



Dumping and Placement of Dredged Material

OSPAR Thematic Assessment



Key Message No trends were identified in the amounts of dredged material dumped or placed within the OSPAR Maritime Area in the period 2008–2014, or in the average contaminant concentrations or contaminant loads associated with this material.

Background

Sediment is an integral and dynamic part of the ecosystem, and through various natural processes can build-up in estuaries and harbours. Sediments, although not in themselves polluting materials, are sinks for some contaminants bound to the sediment particles that end up in waterways, harbours, ports and seas mainly from anthropogenic sources such as sewage discharges, storm-water overflows, marine traffic, agricultural run-off, industrial wastewater and historically poor environmental management.

Ports and waterway authorities have a legal obligation to maintain navigation channels. This results in the need to dredge; referred to as maintenance or navigation dredging. Removal of sediment for new construction activities or deepening of navigation channels is referred to as capital dredging. Most dredging activities result in the material being dumped or placed at designated sites within the marine environment. Adverse impacts from the dumping or placement of the dredged material can be physical (through smothering of habitats and organisms), chemical (through toxicity) and / or biological (though increased turbidity, and from bioaccumulation and biomagnification of contaminants through the food web). Dumping or placement of sediments on the seabed will bury benthos and can lead to damage to habitats and biological communities especially at newly designated sites. There is also potential for contaminants to be transferred and redistributed by re-suspension and uptake by biota.

Since 1986, the OSPAR Convention has encouraged Contracting Parties to minimise adverse impacts on the marine environment through its guidelines for management of dredged material and through actions addressing substances found in dredged material at source.

Results

In the period 2008–2014, over one thousand million tonnes of dredged material were deposited in the OSPAR Maritime Area. This value includes material from capital and maintenance dredging. The total amount disposed per country per year is given in **Figure 1**.

Average contaminant concentrations and total loads per country were calculated for cadmium, mercury, lead and tributyltin (TBT) for the period 2008–2014. Changes in total dredging quantities and total contaminant loads are dependent on external factors, including variation in sediment siltation rates due to storm events.

The calculated average concentrations, in mg/kg, dry weight (dw), for the trace metals are comparable to those described in the OSPAR Quality Status Report 2010. Although yearly fluctuations can be seen, there do not appear to be any meaningful increases or decreases across the entire assessment period. **Figure 2** shows the change in annual average calculated mercury concentration, per country for the period 2008–2014. Annual average mercury concentration varied between 0.17 and 0.23 mg/kg. These values are almost identical to those reported for mercury in the previous assessment period 2003–2007 (0.18–0.22 mg/kg).

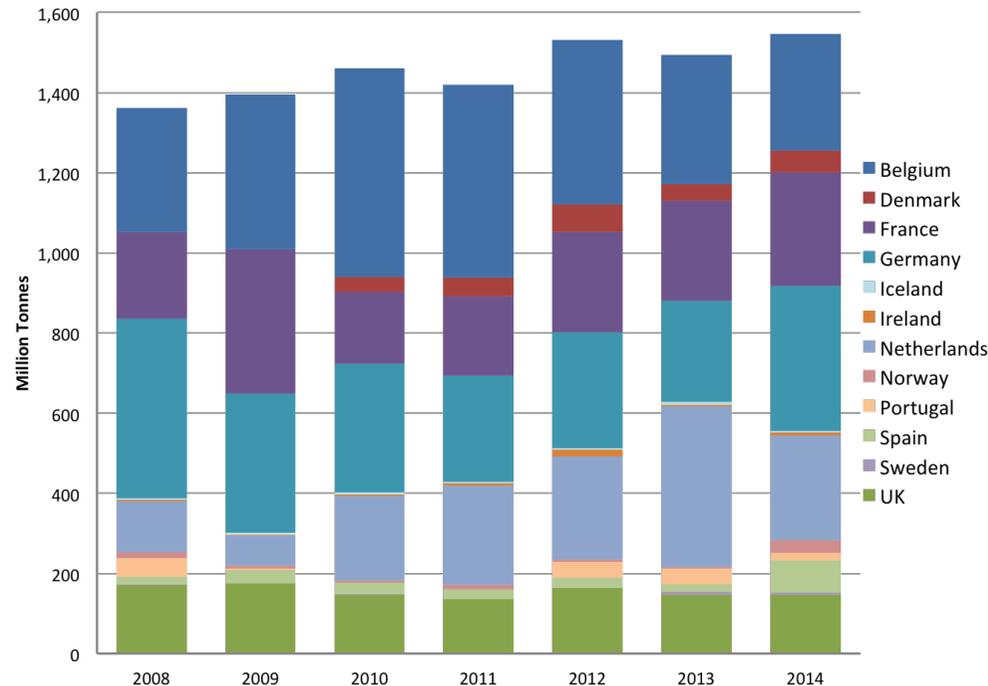


Figure 1: Total amounts, in million tonnes, of dredged material deposited in the OSPAR Maritime Area per country over the period 2008–2014

Results cont...

Figure 3 shows the total mercury load deposited in the OSPAR Maritime Area through the dumping or placement of dredged material by Contracting Party for the period 2008–2014. Trends cannot be accurately determined from these data owing to changes in the amount of material dredged each year; interannual variability is clearly apparent in the graphic. It must be noted that **Figure 3** shows the total amount of mercury deposited, which includes the naturally occurring background level as well as anthropogenically-derived mercury. The net amount of mercury from anthropogenic sources transported from the dredging location to the receiving sites is therefore less. At present, there is no obligation under the OSPAR Convention for Contracting Parties to monitor the environmental impacts of dumping and placement operations, however many Contracting Parties undertake monitoring activities under national programmes. Beneficial use of dredged material (such as for beach nourishment and sediment recharge) has been monitored by OSPAR since 2013. This short period does not allow for trend analysis. The amounts for 2013 (28 million tonnes) and 2014 (37 million tonnes) are comparable; for both years beneficial use was implemented at approximately 80 sites. The most frequent reasons for beneficial use are beach nourishment and sediment recharge.

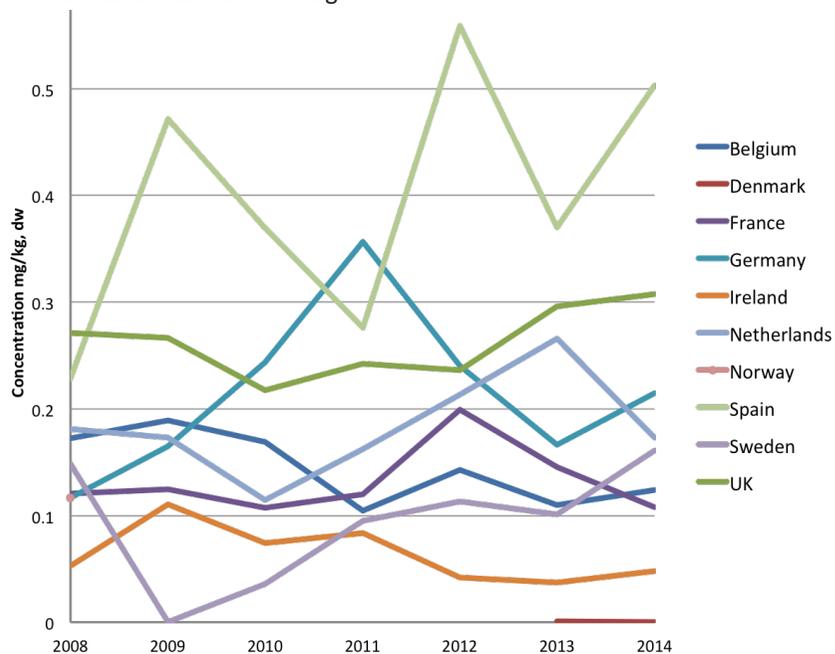


Figure 2: Annual average calculated mercury concentration (mg/kg, dw) in dredged material deposited in the OSPAR Maritime Area.

Conclusion

Dumping or placement of dredged material at sea is common practice within the OSPAR Maritime Area. No changes were detected for amounts of dredged material dumped or placed, for contaminant concentrations or for contaminant loads within the period 2008–2014. The range of concentrations for trace metals is consistent with the QSR 2010 assessment. Dumping and placement of dredged material is well regulated by OSPAR and the related regulations of the Contracting Parties. Together with European Union regulations, these have led to a reduction in pollution from dredged material in the past decades. However, there is a need to look further into

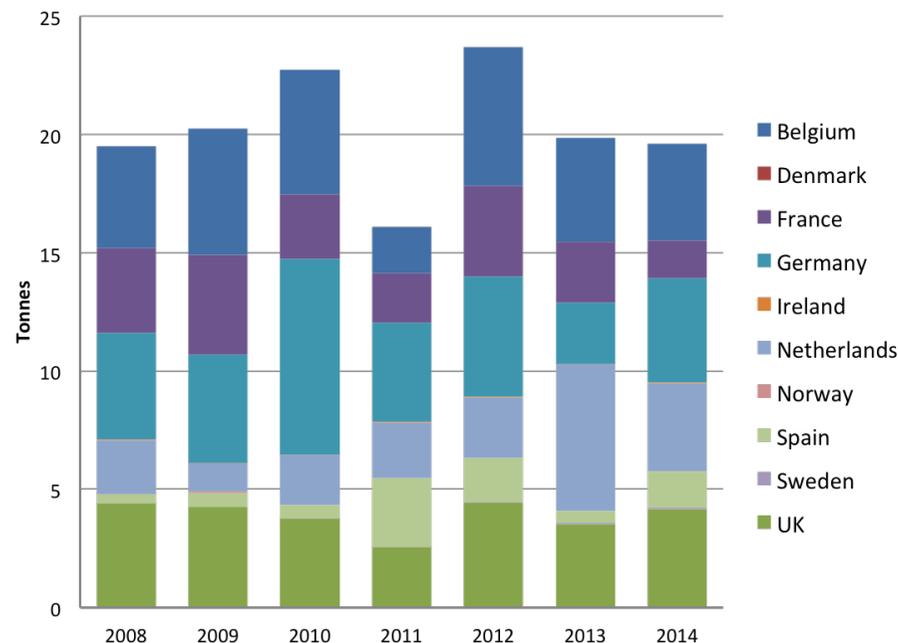


Figure 3: Total mercury load deposited in the OSPAR Maritime Area, in tonnes, through the dumping or placement of dredged material in the period 2008–2014 (data for Norway only available for 2008–2009 and for Denmark for 2013–2014).

Knowledge Gaps

While there has been research on the impacts of dumping and placement of dredged material on the marine environment there are emerging issues. These include the effects and amounts of microplastics and marine litter, in dredged material and the identification of new contaminants of concern. These require further investigation.

OSPAR collects data to support the management of dredged material, not for environmental monitoring purposes. As this is a limited data set, to improve the quality of future dredged material assessments, it would be beneficial to look into how data is collected and the analysis is undertaken. Concepts and methods for cumulative impact assessment could also be considered.

the possibilities for harmonising assessment methodology and objectives, as well as for technical developments that would enable the detection of chemicals of emerging environmental concern, and thus reduce pollution further.

The 2014 data show that there are many cases where dredged material is being put to beneficial use. However not enough data have been collected on placement activities for a trend assessment to be undertaken.