Supporting **I**mplementation of **M**aritime Spatial Planning in the **Celt**ic Seas

Component 1: Supporting Implementation of MSP

Component 1.2.2: Data and Information requirements for MSP

Deliverable 4: Analysis of Data Needs and Existing Gaps – Specifically Relating to Transboundary Working

European Commission
Directorate-General for Maritime Affairs and Fisheries

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Acronyms

AAMP: Agence des Aires Marines Protégées
AFB: Agence Française de la Biodiversité (previously AAMP)
CEFAS: Centre for Environment, Fisheries and Aquaculture Science
CSW: Catalogue Service for the Web
DAERA: Department of Agriculture, Environment and Rural Affairs
DAFM: Department of Agriculture, Food and the Marine
DCENR: Department of Communications, Energy and Natural Resources
DDTM29: Direction Départementale des Territoires et de la Mer du Finistère
DDTM35: Direction Départementale des Territoires et de la Mer d'Ille-et-Vilaine
DGEC: Direction Générale de l'Energie et du Climat
DREAL: Direction Régionale de l'Environnement, de l'Aménagement et du Logement
EEZ: Exclusive Economic Zone
ENC: Electronic Navigational Chart
EPCI: Etablissement Public pour la Coopération Intercommunale
GIS: Geographic Information System
GML: Geography Markup Language
IGN: Institut National de l'Information Géographique et Forestière
ISO: International Organisation for Standardisation
MaREI: Marine and Renewable Energy Ireland
MCA: Maritime and Coastguard Agency
MEEM: Ministère de l'Environnement, de l'Energie et de la Mer
MIG: Mission de l'Information Géographique
MMO: Marine Management Organisation
MS: Member State
MSDI: Marine Spatial Data Infrastructure
MSP: Maritime Spatial Planning
NMPi: National Marine Plan interactive
OGC: Open geospatial Consortium
ONS: Office for National Statistics
OSNI: Ordnance Survey of Northern Ireland
OSPAR: Oslo-Paris Convention (for protection and conservation of North-East Atlantic)
RCAHMS: Royal Commission on the Ancient and Historical Monuments of Scotland
SDI: Spatial Data Infrastructure
Shom: French public establishment in charge of description and forecasting of ocean, from littoral to offshore
SIMCelt: Supporting Implementation of Maritime Spatial Planning in the Celtic Seas
SLD: Style Layer Descriptor
SOAP: Simple Object Access Protocol
UKHO: United Kingdom Hydrographic Office
WCS: Web Coverage Service
WFS: Web Feature Service
WMS: Web Map Service
WMTS: Web Map Tile Service

About SIMCelt

SIMCelt - Supporting Implementation of Maritime Spatial Planning in the Celtic Seas is a two-year €1.8 million project co-financed by DG Mare and focussed on promoting the development of transnational cooperation to support the implementation of EU Directive 2014/89/EU in the Celtic Seas. Led by University College Cork, the project consortium comprises both planners and researchers from seven partner institutes representing a mix of governmental authorities and academic institutes from Ireland, France and the United Kingdom of Great Britain and Northern Ireland. This consortium is particularly interested in developing meaningful cooperation between neighbouring Member States to support implementation of spatially coherent plans across transboundary zones of the Celtic Seas, building on previous work and leveraging new opportunities to identify and share best practice on technical, scientific and social aspects of transboundary MSP.

General Introduction

A European framework to support access to and use of data for MSP

High quality maritime spatial data and information is a key element for implementing MSP. Data and information sharing is allowed by Marine Spatial Data Infrastructures which therefore support transboundary cooperation as well as national efforts linked to MSP. The associated tools are also critical to enable access to data and information as a basis for dialogue with the public and all interested parties, as well as providing support for decision making.

The Inspire Directive was published in 2007 by the European Commission in order to create a European Spatial Data Infrastructure to ensure interoperability between databases and to facilitate geographic data dissemination, availability and use. On the technical side, the directive relies on OGC standards for metadata elaboration (ISO19115 – ISO19139) as well as diffusion protocols (CSW, WMS, WFS, WCS), which allow to use and display data and metadata directly from the source. This ensures that the most up-to-date datasets are being used, following a core principle of Information Management: *"Collect once, use many".*

The Inspire Directive implementation includes a timeline. For example, maritime delimitations, like the other data categories of the Annex I of the Directive must be Inspire-compliant before 23rd November, 2017[1]. In that context, an increasing amount of data has been made available during the last few years, and the dynamic is still on-going.

MSP is also taking advantage of this evolving situation, as a considerable amount of datasets has been published, either with European projects (e.g. EMODnet) or national MSDI (e.g. Marine Scotland NMPi).

In the Celtic Seas, the technical requirements for data and information to implement MSP in a transboundary context, particularly regarding interoperability, are investigated under SIMCelt component C1.2.2 data and information requirements for MSP, Deliverable 4: *Analysis of Data Needs and Existing Gaps – Specifically Relating to Transboundary Working*.

This report aims to give a description of the state of current data needs and gaps and to identify the challenges and opportunities associated to data and information in support of transboundary MSP in the Celtic Seas.

[1] http://inspire.ec.europa.eu/inspire-roadmap/61

Part 1. Guidance document

Introduction

The guidance document is an output of the workshop "Priorities for data & information requirements dedicated to Maritime Spatial Planning" of the Task Group on Data, held in Saint-Mandé, France, on 23rd-24th June 2016.

The Task Group on Data brings together experts on maritime spatial data, maritime spatial data infrastructures and portals, and maritime planners from SIMCelt Partners and/or Stakeholders[2].

The guidance document objective is to define the ideal requirements to reach for data and information relevant for MSP in order to be shared and disseminated. It also describes the scope of the investigation.

[2] Agence des Aires Marine Protégées (AAMP), Department for Agriculture, Environment and Rural Affairs (DAERA), Marine Interregional Direction, region North Atlantic Western Channel (DIRM NAMO), Marine Institute, Marine Management Organisation, Marine Scotland, United Kingdom Hydrographic Office, Préfecture maritime de l'Atlantique

1. General requirements

Data themes to be published together on a geographic portal for transboundary areas of the SIMCelt action area should reach the criteria below:

- Data must be available in WMS, WFS, WMTS and GML formats
- Priority themes must include compulsory sectors as listed in the EU MSP Directive
- Priority is given to datasets provided by SIMCelt partners and national MSP focused MSDI
- Datasets should be INSPIRE compliant
- Portrayal coherence (i.e. symbology) should be ensured between datasets concerning the same theme but from different sources
- Multilingual metadata would be an asset for transboundary data sharing
- Information about quality of data should be highlighted
- Interoperability between portals should be ensured

2. Selection criteria

To prioritize the selected datasets and themes for Spatial Data Infrastructure, selection criteria listed below can be used:

- They beneficiate of time commitment of the actors for data harmonization
- They are needed for Cases studies

3. Themes / data

Maritime delimitations (sovereignty, jurisdiction)

Maritime delimitations are a major theme identified as a core data requirement for transboundary MSP. With the numerous spatial incongruences in the current delimitations of maritime boundaries between neighbouring MS, this theme highlights one of many issues regarding data requirements for transboundary MSP.

Issues to be dealt with to provide maritime delimitations theme on SIMCelt SDI are listed below:

- Ontology
- Data model (Inspire Annex 1 administrative units))
- Portrayal (SLD)
- Geometry
- Map

Other proposed themes

A list of themes/data considered relevant for SIMCelt C1.2.2 is provided below:

- Marine limits (intertidal zones, …)

- Maritime traffic, navigation:
    - Traffic separation schemes
    - Anchorage areas
    - Transports
    - Lanes (AIS data)
    - Ports
    - Buoys and obstacles
    - Navigation channels
    - ….
- Marine Protected Areas
- Fishing
- Aquaculture
- Marine renewable energy
- Additional themes/data related to SIMCelt C1.2.4 Case studies

4. Issues to progress on

Data quality

Shom will define a categorical method for defining the relative quality of aggregated data sets/themes.

SIMCelt portal Data licencing

The best approach to adopt regarding Data licencing has to be defined

Requests to SIMCelt Steering Committee

Sensitive issues are to be submitted for advice to SIMCelt Steering Committee e.g. maritime delimitations inconsistencies between national representations.

5. Maritime Spatial Data Infrastructure supporting results of SIMCelt C1.2.2

The name of the SDI has to be defined in relation with Component 3 (Communication and Dissemination).

The Marine Spatial Data Infrastructure supporting results of SIMCelt C1.2.2 should be composed of elements listed below:

- master copy of Shom Geospatial Portal Infrastructure
- Viewer
- Dashboard comprising advice and information regarding the approaches of the portal and its limitations (differences observed regarding symbology, …)

6. Resources

A shared excel file is created and shared to complete the preliminary list of ressources of interest below:

Vocabulary

A standardized vocabulary for data related matters will be adopted in order to minimize misunderstandings going forward

- BODC British Oceanographic Data Centre
    - P22 – INSPIRE themes
    - Maritime delimitations :
        - BODC C16, C19
- GEMET
- http://inspire.ec.europa.eu/codelist
- DBpedia

Best practices

- W3C Recommendations

Quality of data

- SeaDataNet flags

Coastline

- Coastal mapping project (EU Project)

Land and sea

- BLAST (EU INTERREG)

Bathymetry

- EMODnet bathymetry (EU Project)

Part 2. Analysis

Introduction

The analysis is presenting an inventory of available data in Celtic Seas area for Maritime Spatial Planning and their analysis.

Data is selected on the basis of the scope defined by the general requirements listed in the Guidance document (Part1). The table of sources studied to select data is provided in annex n° 1.

The inventory below sets the baseline of a portal demonstrator for SIMCelt project in order to enhance data accessibility.

Selected data needed to reach some prerequisites:

- When possible choose one source covering the whole project area
- If not possible, favour data sources provided by national MSDI
- Data must be available through OGC / inspire compliant web services (WMS / WFS / WCS)
- Datasets must comply as much as possible with requirements listed in the guidance document

The categorisation used to present the inventory of data is based on the one established in the report on MSP Data Study led by S.Pro and Ecorys on behalf of DG MARE[3].

Each category presentation is accompanied by an illustration of the view of the data layers displayed jointly. This illustration emphasizes the coverage of selected data sources, and the existing differences in the symbology.

[3] *MSP Data Study Executive Summary*. Technical Study under the Assistance Mechanism for the Implementation of Maritime Spatial Planning, 2016.

How to read this document

Administrative borders — Category

Terrestrial boundaries — Subcategory

Short description of the subcategory

includes seven countries, each with different structures of their administrative organisations. When there is one major administrative subdivision level in Scotland (Council areas), we can identify 4 levels in France (from largest to smallest: Regions, Departments, EPCI, municipalities).

Summary of data coverage

but it requires many data sources.

Illustration representing data coverage and differences of symbologies

Terrestrial boundaries: selection of datasets

Theme	Layers	Area	Producer	SDI	Inspire Metadata	Diffusion	Openness
Terrestrial boundaries	Communes Départements Régions	France	IGN	Géobretagne, Géoportail	Yes	WFS	Open
Terrestrial boundaries	EPCI en Bretagne au 01/01/2017	Brittany	DREAL Bretagne	Géobretagne	Yes	WFS	Open
Terrestrial boundaries	Local authorities of Ireland Electoral division	Ireland	Central Statistics Office	Ireland's Marine Atlas	Yes	WFS	Open
Terrestrial boundaries	Local authority boundaries	Scotland	Ordnance Survey	Marine Scotland NMPi	Yes	WFS	Open
Terrestrial boundaries	Largescale boundaries NI outline Largescale boundaries - Local government districts	Northern Ireland	OSNI	Opendata NI	No	WMS	Open

List of the selected datasets linked to the subcategory. Fields presented here give information on the degree of compliancy with the requirements. It is an extract of the complete inventory.

Assets

- Most data sources are available in WFS and with an open licence
- Completeness: exhaustive coverage
- Authoritative data

Barriers

- Many different data sources, reflecting a great heterogeneity in terrestrial administrative organisations between jurisdictions

Action needed

- Portrayal harmonisation: unique style for boundaries at the same hierarchical level

Analysis of the selection of datasets, focusing on assets, barriers, and first improvement propositions

Administrative borders

Terrestrial boundaries

While the SIMCelt project area comprises three member states, in total it includes seven countries, each with different structures of their administrative organisations. When there is one major administrative subdivision level in Scotland (Council areas), we can identify 4 levels in France (from largest to smallest: Regions, Departments, EPCI, municipalities).

Coverage

Complete coverage of terrestrial boundaries in Celtic Seas area is reached, but it requires many data sources.

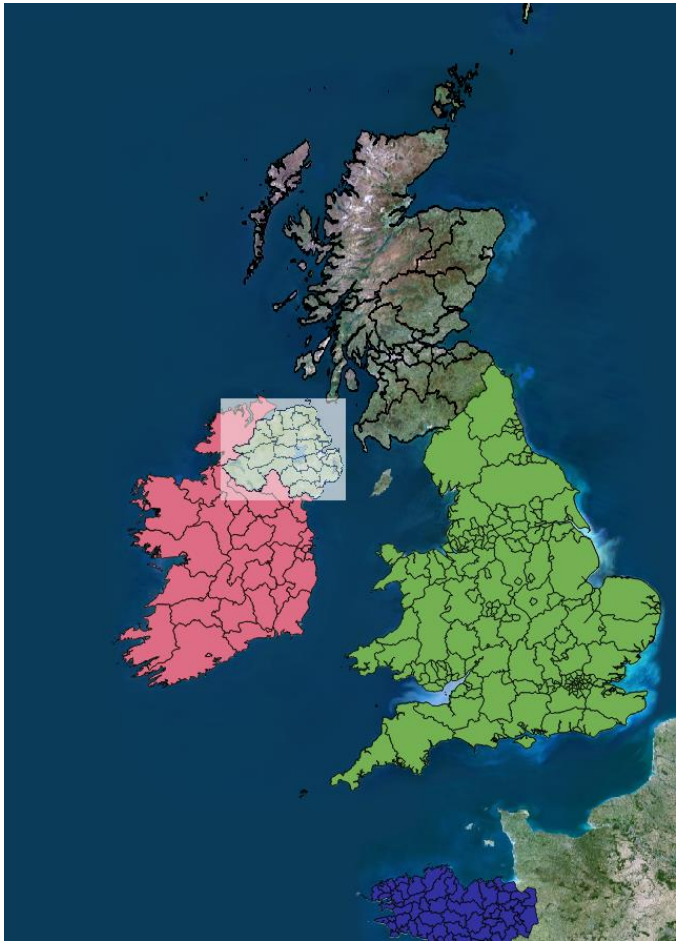

Figure 1 - Terrestrial boundaries

Terrestrial boundaries: selection of datasets

Theme	Layers	Area	Producer	SDI	Inspire Metadata	Diffusion	Openness
Terrestrial boundaries	Communes Départements Régions	France	IGN	Géobretagne, Géoportail	Yes	WFS	Open
Terrestrial boundaries	EPCI en Bretagne au 01/01/2017	Brittany	DREAL Bretagne	Géobretagne	Yes	WFS	Open
Terrestrial boundaries	Local authorities of Ireland Electoral division	Ireland	Central Statistics Office	Ireland's Marine Atlas	Yes	WFS	Open
Terrestrial boundaries	Local authority boundaries	Scotland	Ordnance Survey	Marine Scotland NMPi	Yes	WFS	Open
Terrestrial boundaries	Largescale boundaries NI outline Largescale boundaries - Local government districts	Northern Ireland	OSNI	Opendata NI	No	WMS	Open
Terrestrial boundaries	Regions	England	ONS	ONS Open geography portal	Yes	WFS	Open
Terrestrial boundaries	Counties and unitary authorities	England & Wales	ONS	ONS Open geography portal	Yes	WFS	Open

Table 1 - Terrestrial boundaries: selection of datasets

Assets

- Most data sources are available in WFS and with an open licence
- Completeness: exhaustive coverage
- Authoritative data

Barriers

- Many different data sources, reflecting a great heterogeneity in terrestrial administrative organisations between jurisdictions

Action needed

- Portrayal harmonisation: unique style for boundaries at the same hierarchical level

Maritime boundaries

Maritime boundaries are key data when dealing with Maritime Spatial Planning, as it identifies which Member State has authority on which area.

Coverage

Data relative to maritime boundaries are provided by a reference producer in each member state: Shom for France, UKHO for United Kingdom and DCENR for Ireland. Coverage is nearly complete, apart from baselines.

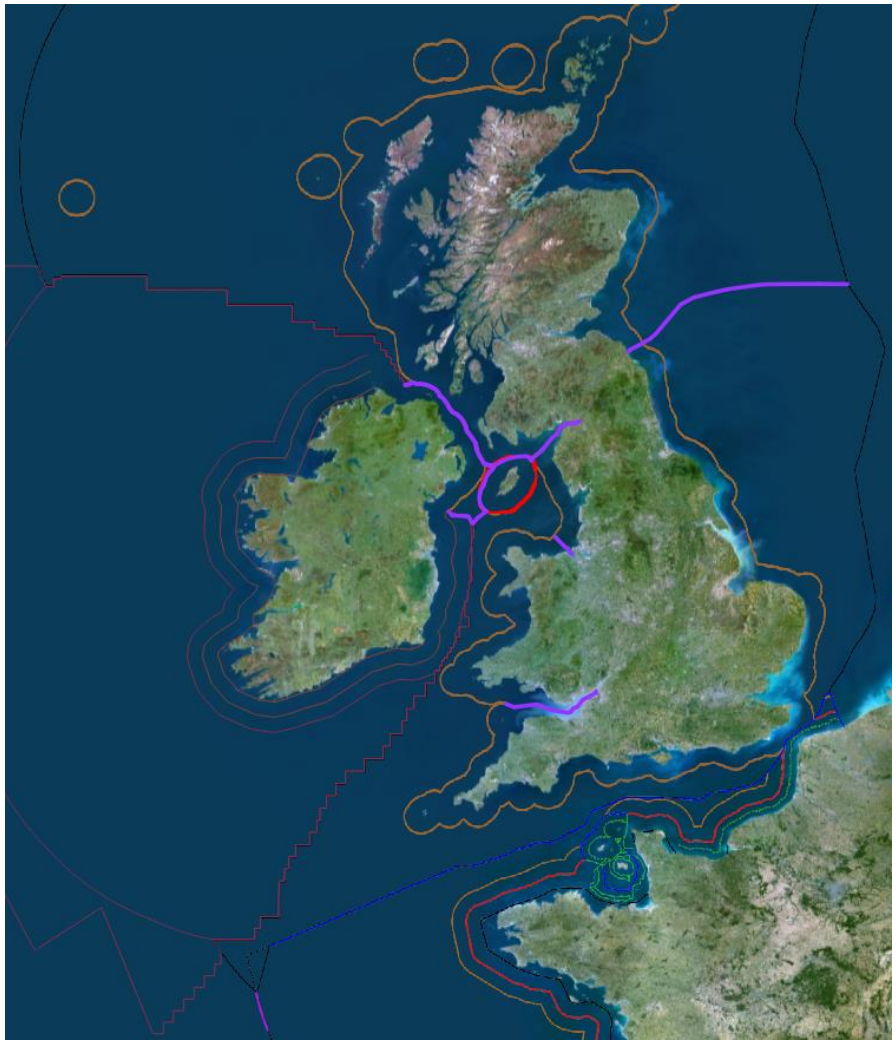

Figure 2 - Maritime delimitations

Maritime boundaries: selection of datasets

Theme	Layers	Area	Producer	SDI	Inspire Metadata	Diffusion	Openness
Maritime boundaries	Délimitations maritimes	France	Shom	data.shom.fr	Yes	WMS	shared
Maritime boundaries	Straight baselines Maritime boundary territorial sea Maritime boundary contiguous zone Maritime boundary exclusive Economic Zone Designated maritime boundary Continental Shelf	Ireland	DCENR	Ireland's Marine Atlas	Yes	WFS	Open
Maritime boundaries	12 nautical miles limit UK EEZ Continental shelf limit Northern Ireland Adjacent Waters Limit Scottish Adjacent Waters Limit Wales Adjacent Waters Limit	United Kingdom	UKHO	UKHO Inspire portal	No	WMS	shared

Table 2 - Maritime boundaries: selection of datasets

Assets

- For maritime boundaries, producers providing official data for regulation are well identified.
- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.
- We can get exhaustive coverage of the Celtic Seas from identified sources

Barriers

- Portrayal of maritime delimitations completely different between France, Ireland and UK
- Data models based on different standards (S-57, Inspire)
- Some layers not available (ex: UK straight baseline)
- Availability of some data sources in WMS instead of WFS could make working with them more difficult

Action needed

- Step 1: portrayal harmonisation, in order to provide a single legend for all the data sources
- Step 2: light data structure harmonisation to ensure that all datasets contain compulsory Inspire fields
- Step 3: Agree on a common data model for the different data sources

Physical, chemical & biological information

Physical characteristics

Physical characteristics include information about seabed like bathymetry and geology, but also data concerning the water column and surface: temperature, salinity, waves, currents, etc. For the most part of these parameters, it is possible to identify sources of information covering the whole project area and available by web service.

Coverage

For many physical parameters, it is possible to identify sources of information covering the whole project area and available by web service. Shom, known as a reference producer and partner in SIMCelt project, can provide some physical parameters datasets updated on a daily basis.

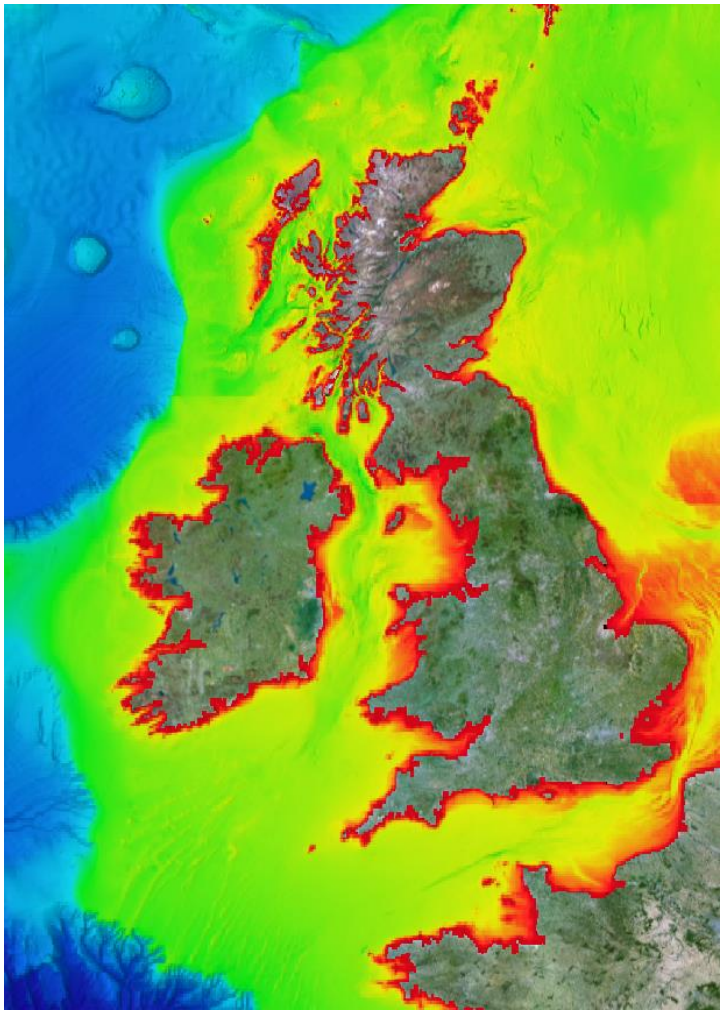

Figure 3 – Physical parameters, example of Bathymetry

Physical parameters: selection of datasets

Theme	Layers	Area	Producer	SDI	Inspire-compliant	Diffusion	Openness
Bathymetry	EMODnet Bathymetry EMODnet Bathymetry source references	Europe	EMODnet Bathymetry	EMODnet Bathymetry	Yes	WMS - WFS	Open
Geology	Carte sédimentaire mondiale	World	Shom	data.shom.fr	Yes	WMS	shared
Other parameters	Courant Température eau de mer Salinité eau de mer Vitesse et direction du vent Hauteur significative et direction mer totale Période mer totale	Europe	Shom	data.shom.fr	Yes	WMS	Open

Table 3 - Physical parameters: selection of datasets

Assets

- Usually possible to find one reference layer for the whole Celtic seas area for each physical parameter
- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- No barrier identified

Action needed

- No action needed.

Types of habitats

We can identify two types of data when dealing with marine habitats: data collected from surveys, and predictive maps based on models. When surveys bring accurate data on focused areas of interest, models try to extrapolate in order to provide regional maps. For the needs of SIMCelt portal demonstrator, predictive maps providing complete coverage of the project area is relevant.

Coverage

A complete map of marine habitats in Europe, therefore covering the Celtic Seas, is made available through EMODnet Seabed Habitats project.

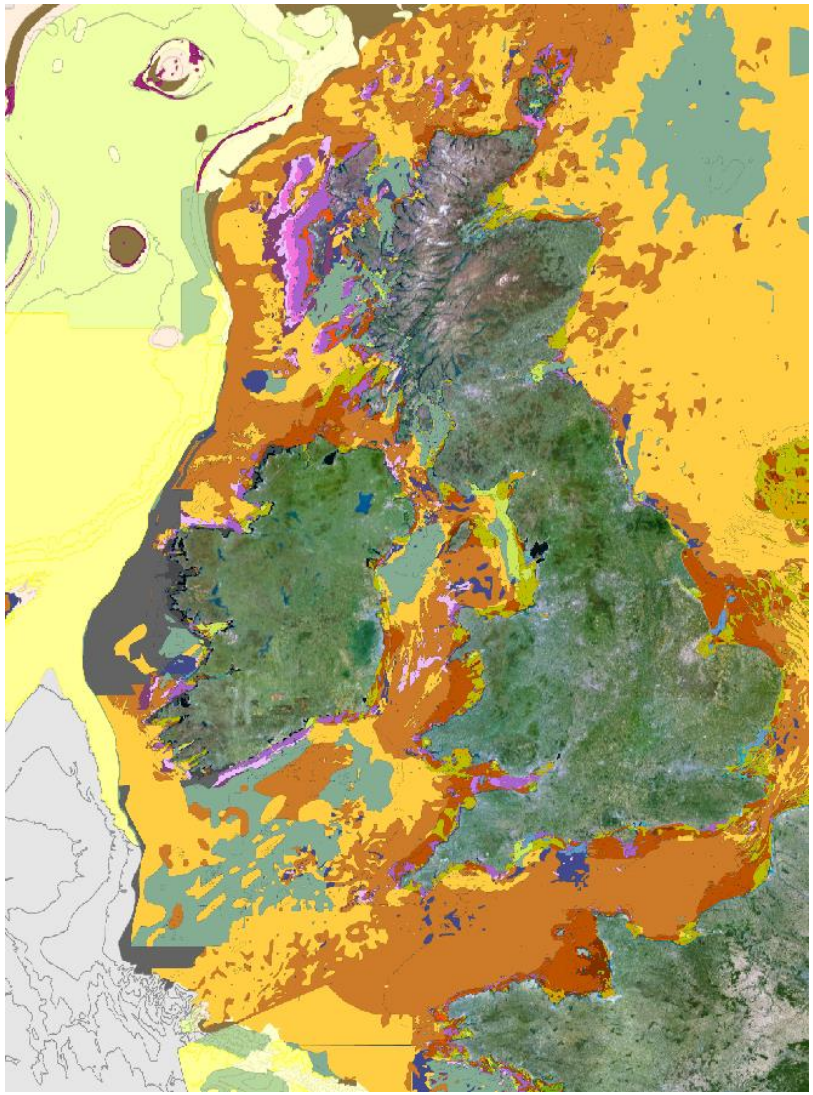

Figure 4 - Marine Habitats

Types of habitats: selection of datasets

Theme	Layers	Area	Producer	SDI	Inspire-compliant	Diffusion	Openness
Habitats	EUSeaMap2 (2016) Broad-Scale Predictive Habitat Map	Europe	EMODnet Habitats	EMODnet Habitats	Yes	WMS	shared

Table 4 - Types of habitats: selection of datasets

Assets

- One reference layer for the whole project area

Barriers

- Limit of confidence of modelled habitats maps

Action needed

- No action needed

Biological characteristics

Marine SDI dedicated to maritime spatial planning in Celtic seas, especially in Ireland and Scotland, provide a wide range of datasets focused on species distribution. The EMODnet Biology project also releases datasets on taxa distribution, but provided information appears to be less accurate compared to datasets available on other Celtic Seas marine portals.

For the purpose of this report, it was not possible to commit on the analysis of the full list of available datasets for biological characteristics. The choice was thus made to focus on 2 species i.e. Grey Seals and Nephrops, with different relevance to the maritime economy e.g. one being a tourist attraction / hazard to fishing gear / nuisance to finfish aquaculture and the other being of major commercial relevance to the Irish Sea fishing industry.

Coverage

Access to data about species distribution, spawning and nursery grounds is more difficult on the French seas part of the SIMCelt project area. No WMS or WFS layers were found available for these species.

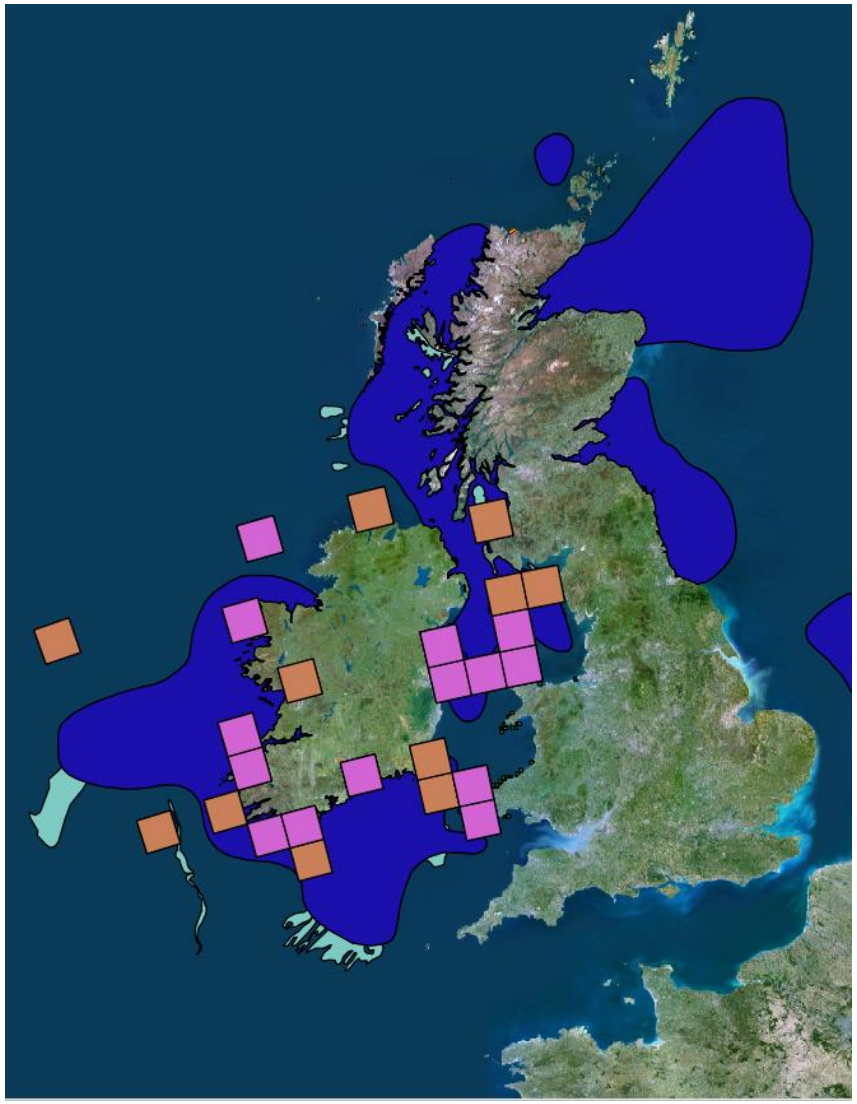

Figure 5 - Biological characteristics

Biological Characteristics: selection of datasets

Theme	Layers	Area	Source	SDI	Inspire Metadata	Diffusion	Openness
Nephrops	Nephrops Ground Nephrops Underwater Television Survey Stations	Ireland	Marine Institute	Ireland's Marine Atlas	Yes	WFS	Open
Nephrops	Nephrops Spawning Grounds Nephrops Nursery grounds	UK & Ireland	Marine Scotland	Marine Scotland NMPi	No	WMS	Shared
Nephrops	Nephrops Spawning Grounds	UK & Ireland	CEFAS	Wales Marine Planning Portal	No	WFS	Open
Grey Seal	Observations of Grey Seal Abundance of Grey Seal Search of Grey Seal Range of Grey Seal	Ireland	Irish Wales and Dolphin Group	Ireland's Marine Atlas	Yes	WFS	Open
Grey Seal	Seal Density	Celtic Seas	Marine Scotland	Marine Planning Evidence	No	SOAP	
Grey Seal	Grey Seal Pupping Sites	Scotland	Sea Mammal Research Unit	Marine Scotland NMPi	No	WMS	
Grey Seal	Grey Seal Pupping Haul Out	Wales	Natural Ressources Wales	Wales Marine Planning Portal	No	WFS	

Table 5 - Biological characteristics: selection of datasets

Assets

- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Some issues when trying to combine data coming from different protocols (WxS vs SOAP)
- Information less accessible in France
- Some missing information about licences.

Action needed

- No action plan defined yet

Pressures & impacts

It is possible to find many data sources for pressures on the Celtic Seas area. In the case of a portal demonstrator for maritime spatial planning, getting already harmonised sources for some example of pressures appears to the most relevant, so the choice was made to select datasets provided by OSPAR Commission.

Coverage

OSPAR datasets cover North-East Atlantic, and include SIMCelt project area in totality. They provide therefore a good representation of some pressures existing in this maritime zone.

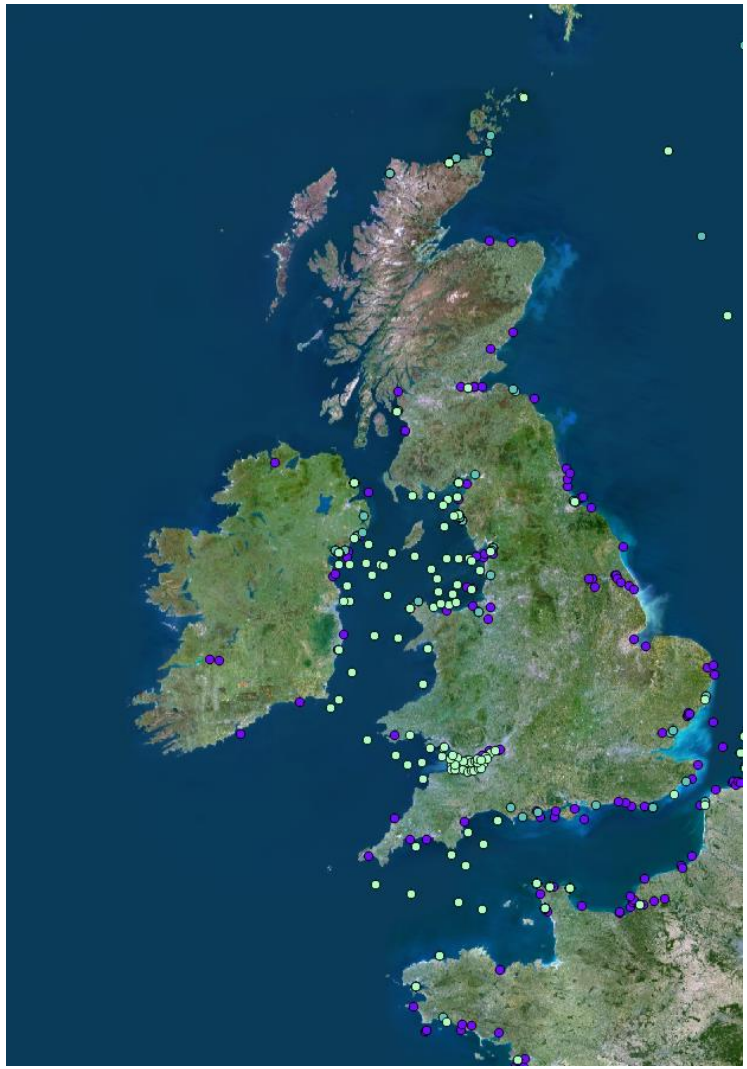

Figure 6 – Pressures & impacts

Pressures and impacts: selection of datasets

Theme	Layers	Area	Source	SDI	Inspire Metadata	Diffusion	Openness
Marine contaminants	OSPAR marine contaminants - biota OSPAR marine contaminants - Sediments OSPAR marine contaminants - water	Europe	OSPAR	OSPAR data portal	Yes	WFS	Shared
Dumping	OSPAR Dumpingat sea	Europe	OSPAR	OSPAR data portal	Yes	WFS	Shared
Radioactive substances	Environmental Monitoring of Radioactive Substances in Biota Environmental Monitoring of Radioactive Substances in seawater	Europe	OSPAR	OSPAR data portal	Yes	WFS	Shared
Underwater noise	OSPAR impulsive underwater noise	Europe	OSPAR	OSPAR data portal	Yes	WFS	Shared

Table 6 - Pressures and impacts: selection of datasets

Assets

- All chosen datasets available in WFS
- Chosen layers cover the whole project area

Barriers

- Completeness: no complete coverage of the Celtic Seas area

Action needed

- No action needed

Activities / uses

Aquaculture

With respect to aquaculture, EMODnet Human Activities European program provides layers of information about finfish and shellfish production areas. These datasets are the result of harmonisation work at a European scale, partly based on previous projects, like EUROSHELL[4] regarding shellfish production sites. There is no seaweed culture dataset coming from EMODnet Human activities program, so national datasets for Ireland, Scotland and France were added.

Coverage

EMODnet datasets for finfish and shellfish production areas seem to be accurate enough for United Kingdom and Ireland, and to provide less information for France, especially for finfish farming sites. Regarding seaweed culture, data for Scotland, Ireland and France can be accessed by web services.

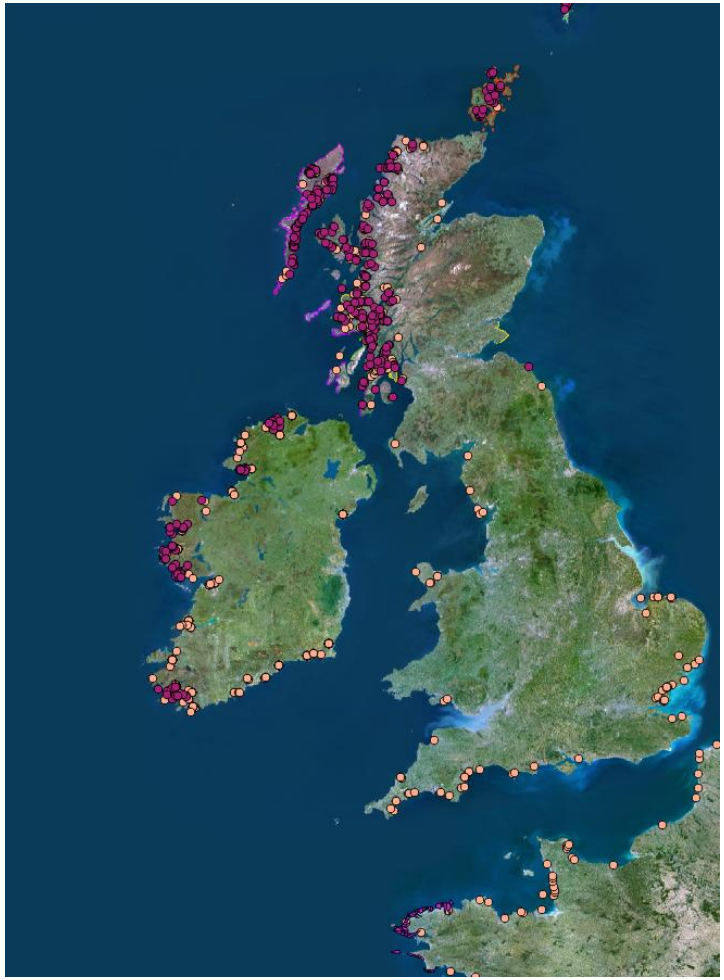

Figure 7 - Aquaculture

[4] http://www.euroshell-net.eu/Project

Aquaculture: selection of datasets

Theme	Layers	Area	Producer	SDI	Inspire Metadata	Diffusion	Openness
Shellfish	Shellfish production areas	Europe	EMODnet Human activities	EMODnet Human activities	yes	WFS	Open
Finfish	Finfish farming sites	Europe	EMODnet Human activities	EMODnet Human activities	yes	WFS	Open
Seaweed	Seaweed by culture type Seaweed by species type	Ireland	DAFM	Ireland's Marine atlas	Yes	WMS	Closed
Seaweed	Current green Seaweed harvesting methods Current kelp harvesting methods current red seaweed harvesting methods current wracks harvesting methods Proposed future resource harvesting locations Resource maps	Scotland	Marine Scotland	Marine Scotland NMPi	No	WMS	Shared
Seaweed	Lieux de pêche de laminaires du Finistère	France	DDTM29	Géobretagne	Yes	WFS	Open

Table 7 - Aquaculture: selection of datasets

Assets

- Datasets harmonisation work initiated through EMODnet and Euroshell projects
- Shellfish and finfish: data accessible in WFS for the whole project area
- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Completeness: EMODnet layers don't take into account seaweed culture
- Seaweed: Heterogeneity in datasets structures

Action needed

- No action plan defined yet

Fishing

Fishing activity can be characterized by two kinds of information. The first one corresponds to regulation data, i.e. areas where fishing activity is restricted. The second one is the observed activity. Data relative to activity can be collected with Vessel Monitoring System (VMS), which is mandatory equipment for fishing vessels above 15 meters.

Coverage

Aggregated VMS data is accessible for fishing vessels from United Kingdom and Ireland. In France, access to this kind of dataset is restricted.

For regulation data, datasets were available by web services for France, Ireland and Scotland.

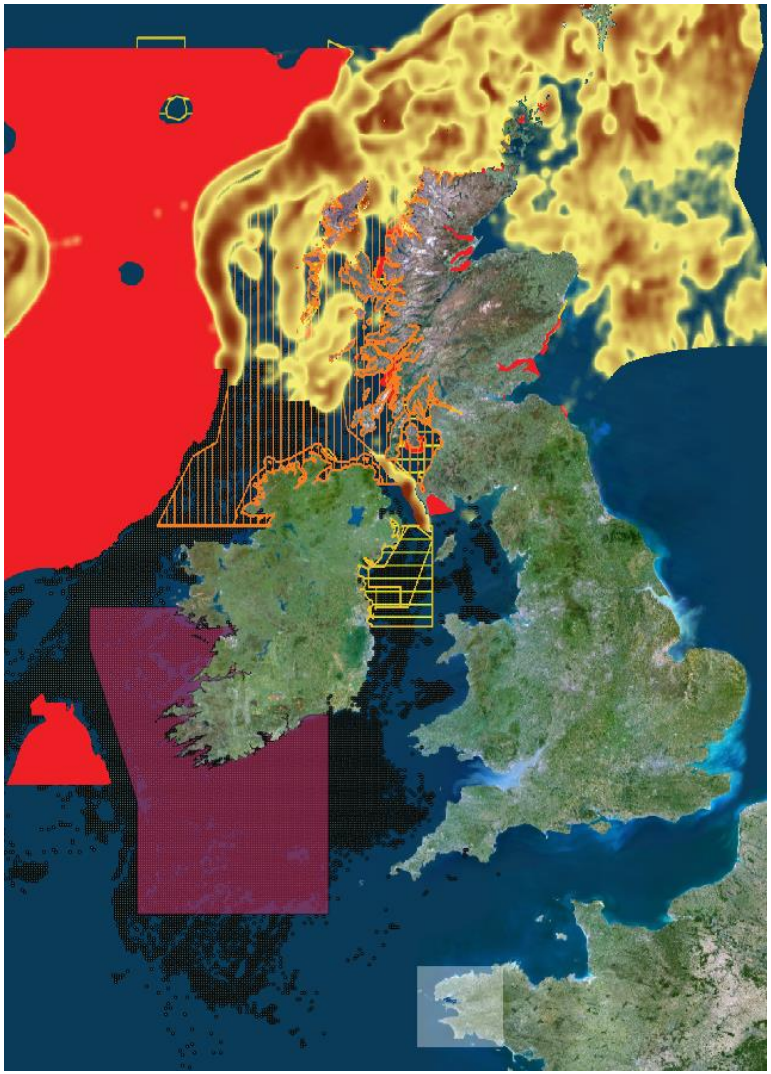

Figure 8 - Fishing

Fishing: selection of datasets

Theme	Layers	Area	Source	SDI	Inspire metadata	Diffusion	Openness
Regulation	Brest métropole : Zones de pêche en Rade de Brest	France	Brest Métropole	Géobretagne	Yes	WMS	Open
Regulation	Lignes interdiction de chalutage du Finistère	France	DDTM29	Géobretagne	Yes	WFS	Open
Regulation	Les cantonnements de pêche dans les eaux françaises	France	AAMP	Cartomer	Yes	WFS	Shared
Regulation	Fishing - managed areas	Scotland	Marine Scotland	Marine Scotland NMPi	No	WMS	Open
Regulation	Fisheries biologically sensitive areas Greencastle Codling Protected Area	Ireland	Marine Institute	Ireland's Marine Atlas	Yes	WFS	Open
VMS data	Commercial Fishing Intensity by Fishing Gear & Fishing Time	Ireland	Marine Institute	Ireland's Marine Atlas	Yes	WFS	shared
VMS data	VMS Amalgamated Fishing Intensity Layers	Scotland	Marine Scotland	Marine Scotland NMPi	No	WMS	Shared
VMS data	Fishing effort - VMS	United Kingdom	MMO	Marine planning evidence	No	SOAP	

Table 8 - Fishing: selection of datasets

Assets

- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Access to datasets relative to fishing sector sometimes very difficult (ex: VMS data in France)
- Some issues when trying to combine data coming from different protocols (WxS vs SOAP)
- Many data sources needed to cover the project area.

Action needed

- No action plan defined yet

Marine Renewable Energies

Marine renewable energies concern offshore facilities dedicated to electricity production from wind, tides, waves and current. EMODnet Human Activities project and OSPAR Commission provide datasets related to marine renewable energies covering the whole Celtic Seas area. However, they are not exhaustive and need to be completed by national datasets.

Coverage

Combination of data coming from EMODnet Human Activities project and from OSPAR Commission seem to provide a good coverage for the SIMCelt project area. Few sites can be added from Irish and Scottish data sources.

Figure 9 - Marine renewable energies

Marine Renewable Energies: selection of datasets

Theme	Layers	Area	Producer	SDI	Inspire metadata	Diffusion	Openness
Wind energy	Wind Farms	Europe	EMODnet Human activities	EMODnet Human activities	yes	WFS	Open
Wind energy	Wind Lease Sites	Scotland	The Crown Estate	Marine Scotland NMPi	No	WMS	Open
Ocean energy	Ocean energy facilities	Europe	EMODnet Human activities	EMODnet Human activities	yes	WFS	Open
Ocean energy	Galway Bay 1/4 Scale Wave Energy Test Site Atlantic Marine energy full scale test site	Ireland	Marine Institute	Ireland's Marine Atlas	Yes	WMS	Open
Ocean energy	Wave lease Sites Tidal Lease Sites	Scotland	The Crown Estate	Marine Scotland NMPi	No	WMS	Open
Wind & ocean energies	OSPAR Offshore Renewable Energy Developments	Europe	OSPAR Commission	OSPAR Data Portal	Yes	WFS	Shared

Table 9 - Marine Renewable Energies: selection of datasets

Assets

- Some data harmonisation work already initiated with EMODnet Human activities project and OSPAR commission
- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Some datasets only viewable on MSDI and not available by web services (ex: Wales)
- Heterogeneity in data models, object types, licencing, etc between the different sources.

Action needed

- No action plan defined yet

Maritime transport routes and traffic flows

Maritime transport data are grouped into many different themes. Some can be retrieved on nautical charts, like navigational assistance data (anchorage areas, buoys, lights), or traffic separation schemes, but others concern traffic, either theoretical (for example indicative ferry routes) or collected by Automatic Identification System (AIS). In the Celtic Seas area, data can come from many different national sources while coverage of vessel type and transit can be limited.

Coverage

Maritime transport data is more easily available by webservices in United Kingdom and in Ireland than in France, where traffic separation schemes are not officially published yet and AIS data access is complicated.

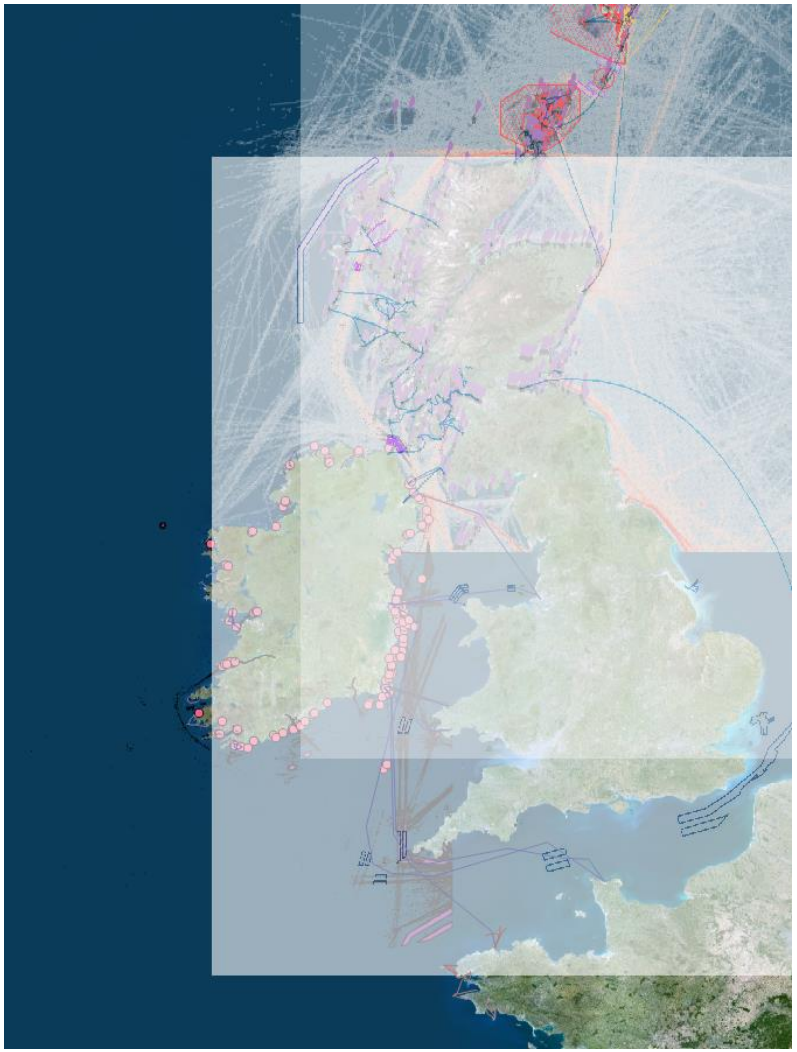

Figure 10 - Maritime transportation

Maritime transport: selection of datasets

Theme	Layers	Area	Producer	SDI	Inspire metadata	Diffusion	Openness
AIS Data	Coastguard AIS traffic frequency	Ireland	Irish coast guard	Ireland's Marine atlas	Yes	WFS	Closed
AIS Data	AIS - Shipping Traffic - Average weekly density of vessel types	Scotland	MMO MCA	Marine Scotland NMPi	No	WMS	Open
AIS Data	National Shipping density 2014	UK	MMO	Marine Planning Evidence	No	SOAP	Open
Navigational assistance	Commissioners of Irish Lights Buoy	Ireland	Commissioners of Irish Lights	Ireland's Marine atlas	Yes	WFS	Shared
Navigational assistance	Navigational lights and lighthouses	Scotland	Northern Lighthouse board	Marine Scotland NMPi	No	WMS	
Navigation channels	Navigational approaches	England		Marine Planning Evidence	No	WMS	
Navigation channels	Navigation channels	Scotland	OceanWise	Marine Scotland NMPi	No	WMS	Shared
Ferry routes	Ferry routes	Ireland	Marine Institute	Ireland's Marine atlas	Yes	WFS	Open
Ferry routes	Scottish ferry routes (indicative courses)	Scotland	Transport Scotland	Marine Scotland NMPi	No	WMS	Open
Ferry routes	Liaisons maritimes du finistère	France	DDTM29	Géobretagne	Yes	WFS	Open
Traffic separation scheme	Traffic separation scheme zone	UK	MMO	Marine Planning Evidence	No	WMS	
Traffic separation scheme	IMO traffic routing schemes	Scotland	IMO	Marine Scotland NMPi	No	WMS	Shared
Anchorage areas	Anchor berths and anchorage areas	Scotland	OceanWise	Marine Scotland NMPi	No	WMS	Shared
Anchorage areas	Anchoring areas	England		Marine Planning Evidence	No	WMS	

Table 10 - Maritime transport: selection of datasets

Assets

- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Some important datasets not published yet (ex: Traffic separation schemes for France) or not available by web services
- AIS data not easily available (even aggregated) in WMS
- Difficulties combining data coming from different protocols (WxS vs SOAP)
- Issues with some WMS coming from ArcGIS server: white background
- MMO metadata: information missing (producer, date, …)

Action needed

- Protrayal harmonisation: provide a specific style for each theme

Ports

Many sources provide information layers on ports in the Celtic Seas area, with a huge heterogeneity in data models: some sources indicate only the name and coordinates, when others include functional information, frequentation, etc.

Coverage

2 kinds of datasets can be identified. At the project area scale, the layer coming from EMODnet Human Activities project gives harmonised information on the main ports. Then more detailed datasets can be provided by national sources. At national level, datasets from England and Wales are not available by webservices.

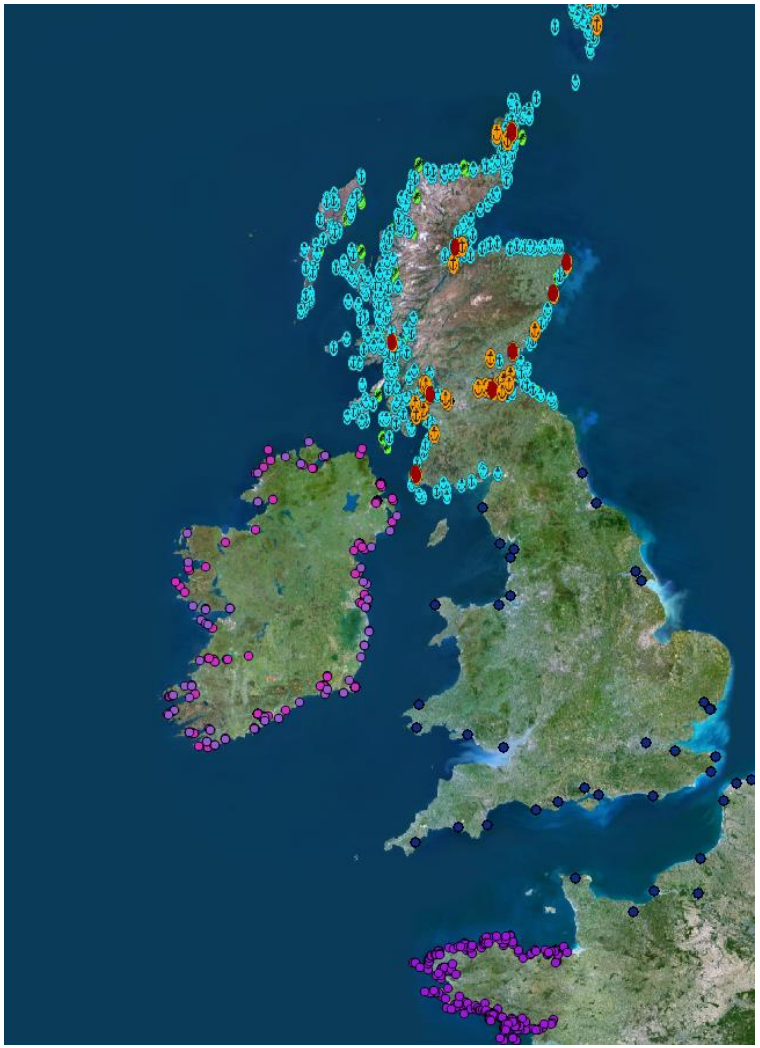

Figure 11 - Ports

Ports: selection of datasets

Theme	Layers	Area	Producer	SDI	Inspire metadata	Diffusion	Openness
Ports	Main ports	Europe	EMODnet Human activities	EMODnet Human activities	yes	WFS	Open
Ports	Ferry port Commercial port	Ireland	MaREI	Ireland's Marine Atlas	Yes	WFS	Open
Ports	Fishing port	Ireland	DAFM	Ireland's Marine Atlas	Yes	WFS	Open
Ports	Scottish ports and harbours	Scotland	Marine Scotland Transport Scotland	Marine Scotland NMPi	no	WMS	Shared
Ports	Ports de Bretagne	France	Région Bretagne	Géobretagne	Yes	WFS	Open

Table 11 - Ports: selection of datasets

Assets

- Majority of datasets available in WFS
- Some data harmonisation work already initiated with the EMODnet Human activities project
- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Different data models, some with very few information (name & location only)

Action needed

- portrayal harmonisation, in order to provide a single legend for all the data sources

Military

As far as military data is concerned, some harmonisation work has been done by the EMODnet Human Activities project and the OSPAR commission on the theme of munition dumping sites. When dealing with zones restricted to military usage, less information can be found on the various official SDI, and datasets that are available come with specific usage restrictions.

Coverage

Datasets on areas of military usage were available for the United Kingdom. In France they are not published yet, and they were not found for Ireland.

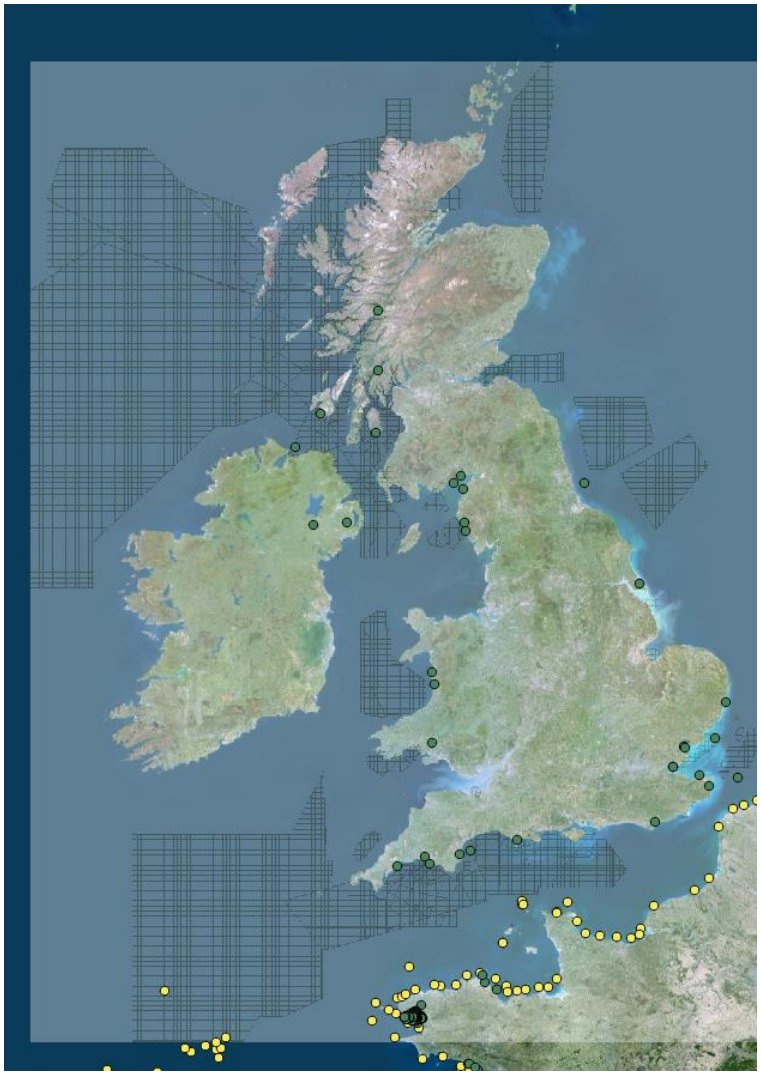

Figure 12 - Defence

Defence: selection of datasets

Theme	Layers	Area	Producer	SDI	Inspire metadata	Diffusion	Openness
Munition dumping	Munitions dumping sites	Europe	EMODnet Human Activities	EMODnet Human Activities	Yes	WMS	Open
Munition dumping	OSPAR Encounters with dumped chemical and conventional munitions	Europe	OSPAR	OSPAR MPA Map tool	Yes	WFS	Shared
Munition dumping	Historic munitions disposal sites	Scotland	National Archives	Marine Scotland NMPi	No	WMS	Shared
Munition dumping	Munition dumping ground	United Kingdom	MMO	Marine Planning Evidence	No	WMS	
Military areas	MOD establishments	Scotland	Ministry of Defence	Marine Scotland NMPi	No	WMS	Shared
Military areas	Military practice areas	United Kingdom	MMO	Marine Planning Evidence	No	WMS	

Table 12- Defence: selection of datasets

Assets

- No specific asset identified

Barriers

- Data not available in web service for all countries (e.g. France)
- Data accuracy not very good
- Issues with WMS layers coming from ArcGIS Server: white background

Action needed

- No action plan defined yet

Nature and species conservation sites and protected areas

The Maia Network project aims at providing all the Marine Protected Areas located within the Atlantic Arc in a single database. It covers the entire SIMCelt area, except north Brittany. Through this dataset, a work of harmonisation has been led in order to provide a single data model for all the MPAs of Atlantic European countries, and especially Ireland, United Kingdom and France. The only missing data concerning SIMCelt area correspond to MPAs located around north Brittany, where we will get data from AAMP.

Coverage

Maia database combined with French MPA datasets for north Brittany provide very good coverage for this theme in the SIMCelt project area.

Figure 13 - Nature and species conservation sites and protected areas

Marine protected areas: selection of datasets

Theme	Layers	Area	Source	SDI	Inspire Metadata	Diffusion	Openness
Marine protected areas	Designated marine protected areas (point) Designated marine protected areas (polygon)	Europe	Maia Network	Maia portal	No	WFS	Open
Marine protected areas	Aires marines protégées françaises	France	AFB	Cartomer	Yes	WFS	Open

Table 13 - Marine Protected Areas: selection of datasets

Assets

- All data is available through WFS protocol
- Completeness: Exhaustive coverage of the Celtic Seas area when combining these sources of information
- Databases coordinated by a SIMCelt partner, makes easier to process updates

Barriers

- No metadata accessible through CSW protocol

Action needed

- No specific action needed

Raw material extraction areas

This raw material extraction theme covers marine aggregates and ore exploitation, but also hydrocarbon extraction. The EMODnet Human Activities project provides harmonised information for both subthemes.

Coverage

Regarding Hydrocarbon extraction, EMODnet layers seem complete enough as they match well with national datasets.

Complementary datasets are needed to get a better coverage of aggregate extraction subtheme, they are provided by Marine Institute for Ireland and the Crown Estate for United Kingdom.

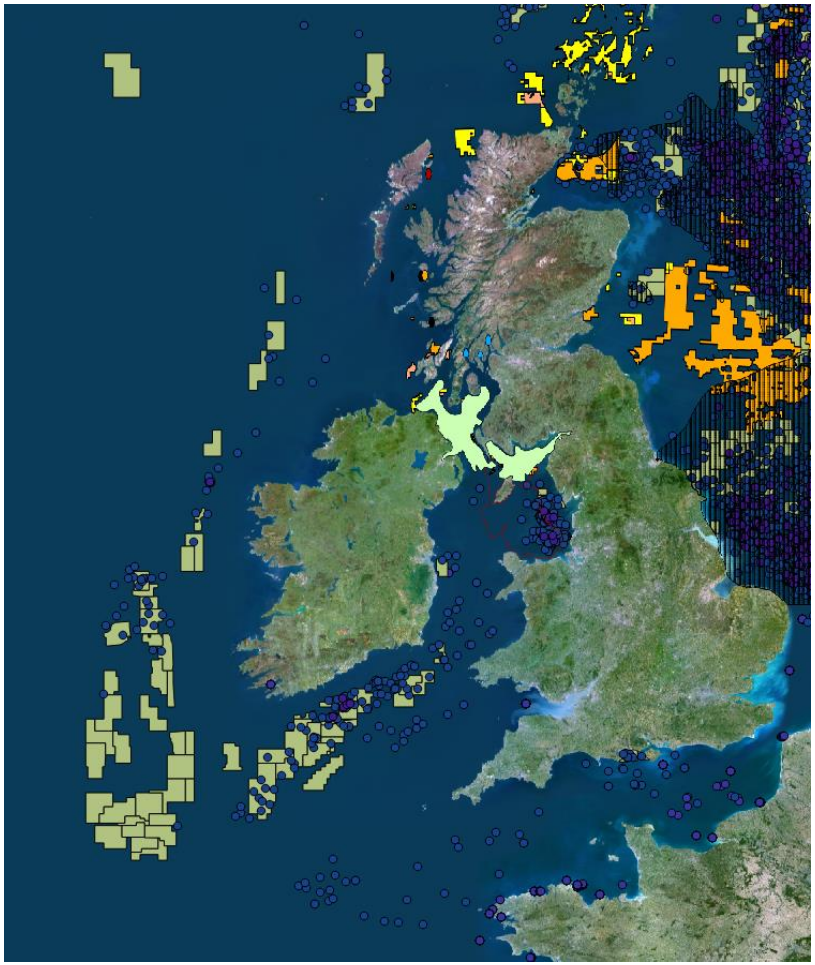

Figure 14 - Raw material extraction areas

Raw material extraction areas: selection of datasets

Theme	Layers	Area	Source	SDI	Inspire Metadata	Diffusion	Openness
Aggregate extraction	Aggregate extraction	Europe	AZTI- Tecnalia	EMODnet human activities	Yes	WFS	Open
Aggregate extraction	Irish sea aggregate resource area	Ireland	Marine Institute	Ireland's Marine atlas	Yes	WFS	Open
Aggregate extraction	Sand gravel resources prospective areas for sand gravel resources Evaporite Resources Metallic Mineral Resources	Scotland	The Crown estate	Marine Scotland NMPi	No	WMS	Shared
Aggregate extraction	MMO Legacy aggregate license areas Marine aggregate application areas Marine aggregate license areas Aggregate exploration and option areas	United Kingdom	The Crown estate	Marine Planning Evidence	No	WMS	Shared
Hydrocarbon extraction	Active Licenses Boreholes offshore installations	Europe	Cogea	EMODnet human activities	Yes	WFS	Open

Table 14 - Raw material extraction areas: selection of datasets

Assets

- Data harmonisation work already initiated with EMODnet Human activities project
- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Some datasets with no Inspire compliant metadata associated.
- Availability of some data sources in WMS instead of WFS could make working with them more difficult

Action needed

- No action plan defined yet

Submarine cables and pipeline routes

We can identify 3 major sources dealing with submarine cables in the SIMCelt study area: one from the KIS-ORCA[5] European project and the other two from national hydrographical services (Shom and UKHO). Each data source contains different cables, with different attribute information associated to these cables. Some additional cables are brought with Irish and Scottish datasets. Regarding pipelines, the information is mainly coming from national producers.

Coverage

Putting all the listed sources together gives the appearance of a seemingly complete picture of the Celtic Seas area, but it is actually very difficult to say if we get a complete coverage. The main issue regarding submarine cables and pipelines concerns data accuracy. Many cables can be found in several of the identified datasets, but with divergent geometries, and different attributes.

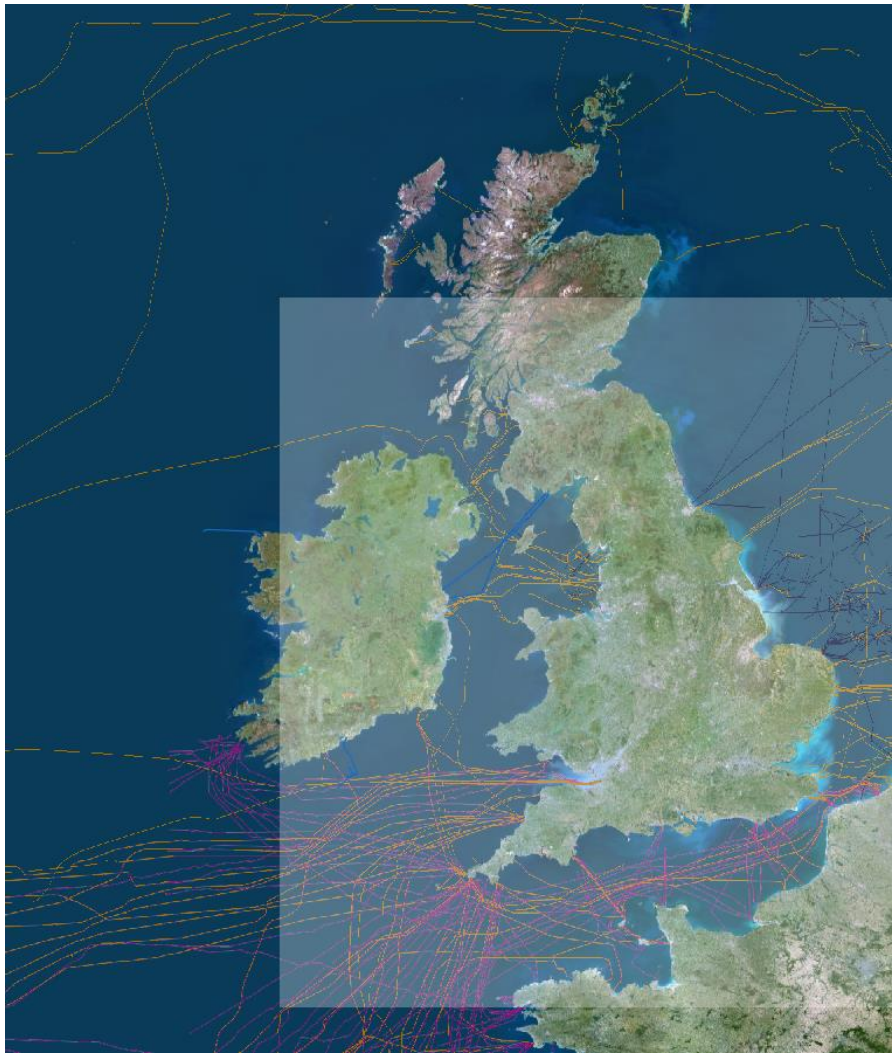

Figure 15 - Submarine cables & pipelines

[5] http://www.kis-orca.eu

Submarine cables and pipelines: selection of datasets

Theme	Layers	Area	Source	SDI	Inspire Metadata	Diffusion	Openness
Cables	KIS-Orca subsea cables	Europe	KIS-Orca project dpt	Marine Planning Evidence	No	WMS	Shared
Cables	submarine cables	United Kingdom	UKHO	Marine Planning Evidence	No	WMS	Shared
Cables	Telecommunication cables - Historic cables	Scotland	Marine Scotland	Marine Scotland NMPi	No	WMS	Open
Cables	Arklow Bank Wind Park Connection Cable	Ireland	Marine Institute	Marine Atlas	Yes	WFS	Open
Pipelines	Pipelines	England	UKHO	Marine planning evidence	No	WMS	Shared
Pipelines	Hydrocarbon pipelines	Scotland	CDA Limited	Marine Scotland NMPi	No	WMS	Shared
Pipelines	Offshore Gas Pipeline	Ireland	DCENR	Marine Atlas	Yes	WFS	Open
Cables & pipelines	Cables et conduites	France	Shom	data.shom.fr	Yes	WMS	Shared

Table 15- Submarine cables and pipelines: selection of datasets

Assets

- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Data portrayal: Each layer has its own symbology
- Difference of accuracy between layers, very difficult to identify which one is more accurate
- Availability of some data sources in WMS instead of WFS could make working with them more difficult
- Issues with WMS layers coming from ArcGIS Server: white background

Action needed

- Portrayal harmonisation, in order to provide a single legend for all the data sources

Tourism & recreation

Access to information about tourism and recreation is far from easy. A large range of activities need to be considered, involving countless potential sources of information, each one providing data with different structure and representation.

Two activities are considered here: yachting and bathing, as they concern identified data from all the countries or the Celtic Seas.

Coverage

Scottish Government carried out a marine recreation and tourism survey in 2015, aiming at filling the gaps on marine recreation data and providing baseline information for maritime spatial planning. Consequently many information layers are available online at Scottish National Marine Plan interactive (NMPi) WMS consolidated within the new Marine Scotland Information (MSI) webpages[6]. Aside from that, some datasets on leisure activity are provided for England, and very few are available on other Celtic Seas territories.

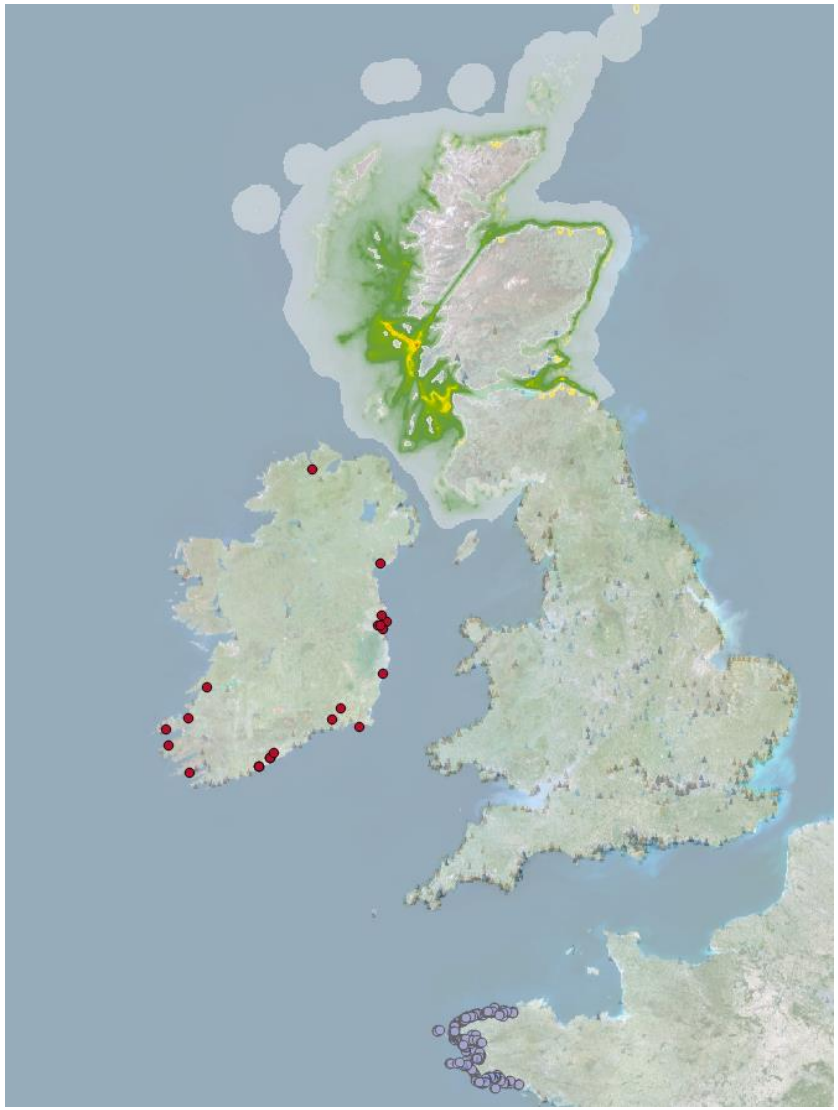

Figure 16 - Tourism & recreation

[6] http://marine.gov.scot

Tourism & recreation: selection of datasets

Theme	Layers	Area	Source	SDI	Inspire Metadata	Diffusion	Openness
All activities	Scottish Marine Recreation & Tourism Survey 2015	Scotland	Marine scotland	Marine Scotland NMPi	No	WMS	Shared
Yachting	Training Centres Scotland Marinas Sailing Clubs Sailing Areas Recreational cruising routes Racing areas	Scotland	Royal Yachting Association	Marine Scotland NMPi	No	WMS	Shared
Yachting	Scottish canals	Scotland	Scottish canals	Marine Scotland NMPi	No	WMS	Shared
Yachting	Slipways Marinas	Europe	http://www.boatlaunch.co.uk	Marine Planning Evidence	No	WMS	Shared
Yachting	Marinas	Ireland	MaREI	Ireland's Marine Atlas	Yes	WFS	Open
Bathing	Blue flag and seaside awards since 2012	Scotland	Keep Scotland Beautiful	Marine Scotland NMPi	No	WMS	Shared
Bathing	Bathing Waters compliance	England	Environment Agency	Marine Planning Evidence	No	WMS	Shared
Bathing	Blue flag beaches	England	Keep Britain Tidy	Marine Planning Evidence	No	WMS	Shared
Bathing	Sites de baignade du Finistère	France	DDTM29	Géobretagne	Yes	WFS	Open

Table 16 - Tourism and recreation: selection of datasets

Assets

- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Few data available aside from Scotland and England
- Issues with WMS layers coming from ArcGIS Server: white background

Action needed

- No action plan defined yet

Underwater cultural heritage

Underwater cultural heritage mainly relates to shipwrecks, but also integrates specific sites of interest, like historic marine protected areas or World Heritage sites.

Coverage

Some information on wrecks is present in both European projects EMODnet Bathymetry and EMODnet Human Activities, but data does not cover the Celtic Seas area. Instead, Shom for France and Infomar project for Ireland provide interesting datasets. UKHO also maintains a wrecks database, but it is not publicly available. Data for sites of interest linked to underwater cultural heritage were only found for Scotland.

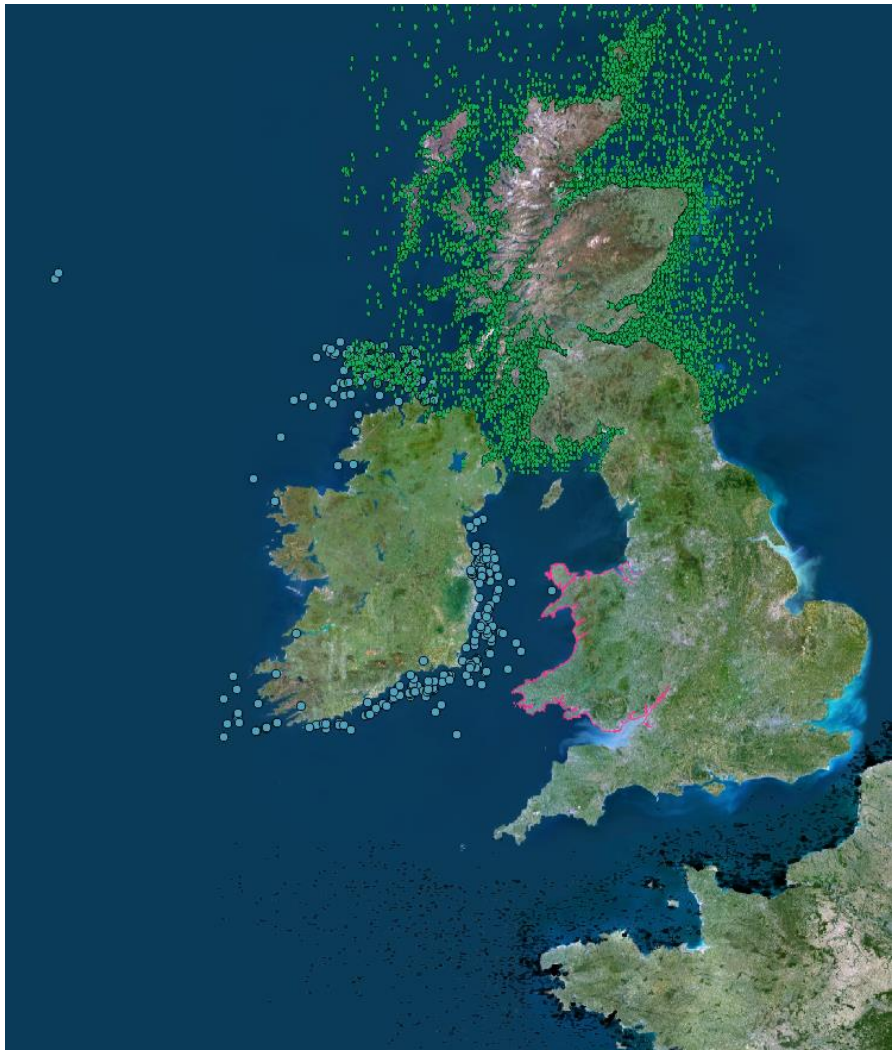

Figure 17 - Underwater cultural heritage

Underwater cultural heritage: selection of datasets

Theme	Layers	Area	Source	SDI	Inspire Metadata	Diffusion	Openness
Wrecks	Epaves et obstructions	France	Shom	data.shom.fr	Yes	WMS	Shared
Wrecks	Infomar seabed survey shipwrecks	Ireland	INFOMAR Project	Marine atlas	Yes	WFS	Open
Wrecks	Losses Vessels designated as Controlled Sites under the Protection of Military Remains Act 1986	Scotland	RCAHMS	Marine Scotland NMPi	No	WMS	Shared
Sites of Interest	Historic Marine protected areas World heritage sites	Scotland	Historic Environment Scotland	Marine Scotland NMPi	No	WMS	Shared

Table 17 - Underwater cultural heritage: selection of datasets

Assets

- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Data portrayal: Each layer has its own symbology
- Issues with WMS layers coming from ArcGIS Server: white background

Action needed

- No action plan defined yet

Coastal defence

The coastal defence theme covers data about shoreline management and protection against coastal risks. Information types required for MSP include coastline position, shoreline management plans, dredging, and coastal hazard characterisation.

Coverage

The EMODnet Human Activities project provides a layer with a good coverage of SIMCelt project areas, and containing already harmonised data. The other subthemes show important coverage variations on data availability by web services. When data on coastal hazards have easier access in France, more information can be found on shoreline management plans in England and Wales.

Figure 18 - Coastal defence

Coastal defence: selection of datasets

Theme	Layers	Area	Source	SDI	Inspire Metadata	Diffusion	Openness
Dredging	Dredging	Europe	AZTI- Tecnalia	EMODnet human activities	Yes	WFS	Open
Shoreline management	Shoreline management plans	England	Environment Agency	MMO Marine Planning Evidence	No	SOAP	Shared
Shoreline management	Shoreline management plans	Wales	Natural Resources Wales	Wales Marine Planning Portal	No	WFS	Shared
Coastal protection Schemes	Coastal Protection and Flood Defence - Coast protection schemes since 2000 Coastal Protection and Flood Defence - Flood defence schemes since 1961 Coastal Protection and Flood Defence - Managed re-alignment schemes	Scotland	Scottish Government	Marine Scotland NMPi	No	WMS	Open
Coastal protection Schemes	Communes avec des PPRL approuvés	France	MEEM	Géolittoral	Yes	WFS	Shared
Coastline	Coastline	Ireland	Ordnance Survey Ireland	Ireland's Marine Atlas	Yes	WFS	Open
Coastline	Trait de côte Histolitt	France	Shom	data.shom.fr	Yes	WMS	Open
Hazard	Submersion marine Indicateur national de l'érosion côtière Nombre de catastrophes naturelles liées à la mer par commune	France	MEEM	Géolittoral	Yes	WFS	Shared

Table 18 - Coastal defence: selection of datasets

Assets

- Data partly comes from SIMCelt partner which will make it easier to provide updates to datasets.

Barriers

- Difficulties combining data coming from different protocols (WxS vs SOAP)

Action needed

- No action plan defined yet

Spatial policy

Spatial policy data include marine planning zoning information. This kind of delimitation can be created at different scales, from regional planning to local partnerships.

Coverage

Regional marine planning areas are currently provided for England and Scotland. Regarding Wales, a marine plan areas dataset is viewable on Wales Marine Planning portal[7], but it is not reachable by using web services. France, Ireland and Northern Ireland have no marine plans adopted yet. Local partnerships were only found for Scotland.

Figure 19 – Spatial Policy

[7] http://lle.gov.wales/apps/marineportal

Marine spatial policy: selection of datasets

Theme	Layers	Area	Source	SDI	Inspire Metadata	Diffusion	Openness
Spatial policy	Coastal typologies	England	MMO	Marine planning evidence	No	WFS	Shared
Spatial policy	Scottish Marine Regions Local Coastal Partnerships	Scotland	Marine Scotland	Marine Scotland NMPi	No	WMS	Open

Table 19 - Marine Spatial Policy: selection of datasets

Assets

- Data for all approved plans are available.

Barriers

- No Inspire compliant metadata associated to datasets

Action needed

- No action plan defined yet

Conclusion

Some general issues

The analysis of data needs and existing gaps particularly highlights the issues below:

- There are many relevant layers for transboundary MSP. Some countries have conduced national inventories identifying reference data producers or sources to collect data. Considering transboundary issues, it is useful for Members States and planners to access to the knowledge related to neighbouring States waters. The minimum useful information is the availability and coverage of data. Webservices are an easy way to access to it as they allow reading data and information without having to collect or download it. These useful data formats are much less available. When some relevant data for MSP in a transboundary context is not listed in the inventory of this report, it is not denying that the data exists, but it highlights that it is not easily available in these useful formats.
- Data harmonisation is probably the main concern linked to data for transboundary MSP. Consistent layers covering the whole area of interest are indeed necessary, and very difficult to obtain when datasets from different jurisdiction have various portrayal, not the same attribute information, etc. The action plan led by SIMCelt C1.2.2 will have a large part dedicated to improving data harmonisation in Celtic Seas.
- Data publication progress: several important datasets for maritime spatial planning are not available in an Inspire-compliant format (and so it is for metadata publication). However the situation is gradually evolving.
- Licencing can become an essential issue in a cross-border context, and in a dynamic of sharing harmonised information. Many datasets have restrictive use, even for non-commercial purposes. However, there is positive progress encouraged by legislation evolution (for example, in France, data from public services will have to be open data).
- Finally several technical challenges are identified, like issues when trying to visualize data brought by different protocols. The problem is mainly met when trying to connect to SOAP protocol emitted by ArcGIS server. One possible answer could be to ask the responsible administrations to activate WMS services.

Other data sources to explore

If usually data from State services or other official sources are preferred, some other sources may be worth exploring. It is the case of datasets coming from crowdsourcing, like OpenStreetMap[8] and its marine counterpart, OpenSeaMap[9]. These sources still raise some questions, like data reliability, but can

[8] http://www.openstreetmap.org
[9] http:// openseamap.org

bring some advantages. One is the high update frequency. It should be possible to identify some application areas where data from crowdsourcing could bring added value.

Part 3. Action plan

Overview

The action plan sets the guidelines of the operations conducted during year 2 of SIMCelt project on datasets identified in the analysis in order to increase interoperability and added value for MSP process.

Here are the proposed action points:

Theme	subtheme	action	Priority
administrative borders	terrestrial boundaries	Inspire-compliant metadata	low
administrative borders	terrestrial boundaries	portrayal harmonisation	Low
administrative borders	maritime boundaries	Inspire-compliant metadata	High
administrative borders	maritime boundaries	portrayal harmonisation	High
administrative borders	maritime boundaries	Inspire-compliant dataset	High
Physical, chemical & biological information	Biological characteristics	Inspire-compliant metadata	Low
Human activities	Aquaculture	Inspire-compliant metadata	High
Human activities	Aquaculture	portrayal harmonisation	High
Human activities	Fishing	Inspire-compliant metadata	High
Human activities	Fishing	portrayal harmonisation	High
Human activities	Marine Renewable energies	Inspire-compliant metadata	High
Human activities	Marine Renewable energies	portrayal harmonisation	High
Human activities	Maritime transport routes	Inspire-compliant metadata	High
Human activities	Maritime transport routes	portrayal harmonisation	High
Human activities	Ports	Inspire-compliant metadata	High
Human activities	Ports	portrayal harmonisation	High
Human activities	Defence	Inspire-compliant metadata	Low
Human activities	Defence	portrayal harmonisation	Low
Human activities	Raw material extraction areas	Inspire-compliant metadata	Low
Human activities	Raw material extraction areas	portrayal harmonisation	Low
Human activities	Submarine cables and pipeline routes	Inspire-compliant metadata	High
Human activities	Submarine cables and pipeline routes	portrayal harmonisation	High
Human activities	Tourism & recreation	Inspire-compliant metadata	High
Human activities	Tourism & recreation	portrayal harmonisation	High
Human activities	Underwater cultural heritage	Inspire-compliant metadata	Low
Human activities	Underwater cultural heritage	portrayal harmonisation	Low
Human activities	coastal defence	Inspire-compliant metadata	Low
Human activities	coastal defence	portrayal harmonisation	Low
Human activities	Spatial policy	Inspire-compliant metadata	Low

Table 20 - Actions points

SIMCelt meeting held in Liverpool on January 9th 2017 provided a list of major sectors to focus on. Those sectors are thus given a high priority.

Some identified action points will be found in nearly every category, and are subject to the same treatment.

Inspire-compliant metadata

The goal is to be able to display metadata in the Inspire standard for every dataset provided in SIMCelt portal demonstrator. Two initial situations can be identified as starting points to reach this goal: either provider already has a harvestable catalogue or he has not.

Situation 1: data provider already has a CSW catalogue

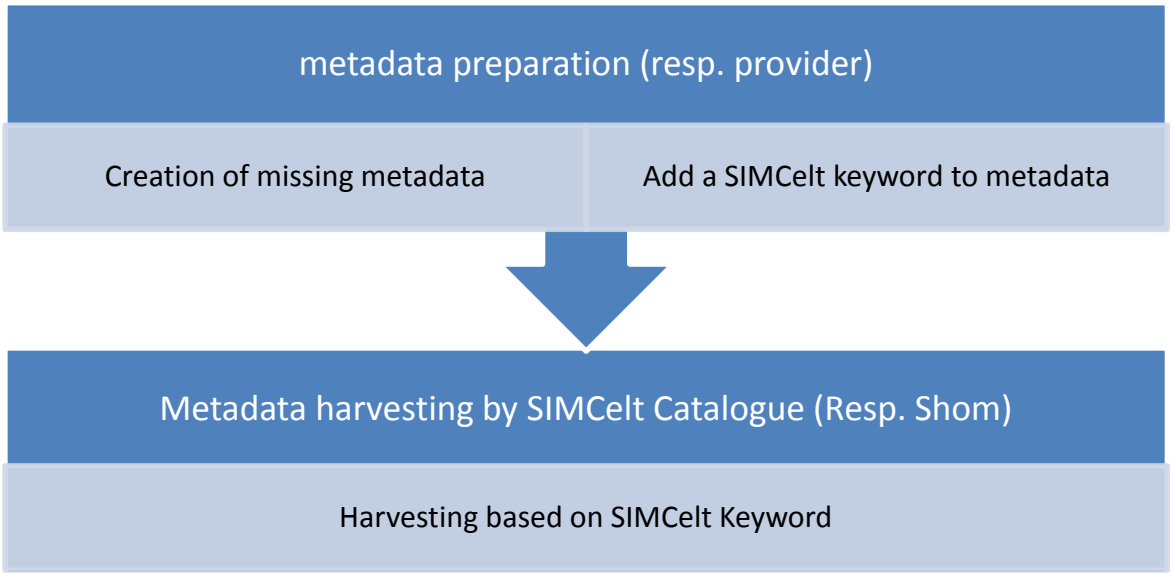

Figure 20 - Inspire-compliant metadata publication workflow with CSW catalogue

Situation 2: data provider doesn't have a CSW catalogue

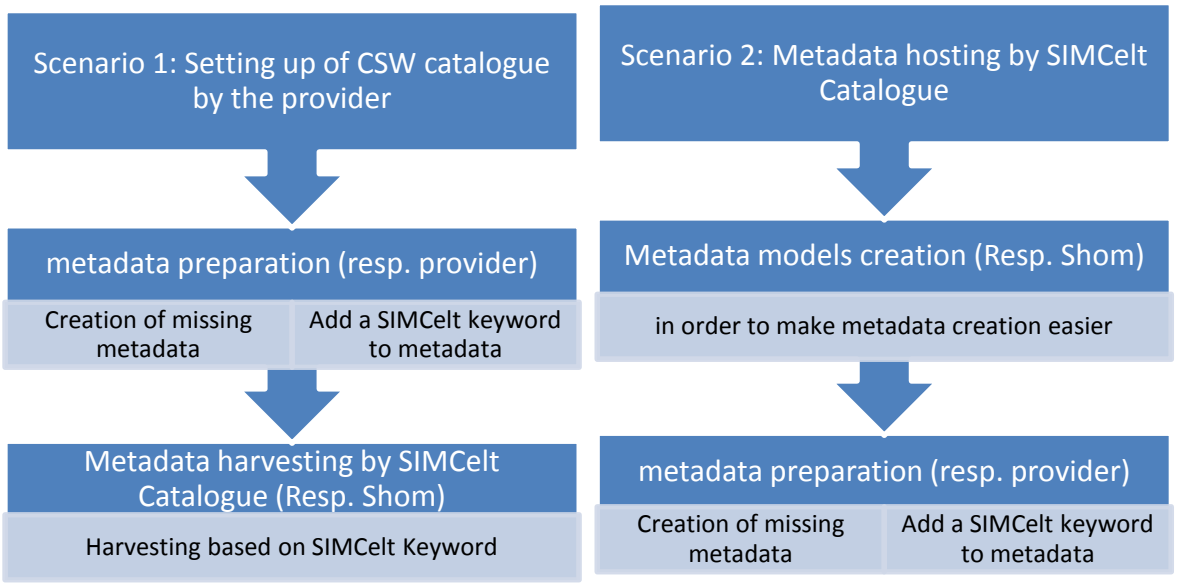

Figure 21 - Inspire-compliant metadata publication workflow without CSW catalogue

Portrayal harmonisation

Displaying data from different sources on the same cartographic interface can create issues. One of them is that the different sources often don't use the same legend, making the map difficult to read and to understand. Therefore, there is a need to provide common symbologies for datasets on the same sector / theme

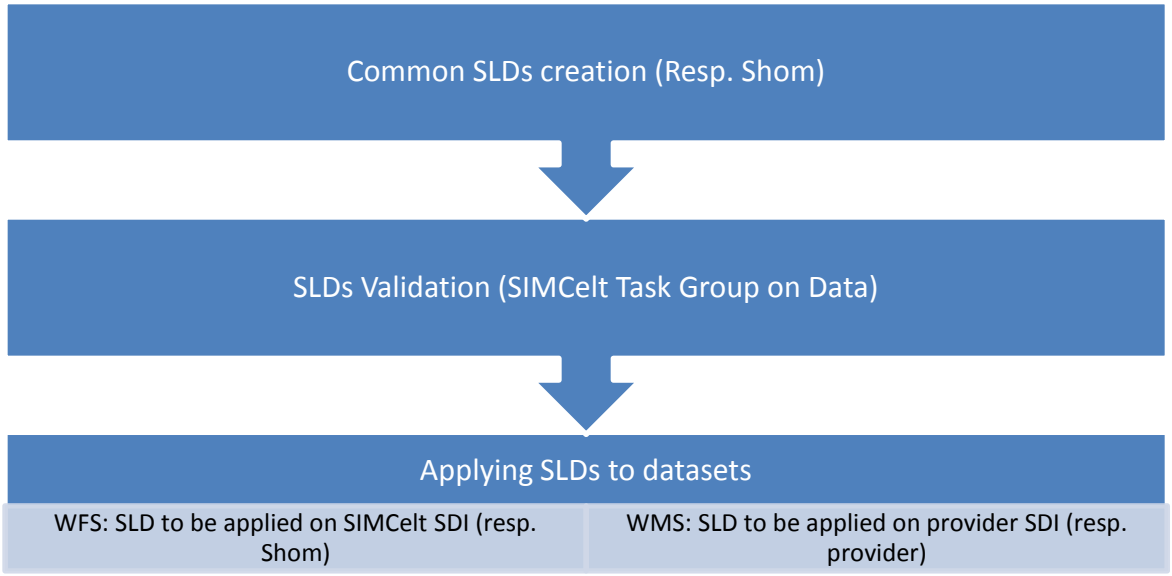

Figure 22 - Portrayal harmonisation workflow

Annex 1: List of sources

National MSP Spatial Data Infrastructures

Name	Organisation	area of interest	metadata	webservices
Ireland's Marine Atlas	Marine Institute	Ireland	Inspire	WMS - WFS
National Marine Plan Interactive	Marine Scotland	Scotland	Webpage	WMS
Marine Planning Evidence	Marine Management Organisation	England	Rest	SOAP - WMS
Wales Marine planning portal	Marine Institute	Ireland	Inspire	WMS - WFS

SIMCelt Partner SDI

Name	Organisation	area of interest	metadata	webservices
Data Shom	Shom	France	Inspire	WMS - WFS
Cartomer	AFB	France	Inspire	WMS - WFS
Irish Spatial Data Exchange	Marine Institute	France	Inspire	WMS - WFS

European projects SDI

Name	Organisation	area of interest	metadata	webservices
EMODnet Bathymetry portal	EMODnet	Europe	Inspire	WMS - WFS
EMODnet Biology portal	EMODnet	Europe	Inspire	WMS - WFS
EMODnet Geology portal	EMODnet	Europe	Inspire	WMS - WFS
EMODnet Seabed habitats portal	EMODnet	Europe	Inspire	WMS - WFS
EMODnet Chemistry portal	EMODnet	Europe	Inspire	WMS - WFS
EMODnet Physics portal	EMODnet	Europe	Inspire	WMS - WFS
EMODnet Human Activities portal	EMODnet	Europe	Inspire	WMS - WFS
EMODnet Coastal Mapping Portal	EMODnet	Europe	Inspire	
TPEA Viewer	TPEA	East-Atlantic	-	-
Inspire Geoportal	European Commission	Europe	Inspire	WMS - WFS
Natura 2000 Network Viewer	European Environment Agency	Europe	Inspire	WMS - WFS

Maia Web GIS	Maia network	East-Atlantic	Inspire	WMS - WFS
VALMER data hub	VALMER	Channel - French Atlantic side	Inspire	WMS - WFS

Other SDI

Name	Organisation	area of interest	metadata	webservices
OSPAR MPA Map tool	OSPAR Commission	North-East Atlantic	Inspire	WMS - WFS
UKHO Inspire portal & Bathymetry DAC	UKHO	United Kingdom		
INFOMAR	Geological Survey of Ireland Marine Institute	Ireland		
National Parks and wildlife service map viewer	National Parks and wildlife service	Ireland		WMS
SNH Interactive map	Scottish natural heritage	Scotland		
Marine Information System	MMO	England	Rest	SOAP - WMS
Sextant	Ifremer	France	Inspire	WMS - WFS
Geolittoral	CEREMA	France	Inspire	WMS - WFS
Global offshore windfarm database	4C Offshore	World		
Geobretagne	Préfecture de la région Bretagne Région Bretagne	Brittany	Inspire	WMS - WFS
BODC	British Oceanographic Data Center	United Kingdom		
MEDIN	MEDIN partnership	United Kingdom		
Data.gov.ie	Department of Public Expenditure and Reform	Ireland		WMS - WFS
data.gouv.fr	Mission Etalab	France	Inspire	WMS - WFS
data.gov.uk	Data Team - Cabinet Office	United Kingdom		
Geoportail	Institut National de l'Information Géographique et Forestière	France	Inspire	WMS - WFS
indigeo	Université de Bretagne Occidentale	Brittany	Inspire	WMS - WFS