Discharges to the sea from Baltic Sea Shipping in 2024

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Discharges to the sea from Baltic Sea shipping in 2006-2024

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Key Messages

1. **The total volume of discharge water from Exhaust Gas Cleaning Systems (EGCSs or scrubbers) was about 378 (2023:362) million cubic meters. This was almost completely (99.99%) from open loop scrubbers.** During the year 2024, there were 840 (2023:815; +3.1%) vessels operating the Baltic Sea area using scrubbers.

2. Bilge water releases from the Baltic Sea fleet were estimated as 257,000 cubic meters (-1.2%). This considers only those ships which have been identified with an IMO number. Considering all vessels, the bilge water releases were estimated as 342,000 cubic meters.

3. Estimated ballast water volume release to the Baltic Sea was 461 million tonnes (2023: 472 million tonnes; -2.3%). This volume contains both untreated and treated ballast water discharge.

4. **Sewage discharge to the sea was predicted to be 621,000 cubic meters (+2.4%)**. Sewage volumes are significantly lower than in 2019 (1.8 million m^3). Since June 2021, it is prohibited to release untreated sewage to the Baltic Sea from passenger ships, unless visiting St. Petersburg from outside the Baltic Sea area. In 2024, very limited cruise ship traffic between Vyborg and St Petersburg was observed.

5. Grey water discharge was estimated to be 7.4 million cubic meters(-1.6%), which is still less than in 2019, before the pandemic (2019: 8.5 million m^3). **Passenger ships are responsible for over 85% of grey water discharges.**

6. **Total Nitrogen discharge was estimated as 490 tonnes (same as in 2023), which were from food waste (97 tonnes), sewage water (143 tonnes) and grey water (250 tonnes)**. Here, it was assumed that the nutrient removal of sewage treatment plants does not lead to any significant reduction in N or P, and passenger ships discharge all their sewage in port reception facilities.

7. **Total Phosphorus discharge was estimated as 135 tonnes (2023: 137 tonnes, -1.3%).** These were from food waste (29 tonnes), sewage (13 tonnes) and grey water (93 tonnes). In 2024, **over 70% of the phosphorus was from grey water discharges**.

8. **Stern tube oil leakage was assumed to be about 2710 (+0.2%; 2023: 2703) cubic meters**. This is an order of magnitude estimate because experimental data concerning leakages are scarce.

9. Release of six anti-fouling paints were modeled. The wet surface area of large vessels is about 54.6 million square meters and the contribution of the 500 000 small boats around the Baltic Sea coastline is estimated at about 7 million square meters. **About 550 tonnes of anti-fouling paint residues are**

released from ships' hulls to the sea, which does not include the contribution from small boats. Of the estimated amount of antifouling paint released for ships, about 83% is Copper(II)oxide (CuO).

Harmful discharges from ships in the Baltic Sea area

This work reports the Baltic Sea ship discharges, including contributions from wind, waves, sea currents and ice cover. The STEAM model used in this work was version 5.1 (Jalkanen et al., 2009, 2012, 2018; Johansson et al., 2013, 2017; Majamäki et al., 2025). The whole timeseries from 2006 to 2024 was updated for this report using Copernicus atmosphere and ocean datasets (Copernicus Marine Service Information (CMEMS), 2024) to describe the ambient conditions.

1. Discharges from ships to water

The parameters used in modeling discharges from ships are listed in Table 1.

Table 1 The parameters used in discharge modelling of water pollutants

Modeled quantity	Main contribution	Quantity
Open loop scrubber discharge water	Used engine kWh, equipment type	Volume
Closed loop scrubber discharge water	Used engine kWh, equipment type	Volume
Bilge water release	Vessel type, engine kW, time	Volume
Ballast water	Vessel type, DWT	Volume
Sewage release	Vessel type, person days, capacity utilization, time	Volume
Sewage Nitrogen	Vessel type, person days, capacity utilization, time	Mass
Sewge Phosphorus	Vessel type, person days, capacity utilization, time	Mass
Grey water release	Vessel type, person days, capacity utilization, time	Volume
Food waste	Vessel type, person days, capacity utilization, time	Mass
Food waste Nitrogen	Vessel type, person days, capacity utilization, time	Mass
Food waste Phosphorus	Vessel type, person days, capacity utilization, time	Mass
Stern tube oil	Vessel type, time	Mass
Release of antifouling paint (Cuprous Oxide)	Vessel wetted surface, operation area, paint type, time	Mass
Release of antifouling paint (Copper Pyrithione)	Vessel wetted surface, operation area, paint type, time	Mass

Release of antifouling paint (Zinc Oxide)	Vessel wetted surface, operation area, paint type, time	Mass
Release of antifouling paint (Zinc pyrithione)	Vessel wetted surface, operation area, paint type, time	Mass
Release of antifouling paint (DCOIT, 4,5-Dichloro-2-octyl-4-isothiazolin-3-one)	Vessel wetted surface, operation area, paint type, time	Mass
Release of antifouling paint (ZINEB, zinc ethane-1,2-diylbis(dithiocarbamate))	Vessel wetted surface, operation area, paint type, time	Mass

Some of the discharged quantities are reported in volumes instead of mass. For example, determining the copper release from open loop scrubber discharge water to the sea requires water analysis results (copper concentration in effluent). Discharges of contaminants can be derived for dozens of different compounds this way, instead of generating a map for each of them. Summary of discharges from various kinds of ships is indicated in Table 2, and nutrients are listed in Table 3. Appendix includes similar tables for all the studied years.

Table 2. Discharged water pollutants and contaminants from ships during 2024 in the Baltic Sea area.

2024	**Ballast** [million m3]	**STO*** [m3]	**Bilge** [10^3 m3]	**Scrubber (Open)** [10^3 m3]	**Scrubber (Closed)** [10^3 m3]	**Grey Water** [10^3 m3]	**Sewage** [10^3 m3]
RoPax_vessels	60.1	397.8	105.1	162072.7	50.5	4922.8	19.1
Vehicle_carriers	3.0	4.9	0.4	2813.1	0.0	2.7	2.0
RoRo_vessels	40.7	46.2	6.4	79783.3	2.9	295.0	212.1
Bulk_carriers	74.1	320.6	14.2	14274.3	0.5	120.8	86.8
General_cargo	53.0	1128.5	29.9	8601.8	7.6	215.4	150.0
Container_ships	59.8	123.0	10.1	44831.0	8.0	54.1	38.9
Reefers	1.8	22.2	1.6	4182.4	0.0	9.4	6.8
Tankers	148.2	403.2	26.3	37854.3	0.0	172.7	55.8
LNG_tankers	11.0	4.4	2.1	0.0	0.0	8.4	2.8
Gas_tankers	2.3	14.3	0.9	0.0	0.0	5.5	1.9
Passenger_ships	0.0	237.7	40.4	0.0	0.0	2011.0	0.2
Cruisers	7.4	6.7	9.1	23374.5	2.4	778.9	7.2
Fishing_vessels	0.0	279.9	17.4	0.0	0.0	76.2	5.9
Service_ships	0.0	215.7	32.3	0.0	0.0	102.5	19.2
Unknown	0.0	18.1	2.5	2333.6	0.0	6.3	1.8
Total, All	461	3516	342	380123	72	8961	651
Total, IMO numbered only	461	2710	257	377790	72	7395	621

*STO = Stern Tube Oil

A. Scrubber discharge water

Table 3 Discharge of nutrients from ships ship to the Baltic Sea in 2024.

2024	Sewage Nitrogen [tonne]	Food Waste Nitrogen [tonne]	Grey Water Nitrogen [tonnes]	Sewage Phosphorus [tonnes]	Food Waste Phosphorus [tonnes]	Grey Water Phosporus [tonnes]
RoPax_vessels	9.2	39.0	138.0	0.5	11.3	59.6
Vehicle_carriers	0.4	0.0	0.1	0.0	0.0	0.0
RoRo_vessels	39.5	4.0	10.9	3.9	1.2	4.7
Bulk_carriers	16.2	1.6	4.5	1.6	0.5	1.9
General_cargo	27.9	2.8	8.0	2.7	0.8	3.4
Container_ships	7.2	0.7	2.0	0.7	0.2	0.9
Reefers	1.3	0.1	0.3	0.2	0.0	0.1
Tankers	24.3	2.4	3.2	1.0	0.3	1.4
LNG_tankers	1.2	0.1	0.2	0.1	0.0	0.1
Gas_tankers	0.8	0.1	0.2	0.1	0.0	0.1
Passenger_ships	0.1	4.1	57.8	0.0	1.1	24.9
Cruisers	3.5	43.0	21.8	0.0	13.1	9.4
Fishing_vessels	4.3	0.4	2.2	0.1	0.2	0.9
Service_ships	2.8	0.3	1.3	0.2	0.1	0.6
Unknown	0.5	0.0	0.2	0.0	0.0	0.1
Total, All	152	100	260	14	30	113
Total, IMO numbered only	143	97	250	13	29	93

Three kinds of scrubbers (open, closed, hybrid loop) were included in the discharge water modeling, which was based on used engine power as a function of time. This allowed modeling of discharge water release based on engine kWh, on top of which additional power requirement (three percent for open loop, 0.5% for closed loop) of pumps was included. Hybrid scrubbers were run in open loop mode whenever possible considering the alkalinity of seawater and regional restrictions. For STEAM v5.1, discharge rules for scrubbers were updated to include the upcoming Finnish, Swedish and the Danish restrictions for open and closed loop systems.

The link to IMO Global Integrated Shipping Information System (GISIS) was established in this work, to get insight into global EGCS installations. Previously, scrubber installations were collected from scattered online data sources, and their numbers were underestimated. The IMO GISIS reports allow the determination of approval date and equipment type in a consistent manner. The data collected for the global fleet represents the situation of February 2024.

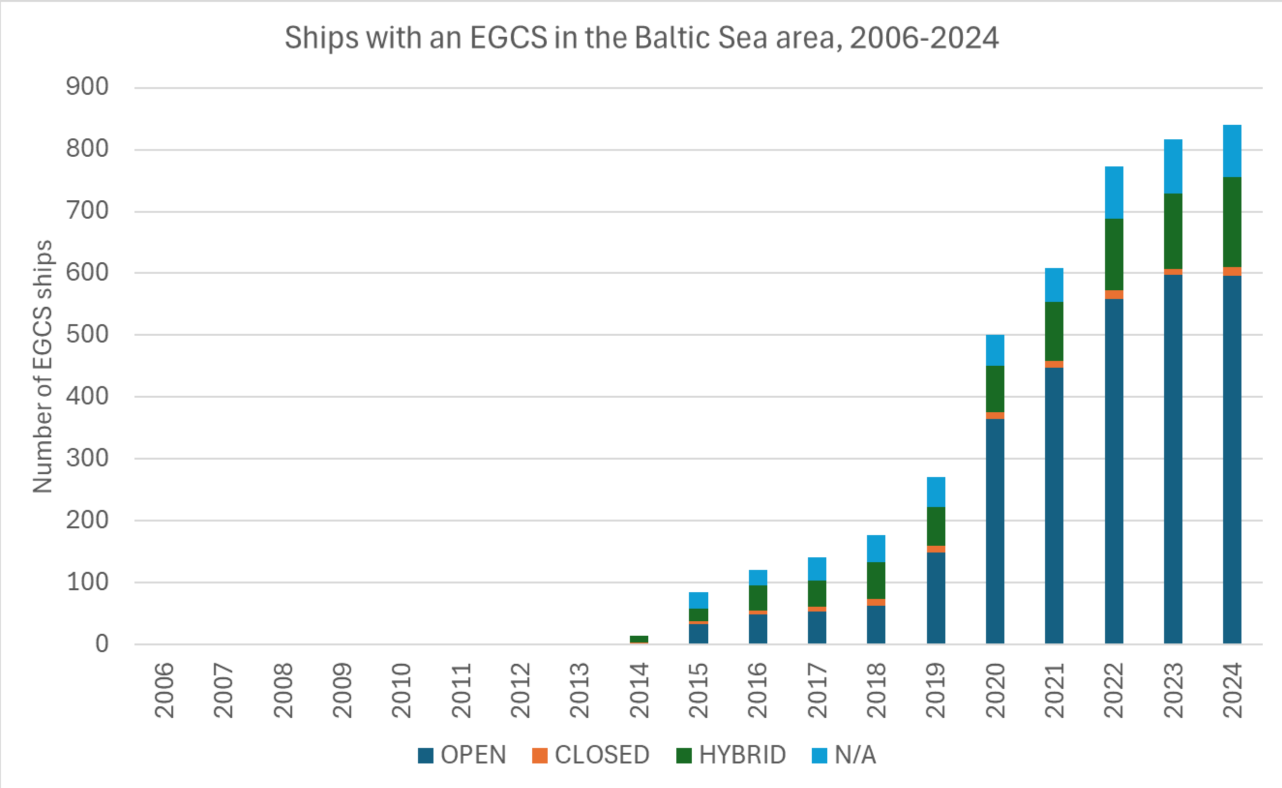


Figure 1 Development of the EGCS equipped fleet in the Baltic Sea area during 2006-2024. Unknown equipment type is listed, but for modeling purposes an Open Loop system is assumed for these cases.

During 2024, 840 (2023: 815) vessels operated a scrubber system in the Baltic Sea area (Figure 1 and Figure 2, Table 4). In the Baltic Sea region, 132 out of 815 (16%) are either closed or hybrid systems, whereas the share of open loop systems is 84%, if Unknown installations are assumed as Open loop systems. In the Baltic Sea fleet, almost two thirds of the open loop installations are in Crude Oil tankers, Bulk Cargo ships and Containerships.

Table 4 EGCS equipment type in various vessel types. This data is for year 2024 only.

TYPE	OPEN	CLOSED	HYBRID	#N/A
ROPAX	13	6	15	1
RORO CARGO	14	0	22	3
CRUISE SHIP	20	3	10	7
CONTAINERSHIP	78	1	60	4
VEHICLE CARRIER	10	0	16	0
CRUDE OIL TANKER	171	0	6	24
UNKNOWN	11	0	1	2
CHEMICAL TANKER	61	1	6	20
BULK CARGO SHIPS	134	2	2	18
GENERAL CARGO SHIP	56	1	2	1
REFRIGERATED CARGO SHIP	8	0	4	0
OIL PRODUCT TANKER	20	0	1	5
LPG TANKER	0	0	0	0
FISHING VESSEL	0	0	0	0
TOTAL	596	14	145	85

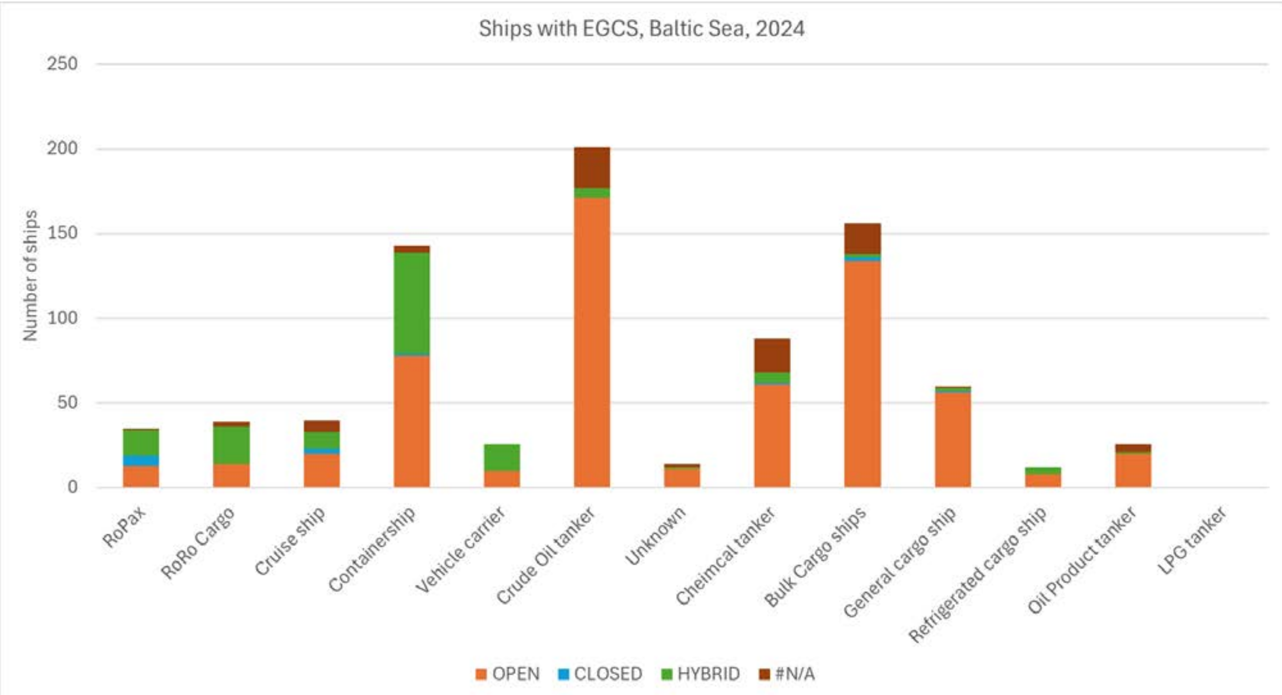


Figure 2 EGCS equipment type of various vessel types in the Baltic Sea area during year 2024. The N/A entry indicates a scrubber of unknown type, which is assumed to be Open Loop during STEAM runs.

The vessels equipped with EGCS operating in the Baltic Sea area released about 378 million cubic meters (2023: 362 million m^3) of discharge water into the sea. Over 99.99% of this release came from vessels using open loop scrubbers (Figure 3).

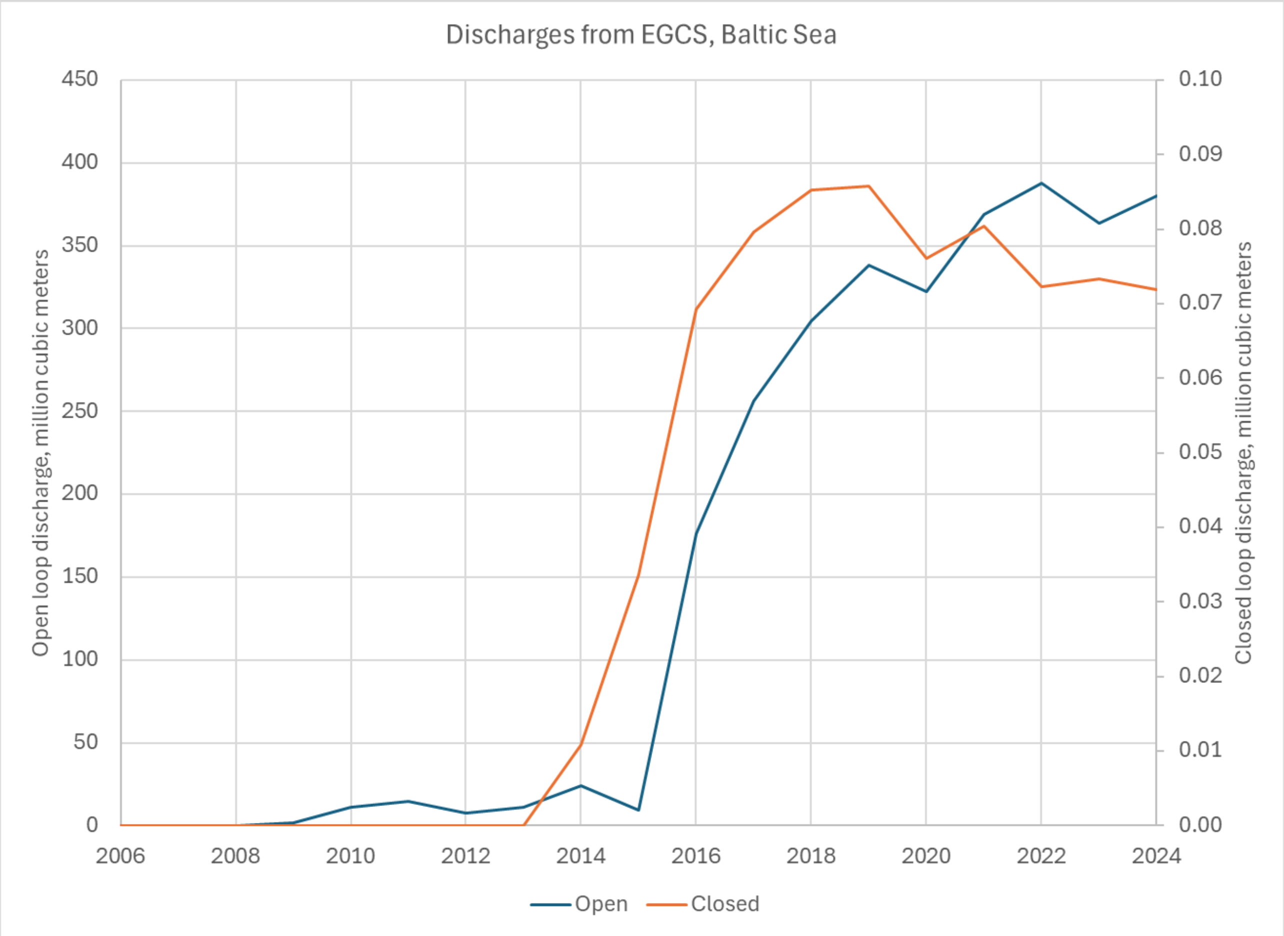


Figure 3 EGCS effluent discharges in the Baltic Sea area during 2006-2024. The blue line represents the Open loop discharge volumes (left vertical axis) and the orange line indicates the Closed loop effluent discharge volume (right side vertical axis). Note the difference of units between the axes.

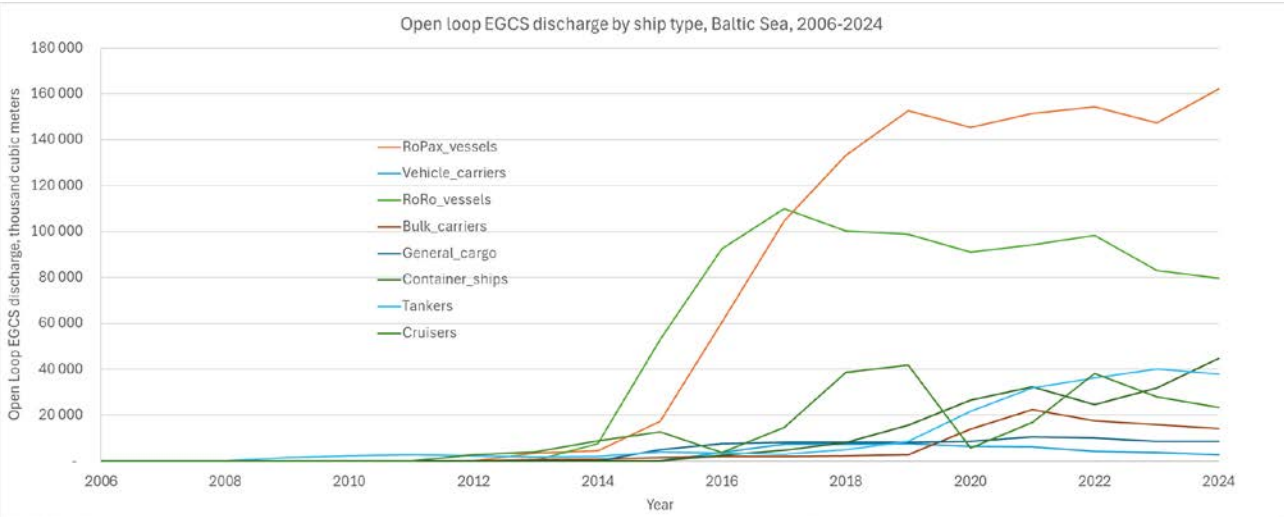
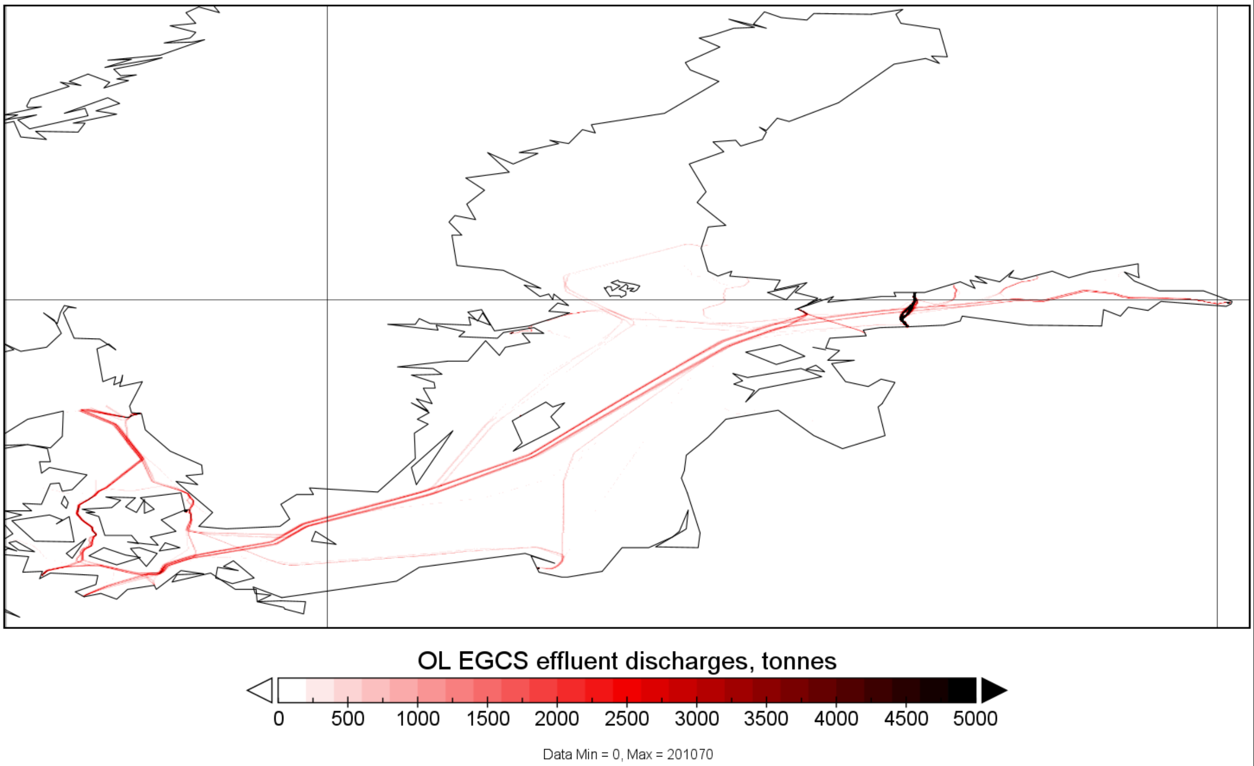
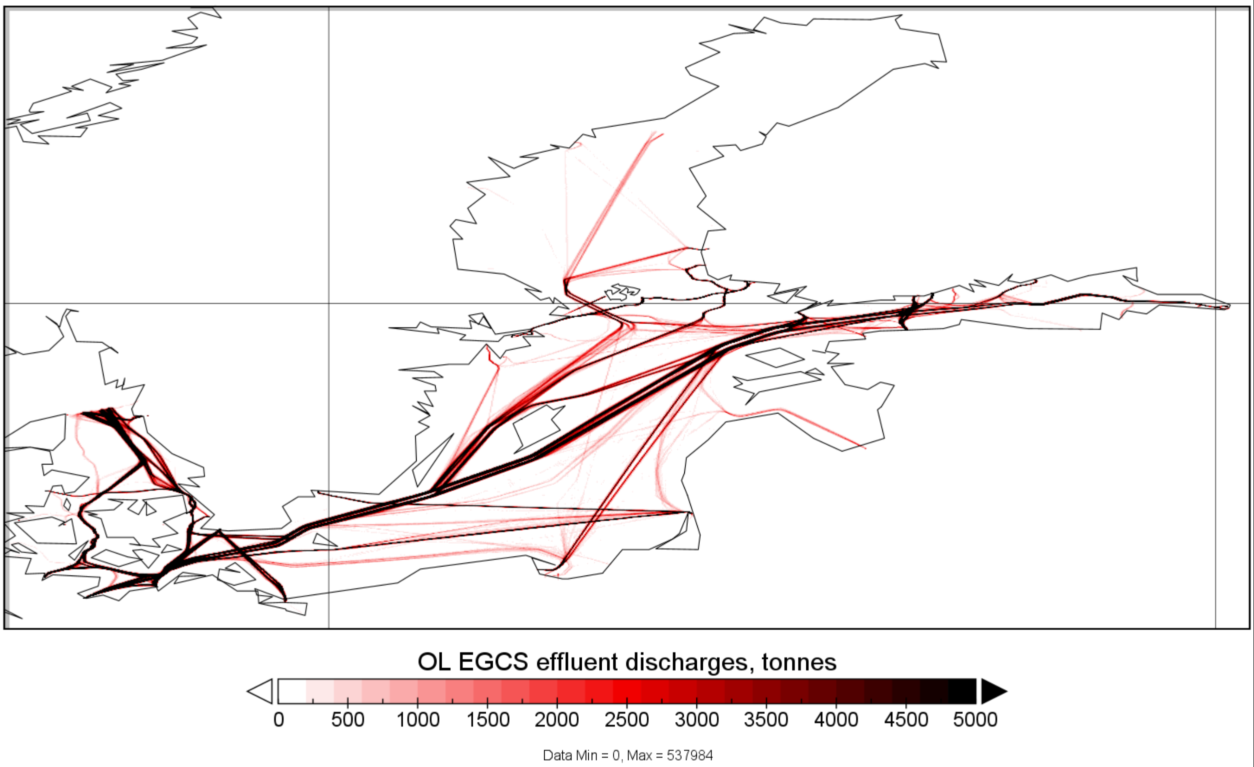


Figure 4 Effluent discharge from Open loop and Hybrid EGCS in the Baltic Sea area during 2006-2024. Largest releases come from EGCS in ro-ro cargo ships, ro-ro passenger ships and containerships.

Open loop EGCS discharges, 2014



Open loop EGCS discharges, 2019



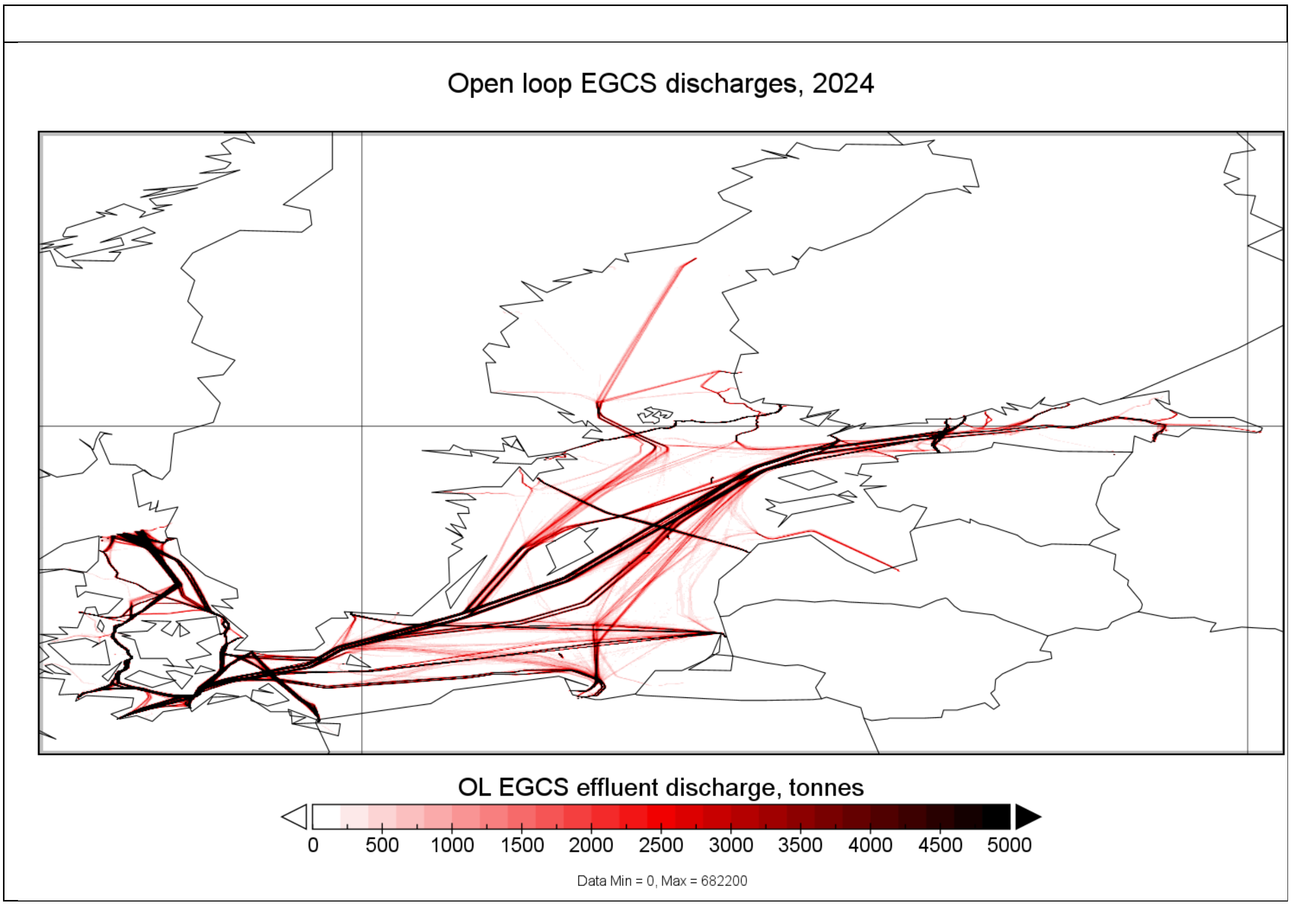


Figure 5 Discharge patterns of EGCS effluent release from Open loop systems in 2009, 2014, 2019 and 2024.Corresponding volumes were 11 million tonnes (2014), 338 million tonnes (2019) and 378 million tonnes (2024).

The current modelling setup assumes that the effluent discharge from open loop is 90 m^3 kWh^{-1} and 0.45 m^3 kWh^{-1} from closed loop systems, in accordance with existing measurements for 48 scrubber systems (Kjølholt et al., 2012; Teuchies et al., 2020).

Majority of EGCS discharge comes from ships operating a regular schedule in the Baltic Sea area (Figure 4-Figure 5). In 2010, most of the discharge was from an oil tanker, but current studies suggest the largest discharges are from ro-ro and ropax ship traffic.

B. Bilge water

According to the IMO MARPOL Annex I, the release of oily water to the sea requires meeting several criteria, for example vessels must be *en route* and the oil content must not exceed 15 ppm. Bilge water can practically contain any number of substances available onboard a vessel, which makes bilge water modeling very complicated if done on pollutant level. Further, the release of bilge water may be a random discharge, depending on e.g. tank capacity. The approach of this report is to model the discharge as a continuous release instead, because actual areas of bilge water release could not be determined. The values reported here are bilge water release volumes, which need to be complemented with water analysis results to obtain final quantities of desired pollutants. Regional rules and restrictions have been applied and the modeled bilge water release follows the rules set in MARPOL Annex I and includes stricter rules in cases where national legislation (Finland, Act on Environmental Protection in Maritime Transport Chapter 2, §1) exceeds the IMO regulation (Figure 7). The total release of bilge water was estimated to be 0.3 million cubic meters.

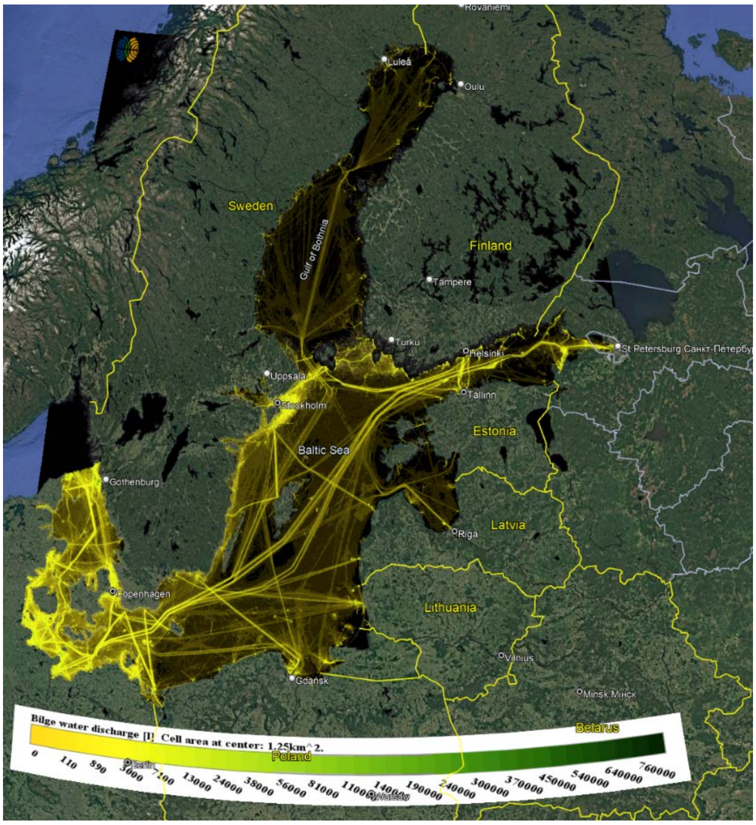


Figure 6 Estimated release of bilge water in the Baltic Sea during 2024. The release is reported in liters.

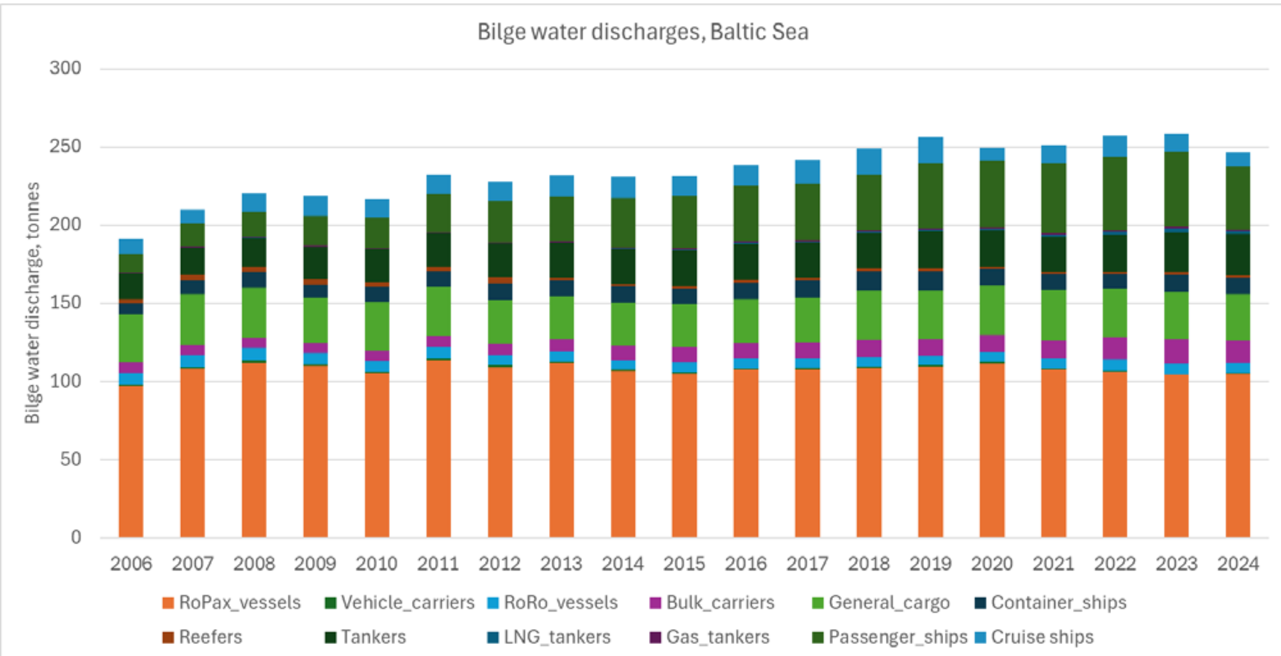


Figure 7 Discharges of Bilge water in the Baltic Sea area during 2006-2024. Totals are given in tonnes of bilge water released from various types of ships.

Bilge water releases were not affected by Covid19, because they do not depend on the number of people onboard the vessel (Figure 7).

C. Ballast water

The IMO Ballast Water Management convention regulation D-2 defines the necessary technological systems for effective treatment on board to minimise the spread of invasive species within ballast water discharges. For accurate modelling of the volumes of treated and untreated ballast water discharges it is necessary to know which ships have D-2 approved systems installed and which have not. In the S&P Global database of ships used by STEAM, this information is available only for about 5000 ships of the global fleet because the whole database is not updated for STEAM every year.

Regardless, an attempt was made to provide an estimate of the share of treated ballast water in the Baltic Sea area. This estimate is divided in two parts; the first describes the discharge volume of treated ballast water from vessels which are known to have treatment systems based on IHS data. The second part is based on an estimate of newbuilds and retrofits of existing vessels with treatment systems.

Total ballast water discharges

Total ballast water releases were estimated as 461 (2023:472) million tonnes (-2.3% when compared to 2023). Most of this is carried by tankers and bulk cargo ships but also released from other vessels (Figure 8). The estimated ballast water discharge at global level is consistent with David and Gollasch (2015), but significantly higher than those estimated by (Endresen et al., 2004), which is in the range of Ballast Water/DWT ratio of previous work of others (David and Gollasch, 2015). Ballast water releases are geographically distributed to areas where cargo operations are conducted. Ballast water releases are modeled as a function of mass carried and it highlights ports where liquid or dry bulk cargo is transferred. Assumptions which have been used in the activity-based modeling work do not take partial cargo deliveries into account, total discharge of all ballast water is assumed at each harbor, which may overestimate the released quantities. This leads to an order of magnitude estimate which is 461 million tonnes of ballast water for the Baltic Sea fleet during 2024.

The share of treated ballast water is also estimated based on existing S&P Global entries of identified ballast water management systems in STEAM data. However, it is likely that this estimate is too low since not all installations of treatment systems are known. For the Baltic Sea fleet of 2024, only 572 entries specifically mentioned that a treatment system exists, and ballast water discharge from these ships is 58 million tonnes (13% from total ballast discharge). Further, 420 entries indicated that ballast water will be exchanged during the voyage, and this would correspond to 38.5 million tonnes (8% from total), but the exchange of ballast water in the Baltic Sea is not allowed. In addition, 1679 ships were constructed after September 2017 and are assumed to carry a treatment system, which combined with the known installations represents 37% from total discharge Figure 9.

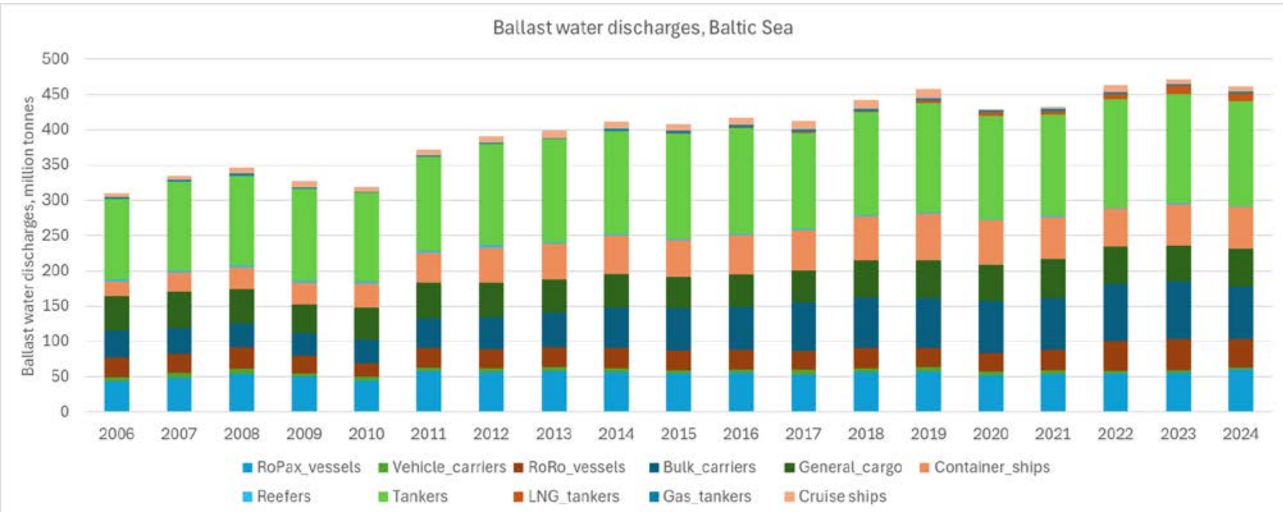


Figure 8 Estimated discharge of ballast water from different types of ships, Baltic Sea, 2006-2024. Both treated and untreated ballast water are included in these totals.

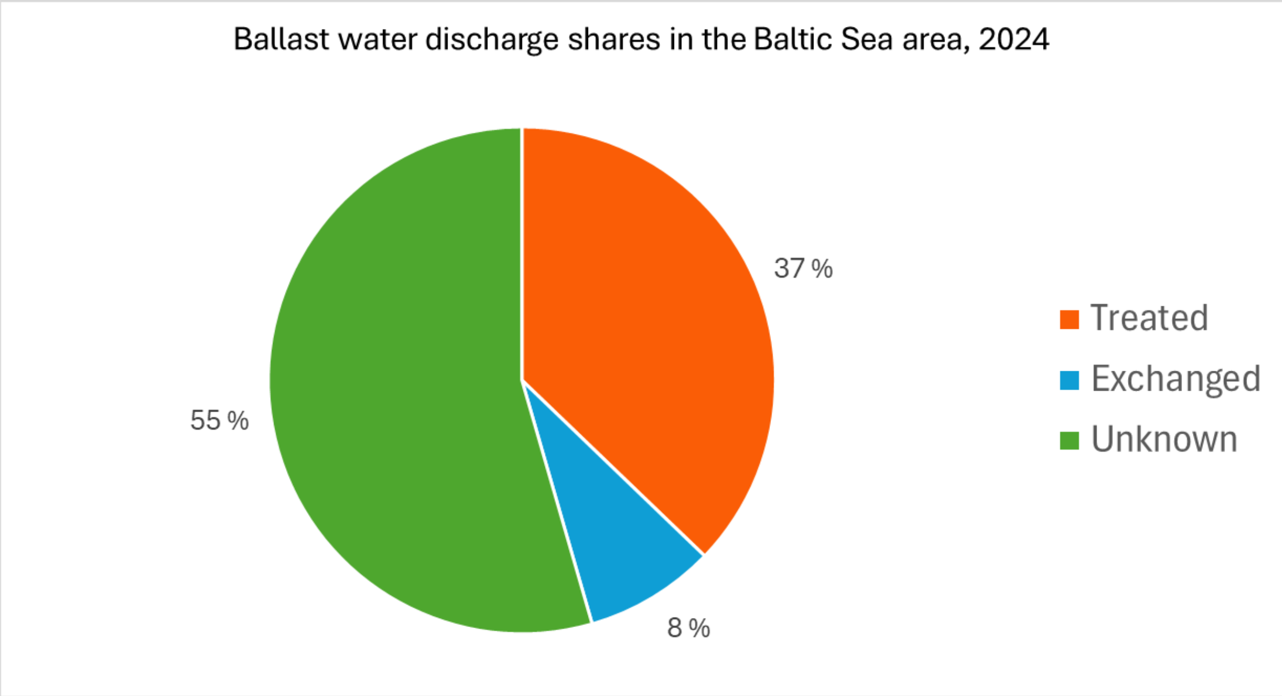


Figure 9 Estimated shares of treated and untreated ballast water discharges in the Baltic Sea area during 2024. Note, the exchange of ballast water is not allowed in the Baltic Sea area.

D. Sewage and grey water

The sewage release ban for discharge of untreated sewage from passenger ships sailing in the Baltic Sea, regulated by the MARPOL convention Annex IV, entered into force on 1st June 2019 for newbuilds, 1st June 2021 for existing vessels with an exemption granted until 1st June 2023 for single voyages from outside of the Baltic Sea to Russian territorial waters and back. Compliance can be achieved by either discharging sewage to Port Reception Facilities (PRF) or using a type-approved sewage treatment plant (MEPC.227(64)). During 2024, no international passenger traffic going/leaving St Petersburg was observed, but some national cruise activity was recorded between Vyborg and St Petersburg.

As per the regulation, passenger vessels that do not carry approved and certified treatment systems are required to discharge their sewage to PRFs. It is worth noting that the regulation only applies to sewage. Grey water, which is wastewater from showers, sinks and galleys, is not yet regulated and thus could be legally discharged into the Baltic Sea in 2024. The upcoming (1.1.2030) regulations for grey water discharge ban in Finnish territorial seas is already included in STEAM v5.1.

To accurately model the volumes of treated sewage discharges into the Baltic Sea, information on MEPC.227(64) specified approved sewage treatment systems installations onboard should be known. Unfortunately, this information is not available because the type of sewage treatment plant onboard cannot be determined based on the S&P Global vessel database used for STEAM. For this reason, it is assumed that all passenger vessels subject to sewage discharge ban leave their sewage to PRFs, and do not discharge sewage to the sea. The treatment systems have challenges to remove the nutrients as efficiently as required (Maritime and Port Authority of Singapore, 2019) by the IMO (MEPC.227(64)), and the assumption of leaving sewage to PRFs is likely to results to an underestimate of discharged sewage. Figure 10 illustrates the modeled sewage discharge time series for the study period. The sewage discharge for years before the Covid19 reflect the situation where most of the sewage is released to the sea, and years 2021-2024 describe the discharge if passenger ships leave all their sewage in PRF. The real sewage discharge may fall between these two extremes.

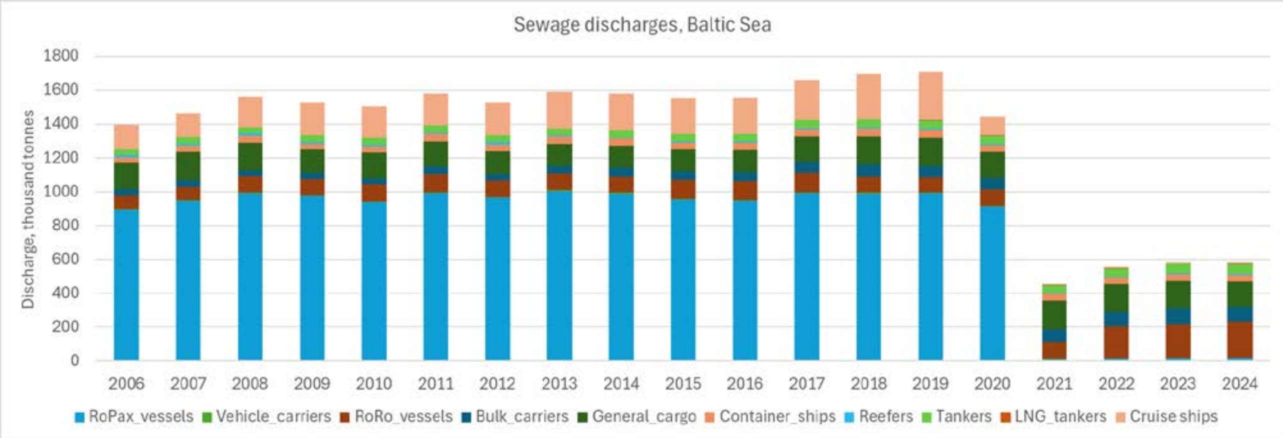


Figure 10 Sewage discharges from ships sailing the Baltic Sea in 2024.

Discharges of black and grey water are directly connected to number of people carried onboard. During the Covid19 pandemic, tight travel restrictions reduced the number of passengers carried significantly, and a slow recovery of passenger traffic was observed in 2021-2024.

In 2024 there were 93 cruise vessels observed in the Baltic Sea area, which were estimated to produce 165,000 tonnes of sewage, generated during normal operation during 2024, of which 96% was modeled to be discharged in PRFs. Similarly, 213 RoPax vessels were estimated to produce 1,155,000 tonnes of sewage, but leave 98% of that in PRF. The estimated total sewage release to the Baltic Sea during 2024 was 0.62 million tonnes and sewage nitrogen was 143 tonnes. It should be noted that significant uncertainty is involved in these estimates since it is not known how well the nutrient removal of the sewage treatment systems works and how much of the sewage was actually left at PRFs.

The estimates of sewage and grey water are based on vessel passenger counts, capacity utilization, crew size, time spent onboard, sewage plant treatment efficiency and share of sewage left in port reception facilities (Wilewska-Bien et al., 2019). It should be noted that the modeling approach chosen applies to all ships, not just passenger vessels, since it depends on the number of crew and passengers onboard.

Discharge volumes of grey water were relatively stable during the period 2006-2019, but a decline was predicted for 2020 and 2021, which reflect the Covid19 effect on passenger traffic (Figure 11). Grey water releases were predicted to be 7.4 (2023: 7.5) million tonnes, which is -1.3% less than in 2023. Estimates concerning the grey water release are based on similar methodology as the estimates of sewage, i.e. passenger counts, size of the crew and time spent onboard. With the previous model version, a 60% decrease in grey water discharges was predicted, whereas with the new model version this decrease is about 15%. The previous version of STEAM (v4.3) included a method to adjust passenger capacity utilization, which is not yet included in the updated model version (v5.1). For this reason, the significant decrease of modeled grey water discharge for 2020 and 2021 observed in the previous work is not reproduced in the current work, yet.

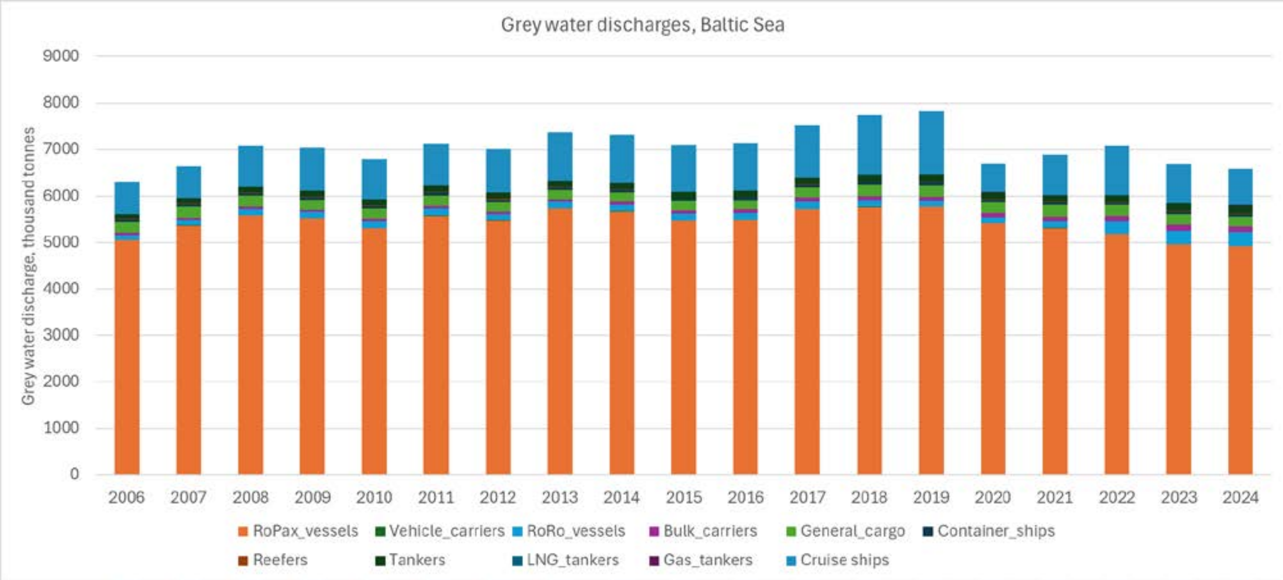


Figure 11 Discharges of Grey Water from ships in the Baltic Sea area during 2006-2024.

Geographical distribution of estimated grey water discharge is depicted in Figure 12. The upcoming grey water discharge ban areas, taking effect in Jan 1st 2030 on Finnish territorial waters, are already included in the model.

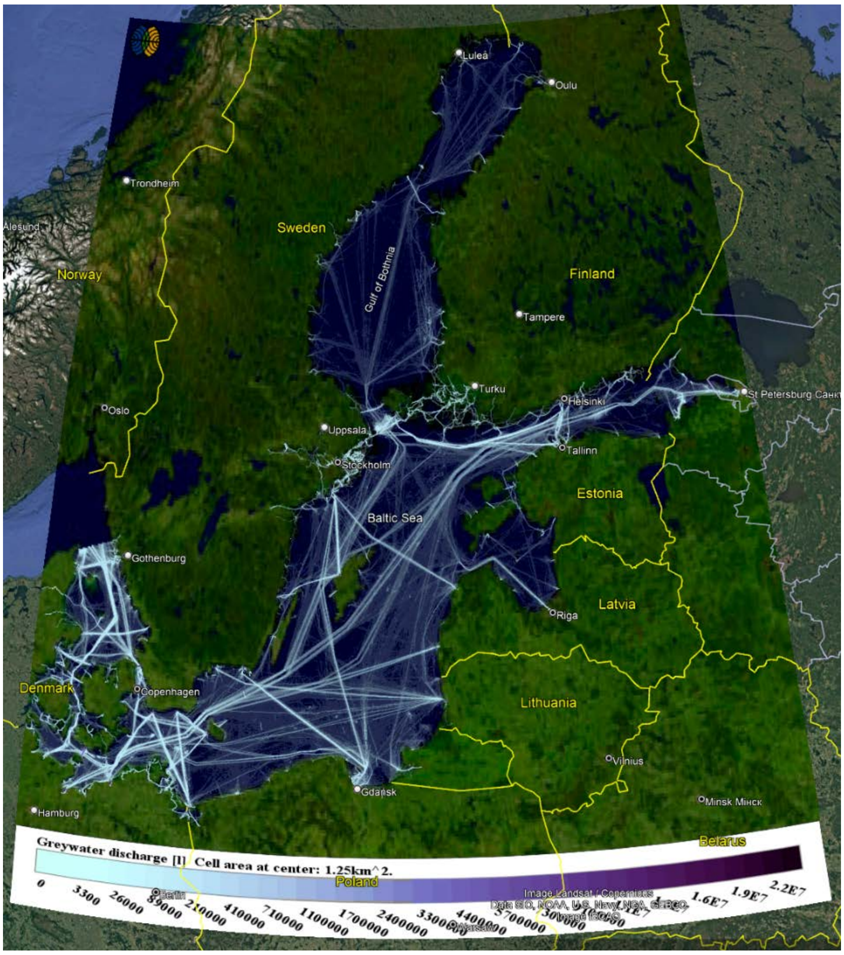


Figure 12 Estimated grey water discharges from ships sailing the Baltic Sea in 2024. Discharge volume is in liters per area of a map grid cell.

E. Predicted nutrient releases with sewage, grey water and food waste discharges

Nitrogen (N) and Phosphorus (P) flows with ship sewage, grey water and food waste releases were estimated based on person days. The nutrient reduction of sewage was not considered, because of frequent problems associated with the performance of sewage treatment systems(Maritime and Port Authority of Singapore, 2019). Instead, it was assumed that sewage was discharged to PRF. The nutrient reduction in grey water and food waste were not considered but assumed to be released to the sea.

The nutrient release in comminuted food waste mainly comes from passenger traffic, due to many passengers and crew onboard. According to the IMO MARPOL Annex V, 12 nautical mile distance is applied in special areas like the Baltic Sea. Total reduced nitrogen release to the Baltic Sea from food waste, grey water and sewage in 2024 was estimated as 491 (+5% increase from 2023 total) tonnes Figure 13,Figure 14. For Phosphorus, corresponding totals were modeled as 29 (+3%), 93 (-3%) and 14 (-2% from those in 2023) tonnes.

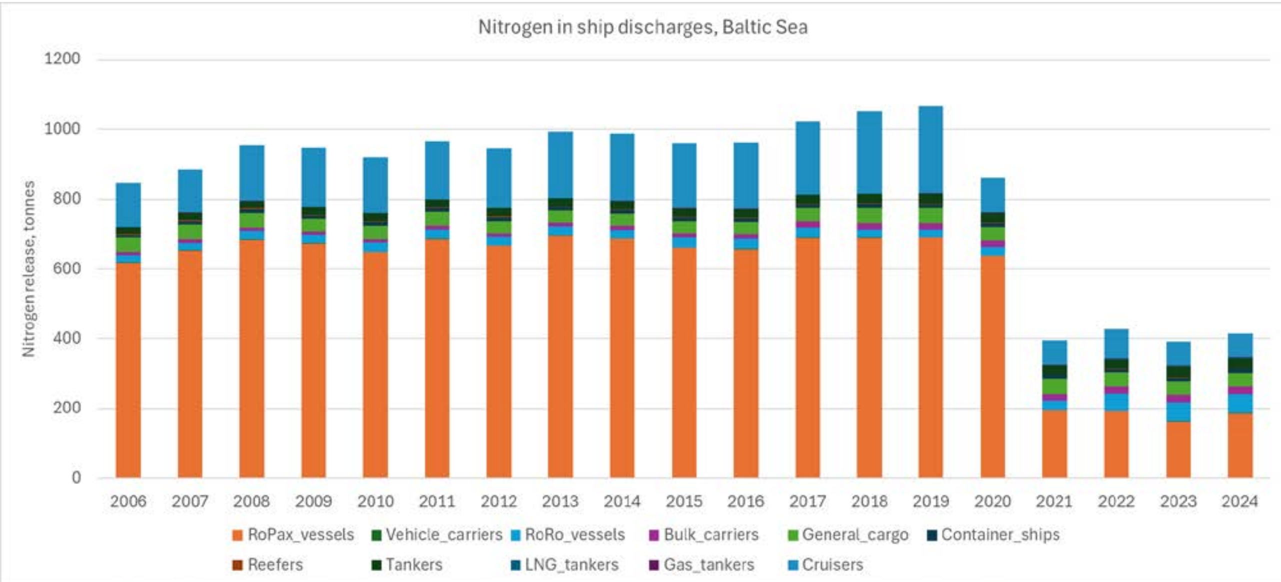


Figure 13 Predicted nitrogen discharges in sewage, grey water and food waste from ships in the Baltic Sea area during 2006-2024.

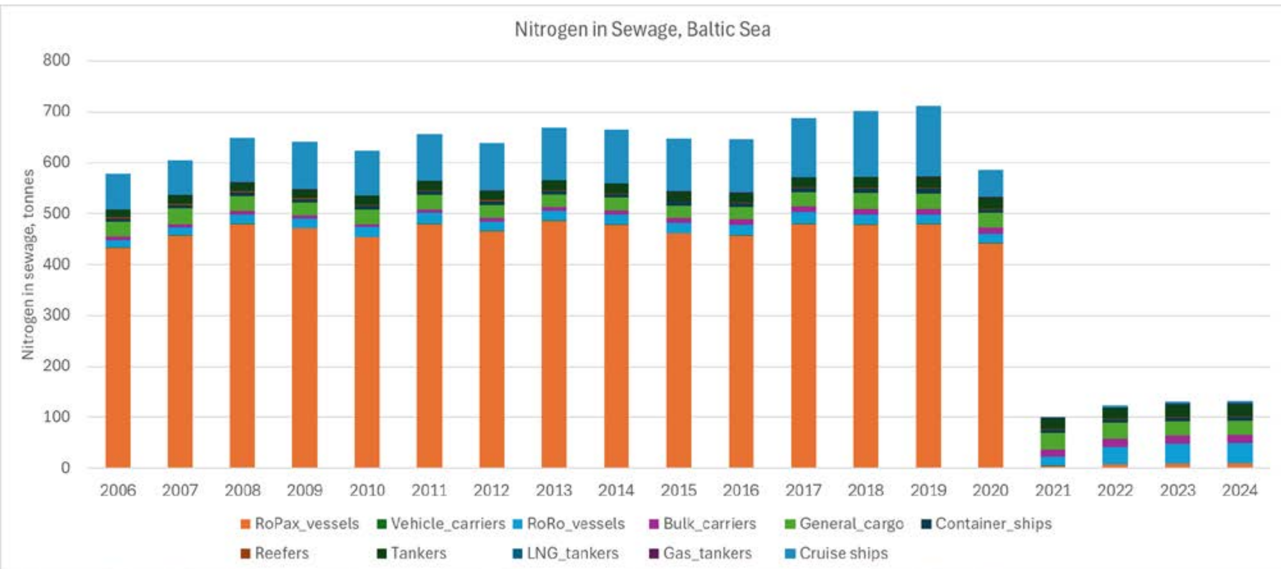


Figure 14 Nitrogen discharge through sewage from ships in the Baltic Sea area during 2006-2024.

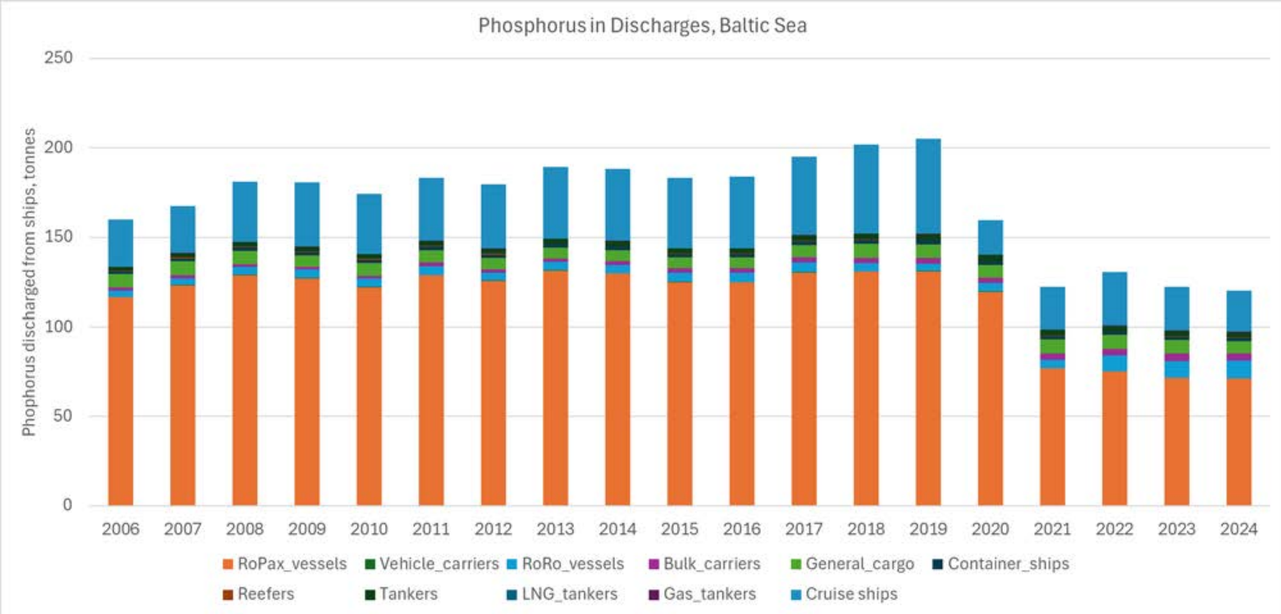


Figure 15 Phosphorus discharges from various kinds of ships in the Baltic Sea area, 2006-2024. Note that the totals for 2020 reflect the changes in passenger ship activity alone, and reduction in the use of passenger capacity was not considered. This will lead to overestimation of phosphorus discharges, especially in phosphorus discharges from the RoPax ships.

It should be noted, however, that in the current modeling setup, the decreased use of passenger capacity was not considered. This means that the passenger traffic restrictions set up during Covid19 pandemic are not fully reflected in nutrient discharge totals. The totals for N and P in figures 13, 14 and 15 for passenger carrying ships are thus overestimated, because they only reflect the changes in passenger ship activity.

The sewage release ban on the Baltic Sea changed the nutrient flow balance of discharges. In 2019, almost two thirds of nitrogen was from sewage. In 2024, less than third of the nitrogen was from sewage, about half was from grey water and the rest was from food waste (Figure 17). In 2019, most of the phosphorus discharges were because of grey water releases, and in 2024 this was predicted to be over 70% from total phosphorus releases from ships to the sea. Sewage release restrictions in 2024 have reduced the phosphorus load by -38% when compared to those in 2019.

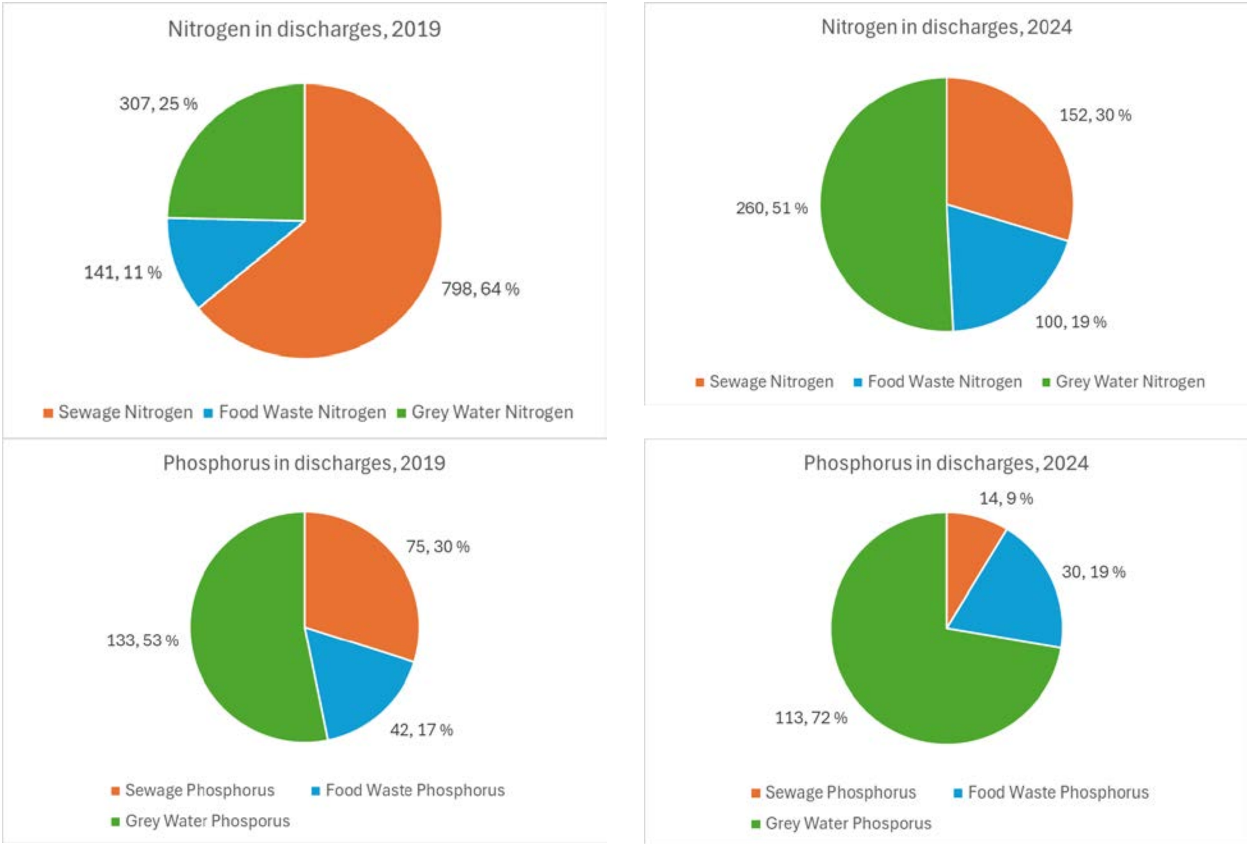


Figure 16 Nitrogen contribution of various discharge streams in 2019 and 2024, before and after the reduction requirements were introduced to the passenger vessels. The total nitrogen is given in tonnes of reduced N.

F. Stern tube oil leaks

The propeller shaft connects the main engine to a propeller through a stern tube, which goes through the ship's hull. This connection uses white metal bearings which are lubricated either by sea water or, in most cases, by oil. Small amounts of oil leakage is allowed (six liters/day is normal according to Lloyds Register seal type approval) and up to 80 million liters/year is leaked to the sea globally (Sengottuvel et al., 2017). In the Baltic Sea area, the estimated stern tube oil leak is 2.7 (+0.4%) million liters (Figure 18).

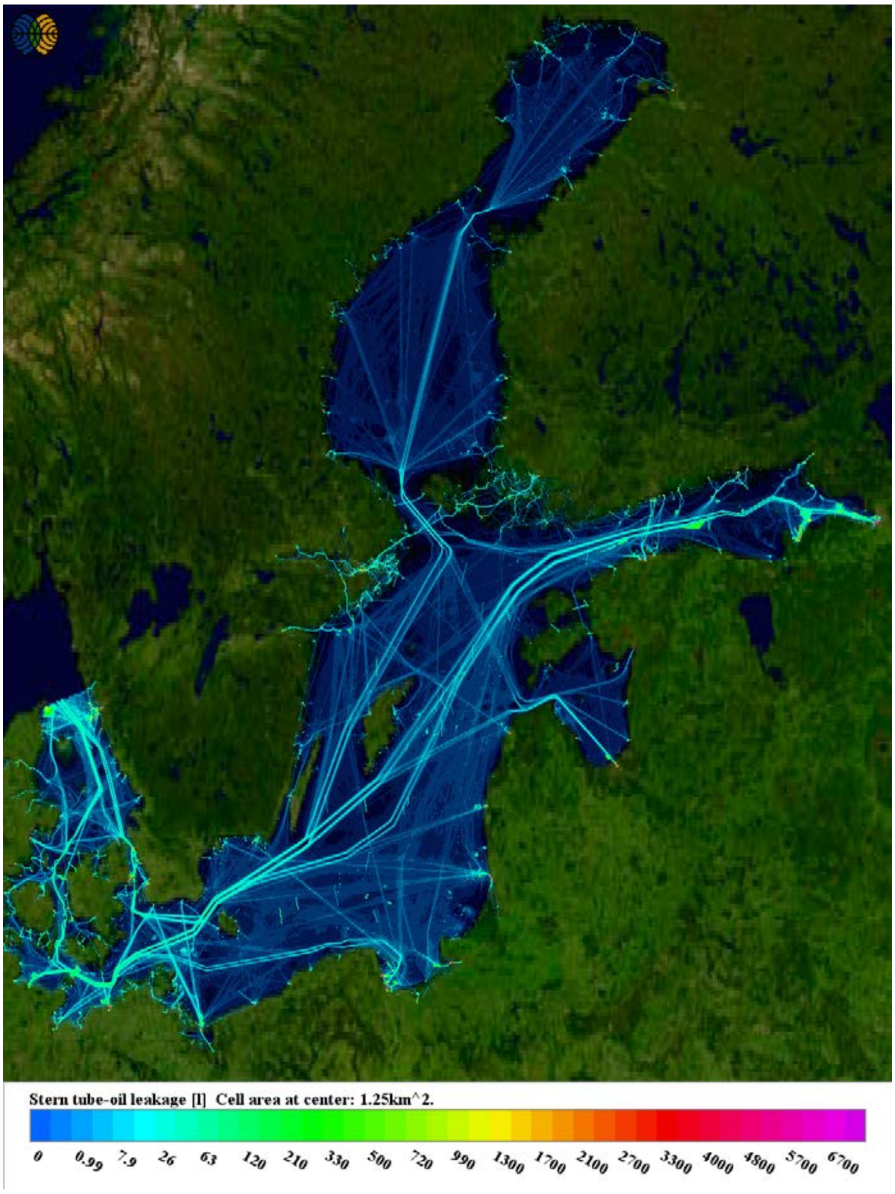


Figure 17 Estimated stern tube oil leakage during 2024 (in liters)

G. Anti-fouling paint release

The anti-fouling convention (AFC) regulates the use and contents of hull paints used to protect underwater surfaces of ships from unwanted fouling. The modeling approach is based on the calculation of the wetted surface area of each vessel, considering the uptake of various paints in the different regions in the Baltic Sea. Specific leaching rates for different compounds are applied. Hull anti-fouling paint (AFP) coatings are not necessarily used in areas where vessels frequently navigate in ice conditions, because abrasion of ice may reduce the effectiveness of hull paints and frequent cleaning of hull is more effective. Vessels are tracked throughout the year, and the highest leaching rate is selected based on where the ship has sailed. High AFP application is assumed for vessels which frequently operate outside the Baltic Sea area.

Six different compounds were considered (Table 5), discharges and their temporal trends in 2006-2024 were estimated (Table 6; Figure 19 and Figure 20).

Table 5 Anti-fouling paints considered in this report. Molecular mass of each compound is indicated as well as the CAS registry number

BIOCIDE	MOLECULAR MASS (G/MOL)	CAS NUMBER
CU(I)OXIDE	143.09	1317-39-1
CU PYRITHIONE	315.86	154592-20-8
ZINC OXIDE	81.38	1314-13-2
ZINC PYRITHIONE	317.7	13463-41-7
DCOIT	282.2	64359-81-5
ZINEB	275.8	12122-67-7

Table 6 Estimated anti-fouling paint release from ship in the Baltic Sea during 2024. All discharges are given in tonnes of compound released. Values in parenthesis indicate the change (%) compared to previous year.

	CUO [TONNES]	CUPYR [TONNES]	ZNO [TONNES]	ZNPYR [TONNES]	DCOIT [TONNES]	ZINEB [TONNES]
TOTAL	458.4 (-4.8%)	0.9 (-6.1%)	88.1 (-7.1%)	1.7 (-7.5%)	0.6 (-7.1%)	1.7 (-6.2%)
BALTIC PROPER	188.5 (-12.2%)	0.4 (-13.3%)	36.6 (-14.2%)	0.7 (-14.6%)	0.2 (-14.2%)	0.7 (-13.4%)
KATTEGAT	104.4 (-11.4%)	0.2 (-13.3%)	20.0 (-14.9%)	0.4 (-15.5%)	0.1 (-14.9%)	0.4 (-13.5%)
GULF OF FINLAND	131.5 (+12.1%)	0.3 (+12.1%)	24.8 (+12.1%)	0.5 (+12.1%)	0.2 (+12.1%)	0.5 (+12.1%)
GULF OF BOTHNIA	26.1 (+8.8%)	0.1 (+6.3%)	5.1 (+3.9%)	0.1 (+3.6%)	0.0 (+4.4%)	0.1 (+6.0%)
GULF OF RIGA	7.9 (-.6%)	0.0 (-.2%)	1.6 (+.3%)	0.0 (+.4%)	0.0 (+.3%)	0.0 (-.1%)
VESSEL TYPE						
ROPAX_VESSELS	15.0 (-6.8%)	0.0 (-4.8%)	4.2 (-3.9%)	0.1 (-3.5%)	0.0 (-3.8%)	0.1 (-4.9%)
VEHICLE_CARRIERS	1.5 (-5.9%)	0.0 (-5.7%)	0.3 (-5.5%)	0.0 (-5.4%)	0.0 (-5.5%)	0.0 (-5.6%)
RORO_VESSELS	12.2 (-5.7%)	0.0 (-8.6%)	2.5 (-10.9%)	0.0 (-11.8%)	0.0 (-11.0%)	0.0 (-8.9%)
BULK_CARRIERS	103.6 (-8.5%)	0.2 (-8.7%)	18.9 (-8.9%)	0.4 (-8.9%)	0.1 (-8.9%)	0.4 (-8.7%)
GENERAL_CARGO	76.4 (+3.0%)	0.2 (+2.3%)	14.5 (+1.7%)	0.3 (+1.4%)	0.1 (+1.6%)	0.3 (+2.2%)
CONTAINER_SHIPS	36.0 (-3.1%)	0.1 (-4.0%)	6.7 (-4.8%)	0.1 (-5.1%)	0.0 (-4.8%)	0.1 (-4.1%)
REEFERS	4.6 (-14.7%)	0.0 (-14.4%)	0.8 (-14.1%)	0.0 (-14.0%)	0.0 (-14.1%)	0.0 (-14.4%)
TANKERS	157.8 (+5.8%)	0.3 (+6.0%)	29.0 (+6.2%)	0.6 (+6.3%)	0.2 (+6.2%)	0.6 (+6.0%)
LNG_TANKERS	9.9 (+11.9%)	0.0 (+11.7%)	2.0 (+12.4%)	0.0 (+12.5%)	0.0 (+12.4%)	0.0 (+12.2%)
GAS_TANKERS	3.2 (-13.7%)	0.0 (-14.7%)	0.6 (-15.6%)	0.0 (-16.0%)	0.0 (-15.6%)	0.0 (-14.8%)
PASSENGER_SHIPS	2.0 (-18.4%)	0.0 (-18.3%)	0.5 (-18.0%)	0.0 (-18.3%)	0.0 (-18.3%)	0.0 (-18.2%)
CRUISERS	4.3 (-6.8%)	0.0 (-9.1%)	0.8 (-10.8%)	0.0 (-11.6%)	0.0 (-10.9%)	0.0 (-9.2%)
FISHING_VESSELS	3.9 (-9.2%)	0.0 (-10.3%)	0.8 (-11.1%)	0.0 (-11.4%)	0.0 (-11.1%)	0.0 (-10.4%)
SERVICE_SHIPS	3.1 (-6.4%)	0.0 (-6.7%)	0.7 (-7.1%)	0.0 (-7.0%)	0.0 (-6.9%)	0.0 (-6.8%)
UNKNOWN	2.0 (-90.0%)	0.0 (-91.7%)	0.4 (-92.7%)	0.0 (-93.1%)	0.0 (-92.7%)	0.0 (-91.8%)
MISC	8.4 (+39.3%)	0.0 (+37.2%)	1.8 (+35.6%)	0.0 (+35.4%)	0.0 (+35.9%)	0.0 (+37.1%)

The largest AFP releases occur in the Baltic Proper, which is largest of the considered sub-regions. It should be noted that the wet surface area of IMO registered vessels is estimated to be about 96% of the total wet surface area of all waterborne vessels reported in this study, the remaining 3% roughly represents the contribution from small boats. The share of wet surface between IMO registered ships and all vessels changes depending on how much of the small boat traffic is visible in AIS data. It is very likely that the quantities listed in Table 6 are underestimated, because small boat AFP releases are not included fully in these results.

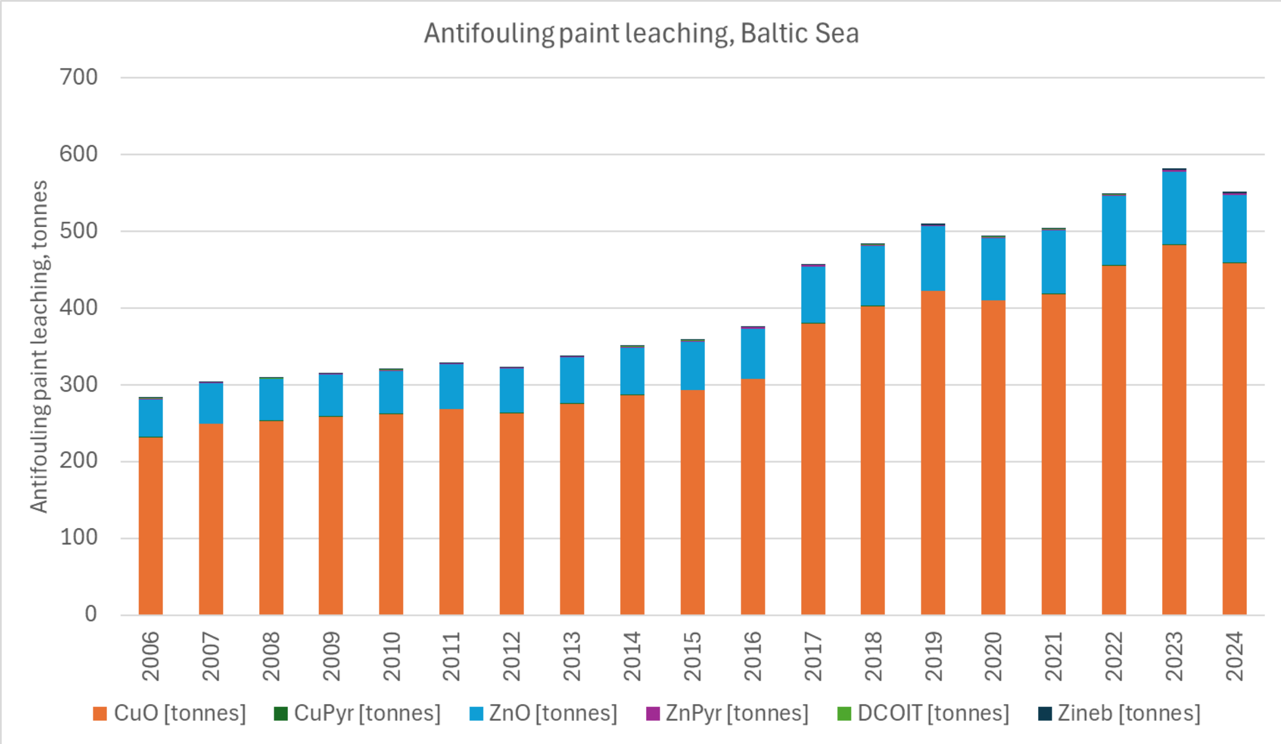


Figure 18 Antifouling paint release from ships in the Baltic Sea area during 2006-2024. Six compounds are reported; Cu(II)Oxide, (orange), Cu-Pyrithione (dark green), Zn Oxide (blue), Zn-Pyrithione (magenta), DCOIT (light green), Zineb(dark blue).

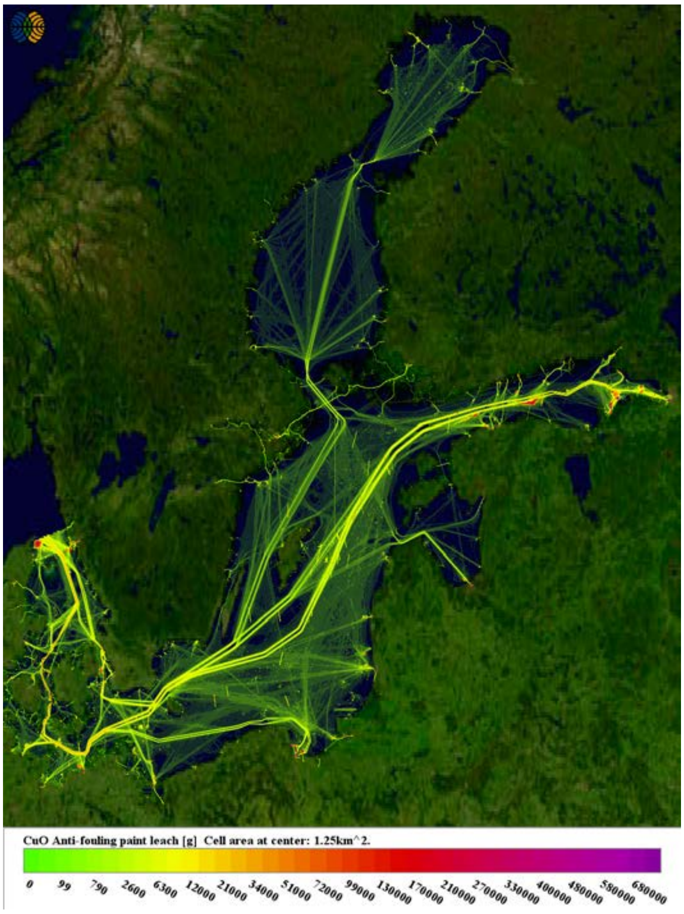


Figure 19 Antifouling paint releases from the Baltic Sea fleet in 2024. Only CuO is presented here, but similar maps are available for other antifouling releases, too. Unit is mass in grams per grid cell area.

The estimated wet surface area of all AIS equipped vessels was about 54.7 million square meters. This mostly describes large ships (96.3% of the total), for which AIS is mandatory. This estimate, however, does not include contribution from small leisure boats, the number of which exceeds half a million around the Baltic Sea coastline. The estimated surface area of small boat fleet is about 7.1 million square meters, considering the number of boats of each type and their average size (Johansson et al., 2020). The boating contribution to overall wet surface is around 11%, considering the length of boating season, which mainly concerns May-September period of each year, the contribution of small boats to antifouling releases was estimated as 106 tonnes of Zn and Cu. Antifouling release from points has a very different spatial pattern than that of ships (ships: Figure 20, boats: Figure 21).

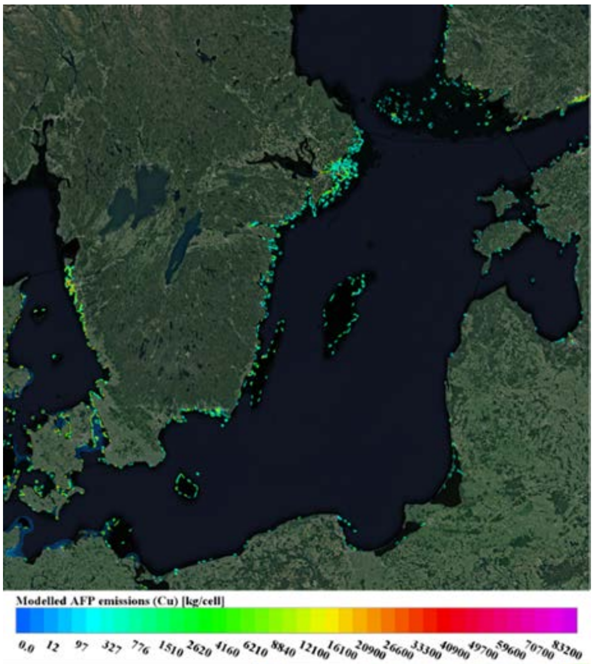


Figure 20. Release of Copper from antifouling paints used in boats in the Baltic Sea area. Image from (Johansson et al., 2020).

Large ships travel along the shipping lanes, whereas small boat traffic occurs close to the shore, extending tens of kilometers to the open sea, but no further.

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Data

The emission estimates for the Baltic Sea area during the year 2024 are based on over 502 million AIS-messages sent by almost 27,000 different ships, of which 9,675 had an IMO registry number indicating commercial marine traffic. The AIS position reports were received by terrestrial base stations in the Baltic Sea countries and collected to regional HELCOM AIS data server. Emissions are generated using the Ship Traffic Emission Assessment Model, STEAM version 5.1 (Jalkanen et al., 2009, 2012, 2018, 2021; Johansson et al., 2013, 2017; Majamäki et al., 2025).

The Baltic Sea AIS data for year 2024 had no temporal gaps, AIS data was available throughout the year, and the temporal coverage was 100%. This is the third time for HELCOM AIS service with a perfect service record. Most of the messages originate from South-Western region of the Baltic Sea near the Danish and southern Swedish sea areas (Figure 22). On average, data flow was lower in 2024 (57,000) than in 2023 (90,000) messages per hour. STEAM applies distance, speed and identity checks during the AIS processing steps which allow consistent voyage construction, but vessels sailing without an active AIS transponder are not covered in this analysis.

The uncertainty evaluation and comparison to EU MRV fuel reporting was made using global AIS data for 2024 from Orbcomm Ltd. This global dataset includes both terrestrial and satellite AIS position reports and includes over 3.11 billion (10^9) position reports. STEAM also uses the technical details of the global fleet based on S&P Global database.

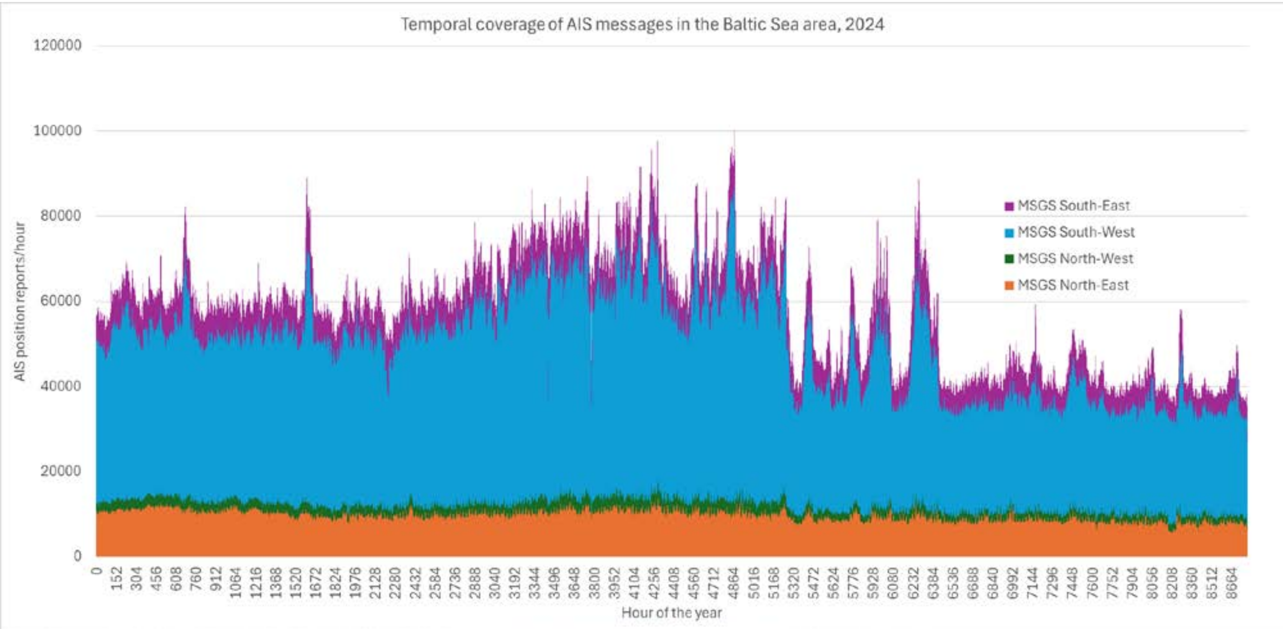

Figure 21 AIS-data hourly coverage in different parts of the Baltic Sea region for 2024.

Metadata

It should be noted that current estimates do not include contributions from vessels without active AIS equipment, which may lead to underestimation of ship activity. Work is in progress to investigate the significance of this issue using complementary datasets. All calculations were made including the effects of sea currents, winds, waves and ice cover thickness.

The STEAM model used in this work was upgraded from v4.3 to v5.1. The new model version was used to recalculate the whole Baltic Sea ship emissions time series, to provide a consistent view over the last 19 years. Significant technical changes were made to improve the modeling accuracy and compatibility with the EU's Monitoring, Reporting, and Verification (MRV) data.

• The modeling of shipping in the Baltic Sea continued to rely primarily on AIS data from the HELCOM AIS data archive. For a broader global perspective, a combination of satellite-AIS and terrestrial-AIS data from Orbcomm Ltd was also utilized. Integrating global AIS data enables comparisons with the MRV reporting scheme. STEAM v5.1 adopted the same voyage-based emission allocation methodology used by both the IPCC and the Fourth IMO GHG Study for international and domestic shipping. Voyages were constructed from confirmed port calls and AIS position reports, ensuring 1:1 compliance with MRV reporting and enabling the detection of anomalies and deviations. AIS decoding and filtering rules have been strengthened. Handling of spurious or faulty identification numbers has been improved.

• The resistance calculation method in STEAM v5.1 is a hybrid approach, combining the Hollenbach method with the methodology consistent with the Fourth IMO GHG Study. The Hollenbach method is applied by default; however, if a vessel falls outside the applicable range or if data is insufficient, a simpler formula is used. It is important to note that static draught is assumed in the calculations, and changes in draught or trim are not accounted for.

• Weather effects—such as wind and current speed and direction, wave height and direction, and ice coverage and thickness—are included in STEAM v5.1 in the same way as in STEAM v4.3. Details of the methods used are described in Majamäki et al (2025).

• By default, STEAM v5.1 uses a simplified auxiliary engine model, like the one in STEAM 2, which improves the comparison scores of STEAM against the MRV data. Users still have the option to choose how auxiliary engines and boilers are modeled. However, due to limitations of the global fleet description, modeling auxiliary systems remains a significant source of uncertainty. This was evident during extensive comparisons with MRV fuel reports. Some biases found in large containership modeling have been addressed, resulting in improved consistency with MRV data, but some biases remain.

• Geographical rules for regional air and water environmental regulations have been updated. These now include vessel-type-specific discharge rules, such as the sewage discharge ban for passenger ships in the Baltic Sea region.

• The modeling of shore-side electricity in STEAM has been revised. The updated setup uses terminal data from the EU Alternative Fuel Observatory (https://alternative-fuels-observatory.ec.europa.eu/transport-mode/maritime-sea/ports-and-infrastructure) to identify ports and terminals equipped with shore power connections. Installation dates and applicable ship types for each terminal are also defined. The model now incorporates the EU requirement for shore power readiness within the TEN-T network by 2030 for container and passenger ships. However, the model does not account for potential incompatibilities between shipboard and land-based electrical frequencies. It also assumes that if both the ship and terminal are shore power-ready, connection is possible during berthing and power needed is always available from the land-based power grid.

• Ships operating in NOx Emission Control Areas (NECAs) now use SCR (Selective Catalytic Reduction) or EGR (Exhaust Gas Recirculation) systems only when required by regulation. This is different from the earlier versions of STEAM, which assumed that vessels with SCR systems would use them regardless of build year. For instance, in the previous model, a ship built in 2005 and retrofitted with SCR would have been treated as compliant with Tier III requirements. In STEAM v5.1, such a ship is modeled using Tier II emission factors, reflecting its exemption from Tier III and its likely focus on minimizing operational costs. Currently, 2,068 entries in the global fleet technical database indicate the presence of SCR systems. Modern EGR units, often paired with scrubbers, are modeled in line with IMO Tier III emission factors. Active SCR systems are modeled to reduce NOx based on engine load, with ammonia slip also considered.

- Global zones with EGCS (Exhaust Gas Cleaning System) discharge bans have been updated, particularly in the Baltic Sea. Recent updates to Danish, Swedish, and Finnish environmental legislation now include restrictions on both Open Loop and Closed Loop discharges. In STEAM, the guiding principle is that EGCS shutdowns must be required by maritime authorities, with clear geographical boundaries and start dates for the restrictions. Recommendations to avoid EGCS use are not included in the model as these are not compulsory bans.

- The model now includes a broader range of fuel types, including High Sulfur Heavy Fuel Oil (HSHFO), Intermediate Fuel Oil (IFO), Very Low Sulfur Fuel Oil (VLSFO), Marine Diesel Oil (MDO), Marine Gas Oil (MGO), Methanol, Ammonia, and LNG. The fuel allocation logic in STEAM v5.1 is based on a combination of technical feasibility, legal compliance, and cost. The model can also examine fuel mixtures, including the use of pilot and alternative fuels. Ships with engines capable of using gas as fuel are identified by manufacturer and engine type codes, with Brake Specific Energy Consumption (BSEC) curves provided by the engine manufacturer. Gas engines are categorized into compression-ignited dual-fuel low-pressure, compression-ignited dual-fuel high-pressure, spark-ignited, and turbines.

- The modeling of sewage discharges and the nutrients contained within assumes a removal rate of 70% for nitrogen (N) and 80% for phosphorus (P). However, these values may be somewhat optimistic, considering the variability in system type, maintenance, and operating conditions within the Baltic Sea fleet. There is also a lack of sufficient data regarding the specific types of sewage treatment systems installed on ships.

Appendix – Annual data tables for discharge volumes, nutrients and antifouling paint releases.

2006	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	43.9	356.3	97.2	0.0	0.0	5048.9	895.7
Vehicle_carriers	5.2	10.5	0.9	0.0	0.0	5.9	4.2
RoRo_vessels	27.6	68.2	7.2	0.0	0.0	107.4	77.0
Bulk_carriers	38.7	177.6	7.1	0.0	0.0	56.6	39.9
General_cargo	48.6	1193.1	30.3	0.0	0.0	227.1	158.8
Container_ships	21.4	121.5	7.0	0.0	0.0	41.0	29.2
Reefers	2.7	50.3	3.0	0.0	0.0	16.1	11.3
Tankers	114.1	278.7	16.5	0.0	0.0	106.9	35.8
LNG_tankers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	1.8	9.7	0.6	0.0	0.0	3.4	1.2
Passenger_ships	0.0	65.2	11.8	0.0	0.0	790.8	40.8
Cruisers	6.0	7.9	9.6	0.0	0.0	687.0	143.6
Fishing_vessels	0.0	21.6	1.8	0.0	0.0	12.3	1.1
Service_ships	0.0	69.3	10.2	0.0	0.0	29.7	6.6
Unknown	0.0	30.0	3.7	0.0	0.0	5.7	0.8
Total, All	310	2536	219	0	0	7194	1458
Total, IMO numbered only	310	2385	200	0	0	6773	1446

2006	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	[tonnes]	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	433.0	43.3	141.5	42.7	12.6	61.1
Vehicle_carriers	0.8	0.1	0.2	0.1	0.0	0.1
RoRo_vessels	14.3	1.4	4.0	1.4	0.4	1.7
Bulk_carriers	7.4	0.7	2.1	0.7	0.2	0.9
General_cargo	29.6	3.0	8.4	2.9	0.9	3.6
Container_ships	5.4	0.5	1.5	0.5	0.2	0.7
Reefers	2.1	0.2	0.5	0.3	0.0	0.2
Tankers	15.6	1.6	2.3	0.8	0.2	1.0
LNG_tankers	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.5	0.1	0.1	0.0	0.0	0.1

Passenger_ships	19.7	2.0	22.5	0.9	0.6	9.7
Cruisers	69.4	37.7	19.3	6.8	11.4	8.3
Fishing_vessels	0.8	0.1	0.4	0.0	0.0	0.2
Service_ships	0.4	0.0	0.3	0.0	0.0	0.1
Unknown	0.2	0.0	0.2	0.0	0.0	0.1
Total, All	604	91	208	58	27	90
Total, IMO numbered only	600	91	203	58	27	84

2006	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	231.7	0.5	49.1	1.0	0.3	0.9
Baltic Proper	103.8	0.2	22.3	0.4	0.1	0.4
Kattegat	58.2	0.1	12.0	0.2	0.1	0.2
Gulf of Finland	49.6	0.1	10.4	0.2	0.1	0.2
Gulf of Bothnia	15.0	0.0	3.3	0.1	0.0	0.1
Gulf of Riga	5.0	0.0	1.1	0.0	0.0	0.0
Vessel type						
Ropax_vessels	12.9	0.0	3.6	0.1	0.0	0.1
Vehicle_carriers	2.5	0.0	0.5	0.0	0.0	0.0
Roro_vessels	12.2	0.0	2.8	0.1	0.0	0.1
Bulk_carriers	37.7	0.1	7.6	0.2	0.1	0.1
General_cargo	56.3	0.1	12.3	0.2	0.1	0.2
Container_ships	16.7	0.0	3.4	0.1	0.0	0.1
Reefers	6.4	0.0	1.3	0.0	0.0	0.0
Tankers	73.2	0.1	14.2	0.3	0.1	0.3
Lng_tankers	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	1.7	0.0	0.3	0.0	0.0	0.0
Passenger_ships	0.7	0.0	0.2	0.0	0.0	0.0
Cruisers	3.2	0.0	0.7	0.0	0.0	0.0
Fishing_vessels	2.3	0.0	0.5	0.0	0.0	0.0
Service_ships	0.5	0.0	0.1	0.0	0.0	0.0
Unknown	0.3	0.0	0.1	0.0	0.0	0.0
Misc	1.1	0.0	0.3	0.0	0.0	0.0

2007	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	48.5	395.7	108.2	0.0	0.0	5360.8	944.7
Vehicle_carriers	6.9	12.7	1.2	0.0	0.0	7.1	5.1
RoRo_vessels	28.0	69.5	7.5	0.0	0.0	110.4	79.0
Bulk_carriers	35.3	167.6	6.6	0.0	0.0	53.0	37.5
General_cargo	51.7	1287.0	32.5	0.0	0.0	242.2	168.7
Container_ships	27.6	144.7	8.7	0.0	0.0	50.6	36.2
Reefers	3.2	59.8	3.5	0.0	0.0	19.4	13.5
Tankers	125.5	296.1	17.6	0.0	0.0	112.8	37.6
LNG_tankers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	2.1	10.1	0.7	0.0	0.0	3.7	1.3
Passenger_ships	0.0	82.4	14.8	0.0	0.0	953.0	49.8
Cruisers	6.3	8.4	8.8	0.0	0.0	677.3	141.4
Fishing_vessels	0.0	44.7	3.2	0.0	0.0	18.0	1.5
Service_ships	0.0	89.0	12.8	0.0	0.0	37.8	7.9
Unknown	0.0	51.7	6.4	0.0	0.0	10.6	1.7
Total, All	335	2823	248	0	0	7735	1541
Total, IMO numbered only	335	2580	220	0	0	7193	1523

2007	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	[tonnes]	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	456.6	45.7	150.2	44.9	13.3	64.9
Vehicle_carriers	0.9	0.1	0.3	0.1	0.0	0.1
RoRo_vessels	14.7	1.5	4.1	1.4	0.4	1.8
Bulk_carriers	7.0	0.7	2.0	0.7	0.2	0.8
General_cargo	31.4	3.1	9.0	3.0	0.9	3.9
Container_ships	6.7	0.7	1.9	0.7	0.2	0.8
Reefers	2.5	0.3	0.6	0.3	0.1	0.2
Tankers	16.4	1.6	2.4	0.8	0.2	1.0
LNG_tankers	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.5	0.1	0.2	0.1	0.0	0.1
Passenger_ships	24.1	2.4	27.3	1.1	0.7	11.8
Cruisers	68.3	37.2	19.0	6.8	11.3	8.2
Fishing_vessels	1.1	0.1	0.5	0.0	0.0	0.2
Service_ships	0.5	0.0	0.3	0.0	0.0	0.1
Unknown	0.4	0.0	0.3	0.0	0.0	0.1

Total, All	637	94	223	61	28	96
Total, IMO numbered only	631	93	218	61	28	90

2007	CuO [tonnes]	CuPyr [tonnes]	ZnO [tonnes]	ZnPyr [tonnes]	DCOIT [tonnes]	Zineb [tonnes]
Total	248.7 (+7.4%)	0.5 (+7.7%)	53.0 (+8.0%)	1.1 (+8.1%)	0.4 (+8.0%)	1.0 (+7.7%)
Baltic Proper	111.9 (+7.8%)	0.2 (+8.1%)	24.2 (+8.3%)	0.5 (+8.4%)	0.2 (+8.3%)	0.4 (+8.1%)
Kattegat	63.1 (+8.5%)	0.1 (+9.0%)	13.1 (+9.5%)	0.3 (+9.6%)	0.1 (+9.5%)	0.2 (+9.1%)
Gulf of Finland	53.3 (+7.4%)	0.1 (+7.4%)	11.2 (+7.5%)	0.2 (+7.5%)	0.1 (+7.5%)	0.2 (+7.4%)
Gulf of Bothnia	15.2 (+1.2%)	0.0 (+1.7%)	3.4 (+2.2%)	0.1 (+2.3%)	0.0 (+2.1%)	0.1 (+1.8%)
Gulf of Riga	5.2 (+4.2%)	0.0 (+5.0%)	1.1 (+5.5%)	0.0 (+5.8%)	0.0 (+5.6%)	0.0 (+5.0%)
Vessel type						
Ropax_vessels	14.8 (+15.0%)	0.0 (+15.7%)	4.2 (+16.2%)	0.1 (+16.5%)	0.0 (+16.3%)	0.1 (+15.8%)
Vehicle_carriers	3.3 (+33.3%)	0.0 (+32.1%)	0.6 (+31.0%)	0.0 (+30.6%)	0.0 (+31.0%)	0.0 (+31.9%)
Roro_vessels	12.4 (+1.6%)	0.0 (+2.7%)	2.9 (+3.5%)	0.1 (+3.8%)	0.0 (+3.5%)	0.1 (+2.8%)
Bulk_carriers	34.0 (-9.8%)	0.1 (-9.5%)	6.9 (-9.2%)	0.1 (-9.1%)	0.0 (-9.2%)	0.1 (-9.4%)
General_cargo	59.3 (+5.3%)	0.1 (+5.7%)	13.0 (+5.9%)	0.3 (+6.0%)	0.1 (+5.9%)	0.2 (+5.7%)
Container_ships	21.8 (+30.4%)	0.0 (+29.1%)	4.4 (+28.2%)	0.1 (+27.8%)	0.0 (+28.2%)	0.1 (+29.1%)
Reefers	7.8 (+21.9%)	0.0 (+20.9%)	1.6 (+20.1%)	0.0 (+19.7%)	0.0 (+20.1%)	0.0 (+20.8%)
Tankers	78.5 (+7.3%)	0.2 (+7.5%)	15.3 (+7.7%)	0.3 (+7.7%)	0.1 (+7.7%)	0.3 (+7.5%)
Lng_tankers	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Gas_tankers	1.7 (+2.1%)	0.0 (+2.5%)	0.3 (+2.8%)	0.0 (+2.9%)	0.0 (+2.8%)	0.0 (+2.5%)
Passenger_ships	1.0 (+42.3%)	0.0 (+40.6%)	0.3 (+40.0%)	0.0 (+40.1%)	0.0 (+40.3%)	0.0 (+40.9%)
Cruisers	3.4 (+5.2%)	0.0 (+3.0%)	0.7 (+1.7%)	0.0 (+.9%)	0.0 (+1.5%)	0.0 (+3.0%)
Fishing_vessels	2.4 (+6.3%)	0.0 (+5.5%)	0.5 (+5.1%)	0.0 (+4.9%)	0.0 (+5.1%)	0.0 (+5.5%)
Service_ships	0.7 (+52.0%)	0.0 (+47.4%)	0.2 (+45.0%)	0.0 (+44.3%)	0.0 (+45.2%)	0.0 (+47.5%)
Unknown	0.6 (+114.1%)	0.0 (+115.7%)	0.2 (+116.1%)	0.0 (+118.7%)	0.0 (+118.2%)	0.0 (+116.1%)
Misc	1.8 (+58.2%)	0.0 (+61.2%)	0.5 (+63.7%)	0.0 (+64.8%)	0.0 (+64.0%)	0.0 (+62.0%)

2008	Ballast [million m3]	STO* [m3]	Bilge [10^3 m3]	Scrubber (Open) [10^3 m3]	Scrubber (Closed) [10^3 m3]	Grey Water [10^3 m3]	Black Water [10^3 m3]
RoPax_vessels	53.4	407.9	112.0	0.0	0.0	5580.2	991.1
Vehicle_carriers	8.0	16.9	1.5	0.0	0.0	9.4	6.8
RoRo_vessels	30.7	72.3	8.0	0.0	0.0	132.7	94.8
Bulk_carriers	33.2	160.0	6.3	0.0	0.0	49.2	34.7
General_cargo	48.6	1281.8	32.3	0.0	0.0	236.2	161.8
Container_ships	31.0	164.1	9.8	0.0	0.0	57.9	41.4
Reefers	3.0	59.8	3.5	0.0	0.0	18.9	13.1
Tankers	127.4	314.5	18.5	0.0	0.0	115.3	37.3
LNG_tankers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	2.6	11.1	0.7	0.0	0.0	4.4	1.5
Passenger_ships	0.0	93.9	16.1	0.0	0.0	1015.7	50.8
Cruisers	7.9	9.2	11.8	0.0	0.0	874.0	180.5
Fishing_vessels	0.0	76.4	5.3	0.0	0.0	25.9	2.1
Service_ships	0.0	97.9	13.8	0.0	0.0	39.8	7.9
Unknown	0.0	75.8	9.4	0.0	0.0	15.7	2.5
Total, All	346	2969	268	0	0	8272	1642
Total, IMO numbered only	346	2630	231	0	0	7675	1621

2008	Sewage Nitrogen [tonne]	Food Waste Nitrogen [tonne]	Grey Water Nitrogen [tonnes]	Sewage Phosphorus [tonnes]	Food Waste Phosphorus [tonnes]	Grey Water Phosporus [tonnes]
RoPax_vessels	479.1	47.9	156.4	47.2	13.9	67.5
Vehicle_carriers	1.3	0.1	0.3	0.1	0.0	0.2
RoRo_vessels	17.7	1.8	4.9	1.7	0.5	2.1
Bulk_carriers	6.5	0.6	1.8	0.6	0.2	0.8
General_cargo	30.1	3.0	8.7	2.9	0.9	3.8
Container_ships	7.7	0.8	2.1	0.8	0.2	0.9
Reefers	2.4	0.2	0.5	0.3	0.1	0.2
Tankers	16.3	1.6	2.7	0.9	0.3	1.1
LNG_tankers	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.6	0.1	0.2	0.1	0.0	0.1
Passenger_ships	24.5	2.5	29.1	1.1	0.7	12.6
Cruisers	87.3	47.5	24.5	8.6	14.5	10.6
Fishing_vessels	1.5	0.2	0.7	0.0	0.1	0.3
Service_ships	0.5	0.0	0.3	0.0	0.0	0.1
Unknown	0.6	0.1	0.5	0.0	0.0	0.2

Total, All	682	107	238	66	32	103
Total, IMO numbered only	674	106	232	65	31	96

2008	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	252.9 (+1.7%)	0.5 (+1.5%)	53.8 (+1.3%)	1.1 (+1.3%)	0.4 (+1.3%)	1.0 (+1.5%)
Baltic Proper	114.0 (+1.9%)	0.2 (+1.3%)	24.4 (+.8%)	0.5 (+.6%)	0.2 (+.7%)	0.5 (+1.2%)
Kattegat	64.5 (+2.2%)	0.1 (+2.8%)	13.6 (+3.3%)	0.3 (+3.5%)	0.1 (+3.3%)	0.3 (+2.8%)
Gulf of Finland	53.1 (-.3%)	0.1 (-.5%)	11.1 (-.7%)	0.2 (-.8%)	0.1 (-.7%)	0.2 (-.6%)
Gulf of Bothnia	15.6 (+2.9%)	0.0 (+2.4%)	3.5 (+2.1%)	0.1 (+2.0%)	0.0 (+2.1%)	0.1 (+2.4%)
Gulf of Riga	5.7 (+8.7%)	0.0 (+9.3%)	1.3 (+9.6%)	0.0 (+9.7%)	0.0 (+9.6%)	0.0 (+9.3%)
Vessel type						
Ropax_vessels	13.8 (-6.7%)	0.0 (-6.0%)	4.0 (-5.8%)	0.1 (-5.8%)	0.0 (-5.9%)	0.1 (-6.1%)
Vehicle_carriers	4.5 (+37.5%)	0.0 (+35.2%)	0.9 (+33.4%)	0.0 (+32.6%)	0.0 (+33.4%)	0.0 (+35.1%)
Roro_vessels	13.1 (+5.5%)	0.0 (+4.1%)	3.0 (+3.1%)	0.1 (+2.7%)	0.0 (+3.1%)	0.1 (+4.0%)
Bulk_carriers	32.2 (-5.2%)	0.1 (-5.5%)	6.5 (-5.8%)	0.1 (-5.9%)	0.0 (-5.8%)	0.1 (-5.6%)
General_cargo	57.4 (-3.1%)	0.1 (-3.1%)	12.6 (-3.1%)	0.3 (-3.1%)	0.1 (-3.1%)	0.2 (-3.1%)
Container_ships	26.1 (+19.5%)	0.1 (+17.6%)	5.1 (+16.2%)	0.1 (+15.6%)	0.0 (+16.2%)	0.1 (+17.6%)
Reefers	7.7 (-1.6%)	0.0 (-1.5%)	1.6 (-1.5%)	0.0 (-1.4%)	0.0 (-1.4%)	0.0 (-1.5%)
Tankers	78.3 (-.2%)	0.2 (+.2%)	15.4 (+.4%)	0.3 (+.5%)	0.1 (+.4%)	0.3 (+.2%)
Lng_tankers	0.1 (+13.0%)	0.0 (-4.8%)	0.0 (-15.8%)	0.0 (-19.7%)	0.0 (-16.0%)	0.0 (-6.0%)
Gas_tankers	2.2 (+23.5%)	0.0 (+23.8%)	0.4 (+24.0%)	0.0 (+24.1%)	0.0 (+24.0%)	0.0 (+23.8%)
Passenger_ships	1.0 (-.9%)	0.0 (-.2%)	0.3 (+.3%)	0.0 (+.1%)	0.0 (-.0%)	0.0 (-.2%)
Cruisers	4.2 (+23.1%)	0.0 (+22.3%)	0.8 (+21.4%)	0.0 (+21.3%)	0.0 (+21.6%)	0.0 (+22.1%)
Fishing_vessels	3.0 (+24.6%)	0.0 (+26.4%)	0.7 (+27.6%)	0.0 (+28.1%)	0.0 (+27.6%)	0.0 (+26.4%)
Service_ships	0.6 (-19.9%)	0.0 (-17.6%)	0.1 (-16.2%)	0.0 (-16.0%)	0.0 (-16.5%)	0.0 (-17.6%)
Unknown	1.0 (+67.1%)	0.0 (+67.8%)	0.3 (+67.4%)	0.0 (+68.7%)	0.0 (+68.6%)	0.0 (+67.6%)
Misc	2.0 (+8.2%)	0.0 (+7.8%)	0.5 (+7.7%)	0.0 (+7.5%)	0.0 (+7.6%)	0.0 (+7.8%)

2009	Ballast [million m3]	STO* [m3]	Bilge [10^3 m3]	Scrubber (Open) [10^3 m3]	Scrubber (Closed) [10^3 m3]	Grey Water [10^3 m3]	Black Water [10^3 m3]
RoPax_vessels	50.2	398.1	110.0		0.0	5517.7	974.0
Vehicle_carriers	4.0	11.5	1.1		0.0	5.6	3.9
RoRo_vessels	25.1	68.7	7.3		0.0	138.6	99.2
Bulk_carriers	32.1	151.7	6.1		0.0	47.7	33.7
General_cargo	41.3	1146.1	28.9		0.0	214.5	138.6
Container_ships	30.5	134.8	8.5		0.0	45.1	32.2
Reefers	2.7	57.7	3.4		0.0	16.6	11.6
Tankers	130.8	348.8	20.8	1664.9	0.0	126.5	40.5
LNG_tankers	0.0	0.3	0.2		0.0	0.2	0.1
Gas_tankers	2.0	8.7	0.6		0.0	3.3	1.1
Passenger_ships	0.0	110.6	19.2		0.0	1124.8	58.0
Cruisers	8.5	9.5	12.5		0.0	921.2	193.6
Fishing_vessels	0.0	94.6	6.3		0.0	27.5	2.2
Service_ships	0.0	115.1	16.3		0.0	43.6	7.8
Unknown	0.0	104.7	13.1		0.0	20.3	2.7
Total, All	327	2917	277	1665	0	8350	1618
Total, IMO numbered only	327	2482	229	1665	0	7664	1590

2009	Sewage Nitrogen [tonne]	Food Waste Nitrogen [tonne]	Grey Water Nitrogen **[tonnes]**	Sewage Phosphorus [tonnes]	Food Waste Phosphorus [tonnes]	Grey Water Phosporus [tonnes]
RoPax_vessels	470.8	47.1	154.6	46.5	13.7	66.8
Vehicle_carriers	0.7	0.1	0.2	0.1	0.0	0.1
RoRo_vessels	18.5	1.8	5.1	1.8	0.5	2.2
Bulk_carriers	6.3	0.6	1.8	0.6	0.2	0.8
General_cargo	25.8	2.6	7.9	2.5	0.7	3.4
Container_ships	6.0	0.6	1.7	0.6	0.2	0.7
Reefers	2.2	0.2	0.5	0.3	0.0	0.2
Tankers	17.6	1.8	3.0	1.0	0.3	1.3
LNG_tankers	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.5	0.0	0.1	0.0	0.0	0.1
Passenger_ships	28.0	2.8	32.2	1.3	0.8	13.9
Cruisers	93.6	50.9	25.8	9.3	15.4	11.1
Fishing_vessels	1.6	0.2	0.8	0.0	0.1	0.3

Service_ships	0.5	0.1	0.4	0.0	0.0	0.2
Unknown	0.7	0.1	0.6	0.1	0.0	0.3
Total, All	679	109	240	65	32	104
Total, IMO numbered only	669	108	234	65	32	95

2009	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	258.3 (+2.1%)	0.5 (+1.7%)	54.5 (+1.4%)	1.1 (+1.2%)	0.4 (+1.3%)	1.0 (+1.7%)
Baltic Proper	110.7 (-2.9%)	0.2 (-3.5%)	23.4 (-4.0%)	0.5 (-4.2%)	0.2 (-4.0%)	0.4 (-3.5%)
Kattegat	75.0 (+16.4%)	0.2 (+16.9%)	15.9 (+17.3%)	0.3 (+17.5%)	0.1 (+17.3%)	0.3 (+16.9%)
Gulf of Finland	51.9 (-2.4%)	0.1 (-3.2%)	10.7 (-3.7%)	0.2 (-4.0%)	0.1 (-3.7%)	0.2 (-3.2%)
Gulf of Bothnia	14.8 (-5.4%)	0.0 (-6.8%)	3.2 (-7.2%)	0.1 (-8.2%)	0.0 (-7.9%)	0.1 (-6.7%)
Gulf of Riga	5.9 (+3.6%)	0.0 (+2.9%)	1.3 (+2.4%)	0.0 (+2.2%)	0.0 (+2.4%)	0.0 (+2.9%)
Vessel type						
Ropax_vessels	13.5 (-2.5%)	0.0 (-2.1%)	3.9 (-1.9%)	0.1 (-1.8%)	0.0 (-1.9%)	0.1 (-2.1%)
Vehicle_carriers	3.0 (-32.9%)	0.0 (-30.9%)	0.6 (-29.3%)	0.0 (-28.6%)	0.0 (-29.2%)	0.0 (-30.8%)
Roro_vessels	12.8 (-2.0%)	0.0 (-2.4%)	2.9 (-2.5%)	0.1 (-2.8%)	0.0 (-2.7%)	0.1 (-2.4%)
Bulk_carriers	32.7 (+1.5%)	0.1 (+.7%)	6.5 (+.1%)	0.1 (-.1%)	0.0 (+.1%)	0.1 (+.7%)
General_cargo	55.3 (-3.7%)	0.1 (-5.6%)	11.8 (-6.8%)	0.2 (-7.4%)	0.1 (-6.9%)	0.2 (-5.7%)
Container_ships	21.8 (-16.4%)	0.0 (-16.0%)	4.3 (-15.8%)	0.1 (-15.7%)	0.0 (-15.8%)	0.1 (-16.0%)
Reefers	7.1 (-7.7%)	0.0 (-6.1%)	1.5 (-4.9%)	0.0 (-4.4%)	0.0 (-4.9%)	0.0 (-6.1%)
Tankers	90.7 (+15.8%)	0.2 (+15.9%)	17.9 (+16.0%)	0.4 (+16.0%)	0.1 (+16.0%)	0.3 (+15.9%)
Lng_tankers	0.7 (+411.5%)	0.0 (+414.9%)	0.1 (+417.7%)	0.0 (+418.9%)	0.0 (+417.8%)	0.0 (+415.2%)
Gas_tankers	1.7 (-19.3%)	0.0 (-18.6%)	0.3 (-17.9%)	0.0 (-17.7%)	0.0 (-17.9%)	0.0 (-18.5%)
Passenger_ships	1.1 (+17.3%)	0.0 (+17.7%)	0.3 (+17.6%)	0.0 (+17.9%)	0.0 (+17.9%)	0.0 (+17.6%)
Cruisers	4.6 (+8.9%)	0.0 (+7.9%)	0.9 (+7.3%)	0.0 (+6.8%)	0.0 (+7.1%)	0.0 (+7.9%)
Fishing_vessels	2.5 (-15.2%)	0.0 (-16.7%)	0.6 (-17.6%)	0.0 (-18.1%)	0.0 (-17.7%)	0.0 (-16.7%)
Service_ships	0.7 (+16.5%)	0.0 (+15.4%)	0.2 (+14.9%)	0.0 (+14.5%)	0.0 (+14.8%)	0.0 (+15.4%)
Unknown	1.3 (+30.1%)	0.0 (+32.7%)	0.4 (+33.9%)	0.0 (+34.8%)	0.0 (+34.3%)	0.0 (+32.7%)
Misc	2.2 (+13.6%)	0.0 (+12.2%)	0.6 (+11.9%)	0.0 (+11.2%)	0.0 (+11.5%)	0.0 (+12.3%)

2010	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	45.4	387.2	105.4		0.0	5307.6	939.5
Vehicle_carriers	4.5	10.1	0.9	0.0	0.0	5.5	3.9
RoRo_vessels	19.5	62.0	6.9	0.0	0.0	138.1	99.2
Bulk_carriers	33.8	158.5	6.4		0.0	50.1	35.4
General_cargo	44.6	1233.9	31.5	0.0	0.0	230.1	153.3
Container_ships	35.1	153.9	9.5		0.0	54.4	38.8
Reefers	2.2	49.0	2.9	0.0	0.0	13.8	9.6
Tankers	126.0	357.4	21.1	2319.2	0.0	128.5	41.0
LNG_tankers	0.0	0.2	0.1	0.0	0.0	0.2	0.1
Gas_tankers	1.4	7.5	0.5	0.0	0.0	3.0	1.0
Passenger_ships	0.0	115.8	19.9	0.0	0.0	1024.1	55.3
Cruisers	6.8	9.5	11.7		0.0	871.8	182.3
Fishing_vessels	0.0	117.1	7.5	0.0	0.0	30.2	2.4
Service_ships	0.0	135.6	19.3	0.0	0.0	55.5	11.2
Unknown	0.0	125.2	15.6	0.0	0.0	21.2	3.0
Total, All	320	3105	285	11366	0	8030	1595
Total, IMO numbered only	320	2596	230	11366	0	7369	1568

2010	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	454.1	45.4	148.7	44.6	13.2	64.2
Vehicle_carriers	0.7	0.1	0.2	0.1	0.0	0.1
RoRo_vessels	18.5	1.8	5.1	1.8	0.5	2.2
Bulk_carriers	6.6	0.7	1.9	0.6	0.2	0.8
General_cargo	28.6	2.9	8.5	2.8	0.8	3.7
Container_ships	7.2	0.7	2.0	0.7	0.2	0.9
Reefers	1.8	0.2	0.4	0.2	0.0	0.2
Tankers	17.9	1.8	3.1	1.0	0.3	1.3
LNG_tankers	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.4	0.0	0.1	0.0	0.0	0.1
Passenger_ships	26.7	2.7	29.4	1.2	0.8	12.7
Cruisers	88.1	47.9	24.4	8.7	14.5	10.6

Fishing_vessels	1.7	0.2	0.9	0.1	0.1	0.4
Service_ships	1.2	0.1	0.6	0.1	0.0	0.3
Unknown	0.8	0.1	0.6	0.1	0.0	0.3
Total, All	661	105	232	63	31	100
Total, IMO numbered only	651	104	225	63	31	92

2010	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	262.0 (+1.4%)	0.6 (+2.0%)	55.8 (+2.3%)	1.1 (+2.5%)	0.4 (+2.3%)	1.0 (+2.0%)
Baltic Proper	114.2 (+3.2%)	0.2 (+3.9%)	24.4 (+4.4%)	0.5 (+4.6%)	0.2 (+4.4%)	0.5 (+3.9%)
Kattegat	72.0 (-4.1%)	0.2 (-4.2%)	15.2 (-4.2%)	0.3 (-4.2%)	0.1 (-4.2%)	0.3 (-4.2%)
Gulf of Finland	54.1 (+4.3%)	0.1 (+4.9%)	11.3 (+5.4%)	0.2 (+5.5%)	0.1 (+5.4%)	0.2 (+4.9%)
Gulf of Bothnia	16.0 (+7.9%)	0.0 (+9.9%)	3.6 (+11.1%)	0.1 (+11.9%)	0.0 (+11.3%)	0.1 (+9.9%)
Gulf of Riga	5.8 (-2.2%)	0.0 (-1.7%)	1.3 (-1.5%)	0.0 (-1.4%)	0.0 (-1.5%)	0.0 (-1.8%)
Vessel type						
Ropax_vessels	13.5 (-.0%)	0.0 (-.8%)	3.9 (-1.2%)	0.1 (-1.4%)	0.0 (-1.2%)	0.1 (-.8%)
Vehicle_carriers	2.9 (-5.4%)	0.0 (-7.7%)	0.5 (-9.3%)	0.0 (-10.1%)	0.0 (-9.4%)	0.0 (-7.8%)
Roro_vessels	12.5 (-2.3%)	0.0 (-3.1%)	2.8 (-3.6%)	0.1 (-3.8%)	0.0 (-3.6%)	0.1 (-3.1%)
Bulk_carriers	34.6 (+5.9%)	0.1 (+6.4%)	7.0 (+6.9%)	0.1 (+7.1%)	0.0 (+6.9%)	0.1 (+6.5%)
General_cargo	56.2 (+1.6%)	0.1 (+3.7%)	12.3 (+5.1%)	0.2 (+5.7%)	0.1 (+5.2%)	0.2 (+3.7%)
Container_ships	23.9 (+9.9%)	0.0 (+10.8%)	4.8 (+11.5%)	0.1 (+11.8%)	0.0 (+11.5%)	0.1 (+10.8%)
Reefers	6.0 (-15.6%)	0.0 (-16.1%)	1.2 (-16.5%)	0.0 (-16.7%)	0.0 (-16.5%)	0.0 (-16.2%)
Tankers	89.4 (-1.5%)	0.2 (-1.7%)	17.5 (-1.9%)	0.3 (-2.0%)	0.1 (-1.9%)	0.3 (-1.7%)
Lng_tankers	0.6 (-8.8%)	0.0 (-11.4%)	0.1 (-13.6%)	0.0 (-14.5%)	0.0 (-13.6%)	0.0 (-11.6%)
Gas_tankers	1.7 (-4.9%)	0.0 (-6.6%)	0.3 (-7.8%)	0.0 (-8.3%)	0.0 (-7.8%)	0.0 (-6.6%)
Passenger_ships	1.2 (+.8%)	0.0 (+1.5%)	0.3 (+1.9%)	0.0 (+2.1%)	0.0 (+2.0%)	0.0 (+1.6%)
Cruisers	4.2 (-6.7%)	0.0 (-5.5%)	0.9 (-4.4%)	0.0 (-4.2%)	0.0 (-4.6%)	0.0 (-5.4%)

Fishing_vessels	2.3 (-8.4%)	0.0 (-5.6%)	0.5 (-3.7%)	0.0 (-3.0%)	0.0 (-3.7%)	0.0 (-5.5%)
Service_ships	1.1 (+68.1%)	0.0 (+72.7%)	0.3 (+73.5%)	0.0 (+75.3%)	0.0 (+74.6%)	0.0 (+71.9%)
Unknown	1.5 (+14.9%)	0.0 (+16.1%)	0.4 (+16.6%)	0.0 (+16.9%)	0.0 (+16.7%)	0.0 (+16.1%)
Misc	2.8 (+24.8%)	0.0 (+25.3%)	0.8 (+25.2%)	0.0 (+25.6%)	0.0 (+25.5%)	0.0 (+25.2%)

2011	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	57.9	413.0	113.6	9.9	0.0	5575.8	992.5
Vehicle_carriers	5.7	12.2	1.1	0.0	0.0	6.8	4.9
RoRo_vessels	27.5	62.7	7.1	0.0	0.0	152.6	109.3
Bulk_carriers	41.4	177.9	7.3		0.0	57.4	40.4
General_cargo	50.5	1220.5	31.2	0.0	0.0	224.6	151.0
Container_ships	42.8	158.8	10.2		0.0	58.4	41.6
Reefers	2.2	45.0	2.6	0.0	0.0	13.2	9.2
Tankers	133.6	360.8	21.7	2779.1	0.0	131.2	41.5
LNG_tankers	0.1	0.2	0.1	0.0	0.0	0.2	0.1
Gas_tankers	1.7	8.1	0.5	0.0	0.0	2.9	1.0
Passenger_ships	0.0	143.6	24.6	0.0	0.0	1278.9	60.5
Cruisers	8.7	9.7	12.3		0.0	906.6	190.1
Fishing_vessels	0.0	156.3	9.9	0.0	0.0	38.0	2.9
Service_ships	0.0	150.4	21.4	0.0	0.0	63.8	12.8
Unknown	0.0	170.3	21.4	0.0	0.0	32.9	4.7
Total, All	372	3305	316	14653	0	8673	1689
Total, IMO numbered only	372	2638	244	14653	0	7801	1652

2011	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	479.8	48.0	156.3	47.2	14.0	67.5
Vehicle_carriers	0.9	0.1	0.3	0.1	0.0	0.1
RoRo_vessels	20.4	2.0	5.6	2.0	0.6	2.4
Bulk_carriers	7.5	0.8	2.1	0.7	0.2	0.9
General_cargo	28.1	2.8	8.3	2.7	0.8	3.6
Container_ships	7.7	0.8	2.2	0.8	0.2	0.9
Reefers	1.7	0.2	0.4	0.2	0.0	0.2
Tankers	18.1	1.8	3.2	1.0	0.3	1.4
LNG_tankers	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.4	0.0	0.1	0.0	0.0	0.1
Passenger_ships	29.3	2.9	36.7	1.3	0.8	15.8
Cruisers	91.9	50.0	25.4	9.2	15.3	11.0
Fishing_vessels	2.1	0.2	1.1	0.1	0.1	0.5

Service_ships	1.6	0.2	0.7	0.1	0.0	0.3
Unknown	1.2	0.1	0.9	0.1	0.0	0.4
Total, All	699	111	250	67	33	108
Total, IMO numbered only	686	109	242	66	33	97

2011	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	267.9 (+2.3%)	0.6 (+3.3%)	58.0 (+4.0%)	1.2 (+4.3%)	0.4 (+4.0%)	1.1 (+3.3%)
Baltic Proper	111.9 (-2.0%)	0.2 (-.8%)	24.4 (+.0%)	0.5 (+.4%)	0.2 (+.1%)	0.5 (-.7%)
Kattegat	71.6 (-.5%)	0.2 (+.1%)	15.3 (+.5%)	0.3 (+.7%)	0.1 (+.5%)	0.3 (+.1%)
Gulf of Finland	61.1 (+12.9%)	0.1 (+14.2%)	13.0 (+15.1%)	0.3 (+15.5%)	0.1 (+15.1%)	0.2 (+14.2%)
Gulf of Bothnia	16.3 (+2.2%)	0.0 (+3.2%)	3.7 (+3.9%)	0.1 (+4.2%)	0.0 (+3.9%)	0.1 (+3.3%)
Gulf of Riga	7.0 (+20.4%)	0.0 (+21.6%)	1.6 (+22.4%)	0.0 (+22.7%)	0.0 (+22.4%)	0.0 (+21.6%)
Vessel type						
Ropax_vessels	14.0 (+3.7%)	0.0 (+4.3%)	4.0 (+4.5%)	0.1 (+4.6%)	0.0 (+4.5%)	0.1 (+4.2%)
Vehicle_carriers	3.4 (+17.5%)	0.0 (+17.4%)	0.6 (+17.2%)	0.0 (+17.2%)	0.0 (+17.2%)	0.0 (+17.3%)
Roro_vessels	11.2 (-10.7%)	0.0 (-9.9%)	2.5 (-9.7%)	0.1 (-9.5%)	0.0 (-9.7%)	0.0 (-10.1%)
Bulk_carriers	40.9 (+18.0%)	0.1 (+17.9%)	8.2 (+17.9%)	0.2 (+17.9%)	0.1 (+17.9%)	0.2 (+17.9%)
General_cargo	52.0 (-7.4%)	0.1 (-5.5%)	11.8 (-4.2%)	0.2 (-3.7%)	0.1 (-4.2%)	0.2 (-5.4%)
Container_ships	24.3 (+1.5%)	0.1 (+2.8%)	4.9 (+3.8%)	0.1 (+4.2%)	0.0 (+3.8%)	0.1 (+2.9%)
Reefers	5.6 (-6.7%)	0.0 (-5.7%)	1.2 (-4.9%)	0.0 (-4.6%)	0.0 (-4.9%)	0.0 (-5.6%)
Tankers	91.5 (+2.4%)	0.2 (+3.4%)	18.3 (+4.3%)	0.4 (+4.6%)	0.1 (+4.3%)	0.4 (+3.5%)
Lng_tankers	0.5 (-30.2%)	0.0 (-31.9%)	0.1 (-33.4%)	0.0 (-34.0%)	0.0 (-33.4%)	0.0 (-32.0%)
Gas_tankers	1.5 (-10.0%)	0.0 (-8.4%)	0.3 (-7.2%)	0.0 (-6.7%)	0.0 (-7.2%)	0.0 (-8.3%)
Passenger_ships	1.3 (+10.5%)	0.0 (+10.8%)	0.4 (+10.9%)	0.0 (+10.8%)	0.0 (+10.8%)	0.0 (+10.7%)
Cruisers	4.4 (+3.7%)	0.0 (+4.1%)	0.9 (+4.1%)	0.0 (+4.7%)	0.0 (+4.6%)	0.0 (+4.0%)
Fishing_vessels	2.4 (+4.2%)	0.0 (+6.1%)	0.6 (+7.2%)	0.0 (+7.5%)	0.0 (+7.1%)	0.0 (+6.0%)
Service_ships	1.3 (+13.5%)	0.0 (+16.2%)	0.3 (+17.6%)	0.0 (+18.4%)	0.0 (+17.9%)	0.0 (+16.3%)
Unknown	2.0 (+35.1%)	0.0 (+34.3%)	0.6 (+33.6%)	0.0 (+33.4%)	0.0 (+33.6%)	0.0 (+34.1%)
Misc	3.3 (+16.9%)	0.0 (+17.1%)	0.9 (+17.1%)	0.0 (+17.2%)	0.0 (+17.1%)	0.0 (+17.0%)

2012	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	56.3	393.7	109.3	64.3	0.0	5471.4	963.5
Vehicle_carriers	6.2	12.4	1.1	0.0	0.0	7.1	5.1
RoRo_vessels	26.3	54.7	6.4	113.2	0.0	133.4	95.3
Bulk_carriers	45.7	171.0	7.2	1721.1	0.0	57.2	40.4
General_cargo	48.6	1096.7	28.1	0.0	0.0	197.5	135.3
Container_ships	49.3	155.0	10.4	0.0	0.0	58.5	41.5
Reefers	4.5	79.6	4.1	0.0	0.0	21.9	12.1
Tankers	142.9	357.0	21.5	2299.6	0.0	131.1	41.1
LNG_tankers	0.1	0.4	0.2	0.0	0.0	0.4	0.1
Gas_tankers	1.9	10.1	0.6	0.0	0.0	3.3	1.1
Passenger_ships	0.0	155.8	26.6	0.0	0.0	1352.6	60.7
Cruisers	9.4	8.8	12.4	2706.6	0.0	921.9	193.4
Fishing_vessels	0.0	212.1	13.2	0.0	0.0	51.9	4.2
Service_ships	0.0	153.8	21.7	0.0	0.0	59.8	9.8
Unknown	0.0	209.2	26.2	0.0	0.0	41.9	6.1
Total, All	392	3313	323	7776	0	8664	1644
Total, IMO numbered only	392	2509	237	7776	0	7664	1592

2012	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	465.7	46.6	153.3	45.8	13.5	66.2
Vehicle_carriers	1.0	0.1	0.3	0.1	0.0	0.1

RoRo_vessels	17.7	1.8	4.9	1.8	0.5	2.1
Bulk_carriers	7.5	0.8	2.1	0.7	0.2	0.9
General_cargo	25.2	2.5	7.3	2.4	0.7	3.2
Container_ships	7.7	0.8	2.2	0.8	0.2	0.9
Reefers	2.3	0.2	0.6	0.3	0.0	0.3
Tankers	17.9	1.8	3.1	1.0	0.3	1.3
LNG_tankers	0.1	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.5	0.0	0.1	0.0	0.0	0.1
Passenger_ships	29.3	2.9	38.8	1.3	0.9	16.8
Cruisers	93.5	50.8	25.8	9.3	15.5	11.2
Fishing_vessels	3.0	0.3	1.5	0.1	0.1	0.6
Service_ships	1.1	0.1	0.6	0.1	0.0	0.3
Unknown	1.6	0.2	1.2	0.1	0.0	0.5
Total, All	684	110	249	66	33	108
Total, IMO numbered only	666	108	241	64	32	95

2012	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	263.2 (-1.8%)	0.6 (-1.5%)	57.3 (-1.3%)	1.1 (-1.2%)	0.4 (-1.3%)	1.1 (-1.5%)
Baltic Proper	112.4 (+.4%)	0.2 (+.6%)	24.6 (+.7%)	0.5 (+.7%)	0.2 (+.7%)	0.5 (+.6%)
Kattegat	73.1 (+2.0%)	0.2 (+2.9%)	15.9 (+3.7%)	0.3 (+3.9%)	0.1 (+3.7%)	0.3 (+3.0%)
Gulf of Finland	56.5 (-7.5%)	0.1 (-7.7%)	11.9 (-7.9%)	0.2 (-7.9%)	0.1 (-7.9%)	0.2 (-7.7%)
Gulf of Bothnia	14.8 (-9.2%)	0.0 (-8.6%)	3.4 (-8.1%)	0.1 (-8.2%)	0.0 (-8.3%)	0.1 (-8.6%)
Gulf of Riga	6.4 (-8.2%)	0.0 (-8.6%)	1.4 (-8.9%)	0.0 (-9.0%)	0.0 (-8.9%)	0.0 (-8.6%)
Vessel type						
Ropax_vessels	13.6 (-2.4%)	0.0 (-2.2%)	3.9 (-2.0%)	0.1 (-1.8%)	0.0 (-1.9%)	0.1 (-2.1%)
Vehicle_carriers	3.5 (+4.3%)	0.0 (+3.3%)	0.7 (+2.4%)	0.0 (+2.0%)	0.0 (+2.4%)	0.0 (+3.2%)

Roro_vessels	10.1 (-10.0%)	0.0 (-10.9%)	2.3 (-11.5%)	0.0 (-11.8%)	0.0 (-11.5%)	0.0 (-10.9%)
Bulk_carriers	42.6 (+4.3%)	0.1 (+4.2%)	8.6 (+4.2%)	0.2 (+4.2%)	0.1 (+4.2%)	0.2 (+4.2%)
General_cargo	45.5 (-12.6%)	0.1 (-12.3%)	10.4 (-12.0%)	0.2 (-11.9%)	0.1 (-12.0%)	0.2 (-12.2%)
Container_ships	23.8 (-2.0%)	0.1 (-.2%)	5.0 (+1.2%)	0.1 (+1.8%)	0.0 (+1.2%)	0.1 (-.1%)
Reefers	6.6 (+17.4%)	0.0 (+20.5%)	1.4 (+22.9%)	0.0 (+23.2%)	0.0 (+22.4%)	0.0 (+20.6%)
Tankers	91.5 (-.1%)	0.2 (-.1%)	18.3 (-.1%)	0.4 (-.1%)	0.1 (-.1%)	0.3 (-.1%)
Lng_tankers	0.6 (+35.8%)	0.0 (+45.0%)	0.1 (+53.1%)	0.0 (+56.8%)	0.0 (+53.3%)	0.0 (+45.7%)
Gas_tankers	1.4 (-5.1%)	0.0 (-2.7%)	0.3 (-.9%)	0.0 (-.2%)	0.0 (-.9%)	0.0 (-2.6%)
Passenger_ships	1.3 (+5.6%)	0.0 (+6.1%)	0.4 (+6.0%)	0.0 (+6.4%)	0.0 (+6.4%)	0.0 (+6.0%)
Cruisers	4.4 (-.6%)	0.0 (+.6%)	0.9 (+1.6%)	0.0 (+2.0%)	0.0 (+1.6%)	0.0 (+.7%)
Fishing_vessels	2.4 (-.9%)	0.0 (+.2%)	0.6 (+1.0%)	0.0 (+1.0%)	0.0 (+.7%)	0.0 (+.2%)
Service_ships	1.2 (-3.2%)	0.0 (-4.7%)	0.3 (-5.0%)	0.0 (-5.3%)	0.0 (-5.1%)	0.0 (-4.4%)
Unknown	2.3 (+16.6%)	0.0 (+18.2%)	0.7 (+19.1%)	0.0 (+19.4%)	0.0 (+19.1%)	0.0 (+18.3%)
Misc	3.7 (+12.5%)	0.0 (+14.4%)	1.0 (+15.7%)	0.0 (+16.0%)	0.0 (+15.6%)	0.0 (+14.6%)

2013	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	58.1	414.3	111.8	3540.8	0.0	5726.8	1004.7
Vehicle_carriers	6.2	12.6	1.2	0.0	0.0	7.3	5.2
RoRo_vessels	27.5	51.3	6.3	250.3	0.0	138.7	99.5
Bulk_carriers	49.5	180.1	7.7	663.9	0.0	61.0	42.9
General_cargo	46.8	1078.9	27.8	0.0	0.0	195.7	131.7
Container_ships	50.7	149.3	10.0		0.0	57.6	41.2
Reefers	1.9	29.8	1.8	0.0	0.0	10.0	6.9
Tankers	145.7	366.3	22.3	1748.9	0.0	135.1	42.4
LNG_tankers	0.1	0.5	0.3	0.0	0.0	0.3	0.1
Gas_tankers	2.1	10.7	0.7	0.0	0.0	3.8	1.3
Passenger_ships	0.0	167.3	28.5	0.0	0.0	1405.3	52.8
Cruisers	10.3	9.2	13.8	4100.3	0.0	1027.5	215.5
Fishing_vessels	0.0	264.5	16.3	0.0	0.0	61.3	4.8
Service_ships	0.0	161.8	22.7	0.0	0.0	61.6	9.2
Unknown	0.0	244.2	30.6	0.0	0.0	47.9	6.6
Total, All	399	3423	341	11057	0	9107	1694
Total, IMO numbered only	399	2508	242	11057	0	8025	1650

2013	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	485.6	48.6	160.5	47.8	14.1	69.3
Vehicle_carriers	1.0	0.1	0.3	0.1	0.0	0.1
RoRo_vessels	18.5	1.9	5.1	1.8	0.5	2.2
Bulk_carriers	8.0	0.8	2.3	0.8	0.2	1.0
General_cargo	24.5	2.5	7.2	2.4	0.7	3.1
Container_ships	7.7	0.8	2.1	0.8	0.2	0.9
Reefers	1.3	0.1	0.3	0.2	0.0	0.1
Tankers	18.5	1.8	3.2	1.0	0.3	1.4
LNG_tankers	0.0	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.6	0.1	0.2	0.1	0.0	0.1
Passenger_ships	25.5	2.6	40.3	1.1	0.7	17.4
Cruisers	104.2	56.7	28.8	10.4	17.3	12.4
Fishing_vessels	3.5	0.3	1.8	0.1	0.1	0.8

Service_ships	0.9	0.1	0.6	0.1	0.0	0.3
Unknown	1.7	0.2	1.4	0.1	0.0	0.6
Total, All	711	117	262	68	35	113
Total, IMO numbered only	694	116	253	67	34	100

2013	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	275.3 (+4.6%)	0.6 (+4.2%)	59.5 (+4.0%)	1.2 (+3.9%)	0.4 (+4.0%)	1.1 (+4.2%)
Baltic Proper	116.8 (+3.9%)	0.3 (+3.3%)	25.3 (+3.0%)	0.5 (+2.8%)	0.2 (+3.0%)	0.5 (+3.3%)
Kattegat	75.6 (+3.5%)	0.2 (+3.4%)	16.4 (+3.3%)	0.3 (+3.2%)	0.1 (+3.3%)	0.3 (+3.3%)
Gulf of Finland	60.4 (+6.8%)	0.1 (+6.7%)	12.7 (+6.7%)	0.3 (+6.7%)	0.1 (+6.7%)	0.2 (+6.8%)
Gulf of Bothnia	15.8 (+6.9%)	0.0 (+6.0%)	3.6 (+5.5%)	0.1 (+5.3%)	0.0 (+5.5%)	0.1 (+6.0%)
Gulf of Riga	6.7 (+4.7%)	0.0 (+3.2%)	1.4 (+2.2%)	0.0 (+1.8%)	0.0 (+2.2%)	0.0 (+3.1%)
Vessel type						
Ropax_vessels	13.6 (+.1%)	0.0 (-.1%)	3.9 (-.2%)	0.1 (-.3%)	0.0 (-.3%)	0.1 (-.1%)
Vehicle_carriers	3.5 (+.8%)	0.0 (+.2%)	0.7 (-.3%)	0.0 (-.5%)	0.0 (-.3%)	0.0 (+.2%)
Roro_vessels	10.1 (+.4%)	0.0 (-.1%)	2.2 (-.4%)	0.0 (-.5%)	0.0 (-.4%)	0.0 (-.1%)
Bulk_carriers	46.4 (+8.9%)	0.1 (+8.9%)	9.3 (+9.0%)	0.2 (+9.0%)	0.1 (+9.0%)	0.2 (+8.9%)
General_cargo	47.3 (+4.0%)	0.1 (+3.4%)	10.7 (+2.9%)	0.2 (+2.8%)	0.1 (+2.9%)	0.2 (+3.3%)
Container_ships	25.1 (+5.4%)	0.1 (+2.4%)	5.0 (+.3%)	0.1 (-.6%)	0.0 (+.2%)	0.1 (+2.3%)
Reefers	4.2 (-36.1%)	0.0 (-39.5%)	0.8 (-42.0%)	0.0 (-42.7%)	0.0 (-41.8%)	0.0 (-39.7%)
Tankers	96.3 (+5.3%)	0.2 (+6.0%)	19.5 (+6.6%)	0.4 (+6.9%)	0.1 (+6.6%)	0.4 (+6.1%)
Lng_tankers	1.0 (+64.8%)	0.0 (+74.2%)	0.2 (+81.9%)	0.0 (+85.1%)	0.0 (+82.1%)	0.0 (+75.0%)
Gas_tankers	1.8 (+30.0%)	0.0 (+26.7%)	0.4 (+24.4%)	0.0 (+23.5%)	0.0 (+24.4%)	0.0 (+26.6%)
Passenger_ships	1.4 (+4.7%)	0.0 (+4.8%)	0.4 (+4.9%)	0.0 (+4.7%)	0.0 (+4.7%)	0.0 (+4.8%)
Cruisers	4.9 (+11.8%)	0.0 (+10.8%)	1.0 (+10.0%)	0.0 (+9.7%)	0.0 (+10.0%)	0.0 (+10.7%)
Fishing_vessels	2.7 (+10.5%)	0.0 (+11.2%)	0.7 (+11.6%)	0.0 (+11.6%)	0.0 (+11.5%)	0.0 (+11.1%)
Service_ships	1.3 (+6.5%)	0.0 (+5.8%)	0.4 (+5.8%)	0.0 (+5.7%)	0.0 (+5.8%)	0.0 (+6.0%)
Unknown	2.7 (+17.7%)	0.0 (+18.4%)	0.8 (+18.8%)	0.0 (+19.0%)	0.0 (+18.9%)	0.0 (+18.4%)
Misc	3.5 (-3.8%)	0.0 (-5.2%)	1.0 (-5.9%)	0.0 (-6.2%)	0.0 (-5.9%)	0.0 (-5.2%)

2014	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	56.6	386.6	106.6	4464.0	0.0	5669.4	990.4
Vehicle_carriers	5.9	12.6	1.2	0.0	0.0	7.0	5.0
RoRo_vessels	28.5	48.1	6.1	7686.4	0.1	133.2	95.8
Bulk_carriers	57.2	205.3	8.8	885.7	0.0	70.1	49.5
General_cargo	47.4	1065.2	27.6	0.0	2.0	193.4	132.4
Container_ships	54.3	151.7	10.4		8.8	58.5	41.9
Reefers	1.6	24.0	1.5	0.0	0.0	8.2	5.9
Tankers	146.6	371.9	22.5	1936.2	0.0	137.2	43.2
LNG_tankers	0.3	0.6	0.3	0.0	0.0	0.6	0.2
Gas_tankers	3.2	12.9	0.8	0.0	0.0	4.8	1.6
Passenger_ships	0.0	183.3	31.3	0.0	0.0	1601.1	57.2
Cruisers	9.9	9.3	13.8	8834.8	0.0	1039.3	217.8
Fishing_vessels	0.0	304.8	18.8	0.0	0.0	71.8	5.6
Service_ships	0.0	178.8	25.2	0.0	0.0	70.3	10.2
Unknown	0.0	304.6	38.1	0.0	0.0	60.3	8.3
Total, All	412	3567	355	24085	11	9298	1697
Total, IMO numbered only	412	2472	235	24085	11	7813	1622

2014	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	478.7	47.9	158.9	47.2	13.9	68.6
Vehicle_carriers	0.9	0.1	0.3	0.1	0.0	0.1
RoRo_vessels	17.8	1.8	4.9	1.8	0.5	2.1
Bulk_carriers	9.2	0.9	2.6	0.9	0.3	1.1
General_cargo	24.7	2.5	7.1	2.4	0.7	3.1
Container_ships	7.8	0.8	2.2	0.8	0.2	0.9
Reefers	1.1	0.1	0.2	0.1	0.0	0.1
Tankers	18.9	1.9	3.3	1.1	0.3	1.4
LNG_tankers	0.1	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.7	0.1	0.2	0.1	0.0	0.1
Passenger_ships	27.7	2.8	45.9	1.2	0.8	19.8
Cruisers	105.3	57.3	29.1	10.4	17.4	12.6
Fishing_vessels	4.0	0.4	2.1	0.1	0.2	0.9
Service_ships	1.0	0.1	0.7	0.1	0.0	0.3
Unknown	2.1	0.2	1.7	0.2	0.1	0.7
Total, All	710	118	267	68	35	116
Total, IMO numbered only	681	115	258	66	34	97

2014	CuO [tonnes]	CuPyr [tonnes]	ZnO [tonnes]	ZnPyr [tonnes]	DCOIT [tonnes]	Zineb [tonnes]
Total	286.4 (+4.0%)	0.6 (+3.8%)	61.7 (+3.6%)	1.2 (+3.5%)	0.4 (+3.6%)	1.1 (+3.8%)
Baltic Proper	123.8 (+6.0%)	0.3 (+5.9%)	26.8 (+5.9%)	0.5 (+5.8%)	0.2 (+5.9%)	0.5 (+5.9%)
Kattegat	77.0 (+1.8%)	0.2 (+1.4%)	16.6 (+1.1%)	0.3 (+1.0%)	0.1 (+1.1%)	0.3 (+1.4%)
Gulf of Finland	61.4 (+1.7%)	0.1 (+1.3%)	12.9 (+1.1%)	0.3 (+1.0%)	0.1 (+1.1%)	0.2 (+1.3%)
Gulf of Bothnia	16.5 (+4.4%)	0.0 (+4.0%)	3.7 (+3.7%)	0.1 (+3.7%)	0.0 (+3.8%)	0.1 (+4.0%)
Gulf of Riga	7.6 (+14.1%)	0.0 (+13.9%)	1.6 (+13.8%)	0.0 (+13.8%)	0.0 (+13.8%)	0.0 (+13.9%)
Vessel type						
Ropax_vessels	12.7 (-6.8%)	0.0 (-6.9%)	3.7 (-7.0%)	0.1 (-7.0%)	0.0 (-7.0%)	0.1 (-6.9%)
Vehicle_carriers	3.4 (-5.1%)	0.0 (-4.2%)	0.6 (-3.5%)	0.0 (-3.1%)	0.0 (-3.5%)	0.0 (-4.2%)
Roro_vessels	9.6 (-4.8%)	0.0 (-4.1%)	2.2 (-3.8%)	0.0 (-3.5%)	0.0 (-3.7%)	0.0 (-4.1%)
Bulk_carriers	54.1 (+16.6%)	0.1 (+16.2%)	10.8 (+15.9%)	0.2 (+15.8%)	0.1 (+16.0%)	0.2 (+16.2%)
General_cargo	47.5 (+.3%)	0.1 (+.2%)	10.7 (+.1%)	0.2 (+.0%)	0.1 (+.1%)	0.2 (+.2%)
Container_ships	25.7 (+2.5%)	0.1 (+3.4%)	5.2 (+4.0%)	0.1 (+4.3%)	0.0 (+4.1%)	0.1 (+3.4%)
Reefers	3.6 (-13.8%)	0.0 (-14.1%)	0.7 (-14.4%)	0.0 (-14.5%)	0.0 (-14.4%)	0.0 (-14.1%)
Tankers	97.9 (+1.7%)	0.2 (+1.2%)	19.6 (+.8%)	0.4 (+.7%)	0.1 (+.8%)	0.4 (+1.2%)
Lng_tankers	1.2 (+21.9%)	0.0 (+14.4%)	0.2 (+8.7%)	0.0 (+6.5%)	0.0 (+8.5%)	0.0 (+13.7%)
Gas_tankers	2.5 (+35.7%)	0.0 (+34.7%)	0.5 (+33.8%)	0.0 (+33.4%)	0.0 (+33.8%)	0.0 (+34.6%)
Passenger_ships	1.6 (+12.6%)	0.0 (+12.3%)	0.5 (+12.5%)	0.0 (+11.9%)	0.0 (+12.0%)	0.0 (+12.4%)
Cruisers	4.9 (+.1%)	0.0 (-.4%)	1.0 (-.9%)	0.0 (-1.0%)	0.0 (-.9%)	0.0 (-.5%)
Fishing_vessels	3.0 (+11.8%)	0.0 (+12.5%)	0.7 (+13.0%)	0.0 (+13.1%)	0.0 (+13.0%)	0.0 (+12.6%)
Service_ships	1.2 (-6.4%)	0.0 (-4.9%)	0.3 (-4.0%)	0.0 (-3.9%)	0.0 (-4.2%)	0.0 (-4.9%)
Unknown	3.5 (+27.9%)	0.0 (+27.8%)	1.0 (+27.8%)	0.0 (+27.9%)	0.0 (+27.9%)	0.0 (+27.9%)
Misc	3.9 (+11.4%)	0.0 (+11.4%)	1.1 (+11.1%)	0.0 (+11.2%)	0.0 (+11.3%)	0.0 (+11.3%)

2015	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water

	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	54.3	389.9	105.2	17426.2	8.1	5461.9	953.7
Vehicle_carriers	4.7	9.6	0.9	0.0	0.0	5.1	3.6
RoRo_vessels	28.4	49.7	6.2	52935.3	0.5	154.0	110.4
Bulk_carriers	59.4	220.8	9.6	1593.1	0.0	75.4	53.1
General_cargo	44.8	1052.2	27.5	4907.3	6.5	190.4	130.2
Container_ships	52.5	144.5	10.0	37.6	15.0	55.9	40.0
Reefers	1.7	25.5	1.6	0.0	0.0	8.3	5.8
Tankers	148.9	386.8	22.9	3875.3	0.0	139.1	43.6
LNG_tankers	0.5	0.9	0.4	0.0	0.0	0.7	0.2
Gas_tankers	3.5	13.0	0.9	6.3	0.0	5.2	1.8
Passenger_ships	0.0	195.0	33.4	0.0	0.0	1659.1	60.0
Cruisers	9.7	8.5	13.0	12679.9	3.5	1010.8	211.9
Fishing_vessels	0.0	320.3	19.7	0.0	0.0	75.6	5.9
Service_ships	0.0	177.5	24.8	0.0	0.0	67.0	9.7
Unknown	0.0	345.8	43.3	1.2	0.0	69.3	9.2
Total, All	408	3657	363	93462	33.6	9172	1674
Total, IMO numbered only	408	2461	233	93461	33.6	7625	1595

2015	**Sewage Nitrogen**	**Food Waste Nitrogen**	**Grey Water Nitrogen**	**Sewage Phosphorus**	**Food Waste Phosphorus**	**Grey Water Phosporus**
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	461.0	46.1	153.1	45.3	13.4	66.1
Vehicle_carriers	0.7	0.1	0.2	0.1	0.0	0.1
RoRo_vessels	20.6	2.1	5.7	2.0	0.6	2.5
Bulk_carriers	9.9	1.0	2.8	1.0	0.3	1.2
General_cargo	24.2	2.4	7.0	2.3	0.7	3.0
Container_ships	7.5	0.7	2.1	0.7	0.2	0.9
Reefers	1.1	0.1	0.2	0.1	0.0	0.1
Tankers	19.0	1.9	3.5	1.1	0.3	1.5
LNG_tankers	0.1	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.8	0.1	0.2	0.1	0.0	0.1
Passenger_ships	29.0	2.9	47.5	1.3	0.8	20.5
Cruisers	102.4	55.7	28.3	10.2	16.9	12.2

Fishing_vessels	4.3	0.4	2.2	0.1	0.2	0.9
Service_ships	1.0	0.1	0.7	0.1	0.0	0.3
Unknown	2.4	0.2	2.0	0.2	0.1	0.9
Total, All	694	115	264	66	34	114
Total, IMO numbered only	664	112	254	65	33	95

2015	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	292.8 (+2.2%)	0.6 (+2.2%)	63.0 (+2.2%)	1.3 (+2.2%)	0.4 (+2.2%)	1.2 (+2.2%)
Baltic Proper	125.6 (+1.4%)	0.3 (+1.3%)	27.1 (+1.2%)	0.5 (+1.2%)	0.2 (+1.2%)	0.5 (+1.3%)
Kattegat	81.1 (+5.3%)	0.2 (+5.8%)	17.6 (+6.1%)	0.4 (+6.3%)	0.1 (+6.1%)	0.3 (+5.8%)
Gulf of Finland	62.1 (+1.1%)	0.1 (+.9%)	13.0 (+.7%)	0.3 (+.7%)	0.1 (+.7%)	0.2 (+.9%)
Gulf of Bothnia	15.7 (-4.8%)	0.0 (-4.9%)	3.5 (-4.9%)	0.1 (-5.2%)	0.0 (-5.1%)	0.1 (-4.9%)
Gulf of Riga	8.2 (+8.0%)	0.0 (+7.8%)	1.8 (+7.7%)	0.0 (+7.7%)	0.0 (+7.7%)	0.0 (+7.9%)
Vessel type						
Ropax_vessels	12.7 (-.0%)	0.0 (-.5%)	3.6 (-.7%)	0.1 (-.8%)	0.0 (-.7%)	0.1 (-.5%)
Vehicle_carriers	2.5 (-26.7%)	0.0 (-26.6%)	0.5 (-26.5%)	0.0 (-26.5%)	0.0 (-26.6%)	0.0 (-26.6%)
Roro_vessels	9.3 (-3.6%)	0.0 (-5.7%)	2.0 (-7.3%)	0.0 (-8.0%)	0.0 (-7.4%)	0.0 (-6.0%)
Bulk_carriers	58.9 (+8.9%)	0.1 (+9.3%)	11.9 (+9.6%)	0.2 (+9.8%)	0.1 (+9.6%)	0.2 (+9.3%)
General_cargo	48.0 (+1.2%)	0.1 (+1.3%)	10.9 (+1.5%)	0.2 (+1.5%)	0.1 (+1.5%)	0.2 (+1.4%)
Container_ships	25.4 (-1.4%)	0.1 (-1.2%)	5.2 (-1.1%)	0.1 (-1.0%)	0.0 (-1.1%)	0.1 (-1.2%)
Reefers	3.7 (+2.5%)	0.0 (+3.1%)	0.7 (+3.6%)	0.0 (+3.8%)	0.0 (+3.6%)	0.0 (+3.2%)
Tankers	99.9 (+2.0%)	0.2 (+1.8%)	19.9 (+1.7%)	0.4 (+1.6%)	0.1 (+1.7%)	0.4 (+1.8%)
Lng_tankers	1.1 (-14.3%)	0.0 (-8.5%)	0.2 (-5.0%)	0.0 (-3.3%)	0.0 (-4.9%)	0.0 (-8.8%)
Gas_tankers	2.8 (+10.7%)	0.0 (+9.6%)	0.5 (+8.8%)	0.0 (+8.5%)	0.0 (+8.8%)	0.0 (+9.6%)
Passenger_ships	1.8 (+11.2%)	0.0 (+10.7%)	0.5 (+10.6%)	0.0 (+10.8%)	0.0 (+10.8%)	0.0 (+10.9%)
Cruisers	4.6 (-6.0%)	0.0 (-6.5%)	0.9 (-7.0%)	0.0 (-7.2%)	0.0 (-7.0%)	0.0 (-6.6%)
Fishing_vessels	3.1 (+5.5%)	0.0 (+5.7%)	0.8 (+5.8%)	0.0 (+5.9%)	0.0 (+5.8%)	0.0 (+5.7%)
Service_ships	1.3 (+5.3%)	0.0 (+5.7%)	0.4 (+6.1%)	0.0 (+6.4%)	0.0 (+6.3%)	0.0 (+5.9%)
Unknown	4.0 (+14.0%)	0.0 (+13.9%)	1.1 (+14.0%)	0.0 (+13.9%)	0.0 (+14.0%)	0.0 (+14.0%)
Misc	4.1 (+4.7%)	0.0 (+6.2%)	1.1 (+7.0%)	0.0 (+7.4%)	0.0 (+7.1%)	0.0 (+6.3%)

2016	**Ballast**	**STO***	**Bilge**	**Scrubber (Open)**	**Scrubber (Closed)**	**Grey Water**	**Black Water**

	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	55.1	409.7	107.6	60400.7	37.0	5479.5	945.4
Vehicle_carriers	4.6	9.1	0.8	3656.3	0.0	4.8	3.5
RoRo_vessels	28.7	52.0	6.4	92619.4	2.3	156.9	112.3
Bulk_carriers	60.8	227.5	10.0	2049.8	0.0	78.4	55.4
General_cargo	45.5	1086.5	28.0	7587.8	8.1	191.3	131.7
Container_ships	56.3	145.6	10.5	2545.3	14.2	57.8	41.4
Reefers	2.1	31.0	1.9	0.0	0.0	9.0	6.3
Tankers	149.0	386.1	22.9	3404.6	0.0	138.9	43.7
LNG_tankers	1.5	1.0	0.6	0.0	0.0	1.1	0.4
Gas_tankers	4.0	15.6	1.0	17.1	0.0	5.9	2.0
Passenger_ships	0.0	208.9	35.2	0.0	0.0	1693.8	60.9
Cruisers	9.6	8.9	13.2	3817.5	7.6	1025.9	215.5
Fishing_vessels	0.0	325.6	19.9	0.0	0.0	71.9	5.6
Service_ships	0.0	184.3	25.8	0.0	0.0	73.0	10.8
Unknown	0.0	407.6	51.0	30.6	0.0	83.2	11.2
Total, All	417	3860	384	176128	69	9282	1688
Total, IMO numbered only	417	2579	245	176097	69	7835	1615

2016	**Sewage Nitrogen**	**Food Waste Nitrogen**	**Grey Water Nitrogen**	**Sewage Phosphorus**	**Food Waste Phosphorus**	**Grey Water Phosporus**
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	457.0	45.7	153.6	45.0	13.3	66.3
Vehicle_carriers	0.6	0.1	0.2	0.1	0.0	0.1
RoRo_vessels	20.9	2.1	5.8	2.1	0.6	2.5
Bulk_carriers	10.3	1.0	2.9	1.0	0.3	1.3
General_cargo	24.5	2.5	7.1	2.4	0.7	3.1
Container_ships	7.7	0.8	2.1	0.8	0.2	0.9
Reefers	1.2	0.1	0.3	0.2	0.0	0.1
Tankers	19.1	1.9	3.4	1.1	0.3	1.5
LNG_tankers	0.2	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.9	0.1	0.2	0.1	0.0	0.1
Passenger_ships	29.4	2.9	48.5	1.3	0.8	21.0
Cruisers	104.2	56.6	28.8	10.4	17.3	12.4

Fishing_vessels	4.0	0.4	2.1	0.1	0.2	0.9
Service_ships	1.3	0.1	0.7	0.1	0.0	0.3
Unknown	2.9	0.3	2.4	0.2	0.1	1.0
Total, All	696	116	267	66	34	116
Total, IMO numbered only	671	113	256	65	34	98

2016	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	307.2 (+4.9%)	0.7 (+4.4%)	65.6 (+4.0%)	1.3 (+3.9%)	0.4 (+4.0%)	1.2 (+4.4%)
Baltic Proper	131.4 (+4.6%)	0.3 (+4.1%)	28.2 (+3.8%)	0.6 (+3.7%)	0.2 (+3.8%)	0.5 (+4.1%)
Kattegat	85.4 (+5.2%)	0.2 (+4.7%)	18.4 (+4.3%)	0.4 (+4.1%)	0.1 (+4.3%)	0.3 (+4.6%)
Gulf of Finland	65.4 (+5.3%)	0.1 (+4.9%)	13.6 (+4.7%)	0.3 (+4.6%)	0.1 (+4.7%)	0.3 (+4.9%)
Gulf of Bothnia	17.3 (+9.8%)	0.0 (+8.3%)	3.8 (+7.4%)	0.1 (+6.8%)	0.0 (+7.2%)	0.1 (+8.2%)
Gulf of Riga	7.8 (-5.4%)	0.0 (-5.9%)	1.7 (-6.2%)	0.0 (-6.4%)	0.0 (-6.2%)	0.0 (-5.9%)
Vessel type						
Ropax_vessels	13.0 (+2.6%)	0.0 (+2.1%)	3.7 (+1.9%)	0.1 (+1.7%)	0.0 (+1.8%)	0.1 (+2.1%)
Vehicle_carriers	2.5 (+.7%)	0.0 (+.0%)	0.5 (-.5%)	0.0 (-.8%)	0.0 (-.5%)	0.0 (-.0%)
Roro_vessels	10.0 (+7.2%)	0.0 (+6.0%)	2.1 (+5.2%)	0.0 (+4.9%)	0.0 (+5.2%)	0.0 (+6.0%)
Bulk_carriers	62.3 (+5.8%)	0.1 (+5.7%)	12.5 (+5.6%)	0.2 (+5.6%)	0.1 (+5.6%)	0.2 (+5.7%)
General_cargo	51.1 (+6.5%)	0.1 (+4.7%)	11.3 (+3.5%)	0.2 (+3.0%)	0.1 (+3.4%)	0.2 (+4.6%)
Container_ships	27.4 (+8.2%)	0.1 (+7.5%)	5.5 (+6.9%)	0.1 (+6.7%)	0.0 (+6.9%)	0.1 (+7.4%)
Reefers	4.4 (+18.7%)	0.0 (+19.6%)	0.9 (+20.3%)	0.0 (+20.6%)	0.0 (+20.3%)	0.0 (+19.6%)
Tankers	100.8 (+.9%)	0.2 (+.6%)	20.0 (+.3%)	0.4 (+.2%)	0.1 (+.3%)	0.4 (+.5%)
Lng_tankers	1.6 (+55.8%)	0.0 (+52.7%)	0.4 (+51.3%)	0.0 (+50.6%)	0.0 (+51.2%)	0.0 (+53.0%)
Gas_tankers	3.1 (+13.6%)	0.0 (+13.4%)	0.6 (+13.2%)	0.0 (+13.2%)	0.0 (+13.2%)	0.0 (+13.4%)
Passenger_ships	1.8 (-1.0%)	0.0 (-1.2%)	0.5 (-1.7%)	0.0 (-1.6%)	0.0 (-1.5%)	0.0 (-1.5%)
Cruisers	4.8 (+5.0%)	0.0 (+5.1%)	1.0 (+5.5%)	0.0 (+5.3%)	0.0 (+5.3%)	0.0 (+5.2%)
Fishing_vessels	2.8 (-9.4%)	0.0 (-9.2%)	0.7 (-8.9%)	0.0 (-9.0%)	0.0 (-9.0%)	0.0 (-9.1%)
Service_ships	1.5 (+17.0%)	0.0 (+17.6%)	0.4 (+18.1%)	0.0 (+18.0%)	0.0 (+17.9%)	0.0 (+17.7%)
Unknown	4.9 (+23.6%)	0.0 (+22.2%)	1.4 (+21.5%)	0.0 (+21.3%)	0.0 (+21.5%)	0.0 (+22.2%)

Misc	4.0 (-3.0%)	0.0 (-5.1%)	1.1 (-6.2%)	0.0 (-6.6%)	0.0 (-6.2%)	0.0 (-5.1%)

2017	Ballast [million m3]	STO* [m3]	Bilge [10^3 m3]	Scrubber (Open) [10^3 m3]	Scrubber (Closed) [10^3 m3]	Grey Water [10^3 m3]	Black Water [10^3 m3]
RoPax_vessels	53.1	383.8	107.7	104676.5	40.6	5716.3	993.6
Vehicle_carriers	6.5	10.3	1.0	7282.5	0.0	6.1	4.4
RoRo_vessels	27.0	46.2	5.9	109983.6	2.8	158.8	114.4
Bulk_carriers	68.4	238.8	10.7	1923.4	0.0	91.7	65.9
General_cargo	45.7	1064.9	28.2	8159.3	10.1	209.4	147.0
Container_ships	57.3	153.4	11.3	4703.3	13.9	62.6	45.0
Reefers	2.0	28.2	1.8	0.0	0.0	10.3	7.4
Tankers	135.7	371.0	22.2	3055.8	0.2	142.5	46.2
LNG_tankers	1.8	1.1	0.6	0.0	0.0	1.3	0.5
Gas_tankers	3.3	13.5	0.9	27.6	0.0	5.2	1.8
Passenger_ships	0.0	202.7	36.5	0.0	0.0	2106.4	114.8
Cruisers	11.7	10.5	14.9	14725.0	12.1	1123.7	236.3
Fishing_vessels	0.0	303.7	18.9	0.0	0.0	85.6	7.0
Service_ships	0.0	182.1	27.2	0.0	0.0	84.5	15.8
Unknown	0.0	135.4	17.2	1511.8	0.0	23.2	3.6
Total, All	412	3390	342	256050	80	9973	1838
Total, IMO numbered only	412	2527	247	254538	80	8182	1724

2017	Sewage Nitrogen [tonne]	Food Waste Nitrogen [tonne]	Grey Water Nitrogen **[tonnes]**	Sewage Phosphorus [tonnes]	Food Waste Phosphorus [tonnes]	Grey Water Phosporus [tonnes]
RoPax_vessels	480.3	48.0	160.2	47.1	14.0	69.2
Vehicle_carriers	0.8	0.1	0.2	0.1	0.0	0.1
RoRo_vessels	21.3	2.1	5.9	2.1	0.6	2.5
Bulk_carriers	12.3	1.2	3.4	1.2	0.4	1.5
General_cargo	27.4	2.7	7.7	2.7	0.8	3.3
Container_ships	8.4	0.8	2.3	0.8	0.2	1.0
Reefers	1.4	0.1	0.3	0.2	0.0	0.1

Tankers	20.2	2.0	3.4	1.1	0.3	1.5
LNG_tankers	0.2	0.0	0.0	0.0	0.0	0.0
Gas_tankers	0.8	0.1	0.2	0.1	0.0	0.1
Passenger_ships	55.5	5.6	60.2	2.3	1.6	26.0
Cruisers	114.2	62.1	31.5	11.4	19.0	13.6
Fishing_vessels	5.1	0.5	2.5	0.2	0.2	1.1
Service_ships	1.9	0.2	1.0	0.2	0.1	0.4
Unknown	0.9	0.1	0.7	0.1	0.0	0.3
Total, All	762	127	287	71	38	124
Total, IMO numbered only	713	122	279	69	36	102

2017	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	380.1 (+23.7%)	0.8 (+17.1%)	73.6 (+12.3%)	1.4 (+10.4%)	0.5 (+12.2%)	1.4 (+16.7%)
Baltic Proper	172.8 (+31.6%)	0.4 (+24.6%)	33.8 (+19.8%)	0.7 (+17.8%)	0.2 (+19.7%)	0.7 (+24.4%)
Kattegat	89.2 (+4.5%)	0.2 (-1.4%)	17.3 (-5.9%)	0.3 (-7.7%)	0.1 (-6.0%)	0.3 (-1.9%)
Gulf of Finland	85.2 (+30.2%)	0.2 (+23.7%)	16.1 (+18.9%)	0.3 (+16.9%)	0.1 (+18.8%)	0.3 (+23.4%)
Gulf of Bothnia	24.0 (+38.8%)	0.0 (+30.4%)	4.7 (+23.4%)	0.1 (+22.5%)	0.0 (+24.8%)	0.1 (+29.8%)
Gulf of Riga	8.9 (+14.7%)	0.0 (+8.5%)	1.7 (+4.1%)	0.0 (+2.3%)	0.0 (+4.0%)	0.0 (+8.2%)
Vessel type						
Ropax_vessels	17.0 (+30.7%)	0.0 (+28.3%)	4.7 (+27.8%)	0.1 (+27.8%)	0.0 (+28.1%)	0.1 (+28.8%)
Vehicle_carriers	3.1 (+25.9%)	0.0 (+24.0%)	0.6 (+22.4%)	0.0 (+21.6%)	0.0 (+22.4%)	0.0 (+23.8%)
Roro_vessels	12.7 (+28.1%)	0.0 (+23.1%)	2.5 (+19.9%)	0.0 (+18.6%)	0.0 (+19.9%)	0.0 (+23.2%)
Bulk_carriers	77.8 (+24.9%)	0.2 (+18.0%)	14.1 (+12.5%)	0.3 (+10.2%)	0.1 (+12.4%)	0.3 (+17.5%)
General_cargo	73.0 (+42.8%)	0.1 (+30.9%)	13.8 (+22.6%)	0.3 (+19.3%)	0.1 (+22.5%)	0.3 (+30.4%)
Container_ships	34.9 (+27.0%)	0.1 (+23.5%)	6.7 (+21.0%)	0.1 (+19.9%)	0.0 (+20.9%)	0.1 (+23.4%)
Reefers	4.8 (+8.7%)	0.0 (+2.2%)	0.9 (-2.8%)	0.0 (-4.9%)	0.0 (-2.9%)	0.0 (+1.8%)
Tankers	113.4 (+12.5%)	0.2 (+7.5%)	20.7 (+3.4%)	0.4 (+1.7%)	0.1 (+3.3%)	0.4 (+7.1%)
Lng_tankers	1.9 (+14.1%)	0.0 (+8.3%)	0.4 (+4.0%)	0.0 (+2.3%)	0.0 (+3.9%)	0.0 (+8.0%)
Gas_tankers	2.8 (-9.6%)	0.0 (-11.5%)	0.5 (-12.9%)	0.0 (-13.5%)	0.0 (-12.9%)	0.0 (-11.5%)
Passenger_ships	2.9 (+68.0%)	0.0 (+57.6%)	0.8 (+52.3%)	0.0 (+51.4%)	0.0 (+53.1%)	0.0 (+57.7%)
Cruisers	6.9 (+42.5%)	0.0 (+35.9%)	1.3 (+30.7%)	0.0 (+29.0%)	0.0 (+30.9%)	0.0 (+35.6%)
Fishing_vessels	3.9 (+36.6%)	0.0 (+27.1%)	0.9 (+20.5%)	0.0 (+19.2%)	0.0 (+21.3%)	0.0 (+26.6%)

Service_ships	2.7 (+73.4%)	0.0 (+57.7%)	0.6 (+48.6%)	0.0 (+45.8%)	0.0 (+48.8%)	0.0 (+57.0%)
Unknown	2.1 (-57.1%)	0.0 (-60.8%)	0.5 (-63.1%)	0.0 (-63.7%)	0.0 (-63.0%)	0.0 (-61.1%)
Misc	7.2 (+81.2%)	0.0 (+63.4%)	1.7 (+53.7%)	0.0 (+50.4%)	0.0 (+53.8%)	0.0 (+63.1%)

2018	Ballast [million m3]	STO* [m3]	Bilge [10^3 m3]	Scrubber (Open) [10^3 m3]	Scrubber (Closed) [10^3 m3]	Grey Water [10^3 m3]	Black Water [10^3 m3]
RoPax_vessels	56.4	394.1	108.5	133180.3	45.6	5760.5	990.2
Vehicle_carriers	6.3	10.7	1.0	7259.8	0.0	6.5	4.6
RoRo_vessels	28.6	47.8	5.9	100403.8	2.9	133.6	96.4
Bulk_carriers	71.5	246.7	11.1	2335.0	0.0	93.0	66.8
General_cargo	51.9	1176.7	31.6	8119.7	9.1	242.1	168.6
Container_ships	63.4	161.9	12.6	8133.3	15.5	65.5	46.9
Reefers	1.5	25.0	1.6	0.0	0.0	9.1	6.5
Tankers	145.1	378.1	22.8	5030.7	0.4	146.9	48.2
LNG_tankers	1.8	1.4	0.6	0.0	0.0	1.8	0.6
Gas_tankers	3.1	12.0	0.8	32.5	0.0	4.8	1.7
Passenger_ships	0.0	199.1	36.0	0.6	0.0	1916.0	115.3
Cruisers	12.6	10.2	16.5	38657.4	11.9	1276.9	267.3
Fishing_vessels	0.0	307.6	19.1	0.0	0.0	87.0	7.2
Service_ships	0.0	194.0	29.2	0.0	0.0	95.4	20.0
Unknown	0.0	162.1	20.6	1435.6	0.0	28.5	5.5
Total, All	442	3589	357	304589	85	10024	1882
Total, IMO numbered only	442	2660	256	303154	85	8371	1751

2018	Sewage Nitrogen [tonne]	Food Waste Nitrogen [tonne]	Grey Water Nitrogen [tonnes]	Sewage Phosphorus [tonnes]	Food Waste Phosphorus [tonnes]	Grey Water Phosporus [tonnes]
RoPax_vessels	478.7	47.9	161.4	47.1	14.0	69.7
Vehicle_carriers	0.9	0.1	0.2	0.1	0.0	0.1
RoRo_vessels	17.9	1.8	4.9	1.8	0.5	2.1
Bulk_carriers	12.4	1.2	3.4	1.2	0.4	1.5
General_cargo	31.4	3.1	9.0	3.1	0.9	3.9
Container_ships	8.7	0.9	2.4	0.9	0.3	1.0
Reefers	1.2	0.1	0.3	0.2	0.0	0.1
Tankers	21.0	2.1	3.6	1.2	0.4	1.6
LNG_tankers	0.3	0.0	0.1	0.0	0.0	0.0
Gas_tankers	0.7	0.1	0.2	0.1	0.0	0.1

Passenger_ships	55.7	5.6	54.8	2.3	1.6	23.6
Cruisers	129.2	70.3	35.8	12.8	21.3	15.5
Fishing_vessels	5.2	0.5	2.5	0.2	0.2	1.1
Service_ships	2.7	0.3	1.2	0.2	0.1	0.5
Unknown	1.4	0.1	0.8	0.1	0.0	0.4
Total, All	779	135	288	73	40	125
Total, IMO numbered only	727	130	280	70	39	104

2018	CuO [tonnes]	CuPyr [tonnes]	ZnO [tonnes]	ZnPyr [tonnes]	DCOIT [tonnes]	Zineb [tonnes]
Total	402.3 (+5.8%)	0.8 (+5.9%)	78.0 (+5.9%)	1.5 (+5.9%)	0.5 (+5.9%)	1.5 (+5.9%)
Baltic Proper	186.8 (+8.1%)	0.4 (+8.0%)	36.4 (+7.9%)	0.7 (+7.9%)	0.2 (+7.9%)	0.7 (+8.0%)
Kattegat	91.9 (+3.0%)	0.2 (+2.6%)	17.7 (+2.2%)	0.3 (+2.1%)	0.1 (+2.2%)	0.3 (+2.5%)
Gulf of Finland	88.7 (+4.2%)	0.2 (+4.6%)	17.0 (+5.0%)	0.3 (+5.2%)	0.1 (+5.0%)	0.3 (+4.6%)
Gulf of Bothnia	25.2 (+5.2%)	0.1 (+6.4%)	5.0 (+7.5%)	0.1 (+7.9%)	0.0 (+7.5%)	0.1 (+6.5%)
Gulf of Riga	9.8 (+9.1%)	0.0 (+8.4%)	1.9 (+8.0%)	0.0 (+7.7%)	0.0 (+7.9%)	0.0 (+8.4%)
Vessel type						
Ropax_vessels	17.2 (+1.2%)	0.0 (-1.8%)	4.6 (-3.5%)	0.1 (-4.3%)	0.0 (-3.7%)	0.1 (-2.0%)
Vehicle_carriers	3.1 (-.1%)	0.0 (+1.8%)	0.6 (+3.4%)	0.0 (+4.2%)	0.0 (+3.5%)	0.0 (+1.9%)
Roro_vessels	13.2 (+3.3%)	0.0 (+5.5%)	2.7 (+7.4%)	0.1 (+8.2%)	0.0 (+7.5%)	0.1 (+5.7%)
Bulk_carriers	81.1 (+4.3%)	0.2 (+4.3%)	14.7 (+4.4%)	0.3 (+4.4%)	0.1 (+4.4%)	0.3 (+4.3%)
General_cargo	80.2 (+9.9%)	0.2 (+10.5%)	15.3 (+11.0%)	0.3 (+11.2%)	0.1 (+11.0%)	0.3 (+10.5%)
Container_ships	40.8 (+17.2%)	0.1 (+15.7%)	7.6 (+14.5%)	0.1 (+14.0%)	0.1 (+14.5%)	0.2 (+15.6%)
Reefers	4.3 (-10.3%)	0.0 (-10.1%)	0.8 (-9.8%)	0.0 (-9.7%)	0.0 (-9.8%)	0.0 (-10.0%)
Tankers	116.5 (+2.7%)	0.2 (+3.4%)	21.5 (+3.9%)	0.4 (+4.2%)	0.1 (+3.9%)	0.4 (+3.4%)
Lng_tankers	1.9 (+.6%)	0.0 (+.5%)	0.4 (+.4%)	0.0 (+.4%)	0.0 (+.4%)	0.0 (+.5%)
Gas_tankers	2.5 (-12.2%)	0.0 (-13.2%)	0.5 (-14.3%)	0.0 (-14.7%)	0.0 (-14.3%)	0.0 (-13.4%)
Passenger_ships	2.6 (-13.2%)	0.0 (-11.0%)	0.7 (-9.9%)	0.0 (-9.6%)	0.0 (-10.0%)	0.0 (-11.0%)
Cruisers	7.3 (+6.4%)	0.0 (+6.8%)	1.4 (+7.1%)	0.0 (+7.2%)	0.0 (+7.1%)	0.0 (+6.8%)
Fishing_vessels	3.8 (-1.2%)	0.0 (-1.8%)	0.8 (-2.3%)	0.0 (-2.4%)	0.0 (-2.3%)	0.0 (-1.9%)
Service_ships	3.6 (+37.1%)	0.0 (+32.8%)	0.8 (+30.0%)	0.0 (+29.3%)	0.0 (+30.3%)	0.0 (+32.8%)
Unknown	2.6 (+24.6%)	0.0 (+22.2%)	0.6 (+20.5%)	0.0 (+19.9%)	0.0 (+20.5%)	0.0 (+22.0%)
Misc	7.2 (-.3%)	0.0 (-2.1%)	1.6 (-3.3%)	0.0 (-3.9%)	0.0 (-3.4%)	0.0 (-2.2%)

2019	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	57.3	407.4	109.7	152734.2	48.5	5766.2	992.5
Vehicle_carriers	6.4	9.5	0.9	7578.2	0.0	5.8	4.2
RoRo_vessels	27.1	45.8	5.7	98809.5	2.7	126.3	90.8
Bulk_carriers	71.4	243.1	10.8	2764.7	0.0	92.5	66.4
General_cargo	52.2	1179.1	31.2	8070.0	8.4	237.5	164.9
Container_ships	66.5	155.5	12.4	15725.3	14.4	67.1	47.8
Reefers	1.8	22.3	1.5	0.0	0.0	8.7	6.2
Tankers	154.8	406.8	24.0	8571.4	0.2	154.7	49.9
LNG_tankers	3.6	2.3	0.9	0.0	0.0	3.3	1.2
Gas_tankers	3.5	14.2	0.9	19.7	0.0	5.7	2.0
Passenger_ships	0.0	239.4	41.7	0.0	0.0	2089.9	106.0
Cruisers	13.4	9.8	16.6	41902.0	11.6	1358.3	285.0
Fishing_vessels	0.0	367.7	22.6	0.0	0.0	94.2	7.4
Service_ships	0.0	213.3	31.8	0.0	0.0	103.6	19.0
Unknown	0.0	937.2	118.6	1761.2	0.0	211.6	28.8
Total, All	460	4730	495	338046	86	10653	1940
Total, IMO numbered only	460	2665	259	338046	86	8487	1767

2019	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	479.8	48.0	161.6	47.1	14.0	69.8
Vehicle_carriers	0.8	0.1	0.2	0.1	0.0	0.1
RoRo_vessels	16.9	1.7	4.7	1.7	0.5	2.0
Bulk_carriers	12.4	1.2	3.4	1.2	0.4	1.5
General_cargo	30.7	3.1	8.8	3.0	0.9	3.8
Container_ships	8.9	0.9	2.5	0.9	0.3	1.1
Reefers	1.2	0.1	0.2	0.2	0.0	0.1
Tankers	21.7	2.2	3.7	1.2	0.4	1.6
LNG_tankers	0.5	0.1	0.1	0.0	0.0	0.0
Gas_tankers	0.9	0.1	0.2	0.1	0.0	0.1
Passenger_ships	51.2	5.1	59.8	2.1	1.5	25.8

Cruisers	137.8	74.9	38.1	13.8	22.9	16.4
Fishing_vessels	5.3	0.5	2.7	0.2	0.2	1.2
Service_ships	2.6	0.3	1.2	0.2	0.1	0.5
Unknown	7.4	0.7	6.1	0.5	0.2	2.6
Total, All	798	141	307	75	42	133
Total, IMO numbered only	736	135	287	71	40	106

2019	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	422.1 (+4.9%)	0.9 (+6.0%)	83.3 (+6.8%)	1.6 (+7.2%)	0.6 (+6.9%)	1.6 (+6.0%)
Baltic Proper	189.4 (+1.4%)	0.4 (+2.7%)	37.8 (+3.7%)	0.7 (+4.1%)	0.3 (+3.7%)	0.7 (+2.7%)
Kattegat	105.0 (+14.3%)	0.2 (+16.1%)	20.8 (+17.6%)	0.4 (+18.2%)	0.1 (+17.6%)	0.4 (+16.2%)
Gulf of Finland	92.6 (+4.4%)	0.2 (+4.5%)	17.7 (+4.6%)	0.3 (+4.6%)	0.1 (+4.6%)	0.3 (+4.5%)
Gulf of Bothnia	25.8 (+2.0%)	0.1 (+3.0%)	5.2 (+3.6%)	0.1 (+3.9%)	0.0 (+3.7%)	0.1 (+3.0%)
Gulf of Riga	9.4 (-4.1%)	0.0 (-3.5%)	1.8 (-3.0%)	0.0 (-2.7%)	0.0 (-3.0%)	0.0 (-3.5%)
Vessel type						
Ropax_vessels	16.1 (-6.6%)	0.0 (-3.2%)	4.5 (-1.3%)	0.1 (-.4%)	0.0 (-1.1%)	0.1 (-3.1%)
Vehicle_carriers	2.8 (-9.8%)	0.0 (-9.9%)	0.5 (-10.0%)	0.0 (-10.1%)	0.0 (-10.0%)	0.0 (-9.9%)
Roro_vessels	11.4 (-13.8%)	0.0 (-12.3%)	2.4 (-11.3%)	0.0 (-10.9%)	0.0 (-11.3%)	0.0 (-12.3%)
Bulk_carriers	78.5 (-3.3%)	0.2 (-3.0%)	14.3 (-2.8%)	0.3 (-2.6%)	0.1 (-2.8%)	0.3 (-3.0%)
General_cargo	77.1 (-3.9%)	0.2 (-3.9%)	14.7 (-3.9%)	0.3 (-3.9%)	0.1 (-3.9%)	0.3 (-3.9%)
Container_ships	40.9 (+.1%)	0.1 (+1.6%)	7.8 (+2.8%)	0.2 (+3.3%)	0.1 (+2.8%)	0.2 (+1.7%)
Reefers	4.3 (-.2%)	0.0 (-.6%)	0.8 (-1.0%)	0.0 (-1.1%)	0.0 (-1.0%)	0.0 (-.6%)
Tankers	120.9 (+3.8%)	0.2 (+3.5%)	22.2 (+3.3%)	0.4 (+3.2%)	0.1 (+3.3%)	0.4 (+3.5%)
Lng_tankers	3.2 (+67.0%)	0.0 (+63.7%)	0.6 (+61.7%)	0.0 (+60.7%)	0.0 (+61.6%)	0.0 (+63.9%)
Gas_tankers	3.0 (+19.0%)	0.0 (+19.4%)	0.5 (+19.7%)	0.0 (+19.9%)	0.0 (+19.7%)	0.0 (+19.4%)
Passenger_ships	2.8 (+8.3%)	0.0 (+6.3%)	0.7 (+4.6%)	0.0 (+4.5%)	0.0 (+5.0%)	0.0 (+6.0%)
Cruisers	7.5 (+2.9%)	0.0 (+3.6%)	1.4 (+4.2%)	0.0 (+4.5%)	0.0 (+4.2%)	0.0 (+3.6%)
Fishing_vessels	4.3 (+13.3%)	0.0 (+15.3%)	1.0 (+16.9%)	0.0 (+17.5%)	0.0 (+17.0%)	0.0 (+15.5%)
Service_ships	4.9 (+35.5%)	0.0 (+32.9%)	1.1 (+31.0%)	0.0 (+30.4%)	0.0 (+31.1%)	0.0 (+32.7%)
Unknown	13.6 (+417.4%)	0.0 (+443.3%)	3.5 (+463.2%)	0.1 (+470.6%)	0.0 (+463.7%)	0.1 (+446.3%)
Misc	11.7 (+62.2%)	0.0 (+60.4%)	2.6 (+59.7%)	0.1 (+59.5%)	0.0 (+59.8%)	0.0 (+60.7%)

2020	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	51.9	410.2	111.6	145322.2	45.9	5406.9	913.0
Vehicle_carriers	4.8	9.7	1.0	6523.4	0.0	6.1	4.3
RoRo_vessels	26.8	52.3	6.3	91141.5	2.7	135.9	97.6
Bulk_carriers	73.0	251.9	11.1	13897.2	0.1	94.8	67.9
General_cargo	51.7	1192.2	31.2	8594.3	8.8	220.5	152.7
Container_ships	63.0	138.3	10.6	26614.8	15.0	58.1	41.7
Reefers	1.9	21.9	1.5	2762.1	0.0	8.6	6.2
Tankers	146.5	404.3	23.4	21805.2	0.3	149.2	47.6
LNG_tankers	5.3	2.7	1.1	0.0	0.0	4.4	1.5
Gas_tankers	3.1	14.0	0.9	0.0	0.0	5.5	1.9
Passenger_ships	0.0	249.5	42.5	0.0	0.0	1843.5	70.0
Cruisers	0.7	7.6	8.3	5617.0	3.3	614.9	109.5
Fishing_vessels	0.0	367.3	22.6	0.0	0.0	93.6	7.1
Service_ships	0.0	215.0	31.5	0.0	0.0	96.3	16.5
Unknown	0.0	936.8	118.5	0.0	0.0	210.2	22.1
Total, All	429	4765	489	322288	76	9266	1615
Total, IMO numbered only	429	2655	251	322288	76	7326	1504

2020	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	441.3	44.1	151.5	41.7	12.4	65.4
Vehicle_carriers	0.8	0.1	0.2	0.1	0.0	0.1
RoRo_vessels	18.2	1.8	5.0	1.8	0.5	2.2
Bulk_carriers	12.6	1.3	3.5	1.3	0.4	1.5
General_cargo	28.4	2.8	8.2	2.8	0.8	3.5
Container_ships	7.8	0.8	2.1	0.8	0.2	0.9
Reefers	1.2	0.1	0.2	0.2	0.0	0.1
Tankers	20.8	2.1	3.9	1.3	0.4	1.7
LNG_tankers	0.7	0.1	0.1	0.0	0.0	0.1
Gas_tankers	0.8	0.1	0.2	0.1	0.0	0.1
Passenger_ships	33.8	3.4	52.7	1.4	0.9	22.8

Cruisers	52.9	28.8	17.2	4.1	7.6	7.4
Fishing_vessels	5.1	0.5	2.7	0.2	0.2	1.2
Service_ships	2.0	0.2	1.0	0.2	0.1	0.4
Unknown	5.7	0.6	6.0	0.3	0.2	2.6
Total, All	649	88	267	58	24	116
Total, IMO numbered only	610	84	249	56	23	92

2020	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	409.7 (-2.9%)	0.8 (-3.4%)	80.2 (-3.7%)	1.6 (-3.9%)	0.5 (-3.7%)	1.5 (-3.4%)
Baltic Proper	176.2 (-7.0%)	0.4 (-7.5%)	34.8 (-7.9%)	0.7 (-8.0%)	0.2 (-7.9%)	0.7 (-7.5%)
Kattegat	111.0 (+5.7%)	0.2 (+5.5%)	21.9 (+5.4%)	0.4 (+5.3%)	0.1 (+5.4%)	0.4 (+5.5%)
Gulf of Finland	88.0 (-5.0%)	0.2 (-5.2%)	16.8 (-5.4%)	0.3 (-5.5%)	0.1 (-5.4%)	0.3 (-5.2%)
Gulf of Bothnia	26.2 (+1.7%)	0.1 (-.2%)	5.2 (-1.3%)	0.1 (-2.2%)	0.0 (-1.7%)	0.1 (-.2%)
Gulf of Riga	8.4 (-10.4%)	0.0 (-10.9%)	1.6 (-11.4%)	0.0 (-11.6%)	0.0 (-11.4%)	0.0 (-11.0%)
Vessel type						
Ropax_vessels	16.9 (+5.1%)	0.0 (+3.0%)	4.6 (+2.1%)	0.1 (+1.6%)	0.0 (+1.9%)	0.1 (+3.0%)
Vehicle_carriers	3.7 (+30.8%)	0.0 (+28.3%)	0.7 (+26.1%)	0.0 (+25.2%)	0.0 (+26.1%)	0.0 (+28.1%)
Roro_vessels	13.3 (+17.3%)	0.0 (+16.2%)	2.8 (+15.4%)	0.1 (+15.1%)	0.0 (+15.4%)	0.1 (+16.2%)
Bulk_carriers	80.7 (+2.9%)	0.2 (+2.6%)	14.7 (+2.4%)	0.3 (+2.2%)	0.1 (+2.3%)	0.3 (+2.6%)
General_cargo	78.6 (+2.0%)	0.2 (+.6%)	14.7 (-.5%)	0.3 (-1.0%)	0.1 (-.5%)	0.3 (+.5%)
Container_ships	36.6 (-10.5%)	0.1 (-11.1%)	6.9 (-11.6%)	0.1 (-11.9%)	0.0 (-11.7%)	0.1 (-11.2%)
Reefers	4.0 (-5.8%)	0.0 (-5.7%)	0.7 (-5.6%)	0.0 (-5.5%)	0.0 (-5.5%)	0.0 (-5.7%)
Tankers	117.6 (-2.7%)	0.2 (-2.7%)	21.6 (-2.7%)	0.4 (-2.7%)	0.1 (-2.7%)	0.4 (-2.7%)
Lng_tankers	4.2 (+31.6%)	0.0 (+30.9%)	0.8 (+30.4%)	0.0 (+30.2%)	0.0 (+30.4%)	0.0 (+30.9%)
Gas_tankers	3.0 (+2.5%)	0.0 (+1.3%)	0.5 (+.5%)	0.0 (+.1%)	0.0 (+.5%)	0.0 (+1.3%)
Passenger_ships	2.2 (-20.5%)	0.0 (-18.8%)	0.6 (-17.7%)	0.0 (-17.8%)	0.0 (-18.1%)	0.0 (-18.8%)
Cruisers	3.9 (-47.9%)	0.0 (-48.2%)	0.7 (-48.5%)	0.0 (-48.7%)	0.0 (-48.5%)	0.0 (-48.3%)
Fishing_vessels	4.4 (+.4%)	0.0 (-1.2%)	1.0 (-2.3%)	0.0 (-2.8%)	0.0 (-2.4%)	0.0 (-1.3%)
Service_ships	3.0 (-39.5%)	0.0 (-38.6%)	0.7 (-38.1%)	0.0 (-38.2%)	0.0 (-38.4%)	0.0 (-38.7%)
Unknown	12.5 (-8.7%)	0.0 (-6.5%)	3.3 (-5.0%)	0.1 (-4.6%)	0.0 (-5.1%)	0.1 (-6.3%)
Misc	6.2 (-46.8%)	0.0 (-45.8%)	1.4 (-45.3%)	0.0 (-45.1%)	0.0 (-45.4%)	0.0 (-45.9%)

2021	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	53.4	396.8	107.6	151528.9	49.0	5310.5	7.7
Vehicle_carriers	5.2	8.2	0.8	6266.1	0.0	5.0	3.6
RoRo_vessels	30.1	50.2	6.2	94287.0	2.9	143.4	102.6
Bulk_carriers	73.4	264.9	11.6	22485.8	1.2	99.0	71.2
General_cargo	55.1	1212.1	32.2	10460.7	8.4	249.0	171.7
Container_ships	59.8	135.0	10.3	32415.6	13.7	57.3	40.6
Reefers	1.7	21.6	1.5	2516.8	0.0	8.5	6.0
Tankers	142.7	385.6	22.6	31946.7	0.1	144.0	46.3
LNG_tankers	5.4	2.8	1.2	0.0	0.0	4.7	1.6
Gas_tankers	2.8	11.5	0.7	0.0	0.0	4.4	1.5
Passenger_ships	0.0	262.7	44.9	0.0	0.0	2153.5	0.2
Cruisers	2.8	10.1	11.5	16838.8	5.2	858.4	2.3
Fishing_vessels	0.0	351.3	21.7	0.0	0.0	89.6	6.7
Service_ships	0.0	222.7	33.5	0.0	0.0	105.7	18.6
Unknown	0.0	1141.3	144.4	0.0	0.0	260.0	31.1
Total, All	431	4978	520	368647	80	9834	578
Total, IMO numbered only	431	2670	254	366858	80	7582	477

2021	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	3.7	43.1	148.8	0.2	12.5	64.3
Vehicle_carriers	0.7	0.1	0.2	0.1	0.0	0.1
RoRo_vessels	19.1	1.9	5.3	1.9	0.6	2.3
Bulk_carriers	13.3	1.3	3.7	1.3	0.4	1.6
General_cargo	32.0	3.2	9.2	3.1	0.9	4.0
Container_ships	7.6	0.8	2.1	0.8	0.2	0.9
Reefers	1.1	0.1	0.2	0.2	0.0	0.1
Tankers	20.2	2.0	3.6	1.2	0.3	1.6
LNG_tankers	0.7	0.1	0.1	0.0	0.0	0.1
Gas_tankers	0.7	0.1	0.2	0.1	0.0	0.1
Passenger_ships	0.1	4.1	61.6	0.0	1.2	26.6
Cruisers	1.1	45.4	24.1	0.0	13.3	10.4
Fishing_vessels	4.8	0.5	2.6	0.1	0.2	1.1

Service_ships	2.5	0.2	1.2	0.2	0.1	0.5
Unknown	8.0	0.8	7.5	0.5	0.2	3.2
Total, All	135	106	284	12	31	123
Total, IMO numbered only	109	101	263	10	29	95

2021	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	417.8 (+2.0%)	0.9 (+2.5%)	82.5 (+2.9%)	1.6 (+3.1%)	0.6 (+2.9%)	1.6 (+2.5%)
Baltic Proper	182.9 (+3.8%)	0.4 (+4.3%)	36.4 (+4.7%)	0.7 (+4.9%)	0.2 (+4.7%)	0.7 (+4.4%)
Kattegat	104.2 (-6.1%)	0.2 (-4.9%)	21.0 (-4.0%)	0.4 (-3.6%)	0.1 (-3.9%)	0.4 (-4.8%)
Gulf of Finland	97.3 (+10.6%)	0.2 (+10.5%)	18.5 (+10.5%)	0.4 (+10.4%)	0.1 (+10.5%)	0.4 (+10.5%)
Gulf of Bothnia	25.1 (-4.2%)	0.1 (-3.9%)	5.0 (-3.4%)	0.1 (-3.6%)	0.0 (-3.7%)	0.1 (-3.8%)
Gulf of Riga	8.2 (-1.6%)	0.0 (-1.4%)	1.6 (-1.3%)	0.0 (-1.2%)	0.0 (-1.3%)	0.0 (-1.4%)
Vessel type						
Ropax_vessels	15.9 (-5.9%)	0.0 (-6.1%)	4.3 (-6.3%)	0.1 (-6.4%)	0.0 (-6.3%)	0.1 (-6.2%)
Vehicle_carriers	2.7 (-26.5%)	0.0 (-26.1%)	0.5 (-25.8%)	0.0 (-25.7%)	0.0 (-25.8%)	0.0 (-26.1%)
Roro_vessels	14.3 (+7.1%)	0.0 (+5.2%)	2.9 (+4.0%)	0.1 (+3.4%)	0.0 (+3.9%)	0.1 (+5.2%)
Bulk_carriers	84.5 (+4.7%)	0.2 (+5.1%)	15.4 (+5.4%)	0.3 (+5.5%)	0.1 (+5.4%)	0.3 (+5.1%)
General_cargo	81.0 (+3.0%)	0.2 (+3.8%)	15.3 (+4.5%)	0.3 (+4.8%)	0.1 (+4.5%)	0.3 (+3.8%)
Container_ships	34.2 (-6.5%)	0.1 (-5.6%)	6.6 (-4.9%)	0.1 (-4.6%)	0.0 (-4.9%)	0.1 (-5.6%)
Reefers	4.0 (-1.7%)	0.0 (-1.8%)	0.7 (-1.8%)	0.0 (-1.9%)	0.0 (-1.9%)	0.0 (-1.8%)
Tankers	114.8 (-2.4%)	0.2 (-2.5%)	21.1 (-2.6%)	0.4 (-2.6%)	0.1 (-2.6%)	0.4 (-2.5%)
Lng_tankers	4.0 (-2.8%)	0.0 (+3.4%)	0.8 (+8.7%)	0.0 (+11.0%)	0.0 (+8.8%)	0.0 (+3.9%)
Gas_tankers	2.5 (-16.3%)	0.0 (-16.3%)	0.5 (-16.1%)	0.0 (-16.2%)	0.0 (-16.2%)	0.0 (-16.2%)
Passenger_ships	2.3 (+5.1%)	0.0 (+5.8%)	0.7 (+6.2%)	0.0 (+6.3%)	0.0 (+6.2%)	0.0 (+5.8%)
Cruisers	5.6 (+42.7%)	0.0 (+45.8%)	1.1 (+49.2%)	0.0 (+49.8%)	0.0 (+48.6%)	0.0 (+46.3%)
Fishing_vessels	4.2 (-3.7%)	0.0 (-3.3%)	0.9 (-3.0%)	0.0 (-2.8%)	0.0 (-2.9%)	0.0 (-3.2%)
Service_ships	4.7 (+57.6%)	0.0 (+56.6%)	1.0 (+56.1%)	0.0 (+56.8%)	0.0 (+56.9%)	0.0 (+57.0%)
Unknown	15.6 (+25.4%)	0.0 (+24.9%)	4.1 (+24.7%)	0.1 (+24.6%)	0.0 (+24.7%)	0.1 (+24.9%)
Misc	7.7 (+24.1%)	0.0 (+25.6%)	1.8 (+26.6%)	0.0 (+27.2%)	0.0 (+26.8%)	0.0 (+25.7%)

2022	Ballast [million m3]	STO* [m3]	Bilge [10^3 m3]	Scrubber (Open) [10^3 m3]	Scrubber (Closed) [10^3 m3]	Grey Water [10^3 m3]	Black Water [10^3 m3]
RoPax_vessels	54.5	395.5	106.2	154303.2	50.3	5183.8	14.2
Vehicle_carriers	3.2	6.0	0.6	4208.6	0.0	3.7	2.6
RoRo_vessels	43.1	54.0	7.4	98323.1	2.7	263.8	189.4
Bulk_carriers	81.0	312.7	14.0	17591.5	0.4	117.1	83.6
General_cargo	52.9	1176.2	31.2	10094.6	8.6	239.0	165.8
Container_ships	53.2	115.0	9.2	24634.6	3.3	49.4	35.4
Reefers	1.5	22.2	1.6	1748.6	0.0	9.2	6.6
Tankers	153.3	386.4	23.7	36228.9	0.2	151.8	49.4
LNG_tankers	7.9	3.6	1.8	0.0	0.0	5.9	2.0
Gas_tankers	3.2	16.8	1.1	175.1	0.0	6.8	2.3
Passenger_ships	0.0	275.9	47.3	0.0	0.0	2358.9	0.3
Cruisers	9.1	9.3	13.3	38163.7	6.7	1043.0	7.2
Fishing_vessels	0.0	330.0	20.4	0.0	0.0	81.9	6.2
Service_ships	0.0	223.8	33.1	0.0	0.0	111.8	23.7
Unknown	0.0	1249.0	158.2	2183.1	0.0	288.3	36.8
Total, All	463	5067	537	387667	72	10238	689
Total, IMO numbered only	463	2676	258	385484	72	7804	577

2022	Sewage Nitrogen [tonne]	Food Waste Nitrogen [tonne]	Grey Water Nitrogen [tonnes]	Sewage Phosphorus [tonnes]	Food Waste Phosphorus [tonnes]	Grey Water Phosporus [tonnes]
RoPax_vessels	6.8	41.9	145.3	0.3	12.2	62.7
Vehicle_carriers	0.5	0.0	0.1	0.0	0.0	0.1
RoRo_vessels	35.3	3.5	9.8	3.5	1.0	4.2
Bulk_carriers	15.6	1.6	4.3	1.5	0.5	1.9
General_cargo	30.9	3.1	8.8	3.0	0.9	3.8
Container_ships	6.6	0.7	1.8	0.7	0.2	0.8
Reefers	1.2	0.1	0.3	0.2	0.0	0.1
Tankers	21.5	2.2	3.4	1.1	0.3	1.5
LNG_tankers	0.9	0.1	0.2	0.0	0.0	0.1
Gas_tankers	1.0	0.1	0.3	0.1	0.0	0.1
Passenger_ships	0.1	5.0	67.7	0.0	1.4	29.2
Cruisers	3.5	57.5	29.2	0.0	16.9	12.6
Fishing_vessels	4.5	0.4	2.4	0.1	0.2	1.0

Service_ships	2.3	0.2	1.2	0.2	0.1	0.5
Unknown	9.5	0.9	8.3	0.6	0.3	3.6
Total, All	160	119	296	14	35	128
Total, IMO numbered only	131	113	275	12	33	98

2022	**CuO [tonnes]**	**CuPyr [tonnes]**	**ZnO [tonnes]**	**ZnPyr [tonnes]**	**DCOIT [tonnes]**	**Zineb [tonnes]**
Total	455.5 (+9.0%)	0.9 (+8.5%)	89.3 (+8.2%)	1.7 (+8.0%)	0.6 (+8.2%)	1.7 (+8.5%)
Baltic Proper	202.9 (+10.9%)	0.4 (+10.0%)	39.9 (+9.4%)	0.8 (+9.1%)	0.3 (+9.4%)	0.8 (+10.0%)
Kattegat	112.1 (+7.6%)	0.2 (+7.1%)	22.4 (+6.7%)	0.4 (+6.6%)	0.2 (+6.7%)	0.4 (+7.1%)
Gulf of Finland	103.6 (+6.5%)	0.2 (+6.4%)	19.7 (+6.3%)	0.4 (+6.3%)	0.1 (+6.3%)	0.4 (+6.4%)
Gulf of Bothnia	25.8 (+2.8%)	0.1 (+3.3%)	5.2 (+3.5%)	0.1 (+3.9%)	0.0 (+3.8%)	0.1 (+3.3%)
Gulf of Riga	11.1 (+34.3%)	0.0 (+34.6%)	2.1 (+34.9%)	0.0 (+35.1%)	0.0 (+35.0%)	0.0 (+34.7%)
Vessel type						
Ropax_vessels	15.4 (-3.3%)	0.0 (-1.3%)	4.3 (-.2%)	0.1 (+.3%)	0.0 (-.1%)	0.1 (-1.2%)
Vehicle_carriers	2.1 (-23.8%)	0.0 (-23.8%)	0.4 (-23.8%)	0.0 (-23.8%)	0.0 (-23.8%)	0.0 (-23.8%)
Roro_vessels	17.3 (+21.5%)	0.0 (+18.1%)	3.3 (+15.4%)	0.1 (+14.2%)	0.0 (+15.3%)	0.1 (+17.9%)
Bulk_carriers	103.0 (+21.8%)	0.2 (+21.9%)	18.8 (+21.9%)	0.4 (+22.0%)	0.1 (+21.9%)	0.4 (+21.9%)
General_cargo	78.0 (-3.7%)	0.2 (-3.2%)	14.9 (-2.7%)	0.3 (-2.5%)	0.1 (-2.7%)	0.3 (-3.1%)
Container_ships	32.8 (-4.2%)	0.1 (-5.9%)	6.1 (-7.3%)	0.1 (-7.9%)	0.0 (-7.4%)	0.1 (-6.0%)
Reefers	4.3 (+8.4%)	0.0 (+8.1%)	0.8 (+7.9%)	0.0 (+7.8%)	0.0 (+7.9%)	0.0 (+8.1%)
Tankers	129.5 (+12.8%)	0.3 (+12.8%)	23.8 (+12.9%)	0.5 (+12.9%)	0.2 (+12.9%)	0.5 (+12.9%)
Lng_tankers	7.0 (+73.4%)	0.0 (+63.1%)	1.3 (+55.1%)	0.0 (+51.8%)	0.0 (+54.8%)	0.0 (+62.2%)
Gas_tankers	4.1 (+62.1%)	0.0 (+62.0%)	0.7 (+62.0%)	0.0 (+62.0%)	0.0 (+62.0%)	0.0 (+62.0%)
Passenger_ships	2.7 (+15.8%)	0.0 (+14.3%)	0.7 (+13.2%)	0.0 (+13.3%)	0.0 (+13.6%)	0.0 (+14.2%)
Cruisers	6.1 (+8.9%)	0.0 (+7.6%)	1.2 (+6.3%)	0.0 (+6.2%)	0.0 (+6.7%)	0.0 (+7.5%)
Fishing_vessels	3.8 (-10.4%)	0.0 (-10.1%)	0.8 (-9.9%)	0.0 (-10.0%)	0.0 (-10.0%)	0.0 (-10.1%)
Service_ships	3.5 (-25.4%)	0.0 (-24.3%)	0.8 (-23.6%)	0.0 (-23.5%)	0.0 (-23.7%)	0.0 (-24.3%)
Unknown	19.4 (+24.1%)	0.0 (+22.1%)	5.0 (+20.9%)	0.1 (+20.6%)	0.0 (+21.0%)	0.1 (+22.0%)
Misc	7.3 (-5.6%)	0.0 (-7.0%)	1.6 (-7.8%)	0.0 (-8.2%)	0.0 (-7.9%)	0.0 (-7.0%)

2023	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water
	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	55.6	396.2	104.3	147233.5	51.1	4964.3	17.1
Vehicle_carriers	2.9	4.7	0.4	3728.1	0.0	2.8	2.0
RoRo_vessels	45.5	49.1	6.7	82966.3	2.6	281.2	199.9
Bulk_carriers	81.6	352.5	15.7	15836.4	0.3	132.0	94.4
General_cargo	50.9	1146.3	30.4	8635.8	8.1	231.6	160.0
Container_ships	58.5	120.8	10.6	31821.2	8.2	54.7	39.0
Reefers	1.7	26.6	1.9	3159.5	0.0	10.9	7.8
Tankers	154.2	395.3	25.4	40233.6	0.1	164.5	53.2
LNG_tankers	10.9	5.7	2.6	0.0	0.0	8.5	2.4
Gas_tankers	3.0	16.1	1.1	94.2	0.0	6.3	2.2
Passenger_ships	0.0	282.3	48.0	0.0	0.0	2325.8	0.1
Cruisers	6.7	6.9	11.4	27899.7	3.0	836.1	8.1
Fishing_vessels	0.0	322.4	20.0	32.2	0.0	82.7	6.4
Service_ships	0.0	230.9	34.2	0.0	0.0	106.1	18.6
Unknown	0.0	1356.8	171.7	2197.1	0.0	309.0	38.9
Total, All	472	5195	550	363842	73	9832	712
Total, IMO numbered only	472	2703	260	361645	73	7517	606

2023	Sewage Nitrogen	Food Waste Nitrogen	Grey Water Nitrogen	Sewage Phosphorus	Food Waste Phosphorus	Grey Water Phosporus
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	8.3	38.9	139.1	0.4	11.3	60.1
Vehicle_carriers	0.4	0.0	0.1	0.0	0.0	0.0
RoRo_vessels	39.5	4.0	10.9	3.7	1.1	4.5
Bulk_carriers	16.2	1.6	4.5	1.7	0.5	2.1
General_cargo	27.9	2.8	8.0	2.9	0.9	3.7
Container_ships	7.2	0.7	2.0	0.7	0.2	0.9
Reefers	1.3	0.1	0.3	0.2	0.0	0.1
Tankers	24.3	2.4	3.2	1.0	0.3	1.4
LNG_tankers	1.2	0.1	0.2	0.1	0.0	0.1
Gas_tankers	0.8	0.1	0.2	0.1	0.0	0.1
Passenger_ships	0.1	4.1	57.8	0.0	1.3	28.8
Cruisers	3.5	43.0	21.8	0.0	14.0	10.1
Fishing_vessels	4.3	0.4	2.2	0.1	0.2	1.0

Service_ships	2.8	0.3	1.3	0.2	0.1	0.5
Unknown	0.5	0.0	0.2	0.7	0.3	3.8
Total, All	166	105	260	14	31	124
Total, IMO numbered only	139	100	252	13	30	95

2023	CuO [tonnes]	CuPyr [tonnes]	ZnO [tonnes]	ZnPyr [tonnes]	DCOIT [tonnes]	Zineb [tonnes]
Total	481.8 (+5.8%)	1.0 (+6.0%)	94.8 (+6.2%)	1.9 (+6.2%)	0.6 (+6.2%)	1.8 (+6.0%)
Baltic Proper	214.7 (+5.8%)	0.4 (+6.5%)	42.6 (+7.0%)	0.8 (+7.2%)	0.3 (+7.0%)	0.8 (+6.5%)
Kattegat	117.8 (+5.1%)	0.2 (+5.0%)	23.5 (+4.9%)	0.5 (+4.8%)	0.2 (+4.9%)	0.5 (+5.0%)
Gulf of Finland	117.2 (+13.1%)	0.2 (+12.8%)	22.1 (+12.5%)	0.4 (+12.3%)	0.1 (+12.5%)	0.4 (+12.8%)
Gulf of Bothnia	24.0 (-6.8%)	0.0 (-6.0%)	4.9 (-5.3%)	0.1 (-5.2%)	0.0 (-5.4%)	0.1 (-6.0%)
Gulf of Riga	7.9 (-28.3%)	0.0 (-26.9%)	1.6 (-26.0%)	0.0 (-25.5%)	0.0 (-25.9%)	0.0 (-26.9%)
Vessel type						
Ropax_vessels	16.1 (+4.4%)	0.0 (+2.7%)	4.4 (+2.0%)	0.1 (+1.6%)	0.0 (+1.9%)	0.1 (+2.7%)
Vehicle_carriers	1.6 (-22.0%)	0.0 (-22.4%)	0.3 (-22.7%)	0.0 (-22.8%)	0.0 (-22.7%)	0.0 (-22.4%)
Roro_vessels	13.0 (-25.1%)	0.0 (-19.4%)	2.8 (-14.9%)	0.1 (-12.8%)	0.0 (-14.7%)	0.1 (-19.1%)
Bulk_carriers	113.1 (+9.9%)	0.2 (+10.1%)	20.8 (+10.3%)	0.4 (+10.4%)	0.1 (+10.3%)	0.4 (+10.1%)
General_cargo	74.2 (-4.8%)	0.1 (-4.6%)	14.3 (-4.3%)	0.3 (-4.2%)	0.1 (-4.3%)	0.3 (-4.5%)
Container_ships	37.1 (+13.4%)	0.1 (+14.2%)	7.0 (+14.9%)	0.1 (+15.2%)	0.0 (+14.9%)	0.1 (+14.3%)
Reefers	5.4 (+25.6%)	0.0 (+25.5%)	1.0 (+25.4%)	0.0 (+25.4%)	0.0 (+25.4%)	0.0 (+25.5%)
Tankers	149.1 (+15.1%)	0.3 (+15.1%)	27.4 (+15.1%)	0.5 (+15.1%)	0.2 (+15.1%)	0.5 (+15.1%)
Lng_tankers	8.8 (+25.8%)	0.0 (+29.7%)	1.7 (+32.5%)	0.0 (+33.8%)	0.0 (+32.6%)	0.0 (+29.7%)
Gas_tankers	3.7 (-8.9%)	0.0 (-7.8%)	0.7 (-6.8%)	0.0 (-6.4%)	0.0 (-6.8%)	0.0 (-7.7%)
Passenger_ships	2.4 (-10.7%)	0.0 (-10.2%)	0.7 (-10.0%)	0.0 (-10.2%)	0.0 (-10.3%)	0.0 (-10.3%)
Cruisers	4.6 (-24.4%)	0.0 (-23.1%)	0.9 (-22.1%)	0.0 (-21.6%)	0.0 (-22.0%)	0.0 (-23.0%)
Fishing_vessels	4.3 (+13.6%)	0.0 (+13.2%)	0.9 (+13.0%)	0.0 (+13.0%)	0.0 (+13.0%)	0.0 (+13.3%)
Service_ships	3.3 (-4.5%)	0.0 (-4.8%)	0.7 (-5.0%)	0.0 (-5.1%)	0.0 (-5.1%)	0.0 (-4.8%)
Unknown	20.4 (+5.5%)	0.0 (+6.3%)	5.3 (+6.9%)	0.1 (+7.0%)	0.0 (+6.9%)	0.1 (+6.4%)
Misc	6.0 (-17.8%)	0.0 (-16.9%)	1.4 (-16.6%)	0.0 (-16.6%)	0.0 (-16.7%)	0.0 (-17.1%)

2024	Ballast	STO*	Bilge	Scrubber (Open)	Scrubber (Closed)	Grey Water	Black Water

	[million m3]	[m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]	[10^3 m3]
RoPax_vessels	60.1	397.8	105.1	162072.7	50.5	4922.8	19.1
Vehicle_carriers	3.0	4.9	0.4	2813.1	0.0	2.7	2.0
RoRo_vessels	40.7	46.2	6.4	79783.3	2.9	295.0	212.1
Bulk_carriers	74.1	320.6	14.2	14274.3	0.5	120.8	86.8
General_cargo	53.0	1128.5	29.9	8601.8	7.6	215.4	150.0
Container_ships	59.8	123.0	10.1	44831.0	8.0	54.1	38.9
Reefers	1.8	22.2	1.6	4182.4	0.0	9.4	6.8
Tankers	148.2	403.2	26.3	37854.3	0.0	172.7	55.8
LNG_tankers	11.0	4.4	2.1	0.0	0.0	8.4	2.8
Gas_tankers	2.3	14.3	0.9	0.0	0.0	5.5	1.9
Passenger_ships	0.0	237.7	40.4	0.0	0.0	2011.0	0.2
Cruisers	7.4	6.7	9.1	23374.5	2.4	778.9	7.2
Fishing_vessels	0.0	279.9	17.4	0.0	0.0	76.2	5.9
Service_ships	0.0	215.7	32.3	0.0	0.0	102.5	19.2
Unknown	0.0	18.1	2.5	2333.6	0.0	6.3	1.8
Total, All	461	3516	342	380123	72	8961	651
Total, IMO numbered only	461	2710	257	377790	72	7395	621

2024	**Sewage Nitrogen**	**Food Waste Nitrogen**	**Grey Water Nitrogen**	**Sewage Phosphorus**	**Food Waste Phosphorus**	**Grey Water Phosporus**
	[tonne]	[tonne]	**[tonnes]**	[tonnes]	[tonnes]	[tonnes]
RoPax_vessels	9.2	39.0	138.0	0.5	11.3	59.6
Vehicle_carriers	0.4	0.0	0.1	0.0	0.0	0.0
RoRo_vessels	39.5	4.0	10.9	3.9	1.2	4.7
Bulk_carriers	16.2	1.6	4.5	1.6	0.5	1.9
General_cargo	27.9	2.8	8.0	2.7	0.8	3.4
Container_ships	7.2	0.7	2.0	0.7	0.2	0.9
Reefers	1.3	0.1	0.3	0.2	0.0	0.1
Tankers	24.3	2.4	3.2	1.0	0.3	1.4
LNG_tankers	1.2	0.1	0.2	0.1	0.0	0.1
Gas_tankers	0.8	0.1	0.2	0.1	0.0	0.1
Passenger_ships	0.1	4.1	57.8	0.0	1.1	24.9
Cruisers	3.5	43.0	21.8	0.0	13.1	9.4
Fishing_vessels	4.3	0.4	2.2	0.1	0.2	0.9
Service_ships	2.8	0.3	1.3	0.2	0.1	0.6
Unknown	0.5	0.0	0.2	0.0	0.0	0.1
Total, All	152	100	260	14	30	113

Total, IMO numbered only	143	97	250	13	29	93

2024	CuO [tonnes]	CuPyr [tonnes]	ZnO [tonnes]	ZnPyr [tonnes]	DCOIT [tonnes]	Zineb [tonnes]
Total	458.4 (-4.8%)	0.9 (-6.1%)	88.1 (-7.1%)	1.7 (-7.5%)	0.6 (-7.1%)	1.7 (-6.2%)
Baltic Proper	188.5 (-12.2%)	0.4 (-13.3%)	36.6 (-14.2%)	0.7 (-14.6%)	0.2 (-14.2%)	0.7 (-13.4%)
Kattegat	104.4 (-11.4%)	0.2 (-13.3%)	20.0 (-14.9%)	0.4 (-15.5%)	0.1 (-14.9%)	0.4 (-13.5%)
Gulf of Finland	131.5 (+12.1%)	0.3 (+12.1%)	24.8 (+12.1%)	0.5 (+12.1%)	0.2 (+12.1%)	0.5 (+12.1%)
Gulf of Bothnia	26.1 (+8.8%)	0.1 (+6.3%)	5.1 (+3.9%)	0.1 (+3.6%)	0.0 (+4.4%)	0.1 (+6.0%)
Gulf of Riga	7.9 (-.6%)	0.0 (-.2%)	1.6 (+.3%)	0.0 (+.4%)	0.0 (+.3%)	0.0 (-.1%)
Vessel type						
Ropax_vessels	15.0 (-6.8%)	0.0 (-4.8%)	4.2 (-3.9%)	0.1 (-3.5%)	0.0 (-3.8%)	0.1 (-4.9%)
Vehicle_carriers	1.5 (-5.9%)	0.0 (-5.7%)	0.3 (-5.5%)	0.0 (-5.4%)	0.0 (-5.5%)	0.0 (-5.6%)
Roro_vessels	12.2 (-5.7%)	0.0 (-8.6%)	2.5 (-10.9%)	0.0 (-11.8%)	0.0 (-11.0%)	0.0 (-8.9%)
Bulk_carriers	103.6 (-8.5%)	0.2 (-8.7%)	18.9 (-8.9%)	0.4 (-8.9%)	0.1 (-8.9%)	0.4 (-8.7%)
General_cargo	76.4 (+3.0%)	0.2 (+2.3%)	14.5 (+1.7%)	0.3 (+1.4%)	0.1 (+1.6%)	0.3 (+2.2%)
Container_ships	36.0 (-3.1%)	0.1 (-4.0%)	6.7 (-4.8%)	0.1 (-5.1%)	0.0 (-4.8%)	0.1 (-4.1%)
Reefers	4.6 (-14.7%)	0.0 (-14.4%)	0.8 (-14.1%)	0.0 (-14.0%)	0.0 (-14.1%)	0.0 (-14.4%)
Tankers	157.8 (+5.8%)	0.3 (+6.0%)	29.0 (+6.2%)	0.6 (+6.3%)	0.2 (+6.2%)	0.6 (+6.0%)
Lng_tankers	9.9 (+11.9%)	0.0 (+11.7%)	2.0 (+12.4%)	0.0 (+12.5%)	0.0 (+12.4%)	0.0 (+12.2%)
Gas_tankers	3.2 (-13.7%)	0.0 (-14.7%)	0.6 (-15.6%)	0.0 (-16.0%)	0.0 (-15.6%)	0.0 (-14.8%)
Passenger_ships	2.0 (-18.4%)	0.0 (-18.3%)	0.5 (-18.0%)	0.0 (-18.3%)	0.0 (-18.3%)	0.0 (-18.2%)
Cruisers	4.3 (-6.8%)	0.0 (-9.1%)	0.8 (-10.8%)	0.0 (-11.6%)	0.0 (-10.9%)	0.0 (-9.2%)
Fishing_vessels	3.9 (-9.2%)	0.0 (-10.3%)	0.8 (-11.1%)	0.0 (-11.4%)	0.0 (-11.1%)	0.0 (-10.4%)
Service_ships	3.1 (-6.4%)	0.0 (-6.7%)	0.7 (-7.1%)	0.0 (-7.0%)	0.0 (-6.9%)	0.0 (-6.8%)
Unknown	2.0 (-90.0%)	0.0 (-91.7%)	0.4 (-92.7%)	0.0 (-93.1%)	0.0 (-92.7%)	0.0 (-91.8%)
Misc	8.4 (+39.3%)	0.0 (+37.2%)	1.8 (+35.6%)	0.0 (+35.4%)	0.0 (+35.9%)	0.0 (+37.1%)