Marine Management Organisation

Evidence requirement R077:

Redefining physical oceanographic conditions to determine extent of sediment plumes as a result of dredge disposal at disposal sites

1. Requirement overview:

Requirements	Understanding extent of sediment plumes as a result of dredge disposal at disposal sites
Requirement detail	The Marine Management Organisation (MMO) requires physical models to improve understanding of sediment transport routes, during dredge disposal operations at designated disposal sites, to provide further evidence and support decisions around licensing conditions. To consider: • physical conditions have an influence on the environmental impact of dredge disposal (for example, sediment plumes, changes in conditions of substrate, seabed morphology and removal/smoothering of subtidal benthic species and communities) • existing physical conditions are defined, for example, as part of the process involved in designating a new disposal site • physical oceanographic information or approach (see existing evidence) may be used to improve understanding other evidence needs, such as defining local physical conditions at marine protected areas, for example the effectiveness of closed areas (larval dispersal) as well as in planning to support descriptions of habitats
MMO use	Marine licensing: • identify disposal sites where additional management measures may be required to reduce possible extent of sediment plumes • form part of evidence base for marine licensing Marine planning: • determine if evidence acquired can be used to support marine planning Marine conservation: • determine if evidence acquired can be used to inform future decisions marine conservation
External interest	Natural England, Environment Agency, Cefas and JNCC
Delivery target	2016, Q4

2. Aims and objectives

Aim:

To determine the extent of sediment plumes as a result of dredge disposal at disposal sites.

Objectives:

- complete a disposal site review, to include assessment of physical conditions for all open disposal sites within England
- investigate incorporation of admiralty charts, and higher resolution bathymetric data into MMO data systems
- review whether approach used for assessment of physical conditions at disposal sites can be used for other MMO evidence needs, such as MPAs to determine effectiveness of closed areas (eg. larval dispersal), or for marine planning purposes to aid habitat descriptions

3. Existing evidence

MMO	Limited specific evidence.
Academic	The MMO are aware of ongoing research that may be able to support broader physical oceanographic evidence needs, including the NERC Shelf seas biogeochemistry progamme (Shelf Seas Biogeochemistry).
Other	**Physical oceanographic information:** The MMO licenses disposal at sea under the Marine and Coastal Access Act 2009. Such activity is usually licensed at a number of disposal sites that have been in use for longer than 10 years. There are approximately 155 open disposal sites designated for dredged material disposal around the coast of England, not all of which are used in any one year. While the majority of these are located along the coast of the mainland, generally within a few miles of a major port or estuary entrance, a significant number are positioned within estuaries (e.g., Humber) or on intertidal mudflats as part of beneficial use schemes. In total, approximately 40 Mt (wet weight) are annually disposed to coastal sites around England, although this varied from 28 to 57 Mt (wet weight) for the period between 1986 and 2010. Individual quantities licensed may range from a few hundred to several million tonnes, and the nature may vary from soft silts to stiff clay, boulders or even crushed rock according to origin, although the majority consists of finer material' (Bolam et al, 2014) . There are also various physical oceanographic data sources available, such as Liverpool bay Coastal Observatory (Cobs); Wavenet; Smartbuoys; MEDINocean; EMODNET.

4. Current activity

The MMO has commissioned a review of disposal sites that includes assessment of physical conditions for open disposal sites, including those close to marine conservation zones (MCZs). The disposal site review collates the available monitoring data, case officer knowledge and outputs of model runs to identify those disposal sites that are considered a high priority. This can ensure management measures are in place to minimise any potential interactions between dredge disposal at these sites and Marine Protected Areas (MPA), particularly Marine Conservation Zones. . Priority objective commissioned and outputs expected by end of Q2 2016.

5. Associated evidence requirements

Ref	Title
R018	Improved distribution and condition data for protected species and habitats and the uptake of this information into marine management
R023	The distribution and condition of major non-protected mammal, bird and fish species, including habitat conditions
R117	Natural variability and anthropogenic driven change in marine protected areas

More information on these is available here

6. Potential delivery route

Although we have set out how we think we can deliver this evidence requirement, we'd like to hear from anyone interested in working with us to deliver all or part of this requirement.

It is expected that this requirement will be delivered primarily by discrete commissioning, followed by knowledge exchange and in-house delivery. We expect this requirement to be delivered by Q4 2016. However, it is expected that this work programme may lead to additional questions that will be covered under other evidence requirements into 2019 and beyond.

Commissioning

As this is a relatively specialist area, there are a limited number of organisations able to complete this work so directly commissioning one of them is the primary route of delivery for this evidence need, especially due to the time limited nature and need for this particular request.

Knowledge exchange

Continued knowledge exchange will occur throughout the delivery of this requirement however, there will be two specific periods of intensive knowledge exchange in order to share knowledge and plan future activities. The first event will be a workshop with stakeholders. The second event will involve inviting experts to MMO to present physical oceanographic model results. This will be at the end of the work programme to ensure the increased evidence base can be implemented into delivery and investigate whether this approach can be adapted to support other evidence needs.

See Table 1 for timescales.

Table 1: Delivery timescales 2016 to 2020

Delivery Route	2016			2017				2018				2019				2020			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. Commissioning				Project complete															
2. Knowledge exchange																			

7. Contact

For more information or to add further research to the existing evidence list please email evidence@marinemanagement.org.uk