OSPAR COMMISSION

Assessment on the Management of Wastes or Other Matter (Dredged Material) 2008 - 2020

Other Assessment

OSPAR

QUALITY STATUS REPORT 2023

2023

OSPAR's Quality Status Report 2023

Assessment of Data on the Management of Wastes or Other Matter (Dredged Material) 2008 - 2020

OSPAR Convention

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention") was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. The Contracting Parties are Belgium, Denmark, the European Union, Finland, France, Germany, Iceland, Ireland, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Convention OSPAR

La Convention pour la protection du milieu marin de l´Atlantique du Nord-Est, dite Convention OSPAR, a été ouverte à la signature à la réunion ministérielle des anciennes Commissions d´Oslo et de Paris, à Paris le 22 septembre 1992. La Convention est entrée en vigueur le 25 mars 1998. Les Parties contractantes sont l´Allemagne, la Belgique, le Danemark, l´Espagne, la Finlande, la France, l´Irlande, l´Islande, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, le Royaume-Uni de Grande Bretagne et d´Irlande du Nord, la Suède, la Suisse et l´Union européenne

Contributors

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Executive Summary

Dredging and dumping at sea activities have been well regulated by Contracting Parties since the Oslo Convention came into force in 1974, and then through the OSPAR Convention which came into force in 1998. Since the implementation of the original OSPAR guidelines in 1998, loads of contaminants have decreased and have been levelling since the mid-2000s. Concentrations of many contaminants monitored are considered to be now at, or close to, background concentrations in much of the dredged material.

- *A downward trend is evident in loads of TBT in dredged sediment.*
- *Loads of other contaminants did not display trends, confirming findings of the OSPAR 2017 Intermediate Assessment.*
- *Amounts of dredged material dumped or placed have been relatively stable over the past 20 years, with quantities dredged from 2008 to 2020 broadly similar to quantities reported in the QSR (Quality Status Report) 2010.*
- *Changes in reporting are recommended to allow for more relevant future assessments.*

Récapitulatif

Les activités de dragage et d'immersion des déchets et d'autres matières sont bien réglementées depuis l'entrée en vigueur de la Convention d'Oslo en 1974, et par la suite dans le cadre de la Convention OSPAR, qui est entrée en vigueur en 1998. Depuis la mise en œuvre des lignes directrices OSPAR en 1998, les charges de contaminants ont diminué et se sont stabilisées depuis le milieu des années 2000. On considère que les concentrations de nombreux contaminants surveillés sont maintenant égales ou proches des concentrations ambiantes dans une grande partie des matériaux de dragage.

- *On constate une tendance à la baisse des charges de TBT dans les sédiments dragués.*
- *Les charges d'autres contaminants n'ont pas affiché de tendances, ce qui confirme les conclusions de l'Évaluation intermédiaire OSPAR 2017.*
- *Les quantités de matériaux de dragage immergés ou déposés sont restées relativement stables au cours des 20 dernières années, les quantités draguées entre 2008 et 2020 étant globalement similaires aux quantités déclarées dans le QSR (Quality Status Report/ Bilan de Santé) 2010.*
- *On recommande de modifier les exigences de la notification afin de permettre des évaluations futures plus pertinentes.*

1. Management of wastes or other matter

Under Annex II, Article 3 of the OSPAR Convention the dumping of all wastes or other matter is prohibited, except for those specifically listed. The allowed wastes or other matter from this list include dredged material, inert materials of natural origin and fish waste from industrial fish processing operations. Article 4 requires Contracting Parties to authorise all management of wastes or other matter in line with criteria, guidelines and procedures adopted by the OSPAR Commission. OSPAR Guidelines for the Management of Dredged Material at Sea (OSPAR Agreement 2014-06), set out best practice for minimising adverse effects through sampling and analyses of dredged material, for characterisation and advice on site selection, management options and monitoring.

Such management of wastes or other matter in OSPAR are categorised as:

- ***Dredged material management*** - relates to dredging sediments from harbours and their approaches to ensure they are navigable, with material relocated to established sites or used for purposes such as beach nourishment or land reclamation.
- ***Fish waste management -*** relates to material resulting from industrial fish processing operations from either wild stocks or aquaculture. Fish waste is only dumped in small amounts and at only a few sites (fewer than 1000 tonnes per year). These small quantities of material have not been considered in these analyses.
- ***Inert material of natural origin management*** - for example rock and uncontaminated material generated from mining activities, are also sometimes dumped at sea. These small quantities of geologically inert material have not been considered in these analyses.

The phasing out of several types of waste disposal has reduced pressure on the marine environment. Dumping of sewage sludge and of vessels or aircraft has been banned by OSPAR since 1998 and 2004, respectively. Dumping of radioactive wastes has been prohibited since 1999.

2. Dredged material management

Sediments, although not in themselves polluting materials, can be sinks for some contaminants 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. Management practices have been developed in recognition that sediment is an essential, integral and dynamic part of the ecosystem.

Much material dredged from navigation channels within the OSPAR Maritime Area is considered to be either uncontaminated or only mildly contaminated by human activities (i.e. close to natural background levels). However, in some areas dredged material is contaminated to an extent that environmental constraints need to be applied when considering management options.

Consequently, some of the main concerns over dredged material management in OSPAR are associated with the release of contaminants from the sediment, temporary increases in turbidity and the release / remobilisation of contaminants to the water column. These impacts may also have the potential to affect increased availability of contaminants through the food web. To address this concern, OSPAR Contracting Parties monitor and report details of specific contaminant loads in managed dredged sediments, and limit the disposal of contaminated material. The QSR 2010 https://qsr2010.ospar.org/en/index.html identified a stabilising of the earlier downward trend of contaminant concentrations in dredged material from the southern North Sea, as observed throughout the 1990s. To broaden the assessment, data from 2008 to 2020 were assessed for QSR 2023.

3. Results

Dredging activity: Dredging is classed in this report under three types; maintenance, capital and environmental. Maintenance (or navigation) dredging is the periodic dredging of navigation channels, berthing pockets and turning basins to their design depth in order to allow safe passage of ships; capital dredging is dredging of new areas for the purpose of new infrastructure; environmental (or remedial) dredging is carried out on contaminated material or in sensitive areas to minimise environmental impacts. The level of maintenance dredging, and associated management of dredged material has been relatively stable over the past 20 years, with quantities dredged from 2008 to 2020 (see **Figure 1** and **Figure 2**) broadly similar to quantities reported in QSR 2010 (which described trends between 1995 and 2005).

Note, the values in these figures represent only the data reported by Contracting Parties. There were several reported instances from 2008 to 2020 where the amounts of material dredged and disposed were not available for reporting. In some cases, these were from Contracting Parties where dredging activity represents a substantial proportion of the total amount.

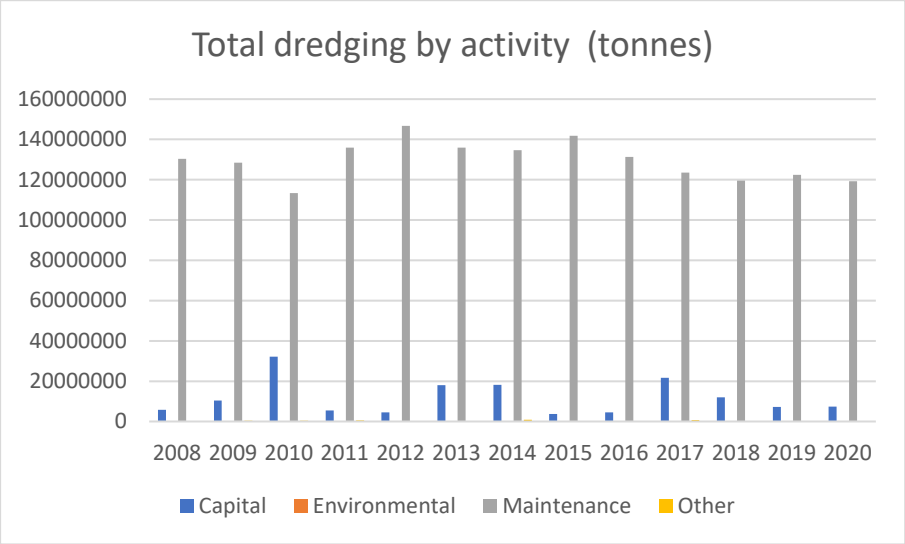

Figure 1: Total dredging activity by category - capital, maintenance, environmental and other

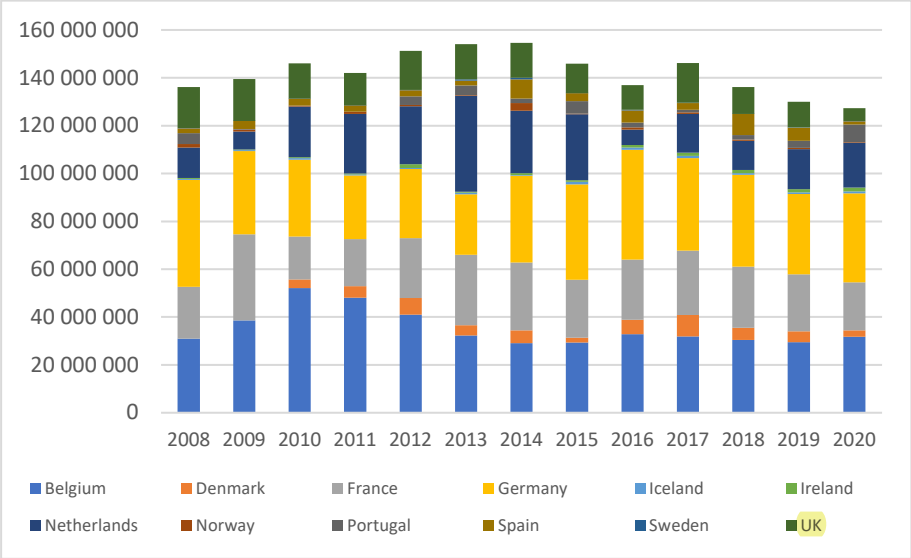

Figure 2: Quantities of dredged material dumped at sea by Contracting Party per year (tonnes). Includes both disposal and placement.

Dredged material is disposed of through use of designated and licenced sites and through beneficial use. **Figure 3** illustrates the location of sites used by Contracting Parties in the assessment period 2008 to 2020, and the total amount of dredged material disposed of per Contracting Party.

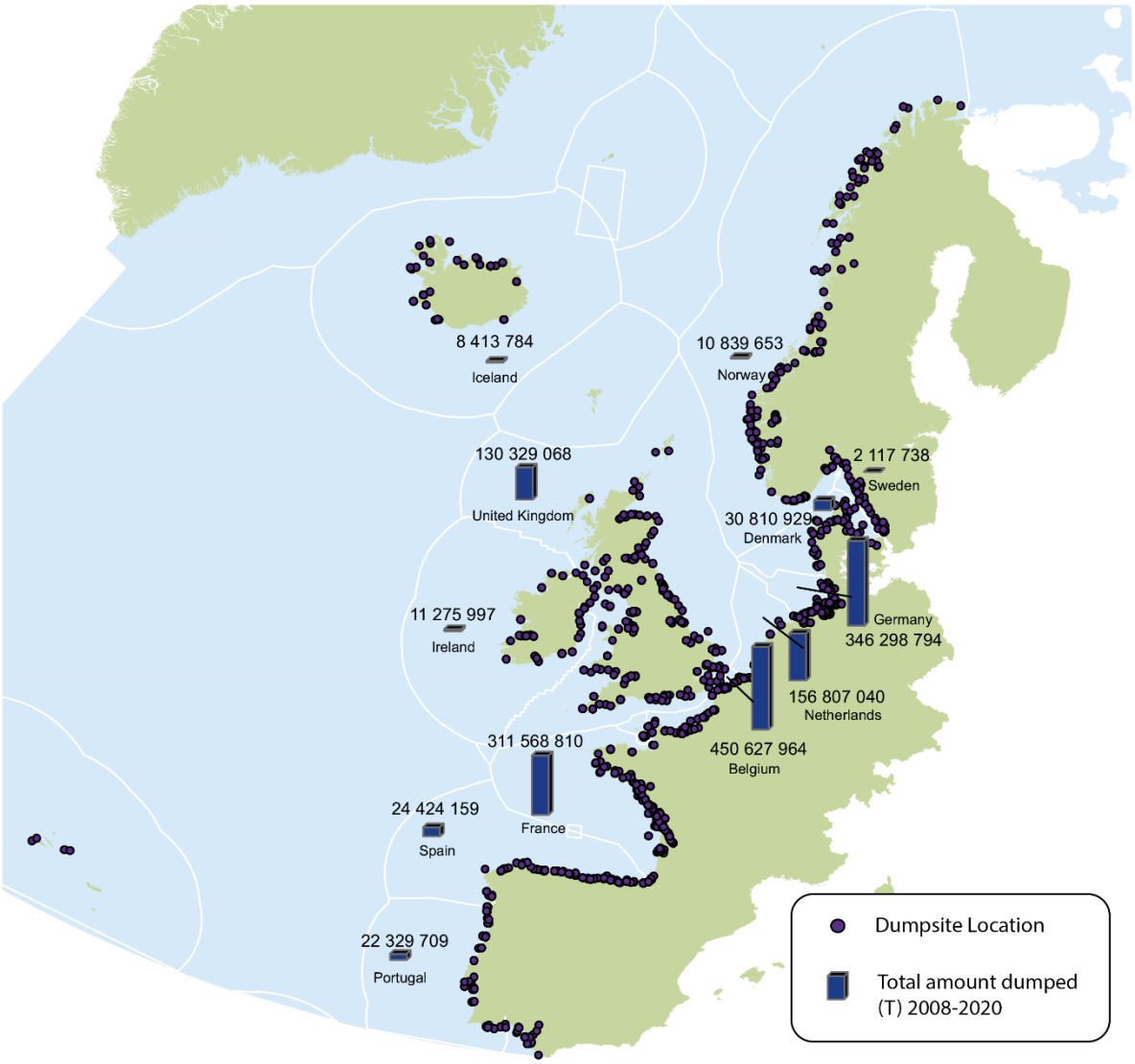

Figure 3: Designated sites and total amounts 2008 to 2020.

***Contaminant loads*:** Loads were calculated for the total OSPAR area for all monitored parameters. For many parameters, data sets were incomplete due to inconsistent frequency of testing. Data on cadmium (Cd), mercury (Hg), and lead (Pb) were selected for this assessment as these parameters provided the most complete data sets. In addition, tributyl tin (TBT) was also assessed; although not as complete a data set as for the trace metals, there are many data points for TBT throughout the assessment period.

Loads of Cd, Hg, Pb and TBT are illustrated in **Figure 4**. There is no evident trend for the trace metal loads. QSR 2010 and Intermediate Assessment 2017 demonstrated the early decline in loads for these metals, which was brought about by introduction across Contracting Parties of the OSPAR Guidelines. Current levels of these heavy metals are now considered close to background in many cases, thus accounting for the plateauing. It should be noted, however, that the annual contaminant load depends not just on the total amount of material dredged but also from which ports, or areas, the sediment has been dredged. For example, in 2019 and 2020 there has been an upswing in overall trace metal loads, which can be explained by increased dredging taking place in two particular ports where levels are known to be high.

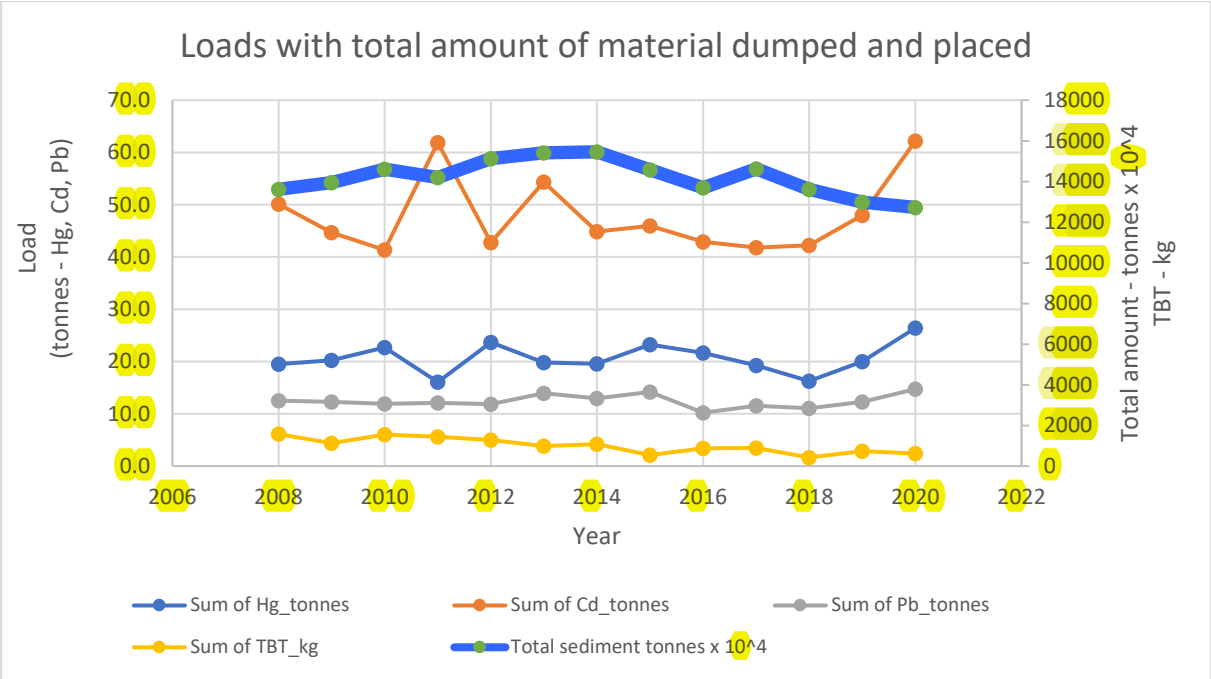

Figure 4: Total loads for cadmium Cd, mercury Hg, lead Pb and tributyl tin TBT with corresponding annual amounts of dredged material.
Note: Cd and Hg are displayed on primary axis (lhs) while amounts, TBT and Pb are displayed on secondary axis (rhs).
Note, loads for cadmium, mercury, and lead are in tonnes. Loads for TBT are in kg.

There is a detectable downward trend in TBT (see **Figure 5**). This is evident, notwithstanding advances in analytical methodologies, which have improved limits of detection. TBT was introduced to the marine environment purely by anthropogenic means, predominantly through its use as an antifoulant on sea-going vessels. Following a complete ban on all ships since 2008, decreasing concentrations of TBT have been detected in dredged sediment. In addition, the application of the OSPAR guidelines has facilitated Contracting Parties in limiting the disposal of contaminated sediment from ports.

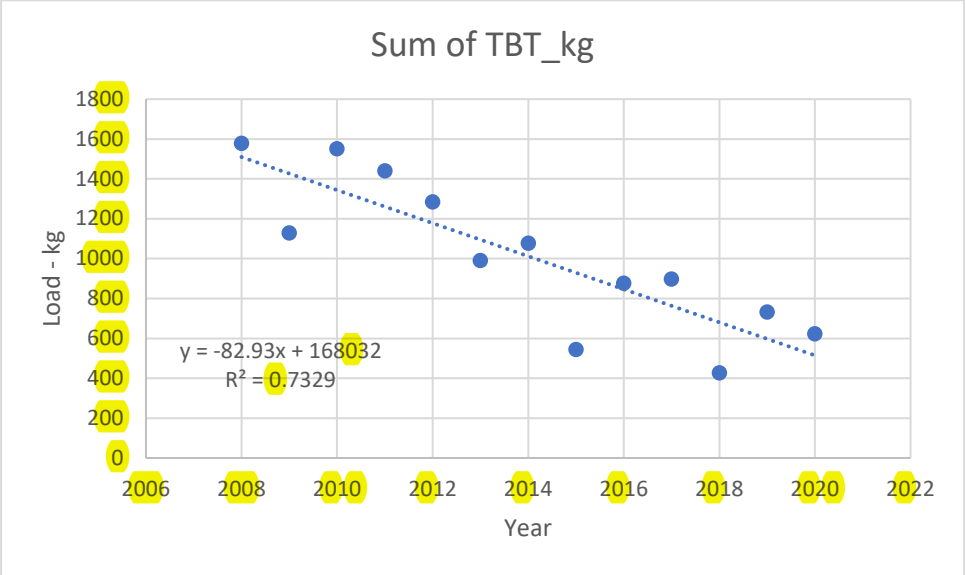

Figure 5: Total load of TBT (kg) per year from all Contracting Parties

Beneficial uses: Where feasible, dredged sediment, particularly clean coarse sediment, may be used for an assortment of beneficial means, for example, land reclamation, coastal protection, sediment

recharge, construction or habitat generation. **Figure 6**, below, demonstrates the amount of material reported specifically as having been used beneficially.

The interpretation of what is beneficial use or not is not overly prescriptive. Some Contracting Parties consider all dumping of dredged sediment to be beneficial, while others consider only certain uses to be beneficial, therefore it is difficult to make an assessment on trends of material used for beneficial means. Although there is a wide variety of uses, operations have been combined under the headings of beach nourishment, engineering, habitat restoration and other / unspecified (**Figure 6**), for the purpose of this assessment.

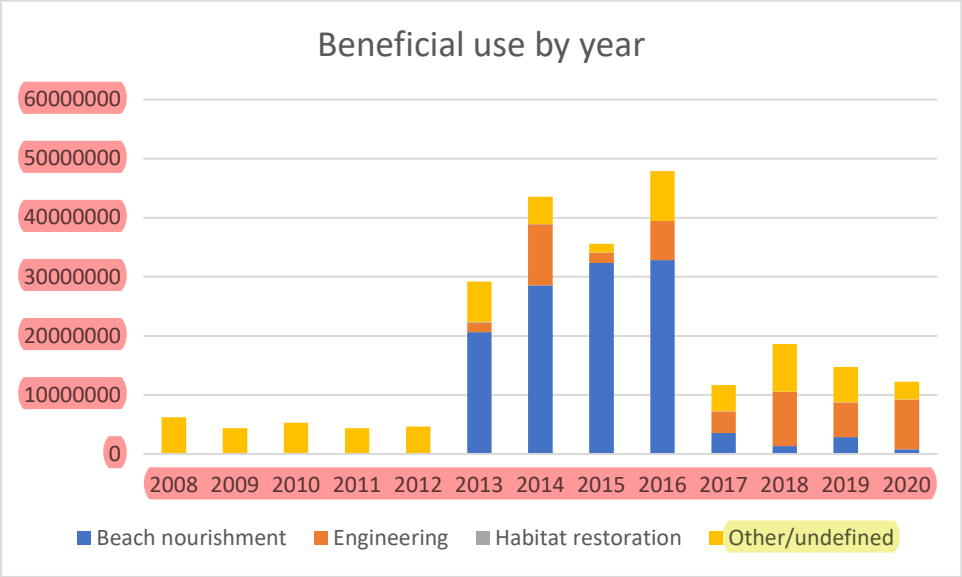

Figure 6: Amount of material used for beneficial means by year

4. Discussion and Conclusion

Dredged material management is a common and necessary practice within the OSPAR Maritime Area. Management of dredged material is well regulated by OSPAR measures and the related national regulations of the Contracting Parties.

Together with European Union and national regulations, OSPAR measures have led to a reduction in pollution from dredged material in the past three decades; in 2003, an Overall Assessment of the Dumping of Wastes at Sea from the mid-1980s to 2001 in the OSPAR Area found large reductions in concentrations of trace metal contaminants in sediments from the main ports, particularly in the years from 1986 to the early 1990s. QSR 2010 found a clear downward trend in contaminant concentrations in the Southern North Sea throughout the 1990s, which then stabilised. Little change has been detected for amounts of dredged material excavated, for contaminant concentrations or for contaminant loads assessed within this study period from 2008–2020, indicating a continued plateau from the 1990s reductions. It should be noted, however, that the reported loads of trace metals do not necessarily represent high levels of contamination in all cases, as these metals are also naturally occurring within sediment. In many cases, it can be seen that trace metal concentrations are at or approaching the natural geological concentrations.

OSPAR data collection is intended to support the management of dredged material rather than for long-term environmental monitoring. There is a need to consider further harmonising of assessment methodologies and objectives, as well as technical developments to enable the detection of chemicals of emerging environmental concern, and thus further reduce sources of pollution. Improvements to the quality of future assessments will also require changes the way the data are collected, such as reporting of measured concentration values rather than total loads, as well as increased harmonisation of analyses.

It is currently considered that the need for dredging may increase in future due to growth in ship sizes, requiring deeper and wider navigation channels. In addition, climate experts forecast greater intensity of storm events, which may lead to increased infilling of channels and harbours. (link to Shipping feeder report ; link to shipping section of the human activity thematic assessment).

A report on the use of OSPAR 2014 guidelines was presented to the OSPAR Environmental Impacts of Human Activities Committee in 2020, identifying that the guidelines are fully implemented by most Contracting Parties. It may, however, be necessary to harmonise the approaches taken in order to have more relevant and directly comparable data for future assessments.

The data show that there are many cases where dredged material is put to beneficial use but insufficient focussed data have been collected for a trend assessment to be undertaken.

5. Challenges encountered

While this assessment endeavoured to use all data collected from Contracting Parties, several difficulties were identified. Although all Contracting Parties follow the OSPAR guidelines, the approach is not entirely harmonised. The challenges encountered include:

1. *Lack of harmonisation*: Each Contracting Party applies its own interpretation of the OSPAR Agreement 2014-06 and Guidelines. The lack of harmonisation creates inaccuracies in the data in many assessment aspects, for example, in evaluating permitting activities and in assessment of contaminant concentrations and loads.
2. *Action levels:* While local geology may influence how lower action levels are set, there is a lack of harmonisation in techniques for setting upper action levels. There is also a lack of consistency in the application of upper action levels.
   Methodology for setting action levels, as well as method of application, varies across Contracting Parties. Consequently, an assessment of "contaminated" material above upper action levels has not been feasible due to these differences in action levels and how they are interpreted. These values were not, however, excluded from the load calculations.
3. *Contaminant loads:* Examining contaminant loads on an annual basis can be problematic. Background geology varies from place to place. In addition, contaminant concentrations are known to be higher in some ports than in others, and in some cases in specific areas of a particular port. As a result, the annual contaminant load will depend not just on the total amount of material dredged but also on which ports, or areas, have been dredged at that time. For example, in 2019 and 2020 there has been an upswing in overall trace metal loads, which can be accounted for by increased dredging taking place in two particular ports where levels are known to be high.
   In addition, there are no hard guidelines for calculating loads for material where the chemical analysis result is less than the limit of detection, resulting in minor inconsistencies to the overall contaminant load.
4. *Sample treatment:* Variations in sample pre-treatment, e.g. grain size fraction analysed and digestion method, can produce concentration and load results that are not directly comparable, therefore it is not possible to calculate accurate or reliable concentrations of contaminants in material due to the lack of particle size data with which to normalise the concentrations per operation. Incomplete reporting by some Contracting Parties has added to inconsistencies. In addition, differences in frequency of testing for particular contaminants have resulted in inadequate datasets available for full assessment.
5. *Comparison with pre 2014 data*: Following agreement at the Committee meeting for the Environmental Impacts of Human Activities (EIHA) 2013, the reporting format for dumping at sea was modified. Earlier reports did not clearly differentiate between capital and maintenance dredging making the earlier estimations less accurate. In addition, no details were collected on beneficial use or in some instances, it has not been possible to delineate between these and so assumptions have been made on the proportion of each. Note, in these cases, the amount of material involved was relatively minor.

6. Knowledge Gaps and Recommendations

OSPAR collects data to support the management of dredged material rather than for long-term environmental monitoring. There is a need to consider further harmonising of assessment methodologies and objectives, in addition to technique developments, to enable the detection of chemicals of emerging environmental concern, and thus reduce pollution further. Improvements to the quality of future assessments will require changes the way the data are collected (e.g. to collect measured concentration values instead of loads) and increased harmonisation of analyses.

New chemicals, such as brominated flame retardants, are constantly being developed for use in everyday life but some may ultimately end up in the marine environment. It is essential to keep abreast of changes in impacts from dredged material. It is recommended that the OSPAR Guidelines for the Management of Dredged Material be regularly amended to include emerging chemicals in order that baseline conditions can be established, and subsequent trends monitored.

In recent years, concern about the fate and impacts of litter / debris and microplastics in the marine environment has increased. While there are currently some technical challenges around the analytical techniques for detecting and identifying microplastics and marine litter in dredged material, more information is being generated on impacts of these substances on marine life. It is crucial that techniques be developed and rolled out for regular assessment of the contribution of litter / debris and microplastics to adverse impacts of dredged material, and if necessary, the management of these substances be included in future versions of the OSPAR Guidelines.

Impacts from dredging and dumping at sea of port sediment may be exacerbated by the co-occurrence of other human activities, such as aggregate extraction, fishing and /or infrastructure development. Concepts and methods for impact assessment could be further developed to include dredging and dumping as part of overall cumulative impact assessment.

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Our vision is a clean, healthy and biologically diverse North-East Atlantic Ocean, which is productive, used sustainably and resilient to climate change and ocean acidification.

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