

# REGULATING THE WEST COAST CRUISE INDUSTRY: Canada at the low water mark

An Investigation into the regulations  
for Cruise Ship Pollution along the  
West Coast from California to Alaska



*By Stand.earth and West Coast  
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Soundkeeper Alliance.*

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PHOTO: JAMIE WOMBLE / NPS

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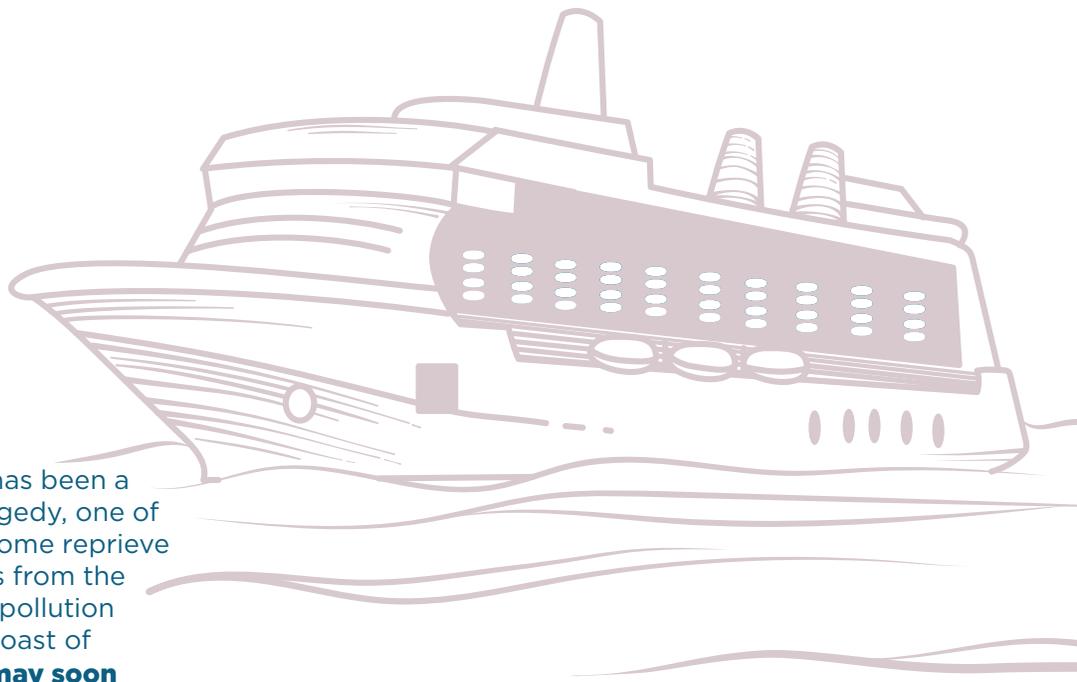
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# Executive Summary



While the Covid-19 pandemic has been a once-in-a-century global tragedy, one of its unforeseen impacts was a welcome reprieve for marine and coastal ecosystems from the gargantuan amount of cruise ship pollution that is discharged off the Pacific Coast of Canada each year. **That reprieve may soon come to an end as Carnival Corporation and other cruise companies are preparing for business-as-usual in 2021.** If it's anything like 2019, more than a million passengers will arrive on dozens of voyages through the waters off BC on their way to and from Alaska, leaving in their wake more than 31 billion litres of inadequately treated cruise ship pollution laden with fecal coliform, ammonia, heavy metals and polycyclic aromatic hydrocarbons—pollutants that are harmful to human health, aquatic organisms and coastal ecosystems.

Canada's cruise ship pollution regulations have lagged behind the regulations in other places. When the federal government adopted the Vessel Pollution and Dangerous Chemicals (VPDC) Regulations in 2012, they were already the weakest protections against cruise ship pollution on the West Coast of North America from California to Alaska. Neighboring jurisdictions in Washington State and Alaska had recognized the threat of a rapidly expanding cruise ship industry more than a decade earlier, and passed a suite of laws and regulations that held cruise ship operators accountable for the vast amounts of water pollution these floating cities create on their voyages up and down the West Coast.

But even these regulatory regimes need to be updated to deal with a relatively new source of pollution: scrubber washwater. Vast quantities of washwater are deposited in ocean waters in an attempt to remove sulfur dioxides from the heavy fuel oil combustion exhaust pouring from cruise ship smokestacks. Washwater may sound benign, but it is full of heavy metals and organic compounds that threaten human health and aquatic ecosystems.

As this report illustrates, our coastal neighbors have led the way so far. The unique nature of Pacific coastal waterways and **the sensitivity of these aquatic ecosystems call for even stronger protections before the cruise industry attempts to start up where it left off in 2019.**

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**If Canada is going to lift restrictions and allow cruise ships to return in the post-pandemic era, the federal government must act now to improve the laws and regulations that protect coastal waters from massive amounts of cruise ship pollution.**

# Carnival Corporation

**Carnival Corporation is the largest cruise operator in the world.** In 2019, its fleet of 100+ cruise ships across nine cruise brands—Aida Cruises, Carnival Cruise Line, Costa Cruises, Cunard, Holland American Line, P&O Cruises, P&O Cruises Australia, Princess Cruises, Seabourn—ferried 13 million customers through pristine coastal waters and sensitive marine ecosystems all over the world, earning the company an estimated \$3 billion in annual profit.<sup>1</sup>

Carnival Corporation's ships use Victoria's terminal as a stopover on sailings between Seattle, Washington, and Ketchikan, Alaska. Unfortunately for the sea life along BC's West Coast, Carnival Corporation's cruise brands have some of the poorest environmental performance in the industry, and have been subjected to criminal prosecution for a variety of misdeeds, including **multiple felony convictions for the**

**intentional illegal dumping of oily wastes** for nearly a decade, the unlawful dumping of untreated waste in marine parks, and violating the terms of court-appointed probation.<sup>2</sup>

Carnival Corporation's cruise brands have some of the **poorest environmental performance in the industry**





# The Journey of the Celebrity Solstice Along the West Coast

PHOTO: MANAMANA VIA SHUTTERSTOCK

Despite their track record, Carnival Corporation and other cruise companies appear to be looking to return to as close to business-as-usual as possible in 2021.

The rapid transmission of Covid-19 onboard cruise ships, and subsequent transmission to onshore communities by cruise passengers, left federal health officials no choice but to shutter the 2020 cruise industry in Canadian jurisdiction, including on the West Coast. Covid-19 is one in a series of viruses, including Norovirus<sup>34</sup>, swine flu<sup>5</sup> and others<sup>67</sup>, that have demonstrated that cruise vessels are not suited to stopping or preventing the spread of infectious disease. Despite their track record, Carnival Corporation and other cruise companies appear to be looking to return to as close to business-as-usual as possible in 2021 while the pandemic is ongoing.

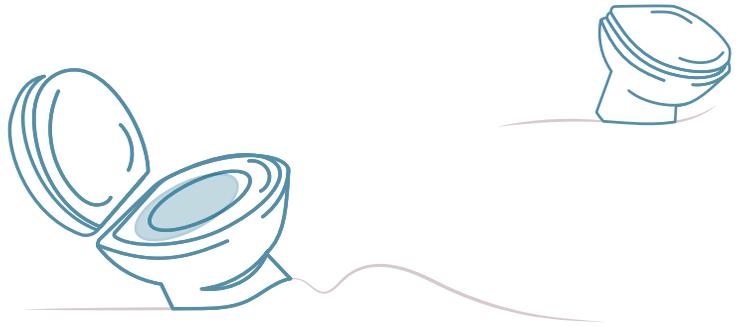
If it's anything like 2019, **approximately 30 giant cruise ships will sail through ports in the waters off Canada multiple times on sailings to and from Alaska.**

Celebrity Cruises, for instance, sent the Celebrity Solstice to Alaska on 16 different seven-day "Alaska Dawes Glacier" cruises.<sup>8</sup> At 1041 feet long and 121 feet wide, the Celebrity Solstice is an enormous ship. It has 19 passenger decks and more than 1400 rooms, almost 3 times as many as the Fairmont Hotel Vancouver. Its six heavy fuel oil-burning engines can generate more than 90,000 horsepower, about 3 times more than a Boeing 777. All of this space and power allows more than 2800 guests—and the 1500 crew members who serve them—to eat and drink and dance and swim and sleep to their hearts' content while **plying the waters in some of the world's most sensitive marine ecosystems.**

**the Celebrity Solstice...has 19 passenger decks and more than 1400 rooms, almost 3 times as many as the Fairmont Hotel Vancouver. Its six heavy fuel oil-burning engines can generate more than 90,000 horsepower, about 3 times more than a Boeing 777.**

Cruising comes with huge environmental costs, creating enormous amounts of garbage, pollution and various kinds of wastestreams. **On a one-week trip to Alaska and back, a ship the size of the Celebrity Solstice generates approximately...**

1 million litres of human sewage



8.7 million litres of highly polluting greywater (wastewater from sinks, showers and laundry facilities)



200 million litres of toxin-laden scrubber washwater<sup>9</sup>



8 tonnes of garbage (the weight of two male killer whales)



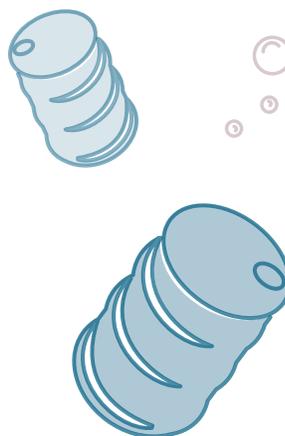
95,000 litres of oily bilge water



more than 500 litres of hazardous waste<sup>10</sup>

What is the captain of the Celebrity Solstice to do with all that pollution-laden waste? It is impossible to store it all onboard and dispose of it when the ship returns, so much of it will be discharged somewhere along the way.

**Canada, with its weak regulations and lack of monitoring, is almost certainly the preferred dumping grounds.**



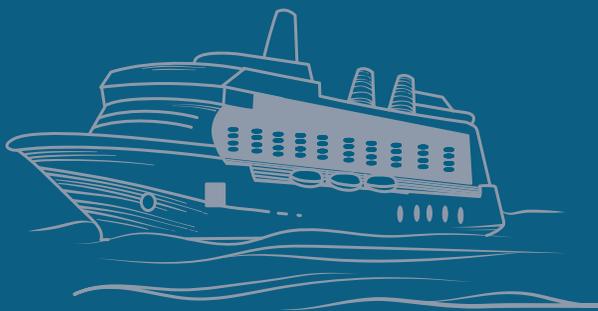
According to Vesseltracker.com, the Celebrity Solstice started and finished its Alaska trips in the Port of Seattle in 2018 and 2019. In December of 2020, Celebrity Cruises was advertising that the Celebrity Solstice will begin its journeys in Victoria and end in Seattle, though the rest of the route remains essentially the same.<sup>11</sup> **It will leave port on the first of its 14 sailings at 4:00 pm on May 28 and skirt the edge of the Race Rocks Ecological Reserve** off the southwest point of Vancouver Island, part of

the Salish Sea. Rounding the horn, the Solstice will bear northwest along the coast of Vancouver Island, generally staying far enough from shore (12 nm) that it can discharge as much untreated sewage, greywater and scrubber washwater as it wants, even though it's the home waters of the endangered southern resident killer whale population that is listed as endangered by both the US and Canadian governments.<sup>12</sup> But at this point there is likely no need to dump anything at all. The trip has only just begun.

All of **Day 2** is spent at sea, passing the north end of Vancouver Island into Queen Charlotte Sound and Hecate Strait. **Here, too, Canada's federal government allows cruise ships to**

**discharge untreated sewage, greywater and scrubber washwater into what's known as the Great Bear Sea,**<sup>1</sup> where the northern resident killer whale population—listed as threatened under the federal Species at Risk Act—ekes out an existence on Chinook salmon, many populations of which are also listed as threatened or endangered.<sup>13</sup>

In the early morning hours of **Day 3**, the Celebrity Solstice passes Prince Rupert and enters Alaskan jurisdiction. For the next four days, it will ply the waters of the 300-mile-long Alexander Archipelago, a magnificent grouping of 1,100 or so islands and deep fjords, their steep cliffs rising imposingly from the Pacific Ocean. **Here, the Celebrity Solstice will have to obey the most comprehensive suite of cruise ship pollution regulations on its voyage.**<sup>14</sup>



Victoria

Race Rocks Ecological Reserve

SALISH SEA

PACIFIC OCEAN

<sup>1</sup>A map of the Great Bear Sea is here: <https://www.livingoceans.org/media/news/help-protect-our-great-bear-sea>



**Unlike Canada, cruise ships must apply for and receive permission to discharge sewage in Alaska,** and can only dump treated sewage and greywater more than 1 nautical mile (nm) from shore. The standards for wastewater discharge are much stricter than in Canada, where less effective wastewater treatment systems (like the one the Celebrity Solstice uses) and higher fecal coliform levels are allowed.<sup>15</sup> In fact, **Alaska's standards are 18 times more stringent than the Canadian allowances** for fecal coliform and suspended solids in treated sewage discharge.

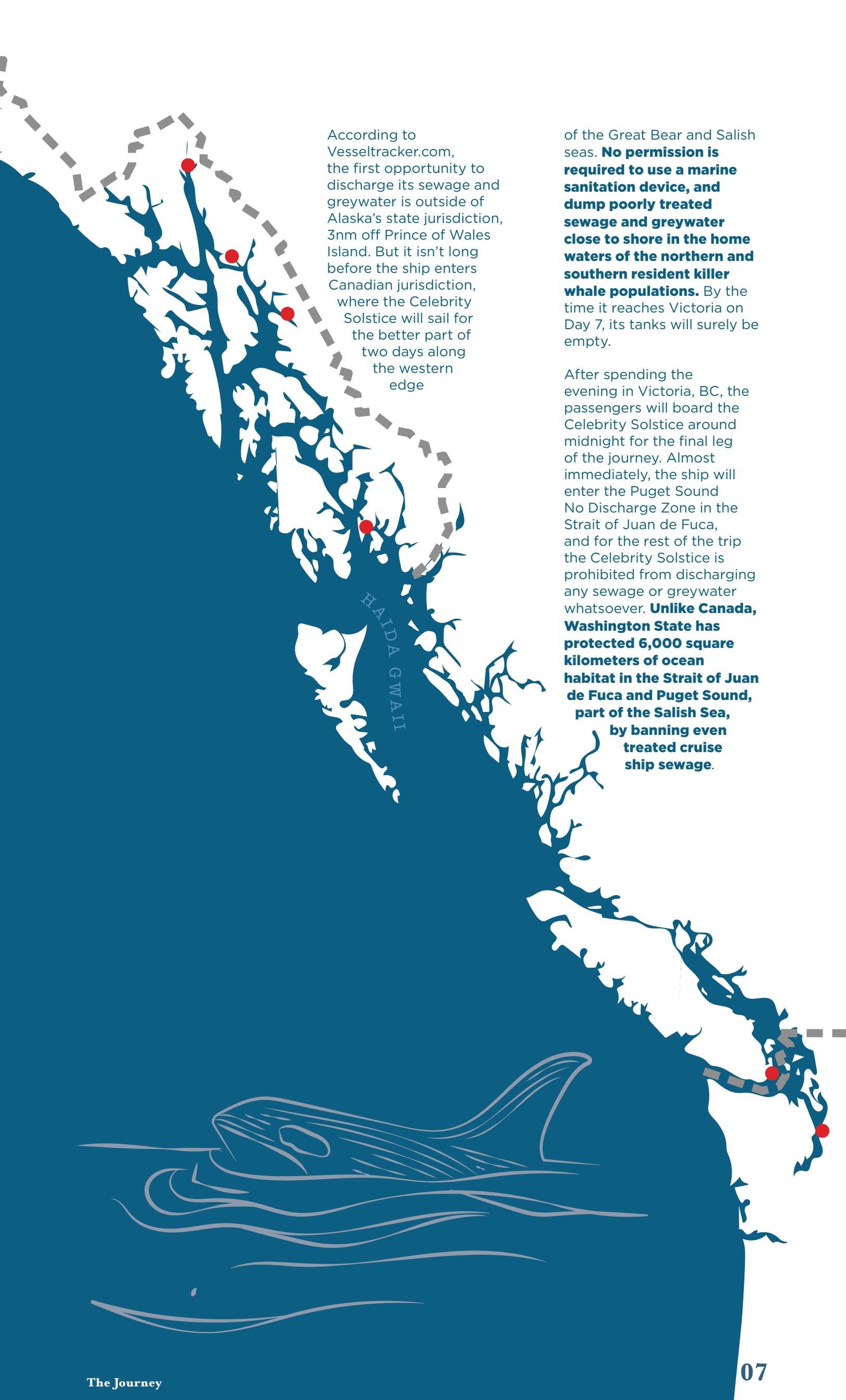
Almost half of the 40 large cruise ships that visit waters under Alaska's jurisdiction do not have the necessary permission to discharge wastewater, and the Celebrity Solstice is one of them.<sup>16</sup> Instead, it would need to make an extra trip 3 nm out to sea to dispose of its wastewater or dump it in the waters off of Canada before or after it enters the waters off Alaska. With this in mind, it may well have emptied its storage tanks off the north end of Haida Gwaii before it crossed the border into Alaska.

After four days ferrying passengers to a variety of Alaskan ports—Ketchikan, Endicott Arm, Juneau, Skagway—the Celebrity Solstice heads south toward Victoria, BC and, finally, Seattle, WA. Since it

crossed the BC-Alaska border early on Day 3, the Celebrity Solstice generated approximately 3.4 million litres sewage and greywater, which it could not discharge in the waters off Alaska.<sup>ii</sup> **As long as it had obeyed US laws and regulations, its tanks are getting full.**

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<sup>ii</sup> Calculated using average sewage and greywater generation data in, "Cruise Ship Discharge Assessment Report," published by the United States Environmental Protection Agency, Oceans and Coastal Protection Division, December 29, 2008.



According to Vesseltracker.com, the first opportunity to discharge its sewage and greywater is outside of Alaska's state jurisdiction, 3nm off Prince of Wales Island. But it isn't long before the ship enters Canadian jurisdiction, where the Celebrity Solstice will sail for the better part of two days along the western edge

of the Great Bear and Salish seas. **No permission is required to use a marine sanitation device, and dump poorly treated sewage and greywater close to shore in the home waters of the northern and southern resident killer whale populations.** By the time it reaches Victoria on Day 7, its tanks will surely be empty.

After spending the evening in Victoria, BC, the passengers will board the Celebrity Solstice around midnight for the final leg of the journey. Almost immediately, the ship will enter the Puget Sound No Discharge Zone in the Strait of Juan de Fuca, and for the rest of the trip the Celebrity Solstice is prohibited from discharging any sewage or greywater whatsoever. **Unlike Canada, Washington State has protected 6,000 square kilometers of ocean habitat in the Strait of Juan de Fuca and Puget Sound, part of the Salish Sea, by banning even treated cruise ship sewage.**

# Bigger Cruise Ships, Bigger Problems



**If Covid-19 had not forced the shuttering of Canada's 2020 cruise season...This would have broken the record for the fourth time in as many years. These ships would have generated more than 31 billion litres of contaminated wastewater that would have been discharged into BC waters.**

For all its industry-purported benefits, pleasure cruising creates enormous quantities of pollution. The numbers are staggering. **The cruise industry has grown by leaps and bounds over the last two decades, and more and much bigger ships ply sensitive marine waters all over the world.** According to the 2019 Cruise Trends & Industry Outlook, the number of global cruise passengers has roughly doubled, from 17.8 million to 30 million, since 2009.<sup>17</sup>

Off the West Coast of Canada, the number of cruise ships, and the amount of pollution these vessels discharge is skyrocketing. Cruise ship arrivals to Greater Victoria Harbour Authority's (GVHA) Ogden Point cruise ship terminal have increased 45 per cent since 2010, making it Canada's busiest single cruise ship port of call.<sup>18</sup> In 2019, more than one million passengers and crew from 30 different cruise ships visited the Victoria cruise terminal during 256 ship calls on the way to and from Alaska.<sup>19</sup> This broke the cruise tourism record set the year before, which had broken the record in 2017.<sup>20</sup>

If Covid-19 had not forced the shuttering of Canada's 2020 cruise season, Victoria's cruise ship terminal would have had 300 ship calls and approximately 1.1 million cruisers and crew. This would have broken the record for the fourth time in as many years. These ships would have generated more than 31 billion litres of contaminated wastewater that would have been discharged into BC waters.<sup>21</sup> **These trends indicate the problem will only get worse.**



# Watery Waste Streams

Cruise ships generate as much waste-water as small cities, of which there are 3 main types:

sewage  
greywater  
scrubber washwater

**Sewage, or blackwater, is composed of human body wastes that flow from toilets into holding tanks before treatment**, if required, and then discharge into the sea. Cruise ship sewage is more concentrated than household sewage because less water is used for sanitary purposes on ships than on land. It contains fecal coliform, ammonia, chlorine and a variety of toxic pollutants, such as pharmaceuticals, heavy metals, hydrocarbons and organochlorines.<sup>22</sup>

**Greywater is liquid waste from the galley (i.e. kitchen), showers and laundry facilities— basically anything else that isn't the toilet or an industrial part of the ship.** The US Environmental Protection Agency (EPA) found higher counts of fecal coliform—bacteria that can cause gastroenteritis in humans—in cruise ship greywater than in the inflow to municipal sewage treatment facilities. Greywater may also contain detergents, cleaners, lotions and topical creams, nutrients, solids, oil and grease, and hazardous carcinogens and other pollutants.<sup>23</sup>

Just like land-based sewage treatment, the primary means of reducing the toxic load in cruise ship wastewater streams are wastewater treatment systems. In regulations in the US and Canada **there are two named categories of wastewater treatment systems for marine vessels like cruise ships, Marine Sanitation Devices (MSD) and Advance Wastewater Treatment Systems (AWTS).** The US EPA (1972) and the Canadian federal government (2013) have mandated the use of MSDs in cruise ships. However, since at least 2012, scientists and engineers have known that MSDs do not adequately treat sewage and greywater.<sup>24</sup> Because of stricter pollution regulations in some jurisdictions, AWTS are being installed and used as these systems have improved the treatment of sewage and greywater compared to MSDs. According to Alaska's 2012 Cruise Ship Wastewater Science Advisory Panel, a combination of AWTS and other technologies to remove ammonia and heavy metals, such as ion exchange and reverse osmosis, may reduce concentrations of constituents of concern.<sup>25</sup>

**The EPA found higher counts of fecal coliform—bacteria that can cause gastro-enteritis in humans—in cruise ship greywater than in the inflow to municipal sewage treatment facilities.**



PHOTO: WK1003MIKE VIA SHUTTERSTOCK



According to Cruise Lines International Association's (CLIA) 2020 State of the Cruise Industry Outlook report, all new cruise ships will have AWTs.<sup>26</sup> These systems are effective in removing pathogens, oxygen demanding substances, particulate metals, oil and grease, and suspended solids, provided there is a rigorous maintenance program in place. However, it is important to note that even in ideal circumstances AWTs are only moderately effective in removing nutrients and dissolved metals.<sup>27</sup>

While the installation of AWTs on new cruise vessels is a step forward, the importance of regular maintenance and performance testing cannot be overstated. **An independent performance study of AWTs found that over 90 per cent of the time suspended solids and fecal coliforms were 10 and 10,000 times higher than the legal limits.**<sup>28</sup> This was attributed to a lack of rigorous maintenance and performance testing, and resulted in ships with technologically advanced systems discharging what is essentially untreated sewage.

Further, the lifespan of a cruise ship can be longer than 30 years. Many older ships will still be in operation for years to come, and, as the Celebrity Solstice does, may continue to use inferior MSD systems if permitted. **This highlights the need for not only stricter pollution standards for sewage and greywater discharges, but also mandated regular maintenance and performance testing for marine sanitation technologies.**

# Emissions Cheat Systems

**Scrubber washwater is a newer phenomena. Washwater is acidic, toxin-laden thermal pollution created by Exhaust Gas Cleaning Systems, known as “scrubbers”.** Ship operators take advantage of a loophole in air pollution regulations by installing scrubbers. Once these systems are installed on a vessel, the operator can then continue to burn heavy fuel oil (HFO), rather than switch to a cleaner marine fuel. HFO, an oil refinery waste product, is one of the cheapest and dirtiest fossil fuels on earth. It contains concentrated levels of heavy metals, carcinogenic polycyclic aromatic hydrocarbons (PAH), sulfur oxides and other harmful toxins.<sup>29</sup>

In January 2020, a restriction on the sulfur content of marine fuels adopted by the United Nations International Marine Organization (IMO) came into effect. Widely known as simply “IMO 2020,” the new regulation should have resulted in the end of the use of high-sulfur HFO in the maritime sector. However, **after the sulfur standard was adopted, it was quickly amended to allow for so-called “equivalent” compliance measures (i.e. scrubbers) rather than using low-sulfur fuel**, though few ships had scrubber systems installed at that time.<sup>30</sup>

The vast majority of these scrubbers are open-loop or hybrid systems that use seawater to remove sulfur oxides from marine exhaust gases and then discharge it back into the ocean—along with toxic pollution including heavy metals and PAHs. PAHs are persistent



**Once these systems are installed on a vessel, the operator can then continue to burn heavy fuel oil (HFO), rather than switch to a cleaner marine fuel.**

organic pollutants that are stored in fat reserves and can cause cancer and damage DNA.<sup>31</sup> Even though open-loop scrubbers purportedly have the capability to separate out sludge, there is no evidence that operators are actually doing so. All indications point to operators simply bypassing the sludge separator and discharging the entire wastestream—treated only with more seawater to dilute it.<sup>32</sup>

**Even so-called closed-loop scrubbers and hybrid scrubbers operated in closed-loop mode generate toxic wastewater, called bleedoff.** Though the volume of bleedoff is less than the volume of contaminated washwater generated by open-loop systems, it is far more concentrated with dangerous pollutants. Bleedoff is typically also discharged into the marine environment.<sup>33</sup>

The cruise industry was one of the first sectors to begin installing scrubber systems on its vessels. There were two important driving factors for this adoption of scrubbers by the cruise sector. First, the IMO committed in 2008 to cut the maximum allowable sulfur content in marine fuels globally to 0.5 percent. This decision was reconfirmed in 2016, and four years later IMO 2020 came into force. Secondly, in 2010 the IMO designated the waters off the coasts of the US and Canada as the North American

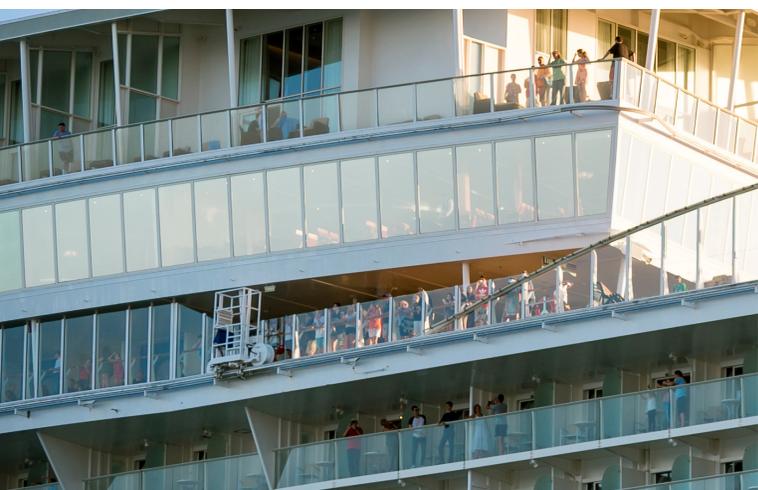


PHOTO: LAZYLAMA VIA SHUTTERSTOCK

**The cruise industry made a choice to opt for scrubbers and continue burning heavy fuel oil, rather than use cleaner fuel.**

Emissions Control Area (ECA), with a maximum allowable sulfur content standard of 1 per cent after 2012 and 0.10 per cent after 2015.<sup>34</sup>

The cruise industry made a choice to opt for scrubbers and continue burning heavy fuel oil, rather than use cleaner fuel. Cruise ships have a high proportion of scrubber installation compared to other ships, and are responsible for a higher proportion of scrubber washwater discharged.<sup>35</sup> While the IMO maintains that sulfur-standard regulations will reduce airborne sulfur oxide emissions by 77 per cent,<sup>36</sup> the “equivalency” loophole has created a scrubber washwater crisis. Scrubber use has grown across all maritime sectors from just 3 ships in 2008, to over 4,300 globally in 2020.<sup>37</sup> This has created an enormous new, and very harmful, wastestream full of toxins, carcinogens and other pollutants.

The use of scrubbers is effective at reducing sulfur dioxide in emissions, however, the use of these systems is not equivalent to the fuel switching prescribed in the fuel standards. Ships that use scrubbers have increased greenhouse gas emissions, particulate matter, and black carbon (a potent climate change forcer in the ice and snow covered parts of the world).

**As such, not only does the use of scrubbers create a novel and unnecessary water pollution wastestream, it also worsens air pollution compared to switching to low-sulfur distillate fuel.<sup>38</sup>**

PHOTO: STEVE CORDORY VIA SHUTTERSTOCK



## Canada: The Low Water Mark

**Government regulators in Canada have created the weakest vessel water pollution regulatory regime on the West Coast, from California to Alaska.**

These outdated and low-bar standards allow cruise ships to discharge more than **31 billion litres** of contaminated sewage, greywater and washwater under Canadian jurisdiction, year after year.<sup>39</sup> When released into the ocean, the wide array of toxic substances in these cruise ship liquid wastestreams pose a significant, compounding threat to aquatic wildlife and the habitat and food webs on which they depend.<sup>40</sup> This includes recovering threatened sea otter populations and threatened and critically endangered populations of resident killer whales that live off the coast of British Columbia.<sup>41</sup>

**We must do better, because our US neighbours certainly are.**

PHOTO: MICHELE VERDURE

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# Taking Cruise Ship Pollution Seriously

Growing recognition of the significant environmental impacts of a booming cruise industry has encouraged national governments to pass laws and regulations that significantly reduce the amount of pollution dumped into the air and water. However, **Canadian regulation of cruise ship pollution lags far behind the regulatory regimes in other countries** and, significantly, is much weaker than in the US states with whom we neighbour on the Pacific Ocean and share the West Coast cruise industry.



## US Federal Laws and Regulations

The US Clean Water Act, passed in 1972, lays out the groundwork for regulating pollution in the ocean and all other US waters.<sup>42</sup> Specifically, Section 312 prohibits the discharge of untreated or inadequately treated sewage into the navigable waters of the US, within 3 nm of shore. This is where the majority of West Coast cruise ships spend the most time.<sup>iii</sup> It also requires ships to use Marine Sanitation Devices (MSDs), certified by the US Coast Guard, to prevent the discharge of untreated sewage.<sup>43</sup> The implementing regulations of the Clean Water Act require that treated sewage discharged from ships must not exceed a fecal coliform count greater than 200/100 mL, nor suspended solids greater than 150 mg/L.<sup>44</sup> Beyond the 3 nm limit, raw sewage can be dumped into the ocean.<sup>45</sup> These federal standards, updated in the 1980s, are only slightly better than Canada's standards, and are also outdated and ineffective for adequately regulating cruise ship pollution.<sup>46</sup>

**The US Clean Water Act... Section 312 prohibits the discharge of untreated or inadequately treated sewage into the navigable waters of the US, within 3 nm of shore. This is where the majority of West Coast cruise ships spend the most time.**

PHOTO: SHUTTERSTOCK

<sup>iii</sup>In 2018, the US federal government enacted the *Vessel Incidental Discharge Act*, which will restructure the regulation of discharges from vessels including cruise ships. However, the regulations that will implement the Act are not anticipated to be finalized until 2022.



an average one-week Alaska cruise will generate approximately 25,000 gallons of oily bilgewater.



PHOTO: SHUTTERSTOCK

**Section 311 of the Clean Water Act prohibits ships from discharging oil or hazardous wastes in harmful quantities in US navigable waters,** adjoining shorelines, or into waters of the contiguous zone (typically 12 nm from shore).<sup>47,48</sup> Regulations under the Clean Water Act define a “harmful quantity” as less than 15 parts per million without dilution. Ships must also use an oily-water separator and other equipment to ensure that harmful quantities of oil are not discharged into the sea.<sup>49</sup> **In cruise ships, the biggest risk of oily discharge comes in the form of bilge water,** which collects at the bottom of a ship’s hull from condensation, water-lubricated shaft seals, and propulsion cooling systems; an average one-week Alaska cruise will generate approximately 25,000 gallons of oily bilgewater.<sup>50</sup>

In 2009, **the US Environmental Protection Agency issued what’s known as the Vessel General Permit, which regulates greywater, scrubber washwater and some other waste streams not covered by the Clean Water Act.**<sup>51</sup> Cruise ships, in particular, may not discharge untreated greywater within 3 nm. Treated greywater may be released within 3 nm as long as it meets a standard that is even safer than for sewage; the monthly average for fecal coliform count cannot exceed 20/100 ml, and not more than 10% of samples can exceed 40/100 ml.

**The Vessel General Permit also regulates scrubber washwater, and includes discharge standards consistent with Section 10 of the International Maritime Organization 2009 Guidelines for Exhaust Gas Cleaning Systems.**<sup>52</sup> Within 3 nm, the VGP prohibits discharge of oil, sludge or residues generated from separating particulate matter and oil from scrubber washwater, and sets numeric limits for

concentrations of a number of harmful pollutants, including pH, PAHs, suspended particulate matter, and nitrates and nitrites.<sup>53</sup> However, as noted above, **there is evidence that contaminants that would have constituted sludge if they were separated from scrubber washwater are being discharged anyway.** It appears that operators bypass the prohibition on sludge discharges by bypassing the separators that would remove these contaminants from the washwater.<sup>54</sup>

The Vessel General Permit also mandates ongoing monitoring and analysis of regulated pollutants and reporting to the Environmental Protection Agency to demonstrate the effectiveness of the ship’s treatment systems. However, **these reporting systems rely on self-reporting and are unreliable.** Without independent third parties (like Alaska’s Ocean Rangers Program) onboard ships to verify results, it is difficult to know whether waste streams from cruise ships meet regulatory standards.

Despite this long list of federal laws and regulations, the health of US coastal waters has been imperiled by regulatory loopholes, ineffective treatment systems, and cruise industry lawbreaking. **In response, several states have implemented their own protective measures to curtail the pollution burden from cruise ships in recent years.**

# Alaska-specific Regulatory Regime

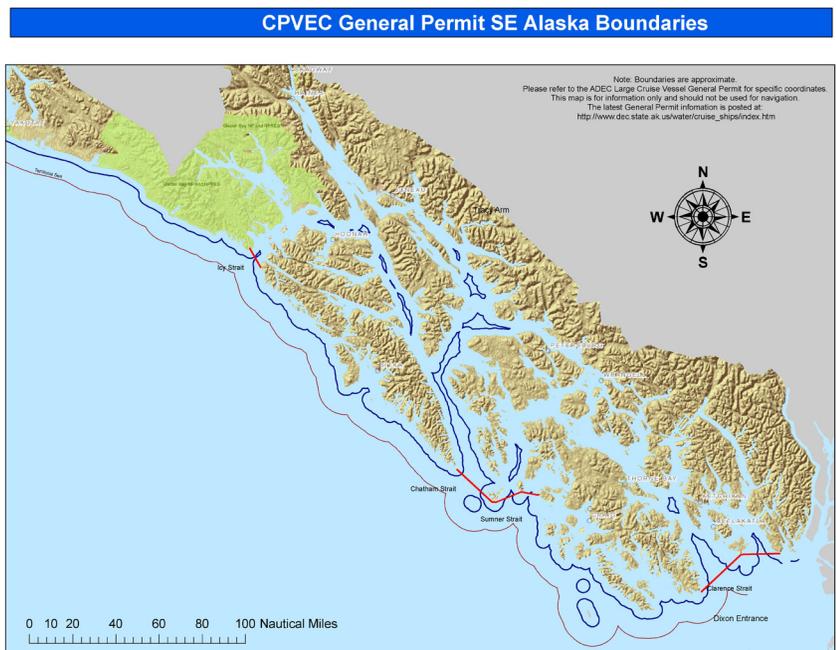
PHOTO: LEMBI VIA SHUTTERSTOCK

**Southeast Alaska is one of the busiest cruise destinations in North America and one of the top six in the world.** Cruise ship visits have skyrocketed here over the last 25 years, and more trips and bigger ships have increased cruise ship tourism by 50 per cent over the last decade alone. These floating resorts bring more than 1.3 million passengers to the coast of Alaska each year, and can bring as many as **15,000 visitors to Juneau, a city of 32,000, in a single day.**<sup>55</sup>

In the late twentieth century, federal and state lawmakers grew increasingly concerned about the large number of cruise ships visiting, and polluting, the coastal waters off Alaska. **Between 1999 and 2001, cruise ships made 39 illegal discharges in state waters.**<sup>56</sup> In July 2001, the state legislature responded by passing the *Commercial Passenger Vessel Environmental Compliance Statutes* to establish the Commercial Passenger Vessel Environmental Compliance (Cruise Ship) Program.<sup>57</sup> **Sixteen months later, the Commercial Passenger Vessel Environmental Compliance Regulations were put in place** to regulate the discharge of sewage from cruise ships within Alaska state waters.

In addition to the federal laws and regulations mentioned above, **these Alaska statutes prohibit the discharge of untreated sewage within state marine waters** (i.e. within 3 nm), and set up a “verified program of sampling, testing and

reporting.” If cruise ships wish to discharge treated sewage into state waters, each vessel must apply for and receive permission under the Large Commercial Passenger Vessel Wastewater Discharge General Permit (aka Large Cruise Ship General Permit).<sup>58 59</sup> Discharged sewage and greywater must not exceed average monthly fecal coliform counts of 14/100 ml (and a daily max of 40/100 ml) and suspended solids must average less than 30 mg/ml (with a daily maximum of 150 mg/ml). If a ship does not receive permission



<https://dec.alaska.gov/media/6404/cruise-gp-map.jpg>

PHOTO: LEMBI VIA SHUTTERSTOCK

under the General Permit, it must store sewage and greywater on-board and discharge the waste outside of Alaska's jurisdiction. Theoretically, waste discharges could be made in a port reception facility. In practice, it is either 3 nm miles from shore in the US (i.e. outside of Alaskan jurisdiction in the Alexander Archipelago) or under Canadian jurisdiction.<sup>60</sup> Data from Vesseltracker.com indicates few cruise ships make the extra three-mile trip outside Alaskan jurisdiction just to dump sewage.

**An additional federal bill, known as the Murkowski Bill, was passed to protect isolated pockets of US federal waters surrounded by Alaskan state waters,** known as “doughnut holes”. Cruise ships had been habitually entering these federal water enclaves to discharge wastewater without having to meet higher water quality standards.<sup>61</sup> These areas, referred to as the “applicable waters of Alaska,” are defined as the waters of the Alexander Archipelago, the Kachemak Bay National Estuarine Research Reserve, and the navigable waters of the United States within the State of Alaska.<sup>62</sup>

The Murkowski Bill prohibits the discharge of untreated sewage from a cruise vessel anywhere within the applicable area.<sup>63</sup> It also prohibits the discharge of treated sewage unless the vessel is more than 1 mile from shore and travelling at a speed of more than 6 knots, and the discharge meets effluent discharge standards.<sup>64</sup> To discharge treated sewage closer than 1nm and/or travelling slower than six knots,

the effluent must meet more stringent treatment and effluent standards. The cruise ship must also certify that it has completed a self-test.<sup>65</sup> If all standards are met, the ship may receive permission from the US Coast Guard to discharge.

**Alaska has implemented the most comprehensive cruise ship pollution-regulation regime** for the journey of the vast majority of ships in the Alaska cruise industry. (A very few ships come from California each year, which has stronger overall regulations, but the vast majority of Alaska-bound ships depart from either

Seattle, Vancouver or Victoria.) Alaska's fecal coliform and suspended solids limits for sewage are 10 times stronger than US federal Clean Water Act regulations and 18 times more stringent than Canadian allowances for fecal coliform and suspended solids in treated sewage discharge.

Alaska's fecal coliform and suspended solids limits for sewage are 10 times stronger than US federal Clean Water Act regulations and 18 times more stringent than Canadian allowances

Alaska's Ocean Ranger Program also requires US Coast Guard-licensed marine engineers on board vessels to act as independent observers monitoring whether State environmental and marine discharge requirements are met.<sup>66</sup> Apart from a few high-profile cases of cruise ship misdeeds—Holland America's Westerdam unlawfully dumped 26,000 gallons of greywater into Glacier Bay National Park in 2018, for example<sup>67</sup>—this program has greatly reduced illegal discharges of pollution.

PHOTO: ONDREJ PROSICKY VIA SHUTTERSTOCK

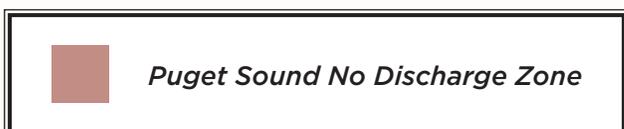
## Washington State-specific Regulatory Regime

In 2018, the EPA approved a no discharge zone for Puget Sound and certain adjoining areas

Like Alaska, cruise ship traffic to Washington State has increased dramatically over the last two decades. The Port of Seattle now brands itself as the “premier hub for Alaska and Pacific Northwest cruises.” Over 200 vessels bring more than a million cruise passengers to the city each year. **Like Alaska, cruise ship traffic to Washington State has increased dramatically over the last two decades. The Port of Seattle now brands itself as the “premier hub for Alaska and Pacific Northwest cruises.” Over 200 vessels bring more than a million cruise passengers to the city each year.**

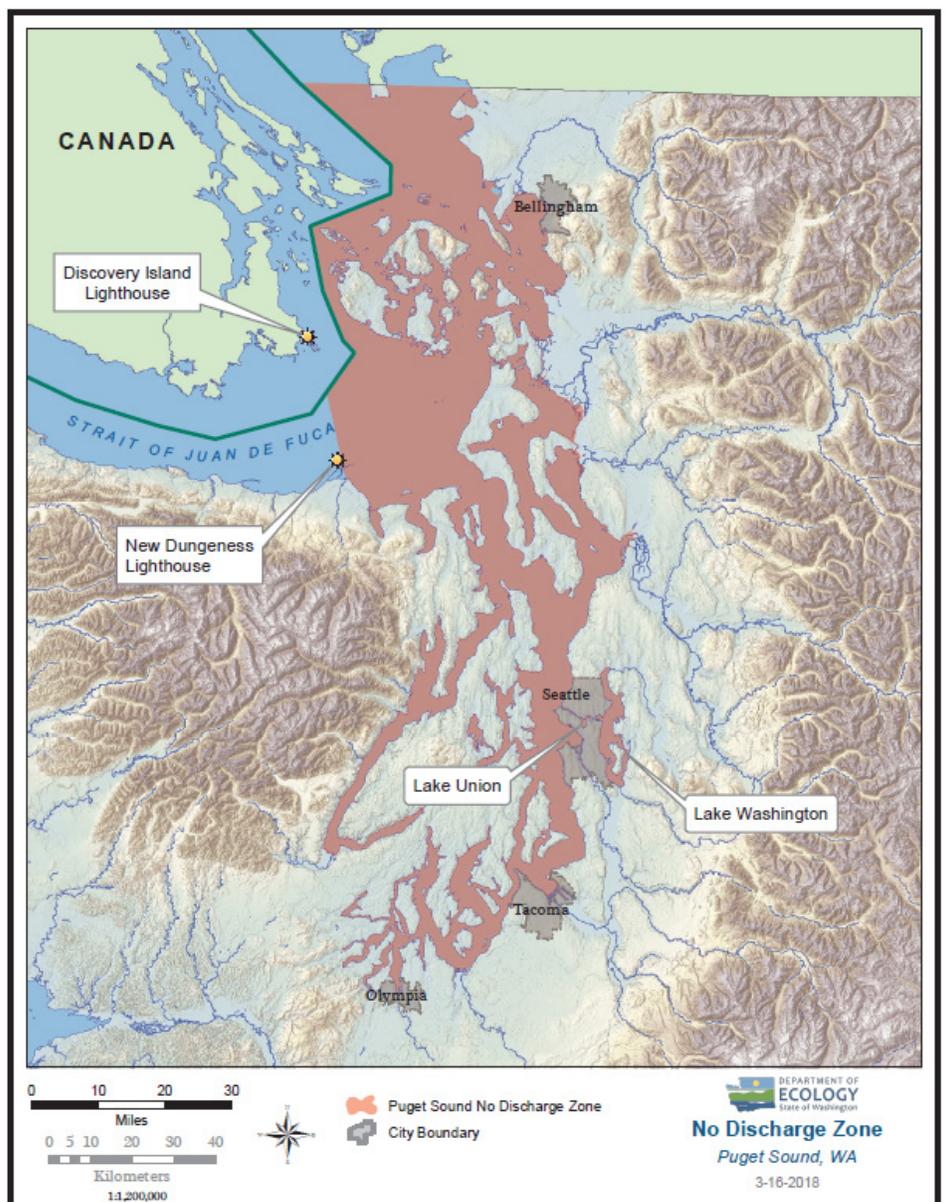
Washington State officials decided to take additional measures to protect their coastal waters from cruise ship pollution as escalating cruise traffic brought increasing volumes of sewage, greywater, and other hazardous discharges. In 2018, the EPA approved a no discharge zone for Puget Sound and certain adjoining areas under Section 312 of the Clean Water Act. This is **one of more than 90 such zones the US has designated in order to protect public health, water quality, and sensitive marine resources.**<sup>69</sup>

**All marine vessels (including cruise ships) are prohibited from discharging treated or untreated sewage in the no discharge zone,** which encompasses all marine



waters of Washington State from a line between the New Dungeness and Discovery Island lighthouses to the Canadian border (approximately 6,000 square kilometres). The Puget Sound no discharge zone also includes the fresh waters of Lake Washington and Lake Union and all the water bodies that connect Lake Washington and Lake Union to Puget Sound.<sup>70</sup> Within these boundaries, all commercial and recreational boaters are required to hold sewage on board their vessels for disposal at land-based pump-out facilities or outside the boundaries of the zone.<sup>71</sup>

Discharges from cruise ships in Washington State are also restricted by a voluntary Memorandum of Understanding (MOU) between the Washington Department of Ecology, Cruise Lines International Association (North West and Canada), and the Port of Seattle.<sup>72</sup> This MOU covers all waters in Washington State's jurisdiction south and east of the Canadian border, including ocean waters up to 3 miles from shore and the Olympic Coast National Marine Sanctuary. **The MOU bans sewage and greywater discharges to waters of the state from cruise ships unless treated by AWTs, a much more effective means of treating wastewater than the MSDs required by federal law.** The MOU also limits discharges of oily bilge water, prohibits discharges close to shellfish beds, allows the Department of Ecology to inspect wastewater treatment systems on cruise ships, and requires cruise lines to sample and monitor wastewater discharges from its ships.

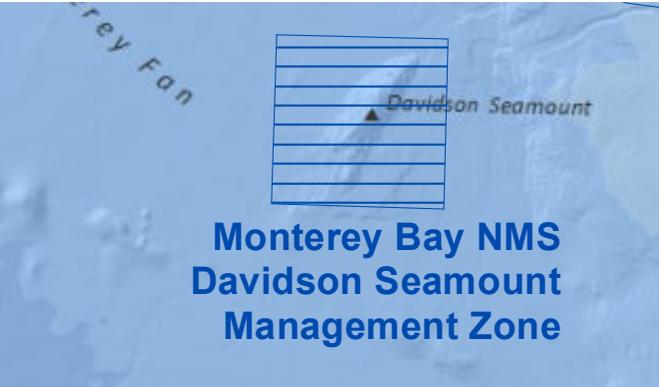


<https://ecology.wa.gov/Water-Shorelines/Puget-Sound/No-discharge-zone#recreation>

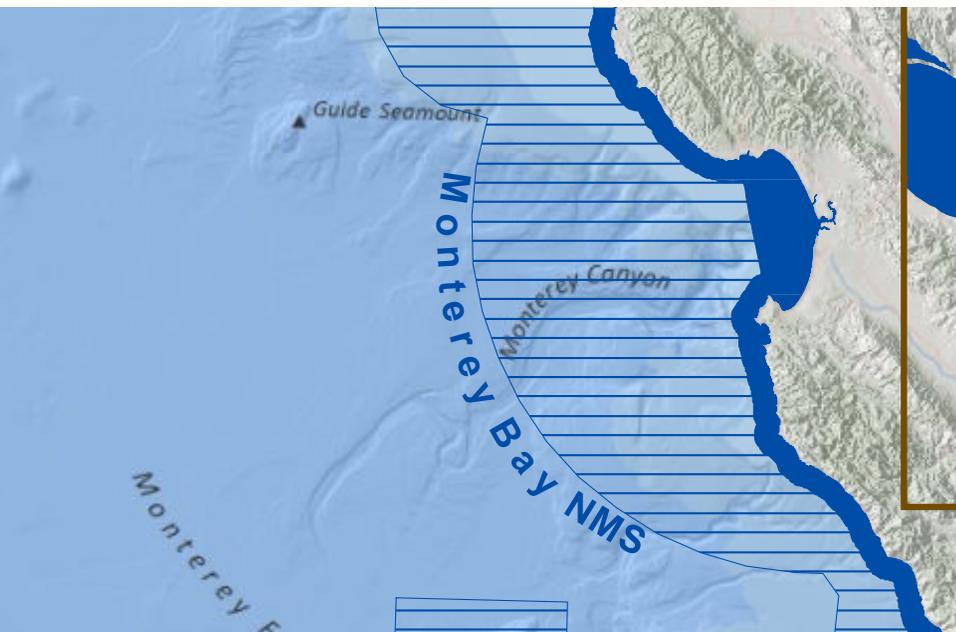


# California-related Regulatory Regime

PHOTO: PIXABAY



The state of California has implemented the most stringent cruise ship pollution prevention regime on the West Coast.



The impetus for these regulations was a massive pollution event in 2002, when the *Crystal Harmony* dumped more than 36,000 gallons of untreated greywater and treated sewage and bilgewater in the Monterey Bay Marine Sanctuary. This event, and a tremendous increase in cruise ship traffic, pushed the State of California to pass laws limiting cruise ship pollution.<sup>73</sup>

**The state responded swiftly, enacting a law that has been refined and amended so that it bans passenger ships from discharging greywater, sewage, hazardous waste, sewage sludge and oily bilge water.<sup>74</sup>**

	No Discharge Zone for Large Passenger & Large Oceangoing Vessel (Final 2012)
	National Marine Sanctuaries* (NOAA)

\*Large passenger and large oceangoing vessels are prohibited from discharging any sewage in these National Marine Sanctuaries

**In 2012, the EPA established the California No Discharge Zone**, prohibiting the discharge of all sewage (treated or not) from all large passenger vessels of 300 gross tons or greater in California's jurisdiction (i.e. within 3 nm of shore and all bays and estuaries subject to tidal influence).<sup>75</sup>



Figure 2 <https://19january2017snapshot.epa.gov/www3/region9/water/no-discharge/overview.html>

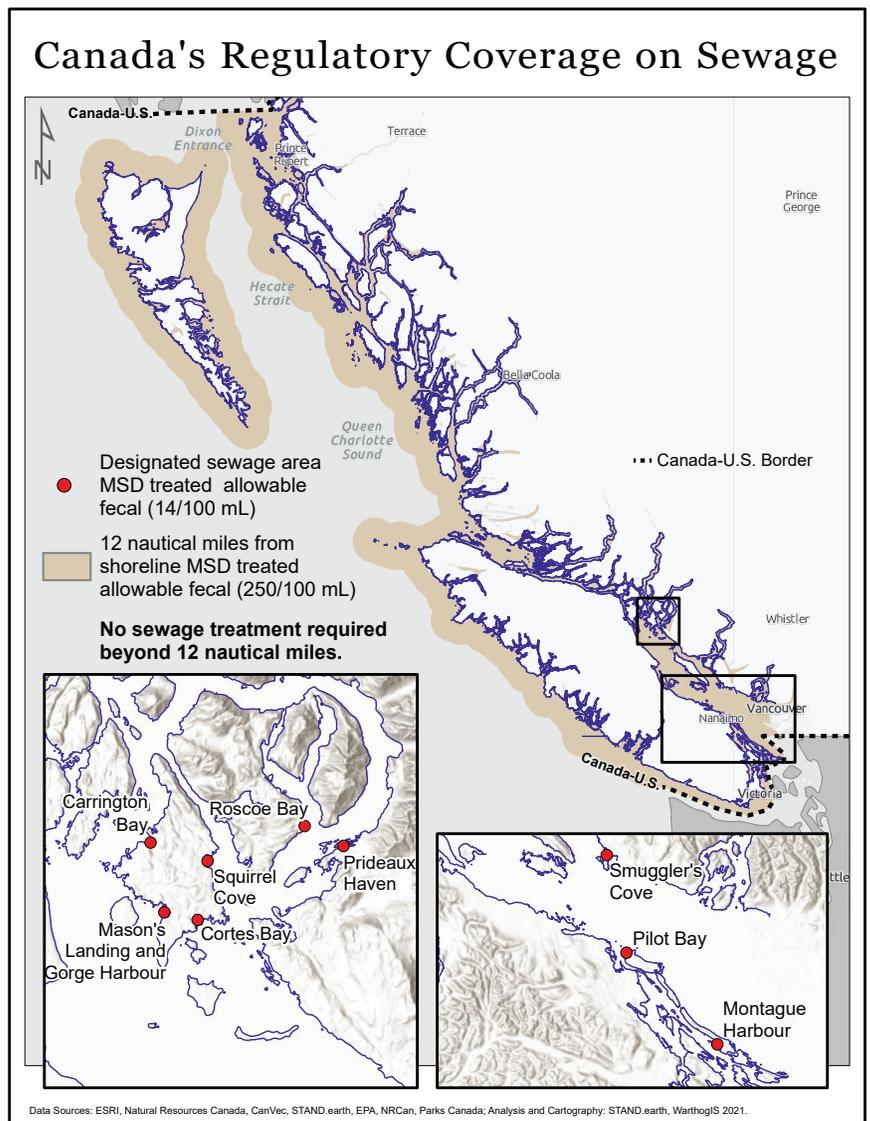
**Additionally, California does not allow the use of scrubbers to comply with the 0.1% sulfur limit in state waters and within 24 nm of the California coast, and requires cruise ships to switch to low-sulfur fuels.**<sup>76</sup> Numerous countries and/or ports have followed California's lead, forbidding the use of open-loop scrubbers over concerns that scrubber washwater effluent is harmful to the environment.<sup>77</sup>

Today, the Port of Los Angeles sees over 100 ship calls and around 600,000 passengers, all while protecting its coastal waters and marine ecosystems.<sup>78</sup>

# Canada's Cruise Ship Pollution Crisis

PHOTO: PIXABAY

Canada's cruise ship regulations on the West Coast have long been more lax than in West Coast US States. As the cruise ship industry has grown, so has public concern for the environmental impacts of all of these ships.<sup>79</sup> **In 2012, Canada enacted the Vessel Pollution and Dangerous Chemicals (VPDC) Regulations to regulate discharges from cruise ships**, and other marine vessels, under Canadian jurisdiction.<sup>80</sup> The regulations have been amended several times since, but are still not as stringent as their American counterparts. The *Arctic Waters Pollution Prevention Act* also plays a role in regulating cruise ship discharges in the waters off Canada, but it does not apply to waters off the BC coast.



Prepared for Stand by Warthog/IS

In a few “designated sewage areas” near the Gulf Islands, sewage discharges must be passed through an MSD and have a fecal coliform count that is no greater than 14/100 ml, a conservative level that is not likely to be achieved by the use of an MSD.

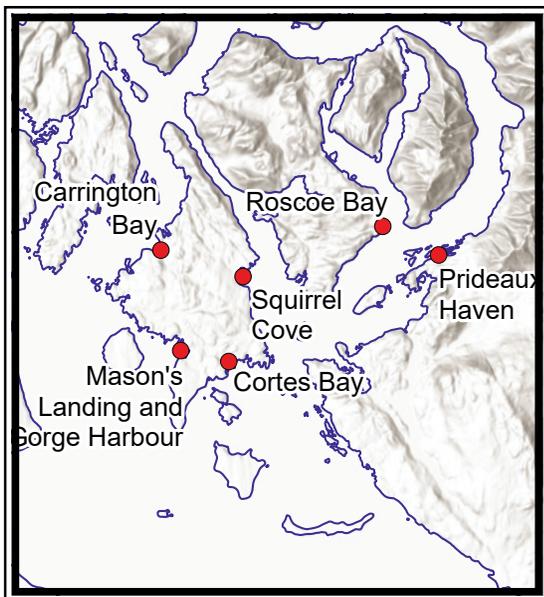
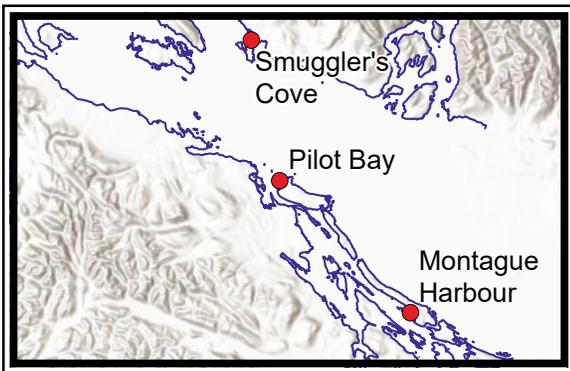


PHOTO: PIXABAY

The VPDC regulations state that any sewage discharge from a cruise ship must not contain any visible solids, cause a film, sheen, or discoloration on the water or shoreline, or cause “sewage sludge or an emulsion to be deposited beneath the surface of the water or on its shorelines.”<sup>81</sup>

**This is a standard that is difficult to enforce.** Although they mandate the use of MSDs within twelve nm of shore, which is considerably farther than the limits used in most of the US West Coast

states, MSDs are known to be an outdated and ineffective wastewater treatment technology, leaving fecal coliform levels as high as 9-24 million colonies per 100 ml.<sup>82</sup> Within 12 nm of shore cruise ships are required to maintain a fecal coliform count that is equal to or less than 250/100 mL in discharged sewage.<sup>83</sup> This limit is much higher than what is allowed in Alaska and California jurisdictions, as well as most of Washington State jurisdiction. **In a few “designated sewage areas” near the Gulf Islands, sewage discharges must be passed through an MSD and have a fecal coliform count that is no greater than 14/100 ml,<sup>86</sup> a conservative level that is not likely to be achieved by the use of an MSD.** However, these areas are too small to make a meaningful difference to the pollution loads of the surrounding waters. Beyond 12 nm of shore, cruise ships can dump as much untreated sewage as is onboard, as long as it is discharged at a “moderate rate”<sup>iv</sup> and the cruise ship is proceeding at a speed of at least 4 knots.<sup>85</sup>



● Designated Sewage Area

these areas are too small to make a meaningful difference to the pollution loads of the surrounding waters.

<sup>iv</sup>Moderate rate “means a rate that on average over any 24-hour or shorter period of discharge is not greater than the maximum permissible discharge rate calculated in accordance with section 3.1 of the Annex to the Recommendation on Standards for the Rate of Discharge of Untreated Sewage from Ships, IMO Resolution MEPC.157(55), and that over any hourly period is not more than 20% greater than that rate.”

# Canadian regulations for greywater are even weaker than for sewage.

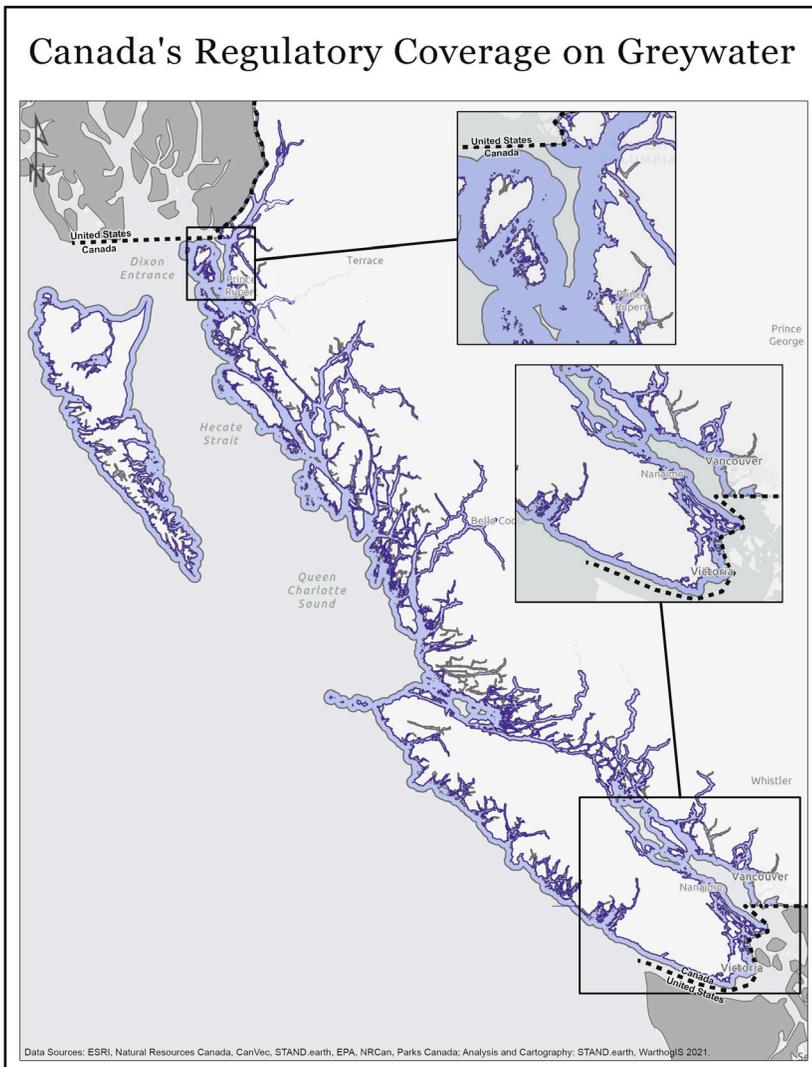
The VPDC Regulations did not specifically address the discharge of greywater until 2013, when they were amended to ensure the release of greywater in non-Arctic waters does not “deposit solids in the water or leave a sheen on the water.”<sup>86</sup> Within 3 nm of shore, “new passenger vessels” (built or converted after 2013) carrying more than 500 passengers in non-Arctic waters are required to pass the greywater generated through an MSD—rather than a more effective AWTS—prior to discharge into the sea; discharge of untreated greywater may take place more than 3 nm from shore.<sup>87</sup> **This means that the only greywater discharge restriction on cruise ships built prior to 2013—which was 22 of the 25 cruise ships plying the waters off BC’s West Coast in 2019—is that the discharge must not include solids or leave a sheen on the water.**<sup>v</sup> Compare this to the standards in the US EPA’s Vessel General Permit, which contains strict limits on the amount of fecal coliform that can be released in greywater. State laws in Alaska and Washington are even more protective.

**Oil is the only cruise ship pollutant addressed in a way that is consistent with US standards.** The VPDC Regulations allow for discharge of an oily mixture if a vessel is “en route,” the discharge is processed through oil filtering equipment, and the discharge has an oil content of less than 15 parts per million. The oil filtering equipment on the vessel must trigger an alarm and automatically halt discharge if the oil content exceeds this limit.<sup>88</sup>

As for scrubber washwater, the VPDC Regulations require that if a vessel operates a scrubber that has been certified in accordance with IMO Guidelines, residues from the system

<sup>v</sup>These numbers are based on the 2019 cruise schedule for Greater Victoria Harbour.

## Canada's Regulatory Coverage on Greywater



Prepared for Stand by WarthogIS

	<p><b>3 nautical miles from shoreline MSD treated grey water required from passenger vessels build as or converted to passenger vessels after 2013</b></p>
	<p><b>No grey water requirements for these cruise ships beyond 3 nautical miles</b></p>
	<p><b>No grey water treatment required for any cruise ships build prior to 2013</b></p>



PHOTO: NPS/ KAITLIN THORENSEN

must be delivered to an onshore reception facility and the system must be operated, monitored, and recorded in accordance with the requirements of section 10 of the IMO Guidelines.<sup>89</sup> As of January 1, 2020, **most cruise ships will be outfitted with open-loop or hybrid exhaust gas scrubbers rather than switch to low-sulfur fuels to meet the IMO low-sulfur standards.** Like in the US, scrubber “residues” from open-loop systems are only generated if the operator chooses to use the separator to remove these pollutants.

As previously discussed, it appears that **the vast majority—if not all—operators with open-loop systems bypass this equipment and discharge the scrubber washwater without separating residues.** This loophole has resulted in the discharge of 31 billion litres of polluted washwater off of the coast of BC every year from cruise ships alone.<sup>90</sup> Canada has accepted by reference the rules the IMO set out in 2008, without amendment or adjustment for the Canadian context or sensitive ecosystems. As California has done, these regulations need to be amended to take into account the cumulative effects of increasing pollution burdens resulting from the rapid growth of scrubber use, and the impact on species already threatened and endangered, like southern and northern resident killer whale populations.<sup>91</sup>

Canadian laws and regulations do require the reporting of illegal discharges and discharges in emergency situations,

This loophole has resulted in the discharge of 31 billion litres of polluted washwater off of the coast of BC every year

we cannot confirm that the Minister of Transport has ever considered it necessary to test the compliance of sewage discharges on any cruise ship.

but not regular monitoring and analysis of regulated pollutants or reporting to the relevant government agency or in a publicly transparent fashion. The Minister of Transport can require a ship tests its discharges.<sup>92</sup> However, due to a lack of transparency in the Canadian regime, we cannot confirm that the Minister of Transport has ever considered it necessary to test the compliance of sewage discharges on any cruise ship. Canada does not train or certify third-party marine engineers to go on board vessels to act as independent observers or inspect while the vessel is underway. **Given the number of violations that have been caught by Alaska’s Ocean Ranger Program every year, this is a serious problem with Canada’s “we trust you” policy.**

Transport Canada has published the *Pollution Prevention Guidelines for the Operation of Cruise Ships Under Canadian Jurisdiction*.<sup>93</sup> These non-binding guidelines “provide a clear indication to cruise ship operators of the procedures they must develop in order to comply with Canadian legislation and at the same time include practices that the cruise ship operators have agreed to follow that exceed current regulatory requirements.” **However, anything in these guidelines apart from what has been detailed above is voluntary and unenforceable,** and therefore of little use in preventing cruise ships from polluting the Pacific coastal waters off of Canada.



**The greatest problem with Canada's outdated regulatory regime is that it incentivizes cruise companies to dump the enormous volumes of wastewater generated onboard in waters off Canada**

The greatest problem with Canada's outdated regulatory regime is that it incentivizes cruise companies to dump the enormous volumes of wastewater generated onboard in waters off Canada. Cruise ships are prohibited from discharging sewage and greywater in the vast majority of waters off and within Washington State, and many of the ships either do not have a permit to dump under the Alaskan regime or choose not to. (In 2019, 14 of 40 large cruise ships didn't have a permit to discharge sewage or greywater in Alaskan jurisdiction, and one other ship did have a permit but committed not to discharge.<sup>94</sup>) These vessels must dump that waste somewhere, vso at least one-third of Alaskan cruise ships either dump it more than 3 nm from the Alaska shore or on their days-long voyages through the waters off Canada.

This is the unfortunate reality behind the refrain that the waters off of BC have become the cruise industry's toilet bowl.



PHOTO: PIXABAY

# Recommendations for the regulation of cruise ship pollution in BC waters



**As COVID-19 vaccines spread throughout the world and cruise ships push to return, regulations must be updated to prevent billions of litres of pollution from being left in the wake of these floating cities.**

We make the following recommendations to Transport Canada in its work with Environment and Climate Change Canada and the Department of Fisheries and Oceans to balance the return of cruise tourism with the need for stronger ocean and coastal protection:

**01**

Prohibit cruise ships from using scrubbers to comply with the sulfur fuel-standard limits set forth in the North American Emissions Control Area and mandate the use of low-sulfur distillate fuels (as California does), namely marine gas oil.

**02**

Set standards for treated sewage and greywater equivalent to or stronger than those under the Alaska Large Commercial Passenger Vessel Wastewater Discharge General Permit and under the US EPA Vessel General Permit through the entire Canadian territorial sea.

**03**

Seek approval from the International Maritime Organization to extend the prohibition on the discharge of untreated sewage and greywater and the standards for treated sewage and wastewater to the Canadian Exclusive Economic Zone in the Pacific Ocean.

**04**

Require regular independent third-party monitoring while ships are underway to ensure environmental and marine discharge requirements are met. Fund this program by a per-passenger fee.

**05**

Designate no discharge zones (as in Puget Sound) in sensitive areas to protect human health and environmental features such as shellfish beds, aquaculture sites and critical habitat for species at risk. This should include, at a minimum, marine protected areas, the entirety of the Great Bear Sea, as well as critical habitat for endangered and threatened species like the southern and northern resident killer whale populations.

**06**

Work with the US federal government, Pacific coast state and provincial governments and Indigenous nations and Tribes to create a harmonized, world-class regulatory regime to limit cruise ship pollution and protect human health, sensitive marine ecosystems and species at risk in the Pacific Coast portion of the North American Designated Emission Control Area.

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<sup>72</sup> "Memorandum of Understanding Cruise Ship Operations in Washington State." March 2016. <https://ecology.wa.gov/DOE/files/cf/cffa5484-abb8-4cd6-ba8d-3d346a0380dd.pdf>, accessed Nov. 16, 2020.

<sup>73</sup> Ibid supra 46.

<sup>74</sup> Cal. Pub. Res. Code § 72401. <https://casetext.com/statute/california-codes/california-public-resources-code/division-38-california-clean-coast-act/chapter-1-findings-and-declarations/section-72401>, accessed Dec. 21, 2020.

<sup>75</sup> "No Discharge Zones in Region 9—California." United States EPA. <https://19january2017snapshot.epa.gov/www3/region9/water/no-discharge/index.html>, accessed Nov. 16, 2020.

<sup>76</sup> 13 CCR, section 2299.2. Fuel Sulfur and Other Operational Requirements for Ocean-going Vessels within California Waters and 24 Nautical Miles of the California Baseline.

<sup>77</sup> Ibid supra 29.

<sup>78</sup> The Port of Los Angeles. Cruise statistics. <https://www.portoflosangeles.org/business/80statistics/cruisestatistics>, accessed December 15, 2020.

<sup>79</sup> Nowlan, Linda and Kwan, Ines "Cruise Control: Regulating Cruise Ship Pollution on the Pacific Coast of Canada" West Coast Environmental Law. 2001

<sup>80</sup> *Vessel Pollution and Dangerous Chemicals Regulations*, SOR/2012-69, s 96(2).

<sup>81</sup> Ibid.

<sup>82</sup> Gorecki, Karen and Wallace, B. "Ripple Effects: The Need to Assess the Impacts of Cruise Ships in Victoria, B.C." Vancouver Island Public Interest Research Group. 2003; Ibid. s 96(1).

<sup>83</sup> Ibid, supra 80 96(1)(a).

<sup>84</sup> Ibid. VPDC Regulations s 96(1)(b).

<sup>85</sup> Ibid. supra 80 96(1)(d)(i).

<sup>86</sup> Ibid, supra 80 131.1(4).

<sup>87</sup> Ibid, supra 80 131.1(5).

<sup>88</sup> Ibid supra 80 29-31

<sup>89</sup> Ibid supra 80 111(6).

<sup>90</sup> Ibid supra 22.

<sup>91</sup> Ibid, supra 30

<sup>92</sup> Ibid supra 80 97(2)

<sup>93</sup> Transport Canada. "Pollution Prevention Guidelines for the Operation of Cruise Ships Under Canadian Jurisdiction." 2013.

<sup>94</sup> Ibid supra 16.

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