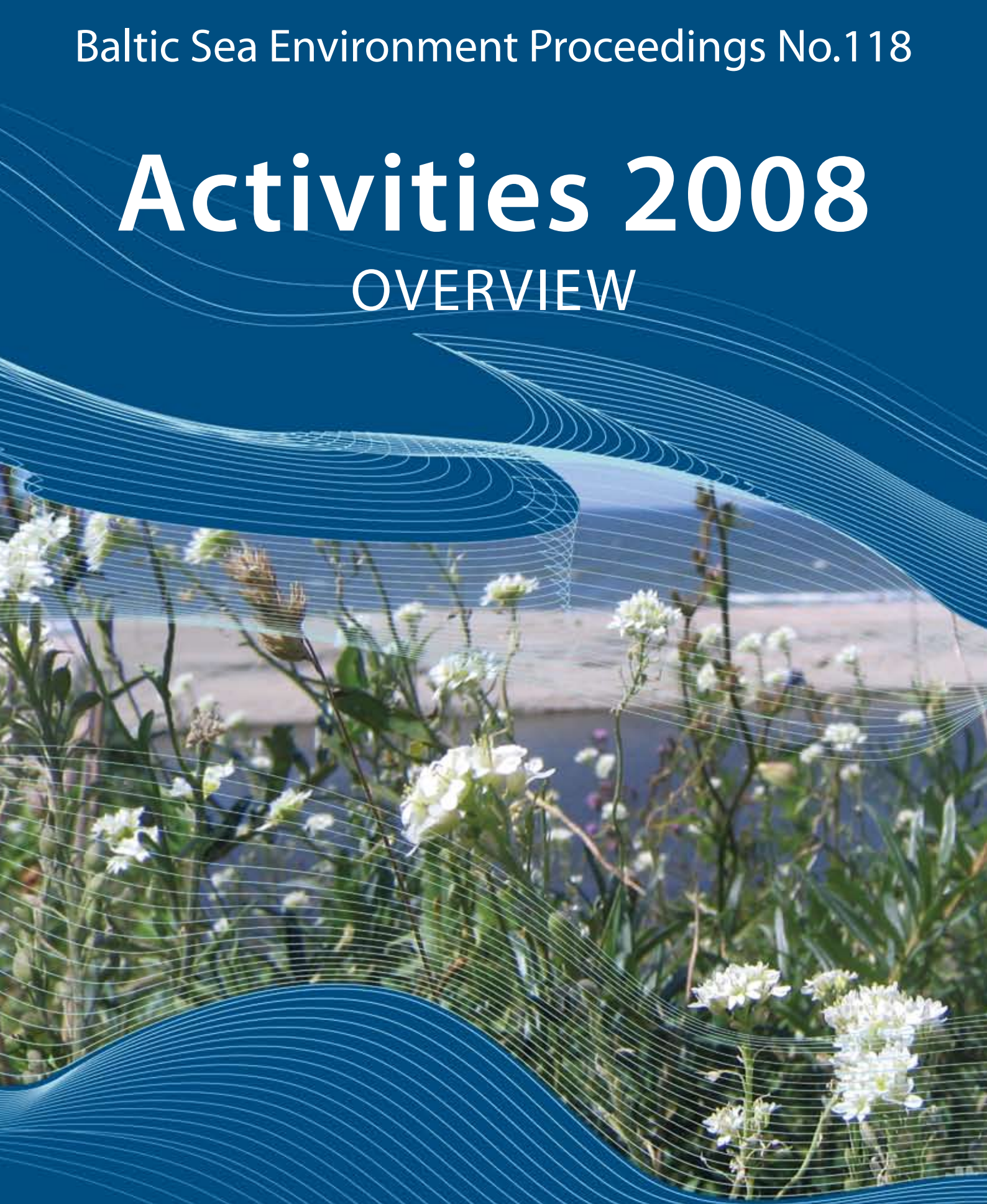
Baltic Sea Environment Proceedings No.118

Activities 2008

OVERVIEW



Helsinki Commission

Baltic Marine Environment Protection Commission

HELCOM Activities 2008 Overview

This report summarises the activities of the Helsinki Commission (HELCOM) related to the protection of the Baltic marine environment over the period March 2008 to March 2009.

It provides the latest HELCOM assessment of the current trends in the Baltic marine environment, as well as an update on HELCOM's recent activities. HELCOM's work aims to curb eutrophication caused by excessive nutrient loads entering the sea, prevent pollution involving hazardous substances,improve maritime safety and accident response capacity, and halt habitat destruction and the decline in biodiversity.

More details of HELCOM's activities, projects and publications are available at www.helcom.fi, together with background information about environmental issues related to the Baltic Sea.

HELCOM Activities 2008 Overview
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Foreword

As Executive Secretary of the Baltic Marine Environment Protection Commission (Helsinki Commission), I am pleased to present our Annual Report, an overview of our organisation's key accomplishments during the last 12 months, ending in March 2009.

The year 2008 was one of new beginnings, intense activities, and accomplishments for HELCOM. It was a year when we launched the implementation of the strategic Baltic Sea Action Plan to radically reduce pollution to the sea and restore its good ecological status by 2021. This overarching programme of actions, which signals a new future for the troubled marine environment, was adopted by HELCOM in November 2007.

The actions contained in the HELCOM Baltic Sea Action Plan are, to a great extent, epoch-making as HELCOM is pioneering some innovative new concepts for the Baltic. The programme provides a plan for implementing the ecosystem-based approach to the management of human activities in the Baltic. The plan focuses on the four most significant environmental issues in the Baltic: eutrophication caused by excessive inputs of nutrients; pollution by hazardous substances; biodiversity decline; and maritime safety.

The plan is notable because it has a close connection to the work being carried out at both European and global levels. Thus, the implementation of the HELCOM plan also facilitates the implementation of these other international legal frameworks, while at the same time ensuring that the regional specificities are taken into account - be it the natural sensitivity and environmental condition of our common sea, or the human activities and other pressures that affect it. The European Commission has already recognised that the HELCOM Baltic Sea Action Plan will be instrumental for the successful implementation of the EU Marine Strategy Framework Directive in the region. The importance of HELCOM's work is also recognised in relation to the EU Maritime Policy. And the currently evolving EU Strategy for the Baltic Sea Region is likewise expected to draw heavily from the HELCOM Baltic Sea Action Plan in its environmental as well as safety and security pillars.

The implementation of the HELCOM action plan officially commenced in April 2008, following the inaugural session of the Commission's newly established Group to steer the Baltic recovery. One of the first key tasks of the Implementation Group was to elaborate a comprehensive list of municipal wastewater treatment plants and a list of agricultural pollution hot spots that do not fulfil the HELCOM requirements. This project is vital for the successful implementation of the plan. Inadequately treated sewage and agricultural run-off are the major sources of phosphorus and nitrogen inputs into the Baltic Sea responsible for its eutrophication. Therefore, the mitigation of excessive nutrient loads from these sources is recognised as one of the priority actions.

The year also saw many new successful projects and initiatives launched to support the implementation of the Baltic Sea Action Plan. In March 2008, HELCOM held the third international Stakeholder Conference on the Baltic Sea Action Plan, which focused on the involvement of international financial institutions (IFIs) in the implementation of the programme to restore the sea, as well as maritime spatial planning issues. Together with regional authorities, HELCOM also arranged several regional/national Stakeholder Workshops on the implementation of the plan. HELCOM considers these workshops as a crucial means to facilitate the elaboration of national programmes of action and development of prioritised lists of actions, and acquire financing to speed-up the implementation process.

Several major assessments were prepared in the past twelve months on eutrophication, biodiversity and nature conservation, hazardous substances, radioactivity, as well as on coastal fish. Additionally, the elaboration of an overarching, holistic assessment of the status of the marine environment was initiated. Two large projects, co-financed by the EU, were launched at the beginning of 2009. One aimed at considerably improving the readiness of the coastal countries to respond to major oil and

hazardous substance spills (BRISK); the other focused on the identification of sources of the selected hazardous substances by screening in municipal and industrial wastewaters (COHIBA). Another crucial project for the success of the action plan – BALTHAZAR, launched in early 2009 with the financial support of the European Parliament pilot project facility, specifically aims at reducing the losses of hazardous substances and nutrients from point sources in St. Petersburg, Leningrad and Kaliningrad Oblast'. In 2008, HELCOM also made two submissions to the International Maritime Organisation calling for tighter international regulations to decrease nitrogen oxides (NOx) and sulphur oxides (SOx) emissions from ships.

The beginning of the action plan implementation process coincides with the two-year Russian Chairmanship of HELCOM which began on 1 July 2008. Russia has indicated that it will strongly support the implementation of the Baltic Sea Action Plan, considering it as a joint initiative of the highest political importance for the region. Russia has also announced that it will host the HELCOM Ministerial Meeting in 2010 in Moscow where the Baltic Sea countries will present their national plans on how they are to implement the actions decided upon in the HELCOM Baltic Sea Action Plan to curb eutrophication and halt the inputs of hazardous substances. At the same time, the Meeting will offer a good opportunity to view status reports on the implementation of the actions within the fields of maritime and nature protection.

I hope that this annual report will provide you with much useful information on the Baltic Sea Action Plan, as well as an overview of HELCOM's assessments of the current trends in the Baltic marine environment and the many other wide-ranging activities carried out by the Helsinki Commission during 2008 to protect the Baltic Sea.

Anne Christine Brusendorff
Executive Secretary of HELCOM

Photo: Elena Bulycheva

Photo: Kaj Granholm, HELCOM

1. The working structure of HELCOM

The Baltic Marine Environment Protection Commission, usually referred to as the Helsinki Commission, or HELCOM, works to protect the marine environment of the Baltic Sea from all sources of pollution through intergovernmental cooperation between Denmark, Estonia, the European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.

HELCOM is the governing body of the 'Convention on the Protection of the Marine Environment of the Baltic Sea Area' - usually called the Helsinki Convention.

The 1974 Convention

For the first time in history, all the sources of pollution around an entire sea were made subject to a single Convention which was signed in 1974 by the then seven Baltic coastal states. The 1974 Convention entered into force on 3 May 1980.

The 1992 Convention

In light of political changes and developments in international environmental and maritime law, a new Convention was signed in 1992 by all the states bordering on the Baltic Sea and the European Community. After ratification, the Convention entered into force on 17 January 2000. The Convention covers the whole of the Baltic Sea area and includes the inland waters, the waters of the sea itself and the sea-bed. Measures are also taken in the whole catchment area of the Baltic Sea to reduce land-based pollution.

Organisation

The Helsinki Commission meets annually. Ministerial-level meetings are also held occasionally. The Commission unanimously adopts Recommendations for the protection of the marine environment, which the governments of the Contracting Parties must act on in their respective national programmes and legislation.

The chairmanship of the Helsinki Commission rotates between the Contracting Parties every two years in alphabetical order in English. HELCOM is currently chaired by Russia (1 July 2008 – 30 June 2010).

The working structure of HELCOM, supported by the Secretariat, consists of the meetings of the Helsinki Commission, the Heads of Delegation, the Baltic Sea Action Plan Implementation Group and five main expert Groups.

The goals of the Helsinki Commission

HELCOM's main goal is to protect the marine environment of the Baltic Sea from all sources of pollution, and to restore and safeguard its ecological balance.

Priorities

- Environmental monitoring and assessment
- Combating eutrophication caused by excessive nutrient loads from municipal wastewater and agricultural run-off
- Preventing pollution by hazardous substances
- Improving navigational safety and accident response capacity
- Protecting and conserving marine and coastal biodiversity

Photo: Elena Bulycheva

2. Putting the HELCOM Baltic Sea Action Plan into action

Stakeholders discuss the basic building blocks for the successful implementation of the Baltic recovery plan

The Fourth Stakeholder Conference on the Baltic Sea Action Plan, held on 3 March 2009 in Helsinki, focused on the implementation of a series of strategies to radically reduce pollution to the marine environment and restore its good ecological status by 2021. Senior government officials, representatives of the science and business communities, and various organisations from around the Baltic Sea discussed the political, economic and scientific pre-requisites for successfully achieving a healthy Baltic Sea in a timely manner.

The action plan requires three essential building blocks for its successful implementation: a good knowledge based on thematic assessments of the marine environment; the economic perspectives of protecting the marine environment; and regional cooperation for taking cost-effective measures. Therefore, the theme of the 2009 HELCOM Stakeholder Conference was 'Building blocks for a cost-effective implementation of the Baltic Sea Action Plan'.

Keynote speakers at the opening plenary included Ms. Paula Lehtomäki, Minister of the Environment of Finland; Mr. Yuri Trutnev, Minister of Natural Resources and Ecology of the Russian Federation; Ms. Åsa-Britt Karlsson, State Secretary, Ministry of the Environment of Sweden, and Mr. Peter Gammeltoft of the European Commission.

The Stakeholder Conference consisted of three thematic sessions which discussed the new HELCOM biodiversity and eutrophication assessments - which will set a baseline for implementing the measures of the plan; economic perspectives of the protection of the Baltic Sea; and issues of regional cooperation in strengthening the knowledge base for the cost-efficient implementation of the plan. The sessions were followed by a general roundtable discussion on the HELCOM Baltic Sea Action Plan with the participation of officials from the coastal countries, the European Commission,

Yuri Trutnev

Paula Lehtomäki

Åsa-Britt Karlsson

representatives of the scientific community, IFIs and NGOs.

The participants expressed a common opinion that the HELCOM plan is an initiative of the highest political importance in the region. The Baltic Sea, which can be described as the region's 'motorway' for growth and prosperity, has enormous importance to all the coastal countries. The long-term economic and social well-being of the 85 million people living in its catchment area highly depends on the state of the marine environment. For this reason, the implementation of the plan will not only restore a healthy environment but will also be a driving force for growth and employment.

It was noted that HELCOM's plan has already been heralded as a forerunner and a model example to be followed by other regional seas conventions. It is the first bold attempt by a regional marine protection commission to implement the innovative eco-system approach to obtain a good environmental status of the marine environment. The HELCOM plan has also been seen as instrumental in implementing obligations under other international legislative frameworks such as the Convention on Biological Diversity (CBD); the 2002 World Summit on Sustainable Development (WSSD); the EU Marine Strategy Framework Directive (MSFD); and the EU Maritime Policy. The EU Strategy for the Baltic Sea Region is also expected to be based on the HELCOM Baltic Sea Action Plan in its environmental as well as safety and security pillars.

Recognising that HELCOM has obligations to measure, monitor and assess what is happening in the Baltic marine environment, and how pressures to the environment are

Peter Gammeltoft

evolving, stakeholders acknowledged that the Commission has been producing comprehensive thematic assessments covering inputs and their effects on the marine environment since the 1980s, and that these findings are the basis for identifying priorities for actions. The Conference also noted that recently, these obligations have been fulfilled by elaborating comprehensive thematic assessments covering two of the four environmental priority areas of HELCOM's work - eutrophication and biodiversity. A thematic assessment on hazardous substances should be developed during 2009-2010 and one for maritime activities by 2010. Furthermore, HELCOM countries should undertake to produce a holistic assessment of the status of and pressures to the Baltic Sea marine environment for the HELCOM Ministerial Meeting which will take place in 2010 in Moscow.

At the same time, it was stated that the success of the HELCOM Baltic Sea Action Plan will largely depend on how all the coastal countries and involved stakeholders, including international financial organisations, can cooperate to achieve a healthy Baltic Sea environment.

Photo: Elena Bulycheva

HELCOM launches Group to steer Baltic recovery

On 7 April 2008, HELCOM held the inaugural session of the Commission's newly established Group which will steer the implementation of the strategic Baltic Sea Action Plan. The task of this ad hoc Group is to supervise and lead the implementation of the Baltic Sea Action Plan; advise the Helsinki Commission on any additional actions; and to consider financial issues including the financing possibilities of the agreed measures as well as cost-efficiency and economic incentives.

During the past year, the Baltic Sea Action Plan Implementation Group focused on those practical issues related to the implementation of the plan which need immediate action to meet some of the plan's deadlines in 2009 and 2010; it also reviewed national implementation processes and potential difficulties.

One of the top most issues on the agenda was the elaboration of a comprehensive list of municipal wastewater treatment plants (MWWTPs). This is considered as one of the priority projects for the successful implementation of the action plan. MWWTPs contribute to one third of the total nutrient load to the Baltic Sea - one of the major causes of eutrophication. Mitigation of their excessive nutrient loads is therefore recognised as one of the priority actions due to its cost-efficiency and the ease by which progress can be monitored. The Implementation Group has elaborated a comprehensive list of MWWTPs, in which those plants discharging directly to the Baltic Sea, and not yet fulfilling HELCOM's requirements, are addressed as the first step in project prioritisation.

Another key task in the work of the Implementation Group was the elaboration of a list of those agricultural pollution hot spots that do not fulfil HELCOM's requirements. Agriculture remains a major source of nutrient inputs to the Baltic Sea and is mainly considered a diffuse source of pollution as the nutrients affecting the Baltic Sea enter indirectly via run-off in the watershed area. The impacts of agriculture can be reduced by means of the broad application of Good Agricultural Practices at farmlands.

Nevertheless, the intensified development of the industrial production of cattle, pigs and poultry within the Baltic Sea area has led to the creation of a new segment of pollution point sources which significantly contribute to the amount of nutrient loads. These can be addressed in the same manner as industrial point sources, e.g. by establishing a list of priority hot spots that need to be remediated first.

The Implementation Group has examined the effects and cost-effectiveness of the rapid implementation of the requirements for municipal wastewater treatment plants discharging directly to the Baltic Sea and for agricultural pollution hot spots.

Regional Workshops address key actions within the Baltic Sea Action Plan

As one of the first steps towards the upcoming implementation of the strategic HELCOM Baltic Sea Action Plan, local Russian authorities in St. Petersburg, Kaliningrad and Leningrad Oblast' hosted several regional Stakeholder Workshops in 2008 and at the beginning of 2009 in order to build up support for this multinational strategy to rescue the troubled marine environment.

The overall objective of the regional Workshops, arranged in Kaliningrad on 22 May 2008 and in St. Petersburg on 11 February 2009 in close cooperation between HELCOM, the


Photo: Nikolay Vlasov, HELCOM

Nordic Council of Ministers, Russia's Ministry of Natural Resources and Ecology, and local Russian authorities, was to facilitate stakeholder involvement in the process of implementing the plan, identify the environmental issues that concern the Kaliningrad and Leningrad Regions, and prioritise actions.

Senior government officials of Russia's coastal regions, representatives of the scientific and business communities, international financial institutions (IFIs), NGOs, as well as officials from neighbouring countries discussed actions within all the four segments of the action plan. These included: combating eutrophication caused by excessive inputs of nitrogen and phosphorous mainly originating from inadequately treated sewage and agricultural run-off; preventing pollution by hazardous substances; halting habitat destruction and the decline in biodiversity; and improving the maritime safety and accident response capacity. However, the major focus was on eutrophication and biodiversity as well as other issues of interest to the regions.

Both pollution from municipal wastewater and agricultural run-off, and the status of biodiversity were addressed at parallel sessions in order to discuss what concrete actions can be taken to solve existing environmental problems. The financial aspects of the plan's implementation and the cost-efficiency of the measures were one of the main issues. Discussions mainly focused on the sources of funding and the involvement of the IFIs and the private sector in the implementation of the HELCOM Baltic Sea Action Plan. Much attention was focused on understanding their requirements for providing financing support, as well as how to prepare successful projects to ensure and increase the investments for marine environmental protection. Participating in the discussions were IFIs such as the European Bank of Reconstruction and Development (EBRD); the Nordic Dimension Environmental Partnership (NDEP); the Nordic Environment Finance Corporation (NEFCO); and local banks including Rosselkhoz.

The outcome reports from the two Workshops with concrete suggestions on priority issues serve as a roadmap for the implementation of the action plan in the Kaliningrad and Leningrad regions. They will also contribute to and facilitate the elaboration of the overall national action programme for the implementation of the HELCOM Baltic Sea Action Plan in Russia, which should be finalised by 2010.

Implementing the actions within the maritime segment of the Baltic Sea Action Plan in Russia was the primary focus of the two additional HELCOM Stakeholder Workshops which were held in Kaliningrad on 29 August and in St.

Petersburg on 21 November 2008.

The Workshop in Kaliningrad was attended by representatives of marine pollution response and environmental authorities from Denmark, Finland, Lithuania, Poland and Russia, as well as from the NGO sector. The objective of the Workshop was to provide a local perspective and contribute to the implementation of the maritime segment of the HELCOM Baltic Sea Action Plan with particular focus on improving maritime safety and oil spill response capacity, as well as strengthening sub-regional cooperation in this field in the south-eastern Baltic. Another major theme was the coastal preparedness for oil spills and how to integrate wildlife response into local/regional contingency planning. Additionally, the participants examined ways on how to efficiently enforce compliance with anti-pollution regulations, and on how to increase public involvement in enforcement campaigns.

The Workshop in St. Petersburg, which was hosted by the Admiral Makarov State Maritime Academy, also addressed key issues within the maritime segment of the Baltic Sea Action Plan. Participants came from government agencies, regional authorities, maritime administrations, port authorities, scientific and business communities, regional organisations and NGOs from Russia, as well as from Estonia, Finland and Poland. They discussed the new IMO regulations on the prevention of air pollution from ships; the use of economic incentives in Russian ports; a new proposal by the HELCOM countries to the IMO to tighten the requirements for sewage from ships; and measures to increase the safety of winter navigation including the training of seafarers. Additionally, the participants reviewed measures related to the response to oil pollution,


Photo: Nikolay Vlasov, HELCOM

including the enhanced cooperation on places of refuge, the role of the municipal authorities in shoreline response, as well as the new project on sub-regional risk assessment of spills of oil and hazardous substances in the Baltic Sea (BRISK Project).

Both Workshops were arranged in close cooperation between the Regional Governments, HELCOM, Russia's Federal Agency for Maritime and River Transport, Port Maritime Authorities, the Ministry of Natural Resources and Ecology of the Russian Federation, and the Nordic Council of Ministers.

To date, there have been five regional/national Stakeholder Workshops on the implementation of the HELCOM Baltic Sea Action Plan since its adoption. The first, held in Sweden on 25 January 2008, was arranged in Stockholm for municipal authorities on financing actions for implementing the action plan.


Photo: Andrei Stepanov

Photo: Sergey Vlasov

3. Monitoring the marine environment

HELCOM carries out monitoring and assessment activities according to the HELCOM Monitoring and Assessment strategy adopted in 2005. HELCOM's monitoring programmes, such as COMBINE, MORS-PRO and pollution load monitoring, produce data for assessments. All assessments require data from HELCOM's pollution load compilations, which are currently carried out for airborne and waterborne loads of nutrients and hazardous substances entering the Baltic Sea. The Fifth Pollution Load Compilation (PLC-5), which focuses on data on waterborne nutrient inputs from 2006, will be finalised by 2010.

During the past year, HELCOM has been engaged in producing two major assessments: an integrated thematic assessment of eutrophication and another integrated thematic assessment on biodiversity. HELCOM has also compiled an inventory of radioactive substances in the Baltic Sea and a report on hazardous substances. In addition, HELCOM is preparing a number of other assessments to support the implementation of its strategic Baltic Sea Action Plan. Thematic assessments on hazardous substances and maritime shipping should be completed by 2010. These assessment reports will be produced from the results of a unique compilation of data and analyses based on the vast amounts of scientific research being carried out around the Baltic Sea. The assessment on hazardous substances aims to focus on the sources of hazardous substances, their occurrence in the ecosystem, and their accumulation and effects in biota.

The first meeting of the HELCOM Project for Expert Network on Monitoring and Protecting of Coastal Fish and Lamprey Species (HELCOM FISH 1/2008) agreed on the elaboration of an assessment of the coastal fish in the Baltic Sea area by 2010. The assessment will update and improve knowledge on the occurrence and distribution of populations of coastal fish and lamprey species, including all anadromous species, with special focus on the threats and any decline in populations. It will also help identify potential restoration programmes for threatened species and provide recommendations for an ecosystem-based management of coastal fisheries.

Together, these thematic assessments will provide the basis for a subsequent holistic assessment of the status of and pressures on the marine environment of the Baltic Sea, which will be prepared for the HELCOM 2010 Ministerial Meeting.

In addition to the thematic assessments and other assessment reports, nearly 40 indicator fact sheets are kept up to date with annual updates and presented on the HELCOM website (http://www.helcom.fi/environment2/ifs/ifs2008/en_GB/cover/).

These reports provide much information on the different aspects of the status of the marine environment of the Baltic Sea and the factors affecting the status, such as pollution loads.

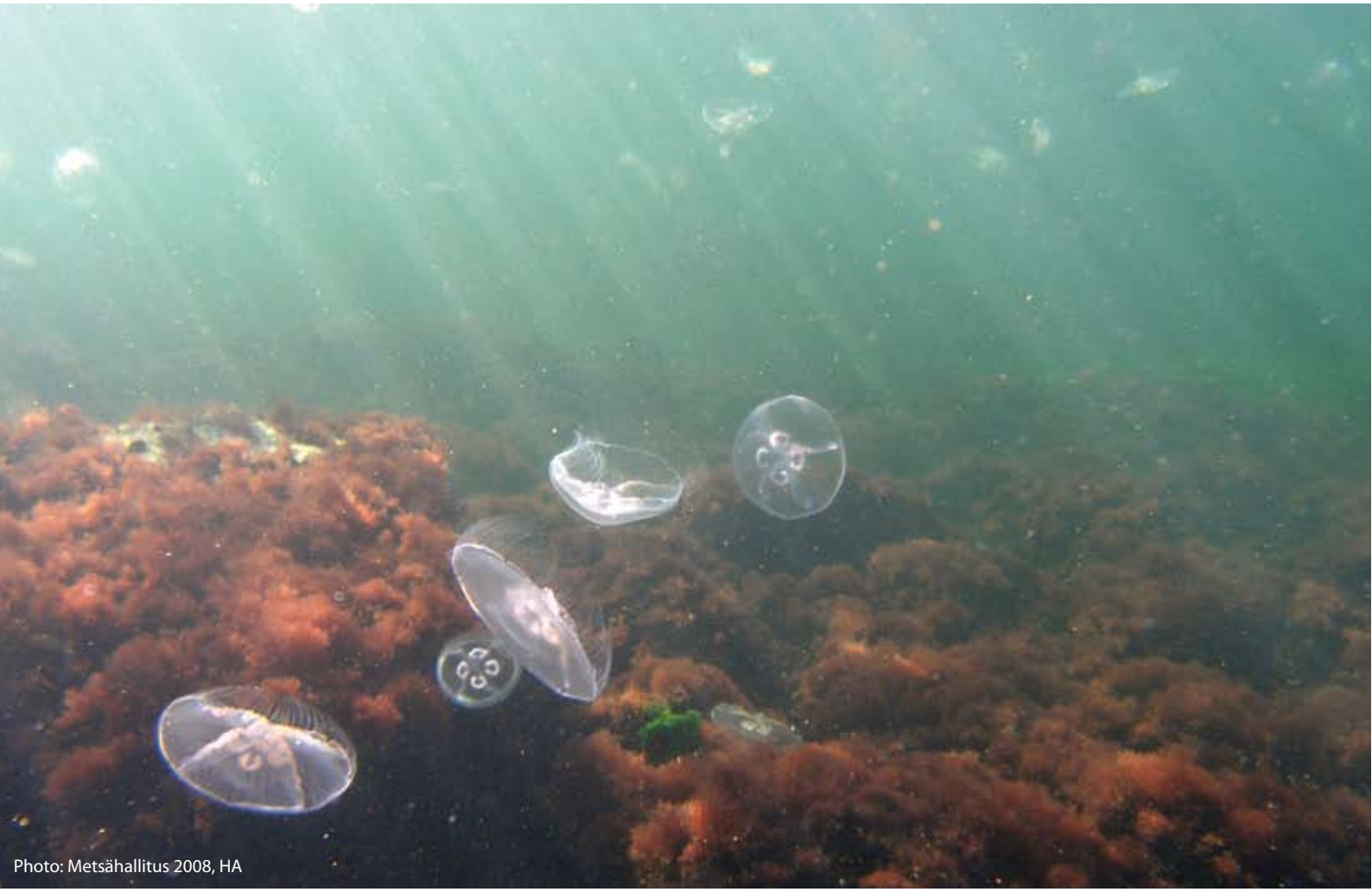
Photo: Metsähallitus 2008, PL

Assessing the eutrophication status of the Baltic Sea

The effects of nutrient enrichment are perhaps the most significant environmental concern of the Baltic Sea marine environment. In short, eutrophication means 'well nourished'; however, for more than three decades, it has been acknowledged that too large amounts of nutrients, e.g. nitrogen, phosphorus, and sometimes organic matter, can result in a series of undesirable effects in the structure and function of the ecosystem.

The Baltic Sea Action Plan identified eutrophication as one of the four main environmental problems to be addressed to improve the health of the Baltic Sea environment. The plan sets a strategic goal related to eutrophication: 'a Baltic Sea unaffected by eutrophication'. The goal for good environmental status in terms of eutrophication has been classified into five eutrophication-related ecological objectives: 'Concentrations of nutrients close to natural levels'; 'Clear water'; 'Natural level of algal blooms'; 'Natural distribution and occurrence of plants and animals'; and 'Natural oxygen levels'.

The eutrophication status of the Baltic Sea in 2001–2006 was extensively assessed, analysed and evaluated in an integrated thematic assessment of eutrophication in the Baltic Sea. According to the report, which was released in March 2009, the overall eutrophication status of the Baltic Sea is unacceptable. Only 13 of the studied areas were classified as being 'eutrophication non-problem areas', while 176 areas were classified as 'eutrophication problem areas'. The 'non-problem areas' were found in the Gulf of Bothnia and in the Kattegat.



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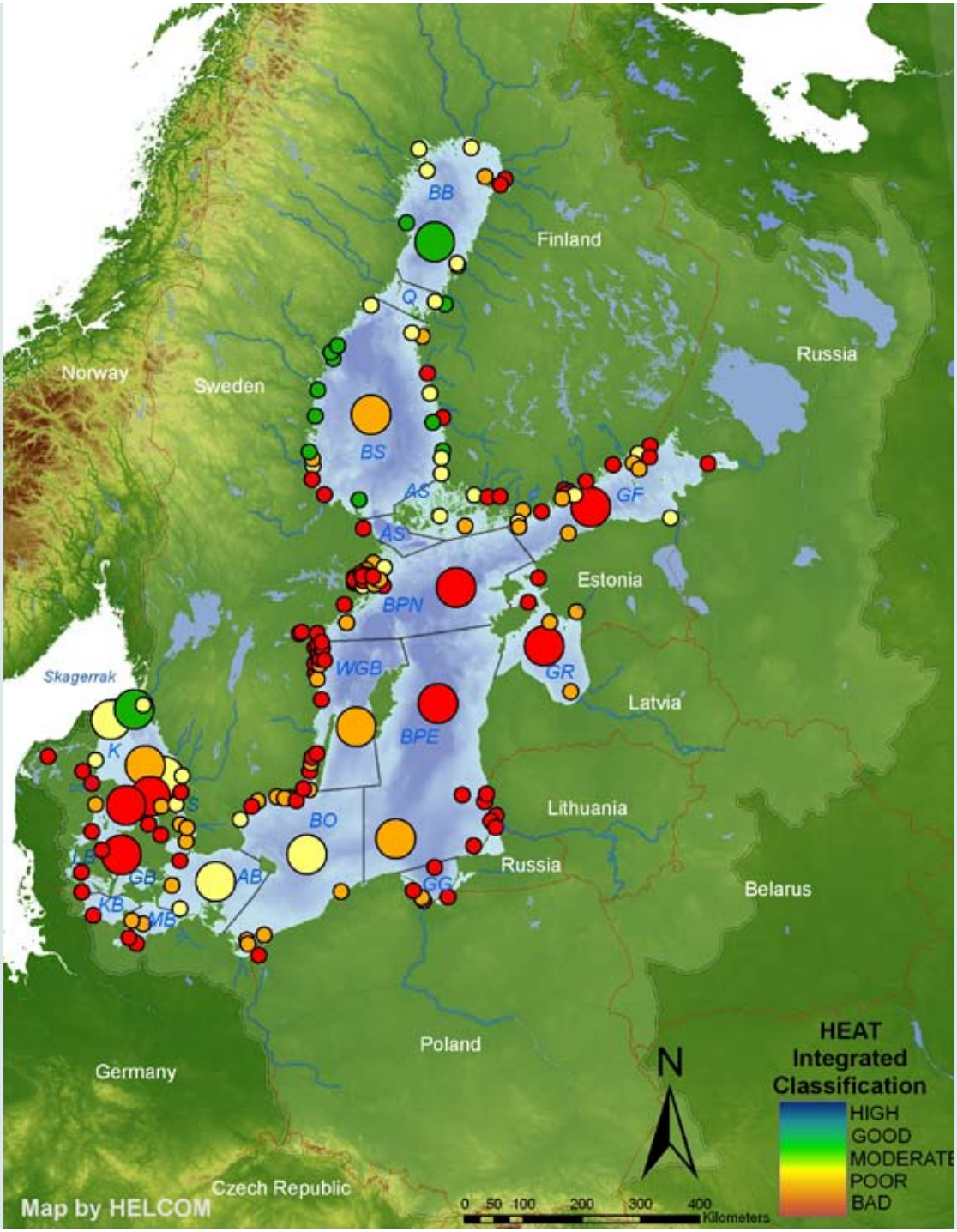


Integrated classification of eutrophication status based on 189 areas. Good status is equivalent to 'areas not affected by eutrophication', while moderate, poor and bad are equivalent to 'areas affected by eutrophication'. Large circles represent open basins, while small circles represent coastal areas or stations. HEAT = HELCOM Eutrophication Assessment Tool. Abbreviations: BB (Bothnian Bay); Q (the Quark); BS (Bothnian Sea); AS (Archipelago Sea); ÅS (Åland Sea); BPN (Baltic Proper northern parts); GF (Gulf of Finland); BPE (Baltic Proper Eastern Gotland Basin); GR (Gulf of Riga); WGB (Western Gotland Basin); GG (Gulf of Gdansk); BO (Bornholm Basin); AB (Arkona Basin); MB (Bay of Mecklenburg); KB (Kiel Bay); GB (Great Belt); LB (Little Belt); S (the Sound); K (Kattegat).

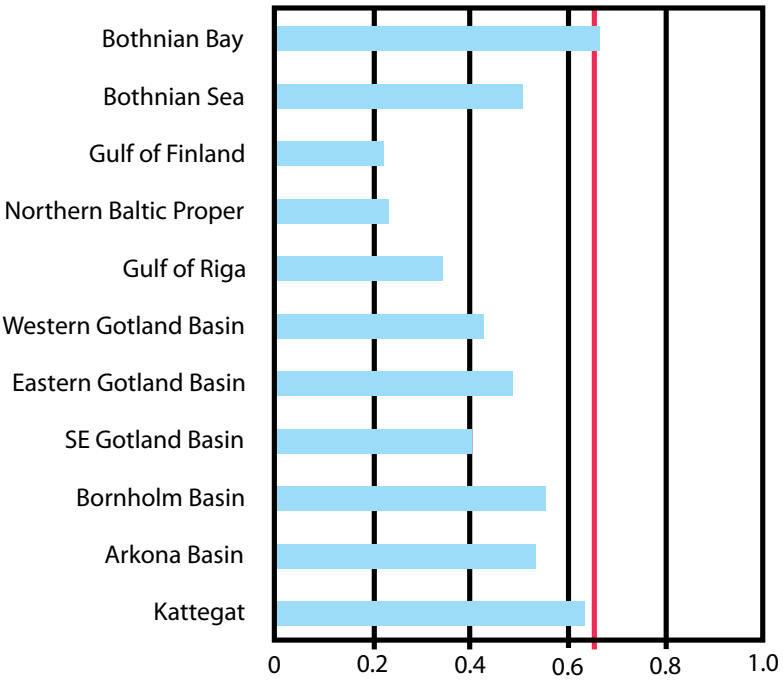
In most open and coastal Baltic areas, chlorophyll-a concentrations indicated the prevalence of eutrophication. In the open sea, the chlorophyll-a derived status was the best in the Bothnian Bay and the Kattegat, and lowest in the Gulf of Finland, the Northern Baltic Proper, and the Gulf of Riga. Typically, chlorophyll-a derived Ecological Quality Ratio (EQR) values were lower in the inner coastal waters than in the outer coastal waters.

The quantity of planktonic algae dispersed in water and measured as chlorophyll-a affect the transparency of water. Water transparency status has also decreased in all Baltic Sea sub-areas, reflecting visible eutrophication effects in the entire Baltic Sea both at coastal and open-sea sites.

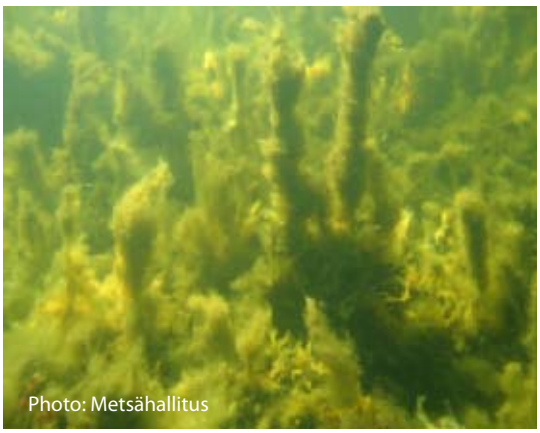
Generally, the level of eutrophication has caused serious changes in the Baltic Sea submerged aquatic vegetation communities, although the gaps in historic data do not allow us to identify the exact timing of larger shifts in communities. Present-day monitoring data show that in several areas, the degradation of communities is ongoing. At the same time, positive signs of a slowing down or reversal of eutrophication effects on submerged aquatic vegetation parameters could be observed in areas of the Northern Baltic Proper and the Gulf of Finland, where the distribution of macrophyte species has recovered.

Oxygen depletion is a common effect of eutrophication in the bottom waters of coastal marine ecosystems. The benthic responses to hypoxia include a shift from communities of large, slow-growing and slowly reproducing species to communities of small, rapidly reproducing organisms. Anoxic conditions result in the formation of hydrogen sulphide (H2S), which is lethal to higher organisms. During the 2001–

Summer chlorophyll-a in the open Baltic Sea



Chlorophyll-a status in the Baltic Sea open areas expressed as EQR values. The EQR values are based on the average summer (June-September) chlorophyll-a concentrations for the period 2001-2006 and reference conditions for the respective areas. The red line indicates the target EQR of 0.67.



Bladderwrack in good conditions (left) and in severely impaired conditions (right)

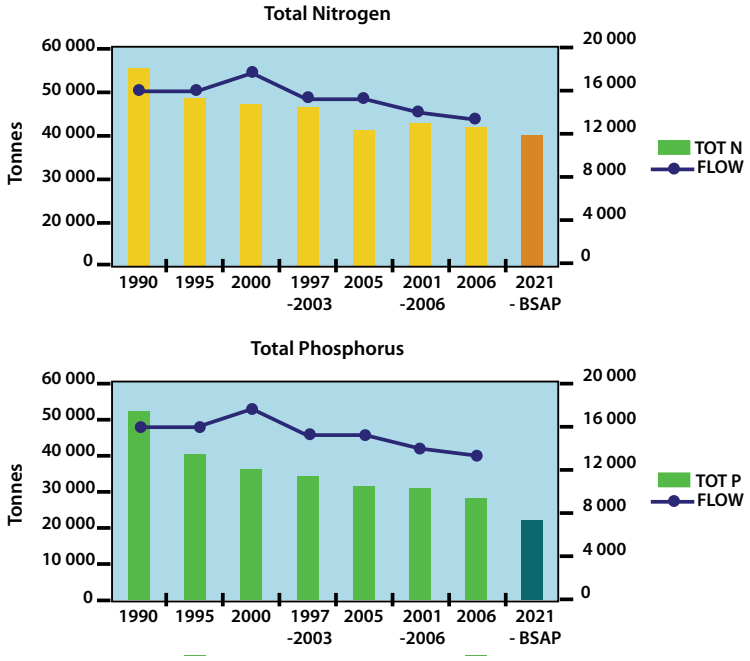
Photo: Nikolay Vlasov, HELCOM

2006 assessment period, the Gulf of Bothnia appeared to be free of both seasonal and long-term hypoxia, with the exception of some coastal sites. All other basins of the Baltic seem to have suffered from seasonal or permanent hypoxia during this period. In many areas of the Baltic, the benthic animals are exposed to widespread oxygen depletion. Macrobenthic communities are severely degraded throughout the open-sea areas of the Baltic Proper and the Gulf of Finland, whereas conditions in the Arkona Basin, the Danish Straits, open Kattegat and the Gulf of Bothnia, in general, are classified as being good. Macrozoobenthic communities in coastal waters are highly variable both between and within different sub-basins.

The overall outlook on eutrophication, however, is not completely negative since nutrient inputs to the Baltic seem to have decreased. There appears to have been a slightly decreasing trend in the riverine and direct point-source loads of both nitrogen and phosphorus in the Baltic Sea catchment between 1990 and 2006. The average annual waterborne inputs to the Baltic Sea were estimated to be 641,000 tonnes of nitrogen and 30,200 tonnes of phosphorus for 2001–2006. However, the target input levels indicated in the Baltic Sea Action Plan have not been reached for either of the nutrients. There are large variations in area-specific inputs. The only part of the Baltic Sea with low specific loads of both nitrogen and phosphorus is the Gulf of Bothnia.

Photo: Nikolay Vlasov, HELCOM

The external inputs of nutrients to the Baltic Sea come from the drainage basin via riverine inputs and for nitrogen via the atmosphere as deposition onto the sea. Excess nutrients originate particularly from municipal and rural human sources and from agricultural activities. Nitrogen emissions originate in land and sea transport, from combustion activities, and result in deposition onto the Baltic Sea.



Direct riverine and point-source loads of nitrogen (top) and phosphorus (bottom) to the Baltic Sea with the maximum allowable loads sensu the Baltic Sea Action Plan

Concentrations of phosphorus and nitrogen in the Baltic Sea surface waters increased up to the 1980s. However, in all areas except for the Gulf of Finland, phosphorus concentrations have declined over the past two decades. Management actions to reduce nutrient loads from land have shown results in some regions, reducing nutrient concentrations to the level of the 1970s. However, further reduction measures are generally necessary.

Because of the shallow and strongly stratified basin and long residence time of water, the Baltic Sea is highly sensitive to eutrophication. High nutrient inputs in combination with long residence times mean that nutrients discharged to the sea stay in the sea for a long time, even decades, before either being flushed out into the Skagerrak and North Sea surface waters or being buried in the sediments.

Eutrophication is a Baltic-wide problem of serious concern, which has a negative effect on most components of biodiversity in the Baltic Sea. It reduces water quality and extends to nearly all areas of the Baltic Sea, including the marine protected areas. This also implies that spatial protection measures aimed at conserving biodiversity cannot result in a favourable conservation status unless eutrophication is reduced to a level that does not cause disturbance.

The eutrophication status will only improve if loads of both nitrogen and phosphorus are further

reduced significantly. The key to improvement is the progressive reduction of loads, especially from diffuse sources. Climate change creates an extra challenge because precipitation is projected to increase especially in the northern part of the Baltic Sea catchment area, which may, in combination with increasing winter temperatures, lead to increased winter run-off and leaching of nutrients. Furthermore, an increase in water temperatures will make benthic communities more vulnerable to eutrophication and hypoxia. Ultimately, the effects of climate change could make the HELCOM strategic goal on eutrophication 'a Baltic Sea unaffected by eutrophication' impossible to attain using currently agreed reduction targets. Further reductions are evidently required in order to reduce eutrophication effects, especially under a changing climate.

Evaluating the status of Baltic biodiversity

HELCOM has recently finalised a three year project to produce a thematic integrated assessment on biodiversity and nature conservation (HELCOM BIO). The overall objectives of the HELCOM BIO Project which was launched in 2006 have been to:

- Assess the conservation status of the whole Baltic Sea on the basis of a harmonised approach;
- Set up conceptual models illustrating the linkages between effect, pressures and drivers;
- Show the actual, past and potential distribution of key habitat forming species;
- Visualise the species and habitats of special interest in the Baltic Sea;
- Assess the effectiveness of measures already taken in order to indicate to what extent the goal of having a favourable conservation status is ful filled.

The project also had an objective to maintain

Photo: Elena Bulycheva

a clear link to the Baltic Sea Action Plan, in particular to the targets of the biodiversity segment for which the overarching goal is to 'reach a favourable conservation status of Baltic biodiversity'.

The final assessment report was largely drafted during 2008 and it is based on two major components:

- An assessment provided by experts based on reviews and analyses of the state and trends of different components/indicators of biodiversity;
- An evaluation based on the pilot testing of an assessment tool that is developed within the project: The HELCOM Biodiversity Assessment Tool - BEAT.

The report will be published in the Baltic Sea Environment Proceedings in mid 2009.

Inventory of radioactivity in the Baltic Sea

According to the HELCOM Indicator Fact Sheets, the concentrations of man-made radionuclides in 1999–2006 remained higher than HELCOM's ecological objective of 'radioactivity at pre-Chernobyl level'. This is particularly true for the Bothnian Sea and the Gulf of Finland, which received the largest amounts of the fallout from Chernobyl in 1986. Nonetheless, the concentrations of man-made radionuclides in sediments during 1999–2006 were generally at or below the concentrations of naturally occurring radionuclides and, as such, are not expected to cause any harmful effects on the wildlife of the Baltic Sea. The HELCOM Indicator Fact Sheets show that the levels of radioactivity in Baltic Sea water and biota have generally shown declining trends since the 1990s.

Local discharges of radioactivity in the Baltic Sea are of minor importance. In 2007, the total discharges of caesium-137 (^{137}Cs), strontium-90 (^{90}Sr) and cobalt-60 (^{60}Co) into the Baltic Sea were 1.5, 30 and 6.8 GBq, respectively. In general, there has been a clear decreasing trend in the discharges of these from local nuclear power plants into the Baltic Sea over the last decade. In each case, the annual discharges have only been a few percent of the permitted discharge limits.

The most important sources with respect to the present total inventory of artificial radionuclides in the Baltic Sea have been the fallout from the Chernobyl accident in 1986, the fallout from atmospheric nuclear weapons tests in the 1950s and 1960s, and the discharges from nuclear reprocessing plants in Western Europe.

The Baltic Sea was the marine area most affected by the Chernobyl accident because the first radioactive clouds from Chernobyl travelled north and caused strong deposition in the Baltic Sea region. The total input of ^{137}Cs from Chernobyl to the Baltic Sea has been estimated at 4,700 TBq, and the post-Chernobyl river discharges of ^{137}Cs to the Baltic Sea were estimated at 300 TBq comprising 6-7% of the total fallout. Most of the radionuclides released were short-lived, however, and their impact on the environment was negligible. Among the longer-lived radionuclides, ^{137}Cs was the most important owing to its relatively long half-life (30.1 years) and its relevance with respect to radiation doses to man.

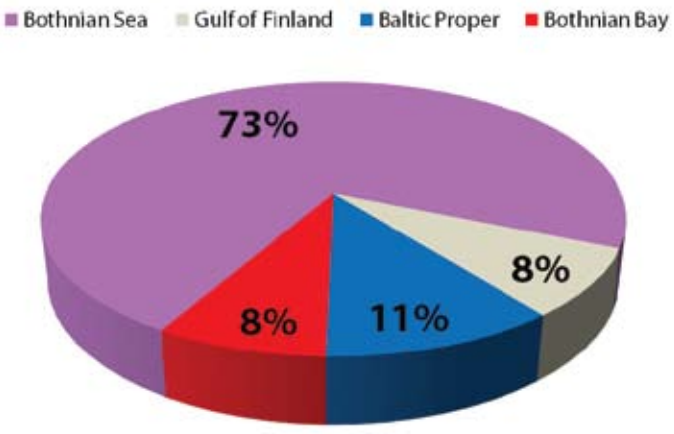
Results show that about half of the total input of ^{137}Cs from Chernobyl into the Baltic Sea area has accumulated in the seabed. Although accumulation was most intense in the first 5–6 years after the accident, it is still in progress. ^{137}Cs


Photo: Elena Bulycheva

is still being transported from the drainage area into the sea, and moving within the sea from the water column to the bottom. In recent years, the accumulation rate of ^{137}Cs has become slower, and total inventories of this radionuclide in the seabed have stopped increasing, which means that the accumulation rate of ^{137}Cs and its radioecological half-life in the sediments are essentially attaining a balance at present.

The total inventory of ^{137}Cs in the seabed of the Baltic Sea is now estimated at 2,100–2,400 TBq. The Bothnian Sea, the main accumulation basin for Chernobyl caesium, contains 73% of the total inventory. Chernobyl-derived caesium has continued to deposit into the seabed; however, due to the slower accumulation rate and radioactive decay of ^{137}Cs, the total inventories of this radionuclide have stopped increasing. Today, the inventory of ^{137}Cs is 8 - 9 times higher compared to the pre-Chernobyl level.

Today, ^{137}Cs is the main indicator of man-made radioactivity in Baltic seawater. The highest concentrations observed in seawater during 1999-2006 were found in the Baltic Proper and the Bothnian Sea. The general trend is steadily decreasing. It is estimated that the target value of 15 Bq/m^3, corresponding to pre-Chernobyl levels, will be reached between 2020 and 2030. The first estimates of effective half-lives for different parts of the Baltic Sea have been calculated. The inventory of ^{137}Cs in the Baltic seawater in 2006 is estimated at 870 TBq.



Distribution of caesium-137, as percent of the total inventory in sediment, between different sub-regions of the Baltic Sea

Photo: Metsähallitus 2008, HA

However, most of the radioactivity in the sediments of the Baltic Sea originates from naturally occurring radionuclides, such as ^{40}K. The inventory of ^{40}K is estimated to be roughly 8,500 TBq, which is four times higher than the total inventory of ^{137}Cs. While there are still considerable amounts of artificial radioactivity in the Baltic Sea sediments due to the radionuclides with long half-lives, the radioactivity is not expected to cause harmful effects to the Baltic Sea wildlife.

Concentrations of man-made radioactivity in fish show generally decreasing trends - in agreement with the trends in concentrations in seawater. Chernobyl-derived ^{137}Cs continued to be the most dominant man-made radionuclide in the Baltic Sea fish. By the end of the reporting period, the mean values of 1–10 Bq kg^{-1} wet weight were found in marine round fish (cod, herring, whiting) in various Baltic Sea basins, while the concentrations in pike were 10–25 Bq kg^{-1} wet weight on the Finnish coast. In marine flat fish (plaice, flounder, dab), slightly lower mean values were found than in marine round fish. Overall, the ^{137}Cs activity concentrations of herring and flounder muscle as well as of surface waters in the Baltic Sea basins are approaching the pre-Chernobyl levels.

The Baltic Sea has the highest concentrations of ^{137}Cs of any regional sea around the world due to the radioactive fallout from the Chernobyl accident. The Baltic Sea ranks third in the world with respect to ^{90}Sr in seawater, with only the Irish Sea and the Black Sea showing higher levels. Average concentrations of ^{137}Cs in fish from the Baltic Sea in 1990 were similar to those in the Irish Sea - about four times higher than in the Black Sea, and about 30 times higher than in the Mediterranean Sea.

Radiation doses to humans from man-made radionuclides in the Baltic Sea are mainly due to the ingestion of ^{137}Cs in fish. Doses from tritium (^{3}H) are lower by several orders of magnitude. During 1999-2006, doses to members of the public from marine pathways have not exceeded an annual value of 0.02 mSv, which is well below the limit of 1 mSv for the general public set in the Basic Safety Standards of the European Council (EC, 1996) and the IAEA (IAEA, 1996).

Concentrations of radioactive substances in the Baltic Sea are not expected to cause harmful effects to wildlife in the foreseeable future. However, in line with international developments, the future work of HELCOM will continue to include assessments of the radiological risks to the environment from radioactive substances in the Baltic Sea.

Preparing a holistic assessment of the status of the marine environment for the 2010 Ministerial Meeting

In order to ensure full application of the ecosystem approach, HELCOM has launched a holistic assessment of the status of the Baltic marine environment, including pressures and their impacts on the marine environment, as well as a socio-economic analysis within the HELCOM HOLAS Project. The last overarching assessment covering 1994-1998 was published in 2002 with an update covering 1999-2002 published in 2003.

This holistic assessment will be based on data from co-ordinated joint HELCOM monitoring, common HELCOM assessment methodologies and the four thematic assessment reports on eutrophication, biodiversity, hazardous substances and maritime activities. The aim is to finalise the assessment report by April 2010 and present it for approval to the upcoming 2010 Ministerial Meeting.

The production of an indicator-based thematic assessment on hazardous substances will form a significant part of the work on the holistic assessment. The work will involve the development and application of an indicator-based quantitative assessment tool. Similar tools have been used in the thematic assessments of eutrophication and biodiversity and will also be employed for the holistic assessment. In addition, a more management-orientated assessment concerning the impacts of shipping on the marine environment will be produced by HELCOM by 2010. It will also be made use of in the holistic assessment.

The HELCOM thematic assessments, along with the Indicator Fact Sheets, will provide a solid basis and a core for the holistic assessment.

The holistic assessment will provide a baseline for assessing how the vision, goals and ecological objectives of HELCOM have been achieved. The assessment will be quantitative in regard to the four themes (eutrophication, hazardous substances, biodiversity and maritime traffic), whereas cross-sectoral parts of the assessment will be more descriptive. The assessment will cover the period preceding the implementation of the Baltic Sea Action Plan (e.g. up to 2008). It will link the above information to the more general socio-economic and climatic development of the Baltic Sea region, make conclusions and provide policy recommendations for the protection of the Baltic marine environment.

Photo: Elena Bulycheva

The latest data on the state of the marine environment and pollution inputs

According to the latest HELCOM Indicator Fact Sheets, the Baltic marine environment is still being degraded as human activities in the region generate serious pollution and overexploit fragile ecosystems. At a Meeting on 3-7 November 2008 in Stockholm, HELCOM's Monitoring and Assessment Group (HELCOM MONAS) presented new information on the state of the marine environment as well as on sources and quantities of inputs of harmful substances into the Baltic Sea.

Experts from the coastal countries have compiled a set of new and updated Indicator Fact Sheets showing current trends in pollution loads and their impacts on Baltic ecosystems. The 35 reports provide the latest data on the inputs of nutrients and hazardous substances, which are mainly responsible for the ongoing degradation of the marine environment. The data include: details of hydrographic conditions in the Baltic Sea; concentrations of hazardous substances in fish; changes in the summer phytoplankton communities; distributions and quantities of recently arrived aquatic invasive species; and pollution originating from shipping. New indicator fact sheets approved at the Meeting address predatory bird health, concentrations of perfluorooctane sulfonate (PFOs) in biota, grey seal health and emissions from shipping.

HELCOM's indicators provide crucial background information to facilitate the management of environmental problems. These indicators are compiled by dedicated research institutions around the Baltic Sea, and approved by HELCOM MONAS. They are primarily based on variables studied in HELCOM's monitoring programmes. Although each indicator only provides limited information on a specific issue, when combined, the indicators can reflect conditions and trends in the whole ecosystem.

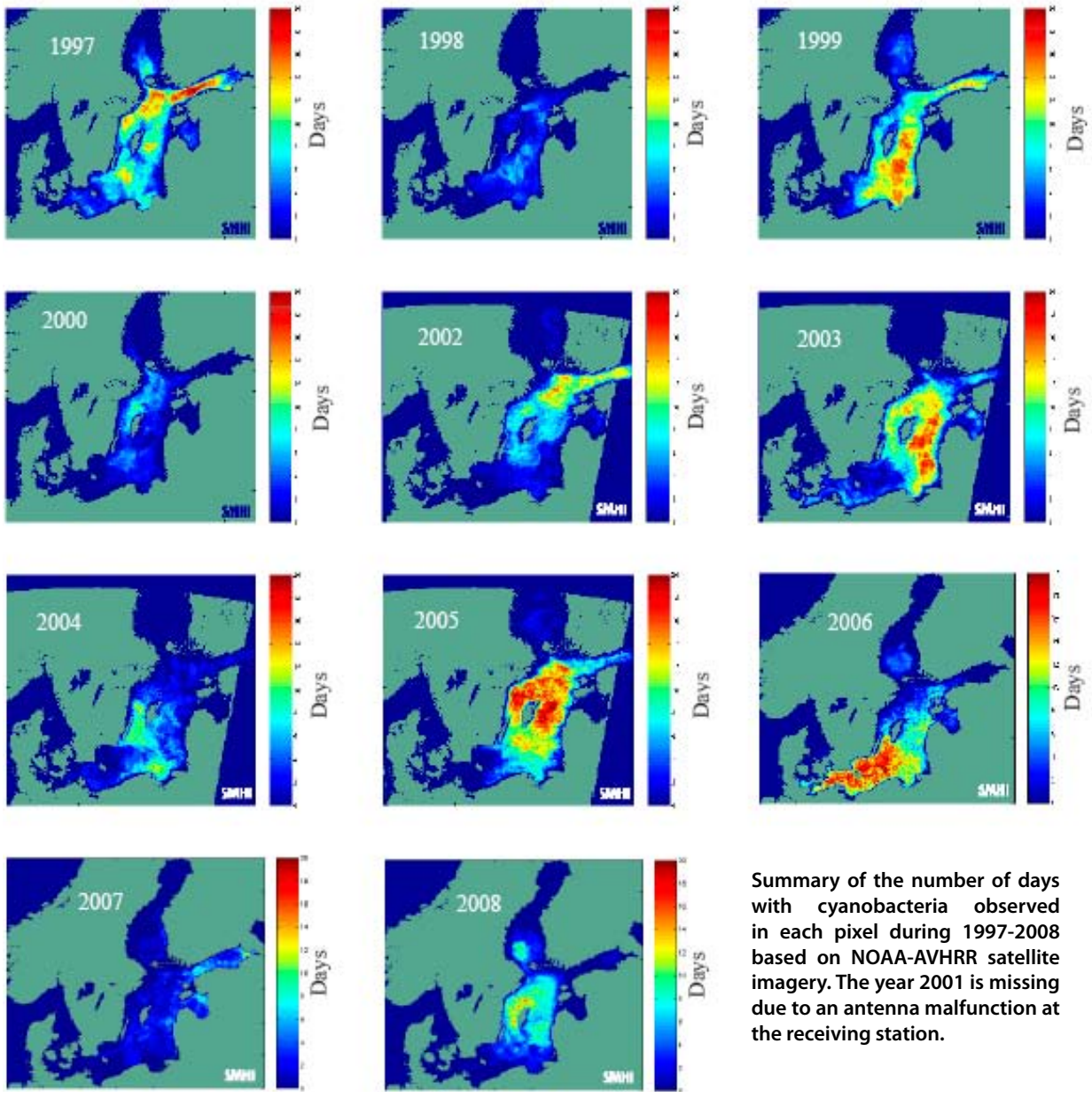
The latest HELCOM Indicator Fact Sheets are available at http://www.helcom.fi/environment2/ifs/ifs2008/en_GB/cover/.

Photo: Elena Bulycheva

1. Unsettled summer weather prevents major algae blooms in the Baltic

In 2008, the cool and windy weather held back the growth of algae and the formation of mats during the entire season. Compared with long-term averages, the algae situation in the sea was better than usual in June and August but was average in July.

The cyanobacterial blooms in the Baltic Proper occurred mainly in July, whereas blooms in the Bothnian Sea continued towards the end of August. The first extensive surface accumulations were observed in the southern half of the Baltic Proper on 2 July. The summer's bloom culminated in the warm and sunny period of 24 July to 1 August, when the satellite revealed that almost the entire Baltic Sea was green. The maximal extent (~180,000 km^2) was observed on 31 July when almost the entire Baltic Proper and parts of the Bothnian Sea and the Gulf of Finland were covered by surface accumulations. However, the normalised bloom indexes for bloom extent (6,675 km^2), duration (4.9 days) and intensity (32,651 km^2 days) were all lower than the means for the period 1997-2007.



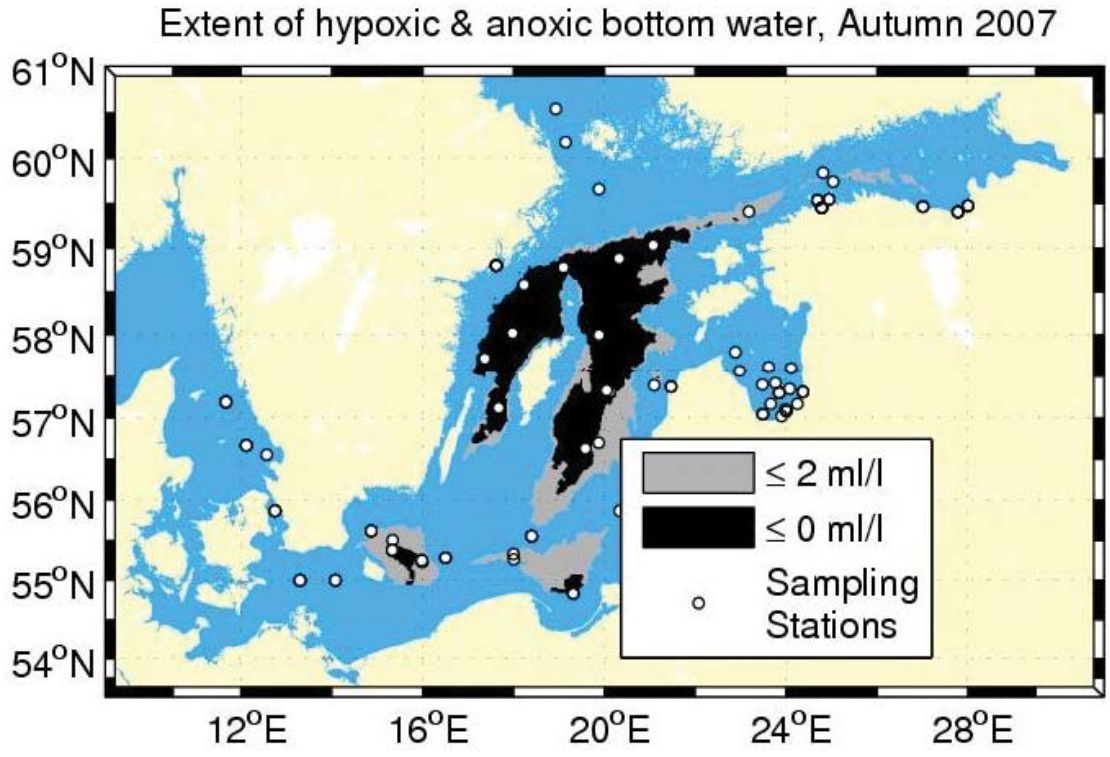
Summary of the number of days with cyanobacteria observed in each pixel during 1997-2008 based on NOAA-AVHRR satellite imagery. The year 2001 is missing due to an antenna malfunction at the receiving station.

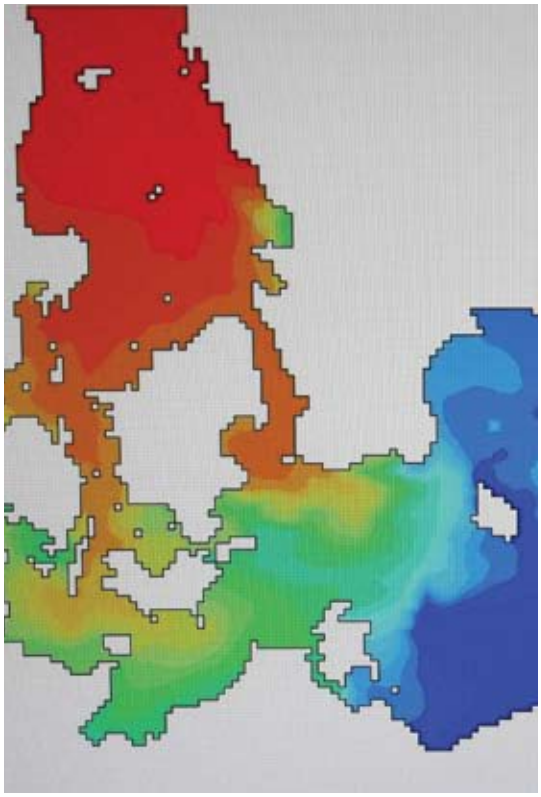
2. The absence of major inflows is intensifying the stagnation of the Baltic

The present state of the Baltic Sea is not only the result of anthropogenic pressures but is also influenced by meteorological conditions and hydrographic forces such as water exchange between the Baltic Sea and the North Sea. Before 1980, major Baltic inflows (causing higher salinities, lower temperatures and increased oxygen levels in the deep basins) were relatively frequent and could be observed once a year on average. In the last two decades, however, they have become rather scarce; the last three major inflows took place in 1993, 1997 and 2003 with a minor one in 2001.

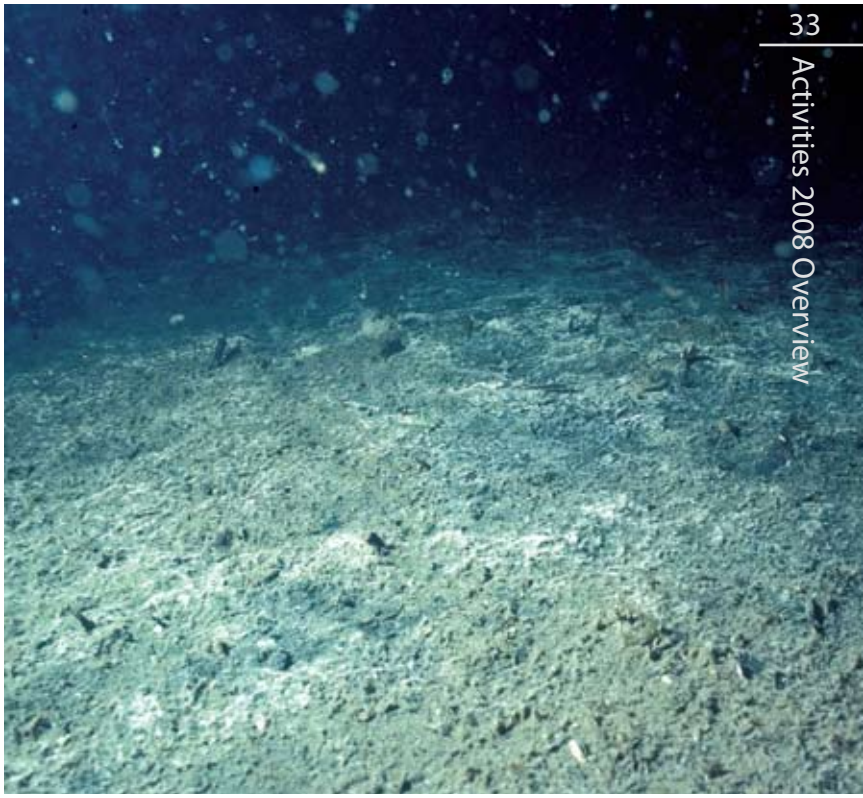
The inflow of waters from the Kattegat into the Baltic Sea during 2002-2003 terminated the stagnation period in the Baltic deep water which had lasted since 1995. The period afterwards has been characterised by low inflow activities and, except for in the southern Baltic, the stagnation period lasting since 2004-2005 is strengthening further. This stagnation period has resulted in a steady worsening of oxygen conditions in the deep basins of the Baltic Proper. In the south-eastern Baltic Proper, Western and Eastern Gotland Basins and Northern Baltic Proper, deep water salinity has increased, making the ventilation of these deep basins less likely. In all these basins, around 40% of the water has oxygen levels below 1 ml/l. This is acutely toxic to benthic fauna, and the sea bottoms covered by this water can be considered dead. This has an impact on benthic and demersal fish, such as cod, which prey upon benthic animals

A baroclinic inflow in summer 2006, followed by small barotropic inflows in 2007, resulted in an oxygenation of the deep water in the Bornholm basin in both years; however, no significant ventilation of the deep water in the Baltic Proper has occurred since the inflows of 2002 – 2003. Oxygen has been consumed across an increasing area and hydrogen sulphide exists in a large area of the Eastern Gotland Basin below about 125 metres, and below 70 metres in the Western Gotland Basin and Northern Baltic Proper. The deep anoxic water even extends up into the Gulf of Finland – although the volume of water affected is not great. As this deep water does not make it over the sill and into the Gulf of Bothnia, the Åland Sea remains well oxygenated even during autumn.





Computer simulation of an inflow



Dead Sea bottom, photo by Nanna Rask

3. Promising trends in emissions and inputs of hazardous substances

The Baltic Sea's habitats and species are threatened by eutrophication and elevated amounts of hazardous substances as a result of decades of human activities in the sea and its surrounding catchment area.

Meteorological conditions, including wind patterns and precipitation, affect the inflow of water from the catchment area and the deposition of pollutants directly into the sea. The total run-off to the Baltic Sea area shows no long-term trend for the period 1950 – 2007. In the last ten years, the total inflow to the Baltic Sea has decreased from a top flow rate of more than 17,500 m^3/s in 1998 to less than 11,000 m3/s in 2003. In 2007, the flow of 13,707 m^3/s was still below the mean.

The inputs of some hazardous substances to the Baltic Sea have been reduced considerably over the past 20 to 30 years. Discharges of heavy metals have particularly decreased. Significant proportions of heavy metals enter the Baltic via rivers or as direct discharges: 47% for lead, 78% for mercury and 87% for cadmium. The remaining share of inputs is mainly from atmospheric deposition of these heavy metals. Dioxin and furan emissions to the air from anthropogenic activities in the Baltic coastal states have decreased by 22% during 1990-2006, whereas the atmospheric deposition of these into the Baltic Sea during the same period has decreased by up to 59%.

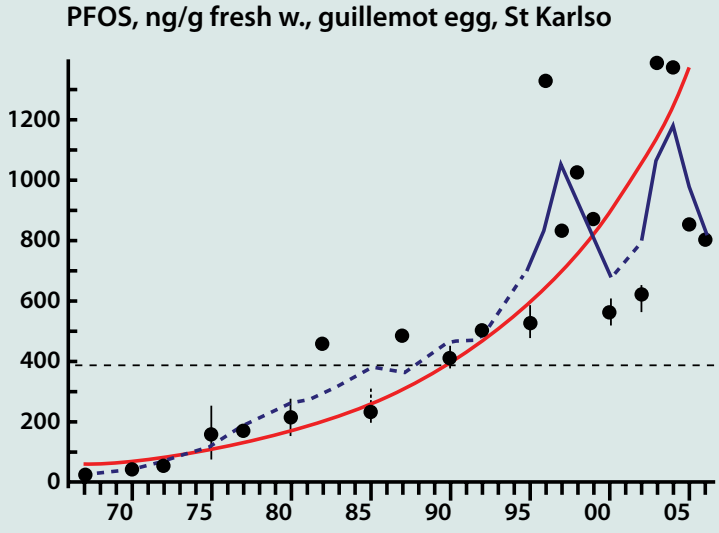
Annual emissions of nitrogen to the air from the HELCOM countries were lower in 2006 than in 1995. Emissions from outside the Baltic Sea region add to the nitrogen loads entering the Baltic, as do emissions from ships. In 2006, 16% of nitrogen oxide (NOx) emissions from international shipping traffic were deposited into the Baltic Sea. Mainly because of annual weather variations, no significant temporal patterns can be detected in nitrogen deposition rates for the Baltic Sea and its sub-basins for the period 1995-2000. Nevertheless, a clear decline after 2000 can be observed, with reductions of 12%, 7% and 10% in the deposition of oxidised, reduced and total nitrogen, respectively, between 1995 and 2006.

4. Heavy metals and organic pollutants still pose a treat to the marine environment

Despite considerable reductions in the inputs of some hazardous substances into the Baltic Sea, the concentrations of heavy metals and organic pollutants in seawater are still several times higher in the Baltic Sea compared to waters of the North Atlantic.

Concentrations of contaminants in fish vary according to substance, species and location. While concentrations of cadmium, lead, PCBs and lindane have all decreased, there is no general trend observable for mercury concentrations. Dioxins show declining trends due to measures taken to reduce emissions between 1969 and 1985; this decline has since ceased. As for the concentrations of flame retardant HBCD, a significant increase of about 3% per year can be observed in guillemot eggs, although no general trend is evident for HBCD levels in herring muscle during the monitoring period 1999-2005. The levels of perfluorooctane sulfonate (PFOS) in guillemot eggs in the early 2000s have been found to be 25-30 times higher when compared to levels in the late 1960s. Although no trend can be observed for the last ten years, no rapid decrease can be expected due to the long environmental half-live of PFOS.

On a positive note, following bans of DDT and PCB during the 1970s around the Baltic, white-tailed eagle productivity began to recover in the 1980s and since the mid-1990s is largely back to a pre-1950 level, with the population on the Swedish Baltic coast increasing by 7.8% per year since 1990.



The temporal trend of PFOS concentration (ng/g fresh w.) in guillemot eggs (1968-2007). The red line is based on a log-linear regression analysis and shows an increasing trend of 7-10% per year; the blue line is a simple 3-point running mean smoother fitted to the annual geometric mean values; the horizontal dotted line is the mean concentration over the whole period.

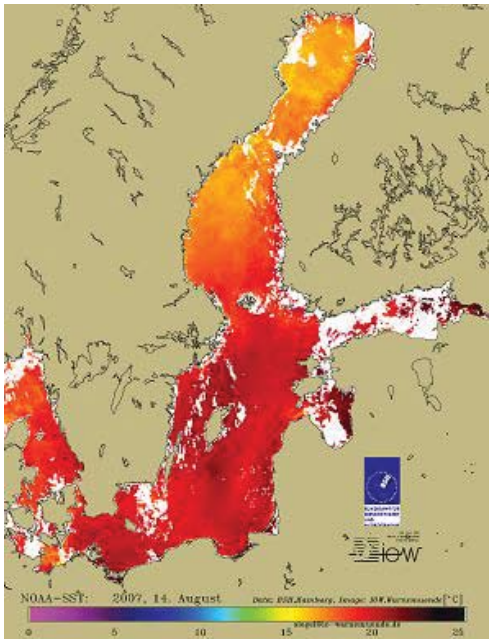

Photo: Metsähallitus 2008, HA

5. Observing sea surface temperatures

The sea surface temperature in 2007 was comparatively warm in the first half of the year with January, February, and April being the

warmest months since 1990 in the entire Baltic Sea and during June in the Baltic Proper. July, August, and September were below the long-term means, however. Consequently, the ice season of 2007-2008 was very late, short and extremely mild in terms of ice extent. According to the Russian Ice Service, the ice season was the warmest recorded during more than 100 years of observations. The largest ice cover (49,000 km^2) was reached as late as 24 March; on 25 May, the Baltic Sea was ice free.

In terms of wave climate, January was clearly the roughest month at all stations where measurements were made. The highest significant wave heights for the year were measured in the Gulf of Finland, the Northern Baltic Proper, the Arkona basin and Skagerrak.



6. Dreaded comb jellies found in the Baltic turn out to be harmless species

In February 2009, the results of DNA tests suggested that the comb jellies, taken as samples in the Baltic Sea last autumn, appear to be a more benign Arctic variety of the Mertensia genus and not the feared American comb jelly species (Mnemiopsis ledyi). Although similar in many ways to the Mnemiopsis ledyi, it is not believed to pose the same threats to the marine ecosystem. Mnemiopsis ledyi has, when introduced to areas outside its own distribution, caused widespread damage to fish stocks, as in the Black Sea, after being introduced there presumably in ships' bilge water.

Researchers now say that the comb jelly which was identified as the intrusive Mnemiopsis ledyi, and first detected in samples taken in the Baltic in 2007, either did not survive the winter or may have been misidentified to begin with.

Comb jellies, now believed to be of the Mertensia variety, were found in samples taken in many parts of the Baltic. It may take some time before precise identification can be made. Researches even think that the Mertensia might actually occur naturally in the Baltic Sea. The Mertensia can grow to between 6 and 8 cm while the Mnemiopsis ledyi, native to the coastal waters of North and South America, can reach 15 cm in length.

In the northern Baltic Sea, gooseberry (Pleurobrachia pileus) occurs naturally but has not been abundant for some twenty years. It is possible, however, that this species has begun to increase again. As the juvenile stages of Pleurobrachia pileus cannot be distinguished with any certainty by microscope, species identification is carried out by genetic methods.

The disputed jelly fish.
Photo: Ilkka Lastumäki, SYKE.

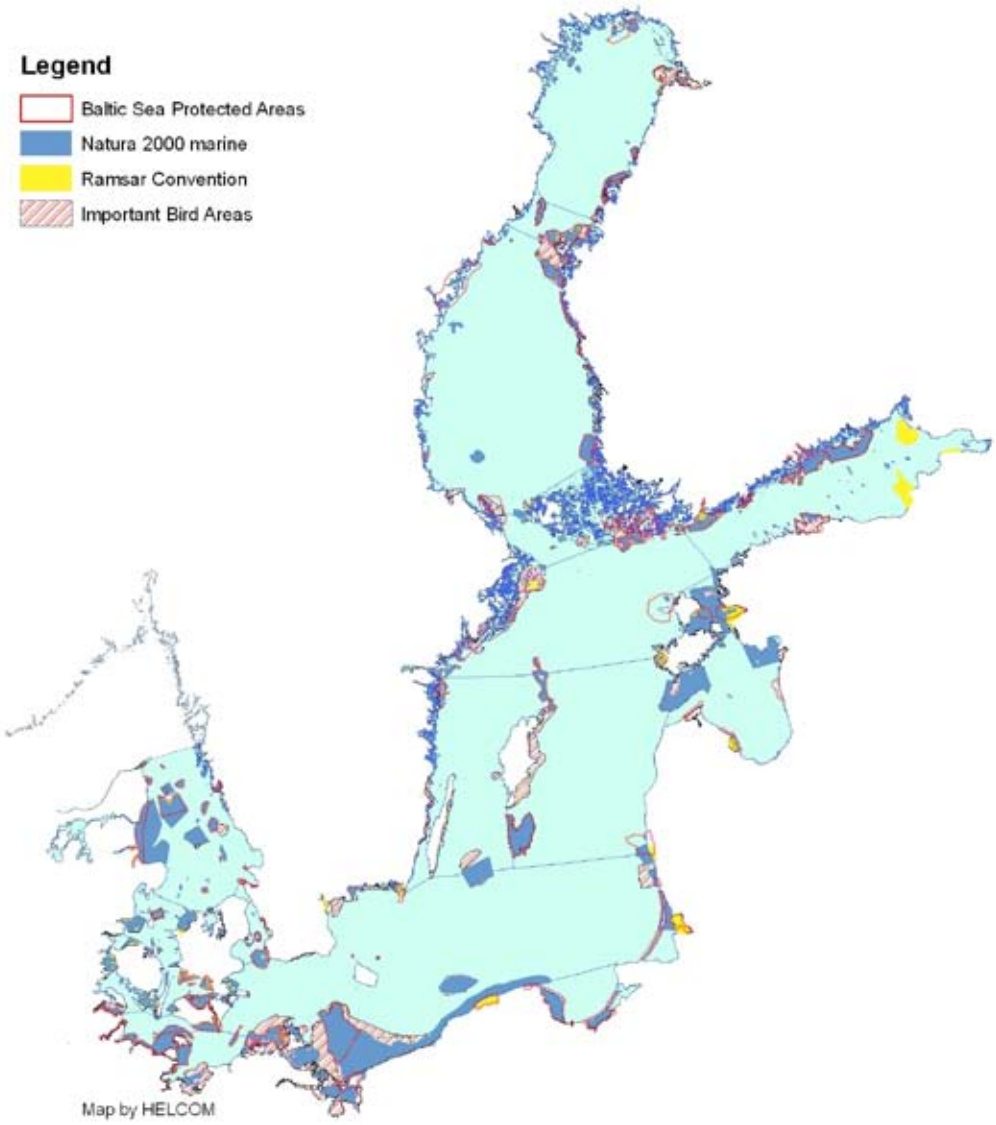
Photo: Michael Hassett

4. Protecting biodiversity

Status of the Baltic Sea Protected Areas network

Currently, the Baltic Sea Protected Areas database contains information on 113 different sites, of which 89 are officially nominated as BSPAs. The BSPA database contains information on the size and boundaries, legal protection, management as well as the occurrence of species, habitats and biotopes within the sites which are used to assess the ecological coherence of the BSPA network. In order to meet the requirements from the HELCOM/OSPAR Joint Work Programme, HELCOM has, during 2008, updated the assessment from 2006. A spatial GIS analysis was used to assess aspects of coherence of the network.

In addition, the HELCOM Secretariat has strengthened the liaison with OSPAR with regard to meeting the requirements of the Joint Work Programme by reinforcing the cooperation with the relevant OSPAR bodies, e.g. the Intercessional Correspondence Group on Marine Protected Areas (ICG-MPA).



Overview of MPAs in the sub-regions of the Baltic Sea area as of January 2009. Note that the sites overlap in the order indicated in the legend. Important bird areas are sites proposed by BirdLife International (they have no protection as such).

Photo: Metsähallitus 2008, EK

Country-wide description of the number and size of the designated and managed sites in the HELCOM BSPA database, and information on the marine proportion of the BSPAs as of December 2008

Country	Number of BSPAs	Total area of BSPAs (km^2)	Proportion protected (%)	Marine proportion of the BSPAs (%)	Marine area (km^2)	Marine proportion of BSPAs in EEZ (%) *
Denmark	16	3,022	6.8	87.6	2,647	19.5
Estonia	5	2,560	6.9	63.0	1,612	0
Finland	22	6,100	7.4	90.4	5,512	0
Germany	12	4,780	31.5	93.7	4,480	54.8
Latvia	4	1,154	4.0	74.8	8,63	0.1
Lithuania	3	6,208	9.5	3.6	2,23	0
Poland	4	2,045	6.9	63.5	1,299	0
Russia	2	3,427	1.4	7.2	246	0
Sweden	21	6,781	4.5	83.9	5,687	2.0
Total	89	27,405	6.6	82.4	22,569	1.2

* Exclusive Economic Zone excl. Territorial Waters.

The 2008 status report concluded that the establishment of an ecologically coherent and well-managed network of Baltic Sea Protected Areas requires relevant legal protection and management measures. Most existing sites lack implemented management plans or other means of site management and are predominantly aimed to protect birds or terrestrial species. Although many sites enjoy some national protection also in marine areas, in most cases it is not clear what species or habitats within the site are really protected features. Since nearly all BSPAs are also EU Natura 2000 sites, this should ensure that at least habitats and species covered by the EU Habitats and Birds Directives are protected. However, since the species and habitats considered in the Habitats Directive only cover a part of the existing biodiversity values in the Baltic Sea, more is needed to create a truly representative and coherent network of marine protected areas. As the HELCOM Lists contain more marine habitats and species than the Habitats and Birds Directives, the BSPA network is an important complement to Natura 2000.

With respect to the full implementation of HELCOM Recommendation 15/5, the Joint Work Programme and the Baltic Sea Action Plan, the BSPA network cannot be considered sufficient to date. Although the BSPA database contains some information on the parameters used to assess the ecological coherence, the information in the database is patchy and, as a result, it is not possible to undertake a comprehensive assessment based on the current level of information and data.

Based on the identified gaps, the following actions were proposed to be carried out by the HELCOM Member States:

- Use the BSPA network as one measure to protect the entire ecosystem and the whole range of species, habitats and ecological processes in the region, including the threatened and/or declining species, habitats, biotopes and biotope complexes, and habitat building species;

- Designate all marine Natura 2000 sites as BSPAs and designate additional offshore areas of ecological importance as BSPAs;

- Develop and implement management plans for all BSPAs (or where more appropriate measures and routines);

- Complete the HELCOM BSPA database with all data required, particularly with data on marine landscapes, species and habitats inside BSPAs and in the entire Baltic Sea in order to:

  - assess how habitats and species are represented and protected in the network,

  - assess how important nursery, juvenile, spawning, feeding, moulting and wintering areas of threatened or declining (and important) species are represented and protected in the network,

  - assess how rare, unique or representative geological or geomorphological structures or processes are represented and protected in the network;

- Use the marine landscapes to protect a wide range of species, habitats and ecological processes, especially when there is a lack of more detailed data;

- Use a regional and systematic approach to site selection as it maximises the chance of creating a BSPA network that meets the conservation targets in an efficient way and, at the same time, minimises the impact on other interests;

- Integrate the BSPA designation in an overarching spatial planning and management process in combination with other management tools.

Photo: Metsähallitus 2008, HA

Identifying and listing threatened species and biotopes

Pressures on the Baltic marine environment from human activities have resulted in losses of sensitive marine habitats and reductions in several areas in the populations of marine species, including many fish and marine mammals.

The publication of HELCOM's lists of threatened and declining species and habitats or biotopes in 1998 and 2007 was a first step in identifying species and habitats which are threatened, declining, or in immediate need of protection, and in assessing human activities with adverse impacts on biodiversity. Experts have also compiled draft fact sheets for most of the listed species and biotopes, which can be viewed on the HELCOM website (http://www.helcom.fi/environment2/biodiv/endangered/en_GB/fact_sheets/).

With the adoption of the Baltic Sea Action Plan, it was agreed that the HELCOM Red Lists of habitats/biotopes and biotope complexes will be updated and a comprehensive Red List of Baltic Sea species will be produced by 2013.

The five-year project to complete the Red Lists on habitats/biotopes and species was initiated in 2009. The activities will include the production of complete species lists and threat assessments according to the IUCN criteria concerning macrophytes, benthic invertebrates, water birds, fish and lamprey species and marine mammals.

Towards the ecosystem-based management of the Baltic fisheries

A new initiative to intensify the integration of fisheries and environment policies in the Baltic Sea area in order to ensure conservation and sustainable use of marine biodiversity was launched in 2008. The First Meeting of the Baltic Fisheries and Environmental Forum, held by HELCOM on 23 September, showed that the fisheries and environmental authorities of the Baltic Sea countries have considerable interest in working together to resolve possible conflicts between nature protection and fisheries management. The Meeting discussed a wide range of issues, including fisheries management within marine protected areas in the Baltic Sea. The development of an ecologically coherent network of marine protected areas, including fisheries management measures to be applied there by 2010, is one of the goals of the HELCOM Baltic Sea Action Plan.

It is essential that the competent environmental and fisheries authorities in the region have a common platform to discuss fisheries in the context of the protection of the Baltic marine environment. Although the fisheries sector has a significant impact on biological diversity, habitats and species, it is also dependant on a healthy ecosystem for its survival. The results of these discussions on how to better integrate fisheries and environment policies will be very important for the successful implementation of the Baltic Sea Action Plan.

The First Meeting of the Forum approved a Joint Statement on the general implementation status of marine protected areas in the Baltic Sea area, with a specific focus on fisheries management measures. Taking into account the ongoing EU work to develop guidelines for fisheries in marine protected areas around Europe, the Joint Statement calls for the need to have a Baltic regional approach, which takes into account regional specificities. It underlined the importance of gathering and exchanging data on marine environmental status and fisheries efforts. The Joint Statement also stressed the importance of projects carried out jointly with fisheries and environmental authorities to study the possible harmful effects of specific fishing practices in marine protected areas, and the need to ensure that the outcomes of joint projects are used in the policy-making processes. Additionally, participants agreed on the importance of broad stakeholder involvement, as well as the need to enhance knowledge on socio-economic impacts in relation to the analysis of various management options for fisheries. The Joint Statement was submitted to the Expert Meeting on the establishment of the EU Natura 2000 marine sites, held on 29 September 2008 in Brussels, where the implementation of fisheries management measures and the guidelines on the establishment of such in marine protected areas were also discussed.

Among other key issues, the Meeting discussed the idea of a possible HELCOM project concerning a new inventory and classification of the Baltic salmon and sea trout rivers. Participants agreed that this inventory will be essential for the development and implementation of the new salmon management plan in the region. Participants also agreed that such an inventory should be carried out in close cooperation with the fisheries and environmental administrations of all the Baltic coastal countries. Additionally, the Meeting discussed the promotion of the ecosystem-based management of coastal fisheries, spatial planning issues and the integration and exchange of fisheries and environmental data for this purpose.

Photo: Samuli Korpinen, HELCOM

Photo: Nikolay Vlasov, HELCOM

5. Combating eutrophication and hazardous substances

Excessive nitrogen and phosphorus loads from land-based sources are the main cause of the eutrophication of the Baltic Sea. Up to 75% of the nitrogen load and at least 95% of the phosphorus load enter the Baltic Sea via rivers or as direct waterborne discharges. At least 25% of the nitrogen load comes as atmospheric deposition.

Hazardous substances include various anthropogenic substances which pollute the marine environment. They include both substances that do not occur naturally in the environment and certain naturally occurring substances whose concentrations today exceed natural levels.

Hazardous substances have adverse effects on the ecosystem, including the impaired general health status and reproductive ability of animals, especially top predators, and the increased contamination of fish eaten by humans.

Although monitoring indicates that the loads of some hazardous substances have been reduced considerably over the past 20–30 years, problems still persist, and concentrations in the marine environment of some new substances have even increased.

Measures to reduce impacts of eutrophication and hazardous substances have been equally addressed within the activities of the HELCOM Land-based Pollution Group.

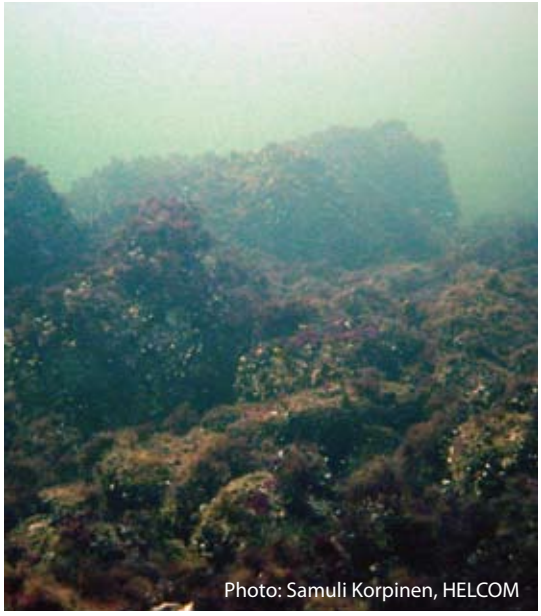


Photo: Samuli Korpinen, HELCOM

Assessing eutrophication impacts

HELCOM assessments clearly show that problems with eutrophication persist in most of the Baltic's sub-basins and that good environmental status has not been reached. Activities to identify further cost-effective nutrient reduction measures in different sectors and parts of the Baltic Sea catchment area are ongoing, and will continue to provide input for implementation of the Baltic Sea Action Plan.

While preparing the plan, HELCOM has assessed the environmental impacts of various policies in the Baltic Sea region. The results of a number of policy scenarios produced by the Baltic NEST Institute using the MARE programme have been compared with HELCOM's target levels for the environmental indicator 'water clarity' measured by Secchi depth. The results show how far the existing EU legislation and programmes, as well as HELCOM Recommendations, will bring us towards reaching the targets for eutrophication and good environmental status. While accurate policy scenarios are difficult to develop, even imperfect scenarios can provide useful guidance on the extent to which further measures are needed. This work combines pollution load models with environmental effect models in order to predict the environmental effects of various policies.

Nutrient reduction efforts should particularly address the impact of agriculture, since less progress has so far been made to reduce emissions in agriculture than for point sources such as municipalities and industry, and also because agricultural production is expected to grow following the enlargement of the European Union. Reductions in nutrient releases from agriculture can be achieved through a combination of different measures applied according to local characteristics such as soil properties and watershed retention rates. Scenarios show substantial reductions in nitrogen and phosphorus releases if balanced strategies are applied optimising nutrient use and minimising nutrient fluxes from agricultural systems, such as animal feeding, manure use and crop cultivation. The scenarios also show that nutrient inputs will increase substantially if agricultural production is intensified

throughout the Baltic Sea region without the application of strict measures.

The results of the MARE scenarios also show that there is great potential for further decreases in nutrient inputs from other sources, especially in Estonia, Latvia, Lithuania, Poland, Russia and Belarus. Key measures include:

- the implementation of efficient municipal wastewater treatment,
- increased connectivity to sewerage systems, and
- the introduction of phosphorus free detergents.

Although the implementation of existing regulations will reduce such inputs substantially, going beyond and speeding up the agreed programmes would further improve the situation. These measures will primarily reduce loads of phosphorus. In order to reduce the loads of nitrogen, non-point sources, particularly in agriculture, have to be addressed.


Photo: Elena Bulycheva

Assessments also show that the atmospheric nitrogen deposition to the Baltic Sea, including nitrogen coming from sources outside the catchment of the HELCOM countries, makes up a large proportion of nitrogen input and thus should also be addressed. According to scenarios, the deposition of nitrogen will not decrease even if the existing targets for nitrogen under the Gothenburg Protocol to the UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP) and the EU National Emissions Ceilings (NEC) Directive are reached.

One of the aims of the HELCOM Baltic Sea Action Plan is to encourage and enhance the full enforcement of existing legislation. However, even after the current legislation has been fully implemented, additional nutrient reductions will be necessary to achieve a good ecological and environmental status for the Baltic Sea. The necessary actions go beyond those needed to reach good status according to the EU Water Framework Directive (WFD), as the restoration of the whole Baltic Sea requires more drastic measures than those within the one nautical mile limit from the coast regulated by the WFD. It is expected that the actions presented

Photo: Elena Bulycheva

in the Baltic Sea Action Plan will also serve to implement the EU Marine Strategy Framework Directive.

Based on the results of the scenarios, cost-efficiency analyses and evaluations of gaps in existing requirements at HELCOM, national and international level, there is a need to take actions both for point and diffuse sources in the following sectors:

- Wastewaters from municipalities, scattered settlements and single family homes
- Agriculture
- Transboundary airborne and waterborne pollution

Since diffuse nutrient sources also have a central role in determining the future state of the Baltic marine environment, the EU Member States around the Baltic will give joint input to the forthcoming Health Check of the EU Common Agricultural Policy. They will state the importance to the marine environment of pillar II on the rural development programmes and cross compliance, as well as the need to revise the targets for nitrogen in the UNECE Gothenburg Protocol and the EU NEC Directive.

The implementation of the action plan will also include the identification of further pollution hot spots on a plant-by-plant basis, e.g., concerning installations for the intensive rearing of poultry, pigs and cattle which should be addressed as a first priority. There will also be more stringent requirements for agriculture such as environmental permit conditions for livestock farms and rules governing the application of manure. The action plan also encourages the elaboration of bilateral and/or multilateral projects and programmes to reduce nutrient inputs using the most cost-efficient measures, particularly seeking to address transboundary nutrient inputs from the non-HELCOM countries. The action plan suggests that such inputs should be jointly dealt with under a 'common pool', which can be diminished through both national means and voluntary funding from non-profit foundations and private companies.

Present nutrient inputs to the Baltic Sea

HELCOM's monitoring programmes provide regular information on the waterborne and airborne inputs and sources of nutrients to the Baltic Sea and their trends. HELCOM's Pollution Load Compilations (PLCs) are among the most comprehensive sources of reliable scientific data on the state of the environment of the Baltic Sea, as they contain quantitative and qualitative information on direct and indirect discharges of various contaminants into the Baltic Sea watershed and air emissions by all the HELCOM countries. The integrated thematic assessment of eutrophication of the Baltic Sea, released in March 2009, complimented the work carried out within the PLCs by measuring and evaluating impact of nutrient enrichment in the Baltic Sea Region, and linking excessive nutrient inputs to their effects in marine environment thus enabling the development of policy measures to curb eutrophication.

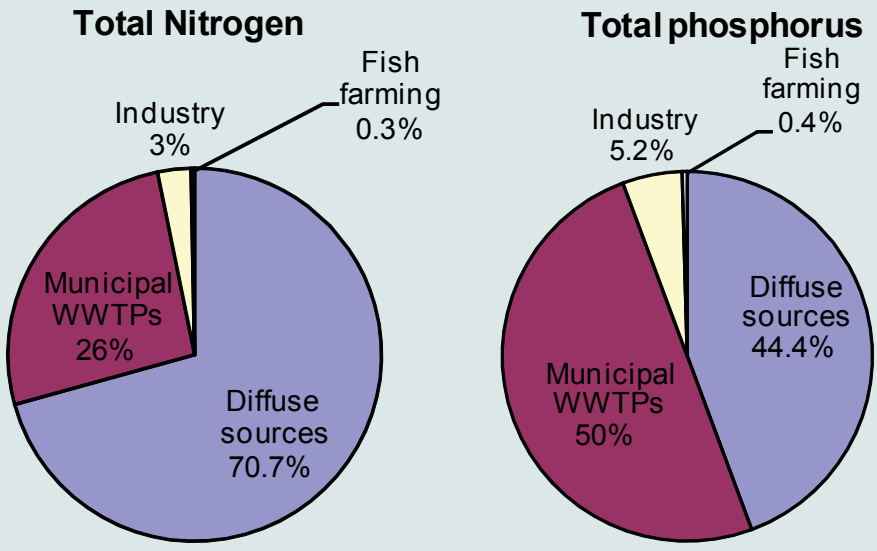

Photo: Metsähallitus 2008

1. Overview of nutrient inputs

Nutrients enter the Baltic Sea via rivers, as direct discharges from sources located along the coastline, and via atmospheric deposition. Nutrients in riverine discharges originate from the catchment area. They may originate as discharges from point sources, such as industrial or municipal wastewater plants, as losses from diffuse sources, mainly agriculture and scattered dwellings, or as airborne deposition onto the land and waterbodies of the catchment. Natural background sources mainly refer to natural erosion and leakage from unmanaged areas that would occur irrespective of human activities. The airborne loads originate from emissions both inside and outside the catchment area of the Baltic Sea.

2. Waterborne nutrient inputs

In the Baltic Sea catchment area, the major anthropogenic source of waterborne nitrogen is clearly diffuse inputs. They constitute 71% of the total load into surface waters within the catchment area. Agriculture alone contributed



Proportion of the inputs of total nitrogen and phosphorus by source into surface waters within the catchment area of the Baltic Sea in 2000 (HELCOM 2004)

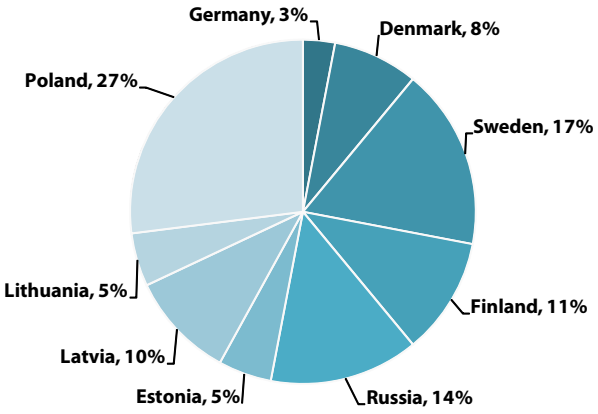

Photo: Nikolay Vlasov, HELCOM

about 80% of the reported total diffuse load. The largest loads of phosphorus originated from point sources (56%), with municipalities as the main source, constituting 90% of total point source discharges in 2000.

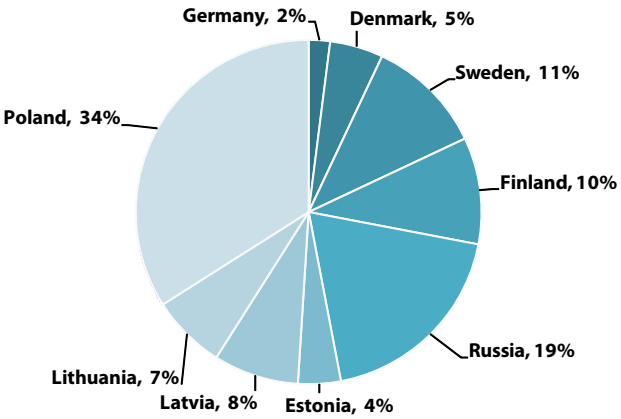
Load inventories with source apportionment in the catchment are carried out only periodically (annual data are not available). The final data concerning loads for 2006 from the ongoing Fifth Pollution Load Compilation (PLC-5) Project are not yet available; however, some preliminary results have been included in the thematic assessment of eutrophication. The data currently available indicate that the general situation will not change significantly from the situation in 2000 (PLC-4 Project). However, the role of agriculture may be somewhat more pronounced as a result of the increased implementation of nutrient removal measures in the municipal sector.

In 2001–2006, the average annual total waterborne (riverine, coastal areas, and direct point and diffuse sources) load of nitrogen entering the Baltic Sea amounted to 641,000 tonnes, and phosphorus 30,200 tonnes. The main contributors of nitrogen were Poland (27%), Sweden (17%), and Russia (14%). The largest loads of phosphorus originated from Poland (34%), Russia (19%), and Sweden (11%).

Total Nitrogen



Total Phosphorus



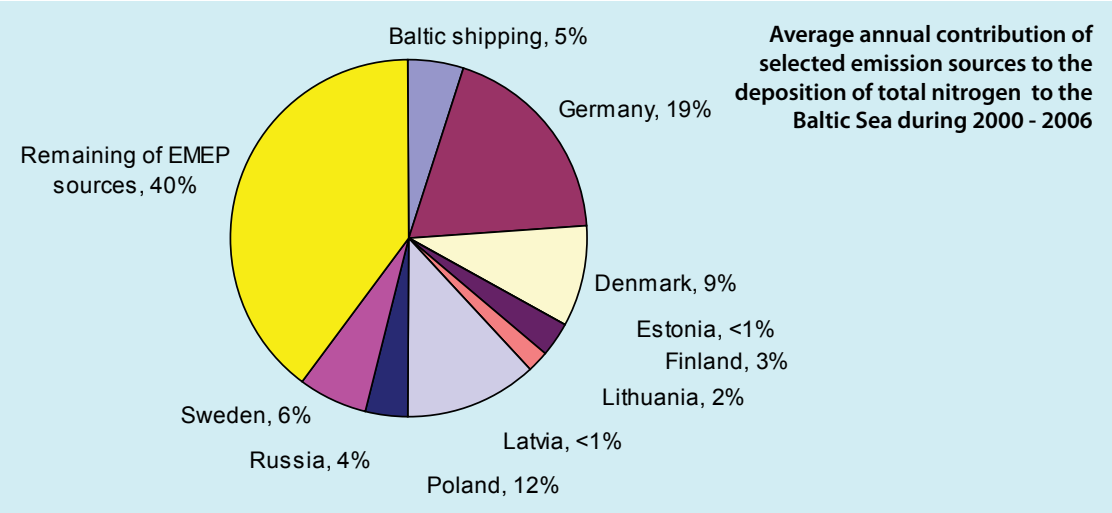
The average annual proportions of total nitrogen (left diagram) and total phosphorus (right diagram) inputs into the Baltic Sea by HELCOM countries in the period 2001–2006

3. Airborne nutrient inputs

Airborne nitrogen contributes significantly to the input of nutrients to the Baltic Sea - of the total nitrogen input to the Baltic around a quarter comes as atmospheric deposition. The estimated airborne contribution to total phosphorus loads is only 1-5%.

Nitrogen compounds are emitted into the atmosphere as nitrogen oxides and ammonia. Road transportation, energy combustion and shipping are the main sources of nitrogen oxide emissions in the Baltic Sea region.

In the case of ammonia, roughly 90% of emissions originate from agriculture. Agriculture is the most significant contributor of total airborne nitrogen, accounting for 43% of the total air emissions of nitrogen from the HELCOM countries. Consequently, the need to reduce emissions and discharges from agriculture has become increasingly important as this sector is also responsible for the majority of waterborne nitrogen discharges into the Baltic Sea. Distant sources outside the Baltic Sea catchment area account for up to 40% of the total airborne deposition of nitrogen.

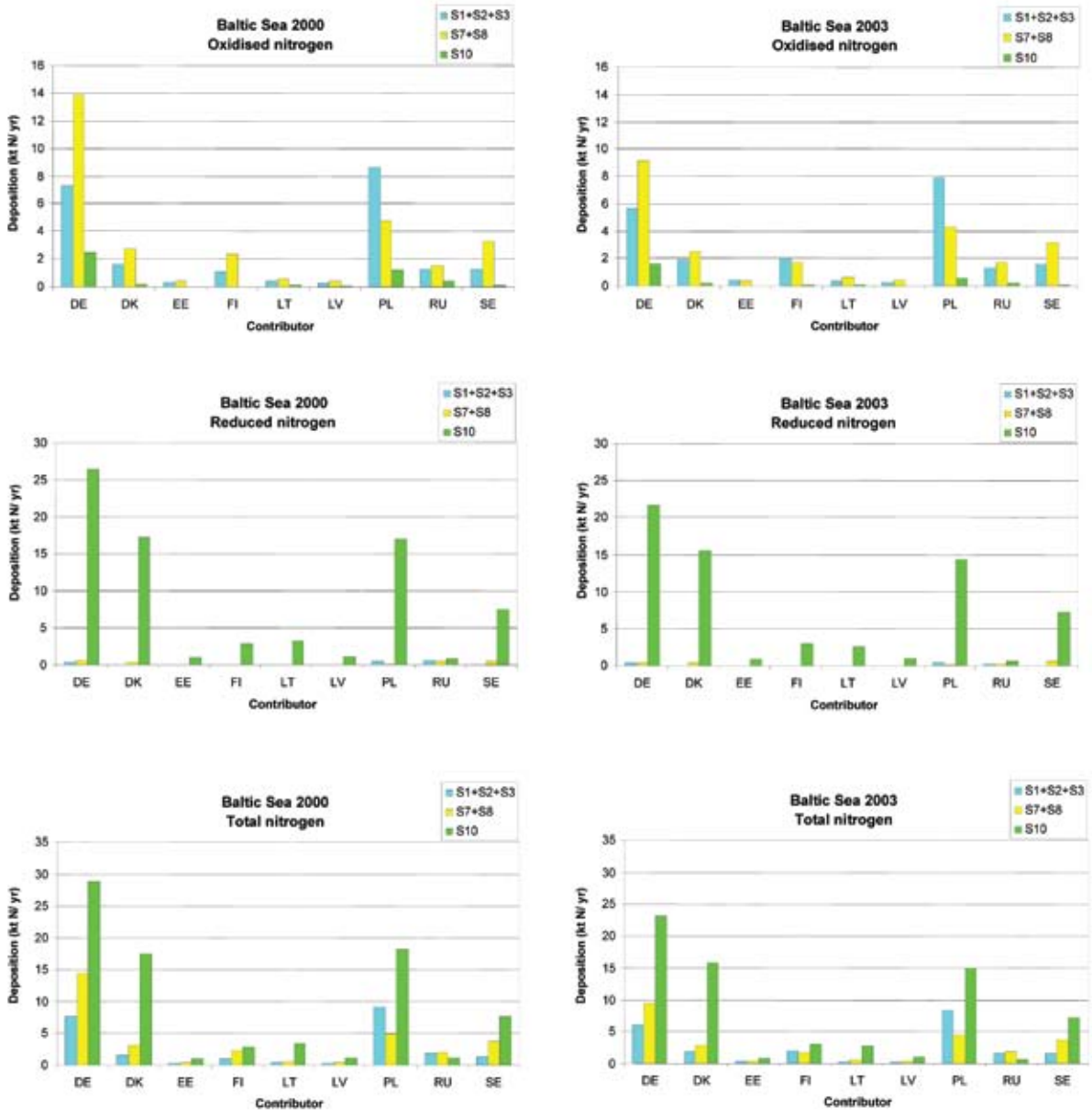


Average annual contribution of selected emission sources to the deposition of total nitrogen to the Baltic Sea during 2000 - 2006

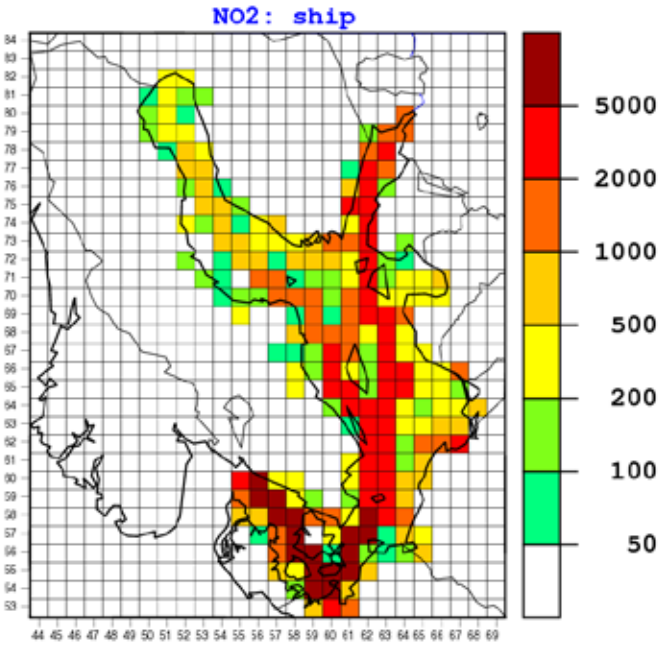
Photo: Sergey Vlasov

Contributions of selected emission sectors from individual HELCOM countries to the depositions of oxidised, reduced and total nitrogen in the entire Baltic Sea basin in 2000 and 2003 are given below. The major changes between 2000 and 2003 are lower contributions of transportation sectors from Germany and higher contributions of combustion sectors from Finland to oxidised nitrogen deposition in 2003.

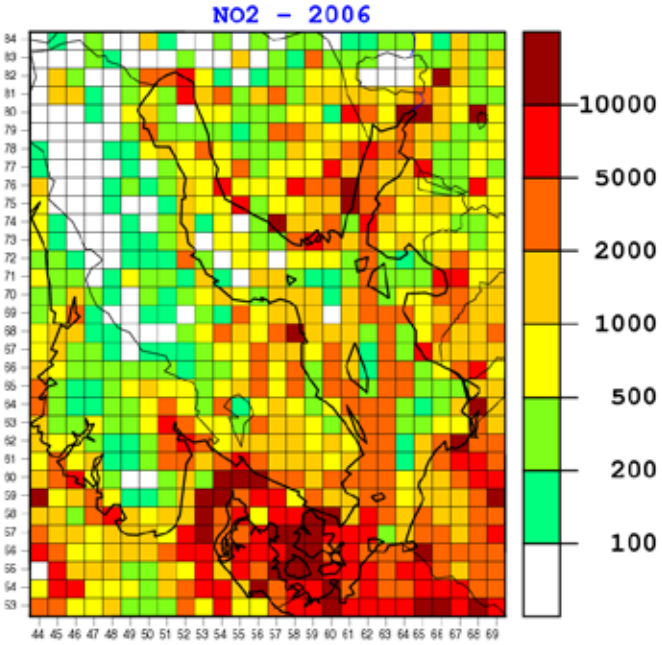
The spatial distribution of nitrogen emissions from HELCOM countries and from the ship traffic does not change much from one year to another.



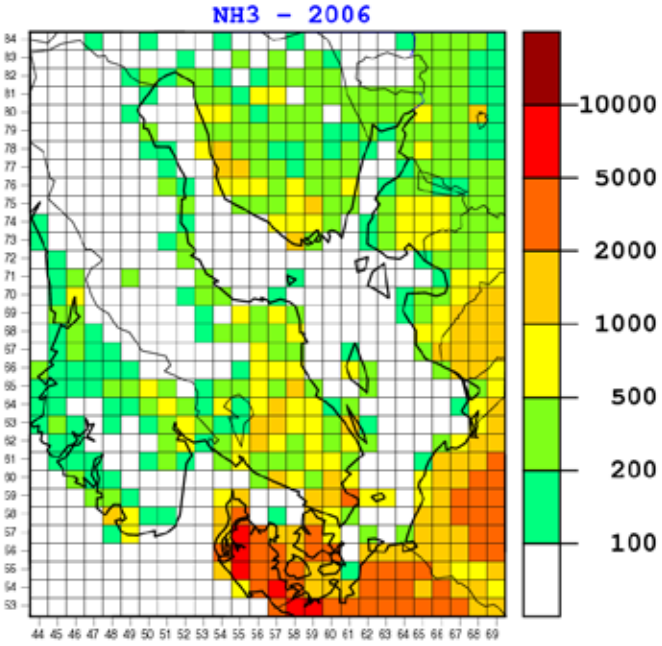
Contributions of selected emission sectors in individual HELCOM Contracting Parties to the depositions of oxidised, reduced and total nitrogen in the entire Baltic Sea basin in 2000 and 2003. Units: kt N per year. Note that sectors 1, 2 and 3 are related to emissions from combustion processes; sectors 7 and 8 are related to emissions from transportation; and sector 10 is related to emissions from agriculture.



Map of annual emissions of nitrogen oxides from international ship traffic on the Baltic Sea in 2006 used in the EMEP model calculations. Units: Mg of NO_2 per year and per 50×50 km grid cell.



Map of annual emission of oxidised nitrogen (including emissions from ship traffic) in the Baltic Sea region in 2006. Units: Mg (tonnes) of NO_2 per year and per 50×50 km grid cell.



Map of annual emission of ammonia in the Baltic Sea region in 2006. Units: Mg of NH_3 per year and per 50×50 km grid cell.

Achieved input reductions

The Helsinki Convention, HELCOM's Recommendations, the EU legislation and other national and international regulations have all imposed stricter controls on industry, municipalities and diffuse sources such as agriculture.

1. Achieved reductions in waterborne discharges and inputs

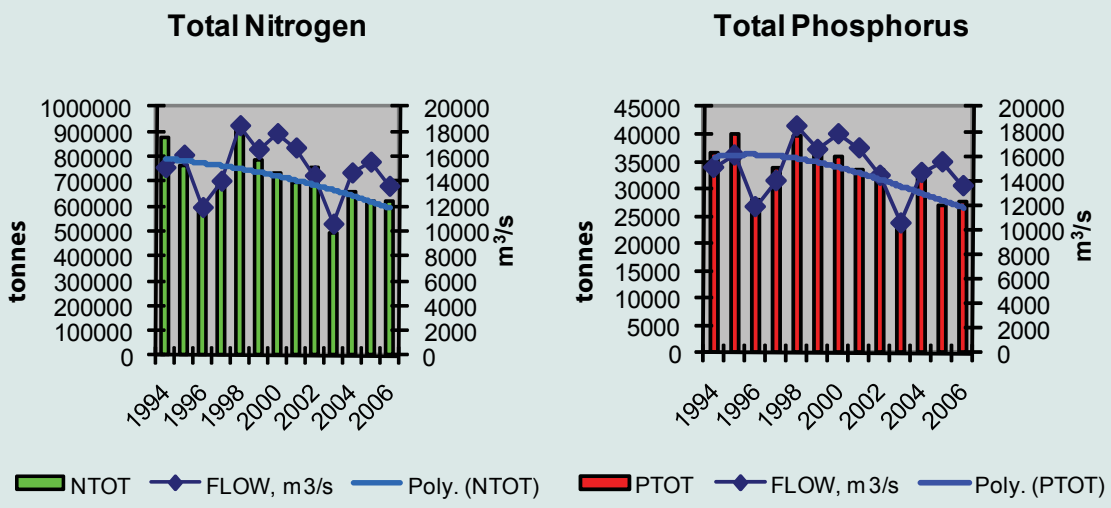
Compared with the previous six-year period (1995–2000), total loads decreased for both nitrogen [without Russia, which did not provide data for the former period] (–16.9%) and phosphorus (–17.5%). At the same time, the average annual flow also decreased by 9.8% [11.2% without Russia]. Therefore, it is obvious that almost two-thirds of the observed decrease can be explained by the differences in hydrological conditions during these two periods. Nutrient fluxes vary considerably from year to year depending mainly on hydrological conditions. In periods of high run-off, nutrients are abundantly leached from soil, thus increasing the loads originating from diffuse sources and natural leaching.

Riverine nutrient discharges, especially of phosphorus, appear to have decreased during the entire 13-year period from 1994–2006, for which annual data are available from the HELCOM countries. In addition to the hydrological changes, this most probably also reflects the implementation of load reduction measures in the catchment area (mainly improved treatment of municipal and industrial wastewaters). It is also known that the load reduction measures are particularly efficient for phosphorus in municipal wastewater treatments plants, which is reflected in the larger decrease in the phosphorus load. This conclusion is also supported by the data on direct discharges of phosphorus and nitrogen

Photo: Elena Bulycheva


Photo: Nikolay Vlasov, HELCOM

into the Baltic Sea during the periods mentioned above. Comparable data for these periods are available from five HELCOM countries (Germany, Denmark, Finland, Lithuania, and Poland). Direct discharges decreased between these two periods in all cases for both phosphorus and nitrogen. The average decrease varied from 16.4% in Poland to 66.5% in Germany for nitrogen; and from 23.4% in Finland to 68.9% in Lithuania for phosphorus. The proportion of direct point-source discharges in the total load was significant in Denmark and Finland. In Denmark, the decrease was around 40% for both phosphorus and nitrogen and in Finland it was around 25% respectively.



Riverine and direct point-source inputs into the Baltic Sea from 1994–2006.
NTOT = Total nitrogen; PTOT = Total phosphorus

Point sources

The progress in reducing waterborne nutrient discharges from point sources has been rather good, with the 50% reduction target (1988 Ministerial Declaration) for phosphorus achieved by almost all HELCOM countries already in 2000. Further reductions in nutrient discharges from point sources are likely in many countries as a result of the continued implementation of phosphorus removal measures in municipal wastewater treatment plants (MWWTPs). In particular, the new EU Member States have, in recent years, undertaken extensive modernisation actions for both MWWTPs and industries. In Russia, the situation is improving rapidly and the largest single polluter, the city of St. Petersburg, targets a phosphorus removal efficiency of 90% by the year 2012.

Preliminary country-wide priority lists for municipal waste water treatment plants have been prepared within the Project prioritisation under the eutrophication segment of the HELCOM Baltic Sea Action Plan. The lists identify some potential priority targets for environmentally motivated investments, the full-scale improvement of sewage treatment and the acceleration of reaching the advanced requirements for phosphorus removal.

According to the project description, the first stage of the project seeks to identify and collect data from waste water treatment plants located within a 50 km coastal strip in the eastern Baltic Sea catchment countries Estonia, Latvia, Lithuania, Poland and Russia. In addition, WWTPs in the Baltic Sea catchment area of Belarus can be included if sufficient data can be obtained. Identification of single municipal waste water treatment plants including the collection of available data was made on the basis of PLC-5 reports. These were complemented by HELCOM LAND reports as well as national, publicly available reports and datasets. The combined national working lists of WWTPs >10,000 p.e. and >2,000 – 10,000 p.e., respectively, are being reviewed by HELCOM PLC focal points.

Another measure which can significantly reduce load of phosphorus into the Baltic Sea is introduction of phosphate-free detergents. Scenario calculations by the Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Germany, and the Baltic NEST Institute, Sweden, clearly showed that the introduction of phosphorus-free detergents would substantially contribute to the needed reduction of phosphorus load and eutrophication in the Baltic Sea. The largest effect would be achieved in transitional countries such as Poland and the Baltic States where the cleaning standard by MWWTPs is less compared to the EU-15 countries. The effect of phosphorus-free

Photo: Irina Gasilina


Photo: Elena Bulycheva

detergents in the Odra watershed, for example, is larger than the effect of MWWTPs treatment efficiency improvement. The combined measures (phosphorus-free detergents + MWWTP) could be sufficient to reach a good ecological state in the lower part of Odra. P-free detergents would lead to a substantial reduction of the phosphorus load of Odra and Daugava to the Baltic Sea. This would also be the case if the improvement of the MWWTPs is implemented. Larger effects can be reached if phosphorus-free detergents would also be introduced in the none-EU countries such as Russia and Belarus. For Poland alone, an introduction of phosphorus-free detergents could reduce the loads to the Baltic Sea by up to 3,000 tonnes per year. For the entire Baltic Sea catchments, the possible reductions could be in the order of 3,000-9,000 tonnes per year, corresponding to 10-30% less inputs of total phosphorus into the Baltic Sea. This would certainly improve the environmental status of the Baltic Sea, as marine model runs (SANBALTS, BNI) clearly demonstrated that such a drastic reduction in total phosphorus loads would significantly decrease blue-green algae blooms.


Photo: Metsähallitus 2008, HA

Phosphate is used in a detergent to bind calcium and magnesium ions. These would otherwise bind to the tensides that are intended to dissolve dirt and would thus become innefective. Phosphate also prevents dirt from attaching to the materials being washed and from forming lime deposits in the washing machine. It is what is called a 'softener' or 'builder'. Phosphate is a nutrient for algae and other plants when the washing water is released to lakes and streams. During the end of the 1980s, the annual use of sodium tripolyphosphate by Swedish households was estimated to be more than 12,000 tonnes. In many detergents, phosphates have since been substituted by other softeners, for example by carboxylates such as citrates and gluconates or by zeolites.

On 6 December 2007, the Swedish government decided to ban phosphates in detergents for

consumer use. The prohibition came into force on 1 March 2008. Sweden has been supporting a proposal for a ban of phosphates in laundry detergents for countries around the Baltic Sea in the work of HELCOM. In the next few years, all HELCOM countries (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden) will be presenting national programmes on phosphates in detergents.

Diffuse sources

Contrary to the development for point-source loads, the results from the diffuse sector reflect the fact that measures to reduce nutrient loads from agriculture have fallen short of their aims in many HELCOM countries. However, also for agriculture it can be foreseen that the implementation of load reduction measures will support further reductions in nutrient loading (e.g. the Baltic Sea Action Plan, the EC Nitrates Directive and the EU Water Framework Directive). On the other hand, a possible intensification of agricultural activities in the new EU countries and Russia might, without further measures, lead to an increase in nutrient loads to the Baltic Sea.

The prevention of pollution from agriculture was also addressed by the submission of a joint position of the HELCOM countries, also being EU Member States, to the process of revision of the EU Common Agricultural Policy with a view to highlight the need for region-specific measures to be applied in local agricultural practices.

The revised Part II of Annex III of the Helsinki Convention, regarding prevention of pollution from agriculture, as amended by HELCOM Recommendation 28E/4, will require additional measures to be implemented in all HELCOM countries, particularly with regards to intensive rearing of cattle, poultry and pigs, which goes beyond the obligations under the EU legislation.

The share of phosphorus discharges from scattered settlements is thought to be higher than from municipalities. Therefore, scattered settlements and single-family houses will be required by HELCOM Recommendation 28E/6 to implement adequate level of treatment of their wastewaters.

Photo: Maria Laamanen, HELCOM


Photo: Nikolay Vlasov, HELCOM

2. Achieved reductions in airborne emissions and deposition

Since 1980, there has been a reduction of approximately 38% in the emissions of total nitrogen emissions into the air. For all HELCOM countries, except Russia (3% increase) and Lithuania (2% increase), reductions of total nitrogen emissions can also be observed in the period 1994 – 2006. The reduction is more significant for nitrogen oxides emissions than for ammonia emissions; however, it should be taken into account that nitrogen oxide emissions from international ship traffic on the Baltic Sea showed an increasing trend during this period and is also expected to increase.

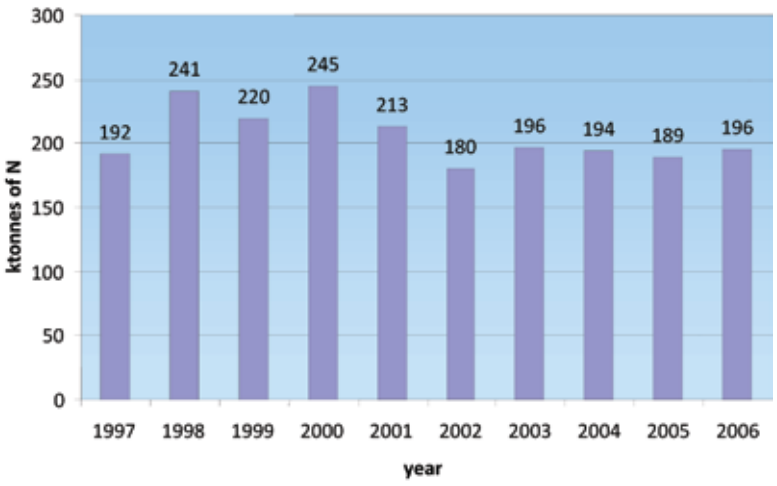
In all HELCOM countries, except Latvia and Russia, nitrogen oxides emissions were lower in 2006 than in 1995 with the most significant drop of nitrogen oxides emissions in Sweden (35%) and Germany (35%). A reduction during this period can be also noticed in Denmark (27%), Finland (25%), Estonia (21%), Poland (21%) and Lithuania (5%). Nitrogen oxides emissions in Latvia were 7% and in the Russian Federation 30% higher in 2005 than in 1995.

Ammonia emissions in all HELCOM Contracting Parties, except Finland and Lithuania, were lower in 2006 than in 1995, by 3% to 28%. Compared to 1995, ammonia emissions in Finland and Lithuania were respectively 4% and 3% higher in 2006.

Mainly because of inter annual changes in meteorological conditions, annual nitrogen deposition to the Baltic Sea and its sub-basins vary significantly year on year during 1995 - 2006. The maximum annual deposition of oxidised and reduced nitrogen deposition to the Baltic Sea took place in 1998 and 2000 respectively. The minimum annual deposition can be noticed in 2002 for both oxidised and reduced nitrogen. The annual deposition of oxidised, reduced and total nitrogen in 2006 was respectively 12%, 7% and 10% lower than in 1995.

Land-based air emissions are quite well regulated at all levels, and programmes for the reduction of emissions from the different sectors have been adopted in the EU and by the United Nations Economic Commission for Europe (UNECE). The Gothenburg Protocol under the Convention on Long-Range Transboundary Air Pollution (CLRTAP) of UNECE and the EU National Emission Ceilings (NEC) Directive are among the most important regulatory instruments at the European level to reduce airborne pollutants. Taking into account that almost half of the nitrogen deposition on the Baltic Sea originates from outside the catchment area, these instruments are important when evaluating possible further developments and the adequacy of measures taken to reduce airborne nitrogen pollution.

Deposition of total nitrogen to the Baltic Sea during 1997-1006



HELCOM eliminates another Baltic Sea pollution hot spot

In March 2008, HELCOM approved the removal of one more hot spot from the list of the Baltic Sea's most significant pollution sources. This latest development means that more than half of the designated 162 pollution hot spots in the region have now been eliminated.

The most recent development, announced by the annual HELCOM Meeting in March 2008, is the recovery of Hot Spot No. 22 'St. Petersburg Metal Plating Industry/Heavy metals in wastewater and sludge', where major investments in wastewater treatment have significantly reduced pollution.

The Hot Spots List of the most significant point sources of pollution around the Baltic Sea was first drawn up under the HELCOM Baltic Sea Joint Comprehensive Environmental Action Programme (JCP) in 1992. The hot spots were designated by an international group of scientists, engineers, environmental managers, financers and government representatives, according to practical economic considerations as well as the seriousness of their impact on the environment and human health.

The JCP programme aims to facilitate the implementation of pollution reduction measures at the most polluted sites in the Baltic Sea catchment area. This programme, which should be completed by 2012 at the latest, specifies a series of actions to be undertaken at pollution hot spots. The most notorious hot spots are point sources such as municipal facilities and industrial plants; however, the programme also covers pollution from agricultural areas and rural settlements, as well as sensitive areas where special environmental measures are needed, such as coastal lagoons and wetlands.

Certain hot spots have been broken down into sub-hot spots in order to facilitate their management and actions to reduce pollution. A total of 79 hot spots and sub-hot spots now remain on the list, following the deletion of 83 of the earlier identified 162 hot spots/sub-hot spots.

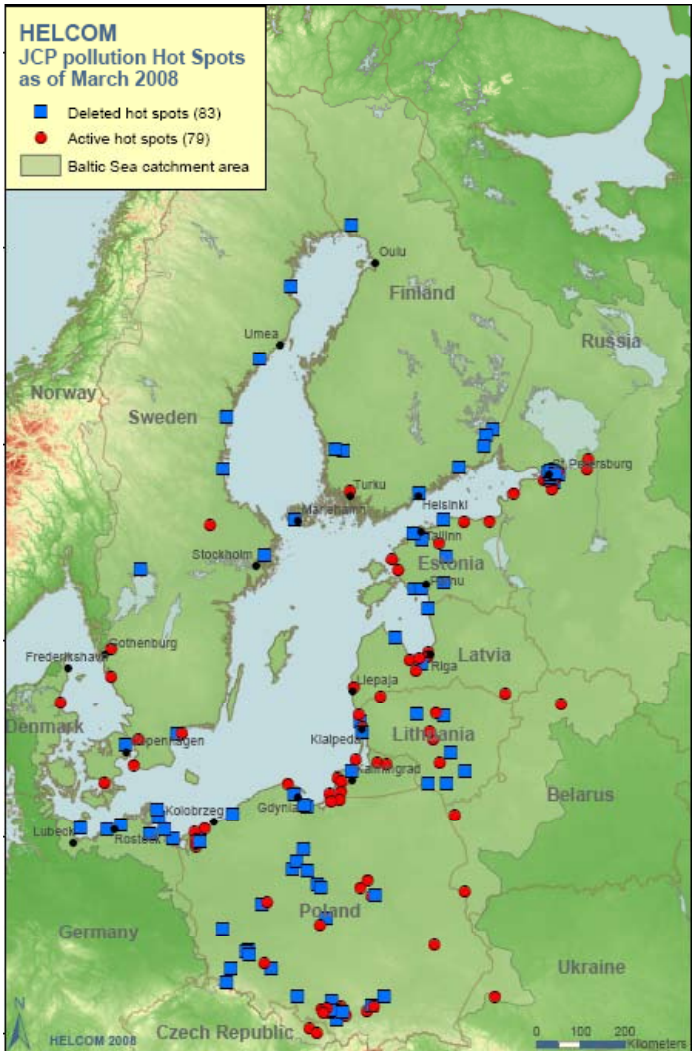


Photo: Irina Gasilina

Alleviating pollution at hot spots involves considerable investments. In 1992, it was estimated that total funding of ECU 18 billion would be needed to finance the necessary measures at all the hot spots. Rough current estimates of the total clean up costs for the remaining hot spots amount to EUR 9-11 billion.

Investments and remediation projects carried out at pollution hot spots around the Baltic Sea have contributed substantially towards overall pollution load reductions in the Baltic Sea catchment area. Water quality in many coastal waters of the Baltic Sea has improved considerably since 1992, reflecting welcome progress in the treatment of municipal and industrial wastewater.

Photo: Metsähallitus 2008, JE

List of agricultural hot spots to be elaborated

Large areas of the Baltic Sea catchment area have been identified as Agricultural Hot Spots. The list of JCP Hot Spots, established in 1992, contained 16 Agricultural hot spots. The list also contained five Coastal Lagoon/Wetlands hot spots which are influenced by agricultural activities, and where relevant management programmes are needed.

So far, five such hot spots have been deleted from the list: two in Estonia, one shared by Estonia and Latvia, one in Latvia and one in Germany. The main reason for deletion has been a remarkable decrease in agricultural activities in Estonia and Latvia due to the economic recession. However, current economic trends indicate fairly rapid growth in the agricultural sector in all of the countries of the region, which can be expected to lead to increased amounts of nutrients being applied, and consequent rises in nutrient loads.

The current list of agricultural hot spots mainly covers agricultural run-off as a diffuse source of nutrient inputs, while large facilities for the intensive rearing of cattle, poultry and pigs were not considered as ordinary 'point sources', although recent developments within the EU legislation (e.g. the IPPC Directive) and other international fora show the importance of pollution originating from such facilities.

The criteria for the inclusion and deletion of hot spots, defined by the HELCOM Programme Implementation Task Force (PITF) in 1999, state that the development and adoption of new agricultural policies and practices, the potential revival of older input-intensive agriculture, and increases in livestock production could all create site-specific situations in the Baltic Sea region. This would result in the need to consider new agricultural non-point source hot spots. In undertaking activities in this area, special reference should be made to Annex III of the Helsinki Convention, which addresses environmental management issues in agriculture.

The HELCOM Ministerial Meeting in Krakow in 2007 thus decided that a list of hot spots


Photo: Michael Hassett

identifying existing installations for the intensive rearing of cattle, poultry and pigs not fulfilling the requirements of the revised Annex III of the Convention should be drawn up by 2009 as part of the Baltic Sea Action Plan. The step-wise approach was applied in order to establish the list as agreed by the Baltic Sea Action Plan Implementation Group in April 2008. It presumed adjustment of existing criteria for inclusion/deletion of hot spots for the purposes of agricultural hot spots represented by point-sources of pollution and elaboration of the first draft list of priority agro-industrial installations, which could be considered for inclusion into the new list. The process of criteria revision involved a wide range of experts from national environmental and agricultural authorities, as well as NGOs and has been finalised by the adoption of the set of criteria by HELCOM in March 2009. The prioritisation of agricultural hot spots has started through the pilot project in the Eastern Baltic States with financial support of the Finnish Ministry of Environment and will continue in 2009 along with the process of national nomination of new agricultural hot spots, which fall under the adopted criteria.

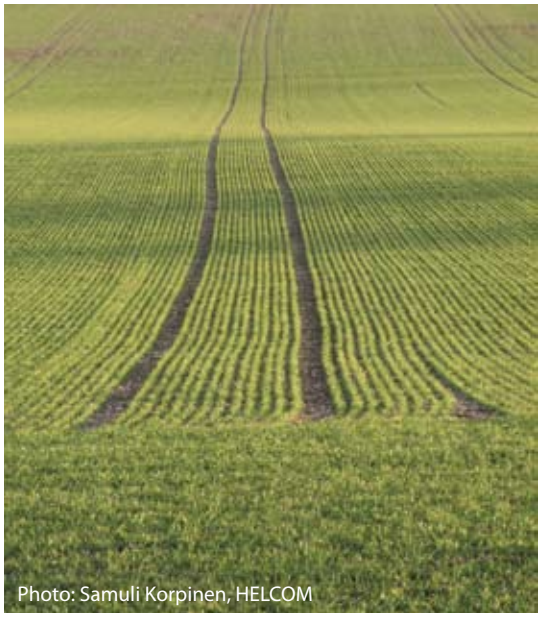


Photo: Samuli Korpinen, HELCOM


Photo: Samuli Korpinen, HELCOM

BALTHAZAR - European Parliament pilot project for Russia

Part-financed by the European Union

In early 2009, HELCOM launched the BALTHAZAR Project (Baltic Hazardous Waste and Agricultural Run-off Reduction) which will deal with the issue of hazardous waste and run-off from large industrial agricultural installations from St. Petersburg, the Leningrad and Kaliningrad regions in Russia. This two-year project with a EUR 2.5 million budget is part-financed by the European Parliament pilot project facility.

Given that the overall objective of this pilot project is to promote the Baltic Sea protection from hazardous waste as well as from agricultural nutrient loading, the Project will aim at reaching this goal by improving the management of hazardous and agricultural wastes in St. Petersburg, Leningrad and Kaliningrad Oblasts of the Russian Federation.

This will be achieved through performing two simultaneously implemented components: 1) hazardous waste, and 2) agricultural waste.

Photo: Elena Bulycheva

The following tasks will be accomplished within the implementation of both components of the Project:

- Carrying out an inventory of landfills/ dumpsites and other facilities for temporal and/or permanent storage/ utilisation of hazardous and agricultural waste that pose a threat to the marine environment of the Baltic Sea
- Assessing the waste management regime of sites being included in the inventory (legal aspects and waste management practices)
- Assessing related environmental risks and selecting priority sites (hot spots)
- Developing measures to reduce the negative impact from selected hot spots
- Strengthening stakeholder dialogue, including capacity building and awareness raising by means of training and workshops

The implementation of the Project will facilitate the achievement of the environmental objectives of the hazardous substances and eutrophication segments of the HELCOM Baltic Sea Action Plan through assisting the development of national action programmes and prioritising necessary measures.

The Project will build upon existing knowledge, experience and expertise on the problem of hazardous and agricultural wastes in North West Russia, being obtained both from already accomplished projects and information on activities in this field available from the relevant Russian authorities.

Struggling against pollution by hazardous substances

HELCOM monitoring programmes provide regular information on the waterborne and airborne inputs and sources to the Baltic Sea, as well as trends for selected heavy metals and organic pollutants. Data on the sources and inputs of hazardous substances is scarce compared to the information on nutrients.

The loads of some hazardous substances to the Baltic Sea have been reduced considerably over the past 20-30 years. In particular, discharges of heavy metals have decreased, although no similar general trend has been observed for concentrations of heavy metals in marine biota since 1990.

For mercury, lead and cadmium, waterborne inputs to the Baltic Sea, via rivers or as direct discharges, are the main sources. The remaining inputs are mainly from atmospheric deposition.

Dioxins are never intentionally produced - they are formed as by-products or impurities during several different industrial processes and many combustion processes in the chemical, paper and metal industries, the incineration of municipal and hazardous waste, and small scale burning. The use of fossil fuels in energy generation and transport in Central Europe and in the countries around the Baltic Sea also contribute to their presence. Natural events or processes such as forest fires or steppe fires and volcanic eruptions can also result in dioxin emissions. Dioxins thus enter the Baltic Sea as atmospheric fallout when transported from land-based sources and via water courses. Knowledge of dioxin air emissions has improved to the point where relatively accurate measurements or estimates are available from some countries. However, less information is available concerning dioxin concentrations in wastewater or wastes.

Photo: Elena Bulycheva

According to a HELCOM evaluation in 2001, it can be assumed that 50% of the discharge reduction target has been largely achieved for 46 hazardous substances prioritised by HELCOM.

Estimated significant sources of eight organic substances are presented in the table on the opposite page. It should be noted that not all of the sources mentioned may be relevant in all of the HELCOM countries, and significant sources should be identified within national programmes under the HELCOM Baltic Sea Action Plan. The industrial sector or professional use has been identified as a significant source if the emission factor is relatively high, or if it has been identified as risk use in national risk assessments, or if experts otherwise believe this is the case. The significance of other activities (e.g. wastewater treatment plants) has been evaluated on the basis of measured effluent concentrations.

Photo: Elena Bulycheva

Further Actions

The information available on inputs and sources for hazardous substances is much scarcer than that on nutrients, and does not allow for a comprehensive assessment of the situation in the Baltic at present.

There is a clear need to efficiently implement existing regulations concerning hazardous substances, such as Best Available Techniques (BAT) and the substitution of hazardous substances in production processes. One particular field with direct impact on the marine environment, where the implementation of existing HELCOM regulations should be further improved, seems to be dredging and the disposal of dredged spoils. The HELCOM survey shows that TBT concentrations are high in sediments in some areas, indicating that disposal of contaminated material from those areas should be managed in an appropriate way.

As a basis for the Baltic Sea Action Plan, HELCOM has evaluated all available information on certain hazardous substances with the aim of assessing their impacts on the Baltic marine environment. Efforts have focused on nine organic hazardous substances and two heavy metals selected by HELCOM as being of specific concern to the Baltic marine environment. These substances have also been included in the HELCOM Baltic Sea Action Plan, acknowledging that the list and planned actions could be revised in the future when more information is available.

Estimated significant sources of priority organic substances

Substance	Sources of substances entering aquatic environments	Sources of substances entering the atmosphere
TBT, TPhT	• anti-fouling use in sea ship hulls • waste treatment, storm water from waste sorting sites • landfills	• considered to be unimportant
Brominated Flame retardants (penta, octa, deca BDE)	• waste treatment, storm water from waste sorting sites • landfills • WWTPs • industrial wastewater from the textile industry and pentaBDE, octaBDE, decaBDE production	• waste treatment • losses from products during service life
HBCDD	• industrial wastewater from the textile industry and laundries • landfills • waste treatment, storm water from waste sorting sites • production of HBCDD	
PFOS & PFOS related substances PFOA	• use of PFOA related substances • fluoropolymer production • landfills • WWTPs • industrial wastewater from metal plating factories, semiconductor and photographic industry, manufacture (and use) of fire fighting foams, paper and packaging protection industry	• semiconductor industry • use of PFOA related substances • fluoropolymer production
Nonylphenols (NP, NPE)	• use of NPE-based products, see NPE sources • industrial wastewater from NPE production, pulp and paper industry, paint industry, production (also use) of detergents and cleaning agents, metal working industry, textile and leather industry, photographic industry and civil and mechanical engineering industry • air transport (de-icing use) • agriculture • WWTPs • landfills • storm water from waste sorting sites and residential areas	• considered to be unimportant
Octylphenols (OP, OPE)	• use of OPE-based products, see OPE sources • industrial wastewater possibly * • WWTPs • landfills • waste treatment, storm water from waste sorting sites and residential areas	• considered to be unimportant
Short- and medium-chained chlorinated paraffines (SCCP MCCP)	• industrial wastewater from metal cutting and leather • industry and manufacture of fat liquoring products used in the textile industry	• industrial wastewater from metal cutting, plastics and rubber industry
Endosulfan	• agricultural pesticide use	• agricultural pesticide use

** An assessment is not possible due to lack of information on emission factors*

1. Assessing the discharges of hazardous substances of specific concern

HELCOM has collected information on the use of the selected substances in different sectors from national registers and other sources. Information has also been collected on their occurrence in discharges and emissions, and in the Baltic marine environment, and on possible actions needed to reduce the chemical loads entering the Baltic Sea. This information will be used when considering actions to restrict and substitute the use of the selected substances in important sectors within an agreed timetable in the whole catchment area. This information is compiled in the form of an assessment and will be published in the Baltic Sea Environmental Proceedings.

The information in the assessment mainly originates from nine HELCOM countries: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden and based on information received via HELCOM questionnaire from the Contracting Parties.

The main objective in assessing the discharges was to compare the effluent concentrations to substance-specific Predicted No-Effect Concentrations (PNEC) in surface water. The occurrence of each hazardous substance has been considered in the Baltic marine environment. The levels in different environmental compartments of the Baltic Sea have been compared to PNEC in respective environmental compartments.

The uses of hazardous substances identified in the assessment are not necessarily relevant for all countries or even for certain industrial sectors within the same country due to the fact that the processes can run with a great variety of methods and chemicals. In general, it became evident that several HELCOM countries do not have sufficient information on the use or discharges/emissions of substances considered in this report. Measured data on discharges

Photo: Elena Bulycheva

(WWTPs, landfills storm water) and emissions of substances is needed.

As a general conclusion, the Baltic wide substance-flow analysis should be prepared for each substance as soon as possible in order to have a clear overview of how the substance is 'moving' in our society. Substance-flow analysis would give information on the pathways and amounts of substance with respect to emissions/discharges to different environmental compartments. In general, additional information on the occurrence of the mentioned substances in the Baltic Sea - biota, water and sediment - is required.

The occurrence of **tributyltin (TBT)** and to a lesser extent **triphenyltin (TPhT)**, is widespread in the Baltic marine environment. Despite the legislative measures taken and the declining concentration trends in the Baltic Sea, the current levels of TBT and TPhT pose a risk to the Baltic marine environment and especially to organisms at lower trophic levels of the food web, such as sediment dwelling organisms near harbours and shipyards in particular, but also near sea routes and at the disposal sites for dredged material.

The occurrence of **bromodiphenyl ethers (BDEs)** is also widespread in the Baltic marine environment. It is likely that current legislative measures (penta- and octaBDE banned in EU since 2004) have already decreased penta- and octaBDE levels in the Baltic Sea. PentaBDE and octaBDE do not seem to pose a risk to the marine environment in the western Baltic Sea; however, the situation may be different in the eastern part of the Baltic Sea. DecaBDE is the dominant congener in WWTP sludge and in the Baltic Sea sediments. It can also be found in the Baltic Sea fish although tetraBDE is the most dominant


Photo: Sergey Vlasov

congener in biota. Levels of decaBDE may be increasing due to fact that its use has not been restricted.

At present, information on the occurrence of **hexabromocyclododecane (HBCDD)** in the environment is very scarce. The results of a draft EU risk assessment indicate that there is a need to limit risks to the aquatic environment concerning the use of HBCDD. Predators, especially, such as mammals and predatory birds face the risks via secondary HBCDD contamination. PBT-assessment showed that HBCDD is a persistent, very bioaccumulative and toxic substance. HBCDD is commonly found in fish along the Swedish coast of the Baltic Sea. However, the situation may be different in other parts of the Baltic Sea.

PBT-assessment, which is very relevant especially with regard to the marine environment, showed that **perfluorooctane sulfonate (PFOS)** alike


Photo: Sergey Vlasov

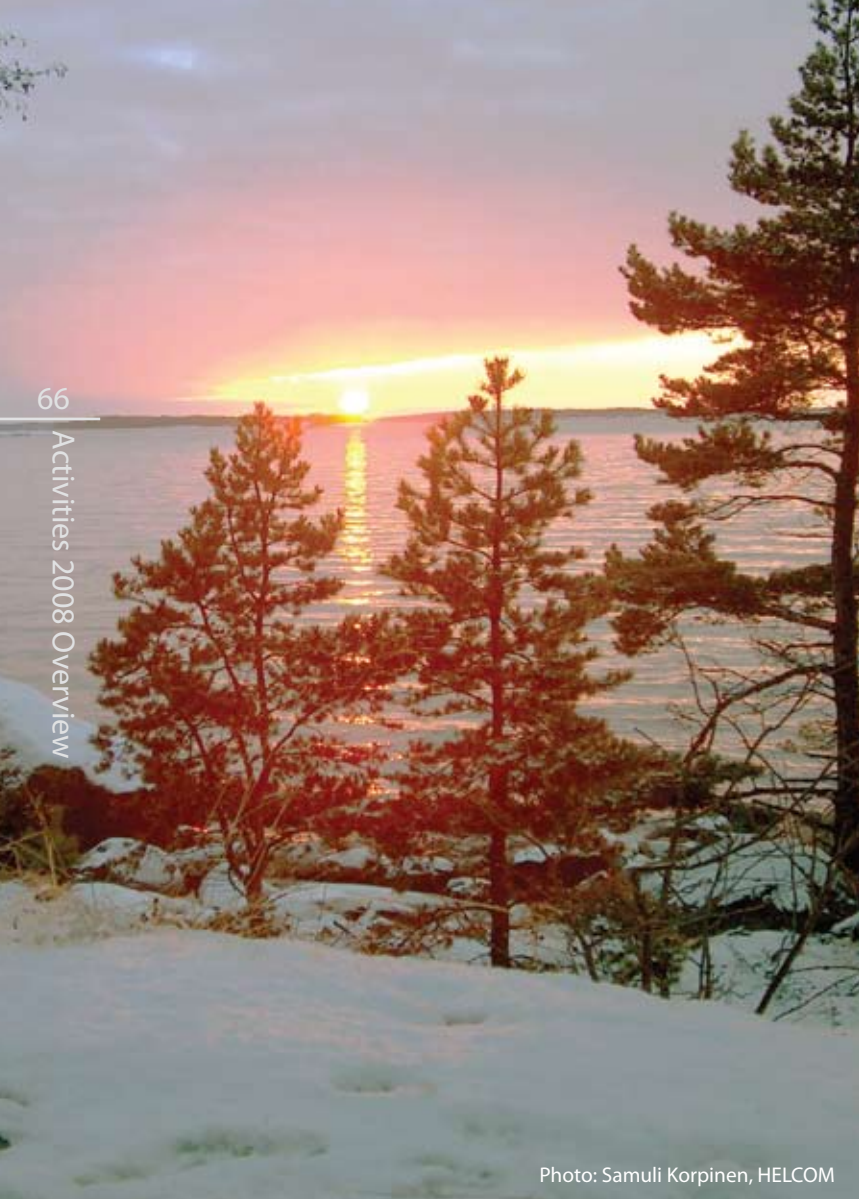


Photo: Samuli Korpinen, HELCOM

is a very persistent, bioaccumulative and toxic substance. PFOS is a widespread contaminant in the Baltic Sea wildlife, while **perfluorooctanoic acid (PFOA)** was not detected commonly. As a whole, the situation regarding perfluorooctanoic acid substances (PFAS) is complicated because the number of compounds is very large and it is not exactly known which substances have harmful properties, or can degrade to PFOS and other persistent PFAS in the environment. The findings in this study imply the threat caused by PFOS and HBCDD to the Baltic Sea's top predators such as seals and predatory birds is via secondary contamination. The risks and threats of PFOA on the Baltic marine environment are currently difficult to estimate due to the lack of ecotoxicological information.

Nonylphenol (NP) and **octylphenol (OP)** are substances very toxic to aquatic organisms and not easily degraded in the environment. Additionally, both NP, OP and nonylphenol ethoxylates (NPE) are possible endocrine-disrupting substances. Although the scarce data available indicate that NP levels in the seawater and biota (fish), and OP levels in fish are not high, the levels in the sediment may have adverse effects on the marine environment.

Furthermore, the levels of medium-chain **chlorinated paraffin (MCCP)** levels in fish in the Baltic Sea may have unfavourable effects on Baltic marine environment. On the other hand, **short-chain chlorinated paraffin (SCCP)** levels in fish and sediment of Baltic Sea seems to be quite low. This difference in MCCP and SCCP concentration levels in fish and the sediment

Photo: Elena Bulycheva

Photo: Metsähallitus 2008, AL

is likely due to a wider current use of MCCP compared to SCCP.

Endosulfan poses a risk of an endocrine-disruption and has a potential for long-range atmospheric transport. Endosulfan is classified as a POP (Persistent Organic Pollutant) and is also potentially a PBT (Persistent, Bioaacumulative, Toxic). The transformation product of endosulfan - endosulfan sulphate - is yet another potential endocrine-disrupting substance and highly persistent in the sediments and soil. While endosulfan levels are generally below the detection limit or low, endosulfan sulphate may occur mainly in the sediments but also in fish.

Although in many cases detected concentrations are below estimated effect levels for individual substances, it is still possible that the substances contribute to the toxic effects triggered by mixtures of biologically active substances.

2. Screening the occurrence of hazardous substances

Additional information will be collected in a screening study focusing on the occurrence of the selected hazardous substances in the Baltic marine environment. It started in 2008 with the financial support from the Nordic Council of Ministers.

The study will identify the occurrence of

Photo: Sergey Vlasov

selected hazardous substances in the eastern Baltic marine environment (Poland, Lithuania, Latvia, Estonia and Russia). The results from the project will be an important contribution to the thematic assessment on hazardous substances in the Baltic Sea region to be ready by 2010. The study will also promote capacity building in Estonia, Latvia, Lithuania, Poland and Russia with regard to screening as a tool to focus the actual monitoring in a cost-efficient way, specifically for the substances of concern. Additionally, it will contribute to the review of HELCOM monitoring programme on contaminants.

The sampling took place in August - October 2008 by Estonia, Latvia, Lithuania and Poland. In total, ten sites (eight affected sites and two backgrounds) were sampled once in order to assess levels of contamination in the eastern part of Baltic Sea. The main target matrix was fish (muscle or liver depending on substance); some seawater samples were also studied. Herring (*Clupea harengus*), perch (*Perca fluviatilis*) and flounder (*Platichthys flesus*) were the primary target fish species.

The samples were taken within the regular national monitoring programmes in order to minimise sampling costs. Russia was unable to contribute to the sampling. Instead, Estonia took 'extra samples' from their Baltic waters in order to partly cover the eastern Gulf of Finland. All samples were delivered to IVL Laboratory in Sweden. Altogether, 138 chemical analyses of hazardous substances in fish and 18 analyses in seawater will be carried out.

The second part of the Screening project, which aims to collect existing information on occurrence of dioxins, furans and dioxin-like PCBs off the coasts of Estonia, Latvia, Lithuania, Poland and Russia, was launched in October 2008. It is expected that the final results of the study will be released at the Workshop in November 2009.

Photo: Elena Bulycheva

Part-financed by the European Union

New project to estimate inputs of hazardous substances into the Baltic Sea

The Helsinki Commission together with its partners has launched a new project to identify the most important sources of hazardous substances inputs into the Baltic Sea and estimate their impacts on the marine environment. This project, named COHIBA, is part of the HELCOM Baltic Sea Action Plan. The plan includes actions for preventing pollution by hazardous substances, which is one of the four priority areas within HELCOM's work, and sets the goal to achieve a "Baltic Sea with life undisturbed by hazardous substances".

One of the major objectives of the COHIBA project is to identify sources of the selected hazardous substances for which there is currently scarce information available, by performing screening in municipal and industrial wastewaters, as well as landfill effluents and storm waters, especially on the eastern side of the Baltic Sea.

Additionally, COHIBA will evaluate effluents for the Baltic Sea region and develop safe factor limits and recommendations and guidance on how best to use the bioassays to deliver sustainable and cost-effective water quality improvements based on the Whole Effluent Approach (WEA). The project will analyze flow patterns from production, processes and uses as well as to quantify releases and inputs of the selected hazardous substances to the Baltic Sea. COHIBA will also assess different management measures and options as well as their effects and cost-effectiveness.

Various institutions and organizations from all the Baltic Sea countries are participating in COHIBA. Altogether there are 26 Project Partners, giving it a strong transnational character. The Lead Partner is the Finnish Environment Institute (SYKE). The initial activities to launch the project were discussed at a kick-off Meeting which was held on 12-13 February 2009 in Helsinki. The Project is expected to last for 42 month, including 36 month of implementation period (2009-2011).

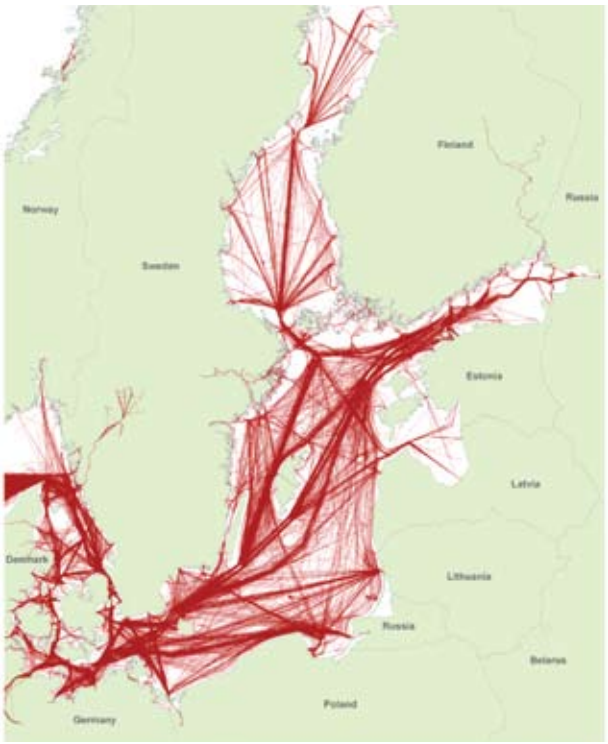
COHIBA is co-financed by the European Union. The Project has been approved for financing by the Baltic Sea Region Programme (BSRP) 2007-2013 and its total budget amounts to around EUR 5 million, with approximately EUR 3.8 million to be allocated as co-financing from the European Regional Development Fund. COHIBA has been chosen as one of the strategic projects within the Baltic Sea Region Programme due to its importance for the sustainable development of the Baltic Sea Region.

The project will serve both international purposes (HELCOM, the European Marine Strategy, the EU Water Framework Directive, the UNEP Stockholm's POP Convention, and the UNECE framework for hazardous substances) as well as national activities to identify and address sources of hazardous substances in the Baltic Sea area and to reach the cessation targets for HELCOM/EU priority hazardous substances by 2020.

Photo: Samuli Korpinen, HELCOM

Photo: Nikolay Vlasov, HELCOM

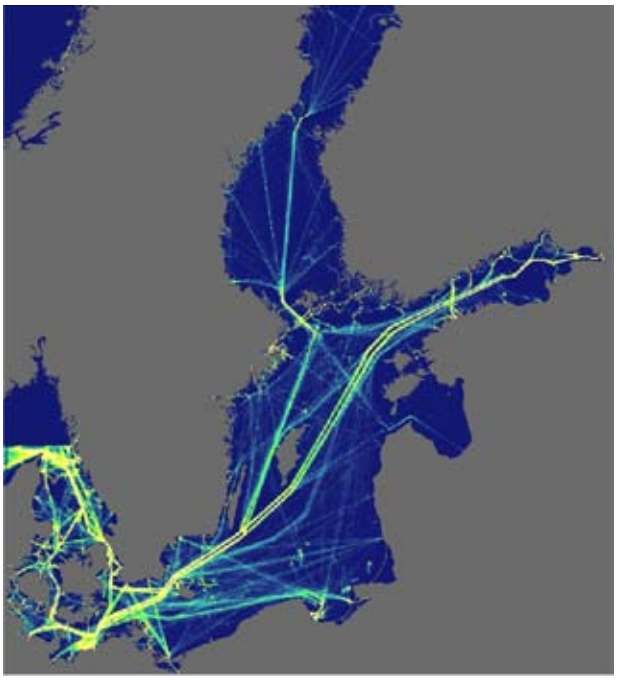
6. Reducing the impacts of shipping on the marine environment



Today, the Baltic Sea is one of the busiest seas in the world. According to the HELCOM Automatic Identification System (AIS) for monitoring maritime traffic, there are about 2,000 ships in the Baltic marine area at any given time with some 3,500-5,000 ships per month plying the waters of the Baltic.

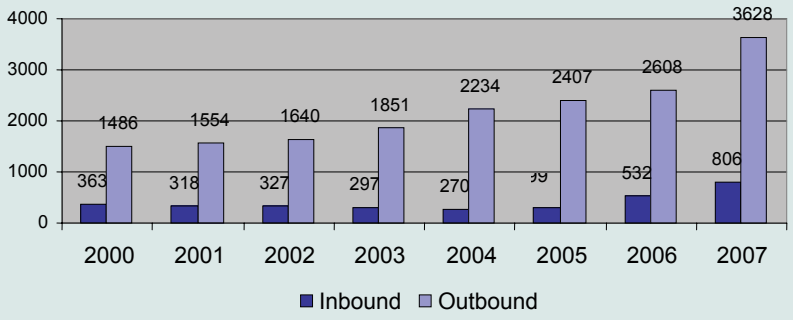
In 2007, 57% of the ships in the Baltic Sea area were cargo vessels; 17% were tankers; and 10% passenger vessels. Forecasts indicate that due to economic growth, especially in the eastern part of the region, the amounts of cargo shipped on the Baltic will grow by 64% by 2020 from a level of 731 million tonnes in 2003.

The transportation of oil and other potentially hazardous cargoes is growing steeply and steadily. By 2015, a 40% increase is expected in the amounts of oil being shipped on the Baltic, which in 2007 reached more than 170 million tonnes. The use of much bigger tankers is also expected to rise with more carrying 100,000-150,000 tonnes of oil.

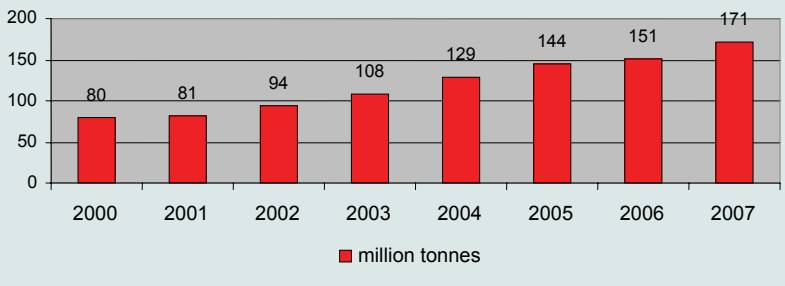


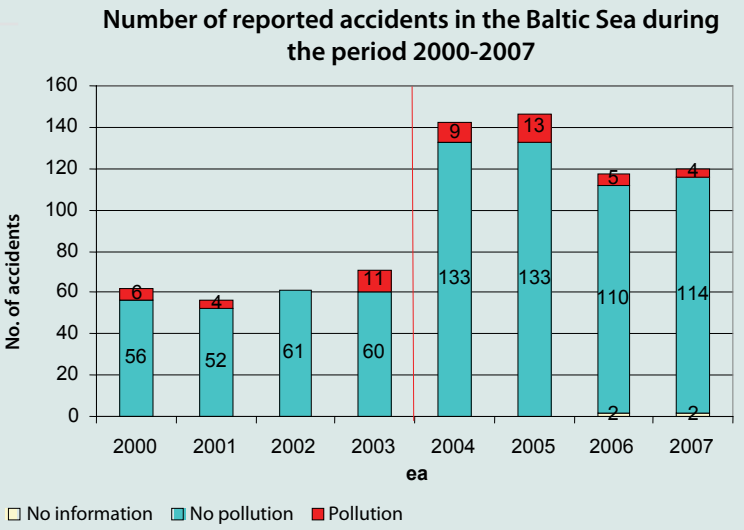
These two images (above) show the traffic on the Baltic Sea during a one-week period (2008). The sharp red lines are actual ship passages and the green-yellow lines on blue background represent data calculated on a grid, showing the areas of heavy traffic.

Number of laden tankers entering and leaving the Baltic (SHIPPOS)

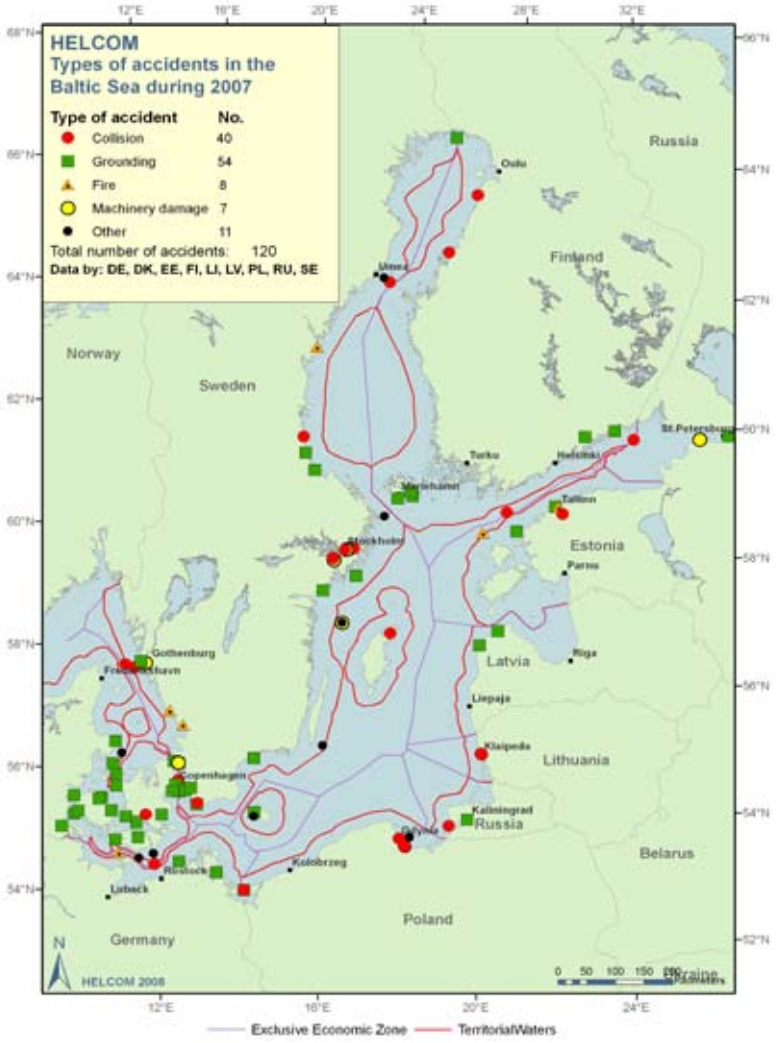


Amount of oil transported via the Great Belt (SHIPPOS)





Total number of accidents 2000-2007: 775



Sharp decrease in ship collisions in the Baltic

While every year there are more and more ships plying the waters of the Baltic Sea, the occurrence of ship-to-ship collis ions, one of the most serious types of accidents at sea, has decreased sharply since 2005, especially in such a busy traffic area like the Gulf of Finland.

Photo: Sergey Vlasov

Photo: Nikolay Vlasov, HELCOM

The analysis of the data contained in the annual reports provided by the Member States to HELCOM in 2008 reveals that overall there was a total of 120 accidents in 2007, compared to 117 in 2006, 146 in 2005 and 142 in 2004. In 2007, only four accidents resulted in small-scale pollution, compared to five similar cases in 2006, and 13 in 2005.

The most common type of accident was grounding, which accounted for almost a half of all reported cases (55 accidents or 45%). Collisions were the second most frequent amounting to 40 cases (33%), including collisions with vessels, fixed or floating structures, e.g. peers and navigation signs. There were only 15 ship-to-ship collisions - 50% less than in 2006 and 2005. Other major types of accidents included fires (8%) and machinery damage (6%).

Ship-to-ship collisions have decreased despite a 10% increase in ship traffic. The launch of the HELCOM Automatic Identification System (AIS) in 2005, traffic separation schemes and ship reporting systems introduced in the Baltic (e.g. Gulf of Finland Reporting System - GOFREP) have had a positive effect on the safety of navigation and might even have contributed to the reduced number of collisions over the recent years, especially in the Gulf of Finland.

Most of the accidents occurred in the south-western Baltic Sea. Cargo vessels (55%), tankers (13%) and passenger ferries (20%) were the main types of vessels involved. This proportion somewhat reflects the number of different vessel types making up the Baltic Sea traffic in 2007. However, the higher risk can be observed for passenger ships which made up 10% of the overall traffic while their share in accidents was as much as 20%. The main cause of accidents in 2007 is not clear due to the lack of information in 32% of all cases. However, human error still seems to continue to be the main factor (32%), followed by technical factors (20%).

Of the four oil spills which occurred as a result of accidents in 2007, the largest contained 12 tonnes of oil (following a grounding in heavy weather conditions in Latvia); the second largest was no more than 0.2 tonnes of oil (following a collision off Kaliningrad).

Fortunately, most accidents in the Baltic do not cause notable pollution; however, even one large-scale accident would seriously threaten the marine environment. Over the period 2000-2006, an average of 7% of all reported accidents resulted in some kind of pollution. In 2007, this percentage was lower (3%). Two of the five most serious accidents in the Baltic marine area have occurred since 2001 and involved 'Baltic Carrier' in 2001 (2,700 tonnes of oil spilt), and 'Fu Shan Hai' in 2003 (1,200 tonnes of oil spilt).

New regulations to curb air pollution from shipping

At the end of 2007 and the beginning of 2008, the HELCOM countries submitted two joint documents to the 57th session of the IMO Marine Environment Protection Committee (MEPC) calling for tighter international regulations to prevent a predicted sharp increase in nitrogen oxide (NOx) emissions from ships in the Baltic Sea as well as describing the Baltic region's experience as a sulphur oxides (SOx) Emission Control Area (SECA). The submissions were carried out following the provisions of the HELCOM Baltic Sea Action Plan.

Following the approval by MEPC 57, MEPC 58 in 2008 adopted new requirements for NOx and SOx emissions under Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78). The new legislation makes it mandatory that the sulphur content of any fuel oil used on board ships within the Baltic SECA, currently set at the level of 1.50% m/m, shall not exceed 1.00% m/m from 1 July 2010, and 0.10% m/m from 1 January 2015.

The total annual SOx emission from ships in the Baltic is estimated at more than 147 kilotonnes in 2006 and 137 kilotonnes in 2007 (6.4% decrease). The year 2007 was the first full calendar year with the SECA in effect and therefore a benchmark for future SOx emissions.

As far as NOx emissions are concerned, the revised Annex VI to MARPOL 73/78 requires world-wide that marine diesel engine installed on a ship constructed on or after 1 January 2011 achieves a 15% reduction level comparing to the current legislation. It also provides for the establishing of NOx Emission Control Areas, requiring ships to be constructed on or after 1 January 2016 operating in NECA to reduce their NOx emission by 80% compared to the current situation.

The results of available studies made for HELCOM (ShipNODeff) indicate that only 80% reduction in NOx emissions from shipping would lead to decreasing the NOx emissions in the Baltic by 2030. Therefore, if only the Baltic were to be

Photo: Nikolay Vlasov, HELCOM

Photo: Sergey Vlasov

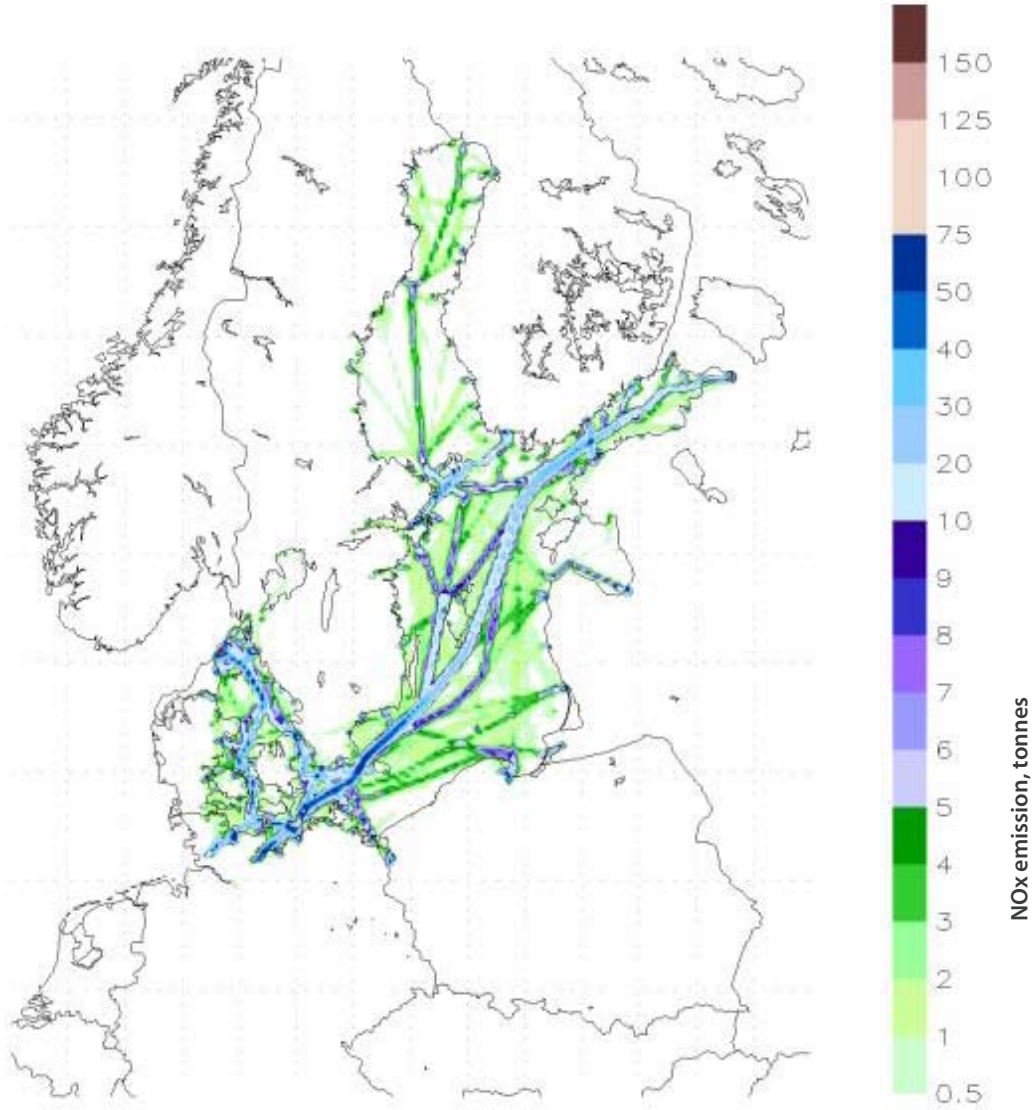
established as an NECA, a substantial reduction of NOx emissions from ships could be achieved in the long run. Such a reduction is needed due to heavy eutrophication of the Baltic Sea.

In order to make the best use of regulations of revised Annex VI to MARPOL 73/78, HELCOM countries agreed, in principle, to propose to the IMO that the Baltic Sea is designated as an NECA, and established a Correspondence Group on Designation of the Baltic Sea as a NOx Emission Control Area under the lead of Finland. Taking into account the time needed for industry to prepare for new regulations and for IMO to consider and adopt the proposal, the target date for a joint submission by the Baltic Sea countries to the IMO is 2010.

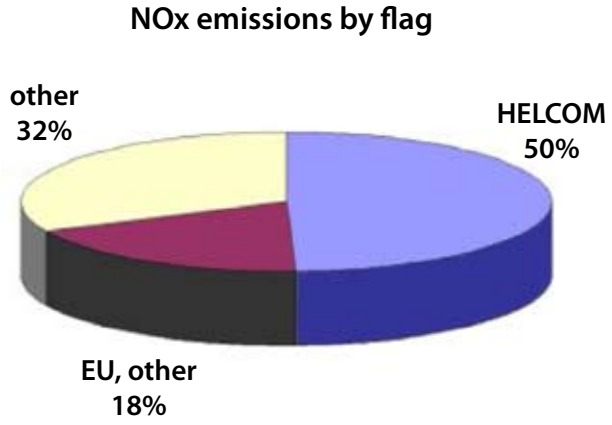
Atmospheric nitrogen deposition is one of the main contributors to the high nutrient concentrations that stimulate massive algae blooms in the Baltic. During 2000-2006, shipping in the Baltic contributed 9% to atmospheric nitrogen oxide deposition to the Baltic Sea. However, a recent study shows the contribution to reach up to 50% in some areas and seasons. The total annual NOx emission from ships is estimated at more than 370 kilotonnes in 2006 and 400 kilotonnes in 2007 (7.7% increase). The estimate is based on the AIS information and is verified against information on fuel consumption obtained from shipping companies and measurements of air quality near fairways.

The NOx emissions from shipping in Finnish waters alone are higher than emissions from Finnish land-based traffic. On the Baltic Sea scale, the emissions from shipping are comparable to the combined land-based NOx emissions from Denmark and Sweden. Most of the emissions are concentrated in the southern part of the Baltic Sea, around the Danish Straits and the Kiel Canal where shipping is intense. Significant emissions, however, can also be seen throughout the Gulf of Finland.


Photo: Nikolay Vlasov, HELCOM



NOx emissions from shipping in the Baltic in March 2007



Half of the annual NOx emissions in 2007 were generated by ships flying the flags of the HELCOM countries; 18% from vessels flying a flag of the EU Member States from outside the HELCOM area; and the remaining one third from ships under other countries' flags.

Share of ship emissions based on flag state. The total annual NOx emission in 2007 was 400 kilotonnes

HELCOM to call for an international ban on sewage discharges

One of the high-profile issues on the agenda of the HELCOM Maritime Group is the preparation of a submission to the IMO with a proposal to revise sewage discharge regulations for passenger ships and ferries. This initiative is part of the HELCOM Baltic Sea Action Plan in order to eliminate the discharge of nutrients in sewage from ships. The proposal which is being elaborated under the leadership of Finland is to be jointly submitted by all the HELCOM Member States to the 60th session of the IMO Marine Environment Protection Committee in 2010.

Currently, international regulations do not contain requirements to remove nutrients from ships' sewage prior to discharge into the sea. According to Annex IV of MARPOL 73/78, the discharge of sewage from ships is prohibited within 12 nautical miles off the nearest land unless sewage has been comminuted and disinfected using an approved system and the distance from the nearest land is longer than three nautical miles. In any case, when discharging from a sewage holding tank, the discharge must be at a moderate rate and the ship must be proceeding en route at a minimum speed of four knots.

The nutrient pollution loads originating from wastewater discharges from ships into the Baltic Sea remain rather small, but not negligible due to the high sensitivity of the marine environment, according to a major study prepared by Finnish researchers from VTT for HELCOM in 2007 and updated in 2009. These loads, which

Photo: Sergey Vlasov

Photo: Nikolay Vlasov, HELCOM

are concentrated along shipping routes, are immediately available for uptake by planktonic algae adding to the severe eutrophication of the Baltic Sea.

The results of the study indicate that the main nutrient load to the Baltic Sea derives from waterborne inputs and atmospheric deposition. The ship-borne nitrogen load represents approximately 0.04% of the total nitrogen load (744,900 tonnes), and the phosphorus load represents approximately 0.3% of the total phosphorus load (34,500 tonnes) into the Baltic Sea. In the Gulf of Finland, where maritime traffic has increased rapidly, the annual phosphorus load from ships is now almost the same as from the four largest Finnish coastal cities along the Gulf - Espoo, Hamina, Kotka and Porvoo.

To eliminate illegal discharges and encourage the delivery to shore facilities of ship-generated wastes, including oily wastes and as of 1 January 2006 also sewage and garbage, HELCOM has established a 'no-special-fee' system for the use of port reception facilities. Under this system, ships should not be charged for using such reception facilities; costs, for example, could be recovered from general harbour fees or general environmental fees.

Online version of mariners' routeing guide for the Baltic

In 2008, HELCOM launched an online version of the Transit Guide for the Baltic Sea, which is a single source of essential navigational information for shipmasters planning safe routes through the Baltic.

The web version of the HELCOM Transit Guide is the first undertaking of its kind in the Baltic Sea area. It has been developed to provide online access to systematic and updated guidance and information related to the safety of navigation in the Baltic Sea area. It includes the same kind of information and has the similar outline as the print version of the Guide, designed to supplement the existing nautical chart portfolio for the Baltic Sea. It includes information on ship routeing systems, including numerous traffic separation schemes and deep water routes, ship reporting systems, pilotage, ice conditions, maritime assistance services and special regulations.

The online Guide has been developed by the HELCOM Transit Route Expert Working Group under the lead of Denmark, using a chart designed and printed by the German Federal Maritime and Hydrographic Agency (BSH). The initial idea of the whole project, which included the development of both the print and online versions, was to provide mariners with an easy-to-use guide which allows users to instantly access necessary information. Germany has been keeping the Transit Guide print version up to date since the initial release in 2006. The latest third edition was published in April 2008. The web-based Guide is maintained by the Danish Maritime Safety Administration and is available at: http://www.helcom.dk/map/.


Photo: Nikolay Vlasov, HELCOM

Speeded implementation of the IMO Ballast Water Management Convention

Due to increasing shipping, more alien species are finding their way into the Baltic Sea than ever before. These non-indigenous invaders can induce considerable changes in the structure and dynamics of marine ecosystems. They may also hamper the economic use of the sea or even represent a risk to human health. Over 120 non-native aquatic species have been recorded in the Baltic Sea to date, and around 80 of these have established viably reproducing populations in some parts of the Baltic. Most of these invasive species originate from freshwater or brackish-water environments, particularly from North America or the Ponto-Caspian region.

In order to reduce the risks of such species entering the HELCOM maritime area through ballast water exchange, the HELCOM countries have agreed to ratify by 2010, or at the latest by 2013, the 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention). Before ratification can take place, certain steps must be taken as set out in the HELCOM Road Map drawn up to facilitate the implementation of the Convention.

As part of this process starting from 1 April 2008, both HELCOM and OSPAR countries have been applying General Guidance according to which vessels transiting the Atlantic or entering the North-East Atlantic from routes passing the West African Coast are requested to carry out ballast water exchange on a voluntary basis before arriving in the OSPAR area or passing through the OSPAR area and heading to the Baltic Sea. Vessels are expected to carry out voluntary ballast water exchange in waters of specific depth and distance from the coast. IMO was notified of this action as included in the circular BWM.2/Circ.14.

A similar initiative to address vessels leaving the Baltic and transiting through the OSPAR maritime area to other destinations has been undertaken, whereby as of 1 January 2010 ballast water will not be exchanged in the Baltic or until the vessel was 200 nm off the coast of North West Europe and in waters deeper than 200 m.

Photo: Nikolay Vlasov, HELCOM

Additionally, to prepare for implementation of the Ballast Water Management Convention, HELCOM has developed a list of non-indigenous, cryptogenic and harmful native species in the Baltic Sea. The aim of listing the species is to provide some basic background information for further consideration and selection of the species that are of particular relevance in the context of the requirements of the BWM Convention and the related IMO Guidelines. The list is also to serve the information needs of other marine regions.

Furthermore, a list of HELCOM Target Species that may impair or damage the environment, human health, property or resources in the Baltic Sea has been developed. The list is to facilitate risk assessments which are required in order to make use of Regulation A-4 of the BWM Convention allowing certain ships or routes to be exempted from the requirements of the ballast water management. The Target Species list covers, as a first step, the relevant species from the North Sea region, the Ponto-Caspian region and the North American Great Lakes, as they are considered as high risk donor areas due to similar climate and salinity ranges as the Baltic Sea and because of recorded donations of alien species in the past.

Both lists, available on the HELCOM website, will be regularly reviewed and updated by HELCOM HABITAT, in cooperation with HELCOM MONAS.

Baltic Clean Seas Guide 2009

HELCOM has released the 2009 Clean Seas Guide for mariners plying the waters of the Baltic Sea. Its aim is to provide ship masters with basic information on the pollution prevention regulations which have been established in the region by HELCOM.

To protect the marine environment of the Baltic Sea area from pollution, every ship entering the area is urged to comply with the HELCOM anti-pollution regulations. This applies to all ships, irrespective of whether or not they are flying the flag of the HELCOM Member State.

In accordance with the IMO's International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), under which the Baltic Sea area has been designated as a special area due to its extreme sensitivity to harmful substances, far-reaching prohibitions and restrictions on any discharge into the sea of oil or oily mixtures and garbage have been introduced by the Baltic Sea States. The discharges of noxious liquid substances are also strictly regulated. In addition, bans on discharges of sewage and incineration of ship-generated wastes within 12 nautical miles from the nearest land have been imposed by HELCOM. There is also a general ban on dumping and incineration of other wastes, not incidental to or derived from the normal operation of ships, in the entire Baltic Sea area.

The discharge regulations must be strictly observed owing to the vulnerable marine environment of the Baltic Sea area and in order to keep the shorelines and beaches clean. The responsibility for avoiding discharges of oil or other harmful substances rests not only with the master and crew, but also with the charterer, the ship-owner and the ports. The Baltic Sea States place high priority on the elimination of violations of anti-pollution regulations, and on the conviction of any offenders. Various actions have been taken to this end. In order to prevent and detect any violation of discharge regulations, the Baltic Sea States regularly conduct aerial surveillance supported by satellite observations of their response regions and jointly survey specific parts of the Baltic Sea area. The HELCOM Member States are cooperating to investigate violations of anti-pollution regulations and fine polluters.

In addition to the pollution prevention measures, the coastal countries have agreed on certain safety of navigation measures in the Baltic Sea area, such as ship traffic monitoring using the Automatic Identification System; ship routing systems, including numerous traffic separation schemes and deep water routes; ship reporting; pilotage; and measures related to winter navigation safety.

Photo: Nikolay Vlasov, HELCOM

7. Improving response capacity

BRISK Project – sub-regional risk assessment of spills of oil and hazardous substances in the Baltic Sea

The Baltic Sea coastal countries already have substantial resources to effectively respond to pollution at sea in the region. A high number of emergency tugs and more than 45 sea-going vessels are located around the Baltic. Moreover, several new vessels will be built in the forthcoming years. Operational procedures for joint, international response operations have been put in place within the framework of the Helsinki Commission, and a number of response exercises are held regularly. The most well known is BALEX DELTA which aims at testing HELCOM's response system, command structure and communication system, as well as the cooperation and coordination between the various response units of the Baltic Sea countries.

The system has proved to be efficient in tackling the recent major pollution accidents in the Baltic.

Recent major shipping accidents resulting in pollution:

- 1990 'Volgoneft', 700-800 tonnes of waste oil
  - five countries and more than 20 ships involved
  - nearly all oil recovered at sea
- 2001 'Baltic Carrier', 2,700 tonnes of oil
  - three countries involved
  - around 50% of oil recovered from the water
- 2003 'Fu Shan Hai', 1,200 tonnes of fuel oil
  - three countries involved
  - around 1,100 tonnes of oil recovered at sea

In order to address the increasing risk of accidental pollution from shipping connected to the increase in the maritime transportation in the Baltic, a strategic project on sub-regional risk assessment of spills of oil and hazardous substances in the Baltic Sea (BRISK) has been launched by the Baltic Sea countries under the HELCOM umbrella, led by the Admiral Danish Fleet HQ.

Part-financed by the European Union
(European Regional Development Fund)

The overall objective of BRISK is to substantially contribute to the development of an appropriate level of preparedness in the whole Baltic Sea area to tackle major spills. The project is to implement the provisions of the HELCOM Baltic Sea Action Plan, concerning step-wise actions to fulfil the requirements of HELCOM Recommendation 28E/12 on strengthening sub-regional cooperation in response.

The project area covers all transnational maritime areas in the Baltic, divided into six sub-regions. Institutions and organisations from all the Baltic Sea countries are participating in BRISK.

Photo: Nikolay Vlasov, HELCOM

HELCOM applies a three-tier approach to responding to pollution at sea, where minor spills are addressed by one country, medium-size spills require assistance from several neighbouring countries, and the largest spills are addressed by all coastal states and, if necessary, using external assistance. BRISK will focus on tier II accidents corresponding to the sub-regional level of cooperation.

First, based on a common methodology, a comprehensive Baltic-wide analysis will be made within BRISK to check whether the existing emergency and response capacities in each sub-region of the Baltic are sufficient to tackle medium-size and large spills. No such overall risk assessment for the Baltic has been carried out so far. Based on the risk assessment, the Project will identify missing resources and will help prepare pre-investment plans on how the Baltic Sea countries should jointly fill in the identified gaps. When building the response capacities, the sub-regional approach, as applied in BRISK, is the most cost-efficient as countries can 'share' their resources to build a common pool of response vessels and equipment sufficient for a given sub-region. Moreover, the Project will facilitate and speed up the process of developing and concluding sub-regional agreements between neighbouring countries for joint response operartions.

Through these activities, the Project will substantially and in a concrete way contribute to the development of an appropriate level of preparedness in the whole Baltic Sea area.

BRISK will go on for three years. It is co-financed by the European Union within the Baltic Sea Region Programme (BSRP) 2007-2013. Its total budget amounts to around EUR 3.3 million, with approximately EUR 2.5 million to be allocated from the European Regional Development Fund. BRISK has been chosen as one of the strategic projects within the BSRP due to its importance for the sustainable development of the Baltic Sea Region.

Photo: Nikolay Vlasov, HELCOM

HELCOM's fleet conducts a successful emergency response exercise off the Russian coast

As part of the Helsinki Commission's continued focus on maritime safety and disaster preparedness in the Baltic Sea area, a HELCOM flotilla of oil-combating ships staged its annual international pollution response exercise BALEX DELTA 2008, which simulated a major oil spill from an offshore platform off the coast of Kaliningrad, Russia, on 27 August 2008.

Up to 20 oil-pollution-combating ships and other vessels from six HELCOM Member States - Denmark, Finland, Lithuania, Poland, Russia and Sweden - supported by helicopters took part in the exercise. The European Union (which is one of the HELCOM Contracting Parties) was also represented by one response vessel chartered by the European Maritime Safety Agency (EMSA). In addition, about 40 observers from Denmark, Estonia, Finland, Latvia, Lithuania, Poland, Russia, Sweden, and EMSA monitored the actions of the response units.

The basic aim of the exercise - the largest maritime emergency and counter-pollution drill of its kind in the Baltic Sea area and one of the largest worldwide - was to test HELCOM's accident response system, its command and communication system, as well as the cooperation between the response units of the Baltic Sea countries in the event of a major oil spill accident at sea.

Photo: Alexei Bugakov

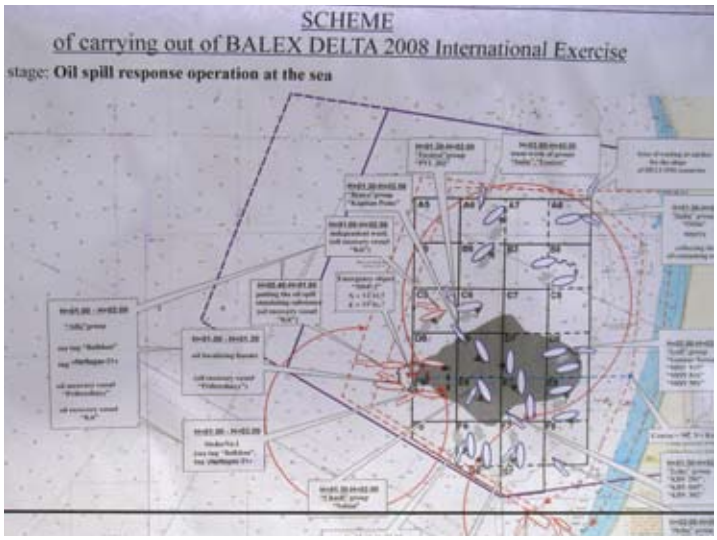


Photo: Nikolay Vlasov, HELCOM

Photo: Monika Stankiewicz, HELCOM


Photo: Nikolay Vlasov, HELCOM

The 2008 HELCOM annual exercise was organised by Russia's Federal Agency of Maritime and River Transport and the State Marine Pollution Control, Salvage & Rescue Administration. The exercise involved a scenario where a well on a Russian oil platform off the coast of Kaliningrad Oblast' blows out after a gas leak. As a result of the accident, the platform catches fire and spews 1,200 tonnes of crude oil into the sea which drifts towards the Russian coastline. Following the fire fighting operation and the evacuation of workers from the platform by a rescue helicopter, units from the HELCOM countries were tasked to deploy oil containment booms and skimming equipment to jointly collect oil from the sea and prevent the oil slick from reaching the shore.

The discharged oil was simulated with expanded perlite - a lightweight, micro-porous mineral substance produced from a volcanic rock which is white in colour and thus easily visible on the sea surface.

BALEX DELTA operational response exercises have been held annually since 1989. Throughout this time, HELCOM has steadily improved the readiness of the countries around the Baltic to jointly respond to oil spills at sea. The Baltic Sea countries now have more than 45 open-sea going response vessels located around the region. These vessels are able to reach any place in the Baltic Sea within 6 to 48 hours of being notified of an accident.

The issue of responding to accidents at sea has high priority within the Baltic Sea region. The Baltic Sea's unusual hydrographic, chemical and physical conditions make its waters extremely sensitive to pollution. Any large-scale oil spill could lead to an environmental catastrophe. The risk of such a spill occurring has increased substantially over the last decade due to the rising number of cargo ships carrying large amounts of fuel and the constantly increasing volumes of oil transported on the Baltic.

Photo: Nikolay Vlasov, HELCOM

Russian team wins 13th annual HELCOM Trophy rowing competition following BALEX DELTA 2008


Photo: Nikolay Vlasov, HELCOM

HELCOM mutual plan for places of refuge

The Expert Meeting on Compensation and Liability in relation to a Mutual Plan for Places of Refuge was held in Copenhagen, Denmark, on 25-26 September 2008, with the participation of legal experts from the HELCOM countries. The aim of the meeting was to investigate the questions of compensation and liability for damage in relation to a mutual plan for places of refuge in the Baltic Sea to be developed according to the HELCOM Baltic Sea Action Plan by 2009.

A mutual plan is to specify circumstances under which a place of refuge could be granted to a ship in a country other than the one where the ship first needed assistance. The benefits of a mutual plan include the reduced risk of pollution and faster response times.

The experts discussed circumstances under which a request for places of refuge could be submitted to a neighbouring country, what are the damage costs to be covered by the mutual plan for places of refuge and how those costs could be reimbursed to the country offering a place of refuge to a ship from a response zone of another country. One of the crucial issues also discussed was how to address the recovery of costs between HELCOM countries going beyond reimbursement schemes within the existing international conventions.

Based on the outcome of the workshop, in October 2008 HELCOM RESPONSE agreed to have a new HELCOM Recommendation on a Mutual Plan for Places of Refuge aiming at deepening cooperation between the Baltic Sea coastal countries in providing a shelter to ships in need of assistance in their territorial waters. The Recommendation, once adopted, will be made operational by including a new chapter in the HELCOM Response Manual and also relevant provisions in sub-regional response agreements.


Photo: Elena Bulycheva

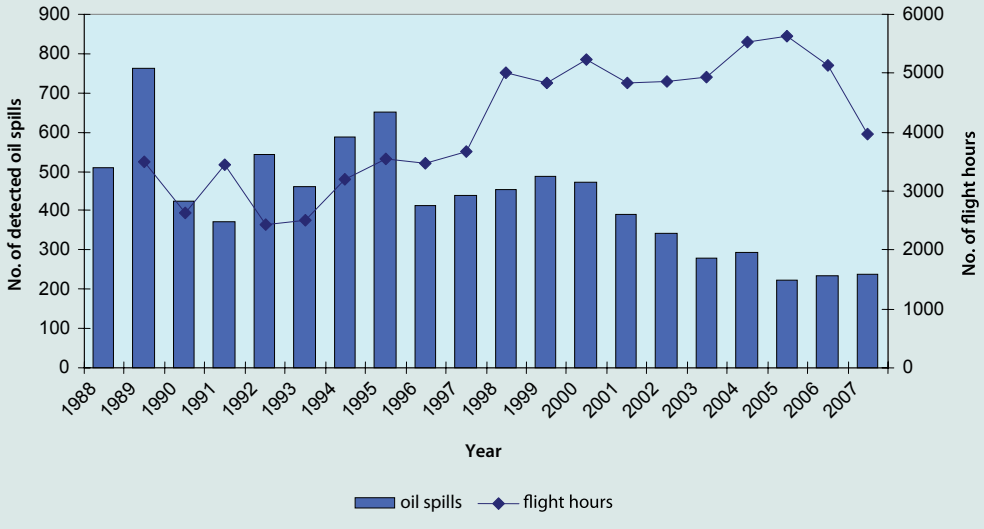

Photo: Elena Bulycheva

HELCOM's measures keep illicit oil spills in the Baltic near record lows

While the annual number of deliberate, illegal oil discharges from ships observed by national surveillance planes and satellites over the Baltic Sea area has increased slightly, it still remains near record lows.

According to the national annual reports provided by the Member States to HELCOM in 2008, 238 illicit oil spills were detected during a total of 3,969 hours of surveillance flights conducted by the coastal countries over the Baltic Sea during 2007. This was compared to 236 discharges observed during 5,128 air patrol hours in 2006, and 224 discharges observed during 5,637 air patrol hours in 2005. Despite the small increase, this is still one of the lowest numbers since 1999 when 488 discharges were detected during 4,883 flight hours.

The total number of flight hours and observed oil spills in the HELCOM area during aerial surveillance, 1988-2007



Deliberate oil discharges from ships have been regularly observed during surveillance flights over the Baltic Sea since 1988. One of the peak years was 1989, when 763 spills were detected during 3,491 flight hours. Since 1999, the number of discharges has been steadily decreasing.

In 2007, most of the illegal oil discharges were detected along major shipping routes. Up to 84% of the discharges were smaller than one cubic metre; however, four discharges of over 10 cubic metres were detected in the Estonian Exclusive Economic Zone. The total estimated volume of oil spills observed in 2007 was 125.4 cubic metres.

In the vast majority of cases of detected illegal discharges, the polluters remain unknown. In 2007, out of the total number of confirmed illegal discharges (238), the polluters were identified only in seven cases - eleven less than in 2006 when 236 oil spills were observed.

Regular aerial surveillance flights have contributed significantly to the decrease in discharges because ships are aware that their illicit polluting activities can be detected. Today, the HELCOM aerial surveillance fleet comprises more than 25 aircraft and helicopters - many of which are equipped with remote sensing equipment such as side-looking airborne radar (SLAR), infrared (IR) and ultraviolet (UV) cameras, photo and video equipment.

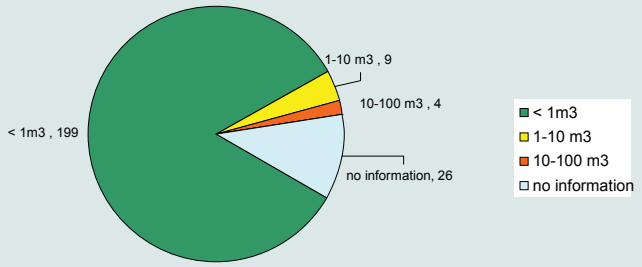
HELCOM also uses satellite surveillance to detect illegal polluters. In 2007, this means of pollution control was substantially strengthened thanks to the CleanSeaNet (CSN) satellite service launched by the European Maritime Safety Agency. From April until December 2007, 401 images comprising 313 possible oil slicks were delivered to the Baltic Sea countries; of these, 54 were eventually confirmed as being oil.

Satellite images can indicate 'candidates' for oil spills at sea, which can be later verified on site by a vessel or aircraft. The nationally ordered satellite images, coupled with CSN, can detect illegal discharges at sea as well as provide support to response operations in the event of accidental oil spills.

Both aerial and satellite surveillance have contributed to the enforcement of the Baltic Strategy. The main objectives of the Strategy, which was operationalised by the HELCOM Ministerial Meeting in 1998, are to ensure ships' compliance with global and regional discharge regulations, and to eliminate illegal discharges into the sea of all wastes from all ships and thus prevent polluting the Baltic Sea. Another objective is to ensure the environmentally sound treatment of ship-generated wastes when these wastes have been delivered to port reception facilities ashore.

Today, a blanket ban covers all discharges into the Baltic Sea of oil or diluted mixtures containing oil in any form, including crude oil, fuel oil, oil sludge and refined products. This prohibition stems from the international designation of the Baltic Sea as a 'special area' under the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78).

Illegal oil discharges detected in the Baltic Sea during HELCOM aerial surveillance, according to size of spill in 2007



Total no. of illegal oil discharges confirmed: 238

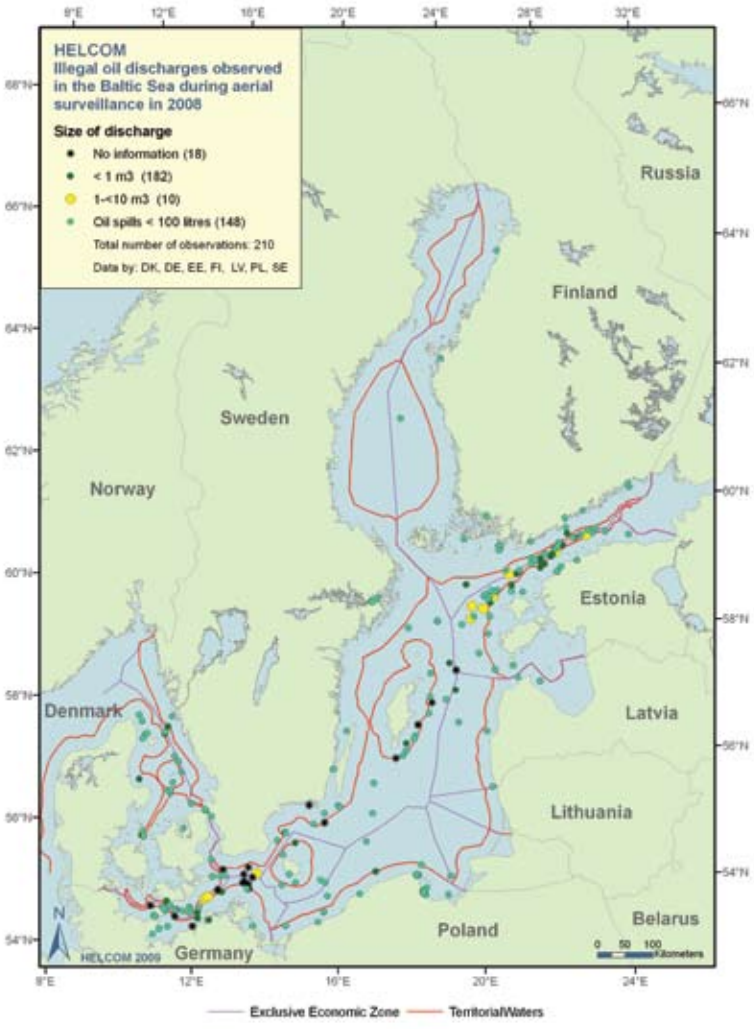


Photo: Florian Friz

To uphold this prohibition, HELCOM requires all ships, with a few exceptions, to deliver all such oily wastes to reception facilities before leaving port. To further encourage delivery, the countries bordering the Baltic Sea have agreed that ships should not be charged for using such reception facilities, under the 'no-special-fee' system. Instead, costs are recovered from general harbour fees or general environmental fees.

Several oil spills detected during HELCOM's CEPCO North and CEPCO South flights

Two Coordinated Extended Pollution Control Operation (CEPCO) flights are arranged annually by HELCOM in the Baltic Sea: one in the south and one in the north. During the CEPCO flights, several HELCOM countries jointly carry out continuous aerial surveillance activities for 24 hours or more along predetermined routes in areas where operational spills are likely. CEPCO flights are also planned to support national aerial surveillance data by detecting illegal discharges which would not be disclosed by routine national surveillance activities. This enables a realistic estimation of the total number of oil spills discharged into the Baltic Sea during one randomly selected day.

The CEPCO South 2008 aerial surveillance flights were carried out in the southern Baltic Sea from a base in Lübeck, Germany. The surveillance operation was organised by the German Central Command for Maritime Emergencies and involved four aircraft from Denmark, Estonia, Germany and Sweden which surveyed the Kadet Strait area and those areas around the island of Bornholm with high vessel traffic intensity on 17-19 June 2008. Two German response vessels and seven patrol vessels from Denmark, Germany, Poland and Sweden were ready to make onboard investigations of any ships detected of illegally discharging oil.

During SEPCO South, 11 small discharges of mineral oil were observed by aircraft totalling 5.14 cubic metres; some unconfirmed slicks were also detected during one satellite overpass.

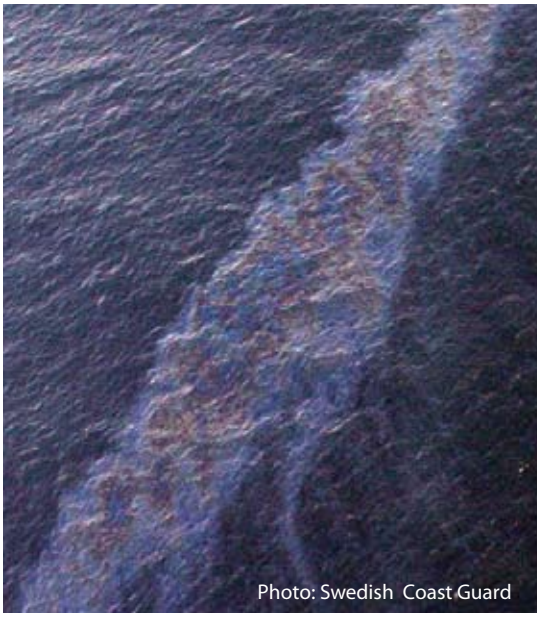
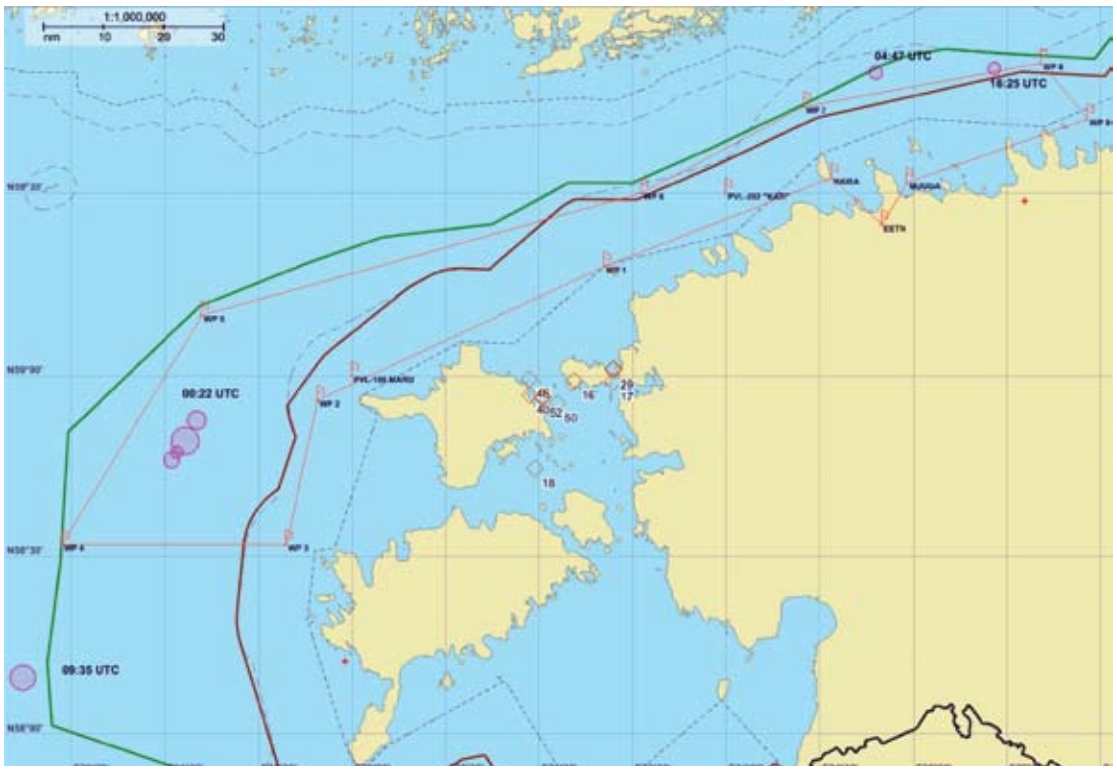


Photo: Swedish Coast Guard



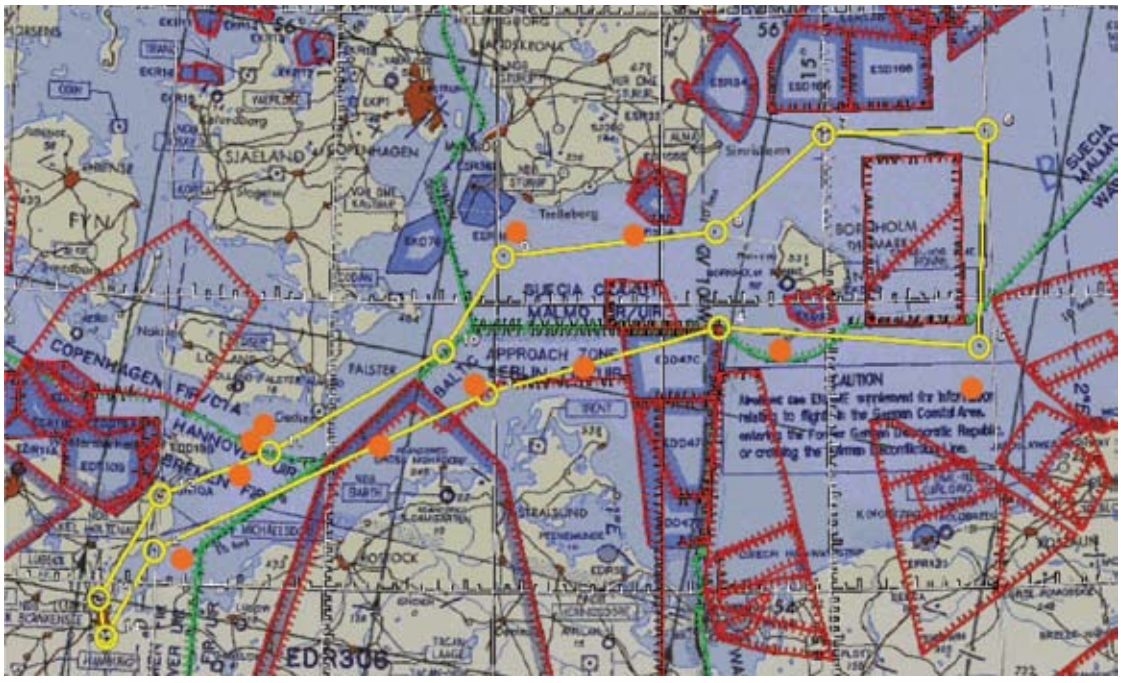
Operation area of CEPCO North 2008

One possible suspect of illegal pollution was identified by the German authorities.

A total of seven illegal discharges of oil were detected during CEPCO North 2008 conducted over the north-eastern parts of the Baltic Sea during 16-17 September 2008. Four aircraft from Estonia, Finland, Latvia and Poland continuously surveyed the agreed route for oil pollution in the Gulf of Finland and the north-eastern Baltic Proper over a 24-hour period.

The operation was organised by the Estonian Border Guard Aviation Group. The aircraft base for the CEPCO North flights was in Tallinn. The detected spills have been recognised to contain only minor amounts of mineral oil - the largest being some 5.0 cubic metres. The total amount of oil in all detected slicks has been estimated at 10.1 cubic metres. Due to heavy ship traffic in the area, no suspects have been identified so far.

Remote sensing equipment, such as side looking radars (SLAR), infrared (IR) and ultraviolet (UV) cameras, were used during both operations. Also, the European Maritime Safety Agency's CleanSeaNet service provided satellite images of the flight areas.



Operation area of CEPCO South 2008

Photo: Nikolay Vlasov, HELCOM

Front-looking infrared camera

Almost twenty illegal oil discharges detected during Super CEPCO surveillance flights

Almost twenty illegal oil discharges from ships were detected in the North Sea during the world's largest multi-national aerial surveillance operation against polluters at sea – Super CEPCO - which took place on 21-30 April 2008 along the major shipping routes connecting the Atlantic with the Baltic Sea area.

Eight surveillance aircraft from eight countries, including several HELCOM Member States, participated in the round-the-clock flights which continuously surveyed the designated route off the southern shores of Norway and in the Skagerrak area for oil pollution. Altogether, 185 flight hours were logged during the operation.

The operation remained classified until the last plane landed in order to prevent possible offenders from discovering the surveillance activities. Up to 50 detections were made of which 17 were confirmed as mineral oil. All the confirmed illegal discharges were less than one cubic metre. A Norwegian ship was caught 'red-handed' polluting the Danish waters.

Remote sensing equipment, such as side-looking airborne radars (SLAR), infrared (IR) and ultraviolet (UV) cameras, was used during the operation. Tens of satellite images were also used to supplement the aerial surveillance.

Super CEPCO 2008 was organised by Denmark, Norway and Sweden under the Bonn Agreement, and with the support of the European Maritime Safety Agency's CleanSeaNet Service, which provided satellite images of the flight area. Surveillance planes from Belgium, Denmark, Finland, France, Germany, the Netherlands, Spain and Sweden participated in the flights. The aircraft base was in Aalborg, Denmark.

The main aim of the operation was continuous aerial surveillance over a region of interest in the North Sea over ten consecutive days in order to maximise the chances of catching 'red handed' any polluting vessels, develop rapid and

Photos: Monika Stankiewicz, HELCOM

effective procedures for prosecuting offenders in a multinational context, and to optimise the use of satellite imagery as a complementary surveillance means.

The first Super CEPCO operation took place in 2007. Seven aircraft from six countries flew over the English Channel and the southern part of the North Sea. The Super CEPCO flights will take place again in the future on top of surveillance operations conducted regularly in different European regions. In the HELCOM area, a Super CEPCO operation will be organised in 2009 instead of the CEPCO 2009 flights, during which the chosen shipping routes will be continuously surveyed by aircraft and satellites for around six days.

Photo: Nikolay Vlasov, HELCOM

Photo: Maria Laamanen, HELCOM

8. Developing regional principles for maritime spatial planning

Maritime Spatial Planning (MSP) is a cross-sectoral process of steering the various uses of the multidimensional sea space. It provides an opportunity to distribute human activities in a sustainable manner and to integrate environmental concerns into various sectoral policies, such as maritime transport, offshore energy production development and fisheries. In relation to the Baltic Sea Action Plan, MSP delivers the spatial component needed in implementing the ecosystem approach to the management of human activities in marine areas.

The planning of the Baltic maritime space is a field where HELCOM has naturally a strong role, but where added value is created from active cooperation with other regional organisations, such as VASAB and the BS RAC, as well as with relevant NGOs.

During 2008-2009, HELCOM has carried out work towards implementing MSP according to the HELCOM Baltic Sea Action Plan and HELCOM Recommendation 28E/9. An interactive MSP activity was included in the programme of the Third HELCOM Stakeholder Conference to launch the issue to the wider HELCOM community. The HELCOM Secretariat also carries out an ongoing (March 2008 - Autumn 2009) kick-off project - HELCOM SCALE - funded by the EU assisting the Baltic Sea coastal countries to carry out the needed actions related to MSP. The project has inter alia developed a web-based GIS portal for MSP (http://www.helcom.fi/GIS/en_GB/HelcomGIS/) and promoted the issue in various HELCOM and other international meetings. The project will release a report towards the end of 2009.

The first HELCOM Meeting specifically dealing with the issue - the HELCOM Workshop on Broad Scale Marine Spatial Planning in the Baltic Sea (HELCOM SPATIAL WS 1/2009) - took place on 27-29 January 2009. The participants of HELCOM SPATIAL WS 1/2009 included officials from the ministries of the HELCOM Member States and the European Commission DGs responsible for spatial planning, environmental issues, maritime traffic and fisheries. In addition, the participants included a number of observer organisations. The Meeting was prepared and organised as part of the activities of the HELCOM SCALE project.

As a main output, the Workshop produced a draft list of eleven HELCOM Maritime Spatial Planning Principles for further consideration. The Meeting stressed the importance of involving other Baltic Sea region organisations in addition to HELCOM in further work concerning the Baltic-wide MSP process to ensure the cross-sectoral dimension of the process. The Meeting proposed a joint meeting among, inter alia, HELCOM/VASAB/BS RAC/Nordic Council of Ministers to discuss a joint regional view to a Baltic-specific MSP.

Photo: Nikolay Vlasov, HELCOM

Photo: Metsähallitus

9. Appendices

Press releases

05.03.2009 HELCOM launches an overarching environmental assessment of the status of the Baltic Sea

04.03.2009 HELCOM Conference shows consensus on key building blocks for effective implementation of the Baltic recovery plan

04.03.2009 Statement by the Executive Secretary at the opening of the annual HELCOM Meeting

03.03.2009 Opening Statement by the Chairman of HELCOM at the Fourth HELCOM Baltic Sea Action Plan Stakeholder Conference

03.03.2009 The Baltic remains in a bad shape, but there are some signs of improvement

02.03.2009 Media advisory: HELCOM Executive Secretary to hold media availability

02.03.2009 HELCOM to call on IMO to establish a total ban on sewage discharges from ships in the Baltic

26.02.2009 HELCOM Chairman pays a visit to Minsk to discuss Belarus's accession to the Helsinki Convention

23.02.2009 Media Advisory: Fourth Stakeholder Conference on the HELCOM Baltic Sea Action Plan

23.02.2009 International Conference to review latest assessments of the state of the Baltic Sea and implementation of HELCOM recovery activities

19.02.2009 Call for participants: Fourth HELCOM Stakeholder Conference on the Baltic Sea Action Plan

16.02.2009 HELCOM launches a new project to estimate inputs of hazardous substances into the Baltic Sea

03.02.2009 Second call for applications: Fourth HELCOM Youth Forum

30.01.2009 Stakeholders to discuss the implementation of the HELCOM Baltic recovery plan in Russia's Leningrad Oblast'

Photo: Irina Gasilina

27.01.2009 HELCOM experts to discuss first results of the Baltic coastal fish assessment project

09.01.2009 New project to improve HELCOM countries' readiness to respond to an environmental disaster at sea

12.12.2008 HELCOM releases Baltic Clean Seas Guide 2009

11.12.2008 HELCOM to hold the Fourth Stakeholder Conference on the Baltic recovery plan


Photo: Samuli Korpinen, HELCOM


Photo: Samuli Korpinen, HELCOM

05.12.2008 Baltic Sea to become a pilot area under the EU Marine Strategy Framework Directive

02.12.2008 HELCOM report shows sharp decrease in ship collisions in the Baltic

28.11.2008 Latest issue of HELCOM Newsletter released

28.11.2008 HELCOM to consider a revision process for nutrient reduction targets of the Baltic Sea Action Plan

27.11.2008 Fourth Meeting of the Baltic recovery plan Steering Group to focus on eutrophication

25.11.2008 Stakeholder Workshop in St. Petersburg addresses key actions within the maritime segment of the HELCOM Baltic Sea Action Plan

24.11.2008 HELCOM to call for an international ban on sewage discharges in the Baltic

14.11.2008 HELCOM to consider further measures to reduce emissions from ships

10.11.2008 Speech by the HELCOM Chairman at the annual HELCOM Diplomatic Lunch

10.11.2008 HELCOM's Chairman hosts a working lunch for the Ambassadors of the Baltic Sea countries

31.10.2008 HELCOM set to release latest information on eutrophication status of the Baltic Sea

28.10.2008 HELCOM to consider a new regulation on sheltering ships in need of assistance

24.10.2008 HELCOM Chairman to visit Helsinki and Stockholm

10.10.2008 HELCOM countries to discuss maritime activities under the Baltic recovery plan

Photo: Samuli Korpinen, HELCOM

03.10.2008 HELCOM launches Fisheries and Environmental Forum on sustainable use of Baltic marine biodiversity

23.09.2008 Catches of chemical munitions in the Baltic hit record low

17.09.2008 Seven illegal oil discharges detected during HELCOM's aerial surveillance flights over the north-eastern Baltic

12.09.2008 HELCOM to assess contamination levels of hazardous substances in eastern Baltic

08.09.2008 Germany to host the Fourth HELCOM Youth Forum

01.09.2008 HELCOM fleet conducts a successful emergency response exercise off the Russian coast

01.09.2008 Russian team wins HELCOM Trophy

15.08.2008 HELCOM launches online version of mariners' routeing guide for the Baltic

13.08.2008 Media Advisory: Accreditation deadline for BALEX DELTA has been extended

13.08.2008 Kaliningrad to host a Stakeholder Workshop on improving accident response capability in the south-eastern Baltic

01.07.2008 Statement by the new Chairman of HELCOM

08.08.2008 Media Advisory: HELCOM to hold its annual international rowing competition

07.08.2008 Media Advisory: Tour of the HELCOM BALEX DELTA exercise area

07.08.2008 HELCOM fleet to drill response to an oil platform accident off Kaliningrad

24.06.2008 Russia set to take over the Chairmanship of HELCOM

24.06.2008 HELCOM releases Annual Report on 2007 activities

03.06.2008 HELCOM measures keep illicit oil spills in the Baltic near record lows

02.06.2008 HELCOM to update pollution reduction requirements of the Baltic recovery plan

16.05.2008 Kaliningrad to host a Stakeholder Workshop on the implementation of the HELCOM Baltic recovery plan

15.05.2008 HELCOM experts to discuss further actions to limit pollution to the Baltic Sea from land-based sources

30.04.2008 Almost twenty illegal oil discharges detected during Super CEPCO flights

28.04.2008 HELCOM HABITAT Group to discuss implementation of the Baltic recovery plan

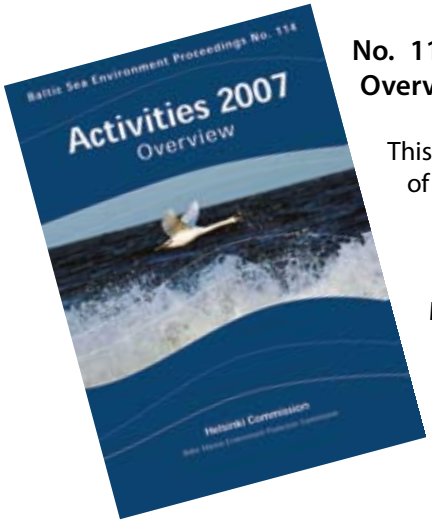
04.04.2008 HELCOM launches group to steer Baltic recovery

Publications

The following list includes HECOM publications released since the 29th annual Meeting of the Helsinki Commission in March 2008.

A complete list of HELCOM publications is available at: http://www.helcom.fi/publications, where these publications can also be viewed. To order printed copies, please call the HELCOM Secretariat: + 358 (0)207 412 649 or send an e-mail to info@helcom.fi.

1. Baltic Sea Environment Proceedings (BSEP)



No. 114 HELCOM Activities 2007 Overview (2008)

This report summarises the activities of the Helsinki Commission related to the protection of the Baltic marine environment over the period from March 2007 to March 2008. It also reviews these activities together with current trends related to the main environmental issues.

No. 115A Integrated Thematic Assessment of Eutrophication in the Baltic Sea, Executive Summary (2009)

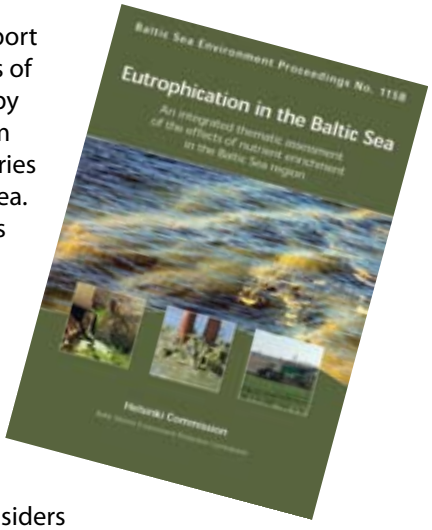
The Executive Summary of the assessment of eutrophication in the Baltic Sea: An integrated thematic assessment of the effects of nutrient enrichment in the Baltic Sea region provides an extract of the assessment report published in BSEP 115B. The main results, conclusions, recommendations and perspectives concerning the eutrophication status of the Baltic Sea in 2001-2006 and trends that have lead to the current situation are presented in this twenty-page public oriented summary report.

Newsletters

HELCOM News 1-2008

HELCOM News 2-2008

No. 115B Eutrophication in the Baltic Sea: An Integrated Thematic Assessment of the effects of nutrient enrichment in the Baltic Sea region (2009)



The assessment report presents the results of four years of work by tens of experts from the HELCOM countries around the Baltic Sea. The report provides an overview of the eutrophication status of the Baltic Sea in 2001-2006, the trends and the causes that have lead to the current status. The report also considers management actions that have been agreed or taken so far by the HELCOM countries, HELCOM and the EU to combat eutrophication and additional management actions that will still be needed to meet the eutrophication targets of the Baltic Sea Action Plan. The assessment also provides perspectives to future challenges, such as increased precipitation and temperatures caused by the projected climate change which are likely to exacerbate eutrophication.

2. Other publications

Clean Seas Guide 2009 (2008)

This publication is an updated version of the HELCOM Clean Seas Guide for mariners plying the waters of the Baltic Sea. Its aim is to provide ship masters with basic information on the pollution prevention regulations which have been established in the region by HELCOM.

BRISK Project brochure (2009)

This brochure provides details on the new HELCOM Project, co-financed by the EU, which aims at considerably improving the readiness of the coastal countries to respond to major spills of oil and hazardous substances.

Fourth Stakeholder Conference on the HELCOM Baltic Sea Action Plan (2009)

This set of online materials was released following the Fourth Stakeholder Conference on the Baltic Sea Action Plan held on 3 March 2009. It includes the conference outcome document as well as presentations from the opening plenary, and the three thematic sessions discussing the new HELCOM biodiversity and eutrophication assessments which are setting a baseline for implementing the measures of the plan; the economic perspective of the protection of the Baltic Sea; and issues of regional cooperation in strengthening the knowledge base for cost-efficient implementation of the plan.

The materials are available via the HELCOM website at http://www.helcom.fi/BSAP/4th/en_GB/Fourth_Stakeholder_Conference/.

www.helcom.fi