TOWARDS A BALTIC SEA WITH ENVIRONMENTALLY FRIENDLY MARITIME ACTIVITIES

HELCOM Overview 2007

HELCOM Ministerial Meeting

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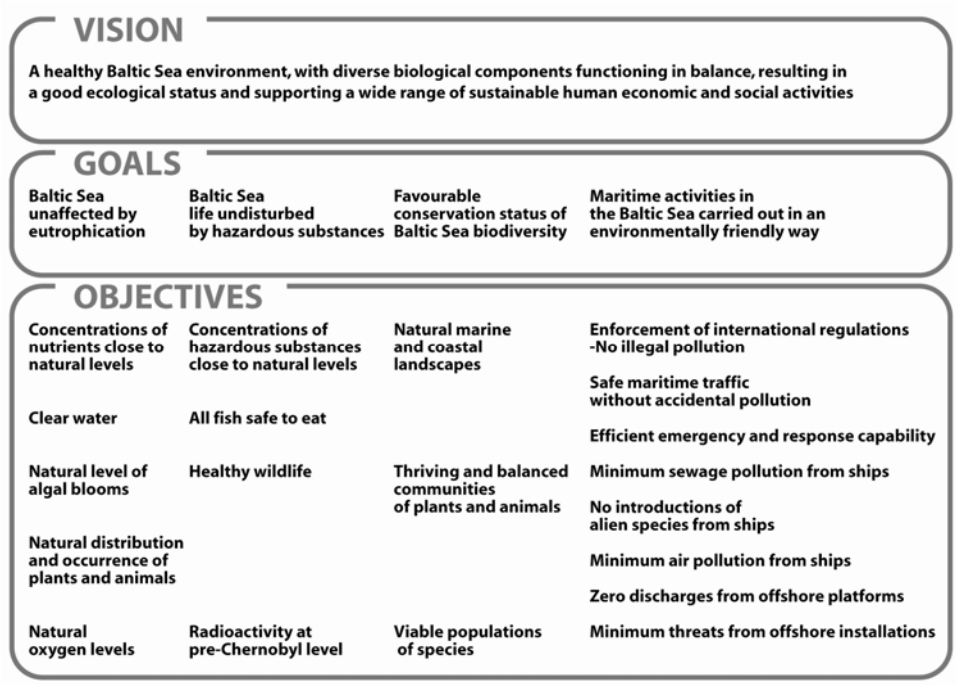
Cover photo by Tadas Navickas

Note: This is a background document for the HELCOM Ministerial Meeting 2007 elaborated by the HELCOM Secretariat.

PREFACE

The aim of this topic-oriented overview is to present what kind of further actions are needed to bridge the gaps in the existing national, regional and international legal regimes, policies, practices and monitoring programmes so as to ensure good environmental performance of shipping and other uses of the Baltic Sea. The ultimate goal is to contribute to achieving a good ecological and environmental status of the Baltic Sea environment.
The necessary new measures described in this report have been included in the HELCOM Baltic Sea Action Plan.

For the implementation of the ecosystem approach, HELCOM has adopted a system of vision, strategic goals and ecological and management objectives. Even if the Baltic Sea Action Plan focuses on four separate thematic areas, the protection of biodiversity, which determines the resilience of the whole Baltic ecosystem, is central to all themes.



The HELCOM system of vision, strategic goals and ecological objectives

The **strategic goal** of *Maritime activities in the Baltic Sea carried out in an environmentally friendly way* has been agreed by HELCOM and serves as a point of departure for deliberations on main areas for which actions are needed to ensure that the impacts of maritime activities on the marine environment of the Baltic Sea is minimised.

As a result, eight topics of major importance for all Baltic Sea riparian countries have been addressed and converted into the following **management objectives**:

- Enforcement of international regulations - No illegal pollution
- Safe maritime traffic without accidental pollution
- Efficient emergency and response capability
- Minimum sewage pollution from ships
- No introductions of alien species from ships
- Minimum air pollution from ships
- Zero discharges from offshore platforms
- Minimum threats from offshore installations.

These management objectives do not directly describe the good ecological status of the Baltic Sea, but they rather indicate the main areas of concern as to the human activity at sea and its possible negative impact.

Failure to reach these objectives will impair the achievement of a good ecological status of the Baltic Sea which is unaffected by eutrophication, with its life undisturbed by hazardous substances and with a favourable status of biodiversity.

EXECUTIVE SUMMARY

The Baltic Sea is one of the most intensely trafficed marine areas in the world. Both the numbers and the sizes of ships have been growing in recent years, especially oil tankers, and this trend is expected to continue.

This heavy traffic occurs in narrow straits and shallow waters that are covered by ice for prolonged periods in winter, making the Baltic Sea a difficult area for navigation, with an increased risk of shipping incidents.

The share of the pollution loads to the sea originating from maritime activities is growing, partly due to the stricter controls now applied to limit pollution from land-based sources.

The main environmental effects of shipping and other activities at sea include pollution to the air, illegal and accidental discharge of oil, hazardous substances and other wastes, and the introduction of invasive alien organisms via ships' ballast water or on their hulls. Emissions of nitrogen oxides from ships contribute to the eutrophication of the sea, oil spilled during accidents may destroy important marine and coastal habitats, and alien species may cause economic loss and even pose risks to human health.

The safety of navigation and the protection of the environment from shipping are of global importance and scope. Actions by the HELCOM Contracting Parties to address these problems are taken at all levels: national, regional, European and global. Joint initiatives of the HELCOM countries in the International Maritime Organization (IMO) have led to the recognition of the sensitivity of the Baltic Sea to heavy sea traffic. Where possible and needed, the strictest implementation of international environmental regulations is pursued. Regional actions are additionally initiated in order to respond to specific needs of the Baltic Sea.

The strategic goal of *Maritime activities in the Baltic Sea carried out in an environmentally friendly way* has been agreed by HELCOM. To reach this goal, further actions are needed with regard to eight issues of major importance for all the Baltic Sea coastal countries, called **management objectives**:

- *Enforcement of international regulations - No illegal pollution*
- *Safe maritime traffic without accidental pollution*
- *Efficient emergency and response capability*
- *Minimum sewage pollution from ships*
- *No introductions of alien species from ships*
- *Minimum air pollution from ships*
- *Zero discharges from offshore platforms*
- *Minimum threats from offshore installations.*

These management objectives do not directly describe the good ecological status of the Baltic Sea, but rather they indicate the main areas of concern in relation to economic activities at sea and their possible negative impacts.

In order to ensure that the objectives will be met, a set of actions has been proposed in the HELCOM Baltic Sea Action Plan based on deficiencies and gaps within existing policies, control and enforcement frameworks and monitoring programmes.

Enforcement of international regulations - No illegal pollution

The annual numbers of illegal discharges of oil in the Baltic Sea are decreasing, but every single breach of the anti-discharge regulations is unacceptable. It is therefore of vital importance to further strengthen countries' ability to survey the Baltic Sea to detect illegal oil discharges, also at night or in poor visibility when deliberate discharges are more likely to occur.

The problem of illegal deliberate discharges does not only concern oil. Plastic and synthetic materials, which are durable and slow to degrade, have become the most abundant form of marine litter. Based on the recent study on the amounts and types of marine litter in the Baltic, new measures will be taken, including extension of the "no-special-fee" system for ship-generated wastes, to cover also wastes caught in fishing nets.

Enforcement of international rules by ships will further be strengthened by not only detecting single hull tankers banned to carry heavy oil, but also other non-compliant ships entering the HELCOM area.

HELCOM's shipping related policies already address all major marine pollutants and their significant sources. However, for some areas, stricter legislation has recently been introduced at a European and global level, including the International Convention on the Control of Harmful Anti-fouling Systems on Ships. The Baltic Sea countries who have not ratified the Convention yet have committed themselves to do so by 2009 at the latest.

Safe maritime traffic without accidental pollution

The statistics on shipping accidents in the Baltic shows increasing numbers of groundings and collisions. Very few areas show positive trends. This is mainly due to the growing density of shipping, which requires the Contracting Parties to put even more emphasis on ensuring the safety of navigation.

Therefore, a new HELCOM Recommendation to further improve the safety of navigation in ice conditions has been developed. Furthermore, HELCOM countries agreed to work within the IMO to support needed modifications to the content of the Automatic Identification System (AIS) information and to speed up the introduction of a general carriage requirement for an Electronic Chart Display and Information System (ECDIS).

Efficient emergency and response capability

The risk of a shipping accident will never be totally eliminated, so there is a need to ensure sufficient emergency and response resources in the HELCOM countries. The most efficient way to establish an adequate response capability, also in financial terms, is to build up capacity on a sub-regional basis. Thus, a "three-tier" approach is applied by HELCOM reflecting three levels at which countries should be ready to act: national, sub-regional and regional.

Much has been done to build up an adequate emergency capacity and response capability. Around 30 emergency tugs with bollard pull of 50 or more tonnes and around 40 sea-going response vessels are located around the Baltic, including vessels chartered by the European Maritime Safety Agency. Building up an effective capacity is a costly and timely process, so a step-wise approach will be applied, in which the work will start by assessing the risk of accidents in individual sub-regions. A concrete timetable has been agreed for finalisation of the risk assessments, identification of missing capacities and taking common actions to fill in such gaps in the most efficient way.

Minimum sewage pollution from ships

The proportion of the nutrient pollution load to the Baltic Sea which originates from ship borne sewage discharges remains rather small. It is, however, not negligible due to the high sensitivity of the Baltic Sea marine environment. This nutrient load, which is concentrated along shipping routes, is immediately available for uptake by plankton algae, adding to the severe eutrophication of the Baltic Sea.

Currently, the nutrient load from ships' treated sewage is not regulated by any international legislation. Voluntary agreements with ship owners of ferries and passenger ships operating in the Baltic to deliver sewage to port reception facilities has proven to be very effective and will be further encouraged. HELCOM Contracting Parites are also planning to work within IMO towards amending Annex IV of MARPOL 73/78 Convention with requirements on nutrient discharges in sewage.

No introductions of alien species from ships

Increasing numbers of non-indigenous species are being observed in seas all around the world, and the Baltic is no exception. Shipping is the most important vector of unintentional species introductions into aquatic environments, due to releases of ballast water and the fouling of hulls. The entry into force of the 2004 International Convention for Control and Management of Ships' Ballast Water and Sediments (BWM Convention) would be the most important step forward to tackle this problem. The ratification of the Convention by the HELCOM Contracting Parties is a very challenging goal, but would provide an effective and - for the time being – the best available legislative tool to reduce the risk of introductions of alien species into the Baltic. The Contracting Parties have agreed to implement the road map towards harmonised implementation of the BWM Convention with an ultimate goal of ratifying it preferably by 2010, but in all cases not later than by 2013.

Minimum air pollution from ships

Emissions from shipping are already significant, and they are projected to grow in future. There are already feasible and cost-effective methods of substantially reducing air pollution from ships, however. The HELCOM Contracting Parties will continue to work out common positions and provide joint inputs to ongoing global legislative processes to ensure that the best solutions are promoted and up-to-date technology is applied.

Zero discharges from offshore platforms

Best Environmental Practice (BEP) and Best Available Techniques (BAT) are subject to continuous review and updating. Drawing on BEP and BAT, HELCOM has adopted a target of "zero discharge" from offshore platforms to be applied throughout the Baltic Sea area. This target is an underlying concept behind the Action Plan for the protection of the environment from offshore platforms adopted by HELCOM.

Minimum threats from offshore installations

The Baltic Sea faces an increasing number of – in many cases - competing uses and increasing pressure from installations such as underwater cables, pipelines and offshore wind farms. The HELCOM Contracting Parties will carefully follow relevant processes with the understanding that any environmentally significant adverse impacts on the Baltic Sea that may be caused by any offshore installation should be prevented, reduced or as fully as possible offset.

OVERVIEW OF SHIP TRAFFIC IN THE BALTIC SEA

The Baltic Sea is one of the most intensely trafficked marine areas in the world. Both the numbers and the sizes of ships have been growing in recent years, especially oil tankers, and now ships carrying up to 150 thousand tonnes of oil are sailing the waters of the Baltic.

To get a full picture of shipping safety in the Baltic, some basic information on shipping intensity in the region is of importance and can be illustrated by the number of ships crossing the HELCOM AIS pre-defined lines as presented in ***Figure 1*** and ***Figure 2*** (ships according to the type of vessels and their draught, respectively).

There are around 2000 ships at sea in the Baltic at any given time, accounting for 15% of the world's cargo transportation. A snapshot illustrating the spatial distribution of shipping activities in the whole Baltic at a specific moment can be seen in ***Figure 3***. The numeric data used in developing the maps are presented in ***Table 1*** and ***Table 2***.

Fact box: What is AIS?

The Automatic Identification System (AIS) is a very high frequency (VHF) radio-based system which enables the identification of the name, position, course, speed, draught and cargo of every ship of more than 300 gross tonnes engaged on international voyages, cargo ships of 500 gross tonnage and upwards not engaged on international voyages and all passenger ships irrespective of size sailing on the Baltic Sea.

AIS displays all available data over a common background map. The system facilitates exchange of information between ships and between ships and shore stations. The whole Baltic Sea area has been covered by land-based AIS stations since mid-2005.

HELCOM AIS information is stored in a dedicated server and can be used for generation of shipping statistics and analysis of shipping patterns.

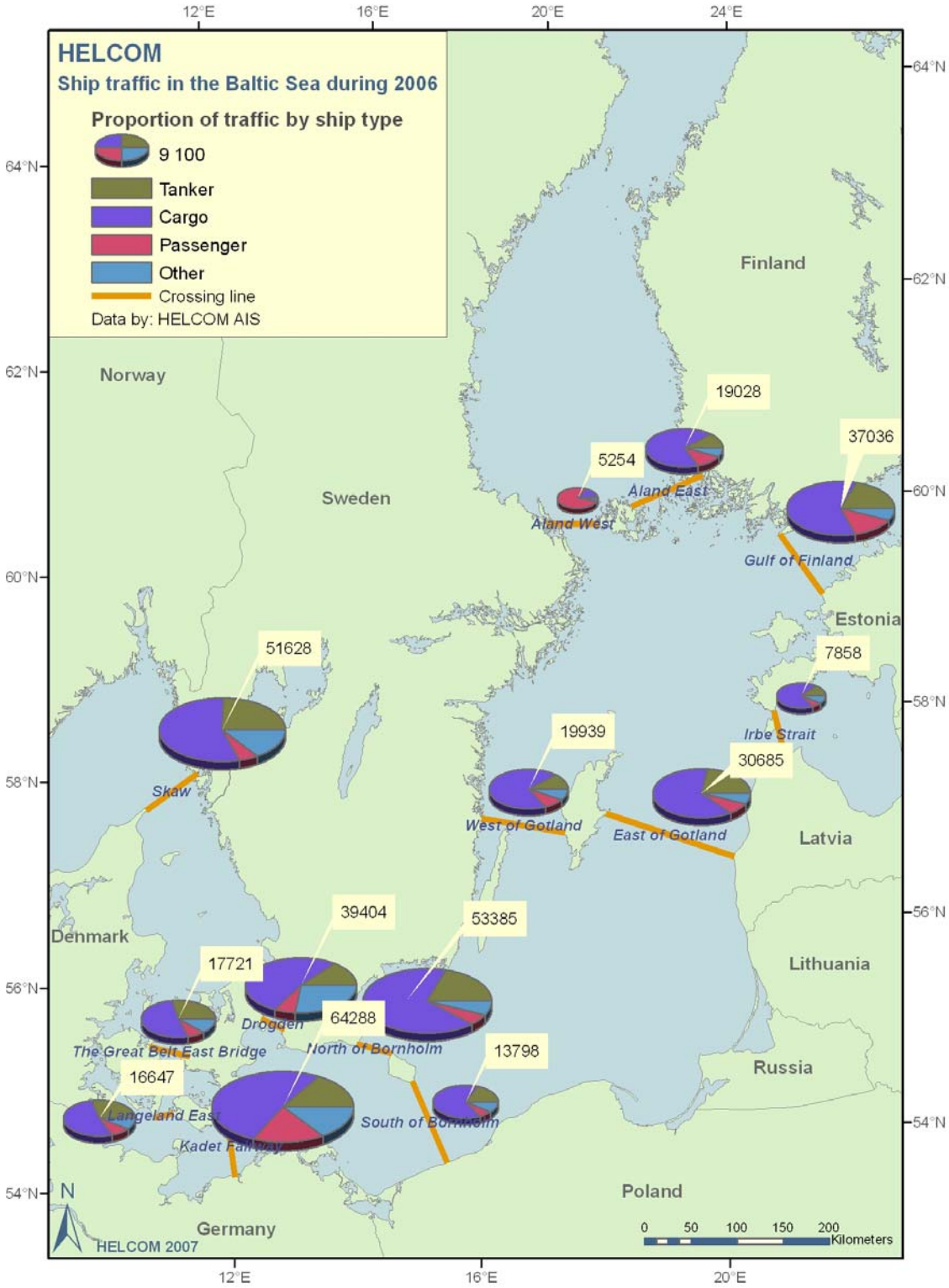


Figure 1. *Number of ships crossing the AIS fixed lines in the Baltic Sea according to the type of the vessels, 2006.*

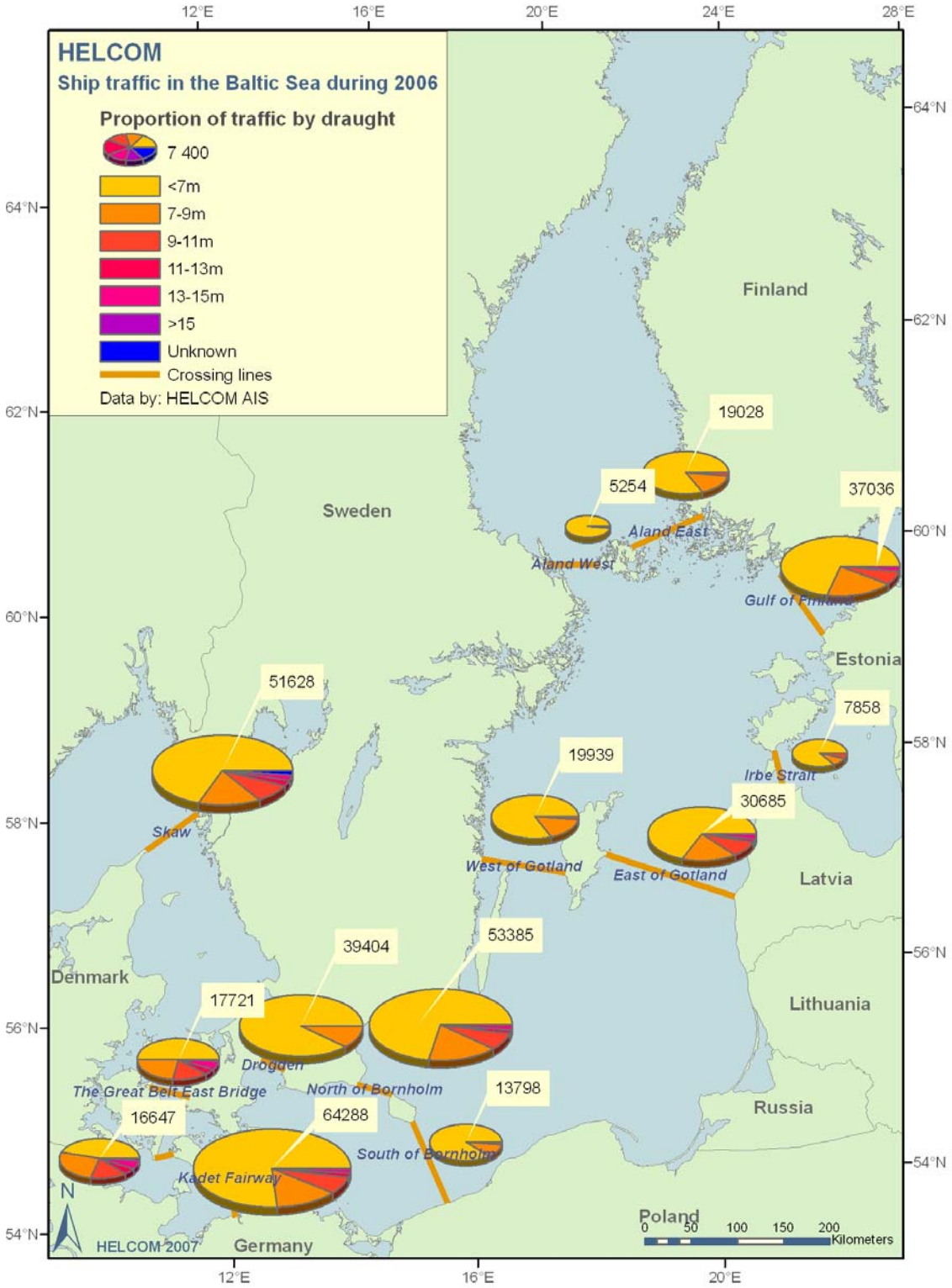


Figure 2. *Number of ships crossing the AIS fixed lines in the Baltic Sea according to the draught, 2006.*

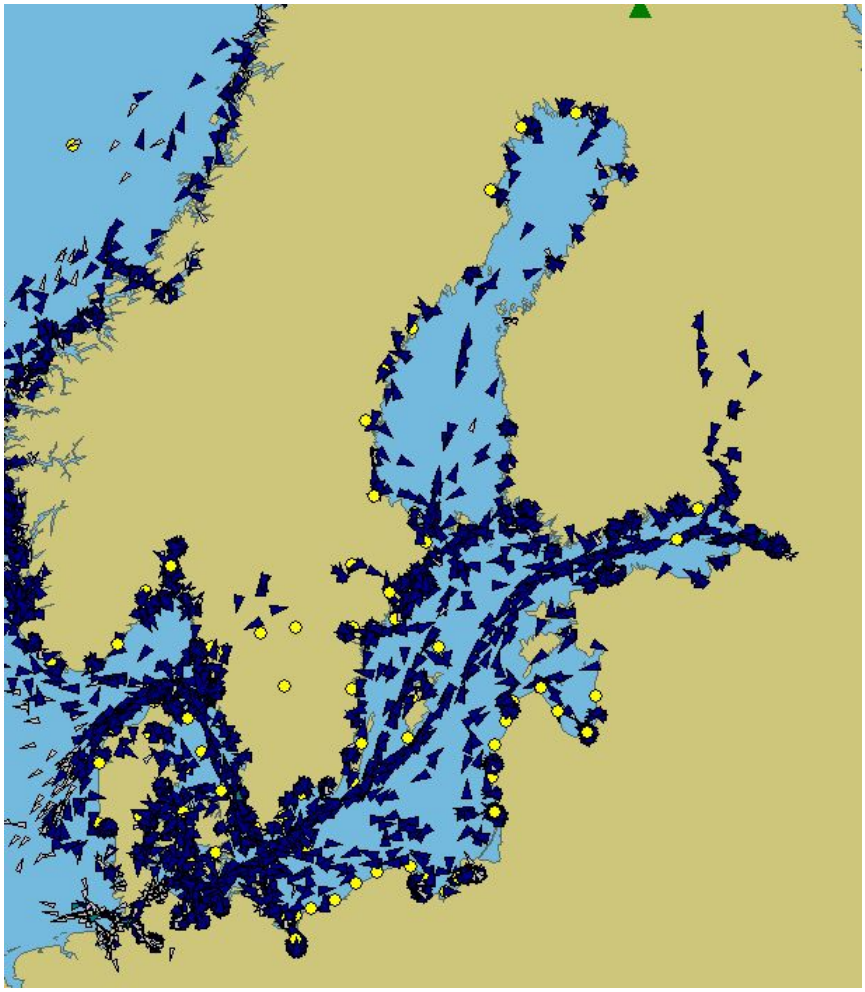


Figure 3.
Snapshot of ship traffic in the Baltic Sea illustrating the major shipping routes, 27 February 2007 (HELCOM AIS).

Table 1. Number of ships crossing the AIS fixed lines in the Baltic Sea according to the type of the vessels, 2006.

Location	Type of ship				
	Tanker	Cargo	Passenger	Other	Total
Skaw	12702	29101	3149	6676	51628
The Great Belt East Bridge	5133	9213	1527	1848	17721
Drogden	4638	20833	3117	10816	39404
Langeland East	5044	8743	1580	1280	16647
Bornholm North	9990	38013	2486	2896	53385
Bornholm South	2319	9386	895	1198	13798
Kadet Fairway	8942	33333	13909	8104	64288
Gotland West	2015	14792	1762	1370	19939
Gotland East	6838	20125	2139	1583	30685
Åland West	1921	13791	2253	1063	19028
Åland East	110	677	4291	176	5254
Gulf of Finland	6850	23107	5098	1981	37036
Irbe Strait	956	5741	525	636	7858
Total	67458	226855	42731	39627	376671
Percantage	18%	60%	11%	11%	100%

Table 2. Number of ships crossing the AIS fixed lines in the Baltic Sea according to the draught, 2006.

Location	Draught							
	<7m	7-9m	9-11m	11-13m	13-15m	>15m	Unknown	Total
Skaw	34424	9823	4089	1024	989	487	792	51628
The Great Belt East Bridge	8862	3824	3105	764	899	190	77	17721
Drogden	35096	3703	82	6	0	152	365	39404
Langeland East	7689	3876	3120	759	904	187	112	16647
Bornholm North	37694	10407	3312	690	868	233	181	53385
Bornholm South	12150	1318	208	15	22	9	76	13798
Kadet Fairway	48811	9634	3648	770	904	253	268	64288
Gotland West	16411	2998	313	66	44	50	57	19939
Gotland East	20332	6519	2416	440	683	169	126	30685
Åland West	15749	2776	317	52	32	25	77	19028
Åland East	5146	69	6	0	0	5	28	5254
Gulf of Finland	25388	8194	2187	321	624	154	168	37036
Irbe Strait	6689	683	370	76	0	5	35	7858
Total	274441	63824	23173	4983	5969	1919	2362	376671
Percantage	72.86	16.4	6.15	1.32	1.58	0.51	0.63	~100%

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

Forecasts indicate that due to the economic growth, especially in the eastern part of the region, the amount of cargo shipped in the Baltic will double by 2015. In particular, outbound transport and oil shipment are showing strong growth (***Figure 4***).

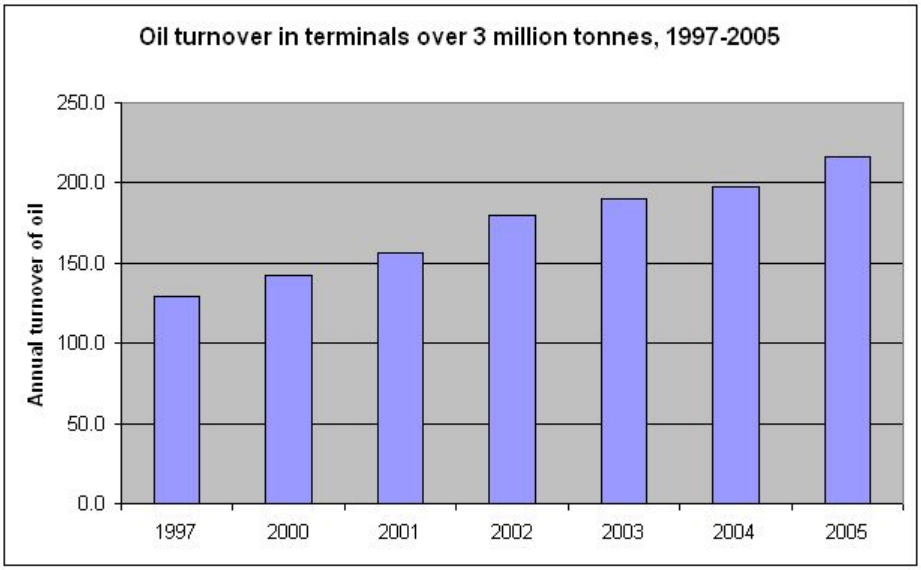


***Figure 4**. Amount of oil transported via the largest oil terminals in the Baltic Sea (in millions of tonnes), 1997-2005.*

MARITIME ACTIVITIES IN THE BALTIC SEA CARRIED OUT IN AN ENVIRONMENTALLY FRIENDLY WAY

This section of the report provides a concise overview of measures which have been taken by the Contracting Parties so far to reduce the impact of shipping and other activities on the Baltic Sea environment and to build up adequate capacity to respond to possible pollution at sea. The necessary actions to fill in identified gaps are described here.

1. Enforcement of international regulations - No illegal pollution

The unique character and sensitivity of the Baltic Sea on one hand, and the growing pressure from maritime transportation on the other, call for special regulations to be applied within the Baltic Sea region. Much has already been done to properly address shipping as a source of pollution to the marine environment and to put in place the demanding and comprehensive anti-discharge regulations.

What has been achieved so far?

Adequate reception facilities in ports, mandatory delivery of ship-generated wastes and the "no-special-fee" system for waste delivery are the main components of the Strategy for Port Reception Facilities for Ship-generated Wastes and Associated Issues, also known as the Baltic Strategy, initiated by HELCOM in the late 1990s.

To a great extent this policy has been implemented by the Contracting States. The outstanding issues are addressed by HELCOM on a regular basis, and include, *inter alia*, full unification of application of the established exemption regime and ensuring that any amount of waste provided for in the strategy can be delivered to all ports under the no-special-fee system.

Has the main aim of the Baltic Strategy, which is to eliminate illegal discharges into the sea of all wastes from all ships, been achieved?

The positive effects of implementing the Baltic Strategy can be proved by comparing the number of detected illegal oil spills in the Baltic now and more than ten years ago (***Figure 5***). At the same time one has to remember that during this period the density of shipping has rapidly grown and aerial surveillance activities carried out by the HELCOM Contracting Parties have been substantially improved, e.g. the number of flight hours has increased and remote sensing equipment on board aircraft, like Side Looking Airborne Radar, has been more widely used.

Fact box: Anti-discharge regulations

According to the International Convention for the Prevention of Pollution from Ships, 1973, modified by Protocol of 1978 (MARPOL 73/78), the Baltic Sea has been internationally designated as a special area where far-reaching prohibitions and restrictions have to be followed as regards any discharges into the sea of oil or oily mixtures and garbage. The Baltic Sea was also a special area in relation to discharges of noxious liquid substances. Now the revised Annex II to MARPOL 73/78 requires the same demanding restrictions to be applied all around the world.

Additionally, the Helsinki Convention requires strict rules to be applied for discharge of sewage from ships as well as incineration of wastes on board ships.

All ship-generated wastes which are not allowed to be discharged into the sea have to be delivered by ships to a port reception facility, and it is a responsibility of the Contracting States to provide such facilities. To encourage ships to deliver waste ashore, no special fee is charged for the delivery, with few an exceptions.

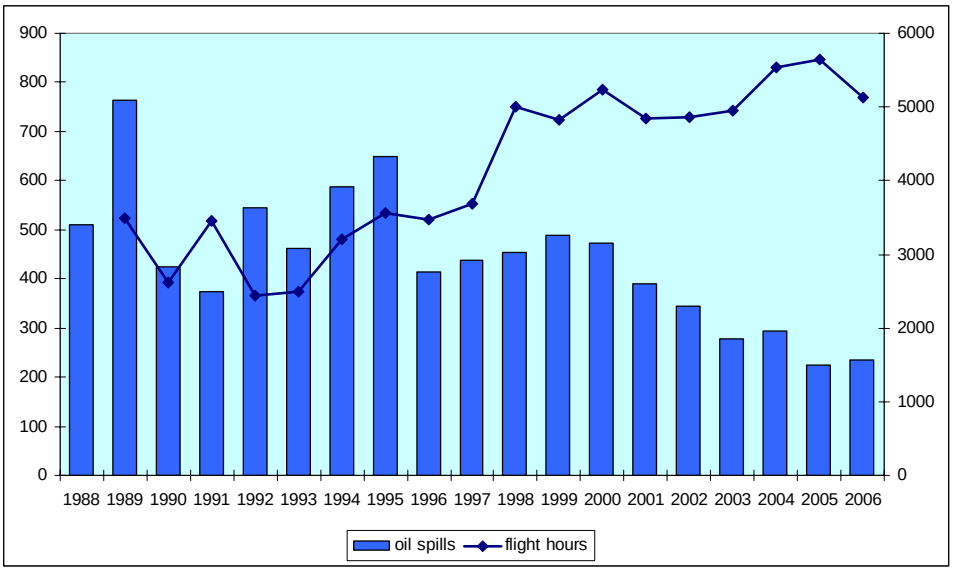


Figure 5. *Number of flight hours and observed illegal oil discharges in the Baltic Sea, 1988-2006.*

In the vast majority of cases of detected illegal discharges, the aircraft or vessel surveying the area arrives on scene too late and most of the polluters remain unknown.

In order to increase the chances of identifying illegal polluters, a new tool, the so called Seatrack Web/AIS, has been developed by HELCOM. STW/AIS is an oil drift forecasting system integrated with information from the Automatic Identification System, which not only increases the possibility to identify the source ship of illegal oil spills, but also provides better evidence for the courts.

STW/AIS is now being further developed in order to improve the AIS functionality and to integrate satellite imagery information into the tool.

Fact box: STW/AIS - how does it work?

After an oil spill has been detected, a backtracking simulation is performed. Based on a time window and an area of interest, a database query is sent to an AIS database server. Ships' tracks that match the query are extracted from the database, and subsequently plotted together with the oil spill backtracking trajectory in the Seatrack Web application, leading to the narrowing of the number of ships suspected of discharging oil.

Not only ships illegally discharging are monitored in the Baltic, but also other ships non-compliant with international requirements. The ongoing HELCOM/EMSA Single Hull Tanker Project aims at monitoring ships' compliance with the provisions of the amended Annex I of the MARPOL 73/78 and Regulation (EC) No. 1726/2003, regarding banning the carriage of heavy oil in single hull tankers, which entered into force on 5 April 2005. The Project exploits the national and regional traffic monitoring systems of the Baltic Sea countries and database systems of the European Maritime Safety Agency as well as the 1982 Paris Memorandum of Understanding Secretariat list of banned vessels by the HELCOM Automatic Identification System (AIS).

What are the gaps?

The annual numbers of detected illegal oil discharges in the Baltic Sea are decreasing (HELCOM 2007a), but every single breach of the anti-discharge regulations is unacceptable. Even though most of the detected deliberate discharges of oil are smaller than 1 m^3 (***Figure 6***), the total volume of oil is substantial (***Figure 7***) and much larger than the amount of oil spilled accidentally during most years. Additionally, the actual number of illegal discharges is probably much higher than the 200-300 detected every year.

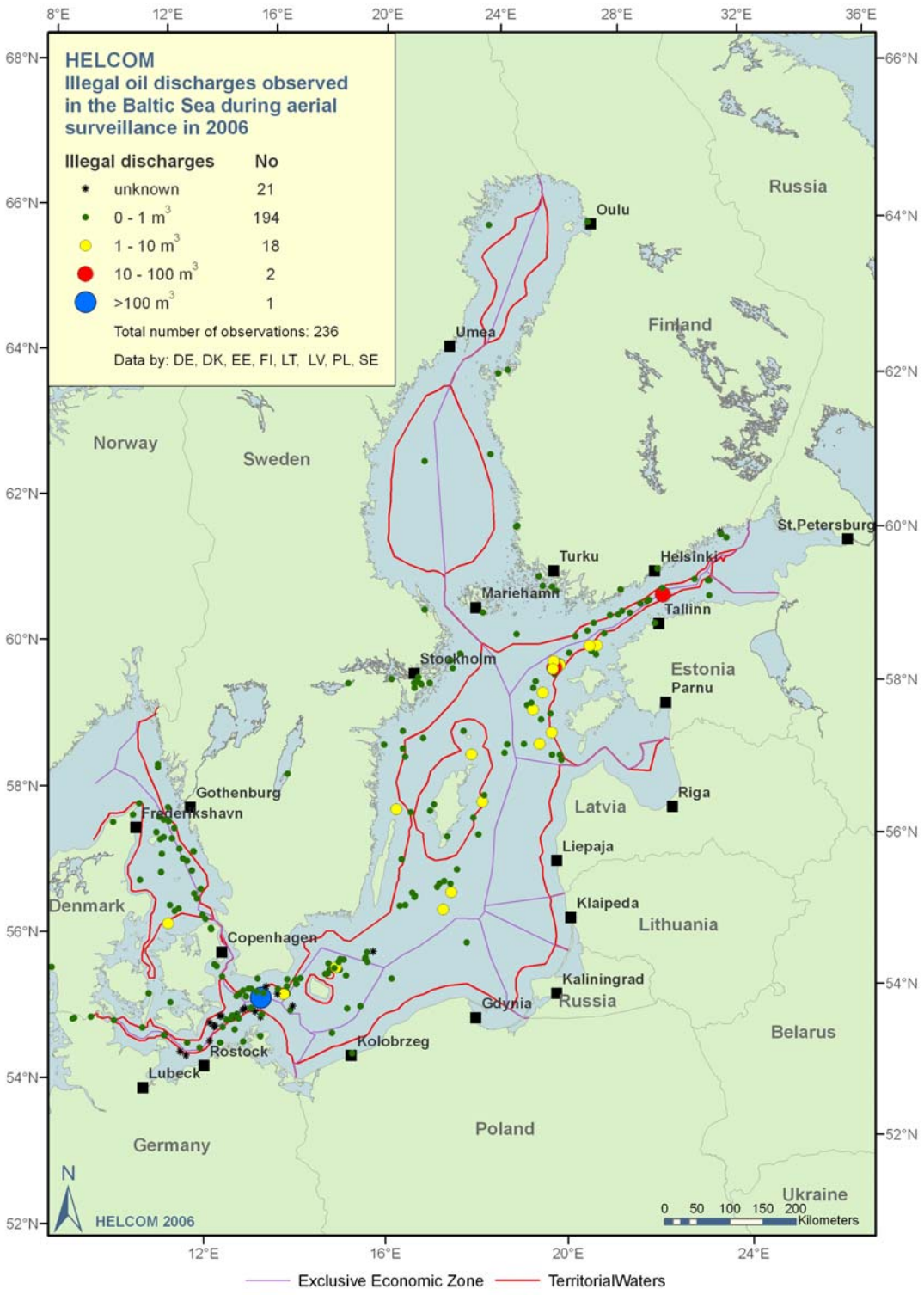


***Figure 6**. Location and size of detected oil spillages in the Baltic Sea, 2006.*

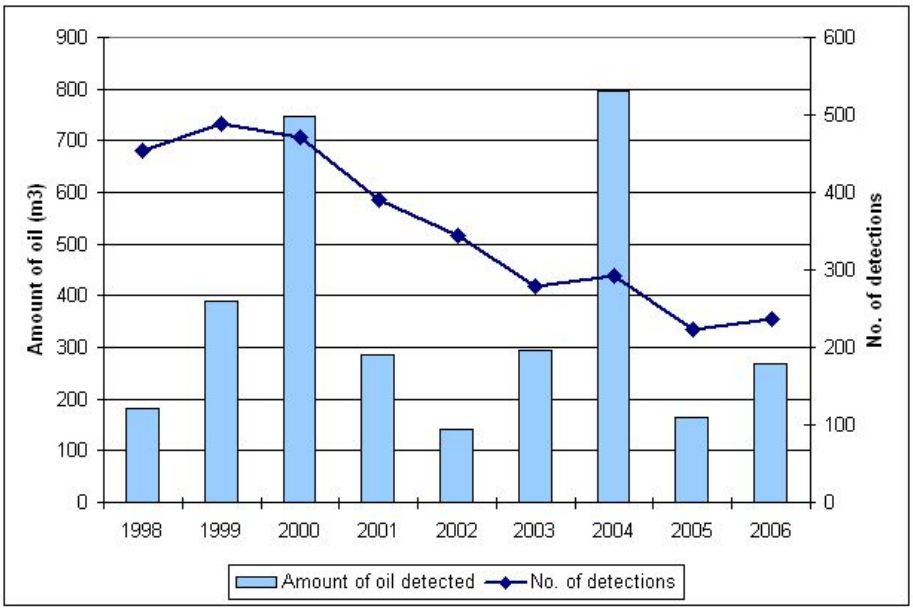


Figure 7. *Total amount of oil illegally discharged in the Baltic Sea detected by the HELCOM Contracting States, 1998-2006.*

Most parts of the Baltic with regular traffic zones are covered by national aerial surveillance, but still some Contracting States do not carry out surveillance flights in accordance with the HELCOM Response Manual and Recommendations (***Figure 8***). There is also a need to ensure a certain proportion of flight hours for detection of polluters in darkness, when deliberate discharges are more likely to occur, which means that aircraft should be properly equipped to detect oil at night or in poor visibility (***Figure 9***).

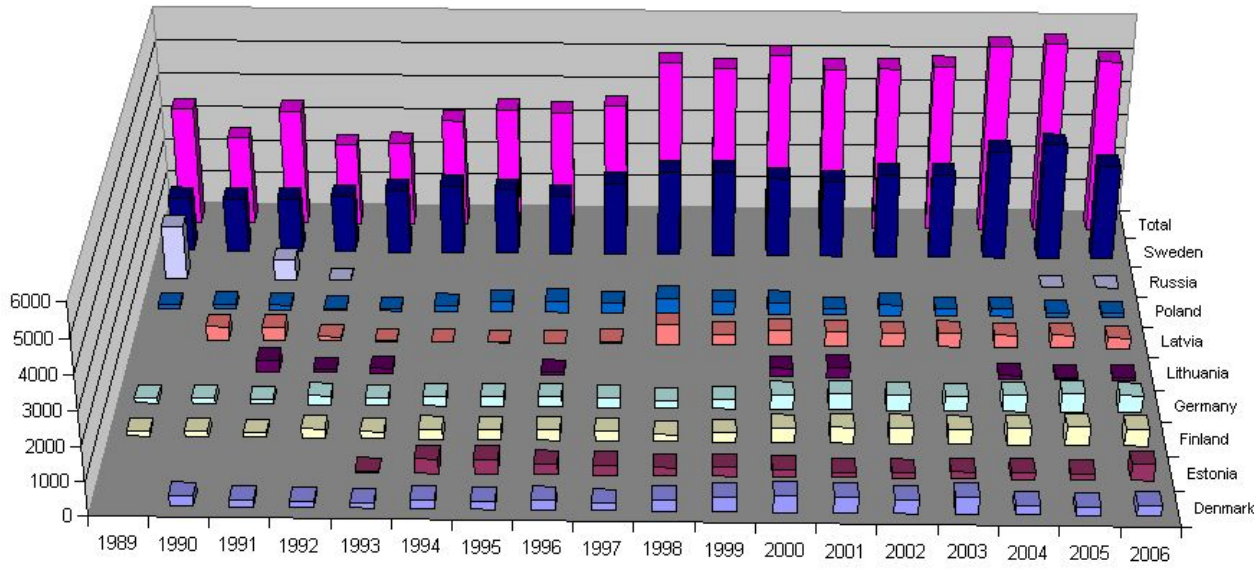


Figure 8. *Number of aerial surveillance flight hours carried out by the HELCOM Contracting States, 1989-2006.*

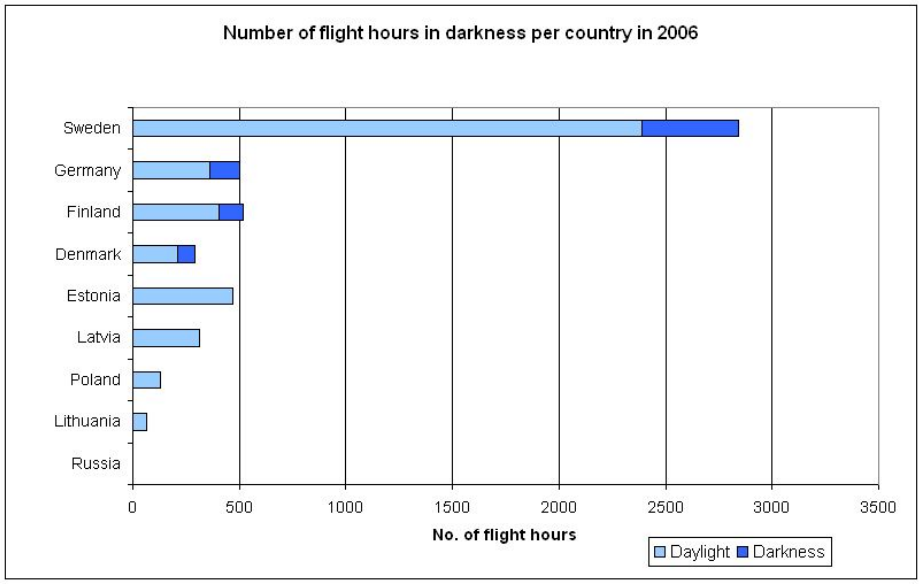


Figure 9.
Proportion of aerial surveillance flight hours in darkness per Baltic Sea country, 2006.

The problem of illegal deliberate discharges does not only concern oil. Plastic and synthetic materials, which are durable and slow to degrade, have become the most abundant form of marine litter. HELCOM, in co-operation with UNEP, has carried out a regional assessment and evaluation of sources, magnitude and effects of marine litter in the Baltic Sea. The project has been a first of its kind in the Baltic and identified several gaps in existing policies and monitoring programmes to be filled.

HELCOM's shipping related policies address, in a comprehensive way, all major marine pollutants and their significant sources, including toxic organotin compounds. In addition to these, other legal frameworks targeting specific hazardous substances are recognised and their implementation needs to be promoted. The 2001 International Convention on the Control of Harmful Anti-fouling Systems on Ships which will enter into force on 17 September 2008 introduces a total ban on the use of organotin compounds in anti-fouling paints. The Convention has so far been ratified by five HELCOM Contracting Parties: Denmark, Latvia, Lithuania, Poland and Sweden.

What are the necessary actions?

Enhanced surveillance of illegal oil discharges

The Contracting Parties will strengthen control and enforcement of the existing anti-discharge regulations by utilising more extensively regular satellite surveillance. Satellite images can indicate "candidates" for oil spills at sea, which can be further on confirmed on location by a vessel or aircraft. Arrangements have already been undertaken by HELCOM and the European Maritime Safety Agency concerning provision of satellite surveillance service to the Baltic Sea countries through CleanSeaNet. The ambition is to have sufficient and harmonised satellite and aerial surveillance covering the whole Baltic Sea area.

Monitoring of non-compliant ships

Monitoring the enforcement of international rules by ships will be strengthened by making further use of new tools available to control shipping traffic, e.g. the Automatic Identification System. Following positive experience within the Single Hull Tanker Project, other non-compliant ships entering the HELCOM area will also be monitored, e.g. vessels detained under the 1982 Paris Memorandum of Understanding.

Necessary actions continued…

Marine litter

The "no-special-fee" system for ship-generated wastes in the Baltic Sea region will be extended to cover also wastes caught in fishing nets. Full support will be provided by the Contracting Parties to initiatives by local governments and local communities to remove litter from the coastal and marine environments and to public awareness activities on environmental and economic effects of marine litter.

Ratification of the AFS Convention

The 2001 International Convention on the Control of Harmful Anti-fouling Systems on Ships provides for a global prohibition on the new application of organotin compounds which act as biocides in anti-fouling systems on ships by 1 January 2003, and a complete prohibition by 1 January 2008. Those Baltic Sea countries who have not ratified the Convention yet have decided to do so by 2009 at the latest.

2. Safe maritime traffic without accidental pollution

The rising density of ship traffic in the Baltic is exerting more and more pressure on the marine environment. As a result, one of the major risks the Baltic nations are facing is the risk of considerable accidental pollution of oil or other hazardous substances due to possible groundings or collisions of ships.

A non-exhaustive list of environmental effects of shipping accidents includes pollution of sea water and seabed, killing of sea birds and mammals, pollution of the shores in recreational areas and wildlife habitats, as well as economic losses.

The number of reported shipping accidents in the Baltic Sea is high (HELCOM 2007b). Fortunately, most of them do not cause pollution of the marine environment. According to the 2000-2006 data, 7% of reported accidents resulted in some kind of pollution. In 2006 this percentage was lower (4%), with five pollution accidents reported by the Contracting Parties (***Figure 10***).

Fact box: Recent major shipping accidents in the Baltic Sea

1990 "Volgoneft" incident:

- 700-800 tonnes of waste oil spilled,
- joint response operation with participation of 5 countries and more than 20 ships,
- nearly all oil recovered at sea.

2001 "Baltic Carrier" collision with "Tern"

- 2,700 tones of oil spilled,
- joint response operation with 3 participating countries,
- around 50% of oil recovered from the sea.

2003 "Fu Shan Hai" incident

- around 1,200 tonnes of fuel oil spilled,
- three countries respond jointly and recover around 1,100 tonnes of oil at sea.

Note that HELCOM shipping accident statistics presented in this report cover tankers over 150 GT and/or other ships over 400 GT. The difference in the number of shipping accidents between 2003 and 2004 can be partly explained by improved reporting within HELCOM (which is marked with the red line).

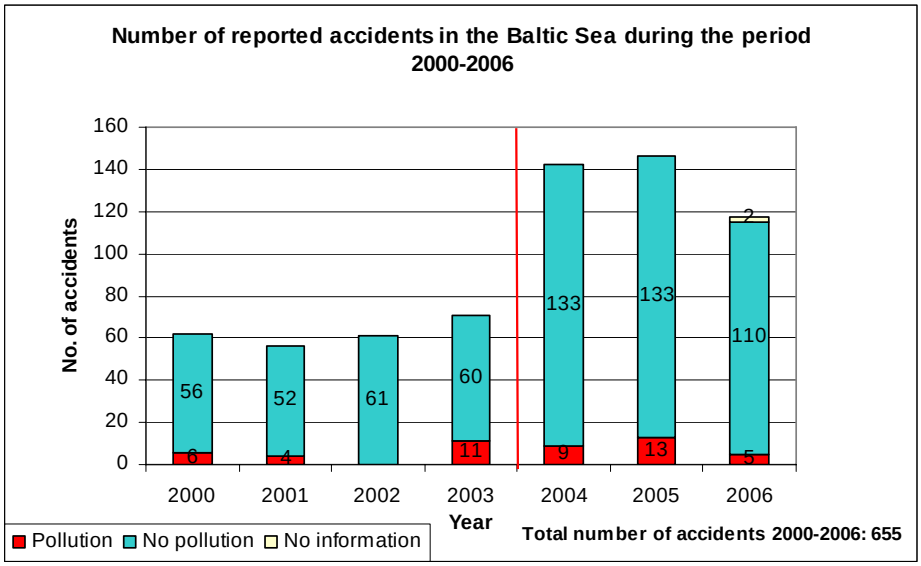


Figure 10. *Number of reported shipping accidents in the Baltic Sea, 2000-2006*

What has been achieved so far?

One of the milestones in improving the safety of navigation in the Baltic Sea was the adoption of the Declaration on the Safety of Navigation and Emergency Capacity in the Baltic Sea Area (HELCOM Copenhagen Declaration), 2001. The Declaration contains a number of important measures, which to a great extent have already been implemented by the Contracting Parties.

These include:

- increased use of pilots for ships posing a risk to the environment;
- provision of up-to-date information on water depths through co-operation with the Baltic Hydrographic Commission and a Joint Re-surveys Plan under implementation;
- promotion of the use of an Electronic Chart Display and Information System, whereby a ship is able to display in real time its own position;
- covering the major and secondary shipping routes with Electronic Nautical Charts;
- introduction of new routeing measures, which, e.g., have led to a much clearer traffic pattern for deep-draught ships;
- phasing out the use of single-hull oil tankers;
- establishing of the AIS system, which improved the communication between ships and shore stations;
- establishing the Baltic Sea as a Particularly Sensitive Sea Area, except for Russian waters, which requires ships to take special care when navigating through areas of ecological, economic, cultural or scientific significance, and for which Associated Protective Measures have already been approved by IMO.

Furthermore, following the HELCOM Copenhagen Declaration, a great deal of additional work has been undertaken to improve the safety of navigation during winter in the Baltic. The HELCOM countries have agreed on a joint policy with regards to traffic restrictions and have determined an equivalence of the ice classes of different Classification Societies with the Finnish-Swedish Ice Class Rules.

What are the gaps?

The statistics on shipping accidents in the Baltic provide a good basis for analysing the existing situation and identifying high risk areas. When doing so, one has to take into account the growing density of shipping in the Baltic.

Types of accidents in 2006

Collisions were the most common type of accident in the Baltic in 2006 accounting for almost a half of all reported cases (46%) and for the second year in a row surpassing the number of groundings (39%) (***Figure 11***). The share of the both types of accidents has increased as much as 10% for collisions and 2% for groundings compared to 2005.

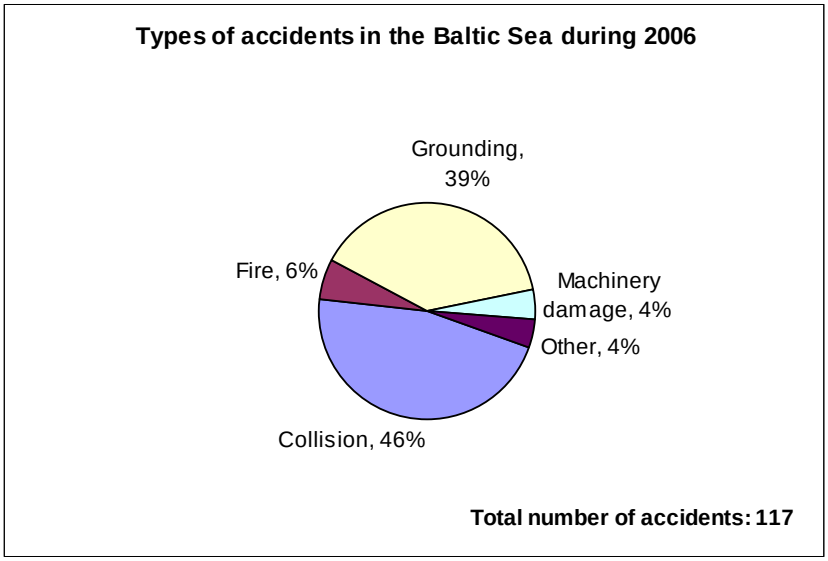


Figure 11. *Types of shipping accidents in the Baltic Sea, 2006.*

Causes of accidents in 2006

The main cause of accidents in 2006 is not as clear as the year before due to the lack of information for 35% of reported incidents. However, human factor seems to continue to be the main reason for an accident to happen (36%), followed by technical factor (15%) (***Figure 12***).

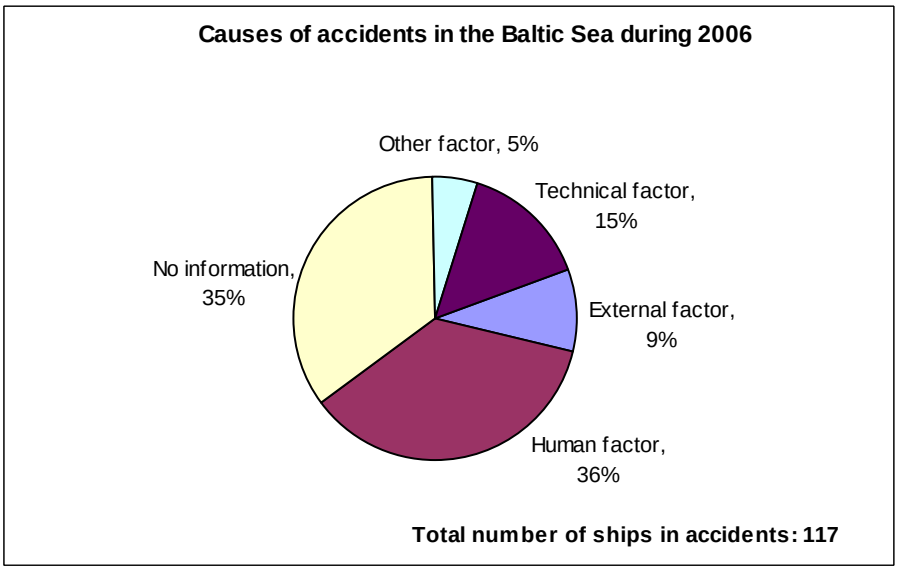


Figure 12. *Causes of shipping accidents in the Baltic Sea, 2006.*

Collisions

Amounting to 54 cases (46% of all accidents) in 2006 and 206 cases (31%) in 2000-2006, collisions became the most frequent type of shipping accident in the Baltic. The number of reported collisions in 2006 remains on the same level as in the previous year, however, is higher by ten compared to 2004 (***Figure 13***).

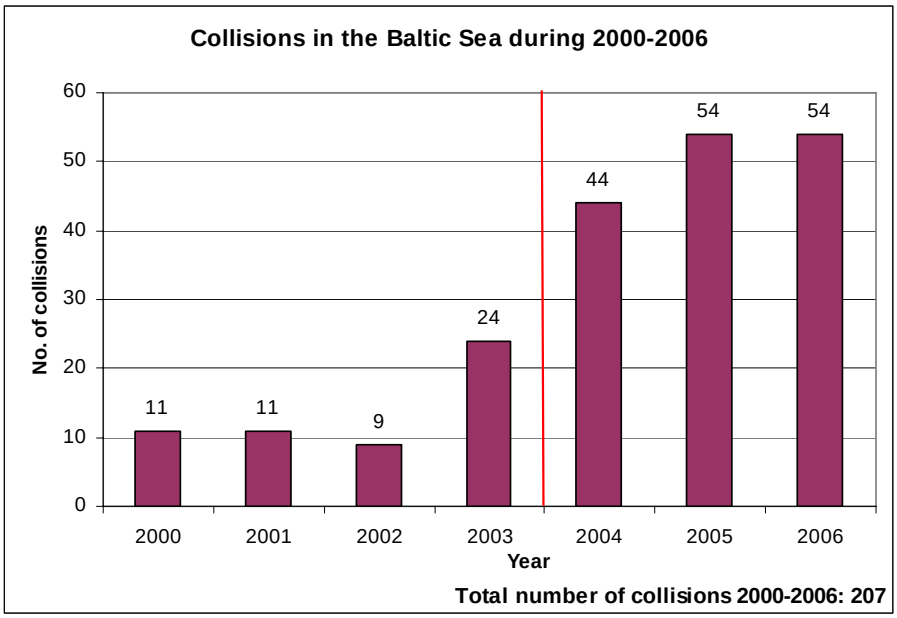


Figure13. *Total number of collisions in the Baltic Sea, 2000-2006.*

Groundings

Accounting for 39% of the total number of reported accidents in 2006, groundings are the second most common type of shipping accident in the Baltic. A decrease in the number of groundings in the Baltic can be observed in the last three years (***Figure 14***).

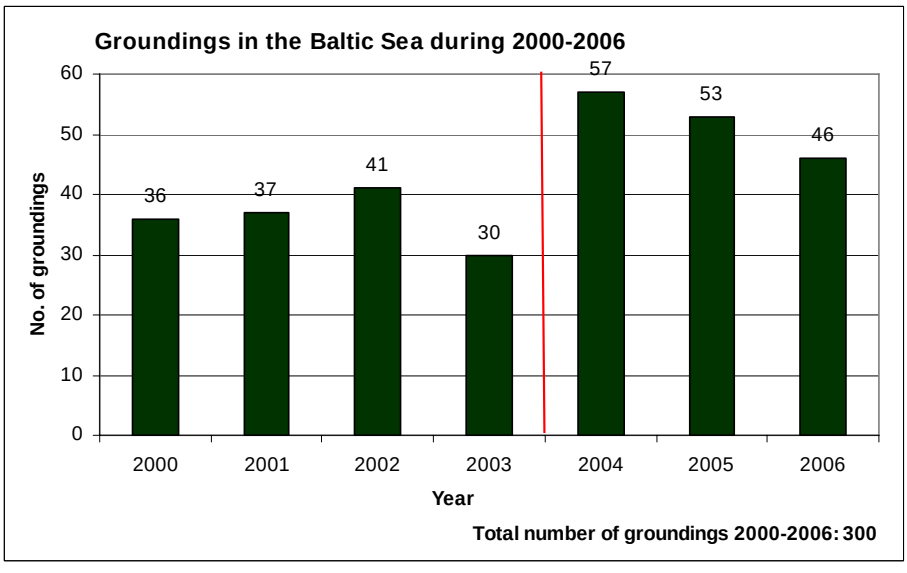


Figure 14. *Total number of groundings in the Baltic Sea, 2000-2006.*

The map of the reported groundings in 2000-2006 (***Figure 15***) clearly indicates the areas of primary concern:

- Danish straits
- Gulf of Finland, especially the Estonian coast
- Åland archipelago area
- Swedish coast of the Baltic Proper
- Ports.

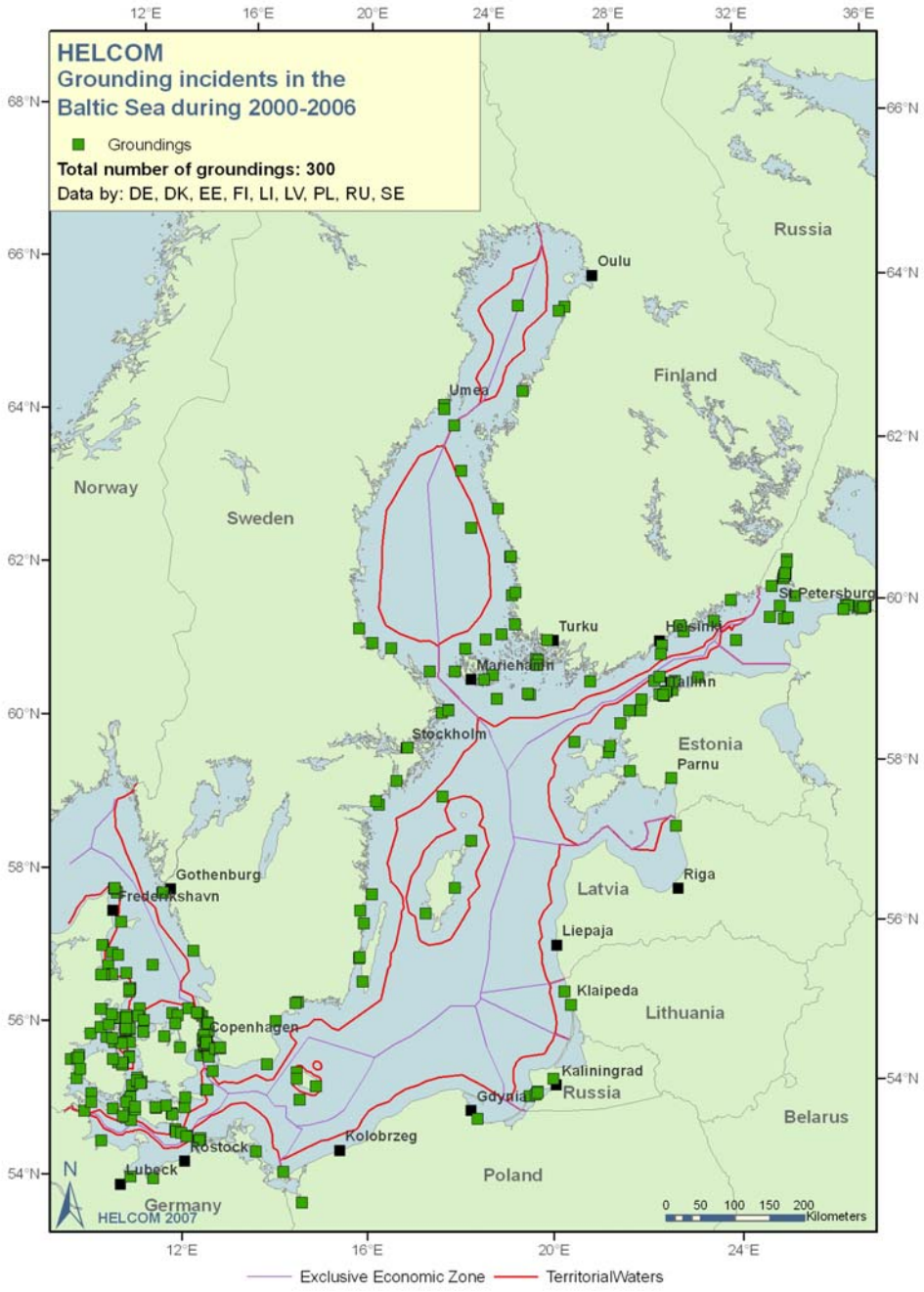


Figure 15. *Location of groundings in the Baltic Sea, 2000-2006.*

There is a clear link between the absence of a pilot onboard and the risk of grounding. Last year, out of the total number of 46 groundings, only in three cases a pilot was present onboard.

What are the necessary actions?

Improved safety of navigation in ice conditions

Some areas of the Baltic Sea are ice-covered for several winter months, which places some limitations on maritime transportation and entails greater risks of accidents and pollution. Having in mind the increasing transportation of oil products in the Baltic as well as difficulties in responding to oil spills in ice conditions, co-operation between HELCOM and the Baltic Icebreaking Management, an organisation consisting of icebreaking authorities from all Baltic Sea countries, will be enhanced. The co-operation will be based on a new HELCOM Recommendation aiming at, e.g., a more effective use of icebreaking resources by managing the service at a sub-regional level and better training in ice navigation. Use of voluntary pilotage for winter navigation will be further encouraged.

Improved AIS information

Since July 2005 HELCOM AIS has been able to provide information related to shipping traffic in the Baltic. AIS information exchange capacity is limited and IMO administers the content of the AIS messages to avoid overloading of the AIS frequencies.

HELCOM countries are planning to have a joint submission to IMO in 2008 on the needed modification of AIS information content in order to better serve maritime safety, security and environmental authorities as well as ships.

The joint submission will be based on the results of the testing of AIS binary message exchange and the evaluation of AIS message information content within the Baltic AIS trial project to ensure that these messages reflect the information needs of users.'

Use of ECDIS

IMO has already agreed on an Electronic Chart Display and Information System (ECDIS) carriage requirement for High Speed Craft (HSC), effective from July 2008. However, a time schedule for a general ECDIS carriage requirement does not exist yet and HELCOM countries will work within IMO towards speeding up the introduction of such a requirement as early as possible.

ECDIS is a specific form of computer-based navigation information system that can be used instead of paper navigation charts whereby a ship is able to display in real time its own position. Use of ECDIS is related to current coverage with official Electronic Navigational Charts (ENCs) and decreases the risk of groundings. In the Baltic, all major and secondary shipping routes are already covered by ENCs.

3. Efficient emergency and response capability

The risk of a shipping accident will never be totally eliminated, so there is a need to ensure efficient emergency and response capabilities in the HELCOM countries.

The idea behind emergency assistance is to ensure assistance to a vessel at a very early stage of the accident and in that way to avoid or reduce the scale of the pollution. Early and well organised response operations can be a very effective tool for reducing the environmental effects of pollution accidents.

Clear procedures for requesting and providing assistance, easy border crossing and financial aspects of assistance are crucial for a co-ordinated response to pollution incidents, also in cases where oil comes ashore and municipalities take a lead in response actions.

What has been achieved so far?

The most efficient way to establish an adequate response capability, also in financial terms, is to build up capacity on a sub-regional level. A “three-tier” approach is applied by HELCOM which means that minor oil spills should be tackled efficiently by a single Contracting Party, it should be possible to address spills of a medium size by well organised and timely action by several neighbouring Contracting Parties, and in case of larger oil spills all Contracting Parties should be involved.

Much has been done to build up an adequate emergency capacity and to prevent pollution by addressing incidents at a very early stage. Around 30 emergency tugs with bollard pull of 50 or more tonnes are located around the Baltic. Moreover, several emergency assistance vessels are to be built in coming years. Most of the Contracting Parties have mechanisms to involve commercial emergency resources in case of an urgent need.

When it comes to actual spills, quite often the first task for a responder is to prevent oil from going ashore or to sensitive coastal areas and to recover as much oil as possible in the open sea. Around 40 sea-going response vessels are located around the Baltic (***Figure 16***). They have necessary equipment, capacity, trained crew and in principle are able to reach any place in the Baltic within six hours after an incident. Additional response capacity has been provided by EMSA to “top-up” the existing resources in case of a big accident.

Exercising is a key to efficient response operations at sea. Several kinds of exercises are conducted under the HELCOM flag. The most famous one is the BALEX DELTA, which tests the alarm procedures and response capability of the Contracting Parties in case of a major accident and an international response operation. BALEX DELTA exercises take place each year and are hosted by the Contracting Parties according to an agreed schedule.

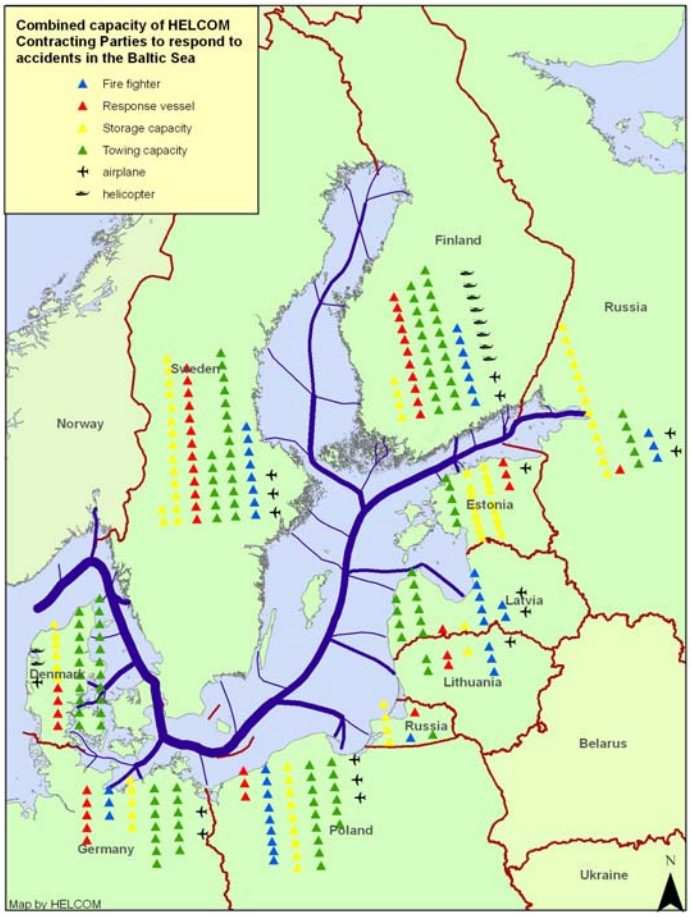


Figure 16.
Emergency towing and sea-going response vessels located in the Baltic Sea area (MARIS).

What are the gaps?

In spite of the fact that sub-regional risk assessments have been started in most areas of the Baltic, none have yet reached a stage where missing emergency capacities would be quantified to allow decisions on common actions to fill in such gaps in the most efficient way possible.

There are still only few vessels with the bollard pull of 72 tonnes or more in the Baltic and the emergency towing capacity can be assessed as insufficient at least in several sub-regions of the Baltic.

Additionally, most of the Contracting Parties report a lack of capacity to respond to heavy oils and especially chemicals. Only two countries have some equipment suitable for response to oil spills in ice conditions and therefore, response to oil in ice remains among the problematic areas.

What are the necessary actions?

New HELCOM Recommendation to strengthen sub-regional cooperation

A new HELCOM Recommendation "Strengthening of sub-regional co-operation in response field" will provide for a step-wise approach to achieving efficient response capability by the Baltic Sea countries. To implement the Recommendation, HELCOM Contracting Parties will:

- by 2008 - develop a common methodology for the assessment of risk and sufficiency of response capacity;
- by 2009 - finalise assessments of risk of oil and chemical pollution at the sub-regional level;
- by 2010 - identify gaps in emergency and response resources needed to meet the risk and prepare concrete programs to fill them in;
- by 2013 - put in place a sufficient emergency and response capacity (by 2016 - for emergency towing and accidents involving chemicals).

Decision support system for use of dispersants in the Baltic

It has been decided within HELCOM that response to oil should as far as possible take place by the use of mechanical means. However, the use of dispersants is not prohibited, only recommended to be limited. Work will continue to improve knowledge about the properties of oil being transported in the Baltic as well as the effectiveness and environmental impacts of using dispersants to combat oil spills in the Baltic Sea.

Mutual plan for Places of Refuge

HELCOM will develop a new co-operation procedure as a basis for considering, under some specific circumstances, granting a place of refuge to a ship in a response zone of another country than the one in which the situation of need of assistance originally started. The benefits of a mutual plan include reduced risk of pollution, time of response and costs. Additionally, a common procedure for Places of Refuge in the HELCOM area will ensure the equal treatment of a master of a vessel in need of assistance by all the Contracting Parties.

4. Minimum sewage pollution from ships

The proportion of the nutrient pollution load to the Baltic Sea originating from the ship borne sewage discharges remains rather small, although it is not negligible due to the high sensitivity of the marine environment. This nutrient load, which is concentrated along the shipping routes, is immediately available for uptake by the plankton algae, thus contributing to the severe eutrophication problem of the Baltic Sea.

Ship borne discharges represent up to 0.05% of the total waterborne nitrogen load, and up to 0.5% of the total phosphorus load into the Baltic Sea. These figures are calculated based on the assumption that there is no sewage treatment onboard ships (cargo ships, cruise ships and passenger/car ferries) and that all sewage is discharged into the sea, i.e. the theoretical worst case scenario.

Fact box: Eutrophication

Eutrophication is caused by excessive inputs of nutrients leading to intense algal growth, decreased water clarity, oxygen depletion in bottom areas as well as death of benthic organisms.

The Baltic Sea has been severely affected by eutrophication and resulting negative effects have already been observed.

What has been achieved so far?

According to Annex IV (Regulations for the Prevention of Pollution by Sewage from Ships) of the MARPOL 73/78 Convention, the discharge of sewage into the sea is allowed if the ship is discharging comminuted and disinfected sewage at a distance of more than 3 nautical miles from the nearest land, or at a distance of more than 12 nautical miles from the nearest land if sewage is not comminuted or disinfected. In either case, sewage that has been stored in holding tanks shall not be discharged instantaneously but rather at a moderate rate when the ship is en route and proceeding at no less than 4 knots.

Additionally, the Helsinki Convention requires pleasure crafts to be fitted with a toilet retention system, subject to certain exemptions, in order to be able to deliver sewage to reception facilities in ports, and as of 1 January 2006 the “no-special-fee” system has been extended to cover also sewage.

What are the gaps?

Currently, the nutrient load from ships’ treated sewage is not regulated by any international legislation. The standards for quality of sewage originating from ships concerns only Biochemical Oxygen Demand (BOD), total suspended solids and faecal coliforms. Hence, treated sewage, containing nitrogen and phosphorus, that is discharged into the sea increases the nutrient load to the Baltic marine environment.

What are the necessary actions?

Work towards stricter sewage discharge regulations

While very effective voluntary agreements with ship owners of ferries and passenger ships operating in the Baltic to deliver sewage to port reception facilities will be further encouraged, HELCOM countries plan to work towards amending Annex IV of the MARPOL 73/78 Convention with requirements on nutrient discharges in sewage.

Next year, the *ad hoc* HELCOM Correspondence Working Group under the lead of Finland will prepare the necessary documentation for a joint submission of HELCOM countries to IMO.

5. No introductions of alien species from ships

Increasing numbers of non-indigenous species are being observed in seas all around the world, and the Baltic Sea is no exception. Shipping is the most important vector of unintentional species introductions into aquatic environments, due to releases of ballast water and the fouling on hulls. The Baltic Sea, which bears a large portion of global shipping, is especially susceptible to invasions. Additionally, the Baltic Sea is connected to the Ponto-Caspian brackish seas by rivers and canals, by which invasive and alien species can be introduced. The ability to live and reproduce in the low salinity conditions of the Baltic Sea is a key factor determining invasion success.

What has been achieved so far?

The entry into force of the 2004International Convention for Control and Management of Ships' Ballast Water and Sediments in the Baltic Sea area would be the most important step towards the reduction of spreading of invasive and alien species.

Important work has already been done within HELCOM, bringing the Baltic Sea coastal countries closer to the ratification of the new Convention. This work includes many years of co-operation in scientific research on alien species in the Baltic, thus providing a sound basis for addressing the problem at a more decisive level.

Two HELCOM workshops on invasive and alien species introduction via shipping have been recently organised and a HELCOM Project to assess the risk of ballast water mediated introductions to the Baltic has been carried out (2005-2006). As a result of these activities, relevant information has been compiled and a set of actions has been recommended.

What are the gaps?

In practise, the Ballast Water Management Convention foresees two management options aiming at reducing the risk of alien species introductions: ballast water exchange and a stepwise application of onboard ballast water treatment systems, enabling achievement of specified reduced numbers of organisms per ballast water volume unit.

The Convention provides for limiting the ballast water exchange starting from 2009, with its final substitution for the remaining option in 2016. However, the Convention doesn't make any particular reference to small, shallow seas, which differ from oceans and where criteria for ballast water exchange cannot be met.

For the time being, no effective measures have been taken to minimise the risk of alien species introductions to the Baltic Sea. There is a need for a unified, common interpretation of the requirements of the Ballast Water Management Convention and working out Baltic tailor-made solutions for its implementation.

What are the necessary actions?

Road map towards implementation of the Ballast Water Management Convention

The HELCOM Contracting Parties have agreed to ratify the International Convention for Control and Management of Ships' Ballast Water and Sediments by 2010 and in all cases no later than by 2013. Before the ratification takes place, the Baltic Sea countries will take a number of measures to prepare themselves for ratification, as included in the HELCOM Road Map.

The focus is on those provisions of the BWM Convention where concerted actions by all the HELCOM countries are required or beneficial and for which common solutions need to be worked out. Some of the actions included in the road map include:

- by the end of 2008 – compilation of a HELCOM list of non-indigenous, cryptogenic and/or harmful native species,
- by the end of 2008 – selection and agreement on HELCOM Target Species, species that would have to be taken into account in assessing a risk for voyages in the Baltic and connecting the Baltic with other marine regions,
- by the end of 2009 – development of common criteria to distinguish between unacceptable high risk scenarios (ballast water management needs to be applied) and acceptable low risk scenarios (exceptions can be granted) for voyages in the Baltic,
- by 2010 – establishing necessary monitoring programmes,
- by 2010 (2013 at the latest) – creation of a regional information system linking all relevant data.

Recognising the global character of the problem, HELCOM has started close co-operation with OSPAR countries in order to identify issues of common interests and work out solutions which would serve the needs of protection of the Baltic Sea and the North Sea.

6. Minimum air pollution from ships

Apart from accidental and deliberate discharges of oil and other wastes to the sea, the normal operation of a ship also contributes to the pollution of marine and coastal ecosystems. The main pollutants concerned are nitrogen oxides (NOx) and sulphur oxides (SOx). NOx is emitted to the air mainly from the operation of diesel engines and SOx emissions results from combustion of marine fuels and directly depend on the sulphur content of the fuel.

While SOx causes acidification of terrestrial and freshwater ecosystems, damages materials and has a negative impact on human health in coastal areas, NOx emissions contribute considerably to the most severe environmental problem of the Baltic Sea, namely eutrophication.

In 2005, 16% of NOx emissions from international shipping traffic were deposited to the Baltic Sea (Bartnicki 2007a). Baltic Sea shipping is the largest contributor to the deposition of oxidized nitrogen (***Figure 17***), and third greatest contributor (9%) to total nitrogen deposition to the Baltic Sea basin, after Germany (18%) and Poland (12%) (Bartnicki 2007b).

Fact box: Contribution of NOx emission to eutrophication

The biggest source of nitrogen and phosphorus entering the Baltic Sea is riverine load. However, for nitrogen, another major pathway is emission of NOx and ammonia (NH_3) to the air and their subsequent depositions to the sea.
In 2005, as much as 25% of nitrogen reaching the sea came from the air (HELCOM 2007c). While in case of ammonia, roughly 90% of the emissions originated from agriculture, the main sources of nitrogen oxides were road transportation, energy combustion and shipping.

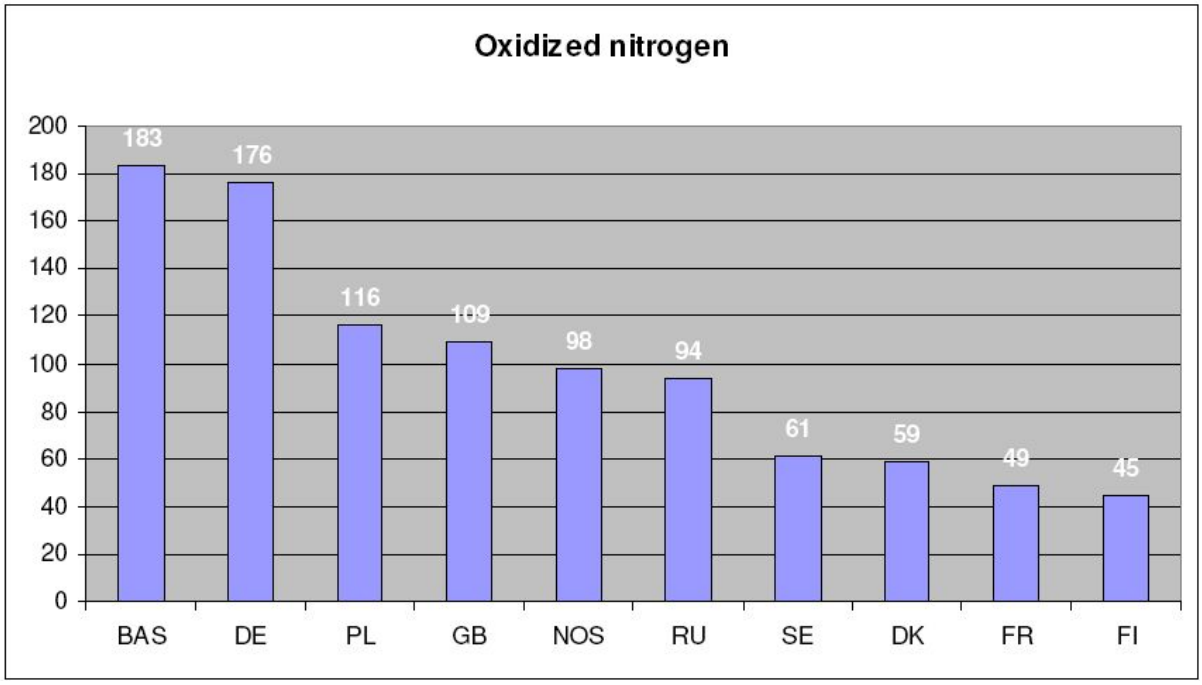


Figure 17*. Top ten contributors of nitrogen emissions to annual deposition of oxidized nitrogen into the Baltic Sea [unit: 100 tons N], 2005.* ***BAS*** *and* ***NOS*** *denote ship emissions from the Baltic Sea and the North Sea, respectively (EMEP 2007).*

What has been achieved so far?

Several Recommendations have been adopted by HELCOM in order to reduce air pollution from shipping. They mainly address incineration, fuel quality and usage of best available technologies on board. On 19 May 2005, Annex VI to the MARPOL 73/78 Convention entered into force, becoming the main global legislation regulating air pollution from ships. Eight out of nine HELCOM Contracting States have already ratified the Annex. The ratification process has also been started in the remaining country.

The HELCOM Contracting States have been jointly contributing to relevant global legislative developments and policy making processes to ensure that the highest practicable standards to control and prevent pollution from ships, also to the air, are applied. For example, as a result of such a joint proposal to the IMO, the Baltic Sea was designated a SOx emission

control area (SECA) under Annex VI. As of 19 May 2006 the sulphur content of fuel oil used onboard ships in the Baltic Sea SECA shall not exceed 1.5% m/m or alternative methods have to be used to ensure the same level of efficiency.

What are the gaps?

According to some estimates the emissions of NOx from international shipping are expected to increase by two thirds by the year 2020, and those of SOx by nearly a half, even after the implementation of Annex VI of MARPOL 73/78 (EEB, 2004).

The share of shipping emissions in total emissions will grow larger since the environmental impacts of the shipping sector are not regulated as extensively as those of many land-based activities and sources. There are predictions that the emission of NOx and SOx from shipping through Europe will surpass emissions from all land-based sources in the 25 EU member states (Entec, 2002). Thus, maritime transportation is a sector where further cost-efficient reductions are possible and should be sought.

Thanks to fast developing shipping technology, new feasible and cost-effective methods for further substantial reduction of emissions from ships have been made available. All Baltic Sea states must jointly take active part in global actions initiated within IMO to promote the worldwide use of these most up-to-date and efficient solutions.

What are the necessary actions?

Economic incentives to further reduce air emission

Economic incentives are one of the best means for promoting the good environmental performance of ships, providing incentives for industry to go beyond regulatory requirements towards the use of best available technology. Economic incentives include differentiated taxation of marine fuels, differentiated port and fairway dues and differentiated tonnage taxes. Environmental Differentiated Fairway Dues have been successfully implemented in Sweden, which resulted in the reduction of SO_2 by 50,000 tonnes and NOx by 41,243 tonnes in 2004. The socio-economic value of this reduction was calculated to be 2.5 billion SEK (277.8 million EUR).

A new HELCOM Recommendation will be adopted to promote such systems in all countries around the Baltic Sea.

Joint input to global legislative processes

Annex VI to the MARPOL 73/78 Convention is currently under revision. The HELCOM Contracting Parties will have two joint submissions to IMO to contribute to this process and support further tightening of requirements for SOx and NOx emissions from ships.

One of the joint submissions will be based on the results of the ShipNODeff Programme carried out by Finland and Estonia. The aim of the programme is to estimate the contribution of the nitrogen emissions from shipping in the Baltic Sea to the eutrophication of the Baltic Sea. The calculations are based information provided by the HELCOM Automatic Identification System (AIS). The results will also include a scenario estimating NOx emissions from ships according to the control measures proposed for the revision of Annex VI.

7. Zero discharges from offshore platforms

Offshore exploration and exploitation of oil and gas are likely to result in discharges of oil and noxious substances as well as emissions of substances, or groups of substances, such as PAHs and NOx to the atmosphere.

What has been achieved so far?

Prevention of pollution from offshore platforms is addressed in Annex VI to the Helsinki Convention. Additionally, the environmental performance of offshore activities should be handled in accordance with HELCOM Guidelines and Recommendation 18/2. The Recommendation requires that Best Environmental Practice (BEP) and Best Available Techniques (BAT) are applied and that no exploration or exploitation activities are carried out in Baltic Sea Protected Areas. Moreover, it sets specific limits for the content of hazardous substances like cadmium and mercury in mud, and oil content in discharged production water from offshore platforms.

What are the gaps?

BEP and BAT are subject to continuous review and updating as new knowledge is gained and up-to-date solutions are available. On this basis the HELCOM countries have come up with a principle of “zero discharge” to be applied to the whole production process on offshore platforms.

What are the necessary actions?

Offshore Action Plan

HELCOM will adopt an Action Plan for the protection of the environment from offshore platforms. The aim of the Plan is to make sure that the environmental impacts from production, and the preceding exploration of oil and natural gas, remain within the limits set out in international and national regulations and correspond to the principles of BEP and BAT.

The Plan is based on the “zero-discharge” principle, successfully implemented at the offshore platform D-6 in the Russian Federation, and sets a timetable for concrete measures to be taken to cease or limit discharges, emissions or generation of hazardous substances, oil-containing water and wastes.

8. Minimum threats from offshore installations

The Baltic Sea faces an increasing number of – in many cases - competing uses and increasing pressure from the installations such as under water cables, pipelines and offshore wind farms. The HELCOM Contracting Parties will carefully follow relevant processes with the understanding that any environmentally significant adverse impacts on the Baltic Sea that may be caused by any offshore installation should be prevented, reduced, or, as fully as possible, offset.

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