

OVERVIEW OF THE SHIPPING TRAFFIC IN THE BALTIC SEA

The Baltic Sea is one of the most heavily trafficked seas in the world, accounting for up to 15% of the world's cargo transportation. Both the number and the size of ships have grown in recent years, especially in respect to oil tankers, and this trend is expected to continue.

The Baltic's narrow straits and shallow waters, many of which are covered by ice for prolonged periods in winter, make navigation very challenging, and increase the risk of shipping accidents.

The main environmental effects of shipping and other activities at sea include air pollution, illegal deliberate and accidental discharges of oil, hazardous substances and other wastes, and the unintentional introduction of invasive alien organisms via ships' ballast water or hulls. Shipping also adds to the problem of eutrophication of the Baltic Sea with its nutrient inputs from sewage discharges and nitrogen oxides (NOx) emissions.

Automatic Identification System

The decision to establish a land-based monitoring system for ships in the Baltic, based on Automatic Identification System (AIS) signals, was agreed during the HELCOM Extraordinary Ministerial Meeting in Copenhagen in 2001, which closely followed the "Baltic Carrier" accident, one of the most serious oil spills in the Baltic in recent years.

The task of the shore-based AIS network of stations is to provide competent authorities with a monitoring tool for supervision, risk analyses, search and rescue (SAR) operations, port state control, security and other safety-related tasks to ensure safe navigation in the Baltic Sea.

The whole Baltic Sea area has been covered by land-based AIS stations since 1 July 2005 making the Baltic the first region in the world capable of real-time monitoring of ship traffic.

Busy waters

According to the HELCOM AIS, there are about 2,000 ships in the Baltic marine area at any given moment, and each month around 3,500–5,000 ships ply the waters of the Baltic.

Figure 1 illustrates clearly the main routes and the density of ship traffic in the Baltic Sea.

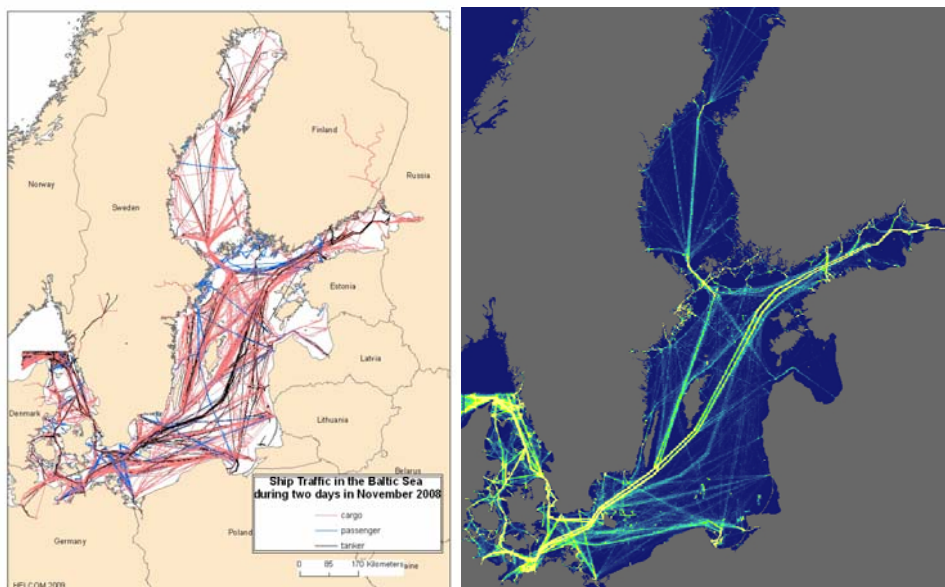


Figure 1. The figure on the left illustrates cargo, tanker and passenger ship traffic on the Baltic Sea during two days in November 2008. The figure on the right shows the density of shipping traffic during one week in 2008, with the busiest routes highlight in yellow. Data source: HELCOM AIS.

Real-time snapshots also give telling information of the characteristics of Baltic Sea shipping. **Figures 2, 3 and 4** show such snapshots, indicating vessel type and direction of travel, for the whole Baltic Sea area, as well as close-ups of the Danish Straits and Gulf of Finland.

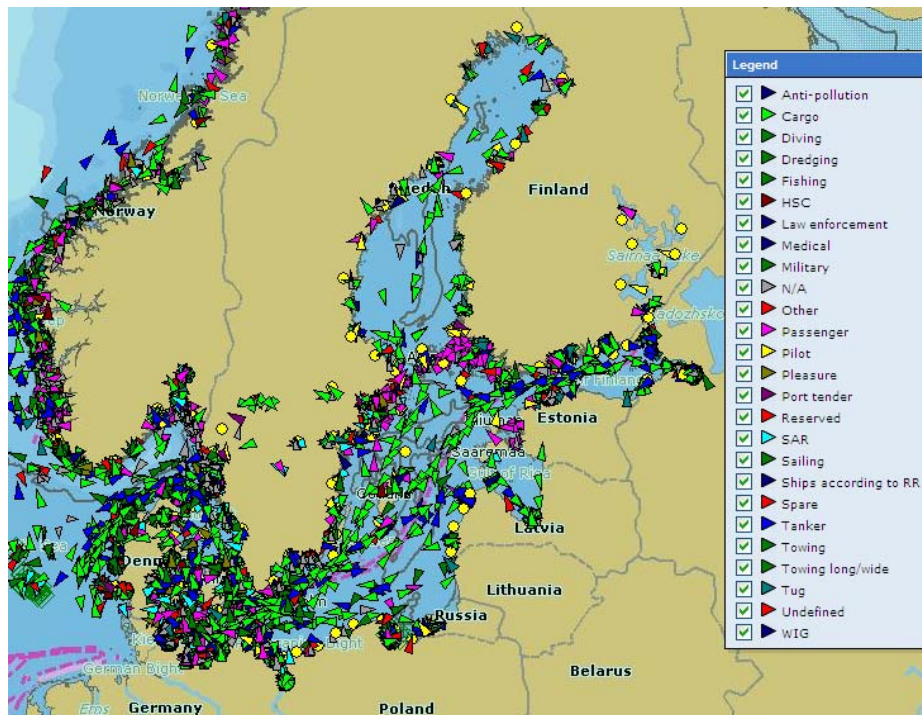


Figure 2. Snapshot of ship traffic in the Baltic Sea on 8 April 2009. Note that the yellow dots illustrate AIS stations and the arrowheads depict different types of ships and direction of travel. Data source: HELCOM AIS.

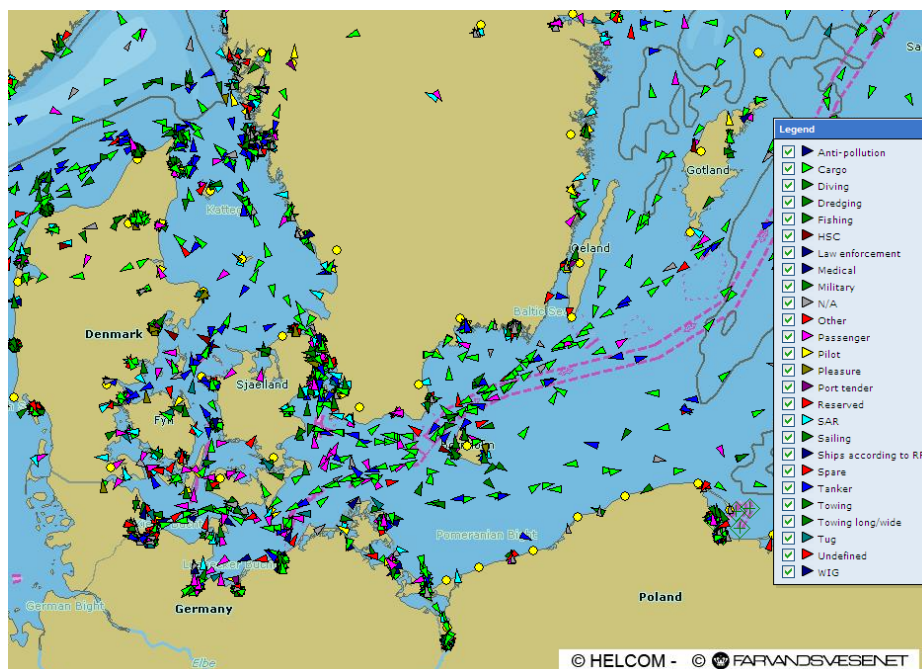


Figure 3. Snapshot of ships' traffic in the south-western part of the Baltic Sea on 8 April 2009. Note that the yellow dots illustrate AIS stations and the arrowheads depict different types of ships and direction of travel. Data source: HELCOM AIS.

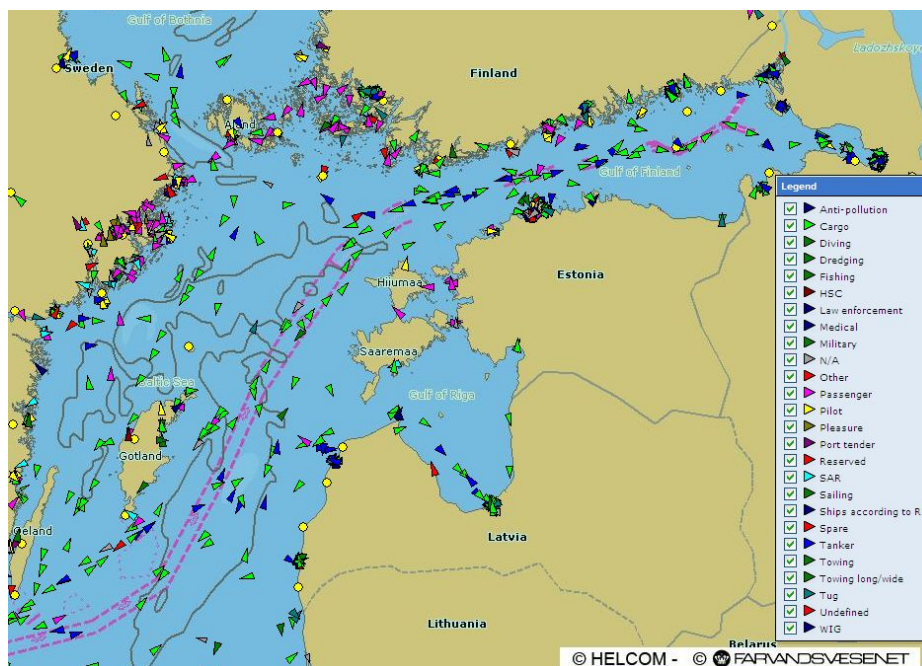


Figure 4. Snapshot of ships' traffic in the north-eastern part of the Baltic Sea on 8 April 2009. Note that the yellow dots illustrate AIS stations and the arrowheads depict different types of ships and direction of travel. Data source: HELCOM AIS.

The HELCOM AIS also provides historical statistics on ship traffic, allowing for the assessment of for instance annual changes in traffic intensity. Since 2006, HELCOM has been following the trends in vessel traffic crossing fixed AIS lines, and a rising trend in number of crossings is clear (**figure 5, table 1**). Although ship traffic is increasing (and is expected to continue doing so), a part of the increase in numbers can also be explained by the growing number of vessels registered in the AIS system.

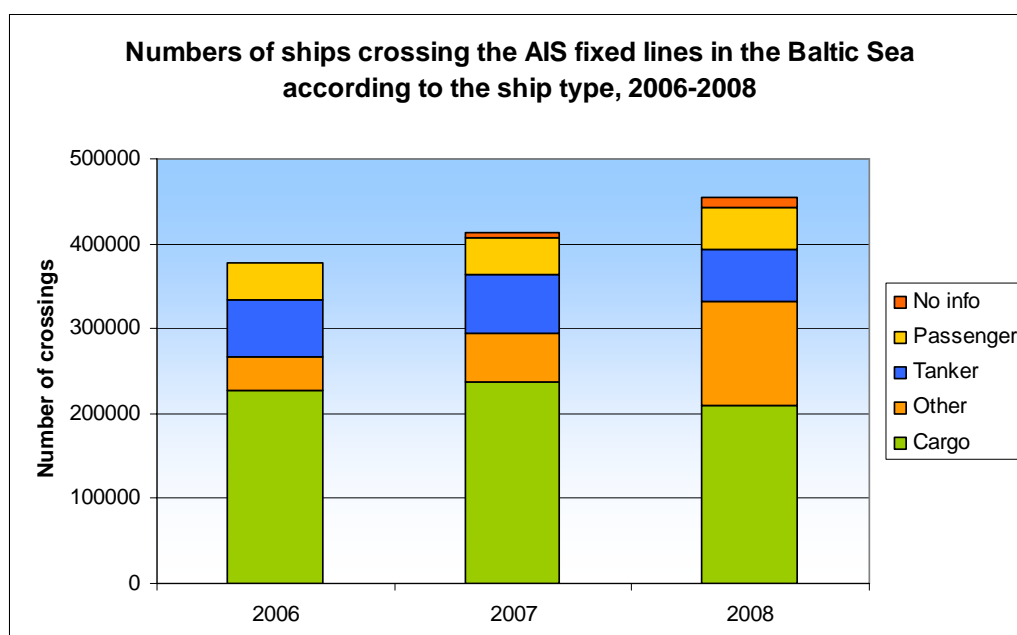


Figure 5. Number of ships crossing fixed AIS lines in the Baltic Sea during 2006-2008, shown here by ship type. Data source: HELCOM AIS.

Table 1. Number of ships crossing fixed AIS lines in the Baltic Sea during 2006-2008. Data source: HELCOM AIS.

	Passenger	Cargo	Tanker	Other	No info	Total
2006	42731	226855	67458	39627	-	376671
%	11.3	60.2	17.9	10.5	-	100.0
2007	43215	237342	69335	56981	6901	413774
%	10.4	57.4	16.8	13.8	1.7	100.0
2008	49355	210021	61996	122029	10297	453698
%	10.9	46.3	13.7	26.9	2.3	100

More detailed statistics on ship crossings over fixed AIS lines, shown by ship type and draft, for the year 2008 can be seen in **figures 6 and 7, and tables 2 and 3.**

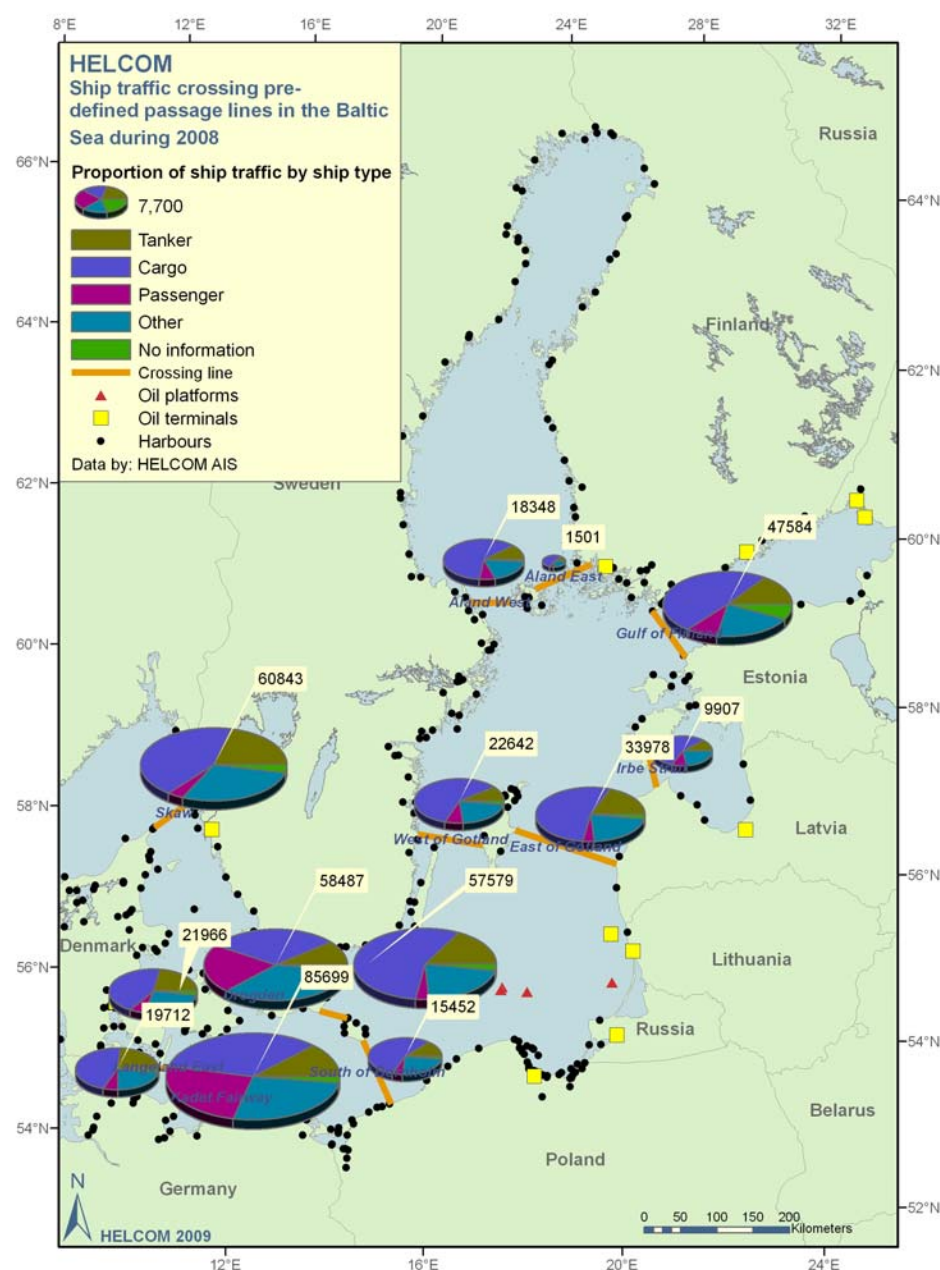


Figure 6. Number of ships crossing the AIS fixed lines in the Baltic Sea according to the type of the vessel, 2008. Data source: HELCOM AIS.

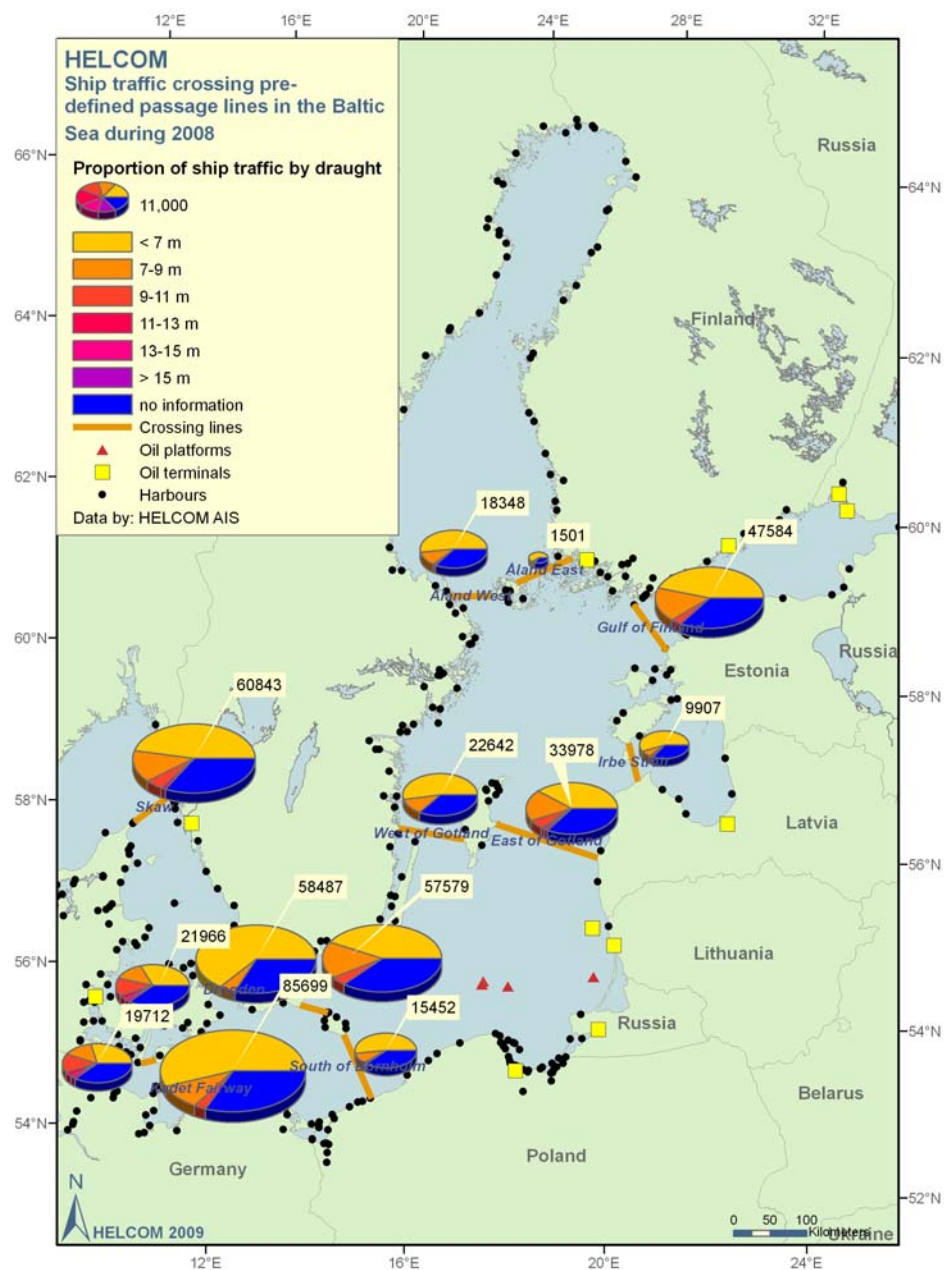


Figure 7. Number of ships crossing the AIS fixed lines in the Baltic Sea according to the draught, 2008. Data source: HELCOM AIS.

Table 2. Number of ships crossing the AIS fixed lines in the Baltic Sea according to the type of the vessels, 2008 (for comparison total percentage for 2006 is also included). Data source: HELCOM AIS.

Location	Type of ship					
	Passenger	Cargo	Tanker	Other	No info	Total
The Skaw	2453	25383	12071	19378	1558	60843
The Great Belt East Bridge	1506	9160	4791	6048	461	21966
Drogden	9965	20219	4991	22370	942	58487
Langeland East	1546	8648	4643	4472	403	19712
Kadet Fairway	19447	31874	8618	24349	1411	85699
North of Bornholm	2402	32869	8509	12597	1202	57579
South of Bornholm	928	8655	1743	3852	274	15452
West of Gotland	2071	13440	1897	4838	396	22642
East of Gotland	1645	18596	5776	7298	663	33978
Åland West	1636	11499	1755	3266	192	18348
Åland East	109	827	168	385	12	1501
Gulf of Finland	4585	23237	6053	10986	2723	47584
Irbe Strait	1062	5614	981	2190	60	9907
Total	49355	210021	61996	122029	10297	453698
Percentage of tot.	10.9	46.3	13.7	26.9	2.3	100

Table 3. Number of ships crossing AIS fixed lines in the Baltic Sea according to the draught, 2008. Data source: HELCOM AIS.

Location	Draught							Total
	<7 m	7-9 m	9-11 m	11-13 m	13-15 m	>15 m	Unknown	
The Skaw	28400	6949	2847	813	572	210	21052	60843
The Great Belt East Bridge	7048	2926	2293	640	552	81	8426	21966
Drogden*	36486	2863	54	10	0	12	19062	58487
Langeland East	5687	2932	2287	645	538	84	7539	19712
Kadet Fairway	46057	7756	2643	643	537	72	27991	85699
North of Bornholm	24755	7651	2301	543	522	87	21720	57579
South of Bornholm	7993	1218	197	23	2	2	6017	15452
West of Gotland	11786	2330	168	44	29	8	8277	22642
East of Gotland	13782	5144	1774	381	471	69	12357	33978
Åland West	9482	1878	259	37	21	2	6669	18348
Åland East	905	70	7	0	0	1	518	1501
Gulf of Finland	21529	6688	1563	256	467	86	16995	47584
Irbe Strait	5466	624	275	89	4	1	3448	9907
Total	219376	49029	16668	4124	3715	715	160071	453698
Percentage of tot.	48.4	10.8	3.7	0.9	0.8	0.2	35.3	100

*) For ships passing the Drogden the maximum draught is 8 m; therefore these numbers are probably due to a reporting error.

Cargo

Forecasts indicate that due to long-term economic growth, especially in the eastern part of the Baltic region, the amounts of cargo shipped on the Baltic Sea will grow 64% by 2020 from a level of 731 million tonnes in 2003.

The current data available in HELCOM AIS on the cargo transported in and out of the Baltic does not provide much information for consideration as over 93 % of all cargo transported across the Skaw in 2008 was classified as “other” or “undefined” according to AIS reports (**Figure 8**). Nevertheless, it is worth noting that 7% of cargo is considered to some degree hazardous. **Figure 9** shows that approximately equal amounts of cargo are transported both in and out of the Baltic.

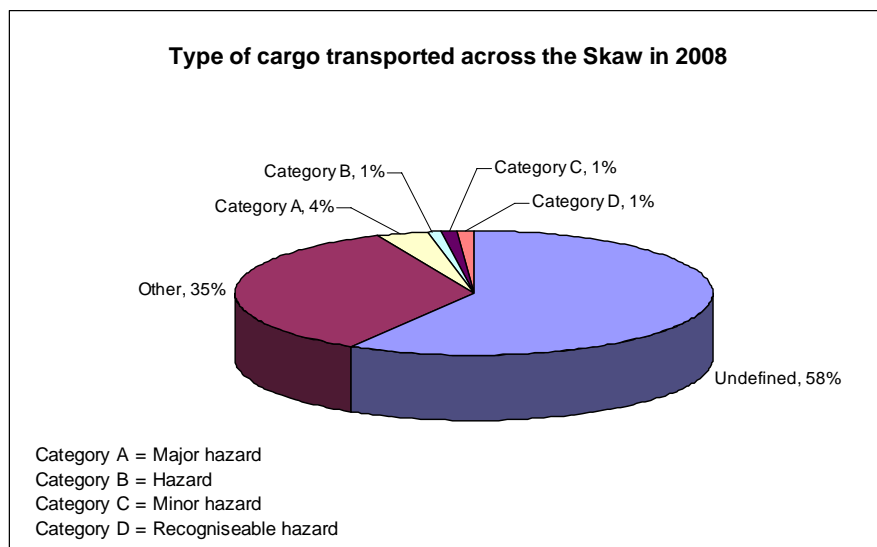


Figure 8. Type of cargo transported via the Skaw in and out of the Baltic Sea during 2008. Data source: HELCOM AIS.

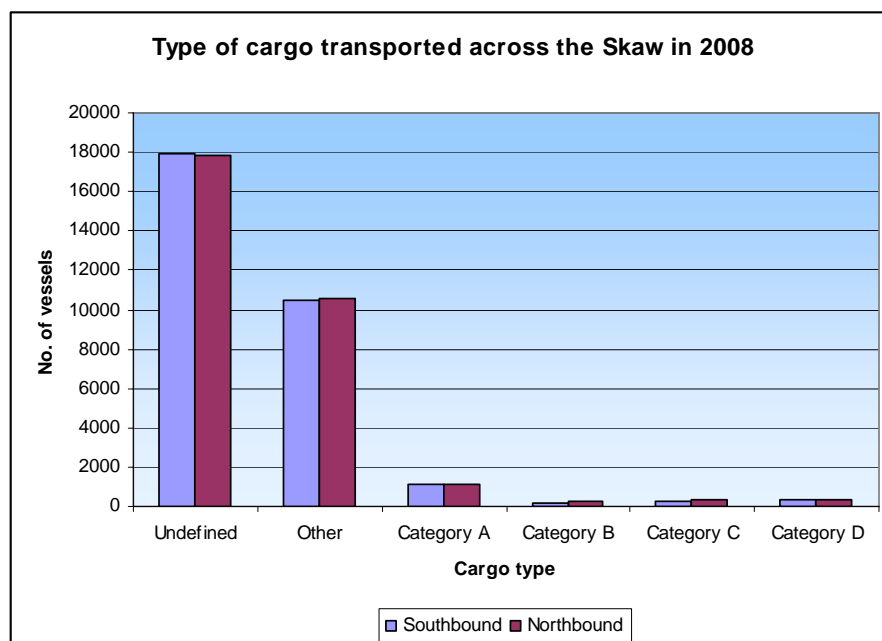


Figure 9. Type of cargo and number of cargo vessels crossing the Skaw during 2008. Data source: HELCOM AIS.

Oil transportation

The transportation of oil and other potentially hazardous cargoes is growing steeply and steadily. More than 4,400 tankers loaded with oil left or entered the Baltic Sea in 2007 (**Figure 10**) and in both 2007 and 2008 approximately 170 million tonnes of oil were shipped on the Baltic Sea (**Figure 11**).

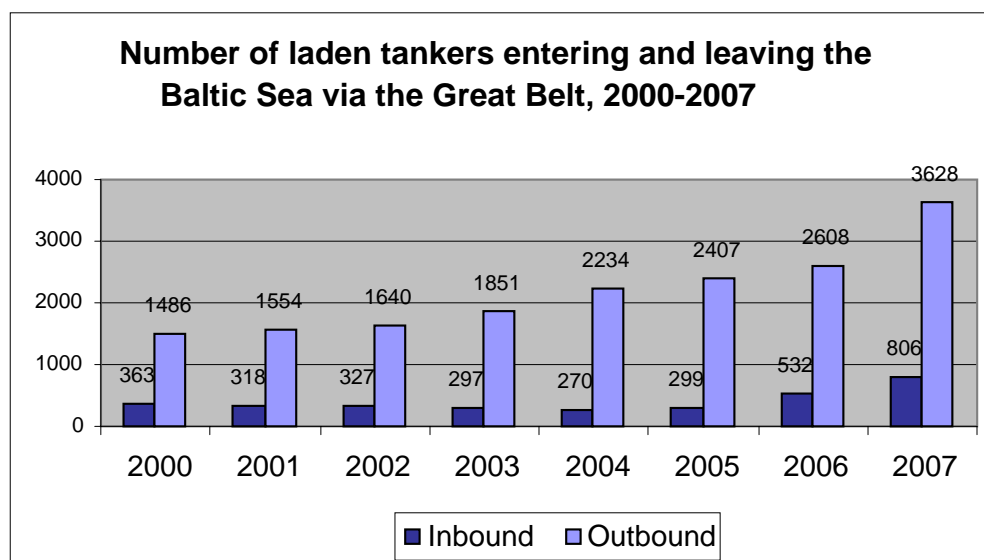


Figure 10. Number of laden tankers entering and leaving the Baltic Sea via the Great Belt during 2000-2007. Data source: SHIPPOS.

Both the number and size of the ships (especially oil tankers) have been growing during last years and now ships carrying up to 150 thousand tons of oil can be seen in the Baltic. By 2015, a 40% increase is expected in the amounts of oil being shipped on the Baltic and the number of large tankers is expected to grow, with more tankers carrying 100,000-150,000 tonnes of oil.

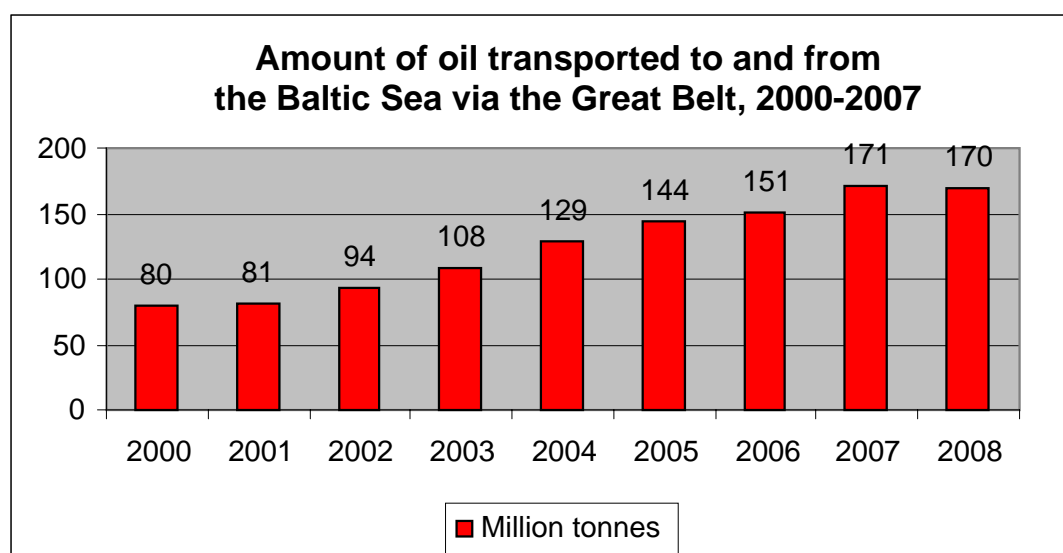


Figure 11. Amount of oil transported to and from the Baltic Sea via the Great Belt during 2000-2008. Data source: SHIPPOS (2000-2007) and Danish reporting system (2008).

Data reported by the HELCOM Contracting States to the HELCOM Maritime Accident and Response Information System ([MARIS](#)) has also been used to look in to the dynamics of the oil transportation in the Baltic (Figure 12).

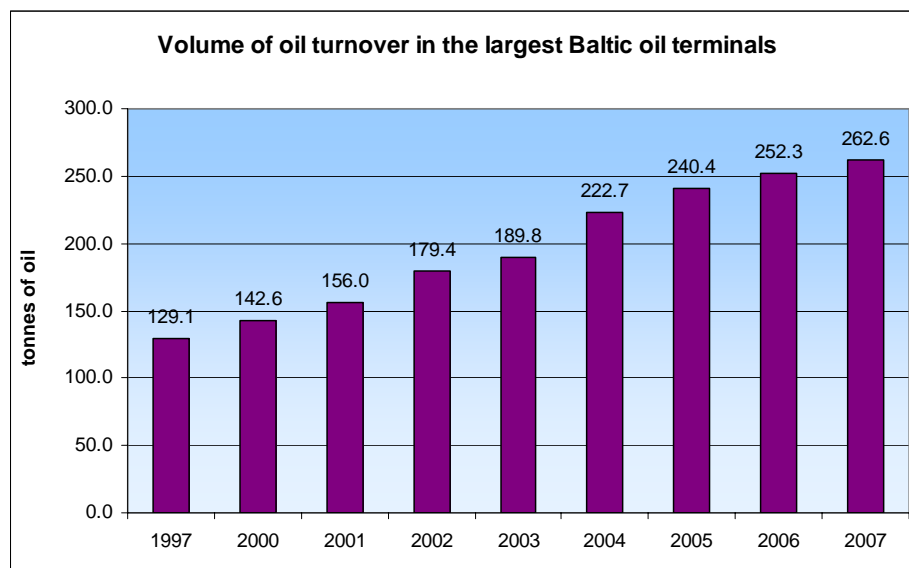


Figure 12. Amount of oil transported via the 17 largest oil terminals in the Baltic Sea area (Fredericia, Kalundborg, Muuga, Porvoo, Naantali, Rostock, Ventspils, Riga, Klaipeda, Butinge, Gdansk, Primorsk, St Petersburg, Kaliningrad, Gothenburg, Brofjorden, and Vysotsk) during 1997-2007. Data source: HELCOM MARIS.

Information on the locations and volumes of oil turnover in the largest Baltic oil terminals are illustrated in figures 13-15.

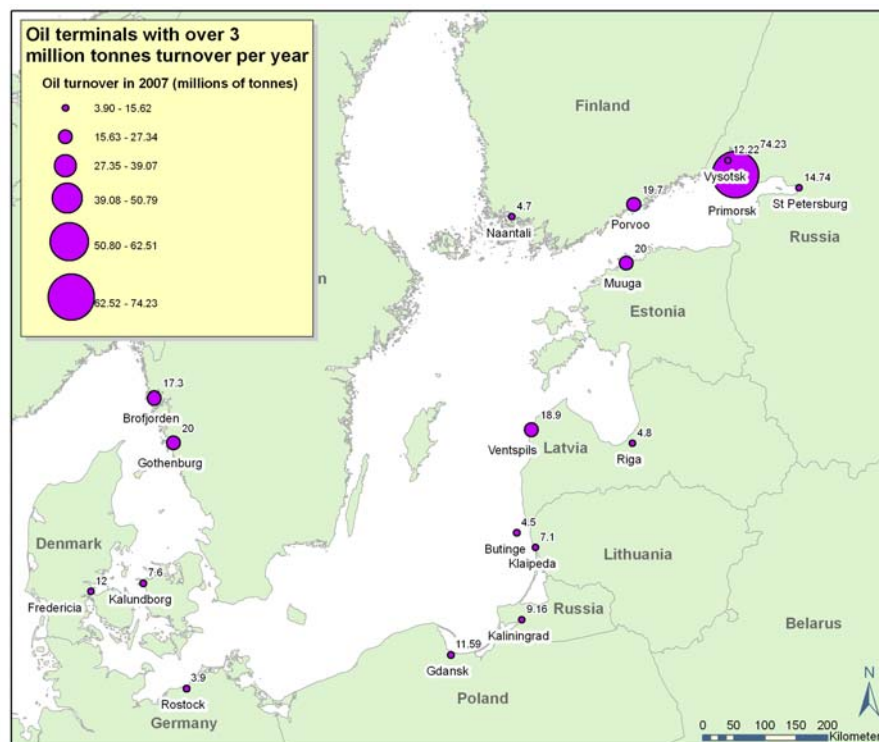


Figure 13. Major oil terminals along the Baltic Sea coastline. Data source: HELCOM MARIS.

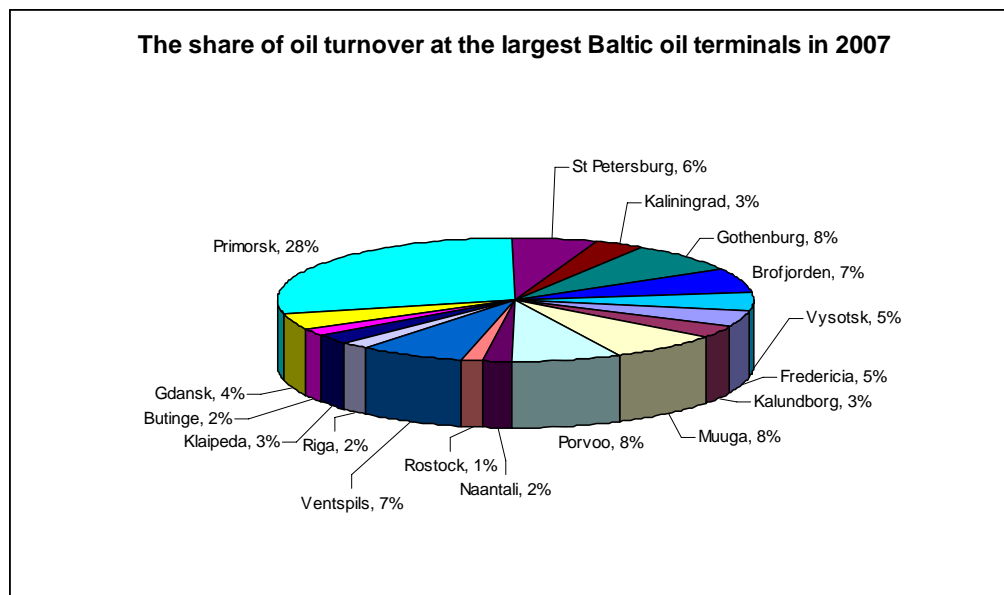


Figure 14. Proportion of oil turnover in the 17 largest Baltic oil terminals during 2007. Data source: HELCOM MARIS.

Oil turnover in largest Baltic oil terminals, 1997-2007

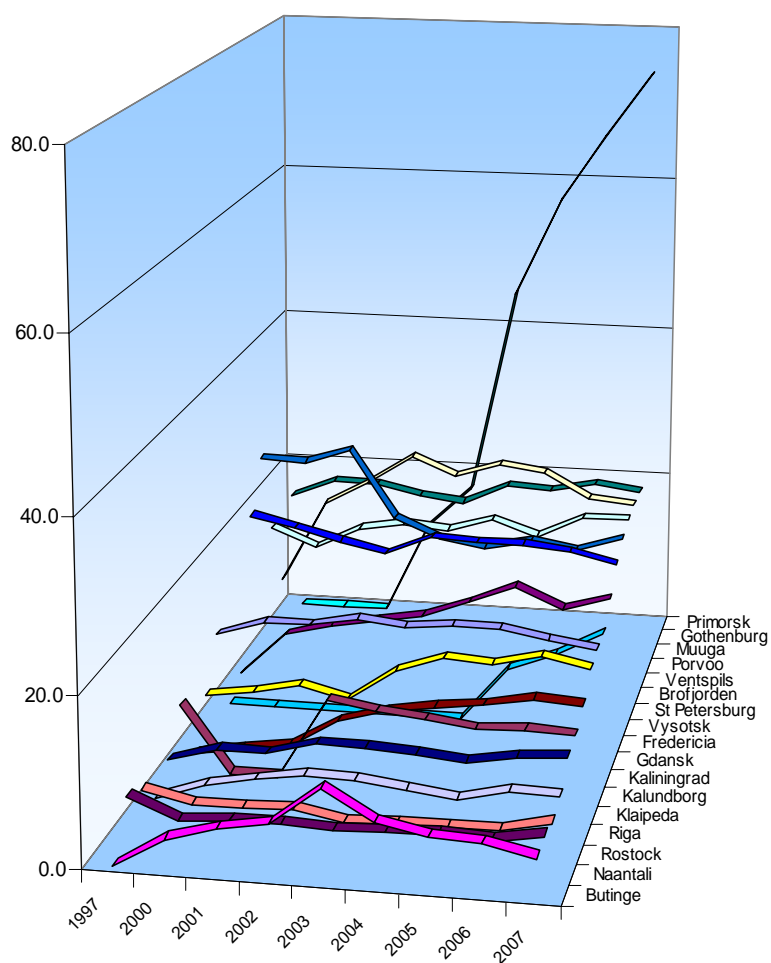


Figure 15. Oil turnover in the largest Baltic oil terminals since 1997. Data source: HELCOM MARIS.

For more information see:

HELCOM web pages on shipping: http://www.helcom.fi/shipping/en_GB/main/

HELCOM annual reports on illegal oil discharges:
http://www.helcom.fi/shipping/waste/en_GB/surveillance/

HELCOM annual reports on shipping accidents in the Baltic Sea:
http://www.helcom.fi/shipping/accidents/en_GB/accidents/

HELCOM web-based interactive map service **Maritime and Accident Response Information System** (MARIS): http://www.helcom.fi/shipping/accidents/en_GB/accidents/

Note that several HELCOM GIS datasets can be downloaded via:
http://www.helcom.fi/GIS/en_GB/data_delivery/