Action Plan for Marine Reference Data

Initial Report

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Contents

Executive Summary

This document presents an action or implementation plan for the creation, maintenance and dissemination of marine reference data. It supports the overall MEDIN aim of providing a robust framework for the management and dissemination of marine data (including data products) to users and relies on and gives rationale to improving the coordination and management of marine data. The action plan will be implemented by providing guidance and resources to data holders that add value to their existing processes. This approach will be supported by projects to develop these resources and to improve and harmonise the content of reference datasets over time. The plan will be reviewed every 6 months (starting Oct 2011) and, where appropriate, an update to the plan produced.

Users have consistently identified the availability and support of data products that underpin many common marine activities and applications as a high priority. The development and coordination of marine reference datasets is a key objective of the current MEDIN Business Plan. The issue of how these data products should be compiled from basic data and how they contribute to a common marine evidence base was recently highlighted at the Marine Science Coordination Committee (MSCC) meeting on 30 March 2011.

The action plan describes key aims and principles that are common to all data products, including how these data products inter-relate. It then identifies and addresses issues that are specific to each data type and recommends actions that MEDIN can instigate and manage in collaboration with data holders and other interested parties. The plan aims to take full account of recent and existing initiatives and will build on these in all cases. Any actions recommended by MEDIN will require the full support and collaboration of data holders. This aspect is crucial to the plan's success and as a consequence the timing of its implementation is dependent on it.

The action plan includes a recommendation for the MEDIN portal to provide direct access to reference data being published under the Open Government Licence, either by the portal storing a copy of the data or providing a link to it. Users will discover the data through the publication of its metadata via the MEDIN (or other) portal, and then either being able to download the actual data in a suitable format or connect to it via a web service. Licence conditions will clearly explain how users can use the data. The portal will allow users to search by names and areas included in the Marine Gazetteer plus in the future to search by administrative units e.g. by Marine Plan Area, either by conducting a spatial query or through a system of linked identifiers.

The ultimate aim is to replicate what users can see (and hence download) through MEDIN, data.gov and potentially other portals via a distributed system of common datasets and shared services. The inter-relationship between the MEDIN and the data.gov search capability is currently being worked on and will act as a test case for potential future work involving single (or automatically replicated) instances of reference datasets, and shared or interoperable services, accessible through each portal which and designed and operated to serve different user needs.

Glossary

The following abbreviations are used in this document:

Acronym	Description	Reference (if applicable)
CAD	Computer Aided Design	
CEFAS	Centre for Environment, Fisheries and Aquaculture Science	http://www.cefas.co.uk
COTS	Commercial Off The Shelf	
COWRIE	Collaborative Offshore Wind Research Into the Environment	http://www.offshorewindfarms.co.uk/Pages/COWRIE/
CRS	Coordinate Reference System	
CS-W	OGC Catalogue Services - Web	http://www.opengeospatial.org/standards
DBA	Database Administrator	
DMS	Document Management System	
EIA	Environmental Impact Assessment	
EMS	Environmental Management System	
EOR	Extent of the Realm	
EPSG	European Petroleum Survey Group	http://www.epsg.org/
FTP	File Transfer Protocol	
GES	Good Environmental Status	http://ec.europa.eu/environment/water/marine/index_en.htm
GI	Geographic Information	
GIS	Geographic Information System	
HAT	Highest Astronomical Tide	
INSPIRE	Infrastructure for Spatial Information in Europe	http://inspire.jrc.ec.europa.eu/
ISO	International Organisation for Standardisation	http://www.iso.org/
LAT	Lowest Astronomical Tide	
LMO	Legally Mandated Organisation	
MCMS	Marine Consents Management System	
MEDIN	Marine Environmental Data and Information Network	http://www.oceannet.org/
MHW(S)	Mean High Water (Springs)	
MLW(S)	Mean Low Water (Springs)	
MSCC	UK Marine Science Coordination Committee	
MSFD	Marine Strategy Framework Directive	http://ec.europa.eu/environment/water/marine/index_en.htm
MSL	Mean Sea Level	
MSP	Marine Spatial Planning	e.g. http://www.gsdi.org/
NGO	Non Governmental Organisation	
OGC	Open Geospatial Consortium	http://www.opengeospatial.org/
OSGB	Ordnance Survey of Great Britain	http://www.ordnancesurvey.co.uk
OSNI	Ordnance Survey of Northern Ireland	http://www.dfpni.gov.uk
SDI	Spatial Data Infrastructure	e.g. http://www.gsdi.org/
TNA	The National Archives	http://www.nationalarchives.gov.uk/
UKDMOS	UK Directory of the Marine Observing Systems	http://www.ukdmos.org/
UKLII	UK Location Information Infrastructure	http://location.defra.gov.uk/
UKLP	UK Location Programme	http://location.defra.gov.uk/
UKMMAS	UK Marine Monitoring and Assessment Strategy	http://www.defra.gov.uk/marine/science/monitoring/ukmuk-background.htm
URI	Uniform Resource Identifier	http://www.w3.org/Addressing

URL	Uniform Resource Locator	http://www.w3.org/Addressing
WFS	OGC Web Feature Service	http://www.opengeospatial.org/standards
WMS	OGC Web Mapping Service	http://www.opengeospatial.org/standards
WMTS	OGC Web Mapping Tiling Service	http://www.opengeospatial.org/standards

Note that acronyms of organisations holding or publishing data can be found in Annex 2.

1. Introduction

This document presents an action or implementation plan for the creation, maintenance and dissemination of marine reference data. It has been created on behalf of, and is owned by, the UK's Marine Environmental Data and Information Network (MEDIN).

It aims to address the challenges that have frustrated users of marine reference data for many years, taking into account recent comments from (e.g.) the UK Marine Monitoring and Assessment Strategy (UKMMAS) and the authors of the Charting Progress 2 Report, and the recommendations of the Marine Data Policy Review commissioned by MEDIN and undertaken by the Crown Estate.

The plan introduces a process model for marine environmental data products that, although applied here to reference data, is equally applicable to other types of data including (e.g.) human activity and pressure data that are important inputs to marine spatial planning. Note that 'product' in this case means a dataset that has been created from source data, or derived from another data product, and made available to users through some form of transformation, replication or view service. The term 'product' does not imply there is a licence or other fee charged for access to the data, although this may be the case.

The process takes into account the different and varied sources of marine data, how they are processed and quality controlled, and the work required synthesizing the data into products. The impact of different management and data processing practices is explained and changes to these practices necessary to achieve greater re-use and fitness for purpose are described.

The action plan and process model draws down on best practice data management principles that are extant within the INSPIRE Directive and the UK Location Strategy and are now being implemented in the UK via the UK Location Programme (UKLP). As a consequence, the approach adopted by this plan, its outcomes and deliverables will provide direct input the marine component of the UK Location Information Infrastructure (UKLII) that is being delivered as part of the UKLP.

The action plan has been prepared on behalf of the marine data community via MEDIN by independent marine data expert, Dr Mike Osborne, in liaison with key users of marine data, relevant data holders and the technical teams delivering the UKLII.

2. Reference Data

An important area identified by MEDIN partners is the need to improve the availability and quality of key datasets that underpin many applications. This need, the definition of which datasets should be included, the problems and issues being experienced by users were all identified in a series of workshops held during the period 2008-2009. Following these workshops, a specification for each dataset was determined and is used here to inform the action plan.

These datasets, termed reference data, can be defined as collectively providing real world context and are found to underpin the majority of marine and coastal activities. They also support, provide

input or act a surrogate for other applied datasets. User priorities for reference data were identified as:

- Coastline (MHW(S), MLW(S), LAT)
- Tidal Surfaces (e.g. Mean Sea Level)
- Offshore Infrastructure
- Coastal Infrastructure
- Managed and Protected Areas
- Elevation (Bathymetry)
- Coastal and Sea Bed Geology
- Shipwrecks and Obstructions
- National and Fisheries Limits
- Marine Gazetteer (incl. Sea Areas)

INSPIRE Themes

It should be noted that many of these are themes covered by the INSPIRE Directive and map almost directly onto terrestrial feature types included in the UKLII. In addition to the above reference datasets, users have identified a number of application specific datasets of key importance to, for example, marine spatial planning. These datasets include habitats and biotopes, species distributions, shipping and fishing activity. Combinations of reference and activity datasets are used to derive human pressure. A full set of priority datasets required for marine planning is presented as Annex 1. The reference and other highest priority datasets contained in this action plan are included.

Many of the above datasets are generated by or held within different public sector organisations to meet a specific, usually internal, purpose and not made available or suitable for wider use. A general lack of cooperation or data sharing in the past means comparable datasets are often held by more than one organisation, leading to inconsistencies in data records and attribution. The outcome is that users requiring access to this data repeatedly re-format or de-conflict the same data, or risk using it inappropriately.

The UKLP has recorded that up to 25% of overall project costs are attributable to discovering, accessing and transforming data to make it ready for use. This action plan addresses these issues with the aim of creating a single definitive source (per geographic area and specific resolution) for each dataset that are easily accessible by the marine community via MEDIN or UK Location portals.

It should be noted that some work was undertaken following a call (by MEDIN) for proposals in 2009. This resulted in the part creation of a Marine Gazetteer, a commentary on some of the issues de-conflicting different infrastructure datasets and fuller and more accurate heritage data stored in the National Monument Record. This action plan builds and improves on this initial work by being much more prescriptive in the actions necessary to achieve the desired outcomes and specifies a number of projects that data holders, or third parties working on their behalf, can bid against and undertake.

3. SDI Principles

This action plan is founded on current best practice data management principles which are enshrined within (e.g.) the UK Location Strategy and the INSPIRE Directive, for which the manifest

outcome is a Spatial Data Infrastructure (SDI). While these principles were developed for data with a spatial or geographic component, they are equally relevant to non-spatial data and data products.

These principles are as follows:

- Data is considered a valuable resource and is managed accordingly
- Data is collected once and managed such that it can be used many times
- Data is collected in accordance with industry best practice to a described standard using common well defined terms
- Data is easily discoverable and well described (i.e. have accompanying metadata and specifications)
- Data is assigned an owner with the responsibility of managing the data and championing the management of data according to these principles
- Data is referenced geographically (aka spatially or geospatially) where relevant to either:
    - a set of coordinates (e.g. British National Grid) or
    - a linked feature with a spatial reference (e.g. Postcode)
- Data is accessible to users under licensing terms and conditions that are clear, understandable and, wherever possible, consistent.

These principles can be applied to marine data and, by taking user need into account within an appropriate process, will result in discoverable and accessible datasets that are fit for use.

4. Process for Marine Reference Data

The above SDI principles can be applied to the creation of reference and other marine datasets, resulting in data products that are described, maintained and easily accessible. The methods and processes required to achieve this vary from dataset to dataset and are described below. These are then used to inform the action plan presented for each reference dataset in the following sections.

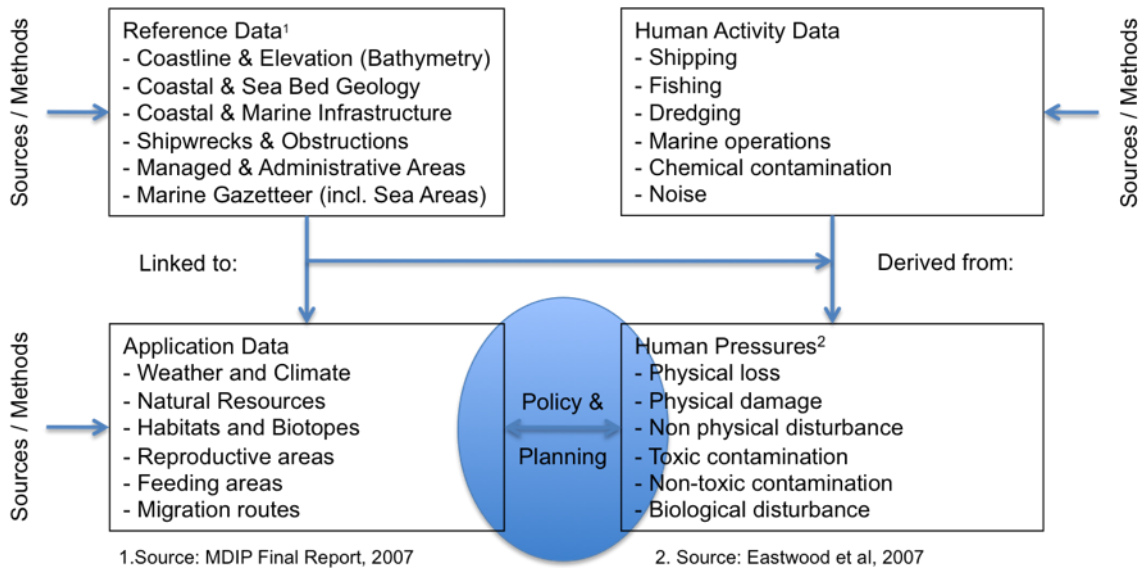
For certain datasets, a responsible owner can be readily identified, which may be the same as the Legally Mandated Organisation (LMO) defined under the INSPIRE Directive. The plan of action for these datasets is based on MEDIN contacting the data owner and working with them to ensure that the principles are adhered to, helping them to improve the data, (e.g.) where it is does meet user requirements, and financially, where this is warranted and there is budget available.

For other datasets, their creation involves additional parties and the methods used are more complex, either because multiple copies of comparable datasets exist, and there may be variance between them, or each data product requires input from multiple sources and different organisations. In these cases, the process clearly defines and describes each input data source and methods used, and its purpose, and determines the role of each party within the overall process. In these cases, the action plan is based on contacting each party involved and agreeing and, if necessary, revising their individual roles accordingly.

Existing initiatives, such as the UKMMAS Evidence Groups, provide input to the process modelling, as required. Where possible, a LMO for each dataset will be identified and this confirmed by contacting The National Archive (TNA). The organisation identified as the LMO will be requested to take ownership of the data and, where other parties are involved, take the leading role. MEDIN will provide support, and performance monitoring, as required. TNA has confirmed it is able to help resolve any difficulties should they arise.

A generalised process model incorporating the above categories of marine data is illustrated as Figure 1. The figure shows how each dataset is derived from multiple sources and methods but also how each dataset is linked i.e. habitat interrelates with coastal and seabed geology and human activity data and reference data is used to derive human pressure. Recognising these linkages and dependencies provides the basis for an integrated process model and streamline processing of data.

Figure 1 A Generalised Process Model for Marine Data



The above process provides a method for the creation and management of marine evidence when coupled with other sources of information. This information, as well as informing policy and delivery directly, also provides input the process. These inputs include:

- Standards and methods for data acquisition (survey)
- Analytical and interpretative standard and techniques (analysis)
- Dictionaries or lists of standard terms and definitions (vocabularies)
- Standards and specifications for metadata, data and exchange
- User specifications, use cases etc.

All of the above are essential to the generalised process model and can be considered to provide the management framework that supports it. The development of the management framework and the standards and resources that support it are key MEDIN objectives.

5. Licensing

Many of the issues identified by users when attempting to access data relate to the terms and conditions under which data is released (or not) by data holders. There may be good reasons for this, such as issues of safety, national security or commercial protection, but seemingly similar (e.g. public sector) organisations often take a different approach to such issues, leading to complexity and difficulties amongst users when trying to re-use data or combine it from different providers to create an aggregated dataset or service.

In many circumstances restrictions not only impact directly on user access but also have consequences when data is being used as input elsewhere. This is illustrated clearly in Figure 1 where reference data is linked to other (e.g. human pressure) data. Data holders attempting to protect data in some way may prevent its re-use entirely, or only release it in a reduced way (e.g. at lower resolution) to make it less valuable and possibly less useful to the end user. The linkages between datasets are lost, or severely restricted, and the shortcomings in the reduced data are propagated to subsequent data products, hence again lowering their value, potential usefulness and preventing interoperability with the primary datasets.

Recent policy changes and work in Government has introduced the 'Open Government Licence' (Ref http://www.nationalarchives.gov.uk/doc/open-government-licence/), based on the creative commons initiative. When adopted by data holders, this simplifies the way data is accessed by users and protects the owner and user alike. For many datasets, such as those being released under Ordnance Survey OpenData Ref: http://www.ordnancesurvey.co.uk/oswebsite/products/os-opendata.html), there are no restrictions on use.

As a consequence, this action plan calls for all marine data holders to release data under the Open Government Licence or, where they do not, provide a good reason why this licence is not applicable. It should be noted that the plan is therefore consistent with other Government transparency initiatives such as data.gov.uk, led by the Cabinet Office (Ref: http://www.cabinetoffice.gov.uk /transparency).

A downside to this approach is the availability of funding to support and improve data. It is not unreasonable to grant data holders the right to charge for data where this contributes directly to its maintenance, and without which the dataset would fall into disrepair, and not be in the users' best interest. However, there are certain datasets that should always be publicly funded and free at the point of use (or re-use) without restriction. A landmark case recently has declared that addressing falls into this category and will be made available in this way. Similar datasets exist in the marine and coastal sector and these are identified as part of the action plan.

In every case, a licence should accompany a dataset that is being released which clearly define the term and conditions of use and addresses any liability or other issues. The Open Government

Licence provides the standard for open data. Where there are restrictions on use the licence should be based on the Open Government Licence and introduce terms in tiered away based on the creative commons initiative. Each tier should be consistent across all datasets being released in a similar way.

Table 1 Tiered Licensing

Licence	Terms and Conditions	Reference
Open Government Licence	Free and No Restrictions on Use	http://www.nationalarchives.gov.uk/doc/open-government-licence/
	Free to View. Chargeable to Download	
	Chargeable to View and Download	

More information can be found in UK Location Operational Guidance Document Part 2 - Licensing and Charging (Ref: http://location.defra.gov.uk/wp-content/uploads/2010/04/Data-Sharing-Operational-Guidance-Part-2-v1-0.pdf).

6. Dissemination

Access to actual data is the ultimate goal for users. This is achieved by users being able to discover data through the publication of metadata via the MEDIN (or other) portal and then either:

- downloading the actual data in a suitable format or
- connecting to it via a web service.

In doing either of these things, it is common to present users, and ask them to agree, with the licence conditions. There may be a requirement to ask users to submit a licence fee or prevent access to the data in some way via a system of rights management. As stated above the licence conditions will clearly explain how users can use the data.

The MEDIN portal already provides the ability for data holders to publish their metadata and for users to discover this data using the MEDIN search facilities. Being able to search by names and areas included in the Marine Gazetteer could be included in a future release. It could also be possible to search by administrative units e.g. by Marine Plan Area. This would entail these datasets being published on the MEDIN portal and then being made accessible to the search engine, either by conducting a spatial query or through a system of linked identifiers.

MEDIN has plans to develop the portal to provide direct access to reference data, which ideally will be published under the Open Government Licence. How this could be achieved, and what security may be required, will need to be considered. However, any solution is likely to involve either the portal storing a managed copy of the data as the published version of the original source or, preferably, providing a link to the original dataset, which is stored on the data owners' systems. Options that may be open to data holders requiring access restrictions include view only, with or

without restrictions on screen resolution or content. The ultimate solution will involve and be governed by the wishes of the data holder in each case.

The ultimate aim is to replicate what users can see (and hence download) through MEDIN, data.gov and potentially other portals via a distributed system of common datasets and shared services. The inter-relationship between the MEDIN and the data.gov search capability is currently being worked on and will act as a test case for potential future work involving single (or automatically replicated) instances of reference datasets, and shared or interoperable services, accessible through each portal which and designed and operated to serve different user needs.

It would be beneficial if the management process for reference data includes the ability for users to comment on existing and request access to new datasets. Ultimately, MEDIN may wish to facilitate users being able to submit amendments and new data, which are then passed to the relevant data owner for consideration. The solution on how to achieve this aim is beyond the scope of the current action plan.

7. Action Plan Overview

The different processes are categorised below and described more fully for each dataset in the following sections

Status	Priority Actions	Follow Up Actions
A Single organisation has management responsibility / interest in a single dataset of the same data type e.g. Territorial Seas Limits (UKHO)	1) Review current status, including any ongoing relevant projects to improve or publish the dataset 2) Contact owner and revise status as required 3) Determine if possible LMO and confirm with TNA 4) Determine publication timeline and level of licensing 5) Provide metadata and publish 6) Provide link or data to MEDIN portal	1) Include data in search engine if appropriate 2) Link data to policy / legislation 3) Match data to instrument or appropriate boundary 4) Link data to underlying data as appropriate 5) Provide generalisations where required
Multiple organisations have management responsibility / interest in two or more datasets comprising similar or overlapping data types	1) Review current status, including any ongoing relevant projects to improve or publish the dataset 2) Identify all interested parties 3) Determine and contact primary data owner (and if possible LMO confirm with TNA) 4) Determine method changes including any cost implications 5) Implement method changes 6) Determine publication timeline	As above

e.g. Submarine Cables (UKCPC, UKHO, MMO etc)	etc, as from 4 above	
The dataset is a composite of two or more datasets belonging to one or more third parties e.g. Elevation (Bathymetry) (UKHO receives data from many third parties and acts as custodian)	1) Review current status 2) Identify all interested parties and data sources 3) Determine and contact primary data owner etc as from 3 above	As above
The dataset is derived (in part or in whole) from a data product belonging to a third party e.g. SAC boundaries (JNCC) derived from depth contours	1) Review current status 2) Identify owner, interested parties and underlying source data 3) Determine and contact primary data owner etc as from 3 above	As above

8. Reference Data Action Plan

An action plan for each reference dataset is contained in the following sections. Each one follows the template below:

- Name
- Description
- Owner
- Other Interested Parties
- Status
- Current Licence
- Current Process
- List of Specific Actions

8.1 Coastline

Name	MHW (Spring Tides in Scotland) MLW (Spring Tides in Scotland) LAT (0 m relative to Chart Datum) Extent of the Realm (EOR) UK Baseline Potentialother Tide Lines (e.g. HAT, MSL)
Description	The line where shore and waters meet. Shoreline and coastline are generally used as synonyms (IHO Dictionary, S-32, 5th Edition, 858, 4695). Coastline may relate to a specified tideline (MHW, MHW(S), MLW, MLW(S), LAT), may include 'closing lines' and may vary according to scale, product and derivation. Different jurisdictions use different definitions (e.g. MHW is used in England and Wales, MHWS in Scotland, although there are exceptions (see McGlashan et al, 2004 for details).
Owner	There are various sources of coastline but in the UK most are derived from Ordnance Survey (OSGB and OSNI), the UK Hydrographic Office (UKHO), which in parts has OS mapping as its source, or captured from Earth Observation. The originator depends on which shoreline is of interest. There are four coastlines that are commonly recognised and available: 1) Mean High Water (Springs in Scotland) from OS 2) Mean Low Water (Springs in Scotland) from OS 3) 0 metre contour as referenced from Chart Datum (or Lowest Astronomical Tide - LAT) from UKHO. Different scales of chart use different resolution of coastline and there are discontinuities between charts of similar and different scale levels. In addition there are 2 quasi coastlines which have significance in UK Law: 4) Extent of the Realm (EOR) from OS partially derived on MLW(S) with 'marine extensions' e.g. around piers 5) The UK baseline from UKHO, determined from the 0 metre contour, with modifications e.g. 'straight baselines' and 'bay-closing lines' (see e.g. Andersen, David (2008). Modern Law of the Sea, Martinus Nijhoff, p452). Other commonly used sources of (Global and EU) coastline include:

	1) World Vector Shoreline (1:250,000) (see http://gcmd.nasa.gov/records/GCMD_WVS_DMA_NIMA.html) (used in the GEBCO dataset). 2) NGA Prototype Global Shoreline (1:250,000 tbc) (see http://dnc.nga.mil/NGAPortal/DNC.portal?_nfpb=true&_pageLabel=dnc_portal_page_72). 3) EC Corine land cover 2000 coastline (1:100,000) (http://www.eea.europa.eu/data-and-maps/data/corine-land-cover-2000-coastline).
Interested Parties	The Extent of the Realm and the Mean High Water (Springs) is available in OS Boundary-Line. These are derived from different sources of topographic mapping (and real world surveys which may be not have an equivalent topographically mapped feature) in collaboration with the Boundary Commissions for England, Wales, Scotland and Northern Ireland (e.g. http://www.boundarycommissionforengland.org.uk) The Law of the Sea section of the UKHO maintains the model of the UK baseline (including straight baselines and bay-closing lines) from which the Territorial Sea and other maritime areas (see National and Fisheries Limits) is measured and provides snapshots of the limit lines when required. UKHO LOS also provides FCO and UK enforcement authorities or agencies with a definitive statement on what jurisdiction applies to any given position at sea when requested.
Status	The Mean High Water (MHW Springs in Scotland) coastline is available in vector format in a range of OS products at different scale levels and with different provenance and maintenance regimes. It is apparent in: OS Strategi (Feature Code 5110) at small scale (1:250,000) (see http://www.ordnancesurvey.co.uk/oswebsite/products/strategi/pdf/strategi_userguide.pdf). Meridian 2 (Feature Code 6200) in which the coastline is derived from Landranger 1:50,000 database (see http://www.ordnancesurvey.co.uk/oswebsite/products/meridian2/pdf/meridian2userguide.pdf). Note MLW is mentioned under Land-Line (now withdrawn) but is it product? OS VectorMap District (Feature Code 25604) (MLW Line 25605) at medium scale (1:25,000) (see http://www.ordnancesurvey.co.uk/oswebsite/products/vectormap/district/techinfo.html). OS Boundary-Line (Extent of the Realm is seaward boundary, MHW(S)

	Feature Code 0071) from original source compilation is the boundary alignments, textural descriptions contained in the Statutory Instruments and is digitised against 1:10,000 scale raster mapping. The Territorial Waters Jurisdiction Act 1878 and the Territorial Waters Order in Council 1964 confirm that the extent of the realm of Great Britain as used by Ordnance Survey is properly shown to the limit of mean low water for the time being, except where extended by Parliament. (see http://www.ordnancesurvey.co.uk/oswebsite/products/boundaryline/pdf/userguide.pdf). OS VectorMap District MHW(S) Feature Code 15604; MLW(S) Feature Code 15605) (see http://www.ordnancesurvey.co.uk/oswebsite/products/vectormap/local/docs/os-vector-map-local-user-guide.pdf). OS MasterMap Topography Layer (Feature Type osgb:meanHighWaterLine; osgb:meanLowWaterLine) (descriptiveGroup "Tidal Water"; descriptiveTerm "Mean High Water (Springs)"; make "Natural" (see http://www.ordnancesurvey.co.uk/oswebsite/products/osmastermap/userguides/docs/OSMMTopoLayerUserGuide.pdf). The UKHO does not publish the UK baseline. However, it is apparent in maps of UK Territorial Seas Limits (see http://www.ukho.gov.uk/ProductsandServices/Services/Documents/UK%20Territorial%20Sea%20Limits.pdf).
Licence Conditions	OS Strategi, Boundary-Line, Meridian 2 and Vector Map District are currently available from OS OpenData. OS VectorMap Local and MasterMap Topgraphy Layer are available on commercial terms and are included in the Public Service Mapping Agreement. More details at: http://www.ordnancesurvey.co.uk/oswebsite/products/pricing/full_pricelist.pdf http://www.ordnancesurvey.co.uk/oswebsite/business/sectors/government/ The UKHO coastline data is contained within its chart derived datasets (Electronic Navigational Charts) under a fee paying re-use licence. See http://copyright.ukho.gov.uk/ for details.

Uses and Comments	MLW, or more accurately the Extent of the Realm (EOR) found in Boundary-Line, marks the seaward edge of County, District etc jurisdictions and therefore is the boundary of terrestrial planning. Marine planning intends (tbc) to use MHW as the land boundary of marine planning i.e. there is (deliberate) overlap between the two systems. VMD = 10K Raster Boundary-Line = 10K Raster or in places OSMM Topo or as defined by Boundary Commissions Currently it is common for marine practitioners to use the World Vector Shoreline (WVS) for general mapping. The WVS is used as the land boundary for SeaVox Sea Areas and the MEDIN extensions (see Marine Gazetteer below). OS has been sent a draft copy of the plan for Coastline for review and the author is awaiting comment.
List of Specific Actions	1) MEDIN to take leading role on behalf of marine community in engaging with Ordnance Survey on coastline survey and mapping issues. This fact to be published on the MEDIN portal soliciting comment and facilitated by establishing a UK Coastline Mapping Working Group. 2) Organisations deriving data with coastline content should be encouraged to adopt one of the OS datasets and to engage with OS to ensure fitness for purpose. Note that OS VectorMap District and Boundary Line are available on OS OpenData. UKHO to be encouraged to adopt OS digital data at relevant output resolution for chart production. 3) OS to standardise survey and production of MHW(S) and MLW(S) across all of its products. This to be based on definitive depiction of coastline at highest practicable resolution. 4) UKHO to publish UK base line including and excluding straight baselines and bay-closing lines (two datasets).

8.2 Elevation (Bathymetry)

Name	Source: XYZ SBES / Lidar / Transects / Profiles XYZ MBES GSF / RAW MBES Product:

	Charted and Non Charted Depth Contours Charted and Non Charted Depth Areas (value range) Charted and Non Charted Spot Heights / Soundings Digital Elevation Model (DEM) Triangulated Irregular Network (TIN)
Description	The elevation of the Earth's surface relative to a defined datum, which may or may not be geodetic. Elevation is depicted as a raster grid, TIN, contour or as a collection of points (spot heights or soundings). Note INSPIRE Elevation Theme includes coastline which is considered separate here (see above).
Owner	The UK Hydrographic Office is MEDIN recognised DAC for bathymetry. However, UKHO collates bathymetric data from a range of sources from the public and private sector. Generally, the data is owned by the Crown, another public body e.g. NERC or the private sector. UKHO acts as custodian for the data it holds and acts according to the terms by which that data is supplied.
Interested Parties	Many different organisations acquire bathymetric data during hydrographic, scientific, other surveys and opportunistically (i.e. vessel tracks). Examples include: The Channel Coastal Observatory (CCO) acquires coastal and marine elevation data as part of its remit. The data is available under a free licence from the CCO portal (see http:// www.channelcoast.org). Port and Harbour Authorities Energy and Water Companies Conservation Agencies (SNH, CCW, NE, DOENI, JNCC) British Geological Survey Local Authorities
Status	In recent years the MCA (who is responsible for the CHP in cooperation with UKHO) has encouraged the coordination of hydrographic surveys, facilitated by the public sector MOU and the Civil Hydrography Annual Seminar. MARG (HBDSEG) has proposed a national seabed survey. A likely (but unknown) majority of all systematically surveyed data is submitted to UKHO. UKHO uses the data its holds in the production of charts, which in turn

	support a range of products (e.g. GEBCO, EMODNet, SeaZone HydroSpatial). Defra has commissioned the development and maintenance (over 3 years) of a Digital Elevation Model of the UKCS. The model will use survey data as input and will be updated as new surveys are undertaken.
Licence Conditions	UKHO currently licences bathymetry data under a fee paying re-use licence. See http://copyright.ukho.gov.uk/ for details. An MOU brokered by the MCA makes XYZ data (and MBES data in GSF and RAW format) obtained under available to the public sector. It is understood that use of the Defra DEM by the public sector has been negotiated as part of a direct agreement between Defra (on behalf of HMG) and UKHO. However, use outside the public sector may not be permissible due to UKHO licence restrictions.
Uses and Comments	It has been proposed that Crown data (as well as some other public sector data) is made available free of charge from the DAC portal and this is awaiting construction. The UKHO currently employs QA and other processes that renders source data suitable for input to navigation but reduces its suitability for other purposes (e.g. shallowest depths are selected when the resolution of MBES data in reduced). Modern MBES surveys usually comprise a range of outputs that are useful to different users. These include RAW and GSF formats and interpreted results e.g. of backscatter. These outputs vary (due to reasons of specification, instrumentation used and management) and therefore are not consistently available for all datasets. The International Association of Oil & Gas producers (OGP) is attempting to streamline and improve the exchange and use of seabed survey data through its Seabed Survey Data Model Task Force (see http://www.epsg.org/ssdm.html). GSF specification is found at http://www.ldeo.columbia.edu/res/pi/MB-System/formatdoc/gsf_spec.pdf.
List of Specific Actions	1) The UKHO DAC portal to be made operational as soon as practically possible, with data held in the DAC made available under the Open Government Licence. 2) The DAC to include no less than all CHP data but hopefully more. If needed, UKHO should request permission from data owners for their data to be included in the DAC portal.

	3) Strong links to be established between the Bathymetry DAC and Marine Geology DAC to allow instant cross matching of survey outputs. (This could be extended to other portals e.g. CCO). 4) All public sector bodies to publish their survey plans at least six months in advance with coordinating body (MCA) who will consult widely to drive cross sectoral priorities and efficiency. 5) UKHO to amend its processes to remove limitations on wider use. 6) MEDIN to keep abreast of OGP SSDM task force with a view to adopting and influencing it, as appropriate.

8.3 Tidal Surfaces

Name	Vertical Offshore Reference Transformation
Description	A model of the different states of the tide in space relative to each other, adjacent land datum and to a common datum (e.g. GRS-80 Ellipsoid). Tidal surface models are used to transform elevation data to a difference reference frame e.g. Chart Datum to Ordnance Datum (Newlyn) and to correct (more accurately and efficiently) survey soundings to a standard datum e.g. Chart Datum.
Owner	UK Hydrographic Office has invested in the Vertical Offshore Reference Frame (VORF), a series of separation grids, zones of validity and a Windows application to undertake single and bulk transformations. It was developed by University College of London with contributions from the Proudman Oceanographic Laboratory (POL) and the Danish National Space Centre (DNSC), with input data provided by numerous third parties.
Interested Parties	Ordnance Survey Coastal Authorities Channel Coastal Observatory NERC (POL / BGS) Commercial Survey Companies
Status	VORF is an essential resource, akin to the Ordnance Survey Geodetic Models and Transformations (OSGM02, OSTN02). In its present form VORF is not producing the wider public benefit that it should. See http://www.cege.ucl.ac.uk/research/geomatics/vorf for more information.
Licence Conditions	UKHO releases either VORF or key data from VORF to selected organisations on request. It has been made available to CHP survey

	contractors for 'proving trials'.
Uses and Comments	VORF output has been used successfully to reduce survey soundings to Chart Datum i.e. tidal correction using GPS height as input (see e.g. http://www.ukho.gov.uk/AboutUs/Documents/2009/TE3A%20Sunk.pdf). It is understood that UKHO is undertaking further validation of VORF and some inshore – offshore boundary issues have been identified. It is not known yet how UKHO intends to resolve these issues or how this may affect plans for its release.
List of Specific Actions	1) Establish current status of VORF and UKHO plans for its release / improvement. 2) MEDIN to request that UKHO makes VORF available under similar terms as Ordnance Survey have published OSGM02 and OSTN02. Details at http://www.ordnancesurvey.co.uk/oswebsite/gps/osnetfreeservices/furtherinfo/questdeveloper.html. 3) Depending on UKHO's response to action 2), MEDIN to consider adopting VORF and developing it further (subject to UKHO's agreement).

8.4 Coastal and Sea Bed Geology

Name	Coastal and Sea Bed Geology
Description	The morphology and lithology of the seabed and coastal zone. A key dataset which uses 'Elevation' as a key input and provides the foundation for habitat maps. Uses output from seabed surveys not specifically used in the production of Elevation e.g. MBES Backscatter, augmented by Side Scan Sonar, shallow seismic, grab and core data.
Owner	British Geological Survey (BGS)
Interested Parties	Many different organisations acquire seabed data during hydrographic, scientific, other surveys. Examples include: The Channel Costal Observatory (CCO) acquires coastal and marine elevation data as part of its remit. The data is available under a free licence from the CCO portal (see http:// www.channelcoast.org). Port and Harbour Authorities Energy and Water Companies Conservation Agencies (SNH, CCW, NE, DOENI, JNCC) Local Authorities

Status	HBDSEG's Seabed Mapping Working Group has been tasked with identifying gaps and producing a proposal on how to fill the gaps that will be submitted to MARG for approval and progression to MSCC. Requested status from Richard Moxon. NERC MAREMAP aims to increase efficiency and take a multi-disciplinary approach to improve understanding of the seabed, shallow geology, habitats and heritage (see http://www.noc.soton.ac.uk/shmg/maremap). Discussed with Bob Gatliff and Alan Stevens, BGS. MAREMAP development plan and website in preparation and requested. NERC would welcome MEDIN involvement. Geological and Geomorphological Data (Layer A) output from Defra funded MB research project Layer.
Licence Conditions	World (1:50M) and European (1:5M) Geological Units, UKCS (1:1M) Seabed Sediments data available from the OneGeology portal for view and download (TBC) DigSBS250 and DigRock250 available under licence from BGS and resellers.
Uses and Comments	Details of recent Defra projects can be found at: MB0102: http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=16368 MB0103: http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=16370
List of Specific Actions	1) MEDIN to promote NERC's MAREMAP initiative as focus for Sea Bed and Coastal Geology, subject to confirmation of JNCC, conservation agency, Cefas, Marine Scotland and DOENI involvement. 2) MAREMAP to be linked to Defra's DEM project and the resulting datasets published as View Services. 3) MEDIN to comment on MAREMAP development plan which is in preparation. This should be consulted on with the view of it being adopted as widely as possible. Note a meeting is planned at NOC on 13 Apr 2011. 4) MAREMAP and Marine DEM to use consistent approach to deriving confidence layers building on results of Defra MB projects.

8.5 Offshore Infrastructure

Name	Industrial Facilities: Pipeline Surface Subsurface Wells Renewable Energy Devices Submarine Cables Transport Networks: Navigational Aids Aquacultural Facilities Environmental Monitoring Equipment Military Installations
Description	A Dataset contains sub-sea pipelines and umbilicals related to the petroleum industry. It does not include telecommunication cables. The definitive data source are the individual owner companies of the infrastructure B Dataset contains sea surface infrastructure (platforms and FPSOs) and hazards (buoys) related to the petroleum industry. The definitive data source are the individual owner companies of the infrastructure C Dataset contains sub-sea infrastructure and hazards related to the petroleum industry. The definitive data sources are the individual owner companies of the infrastructure. D DEAL sourced contains details of over 10,000 offshore wells drilled on the UK Continental Shelf E Submarine telecommunications and power transmission cables in use and disused.
Owner	DECC MMO / Marine Scotland / WAG / DOENI as licensing authorities for cables CDA Ltd (DEAL)
Interested Parties	DEAL (Digital Energy Atlas and Library)

	CDA Limited (a wholly owned subsidiary of Oil and Gas UK) UK cable Protection Committee UKHO Individual Owners / Operators
Status	DEAL (see https://www.ukdeal.co.uk UKHO considers wells as obstructions and charts these where they are a danger to navigation An assessment undertaken in 2010 (Ref: SeaZone/CDA Ltd) concluded the datasets received from CDA Ltd could be improved (in geometries and in attribution) and, if this were done, these datasets could be taken as the definitive, best available datasets for marine infrastructure data in the UK waters.
Licence Conditions	Index of information on DECC website: https://www.og.decc.gov.uk/information/index.htm Oil and Gas Infrastructure (overview): https://www.og.decc.gov.uk/information/bb_updates/maps/Infrast_Off.pdf
Uses and Comments	As the licensing authority for oil and gas DECC publishes some information on its website. This excludes location data for Pipelines, Surface and Subsurface Feature Types but includes location data for Wells. Missing location data is available from DEAL. DEAL data is available on DEFRA SPIRE and by subscription. Cables are available from the Kingfisher Information Service – Cable Awareness (KIS-CA) website (see http://www.kisca.org.uk/charts.htm#option4). RPLs are 'thinned' with a quoted accuracy of 10 m. Other infrastructure data is available in chart form under licence from UKHO. Essential input to Socio economic datasets including 'Seabed Pressure'. The key to success in this area is for the licensing authority to maintain and publish details of all developments and make this data available to UKHO for inclusion in chart and other data products, either under licence or directly. The data should also be available as view services to meet licensing authority obligations under INSPIRE.

List of Specific Actions	1) Establish DECC plans to publish location data, if any, and how DECC is addressing INSPIRE obligations. 2) Establish MMO and DAs plans to publish license details including legacy data from licensing system, which is being replaced, and how . Is data being migrated 3) Depending on 1 and 2 open dialogue with CDA and UKCPC to create definitive datasets for wider use. 4) UKHO to adopt definitive datasets for charting and other products, directly and under licence. 5) MEDIN to work with DECC, the MMO and the DAs so that all details of licensed activities including location are published in full. The data should be made available as a View Service (as a minimum) and be available directly as input to deriving data on human pressure. The data would also be used as input to data product (including by UKHO for charting).

8.6 Shipwrecks and Obstructions

Name	Shipwrecks Obstructions
Description	The ruined remains of a stranded or sunken vessel which has been rendered useless. (IHO Dictionary, S-32, 5th Edition, 6027). An object that hinders or prevents movement, particularly anything that endangers or prevents passage of a vessel. The term is usually used to refer to an isolated danger to navigation (IHO Dictionary, S-32, 5th Edition, 3503).
Owner	UKHO for base data, other interested parties for supplementary data (minimum Database Rights)
Interested Parties	National Monuments Record (English Heritage) CADW (Welsh Assembly Government) Historic Scotland Royal Commission on the Ancient and Historic Monuments for Wales Royal Commission on the Ancient and Historic Monuments for Scotland Environment and Heritage Service, NI Coastal Authorities

	Port and Harbour Authorities Private sector consultants
Status	UKHO currently has the most comprehensive database of shipwrecks
Licence Conditions	UKHO currently licences wrecks (and obstruction) data under a fee paying re-use licence. See http://copyright.ukho.gov.uk/ for details.
Uses and Comments	UKHO receives wreck reports from surveys (in the form of Hydrographic Notes), augmented by other sources e.g. recreational divers, reported losses.
List of Specific Actions	1) Resolve conflicts between UKHO and Heritage datasets. 2) Link UKHO primary and Heritage secondary attributes. 3) Develop protocols and processes so data is exchanged between owners. 4) Consider Wrecks as marine case study for linked data.

8.7 Shoreline Constructions

Name	Piers Slipways Outfalls Intakes Mooring Facilities Training Walls Coastal Protection
Description	Any construction for any purpose that extends seaward of the Mean High Water line (Springs in Scotland)
Owner	Ordnance Survey GB and NI
Interested Parties	UKHO Port and Harbour Authorities Environment Agency Scottish Environment Protection Agency (SEPA) DOENI

	Water Companies and Authorities
Status	Contained with OS digital mapping products. OS surveys within … of the shoreline Contained with UKHO chart products at different resolution EA/SEPA/DOENI datasets
Licence Conditions	OS Strategi, Boundary-Line, Meridian 2 and Vector Map District are currently available from OS OpenData. OS VectorMap Local and MasterMap Topgraphy Layer are available on commercial terms and are included in the Public Service Mapping Agreement. More details at: http://www.ordnancesurvey.co.uk/oswebsite/products/pricing/full_pricelist.pdf http://www.ordnancesurvey.co.uk/oswebsite/business/sectors/government/ The UKHO shoreline construction data is contained within its chart derived datasets (Electronic Navigational Charts) under a fee paying re-use licence. See http://copyright.ukho.gov.uk/ for details.
Uses and Comments	OS surveys, supported intelligence from Local Authorities UKHO takes data from OS and from port and harbour authorities, with some Earth Observation
List of Specific Actions	1) The issue is aligned with that of coastline (see above) and can be solved by taking similar approach i.e. through the UK Coastline Mapping Working Group and by UKHO adopting OS digital mapping. 2) UKHO / OS to agree division of feature types and/or geographic cut-off (as if single organisation). 3) Organisations holding data on assets (e.g. outfalls, intakes and coastal protection) to reference digital mapping utilising inherent unique identifiers.

8.8 National and Fisheries Limits

Name	UK Fishing Limit UK Renewable Energy Zone Renewable Energy Zone (Designation of Area) (Scottish Ministers) Order 2005

	UK Territorial Sea Limits UK Pollution Zone UK Continental Shelf Limits UK Gas Importation and Storage Zone
Description	Limits of national jurisdiction defined in internal law e.g. UNCLOS. See http://www.un.org/Depts/los/convention_agreements/convention_overview_convention.htm
Owner	UKHO Law of the Sea Section (on behalf of HMG – FCO)
Interested Parties	Territorial sea limits are defined in statutory instruments and treaties for the extent of the limit and any territorial sea boundaries that exist – internally between England, Wales, Scotland, N Ireland and Isle of Man and internationally with Republic of Ireland and France. Also for boundaries between the Channel Islands and with France. Not all of the N Ireland – Republic of Ireland TS boundary is defined though. FCO is responsible for these instruments of definition and whilst they will give precise detail of where an agreed boundary lies, so far as limits are concerned, the instruments only define the breadth of the territorial sea and where the breadth is measured from – i.e. normal or straight baselines etc. The instruments or treaties do not, however, give details or coordinates of where the limits of the territorial sea lie, in fact the limits are dynamic in that they move with every change to the charted coastline. UKHO maintain the model of the baselines from which TS is measured and provide snapshots of the limit lines when required. They also provide FCO and UK enforcement authorities or agencies with a definitive statement on what jurisdiction applies to any given position at sea.
Status	PDF documents illustrating the limits are at http://www.ukho.gov.uk/PRODUCTSANDSERVICES/SERVICES/Pages/LawoftheSea.aspx
Licence Conditions	UKCS Designations: https://www.og.decc.gov.uk/information/bb_updates/maps/Designations.jpg
Uses and Comments	UKHO Law of the sea Section updates these as new charts are published. There is a formal annual release of the limits though in Jan each year. Interestingly Territorial Waters are excluded from INSPIRE Annex I 'Administrative Units', which are in fact assigned to the INSPIRE themes 'Cadastral parcels', 'Hydrography' (Annex I) and/or 'Sea regions' (Annex III) (see https://inspire-registry.jrc.ec.europa.eu/registers/FCD/items/156). Which is to be confirmed.

List of Specific Actions	1) UKHO plans to publish the 12 nm limit (at least) under a Open Government Licence. The data has been received by MEDIN but is unavailable generally (see 2). 2) UKHO to publish the National Limits as an INSPIRE Compliant View Service. 3) UKHO requested to comment on its plans for 2 given the inclusion of national limits in INSPIRE (which theme and annex to be confirmed).

8.9 Managed and Protected Areas

Name	Managed Areas: Safety Zones SEA Areas Charting Progress 2 Areas Marine Plan Areas MCZ project areas Renewable Energy Lease Areas Marine Protected Areas
Description	An area which is used in the management of resources, access or safety.
Owner	DECC Defra Conservation Agencies
Interested Parties	Operator / Owners Public and private sectors through consultation
Status	Published ad hoc and included in products. Latter unlikely to be definitive and accurate. Better is that each dataset is managed according to MEDIN standards i.e. it is specified, versioned and metadata created and published. This task would be undertaken by the dataset owner as their obligation to current policy but would be encouraged and supported by MEDIN working closely with data owners. Immediate priority datasets include: Marine Plan Areas, CP2 Areas (Defra), MCZs (JNCC), National Limits and Boundaries (UKHO), Oil and Gas Licences and Safety Zones (DECC), Renewable Energy and

	Aggregate Licences (TCE), Vessel Safety Zones (DFT).
Licence Conditions	Generally the data is freely available subject to the terms and conditions of the base data from which the area data has been derived (e.g. OS mapping or UKHO charting). Potential restrictions on use often determines how area boundaries are derived, with the need for open release driving which base data set is used.
Uses and Comments	There are a number of quick wins to be realised by the owners of Administrative Unit and Management Unit datasets publishing these as web services, either directly, and linking these to the MEDIN portal, or by these datasets being hosted and published by the MEDIN portal. These area datasets would be available via View, Download and as input to Discovery services. The data should be published under an Open Government Licence.
List of Specific Actions	1) Owners to be contacted to identify status of each dataset and plans for publication. Obligations under INSPIRE (if any) to be established. 2) Establish appetite and capacity with owner to undertake 'strengthening work' to define accurate source datasets that ideally are linked to policy / legislation. 3) Data to be published directly as INSPIRE compliant View Service and service metadata exposed to MEDIN portal or data made available to MEDIN portal and published indirectly. 4) MEDIN to retain register of area datasets and status, also to be published on the MEDIN website.

8.10 Marine Gazetteer (incl. Sea Areas)

Name	Marine Gazetteer (incl. Sea Areas)
Description	Lit of common names for geographic locations depicted by a point, line or area. Unlikely to have any legal significance unless extracted from 'National Limits' or 'Managed Areas' datasets
Owner	MEDIN
Interested Parties	IHO Ordnance Survey UK Location Programme SeaDataNet UKHO

Status	In preparation UKHO 'sea areas' as depicted on ENCs are incongruous
Licence Conditions	Open Government Licence
Uses and Comments	MEDIN Gazeteer includes an area dataset as a subset of the SeaVox Salt and Fresh Water Body Gazetteer plus a Points of Interest dataset. The POI dataset has the same specification as the Ordnance Survey 1:50K Gazetteer (using SeaVox and MEDIN areas in place of County). The OS gazetteer is available under OS OpenData and is being used within the UK Location portal. OS will extend the 1:50K Gazetteer to include marine names so on updating any service that uses it will be similarly extended.
List of Specific Actions	1) Publication of version 1 of the MEDIN Marine Gazetteer is imminent. 2) OS to include marine names in its 1:50K Gazetteer for use by UK Location etc. 3) UKHO to comment on Gazetteer for potential improvement with the aim of adopting it for charting. 4) MEDIN Marine Gazetteer to be published on separate page of MEDIN portal with request for comment. 5) MEDIN to on responsibility of maintaining the Gazetteer in conjunction with UK stakeholders and international bodies (e.g. SeaVox).

9. References

Eastwood, P. D., Mills, C. M., Aldridge, J. N., Houghton, C. A., and Rogers, S. I. 2007. Human activities in UK offshore waters: an assessment of direct, physical pressure on the seabed. – ICES Journal of Marine Science, 64: 453–463.

ANNEX 1 – PRIORITY DATASETS FOR MARINE SPATIAL PLANNING

Theme	INSPIRE Theme	Feature Type (Examples Listed)	Data Holder
Marine Gazetteer	Geographical names / Sea regions	Terrestrial Gazetteer	OS
		Marine Gazetteer	MEDIN
Coastline	Hydrography	MHW(S)	OS
		MLW(S)	OS
		LAT	UKHO
		Rivers	OS
		Lakes	OS
Elevation	Elevation	Depth - Gridded	UKHO
		Depth - Contours	UKHO
		Depth - Areas	UKHO
National Limits	Administrative Units	UK Fishing Limit	UKHO
		UK Renewable Energy Zone	UKHO
		Renewable Energy Zone (Scotland)	UKHO
		UK Territorial Sea Limits	UKHO
		UK Pollution Zone	UKHO
		UK Continental Shelf Limits	UKHO
		UK Gas Importation and Storage Zone	UKHO
		Custom Zones	UKHO
		Port and Harbour Areas	UKHO
Protected Sites	Protected Sites	Area of Outstanding Natural Beauty	NE, SNH, CCW, DOENI
		Biogenetic Reserves	NE, SNH, CCW, DOENI
		Biospheric Reserves	NE, SNH, CCW, DOENI
		Heritage Area	NE, SNH, CCW, DOENI
		Landscape Character Areas	NE, SNH, CCW, DOENI
		Local Nature Reserves	NE, SNH, CCW, DOENI
		Marine Consultation Areas	NE, SNH, CCW, DOENI
		Marine Nature Reserves	NE, SNH, CCW, DOENI
		National Nature Reserves	NE, SNH, CCW, DOENI
		National Parks	NE, SNH, CCW,

			DOENI
		Ramsar Sites	NE, SNH, CCW, DOENI
		Special Areas of Conservation	NE, SNH, CCW, DOENI
		Special Protection Areas	NE, SNH, CCW, DOENI
		Sites of Special Scientific Interest	NE, SNH, CCW, DOENI
		World Heritage Sites	NE, SNH, CCW, DOENI
		Scheduled Ancient Monuments	EH, RCHAMS/W, DOENI
		Protected Wreck Sites (including War Graves)	EH, RCHAMS/W, DOENI, MOD
Geology	Geology	Sea Bed Sediments	BGS
		Bedrock Geology	BGS
		Mineral Area - Aggregate	BGS
		Mineral Area - Hydrocarbon	BGS
		Seabed Area (S-57 Only)	UKHO
		Sea Bed Geology (Bedforms, Morphology, Lithology)	BGS
		Sediment Mobility / Stability	
Infrastructure (Coastal)	Hydrography / Buildings / Production and industrial facilities	Piers Jetties Slipways Water Intakes Barrages Barriers Outfalls	OS, UKHO
Infrastructure (Offshore)	Transport Networks - TBC	Buoys (Navigational Aids) Beacons Light Vessels	Trinity House, NLB, UKHO
	Production and industrial facilities	Submarine Cables	TBA (UKCPC)
		Oil & Gas Platforms	DECC (DEAL)
		Oil & Gas Wells	DECC (DEAL)
		Oil & Gas Pipelines	DECC (DEAL)
		Turbines (Wind, Wave, Tidal)	MMO (TCE)
		Buoys (Mooring)	
	Agricultural and aquaculture facilities	Fish and Shellfish Cages	MMO (TCE)

	Environmental monitoring facilities	Buoys (ODAS) Meteorological Masts	
Shipwrecks & Obstructions	Hydrography - TBC	Shipwrecks Debris (Miscellaneous)	UKHO
Licensed Areas	Area management / restriction / regulation zones & reporting units	Windfarm Licensing Areas	TCE
		Mineral Extraction Licensing Areas	TCE
		Oil & Gas Licensing Areas	DECC
		Military Practice Areas	MOD
		Mooring and Anchorage Areas	UKHO
		Licensed Disposal Sites	Cefas, FRS, DOENI
		Munitions Dumps	UKHO
Activity Areas	Area management / restriction / regulation zones & reporting units	Anchoring Areas	UKHO
		Anchoring Prohibition Area	
		Berth	
		Cargo Transhipment Area	
		Deep Water Route Centerline	
		Diving Prohibition Area	
		Dock Area	
		Fairway	
		Ferry Route	
		Harbour Basin	
		Inshore Traffic Zone	
		Landing Location	
		Leisure Activity Area	
		No Wake Area	
		Pilot Boarding Location	
		Recommended Route Centerline	
		Safety Zone	
		Sea-Plane Landing Area	
		Submarine Transit Lane	
		Swinging Area	
		Traffic Separation Zone	
Managed Areas	Area management / restriction /	Charting Progress Regional Seas	Defra

	regulation zones & reporting units		
		OSPAR Areas	OSPAR
		ICES Divisions	ICES
		ICES Statistical Rectangles	ICES
		EC Water Framework Directive Waters	EA, SEPA. DOENI
		EC Bathing Waters	EA, SEPA, DOENI
		Areas Regulated under the Common Fisheries Policy	Cefas, MS, DOENI
		Sea Fisheries Committee Districts and Byelaws	SFC, Cefas, MS
		CFP Regional Advisory Council Areas	Cefas, MS
		EC Shellfish Waters	EA, Cefas, SEPA, MS, DOENI
		Classified Bivalve Mollusc Harvesting Areas (England and Wales)	Cefas, MS
		RSPB Reserves (GB)	RSPB
		Fish Farms (Scotland)	SEPA
Marine Use	Land Use	Shipping intensity	MCA
		IMO Routing	DFT
		Port Locations	DFT
		Fish Landings	DEFRA
		Fishing intensity - commercial	MMO
		Fishing intensity - recreational	SFC (IFCAs)
		Fisheries landings - commercial	MMO, …
		Fisheries discards	Cefas, FRS, DARDNI
		Waste disposal intensity	Cefas
		Mineral extraction intensity	TCE
		Dredge Routes	BMAPA
		Waste disposal intensity	Cefas, MS, DOENI
		NATS Radar Interference Zones (140 m)	NATS
		NATS Radar Interference Zones (40 m)	NATS
		Candidate SACs (cSAC)	JNCC
		Draft SACs (dSACs)	JNCC
		Possible SACs (pSACs)	JNCC
		Helicopter Main Routes (North & Irish Seas)	CAA
		Bathing Beaches	EA/SEPA
		Blue Flag Beaches and Marinas	FEE
		Recreational boating	RYA
Oceanography	Oceanographic	Annual and seasonal salinity	POL, BODC,

	features		ICES
		Annual and seasonal water temperature	POL, BODC, ICES
		Annual and seasonal productivity	PML, Cefas
		Predominant currents and tides	POL
		Physical oceanography (in situ)	
		Physical oceanography (satellite)	
		Physical oceanography (model)	
		Chemical composition of seawater	
		Suspended sediments	
Weather and Climate	Meteorological features	UK Climate Summaries	UKMO
		Climate change forecasts	
Habitats and Biotopes	Habitats and biotopes	Marine landscapes	JNCC
		Natural Sea Bed Structures	JNCC
		UK SeaMap Sea Bed Landscape	JNCC
		Combine EUNIS Habitat	MESH
		Predicted EUNIS Habitat	MESH
		Marine biotopes	JNCC
		Habitats listed under OSPAR and EC Directives	JNCC
		Shellfish Beds	Cefas, FRS, DOENI
		Coastal habitats : -	NE, CCW, SNH
		Vulnerable Concentrations of Seabirds to Oil Spills (GB) (Jan - Dec)	
		Sensitive Fish Areas (GB) (Jan - Dec)	
		Seismic Sensitivity (All, Jan - Dec)	
		Biodiversity	
		Eutrophication Status	
		Fisheries	
Species Distribution	Species distribution	Plankton	SAHFOS, Cefas
		Infauna	JNCC, Cefas
		Epifauna	JNCC, Cefas
		Fish (adults, spawning, nursery)	Cefas
		Basking Shark Locations	
		Mammals	JNCC, SMRU
		Cetacean Atlas (by Species)	JNCC
		Seal Observation Locations by Species	
		Seabirds	
		Breeding Seabird Population of the UK (seabird 2000)	JNCC
		Seabird Colony Reserves in the UK	JNCC
		Seabird Distribution Atlas	JNCC
		Important Bird Areas	

		Species listed under OSPAR and EC Directives	JNCC
		Waders and Wildfowl Mean Peaks (GB) (Spring, Winter, Autumn)	BTO
		Seabird Nesting Counts (British Isles)	JNCC
		Grey Seal Breeding Colonies (GB)	SMRU
		Harbour and Grey Seal Counts August 1996-97 (GB)	
		Atlantic White Sided Dolphin - Search Time (GB)	
		Atlantic White Sided Dolphin - Max Sighting Rate Per Hour (GB)	
		Harbour Porpoise - Max Sighting Rate Per Hour (GB)	
		Harbour Porpoise - Search Time (GB)	
		Short-Beaked Common Dolphin - Max Sighting Rate Per Hour (GB)	
		Short-Beaked Common Dolphin - Search Time (GB)	
		Minke Whales - Max Sighting Rate Per Hour (GB)	
		Minke Whales - Search Time (GB)	
		White Beaked Dolphin - Max Sighting Rate Per Hour (GB)	
		White Beaked Dolphin - Search Time (GB)	
Energy Resources	Energy resources	Marine Renewable Energy Resource Atlas - Wind	DECC
		Marine Renewable Energy Resource Atlas - Wave	DECC
		Marine Renewable Energy Resource Atlas - Tide	DECC
		Oil Reservoirs	DECC
		Gas Reservoirs	DECC
Mineral Resources	Mineral resources	Minerals distribution	BMAPA
		Potential Gas Storage Areas	DECC
		Potential Carbon Storage Areas	DECC

ANNEX 2 – KEY TO DATA HOLDERS

Abbreviation	Name
AFBI	Agri-Food and Biosciences Institute
BERR	Department of Business, Innovation and Skills
BGS	British Geological Survey
BMAPA	British Marine Aggregate Producers Association
BODC	British Oceanographic Data Centre
BTO	British Trust for Ornithology
CAA	Civil Aviation Authority
CADW	Welsh Assembly Government Historic Environment Division
CCW	Countryside Council for Wales
CEFAS	Centre for Environment, Fisheries & Aquaculture Science
DEAL	Oil and Gas UK
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
DFT	Department for Transport
DOENI	Department of Environment, Northern Ireland
EA	Environment Agency
EH	English Heritage
FEE	Foundation for Environmental Education
HS	Historic Scotland
ICES	International Council for the Exploration of the Sea
JNCC	Joint Nature Conservation Committee
KISCA	Kingfisher Information Service - Cable Awareness
MCA	Maritime and Coastguard Agency
MFA	Marine and Fisheries Agency
MOD	Military of Defence
MS	Marine Scotland
NATS	National Air Traffic Service
NE	Natural England
NGA	National Geospatial-Intelligence Agency, USA
NLB	Northern Lighthouse Board
OSGB	Ordnace Survey of Great Britain
OSNI	Ordnace Survey of Northern Ireland
OSPAR	Olso Paris Commission
PML	Plymouth Marine Laboratory
POL	Proudman Oceanographic Laboratory
RCAHMS	Royal Commission on the Ancient and Historic Monuments of Scotland
RCAHMW	Royal Commission on the Ancient and Historic Monuments of Wales
RSPB	Royal Society for the Protection of Birds
RYA	Royal Yachting Association
SAHFOS	Sir Alastair Hardy Foundation for Ocean Science
SEPA	Scottish Environment Protection Agency
SFC	Sea Fisheries Committees

SMRU	Sea Mammal Research Unit
SNH	Scottish Natural Heritage
TCE	The Crown Estate
TH	Trinity House
UKHO	UK Hydrographic Office
UKMO	UK Meteorological Office
WAG	Welsh Assembly Government