

## AGGREGATE DREDGING AND THE MARINE ENVIRONMENT:

an overview of recent research and current industry practice



## Marine aggregate dredging and the coastline: a guidance note



**Best practice guidance for assessment, evaluation and  
monitoring of the possible effects of marine aggregate  
extraction on the coast – a Coastal Impact Study**

# AGGREGATE DREDGING AND THE MARINE ENVIRONMENT

The marine Aggregate Levy Sustainability Fund (“marine ALSF”) programme represents one of the most substantial investments in UK marine research. The research focuses on improving the way that the marine aggregate industry is planned, assessed and managed.

A goal for the programme was to deliver practical outcomes that improve understanding and knowledge of the environmental implications of marine aggregate extraction in order to ensure such practices are sustainable. Outcomes should increase certainty and provide greater confidence to regulators, advisors and industry alike.

This overview report demonstrates that the marine ALSF programme has delivered significant improvements to our understanding across a wide range of environmental disciplines.

Many of the research outputs generated through the marine ALSF programme and described in this report can provide significant added value to the wider marine science that underpins the planning and management of many activities within the UK marine area.

# MARINE AGGREGATE DREDGING AND THE COASTLINE – A GUIDANCE NOTE

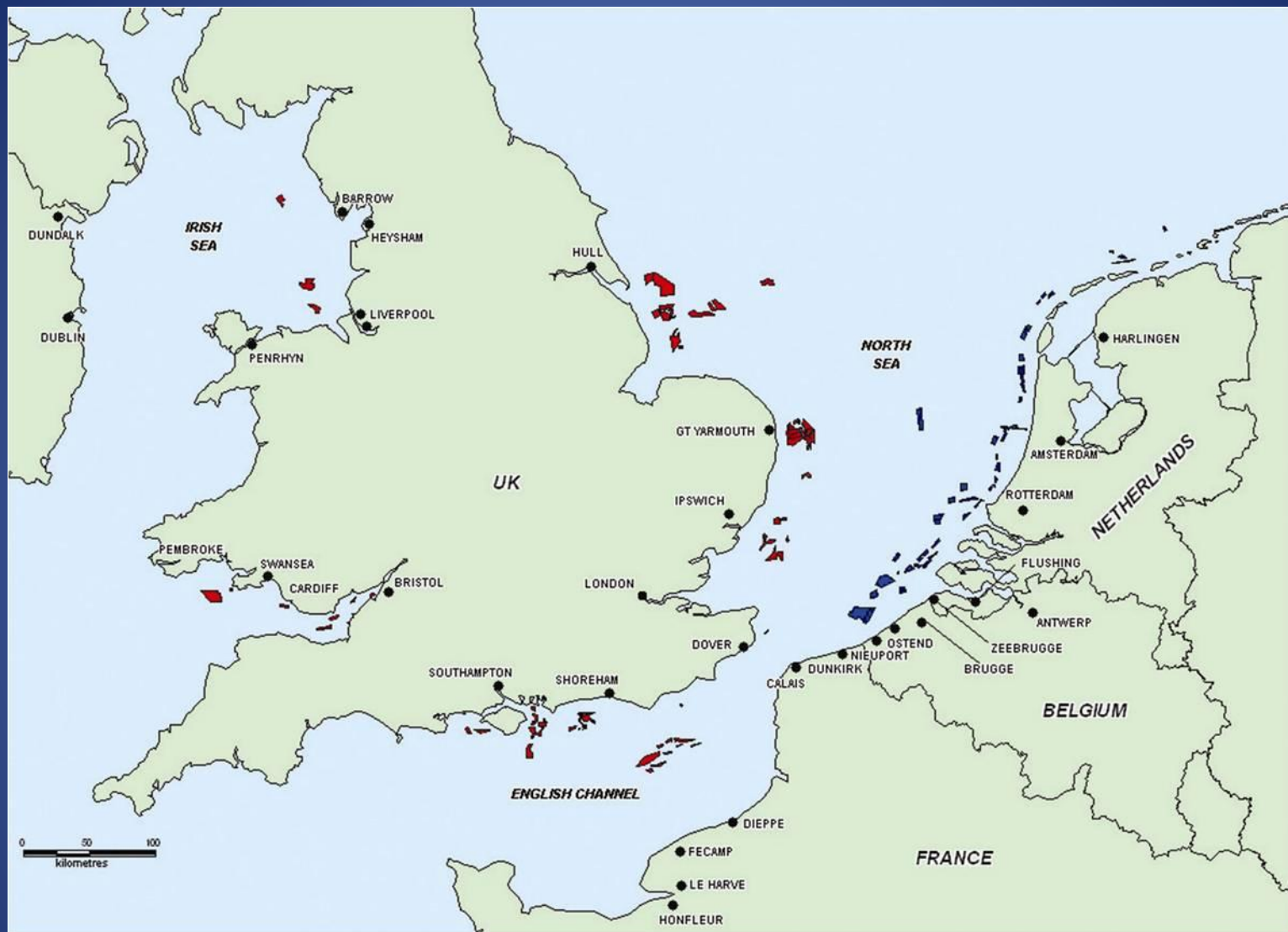
This guidance note, which has been developed by the British Marine Aggregate Producers Association and The Crown Estate from well established approaches to assessing coastal impacts, seeks to establish best practice for the British marine aggregate industry and advises on the scope, standards and transparency that are expected in a Coastal Impact Study (CIS).

It is designed to be a valuable reference for stakeholders and consultees, including dredging companies, consultants, government regulators and agencies, local authorities, NGOs, other seabed and coastal users and the public.

## The Crown Estate and mineral rights

The Crown Estate owns virtually the entire seabed out to the 12 nautical mile territorial limit as well as having the rights to explore and utilise the natural resources of the UK continental shelf such as aggregates. As the landowner, The Crown Estate issues commercial production agreements for marine aggregate dredging, although the marine licence to dredge is given by the regulator – either the Marine Management Organisation in English waters (a Non-Departmental Public Body) or Natural Resources Wales in Welsh waters (a Welsh Government Sponsored Body). The Crown Estate has two main objectives: to enhance the value of the estate and the income it generates; and to manage the estate in a responsible manner. Royalties from mineral extraction benefit the taxpayer by contributing revenue from national assets directly to the Treasury.





Map of the coastline showing the location of aggregate licence areas in the UK and adjacent coast of continental Europe. Courtesy of BMAPA.



Sources of marine and land-won sand and gravel in Southern Britain.

# COASTAL IMPACT ASSESSMENT CRITERIA

The set of criteria that should be used when assessing the effects of proposed marine aggregate dredging on the coastline around the UK have developed over time (CIRIA, 1998); they have been incorporated into historic government policy (MMG1, 2002). The criteria have been designed to include all possible mechanisms by which marine aggregate dredging could affect a coastline.

A Coastal Impact Study (CIS) should, as a minimum, assess whether coastlines could be unacceptably affected by the dredging plan. The CIS should include consideration of the following criteria:

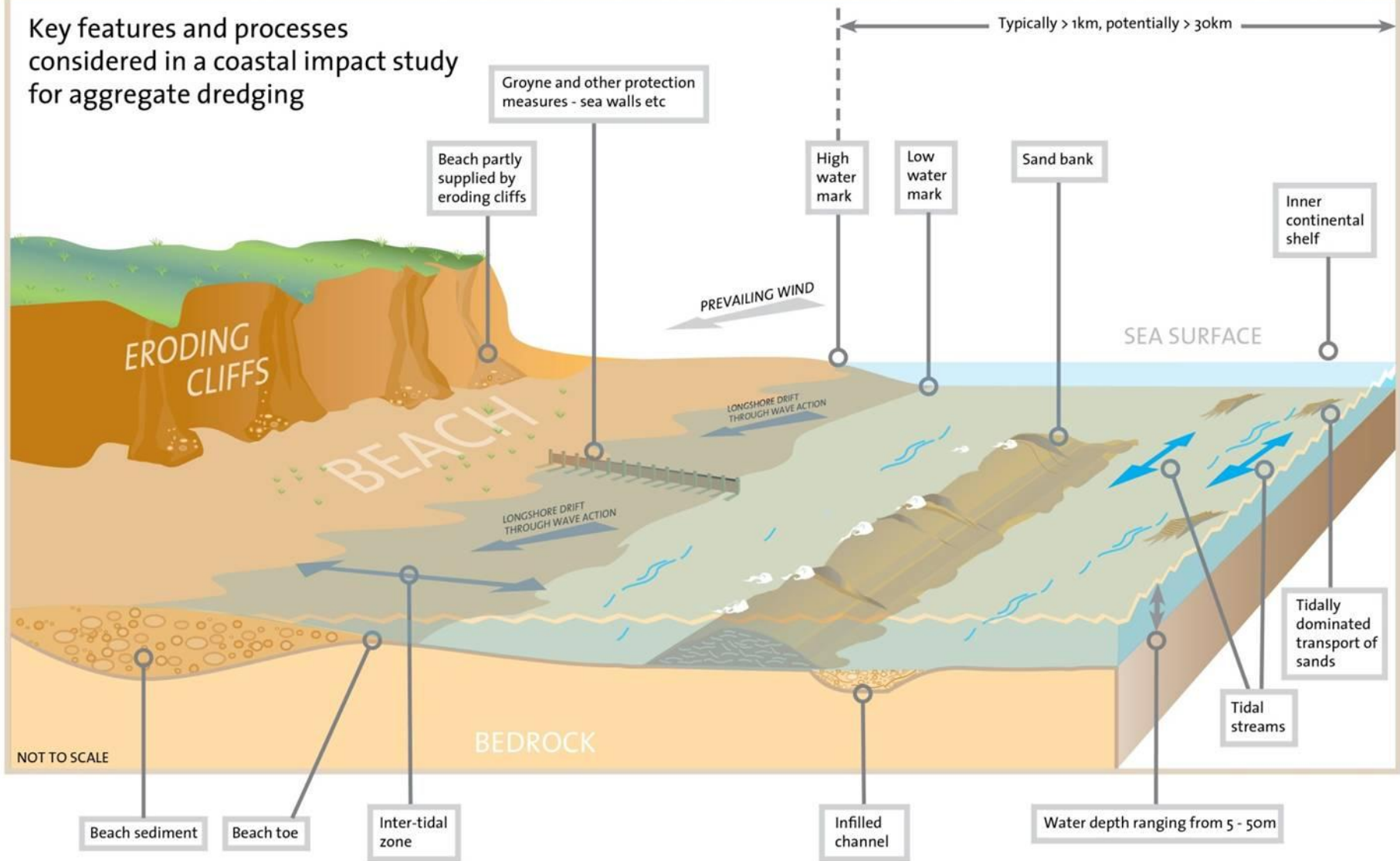
- Changes in nearshore wave conditions as a result of changes in the wave patterns over the dredged area;
- Changes in nearshore wave conditions as a result of the alteration of sandbanks, or other significant seabed features, by the proposed dredging;
- Changes in the nearshore tidal currents due to bed lowering in the dredging area;
- Any draw-down into the dredged area, of beaches or sandbanks;
- Changes in sediment transport patterns, interrupting supply to coastal sandbanks or beaches;
- Changes to the form and function of any nearby sandbanks.

# CONSIDERATION OF CUMULATIVE IMPACTS

Within some seabed regions, for example off the coastline from the east of the Isle of Wight to Brighton, there are a number of existing dredging and application areas lying between five to 15km offshore. Considered alone, dredging in any and each of these areas is unlikely to result in any changes along the coastline.

Established best practice requires assessment of the cumulative effects on the coastline of removing aggregate from **all** these dredging areas. In some regions it is common for waves travelling towards the coast to pass over several of dredging areas and be successively altered. In this situation, a study of potential cumulative effects will be required.

Key features and processes considered in a coastal impact study for aggregate dredging



## Protected Habitats and Communities

Communities and habitats that have statutory protection under the EU Habitats Directive and are likely to occur in the vicinity of aggregate dredge sites include:

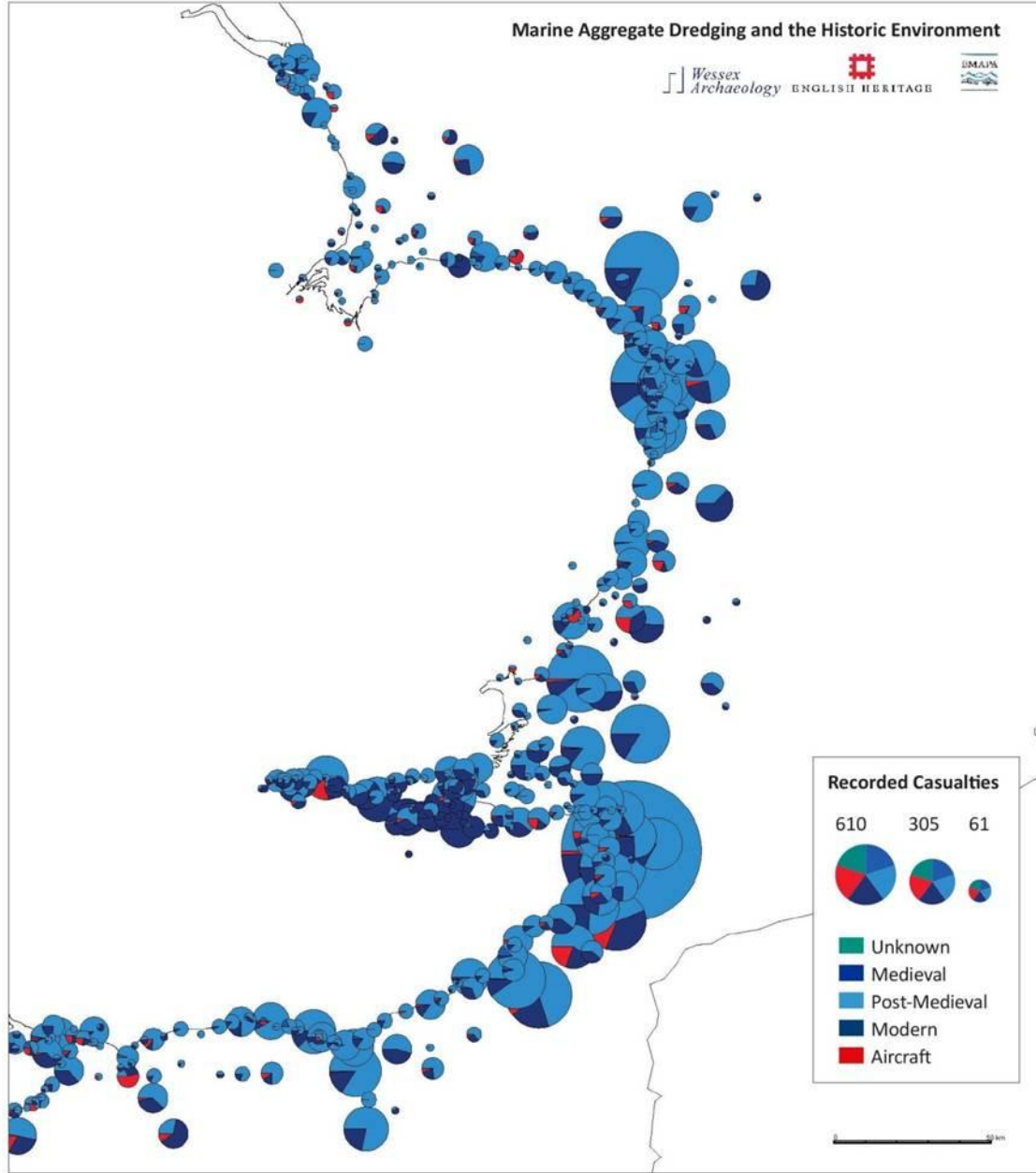
- Sandbanks that are covered by the sea at all states of the tide;
- Geogenic reefs;
- Biogenic reefs



A typical Horse Mussel bed showing the accumulation of silt and attached fauna.

# Marine Aggregate Dredging and the Historic Environment

Wessex Archaeology ENGLISH HERITAGE



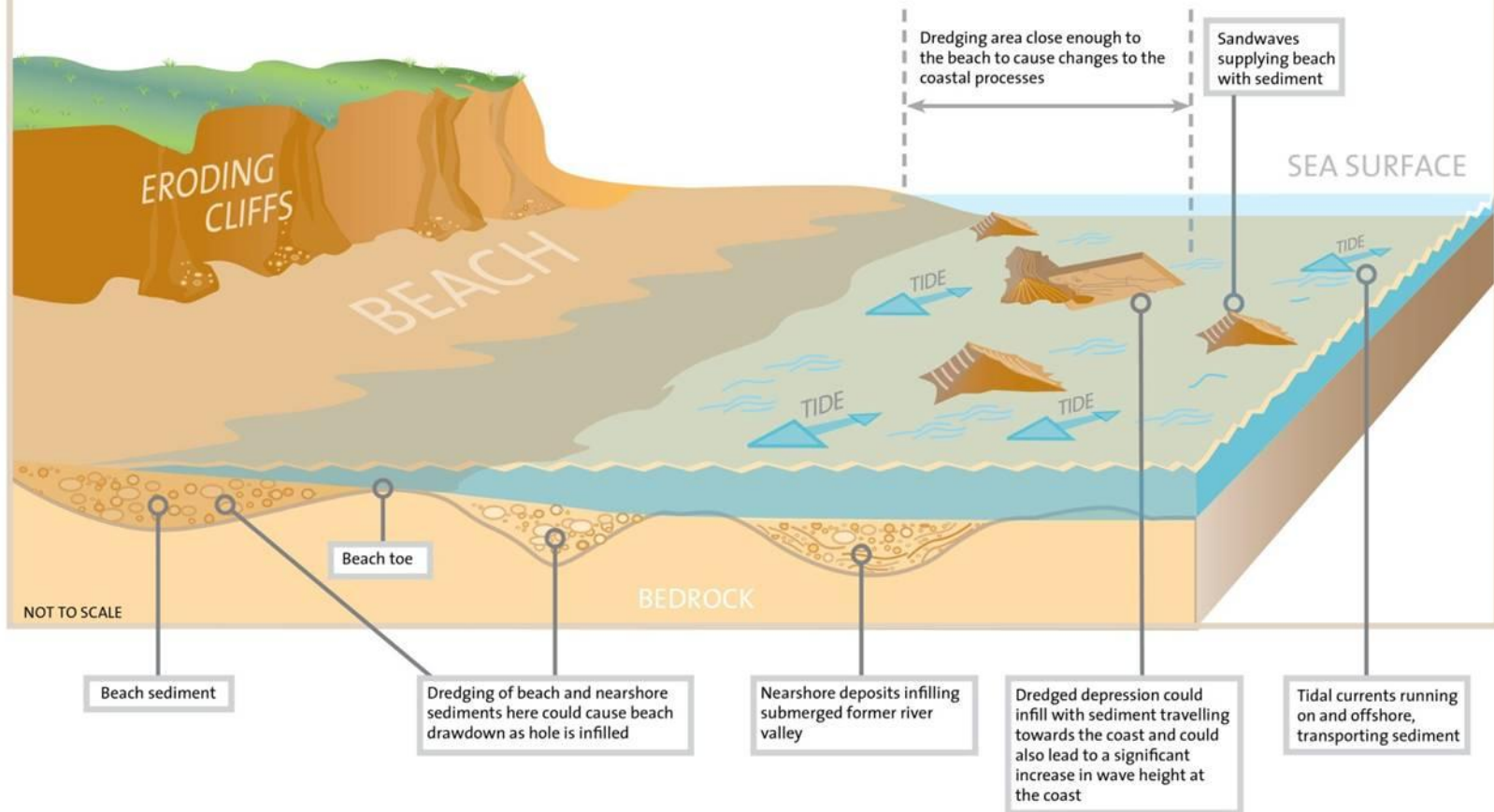
Map summarising records of shipping losses on the East Coast, drawn from the National Record of the Historic Environment (NRHE) in the course of a pre-ALSF project for BMAPA and English Heritage.

# IMPACTS ON FISHERIES

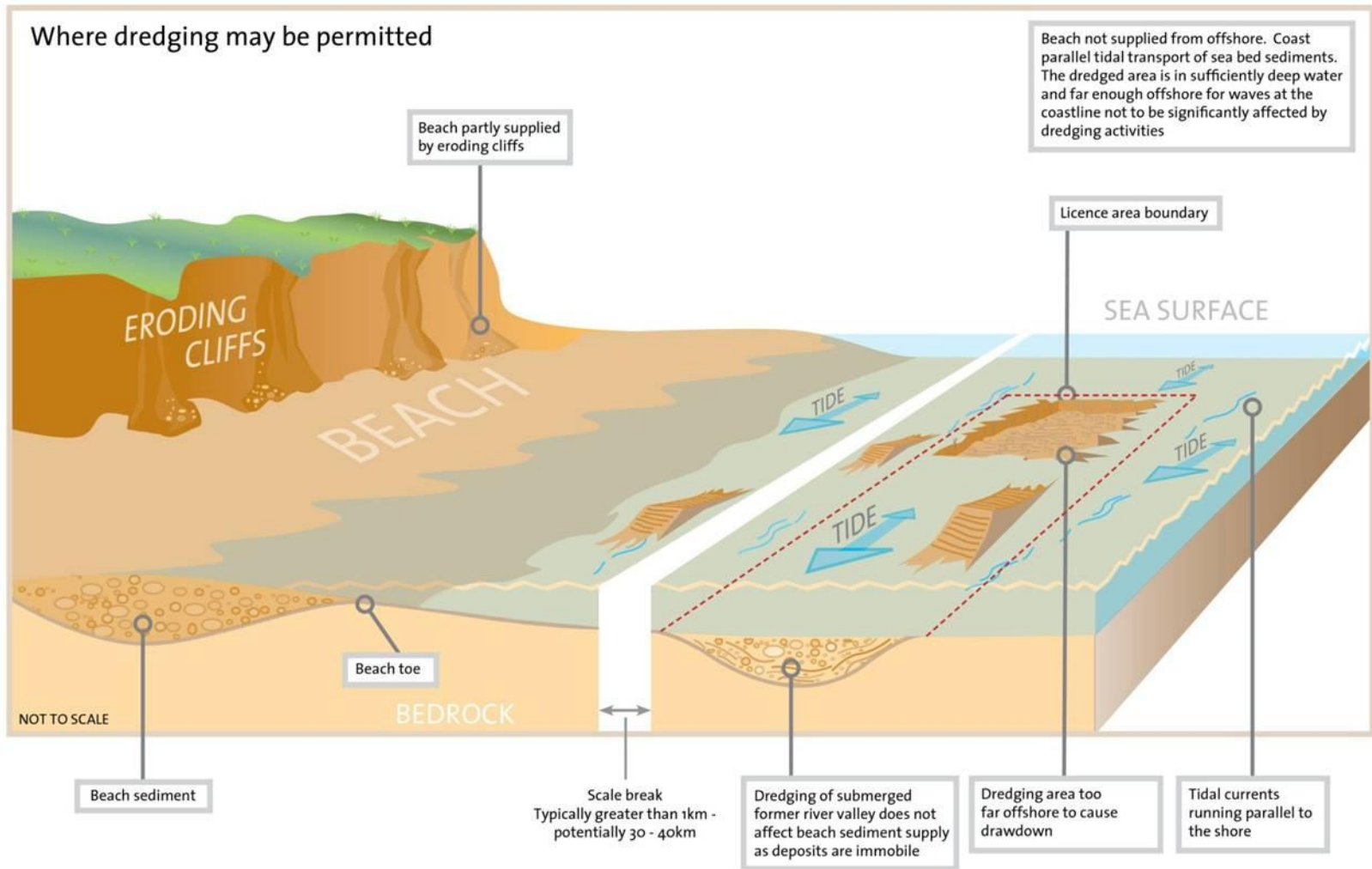
- Availability of Information.
- Risk Assessment for Fisheries in the EIA for marine aggregate extraction licences.
- Overlap between fisheries and other marine activities.

## Where dredging may not be permitted

Beach supplied from offshore. Inshore tidal transport of seabed sediment. Due to inshore shallow waters and proximity to the coast, waves at the coastline may be significantly affected by dredging activity

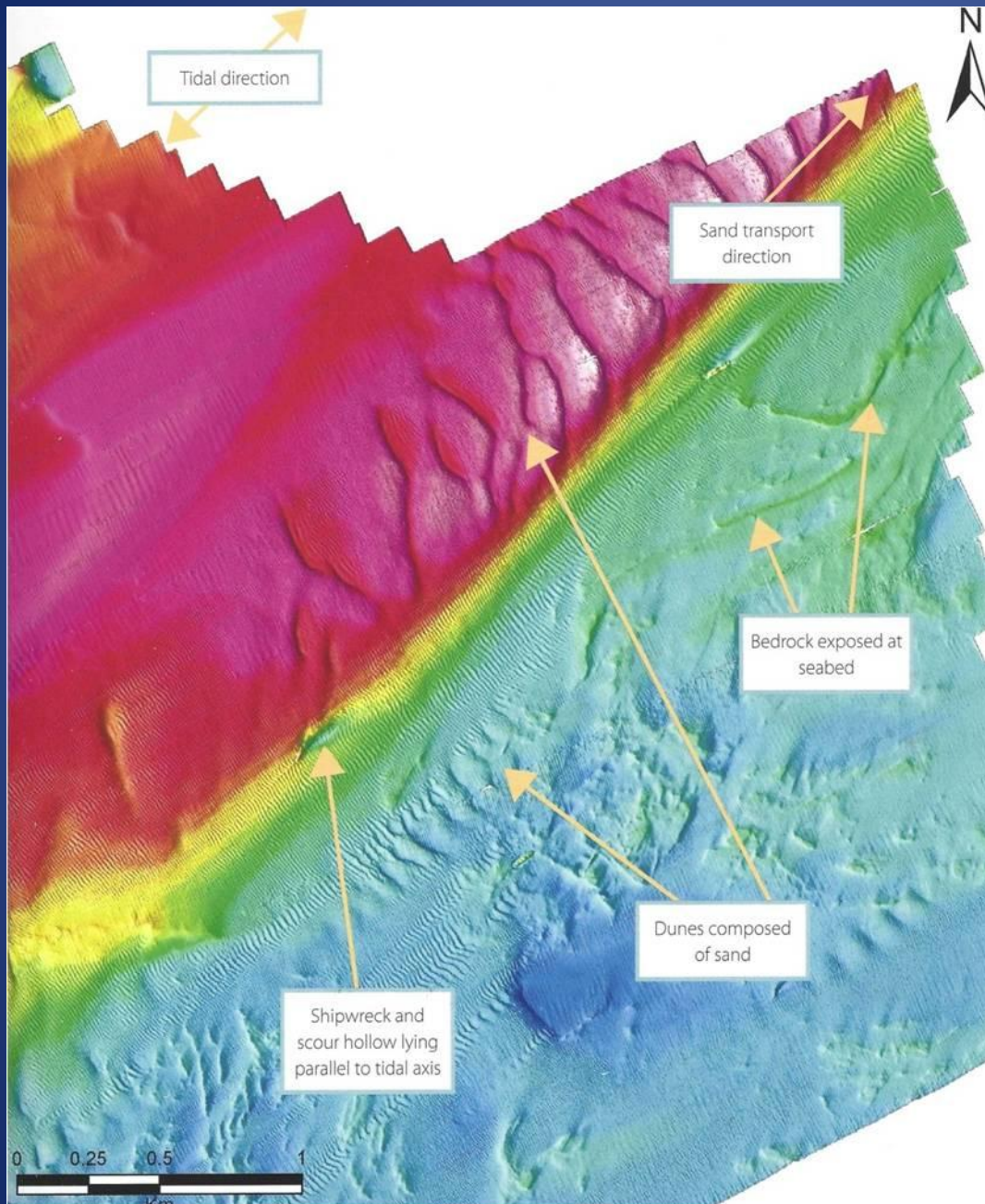


## Where dredging may be permitted



# ASSESSMENT OF IMPACTS OF DREDGING - METHODS

1. Changes in nearshore wave conditions.
2. Changes in nearshore tidal currents.
3. Beach and sandbank draw-down.
4. Changes in sediment transport and supply patterns;
  - Information requirements;
  - Assessment methods.



Swath bathymetry image of the seabed in the English Channel off Hastings with a range of transverse sand bedforms.

# COASTAL IMPACT STUDY - REPORTING

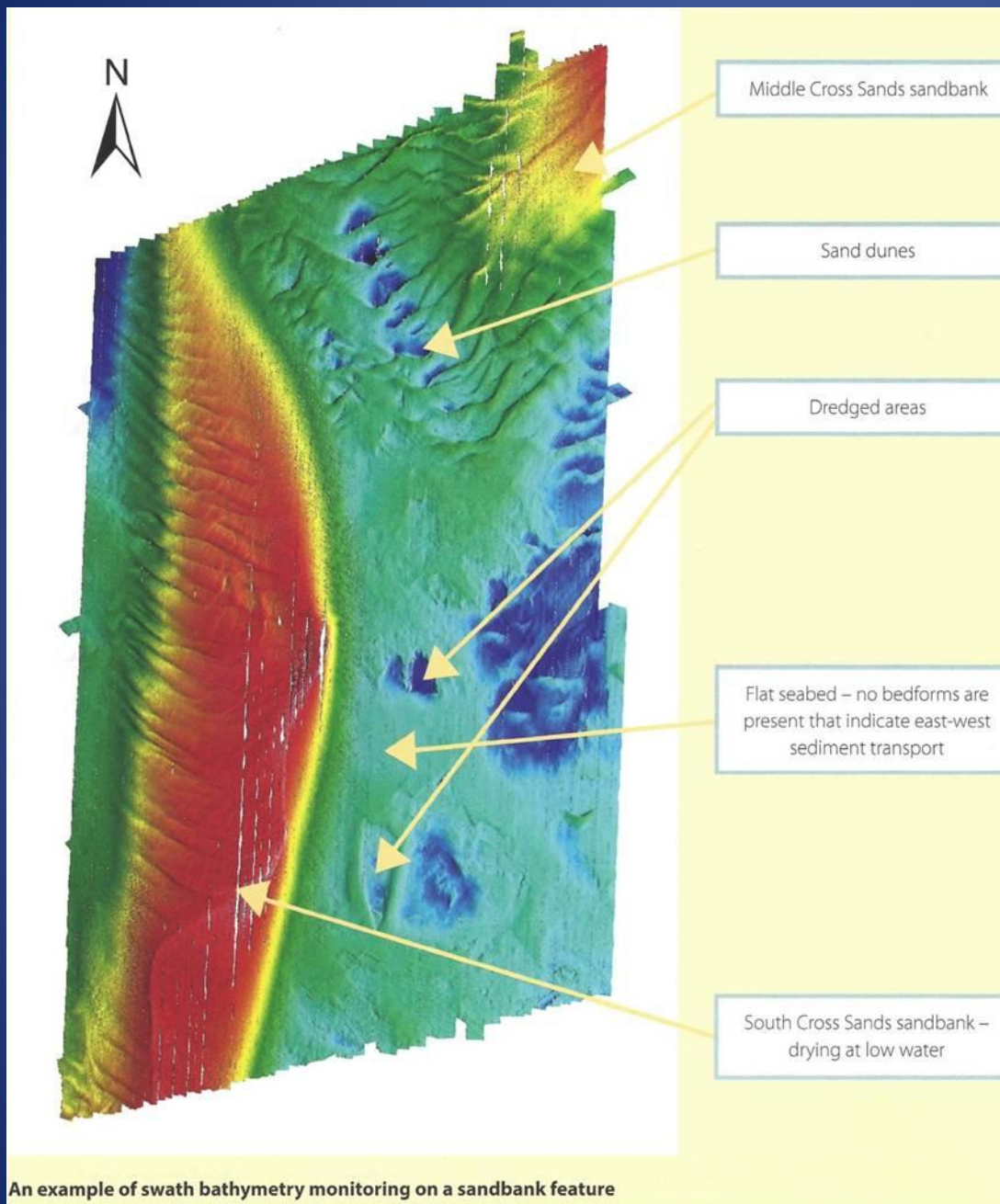
The report on a Coastal Impact Study will typically contain the following sections:

- A non-technical summary (NTS) to support the detailed technical report. The NTS should outline the methods of assessment and conclusions for the lay reader;
- A detailed technical report should contain a comprehensive report of the entire CIS process, together with supporting data included in an appendix and/or a CD.

# MONITORING

To date, CISs have typically predicted a series of minor impacts, which will not result in significant changes at the coast. To ensure that the CIS predictions are robust and accurate and to safeguard against unexpected and unacceptable environmental impacts occurring, it is common for some form of physical processes monitoring to occur throughout the duration of the permission.

This monitoring, which is reviewed on a minimum 5-yearly basis through the substantive review process of marine licence decisions undertaken by the regulator, provides confidence in the outcomes of the CIS process and allows the licensed activity to be re-assessed, modified, or even halted, if any additional concerns are identified.



Monitoring of dredging adjacent to a sandbank.

## **Marine Environment Protection Fund Steering Group Members**

British Marine Aggregate Producers Association (BMAPA)  
Centre for Environment, Fisheries and Aquaculture Science  
Department for Environment, Food and Rural Affairs  
English Heritage  
Joint Nature Conservation Committee  
Marine Management Organisation  
Natural England  
The Crown Estate

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[www.bmapa.org](http://www.bmapa.org)

# Thank you.



Tel: 0044 (0)1983 854865

Email: [rgmcinnes@btinternet.com](mailto:rgmcinnes@btinternet.com)

[www.coastalandgeotechnicalservices.com](http://www.coastalandgeotechnicalservices.com)