

Pollution by oil and other hazardous or noxious substances

Incidents involving ships carrying oil and other hazardous or noxious substances can have severe effects on the marine ecosystem. The effects may be short- or long-term depending on climatic and environmental conditions at the time of the spill and the sensitivity of the area. Pollution from oil and other hazardous or noxious substances arises from the incidental discharge of these substances that are carried by ships as cargo or fuel. Loss of fuel from the wrecks through leakage and the illegal discharge from ships into the sea of oily waste produced during ship operations may also contribute to pollution.

It is anticipated that oil tanker traffic will continue to grow as more oil is transported into the global market via the OSPAR area. The growth in environmental risk will be in the North Sea, waters off Norway, Sweden, Denmark, Germany, the Netherlands, Belgium, France and the United Kingdom.

What is the problem?

Oil spills from tanker accidents may have major economic and ecological impacts, including the effects on wildlife, mariculture and tourism.

In 1999 the laden oil tanker *Erika* encountered heavy weather in the Bay of Biscay. The vessel broke in two and sank resulting in the loss of several thousand tonnes of oil which killed marine life and polluted the shores around Brittany, France. The guillemot (*Uria aalge*, see photo) accounted for 82% of the victims. At the end of June 2000, the League for the Protection of Birds reported over 63 000 oiled birds collected. By 4 September 2000, a total of 2150 birds had been freed, 61 403 had died and 53 were still convalescing.



In April 2000, the pollution from the *Erika* raised the question of whether the quality of water was acceptable to fill the fens in Guérande, France, for the local production of salt, which was necessary for a proper harvest in the year 2000. Pre-spill concentration levels of 16 PAHs, considered as priority pollutants, ranged between 5 and 20 ng/l in the water. After the spillage, water pollution in the fens area (fortunately protected by earth dams) ranged from 20 to over 300 ng/l. In order to respect the precaution principle as regards health and the environment, salt producers in Guérande agreed against harvesting in 2000. (CEDRE, April 2005)

Another major pollution incident was the sinking of the tanker *Prestige* in 2002 on the Galicia bank, a large seamount off the Spanish Galician coast. After the sinking, the wreck continued leaking oil which polluted the seabed and contaminated the coastline, especially along the territory of Galicia. Some estimated 64 000 tonnes of heavy fuel oil have been spilled (CEDRE¹), polluting more than 1000 km of coastlines in Spain and France (ETC-LUSI²). Of the 20 000 oiled birds collected, 75% were dead and only few of those alive made a recovery (EEA, 2003). The Iberian population of the threatened guillemot (*Uria aalge*) was hit worst. Given the broad geographical extension of the pollution and the long time-span of the incident, overall mortality has been estimated to be much higher; estimates range between 100 000 – 200 000 birds (EEA, 2003) and 250 000 to 300 000 birds (WWF, 2003). The affected area is an important ecological region, supporting coral reefs and many species of sharks and birds. It also supports the fishing industry on which 60% of Galicia's population depends. The coastal pollution forced the region's government to suspend offshore fishing for six months. The World Wildlife Fund (WWF) published a [study](#) on the spill's short term ecological consequences (WWF, 2003), noting

¹ <http://www.cedre.fr> – status French site: May 2005; status English site: April 2006.

² http://terrestrial.eionet.eu.int/en_Prestige. European Topic Centre on Land Use and Spatial Information

a decrease in the population of inter-tidal animals. Additional studies showed high concentrations of heavy metals in the affected coastal salt marshes (Andrade *et al.*, 2005). Biomarker measurements in fish showed that large areas of the northern Iberian shelf were affected by oil from the *Prestige* and that measurable effects decreased over the period 2002 – 2005 to levels indicating a recovery of the water quality (ICES/OSPAR, 2009; Martínez-Gómez *et al.*, 2009). A recent biological effects study of the spill on mussels on the affected Galician coast, suggests signs of recovery of mussel health but that pre-spill status has not yet been reached (Basque Research, 2009). Little is known about the effects of the oil pollution on the deep seabed and its biological communities and the rate of recovery.

Oil pollution may also result from operational discharge. Various routine maintenance operations may result in liquid oily wastes. Controlled discharge of oily waste at sea is not illegal if it is done in accordance with MARPOL, hence bilge water can be legally discharged in the open sea if the hydrocarbon content is no higher than 15 parts per million (ppm) whatever the volume involved. Discharging oily sludge and waste oil is prohibited under all circumstances.

The North Sea has been assigned a Special Area under MARPOL Annex I which means the operational discharge of oily waste is more stringently controlled. However, surveillance undertaken under the Bonn Agreement suggests that possible illegal discharge of operational oily waste may occur (Figure 4.1).

What has been done?

New technical standards and routing measures have been introduced to help reduce the risks. As a result of the *Erika* incident legislative measures have been put in place to phase out the use of single hull tankers for transporting crude oil. These measures are now in force in the EU. A detailed account of measures taken is given in Table 3.1.

Important progress has been made in the design of oily water separating equipment for machinery space bilges and oil tanker discharges, and in the monitoring and control of the discharge of such mixtures. These technological advances have allowed international regulations to be adopted, reducing the permitted operational discharge of oil effluent from machinery space bilges from 100 parts per million (ppm) to 15ppm.

Discharges are not limited to oil; many tankers carrying different liquid products rinse their tanks at sea to clean them from cargo residue.

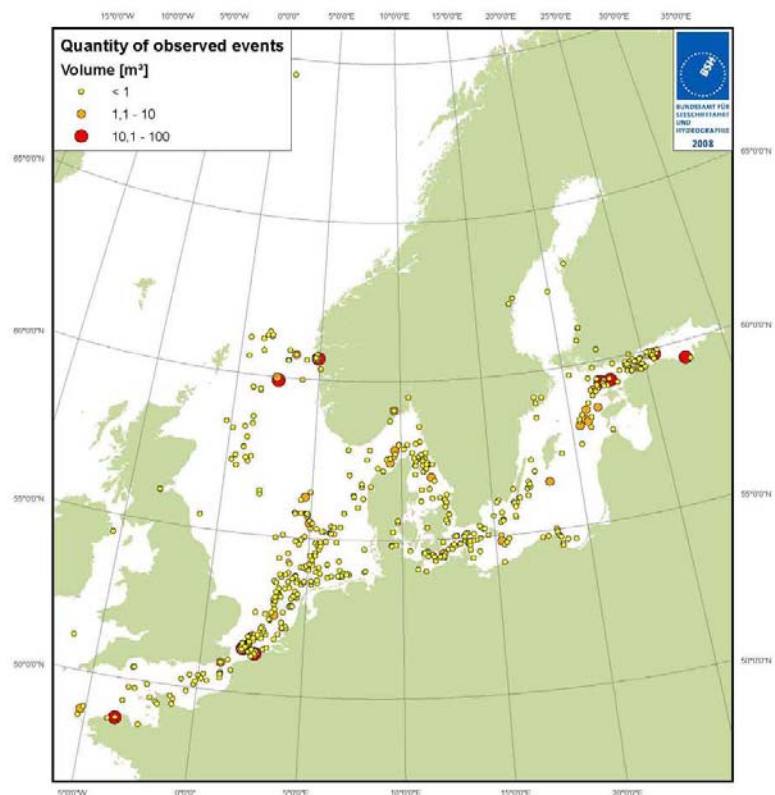


Figure 4.1 Oil spillage in the North and Baltic Sea in 2007 located through aerial surveillance under the Bonn Agreement by Belgium, Denmark, Estonia, Finland, France, Germany, Latvia, Netherlands, Norway, Poland, Sweden and United Kingdom. Source: Bonn, 2008.

MARPOL Annex II on noxious liquid substances carried in bulk was revised with effect from January 2007 to reduce the impact of cargo tank cleaning through linking discharge regulations to revised toxicity categories of noxious substances.

Did it work?

There is not sufficient information to conclude on trends and effectiveness of measures.

There are limited figures available to quantify how much oil has been spilt in the OSPAR area since 2000 as a result of incidental or illegal discharges from ships. However, there is evidence of pollution and this is highlighted through the Bonn Agreement annual reports on aerial surveillance of the North Sea (Figure 4.1).

The 2008 report clearly states that for about 80% of the oil slicks observed/confirmed the source of the polluter has not been identified (Bonn, 2008). As such it is not possible to quantify how many of these slicks are attributable to ships but it is recognised that shipping is a possible contributing source of pollution.

What lessons have we learnt since 1998?

The Paris Memorandum of Understanding for Port State Control³ shows a steady decrease in the detention rate of substandard ships indicating that the standard of ships operating in the region is improving. Although serious accidents occasionally occur – the loss of the *Erika* and *Prestige* being recent high profile examples – the trend shows a continuing improvement, both in quantity and frequency of oil spills each year and the number of major oil spills shows a steady reduction.

↪ *Go to full QSR assessment report on the impact of shipping on the marine environment (publication number 440/2009)*

³ <http://www.parismou.org/>