to assess patterns and trends in local ballast water management activities.

Reporting compliance has been largely dependent upon the resources devoted to local follow-up efforts with vessel operators and local shipping agents (STAIS 2010, Figure 9). The rate of missing reports (or reports with incomplete data) is much higher in the absence of dedicated resources. Over the past five years ó and especially since the increase of an additional 0.5 staff FTE ó the DEQ ballast program has been able to obtain reports for >98% of all arrivals (Figure 9).

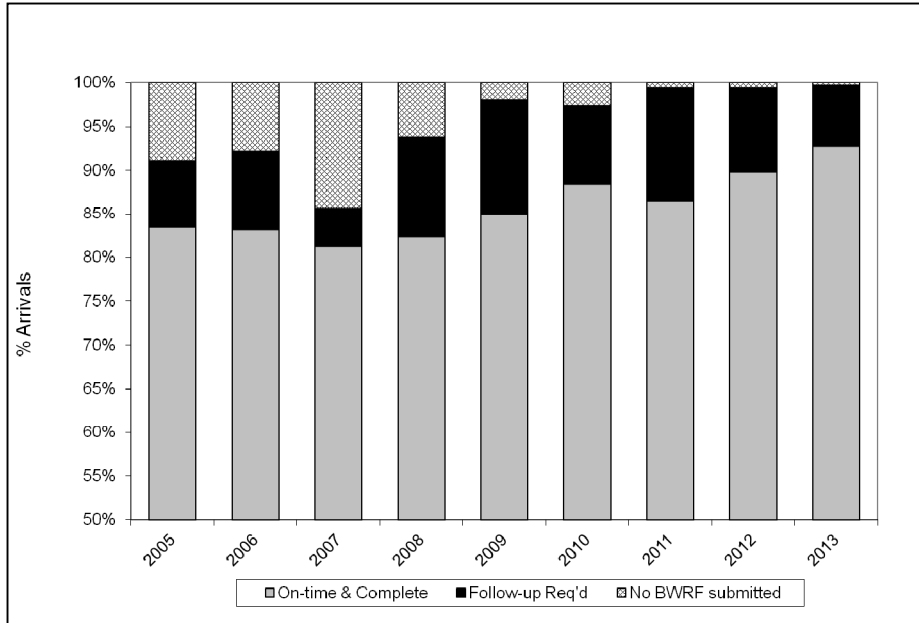


Figure 9. Annual pre-arrival ballast water reporting compliance for QV's to Oregon (2007-2013).

Vessel Inspections

Vessel inspections are the front line of outreach and technical assistance efforts for achieving understanding and compliance with our state ballast management regulations. DEQ staff prioritize vessel boarding using a variety of risk-based criteria to help target vessels at risk of non-compliance, including: prior non-compliance history, years since last visit to Oregon waters, proposed discharge behavior, or voyage characteristics (e.g. recent ballasting from low-salinity ports).

Inspection protocols focus on an audit of bookkeeping records to ensure that various shipboard logbooks (i.e., ballast logbook, deck logbook) reveal consistent reporting and cataloging of ballast management activities. Sampling of ballast tanks may be conducted when record book audits reveal inconsistencies, at random, or for non-enforcement research purposes. Salinity is most often used the basic measure of oceanic exchange efficacy and compliance, where salinity values are expected to be greater than 30 ppt if a complete mid-ocean exchange was performed adequately.

Vessel inspection activities by DEQ staff have increased substantially since the additional 0.5 FTE effort was acquired in September 2012. The monthly inspection rate has risen from approximately 4% to 16% for vessels that call upon port facilities in Oregon (Figure 10).

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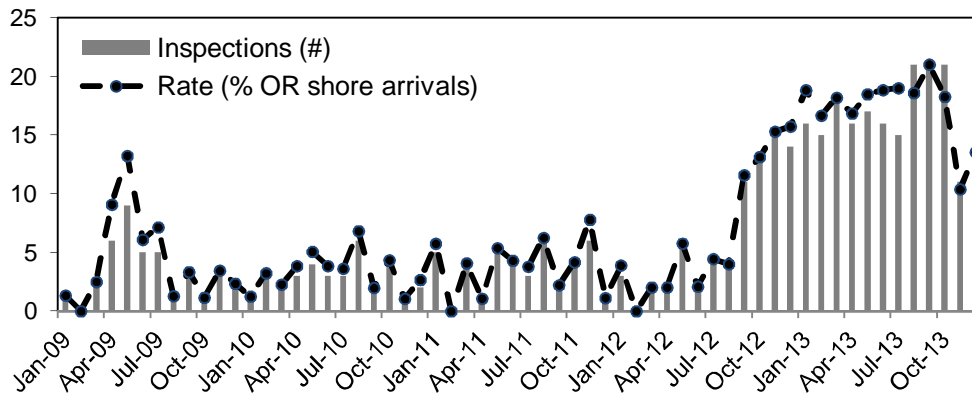


Figure 10. Total number (gray bars) and monthly rate (black dots) of vessel inspections by the Oregon Ballast Water Program (2008-2013).

The recent increase in vessel inspection effort has allowed for closer scrutiny of the types of compliance problems encountered. For the vessels targeted for inspection, only 12% were deemed fully compliant with state regulations, 14% had issues identified as cautionary (e.g. questionable best management practices; organization or clarity of ballast management plan; non-compliance with EPA VGP salt-water flushing of empty tank(s) requirement) and 74% were identified with some type of non-compliance in need of corrective action (Figure 11). In most cases (55% overall), the shipboard handling logs failed to capture sufficient detail of ballasting operations (e.g. start and stop times and locations for all ballasting operations) or operator had failed to update the logbook with most recent in-port ballast operations. Many of the vessels identified with non-compliant ballast water (19% overall) had tank(s) that had undergone oceanic exchange but at an insufficient distance from shore. Particularly during the winter months, we have found that many vessels transiting in a northerly arc from east Asia to the Pacific Northwest tend to voyage in close proximity to east Asian and Aleutian Islands. In cases where vessels are avoiding stormy seas and must conduct BWE less than 200 nm from land, vessel operators should declare a safety exemption from the 200nm requirement when filing their ballast water reporting form. Enforcement response to non-compliance cases takes into account various factors, including; potential threat to environment or human health, corrective actions taken, and vessel operator history of non-compliance.

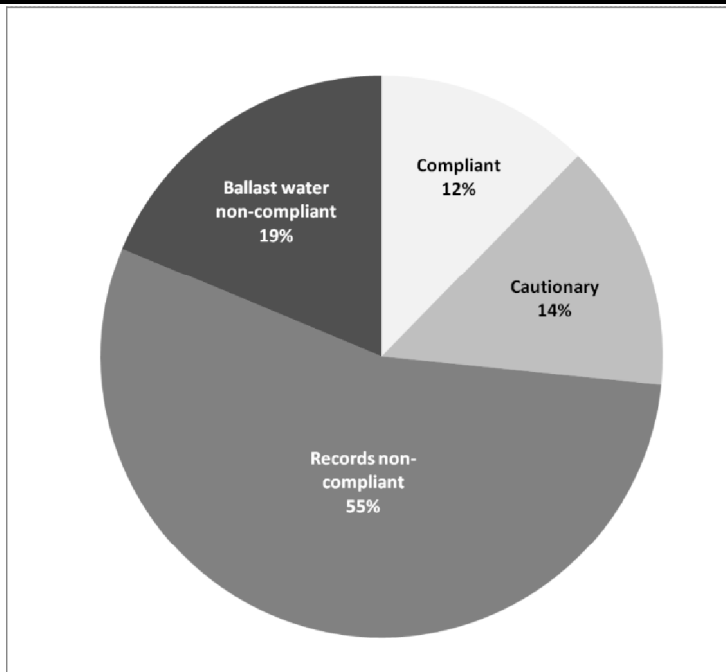


Figure 11. Final determination of compliance for vessels inspected by the Oregon Ballast Water Program in 2013 (n=203).

Enforcement

DEQ may issue civil penalties in response to non-compliance under authority established in ORS 783.620-992. During the first few years of implementing a ballast water program, DEQ was primarily focused on outreach and education efforts as a means to encourage regulatory understanding and compliance. In 2012 DEQ completed two actions that laid the groundwork for a shift towards a consistent and transparent enforcement policy. First, an expedited enforcement offer (EEO) program was developed which allows the department to issue penalties at a reduced rate for first time violations that do not represent a significant threat to the environment. Acceptance of the offer can provide a more efficient means of resolving penalties for both the responsible party and the state. If the responsible party opts to decline the EEO, the case will be referred for formal enforcement action. Second, DEQ revised the ballast program enforcement guidance to more reasonably identify the scope and severity of violations. Following the completion of these tasks, the ballast water program began implementing a more formal approach towards enforcement action beginning January 2013 (Figure 12).

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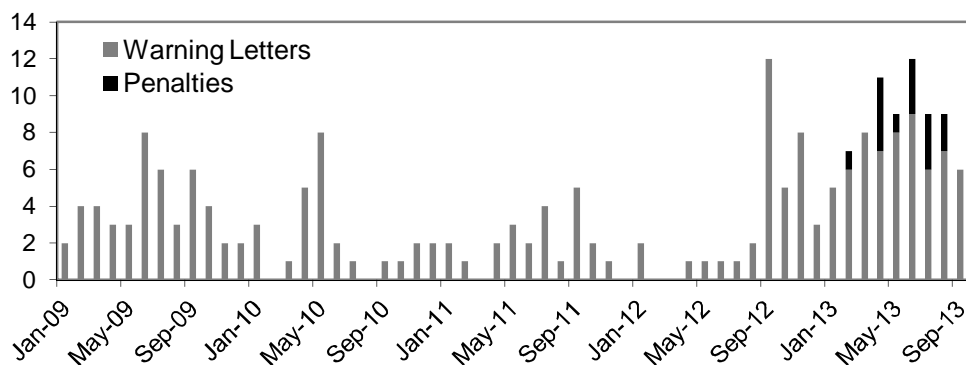


Figure 12. Number and type of enforcement actions issued by DEQ ballast water program, 2009-2013.

The implementation of enforcement guidance resulted in the issuance of 23 EEOs and one formal enforcement action during 2013, in addition to 76 warning letters. The total amount of penalties collected for all enforcement citations was \$23,500 (Table 1). All penalty based revenue is deposited to the state General Fund, and is not available for use by DEQ programs.

Table 1. Oregon Ballast Water Program enforcement actions issued during 2013.

<u>Enforcement Action</u>	<u># issued (2013)</u>	<u>Penalty Amount (total)</u>
Warning Letters	76	N/A
Expedited Enforcement Offers (Field Ticket)	23	\$19,750
Formal Enforcement Action	1	\$3,500

Enforcement Policy Development

In December 2013, DEQ's Office of Compliance and Enforcement (OCE) completed a rulemaking effort for OAR 340 Division 12 (Penalties) that revised violation categories and the base penalty matrix used for assessing penalties related to state ballast management regulations. Base penalties had never been established in administrative rule for the ballast program, and as such, assessment of penalties had been constrained to a default base value that is intended for homeowners and small business scale operators/violations. The base penalties effective in 2014 represent a substantial increase from the default penalty matrix (e.g. moderate magnitude Class I violations increased from \$1,250 to \$6,000) but are now considered to be commensurate with the scale of operations inherent to those regulated under ballast water law.

In light of the Division 12 revisions, and experience gained from implementing enforcement actions during 2013, DEQ staff will be further amending enforcement guidance policies in 2014. The revisions aim to increase clarity and transparency for issuance of warning letters, EEOs, or

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formal enforcement action in a manner that is both appropriate to the scale of the violation(s) and feasible given current resources for DEQ's ballast program. Specific revisions that have been proposed include formal guidance criteria for the use of salinity as compliance verification indicator of ballast water exchange operations. It is widely accepted that proper execution of oceanic ballast exchange operations should result in ballast tank water salinity greater than 32 ppt (Ruiz and Reid 2007) and that ballast tank salinity <15 ppt could represent a substantial AIS risk to low-salinity ports such as the lower Columbia River. The new guidance will adopt compliance verification criteria comparable to the methods established by U.S. Coast Guard; with a range of intermediate salinity values (i.e. lower risk) that will be eligible for EEO's. With appropriate justification (and approval from the agency OCE), Ballast Program staff may deviate from enforcement guidance policies.

Program Resources

State ballast water regulations were originally established in 2002 without dedicated resources for program implementation. In 2007, the legislature allocated General Fund resources to support a 1.0 FTE service level for program activities at DEQ. In 2011 a TF developed recommendation led to passage of SB 81 which established a vessel arrival fee (\$70/arrival) that contributes 50% of the revenue needed to support a 1.5 FTE program service level. In recognition that the program provides general benefits to the state, as well as services to the maritime industry, the remaining 50% of program support is provided by General Fund allocation (GF).

Budget Performance

The SB 81 (2011) vessel arrival fee was initiated in January 2012 with projected revenue collection of \$157,500 (125 QVø per month) during the 2011-13 biennium. The actual number of arrivals for the biennium was slightly higher (128 QVø per month), resulting in revenue collection of \$161,210 (Figure 13). Approximately 7.5% of the fee revenue goes toward invoicing and collection activities that are contracted out by DEQ to the Portland Merchants Exchange.

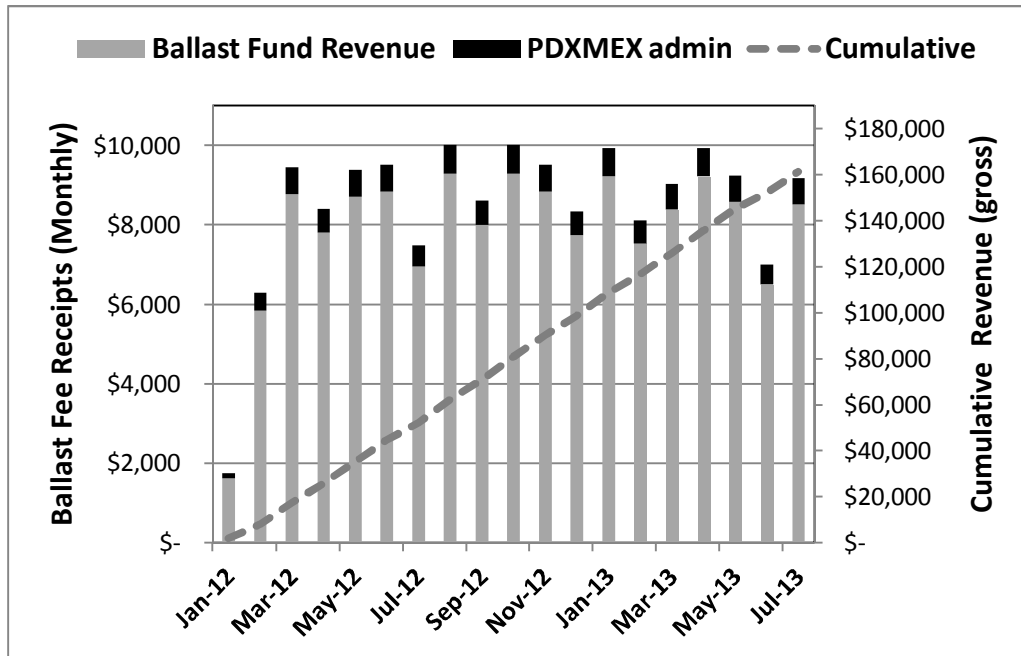


Figure 13. Monthly fee collection (bars; left axis) and cumulative receipts (dashed line; right axis) for Ballast Water Management Fee (2011-13 biennium) beginning January 2012.

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Looking Forward

The current fee amount is no longer sufficient to support 50% of a 1.5 FTE service level ballast program at DEQ. A balanced budget for the 2013-15 biennium has been made possible by a larger than anticipated carry-over ending balance from 2011-13 - funds that were not expended in large part due to an extended statewide hiring freeze in 2011/12 (required DEQ to postpone hiring the 1/2 time ballast water inspector position by 8 months). Without that carry-over, it is estimated that a fee of \$75 per arrival would be necessary to sustain operations in the current biennium. Therefore, *projected revenue at the current fee amount is insufficient to sustain current ballast program activities beyond 2015* (Table 2).

Table 2. Program budget performance and ending balances (2009-13); projected budget, funding and ending balances assuming no legislative change to fees (*italics*); and funding/budget status according to various fee scenarios (*bold italics*). All values assume current program service levels of 1.5 FTE plus supplemental operating funds). Values in (parentheses) represent negative biennial ending balances.

Biennium	<i>Operating Budget</i>	<i>GF Allocation</i>	<i>Fee Scenarios (per arrival)</i>	<i>Fee Scenarios (revenue)</i>	<i>Fee Scenarios (ending balance)</i>
2009-11	\$193,297	\$193,297	\$0	\$0	\$2,837
2011-13	\$328,700	\$181,266	\$70	\$161,210	\$67,701
2013-15	\$448,375	\$195,570	\$70	<i>\$210,000</i>	<i>\$24,000</i>
2015-17	<i>\$490,769</i>	<i>\$231,000</i>	<i>\$70</i>	<i>\$210,000</i>	<i>(\$25,769)</i>
			<i>\$85</i>	<i>\$244,000</i>	<i>\$7,981</i>
			<i>\$88</i>	<i>\$250,500</i>	<i>\$14,731</i>
			<i>\$93</i>	<i>\$262,000</i>	<i>\$25,981</i>
2017-19	<i>\$528,277</i>	<i>\$254,100</i>	<i>\$70</i>	<i>\$210,000</i>	<i>(\$89,946)</i>
			<i>\$85</i>	<i>\$255,000</i>	<i>(\$11,196)</i>
			<i>\$88</i>	<i>\$264,000</i>	<i>\$4,554</i>
			<i>\$93</i>	<i>\$279,000</i>	<i>\$30,804</i>
2019-21	<i>\$569,223</i>	<i>\$279,510</i>	<i>\$70</i>	<i>\$210,000</i>	<i>(\$169,569)</i>
			<i>\$85</i>	<i>\$255,000</i>	<i>(\$45,909)</i>
			<i>\$88</i>	<i>\$264,000</i>	<i>(\$21,159)</i>
			<i>\$93</i>	<i>\$279,000</i>	<i>\$20,091</i>

[Note: Operating budget estimates assume current program service level (1.5 FTE + operating funds), and per biennium inflation rates of 2.7% for services/supplies and 13% personnel services. General Fund (GF) allocations assume 10% increases per biennium following a restoration to pre-recession reductions in 2015. Fee revenue projections assume 1500 QV arrivals per year with hypothetical statutory amendment of fees (\$85, 88, or 93 per arrival) effective January 2016].

In the spirit of the 2010 TF recommendation that led to SB 81, the state's ballast water program should be supported by two balanced sources of funding - fees and GF. However, statewide budget reductions in 2013/15 resulted in approximately 15k less GF contribution to the program than originally anticipated. Yet, the 50/50 cost share balance between GF and fee revenue remains intact when considered over the 2011-2015 period.

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To maintain the 50/50 cost share arrangement and sustain program activities at the current service levels beyond 2015, both General Fund allocation and the vessel arrival fee will need to be increased. Table 2 presents multiple funding scenarios for the 2015-2021 period that were evaluated by the 2014 TF. The TF considered various fee increases, including one option that would only sustain the program for the 2015-17 biennium (\$85/arrival). However the TF discussed and recognizes the value establishing a fee amount that will not require statutory amendments every 1-2 years. Thus, the TF also considered fee increases that would sustain the program thru the 2017-19 biennium (\$88/arrival) and 2019-2021 biennium (\$93/arrival) ó assuming commensurate increases in GF allocation.

To increase the vessel inspection rate and enhance other program services, a 2.0 FTE resource level would require a fee increase to approximately \$105/arrival. This fee revenue - combined with a matching allocation of approximately \$300,000 per biennium General Funds ó would be sufficient to support expanded compliance verification efforts (e.g. 25% vessel inspection rate) through the 2017-19 biennium.

Emerging Issues

Paradigm shift in ballast water management strategies

The most significant forthcoming change in ballast water management is the implementation of numerical standards for ballast discharge. As promulgated by EPA, USCG, some individual states, and anticipated by the ratification of the 2004 Ballast Management Convention at the International Maritime Organization (IMO), the standards establish a limit on the number of living organisms allowed per unit volume of ballast discharge based on size-class and type of different organisms. These regulations aim to phase out reliance on oceanic ballast exchange as the predominant prevention strategy in favor of alternative ballast management strategies typically involving new shipboard ballast treatment system technologies.

Policy development surrounding ballast discharge standards has generally revolved around two contrasting levels of efficacy. First, the 2004 IMO Ballast Water Convention established a numerical discharge standard that limits the number of viable organisms permitted in discharged ballast water. The IMO D-2 standard was developed based on multiple categories of organism size class or type; the standard for each category is a specific number of allowable living organisms per unit volume of discharge (Appendix D).

A second standard 6 more stringent by multiple orders of magnitude and advocated by various countries (including the U.S.) - was considered during the development of the D-2 standard but did not receive sufficient support to be adopted as the international standard. In response to the lower standard adopted at IMO and slow progress in the development of ballast water treatment technologies and the adoption of a U.S. Federal standard, California adopted a version of this more stringent standard in 2006 with implementation beginning in 2009 (multiple implementation timelines delayed until 2016-18). During U.S. Federal rulemaking development (2008-2012), the U.S. Coast Guard had proposed a two-step approach towards implementing the more stringent standard, referring to the two standards as Phase I (i.e. IMO D-2) and Phase II. However, in coordination with EPA, the USCG did not find sufficient evidence for current technological capability to meet the Phase II standard and therefore adopted the Phase I standard for its final rule implementation beginning in 2014 (Appendix D).

Concerns regarding the efficacy of the IMO D-2/ U.S. Federal standard prompted not only the development of state-specific standards that are more stringent than the international and federal baseline (e.g. California), but also the development of hybrid regulatory strategies requiring a continuation of oceanic ballast exchange practices (prior to ballast treatment) for vessels

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discharging into freshwater or low-salinity environments (Briski et al. 2013). Oceanic ballast water exchange can be highly effective for preventing discharge of high-risk AIS to freshwater environments (Gray et al. 2007), but concerns over efficacy for marine ports is the predominant driver for the switch (away from BWE) towards a treatment based strategy (Figure 14).

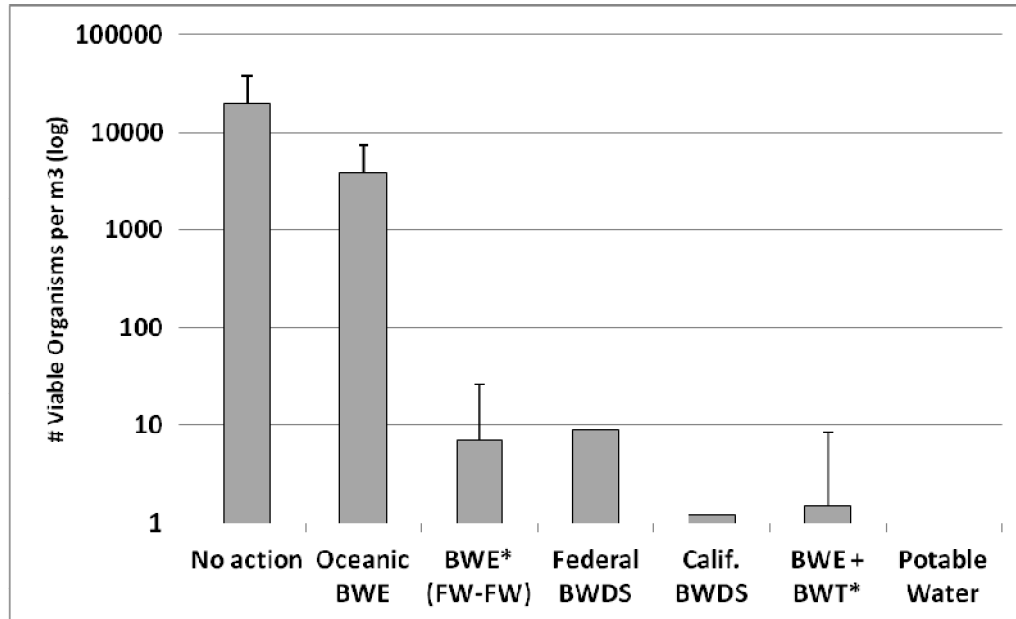


Figure 14. Comparison of various ballast water management strategies. Approximated values are based on total number of viable organisms (> 50 μ m) per m³ (+/- s.e.) at point of discharge; except BWE* (FW-FW), where values represent number of freshwater or euryhaline organisms that are likely to survive BWE and be capable of surviving upon discharge in a freshwater environment. Data based upon Ruiz and Reid 2007, Briski et al. 2013 and J. Cordell (unpublished).

The EPA 2013 Vessel General Permit (VGP) established a ballast water exchange plus treatment (BWE+BWT) strategy as a means to protect the Great Lakes freshwater ecosystems from further AIS damages. Specifically, this strategy would require oceanic exchange followed by treatment to meet the federal discharge standard for a subset of high-risk vessels that had previously sourced their ballast from low-salinity environments. Having sourced their water from low-salinity environments, these vessels represent the greatest threat for transferring potential invasive species to Oregon's port environments which are also low-salinity environments (lower Willamette and Columbia Rivers).

The rationale for not applying this protective measure for all of the nation's freshwater ports is largely based upon the degree to which the Great Lakes have already been affected by AIS (VGP Fact Sheet). In addition to the EPA regulation for the Great Lakes, multiple states (Maine, New York, and Rhode Island) completed their 401 certification of the VGP with conditions requiring all vessels discharging to their state waters to continue ballast water exchange in addition to ballast water treatment meeting the Federal discharge

standard. Oregon strongly considered a BWE+BWT condition for its 401 certification but ultimately ó for reasons unrelated to ballast water management policies ó DEQ opted to waive its right to a 401 certification of the 2013 VGP. Development of the next VGP and state 401 certifications is anticipated beginning in 2016 for final implementation in 2018.

Canada has become a signatory to the IMO ballast management convention and regulatory officials (Transport Canada) have declared intent to implement the IMO D-2 discharge standards with BWE+BWT requirements for all vessels entering low-salinity ports (including Fraser River, British Columbia). Transport Canada has also partnered with the Canadian Department of Fisheries and Oceans to support further research exploring the efficacy and risk-reduction benefit of BWE+BWT for freshwater ports (Briski et al. 2013; Gollasch, unpublished). Transport Canada intends to officially publish its proposed regulations by the end of 2014 in order to be ready for full implementation at the time that the IMO Convention goes into force.

Under current Oregon law, vessels may discharge if they meet one of multiple management or exemption criteria, including oceanic ballast water exchange or by treatment of ballast using a system approved by the USCG. This statutory language was established in 2001, at a time that the USCG was advocating at IMO for a discharge standard that is more stringent than the standard USCG eventually adopted into its 2012 Final Rule. In light of perceived efficacy difference in standards adopted by different jurisdictions (i.e. IMO versus CA), the 2009 Oregon Legislature provided DEQ/EQC with the authority to develop state-specific ballast water discharge standards (ORS 783.635(4)) that will provide adequate protection for Oregon waterways. DEQ established a placeholder for ballast discharge standards in administrative rule in 2010 (OAR 340-143-0050 (1)), but opted to wait for the determination of a federal discharge standard before deciding if a state-specific standard would be necessary.

As an alternative to state-specific discharge standards, the DEQ ballast water program has proposed alternative strategies that would i) allow for the use of ballast treatment systems in Oregon waters that have been certified to the federal/international standard and ii) would strategically target additional management requirements only for the high-risk vessels that represent the greatest risk for transporting AIS. *These strategies are based on evidence suggesting that IMO/U.S. federal discharge standards could represent little (if any) net gain in protection for freshwater port ecosystems like those common to Oregon.* Although the absolute number of organisms released under the new standards will be lower, there is reason to be concerned that the number of high-risk organisms discharged (species that could survive and thrive in Oregon port environments) could increase under the new regulations. In other words, *the current management strategy of BWE may result in the discharge of many living organisms, but it effectively kills the high-risk potential*

invaders to Oregon's low-salinity port environments via osmotic shock; whereas freshwater to freshwater ballast transfer scenarios under forthcoming federal standards could produce discharge events where any of the remaining/surviving organisms discharged could be high-risk potential invaders to Oregon ports (Gray et al. 2007). Moreover, the alternative strategies proposed by DEQ are intended to mimic the hybrid strategies that have already been established by EPA and others for low-salinity waterways in other regions of North America.

Interstate and cross-jurisdictional coordination

Ballast management regulations of west coast states have been closely aligned since the states began implementing programs circa 2000. With the pending implementation of California's performance discharge standards, however, ballast discharged to California state waters will have to meet a more stringent (protective) standard than Oregon or Washington. Oregon regulations allow for the discharge of ballast that has been treated with systems meeting USCG approval (less protective than CA standard), but the regulations also authorize DEQ/EQC to adopt state specific discharge standards that are sufficiently protective of state waters and that are consistent with regulations in our neighboring states (ORS 783.635(4)). In light of this situation, Oregon must determine whether an amendment to its regulatory requirements is necessary to achieve a sufficient level of environmental protection. Options include: adopt the more stringent standard established by California, consider alternative strategies that address concerns specific to Oregon local conditions and that are feasible and practicable, or conclude that no action is necessary.

Oregon and Washington continue to implement a coordinated approach to ballast management on the Columbia River by implementing regulations that are essentially identical. Although all vessels transiting into the Columbia are subject to Oregon laws (regardless of which side of the river they operate on), the states generally defer to one another for inspection and enforcement actions based upon which side of the river the vessel is operating. For vessels that conduct operations on both sides of the river, the two state programs strive to communicate vessel inspection efforts in order to share information and to minimize the likelihood of duplicative boarding/inspection events. Policy coordination between Oregon and Washington will continue to be important as both states consider revisions to their regulations in response to new policy implementation in California and at the Federal level.

Emergency Treatment Options for discharge of high-risk ballast water

As an alternative to discharging high-risk ballast water under safety exemptions or other emergency situations there has been a growing need developing in recent years for ballast management contingency options. Under the current ballast water exchange paradigm (and continued under ballast treatment requirements), safety exemptions allow a vessel to forego conducting required ballast management practices. However, the state reserves the right to require alternative management actions if the discharge is

regarded as a high-risk for the introduction of non-indigenous species (OAR 34-143-0040). Unfortunately, the only alternative management options available to vessels calling on Oregon ports are to wait until conditions are suitable (or until equipment has been fixed) to return to sea to conduct a proper ballast exchange or to transfer ballast to a shore-based water treatment facility (e.g. Vigor at Portland Shipyard) which is prohibitively expensive for most vessels that require discharging a high volume of ballast (approximately \$21/m³). Moreover, ballast water exchange is not feasible for all vessel types (e.g. unmanned barges), and there may be situations when a vessel has unknowingly sourced ballast from a high risk (or contaminated) water body but must discharge while in port.

Contingency options may be increasingly important as vessels begin implementing new ballast treatment technologies that have had limited testing and exposure for shipboard reliability, durability, and longevity. The implementation of these systems is likely to produce scenarios involving equipment failure ó either recognized by vessel operators in transit (in which case they may be able to mitigate the equipment failure by conducting oceanic ballast exchange) or not realized until a vessel has already crossed the bar and transited up river to a port facility.

In any of the above scenarios (or for vessels that choose not to install ballast treatment systems because they rarely need to discharge ballast) it would be highly beneficial if vessels calling on Oregon waters had access to one or more alternative management systems. These systems may be fixed shore-based locations, mobile barge services, or easily deployable units for shipboard application. Active research is underway to develop alternative management options that could be a great benefit to the local maritime industry and for the environmental protection of state waters.

Biofouling Management

Regulatory developments aimed at hull-husbandry and other vessel biofouling management issues are moving forward in California, Hawaii, and other international jurisdictions. The efforts focus on various biofouling concerns related to commercial vessels, including: i) ensuring that vessels are operating within the established manufacturer specifications for use of anti-fouling coatings and re-application timelines; ii) establishing criteria for cleaning of vessels that have been under extended lay-ups in a single location; and iii) establishing management criteria for niche areas of vessels that can harbor a rich diversity of biofouling organisms.

While Oregon freshwater ports are largely buffered from AIS threats associated with oceangoing vessels, the lower portions of the Columbia River and Coos Bay estuaries are vulnerable to any vessels that have poor biofouling management practices (Paul 2011). Furthermore, new regulations in neighboring states may impact fleet operations, voyage patterns and/or the location of in-water vessel cleaning activities - any of which may result in an

unintended increase in biofouling pressure to Oregon if our state regulations are significantly different from our neighboring states.

Lastly, renewed interest for shipbreaking facility proposals in Oregon could increase the risk for de-commissioned or derelict vessels (potentially heavily fouled vectors of non-indigenous species) to be transported into state waters. Although the development of local shipbreaking/recycling facilities would clearly be beneficial for the cleanup and removal of derelict vessels from Oregon waterways, the state may need to strengthen regulations in order to ensure that high-risk vessels from outside the region are not transported into state waters without first being thoroughly cleaned and inspected.

Enforcement

Fewer than ever regulatory differences currently exist between Oregon's ballast management regulations and those established at the Federal level. Yet, the most important difference continues to be the significantly greater level of technical assistance, outreach, compliance verification, and enforcement action efforts that are demonstrated by the state level ballast program. Similar to observations of the past decade, it remains clear that west coast USCG port-state control inspections are focus on a wide variety of issues but that ballast water management and invasive species prevention remains a low-priority. The implementation of the EPA Vessel General Permit (VGP) has not resulted in an increased level of prevention or enforcement activities and the current status of cooperative agreements between EPA and USCG does not suggest any significant changes are to be expected in the next few years.

During 2013, DEQ's enhanced ballast water inspection efforts detected that a subset of vessels declaring no ballast on board (or "NOBOB") are conducting intra-port ballasting and subsequent de-ballasting operations that may represent a high-risk for the introduction of AIS. Moreover, these high-risk activities are not in compliance with federal regulations yet no federal technical outreach or enforcement has occurred. Empty ballast tanks actually contain a significant amount of residual ballast and sediment that can harbor AIS. Because these residual contents can pose a risk if re-suspended and discharged (particularly if the residual water were low-salinity and the receiving environment low-salinity) the EPA VGP requires salt-water flushing of empty tanks such that the residual achieves a salinity value of at least 30 ppt. Oregon ballast water laws have never adopted a comparable management requirement, but doing so would enable DEQ authority to provide outreach, compliance verification, and enforcement, where necessary.

DEQ ballast management violations and base penalty determinations under administrative rule (OAR 340 Division 12) underwent significant amendments, effective January 2014. In response, the DEQ ballast water program will be revising its enforcement guidance policies during 2014 in order to provide greater clarity for issuance of warning letters, expedited

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enforcement offers (EEOs) and formal enforcement actions. The revisions will take into account the five-fold increase in base penalty fines that will be assessed under the new rules, and will seek to establish protocols that can be implemented consistently. With revised guidance and increased vessel operator awareness, we expect to see a reduced number of penalties issued in 2014 compared to 2013. However, because of the amended base penalty values, the total dollar amount of penalties collected is likely to be higher in 2014 than was observed in 2013.

Conclusions

Task Force members unanimously agree that preventing AIS from being introduced to Oregon waterways is necessary for the protection of our economic interests and ecological resources. The TF met four times between August 2013 and April 2014 to share concerns, debate various proposals, and develop the contents and resulting recommendations of this report.

The TF successfully developed five consensus recommendations to the 2015 Legislature ó three of which encourage specific statutory amendments for the 2015 session. The recommendations are intended to address funding support for invasive species prevention activities and to amend ballast management regulations in a manner that enhances protection of Oregon waters. The rationale and details for each recommendation are outlined in the final section of this report, but generally involve:

1. An increase to the vessel arrival ballast management fee that will sustain current DEQ ballast program service levels through the 2017/19 biennium (pending comparable increases in General Fund allocations);
2. A temporary change in the distribution of penalty funds collected on behalf of ballast management violations such that the funds are deposited to the statewide Invasive Species Control Account administered by the Oregon Invasive Species Council rather than the General Fund;
3. Adoption of a Federal requirement for management of residual water and sediment in empty ballast tanks that would enable state inspector compliance verification and enforcement authority;
4. Assistance in promoting the need for periodic non-indigenous species survey efforts in coastal zone and freshwater habitats frequented by commercial shipping activities; and,
5. Increased awareness and ongoing monitoring of i) biofouling management policy developments in neighboring jurisdictions and ii) proposed shipbreaking activities on Oregon shores that may require biofouling prevention measures for the State of Oregon.

Despite achieving consensus for five recommendations, one additional legislative proposal is supported by a majority of task force members but not supported by three TF members representing maritime industry interests. The proposal was designed to address concerns that replacing ballast water exchange with ballast water treatment (as will occur under current state law in light of Federal regulatory changes) may result in decreased protection from AIS threats for Oregon's low-salinity port environments. Specifically, the proposal would maintain an oceanic ballast water exchange requirement for a subset of high-risk vessels discharging into Oregon waterways that are using ballast water treatment systems certified to meet the Federal discharge

standard. DEQ estimates that about 10% of vessel arrivals to Oregon waters could be affected by this requirement. The proposal is comparable to the approach promulgated by EPA for vessels discharging ballast into the Great Lakes, includes additional exemptions specific to operations on the west coast, and would be contingent upon passage of similar measures in other west coast jurisdictions. While most TF members are concerned that the pending replacement of BWE with BWT could represent a decrease in environmental protection from AIS threats (especially during the first few years of implementing the new technologies), some TF members believe that there is insufficient evidence to impose a state regulatory change at this time and that the state should postpone consideration of this matter until a later date. A full description of the problem, the rationale for taking action, and a minority opinion from those in opposition is included in the final section of this report.

In addition to the recommendations to the 2015 Legislature, TF members also developed three consensus recommendations for ballast water program policy development actions for consideration by DEQ and/or the Environmental Quality Commission. A full description of these recommendations is available in the final section of this report.

Recommendations

The 2013-14 Oregon Task Force on Shipping Transport of Aquatic Invasive Species has identified nine recommendations; six are directed to the 2015 Legislature and three are policy recommendations directed at the Department of Environmental Quality and/or Environmental Quality Commission. The task force achieved its goal of developing a consensus solution for all but one of the problems identified below. *In the one case where the group did not reach consensus, the minority opinion is expressed in italics.*

Recommendations to the 2015 Legislature:

1. Sustain current DEQ ballast water program service levels beyond 2015 by adequately increasing vessel arrival fee amount and General Fund allocation.

Problem: The current ballast management fee is set in statute (ORS 783.636) at \$70 per vessel arrival and will not sustain current DEQ ballast program services through the 2015-17 biennium.

Fee revisions via statutory amendment are costly to agency and state-wide resources. As such, the task force recognizes that relying on frequent legislative action to adjust statute based fees needed to maintain program operations is neither efficient nor advised.

In addition to an increase in ballast management fee revenue, there must also be a commensurate increase in General Fund allocations to DEQ's ballast program in order to maintain the 50/50 cost share agreement that was the basis for this task force's 2010 recommendation to establish the fee under SB 81 (2011).

Solution: Amend ORS 783.636 to increase ballast management fee to \$88 per arrival effective January 2016.

This 25 percent fee increase will sustain current ballast water program service levels through the 2017-19 biennium - and is supported by the task force's industry representatives - *with the expectation that there will be a commensurate increase in General Fund allocation to the ballast program of approximately \$50,000 per biennium (total allocation of \$250,000).* Any less funding would not be sufficient to support the program at the stakeholder recommended service levels and would compromise the 50/50 cost share agreement.

The task force discussed proposals to allow fee adjustments via rule under EQC authority, but did not reach a consensus for this component of a proposed legislative change at this time.

2. Prevent high-risk discharges from vessels arriving to Oregon waters classified as ‘No Ballast On Board’ (a.k.a. ‘NOBOB’s’).

Problem: Most vessels cannot completely empty their ballast tanks due to structural and operational limitations of the tank and/or pump configuration. As a result, vessels transiting in an ~~empty~~ ballast tank condition (officially classified as No Ballast On Board or ~~NOBOB~~) carry an average of 60 tons of residual (unpumpable) ballast water and sediments that can harbor a diverse community of invertebrate and microbial organisms (MacIsaac et al. 2002, Bailey et al. 2003). Early ballast water management regulations were developed under the assumption that these types of voyages did not represent a risk and therefore were exempt from management requirements (i.e. mid-ocean exchange). However, research later identified that a significant number of NOBOB vessels entering the Great Lakes were filling these tanks at one port and shortly thereafter discharging the tanks at another port within the Great Lakes system. In cases where the residual ballast harbors a community of non-native freshwater organisms, results clearly indicate that the ballasting, re-suspension and mixing of sediments and residual ballast - and subsequent discharge into a freshwater ecosystem - represents a high risk for introducing new aquatic invasive species (Duggan et al. 2005, Briski et al. 2010).

In 2006, the U.S. Coast Guard began requiring NOBOB vessels to conduct a saltwater flush of empty tanks prior to entering the Great Lakes, and the EPA has subsequently applied this provision under the 2013 Vessel General Permit for all NOBOB vessels entering U.S. waters. In contrast to mid-ocean exchange, saltwater flushing requires that the vessel operator rinse enough seawater into the tank so that the residual ballast (after pumping ~~empty~~) has a salinity of at least 30 parts per thousand (ppt). Recent analyses confirm that this management practice is particularly effective at protecting freshwater ecosystems from the introduction of invasive species (Briski et al. 2010, Bailey et al. 2011).

Oregon ballast management regulations developed under the assumption that few, if any, ~~NOBOB~~ vessels calling on Oregon ports conduct this type of high-risk ballasting and de-

ballasting sequence within state waters. During 2013, however, increased vessel inspection efforts provided greater scrutiny of vessels that had previously been prioritized as moderate and low-risk (i.e. no discharge or common water discharge vessels). These efforts revealed an alarming number of cases (>25/year) where vessels are entering the Columbia River as NOBOB vessels, taking on ballast at one port/facility, and then conducting an inter-port move to a different facility where they subsequently declare discharge of local/common water (exempt from management practices). In virtually all of these cases, DEQ identified that the vessel operator had not conducted a saltwater flush of the residual ballast as required by the EPA Vessel General Permit (VGP). EPA has very limited resources for VGP technical assistance outreach, compliance verification or enforcement. Establishing NOBOB management regulations under Oregon law would allow state ballast water inspectors to be able to require and enforce these important prevention measures.

Solution: Amend ORS 783.630-635 to adopt saltwater flushing requirements of empty ballast tanks in a manner consistent with existing federal regulations under the EPA's Vessel General Permit. Adopting provisions similar to those already established for all U.S. waters under VGP Section 2.2.3.6.3 would allow local state inspectors the ability to provide technical assistance and enforce these important aquatic invasive species prevention measures. Specific conditions should be defined and adopted into Oregon law:

- In order to discharge ballast from any tank(s) that were empty or contained unpumpable residual ballast water upon entering state waters and were subsequently ballasted while in state waters, vessel operators must first conduct a mid-ocean (or coastal ocean for coastwise voyages) saltwater flushing of the tank(s) so that the resulting residual water remaining in the tank(s) has a salinity greater than or equal to 30 ppt.
- Saltwater flushing means the addition of oceanic seawater to empty ballast water tanks; the mixing of the flush water with residual water and sediment through the motion of the vessel; and the discharge of the mixed water, so that the resulting residual water remaining in the tank has either a salinity greater than or equal to 30 parts per thousand or a salinity concentration equal to the ambient salinity of the location where the uptake of the added water took place. In order to conduct saltwater

flushing, the vessel should take on as much coastal exchange zone water into each tank as is safe (for the vessel and crew).

- Tanks that have undergone a mid-ocean exchange prior to de-ballasting at another port and were then empty for arrival in Oregon waters would not be subject to additional salt-water flushing requirements provided that the residual ballast met the >30 ppt salinity criteria and the shipboard ballast water handling logs are documented with sufficient detail of ballast operational history.
- In the event that a vessel already entered into state waters is found to be ineligible for discharge because of a failure to properly conduct a NOBOB saltwater flushing of empty tank(s) and must return to sea in order to meet saltwater flushing requirements - DEQ should explore its legal options to authorize (via statutory amendment, administrative rule, or internal management directive) saltwater flushing operations at a distance from shore less than required by federal regulations (200 nautical miles), but sufficient to prevent the introduction of aquatic invasive species.

3. Distribute penalties collected on behalf of ballast water program toward statewide invasive species rapid response capabilities.

Problem: The 2009 Legislature established the Oregon Invasive Species Control Account (ORS 570.800) for the Oregon Invasive Species Council to be able to readily access funds for rapid response eradication and control activities in the event of a new invasive species threat. Rather than funding the account at the recommended amount of a \$5 million dollar bond, however, the legislature established the fund with a one-time allocation of \$350,000, far below the amount that invasive species management responders would need in the event of a significant invasive species response emergency.

Currently, penalties collected for violations of Oregon ballast water management regulations are deposited into the General Fund and are not dedicated to activities related to invasive species management or environmental protection. The amount of penalties potentially collected by DEQ ballast water program alone (roughly \$30,000 to 50,000/year based on prior violations and new base penalty amounts) will not be sufficient to adequately fund the Invasive Species Control Account. However, dedicating these and other related violations toward this emergency account would be a direct way to link environmental penalties with environmental protection, but

would not incentivize the issuance of penalties for the purpose of supporting any specific state agency program.

Solution: Amend ORS 783.992 so that penalties collected on behalf of ballast water management violations (OAR 340-12-0083) are deposited into the Invasive Species Control Account, not the General Fund. Distribution of funds from the Control Account is administered by the Oregon Invasive Species Council, a multi-agency and stakeholder coalition that includes representation from state natural resource agencies, industry and non-governmental members.

The task force further recommends that this amendment be established with a five-year sunset date so as to provide an opportunity to re-evaluate the objectives and verify that the change has not incentivized the issuance of penalties by DEQ's ballast water program.

4. Support efforts to survey and monitor presence and distribution of non-indigenous species in Oregon's coastal (nearshore, estuarine and riverine) habitats.

Problem: The 2002 Oregon Legislature established state specific ballast water regulations in order to reduce the rate at which non-indigenous species are introduced into state waters via commercial vessel activities. During the same year, researchers conducted a survey of non-indigenous species present in the lower Columbia River which provided an important baseline that policymakers could use to evaluate the efficacy of the state's ballast management regulatory efforts (Sytsma et al. 2004). Unfortunately, the survey did not include funding for future follow-up monitoring, and there has been no funding dedicated to these efforts since. As a result, the state lacks a follow-up survey to identify how many new species have been introduced (if any) and whether its ballast water management strategies have been adequate.

Solution: Wherever possible - via legislative action, the governor's office, and/or natural resource agency activities - state officials should seek opportunities to adequately fund and/or endorse a non-indigenous species survey of Oregon's coastal waters, particularly in the lower Columbia River Estuary. Funding of approximately \$275,000 would be sufficient to complete a follow-up survey and analysis comparable to the survey conducted in 2002. It is recommended that a follow-up survey be conducted every five years.

5. Maintain and/or strengthen policies aimed at preventing biofouling risks from derelict vessels transported to state waters for shipbreaking activities

Problem: Although the vast majority of commercial ships routinely maintain vessel hull surfaces for hydrodynamic and fuel efficiency purposes, there is a subset of vessels that represent a high risk for transporting biofouling species into Oregon waters. Vessel operators that have not sufficiently maintained hull surfaces or niche areas; or have not undergone a cleaning following an extended lay-up period; or obsolete/derelict vessels transported into state waters for shipbreaking all represent a significant risk for transferring aquatic invasive species into the state.

The 2006 Oregon Interagency Coordinating Committee on Environmental Regulations related to Shipbreaking was convened in response to concerns over proposed shipbreaking activities in Oregon. The group's recommendations led to the restriction of shipbreaking activities to dry dock facilities and stipulated that shipbreaking activities may not allow the release of biofouling organisms to state waters (ORS 783.400). The regulations did not, however, address weak enforcement capabilities to prevent heavily fouled vessels from being transported into state waters (e.g., Wildlife Integrity Rules (OAR 635 Division 56).

In response to incidents involving derelict vessels within state waters, industry stakeholders and state officials have explored options to encourage shipbreaking business opportunities that would facilitate the removal of these vessels from state waters in an environmentally beneficial manner. It is unlikely, however, that the proposed shipbreaking facilities would solely source vessels from within state borders. Rather, they would likely also accept vessels transported from out-of-state locations. If derelict or obsolete vessels from outside Oregon waters are not first cleaned before being transported to Oregon, they represent a high risk for transporting aquatic invasive species.

Solution: If the state seeks to encourage the removal of derelict vessels from state waters (or private industry pursues shipbreaking business enterprises on Oregon shores), prevention provisions and enforcement capabilities to prohibit the import of heavily fouled vessels from out of state need to be strengthened under ORS 783.400 and/or OAR 635 Division

56. Biofouling best management practices and policies being developed in neighboring jurisdictions may serve as a template for Oregon actions.

- 6. In response to recently established federal ballast water discharge standards and the implementation of shipboard treatment systems, the state should continue to require ballast water exchange practices for a subset of commercial vessels that have sourced their ballast from low-salinity environments representing a high risk to Oregon waterways** (*Note: The task force did not reach consensus on this recommendation. Task force members sharing a differing opinion were those representing commercial shipping interests, which include the Columbia River Steamship Operators Association, Port of Portland, Sause Bros. Ocean Towing, and Western States Petroleum Association. Their opinions are expressed in italics below*).

Problem: Mid-ocean ballast water exchange (BWE) can be highly effective at killing and/or removing high-risk species prior to discharge into low-salinity environments such as the lower Columbia River. Since 2002 Oregon regulations have allowed vessels to use ballast water treatment systems (BWT) certified by the U.S. Coast Guard as an alternative to BWE, though the certification process was not available until recently. In 2012 the U.S. Coast Guard and EPA established ballast water discharge standards and technology certification processes that have effectively initiated the replacement of BWE with BWT. Instead of establishing a more protective discharge standard that has been legislated in states such as California, however, both federal agencies adopted a weaker standard set by the International Maritime Organization (IMO).

Approximately 10 percent of vessels arriving to Oregon originally source their ballast from low-salinity environments and subsequently discharge into freshwater or low-salinity conditions within the state. These low-salinity ports from outside our region represent a high-risk environmental match for the transfer and introduction of aquatic invasive species to Oregon waterways most heavily frequented by commercial vessels. High-risk organisms are those originating from environments similar to the location of discharge.

The shift towards ballast water discharge standards will generally represent a significant gain in aquatic invasive species prevention efforts by dramatically reducing the number of living organisms allowed per unit volume of discharge (by roughly three orders of magnitude). However, because oceanic

BWE effectively prevents the transfer of high risk species into freshwater ports (by killing them with saltwater exposure) there is concern that U.S. Coast Guard certified BWT could represent little (if any) net gain in aquatic invasive species prevention for freshwater port ecosystems like those common to Oregon (Gray et al. 2007, Briski et al. 2013, Gollasch et al. in prep, Transport Canada 2012). In other words, the state of Oregon is concerned that *the implementation of the new federal discharge standards could result in the release of more high-risk organisms to Oregon port environments than occurs currently with properly conducted BWE* (see further discussion in emerging issues section). Also of significant concern to freshwater ports like those in Oregon is evidence that many of the new BWT technologies may be less effective when used in low salinity and/or high turbidity environments (Bailey et al. in prep). In light of these concerns, DEQ has attempted to identify a small subset of vessel arrivals to Oregon waters that could represent increased risk for invasive species and could be targeted for additional ó yet practicable ó prevention control requirements.

Specifically for the protection of freshwater ports, a two-pronged approach of ballast exchange plus ballast treatment (BWE+BWT) has been studied as a management strategy alternative that would provide a significant benefit for the prevention of aquatic invasive species (Bailey et al. 2011, Briski et al. 2013, Gollasch et al. in prep). For jurisdictions primarily concerned with the protection of low-salinity ports (e.g. Columbia River, Fraser River in British Columbia, the Great Lakes) this combined strategy represents a more practicable approach toward achieving enhanced protections than the option of developing state-specific discharge standards that are more stringent than those adopted by federal authorities.

The EPA Vessel General Permit determined that BWE+BWT is a viable and necessary strategy to protect freshwater port environments from the discharge of ballast treated to IMO standards. However, EPA stopped short of applying this provision for all freshwater ports in the U.S., and limited the application to the Great Lakes. Canadian authorities have declared intentions to adopt IMO ballast discharge standards, but with BWE+BWT requirements for all Canadian waterbodies ó not just the Great Lakes (Transport Canada 2012).

Proposed Solution: Amend ORS 783.630-635 to ensure that high-risk vessels conducting ballast transfer between low-salinity ports continue to perform oceanic ballast exchange, even if the vessel is using a U.S. Coast Guard approved ballast water treatment system (per OAR 143-0050). This ballast exchange plus treatment (BWE+BWT) strategy has demonstrated highly effective results for protecting freshwater ports and is proposed as an interim solution until BWT best-available technology reaches an efficacy level satisfactory to Oregon state interests.

The proposed amendment should require BWE+BWT only for vessels with ballast tanks discharging to state waters that were fully or partially sourced from a coastal, estuarine or freshwater ecosystem resulting in ballast water salinity <18 parts per thousand; except where the vessel BWT meets the highest U.S. Pacific state standard or is at least 100 times more effective than 33 CFR Part 401.30, whichever is greater. In addition, there shall be exemptions from the BWE+BWT requirements for common water and vessel/crew safety (according to OAR 340-143-0010), as well as exemptions for vessels using BWT with limitations that make it infeasible to conduct BWE+BWT given voyage duration or other relevant factors. For example, vessels with active ingredient-based treatment systems should not be subject to delays in order to fulfill BWE +BWT if short duration voyage time would inhibit use of system to prescribed operational specifications.

DEQ estimates that approximately 17 percent of ballast volume discharged to state waters or about 10 percent of all vessel arrivals (~160 per year) could be subject to the regulatory provisions outlined in this recommendation. The number of vessels affected will likely be less when accounting for the exemption criteria outlined above.

This regulatory provision will be comparable to freshwater ecosystem protections that the EPA has deemed necessary for the Great Lakes region and established under the EPA 2013 Vessel General Permit. Implementation of this policy for Oregon waters should begin no later than January 2017, contingent on passage of similar policies for vessels operating in Washington state or British Columbia waters. West coast coordination of this strategy is critical to the extent that is practical - so that other jurisdictions managing ballast

discharge in freshwater ports also adopt a comparable BWE+BWT policy.

Minority Opinion: *Task force members representing commercial shipping interests support measures to protect Oregon waters from the introduction of non-indigenous aquatic species. These members, which include the Columbia River Steamship Operators Association, Port of Portland, Sause Bros. Ocean Towing, and Western States Petroleum Association, have expressed concerns about proposing conditional legislation in the 2015 legislative session given that technology and science will likely evolve over the next few years. These task force members believe that an approach that will introduce regulatory changes at the time they are needed would have better support in the Legislature, ensuring consistency and efficacy needed to protect Oregon waters..*

Policy recommendations to the Oregon Department of Environmental Quality and/or the Oregon Environmental Quality Commission:

1. Establish ballast water exchange minimum salinity standard in program enforcement guidance.

Problem: Although Oregon regulations currently require oceanic ballast water exchange as the predominant ballast management practice, current policies do not specify a water quality standard for discharged ballast against which compliance verification sampling can be measured and enforced.

It is widely accepted that oceanic exchange practices meeting the 95 percent empty refill method (or 300 percent volume flow-thru method) will result in ballast water tank samples with salinity values greater than 30 parts per thousand (Ruiz and Reid, 2007). In fact, at locations over 50nm from shore in any of the world's oceans, it would be exceptionally rare to observe surface salinity values < 32 ppt. For this reason, testing of ballast water salinity is the primary compliance verification tool used by other authorities, including the U.S. Coast Guard.

Clarifying use of this compliance verification tool would add transparency to DEQ's inspection and enforcement protocols. This openness would also provide a clear opportunity for vessel operators to self-verify compliance prior to voyaging into Oregon waters.

Solution: Amend ballast water management violations enforcement guidance for OAR 340-012-0083 (and administrative rules OAR 340-143-0030, if necessary) to clarify the use of salinity as a compliance verification tool. Adopt a minimum salinity criteria of 30 parts per thousand mirroring USCG enforcement guidance under 33 CFR 151 subpart d - as the threshold below which DEQ would consider oceanic exchange practices to have been conducted in an insufficient and non-compliant manner. Specifically, DEQ should consider applying its Expedited Enforcement Offers for compliance verification sampling that reveals ballast water salinity of 18 to 30 ppt. Tanks being discharged with ballast water less than 18 ppt represent a highly significant deviation from proper oceanic ballast exchange practices (and a greater potential for environmental harm) and therefore should be considered for formal enforcement action.

2. Develop a more robust pre-arrival risk assessment system for prioritizing vessel inspection and compliance verification resources.

Problem: DEQ vessel inspection and compliance verification efforts are currently prioritized based on screening pre-arrival reporting forms for reporting errors, proposed discharge activity, vessel type, and general compliance with management requirements. Report screening, as well as prior inspection and enforcement history, are important AIS risk factors (Simkanin et al. 2009, STAIS 2010) that help DEQ focus its limited vessel inspection resources on vessel arrivals that are more likely to need technical assistance or represent a higher likelihood for non-compliance. This current approach does not, however, incorporate information regarding environmental conditions for the vessel's last port of call or recent source locations of ballast water. These are critical factors in determining invasion probability between source and receiving environments (Keller et al. 2011, Seebens et al. 2013). To develop a more robust risk-assessment model, environmental condition data from international ports (available from literature sources) would need to be gathered into a database and incorporated into a model for identifying relative risk of vessels within Oregon waters at any given time.

Solution: Seek out funding opportunities, internships, student projects, fellowship opportunities or other means of obtaining a limited duration increase in resources available to the ballast water program at DEQ. By freeing up DEQ staff time from routine operational tasks, or bringing in additional personnel

with adequate expertise, a risk-assessment model should be developed to provide DEQ operations with the means to evaluate vessel arrival risk more heavily based on ballast source environmental conditions data. This model would allow DEQ to better target its limited inspection and compliance verification resources on the highest-risk arrivals to state waters.

3. Evaluate in-water vessel cleaning policies for commercial vessels in state waters and monitor developments in neighboring jurisdictions to determine if further policy development is necessary in Oregon.

Problem: The threat of transporting biofouling species via commercial vessel traffic has prompted multiple jurisdictions to propose hull-husbandry and biofouling management regulations. These regulations aim to reduce the risk of transferring aquatic invasive species by promoting a “clean before you go” message and restricting entry to state waters by vessels that have failed to meet basic biofouling prevention standards (CSLC 2013). New regulations being developed in neighboring jurisdictions may impose a greater need for in-water cleaning events by those vessels that have not met the basic standards. Port states where in-water cleaning policies are less restrictive could be targeted by vessel operators as a location to conduct in-water cleaning before entering those jurisdictions that have established biofouling management standards.

Solution: Continue to monitor policy developments in other jurisdictions and gather information on frequency of current in-water cleaning activities of commercial vessels in Oregon waters. Report back to task force members as new information emerges. As necessary, engage DEQ water quality program personnel on policy development needs.

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Appendices

Appendix A

Oregon Ballast Management Laws (ORS 783.620-992)

783.620 Discharge of ballast in navigable waters. Except as provided in ORS 783.635, a person may not discharge the ballast of any vessel into the navigable portions or channels of any of the bays, harbors or rivers of this state, or within the jurisdiction of this state, so as to injuriously affect such portions or channels of such bays, harbors or rivers, or to obstruct navigation thereof. [Formerly 783.600]

783.625 Definitions for ORS 783.625 to 783.640. As used in ORS 783.625 to 783.640, unless the context requires otherwise:

(1) "Ballast water" means any water used to manipulate the trim and stability of a vessel.

(2) "Cargo vessel" means a ship in commerce that is equipped with ballast tanks, other than a tank vessel or a vessel used solely for commercial fish harvesting, of 300 gross tons or more.

(3) "Coastal exchange" means exchanging the ballast water taken onboard at a North American coastal port at a distance of at least 50 nautical miles from land and at a depth of at least 200 meters.

(4) "Department" means the Department of Environmental Quality.

(5) "Oil" means oil, gasoline, crude oil, fuel oil, diesel oil, lubricating oil, oil sludge, oil refuse and any other petroleum related product.

(6) "Open sea exchange" means a replacement of ballast water that occurs in an area no less than 200 nautical miles from any shore.

(7) "Passenger vessel" means a ship of 300 gross tons or more carrying passengers for compensation.

(8) "Sediment" means any matter that settles out of ballast water.

(9) "Ship" means any boat, ship, vessel, barge or other floating craft of any kind.

(10) "Tank vessel" means a ship that is constructed or adapted to carry oil in bulk as cargo or cargo residue other than:

(a) A vessel carrying oil in drums, barrels or other packages;

(b) A vessel carrying oil as fuel or stores for that vessel; or

(c) An oil spill response barge or vessel.

(11) "Trip" means travel to an appointed destination and return travel to the point of origin within the waters of this state.

(12) "Vessel" means a tank vessel, cargo vessel or passenger vessel.

(13) "Voyage" means any transit by a vessel destined for any Oregon port.

(14) "Waters of this state" means natural waterways including all tidal and nontidal bays, intermittent streams, constantly flowing streams, lakes, wetlands and other bodies of water in this state, navigable and nonnavigable, including that portion of the Pacific Ocean that is in the boundaries of Oregon. [2001 c.722 §1; 2003 c.692 §1; 2005 c.62 §2; 2007 c.816 §2; 2011 c.321 §3]

783.630 Application; exclusions. (1) ORS 783.625 to 783.640 apply to all vessels carrying ballast water into the waters of this state from a voyage, except a vessel that:

- (a) Discharges ballast water only at the location where the ballast water originated, if the ballast water is not mixed with ballast water from areas other than open sea waters;
- (b) Does not discharge ballast water in waters of this state;
- (c) Traverses only the internal waters of this state;
- (d) Traverses only the territorial sea of the United States and does not enter or depart an Oregon port or navigate the waters of this state;
- (e) Discharges ballast water that originated solely from waters located between the parallel 40 degrees north latitude and the parallel 50 degrees north latitude on the west coast of North America; or
- (f) Discharges ballast water that has been treated to remove organisms in a manner that is approved by the United States Coast Guard.

(2) ORS 783.625 to 783.640 do not authorize the discharge of oil or noxious liquid substances in a manner prohibited by state, federal or international laws or regulations. Ballast water containing oil or noxious liquid substances shall be discharged in accordance with the requirements applicable to those substances.

(3) Nothing in this section:

(a) Requires an open sea or coastal exchange if the owner or operator in charge of a vessel determines that performing an open sea or coastal exchange would threaten the safety or stability of the vessel or the safety of the vessel's crew or passengers because of any extraordinary condition, including but not limited to adverse weather, vessel design limitations or equipment failure.

(b) Exempts the owner or operator in charge of a vessel from the reporting requirements under ORS 783.640, whether or not ballast water is carried or discharged in the waters of this state. [2001 c.722 §2; 2003 c.692 §2; 2005 c.62 §5]

783.635 Discharge of ballast water prohibited; exemption; rules; aquatic invasive species. (1) Except as authorized by this section, the discharge of ballast water in the waters of this state is prohibited.

(2) An owner or operator of a vessel may discharge ballast water in the waters of this state:

(a) If the owner or operator has conducted a complete open sea or coastal exchange of ballast water prior to entering the waters of this state. The open sea or coastal exchange must be performed using either of the following methods:

(A) Flow-through exchange. A flow-through exchange occurs when an amount of ocean water equal to or exceeding three times the capacity of the vessel's ballast water tank is pumped into an opening in the ballast water tank while the existing ballast water is discharged through another opening.

(B) An empty and refill exchange. An empty and refill exchange occurs when a ballast water tank is pumped empty to the point that the pump loses suction and then is refilled with ocean water.

(b) Without performing an open sea exchange or a coastal exchange of ballast water if:

(A)(i) The owner or operator reasonably believes that an exchange would threaten the safety of the vessel; or

(ii) The exchange is not feasible due to vessel design limitations or equipment failure; and

(B) The vessel discharges only the amount of ballast water that is operationally

necessary.

(c) If the ballast water is discharged in a manner consistent with standards and procedures adopted by the Environmental Quality Commission under subsection (4) of this section.

(3) An owner or operator who discharges ballast water in the waters of this state under subsection (2)(b) of this section is subject to the reporting requirements under ORS 783.640.

(4)(a) The Environmental Quality Commission may adopt by rule standards and procedures that the commission considers necessary to carry out the provisions of ORS 783.625 to 783.640. The standards and procedures must minimize the risk of introducing aquatic invasive species into the waters of this state and must be based on the availability of treatment technology. Rules adopted under this subsection include, but are not limited to:

(A) Standards for the discharge of ballast water into the waters of this state and appropriate timelines for the implementation of the standards. In adopting the standards, the commission shall consider the extent to which treatment technology is feasible, practicable and commercially available, or expected to be available, by the proposed implementation timelines.

(B) Emergency response procedures for managing high-risk ballast water. The rules must define high-risk ballast water in light of the source of the water and other applicable factors. The procedures must establish notification and consultation requirements, as well as feasible alternative ballast water management strategies.

(C) Procedures for implementing alternative ballast water management strategies for the exemptions specified in subsection (2)(b) of this section.

(b) To the extent practicable, the commission shall adopt rules under this subsection consistent with relevant rules adopted by the States of California and Washington. [2001 c.722 §3; 2005 c.62 §3; 2009 c.148 §1]

783.636 Fees; rules. (1) The Department of Environmental Quality shall collect a fee of \$70 for each trip by vessels regulated under ORS 783.625 to 783.640.

(2) All fees collected by the department under this section shall be paid into the Ballast Water Fund established under ORS 783.638.

(3) The Environmental Quality Commission may adopt by rule procedures for the payment of the fees specified in this section. [2011 c.321 §2]

783.637 Late charges; waiver. (1) The Department of Environmental Quality shall assess a late charge of \$25 against the owner or operator of a vessel if the department has not received the fee specified in ORS 783.636 by the due date specified by the department.

(2) The department shall assess an additional late charge of \$25 if the owner or operator of a vessel has not paid the fee specified in ORS 783.636 within 45 days after the due date specified by the department.

(3) The department may waive the late charges specified in this section upon a showing of good cause by the owner or operator of a vessel.

(4) All late charges collected by the department under this section shall be paid into the Ballast Water Fund established under ORS 783.638. [2011 c.321 §6]

783.638 Ballast Water Fund; sources; uses. (1) The Ballast Water Fund is established in the State Treasury, separate and distinct from the General Fund. Interest earned by the Ballast Water Fund shall be credited to the fund. Moneys in the fund are continuously appropriated to the Department of Environmental Quality to:

- (a) Monitor vessels regulated under ORS 783.625 to 783.640;
 - (b) Screen ballast water management information reported to the department under ORS 783.640;
 - (c) Inspect vessels and collect samples of ballast water pursuant to ORS 783.640;
 - (d) Conduct ballast water management policy development and coordination;
 - (e) Coordinate with other state agencies, agencies of other states and federal agencies on issues related to ballast water management;
 - (f) Respond to emergencies regarding aquatic invasive species that may have resulted from the discharge of ballast water; and
 - (g) Provide outreach and consultation expertise to maritime industry stakeholders regarding:
 - (A) Best practices related to ballast water management.
 - (B) Standards and procedures adopted by rule by the Environmental Quality Commission under ORS 783.635.
- (2) The fund established by subsection (1) of this section shall consist of:
- (a) Fees collected pursuant to ORS 783.636.
 - (b) Late charges collected pursuant to ORS 783.637. [2011 c.321 §5]

783.640 Reporting of ballast water management. (1) Owners or operators of vessels regulated under ORS 783.625 to 783.640 must report ballast water management information to the Department of Environmental Quality:

- (a) For voyages greater than 24 hours in length, at least 24 hours prior to entering the waters of this state; or
 - (b) For voyages less than 24 hours in length, prior to departing the port or place of departure.
- (2) The department may work with maritime associations and any national ballast information clearinghouse to establish the manner and form of the reporting required under this section.
- (3) The department may verify compliance with ORS 783.625 to 783.640 by:
- (a) Relying on tests conducted by the United States Coast Guard or on other tests determined to be appropriate by the department.
 - (b) Boarding and inspecting vessels regulated under ORS 783.625 to 783.640 and collecting samples of ballast water as part of the inspection. [2001 c.722 §4; 2005 c.62 §4; 2009 c.144 §1]

PENALTIES

- 783.990 Penalties.** (1) Violation of ORS 783.510, 783.520 or 783.610 is a Class B misdemeanor.
- (2) Violation of ORS 783.530, 783.550 or 783.580 is a Class C misdemeanor.
 - (3) Violation of ORS 783.560 by any officer is a Class D violation.
 - (4) Violation of ORS 783.590 and injury or damage of any bridge across the Willamette River for want of the appliances described in ORS 783.590 is a Class A violation.
 - (5) Violation of ORS 783.620 is a Class A misdemeanor. [Amended by 1953 c.113 §2; 1997 c.249 §224; 1999 c.1051 §227; 2011 c.597 §304]

783.992 Civil penalties. As specified in ORS 468.140, the Director of the Department of Environmental Quality may impose a civil penalty on the owner or operator of a vessel for failure to comply with the requirements of ORS 783.625 to 783.640. [2001 c.722 §7; 2005 c.62 §6; 2009 c.267 §16]

Appendix B

Oregon Ballast Management Administrative Rules (OAR 340)

340-143-0001

Authority, Purpose, and Scope

(1) These rules establish procedures for management of ballast water, and reporting of ballast water management information as regulated under ORS 783.620 through 783.640. The rules' purpose is to protect waters of the state from ecological and economic threats associated with aquatic nonindigenous species.

(2) All vessels greater than 300 gross tons equipped with ballast water tanks traversing into waters of the state are subject to these rules, except a vessel that:

(a) Traverses only internal waters of the state; or

(b) Traverses only the territorial sea of the United States and does not enter or depart an Oregon Port or navigate waters of the state.

(3) Under ORS 783.630 (2), these rules do not authorize the spilling or releasing of any oil or hazardous materials in a manner prohibited by state or federal laws or regulations. Ballast water carried in any tank containing a residue of oil or any other pollutant must be discharged in accordance with applicable regulations.

Stat. Auth.: ORS 468.020, 783.620 - 783.640

Stats. Implemented: ORS 783.620 - 783.640

Hist: DEQ 17-2002, f. 11-1-02, cert. ef. 12-1-02; DEQ 4-2011, f. & cert. ef. 3-17-11

340-143-0005

Definitions

(1) "Ballast Water" means any water and associated sediment used to manipulate the trim and stability of a vessel.

(2) "Cargo Vessel" means a ship in commerce, other than a tank vessel or a vessel used solely for commercial fish harvesting, of 300 gross tons or more.

(3) "Coastal Ocean Exchange" means the exchange of ballast water in an area no less than 50 nautical miles from any shore and where the water depth exceeds 200 meters.

(4) "Common Waters Zone" means the Pacific Coast of North America between 40 and 50 degrees north latitude.

(5) "DEQ" means the Oregon Department of Environmental Quality.

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- (6) "Exchange" means to replace the water in a ballast tank using either flow-through exchange, empty/refill exchange, or other exchange methods recommended or required under U.S. Coast Guard rules, 33 CFR, part 151.2035.
- (7) "Exclusive Economic Zone" extends from the baseline of the U.S. territorial sea seaward 200 nautical miles.
- (8) "High-risk Ballast Water" means unexchanged or untreated ballast water obtained from a coastal area outside the common waters zone identified in this rule.
- (9) "Internal Waters of the State" means those waters of this state that do not have shared jurisdiction with an adjacent state.
- (10) "Nonindigenous Species" means any species or other viable biological material entering an ecosystem beyond its natural range. This also includes seeds, eggs, spores and other biological material entering an ecosystem beyond its natural range.
- (11) "Oil" means oil, gasoline, crude oil, fuel oil, diesel oil, lubricating oil, oil sludge, oil refuse and any other petroleum-related product.
- (12) "Open Sea Exchange" means the exchange of ballast water that occurs in an area no less than 200 nautical miles from any shore and where the water depth exceeds 2,000 meters.
- (13) "Pacific Coast Region" means all coastal waters on the Pacific Coast of North America east of 154 degrees W longitude and north of 25 degrees N latitude, exclusive of the Gulf of California.
- (14) "Passenger Vessel" means a ship of 300 gross tons or more, carrying passengers for compensation.
- (15) "Port" means any place to which a vessel is bound to anchor or moor.
- (16) "Sediment" means any matter that settles out of ballast water.
- (17) "Ship" means any boat, ship, vessel, barge or other floating craft of any kind.
- (18) "Tank Vessel" means a ship that is constructed or adapted to carry oil in bulk as cargo or cargo residue other than:
- (a) A vessel carrying oil in drums, barrels or other packages;
 - (b) A vessel carrying oil as fuel or stores for that vessel; or
 - (c) An oil spill response barge or vessel.
- (19) "Territorial Sea of the United States" means the waters extending three nautical miles seaward from the coastline in conformance with federal law.

(20) "Vessel" means a tank vessel, cargo vessel or passenger vessel.

(21) "Voyage" means any transit by a vessel destined for any Oregon port.

(22) "Waters of the State" mean natural waterways including all tidal and non-tidal bays, intermittent streams, constantly flowing streams, lakes, wetlands and other bodies of water in Oregon, navigable and non-navigable, including that portion of the Pacific Ocean that is within Oregon's boundaries.

Stat. Auth.: ORS 468.020, 783.620 - 783.640

Stats. Implemented: ORS 783.620 - 783.640

Hist: DEQ 17-2002, f. 11-1-02, cert. ef. 12-1-02; DEQ 4-2011, f. & cert. ef. 3-17-11

340-143-0010

Ballast Water Management: Discharge Prohibitions

(1) Discharge of ballast water containing oil or hazardous material into waters of the state is prohibited.

(2) Vessels carrying ballast water into waters of the state must not discharge ballast water unless:

(a) The vessel discharges ballast water only at the same location where the ballast water originated, provided that the master, operator or person in charge of the vessel can demonstrate that the ballast water to be discharged was not mixed with ballast water or sediment from an area other than mid-ocean waters. For purposes of this subsection, "same location" means an area within one nautical mile of the berth or within the recognized breakwater of an Oregon port or place, at which the ballast water to be discharged was loaded;

(b) The owner or operator of the vessel conducted proper ballast water exchange management practices before entering waters of the state, such that:

(A) An open sea exchange was conducted for ballast tanks containing water sourced outside the Exclusive Economic Zone; or

(B) A coastal ocean exchange was conducted for ballast tanks containing water sourced from a port within the North American Pacific Coast Region;

(c) The ballast water was solely obtained from mid-ocean waters that are no less than 200 nautical miles from any shore and where water depth exceeds 2,000 meters;

(d) The ballast water originated solely from the common waters zone, as defined by OAR 340-143-0005 (5);

- (e) The ballast water originated solely from municipal or treated drinking water sources and is not mixed with ballast water obtained from areas other than open sea waters;
- (f) The ballast water had been treated in a manner authorized by OAR 340-143-0050; or
- (g) The vessel owner or operator declares a safety exemption in a manner consistent with ORS 783.635 (2)(b) and OAR 340-143-0040.

Stat. Auth.: ORS 468.020, 783.620 - 783.640

Stats. Implemented: ORS 783.620 - 783.640

Hist: DEQ 17-2002, f. 11-1-02, cert. ef. 12-1-02; DEQ 4-2011, f. & cert. ef. 3-17-11

340-143-0020

Ballast Water Management: Reporting, Management Plans and Recordkeeping

- (1) A vessel owner or operator covered by OAR chapter 340, division 143 must report ballast water management information to DEQ at least 24 hours before entering waters of the state. When the vessel's voyage is less than 24 hours in total duration, the report must be submitted prior to departing the vessel's port or place of departure. The report is required whether or not the owner or operator plans to discharge ballast water into waters of the state. Compliance with these reporting requirements may be met by sending the report to DEQ via e-mail (ballast.water@deq.state.or.us) fax, or mail. Vessel owners or operators who rely on a third party to collect, forward or submit ballast water reporting forms are responsible for ensuring that DEQ receives the ballast water management information as required in this section. Electronic reporting must be submitted using methods and file formats approved by DEQ.
- (2) The report must be submitted on a form acceptable to the U.S. Coast Guard pursuant to 33 CFR part 151, unless DEQ approves an alternative format in writing.
- (3) If a vessel owner or operator alters or plans to alter its ballast water management for any reason after reporting its ballast water management information, the owner or operator must submit an amended ballast water management report to DEQ. An amended reporting form must be filed at the time of first known or predictable change of destination, and immediately upon completion of discharge operations resulting in changes to actual volume of ballast water discharged.
- (4) Any owner or operator failing to report ballast water management information as required by this rule must file the required report immediately upon discovering the violation.
- (5) Vessel owners or operators must develop and maintain on board a ballast water management plan that is specifically developed for the vessel and that allows those responsible for the plan's implementation to understand and follow the vessel's ballast management strategy. The contents, training requirements and availability

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must be consistent with ballast water management plan regulations established by the U.S. Coast Guard under 33 CFR 151.2035a subpart D.

(6) Vessel owners or operators must record all ballast water and sediment management operations in the vessel's ballast water log, record book or other suitable documentation system.

(a) Content. Vessel owners or operators must maintain a version of the ballast water log, record book or other suitable documentation system in English on board the vessel that, at a minimum:

(A) Records each operation involving ballast water or sediment management;

(B) Describes each such operation, including the location and circumstances of, and the reason for, the operation;

(C) Records the exact time and position of the start and stop of the ballast water exchange or treatment operations for each tank; and

(D) Describes the nature and circumstances of any situation under which a safety exemption from ballast management requirements was declared.

(b) Availability. Vessel owners or operators must make the ballast water log or record book readily available for examination by DEQ at all reasonable times. The vessel owner or operator must transmit to DEQ any information about the vessel's ballast operations that DEQ requires.

(c) Retention period. The ballast water log or record book must be available on board the vessel for a minimum of two years after the date on which the last entry in the book is made.

(d) Required signatures. DEQ will require that each completed page and each completed vessel exchange or treatment operation in the ballast water log or record book be signed and dated by the vessel owner or operator or responsible officer; and that such owner, operator or responsible officer attest to the accuracy of the information provided and certifies compliance with the vessel ballast water management plan.

(e) Alternative means of recording. The ballast water log or record book may be an electronically recorded system or integrated into another record book or system. At a minimum, any alternative method must meet provisions of this section.

(f) Records Storage for unmanned barges. If no secure location is available to store records on unmanned barges, these vessel operators may meet provisions of this section by storing records on an associated tug or at other accessible locations and must provide logbook records to DEQ on request.

[Publications: Publications referenced are available from the agency.]

Stat. Auth.: ORS 468.020, 783.620 - 783.640

Stats. Implemented: ORS 783.620 - 783.640

Hist: DEQ 17-2002, f. 11-1-02, cert. ef. 12-1-02; DEQ 4-2011, f. & cert. ef. 3-17-11

340-143-0030

Ballast Water Management: Vessel Inspections

(1) DEQ or its agent is authorized to board and inspect vessels, without advance notice, to provide technical assistance, assess compliance and enforce Oregon ballast water management rules as provided under ORS 783.620-640, as long as such inspections are conducted in accordance with standards described in this rule. DEQ may prioritize vessel inspections based on:

- (a) Reporting compliance,
- (b) Information submitted in ballast water reporting forms,
- (c) Discharge behavior; or
- (d) Other applicable criteria to assess the risk of introducing nonindigenous species.

(2) Conditions. DEQ inspections shall be conducted under the following conditions:

- (a) Authorized inspectors. Only DEQ employees, agents or specifically authorized contractors are authorized to conduct such inspections;
- (b) Time. Inspections may be conducted at any time. Reasonable efforts must be taken to not unduly interrupt normal cargo operations of the vessel. Vessel cargo operations may be interrupted when it appears to inspectors that the discharge of unexchanged or untreated ballast water or sediments may be occurring or is imminent;
- (c) Location. DEQ may conduct inspections when the vessel is at anchor or in port within Oregon waters;
- (d) Identification. Inspectors must have official identification, announce their presence and intent at the time of inspection, perform their duties in a safe and professional manner, and follow all appropriate ship safety requirements;
- (e) Vessel escort. The vessel owner or operator must provide an employee to escort the inspector or inspectors.
- (f) Safety. Nothing in this section relieves the vessel owner or operator of the responsibility for ensuring the vessel's safety and stability or the safety of the crew and passengers.

(3) Purpose. Vessel boarding may occur for any of the following reasons:

(a) To verify regulatory compliance under ORS 783.620 through ORS 783.640. The scope of compliance verification inspection activities is described in section (4) of this rule;

(b) To provide technical assistance and explain details of state ballast water management regulations. The inspector may also help provide details on other west coast state and federal ballast law; or

(c) To provide outreach and education about best management practices that may further reduce the likelihood of transporting aquatic nonindigenous species.

(4) Scope. DEQ shall limit vessel inspection to those areas reasonably necessary to inspect ballast management-related activities. DEQ may board a vessel and conduct compliance verification and inspection activities, including;

(a) An audit of vessel ballast water management documentation to verify compliance with state laws. An audit consists of reviewing the vessel's ballast water reporting forms, management plan and record book as required in this section. In addition, the inspector may request and review any other records relating to ballast management operations including the Deck Log, GPS Log, Soundings Log, Stability Reports, Engine Room Log and Oil Record Book. Vessel operators must maintain a concise record of their ballast water management in order to expedite the timeliness and efficiency of the documentation audit.

(b) A collection of samples from ballast tanks. Sampling may require the vessel's crew to provide safe access to ballast tanks for sampling, including lighting and ventilation of cargo holds, spaces and voids as needed. The vessel's crew will open ballast tank manhole covers and present the tank ready for sample access by taking the head off the tank level as necessary to preclude tank overflow. If tank certification is necessary for access, the vessel operator will be responsible for any marine chemist fees. Where safe and practical, an inspector may require a sample of tank sediments, collected by the vessel operator under DEQ observation or by the DEQ inspector.

Stat. Auth.: ORS 468.020, 783.620 - 783.640

Stats. Implemented: ORS 783.620 - 783.640

Hist: DEQ 4-2011, f. & cert. ef. 3-17-11

340-143-0040

Ballast Water Management: Emergency Management Alternatives for Vessel's Declaring Safety Exemption Discharge of High-Risk Ballast Water

(1) Unexchanged or untreated ballast water may not be discharged into waters of the state without DEQ review and authorization. This is to provide DEQ with sufficient time to determine whether ballast water proposed for discharge represents a high-risk for introduction of nonindigenous species and whether or not feasible management alternatives are available to minimize that risk and protect waters of the state.

(2) Vessel owners or operators requesting safety exemptions under ORS 783.635 (2)(b) must file a ballast water reporting form clearly identifying the request, and provide sufficient additional information for DEQ to evaluate the request and determine whether an emergency ballast water management alternative is warranted.

(a) Reporting Requirements. Vessel operators requesting a safety exemption must notify DEQ of their intent on the ballast water reporting form required under ORS 783.640. Notification requires writing the words "safety exemption" on the form where it asks "If no ballast treatment conducted, state reason why not:" and stating the cause as either "adverse weather," "vessel design limitation," "equipment failure" or "extraordinary condition."

(A) Vessel operators may rescind a safety exemption claim by filing an amended ballast water reporting form and notifying DEQ as required in this section.

(B) Vessel operators using treatment technologies and claiming a safety exemption due to equipment failure must conduct an open sea exchange or explain why that was not possible.

(b) Discharge authorization requirement. A vessel owner or operator shall not discharge untreated or unexchanged ballast water without DEQ authorization, except:

(A) Where discharging is necessary to prevent jeopardy to the vessel, crew or passengers, or

(B) For safety exemption discharges from unmanned barges, in which case DEQ shall review ballast water reporting form information and notify the vessel operator if further case review and discharge authorization are required, in accordance with subsection (c).

(c) Case Review. DEQ will review safety exemption claims and determine whether alternative management strategies are feasible and necessary. DEQ will complete case review within 10 days of receiving safety exemption notification on the vessel's ballast water reporting form. When it completes its safety exemption review, DEQ will notify the vessel owner or operator whether they have authorization to discharge or whether ballast water management alternatives, referenced in section (4), are required.

(3) DEQ may identify high-risk ballast water from safety exemption cases using factors including but not limited to:

(a) A nonindigenous species profile of source waters;

(b) The volume and frequency of exchanged ballast water discharged;

(c) Design limitations in vessels that prevent effective ballast exchanges;

(d) Voyage characteristics within 50 nautical miles that may preclude requirements to conduct ballast exchange outside of 50 nautical miles;

(e) Vessel owner or vessel operator compliance history; or

(f) Frequency of vessel claims for safety exemption.

(4) Alternative Management strategies options for responding to high-risk ballast water discharge. For vessels requesting authorization to discharge high-risk ballast water, DEQ shall identify one or more of the following options:

(a) Conduct an open sea or coastal ocean ballast exchange after safety exemption conditions are rectified;

(b) Discharge into DEQ-specified alternative waters;

(c) Employ a ballast water treatment alternative using DEQ-approved methods, or using a ballast treatment system acceptable under 340-143-0050;

(d) Discharge only the minimum amount necessary to complete a safe operation; or

(e) Retain all ballast water on-board.

(5) Alternative Discharge Areas. DEQ, in consultation with the U.S. Coast Guard and the state of Washington, when applicable, may identify alternative locations for the discharge of unexchanged or untreated ballast water.

(6) Safety. Nothing in this section relieves the vessel owner or operator of the responsibility for ensuring the vessel's safety and stability or the safety of the crew and passengers.

Stat. Auth.: ORS 468.020, 783.620 - 783.640

Stats. Implemented: ORS 783.620 - 783.640

Hist: DEQ 4-2011, f. & cert. ef. 3-17-11

340-143-0050

Ballast Water Management: Use of Ballast Water Treatment Systems

(1) Discharge Standards. Reserved

(2) Use of ballast water treatment systems. Ballast water treated in compliance with federal discharge standards or treated using technology approved for shipboard use by the U.S. Coast Guard or the U.S. Environmental Protection Agency may be discharged to waters of the state unless discharge violates section (1).

(3) As an alternative to discharging high-risk ballast water identified in 340-143-0040, DEQ may authorize the use of ballast water treatment systems identified as promising technology by the U.S. EPA, U.S. Coast Guard or neighboring states.

Stat. Auth.: ORS 468.020, 783.620 - 783.640

Stats. Implemented: ORS 783.620 - 783.640

Hist: DEQ 4-2011, f. & cert. ef. 3-17-11

340-143-0060

Ballast Water Management: Ballast Tank Sediment

(1) Except during normal operation of ballast pump systems, a vessel operator may not remove or dispose of unsuspended sediment from spaces designed to carry ballast water into waters of the state.

(2) The cleaning of ballast tanks within Oregon waters is prohibited except under controlled arrangements in port or in dry dock. Fouling organisms and sediments removed during the cleaning of ballast tanks may not be discharged to waters of the state and must be disposed of in accordance with local, state and federal law.

(3) DEQ may approve sediment disposal facilities. These facilities must provide for the disposal of such sediment in a way that effectively eliminates the risk of nonindigenous species and does not impair or damage the environment, human health or property, or resources of the disposal area.

Stat. Auth.: ORS 468.020, 783.620 - 783.640

Stats. Implemented: ORS 783.620 - 783.640

Hist: DEQ 4-2011, f. & cert. ef. 3-17-11

Appendix C

Ballast Water Reporting Form (BWRF; OMB 1625-0069)

OMB Control Number 1625-0069

BALLAST WATER REPORTING FORM

IS THIS AN AMENDED BALLAST REPORTING FORM? YES NO

2. VOYAGE INFORMATION

Vessel Name:	Arrival Port:	Total Ballast Water on Board:	
IMO Number:	Arrival Date (D/M/YYYY):	Volume	No. of Tanks in Ballast
Owner:	Agent:	m3	
Type:	Last Port:	Total Ballast Water Capacity:	
GT:	Country of Last Port:	Volume	Total No. of Tanks on Ship
Call Sign:	Country of Next Port:	m3	
Flag:			

3. BALLAST WATER USAGE AND CAPACITY

Specify Units Below (m³, MT, LT, ST)

4. BALLAST WATER MANAGEMENT Total No. Ballast Water Tanks to be discharged:

Of tanks to be discharged, how many: Underwent Exchange: Underwent Alternative Management:

Please specify alternative method(s) used, if any:

If no ballast treatment conducted, state reason why not:

Ballast management plan on board? YES NO Management plan implemented? YES NO

IMO ballast water guidelines on board [res. A.868(20)]? YES NO

5. BALLAST WATER HISTORY: Record all tanks to be deballasted in port state of arrival; IF NONE, GO TO #6 (Use additional sheets as needed)

Tanks/ Holds List multiple source/tanks separately	BW SOURCE			BW MANAGEMENT PRACTICES				BW DISCHARGE						
	DATE DM/YYYY	PORT or LAT. LONG.	VOLUME (units)	TEMP (units)	DATE DM/YYYY	ENDPOINT LAT. LONG.	VOLUME (units)	% Exch	METHOD (ER/FT/ ALT)	SEA HT. (m)	DATE DM/YYYY	PORT or LAT. LONG.	VOLUME (units)	SALINITY (units)
			m3	C			m3		ER				m3	sg
			m3	C			m3		ER				m3	sg
			m3	C			m3		ER				m3	sg
			m3	C			m3		ER				m3	sg
			m3	C			m3		ER				m3	sg
			m3	C			m3		ER				m3	sg
			m3	C			m3		ER				m3	sg

Ballast Water Tank Codes: EX=Exhaust - EB=Abnormal - AB=Double Bottom - DB=Minor - MT=Tampered - TS=Cargo Hold - AU=Other - C=

Appendix D

Ballast Water Discharge Standards and Timelines

Appendix D: Ballast Water Discharge Standards and implementation timelines proposed by IMO, USCG and California.

Organism Size Class	International / U.S. Federal Discharge Standard (D-2)	California Ballast Discharge Performance Standard^[1]
> 50 µm in minimum dimension	< 10 viable organisms per cubic meter	No detectable living organisms
10 – 50 µm in minimum dimension	< 10 viable organisms per ml	< 0.01 living organisms per ml
< 10 µm in minimum dimension		< 10 ³ bacteria/100 ml < 10 ⁴ viruses/100 ml
<i>Escherichia coli</i>	< 250 cfu ^[2] /100 ml ^[4]	< 126 cfu ^[2] /100 ml ^[4]
Intestinal enterococci	< 100 cfu ^[2] /100 ml ^[4]	< 33 cfu ^[2] /100 ml ^[4]
Toxicogenic <i>Vibrio cholerae</i> (01 & 0139)	< 1 cfu ^[2] /100 ml or < 1 cfu ^[2] /gram wet weight zooplankton samples	< 1 cfu ^[2] /100 ml or < 1 cfu ^[2] /gram wet weight zoological samples

^[1] Final discharge standard for California, beginning January 1, 2020, is zero detectable living organisms for all organism size classes

^[2] Colony-forming-unit ó a measure of viable bacterial numbers

Appendix D (cont): Implementation timelines for ballast discharge standards, as proposed established under USCG Final Rule and EPA 2013 Vessel General Permit (comparable dates for implementation of California performance standards in parentheses).

Ballast Water Capacity of Vessel	Standards apply to new vessels in this size class constructed on or after:	Standards apply to all other vessels in this size class beginning^[a]:
< 1500 metric tons	January 2014 (2016)	January 2016 (2018)
1500 ó 5000 metric tons	January 2014 (2016)	January 2014 (2016)
> 5000 metric tons	January 2014 (2016)	January 2016 (2018)

^[a] BWDS compliance required upon first drydocking after listed date