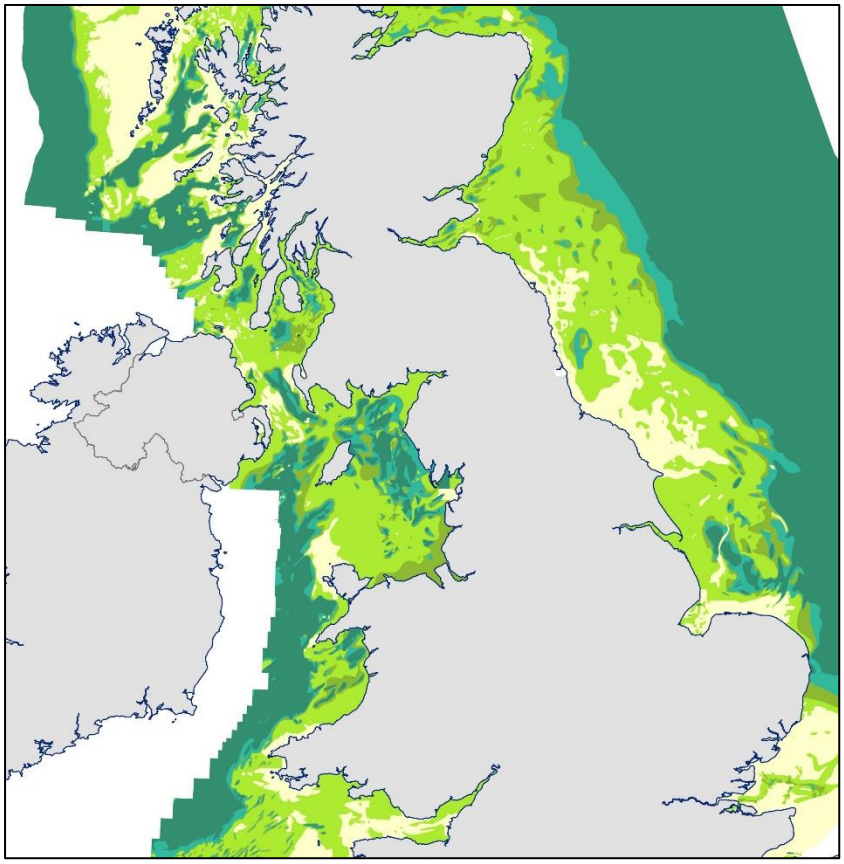
British Geological Survey

THE CROWN ESTATE

National Seabed Geology Scoping Project: Stakeholder Needs and Existing Data Review

Marine Geoscience Programme

Open Report OR/24/055



BRITISH GEOLOGICAL SURVEY

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Keywords

Seabed geology; data; stakeholders.

Front cover

Extract from existing Quaternary thickness geological factor map produced as part of collaboration between BGS and The Crown Estate in 2014. BGS © UKRI. Contains OS data © Crown copyright and database right 2025.

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Report commissioned by The Crown Estate.

National Seabed Geology Scoping Project: Stakeholder Needs and Existing Data Review

Andrew Finlayson, Mary Mowat, Dayton Dove, Joana Gafeira.

Keyworth, Nottingham British Geological Survey 2025

Foreword

This report presents the findings from a study initiated and commissioned by The Crown Estate, with aligned funding provided from the British Geological Survey. The report summarises the results of a stakeholder survey investigating the requirements for seabed geology and shallow subsurface information with a focus on offshore renewables, linear assets and nature. The report also provides a review of existing datasets (at the time of the study) and identifies gaps where current stakeholder needs are not met. The intention is that the findings will encourage and inform the potential development of a new seabed geology data compilation.

Acknowledgements

This project was initiated by The Crown Estate. Michael Blair, Hassan Morran and Gabriella Gilkes are thanked for discussions which helped shape the work and design the stakeholder consultation. Jon Paul Orsi (BGS graphic communications team) is thanked for input in setting up and promoting the online survey. The input from all survey respondents was highly valuable for this work and they are thanked for their contribution.

Nikki Dakin is thanked for her comments on an earlier draft of this report.

British Geological Survey

The British Geological Survey (BGS) is a world-leading geological survey, focusing on public-good science for government, and research to understand earth and environmental processes.

We are the UK's premier provider of objective and authoritative geoscientific data, information, and knowledge to help society to:

- use its natural resources responsibly.
- manage environmental change.
- be resilient to environmental hazards.

We provide expert services and impartial advice in all areas of geoscience. As a public sector organisation, we are responsible for advising the UK Government on all aspects of geoscience as well as providing impartial geological advice to industry, academia and the public. Our client base is drawn from the public and private sectors both in the UK and internationally.

The BGS is a component body of the Natural Environment Research Council (NERC), part of UK Research and Innovation (UKRI).

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Summary

The Crown Estate have proposed a potential project aimed at updating and improving national-scale seabed geology data holdings to ensure that their decision-making processes are informed by the highest quality information. The development of any new data compilation should also be of benefit to external users across multiple marine sectors. This report describes a scoping exercise for the project, aimed at understanding stakeholder needs in relation to national-scale seabed geology information. An online survey was conducted in which 82 participants, representing at least 60 different organisations, responded to questions concerning: access and use of seabed geology data, thematic data needs, regions of interest, and resolution and format. In addition, more than 80 existing primary and derived datasets have been identified that relate to UK seabed geology. These were assessed alongside the survey results to determine a picture of stakeholder needs and priority areas for improvement and development of new datasets. The results are summarised in this report alongside recommendations for a potential new data compilation.

1 Introduction

The Crown Estate uses cutting-edge data to create safe, sustainable and cost-effective new opportunities for future developments, in line with commitments to net zero and nature recovery. Working in partnership with Great British Energy, The Crown Estate aims to bring forward new offshore wind developments, with the potential to deliver up to 20-30 GW of extra offshore wind seabed leases to the market by 2030 (DESNZ, 2024).

Seabed geology information is one of the key inputs that feeds into The Crown Estate tools and processes to support their decision-making and 'Whole of Seabed' evidence base, which underpins their Marine Delivery Routemap (The Crown Estate, 2024). To ensure that The Crown Estate is informed by the highest quality information, they have proposed a potential project aimed at updating and improving national-scale seabed geology data holdings. The intention is that the resulting data package will also be of benefit to external users across multiple marine sectors, with a focus on offshore renewables, linear assets and nature. The project seeks to build on previous collaboration between BGS and The Crown Estate in 2014 (Westhead et al., 2014), which developed a series of geological constraint and factor maps relevant to offshore seabed activities. Together with increasing usage and interest in the seabed environment, the availability of new data (for example through the Civil Hydrography Programme and the Marine Data Exchange) and advances in techniques (including spatial modelling and machine learning approaches) provides a timely opportunity to consider the demand and merits of developing a new compilation of seabed geology information.

This report describes a scoping phase of the project, aimed at developing a clearer understanding of stakeholder needs and reviewing existing datasets. Key sectors and stakeholder groups have been identified (Section 2) and an initial review of seabed geology data and information requirements relevant to national-scale planning and initial desk-study assessments has been undertaken (Section 3). Engagement with internal stakeholders from The Crown Estate took place through meetings and collaborative design of an online survey which was then opened to wider stakeholder groups within the marine community who use seabed geology information. The purpose of the online survey was to understand how stakeholders access and use national-scale seabed geology data, any associated challenges or limitations they experience, and where improvements and addition of new datasets could be made (Section 4). In tandem with the survey, a review of existing seabed geology datasets and spatial products was also carried out (Section 5) and has been used together with the online survey results to develop an initial prioritised list of requirements and recommendations to consider for any new seabed geology data compilation (Section 6).

In this report the terms 'data' and 'dataset' are used in a broad sense and encompass both primary data and derived data (e.g., an interpreted or modelled map output). It is important to note that the focus of the report (and the wider project) is national- to regional-scale data that could be used, for example, in national-scale spatial planning or for initial desk assessment (as opposed to more detailed site-specific information and interpretations that would be generated during a site investigation campaign).

2 Sectors and Stakeholder Groups

There are numerous marine activities that involve interaction with the seabed and shallow subsurface (Dove et al., 2023). As a result, seabed geology information is required by multiple different users. The key sectors and stakeholder groups who this project aims to support were identified in discussion with The Crown Estate (Table 1). Sectors were prioritised into tiers based around The Crown Estate's key themes of net-zero, nature recovery and social value, and by considering the direct relevance of seabed geology information to specific groups. The intention is that potential new data packages will be designed to meet the needs of Tier 1

sectors, while seeking out opportunities to meet needs of Tier 2 sectors (though not specifically be designed for them) and being useful to Tier 3 sectors. Therefore, a particular focus was placed on ensuring that tiers 1 and 2 were well represented in the online stakeholder survey (described in Section 4).

Tier	Sectors	Stakeholder Groups
1: datasets will be designed to meet needs of these sectors.	• Offshore wind • Wave, tidal stream and tidal range • Nature and conservation • Linear assets	• Academic/research • Asset management • Consultancy • Contractor • Developer • Equipment manufacture • Public body / government advisor • Spatial planning
2: datasets will seek opportunities to meet needs of these sectors, but not be specifically designed for them.	• Aggregates and marine minerals • Coastal management • Geological Storage (CCUS / H2) • Historic environment	
3: datasets will be useful for these sectors.	• Aquaculture • Defence • Fisheries • Hydrocarbons • Licensing / permitting • Navigation • Port management	

Table 1. Sectors and stakeholder groups (prioritised with respect to this project).

3 Seabed geology needs: initial review from published reports

Prior to the design of the online survey, a selection of published reports, papers, and guidance documents were reviewed to provide an initial understanding of key geological information relevant for offshore renewables (DNV 2014; Carbon Trust, 2015; Mellet et al., 2015; Velenturf et al., 2021; OSIG 2022; Dakin et al., 2024). A list of the geological parameters identified and their relevance for offshore renewables is given in Table 2. These parameters were grouped into four broad themes: (i) Seabed relief and geomorphology; (ii) Soils; (iii) Landslides, seismic and shallow gas; and (iv) Bedrock. The themes were then used as a framework to help structure questions concerning data requirements in the online survey. Additional questions in the survey were designed to explore any other parameters, not identified in the initial review, that stakeholders would find valuable (see section 4).

An anthropogenic theme was not included during the initial review (e.g., dredging, extraction, wrecks). The intention at this stage of the project was to limit parameters to those related the natural geology whilst trying to ensure the online survey did not become overly long.

Theme	Geological information required	Reason
Seabed relief and geomorphology	Bathymetry and associated derivatives	Water depth and bathymetry derivatives such as seabed slope and roughness are important considerations for infrastructure siting and influence habitat types.
	Likelihood of seabed change	Mobile sediments can bury/expose infrastructure and change the properties and relief of the seabed. Factors influencing likelihood of change include grainsize and shear stress at seabed.
	Marine landforms (including mobile bedforms)	For example, sediment waves. Can indicate potential for dynamic environments, presence of mobile sediments or uneven ground.
	Fluvial landforms	For example, submerged river channels. Can indicate potential for uneven ground or soil variability.
	Glacial landforms	For example, moraines. Some glacial landforms have characteristic soil types; can also indicate potential for soil variability, over-consolidation, or presence of boulders.
	Coastal landforms	For example, gravel barriers. Can indicate potential soil type, uneven ground, or bedrock exposure.
	Exposed bedrock	Indicates likely hard substrate at seabed.
Soils	Seabed sediment type (based on grainsize)	Influences geotechnical properties at seabed; influences seabed habitats.
	Carbon content in seabed sediments	Storage of organic carbon; potential management of blue carbon stock.
	Soil lithology beneath seabed sediments	Influences geotechnical properties.
	Thickness of unlithified soil above rockhead (Quaternary thickness)	The thickness of unlithified soils is a key consideration for foundation and anchor designs and for cable route assessments.
	Potential presence of peats	Can form a very soft and compressible soil with low shear strength. Peats are also associated with low thermal conductivity which can lead to cable overheating.
	Potential presence of buried channels	Buried channels can contain variable sediment infill leading to abrupt changes in geotechnical properties.
	Potential for over consolidated soils	Loading from past glacial processes can result in over consolidation of soils, associated with high shear strength values and difficult testing and construction conditions.
	Potential for presence of boulders	Boulders can create difficult ground conditions (e.g., pile refusal), impact foundation design and need to be considered when planning cable routes.
	Potential for laterally variable soils	Can be associated with abrupt changes in geotechnical properties over short distances.
	Potential for vertically variable soils	Can be associated with abrupt changes in geotechnical properties over vertical profile.
Landslides, seismic and shallow gas	Submarine landslides	Can contribute to hazard assessment and risk register; submarine landslide deposits can introduce heterogeneity to soil profiles.
	Recorded and historical earthquakes	Can contribute to seismic hazard assessment and help inform risk register.
	Seismic hazard	Can be used to help inform risk register.
	Presence of pockmarks	Can indicate presence of shallow gas or over pressurised pore fluids in sediments. Pockmarks also form areas of uneven ground.
	Methane-derived authigenic carbonates (MDAC)	Creates a hard substrate and recognised as a special habitat.
	Areas of interpreted gas or fluid in shallow subsurface	Can lead to reduction in bearing capacity or blowouts when drilling for sediment samples or infrastructure. Shallow gas also causes acoustic blanking of seismic reflection data, masking the soils below.
Bedrock	Lithology type	Lithology strongly influences geotechnical properties.
	Likelihood of exposure to weathering	Periglacial weathering during former periods of lower sea level can affect geotechnical properties.
	Structural geology at seabed	Fault and fracture networks form discontinuities that can affect rock strength, function as conduits for fluid flow, and may be exploited by erosion.

Table 2. Initial review of seabed geology information relevant for national-scale planning and initial (desk study) assessments for offshore renewables.

4 Seabed geology needs: summary of stakeholder survey results

The online survey was designed as the primary method of stakeholder input for the project. The survey was launched on 25th September 2024 and closed one month later having received 82 responses from across at least 60 different organisations. Key sectors and stakeholder groups were invited via individual requests and engagement with expert groups (e.g., the Offshore Site Investigation and Geotechnics (OSIG) Committee, the Quaternary Engineering Research Group (QERG) and the Marine environmental Data and Information Network (MEDIN)). In addition, the survey was advertised via the BGS News Page (https://www.bgs.ac.uk/news/seabed-geology-data-consultation/) and via social media platforms (e.g., LinkedIn and X). Although the survey could be completed anonymously, 57 respondents (70%) chose to provide their name and email when asked an optional question about whether they would like to receive further information, indicating positive engagement with exercise.

A full list of survey questions is given in Appendix 1 and a list of organisations represented is given in Appendix 2. The survey results are summarised below.

4.1 PROFILE OF SURVEY RESPONDENTS

All the sectors that were identified during initial planning with The Crown Estate were represented in the survey responses (Figure 1). Offshore wind had the largest representation (70% of survey responses) while the other Tier 1 and 2 sectors each had 15 or more respondents who indicated that they work in these areas. The largest proportion of respondents were from consultancies, followed by public bodies/government advisors and research or academic organisations (Figure 2). Several responses were also received from contractors and developers (10 or more for each).

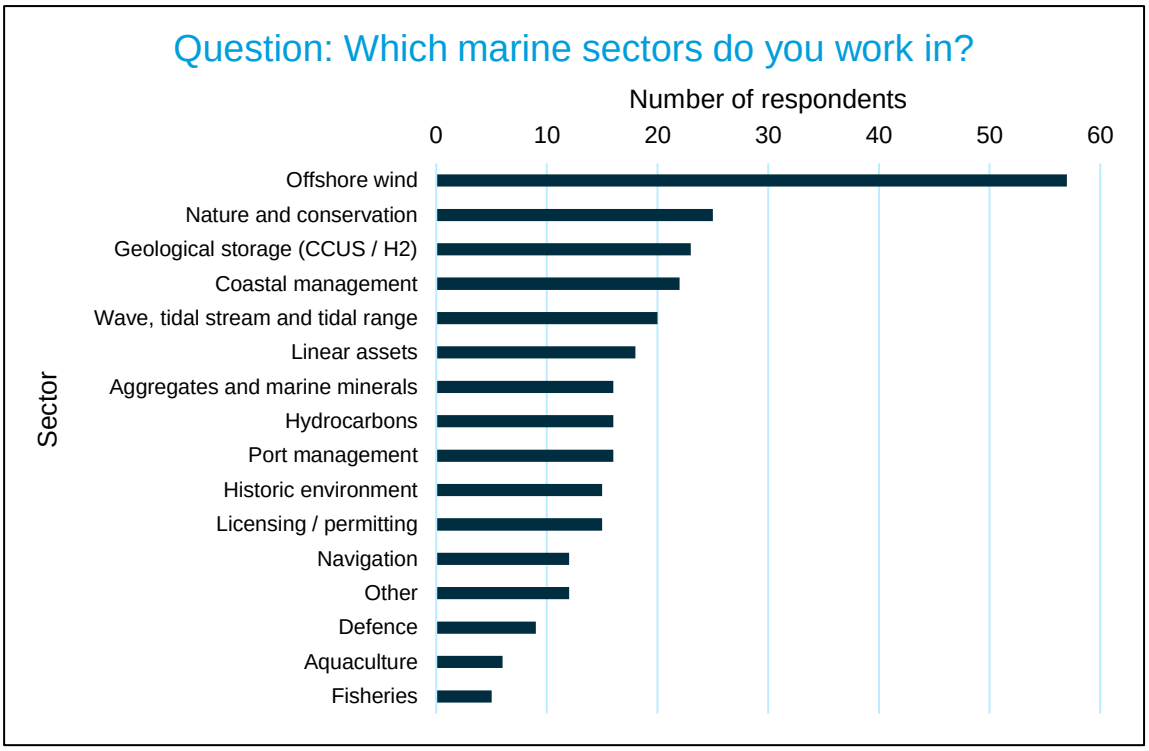

Figure 1. Number of survey respondents who indicated involvement in each of the marine sectors. Note, respondents who work across different sectors could select more than one option (61% work in multiple sectors).

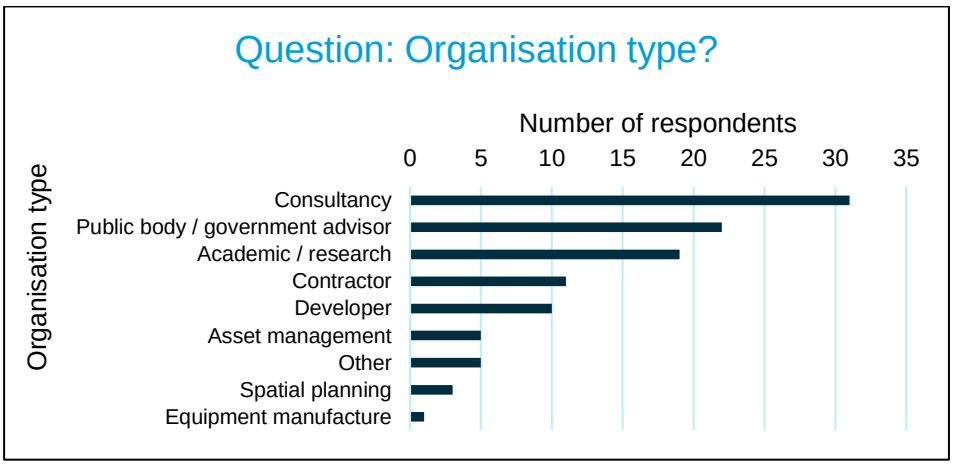

Figure 2. Organisation type selected by respondents. Note, multiple options could be selected (15% of respondents selected multiple options).

4.2 USE AND ACCESS OF SEABED GEOLOGY DATA AND ASSOCIATED CHALLENGES

Most of the survey respondents use of seabed geology information for desk studies, collation of baseline information, and development of preliminary ground models. While the desk studies were largely in relation to offshore wind, other activities were described including permit applications and CO2 storage site scoping. Planning and protection of cable routes was also mentioned frequently (11 responses), and several other uses were highlighted including sediment transport and coastal management studies, aggregate resource assessment, habitat distribution models and environmental impact assessments. A full list of uses described is shown in Figure 3.

Survey respondents used free text answers to describe how they access seabed geology information (Figure 4). The BGS website (Offshore GeoIndex) is the primary portal used, with 54 participants (65% of responses) listing it. Other frequently used portals include EMODnet, the Marine Data Exchange, the Admiralty Marine Data Portal, the National Data Repository (NDR), MEDIN and OneBenthic. Over 60% of respondents indicated that they used more than one portal to access seabed geology information.

The theme of multiple portals was highlighted in questions about challenges associated with data access and use (Table 3). The existence of several different data portals and repositories was described as a difficulty due to time required for stakeholders to search through different sites and uncertainty on where the most up-to-date or appropriate data is held. Other frequently mentioned challenges included: variability in data coverage, resolution and quality; gaining access to data from recent surveys and developments; and a lack of easily findable metadata.

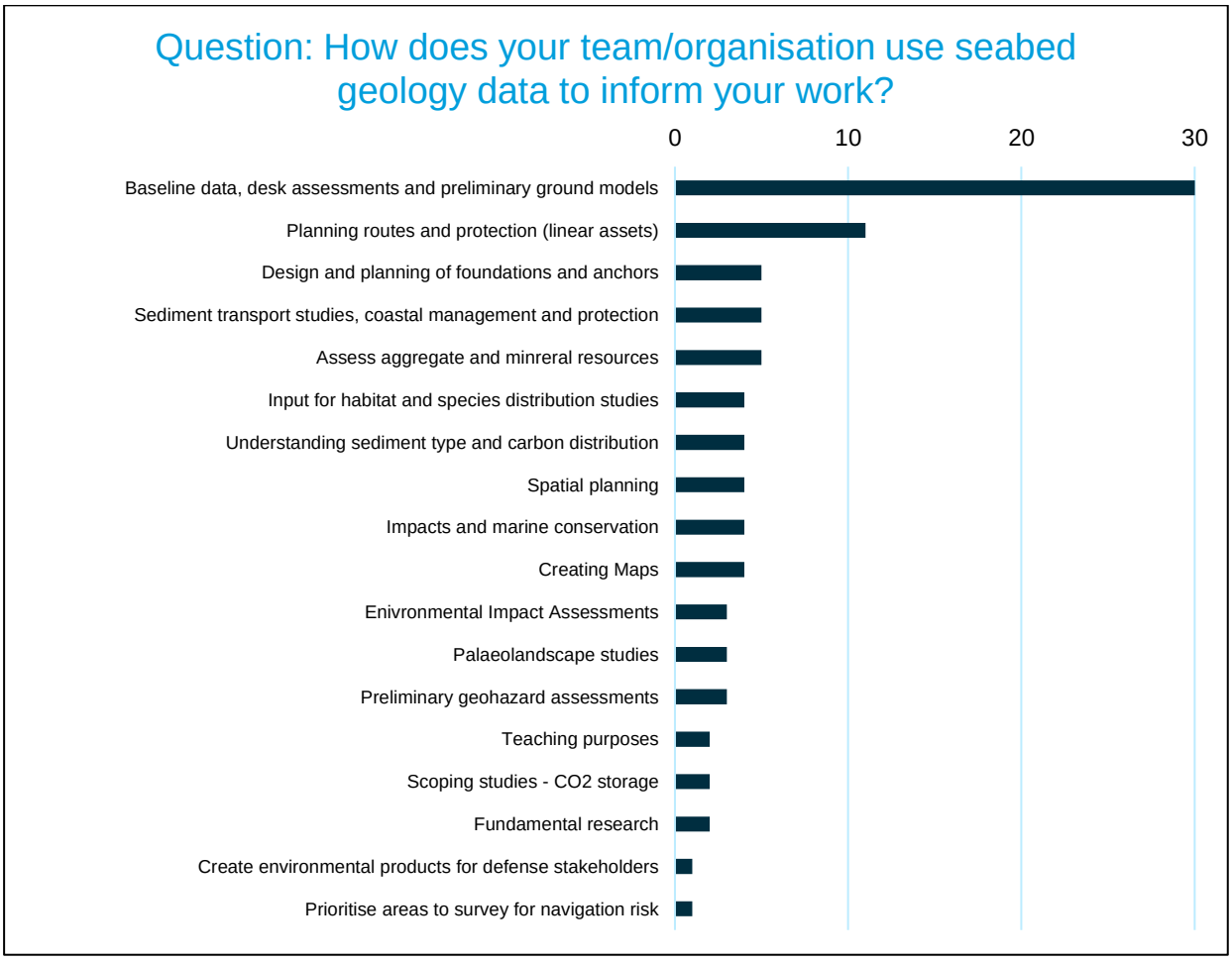

Figure 3. Uses of seabed geology information indicated by survey respondents. Themes and numbers were derived from analyses of free text answers.

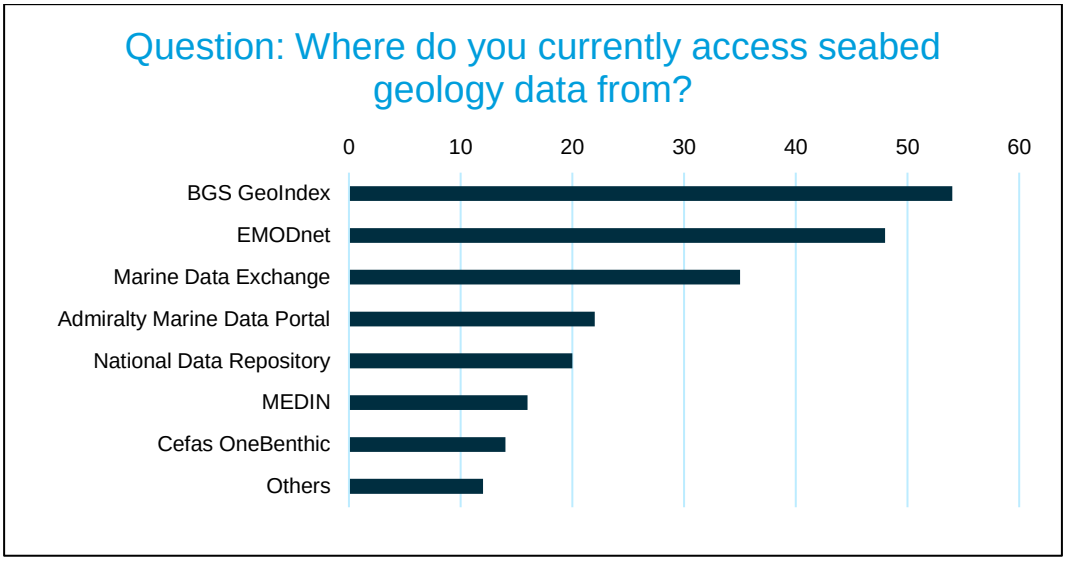

Figure 4. Sources used by survey respondents to access seabed geology data. Number derived from free text answers. 'Others' include: JNCC Resource Hub, Emapsite, GEBCO, Natural England Open data Geoportal, Marine Scotland Data Portal, GNSI GeoIndex, INFOMAR data portal and BRITICE map.

Challenge associated with data access and use	Description
Large number of data portals / accessing data.	Almost one third of respondents made comments about the number of data portals or repositories. These take time to search through and users are sometimes unsure if they have all available data or the most up-to-date data. Being able to integrate data quickly in GIS was considered essential.
Variability in data coverage, resolution and quality.	Challenges exist around lack of data in certain geographical areas, or in many areas relying on legacy data with insufficient detail. In general, users are looking for consistent higher resolution data coverage. For example, higher resolution mapping was requested for seabed geomorphological features and for nearshore areas.
Limited availability of data from recent surveys and developments.	Respondents commented that derived datasets and knowledge could be improved with increased access to industry data. Respondents would like to see more data sharing from different end users and quicker release of data from developers following completion.
Metadata difficult to find.	Users would like to have accessible information about provenance of maps, including clear routes to accessible raw datasets, methodologies, dates of data collection. In addition, users commented that information that is available on BGS published map marginalia is not clearly accessible with BGS digital products.

Table 3. Key challenges associated with the access and use of seabed geology information

4.3 DATA NEEDS

4.3.1 Semi-quantitative responses

Survey respondents were asked a series of multiple-choice questions to help understand the importance and/or current suitability of different thematic datasets. For each category of geological information listed in Table 2, participants were asked to select the most appropriate statement from the following choices:

- N/A – I don't need to use this data
- Existing data fully meets my needs
- Existing data partially meets my needs
- Existing data doesn't meet my needs
- I need this data but I'm not aware if it exists

The latter statements indicate an increasing need for either a major update and improvement to existing datasets, or for the development of completely new datasets, to meet stakeholder requirements. The results are shown in Figure 5 and are plotted in order with increasing need towards the top, based on instances where participants selected either of the latter two choices (existing data doesn't meet needs or data is needed but doesn't exist).

The category with the largest number of responses recording a high level of need was 'likelihood of seabed change'. Datasets relating to potential presence of boulders and soil variability (lateral and vertical) were also ranked with a high level of need. Conversely, information relevant to earthquakes and seismic hazard was ranked as having lower need, either because respondents do not use these data or because existing data already fully meets their needs. It is interesting to note that for all categories at least 10% of respondents selected that they need relevant data but are not aware if it exists. This suggests that improvements relating to findability and accessibility can be made even for established datasets.

There was a large variation across the categories where the response "existing data partially meets my needs", was selected. The number of times this response was selected is plotted separately in Figure 6 and provides insight about datasets that could be improved through, for example, including greater spatial coverage or more input data, or by generating revised interpretations or interpolations. The response was most frequently selected for the 'Bathymetry and associated derivatives' category which likely reflects the spatial variation in coverage that was highlighted in free text answers. Exposed bedrock, seabed sediment, and thickness of unlithified soil (Quaternary) were also identified as categories where improvements are needed to better meet stakeholder requirements.

Comparison of data needs across different sectors was difficult since most of the survey respondents (61%) indicated that they work across several different marine sectors. However, where participants did indicate activity within a single sector some limited observations could be made from the survey results. For example, all three respondents solely representing the linear assets sector indicated very high levels of need for information on: seabed sediment type, potential presence of boulders, potential for lateral and vertical soil heterogeneity, submarine landslides and presence of pockmarks. Coastal management organisations (2 responses) highlighted a high need for information about the likelihood of seabed change and vertical and horizontal soil heterogeneity. Nature and conservation organisations (5 responses) generally had less need for subsurface soils information but indicated a stronger need for data concerning seabed sediment type. There were 11 responses from participants who represented only the offshore wind sector; these were similar to the overall picture shown in Figure 5.

4.3.2 Qualitative responses

In addition to datasets shown in Figure 5, respondents were also an given opportunity to nominate additional information needs and elaborate on potential improvements using free text answers. Respondents entered a free text comment approximately 20% of the time. Most comments elaborated on categories that already exist in Table 2 and Figure 5 rather than nominating new categories. This suggests that many of the key categories that are most

important to survey respondents had been identified in Table 2. A summary of the free text responses relating to different data themes is given below.

Seabed change and mobile bedforms were mentioned by 7 respondents within the theme of **Seabed Relief and Geomorphology**. Requests included provision of information about rates, direction and magnitude of change. Coastal landforms were mentioned 6 times, with comments reflecting a need for increased resolution of geomorphological mapping in near-coast environments and merging maps across the nearshore to onshore transition (i.e., filling the 'white ribbon' gap). Information about seabed boulder fields was mentioned in 3 responses. A further 2 responses indicated a need for a consistent UK-wide seabed geomorphology map, which includes features that meet definitions for marine conservation purposes (e.g., 'seamounts' and 'sandbanks'). Anthropogenic features (e.g., pipelines, extraction sites) were also mentioned (4 responses) within the context of geomorphology. While these were not originally included as a theme for this project, it is noteworthy that some stakeholders added them as a need within the free text responses.

A recurring free text response with the **Soils** theme related to soil thickness (12 responses). Comments included the need to produce improved interpolations of the full thickness of unlithified (Quaternary) soils, and the thickness of units within it (e.g., depth of Holocene or 'mobile' soil layers). Six survey respondents requested the addition of geotechnical summary data to soils maps, or soils domain maps. Other comments mentioned compilation of geochronology data (radiocarbon dates) and the inclusion of organic soils rather than solely having a peat map, with clear definitions of what is meant by both peat and organic soil (1 response each). The need for improved seabed sediment grainsize distribution information was mentioned by 8 respondents.

Within the theme **of Landslides, Seismic and Shallow Gas**, the main free text comment related to improved mapping of shallow gas (5 responses). Survey respondents suggested that more detailed maps would be useful, with areas of acoustic blanking being more precisely indicated and potential depth to hazard given. In addition to shallow gas hazard, comments also included a need for improved pockmark maps (4 responses), slope and palaeo-landslide maps (3 responses), and any hazards associated with river outflows (1 response).

Finally, within the **Bedrock** theme, 7 respondents requested the addition of summary geotechnical data to bedrock information (possibly as domain maps). This request was consistent with comments made under the soils theme. Additionally, comments were made about the need for information on potential weathering profiles (5 responses) and more detailed structural information (2 responses). Two respondents also mentioned the need for joined up onshore and offshore mapping in coastal zones.

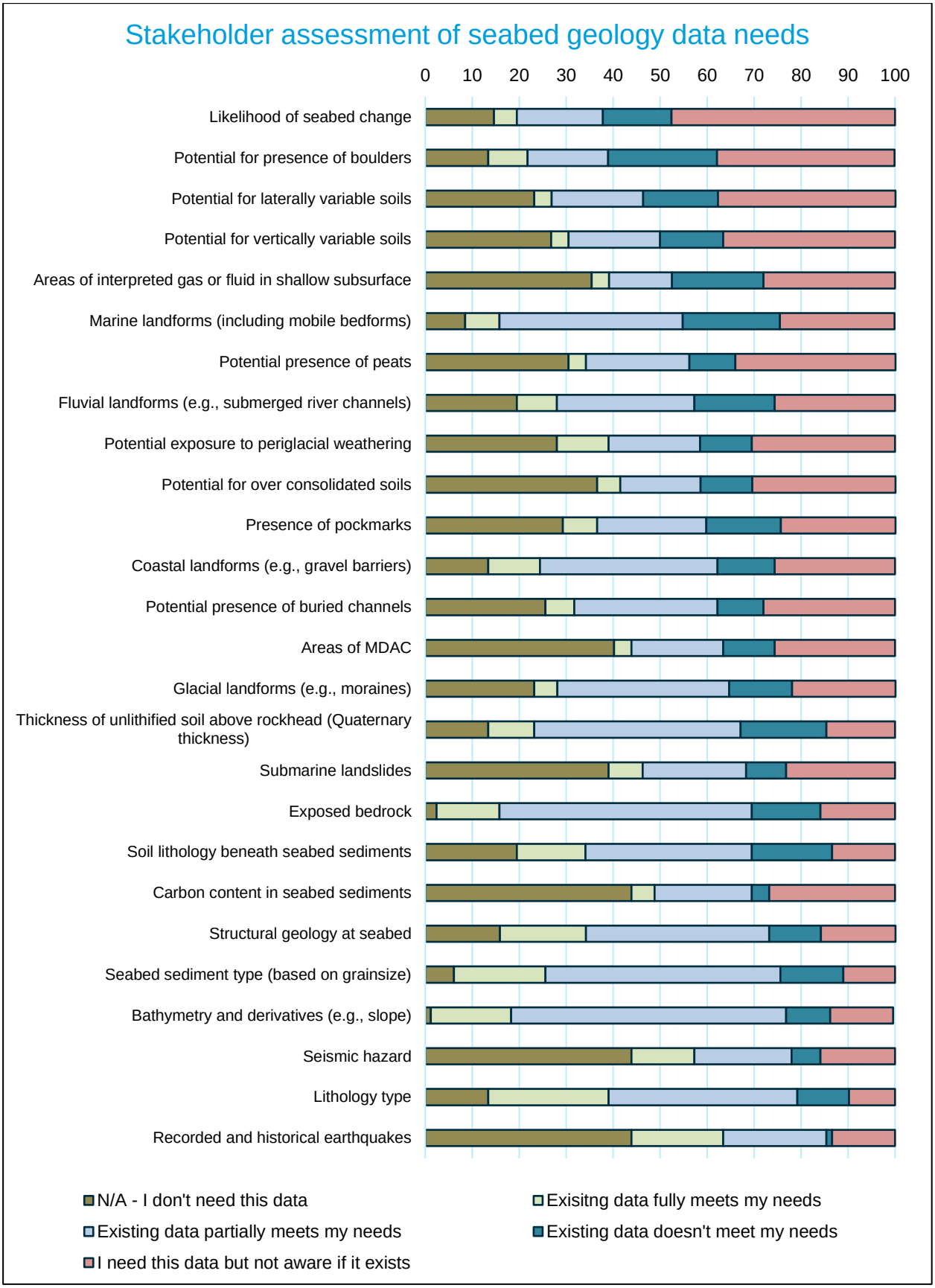

Figure 5. Stakeholder assessment of seabed geology data needs. The segments on the right-hand side of the chart represent increasing need for dataset improvement or new dataset creation.

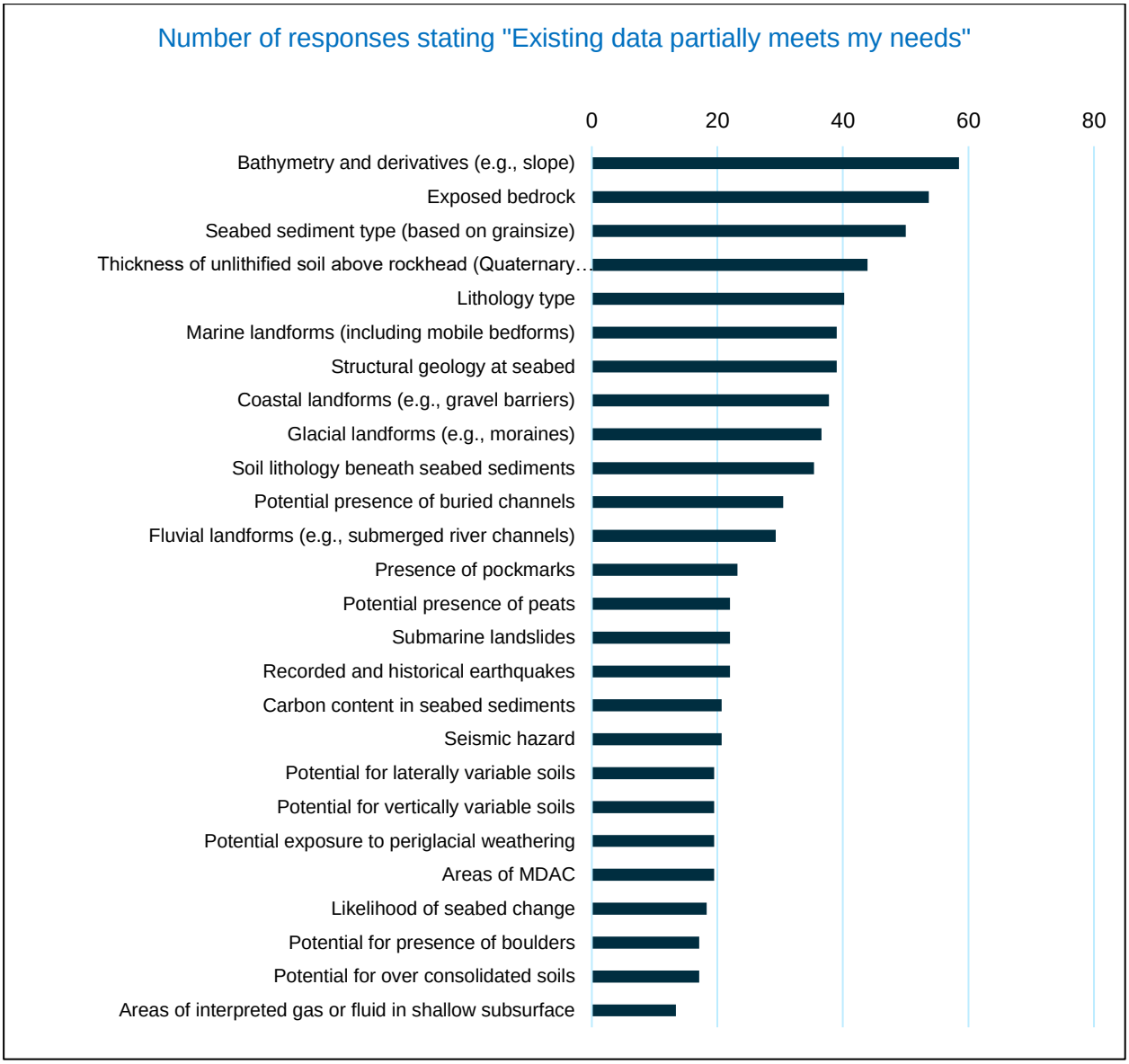

Figure 6. Number of reposnses stating “Existing data partially meets my needs” for each of the seabed geology informaion categories.

4.4 REGIONS OF INTEREST

Survey participants used seabed geology datasets over a range of scales, with broadly equal interest in site specific, regional-scale, and national-scale studies (Figure 7). Participants were given the opportunity to elaborate on regions of interest using an optional free text answer. Many responses indicated an interest in the whole of the UK continental shelf; however, several common regions of interest were also highlighted (Figure 8). In particular, the North Sea, the Celtic Sea and the Irish Sea were flagged as key regions. The need for data in nearshore and coastal environments was also mentioned as a priority by some respondents.

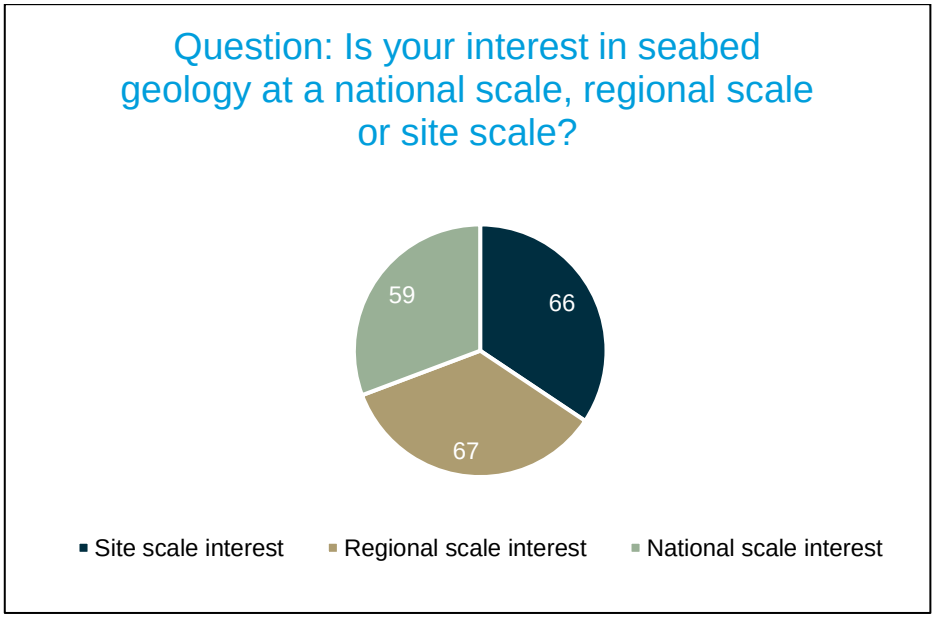

Figure 7. Scale of interest for seabed geology datasets indicated by survey respondents.

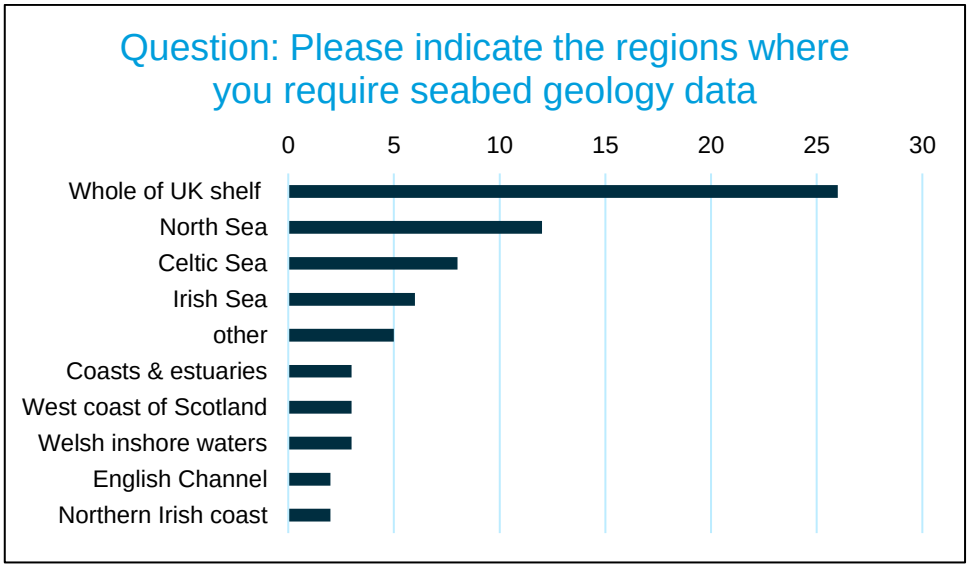

Figure 8. Regions of interest.

4.5 PREFERRED RESOLUTION AND FORMAT

The most appropriate resolution for any output maps and models is dependent on several factors, including quality and distribution of raw input data. Survey respondents indicated that, where possible, the preferred resolution for national-scale seabed geology datasets would be 100 m to 500 m (Figure 9). Vector and raster outputs were the preferred format, with far fewer respondents showing a preference for hexagonal grids (Figure 9), though this could be partly due to familiarity.

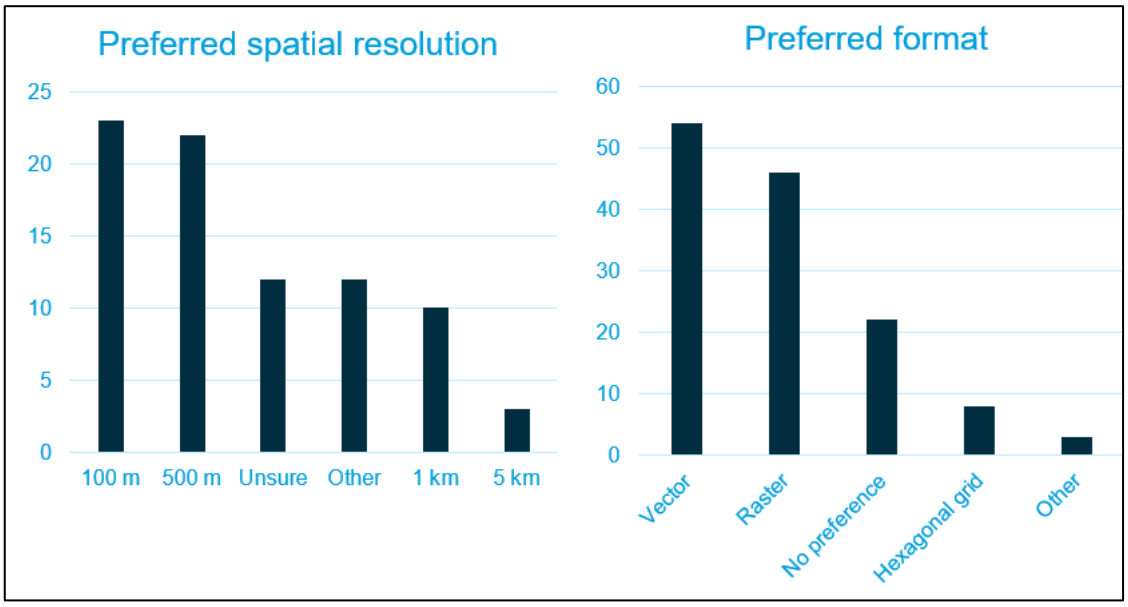

Figure 9. Participant responses for (A) preferred spatial resolution and (B) preferred format for seabed geology datasets. Numbers of respondents are given in the y-axes. More than one option could be selected.

5 Existing data review

A search of existing seabed geology information relevant to the UK continental shelf was undertaken, focusing on derived maps and models as well as input data (point sample and geophysical data). In total, the following datasets were identified: (i) 23 maps or models developed by, or in collaboration with, BGS; (ii) 18 non-BGS maps and models; (iii) 7 collections of BGS-held point datasets; (iv) 14 collections of non-BGS-held point datasets; (v) 2 BGS-held collections of geophysical data; and (vi) 17 collections of non-BGS-held geophysical data. These datasets are listed in Table 4 and are described more fully in Appendix 3 (including considerations or limitations relating to the data, access descriptions and links to sources).

While every effort was made to include all known datasets, there may be some omissions – particularly for more spatially restricted datasets (e.g., local or regional studies) that may have been produced in academic journals. However, since the focus of this exercise in on national-scale seabed geology data, this list is thought to be comprehensive. It provides a valuable starting point to evaluate where gaps are likely to exist in meeting the data needs highlighted by stakeholders (see discussion in Section 6 below).

Type	Dataset	
Maps or models developed by, or in collaboration with, BGS	• Marine Hard Substrate • Predicted rock outcrops • Sediment mobility indicators • EMODnet Coastal behaviour • EMODnet Submerged Landscapes • EMODnet Geomorphology • Seabed Sediments 250k • Quaternary 1M • Quaternary Thickness 1M • Quaternary Deposits Summary • Quaternary Deposits thickness	• EMODnet Seabed Substrate • EMODnet Quaternary • Pockmarks distribution • Shallow Gas • Offshore seismic Hazard in UK waters • EMODnet Geological events and probabilities (Geohazard) • Offshore Bedrock 250k - Lithostratigraphical units • Offshore Bedrock 250k - Structural Geology • Bedrock Summary Lithologies • EMODnet Pre-Quaternary • Marine Mineral Resources • EMODnet Marine Minerals (TCE)
Non-BGS maps and models	• Global Seafloor geomorphic features map (Harris et al., 2014) • BRITICE Glacial Map V2.0 (2017) • BRITICE CHRONO glacial reconstruction (including palaeotopography and coastline positions) (2022) • Submerged Landscapes of the European Continental Shelf: Quaternary Paleoenvironments (2017) • Quaternary Palaeogeographic reconstruction papers • Seabed Mobility Index (Irish Sea) (2021) • EUSeaMap (2023) (incorporating UKSeaMap) • Quantitative sediment composition predictions for the north-west European continental shelf (2019)	• Sediment type and sedimentary carbon stocks (Smeaton et al., 2021) • Tunnel Valley distribution (2024) • Base Quaternary mapping (North Sea) (2017) • Base Quaternary mapping (North Sea) (2018) • The glaciogenic unconformity of the southern North Sea (2012) • Pre-Quaternary Geological map compilation (2019) • Getech Structural Elements Database (2019) • OCTek-UK Crustal Structure Maps (2019) • World Stress Map Database Release 2016 • Stress Map of Great Britain and Ireland 2022
BGS-held point data	• Marine Geological Sample Data from around the UK (1966 onwards) • Marine Sample Geological Description data • Marine Sediment Particle Size Data from around the UK (1966 Onwards) • Marine Borehole Logs, Data and Materials from around the UK (1969 Onwards)"	• Marine Geotechnical Data from around the UK (1975 Onwards) • National Geotechnical Properties Database (NGPD) • AGS data: Site investigation data received by BGS from 3rd party organisations in AGS file format.
Non-BGS-held point data	• Civil Hydrography Programme Sample Data • Marine Data Exchange - Geotechnical data • Marine Data Exchange - Benthic data • Marine Data Exhchange - Sedimentology data • OneBenthic - Grab/core sediment data • Marine Recorder • Seabed Sediment Samples Irish Waters	• ICES - Contaminants and biological effects of contaminants in sediment" • Marine Environment Monitoring and Assessment National database (MERMAN) • Seadatanet • Oil and Gas site survey data - geotechnical • Non-Oil Industry Site Investigation data • Other seabed grab data
BGS-held geophysical data	• (BGS) Marine Geophysical and Seismic Data from around the UK (1966 Onwards)	• Strategic Environmental Assessment (SEA) Data and Related Information
Non-BGS-held geophysical data	• Marine Data Exchange - Geophysical data • NSTA Government seismic • NDR Commercial seismic • Oil and Gas site survey data • Non-Oil Industry Site Investigation data • UK Onshore Geophysical Library (UKOGL) • High-resolution bathymetry data - Civil Hydrography Programme (CHP) (Admiralty Marine Data Portal) • Other bathymetry data (Admiralty Marine Data Portal) • High-resolution Bathymetry data - Marine Conservation Zones (MCZ)	• Marine Multibeam Backscatter Data from around the UK (2005 Onwards) • Seadatanet • Gridded Bathymetry Cells (Admiralty) • Bathymetry - EMODnet DTM (2022) • Bathymetry - GEBCO DTM (2024) • Bathymetry data - Defra's Marine Digital Elevation Model (DEM) • SurfZone Digital Elevation Model (DEM) - 2m (2019) • Oceanwise Marine Themes Digital Elevation Model (DEM) - 1 arc second / 6 arc second

Table 4. List of existing seabed geology datasets relevant to the UK continental shelf at a national scale. These are described more fully in Appendix 3.

6 Discussion: identifying priority needs and initial recommendations

An assessment of each data need flagged in Section 4 is beyond the scope of this report. However, by taking account of the stakeholder feedback and the dataset review, three broad groups of with different levels of requirement have been assigned.

Group 1. High level of stakeholder needs and currently no existing bespoke datasets for UK. This group includes the development of new derived datasets such as: likelihood of seabed change; potential presence of boulders; potential for laterally and vertically variable soils; potential for presence of peats (or organics soils); and information about bedrock weathering. For some of these categories, a logical process for dataset creation may already exist. For example, Coughlan et al. (2021) described a model to classify seabed mobilisation for the Irish Sea – an approach which could be followed for the whole of the UK shelf. Other categories, such as boulder presence or soil variability, would need consideration of appropriate methodologies or adoption of more conceptual (or domains-based) approaches. A further need within this group, strongly indicated by the free text answers, is a dataset or layer that represents geotechnical summary information (raw datasets that could inform this are listed in Appendix 3).

Group 2. Datasets may exist already but require moderate to significant improvement, or greater spatial coverage, to meet stakeholder needs. This group includes datasets that already exist in some form (see Appendix 3), but where stakeholders indicated that needs are largely not met or are only partially met (Figures 5 and 6). Example datasets within this group include: Quaternary (and potentially Holocene) thickness; shallow gas (potentially including depth estimation); seabed geomorphology (including marine, coastal, glacial and fluvial landforms); and sediment type.

Group 3. Existing datasets already generally meet requirements for respondents or could be incrementally improved to meet needs. This group includes datasets that have recently been developed or updated, such as the BGS/IDRIC offshore seismic hazard map or the University of St Andrews/Scottish Government seabed sedimentary carbon stock maps. Other datasets within this group could include, for example, submarine landslides which could be improved incrementally as increased coverage of high-resolution bathymetry data (and derivatives) become available.

Group	Data category	
1	• Likelihood of seabed change • Potential for presence of boulders • Potential for laterally variable soils • Potential for vertically variable soils	• Potential presence of peats • Potential exposure to periglacial weathering • Geotechnical summary maps (domains)?
2	• Exposed bedrock • Marine landforms (including mobile bedforms) • Bathymetry and derivatives (e.g., slope) • Thickness of unlithified soil above rockhead (Quaternary thickness) • Coastal landforms (e.g., gravel barriers) • Seabed sediment type (based on grainsize) • Fluvial landforms (e.g., submerged river channels)	• Glacial landforms (e.g., moraines) • Potential presence of buried channels • Soil lithology beneath seabed sediments • Structural geology at seabed • Presence of pockmarks • Areas of interpreted gas or fluid in shallow subsurface • Potential for over consolidated soils
3	• Lithology type • Areas of MDAC • Submarine landslides	• Carbon content in seabed sediments • Seismic hazard • Recorded and historical earthquakes

Table 5. Initial assignment of datasets into groups. Group 1: High level of stakeholder needs and currently no existing bespoke datasets for UK. Group 2: Datasets may exist already but require moderate to significant improvement, or greater spatial coverage, to meet stakeholder needs. Group 3: Existing datasets already generally meet requirements of survey respondents or could be incrementally improved to meet needs.

It is anticipated that clearer prioritisation for the development (or improvement) of these datasets will be carried out alongside continued stakeholder engagement and more thorough assessment of the resources required (including input data). For example, some of the datasets in Group 2 may require less resource and therefore may be updated ahead of the development of new datasets in Group 1. Continued assessment and prioritisation will be carried out as a subsequent phase to this scoping project.

In addition to specific datasets, there are some more general themes around stakeholder requirements and preferences. Stakeholders indicated a preference for data in raster or vector format and, where appropriate, with a resolution in the order of 100 m to 500 m. Many of the current datasets (Appendix 3) are in vector format with categorical fields. However, in the free text responses some stakeholders requested continuous datasets/interpolations. Where possible (for example with Quaternary thickness) outputs should be produced as raster/grid, which can then be translated to vectors as categories if required.

Many of the existing map and model datasets listed in Appendix 3 are national scale (with some extending more widely); however, the resolution is not sufficient for stakeholder needs. While the ambition is to develop new national-scale datasets, regions of highest priority have been identified, including the North Sea, the Irish Sea, the Celtic Sea and nearshore areas of importance for coastal management. These regions should form initial focus areas for development of new datasets where national-scale outputs might take longer to compile.

In terms of data access, any new or improved datasets should be easily findable and accessible (FAIR data). The issue around multiple data portals and different datasets for similar themes was raised by stakeholders. The existence of multiple sources and different versions of similar datasets is also clear in the existing data review (Appendix 3). A solution is required here, and the ideal situation would be where one portal can be used to host all (or link to all) of the most up-to-date datasets. In addition to visibility and easier / clearer access, accompanying metadata should also be accessible alongside any new datasets.

7 Conclusions

An assessment of seabed geology data needs (with relevance to offshore renewables, linear assets and nature) has been undertaken through an online stakeholder survey and review of existing datasets. Eighty-two participants, representing at least 60 different organisations, responded to questions concerning: access and use of seabed geology data, thematic data needs, regions of interest, and resolution and format. In addition, more than 80 existing primary and derived datasets have been identified that relate to UK seabed geology.

Key findings are recommendations from the review are summarised below:

- A list of existing and new datasets, which are relevant to offshore renewables, linear assets and nature, has been identified. These have been split into three groups with differing relative levels of need:
    - (Group 1) There is a high level of stakeholder need and currently no existing bespoke datasets for UK
    - (Group 2) Datasets may exist already, but they require moderate to significant improvement or greater spatial coverage to meet stakeholder needs
    - (Group 3) Existing datasets already generally meet requirements for respondents, or datasets could be incrementally improved to better meet needs.

- Datasets in Group 1 are considered a priority focus for research and development. Opportunities for improvement of datasets in Groups 2 and 3 should also be considered where appropriate, as these may require less resource or be achievable in shorter timeframes. A follow up exercise is recommended to estimate relative resource required for these improvements.

- While the ambition is to develop new national-scale datasets, stakeholders have indicated several regions or zones of highest priority. These include: the North Sea, the Irish Sea, the Celtic Sea and nearshore areas of importance for coastal management. These regions should form initial focus areas for development of new datasets in instances where national-scale outputs will take longer to compile.

- Stakeholders indicated a preference for data in raster or vector format and, where appropriate/possible a resolution in the order of 100 m to 500 m.

- The large number of data portals that currently exist presents a challenge to stakeholders. A single portal would be preferred which can host (or link to) all up-to-date datasets.

- Stakeholders would like to have accessible information about provenance of maps, including clear routes to accessible raw datasets, methodologies and dates of data collection

- Stakeholders are looking for consistent higher resolution data coverage. For example, higher resolution mapping was requested for seabed geomorphological features and for nearshore areas.

- Stakeholders would like to see more data sharing from different end users and quicker release of data from developers following project completion.

- Ongoing stakeholder engagement will be valuable as specifications for new datasets are further developed.

References

British Geological Survey holds most of the references listed below, and copies may be obtained via the library service subject to copyright legislation (contact libuser@bgs.ac.uk for details). The library catalogue is available at: https://of-ukrinerc.olib.oclc.org/folio/.

Carbon Trust. 2015. Cable Burial Risk Assessment Methodology. Guidance for the Preparation of Cable Burial Depth of Lowering Specification. CT835.

Coughlan, M., Guerrini, M., Creane, S., O'Shea, M., Ward, S.L., Van Landeghem, K.J., Murphy, J. and Doherty, P., 2021. A new seabed mobility index for the Irish Sea: Modelling seabed shear stress and classifying sediment mobilisation to help predict erosion, deposition, and sediment distribution. *Continental Shelf Research*, *229*, p.104574.

Dakin, N., van Heteren, S., Poyiagji, E. and Brandbyge Emsten, V. 2024. Pan-European catalogue of key parameters for offshore windfarm siting – v1. Geological Service for Europe Project 101075609-GSEU-Horizon-CL5-2021-D3-02.

DNV (Det Norske Veritas). 2014. Design of offshore wind turbine structures. Offshore Standard DNV-OS-J101.

Dove, D., Lee, J.R., Kendall, R.S., Gafeira, J. and Finlayson, A., 2023. Land below sea: a new generation of seabed geology mapping. *Geoscientist*, *33*(2), pp.16-24.

DESNZ, 2024. Great British Energy founding statement. Department for Energy Security & Net Zero Policy Paper. Available at: https://www.gov.uk/government/publications/introducing-great-british-energy/great-british-energy-founding-statement#role-of-great-british-energy

Mellett, C, Long, D, Carter, G, Chiverell, R and Van Landeghem, K. 2015. Geology of the seabed and shallow subsurface: The Irish Sea. *British Geological Survey Commissioned Report*, CR/15/057. 52pp.

OSIG (Offshore Site Investigation and Geotechnics Committee) 2022. Guidance Notes for the Planning and Execution of Geophysical and Geotechnical Ground Investigations for Offshore Renewable Energy Developments. Society for Underwater Technology, London. Available at: https://sut.org/books-and-conference-proceedings/guidance-notes-for-the-planning-and-execution-of-geophysical-and-geotechnical-ground-investigations-for-offshore-renewable-energy-developments-2/

The Crown Estate, 2024. Marine Delivery Routemap: Towards a shared vision for our seabed and coastline. Available at: https://www.thecrownestate.co.uk/our-business/marine/Marine-Delivery-Routemap

Westhead, R.K., Campbell, E., Carter, G.D.O., Diaz Doce, D., Gafeira, J.D.L., Gales, J.A, Hobbs, P.R.N., Long, D, & Mellett, C.L. 2014. Geological Constraints on Development across the UK Continental Shelf: a study for The Crown Estate. *British Geological Survey Commissioned Report*, CR/14/050.

Velenturf, A.P.M., Emery, A.R., Hodgson, D.M., Barlow, N.L.M., Mohtaj Khorasani, A.M., Van Alstine, J., Peterson, E.L., Piazolo, S. and Thorp, M., 2021. Geoscience solutions for sustainable offshore wind development. *Earth Science, Systems and Society*, 1, p.10042.

Appendix 1 Survey Questions

1. What is the name of your organisation (optional)?

2. Organisation type (tick all that apply)

- Academic / research
- Asset management
- Consultancy
- Contractor
- Developer
- Equipment manufacture
- Public body / government advisor
- Spatial planning
- Other [insert text]

3. Which marine sectors do you work in (tick all that apply)?

- Aggregates and marine minerals
- Aquaculture
- Coastal management
- Defence
- Fisheries
- Geological Storage (CCUS / H2)
- Historic environment
- Hydrocarbons
- Licensing / permitting
- Linear assets
- Nature and conservation
- Navigation
- Offshore Wind
- Port management
- Wave, tidal stream and tidal range
- Other [insert text]

4. In general, how does your team/organisation use seabed geology data (including interpreted or derived maps and primary input data) to inform your work?

5. Is your interest in seabed geology data at a national scale, regional scale or site scale (tick all that apply)?

- National-scale interest
- Regional-scale interest
- Site-scale interest

6. If you selected regional-scale interest, please indicate the regions where you require seabed geology data.

7. In which format do you prefer seabed geology thematic maps (tick all that apply)?

- Vector
- Raster
- Hexagonal grid
- No preference
- Other [insert text]

8. What spatial resolution (grid spacing) do you think is appropriate for UK-wide seabed geology thematic maps?

- 100 m
- 500 m
- 1 km
- 5 km
- Unsure
- Other [insert text]

9. Where do you currently access seabed geology data from (e.g., Marine Data Exchange, BGS Offshore GeoIndex, MEDIN, OneBenthic, National Data Repository (NDR), EMODnet, etc)? What data types or thematic maps do you use most?

10. What are the challenges in finding, accessing and using seabed geology data? Are there any improvements that you would like to see?

11. User requirements: seabed relief and geomorphology

For each of the categories, please select the statement that most closely applies to you.

	N/A - I don't need to use this data	Existing data fully meets my needs	Existing data partially meets my needs	Existing data doesn't meet my needs	I need this data but I'm not aware if it exists
Bathymetry and derivatives (e.g., slope)					
Likelihood of seabed change					
Marine landforms (including mobile bedforms)					
Fluvial landforms (e.g., submerged river channels)					
Glacial landforms (e.g., moraines)					
Coastal landforms (e.g., gravel barriers)					
Exposed bedrock					

12. Please indicate any other seabed relief and geomorphology information (not listed above) that you would find useful, or that you use.

13. If you have indicated that existing seabed relief and geomorphology data do not fully meet your requirements, what are the challenges and are there any improvements or additions that you would like to see? For additional datasets can you tell us why they would be useful.

14. User requirements: soils
For each of the categories, please select the statement that most closely applies to you.

	N/A - I don't need to use this data	Existing data fully meets my needs	Existing data partially meets my needs	Existing data doesn't meet my needs	I need this data but I'm not aware if it exists
Seabed sediment type (based on grainsize)					
Carbon content in seabed sediments					
Soil lithology beneath seabed sediments					
Thickness of unlithified soil above rockhead (Quaternary thickness)					
Potential presence of peats					
Potential presence of buried channels					
Potential for over consolidated soils					
Potential for presence of boulders					
Potential for laterally variable soils					
Potential for vertically variable soils					

15. Please indicate any other soils information (not listed above) that you would find useful, or that you use.

16. If you have indicated that existing soils data do not fully meet your requirements, what are the challenges and are there any improvements or additions that you would like to see? For additional datasets can you tell us why they would be useful

17. User requirements: landslides, seismic, and shallow gas
For each of the categories, please select the statement that most closely applies to you.

	N/A - I don't need to use this data	Existing data fully meets my needs	Existing data partially meets my needs	Existing data doesn't meet my needs	I need this data but I'm not aware if it exists
Submarine landslides					
Recorded and historical earthquakes					
Seismic hazard					
Presence of pockmarks					
Areas of methane-derived authigenic carbonates (MDAC)					
Areas of interpreted gas or fluid in the shallow subsurface					

18. Please indicate any other landslides, seismic and shallow gas information (not listed above) that you would find useful, or that you use.

19. If you have indicated that existing landslides, seismic, and shallow gas data do not fully meet your requirements, what are the challenges and are there any improvements or additions that you would like to see? For additional datasets can you tell us why they would be useful.

20. User requirements: bedrock.
For each of the categories, please select the statement that most closely applies to you.

	N/A - I don't need to use this data	Existing data fully meets my needs	Existing data partially meets my needs	Existing data doesn't meet my needs	I need this data but I'm not aware if it exists
Lithology type					
Areas where bedrock may have been exposed to periglacial weathering					
Structural geology at seabed					

21. Please indicate any other bedrock information (not listed above) that you would find useful, or that you use.

22. If you have indicated that existing bedrock data do not fully meet your requirements, what are the challenges and are there any improvements or additions that you would like to see? For additional datasets can you tell us why they would be useful.

23. Are there any other comments that you would like to make?

24. This survey is anonymous. However, if you are happy to be contacted further about the project, please give your name and email below (optional).

Appendix 2 Organisations represented in the survey

A P Pinchbeck	OceanIQ
ABPmer	OMS Group
Arup	ORE Catapult
AtkinsRéalis	Orsted
BluMara Services BV	OWC
British Geological Survey	RPS Tetratech
Brynterpretation	Scottish Association for Marine Science
Cathie	Scottish Government (Marine Directorate)
Cefas	Scottish Power Renewables
CGL	SEP Hydrographic
Cooper Marine Advisors Limited	SSE Renewables
Corio Generation	SSER
Cornish Lithium	Ternan Energy
Crown Estate Scotland	TGS 4C Offshore
DAERA	The Crown Estate
DNV	TotalEnergies Renewables UK Limited
EPI Group	UK Hydrographic Office
Global Maritime Consultancy Ltd	University of Aberdeen
GoBe	University of Bradford
GT R4 Limited - Outer Dowsing Offshore Wind	University of Exeter
Historic England	University of Leeds
Jackson Geo Services	University of Lille (F)
Jenico Services Ltd	University of Southampton
Joint Nature Conservation Committee	Channel Coastal Observatory (National Network of Regional Coastal Monitoring Programmes of England)
Marine Management Organisation (MMO)	University of St Andrews
Maritime and Coastguard Agency	Utrecht University
Meta / Edge Networks	Vattenfall
Mooreast UK	Welsh Government
Natural England	XOCEAN
Natural Resources Wales	Xodus

Appendix 3 List of existing datasets

LIST OF EXISTING MAP DATASETS DEVELOPED BY, OR IN COLLABORATION WITH BGS.

Dataset	Supplier	Description	Resolution/Scale	Considerations	Access	Link
Marine Hard Substrate	BGS/Defra	Marine Hard Substrate dataset maps areas of rock or hard substrate outcropping or within 0.5m of the seabed. For this dataset "hard substrate" was defined as cobbles, boulders and rock. The interpretation was based on a variety of data sourced.	Scale **1:250 000** Data consulted included archive sample and seismic records, side scan sonar, multibeam bathymetry and Olex datasets.	(superseded by the Predicted rock outcrops dataset (JNCC/BGS/Cefas)). It should be noted that the definition of Hard Substrate applied, includes but is not limited to rock at outcrop. When using these interpretations, it is important to consider that areas mapped as hard substrate include regions such as boulder fields and sediment veneers up to 0.5m thick may be present.	Licensed (provided with the *Seabed Sediment 250k* dataset) & Free to view via GeoIndex	https://doi.org/10.5285/d933077d-d8af-48cd-85ba-8c31ce2a95a6
Predicted rock outcrops	JNCC (Cefas/BGS)	Prediction of the presence of rock at outcrop or subcrop at the seabed across the UK shelf area. This shapefile was produced through a semi-automated approach.	The Random Forest model used bathymetric, derived bathymetric, geological and modelled hydrodynamic inputs of various scale and resolution.	Semi-automated rock mapping prediction included machine learning based model prediction, combined with 'expert' QA of model outputs, including select manual edits. The work was undertaken within three separate report areas, with associated reports. This dataset is the final harmonised data.	Open (OGL)	https://www.data.gov.uk/dataset/fee9289 6-76a9-4718-a576-cd0d42224751/prediction-of-outcrops-or-subcrops-of-rock-in-uk-shelf-seabed-public
Sediment mobility indicators	BGS/TCE	The British Geological Survey has produced this map for The Crown Estate as one of the Geological Factor Maps.	**Multiscale**	Using seabed bedforms such as sediment waves and banks as indicators of mobile sediment follows several assumptions that may not be true. The presence of a bedform indicates that currents moved sediment at some point in time. The timing of bedform development on the UKCS is unknown and some bedforms may be relict features that formed under different hydrodynamic regimes in the past. Due to variable spatial resolution, in some areas of the seabed features are difficult to identify.	Not open	
EMODnet Coastal behaviour	BGS/EMODnet	**Coastal migration from Field Data:** The map is collated and harmonised from field-monitoring data and aerial photography provided by partners of EMODnet Geology. The main attributes denote the degree of landward (by erosion or submergence) or seaward (by accretion or emergence) change. The criterion for stable coastlines is ≤0.5-meter net change per year over 10 years. **Coastal migration via Satellite Data:** The dataset allows users to visualise pan-European coastal behaviour for 2007-2017 at different spatial scales. **Coastal type:** Pan-European map of morphological and lithological coastal type at zoomable scale. The main attributes denote several types of rocky coast, beach, inshore area and artificial coast.	**Multiscale**		Open (CC-BY 4.0)	https://emodnet.ec.europa.eu/geoviewer/

Dataset	Supplier	Description	Resolution/Scale	Considerations	Access	Link
EMODnet Submerged Landscapes	BGS/EMODnet	Sea level is known to have fluctuated by more than 100 metres over repeated glacial cycles resulting in recurring exposure, inundation and migration of coastlines not only across Europe, but worldwide. Landscape response to these changes in sea level, and the preservation of these features on continental shelves around Europe, are an invaluable resource for improving our understanding of human history and environmental change over geological time. More than 10,000 features representing 26 classes of submerged landscape and palaeo-environmental indicator ranging from mapped and modelled palaeo-coastlines, evidence for submerged forests and peats, thickness of post-Last Glacial Maximum sediments and submerged freshwater springs have been collated	Scale: **Multiscale**	The data may include some errors e.g. overlays, topological gaps and data discontinuities.	Open (CC-BY 4.0)	https://emodnet.ec.europa.eu/geoviewer/
EMODnet Geomorphology	BGS/EMODnet	**General physiographic features: Geomorphology: Geomorphology Lines:**	**Scale: Multiscale (10k to 5M)**	Only the northern sector of the UKCS is covered by the feature layer	Open (CC-BY 4.0)	https://emodnet.ec.europa.eu/geoviewer/
Seabed Sediments 250k	BGS	Digital geological map portraying the distribution of seabed substrate types of the UK Continental Shelf (UKCS) at a scale of 1:250,000. This comprehensive product provides a digital compilation of the paper maps at the same scale published by BGS, as well as additional re-interpretations from regional geological studies.	Scale **1:250 000** It was primarily based on seabed grab samples of the top 0.1 m, combined with cores, dredge samples and side-scan sonar acquired during mapping surveys since the early 1970s. The variations in data density will be reflected in the detail of the mapping.	Marine in situ measurement techniques (e.g. grabs, cores and underwater video footage) reveal detailed information about the sediment properties and provide, in general, an accurate representation of the local seabed. However, the seabed sampling that underpins this dataset was principally collected at a reconnaissance level and, therefore, the data could be several kilometres apart. Consequently, the interpretations are the result of extrapolation between quite widely and heterogeneous distributed sampling points and may not always be sufficient to represent the sediment heterogeneity. Any seabed sediments map should be considered a “snapshot in time” of a transitory reality due to the high mobility of certain sedimentary deposits. Within the most dynamic areas, the spatial distribution of these deposits may change dramatically over time due to the local hydrodynamic regime, plus the seafloor may have been subjected to a range of anthropogenic disturbances (e.g. dredging).	Licensed & free to view via GeoIndex	https://doi.org/10.5285/e0df9db6-09ac-4fa3-a815-1394c1988654
Quaternary 1M	BGS	Quaternary geology around the UK (North and South Sheets) (Holmes, 1993)	Scale **1:1 000 000** This broadscale mapping was derived from geophysical data (e.g. airgun, boomer, sparker, sidescan sonar, magnetometer, gravity meter) and data obtained from commercial wells and BGS shallow boreholes. The variations in data density will be reflected in the detail of the mapping.	This dataset was based on and limited to, an interpretation of data in the possession of The BGS at the time the dataset was created. The data was principally collected at a reconnaissance level and, therefore, the data could be several kilometres apart. Consequently, the interpretations are the result of extrapolation between quite widely and heterogenous distributed information.	Licensed. Free to view scanned maps via maps portal	https://largeimages.bgs.ac.uk/iip/mapsportal.html?id=1003899 , https://largeimages.bgs.ac.uk/iip/mapsportal.html?id=1003902
Quaternary Thickness 1M	BGS		Scale **1:1 000 000** This broadscale mapping was derived from geophysical data (e.g. airgun, boomer, sparker, sidescan sonar, magnetometer, gravity meter) and data obtained from commercial wells and BGS shallow boreholes. The variations in data density will be reflected in the detail of the mapping.	This dataset was based on and limited to, an interpretation of data in the possession of The BGS at the time the dataset was created. The data was principally collected at a reconnaissance level and, therefore, the data could be several kilometres apart. Consequently, the interpretations are the result of extrapolation between quite widely and heterogenous distributed information.	Not open	

Dataset	Supplier	Description	Resolution/Scale	Considerations	Access	Link
Quaternary Deposits Summary	BGS/TCE	Lithostratigraphic units defined in the BGS 1:1,000,000 Quaternary Geology maps were assessed in terms of strength and lithological variability. Lithostratigraphic units were then grouped, based on lithology and depositional process (lithogenetic), and age (chronostratigraphy), into classes depending on their expected impact on engineering activities. The British Geological Survey has produced this map for The Crown Estate as one of the Geological Factor Maps.	Scale **1:1 000 000** This broadscale mapping was derived from geophysical data (e.g. airgun, boomer, sparker, sidescan sonar, magnetometer, gravity meter) and data obtained from commercial wells and BGS shallow boreholes. The variations in data density will be reflected in the detail of the mapping.	BGS mapping at 1M scale means that small scale lithological variability and different geotechnical properties have not been captured. Further, a large proportion of sediment on the continental shelf has been characterised by BGS as 'undifferentiated' and no engineering characterisation can be assigned. Small areas missing from coverage.	Open (OGL)	https://doi.org/10.5285/a9832e62-4054-42ba-9251-bf48dd363ef6
Quaternary Deposits thickness	BGS/TCE	Quaternary cover map was derived from the 1:1,000,000 Quaternary layer (unpublished), by creating five classes of polygons consistent of isopach lines (polylines) with the 1:1,000,000 Quaternary layer. The five thickness classes are <5 m; 5 to 20 m; 20 to 30 m; 30 to 50 m; > 50 m. The British Geological Survey has produced this map for The Crown Estate as one of the Geological Factor Maps.	Scale **1:1 000 000**	Small areas missing from coverage. Download only has only 3 classes rather than 5 classes.	Open (OGL)	https://doi.org/10.5285/0cc60652-c02c-4931-b5bf-def9299b68f2
EMODnet Seabed Substrate	BGS/EMODnet	**Seabed Substrate Multiscale (Folk 5, Folk 7, Folk 16)**: Three maps were collated and harmonised from seabed substrate information within the EMODnet-Geology project. This EMODnet reclassification scheme consists of altogether five seabed substrate classes. If the original seabed substrate dataset has enabled more detailed substrate classification, classifications with 7 and 16 substrate classes might be available. **Seabed erosion:** Seabed erosion is an index map of available seabed erosion studies and related background information. **Sedimentation rates:** The information on modern sedimentation rates for recent sediments is presented as point-source information (cm/year).	Scale: **Multiscale (25k, 50k, 100k, 250k, 1M)**	The data may include some errors e.g. overlays, topological gaps and data discontinuities. No Seabed Erosion or Sedimentation rates data were provided for UKCS.	Open (CC-BY 4.0)	https://emodnet.ec.europa.eu/geoviewer/
EMODnet Quaternary	BGS/EMODnet	**Quaternary Age**: This dataset shows the chronostratigraphic age of geological units of the seafloor originated in the Quaternary period. **Quaternary Lithology:** This dataset shows the rock type (lithology) of geological units of the seafloor originated in the Quaternary period.	Scale: **Multiscale (20k to 2.5M)**	The data may include some errors e.g. overlays, topological gaps and data discontinuities.	Open (CC-BY 4.0)	https://emodnet.ec.europa.eu/geoviewer/
Pockmarks distribution	BGS/TCE	This digital product subdivided the UKCS seabed into three areas: a) areas where there is a low likelihood of having pockmarks at the seabed, b) areas where the occurrence of pockmarks is possible and c) areas where the presence of pockmarks was verified. The British Geological Survey has produced this map for The Crown Estate as one of the Geological Factor Maps.	Scale **1:250 000**	Pockmarks are seabed features resultant of fluid flow; however, their presence does not imply present-day activity. Some areas of the UK shelf, like the Witch Ground Basin, have remained essentially unchanged by erosion or sedimentation since sea level stabilised. Subsequently, the pockmarks present on the seabed represent the cumulative effects of gas escape activity over a period of at least 8,000 years.	Not open	
Shallow Gas	BGS/TCE	The British Geological Survey has produced this map for The Crown Estate as one of the Geological Factor Maps.	Scale **1:1 000 000** Shallow Gas dataset was produced by digitising and combining two distinct previous compilations depicting the extent of gas blanking. The first compilation is presented in the marginalia of the Quaternary sediments around the United Kingdom 1M scale map (North and South sheets) published by the BGS (Holmes et al.,1993), both compiled from the interpretation of analogue seismic reflection profiles.		Not open	

Dataset	Supplier	Description	Resolution/Scale	Considerations	Access	Link
Offshore seismic Hazard in UK waters	BGS/IDRIC	The seismic hazard is computed using a model that aims to characterise the relevant earthquake processes and effects in a region. It consists of two parts: one that characterises earthquake occurrence in space and time (where they occur and their frequency of occurrence, sometimes referred to as the seismic source characterisation model) and another that describes the ground shaking that may result from potential future earthquakes (the ground motion characterisation component). The model is based on historical and instrumental observations of earthquakes and their effects, and information and data relating to the tectonics and geological structure of the UK region.	**Resolution: 1/4 degree (lat/long)**	The maps confirm that seismic hazard is generally low in UK waters but that the hazard is slightly higher in areas like the Irish Sea close to North Wales, the northern North Sea and the southern North Sea immediately offshore Lincolnshire and East Anglia. This largely reflects the higher rates of historical earthquake activity in these regions. Please note that these hazard maps are not a substitute for a site-specific hazard assessment should one be required. The user must take responsibility for checking that use of the results contained in this report is appropriate for the case in question. (Data are downloaded though doesn't include the GIS format maps)	Open (OGL)	https://earthquakes.bgs.ac.uk/hazard/hazard_offshore.html?_ga=2.159532148.85236172.1726573966-1110941117.1726573966
EMODnet Geological events and probabilities (Geohazard)	BGS/EMODnet	**Earthquakes:** Locations of relevant events delivered by National Partners and not reported on the Seismic Portal (EMSC website). **Quaternary submarine tectonic (100k & 250k):** Quaternary submarine tectonic lines in geologically active areas, mapped by various national and regional mapping projects and recovered in the literature. **Submarine Fluid Emissions (100k & 250k):** Fluid emissions of non-volcanic origin and mud volcanoes on seafloors were mapped by various national and regional mapping projects and recovered in the literature. **Submarine landslides (100k & 250k):** Submarine landslides, detected on the seabed, outcropping or buried, mapped by various national and regional mapping projects and recovered in the literature. **Submarine volcanic (100k & 250k):** Submarine volcanic structures and eruption centres including hydrothermal activity, were mapped by various national and regional mapping projects and recovered in the literature. **Tsunamis affected coast:** Locations of coasts affected by tsunamis of unknown origin, mapped by various national and regional mapping projects and recovered in the literature. **Tsunamis origins:** Locations of events which originated tsunamis, mapped by various national and regional mapping projects and recovered in the literature. **Landslide susceptibility:** A map of submarine landslide susceptibility in European seas. High susceptibility values indicate a high probability of landslides.	Scale: **Multiscale**	Blank areas do not necessarily correspond to no occurrence. No Earthquakes or Quaternary Tectonics data were provided for UKCS.	Open (CC-BY 4.0)	https://emodnet.ec.europa.eu/geoviewer/
Offshore Bedrock 250k - Lithostratigraphical units	BGS	Digital geological map portraying the bedrock geology of the UK Continental Shelf (UKCS) at a scale of 1:250,000. This comprehensive product provides a digital compilation of the information captured from the paper maps at the same scale published by BGS, as well as additional re-interpretations from regional geological studies.	Scale **1:250 000** This broadscale mapping was derived from geophysical data (e.g. airgun, boomer, sparker, sidescan sonar, magnetometer, gravity meter) and data obtained from commercial wells and BGS shallow boreholes. The variations in data density will be reflected in the detail of the mapping.	This dataset was based on and limited to, an interpretation of data in the possession of The BGS at the time the dataset was created. The data was principally collected at a reconnaissance level and, therefore, the data could be several kilometres apart. Consequently, the interpretations are the result of extrapolation between quite widely and heterogenous distributed information.	Licensed & free to view via GeoIndex	https://doi.org/10.5285/d933077d-d8af-48cd-85ba-8c31ce2a95a6
Offshore Bedrock 250k - Structural Geology	BGS	This digital map, associated with the BGS Bedrock 250k (Lithostratigraphical units) delineates the principal structural features, such as faults and folds, observed at the rockhead.	Scale **1:250 000** This broadscale mapping was derived from geophysical data (e.g. airgun, boomer, sparker, sidescan sonar, magnetometer, gravity meter) and data obtained from commercial wells and BGS shallow boreholes. The variations in data density will be reflected in the detail of the mapping.	This dataset was based on and limited to, an interpretation of data in the possession of The BGS at the time the dataset was created. The data was principally collected at a reconnaissance level and, therefore, the data could be several kilometres apart. Consequently, the interpretations are the result of extrapolation between quite widely and heterogenous distributed information.	Licensed & free to view via GeoIndex	https://doi.org/10.5285/d933077d-d8af-48cd-85ba-8c31ce2a95a6

Dataset	Supplier	Description	Resolution/Scale	Considerations	Access	Link
Bedrock Summary Lithologies	BGS/TCE	Digital geological map showing the distribution of bedrock types present across the UKCS. The bedrock divisions on the map represent a summary of the principal lithostratigraphical units derived from published BGS Offshore Bedrock mapping at 1:250,000 scale. The divisions on the map combine the bedrock formations into 8 classes (with several subdivisions) of similar strength and lithological variability, each with a 'Category' title that summarises their main lithological character: Class1 – Igneous; Class 2 - Tertiary Sandstone and Limestone; Class 2.5 - Tertiary Sandstone and Limestone Interbedded; Class 3 - Tertiary Mudstone; Class 4 - Mesozoic Sandstone and Limestone; Class 4.5 - Mesozoic Sandstone and Limestone Interbedded; Class 5 - Mesozoic Mudstone; Class 6 – Chalk; Class 7 – Metamorphic; Class 8 - Palaeozoic Sedimentary. The British Geological Survey has produced this map for The Crown Estate as one of the Geological Factor Maps.	Scale **1:250 000**	Very few polygons offshore have been sampled and dated. Even less have had physical measurements made. Small areas missing from coverage. Slight position issue.	Open (OGL)	https://doi.org/10.5285/0f755bcb-8291-4c43-8ad3-4032fa8aca2f
EMODnet Pre-Quaternary	BGS/EMODnet	**Pre-Quaternary Age:** This dataset shows the chronostratigraphic age of geological units of the seafloor originated earlier than 2,588 Ma from now (pre-Quaternary). **Pre-Quaternary Lithology:** This dataset shows the rock type (lithology) of geological units of the seafloor that originated earlier than 2,588 Ma from now (pre-Quaternary). **Pre-Quaternary Faults:** This dataset shows faults and structures of geological units of the seafloor originated earlier than 2,588 Ma from now (pre-Quaternary)	Scale: **Multiscale (25k to 5M)**	The data may include some errors e.g. overlays, topological gaps and data discontinuities.	Open (CC-BY 4.0)	https://emodnet.ec.europa.eu/geoviewer/
Marine Mineral Resources	BGS/TCE	The first map depicting the marine sand and gravel resources of the UK has been developed.		Described in: https://www.sciencedirect.com/science/article/pii/S0301420716300095#f0005		https://www.sciencedirect.com/science/article/pii/S0301420716300095#f0005
EMODnet Marine Minerals (TCE)	BGS/EMODnet	EMODnet Geology's marine minerals layers include all types of naturally occurring geological raw materials, metals and hydrocarbons known to accumulate in European sea regions: - Marine Aggregates - Marine Aggregates Sub Deposits - Marine Critical Minerals - Marine Hydrocarbon Sub Deposits - Marine Hydrocarbon and Hydrates - Marine non-Critical Minerals	**Multiscale**	The data may include some errors e.g. overlays, topological gaps and data discontinuities. The data has not been updated in the last few years and may not correspond to the most update version of the source data released by the TCE.	Open (CC-BY 4.0)	https://emodnet.ec.europa.eu/geoviewer/

LIST OF POINT SAMPLE DATA HELD BY BGS

Dataset	Supplier	Description	Limitations/Considerations	Access	Links
Marine Geological Sample Data from around the UK (1966 onwards)	BGS	The British Geological Survey has collected over 50000 offshore samples using grabs, dredges and shallow coring devices (to a maximum depth of 6m below the seabed). The collection also includes additional third-party data and has assisted in the creation of BGS Marine Geology Maps. The distribution is variable, but in general there are sample stations spaced about every 5 - 10km across the entire UK Continental Shelf (UKCS). In some localised areas the sampling density is much higher. The data held includes digital data and analogue records (sample data sheets), plus associated physical sample material. Sample data sheets which have been scanned contain index information and geological descriptions and are more detailed from 1983 onwards. Coded geological descriptions were entered on sheets which were subsequently digitised, and this information is available for about 10,000 samples. The data also includes results of analyses such as micropaleontological examination or age dating. Sample materials are managed as part of the BGS Materials collection and are available for examination and subsampling. The data are stored within the National Geoscience Data Centre (NGDC) and Marine Environmental Data and Information Network (MEDIN) Data Archive Centre (DAC) for Geology and Geophysics. Data are delivered via the BGS Offshore GeoIndex www.bgs.ac.uk/GeoIndex/offshore.htm.The activity and scan layers contain location information, metadata and links to scanned sample datasheets/core logs, and the geological, geotechnical, geochemical and sea-bed sediment data layers contain observations and/or measurements as digital values. The data are applicable to a wide range of uses including environmental, geotechnical and geological studies. Reference: Fannin, NGT. (1989) Offshore Investigations 1966-87. British Geological Survey Technical Report WB/89/2, British Geological Survey.	Positions are less accurate in older data. Not all information in scanned sample data sheets is available digitally. Not all sheet types are accessible online. Some 3rd party data are restricted. These should be reviewed and released if possible. Database/GeoIndex doesn't contain all more recent data.	Mostly open (OGL) / some restricted	https://ogcapi.bgs.ac.uk/collections/offshore-sample-activity-data https://www.bgs.ac.uk/map-viewers/geoindex-offshore/
Marine Sample Geological Description data	BGS	Geological descriptions associated with offshore sampling activities. It contains a variety of geoscientific observations; these include rock/sediment classification, grain size, sorting, sphericity, roundness, hardness, plasticity, presence of flora or fauna, colour, chronostratigraphy and lithostratigraphy. Note that this layer contains data at depth.	Positions are less accurate in older data. Not all information in sample data sheets is available digitally. Some data are restricted and not open. Doesn't contain all more recent data.	Mostly open (OGL) / some restricted	https://ogcapi.bgs.ac.uk/collections/offshore-sample-geological-data https://www.bgs.ac.uk/map-viewers/geoindex-offshore/
Marine Sediment Particle Size Data from around the UK (1966 Onwards)	BGS	The data set consists of the results of particle size analysis (PSA) performed on approximately 29,000 sea-bed sediment samples collected by BGS from the UK Continental Shelf and adjacent deep-water areas, mostly using sediment grabs, but also sediment corers on occasions. Measurements were also made on approximately 8000 downhole sub-samples from shallow cores and boreholes. Data from other UK organisations have also been added to the PSA dataset. The data are stored as part of the National Geoscience Data Centre (NGDC) and the Marine Environmental Data and Information Network (MEDIN) Data Archive Centre (DAC) for Geology and Geophysics. Data are delivered via the BGS Offshore GeoIndex www.bgs.ac.uk/GeoIndex/offshore.htm Seabed Sediment Data layers.	Positions are less accurate in older data. Some data are restricted and not open. Doesn't contain all more recent data.	Mostly open (OGL) / some restricted	https://ogcapi.bgs.ac.uk/collections/offshore-seabed-sediment-data https://www.bgs.ac.uk/map-viewers/geoindex-offshore/
Marine Borehole Logs, Data and Materials from around the UK (1969 Onwards)	BGS	BGS has drilled almost 600 boreholes to prove seismic interpretations of the marine Quaternary geology and bedrock from the UK Continental Shelf (UKCS). The collection also includes additional third-party data and has assisted in the creation of BGS Marine Geology Maps. The boreholes penetrate beneath the seabed to depths ranging from about 10m to over 300m depending on the target depth or technical problems associated with drilling the borehole. The data includes descriptive geological core logs and data which has been captured from these and in some cases natural gamma logs. A variety of analyses has been conducted on the core material such as Particle Size Analysis, micropaleontological, geotechnical, palaeomagnetic and age dating. Core materials are managed as part of the BGS Materials collection and are available for examination and subsampling. The data are stored as part of the National Geoscience Data Centre (NGDC) and the Marine Environmental Data and Information Network (MEDIN) Data Archive Centre (DAC) for Geology and Geophysics. Data are delivered via the BGS Offshore GeoIndex http://www.bgs.ac.uk/GeoIndex/offshore.htm. The activity and scan layers contain location information, metadata and links to scanned borehole logs, and the geological data layers contain observations and/or measurements as digital values. The data are applicable to a wide range of uses including environmental, geotechnical and geological studies. Reference: Fannin, NGT. (1989) Offshore Investigations 1966-87 British Geological Survey Technical Report WB/89/02, British Geological Survey.	Positions are less accurate in older data. Some data are restricted and not open. Doesn't contain all more recent data.	Mostly open (OGL) / some restricted	https://ogcapi.bgs.ac.uk/collections/offshore-sample-geological-data https://www.bgs.ac.uk/map-viewers/geoindex-offshore/

Marine Geotechnical Data from around the UK (1975 Onwards)	BGS	The data consist of the results of geotechnical testing carried out at various depth intervals on shallow cores or boreholes collected BGS from the UK Continental Shelf. The bulk of the data north of 56N are in digital form and result from testing carried out on board survey vessels using hand-held test equipment (penetrometers and shear vanes). These values are averaged for each test interval and are expressed in kiloPascals. There are approximately 6000 test results in the data set. Some more detailed test information, in non-digital and report form is held for selected sites. Also, for most sites where digital data is not available, geological descriptions of core material will also contain semi-quantitative information on the stiffness of the material. Geotechnical knowledge is required to understand and interpret the results if they are to be used as a basis for engineering studies. Core materials are managed as part of the BGS Materials collection and are available for examination, testing or subsampling. The data are stored as part of the National Geoscience Data Centre (NGDC) and the Marine Environmental Data and Information Network (MEDIN) Data Archive Centre (DAC) for Geology and Geophysics. Data are delivered via BGS Offshore GeoIndex www.bgs.ac.uk/GeoIndex/offshore.htm geotechnical layers. Reference: Fannin, NGT. (1989) Offshore Investigations 1966-87. British Geological Survey Technical Report WB/89/2, British Geological Survey.	Positions are less accurate in older data. Some data are restricted and not open. Doesn't contain all more recent data.	Mostly open (OGL) / some restricted	https://ogcapi.bgs.ac.uk/collections/offshore-sample-geotechnical-data https://www.bgs.ac.uk/map-viewers/geoindex-offshore/
National Geotechnical Properties Database (NGPD)	BGS	The Geotechnical Database contains information about site investigation reports, boreholes and samples. It contains geotechnical measurements taken over borehole intervals and on samples. Some of the data is obtained digitally from AGS files (Association of Geotechnical and Geoenvironmental Specialists - File Transfer Format), some is obtained manually from Site Investigation Reports stored in the National Geoscience Data Centre. The database currently contains geotechnical data from over 450 000 laboratory test samples and core descriptions, borehole observations and in situ tests from over 96 000 boreholes extracted from over 4800 site investigation reports. The database underpins BGS Geo-engineering properties and processes research and is an important information resource for answering enquiries and providing for the data needs of external customers.	Doesn't currently include marine data.	Not open	https://www.bgs.ac.uk/geological-research/science-facilities/engineering-geotechnical-capability/national-geotechnical-properties-database/
Civil Hydrography Programme Sample Data	MCA / UKHO / BGS	Samples that are routinely collected from the seabed during the Maritime and Coastguard Agency 's (MCA) Hydrographic Instruction (HI) Civil Hydrography Programme (CHP) surveys. Seabed sampling is conducted on an approximately 5 km grid with at least one sample being taken in each major textural area identified. Samples (~10000-15000) are stored in the BGS Core Store and are available for further analysis.	Samples are numerous and widely distributed. Some data are in BGS GeoIndex Offshore, but not all. Samples are visually described by the contractors which inhibits their use within further scientific assessment. Particle size analysis (PSA) on these samples would be very valuable and enable significantly improved: regional/national seabed sediment maps, benthic habitat maps, and models of seabed sediment dynamics/vulnerability relevant to renewables industry and coastal erosion. Other types of analysis would also be beneficial (e.g. carbon).	Open (OGL)	https://www.bgs.ac.uk/map-viewers/geoindex-offshore/
Legacy on-Oil Industry Site Investigation data	BGS	Legacy on-Oil Industry Site Investigation data	Not accessible. Reports and paper geophysical records have not been scanned.	Mixed	https://webapps.bgs.ac.uk/services/ngdc/accessions/index.html
AGS data: Site investigation data received by BGS from 3rd party organisations in AGS file format.	BGS	Site investigation and geotechnical data received by BGS from 3rd party organisations in AGS file format. When received by BGS the data is validated against predefined rules, processed and stored in the BGS AGS agnostic store. This data is delivered as received e.g. no interpretative values or observations are added to the data by the BGS. For more details about the Association of Geotechnical & Geoenvironmental Specialists (AGS) see: https://www.ags.org.uk For more details on depositing AGS data with BGS see: http://www.bgs.ac.uk/data/ags	Limited number of boreholes can be accessed through the download service. Doesn't currently include marine data.	Mostly open (OGL) / some restricted	https://agsapi.bgs.ac.uk/ https://mapapps2.bgs.ac.uk/geoindex/home.html?layer=AGSBoreholes

LIST OF GEOPHYSICAL DATA HELD BY BGS

Dataset	Supplier	Description	Limitations/Considerations	Access	Links
(BGS) Marine Geophysical and Seismic Data from around the UK (1966 Onwards)	BGS	The British Geological Survey hold a collection of data recorded during marine geophysical surveys which includes digital data and analogue records. These data result from approximately 350,000-line kilometres of multi-instrument geophysical survey lines. The data include seismic, sonar, magnetic, gravity, echo sounder, multibeam bathymetry and navigation data. The seismic data are mainly for airgun, sparker, boomer and pinger. The data were primarily collected by BGS, and the collection also includes additional third-party data. The data are primarily from the UKCS (United Kingdom Continental Shelf). The data are stored within the National Geoscience Data Centre (NGDC) and the Marine Environmental Data and Information Network (MEDIN) Data Archive Centre (DAC) for Geology and Geophysics. The majority of legacy geophysical paper records are available as scanned images viewable via the BGS Offshore GeoIndex www.bgs.ac.uk/GeoIndex/offshore.htm. Other records can be scanned on request. Older records are of variable quality. Data not yet available online including segy are available on request enquiries@bgs.ac.uk. The data are applicable to a wide range of uses including environmental, geotechnical, geophysical and geological studies. Reference: Fannin, NGT. (1989) Offshore Investigations 1966-87. British Geological Survey Technical Report WB/89/2, British Geological Survey.	Some data are scanned images of paper records only. These would be more useful if converted to sgy if possible. Some paper records have not been scanned. Data/scan quality is variable depending on age, instrument and paper media. Positions are less accurate in older data. Some 3rd party data are restricted. These should be reviewed and released if possible. Sgy data are available for some recent surveys, and some are currently accessible online via the GeoIndex Offshore (other are not currently accessible online and are available on request)	Mostly open (OGL) / some restricted	https://ogcapi.bgs.ac.uk/collections/offshore-geophysical-survey-lines https://ogcapi.bgs.ac.uk/collections/offshore-geophysical-data-magnetics https://ogcapi.bgs.ac.uk/collections/offshore-geophysical-data-gravity https://www.bgs.ac.uk/map-viewers/geoindex-offshore/
Strategic Environmental Assessment (SEA) Data and Related Information	BGS	The SEA portal is managed by the BGS on behalf of DESNZ and provides free access to downloadable data, information and reports which have been produced through the SEA process. The Department of Trade and Industry (now DESNZ) began a sequence of sectoral SEAs of the implications of further licensing of the UK Continental Shelf (UKCS) for oil and gas exploration and production in 1999. The SEA Process subdivided the UKCS into eight areas shown; beginning in 2008, integrated Offshore Energy SEAs have been undertaken that cover the whole UKCS. An integral part of the SEA programme has been a series of research and monitoring surveys commissioned to acquire new data about the offshore environment and used to help inform the relevant SEAs.	Data are not all fully integrated into national datasets.	Open (OGL)	http://www.bgs.ac.uk/data/sea/home.html
Legacy non-Oil Industry Site Investigation data	BGS	Hard copy reports and geophysical records held at BGS	Not accessible. Reports and paper geophysical records have not been scanned.	Mixed	https://webapps.bgs.ac.uk/services/ngdc/accessions/index.html

LIST OF EXISTING MAP DATASETS DEVELOPED BY 3RD PARTY ORGANISATIONS.

Dataset	Supplier	Description	Resolution/Scale	Limitations/Considerations	Access	Links
Quantitative sediment composition predictions for the north-west European continental shelf (2019)	Cefas	Spatial predictions of the fractions of mud, sand and gravel as continuous response variables for the north-west European continental shelf. Mud, sand and gravel fractions range from 0-1 (i.e. 0-100%). These fractions were generated from two additive log-ratios (ALR), ALRs and ALRm which are independent, unconstrained response variables. These raw predictions as rasters are also included presented in the attached dataset. Predicted fractions have been combined to predict the likely sediment classification based on the EUNIS level 3 sediment classification for broadscale habitats, Folk 5, Folk 7, Folk 11 and Folk 15 classification schemes.	Resolution: 7.5 arcseconds	Model excludes samples collected prior to 1990	Open (OGL)	https://data.cefas.co.uk/view/19765
Sediment type and sedimentary carbon stocks (Smeaton et al., 2021)	Scottish Government's Marine Directorate / University of St Andrews	Spatial mapping of the sediment type and the carbon (C) stored in the top 10 cm of the sediments found across the seabed of the United Kingdom's Exclusive Economic Zone (EEZ) and within the territorial waters of the Isle of Man and the Channel Islands. The dataset contains two resources: UK EEZ Sediment Type: Spatial mapping of seafloor sediment type classified using the modified Folk scheme. UK EEZ Surficial Sedimentary Carbon: Spatial mapping of the organic carbon (OC) and inorganic (IC) in the top 10 cm of sediments. The work is part of the Scottish Blue Carbon Forum research programme funded by the Scottish Government. Full details of the production of this data can be found in: Smeaton, C., Hunt, C.A., Turrell, W.R. and Austin, W.E.N. (2021), Marine sedimentary carbon stocks of the United Kingdom's Exclusive Economic Zone, Frontiers in Earth Sciences.	Variable cell size structure, of 500 m2 in the continental shelf and deep-sea zones to 5 m2 in the coastal and fjord areas.	Model based on sediment samples only	Open (OGL)	https://data.marine.gov.scot/dataset/sediment-type-and-surficial-sedimentary-carbon-stocks-across-united-kingdom%E2%80%99s-exclusive
EUSeaMap (2023) (incorporating UKSeaMap)	JNCC / EMODnet	The aim of UKSeaMap is to give a broad-scale overview of the coverage of different physical seabed habitats in the UK. (JNCC) Output of the 2023 EUSeaMap broad-scale predictive model, produced by EMODnet Seabed Habitats. The map was produced using a "top-down" modelling approach using classified habitat descriptors to determine a final output habitat. Habitat descriptors differ per region but include biological zone Energy class Oxygen regime Salinity regime Seabed substrate Riverine input Habitat descriptors (excepting Substrate) are calculated using underlying physical data and thresholds derived from statistical analyses or expert judgement on known conditions. EMODnet	0.00104dd (approx. 100 metres)	PLEASE NOTE: as of early 2024, we recommend using EUSeaMap version 2023 over UKSeaMap 2018. (JNCC)	Open (CC-BY 4.0)	https://emodnet.ec.europa.eu/geoviewer/, https://jncc.gov.uk/our-work/marine-habitat-data-product-ukseamap/
Global Seafloor geomorphic features map (Harris et al., 2014)	Authors / Blue Habitats	Digital seafloor geomorphic features map (GSFM) of the global ocean. The GSFM includes 131,192 separate polygons in 29 geomorphic feature categories, used here to assess differences between passive and active continental margins as well as between 8 major ocean regions (the Arctic, Indian, North Atlantic, North Pacific, South Atlantic, South Pacific and the Southern Oceans and the Mediterranean and Black Seas).	"Manual digitisation and algorithm-assisted digitisation were carried out at a spatial scale of 1:500,000 "	Described in: HARRIS, P.T., MACMILLAN-LAWLER, M., RUPP, J. and BAKER, E.K., 2014. Geomorphology of the oceans. Marine Geology, 352, pp.4-24.	Open (CC-BY 4.0)	https://bluehabitats.org/

Pre-Quaternary Geological map compilation (2019)	OGA / Lloyds Registry	Compilation Depth, thickness, subcrop, supercrop and structure maps for each age period. Offshore only, compiled from various sources. As part of the NSTA's published 2018/19 Activity Plan, NSTA is publishing a set of regional geological maps for the whole of the UKCS. These maps represent the final set of deliverables from a 3-year contract with Lloyd's Register (LR). All data released with this set of geological maps is public domain data. The project has, however, benefited from several additional third-party data sources which have been used to help inform final maps and/or derive interpreted products.	Variable	The following products are available: •Depth structure maps •Isochore maps •Structural elements maps •Depositional facies maps •Reservoir distribution maps •Well penetration maps •Hydrocarbon occurrence maps •Drill stem tests •Well tops (Groups, Formation and Members) •Sand data (N/G, sand thickness)	NSTA Open User Licence	https://opendata-nstauthority.hub.arcgis.com/documents/9dcfd03949f5483594e8e277a136c974/about
Getech Structural Elements Database (2019)	GeTech / NSTA	This structural and tectonics database has been purchased from Getech by the NSTA for publication. It is based on mapping using gravity and magnetic datasets, remote sensing data, geology maps, publicly available seismic data and literature. This structural and tectonics database has been purchased from Getech by the NSTA for publication. It is based on mapping using gravity and magnetic datasets, remote sensing data, geology maps, publicly available seismic data and literature. Structures are mapped at 1:1m scale, and an extensive number of attributes explain the data used in mapping, kinematics and confidence in the interpretation of the structure. Each structural element also has a detailed activation history within the attribution, describing periods of activity or inactivity and the kinematics through time based on direct data and/or Getech's tectonic model for the area. The database is being delivered out as an ArcGIS geodatabase which contains the mapped structural elements fully categorised and attributed together with activation histories where applicable. The "Structural Builds" PDF document should be used to alongside the geodatabase as this provides an explanation of the schema used. The "READ ME" file should also be used to provide some additional information for navigating around the data.	Variable		OGA License (OGAL)	https://opendata-nstauthority.hub.arcgis.com/documents/6fa44b5e243f41bc89a4fa5c568f9baa/about
OCTek-UK Crustal Structure Maps (2019)	Badley / NSTA	In collaboration with Badley Geoscience, the NSTA is making available Badley's OCTek-UK products. OCTek-UK provides maps and grids of crustal structure for the UK and adjacent areas, produced by application of the OCTek gravity inversion technique. The data are provided in an a space-delimited ASCII format (.dat), an ArcGIS format (.asc), a Surfer grid format (.grd) and as a GeoTiff(.tif).	Variable		NSTA Open User Licence	https://opendata-nstauthority.hub.arcgis.com/documents/NSTAUTHORITY::octek-uk/about

World Stress Map Database Release 2016	GFZ German Research Centre for Geosciences	The World Stress Map (WSM) is a global compilation of information on the crustal present-day stress field maintained since 2009 at the Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences within Section 2.6 Seismic Hazard and Risk Dynamics. It is a collaborative project between academia and industry that aims to characterize the crustal stress pattern and to understand the stress sources. he WSM commenced in 1986 as a project of the International Lithosphere Program (ILP) under the leadership of Mary-Lou Zoback. From 1995-2008 it was a project of the Heidelberg Academy of Sciences and Humanities headed by Karl Fuchs and Friedemann Wenzel. Since 2012 the WSM is a member of the ICSU World Data System. All stress information is analysed and compiled in a standardized format and quality-ranked for reliability and comparability on a global scale. The latest WSM database release 2016 contains 42,870 data records within the upper 40 km of the Earth's crust. The WSM is an open-access public database and is used by various academic and industrial institutions working in a wide range of Earth science disciplines such as geodynamics, hazard assessment, hydrocarbon exploitations and engineering.		The main operational areas are Reservoir characterization and management Stability of mines, tunnel, boreholes and waste disposal sites Calibration of geomechanical-numerical models 4D Thermo-Hydro-Mechanical (THM) simulations Hazard assessment e.g. by means of fault-slip tendency and fracture potential analysis	Open (CC-BY 4.0)	https://www.world-stress-map.org/
Stress Map of Great Britain and Ireland 2022	BGS / GFZ German Research Centre for Geosciences	Stress maps from individual countries. These maps are edited with individual partners and institutions.		PDF format	Open (CC-BY 4.0)	https://dataservices.gfz-potsdam.de/wsm/showshort.php?id=bdbec6a3-9fdf-11ec-a8b4-7d2338b1cdf0
BRITICE Glacial Map V2.0 (2017)	University of Sheffield / NERC	The BRITICE Glacial Mapping Project: version two release (2017) is a map and GIS database of glacial landforms related to the last British-Irish Ice Sheet. Maps and GIS data are freely downloadable. We reviewed over 1,800 publications from the academic literature, British Geological Survey and Irish Geological Survey mapping. Relevant data from each published map were compiled into a geographic information system (GIS). Version one of the BRITICE project was completed in 2004. Version two includes mapping updated from 2004. This revised database contains over 170,000 landforms. This is eight times the amount of information than was available in version one. The database now includes Ireland.	designed to be digitally viewed at a scale of 1:200,000	Limited offshore coverage.	Open (OGL)	https://shefuni.maps.arcgis.com/apps/webappviewer/index.html?id=fd78b03a74bb477c906c5d4e0ba9abaf, https://www.sheffield.ac.uk/geography-planning/research/geography/projects/britice
BRITICE CHRONO glacial reconstruction (including palaeotopography and coastline positions) (2022)	University of Sheffield / NERC / Pangaea	Clark, C.D., Ely, J.C., Fabel, D. & Bradley, S.L. (2022b) BRITICE-CHRONO maps and GIS data of the last British–Irish Ice Sheet 31 to 15 ka, including model reconstruction, geochronometric age spreadsheet, palaeotopographies and coastline positions. Associated study: (Clark, C.D., Ely, J.C., Hindmarsh, R.C., Bradley, S., Ignéczi, A., Fabel, D., Ó Cofaigh, C., Chiverrell, R.C., Scourse, J., Benetti, S. and Bradwell, T., 2022. Growth and retreat of the last British–Irish Ice Sheet, 31 000 to 15 000 years ago: the BRITICE-CHRONO reconstruction. Boreas, 51(4), pp.699-758.)		Reconstructed ice sheet boundaries from last glaciation (including palaeotopography and coastline positions).	Open (CC-BY 4.0)	https://doi.pangaea.de/10.1594/PANGAEA.945729
Tunnel Valley distribution (2024)	University of Cambridge / The Geological Society	Compilation of the Pleistocene European tunnel valleys from different authors. (Van der Vegt, P.A.A.M., Janszen, A. and Moscariello, A., 2012. Tunnel valleys: current knowledge and future perspectives. Geological Society, London, Special Publications, 368(1), pp.75-97.)	Multiple scales - compilation	Not accessible online.	via author / publisher	https://www.sciencedirect.com/science/article/pii/S0277379122003110#fig2

Base Quaternary mapping (North Sea) (2017)	University of Manchester/ The Geological Society	This study incorporates continuous, regional 3D seismic data with high-quality chronostratigraphic markers to map the base-Quaternary surface at high resolution across the entire North Sea. Depth conversion, back stripping, seismic geomorphology and sedimentation rate calculations are integrated to analyse the paleogeographical evolution of the North Sea Basin and its infill of c.83×103 km3ofnorthward prograding marine to deltaic sediments. (Lamb, R.M., Harding, R., Huuse, M., Stewart, M. and Brocklehurst, S.H., 2018. The early quaternary North Sea basin. Journal of the Geological Society, 175(2), pp.275-290.)		Limited to North Sea Basin. Not accessible online.	via author / publisher	https://www.lyellcollection.org/doi/pdf/10.1144/jgs2017-057
Base Quaternary mapping (North Sea) (2018)	NGU / Elsevier	We use an extensive 2D and 3D seismic database to correlate major Quaternary seismo-stratigraphic surfaces and units across the North Sea and reconstruct the broad-scale infill pattern of the entire Quaternary North Sea Basin. (Ottesen, D., Batchelor, C.L., Dowdeswell, J.A. and Løseth, H., 2018. Morphology and pattern of Quaternary sedimentation in the North Sea Basin (52–62 N). Marine and Petroleum Geology, 98, pp.836-859.)		Limited to North Sea Basin. Not accessible online.	via author / publisher	https://www.sciencedirect.com/science/article/abs/pii/S0264817218303465
The glaciogenic unconformity of the southern North Sea (2012)	The Geological Society	The recent availability of continuous three-dimensional seismic data between the coasts of Britain and the Netherlands provides the opportunity to establish a new seismic interpretation workflow adapted to the intracratonic glaciogenic successions. By analysing the geomorphology of the buried basal glaciogenic unconformity, four distinct major ice fronts are identified and correlated onshore. (Moreau, J., Huuse, M., Janszen, A., van der Vegt, P., Gibbard, P.L. and Moscariello, A., 2012. The glaciogenic unconformity of the southern North Sea. Geological Society, London, Special Publications, 368(1), pp.99-110.		Limited to southern North Sea. Not accessible online.	via author / publisher	https://www.lyellcollection.org/doi/full/10.1144/SP368.5?casa_token=_RdJwIpLTv4AAAAA%3Ak8PXXsuAz4zBX8IV86woCoYK2hYxh8Mi_8MJMsXv4vKXxt7Ieo40Z-PBFH3CUM4HfKDw39ezlg5PLA
Submerged Landscapes of the European Continental Shelf: Quaternary Paleoenvironments (2017)				Not accessible online.	via author / publisher	https://www.wiley.com/en-us/Submerged+Landscapes+of+the+European+Continental+Shelf%3A+Quaternary+Paleoenvironments-p-9781118927717
Quaternary Palaeogeographic reconstruction papers		Cohen, K.M., Gibbard, P.L. and Weerts, H.J.T., 2014. North Sea palaeogeographical reconstructions for the last 1 Ma. Netherlands Journal of Geosciences, 93(1-2), pp.7-29.; Hijma, M.P., Cohen, K.M., Roebroeks, W., Westerhoff, W.E. & Busschers, F.S., 2012. Pleistocene Rhine–Thames landscapes: geological background for hominin occupation of the southern North Sea region. Journal of Quaternary Science 27: 17–39. Sturt, F., Garrow, D. and Bradley, S., 2013. New models of Northwest European Holocene palaeogeography and inundation. Journal of Archaeological Science, 40(11), pp.3963-3976.				-

Seabed Mobility Index (Irish Sea) (2021)	University College Dublin / Elsevier	Information on current and wave conditions were obtained from numerical modelling to assess their role in generating seabed hydrodynamic conditions. These outputs were coupled with observed seabed grain-size data to predict the exceedance of sediment mobility thresholds by bed shear stress values for a period of one year according to empirical formulae. Exceedance frequency values were used to calculate a number of sediment disturbance and mobility indexes to allow for a robust assessment of sediment dynamics. (Coughlan M, Guerrini M, Creane S, O'Shea M, Ward SL, Van Landeghem KJ, Murphy J, Doherty P. A new seabed mobility index for the Irish Sea: Modelling seabed shear stress and classifying sediment mobilisation to help predict erosion, deposition, and sediment distribution. Continental Shelf Research. 2021 Nov 1; 229:104574.)	For the hydrodynamic (HD) model the mesh element size varies from 2 km resolution at the open boundaries down to a minimum 10 m in areas where validation instruments are deployed. For the Spectral Waves (SW) model the mesh element size varies from 2 km resolution at the open boundaries down to a minimum 200 m in areas where wave buoys are located	Limited to Irish Sea. Not accessible online.	via author / publisher	https://www.sciencedirect.com/science/article/pii/S0278434321002302

LIST OF POINT SAMPLE DATA HELD BY 3RD PARTY ORGANISATIONS

Dataset	Supplier	Description	Limitations/Considerations	Access	Links
Marine Data Exchange - Geotechnical data	The Crown Estate	Geotechnical surveys gather information about the physical characteristics of the soils and rocks that make up the seabed. These surveys are vital to the development of a project. For an offshore wind farm, geotechnical data will inform foundation design. To collect geotechnical data, vibrocores and cone penetration tests (CPT) are usually carried out. The depth of these tests will vary depending upon the target depth of the activity.	Data formats are variable (some in AGS format and some only in PDF). Data are currently in separate survey datasets rather than database. Individual points can't be viewed spatially. Data are generally not released until after the Financial Investment Decision.	Open (for released data)	https://www.marinedataexchange.co.uk/content/info/geotechnical
Marine Data Exchange - Benthic data	The Crown Estate	Benthic Ecology surveys on the MDE can compose of the analysis of data collected by grab samples and/or benthic trawls. Grab sampling obtains quantitative seabed samples for biological and physical analysis.	Contains Particle Size Analysis data. Data are in individual surveys. Some data have been extracted and added to OneBenthic. Data are generally not released until after the Financial Investment Decision.	Open (for released data)	https://www.marinedataexchange.co.uk/content/info/benthic-ecology
Marine Data Exchange - Sedimentology data	The Crown Estate	Sedimentology encompasses the study of modern sediments such as sand, silt, and clay, and the processes that result in their formation, transport, deposition and diagenesis. Sedimentologists often use modern processes to interpret geological history. Sedimentology surveys on the MDE consist of studies focusing on sediment suspension and migration among other areas.	Data are generally not released until after the Financial Investment Decision.	Open (for released data)	https://www.marinedataexchange.co.uk/content/info/sedimentology
OneBenthic - Grab/core sediment data	Cefas	OneBenthic brings together disparate benthic datasets from grab/core, trawl and imagery surveys in a cloud-based platform. Contains Particle Size Analysis data from a range of surveys/sources including Marine Data Exchange,MDE, Aggregates sector, Eurobis., Cefas, Environment Agency, JNCC, NE, Defra, UK Benthos and NRW	Contains a useful compilation of Particle Size Analysis data. Some more recent potentially useful survey data are not released publicly yet if permission has not been given by the data provider (e.g. MPA datasets which haven't been fully reported on, some MDE data, POSEIDON, etc.).	Open (OGL) (for released data)	https://rconnect.cefas.co.uk/onebenthic_portal/ https://rconnect.cefas.co.uk/onebenthic_dataextractiongrabcore/
Marine Recorder	JNCC	Marine Recorder is a benthic survey data management system used widely within the UK's statutory nature conservation bodies to store and query benthic sample data across the UK's offshore and inshore waters. The system is able to store species occurrence data (with associated measurements), biotope information in the Marine Habitat Classification for Britain & Ireland and physical attribute data. The system maintains consistency and relationships between sample information, measurements and surveys allowing for accessible querying of the database.	Contains Particle Size Analysis data. Data are in individual surveys. Some data have been extracted and added to OneBenthic. Data are generally not released until after the Financial Investment Decision.	Open (OGL)	https://jncc.gov.uk/our-work/marine-recorder/#marine-recorder-data https://hub.jncc.gov.uk/assets/b9934e31-39b6-41f9-9364-d1e93db68307
Seabed Sediment Samples Irish Waters	INFOMAR	Location and details of sediment samples taken from the seabed, collected during surveys.	Contains Particle Size Analysis data.	Open	https://experience.arcgis.com/experience/3f2815ec89e745d2b65630429d06385c/page/Page-1/?views=Download-Vector-Datasets#data_s=id%3AdataSource_37-Marine_Download_Seabed_Survey_Vector_Data_IE_Waters_WGS84_1010%3A4
ICES - Contaminants and biological effects of contaminants in sediment	ICES	Temporal and spatial trend data for monitoring the environmental quality. For example, OSPAR, HELCOM, AMAP and ICES working groups.	Contains Particle Size Analysis data	Open	https://dome.ices.dk/views/ContaminantsSediment.aspx
Marine Environment Monitoring and Assessment National database (MERMAN)	BODC	MERMAN holds UK data collected to fulfil the UK's mandatory monitoring requirements under the Oslo and Paris Convention (OSPAR) Joint Assessments and Monitoring Programme (JAMP). These data are used in support of UK Marine Strategy and national assessments, such as Charting Progress 2 and are also supplied to EMODNET.	Contains Particle Size Analysis data	Open	https://www.seadatanet.org/
Seadatanet	Various	SeaDataNet is a pan-European infrastructure to ease the access to marine data measured by the countries bordering the European seas.	Contains some data, but not all. E.g. includes a snapshot of metadata for BGS Particle Size Analysis data, but this is not currently updated, and the data are not accessible from the portal (users are directed to BGS GeoIndex Offshore).	Mostly open / some restricted or available on request	https://www.seadatanet.org/

Oil and Gas site survey data - geotechnical	NDR / BGS / licensees / contractors	Oil and gas industry site survey data. Data includes multibeam bathymetry, seismic, sidescan sonar and geotechnical, seabed grab samples. NSTA can contact the licensee (current or former) to report the associated data. The metadata for these surveys are currently collated by BGS on behalf of MEDIN. Some data are accessible via NDR. Other data are held by the various organisations. BGS hold some legacy data (including bathymetry and seismic) and reports which may be transferred to NDR in future.	Data are not all accessible. Some data are accessible via NDR, and other data are held by various organisations. Some survey metadata bounding boxes are not very representative of the survey extent. Some geotechnical data are held in hard copy reports currently stored at BGS. Reports have not been scanned. Some positions/data have been extracted but are not visible in GeoIndex layers. These should be reviewed. Some core material available in the BGS Core Store.		https://webapps.bgs.ac.uk/services/ngdc/accessions/index.html
Other seabed grab data	Various	Other seabed data that are not currently accessible (e.g. research data in publications)	Some data may not routinely be supplied to data centres / data compilations such as BGS, MDE or OneBenthic and so are not readily accessible for easy input into national scale derived maps. Data flows may need improving.	Mixed	various
Other core data	Various	Other subseabed data that are not currently accessible (e.g. research data in publications)	Some data may not routinely be supplied to data centres / data compilations such as BGS or MDE and so are not readily accessible for easy input into national scale derived maps. Data flows may need improving.	Mixed	various

LIST OF GEOPHYSICAL DATA HELD BY 3RD PARTY ORGANISATIONS

Dataset	Supplier	Description	Limitations/Considerations	Access	Links
Marine Data Exchange - Geophysical data	The Crown Estate	Geophysical surveys often compose of multiple surveys, including magnetometer, side-scan sonar data, bathymetry and seismic surveys. The data generated by geophysical surveys during the planning stages of an offshore project forms a crucial part of the knowledge base. For an offshore wind farm this may be in ensuring that the turbine foundations are located and designed in the most appropriate and cost-effective way; for a marine aggregates license area, it may be in helping to map out where the aggregates resource is and to develop sustainable extraction plans.	Data are held within geophysical survey data series. Individual lines can't be viewed spatially. Data are generally not released until after the Financial Investment Decision.	Open (for released data)	https://www.marinedataexchange.co.uk/content/info/geophysical
NSTA Government seismic	NSTA / NDR	In 2015 and 2016, to support of offshore licensing rounds, the UK government funded the acquisition of four marine 2D surveys: 2015 – North Rockall Basin 2015 – Mid North Sea High 2016 – East Shetland Platform 2016 – South West Britain These provide a regional exploration dataset for almost all the UK's under-explored offshore shelf, in regions where no substantial activity has occurred in decades. These surveys are available for download via the UK National Data Repository.	May be issues when repurposing data for shallow geology. Some merged datasets are also available (Outer Moray Firth, Faroe Shetland Basin, Central North Sea, Northern North Sea). Data can be accessed from NDR (filter for Project ID OA_).	Open	https://ndr.nstauthority.co.uk/ (filter for project_id = OA__) https://www.nstauthority.co.uk/data-and-insights/data/themes/seismic/ https://opendata-nstauthority.hub.arcgis.com/search https://data.nstauthority.co.uk/arcgis/rest/services
NDR Commercial seismic	NSTA / NDR	Seismic Data from the previous (V1) National Data Repository, last updated on June 30th, 2021. Seismic Header Information: NDR2dseiseab Navigation information for all offshore 2D seismic surveys, as reported to BEIS OPRED in seismic survey close out reports. The NSTA did not create this data set and cannot vouch for its completeness or accuracy. NDR_3dseis Survey outline information for all offshore 3D seismic surveys, including those acquired using Ocean Bottom Node and Ocean Bottom Cable techniques, as reported to BEIS OPRED in seismic survey close out reports. The NSTA did not create this data set and cannot vouch for its completeness or accuracy. Reported Seismic Data: NDRSDS2D_Lines Navigation information for offshore 2D seismic surveys which had Post-Stack SEG-Y data available online in the legacy NDR, the data having been reported to the NSTA via the NDR. The seismic trace data has been migrated to the current NDR service, which also holds field and pre-stack seismic data online. Seismic data may be obtained from the NDR https://ndr.nstauthority.co.uk NDR_SDS_3D_Outlines Survey outline information for offshore 3D seismic surveys, including those acquired using Ocean Bottom Node and Ocean Bottom Cable techniques, which had Post-Stack SEG-Y data available online in the legacy NDR, the data having been reported to the NSTA via the NDR. The seismic trace data has been migrated to the current NDR service, which also holds field and pre-stack seismic data online. Seismic data may be obtained from the NDR https://ndr.nstauthority.co.uk	May be issues when repurposing data for shallow geology.	Open (for released data)	https://ndr.nstauthority.co.uk/ https://www.nstauthority.co.uk/data-and-insights/data/themes/seismic/ https://opendata-nstauthority.hub.arcgis.com/search

Oil and Gas site survey data	NDR / BGS / licensees / contractors	Oil and gas industry site survey data. Data includes multibeam bathymetry, seismic, sidescan sonar and geotechnical, seabed grab samples. NSTA can contact the licensee (current or former) to report the associated data. The metadata for these surveys are currently collated by BGS on behalf of MEDIN. Some data are accessible via NDR. Other data are held by the various organisations. BGS hold some legacy data (including bathymetry and seismic) and reports which may be transferred to NDR in future.	Data are not all accessible. Some data are accessible via NDR, and other data are held by various organisations. Some survey metadata bounding boxes are not very representative of the survey extent.	Mixed	https://ndr.nstauthority.co.uk/ Metadata - https://www.bgs.ac.uk/map-viewers/geoindex-offshore/ https://ogcapi.bgs.ac.uk/collections/offshore-oil-gas-site-surveys https://ogcapi.bgs.ac.uk/collections/offshore-geophysical-survey-lines https://webapps.bgs.ac.uk/services/ngdc/accessions/index.html
UK Onshore Geophysical Library (UKOGL)	UKOGL	The UK Onshore Geophysical Library (UKOGL) was established in 1994 to manage the archive and official release of 2D and 3D seismic data recorded over landward areas of the UK. It is a self-sustaining independent charity which receives limited funding from Government for specific projects of national importance. At the time the library was set up these data were dispersed, held on deteriorating media and were in real danger of being lost to the nation. The Library was founded to ensure that this resource was located, recovered, reconciled and saved for the national archive. Working with the North Sea Transition Authority (NSTA), the Library operates as a registered charity, funded by revenues raised from data sales and donations, with the continuing long term objective of bringing all available UK onshore seismic and other technical data into secure archival storage, while providing support, information and open access to its archives for all interested parties. This archive now plays an important part in data provision for activities seeking to achieve the national Net Zero targets.	Mainly onshore but contains some offshore data in a few locations. E.g. Coal Authority data.	Open (OGL) / Licenced (for data not available under OGL)	https://ukogl.org.uk/
High-resolution bathymetry data - Civil Hydrography Programme (CHP) (Admiralty Marine Data Portal)	UKHO / MCA	Systematic surveying of the UK's coastal waters is administered by the Maritime & Coastguard Agency (MCA) under the Civil Hydrography Programme, with technical oversight, data validation and onward charting undertaken by the UK Hydrographic Office. Under the programme, the MCA has issued a number of long-term commercial contracts to ensure accurate hydrographic information is gathered for updating the nation's nautical charts and publications.	Incomplete national coverage. Variable resolution of data.	Open (OGL)	https://seabed.admiralty.co.uk, https://www.gov.uk/guidance/the-civil-hydrography-programme
Other bathymetry data (Admiralty Marine Data Portal)	UKHO	Other bathymetry data provided to UKHO in addition to CHP data (e.g. public sector organisations, ports, etc.)	Variable resolution. Not all data are open.	Open (OGL) / Restricted	https://seabed.admiralty.co.uk, https://www.gov.uk/guidance/the-civil-hydrography-programme
High-resolution Bathymetry data - Marine Conservation Zones (MCZ)	Defra	Marine Conservation Zones (MCZs) are a new form of Marine Protected Area (MPAs) created under the Marine and Coastal Access Act 2009 which will protect a range of nationally important habitats and species. By protecting these species and habitats MCZs will contribute to a network of MPAs in the UK, together with existing MPAs (European Marine Sites, and marine elements of SSSIs and Ramsar sites) and other national designations being planned in Scotland, Wales and Northern Ireland. This means the MPA network will be a collection of areas that work together to provide more benefits than an individual area could on its own. Natural England and JNCC will provide detailed advice to Public Authorities on the sensitivity of MCZ habitats and species following designation.		Open (OGL)	https://seabed.admiralty.co.uk, https://jncc.gov.uk/our-work/marine-conservation-zones/

Marine Multibeam Backscatter Data from around the UK (2005 Onwards)	BGS / MCA / UKHO	The British Geological Survey (BGS) holds an archive of multibeam backscatter data from BGS, Maritime & Coastguard Agency (MCA) and other organisations. The data are stored within the National Geoscience Data Centre (NGDC) and the Marine Environmental Data and Information Network (MEDIN) Data Archive Centre (DAC) for Geology and Geophysics. BGS works with the partner DAC for bathymetry at the United Kingdom Hydrographic Office (UKHO) to archive backscatter data. The majority of the data were collected and processed for the Maritime and Coastguard Agency (MCA) under the Civil Hydrography Programme (CHP). Backscatter data is useful for seabed characterisation for geological and habitat mapping. View the backscatter image layer and download backscatter data (geotiff) via the BGS Offshore GeoIndex www.bgs.ac.uk/GeoIndex/offshore.htm. The data underlying the images are available on request enquiries@bgs.ac.uk. If further backscatter processing is required, BGS can provide a quote. View and download the related bathymetry data via the UKHO INSPIRE portal https://www.gov.uk/guidance/inspire-portal-and-medin-bathymetry-data-archive-centre.	Data are not harmonised in a single backscatter layer. Data quality varies by age. Some data contain RGB values rather than backscatter intensity return values which are less easy to compare data and mosaic together.	Open (OGL)	https://ogcapi.bgs.ac.uk/collections/offshorebackscatterareas https://www.bgs.ac.uk/map-viewers/geoindex-offshore/ https://webapps.bgs.ac.uk/services/ngdc/accessions/index.html?simpleText=backscatter
Seadatanet	Various	SeaDataNet is a pan-European infrastructure to ease the access to marine data measured by the countries bordering the European seas.	Contains some data, but not all. E.g. includes a snapshot of metadata for BGS geophysical data, but this is not currently updated, and the data aren't available from here (users are directed to GeoIndex Offshore).	Mostly open / some restricted or on request	https://www.seadatanet.org/
Gridded Bathymetry Cells (Admiralty)	UKHO	This service provides pre-built cells of bathymetry data which are created and updated with the latest bathymetry surveys available. The UK Hydrographic Office have done the hard work in conflating bathymetric source data sets giving priority to the most recent data to create 6 km2 cells with a gridded resolution of 10m.	Please note that not all cells have complete coverage. The underlying WMS gives an indication of the coverage within the cell. Paid service.	Licensed	https://gbs.admiralty.co.uk/
Bathymetry - EMODnet DTM (2022)	EMODnet	EMODnet-Bathymetry provides a service for viewing and downloading a harmonised Digital Terrain Model (DTM) for the European sea regions. The DTM is generated by the EMODnet Bathymetry partnership. Bathymetric survey data sets are being catalogued as acquired and managed by European data providers for all regions in the world. The current 2022 release of the EMODnet Digital Terrain Model has a grid resolution of 1/16 * 1/16 arc minute.	It is accepted that the accuracy and precision of the gridded data will vary over the basins in question. No new data has or will be collected specifically for this project.	Open (CC-BY 4.0)	https://emodnet.ec.europa.eu/en/bathymetry / https://emodnet.ec.europa.eu/geoviewer/
Bathymetry - GEBCO DTM (2024)	BODC	GEBCO's current gridded bathymetric data set, the GEBCO_2024 Grid, is a global terrain model for ocean and land, providing elevation data, in meters, on a 15 arc-second interval grid. It is accompanied by a Type Identifier (TID) Grid that gives information on the types of source data that the GEBCO_2024 Grid is based on.		Open	https://www.gebco.net/data_and_products/gridded_bathymetry_data/
Bathymetry data - Defra's Marine Digital Elevation Model (DEM)	Defra	This dataset contains Digital Elevation Model (DEM) file download (north) files for the waters surrounding the United Kingdom to a depth of 200 metres. This resolution is 1 arc second covering primarily the coastal areas. Geographic coordinates were used throughout, and the DEM is referenced to the ETRS89 datum horizontally and Chart Datum vertically. All input data was made available under licence by the UK Hydrographic Office (UKHO) to Defra for the purpose of DEM creation. Attribution statement: © Crown Copyright	Data provided within 2 separate geographic areas, UK North and UK South. Not full coverage.	Open (OGL)	https://www.data.gov.uk/dataset/ff23520f-ecb2-4a53-890f-ce0cb13b57ac/defra-s-marine-digital-elevation-model-dem-1-arc-second-north, https://www.data.gov.uk/dataset/e05d3f72-8e67-4cc0-aa2e-abb79e14243c/defra-s-marine-digital-elevation-model-dem-1-arc-second-south
SurfZone Digital Elevation Model (DEM) - 2m (2019)	EA	The SurfZone Digital Elevation Model (DEM) was produced in 2019. Combining LIDAR and near-shore multibeam SONAR Bathymetry elevation data, it is the best currently available Digital Elevation Model (DEM) covering the inter-tidal zone produced by the Environment Agency. The EA SurfZone DEM 2019 is supplied as a tiled raster dataset in GeoTiff format. Each tile is 5km * 5km and aligned to the Ordinance Survey National Grid. Each pixel represents 2 metres spatial resolution on the ground and elevations are presented in metres to Ordinance Survey Great Britain using the OSGM'15 and OSTM'15 transformation models. Elevations are referenced to Newlyn except for the Isles of Scilly which is referenced to St Marys.	Limited coverage; Limited to nearshore environment	Open (OGL)	https://environment.data.gov.uk/dataset/77e6f743-d708-4909-a80f-9510b7dbaa16
Oceanwise Marine Themes Digital Elevation Model (DEM) - 1 arc second / 6 arc second	Oceanwise	Marine Themes Digital Elevation Model (DEM) is a seabed surface model, comprising detailed and accurate data of the seabed. The dataset utilises the most recent commercial single and multi-beam survey and lidar data available. A coverage layer is also provided to ensure the source of the data is always clearly defined. All available surveys are assessed and carefully selected in a deconfliction process.	Licensed product (e.g. BGS doesn't have access)	Licensed	https://www.oceanwise.eu/data/dem/