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Oil spill preparedness in the Baltic Sea countries

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Index

Abstract

The Baltic Sea is one of the world's busiest waterways. An estimated 9 % of the world's trade and 11 % of the world's oil transportation passes through Baltic waters. It is estimated that this will increase by 64 % between 2003 and 2020. For example, the oil transportation has increased by 133 % between 1997 and 2008 and is now over 250 million tonnes per year. Plenty of shallows and narrow passages make parts of the Baltic Sea difficult to navigate. There are around 130 accidents each year, with 10 of these leading to pollution, mostly of oil. The brackish water of the Baltic Sea coupled with a long residence time of water, makes the flora and fauna particularly sensitive to pollution. The Baltic Sea countries are fortunate to never have had a larger oil spill. The largest one, the *Globe Asimi* in Lithuania in 1981 spilled 16 000 tonnes of oil. Compared to the larger oils spills in other parts of the world, for example the *Prestige*, that spilled 63 000 tonnes, this is a small amount.

In the Baltic Sea region, several bilateral agreements and international conventions exist to strengthen the cross border cooperation in case of an oil spill. Annual exercises are held by the respective countries' Navy and Coast Guard on combatting oil spills at sea. These have held multiple joint response operations during the HELCOM Balex Delta exercises for several years. However, this spirit of international cooperation and capacity building has not been the case with the land based oil spill response.

The organisation of the on land oil spill response in the Baltic Sea countries varies. Certain countries have a centralised system, with a federal authority in charge of the response and aided by local resources. Other countries have the local authorities in charge, who are aided by the governmental authorities and resources.

Different countries have worked with contingency planning to a varying degree. Poland for example have had no larger spills at all, but have invested much time and money into response preparedness. Sweden has had several smaller to medium sized spills, but there is large variation between the municipalities concerning the preparedness level. Different nations have set different goals for their oil spill response as well, for example Finland is prepared for an oil spill of 30 000 tonnes, Germany for 15 000 tonnes, Sweden 10 000 tonnes and the Russian Federation for 5 000 tonnes.

The two Baltic Master projects have highlighted the changing patterns related to shipping in the Baltic Sea and the corresponding need to continuously re-assess the threats to coastal environments and communities. One of the important conclusions from Baltic Master II is that the preparedness to deal effectively with oil spills at the local and regional level in most of the Baltic Sea countries is poorly developed. Important aspects are related to the need for updated and well rehearsed contingency plans. The need to test these plans in real exercises with regular intervals must be emphasised in particular. Such practices will test the collaboration between different agencies locally, the cooperation between central and local agencies, and the collaboration across borders. To cover the cost for such an improved preparedness various funding mechanisms can be discussed, one example highlighted in the present report is the development of a fund similar to the Finnish model.

Introduction

The increased maritime traffic in the Baltic Sea in the last decade has fundamentally changed the needs for response preparedness for a major oil spill accident in the adjacent countries. Larger tankers and more oil being transported through the Baltic Sea have also changed the risk factors of the region. Coupled with anticipated development of both coastlines and the sea, many reports are calling for a holistic approach to marine spatial planning. Efforts in this direction have already been made, with the European Union's (EU's) Integrated Maritime Policy and Baltic Sea Strategy and Helsinki Commission's (HELCOM's) Baltic Sea Action Plan. (Boverket, 2006; HELCOM, 2010a; EU, 2009 & 2010 and WWF, 2010)

This report has been written for the EU project Baltic Master II. During the project, several contingency plans have been written for coastal municipalities in the south Baltic Sea. Additionally, exercises has been held in these municipalities to increase the familiarity with the written plans and to make all participants understand the need for a plan. This has also led to an awareness rising for the topic in the region.

The purpose of this report is to describe how the different countries around the Baltic Sea have formed their oil spill preparedness and to identify possible weaknesses that need to be addressed.

The Baltic Sea

The Baltic Sea covers around 377 000 km² and is one of the largest brackish water bodies in the world. It is located in the northeast part of the Atlantic, connected through first Skagerrak, then Kattegat and finally the Danish Belt straits and the Öresund, between Denmark and Sweden. It is divided into the Baltic Proper, the Gulf of Finland, the Bothnian Sea and the Bothnian Bay (see figure 1). It has a shoreline to nine different countries; Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden. All of these countries, except Russia, are part of the EU. Around 85 million people live in the catchment area of the Baltic Sea, most of them in the southern half. Besides the nine countries mentioned before, another five countries (Belarus, Czech Republic, Norway, Slovakia and Ukraine) contribute to the runoff into the Baltic Sea. (HELCOM, 2011b)

In addition to being one of the world's largest brackish seas, it is also very shallow. The average depth is only 56 meters and the deepest point, Landsortsdjupet, reaches 459 meters. The lighter, less saline water from the Baltic Sea is transported as a surface flow out through the Belt Straits and Öresund. Heavier, more saline water flows close to the bottom into the Baltic Sea. These significant in-flows only happen when persistent strong westerly winds prevail, historically once every 10-20 years. The limited influx of oxygenated saline water, the lack of mixing across the halocline and the large input of nutrients and organic matter from the drainage area has led to eutrophication of the Baltic Sea. This has led to severe oxygen depletion over significant portions of the bottom. The lack of oxygen prevents any form of higher life, resulting in lifeless deepwater areas in 40 % of the Baltic Sea. (Elmgren, 2001; Bernes, 2005; HELCOM, 2009; Havsmiljöinstitutet, 2011)

Commercial interests

All forms of tourism in the Baltic Sea countries, including that not related to the Baltic Sea, is estimated to turn over 90 billion euros per year. This gives employment to around 2 million persons. If you value different sectors, for example the pleasure boat industry including service, wharfs and marinas, this turned over 265 million euros in Sweden alone in 2004. The Swedish sport fishing

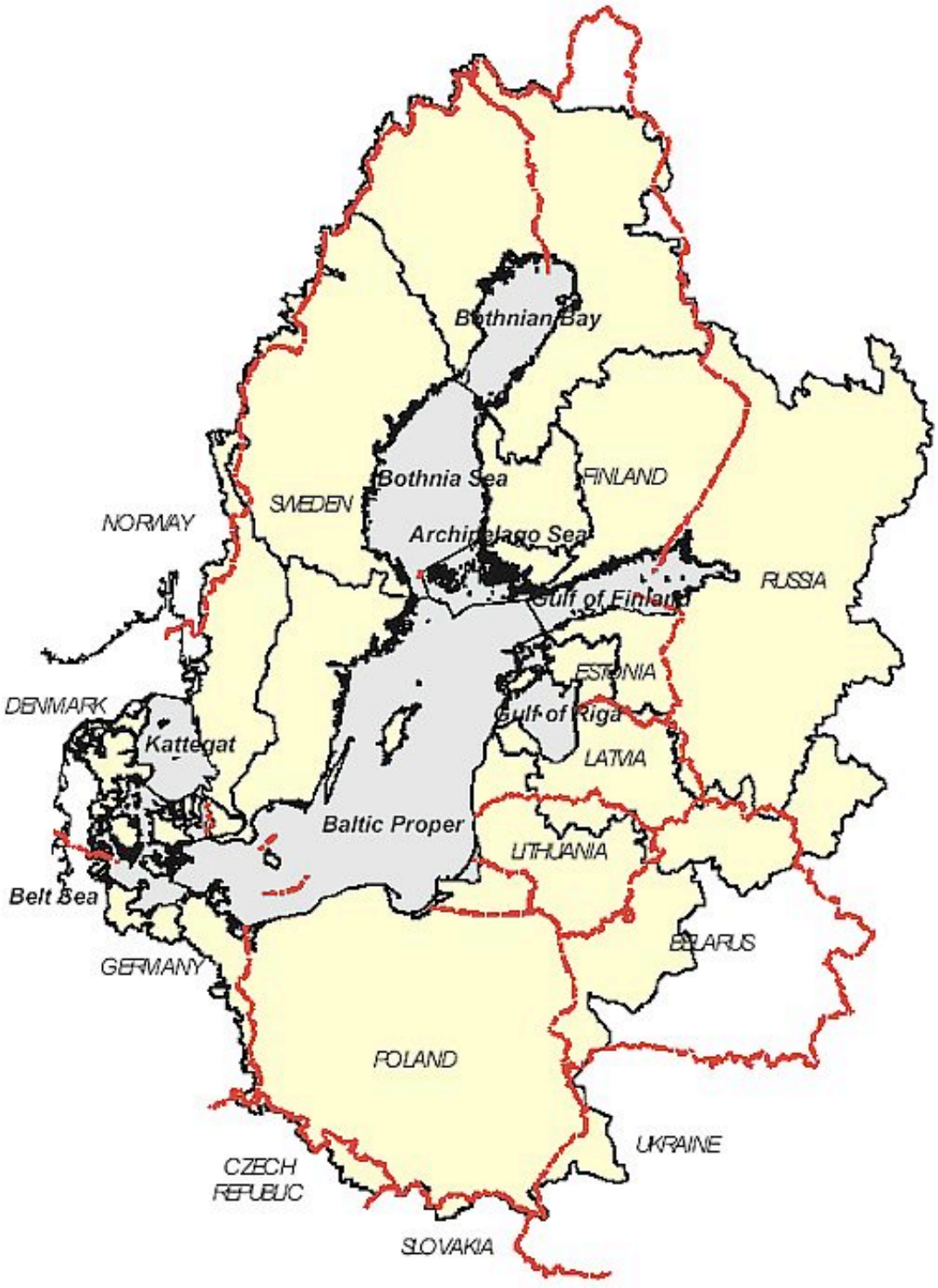

Figure 1: The Baltic Sea, surrounding countries and drainage area (HELCOM, 2011b).

industry with around 1 million practitioners in seas and inland waters was estimated to turn over 265 million euros in 2006. In addition to this, the recreational diving industry has around 235 000 practitioners in Sweden (Naturvårdsverket, 2009). It is much harder to set a price on the value of a healthy sea and clean beaches in relation to the human health and non-market factors, such as recreational factors (Baltic Master II, 2011).

The Baltic sea is also getting increasingly crowded with other kinds of commercial interests. The laying of the gas pipe from Russia to Germany is hindering the shipping, while the finished gas line will decrease the transportation of gas by ship. A report in 2010 from WWF estimates the wind

farms to increase by 6 000 % within the next ten years, which will drastically change the shipping routes, depending on where these wind farms are erected. (WWF, 2010)

Shipping

The Baltic Sea is one of the most heavily trafficked seas in the world with around 2 000 vessels sailing its waters at any given moment. Up to 15 % of the worlds trade is transported on the Baltic Sea and 11 % of the world's oil transport. Given the size of the Baltic basin, this makes the Baltic Sea one of the busiest seas in the world. The amount of oil being transported has doubled between 1997 and 2008 and forecasts indicate that both the amount of traffic and the number of tankers will increase in the future (see figure 2). The size of the vessels is predicted to increase as well since the Russian oil terminals in the Primorsk area recently have been expanded to accommodate tankers carrying 150 000 tonnes of oil. With the growing demand for oil in the world and the opening of new oil fields in Russia west of the Ural, the increase of oil and gas transport through the Baltic Sea will increase even further in the coming years. With denser ship traffic and more and larger tankers, the risk of accidents resulting in oil spills is increasing (HELCOM, 2011a; Sergev et al., 2009).

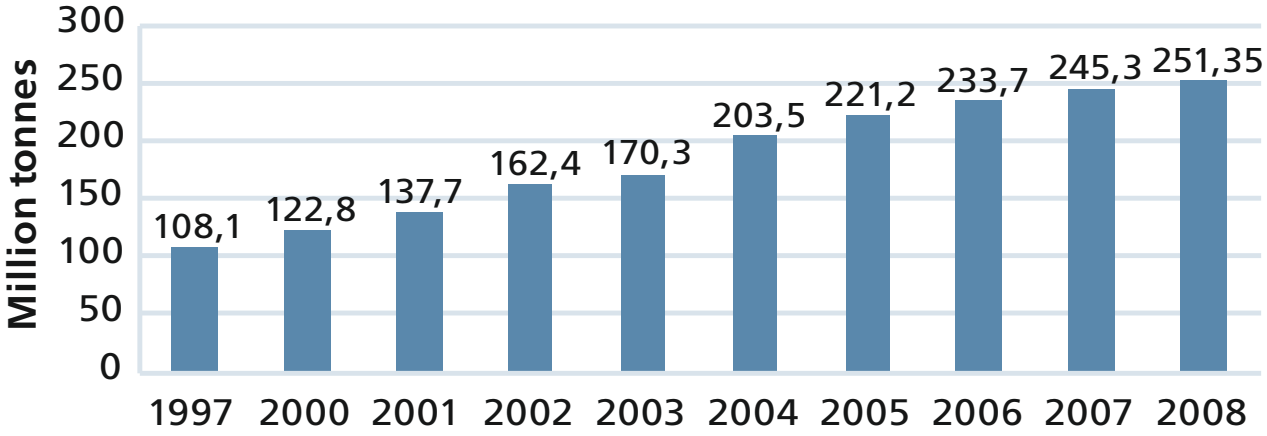

Figure 2: Amount of oil being transported through the 16 largest oil terminals in the Baltic Sea (HELCOM, 2011a).

Compared to European waters in general the Baltic Sea is overrepresented when it comes to maritime accidents. About 120 to 140 are reported every year and there has been an 20 % increase since 2006 (see figure 3). Considering the heavy traffic, this is not surprising at all. The shallow, narrow Danish and Swedish straits connecting the Baltic with the North Sea are known bottlenecks and notoriously difficult to navigate. Most of the groundings occur in this area, while the collisions that occur are spread more or less evenly along the trade routes in the Baltic (HELCOM, 2011a; 2009c).

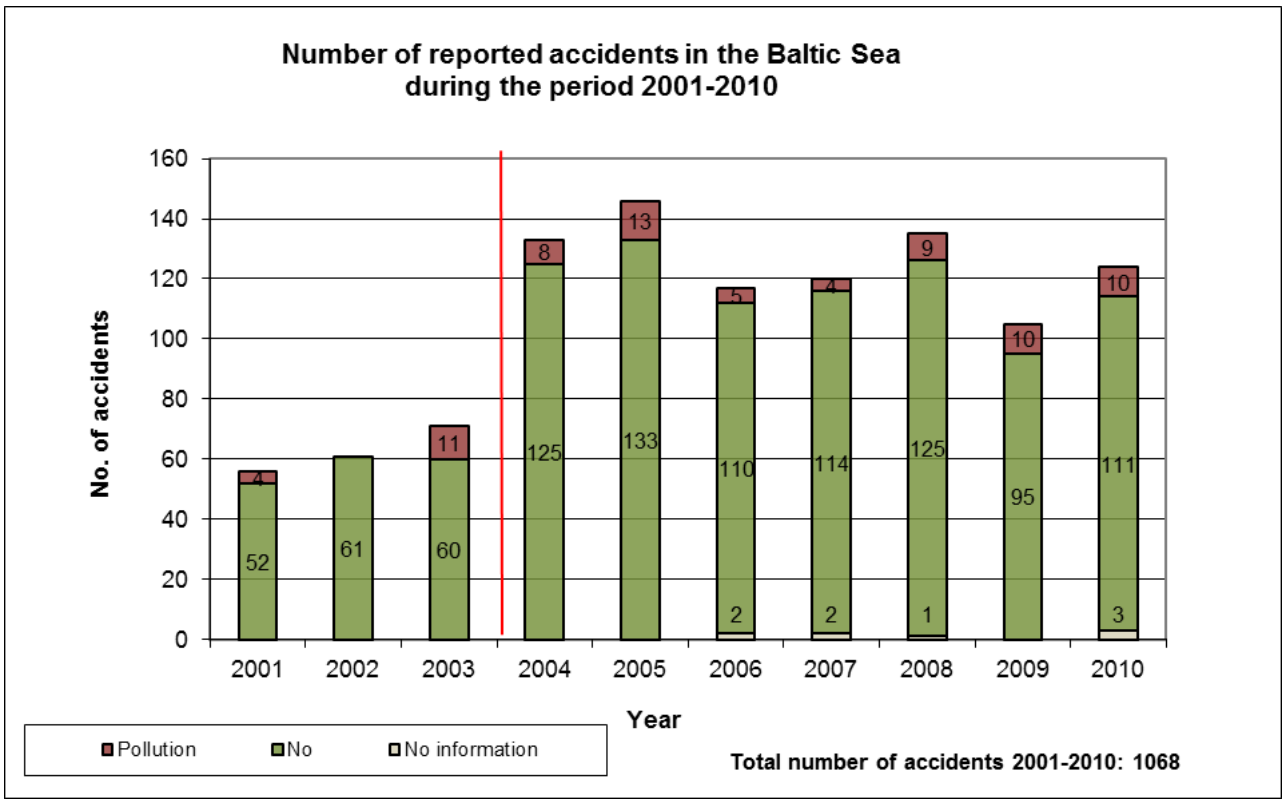

Figure 3: Number of accidents in the Baltic Sea and number of cases that have led to an oil spill (HELCOM, 2011a).

Oil spills

One serious ecological impact of a shipping accident is pollution. Most of the time, this pollution comes from oil. According to data from ITOPF, the number of large oil spill accidents in the world are going down (see figure 4). Groundings and collisions remain the primary causes of oil spills, with groundings the largest of the two. With the ever increasing precision of sea charts, satellite tracking and technology on board the ships, this points to the fact that the primary cause ultimately lies with the human factor. (ITOPF, 2011 & HELCOM, 2011a)

The fact that many of the oil tankers are old, and that single hull tankers are not yet phased out despite the MARPOL ban in 2010, adds to this risk. The oil tanker *Prestige* which sank off Spain's Galician coast in 2002, had passed through the Baltic Sea on its journey south. Once in the stormy waters of the Biscaya, the ship was damaged in the heavy seas, broke into two and sunk. Approximately 63 000 tonnes of oil were spilled, contaminating 1 900 km of the Spanish, French and British coastlines (ITOPF, 2010a). The *Fu Shan Hai* accident in 2003 increased the awareness of the threats of oil spills in the Baltic Sea. The *Fu Shan Hai* spilled approximately 1 200 tonnes of oil, which is a small volume in comparison with other international oil spills during the last 10 years. Had the *Prestige* wrecked in the Baltic Sea instead of the Bay of Biscay, extensive coastlines would have been contaminated.

There has been a number of relatively small accidents earlier in the Baltic Sea; one of the best documented is the *Tsesis* oil spill in the Stockholm archipelago in 1977. The accident which was a grounding resulted in a spill of approximately 1 000 tonnes of heavy fuel oil. The research after that incident and the information gathered in subsequent Baltic Sea oil spills have significantly

improved understanding of the fate and impacts of oil spills in the region (Lindén et al, 1979; Midbøe & Petersson, 2004).

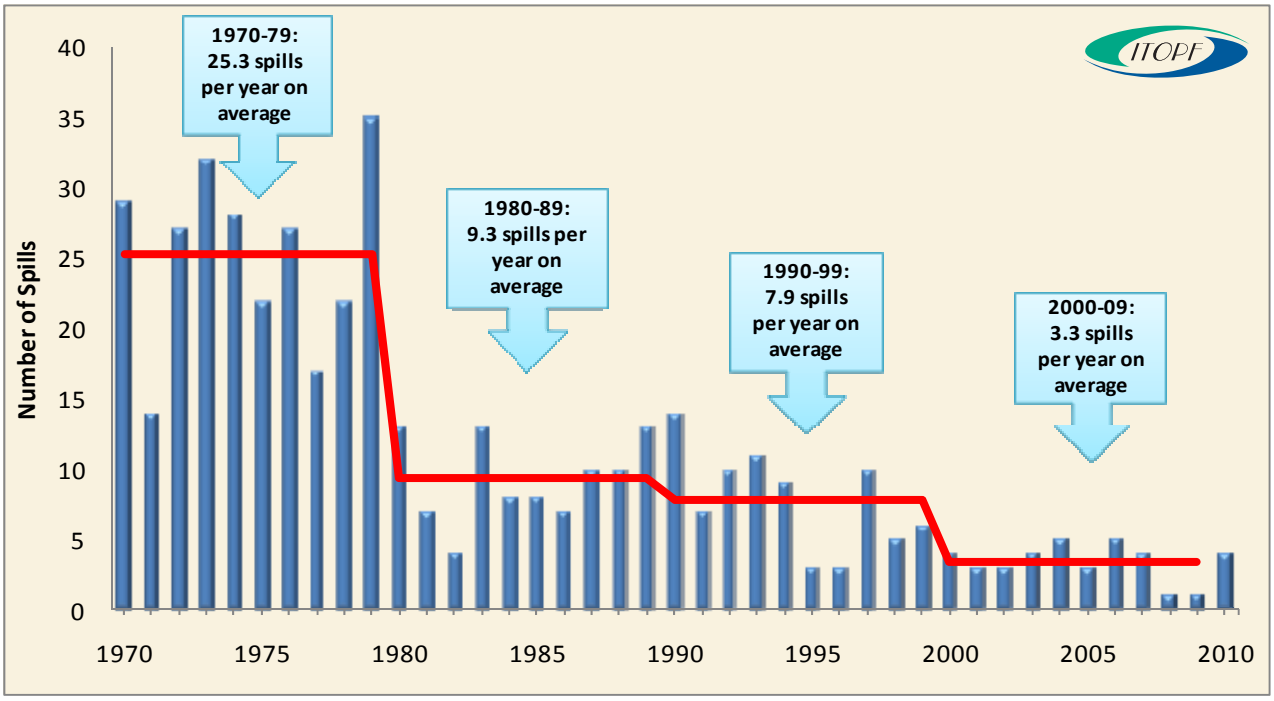

Figure 4: Number of spills in the ITOPF database from 1970 to 2010. (ITOPF, 2011)

The numbers also show that a far larger amount of oil is spilled in smaller quantities during routine operations. Much of the press coverage, however, is focussed on the impact accidents with a larger amount of oil spilled has on the environment. As stated before, studies have shown that there is very little long term effect after a larger oil spill. In contrast, long time chronic spills are far worse, as can be shown in areas like Nigeria. (UNEP, 2011)

Effects

The effects of oil on marine ecosystems have been extensively researched and much more is now known, than was the case when the first oil tanker, *the Torrey Canyon,* sunk in 1967. There have been two oil spill accidents especially, which have raised the concern of the public of what effects an oil spill has on the environment. The first was the *Exxon Valdez* in 1989 in Alaska, USA. The second was *Prestige* of the Galician coast in Spain in 2002.

All types of vessels carry fuel for their engines. Even ships with the latest technology and safety measures that adhere to all international safety standards run the risk of causing accidents potentially resulting in oil spills. So far, the Baltic Sea has been spared major spills, like the infamous *Exxon Valdez* or *Prestige*. The largest oil spill in the Baltic Sea was the *Globe Asimi* outside Klaipėda in Lithuania 1981. In total, approximately 16 000 tonnes of oil was spilled as a result of that incident (Midbøe & Petersson, 2004).

The environment will always be the primary victim after an oil spill. Birds are the animals that are most visibly affected, but fish, marine mammals and vertebrates are also affected. The vegetation is contaminated, and the oil seeps down into the ground where it can continue to leak back to the surface for years. Although the acute effects can be fatal, the long-term non-lethal effects are harder to ascertain. Most studies show that the environment will recover after a few years, but long-term

impacts may be observed, such as reproductive and behavioural effects, shifts in population structure and habitat loss (ITOPF, 2010b; U.S. Fish & Wildlife Service, 2004).

Cost

The socioeconomic cost of an oil spill has been estimated and discussed in several reports, among them the Baltic Master report *Socioeconomic impacts of major oil spills - prediction methods and scenario studies* from 2007. This report showed that the cost of socio-economic damage can be expected to be more than twice the direct response and clean up costs (Baltic Master, 2007 & Baltic Master II, 2011).

The clean up cost of the *Exxon Valdez* was estimated to be approximately €1.8 billion during the first year alone. Claims, fines and penalties have been estimated to be €5.2 billion. Far from all the claims have been settled, and court processes are still pending, over 20 years after the spill. The same can be said of the *Prestige*. The cost of the damage was estimated to reach €1 billion not including the damage to the ecosystem. Only a small fraction of this has been compensated for, and the legal processes are still ongoing (IOPC, 2009; ITOPF, 2010c; 2010d). BP has as of 13 January 2011 paid out close to $5 billion in claims for the *Deepwater Horizon* accident to individuals, industry and government (BP, 2011). This spill did not originate from a tanker but the impacts of the oil to the environment are similar.

The direct clean up cost of an oil spill is not necessarily related to the amount of oil spilled. There are various of factors that play significant roles for the final cost. Among these are location of the spill, prevailing currents, distance to the shore, how fast and effective the response is and accessibility to the accident site. If the clean-up is mostly performed out to sea, the cost is cut dramatically (Yamada, 2009).

Contingency planning

Contingency planning means to plan ahead for a future accident. By establishing a work flow and assign tasks in advance, an organisation can test different scenarios and foresee bottlenecks and problems that will be problematic in a real incident. Hopefully, all the questions that will arise during the planning process will be addressed in time for a real incident. Most importantly, there is a need to exercise the plan, to see whether it works or not.

Response preparedness

Response preparedness of the Baltic Sea countries is in various stages of development. There are several conventions and agreements (for example HELCOM, BRISK and the Copenhagen agreement) regulating cooperation across borders and between organisations. Experience shows that almost all marine oil spills will to some degree affect land. The problem with the existing plans, conventions and agreements is that they are too focused on the oil spills while they are at sea. Very little planning relates to the oil once it has reached the shoreline. Furthermore, the development of shoreline clean up technology has been very limited during the last decades (ITOPF, 2007) Several experts agree that greater effectiveness of the oil spill response can be achieved with preparation (Kirby & Law, 2010).

Accordingly, HELCOM has recently shifted its focus from seaward towards shoreline response to oil spills. For the first time in 2010, shoreline response was made an integral part of the annual Balex Delta exercise. In addition, oiled wildlife response has been developed, together with further recommendations added to the HELCOM response manual (HELCOM, 2010b).

Regulations and strategies

One of the oldest and most respected organisations working in this area is HELCOM. It is the governing body of the "Convention on the Protection of the Marine Environment of the Baltic Sea Area," commonly known as the Helsinki Convention of 1974 and 1992, the first regional convention to address the Baltic Sea (HELCOM, 2010a).

The International Convention for the Prevention of Pollution from Ships, 1973/1978, or MARPOL, is the international treaty covering the prevention of operational or accidental pollution of the marine environment by ships. It is a combination of two treaties and updated by amendments through the years. 98 % of the world's tonnage is signatory to MARPOL Annex I and II (IMO, 2002).

UNCLOS is the United Nations Convention of the Law of the Sea of 1982 and is widely recognised as the constitution of the oceans. UNCLOS has been ratified by a majority of the UN's member states. The treaty deals with a multitude of issues in maritime and marine affairs, including accidents resulting in discharges of hazardous substances into the oceans (UN, 2010).

The European Union (EU) has recently approved their Baltic Sea Strategy, which outlines a comprehensive strategy for the economic development and environmental protection of the Baltic Sea area, The aim is to improve the economy in a sustainable way, while improving the environment (EU, 2010a).

Current initiatives

There are several on-going projects to increase the preparedness in the Baltic Sea, by creating or updating contingency planning as well as testing them in exercises. These can be local projects, but also international initiatives, for example EU projects or through organisations such as HELCOM. A few examples are the Baltic Master II, BRISK and EnSaCo EU projects.

Material and methods

Data has been collected by sending out inquiries over email to identified individuals within the respective countries' emergency response organisations from Marcus Olsson at Region Skåne in Sweden. The individuals have been chosen from personal contacts and recommendations gathered during the course of the Baltic Master II project by Jonas Pålsson and Marcus Olsson and followed up with emails and telephone calls to clarify specific points in the answers. It was compiled by Jonas Pålsson and Marcus Olsson and written by Jonas Pålsson. Supplementary information has been collected from the respective organisation's web pages.

The initial emails specifically inquired about:

Responsible authorities

- Who is responsible for what?
- To whom do they answer?

Response chain

- Who gets the first alert?
- Who does he call?
- How is he response initiated from the alert?

Equipment
- What type of equipment is available?
- Who has it?
- Where is it?

Previous accidents
- Have there been any accidents before?
- Where have they been?
- How much was spilled?
- What was the result of the response?

Exercises
- How often do you exercise?
- With whom do you exercise?

Conventions ratified
- What international conventions are ratified by each country?
- Which conventions are not ratified?

The contact persons for the different countries are shown in Appendix 1.

Results

The preparedness situation around the Baltic Sea is diverse. Countries have different authorities responsible for different tasks, as shown below. Other types of organisational differences exist additionally, for example centralised command in Germany, Estonia, Denmark and Lithuania compared to the decentralised responsibility in Sweden.

Denmark

Division of responsibility

From the 1st of January 2000, the response responsibility to oil spills or other hazardous and noxious substances at sea and in coastal waters was moved from the Danish Ministry of the Environment and Energy to the Danish Ministry of Defence. The Ministry of Defence has subsequently delegated the authority to Defence Command Denmark, who delegated the contingency function to the Admiral Danish Fleet, also called the Royal Danish Navy. The Headquarters of the Royal Danish Navy, Søværnets Operative Kommando (SOK), is responsible for preventing or minimising oil pollution damage to the marine environment, natural resources and recreational areas on coastlines and beaches.

MAS (Maritime Assistance Service) is an integral part of the Danish Navy. It acts as a central maritime contact point for shipping inside and around Danish territorial waters. The main task of the MAS is to handle communication with the ship masters that are in need of assistance, but also other maritime stakeholders, for example salvage companies, fleet owners and port authorities. MAS is manned around the clock to deploy rapid assistance and professional support for ships in need. This can be combating pollution, fire and explosions on board, collisions, groundings and maritime security. MAS receives Ship Security Alert System distress calls from Danish and foreign vessels in Danish waters.

Response and clean-up of beaches and ports are the responsibility of the coastal municipality in question, but most often assisted by the Danish Emergency Management Agency (DEMA).

Oil producing companies and offshore oil drilling operations must have their own contingency plans and organisation as well as equipment. The plans must be approved by the Danish Environmental Protection Agency and must include alarm and communication chains in the organisation and to the authorities, chain of command, equipment, capacity and location list, response techniques, monitoring systems, access routes, crew training, temporary storage, transportation and destruction of contaminated material and regular exercises.

Operations

In case of an oil spill, SOK will decide if a response will be initiated or not, to what extent and with which method. If there is a need to use dispersants, the Ministry of Environment must give special permission. If there is a larger spill, the Danish fleet will assign an On-Scene Commander (OSC) to lead the response. Furthermore, a group will be established, with representatives from different stakeholders, organisations and authorities. When the oil hits the shore, the affected community can seek help from DEMA. Oily waste is transported to already established contractors, for example Kommunen Kemi and Gunnar Lund Olieservice. For illegal discharges into the sea, the Admiral Danish Fleet is responsible for the enforcement of the Danish Marine Environment Protection Act in the Danish Exclusive Economic Zone (EEZ).

Operations at sea when it comes to oil spill response is conducted with vessels from the Admiral Danish Fleet, the Danish Maritime Safety Administration (DaMSA) and private salvage companies, among others. If private companies are used, these have an already established contract. During these operations, air support is accessible through the Danish Air Force.

Equipment

The Admiral Danish Fleet uses seven vessels equipped with different quality of booms, skimmers, pumps and other material located at the different bases of the Navy. Details of these can be found in Appendix 2.

Additionally, tugs and salvage vessels can be hired from private contractors.

DEMA has five stockpiles of equipment in Denmark, located in Thisted, Herning, Haderslev, Næstved and Allinge. These contain material for both shoreline response and clean-up.

Exercises

There is a national oil spill contingency plan in place and since a few years, oil spill contingency plans for the municipalities. The national contingency plan is exercised five or six times a year, with two or three municipalities taking part each time.

Estonia

Division of responsibility

The role of the Ministry of the Environment is to act as the strategical coordinator in environmental matters at international level. The responsibility for pollution both at sea and in the lakes Lämmi and Pihkva are the responsibility of the Ministry of the Interior, who has delegated the responsibility to the Estonian Rescue Board (ERB). The ERB is responsible for the tactical coordination of the different national organisations and stakeholders and also coordinates the international help.

The ERB is further subdivided into three different branches:

- Estonian Coastal Rescue Centre, with four regional centres
- Emergency centres, in four different locations
- Explosive Ordinance Disposal, with four different groups

The Joint Rescue and Coordination Centre Tallinn (JRCC Tallinn) are available around the clock and handle calls on maritime accidents, although primarily search and rescue.

The beach clean up is the responsibility of the Estonian Rescue Board, but is delegated to the regional rescue centres and the local municipalities.

The larger ports are responsible for their own oil spill response.

Operations

When an oil spill occurs at sea, the alarm will come to the Vessel Traffic Service (VTS) or the Gulf of Finland reporting area (GOFREP) first. These will forward the alarm to the JRCC Tallinn and these in turn will inform the Police and Border Guard Board (PBGB), who are responsible for the oil spill response at sea. When the oil hits the shore, this responsibility is the Estonian Rescue Board (ERB), who has 83 rescue service stations spread around the country. There are laws regulating the transportation of oily waste and in Estonia, there are several locations where oil and contaminated material can be incinerated or buried. The command centre for the response operation can, depending on the size of the operation, be located at the respective regions' PBGB office.

Mechanical removal of oil is the primary method used and dispersants are severely limited according to the HELCOM recommendations. It is only allowed in the most extreme cases and then in agreement with the Ministry of the Environment.

Equipment

The ERB uses the three tier system when it comes to response to oil spills. The response resources are different between these tiers.

Tier 1 response, at the local level, is placed at five different locations: Kuressaare, Kärdla, Haapsalu, Mustamäe och Kohtla-Järve and has capacity to respond to spills of 1 000 litres of light oils at sea or on land and equip 30 volunteers with personal protection equipment.

Tier 2 response, at the regional level, is placed at four different locations: Haapsalu, Tartu, Mustamäe och Kohtla-Järve. They have the capacity to each respond to a spill of 10 000 litres of

light oils at sea and on land, equip 50 volunteers with personal protection equipment for three days and nights. They additionally have 105 coastal boom, 500mm * 200 m and 750 * 200 m beach boom, access to hot water washers, skimmers and transport vehicles.

Tier 3 response, at the national level, is located at one location in Kose. It has capacity to eliminate and skim both light oils and viscous oils at up to 10 m^3 per hour and equip 50 volunteers with personal protection equipment for seven days and nights. Additionally, they have equipment for bird washing volunteers, 1 300 m coastal boom and 350 m beach boom, vacuum pumps, absorbents and access to trucks, tanks and other all terrain vehicles for transport.

JRCC Tallinn has three response vessels. Details of these can be found in Appendix 2.

The larger ports have their own oil spill response equipment, since they are responsible for their own clean up.

Exercises

As members of HELCOM, Estonia takes part in the Balex Delta exercises held every year.

Finland

Division of responsibility

In Finland, the Finnish Environment Institute (SYKE) is the marine pollution response authority under the Ministry of the Environment. The Ministry of Environment has supreme management and supervisory responsibility against oil pollution and also against other harmful substances. SYKE is responsible for the response measures necessitated by incidents on the open sea, which includes purchase and development of governmental oil combatting equipment. It is also responsible to give and request international assistance to marine pollution caused by oil or other toxic substances. SYKE also has the authority to order the undertaking of salvage operation, if a vessel is in a position that has a risk for pollution.

The Centres for Economic Development, Transport and the Environment (ELY) give advice and supervise the local municipalities and commercial companies on pollution response and preparedness. When necessary, they also participate in the response operations.

The Rescue Service, who are financed by the municipalities have according to Finnish law responsibility to uphold a response readiness and have a contingency plan in place for the respective coastal municipalities. These oil spill contingency plans need an approval of ELY, before they are implemented. ELY also give advice and supervise the local municipalities and commercial companies on pollution response and preparedness. When necessary, they also participate in the response operations.

There are three coastal region oil spill response plans and one national. If needed, the defence forces, border guard and the Finnish traffic Safety Agency (Trafi) participate in the response, as well as private companies.

Ports, terminals and other facilities that handle oil are required to be able to respond to realistic oil spills in their respective facilities.

Other authorities are obliged to assist in oil or chemical spill combatting within their abilities. The goal is for Finland to be able to handle spills of up to 30 000 tonnes of oil.

Finland adheres to the ”Polluter Pays Principle” and has in addition to this policy a national Oil Pollution Fund that will cover the costs for oil pollution response, when no polluter can be identified. The fund is financed by a set tonnage fee that the transport companies pay to leave or transport oil through Finnish waters. The administration is handled by the Ministry of the Environment, but the compensation decision rests with an independent committee. From this fund, the Rescue Service is then permitted to seek compensation for purchasing new equipment that is recommended by a ELY approved contingency plan. This means that SYKE does not automatically have access to the fund. The government has the right to apply for compensation for equipment as well, and this is judged on a case by case basis.

Operations

The alarm most often reach the Maritime Rescue Coordination Centre (MRCC/MRSC) through radio, pilot or the Coast Guard. MRCC then contact SYKE’s officer on call. SYKE, in turn contact the relevant authorities, initiate and coordinate the response and make sure that oil spill response vessels, equipment and other necessary personal are at hand. The Finnish Meteorological Institute is also contacted, to give an oil spill drift forecast.

In case of a smaller local spill, a local commander is appointed to lead the response. If the situation is larger than the first estimate, neighbouring regions, national authorities or SYKE can be called in for assistance.

Equipment

SYKE maintains 13 stations well equipped with booms, skimmers, pumps and other oil spill response material. These stations are located in Oulu, Vaasa, Rahja, Pori, Uusikaupunki, Turku, Nauvo, Hanko, Kirkkonummi, Porvoo, Kotka and two in the area of Lake Saimaa. The Finnish government has 16 oil spill response vessels equipped with a fixed brush system and extendable arms. Details of these can be found in Appendix 2. There is around 100 km of boom available. Out of these, 10 km is rugged boom, which work well in oil response in rough weather out on the sea.

All the coastal communities maintain a total of 140 smaller oil spill response vessels between 10 and 20 m. Of these, 32 are equipped with oil recovery systems and the rest are used to ferry personnel, equipment and to deploy boom. The Rescue Service within each municipality have access to equipment to respond to oil spills in shallower and near shore waters.

Oil terminals have their own stores of equipment to be able to respond to a spill of reasonable size in their own operations.

Finland do not have any oil spill response companies and do not use dispersants.

Exercises

Finland holds several exercises annually, both national and international. In 2011, Finland participated in four international exercises, one in each of Estonia, Russia, Sweden and Denmark. For the exercise in Estonia, four vessels were sent, one Navy, one Border Guard and two from Meritaito LTD. To the exercise in Sweden, three vessels were sent and to the Danish exercise two.

Since there are so many international exercises in 2011, no national exercises will be held, which is otherwise the case.

The latest national exercise was arranged by Kymenlaaksos Rescue Service, close to Kotka, where five kilometres of boom was deployed. During these exercises, personnel from SYKE are involved both as advisors and evaluators.

In 2010, Finland conducted an exercise with EMSA, when their new response vessel Kontio, to be stationed in the northern Baltic Sea, was inducted.

The national exercises conducted involve one or more vessels with personnel from different organisations. These can involve internal drills to update the vessel crew on the response equipment.

The Rescue Service has their own exercises, but involves SYKE by evaluating how fast they can deploy at a given location with vessels, equipment and personnel.

In 2012, Finland is host to the Balex Delta exercise, which is planned a year in advance. In this exercise, all the oil spill response organisations in Finland will participate as well as several international vessels.

Germany

Division of responsibility

The responsibility of oil spill contingency planning is shared by the federal government through the Federal Waterways and Shipping (WSV) within the ministry of transport and the federal coastal states Bremen, Hamburg, Niedersachsen, Mecklenburg-Vorpommern and Schleswig-Holstein. To coordinate this preparedness the Central Command for Maritime Emergencies (CCME) was created 2003 and based in Cauxhaven. CCME is responsible to update the national oil spill response preparedness.

Even though no requirement exist, some coastal municipalities have their own oil spill response plans.

Individual ports are responsible for their own response and contingency plans, as well as equipment.

Operations

In case of an oil spill at sea, the CCME will take the main responsibility after having communicated with the Maritime Emergencies Reporting and Assessment Centre (MERC) will take the lead in the response operation and call teams on site and to the coordination centre. CCME contain five sections, of whom 3 will be activated. Sector 1 is the MERC, who is the national maritime coordination point on call around the clock. Sector 2 will be responsible for the response on the sea and sector 3 for the shoreline around the coastal states and additionally for the Wadden Sea. If needed, the CCME will handle the entire coordination, including all the involved organisations, for example the rescue services, disaster help corps, the marine and salvage companies. The cost will be split equally between the federal government and the coastal state.

Equipment

The national oil spill contingency plan include a computerised map system that detail sensitive areas and habitats in need of special protection along the coast, called the Marine Atlas. The federal maritime and hydrological agency have a weather and ocean current forecasting program developed for the North Sea, the German bays, Wadden Sea and the Baltic Sea.

The coastal states of Germany have developed a software and a system for data collection and storage of all the different kinds of data of the coastal states, including pollution caused by accidents. The software connects the database, GIS text and photos in a multimedia user interface. The VPS system supports the contingency planning and the response by supplying information on among other things; contact details, organisational details, contingency routines, detailed photos of the entire German coastline, location of oil spill equipment, vessel details and flight routes, oil response manual, sensitive areas, accident reports, logbooks, development and tracking and oil spill drift modelling using the SeaTrack Web program.

A wide selection, around 16, of the more or less universal oil spill response vessels are owned to a large extent by the government. The vessels of private oil spill companies are primarily deployed around the larger ports.

Germany regard themselves to be well prepared to handle a spill of 15 000 m^3 oil if mechanical recovery is possible. Mechanical recovery is prioritised at sea and the use of dispersants is only allowed at depths exceeding 20 meters under exceptional circumstances.

The Federal Maritime and Hydrographic Agency (Bundesamt Für Seeschiffahrt und Hydrographie, BSH) has a dedicated laboratory for analysing oil for the police and rescue services. It is based in Hamburg but can on request immediately redeploy to the incident site.

Pollution response equipment for coast, river and shoreline is located at several different points in Germany. The federal stations are Wilhelmshaven, Cuxhaven, Kiel, Warnemünde, Stralsund and the state owned Hilgenriedersiel, Husum, Meldorf, Rostock, Cuxhaven, Stralsund, Heiligendamm, Kiel, Wilhelmshaven, Stralsund, Bremerhaven, Bremen, Lübeck, Flensburg, Hamburg, Brunsbüttel, Kägsdorf, Eutin, Wittmund and Jever.

The busiest sea traffic routes are constantly patrolled by around 30 Coast Guard vessels, partly to deter, but also to look for oil spills. These vessels are operated from two Coast Guard centrals in the North Sea and the Baltic Sea. Details of these can be found in Appendix 2.

The overflights log around 1 600 hours a year and primarily patrol the German coastline and the busiest sea traffic routes.

Exercises

The oil spill exercises do not follow any specific schedule, but is influenced by several factors. In practice, there are around 20 exercises per year. Participants in these exercises are the CCME and affected municipalities. Germany does not have any dedicated Coast Guard yet, which means that they are excluded from international exercises exclusive for the Coast Guards.

Latvia

Division of responsibility

The Latvian Coast Guard, who are under the department of defence, are responsible for the response in case of a national oil spill disaster. The Coast Guard have response stations in the three largest ports, Riga, Liepaja and Ventspils. MRCC Riga, under the Latvian Coast Guard, is available around the clock. There is a special committee that takes charge in case of a larger oil spill catastrophe. The rescue service and municipalities are delegated by the ministry of the interior to have responsibility of the shoreline clean up.

The municipalities have no specific oil spill contingency plans, the oil spill response responsibility rests with the local rescue service.

Each port authority has their own oil spill contingency plan, which is linked to the national contingency plan.

The older oil spill contingency plan from 2004 was recently replaced with a new one, that includes Hazardous and Noxious Substances (HNS) and entered into force in May 2010.

Operations

In case of a larger oil spill, the MRCC committee in Riga will take full responsibility of the response operation and work as a coordination centre, Both on sea and on land response will be handled together by the Coast Guard and the rescue service. The clean up of the beaches is still the responsibility of the coastal municipality.

In case of a smaller spill, the response is still handled by MRCC Riga, initially by the officer on call and subsequently transferred to an oil spill coordinator.

The ports are responsible for response of oil spills in their respective areas.

Mechanical recovery of oil is the primary method of response, and the use of dispersants is extremely limited and only possible in agreement with the ministry of environmental protection and regional development.

Equipment

Latvia has access to three oil spill response vessels. Details of these can be found in Appendix 2.

Additionally, six smaller Navy vessels will be available to help during an oil spill response.

There is a general agreement made between the larger port authorities that they should make private vessels available in case of an oil spill response operation in their port areas.

When building the oil spill contingency plan, a computerised environmental atlas was developed. This will be used with a weather and ocean current modelling program to forecast where the oil will spread.

Exercises
The national oil spill contingency plan is exercised once a year and involve all the three response levels, administration, coordinators and decision makers. The main actors are the impacted municipalities, national rescue service, port authorities, the maritime administration of Latvia and the Ocean and Lake administration.

The Latvian Coast Guard normally exercise twice per year. One is a theoretical exercise for the coordinators and one a practical exercise for the field staff.

Lithuania

Division of responsibility
The responsible authority for guidelines and standards on oil spill contingency plans along the Lithuanian coast is the regional department for environmental protection in Klaipėda. The municipalities themselves are responsible for the existence of an oil spill contingency plan for shoreline clean up. The Lithuanian Navy are responsible for the coordination and actual response. According to the contingency plans, the civil defence can be called in if needed. In the clean up phase of the response, the ministry of the interior will be involved as well, since they are responsible for the rescue service.

A national oil spill contingency plan was written by the Lithuanian Maritime Institute in 1994 and was signed in 2009 by the departments of defence, environmental protection and internal affairs.

Operations
According to the Lithuanian governments proposition no. 1378, the different authorities in an oil spill response are based on different marine areas. The Lithuanian Navy are responsible for the Baltic proper, through the MRCC Klaipėda and are also generally responsible for the entire operation. They also work as the coordinators for national oil spill response and clean up. The clean up is the responsibility of the duty officer, who delegate this to an on scene coordinator. MRCC Klaipėda is available around the clock. The Lithuanian Coast Guard are responsible for the Curonian lagoon and the port authorities for their own respective ports. The clean up is then the responsibility of the individual municipalities. The civil defence can offer manpower to help with shoreline clean up along the whole of the Lithuanian coast.

The use of dispersants is forbidden and should be extremely limited, according to the HELCOM recommendations. If such a situation arises, an approval must first come from the ministry of the environment.

Equipment
Most of the oil spill response material and equipment in Lithuania are available at the MRCC in Klaipėda, partly onboard their vessels and partly in warehouses on land. The surveillance using Synthetic Aperture Radar (SAR) is also managed here.

In cooperation with the Lithuanian air force, there is aerial surveillance using EMSA's 2nd generation CleanSeaNet 2-4 times a month.

A computer based system detailing sensitive areas and more sensitive areas along the coast exists. The oil spill drift model used is HELCOM's SeaTrack Web program.

In case of a larger spill, the Coast Guard has a vessel equipped with skimmer. The Marine can contribute with additional vessels. The port authority in Būtingė can use their retrofitted tug. Details of these can be found in Appendix 2.

Every municipality have responsibility for their own coastline and have generally only less specialised equipment, like shovels and road scrapers.

The oil terminal in Būtingė has its own booms, skimmers, brushes, tanks and pumps in addition to well trained personnel. This equipment is spread through all the ports.

Exercises

In order to constantly develop and improve the oil spill response, Lithuania is annually participating in international, national and regional exercises. Participating actors are the Coast Guard, air force helicopters, Navy vessels and private companies, particularly the Polish oil company PKN Orlen and the Būtingė oil terminal, where PKN Orlen is a majority owner.

Poland

Division of responsibility

In Poland, it is the Ministry of the Environment that is the main governmental authority responsible for management of the environment. The Ministry of Infrastructure is responsible for the environmental issues relating to maritime transport.

The responsible ministry is responsible for the maritime administration and the maritime economy. It answers to the Ministry of Infrastructure and has mandate from the Marine Areas Administration act. The responsibility for the response itself is delegated to the Maritime Search And Rescue Service (SAR Service), who are responsible for the SAR convention and is located in Gdynia.

Under the SAR Service, there is an operational department with four specialised divisions, the Maritime Rescue Coordination Centre (MRCC), Maritime Search and Rescue Division, Maritime Pollution Combating Division and the Information Centre of the Sea Administration. MRCC is the national contact in case of an oil spill at sea.

When it comes to pollution in the port areas, this is the responsibility of the harbour master. Oil terminals and wharfs are responsible for pollution related to their own operations and is reviewed by the harbour master or environmental inspectors from the relevant maritime administration.

The local oil spill contingency plans are coordinated with SAR Service together with the local rescue services and is then approved by the director of the relevant maritime office. The local plans are integrated in the national contingency plan. The plan includes, contact points, different ways to report and alarm in case of pollution incidents, list and location of measures and equipment to combat environmental and pollution threats, an action plan, a pollution risk assessment, tasks for the different response organisations, financial issues, guidelines for international assistance, training plan, oil spill effect monitoring programme and a list of experts.

The responsibility of the contingency planning and the operative response is the overall responsibility of the response and clean up on sea and land is the ministry of the interior, who work through three coastal regional crisis management centres.

Operations

MRCC Gdynia is the national contact point for safety of life at sea and marine pollution. If an alarm is received anywhere else, for example the coastal radio stations or one of the three communications centres around the coast, the MRCC Gdynia is alerted as well.

In case of an oil spill, the officer in charge of the maritime office has the responsibility to judge the situation and act accordingly.

The areas of responsibility of SAR Service when it comes to oil spill response are the open sea, coastal shallow waters and ports. In all of these cases, the response works through the contingency plan, either at local level or the relevant national level.

When the oil hits land, the officer in charge alerts the regional (Voivodship) governor as well as the regional environmental inspectors, who then work through the county and down to the municipal level. If the oil spill should impact more than one region, the national crisis management centre would be utilised.

The only company that do oil prospecting in Poland is Petrobaltic Co. Ltd. This company has 1 000 m booms, several smaller skimmers and experience to assist in case of a larger oil spill. They also have five vessels in Gdansk; Afrodite, Bazalt, Granit, Santa Barbara and Vivero.

Poland primarily uses mechanical methods for recovering oil at sea and follow the HELCOM recommendations for dispersants. This means that the use of dispersants is restricted and must have an approval from the maritime authorities.

A new version of the national oil spill contingency plan was approved in February 2006 and contains among other things a marine atlas of sensitive areas and temporary storage locations for oily waste. Additionally, the refinery in Gdansk is prepared to receive recovered oil.

Equipment

SAR Service have three custom built vessels for oil spill response at sea. Details of these can be found in Appendix 2.

The different maritime rescue stations are located in Darłowo, Dziwnów, Kołobrzeg, Łeba, Sztutowo, Świbno, Trzebież, Ustka and Władysławowo. Additionally, there are two warehouses with oil spill response equipment in Gdynia and Świnoujście.

The larger ports have their own oil spill response material for Tier 1 (local) and some even have material for a Tier 2 (regional) oil spill. If the spill is larger still, SAR Service will assist with material.

Exercises

SAR Service recommend that the contingency plans are exercised once a year, but the requirements are for every other or every third year only. There is no requirement to have a larger exercise

regularly. A larger exercise was held during summer of 2011 involving SAR Service, the navy, port authorities in Gdynia, the commercial port, the maritime administration, the rescue service and the crisis management centre of Gdynia.

Internationally, the Polish Navy frequent the Balex Delta exercises of HELCOM and Polish SAR Service has operational agreements with the German Pollution Response Service and the port of Kaliningrad.

Russian Federation

Division of responsibility

The State Marine Pollution Control, Rescue and Salvage Administration (MPCRSA) is the national authority that is responsible for oil spills at sea. It is organised under the Sea and River Transport Agency of the Ministry of Transport. The Federal Sea and River Transport Agency is the authority that, when needed, will conduct a revision of the national oil spill response plan. This was last done in 2003 and approved by the ministry of commerce, the ministry of natural resources, the ministry of defence and the Ministry of Civil Defence, Emergencies and Elimination of Consequences of Natural Disaster (EMERCOM). This oil spill contingency plan is planned for a spill of 5 000 tonnes.

The federal Sea and River Transport Agency has the responsibility to uphold search and rescue response. This is done through the MPCRSA and Maritime Rescue Co-ordination Centre (MRCC). MRCC have both regional stations and assisting centres.

The Russian Federation has developed oil spill contingency plans for all of their regions, the Baltic Sea, the Black Sea, NW Pacific, the Caspian Sea and the Arctic. The oil spill response can be activated at the local, regional and federal level.

All companies that handle oil during transportation or loading must have an oil spill contingency plan and material. This material can be requisitioned to a disaster site, if needed. Either to help the rescue service at a beach cleanup, or MPRCRSA at sea.

Operations

In case of an oil spill in the Russian waters of the Baltic Sea, the MRCC in St. Petersburg will initiate a search and rescue response and coordinate the initial response. They will then only work as a communication centre, since the responsibility for the response operation rests on MPCRSA. The land based response is the responsibility of EMERCOM. In case of a Tier 3 response, EMERCOM is also responsible for the coordination of the Navy, Boarder Guard and local municipalities. The regional part of the MPCRSA can supply resources for the response and resources from EMERCOM can also be deployed, if there is a need.

MPCRSA has the full responsibility for the Basin Salvage and Towage Company (BASU). This is a government owned company that is part of the MPCRSA's regional branch and is to be available for salvage and towing operations. If an oil spill should be greater than the local capacity of the Tier 1 response (0-500 tonnes) and the regional Tier 2 response, (500-5 000 tonnes), it is the responsibility of the MPCRSA to mobilise the national Tier 3 response supplies.

The general strategy for oil spill response is that Tier 1 spills will be dealt with using mechanical recovery, if the weather allows. Tier 2 and 3 response is depending on the circumstances for that particular spill. It is not forbidden to use dispersants and in-situ burning. However, it has to be approved by the government and included in the oil spill contingency plan before it is used.

If there is an oil spill in a company, their oil spill contingency plan will be activated. If the company's own resources are insufficient for the spill, they are bund to inform the local and regional authorities. In that case, the regional contingency plan will be activated. If this also proves insufficient, the federal oil spill contingency plan and resources will be mobilised.

Equipment

Details of the Russian response vessels can be found in Appendix 2.

All ports, terminals and other companies storing oil must have oil spill contingency plans and equipment in case of an oil spill. A fundamental part of this plan is to assess the resources required to respond to a worst case scenario. This means that these companies should have their own response teams or have a contract with companies that has the resources for this task.

The equipment of these companies usually contain vessels, booms, skimmers and other equipment. The ports of Murmansk, St. Petersburg, Vladivostok and Sakhalin all have oil spill response vessels, supply vessels, booms, trawls, pumps etc. There is even a few private and local oil spill response companies stationed here.

The first of these companies approved for oil spill response at sea and on land is Ecoshelf Ltd and was founded in 1997. Ecoshelf cooperates with Sakhalin Energy and is responsible for Sakhalin's oil spill response. Ecoshelf has several vessels and oil spill response material. There is an Ecoshelf station in Vyborg called Ecoshelf Baltic servicing the oil terminal of Lukoil in Vysotsk, a Ecoshelf Black Sea in Novorossijsk and an Ecoshelf Caspian Sea in Astrakhan.

Exercises

Both local municipalities and companies that handle oil conduct their own exercises. In the summer of 2010, a federal oil spill exercise was held outside the port of Vysotsk. The exercise started at the oil spill terminal and subsequently expanded through the regional, national and international levels. In October 2011, the Environmental Protection committee conducted an exercise, where they invited different authorities and companies. Sadly, there was a lack of representation from the regional and federal rescue services.

Sweden

Division of responsibility

The Swedish Coast Guard is responsible for marine pollution at sea since 1971. This mandate extends to the great lakes of Sweden, Vänern, Vättern and Mälaren and the responsibility extends all the way to the shoreline, although in reality, the Coast Guard vessels can generally not come close to shore. There are 25 Coast Guard stations around the Swedish coast.

No authority has overall responsibility for oil spill contingency plans on land and no requirements exists to have such a plan. Some municipalities and counties have developed such a plan anyway, or are in the process of developing one. According to a Swedish survey, 31 % of the Swedish

municipalities had an oil spill contingency plan that had been used in an exercise in the last 5 years in 2011. (Baltic Master II, 2011b)

The Swedish Civil Contingencies Agency (MSB) oversee strategic rescue service operations and encourage development of plans. They are responsible for upholding the response preparedness on land, in five regional centres around Sweden and the Swedish lakes.

The Swedish Agency for Marine and Water Management (SwAM) has a standing contract with an environmental consultancy firm to uphold a specialist team of oil spill experts. This team can be called in to assist the municipalities in case of an oil spill, free of charge for the municipality in question.

Ports and private companies are responsible for their own operational needs.

Operations

The alarm is first received at the Coast Guard coordination centre and the regional officer will act as the commanding officer in charge of the response. There are checklists available for the continued alarm chain to the relevant authorities in the effected municipalities and counties. If the oil spill is large, international help can be requested.

The Coast Guard only use mechanical removal of oil and has no permission to use dispersants. Some existing systems could, potentially, be used for dispersant application.

The shoreline response is the responsibility of the local Rescue Service. The Swedish law dictates that the response phase is finished when the risk for injuries and property damage can no longer be increased. This then turns into the clean-up phase, which is the local municipality's responsibility. In case of a larger oil spill, the Rescue Service can request assistance from MSB's regional centres.

Equipment

The Swedish Coast Guard has several vessels designed for oil spill response. Details of these can be found in Appendix 2. They have additional supplies such as pumps, skimmers, boom and containers in store.

MSB has five mobile oil spill centres in different regions of the country. The idea is to complement the resources of the municipalities, if they are insufficient. The supply units are located in Botkyrka, Vänersborg, Karlskrona, Umeå and Visby.

The centres are loaded in containers and ready to be deployed where necessary. They contain, boats, boat trailers, pumps, skimmers, boom, shore protection cloth, temporary storage units, all terrain vehicles, shovels, buckets and personal protection gear for 200 persons and various additional material, such as digital cameras, radios and high pressure steamers.

Oil terminals, ports and other companies that handle oil are required to have a basic preparedness to be able to handle their own accidents and pollution.

The County Administrative Boards of Sweden have an Environmental Atlas, showing priority sites and different coastal zones. The atlas, however, has several data gaps and does not encompass the entire Swedish coastline and several counties are in the process of updating the material.

Sweden also uses the SeaTrack Web oil spill drift forecast model.

Exercises

Sweden holds annual exercises under the Copenhagen agreement, Bonn agreement and HELCOM. Only in the last five years have they started including shoreline response.

On the stations around Sweden where oil spill response vessels are located, there are continuos exercises. Additional exercises are conducted with the Swedish Sea Rescue Society (SSRS), since they have several stations with ”First Aid” booms, which are 200 m boom an a sea sled. The Coast Guard annually participate in HELCOM’s Balex Delta exercises. Within the Copenhagen agreement, annual exercises with Finland on the Swedish east coast, Denmark on the south coast and both Denmark and Norway on the west coast are also conducted. The municipalities that have an oil spill plan only rarely conduct exercises.

Aerial surveillance

Under the auspices of HELCOM, coordinated aerial surveillance is conducted regularly in the Baltic Sea area. Between 1999 and 2009, the the number of observed spills has declined by 63 % (see figure 5). This trend has been observed during a time of increase in the shipping traffic and is attributed by HELCOM to the complex set of measures known as the Baltic Strategy to prevent illegal discharges of oil and waste into the sea. The HELCOM countries have been implementing this strategy since the 1990s. Additional data is gathered from satellite images by the CleanSeaNet (CSN) satellite service of the European Maritime Safety Agency (EMSA). The suspected oil spills identified on the satellite images are then verified on location by a vessel or aircraft. In 2009, 608 satellite images were delivered to the Baltic Sea countries. The images showed 280 suspected oil spills and 0,46 oil spills per suspected spill were detected. (HELCOM, 2011c)

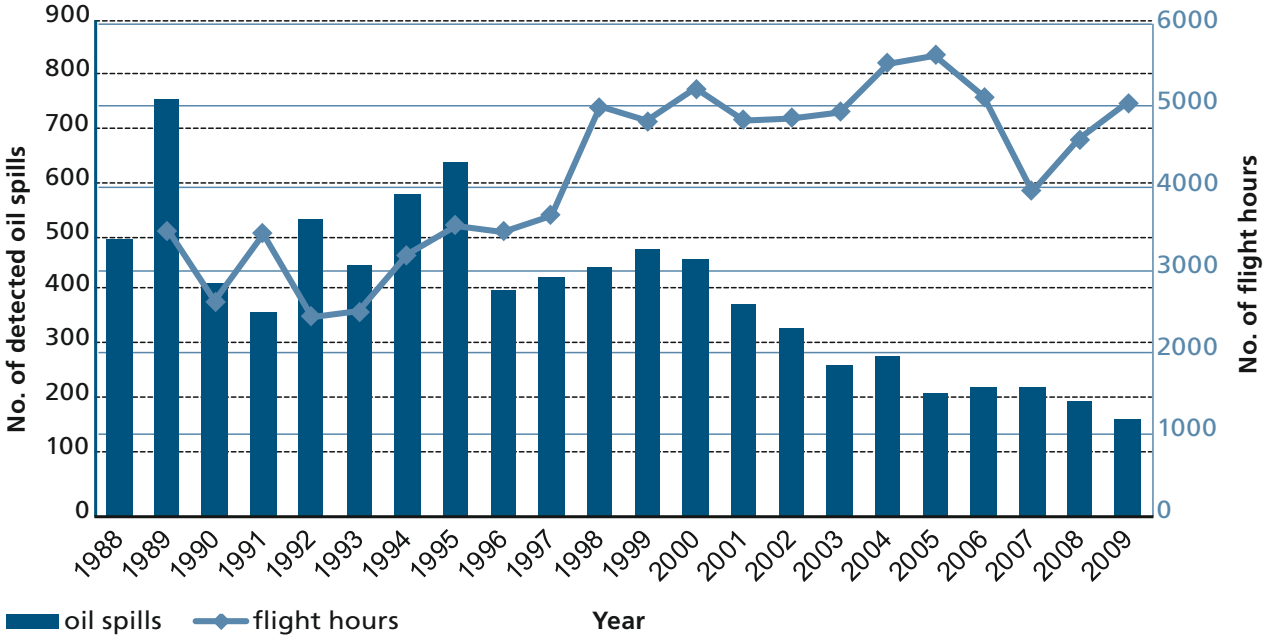

Figure 5: Number of spills in correlation with flight hours in the HELCOM area 1988-2009. (HELCOM, 2011c)

International conventions

There are several international conventions governing marine pollution in the Baltic Sea region made by the IMO. Table 1 gives an overview of the relevant conventions and their status. Most notably, the Bunkers Convention has been ratified by all the states in this region except Sweden.

Table 1: Status of IMO conventions relating to ship-source marine pollution in the states of the Baltic region. In the table, x means accession, ratification, etc. and d means denunciation (Baltic Master II, 2011c).

	MARPOL 73/78 (Annex I/II)	MARPOL 73/78 (Annex III)	MARPOL 73/78 (Annex IV)	MARPOL 73/78 (Annex V)	MARPOL Protocol 97 (Annex VI)	London Convention 72	London Convention Protocol 96	INTERVENTION Convention 69	INTERVENTION Protocol 73	CLC Convention 69	CLC Protocol 76	CLC Protocol 92	FUND Convention 71	FUND Protocol 76	FUND Protocol 92	FUND Protocol 2003	SALVAGE Convention 89	OPRC Convention 90	HNS Convention 96	OPRC/HNS 2000	BUNKERS CONVENTION 01	AFS 2001	BALLASTWATER 2004	HONG KONG SRC 2009	HNS PROTOCOL 2010
Denmark	x	x	x	x	x	x	x	x	x	d	x	x	d	x	x	x	x	x		x	x	x			
Estonia	x	x	x	x	x			x	x	d		x	x		x	x	x	x		x	x	x			
Finland	x	x	x	x	x	x		x	x	d	x	x	d	x	x	x	x	x			x				
Germany	x	x	x	x	x	x	x	x	x	d	x	x	d	x	x	x	x	x		x	x	x			
Latvia	x	x	x	x	x			x	x	x		x			x	x	x	x			x	x			
Lithuania	x	x	x	x	x							x			x	x	x	x	x		x	x			
Poland	x	x	x	x	x	x		x	x	d	x	x	d	x	x	x	x	x		x	x	x			
Russian Federation	x	x	x	x		x		x	x	d	x	x	d	x	x		x	x	x		x				
Sweden	x	x	x	x	x	x	x	x	x	d	x	x	d	x	x	x	x	x		x		x	x		

Previous oil spills

There has never been a major oil spill in the Baltic Sea. As stated before, the largest oil spill in the Baltic Sea was the *Globe Asimi* outside Klaipėda in Lithuania 1981, who spilled 16 000 tonnes. Comparing this to other spills that have occurred in the rest of the world, the amount of oil spilt is not very significant (see table 2). The different Baltic Sea countries have been affected by oil spills at different frequencies as well. Poland has been fortunate to never have had an oil spill, while Estonia and Finland have reported a great number of smaller spills over the years. This is both a blessing and a curse, since the Baltic Sea has been spared a potentially disastrous event, but it has also caused the preventive and response work in the area to have a low priority. As always seem to be the case, preventive measures are difficult to implement until a significant accident actually happens.

Table 2: Large oil spill accidents in the world and in the Baltic Sea (adapted from ITOPF, 2011).

Name	Year	Location	Spill size (tonnes)
Atlantic Empress	1979	Off Tobago, West Indies	287 000
ABT Summer	1991	700 nm off Angola	260 000
Castillo de Bellver	1983	Off Saldanha Bay, South Africa	252 000
Amoco Cadiz	1978	Off Brittany, France	223 000
Haven	1991	Genoa, Italy	144 000
Odyssey	1988	700 nm off Nova Scotia, Canada	132 000
Torrey Canyon	1967	Scilly Isles, UK	119 000
Irenes Serenade	1980	Navarino Bay, Greece	100 000

Name	Year	Location	Spill size (tonnes)
Urquiola	1976	La Coruna, Spain	100 000
Hawaiian Patriot	1977	300 nm off Honolulu	95 000
Independenta	1979	Bosphorus, Turkey	95 000
Jakob Maersk	1975	Oporto, Portugal	88 000
Braer	1993	Shetland Islands, UK	85 000
Khark 5	1989	120 nm off Marocco	80 000
Aegean Sea	1992	La Coruna, Spain	74 000
Sea Empress	1996	Milford Haven, UK	72 000
Nova	1985	Off Kharg Island, Gulf of Iran	70 000
Katina P	1992	Off Maputo, Mozambique	66 700
Prestige	2002	Off Galicia, Spain	63 000
Exxon Valdez	1989	Prince William Sound, Alaska	37 000
Globe Asimi	1981	Klaipėda, Lithuania	16 000
Antonio Gramsci	1979	Åland, Finland	5 500
Weston	1998	Västra Götaland county, Sweden	4 000
North Pacific	2001	Klaipėda, Lithuania	3 427
Baltic Carrier	2001	Kadetrenden, Denmark	2 700
Volgoneft 139	2007	Kerch strait, Black Sea	2 000
Fu Shan Hai	2003	Ystad, Sweden	1 200
Tsesis	1977	Stockholm, Sweden	1 000
Volgoneft	1990	Karlskrona, Sweden	1 000
Antonio Gramsci	1987	Vaarlshti, Finland	650
Esso Nordica	1970	Pellinki, Finland	600
Golden Trader	2011	NW of Denmark	500
Pensa	1970	Hailuoto, Finland	500
Tolmiros (suspect)	1987	Västra Götaland county, Sweden	400
Sotka	1985	Märket, Finland	370
Eira	1984	Merenkurkku, Finland	300
Unknown	1988	Torekov, Sweden	287
Alambra	2000	Muuga harbour, Estonia	250
Raphael	1969	Emäsalo, Finland	250
Pallas	1998	Wadden Sea, Germany	244
Thuntank 5	1987	Bay of Gävle, Sweden	230
Herakles	2004	Grundkallen, Sweden	200
Palva	1969	Utö, Finland	200
Unknown	1992	Västra Götaland and Halland counties, Sweden	200
Hual Trooper	1995	Öresund, Sweden	180

Name	Year	Location	Spill size (tonnes)
Godafoss	2009	Hvaler, Norway	112
Kihnu	1993	Kopli peninsula, Estonia	100
Lloyd Bage	1979	Harmaja, Finland	100
Nunki	1998	Kalundborg Fjord, Denmark	100
Runner 4	2006	Gulf of Finland	100

The number of oil spills since 1969 that has been over 100 tonnes in the Baltic Sea has been pretty steady. There are too few spills to assess any trends (see figure 6). In Estonia, there are several reports each year of smaller observed oil slicks, possibly from cleaning the tanks. Fortunately, these seem to be decreasing, with 99 in 2007, 69 in 2008, 59 in 2009 and 50 in 2010. These reports are not all due to actual oil spills. Several minor oil spills have been reported both at sea and in the rivers Elbe and Weser in Germany. There are also minor spills each year in the port and around Klaipėda harbour in Lithuania. No major oil spills have been documented in Poland. Few accidents have been reported for the Russian Federation in the Baltic Sea, but several of the accidents in Estonia, Latvia and Lithuania happened when they were part of the Soviet Union. It is also uncertain just how many accidents have been reported.

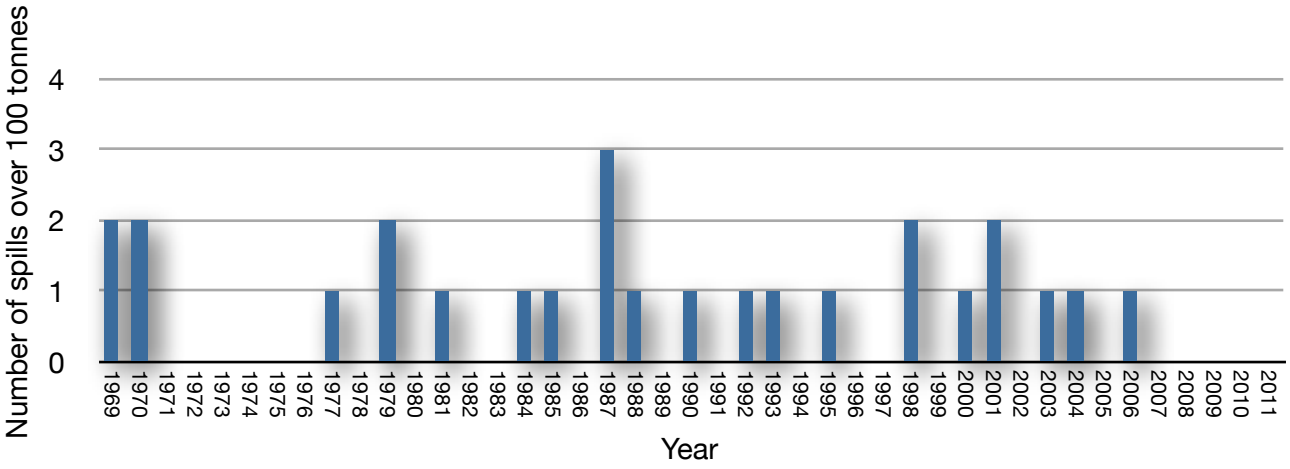

Figure 6: Major oil spills since 1969 in the Baltic Sea from the table above.

Discussion

The Baltic Sea states are prepared for an oil spill. How well prepared they are differ, however, and how they would respond to a larger spill is still untested. The number or amount of spills is not correlated to the preparedness level of the country. For example, Poland has a national contingency plan, despite never having an oil spill, while Sweden, who have had several, does not. Instead this is tied to the organisational structure of the countries and the level of autonomy that the different regions have.

The *Deepwater Horizon* event in the Gulf of Mexico in 2010 clearly showed that even a country with a well organised response, regular exercises and well equipped and trained personnel may not have sufficient capability to handle an oil spill of a significant magnitude. There are no offshore platforms in the Baltic Sea as large as the ones in the Gulf of Mexico, but smaller ones exist. Three are located in Polish waters, Baltic Beta, Petro Baltic and PG-1 and one, MLSP D-6, is in Russian waters. They drill in between 25 and 35 m of water and produce. The Kravtsovskoye oil well was discovered in 1983. The oil produced is transported via pipelines to the mainland. The Russian oil rig spills about 140 tonnes of oil each year and is located 22,5 kilometres from the Kaliningrad coastline, close to the UNESCO World Heritage site the Curonian Spit. (WWF, 2010 & offshore technology.com, 2011)

However, the main concern is shipping. Although the size of new tankers is increasing, these vessels are also modern and have highly trained crew. ITOPF statistics show that the amount of oil spilled from tankers is going down worldwide, but the number of oil spills from other vessels is increasing (see figure 7, ITOPF, 2011). Some of the larger vessels today carry more oil as fuel than some of the smaller tankers.

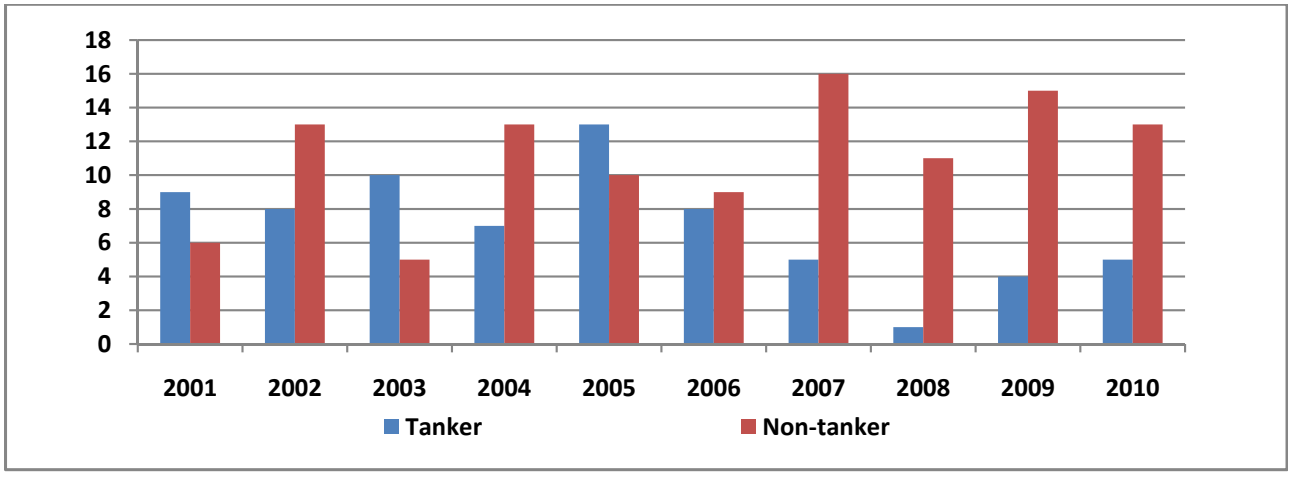

Figure 7: Number of oil spills ITOPF has attended from tanker and non-tanker sources. (ITOPF, 2011)

With the amount of traffic in the Baltic Sea and the projections of increased traffic and more congested routes, the risk of an accident is increasing. The worst case scenario would be if a large oil tanker and a cruise ship collides in the middle of the Baltic Sea.

Several proposals for improving the safety and efficiency of the marine transports have been made and much work has been done in the last few years, for example BRISK, Baltic Master II, EfficienSea, Mona Lisa and other safety projects. This work can broadly be categorised into preventive measures and response measures. Preventive measures are measures like improving the traffic surveillance, increasing aerial surveillance, traffic routing and phasing out the use of single

hull tankers. Response measures are things like increasing the number of ships, training staff and buying equipment. Both categories of measures will probably have to be increased to have an efficient preparedness in the future.

The Baltic Sea has been fortunate to not have had any major oil spills. No rule changing accident, like the *Torrey Canyon* accident changed liability by leading to the Civil Liability Convention 1969 (CLC 69) and the International Convention for the Prevention of Pollution from Ships in 1973 (MARPOL 73), the *Exxon Valdez* set a new litigation record for the time and led to the passing of the Oil Pollution Act 1990 (OPA 90) in the US. The recent Deepwater Horizon has turned out to be a similar wake up call for deep sea drilling, raising issues with the safety in drilling at deeper depths and in increasingly hostile and sensitive environments. No such catastrophe has so far taken place in the Baltic Sea.

But different countries has despite this worked with contingency planning to a varying degree. Poland for example have had no documented larger spills at all, but have invested much time and money into response preparedness. Sweden has had several smaller to medium sized spills, but there is large variation between the municipalities concerning the preparedness level. Different nations have set different goals for their oil spill response as well, for example Finland is prepared for an oil spill of 30 000 tonnes, Germany for 15 000 tonnes, Sweden 10 000 tonnes and the Russian Federation for 5 000 tonnes. The changing risk situation in the Baltic is a good argument to increase this number, since larger vessels mean that an accident with a large spill is more probable than before, compared to the smaller vessels.

Several reports, for example the EU Maritime Spatial Planning policy (EU, 2010a), WWF Future of the Baltic Sea report 2010, the Swedish National Board of Housing, Building and Planning's (Boverket's) report 2006 and the HELCOM Baltic Sea reports, acknowledge and even highlight the need for a holistic view to integrated coastal zone management and marine spatial planning. These reports would suggest a consensus on the need for this approach. The details and priorities for this planning, however, are quite different in the reports, but the main findings are clear: to create a sustainable development for the future. This includes the risks associated with the modern day of life, and should consequently include oil spill contingency planning. Sadly, there seem to be a lack of integration in oil spill contingency planning and Integrated Coastal Zone Management (ICZM).

Increased cooperation is good and the region has held several exercises together, through HELCOM's Balex Delta exercises (see figure 8) or through other agreements, for example for the Copenhagen agreement. However, this history of cooperation has been focussed on the at sea response and little to no effort has been spent on increasing cooperation between different shoreline response exercises. It is only during the last few years that shoreline response has been included on the agenda during the response. For the Balex Delta exercises, this was included in 2010 in Finland and Estonia and 2011 on Bornholm and for the Copenhagen agreement exercises during 2008 on Gotland, 2009 in Karlshamn, 2010 in Gothenburg and 2011 in Nynäshamn.

Host country and the number of Contracting Parties involved in BALEX DELTA exercises since 2000

- 2000 Russia: 5 countries, 12 ships, 1 aircraft
- 2001 Denmark: 7 countries, 11 ships, 2 aircraft
- 2002 Latvia: 6 countries, 18 ships, 2 aircraft
- 2003 Finland: 5 countries, 16 ships
- 2004 Germany: 6 countries, 11 ships, 1 aircraft
- 2005 Sweden: 7 countries, 19 ships, 2 aircraft
- 2006 Poland: 7 countries and EMSA, 23 ships, 3 aircraft
- 2007 Estonia: 6 countries and EMSA, 17 ships, 1 helicopter
- 2008 Russia: 6 countries and EMSA, 18 ships, 2 helicopters

Figure 8: Number of involved countries in the HELCOM Balex Delta exercises.

The trend of fewer number of observed oil spills during the aerial surveillance of the Baltic Sea countries is encouraging. However, these overflights are still mostly performed during daylight, and the drop may simply reflect a change in behaviour of the polluters. Since only 8 cases, or 4,5 % of spills could be traced to a transgressor in 2009, the chance of actually being caught and prosecuted for an illegal and intentional discharge is slim. (HELCOM, 2011c) The low chance of prosecution does not exactly discourage illegal behaviour of this kind, but seems to be working regardless.

Conclusion

There are several recommendations that could be made to increase the preparedness against oil spills in the Baltic Sea. There exists a substantial preparedness for oil spill accidents in the Baltic Sea. However, during the course of the project, the following reflections and recommendations for improvements have been discussed.

The two Baltic Master projects have highlighted the changing patterns related to shipping in the Baltic Sea and the corresponding need to continuously re-assess the threats to coastal environments and communities. Oil spill contingency plans have been written and many bilateral agreements exist that have regular cross border exercises (Copenhagen agreement, Nordic agreement, Baltic Agreement, EMSA, etc). This all serves to increase the preparedness around the Baltic Sea, but several municipalities and areas still have a long way to go to be sufficiently prepared for an oil spill. It would be beneficial for these areas to build up experience on this issue by creating and maintaining an oil spill contingency plan. But to be able to have a useful plan, it needs to be tested and exercised regularly. USCG recommendations are a tabletop exercise once a year, which seems like a good idea. Such practices will test the collaboration between different agencies locally, the cooperation between central and local agencies, and the collaboration across borders. To help in this endeavour, Baltic Master II has developed an oil spill planning guide, to help local municipalities to write contingency plans and exercise them. This guide has been translated to several languages.

Since the designation of the Baltic Sea as a PSSA, traffic separation schemes and ship monitoring systems, for example GOFREP and BELTREP have been put in place, with a decreasing number of accidents in these areas as a consequence. The proven efficiency of such a system suggests that it would be beneficial to create a system that spans the whole of the Baltic Sea, for increased safety of a seafarers, the goods they carry and the environment they travel through.

To cover the cost for such an improved preparedness various funding mechanisms can be discussed, one example highlighted in the present report is the development of a fund similar to the Finnish model. To have a small levy on the oil being transported through the Baltic Sea, there could be enough funds to regularly hold exercises, as well as periodically pay for replacement of equipment. The levy itself wouldn't have to be larger than a fraction of the amount the price of the gasoline changes daily for the consumer, but would still generate enough revenue for a well equipped and exercised oil spill response organisation.

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Appendix 1: Contacts for the inquiry

Country	Name	Organisation	E-mail	Webpage
DK	Jesper Vincent	Søværnets Operative Kommando	pol.con.den@sok.dk	http://forsvaret.dk/SOK
EE	Silver Vahtra	Ministry of the Environment	silver.vahtra@envir.ee	http://www.envir.ee/
EE	Are Piel	Estonian Maritime Administration	are.piel@vta.ee	http://www.vta.ee
Fi	Heli Haapasaari	Finnish Environmental Administration	heli.haapasaari@ymparisto.fi	http://www.ymparisto.fi
LV	Ojars Gerke	Latvian Coast Guard Service	ojars@mrcc.lv	http://www.mrcc.lv
LT	Valdemaras Dima	Lithuanian Navy	valdemaras.dima@mil.lt	http://kariuomene.kam.lt
PL	Marek Reszko	Maritime Search and Rescue Service	marek.reszko@sar.gov.pl	http://www.sar.gov.pl/
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DE	Wolfgang Knopf	Haverikommando	wknopf@havariekommando.de	http://www.havariekommando.de
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SE	Peter Hellberg	Swedish Maritime Administration	peter.hellberg@sjofartsverket.se	http://www.sjofartsverket.se/

Appendix 2: Oil Spill Response Vessels in the Baltic Sea

Country	Name	Type	Equipment
Denmark	A562 Mette Miljø	Seatruck class support vessel	2 x 200 m Ro-Boom Komara skimmers Destroil 250 Ro-Sweep boom system Can work in gas filled environment Storage capacity 63,8 m^3
Denmark	A563 Marie Miljø	Seatruck class multi-purpose vessel	2 x 200 m Ro-Boom Komara skimmers Destroil 250 Ro-Sweep boom system Can work in gas filled environment Storage capacity 63,8 m^3
Denmark	A560 Gunnar Thorson	Supply class multi-purpose vessel	3 x 200 m Ro-Boom 5 x Expandi booms Belt skimmer Desmi Terminator Destroil 250 Ro-Sweep boom system Storage capacity of 311,3 m^3
Denmark	A561 Gunnar Seidenfaden	Supply class multi-purpose vessel	3 x 200 m Ro-Boom Ocean booms 5 x Expandi booms Belt skimmer Desmi Terminator Destroil 250 Ro-Sweep boom system Storage capacity of 311,3 m^3
Denmark	MS201	Barge	Storage capacity 300 m^3 Additional room for 60 m^3
Denmark	MS202	Barge	Storage capacity 300 m^3 Additional room for 60 m^3
Denmark	MS203	Barge	Storage capacity 300 m^3 Additional room for 60 m^3
Denmark	Y340 Miljø 101	Oil recovery vessel	Storage capacity 0,4 m^3
Denmark	Y341 Miljø 102	Oil recovery vessel	Storage capacity 0,4 m^3
Denmark	Y342 Miljø 103	Oil recovery vessel	60 cm draft Brush skimmer Floating bag system
Estonia	PVL-202 Kati	Oil recovery vessel	200 m boom Side mounted skimmers with 160 m^3/h capacity Ice skimmer with 60 m^3/h capacity
Estonia	PVL-109 Valvas	Oil recovery vessel	800 m boom

Country	Name	Type	Equipment
Estonia		Oil recovery vessel	Operational in 2011 600 m boom Side mounted skimmers with 200 m^3/h capacity Ice skimmer with 60 m^3/h capacity
Finland	Halli	Oil recovery vessel	Sweeping arm system Storage capacity 1 400 m^3
Finland	Hylje	Oil recovery vessel	Sweeping arm system Storage capacity 800 m^3
Finland	Kummeli	Oil recovery vessel	Sweeping arm system Storage capacity 70 m^3
Finland	Letto	Oil recovery vessel	Sweeping arm system Storage capacity 43 m^3
Finland	Linja	Oil recovery vessel	Sweeping arm system Storage capacity 77 m^3
Finland	Louhi	Oil recovery vessel	Sweeping arm system Storage capacity 1 200 m^3
Finland	Merikarhu	Oil recovery vessel	Sweeping arm system Storage capacity 40 m^3
Finland	Oili I	Oil recovery vessel	Sweeping arm system Storage capacity 80 m^3
Finland	Oili II	Oil recovery vessel	Sweeping arm system Storage capacity 80 m^3
Finland	Oili III	Oil recovery vessel	Sweeping arm system Storage capacity 80 m^3
Finland	Sektori	Oil recovery vessel	Sweeping arm system Storage capacity 108 m^3
Finland	Seili	Oil recovery vessel	Sweeping arm system Storage capacity 198 m^3
Finland	Svärtan	Oil recovery vessel	Sweeping arm system Storage capacity 52 m^3
Finland	Tursas	Oil recovery vessel	Sweeping arm system Storage capacity 100 m^3
Finland	Uisko	Oil recovery vessel	Sweeping arm system Storage capacity 100 m^3
Latvia	A-90 Varonis	Oil recovery vessel	2008 retrofitted Navy vessel 800 m Ro-Boom 1500 2 x Lamor OPC-4 skimmers Floating skimmer Desmi Terminator Storage capacity 110 m^3
Latvia	KA-14-Astra	Oil recovery vessel	2 x Lamor OPC-4 skimmer
Latvia	JL-1	Barge	Lamor OPC-4 skimmer Desmi Terminator Storage capacity 100 m^3

Country	Name	Type	Equipment
Lithuania	MRCC	Oil recovery vessel	2 x 250 m Ro-Boom 2000 Lamor Skimmer Desmi Terminator Dispersant spray system Storage capacity 228 m^3 4 hour deployment time
Lithuania	Coast Guard	Oil recovery vessel	Vikoma skimmer Storage capacity 25 m^3
Poland	Kapitan Poinc	Oil recovery vessel	2 x 45 m Lamor arm system and 140 m^3/h capacity 900 m Ro-Boom 1500 90 m Expandi 4300 boom Desmi Terminator skimmer with Scantrawl system and 100 m^3/h capacity Storage capacity 512 m^3
Poland	Zodiac	Oil recovery vessel	Lamor arm and brush system Storage capacity 2 x 36 m^3
Poland	Czestaw II	Oil recovery vessel	2 x Lamor arm systems and 20 m^3/h capacity 340 m Expandi 4300 boom Komara 12k skimmer with 12 m^3/h capacity Vicospray 1000 dispersant spray system with 4,2 m^3/h capacity Storage capacity 20 m^3
Russia	Yasnyy	Supply vessel	70 m^3/h capacity Storage capacity 300 m^3
Russia	Topas	Tug/salvage vessel	35 t pull Storage capacity 120 m^3
Russia	Kit	Oil recovery vessel	
Russia	Pribreshny	Oil recovery vessel	
Russia	Sprut-2	Barge	Used in salvage operations
Germany	Arkona	Multi-purpose vessel	2 x sweeping arm systems with 320 m^3/h capacity each Oil separation plant Heating system Gas detection systems Storage capacity 1 000 m^3
Germany	Scharhörn	Multi-purpose vessel	2 x sweeping arm systems with 320 m^3/h capacity each Oil separation plant Heating system Gas detection systems Storage capacity 430 m^3
Germany	Kiel	Multi-purpose vessel	2 x sweeping arm systems with 100 m^3/h capacity each Oil separation plant Storage capacity 350 m^3

Country	Name	Type	Equipment
Germany	Bottsand	Oil recovery vessel	2 x sweeping systems with 160 m^3/h capacity each Oil separation plant Storage capacity 790 m^3
Germany	Vilm	Oil recovery vessel	2 x sweeping arm systems with 160 m^3/h capacity each Oil separation plant Storage capacity 320 m^3
Sweden	KBV 002 Triton	Multi-purpose vessel	Lamor system with 400 m^3/h capacity 3 x 300 m AllMaritim NOFI boom 500 m Lamor sorbent boom Storage capacity 1 100 m^3 Oil analysis laboratory
Sweden	KBV 003 Amfitrite	Multi-purpose vessel	Lamor system with 400 m^3/h capacity 500 m Lamor sorbent boom Storage capacity 1 100 m^3 Oil analysis laboratory
Sweden	KBV 201	Multi-purpose vessel	Advancing cassette system Storage capacity 104 m^3
Sweden	KBV 202	Multi-purpose vessel	Advancing cassette system Storage capacity 104 m^3
Sweden	KBV 005	Multi-purpose vessel	Advancing cassette system Skimmer 300 m boom 100 m absorbent boom Storage capacity 233 m^3 100 m^3 Oilbag 10 x 1 m^3 Oilbag
Sweden	KBV 010	Multi-purpose vessel	Advancing cassette system Skimmer 300 m boom 100 m absorbent boom Storage capacity 212 m^3 100 m^3 Oilbag 10 x 1 m^3 Oilbag
Sweden	KBV 045	Oil recovery vessel	Advancing cassette system Skimmer 300 m boom 100 m absorbent boom Storage capacity 150 m^3 100 m^3 Oilbag 10 x 1 m^3 Oilbag

Country	Name	Type	Equipment
Sweden	KBV 046	Oil recovery vessel	Advancing cassette system Skimmer 300 m boom 100 m absorbent boom Storage capacity 150 m^3 100 m^3 Oilbag 10 x 1 m^3 Oilbag
Sweden	KBV 047	Oil recovery vessel	Advancing cassette system Skimmer 300 m boom 100 m absorbent boom Storage capacity 150 m^3 100 m^3 Oilbag 10 x 1 m^3 Oilbag
Sweden	KBV 866	Barge	Storage capacity 440 m^3
EMSA	Kontio	Icebreaker	Two rigid sweeping arms, 12 m Heavy duty boom 2x250 m Brush skimmer Oil slick detection system Storage capacity 2 003 m^3
EMSA	Aalborg	Tanker	Two flexible sweeping arms, 15,6 m Single point inflation boom 400 m Brush Skimmer; 2 x Arctic skimmers Oil slick detection system Storage capacity 4 487 m^3
EMSA	Copenhagen	Tanker	Two flexible sweeping arms, 15,6 m Single point inflation boom 400 m Brush Skimmer; 2 x Arctic skimmers Oil slick detection system Storage capacity 4 487 m^3

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