

# Analysis of Data needs and existing gaps

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Version 1



Supporting Implementation of Maritime Spatial Planning in the  
Northern European Atlantic



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## Component 1: Supporting Implementation of MSP

### Sub-component 1.3.3: Data Information requirements for MSP

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# Acronyms

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**ADRIPLAN:** ADRIatic Ionian maritime spatial Planning

**AFB:** Agence Française pour la Biodiversité (France)

**AIS:** Automatic Identification System

**AMN:** Autoridade Marítima Nacional (Portugal)

**APA, IP:** Agência Portuguesa do Ambiente (Portugal)

**CEDEX:** Centro de estudios y experimentación de obras publicas (Spain)

**CEREMA:** Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement (France)

**CETMAR:** Centro Tecnológico del Mar (Spain)

**COGEA:** Consulenti per la gestione aziendale (Italy)

**CPMR/CRPM:** Conference OF Peripheral Maritime Regions / Conférence des Régions Périphériques Maritimes

**CROSS:** Centres régionaux opérationnels de surveillance et de sauvetage (France)

**CSW:** Catalog Service for the web

**DCSMM:** Directive cadre Stratégie pour le milieu marin (France)

**DDTM:** Direction départementale des territoires et de la mer (France)

**DEB :** Direction de l'eau et de la biodiversité (France)

**DG Mare:** Directorate General for Maritime Affairs and Fisheries (EU)

**DGITM :** Direction générale des infrastructures, des transports et de la mer (France)

**DGRM :** Direção-Geral dos Recursos Naturais, Segurança e Serviços Marítimos (Portugal)

**DGT:** Direção-Geral do Território (Portugal)

**DIRM:** Direction Inter-Régionale de la Mer (France)

**DREAL:** Direction Régionale de l'Environnement, de l'Aménagement et du Logement (France)

**DTM:** Digital terrain model

**ECW:** Enhanced compression wavelet

**EEA:** European Environment Agency (EU)

**EMEPC:** Estrutura de Missão para a Extensão da Plataforma Continental (Portugal)

**EMODnet:** European Marine Observation and Data Network

**ENMC:** Entidade Nacional para o Mercado de Combustíveis (Portugal)

**EPCI:** établissement public de coopération intercommunale (France)

**FAO:** Food and Agriculture Organisation of the United Nations

**GIMeL:** Groupe de travail Géo-informations pour la mer et le littoral (France)

**IBC :** Intensité du Bâti situé sous les niveaux marins centennaux actuels dans les communes ayant fait l'objet d'un arrêté de catastrophes naturelles d'origine marine (France)

**ICNF :** Instituto da Conservação da Natureza e das Florestas (Portugal)

**IEO:** Instituto espanol de oceanografia (Spain)  
**IFREMER:** Institut français de recherche pour l'exploitation de la mer (France)  
**IGN:** Institut Géographique National (France)  
**IH:** Instituto Hidrográfico (Portugal)  
**IHM:** Geoportal: Geoportal de la Infraestructura de datos espaciales del IHM (Spain)  
**INE:** Instituto Nacional de Estatística (Portugal)  
**INPN:** Inventaire National du Patrimoine Naturel (France)  
**INSPIRE:** Infrastructure for Spatial Information in the European Community  
**IPMA :** Instituto Português do Mar e da Atmosfera (Portugal)  
**ISO:** International Organisation for Standardisation  
**LNEC:** Laboratório Nacional de Engenharia Civil (Portugal)  
**LNEG:** Laboratório Nacional de Energia e Geologia, I.P. (Portugal)  
**MAIA:** Marine protected areas in the Atlantic Arc  
**MAPAMA:** Ministerio de Agricultura y Pesca Alimentacion Medio Ambiente (Spain)  
**MEEM:** Ministère de l'Environnement, de l'Energie et de la Mer (France)  
**MESH-Atlantic:** Mapping Atlantic Area Seabed Habitats for Better Marine Management  
**MNHN:** Muséum national d'Histoire naturelle (France)  
**MSDI:** Maritime Spatial Data Infrastructure  
**MSFD:** Marine strategy framework Directive  
**MSP:** Maritime Spatial Planning  
**NSO:** National Statistics Office  
**NUTS:** Nomenclature of territorial units for statistics  
**OSPAR:** Convention for the Protection of the Marine Environment of the North-East Atlantic  
**PPRL:** Plans de prévention des risques naturels (France)  
**PSOEM:** Plano de Situação do Ordenamento do Espaço Marítimo Nacional (Portugal)  
**REST:** Representational State Transfer  
**SAGE:** Schéma d'aménagement et de gestion des eaux (France)  
**SANDRE:** Service d'administration nationale des données et référentiels sur l'eau (France)  
**SEXTANT:** Infrastructure de données géographiques marines et littorales (France)  
**Shom:** Service hydrographique et océanographique de la marine (France)  
**SIH:** Systèmes d'Informations Halieutiques (France)  
**SLD:** Style Layer descriptor  
**SNIAMB:** Sistema Nacional de Informação de Ambiente (Portugal)  
**SNIG:** Sistema Nacional de Informação Geográfica (Portugal)  
**SNIMAR:** Sistema Nacional de Informação do Mar (Portugal)  
**SOAP:** Simple Object Access Protocol  
**VMS:** Vessel monitoring system  
**WCS:** Web Coverage Service



**WFS:** Web Feature Service

**WMS:** Web Map Service

**WMTS:** Web Map Tile Service

**ZNIEFF:** Zone naturelle d'intérêt écologique, faunistique et floristique (France)

# INTRODUCTION

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## **SIMNORAT project**

Supporting Implementation of Maritime Spatial Planning in the Northern Atlantic region (SIMNORAT) is a project co-financed by the European DG Mare EMFF Funds. The two-year project began in January 2017. It focuses on supporting the implementation of the European Directive 2014/89/EU, called Maritime Spatial Planning (MSP) Directive, and developing concrete cross-border cooperation for MSP between Member States. The project consortium is composed of eleven public bodies, from France, Portugal and Spain and international organisations. SIMNORAT outputs aim to be practitioner focused, and look to identify and share best practice on aspects of MSP implementation that address barriers to implementation of the MSP Directive and effective cooperation on transboundary areas working for MSP.

## **Data use and sharing in Maritime Spatial Planning**

Data use and sharing is required to implement the Maritime Spatial Planning Directive. According to article 10 of the Directive, Member States need to organise the use of the best available data and to decide how to organise the sharing of information, necessary for maritime spatial plans.

The data used may include environmental, social and economic data related to activities and uses, and marine physical data about marine waters. Moreover, Member States shall make use of relevant instruments and tools, including those already available under the Integrated Maritime Policy, for example EMODnet data portals, and under other relevant Union policies, such as those mentioned in the Inspire Directive 2007/2/EC.

The MSP Directive implementation requires the cooperation among Members aiming to ensure that maritime spatial plans are coherent and coordinated across the marine region concerned (article 11). In particular, such cooperation shall take into account issues of a transnational nature. This cooperation could be supported through cross-border data sharing.

## **Tools to support data use and sharing for Maritime Spatial Planning**

The Inspire Directive was published in 2007 by the European Commission in order to create a European Union Spatial Data Infrastructure for the purposes of EU environmental policies and policies or activities which may have an impact on the environment. This European Spatial Data Infrastructure enables the sharing of environmental spatial information among public sector organisations, facilitates public access to spatial information across Europe and assists in policy-making across

boundaries. Inspire is based on the infrastructures for spatial information established and operated by the Member States of the European Union. The Directive addresses 34 spatial data themes and is implemented in various stages, with full implementation required by 2021. Inspire aims to ensure interoperability between databases and to facilitate geographic data dissemination, availability and use. In INSPIRE Directive context, an increasing amount of data has been made available during the last few years, and the dynamic is still on-going. This is useful for the MSP Directive implementation in Members States' waters and to support sharing information about MSP among them.

On the technical side, the Directive relies on Open Geospatial Consortium (OGC) standards for metadata elaboration (ISO19115 – ISO19139) as well as diffusion protocols, also said formats (CSW, WMS, WFS, WCS). They allow to use and display data and metadata directly from the source by harvesting them. This facilitates the separation of the process of collection of data and information from their management, their dissemination and their use. It allows multiple uses of the data and information, based on the Inspire principle "Collect Once, Use Many". In particular, this should ensure that the most up-to-date published datasets and metadata are being used.

Maritime spatial data and information sharing is permitted by Maritime Spatial Data Infrastructures (MSDI). These tools organise and publish spatial data and information on selected geographical areas. They provide support for decision making as well.

MSP implementation and exchanges across borders are also taking advantage of the data and information evolving dissemination situation, as a considerable amount of datasets have been published, either as part of European projects (e.g. EMODnet) or national MSDI.

### **Data and information requirements for MSP**

In the Northern Atlantic area, the data and information requirements for MSP are a technical study<sup>1</sup> of the SIMNORAT project aiming to support access to and use of maritime spatial data in the waters of France, Portugal and Spain. This study is focussing on data exchanges using MSDI and Inspire protocols (on interoperability of data, metadata, data portals and availability of Web Services).

Firstly, building on the work done in the SIMNORAT project, this action identifies the data and information requirements for MSP in a transboundary context. It examines existing infrastructure arrangements in the Northern Atlantic region as well as in the four individual countries, and how these arrangements might be optimised. A group of experts, set up at the beginning of the project, collaboratively supports the study. This Task Group on Data brings together coastal and marine planners, GIS data experts and data portal experts issued from the partnership. This group plays a major role in

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<sup>1</sup> SIMNORAT C1.3.3 Component : Data and information requirements for MSP

supporting the identification of the relevant data and sources available in each country involved.

Secondly, the action seeks to identify and to address technical gaps in data and MSDI.

### **Analysis of Data Needs and Existing Gaps – Specifically Relating to Transboundary Working report**

The Analysis of Data Needs and Existing Gaps – Specifically Relating to Transboundary Working report is an output of the first part of the action item described above. It provides an initial overview on the data arrangements in the Northern Atlantic. This initial information, gathered at the beginning of the SIMNORAT project, is aimed to guide the implementation of the second part of the action item (in the SIMNORAT context). This information provides the members with a good overview of the data arrangements in the area. The report analyses makes the current state of data needs and gaps for MSP in the Northern Atlantic in order to highlight the challenges and opportunities associated with data and information in the region. Building on the SIMCelt project outputs (identified requirements for data and a list of categories of MSP data of the MSP data study<sup>2</sup>), this report also combines outputs of the Initial Workshop of the SIMNORAT Task Group on Data (Saint-Mandé, France, 20-21 June 2017) and of the analysis of the inventoried data and information in the Northern Atlantic region.

This analysis identifies where (portals, infrastructures...) and how (accessibility, interoperability...) relevant data for MSP are available and to what extent it can be improved (assets and barriers) ; it is based on an inventory of existing data, data portals, projects and tools established according to the knowledge of the partnership. Some lack of information would be the result of data not identified yet or not easily available.

This document presents the technical requirements for data in MSP in a transboundary setting. It also provides an overview of the data and information inventoried. Then the report presents in an analysis (part) the data layers organised by thematic classification with reference to the MSP Data Study categories and subcategories, accompanied by an illustration of the coverage of data and an identification of assets, barriers and possible measures to improve the data availability and interoperability. It concludes with suggestions for actions to be developed in the SIMNORAT project in order to overcome the interoperability issues encountered.

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<sup>2</sup> *MSP Data Study Executive Summary*. Technical Study under the Assistance Mechanism for the Implementation of Maritime Spatial Planning, 2016 (<https://bookshop.europa.eu/en/msp-data-study-pbEA0117258/>)

# 1. Analysis scope

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The analysis of this report aims to provide an initial information and overview of the state of available datasets for transboundary MSP in the Northern Atlantic area against the data and information requirements for MSP in a transboundary context. It provides an inventory of data sources and datasets which correspond to the knowledge of SIMNORAT partnership.

The inventory focuses mainly on data available by Web Services formats, associated with metadata and which geographical coverage is in the area of the project or at least the waters of one Member State. Nevertheless, in some cases the inventory list other formats, when these datasets are essential. Data at a local scale can also be relevant for implementing MSP or informing on MSP. But data at local scale cannot be exhaustively described in such a report.

This inventory does not pretend to be exhaustive but should be sufficient to identify the scope and the typology of technical gaps in MSP data and information in the Northern Atlantic area.

## 2. Data and information requirements for MSP in a transboundary context

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The cooperation among Member States according to the MSP Directive (article 11) aims that maritime spatial plans are coherent and coordinated across the marine region concerned. This can be supported by the cross-border spatial data exchanges supporting the identification of transboundary issues and the opportunities of cooperation, the knowledge on the MSP implementation process of the neighbouring countries and on the existing maritime spatial plans.

Thus, to be exchanged in an MSP transboundary context of the Northern Atlantic region, the data and information requires:

- To cover either France, Spain and Portugal marine waters and their littoral, or even the whole area.
- To inform on national limits, as a framework for transboundary issues.

It concerns data describing terrestrial boundaries and maritime delimitations under the law of the sea Convention.

- To correspond to a category of data MSP relevant:

The Directive indicates that the data used for maritime spatial plans elaboration may include environmental, social and economic data related to activities and uses, marine physical data about marine waters.

No classification of data of reference in link with MSP Directive exists. Nevertheless, in 2016, the MSP data study establishes a detailed categorisation of data used by Member States related to MSP. This categorisation can be used as a guidance to identify MSP relevant data. It is organised as below:

- Administrative boundary (Terrestrial boundary, Maritime boundary)
- Physical, chemical, biological information (Physical characteristics, Type of habitat, Biological characteristics, Pressures and impacts)
- Spatial policy (Spatial policy, Land use)
- Activities/uses (Aquaculture, Fishing, Marine renewable energies, Installations and infrastructures, Maritime transport routes and traffic flows, Ports, Nature and species conservation and protected areas, Military, Raw material extraction, Scientific research, Submarine cable and pipeline)

The use of this classification in this report to present the datasets and their analysis does not mean that the organisation of this classification is validated by the Partnership of SIMNORAT project. According to some Partners, some choices of the organisation need to be improved. Nevertheless, this classification is used as a first guess useful list of data themes.

- To concern MSP plans evidences and content/measures:

According to the MSs Directive, it is the responsibility of the Member States to organise the use of the available data and to decide how to organise the sharing of information, necessary for maritime spatial plans (article 10).

Portugal has already developed a maritime spatial plan, the Situation Plan (PSOEM – by Portuguese initials) that is currently under public consultation. Spain and France are currently in the process to define their first maritime spatial plan.

A complete inventory of relevant official data to be used to produce the maritime spatial plans has not been yet elaborated by France and Spain.

- To rely on Inspire standards and protocols dedicated to favour data use and exchanges across European Union.

At National level, to establish plans, the Directive encourages MS to make use of relevant instruments and tools, including such as those mentioned in the Inspire Directive 2007/2/EC.

Moreover, the Inspire Directive gives a frame to exchange spatial data and associated information (metadata) across borders ensuring the interoperability between them.

Thus:

- Data should be available in Web Services (WMS, WFS, and WMTS). These protocols guarantee an access to the most up-to-date published data, to not duplicate the data maintenance work and do not require the storage of the information.
- The spatial data should be associated with metadata to be meaningful to the user. Inspire metadata relies on ISO 19139 and 19115 standards. The ISO 19139 standard is relative to the format of the metadata record. These metadata formats allows the metadata records to be harvested. The ISO 19115 standard structures the metadata records and defines the minimum information content required (list the mandatory features in the metadata record).

# 3. Data Distribution

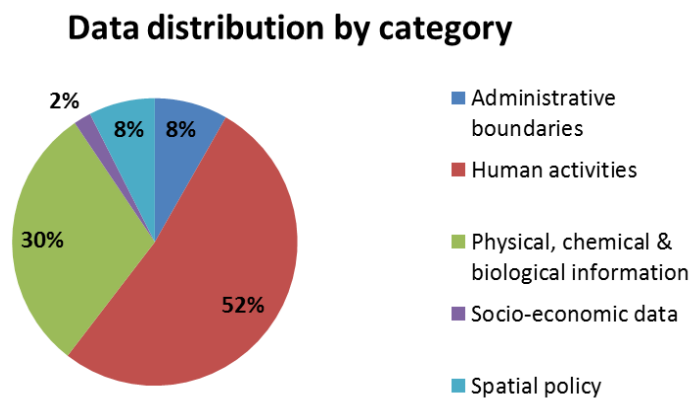
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The following figures present an overview of the inventory of data, on a quantitative point of view. Qualitative information on the data inventoried is brought up in the fifth part of this document (Analysis), for each dataset and its associated metadata.

As explained above, the data inventory presented in this report is based on the spatial data and sources knowledge of the Partnership. 43% of the datasets presented in this report have been identified thanks to its contribution.

254 datasets corresponding to SIMNORAT area of interest are presented in this analysis. They fulfil the main criteria of the data and information requirements for MSP in a transboundary context defined in the first part of the report and allow to highlight the data needs and gaps. These datasets come from 31 different spatial data portals and 51 different producers.

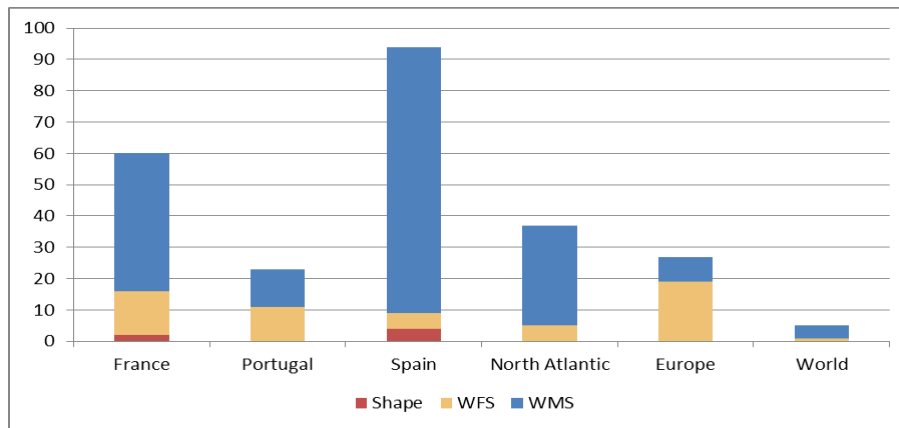
116 of these datasets, as 34%, are open datasets so their use is easily. Open data means datasets that are free to use, reuse and publish without restriction.



**Chart 1 : Data distribution by category**

An important imbalance is visible between categories. The *Human activities* category gathers half of the selected datasets. Only five layers have been found in the *Socio-economic data* category probably because it makes in general reference at alphanumeric information with no spatial representation (chart 3).

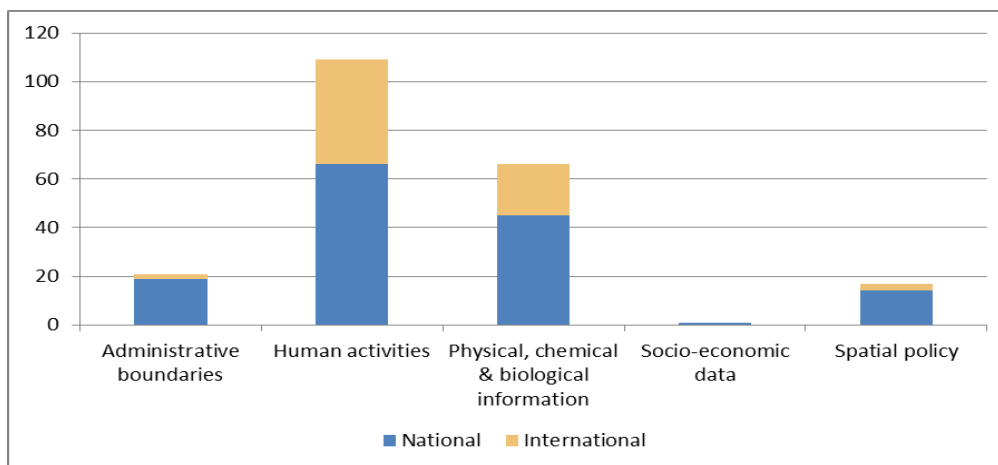




**Chart 2 : Data format distribution by area and format**

The North Atlantic category contains data that cover all or part of the study area and may concern more than one member country. For example, if a data covers the Spanish and French part of the study area, then it is classified in this category.

The chart 2 shows that in the inventory lots of datasets are available in Web Services but also that some particularly relevant data are available only in Shape. Furthermore, the most represented format is the WMS. It represents 74% of the amount of the datasets inventoried. The WMS provides only a visualisation of the spatial data, similar as a georeferenced picture.



**Chart 3 : Data distribution by category and by geographic level**

The national term refers to datasets covering the whole country in the study area. The data is therefore at the national level.

The low number of local datasets presented in this inventory is due to the selection of datasets covering the whole area to provide an overview. Local datasets can be of course useful for MSP for particular and local MSP implementation.

It is interesting to note nevertheless that a lot of local datasets exist but their identification and collection remain difficult because they are available from numerous sources and they are not centralized.

## 4. Data organisation

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Each Member State has to define its maritime spatial plans in 2021. At this time, the Member states involved in SIMNORAT are at different stages of the MSP Directive implementation. Regarding data organisation, also there are disparities between Member states, highlighted by the overview of available data.

In Portugal, the law n°17/2014, April 10th constitutes the bases of maritime planning and management of the national maritime space. The datasets used for the MSP in Portugal are centralised in the PSOEM Geoportal (Plano de Situação do Ordenamento do Espaço Marítimo, [http://www.psoem.pt/geoportal\\_psoem/](http://www.psoem.pt/geoportal_psoem/)). It aims to provide geospatial, restriction, uses and activities geo-spatial information. Multiple datasets are also available in nationally centralised portals like the Sistema Nacional de Informação do Mar (<http://www.snimar.pt/>) and Sistema Nacional de Informação de Ambiente (<https://sniamb.apambiente.pt/>)

- In Spain a lot of data exist and is owned by the public institutions of the MSFD and the MSP but are not yet officially stamped. Some of them are produced at local scale and only available in Shapefile. For the most part, they are not displayed in a geoportal, metadata records do not exist yet and there is not always a Web Service to access to them. Internal databases have been realised but the datasets are not yet published on a spatial data infrastructure. In the framework of SIMNORAT, IEO and CEDEX have created solutions to give access to these datasets and are working on to produce the associated metadata.
- In France, the datasets are multi-sources, sometimes coming directly from well identified web geoportals of reference producers. France is currently organising the use of official data for maritime public policies via a working group called GIMEL. The data used to produce the MSP oriented assessment of the waters of the four French sea basins has been identified, and the MSFD data will be used as the basis of the environmental information of the MSP implementation. Nevertheless, they are not available on an MSDI yet. France is currently setting up a MSP geoportal to publish them.
- Meaningful harmonised information can be found at European or Ospar IV level via MSDI like EMODnet, MAIA. They provide an overview of the situation even if the MSP categories are not exhaustive.

## 5. Analysis

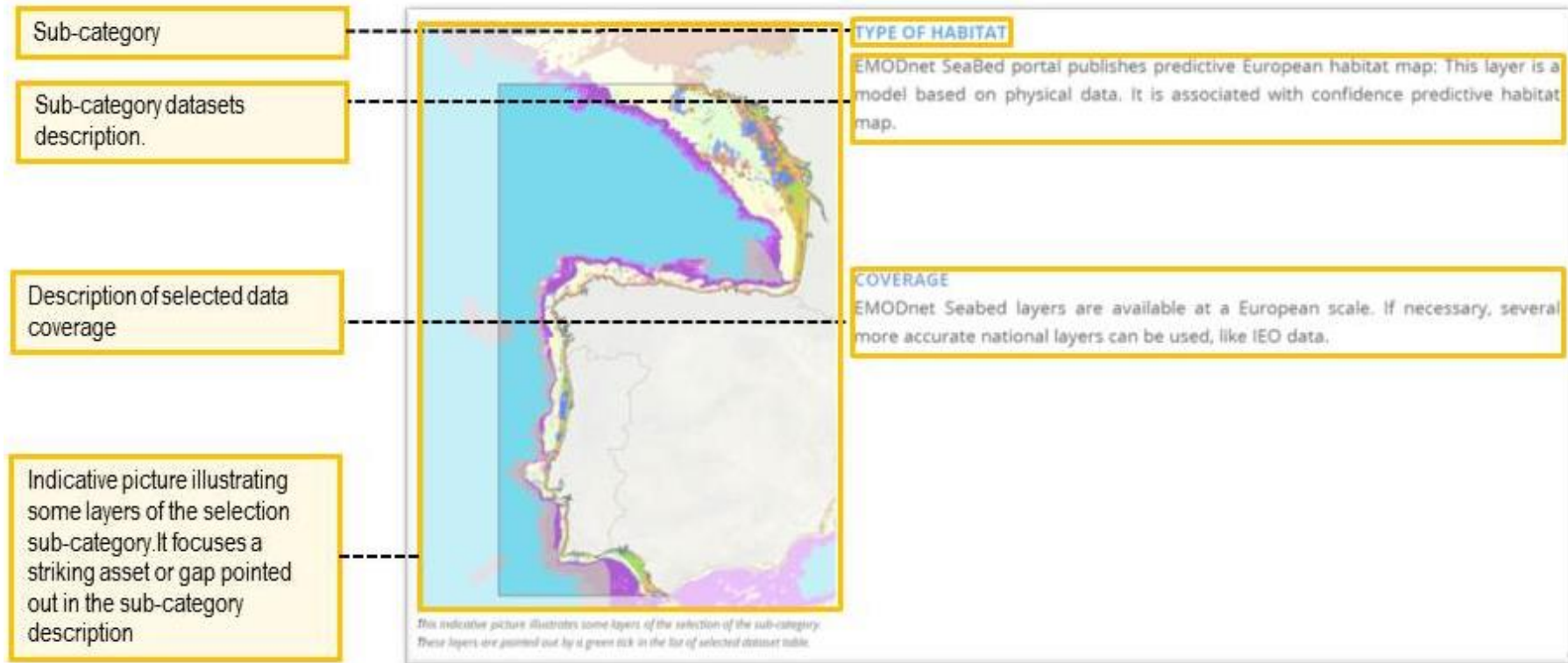
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An overview and a detailed technical description of the data fulfilling the requirements detailed above in the Northern Atlantic area are provided in this part.

The inventory of data is organised by categories and subcategories according to the MSP data study classification. An analysis of each subcategory is made in order to bring out common elements. A particular attention is paid to the technical characteristics to point out potential issues with the datasets.

This Analysis part presents an analysis for each subcategory. It is constituted of a summary, with an illustration of some the data available, a descriptive table of data and an analysis identified issues. Possible actions to solve them are described.



## HOW TO READ THIS DOCUMENT



These fields describe selected datasets. Each field is described below

The green tick means the layer is displayed in the sub-category indicative picture

Datasets selection analysis, focusing on assets, barriers and first improvement propositions

List of selected dataset									
Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	
Type of habitat	<ul style="list-style-type: none"> <li>Broad scale predictive habitat map</li> <li>Broad scale predictive habitat map – confidence</li> <li>Habitat descriptor - Substrate</li> </ul>	Europe		EMOOnet Seabed habitat	EMOOnet Seabed Habitats Portal	Yes	WMS	Open	<input checked="" type="checkbox"/>
Type of habitat	<ul style="list-style-type: none"> <li>Marine habitats Areas Distribution</li> <li>Marine habitats point Distribution</li> <li>Marine habitats Facies Distribution</li> </ul>	Spain		IEO	IEO portal	No	SOAP / WMS	Shared	<input type="checkbox"/>
Seabed	<ul style="list-style-type: none"> <li>Naturaleza Fondo Marino</li> </ul>	Spain		IEO	IEO portal	No	SOAP / WMS	Shared	<input type="checkbox"/>

Selection of datasets analysis		
Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>EMOOnet Seabed habitat centralize data information already</li> <li>IEO provides Web Service relevant for Spanish Maritime planners for SIMNORAT project</li> </ul>	<ul style="list-style-type: none"> <li>IEO Web Services are not directly connected to their database? Static?</li> <li>Data only available in WMS</li> </ul>	<ul style="list-style-type: none"> <li>No action plan is defined yet.</li> </ul>

## Item description:

The following items detail some technical characteristics of the datasets considered relevant in order to improve the level of interoperability of the datasets.

**Theme:** The theme correspond to the sub-category, or, where needed correspond to a division of the sub-category. The themes are the same that are considered in the MSP Data Study

**Layer:** Layer name/ list of layer names. If the layer name is not in English, it is then translated into English

**Area:** Geographical entity concerned by selected dataset

**Coverage:** Dataset coverage. In several cases, coverage is not displayed (dataset cannot be displayed at a large scale, multiple layers...)

**Producer:** The producer corresponds to the one who produces the data or if unknown, to the one who distributes them.

**SDI:** Spatial Data Infrastructure where datasets have been gathered. When possible, dataset from producers SDI are favoured.

**Harvestable metadata:** The inventory describes whether a metadata is harvestable or not. A metadata is considered harvestable if the metadata format is Inspire compatible and most of the mandatory fields are filled.

**Diffusion:** 4 categories are gathered: WFS / WMS / SOAP / SHAPE

**Openness:** Open data means datasets are free to use, reuse and publish without restriction. Shared data means users or a group of users can use, reuse and publish some data under a control (e.g. copyright). Close dataset means datasets are by default not authorized to use, reuse and publish. Using close datasets in SIMWESTMED portal is not authorised.

# 1. ADMINISTRATIVE BOUNDARY





Figure 1: Terrestrial Boundary

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*





## TERRESTRIAL BOUNDARY

SIMNORAT project gathers 3 states with their own jurisdiction. Official Web Services have been found for each jurisdiction. Data harmonization is limited by the fact that each country has its own organisation. What's more, only WMS data has been found in Spain. Moreover, Geometric gaps have been encountered due different accuracy of data produced.

## Coverage

Although the datasets sources are heterogeneous, the whole SIMNORAT area is covered.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Terrestrial boundaries	<ul style="list-style-type: none"> <li>▪ Communes</li> <li>▪ Départements</li> <li>▪ Région</li> </ul>	France		IGN (France)	Geobretagne	Yes	WFS	Open
Terrestrial boundaries	<ul style="list-style-type: none"> <li>▪ Concelhos</li> <li>▪ Distritos</li> <li>▪ Freguesias</li> <li>▪ Regioes</li> </ul>	Portugal		DGT	Sistema Nacional de Informação Geográfica (SNIG)	Yes	WFS	Open
Terrestrial boundaries	<ul style="list-style-type: none"> <li>▪ Administrative Unit - level 0</li> </ul>	World (one layer per country)		Global Administrative Areas	GADM database of Global Administrative Areas	No	Shape	Shared
Terrestrial boundaries	<ul style="list-style-type: none"> <li>▪ Limites administrativas</li> </ul>	Spain		IGN (Spain)	Institut Hydrographico Geoportal	Yes	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ Web Services available in France, Spain, Portugal</li> <li>➤ Open data and in WFS version in France and Portugal</li> <li>➤ Official data available</li> </ul>	<ul style="list-style-type: none"> <li>➤ Centralized EPCI Web Services not found in France</li> <li>➤ No official Web Service found at a European Scale.</li> <li>➤ Spanish data in WMS.</li> <li>➤ National boundaries: No official data found.</li> <li>➤ Overlapping between layers from different sources</li> </ul>	<ul style="list-style-type: none"> <li>➤ Toward Spanish WFS feed availability</li> <li>➤ Portrayal harmonization</li> </ul>

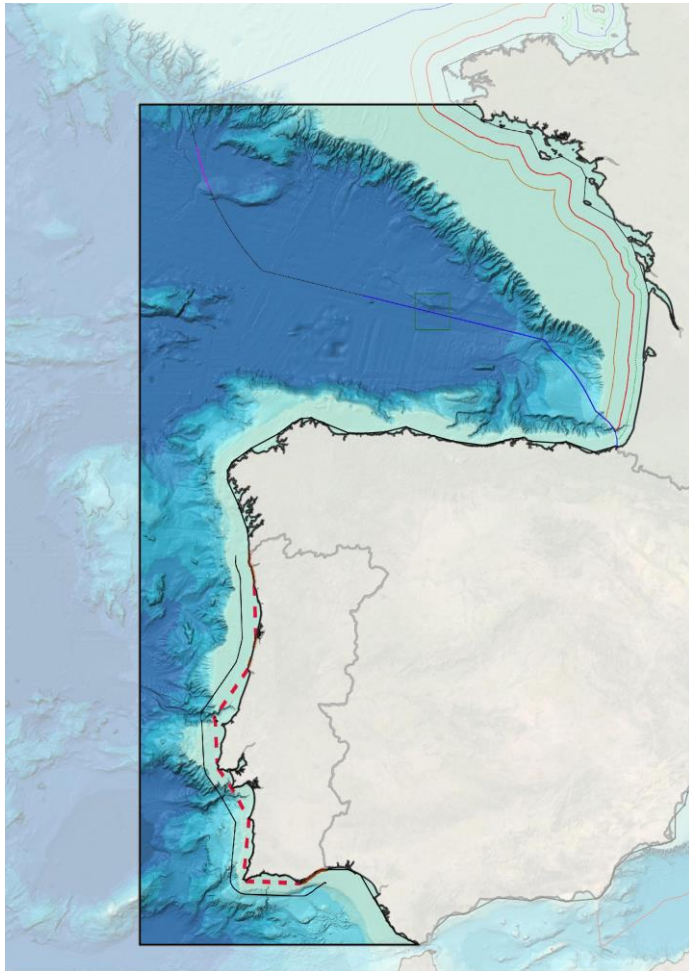


Figure 2: Maritime Boundary

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*




## MARITIME BOUNDARY

Maritime boundary layers are published by national hydrographic institutes in each country. It can be considered as reference data when dealing with Maritime spatial planning in a transboundary context. Despite the existence of non-official WFS Web Services covering the whole SIMNORAT project, only official datasets from hydrographic institutes have been selected.

## Coverage

In each country, hydrographic institute provides official Web Services from their country. Nevertheless, Spanish hydrographic institute doesn't provide data covering the whole area. Exclusive economic and contiguous zone are missing in Spain.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Maritime Boundaries	<ul style="list-style-type: none"> <li>▪ Baseline</li> <li>▪ Territorial sea</li> <li>▪ Contiguous zone</li> <li>▪ Economic Exclusive zone</li> <li>▪ Continental shelf</li> </ul>	France		Shom	Data.shom.fr	Yes	WMS	Shared
Maritime Boundaries	<ul style="list-style-type: none"> <li>▪ Lineas de base recta / Straight base line</li> <li>▪ Mar Territorial / Territorial sea</li> <li>▪ Plataforma Continental / Continental shelf</li> </ul>	Spain		IHM	Geoportal de la Infraestructura de datos espaciales del Instituto Hidrográfico de la Marina	No	WFS	Shared
Maritime Boundaries	<ul style="list-style-type: none"> <li>▪ Lineas de base recta / Straight base line</li> <li>▪ Limite Exterior do Mar Territorial / Exterior limit of territorial sea</li> <li>▪ Contiguous zone</li> <li>▪ Economic exclusive zone</li> </ul>	Portugal		IH	Geoportal do Instituto Hidrográfico	yes	WMS	Shared
Maritime Boundaries	<ul style="list-style-type: none"> <li>▪ Continental shelf and Extended Continental Shelf</li> </ul>	Portugal		IH and EMEPC	SNIMAR	Yes	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"><li>➤ Official data found in each country provided by Hydrographic services</li><li>➤ Data portrayal : French Web Service respects Inspire specification symbology</li><li>➤ Relevant Web Services provided by partners</li></ul>	<ul style="list-style-type: none"><li>➤ Coverage : Spanish maritime limits don't cover the whole country</li><li>➤ Missing Exclusive economic and Contiguous limits in Spain</li><li>➤ Portuguese and French Web Services not available in WFS</li></ul>	<ul style="list-style-type: none"><li>➤ Publication of missing data</li><li>➤ Symbology harmonization</li></ul>

## 2. PHYSICAL, CHEMICAL AND BIOLOGICAL INFORMATION

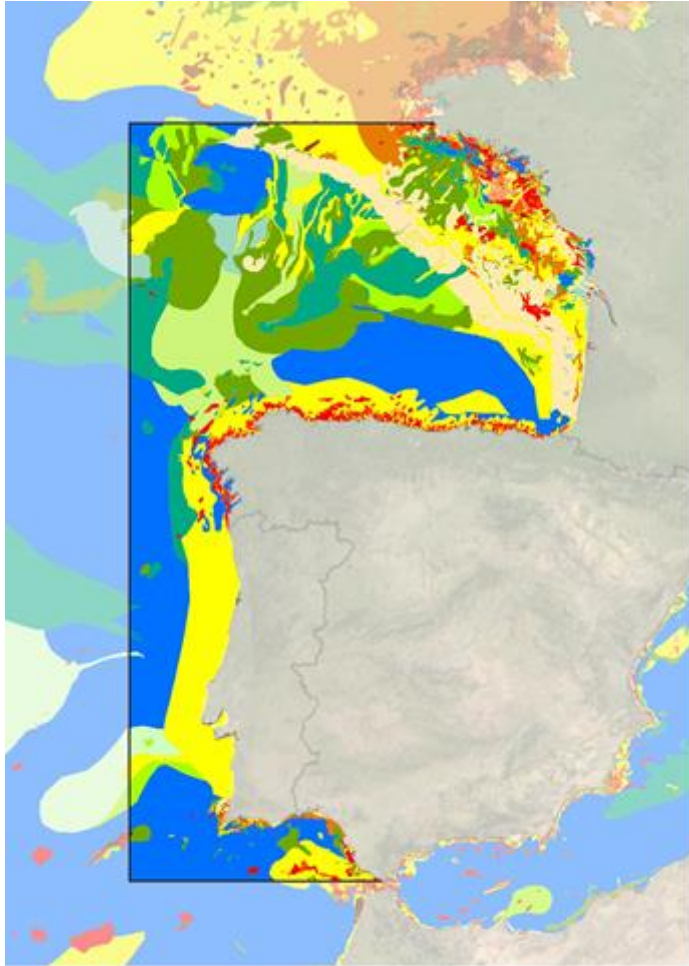


Figure 3: Physical Characteristics

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*

## PHYSICAL CHARACTERISTICS




This sub-category focuses on ground, water physical characteristics and Coast description (coastline and coast typology). Several physical characteristics data are available on a national scale, but international scale layers are also available. Consequently, layers provided by EMODnet bathymetry, EMODnet Geology, Shom have been favoured. Although data are homogeneous, many sources have been used. Relevant use of the “Emodnet Digital Bathymetric” layer involves the association with “Emodnet Digital Bathymetry source” layer.

### Coverage

International data are mainly used in ground, water physical characteristics, layers cover Ospar IV zone.



## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Ground physical characteristic	<ul style="list-style-type: none"> <li>EMODnet Digital Bathymetry (DTM)</li> <li>EMODnet Digital Bathymetry source reference</li> </ul>	Europe		Multiple	EMODnet Bathymetry	Yes	WMS / WMTS / WFS	Shared
Ground physical characteristic	<ul style="list-style-type: none"> <li>Carte sédimentaire mondiale / global sedimentary map</li> </ul>	World		Shom	Data.shom.fr	Yes	WMS / WMTS / WFS	Shared
Ground physical characteristic	<ul style="list-style-type: none"> <li>Sea-floor geology lithology</li> </ul>	Europe		Federal Institute for Geosciences and Natural Resources	EMODnet Geology	Yes	WMS	Shared
Ground physical characteristic	<ul style="list-style-type: none"> <li>Infralittoral Rock Bottom</li> <li>Circalittoral Rock Bottom</li> </ul>	Spain	Coverage not available	IEO	IEO portal	No	SOAP / WMS	Shared
Ground physical characteristic	<ul style="list-style-type: none"> <li>Carta sedimentológica</li> </ul>	Portugal		IH	IH Geoportal	Yes	WMS	Open
Ground physical characteristic	<ul style="list-style-type: none"> <li>Geo-Sítios - Inventário de Sítios com Interesse Geológico</li> </ul>	Portugal		LNEG	LNEG Geoportal		WMS	Shared
Sea Physical characteristics	<ul style="list-style-type: none"> <li>Altura significativa da onda máxima</li> </ul>	Portugal		LNEG/DGRM	Mar Português Geoportal		WMS	Yes

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Sea Physical characteristics	<ul style="list-style-type: none"> <li>▪ Courant / sea current</li> <li>▪ Hauteur significative et direction de la mer / Significant height and direction of the sea</li> <li>▪ Période de mer totale / Total sea period</li> <li>▪ Pression en surface / Surface pressure</li> <li>▪ Salinité de la mer / Sea salinity</li> <li>▪ Température de la mer / Sea temperature</li> <li>▪ Vitesse et direction du vent / Wind speed and direction</li> </ul>	Europe	Coverage not available	Shom	Data.shom.fr	Yes	WMS - Temporal	Shared
Coastline	<ul style="list-style-type: none"> <li>▪ Trait de côte Histolitt / Histolitt coastline</li> </ul>	France	Coverage not available	Shom	Data.shom.fr	Yes	WMS	Open
Coastline	<ul style="list-style-type: none"> <li>▪ Land water boundary</li> </ul>	Spain	Coverage not available	IHM	IHM Geoportal	Yes	WMS	Open
Coastline	<ul style="list-style-type: none"> <li>▪ Linea de Costa / Coast limit</li> </ul>	Spain	Coverage not available	IEO	IEO Geoportal	No	WMS	Shared
Coast typology	<ul style="list-style-type: none"> <li>▪ Nature du trait de côte / Coastline nature</li> </ul>	France	Coverage not available	MEEM	Géolittoral	Yes	WMS	Open
Coast typology	<ul style="list-style-type: none"> <li>▪ Coastline typology</li> </ul>	Spain (North)	Coverage not available			No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ European standardisation of ground physical characteristic data</li> <li>➤ Relevant Web Services provided by partners</li> <li>➤ Coverage: Datasets available at a national and supra-national scale.</li> <li>➤ Shom Web Services available in WMS Vector version: GetFeatureInfo request is available</li> </ul>	<ul style="list-style-type: none"> <li>➤ Disconnection of IEO Web Services from production database</li> <li>➤ Incomplete IEO metadata</li> <li>➤ Several datasets available with missing metadata</li> <li>➤ Portrayal harmonisation : Coastline datasets provided in WMS</li> <li>➤ Thematic harmonisation</li> </ul>	<ul style="list-style-type: none"> <li>➤ Open datasets in WFS</li> <li>➤ Test the interoperability of sea physical characteristics temporal Web Services</li> <li>➤ Portrayal harmonization: improve symbology</li> <li>➤ Publish Inspire compliant metadata when missing are uncomplete</li> </ul>

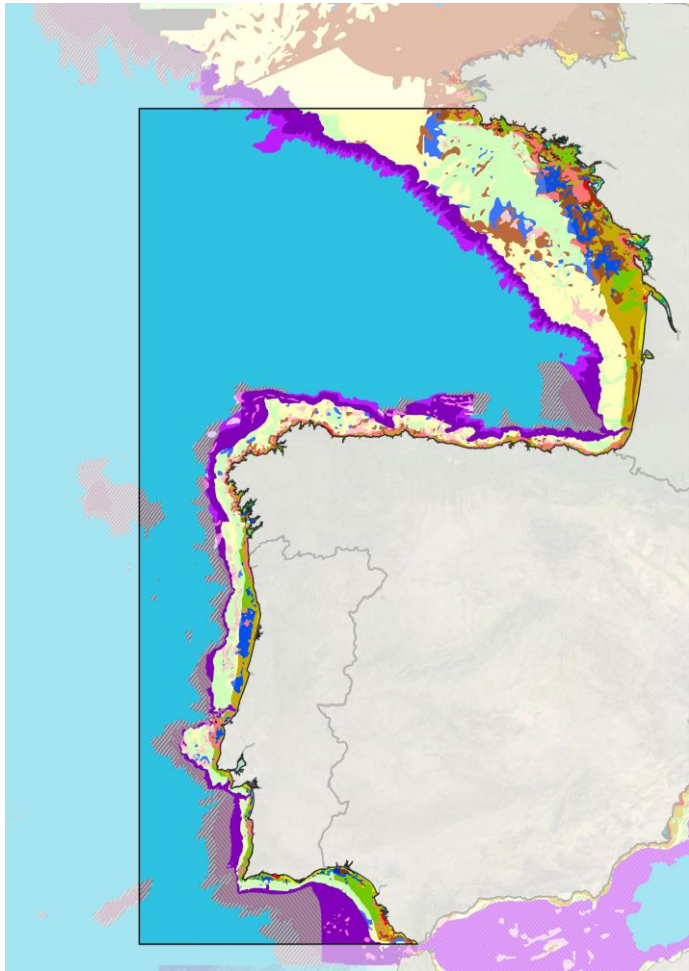


Figure 4: Type of habitat

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*


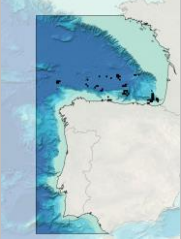
### TYPES OF HABITAT

EMODnet SeaBed portal publishes a predictive European habitat map: This layer is a model based on physical data. It is associated with the confidence predictive habitat map.

### Coverage

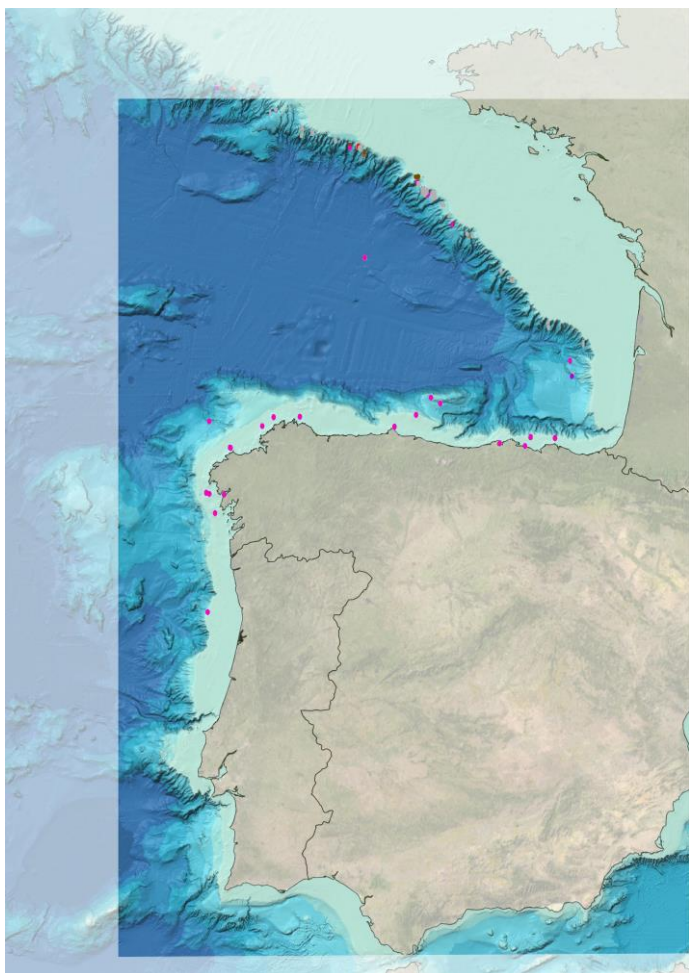
EMODnet Seabed layers are available at a European scale. If necessary, several more accurate national layers can be used, like IEO data.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Type of habitat	<ul style="list-style-type: none"> <li>▪ Broad scale predictive habitat map</li> <li>▪ Broad scale predictive habitat map – confidence</li> <li>▪ Habitat descriptor : Substrate</li> </ul>	Europe		EMODnet Seabed habitat	EMODnet Seabed Habitats Portal	Yes	WMS	Open
Type of habitat	<ul style="list-style-type: none"> <li>▪ Marine habitats Areas Distribution</li> <li>▪ Marine habitats point Distribution</li> <li>▪ Marine habitats Facies Distribution</li> </ul>	Spain		IEO	IEO portal	No	SOAP / WMS	Shared
Seabed	<ul style="list-style-type: none"> <li>▪ Naturaleza Fondo Marino / Seabed nature</li> </ul>	Spain	Coverage not available	IEO	IEO portal	No	SOAP / WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ EMODnet Seabed habitat datasets harmonized at a European scale</li> <li>➤ Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>➤ Disconnection of IEO Web Services from production database</li> <li>➤ Incomplete IEO metadata</li> <li>➤ Availability of datasets only in WMS</li> </ul>	<ul style="list-style-type: none"> <li>➤ Publish Inspire compliant metadata when missing are uncomplete</li> <li>➤ Symbology harmonization</li> </ul>



*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*

## **BIOLOGICAL CHARACTERISTICS**

Multiple datasets are available, but the topics and the production process are heterogeneous. The available layers result of surveys and punctual analysis. Consequently, in general the information covers a very small area.

### **Coverage**

Multiple national Web Services exists at a national scale, but none covering the whole Ospar IV area. French biological datasets are based on several research campaigns in Biscay bay: Consequently, datasets covers a very small area.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Flora	<ul style="list-style-type: none"> <li>▪ Coral garden distribution</li> <li>▪ Echinoturidos Distribution</li> <li>▪ Gelidium Distribution</li> <li>▪ Distribución de Lophelia Pertusa</li> <li>▪ Distribución de Pennatulaceos</li> <li>▪ Non-native point distribution</li> <li>▪ Non_native lineal distribution</li> </ul>	Spain	Coverage not available	IEO	IEO portal	No	SOAP / WMS	Shared
Flora	<ul style="list-style-type: none"> <li>▪ Cartographie des habitats coralliens du Golfe de Gascogne.( Campagnes EVHOE2012, EVHOE2010, EVHOE2009, CE0908, BOBGE02, BOBGE01, BOBGE01, BOBECO) – Cartography of coral habitats in the Biscay Bay</li> </ul>	France	Coverage not available	IFREMER	SEXTANT	Yes	WMS	Shared
Fauna	<ul style="list-style-type: none"> <li>▪ Sensible Fishes Species</li> <li>▪ Opportunistic Fishes Species</li> </ul>	Spain	Coverage not available	IEO	IEO Portal	No	SOAP / WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"><li>➤ Multiple biological characteristics Web Services available at a national</li><li>➤ Relevant Web Services provided by partners</li></ul>	<ul style="list-style-type: none"><li>➤ Web Services not found at the project scale</li><li>➤ Disconnection of IEO Web Services from production database</li><li>➤ Incomplete IEO metadata</li></ul>	<ul style="list-style-type: none"><li>➤ Portrayal harmonization: improve symbology</li><li>➤ Publish Inspire compliant metadata when missing are uncomplete</li></ul>



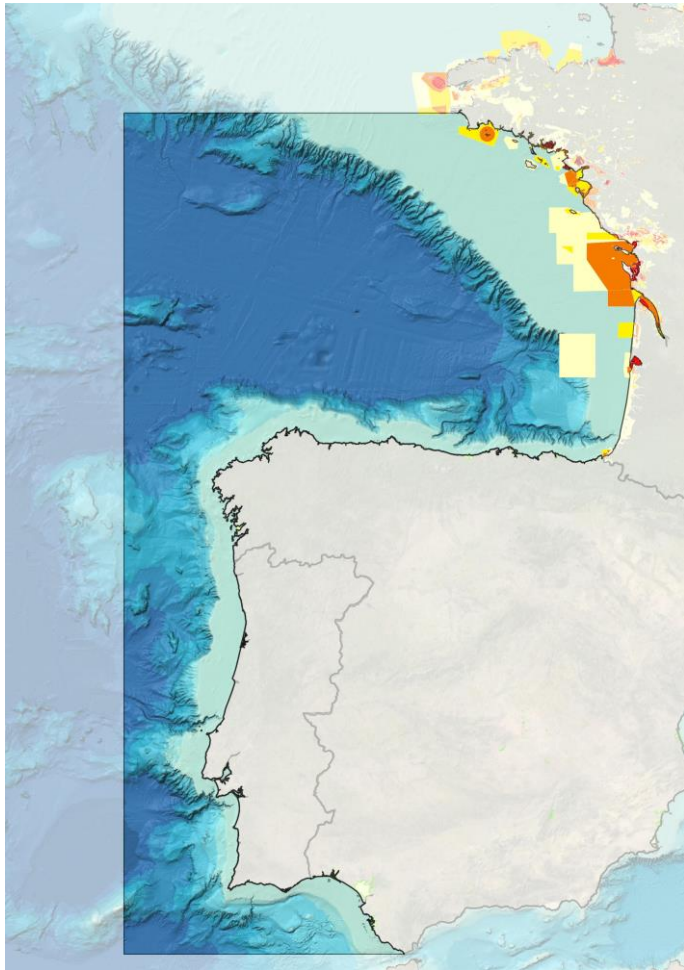


Figure 5: Pressure and Impacts

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*




## PRESSURES AND IMPACTS




This thematic gathers multiple topics: Dumping, environmental sensitivity index, ecological analysis, pollutant emission and pollutant emission potential. Ospar commission provides Centralized Web Services relevant for this thematic. Unfortunately, Instability issues occur when loading these layers. The environmental sensitivity index datasets are hard to compare between countries because they are not based on the same criteria. The list of selected datasets gathers several pollution description Web Services from the national portals in France, Spain and Portugal. Nevertheless, they are also hardly comparable because each of these layers focuses on one particular subject.



### Coverage

Plenty of datasets are available at a national scale, but no information at Ospar IV scale has been gathered.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Dumping	<ul style="list-style-type: none"> <li>Sites d'immersion des sédiments de dragages portuaires 2005-2015 / Sites of dumping sediment of harbor dredging</li> </ul>	France		MEEM / DGITM / DEB	Géolittoral	Yes	WMS	Shared
Dumping	<ul style="list-style-type: none"> <li>Material dumps 2016 dredged</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Environmental sensitivity index	<ul style="list-style-type: none"> <li>Indice de sensibilité environnemental du littoral français / Environmental sensitivity index of the French littoral</li> <li>Indice de sensibilité morpho-sédimentaire du trait de côte du littoral français / Morpho-sedimentation sensitivity index of the French coastline</li> </ul>	France		MEEM	Géolittoral	Yes	WMS	Shared
Environmental sensitivity index	<ul style="list-style-type: none"> <li>Zonas sensibles identificadas por polígonos / Sensitive areas identified by polygons</li> </ul>	Spain		MAPAMA	Geoportal del Ministerio de Agricultura y Pesca Alimentacion medio ambiente (MAPAMA)	Yes	WMS	Open

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Environmental sensitivity index	<ul style="list-style-type: none"> <li>Tourist vulnerability</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared
Ecological analysis	<ul style="list-style-type: none"> <li>WFD CW Chemical Status</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Ecological analysis	<ul style="list-style-type: none"> <li>WFD CW Ecological status - Fitoplancton</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Pollutant emission	<ul style="list-style-type: none"> <li>Registo Europeu de Emissões e Transferência de Poluentes (PRTR) / Pollutant Release and Transfer Register (PRTR)</li> </ul>	Portugal		APA; I.P.	SNIAMB	Yes	WFS	Open
Pollutant emission	<ul style="list-style-type: none"> <li>Emanações de fluidos submarinos em Portugal (Chaminés Hidrotermais, Pockmarks, Vulcões de Lama) / Underwater fluids emanation in Portugal (methane hydrates; methane and hidrothermal vents)</li> </ul>	Portugal		IPMA	SNIAMB	Yes	WMS	Shared

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Pollutant emission	<ul style="list-style-type: none"> <li>Contaminants in Mussel Distribution</li> <li>Contaminants in Sediment</li> <li>Marine litter distribution</li> </ul>	Spain		IEO	IEO Geoportal	No	SOAP / WMS	Shared
Pollutant emission	<ul style="list-style-type: none"> <li>Acumulación de presiones que generan ruido submarino en la Demarcación Noratlántica / Accumulation of pressures that generate submarine noise in the North Atlantic Demarcation</li> </ul>	Spain (North)	Coverage not available	CEDEX	CEDEX	Yes	Shape	Shared
Pollutant emission	<ul style="list-style-type: none"> <li>Acumulación de presiones que pueden causar la entrada de patógenos en la Demarcación Noratlántica / Introduction of microbial pathogenic organisms - Meshing of accumulation of pressures</li> </ul>	Spain (North)		CEDEX	CEDEX	Yes	Shape	Shared
Pollutant emission potential	<ul style="list-style-type: none"> <li>Zonas con potenciales alto y moderado de generación de ruido submarino en la Demarcación Noratlántica / Areas with high and moderate potential for underwater noise generation in the Norat-Atlantic Demarcation</li> </ul>	Spain (North)	Coverage not available	CEDEX	CEDEX	Yes	Shape	Shared
Pollutant emission potential	<ul style="list-style-type: none"> <li>Zonas con potenciales alto y moderado de entrada de patógenos en la Demarcación Noratlántica / Areas with high and moderate potential for the entry of pathogens in the North Atlantic Demarcatio</li> </ul>	Spain (North)	Coverage not available	CEDEX	CEDEX	Yes	Shape	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"><li>➤ Multiple information in France, Spain, Portugal</li><li>➤ Relevant Web Services provided by partners</li></ul>	<ul style="list-style-type: none"><li>➤ Heterogeneous datasets among countries</li><li>➤ No dataset available at an international scale</li><li>➤ Disconnection of IEO Web Services from production database</li><li>➤ Incomplete IEO metadata</li><li>➤ Several datasets available with missing metadata</li></ul>	<ul style="list-style-type: none"><li>➤ Publish Inspire compliant metadata when missing are uncomplete</li><li>➤ Symbology harmonization</li></ul>

## 3. SPATIAL POLICY

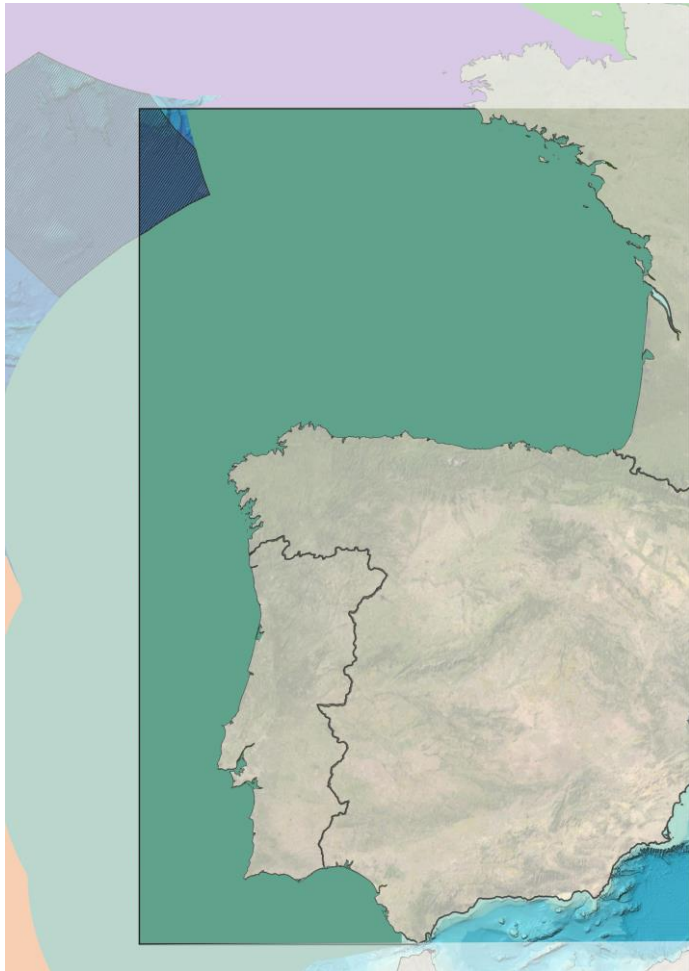


Figure 6: Spatial Policy

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*




## **SPATIAL POLICY**

Spatial policy data includes planning documents, planning authorities and natural delimitation topics. Multiple data sources and contents reflect a heterogeneous Spatial Planning organisation throughout Oskar IV area. The European Marine strategy framework strategy directive is an opportunity to organise and frame national maritime policies in Europe.





### **Coverage**

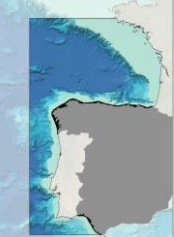
National and European sources are gathered in this thematic. Most of the region Oskar IV zone is covered, although majority of datasets are gathered at a national scale.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Planning document	<ul style="list-style-type: none"> <li>MSFD Regions and Subregions</li> </ul>	Europe		European Commission; European Environment Agency / ETC-UMA	EEA Discomap	No	WMS	Shared
Planning document	<ul style="list-style-type: none"> <li>DCSMM – région marine / Marine region</li> <li>DCSMM – sous-région marine / marine sub-region</li> </ul>	France		AFB	Sextant	Yes	WFS / WMS	Open
Planning document	<ul style="list-style-type: none"> <li>Planos de Ordenamento da Orla Costeira / Coastal planning plans</li> </ul>	Portugal	Coverage not available	APA, I.P.	SNIAMB	Yes	WMS	Open
Planning document	<ul style="list-style-type: none"> <li>Périmètre des SAGE en métropole / French perimeter of waters managment and aménagement pattern</li> </ul>	France		Sandre, Office internationale de l'eau	SANDRE	Yes	WFS / WMS / Shape	Open
Planning document	<ul style="list-style-type: none"> <li>Dominio público marítimo terrestre</li> </ul>	Spain	Coverage not available	MAPAMA	MAPAMA Acuivisor	Yes	WMS	Open
Planning document	<ul style="list-style-type: none"> <li>Prohibited Anchorage Area</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Planning document	<ul style="list-style-type: none"> <li>MSFD Marine Districts</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared



Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Planning authority	<ul style="list-style-type: none"> <li>Zones de compétence DIRM</li> </ul>	France		IFREMER	Sextant	No	WMS	Shared
Planning authority	<ul style="list-style-type: none"> <li>Zones de compétence en mer du préfet de région</li> </ul>	France		IFREMER	Sextant	No	WMS	Shared
Planning authority	<ul style="list-style-type: none"> <li>Division CIEM/ICES (version SIH)</li> </ul>	Europe		IFREMER	Sextant	Yes	WMS	Shared
Planning authority	<ul style="list-style-type: none"> <li>Ospar region</li> </ul>	World		OSPAR COMMISSION	OSPAR data and information system	No	WFS	Open

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Natural delimitation	<ul style="list-style-type: none"> <li>Demarcaciones hidrográficas / Hydrographic delimitation</li> </ul>	Spain		MAPAMA	MAPAMA Acuívisor	Yes	WMS	Open

### Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>Multiple datasets available at a national and European scale</li> <li>Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>Heterogeneous national data due to different policy organisation in each country</li> <li>Several datasets available with missing or not harvestable metadata</li> </ul>	<ul style="list-style-type: none"> <li>Publish Inspire compliant metadata when missing are uncomplete</li> </ul>

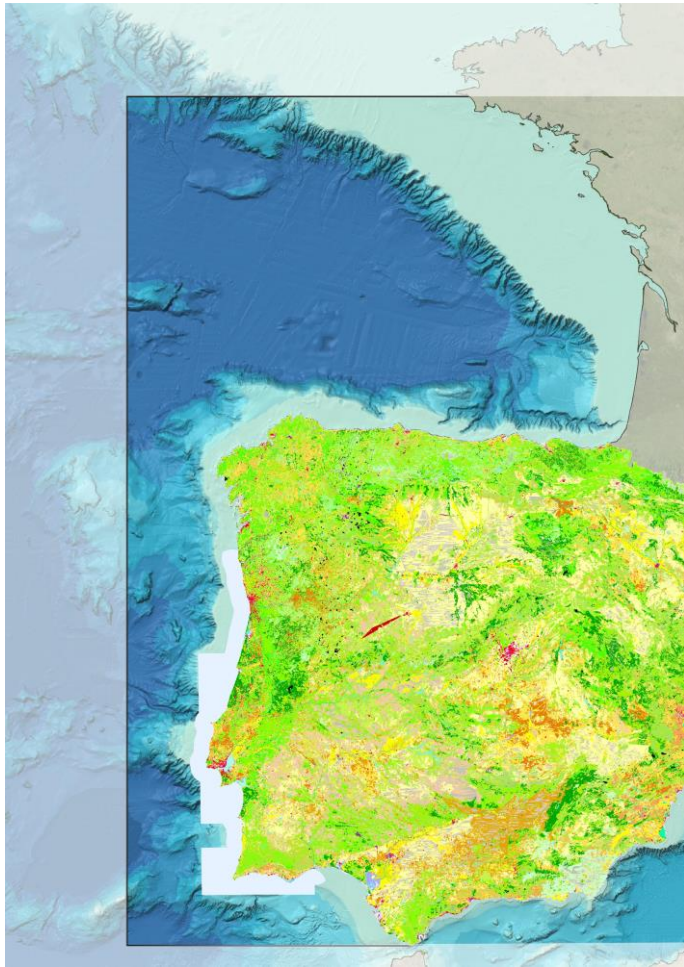


Figure 7: Land Use

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*


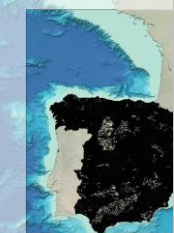
## LAND USE

Corine Land Cover datasets are gathered from French, Portuguese and Spanish data portals. Nevertheless, The datasets production and symbology are normalised, they can be compared in a transboundary context. French datasets are not represented on the opposite picture, because it cannot be displayed on the project scale. What's more, they have been produced at different intervals of time; it makes planners be able to compare the land use evolution in a transboundary context.

## Coverage

Corine Land Cover Web Services are available in France, Spain and Portugal. Orthophotography is relevant for marine planners. The data can be used either as a background or for analysis. It is only available in France.

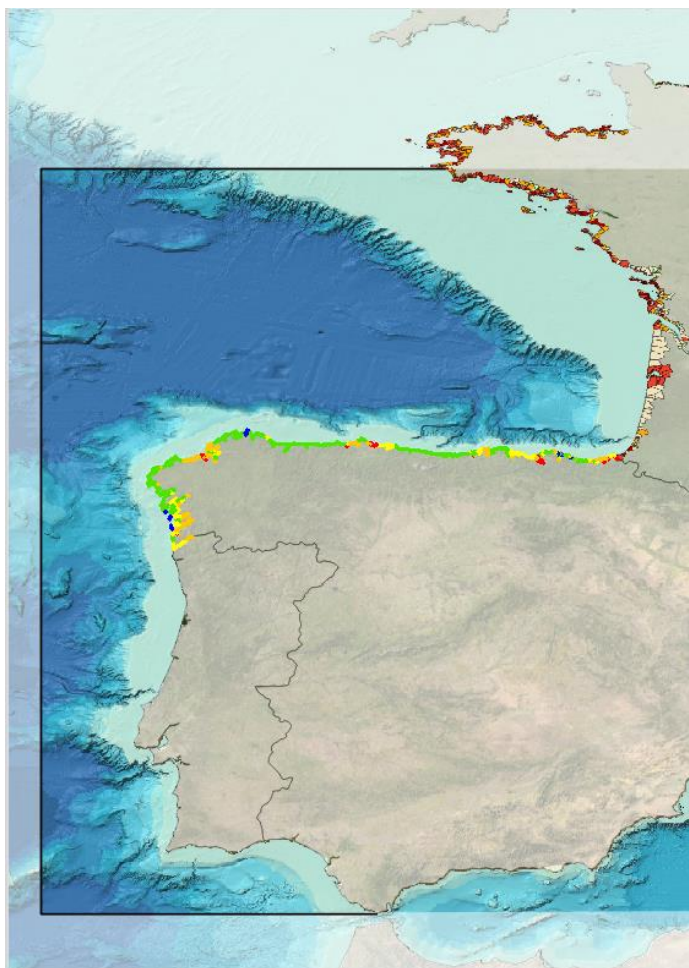
## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Land use	<ul style="list-style-type: none"> <li>Mode d'occupation du sol sur le littoral (LittoMos) / Shoreline coast use</li> </ul>	France	Coverage not available	MEEM	Géolittoral	Yes	WMS	Shared
Land use	<ul style="list-style-type: none"> <li>Ortho Littorale 2000/ Littoral orthophotograph 2000</li> <li>Ortho Littorale 2000/ Littoral orthophotograph 2010-2014</li> </ul>	France	Coverage not available	MEEM	Géolittoral	Yes	WMS	Shared
Land use	<ul style="list-style-type: none"> <li>Corine Land Cover 2006 - 2012</li> </ul>	France	Coverage not available	MEEM	Géolittoral	Yes	WMS / WFS / Shape	Shared
Land use	<ul style="list-style-type: none"> <li>Corine Land Cover 1990 – 2000 – 2006 – 2012</li> </ul>	Portugal		DGT	Catálogo de Serviços de Dados Geográficos	No	WMS	Shared
Land use	<ul style="list-style-type: none"> <li>Corine Land Cover 1990 – 2000 - 2006</li> </ul>	Spain		IGN (Spain)	Instituto Geográfico Nacional	No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ Availability of orthophotography in 2000 and 2010-2014 : It makes possible evolution analysis</li> <li>➤ Availability of normalised Corine Land Cover at a European scale and at difference intervals of time: It makes possible geographical and time comparisons.</li> <li>➤ Availability of Corine Land Cover WMS in France, Spain and Portugal. Datasets construction and representation are standardised at an European scale, WMS version doesn't cause portrayal harmonisation gap</li> </ul>	<ul style="list-style-type: none"> <li>➤ Unavailable Corine Land Cover Spanish metadata</li> <li>➤ Instability of French Corine Land Cover Web Service</li> <li>➤ Unavailability of Orthophotographic and Corine Land cover datasets in WMS temporal version</li> </ul>	<ul style="list-style-type: none"> <li>➤ Fix Corine Land Cover French Web Service</li> <li>➤ Create missing metadata</li> <li>➤ Toward temporal orthophotography and Corine Land Cover Web Services</li> </ul>

## 4. SOCIO-ECONOMIC DATA



## SOCIO-ECONOMIC DATA


Only a few socio-economic Web Services has been gathered. Indeed, although the inventory focuses on spatial datasets, many are represented in alphanumeric version. The indicative picture shows French and Spanish socio-economic Web Services. They are heterogeneous and cannot be compared.

### Coverage

A few Web Services are available in Spain and France, none in Portugal. Availability of Web Services at an international scale would ease the datasets comparison in a transboundary context. Eurostat for example provides Web Services in alphanumeric version.

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Socio-economic data	<ul style="list-style-type: none"> <li>Indice de sensibilité socio-économique du littoral français / index of socio-economic sensitivity of the French coast</li> </ul>	France		MEEM	GEOLITTORAL	Yes	WMS	Shared
Socio-economic data	<ul style="list-style-type: none"> <li>Employment by Port Authorities – Number of workers</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Socio-economic data	<ul style="list-style-type: none"> <li>Demographic Vulnerability 2011</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Socio-economic data	<ul style="list-style-type: none"> <li>Density of population in municipalities - 2016</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Socio-economic data	<ul style="list-style-type: none"> <li>Population in municipalities - 2016</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>No Web Service available in Portugal and at an international scale</li> <li>Heterogeneous datasets among countries</li> <li>Several datasets available with missing metadata</li> </ul>	<ul style="list-style-type: none"> <li>Combine alphanumeric datasets with spatial datasets for a better use of alphanumeric datasets</li> <li>Publish Inspire compliant metadata when missing are uncomplete</li> </ul>



## 5. ACTIVITIES / USES

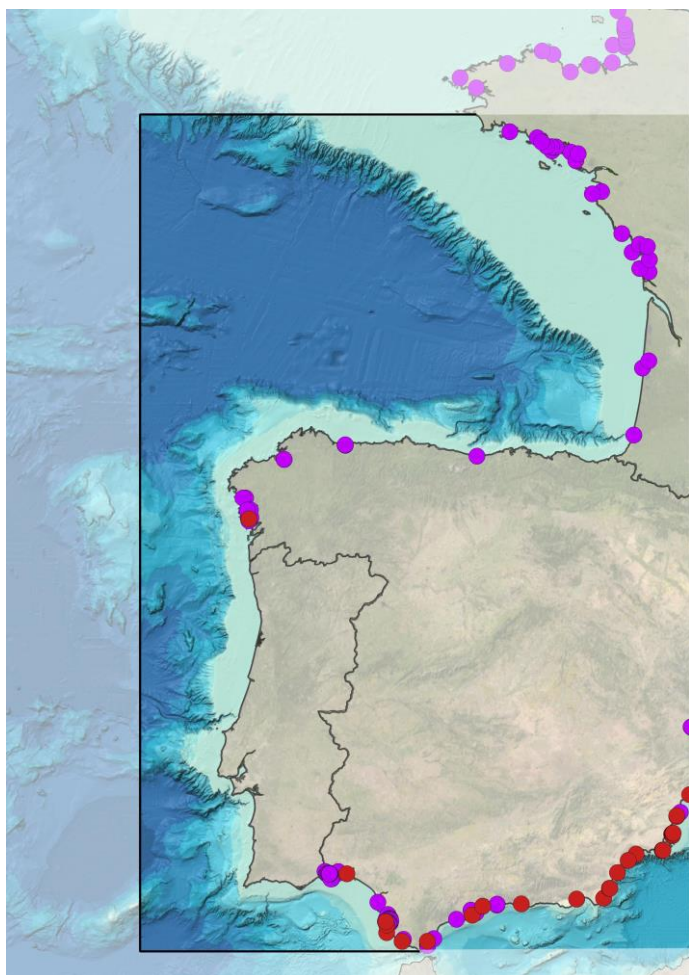


Figure 8: Aquaculture

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*



## AQUACULTURE



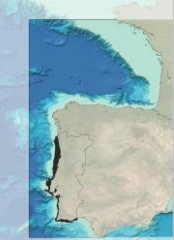
Harmonisation efforts have been already undertaken concerning Aquaculture. Euroshell project took place between 2012 and 2014; it aims notably to spread shellfish scientific knowledge to the producers. Then EMODnet Human activities portal gather finfish and shellfish production data. As a result, aquaculture data is well harmonized and mostly available in WFS version. These datasets are completed by national Web Services.

### Coverage

Web Services have been gathered in France, Portugal and Spain. Euroshell and EMODnet Human Activities Web Services don't cover Portuguese area.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Finfish production	<ul style="list-style-type: none"> <li>Finfish farming sites</li> </ul>	Europe (Spain)		EMODnet Human Activities	EMODnet Human Activities	Yes	WFS	Open
Finfish production	<ul style="list-style-type: none"> <li>Pisciculture existante / Existing pisciculture</li> <li>Potentiel pisciculture / Potential pisciculture development</li> </ul>	France	Coverage not available	IFREMER	Sextant	Yes	Shape	Shared
Shellfish production	<ul style="list-style-type: none"> <li>Shellfish production areas – EMODnet</li> </ul>	Europe (France Spain)		EMODnet Human Activities	EMODnet Human Activities	Yes	WFS	Open
Shellfish production	<ul style="list-style-type: none"> <li>EUROSHELL - Shellfish farmer's organizations</li> </ul>	France, Spain		IFREMER	SEXTANT	Yes	WFS	Open
Shellfish production	<ul style="list-style-type: none"> <li>Mollusc farming areas</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Aquaculture planning	<ul style="list-style-type: none"> <li>▪ Cadastre aquacole / Aquaculture cadastre</li> </ul>	France		DDTM	SEXTANT	Yes	WMS	Shared
Aquaculture planning	<ul style="list-style-type: none"> <li>▪ Águas Conquícolas Litorais Portuguesas 2016 / Watershed Coastal 2016 - Portugal</li> </ul>	Portugal		IPMA	SNIMAR and eAgricultura.pt	Yes	WMS	Shared
Aquaculture planning	<ul style="list-style-type: none"> <li>▪ Zonas de Produção de Moluscos e Bivalves em vigor em Portugal Continental / Mollusc and Bivalve Production Zones in Mainland Portugal</li> </ul>	Portugal		IPMA	SNIMAR and eAgricultura.pt	Yes	WMS	Shared
Aquaculture / Saline	<ul style="list-style-type: none"> <li>▪ Limites dos estabelecimentos de culturas marinhas / Marine culture establishments limits</li> </ul>	Portugal	Coverage not available	DGRM	SNIMAR , eAgricultura.pt and snig.igeo.pt	Yes	WMS and WFS	Open
Aquaculture / Saline	<ul style="list-style-type: none"> <li>▪ Aquaculture facilities 2010-2011</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Vulnerability index	<ul style="list-style-type: none"> <li>▪ Fishing Vulnerability Aquaculture</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ Efforts have already been undertaken in order to harmonize datasets at an European scale</li> <li>➤ Several European and national datasets comparable</li> <li>➤ Multiple Web Services available in WFS version.</li> <li>➤ Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>➤ No covering of EMODnet human activities and Euroshell datasets in Portugal</li> <li>➤ Projection gaps occurring with Portuguese data</li> <li>➤ French “pisciculture” datasets only available in Shape version : No Web Service available</li> <li>➤ Updating issues: Euroshell project finished in 2014, data is not updated anymore.</li> <li>➤ Several datasets available with missing metadata</li> </ul>	<ul style="list-style-type: none"> <li>➤ Fix projection gap of Portuguese datasets.</li> <li>➤ Harmonisation</li> <li>➤ Publish Inspire compliant metadata when missing are uncomplete</li> </ul>

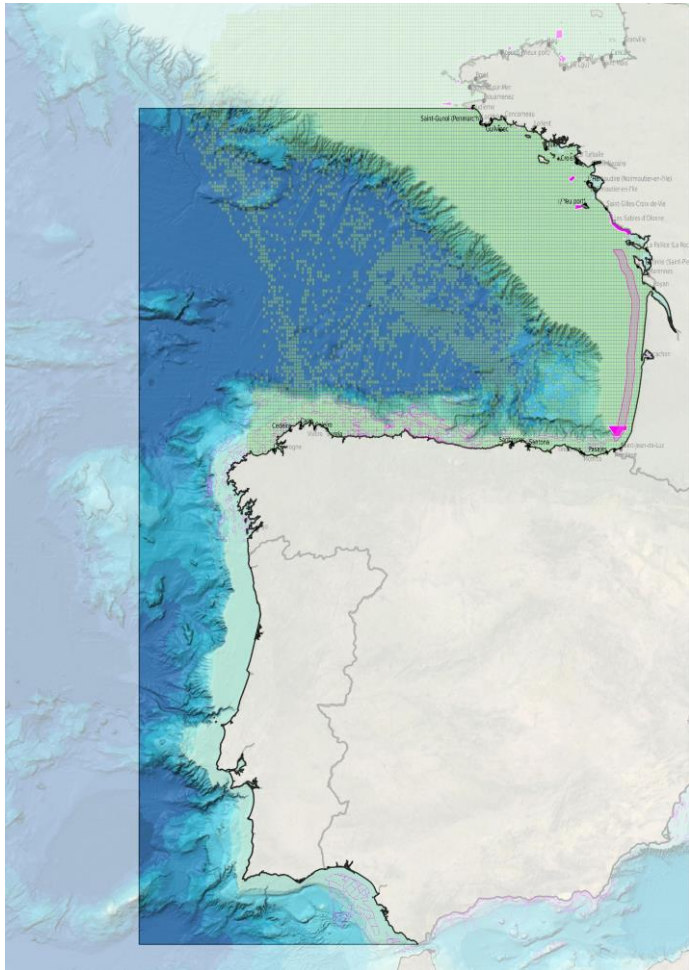


Figure 9: Fishing

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*

## FISHING




Fishing datasets have been gathered from various national sources. There are 4 kinds of fishing data: Regulation, Fishing production, exploitation and scientific research. All datasets are available in WMS version.



VMS data are sensitive; consequently, it is hard to find this kind of dataset at an Ospar IV scale. Time scale Web Service can be particularly relevant when displaying this kind of data.

## Coverage

Scientific research data are homogeneous already because available at an international scale. Other data will be hard to harmonize because they are gathered from national portal and they show specific issues.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Regulation	<ul style="list-style-type: none"> <li>Caladeros / Fishing areas</li> </ul>	Spain		IEO	IEO portal	No	WMS	Shared
Regulation	<ul style="list-style-type: none"> <li>Zones d'autorisation de pêche dans les eaux françaises par les navires étrangers (version SIH) / Areas of authorization to fish in French waters by foreign vessels (SIH version)</li> </ul>	France		AFB	SEXTANT	Yes	WMS	Shared
Scientific research	<ul style="list-style-type: none"> <li>Division CIEM / ICES (version SIH)</li> </ul>	World		IFREMER	SEXTANT	Yes	WMS	Shared

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Fishing production & exploitation	<ul style="list-style-type: none"> <li>▪ Fishing Effort Bottom Trawl Doors Distribution</li> <li>▪ Fishing Effort Bottom Trawl Couples Distribution</li> <li>▪ Fishing Effort Bottom Trawl Distribution</li> <li>▪ Fishing Effort Purse-seine Distribution</li> <li>▪ Fishing Effort Bottom Longline Distribution</li> <li>▪ Fishing Effort Hand Lines Distribution</li> </ul>	Spain	Coverage not available	IEO	IEO Portal	No	SOAP / WMS	Shared
Fishing production & exploitation	<p>Créées (version SIH) / Auction house</p> <p style="text-align: center;">✓</p>	France, Spain		IFREMER	SEXTANT	Yes	WMS	Shared
Fishing production & exploitation	<ul style="list-style-type: none"> <li>▪ Les cantonnements de pêche dans les eaux françaises / Fishing stations in French areas</li> </ul> <p style="text-align: center;">✓</p>	France		AFB	AFB Cartomer	Yes	WMS	Shared



Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Fishing production & exploitation	<ul style="list-style-type: none"> <li>Données VMS 2013 - 2014 / -2013 - 2014 VMS Data</li> </ul>	Europe		SEXTANT	SEXTANT	No	WMS	Shared
Fishing production & exploitation	<ul style="list-style-type: none"> <li>Total number of vessels 2016</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared
Fishing production & exploitation	<ul style="list-style-type: none"> <li>Fish markets</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ Availability of Scientific research datasets at an international scale</li> <li>➤ Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>➤ Availability of datasets only in WMS</li> <li>➤ No European scale data gathered concerning fishing production and exploitation and policy</li> <li>➤ Spanish data from IEO provided as grids without thematic : WFS Web Services or thematic associated with WMS Web Service would improve datasets exploitation</li> <li>➤ Disconnection of IEO Web Services from production database</li> <li>➤ Incomplete IEO metadata</li> <li>➤ Several datasets available with missing metadata</li> </ul>	<ul style="list-style-type: none"> <li>➤ Publish Inspire compliant metadata when missing are uncomplete</li> <li>➤ Symbology harmonization</li> </ul>

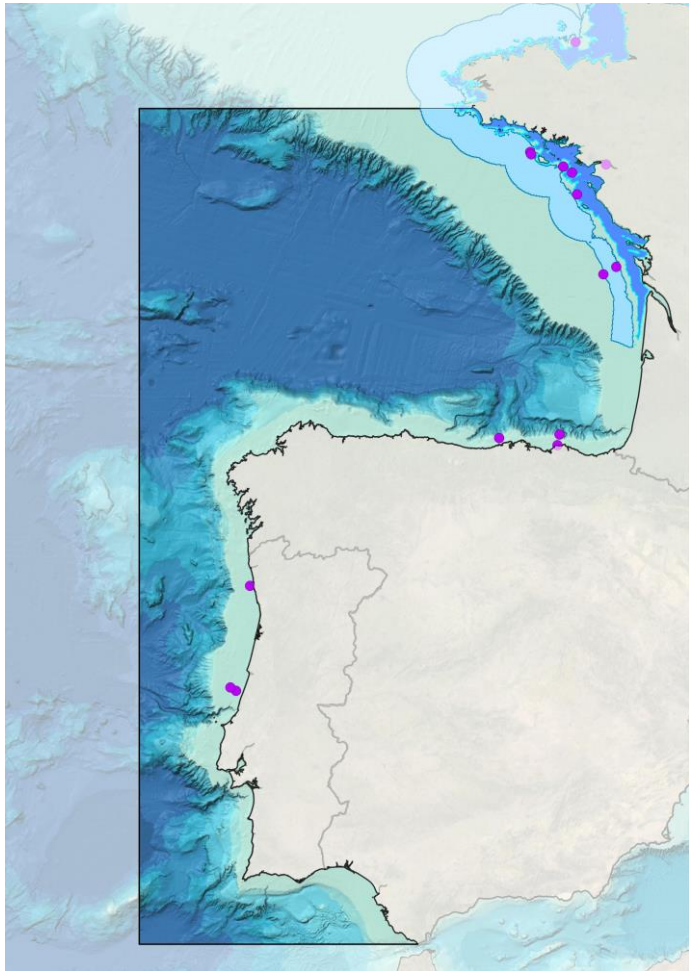


Figure 10: Renewable Energy

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*


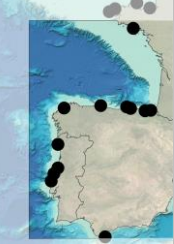
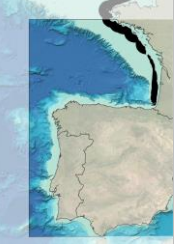

## MARINE RENEWABLE ENERGIES

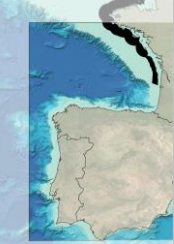
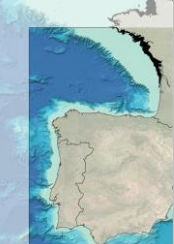

Renewable energy planning projects are recent but development potential is striking. Consequently, we can foresee more Web Services will be available in the future. This sub-category gathers ocean and wind energy datasets. Multiple Web Services are gathered from the European portal EMODnet Human Activities: They are open and available in WFS version, but we faced instability of these Web Services. Renewable energies development potential Web Services are available in the French portal Geolittoral in WMS version, they are shared. In Spain, the wind farms datasets are available in WMS, but metadata are missing.

### Coverage

The EMODnet Human activities portal gathers renewable energy infrastructure from France, Spain and Portugal in one unique Web services. Only France scale Web Services have been found concerning renewable energy development potential.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Ocean energy	<ul style="list-style-type: none"> <li>▪ Ocean energy facilities</li> </ul>	Europe		AZTI-TECNALIA	EMODnet human activities Portal	Yes	WFS	Open
Ocean energy	<ul style="list-style-type: none"> <li>▪ Ocean energy facilities : Project location</li> </ul>	Europe		AZTI-TECNALIA	EMODnet human activities Portal	Yes	WFS	Open
Ocean energy	<ul style="list-style-type: none"> <li>▪ Gisement technique pour le développement de l'énergie houlomotrice / Technical deposit for wave energy development</li> </ul>	France		MEEM	GÉOLITTORAL	Yes	WMS	Shared
Wind energy	<ul style="list-style-type: none"> <li>▪ Wind farm</li> </ul>	Europe		CETMAR	EMODnet human activities Portal	Yes	WFS	Open

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Wind energy	<ul style="list-style-type: none"> <li>Eolien flottant : Gisement technique / Floating wind energy : technical deposite</li> </ul>	France		MEEM	GÉOLITTORAL	Yes	WMS	Shared
Wind energy	<ul style="list-style-type: none"> <li>Eolien posé : Gisement technique / Fixed wind energy : technical deposite</li> </ul>	France		MEEM	GÉOLITTORAL	Yes	WMS	Shared
Wind energy	<ul style="list-style-type: none"> <li>Wind zone</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ Renewable energies infrastructure Web Services available at a European Scale, in WFS version.</li> <li>➤ Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>➤ Lack of data concerning development potential : Datasets only available in France</li> <li>➤ Development potential Web Services available in WMS in France</li> <li>➤ EMODnet data is composed of gathered datasets from different sources : Homogenisation process causes loss of information</li> <li>➤ Several datasets available with missing metadata</li> </ul>	<ul style="list-style-type: none"> <li>➤ Complete French development potential Web Services with Portuguese and Spanish one</li> <li>➤ Publish Inspire compliant metadata when missing are uncomplete</li> </ul>



*Indicative picture not relevant : Cannot display French dataset at a large scale*

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*


## **INSTALLATIONS AND INFRASTRUCTURES**

French and Spanish data doesn't focus on the same topics: These layers are relevant for marine planning, but they are heterogeneous; production homogenisation process represents a first step to improve the quality of their use in a transboundary context.

### **Coverage**

This sub-category gathers datasets in France and Spain. No Web Service was found in Portugal.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Installation and infrastructures	<ul style="list-style-type: none"> <li>Arrecifes Artificiales Zona / Artificial Reefs Zones</li> <li>Arrecifes Artificiales Poligonos / Artificial Reefs Polygons</li> </ul>	Spain	Coverage not available	IEO	IEO Portal	No	WMS / REST	Shared
Installation and infrastructures	<ul style="list-style-type: none"> <li>Ouvrages et aménagements littoraux / Littoral constructions and aménagement</li> </ul>	France	Coverage not available	MEEM / CEREMA	GÉOLITTORAL	Yes	WMS / WFS	Open
Energy infrastructure	<ul style="list-style-type: none"> <li>Gas Platforms</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Safety zone	<ul style="list-style-type: none"> <li>Wrap areas</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>Heterogeneity of Spanish and French datasets</li> <li>No Web Service on the whole Ospar IV area</li> <li>Disconnection of IEO Web Services from production database</li> <li>Several datasets available with missing metadata</li> </ul>	<ul style="list-style-type: none"> <li>Publish Inspire compliant metadata when missing are uncomplete</li> <li>Symbology harmonization</li> </ul>



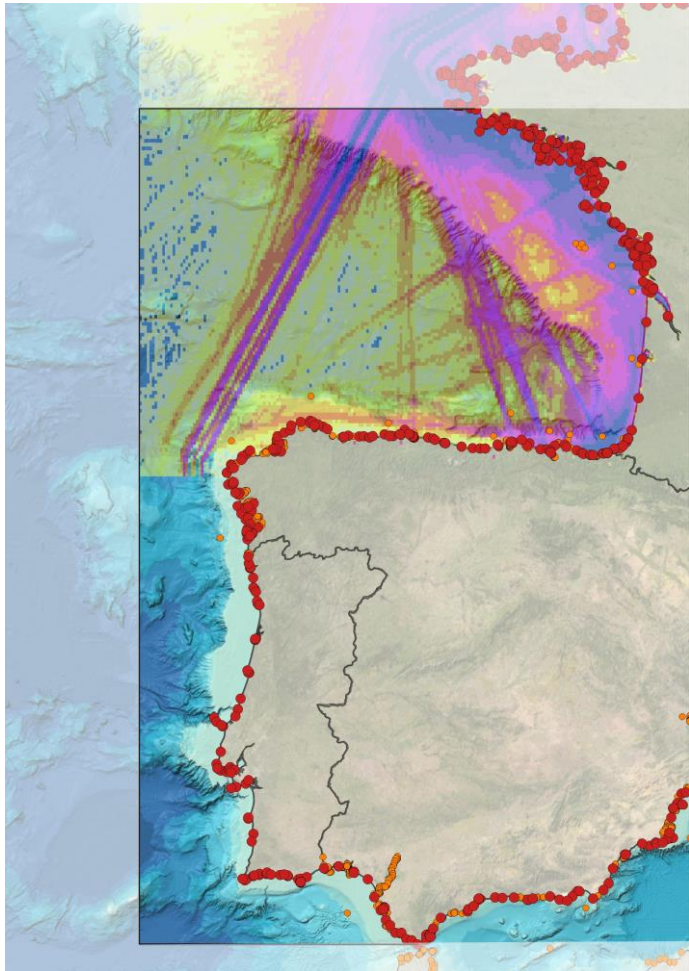


Figure 11: Marine Transport Routes and Traffic Flow

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*





## MARINE TRANSPORT ROUTES AND TRAFFIC FLOWS

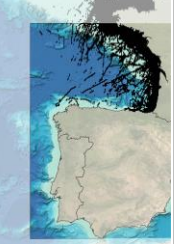
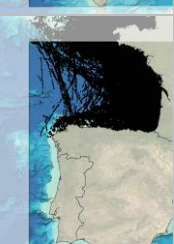

This sub-category gathers safety, navigation, traffic and accommodation datasets. Raster like traffic data is a result of 2016 AIS data treatment. It is a Web service, but static data (no updating). Dynamic time scale data would be relevant to represent AIS information.


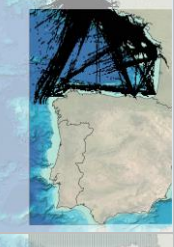


### Coverage

The EMODnet Human portal provides lighthouse Web Service in WFS version. It covers all Ospar IV area. Other datasets have been collected by national organisation; they cover at least one country, but neither the entire Ospar IV nor Portugal area.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Safety navigation	<ul style="list-style-type: none"> <li>Lighthouses</li> </ul>	Europe		AMATEUR RADIO LIGHTHOUSE SOCIETY	EMODnet human activities Portal	Yes	WFS	Open
Safety navigation	<ul style="list-style-type: none"> <li>Luces / lights</li> </ul>	Spain		IHM	Geoportal de la Infraestructura de datos espaciales del Instituto Hidrográfico de la Marina	Yes	WFS	Shared
Safety navigation	<ul style="list-style-type: none"> <li>Chenaux d'accès aux ports / Port access channels</li> </ul>	France		CEREMA	SEXTANT	Yes	WMS	Shared
Safety navigation	<ul style="list-style-type: none"> <li>Traffic separation schema</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Traffic	<ul style="list-style-type: none"> <li>Nombre estimé de cargos sur l'année 2016 / Estimated number of cargo boat over the year 2016</li> </ul>	France, Spain		MEEM / DGITM	GÉOLITTORAL	Yes	WMS	Open

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Traffic	<ul style="list-style-type: none"> <li>Nombre estimé de navires de 'Class B' sur l'année 2016 / Estimated number of cargo boat of 'Class B' over the year 2016</li> </ul>	France / Spain		MEEM / DGITM	GÉOLITTORAL	Yes	WMS	Open
Traffic	<ul style="list-style-type: none"> <li>Nombre estimé de navires de passagers sur l'année 2016 / Estimated number of passagers boat over the year 2016</li> </ul>	France / Spain		MEEM / DGITM	GÉOLITTORAL	Yes	WMS	Open
Traffic	<ul style="list-style-type: none"> <li>Nombre estimé de navires de pêche sur l'année 2016 / Estimated number of cargo boat of Fishing over the year 2016</li> </ul>	France, Spain		MEEM / DGITM	GÉOLITTORAL	Yes	WMS	Open
Traffic	<ul style="list-style-type: none"> <li>Nombre estimé de navires toutes catégories sur l'année 2016 / Estimated number of ships all categories over the year 2016</li> </ul>	France / Spain		MEEM / DGITM	GÉOLITTORAL	Yes	WMS	Open

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Traffic	<ul style="list-style-type: none"> <li>Nombre estimé de yachts sur l'année 2016 / Estimated number of yachts over the year 2016</li> </ul>	France/ Spain		MEEM / DGITM	GÉOLITTORAL	Yes	WMS	Open
Traffic	<ul style="list-style-type: none"> <li>Nombre estimé de tankers sur l'année 2016 / Estimated number of tankers over the year 2016</li> </ul>	France/ Spain		MEEM / DGITM	GÉOLITTORAL	Yes	WMS	Open
Traffic	<ul style="list-style-type: none"> <li>Données AIS 2016 / AIS datasets 2016</li> </ul>	Europe		IFREMER	SEXTANT	No	WMS	Shared
Traffic	<ul style="list-style-type: none"> <li>Motorways of the seas – European Atlas of the seas</li> </ul>	Europe	Coverage not available	European commission	ADRIPLAN	Yes	WFS / WMS	Open
Traffic	<ul style="list-style-type: none"> <li>AIS signal</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Accommodation	▪ Anchorages	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ ISO 19139 compliant metadata</li> <li>➤ Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>➤ No data found at a project scale</li> <li>➤ Traffic Web services are not dynamic</li> <li>➤ Several datasets available with missing metadata</li> </ul>	<ul style="list-style-type: none"> <li>➤ Toward temporal AIS data Web Services</li> <li>➤ Publish Inspire compliant metadata when missing are uncomplete</li> </ul>

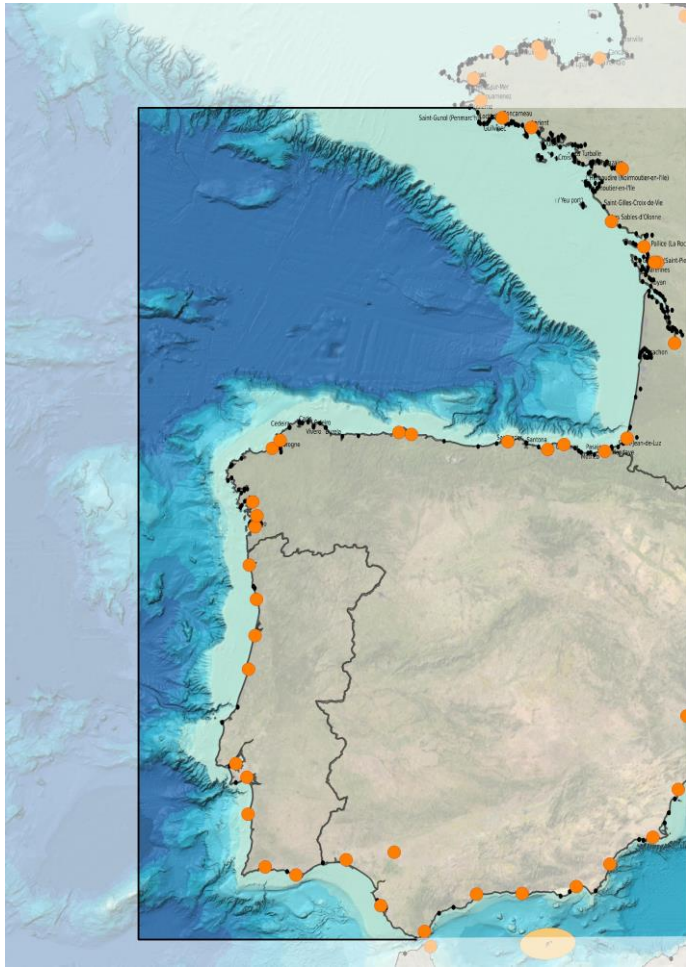


Figure 12: Port

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*





## PORTS

Multiple national / sub-national SDI provide port category Web Services. “Ports (version SIH) data” identify ports around the world, although it is not exhaustive. It represents strategic port stops for French fishing vessels. Web Services are heterogeneous in what they represent and in their typology. Web Services from EMODnet Human activities portal are more relevant in a transboundary context: They identify main port vessels, port passengers and port goods in Europe. These Web Services are open and available in WFS version.

## Coverage

EMODnet Web Services covers all Europe areas. Although Web Services from IFREMER covers World scale area, it represents a strategic port stop for French fishing vessels. Consequently, data is more complete in France than in other countries.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Port	<ul style="list-style-type: none"> <li>➤ Port location / Port vessels / Port Goods / port passengers</li> </ul>	Europe		COGEA / EUROFISH	EMODnet Human Activities Portal	Yes	WFS / WMS	Open
Port	<ul style="list-style-type: none"> <li>➤ Ports (version SIH)</li> </ul>	World		IFREMER	SEXTANT	Yes	WMS	Open
Port	<ul style="list-style-type: none"> <li>➤ Ports General Interest</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared
Port activities	<ul style="list-style-type: none"> <li>➤ Total goods</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared



## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"><li>➤ Availability of aggregate and harmonized data in WFS available with EMODnet Human Activities portal</li><li>➤ Harvestable metadata associated with datasets</li><li>➤ Relevant Web Services provided by partners</li></ul>	<ul style="list-style-type: none"><li>➤ Heterogeneity of datasets due to different themes in each country</li><li>➤ Relevant use of French dataset can be used for French Shipping analysis. In other cases, it is less relevant</li><li>➤ Several datasets available with missing metadata</li></ul>	<ul style="list-style-type: none"><li>➤ No action plan defined yet.</li><li>➤ Publish Inspire compliant metadata when missing are uncomplete</li></ul>



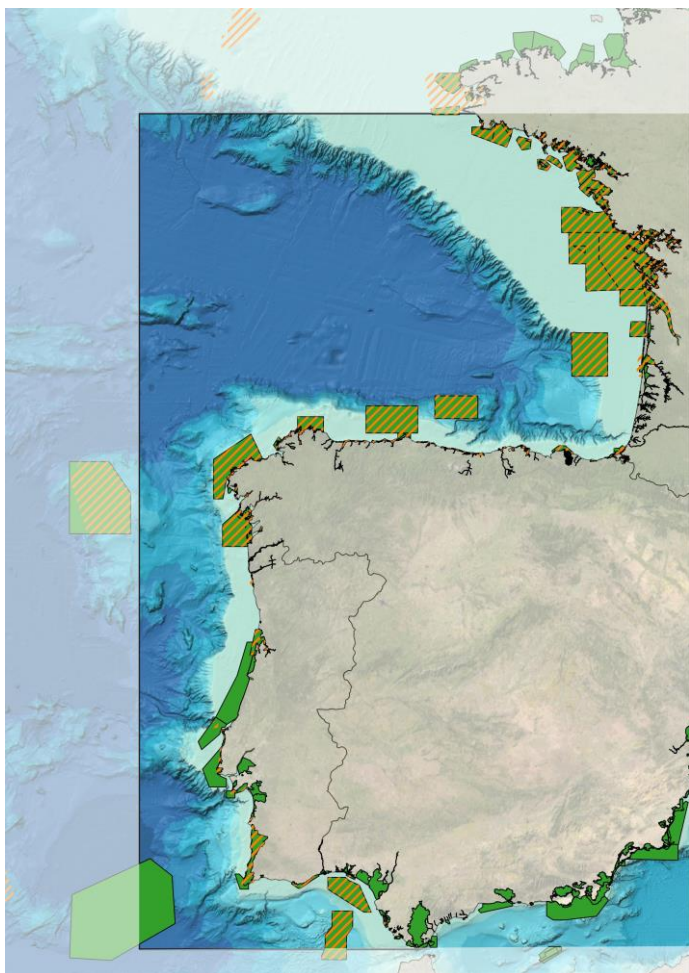


Figure 13: Nature and Species Conservation Sites & Protected Areas

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*

## NATURE AND SPECIES CONSERVATION SITES & PROTECTED AREAS


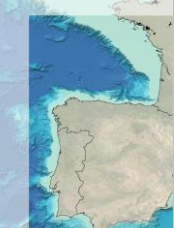
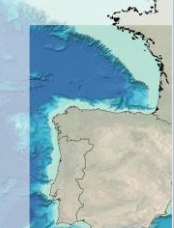
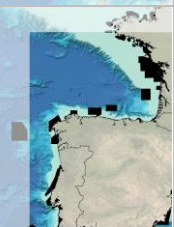
Although plenty of national sources provide multiple layers in this sub-category, European datasets are favoured. MAIA is a European cooperation project with the aim of creating a network of MPA managers and stakeholders. It represents protected areas of seas, oceans, estuaries or large lakes.


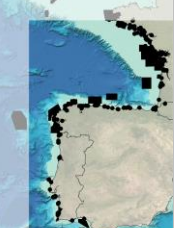
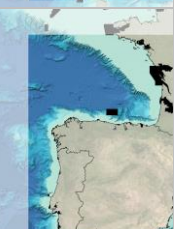
Ramsar convention on “Wetlands of international importance especially as Waterfowl Habitat” has been adopted in 1971. Then areas have been localized in order to promote their conservation.

### Coverage

MAIA data don't cover all Portugal; we complete this data with EMODnet Human activities Web Service. Ramsar area data have been collected from national source. None has been found in Spain.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Marine protected areas	<ul style="list-style-type: none"> <li>Designated marine protected areas (points)</li> <li>Designated marine protected areas (polygon)</li> </ul> <p style="text-align: center;">✓</p>	Europe		Maia Network	Maia Portal	No	WFS	Open
Marine protected areas	<ul style="list-style-type: none"> <li>Sites Ramsar – métropole / Ramsar sites</li> </ul>	France		MNHN	Inventaire National du Patrimoine Naturel	Yes	WFS	Open
Marine protected areas	<ul style="list-style-type: none"> <li>Terrains de conservatoire du littoral – métropole / Nature and species conservation sites &amp; protected areas</li> </ul>	France		MNHN	Inventaire National du Patrimoine Naturel	Yes	WFS	Open
Marine protected areas	<ul style="list-style-type: none"> <li>Natura 2000</li> </ul> <p style="text-align: center;">✓</p>	Europe		Cogea	EMODnet human activities Portal	Yes	WFS / WMS	Open

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Marine protected areas	<ul style="list-style-type: none"> <li>Zonas – Sítios RAMSAR / RAMSAR sites</li> </ul>	Portugal		Agência Portuguesa Do Ambiente and ICNF	Sistema Nacional Informacao De Ambiente and ICNF	Yes	WFS	Open
Marine protected areas	<ul style="list-style-type: none"> <li>Designated marine protected areas (points)</li> <li>Designated marine protected areas (polygon)</li> </ul>	Europe		Maia Network	Maia Portal	No	WFS	Open
Marine protected areas	<ul style="list-style-type: none"> <li>CDDA - Nationaly Designated Areas</li> </ul>	Europe		COGEA	EMODnet human activities Portal	Yes	WFS	Open

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ WFS Web services available</li> <li>➤ Multiple protection areas Web Services available at a European or international scale, in WFS version.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Lack of RAMSAR Web services in Spain</li> </ul>	<ul style="list-style-type: none"> <li>➤ No action plan defined yet</li> </ul>

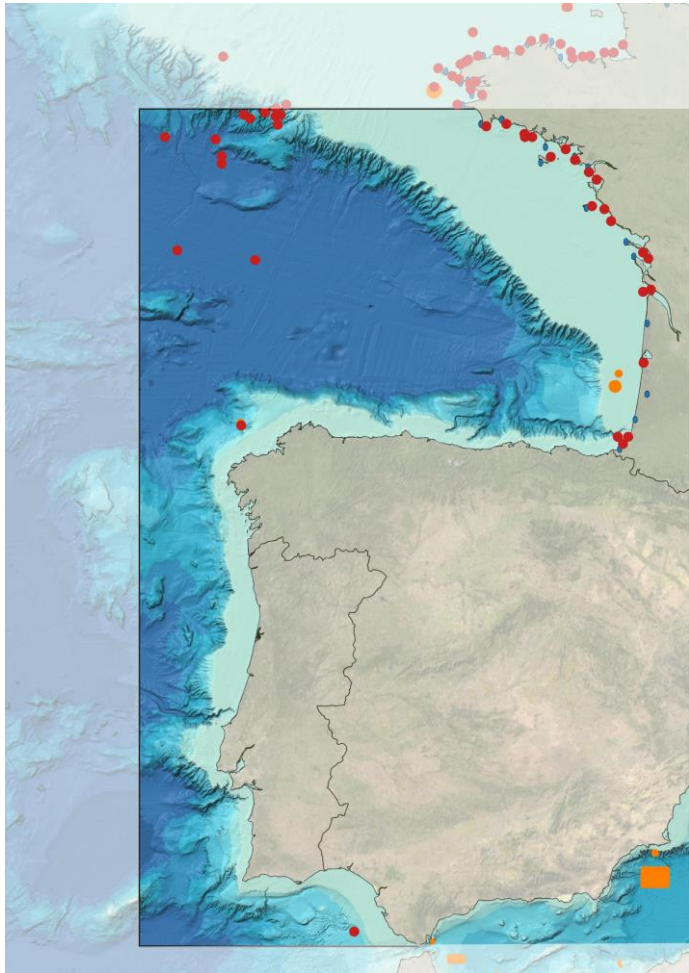


Figure 14: Military

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*




## MILITARY

This thematic includes survey, munition dumping and military area datasets. Military restricted areas highly impact maritime spatial planning, but military datasets seem not to be widely disseminated. Such datasets have been gathered only in Spain.

### Coverage

The EMODnet Human activities portal gathers dumped ammunitions data from all Europe, but data from Portugal are missing. Military area datasets are only available in Spain.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Munition dumping	<ul style="list-style-type: none"> <li>▪ Dumped munitions – point</li> <li>▪ Dumped munitions – polygon</li> </ul>	Europe - France		CETMAR	EMODnet human activities	Yes	WFS / WMS	Open
Survey	<ul style="list-style-type: none"> <li>▪ Sémaphores / semaphore</li> </ul>	France		CEREMA	SEXTANT	Yes	WMS	Shared
Military area	<ul style="list-style-type: none"> <li>▪ Declared landfills</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Military area	<ul style="list-style-type: none"> <li>▪ Military areas</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"><li>➤ Ammunition dumping datasets available in France and Spain</li><li>➤ Relevant Web Services provided by partners</li></ul>	<ul style="list-style-type: none"><li>➤ No military area data available</li><li>➤ Exhaustivity: Dumped munition web service doesn't cover Portugal</li><li>➤ Several datasets available with missing metadata</li></ul>	<ul style="list-style-type: none"><li>➤ Publish Inspire compliant metadata when missing are uncomplete</li></ul>



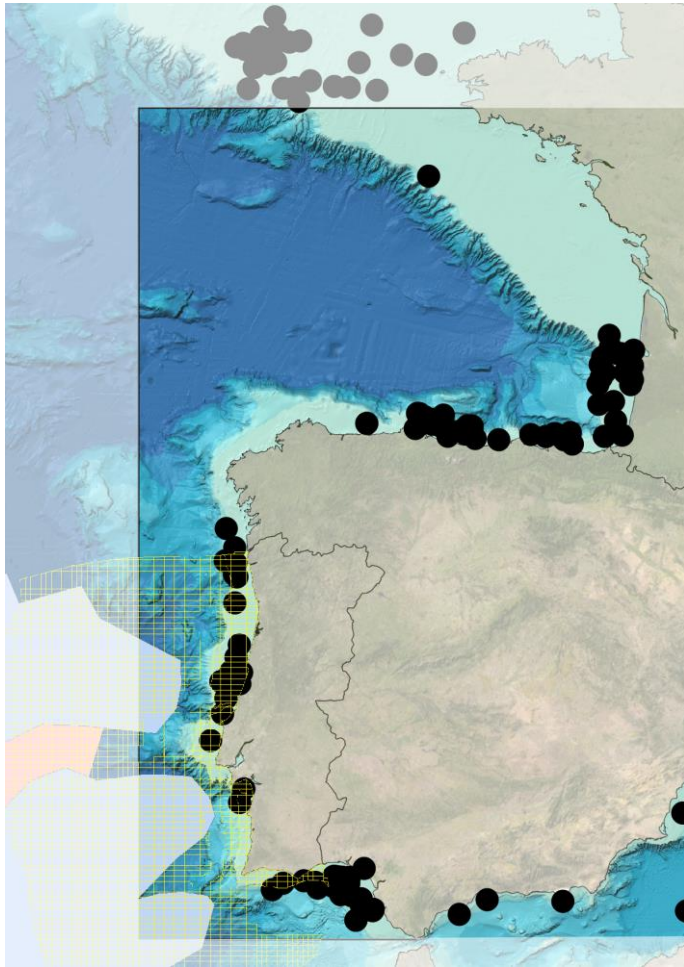


Figure 15: Raw Material Extraction

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*

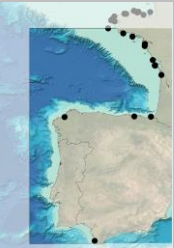
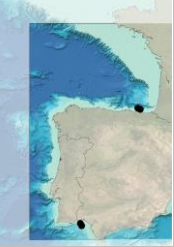
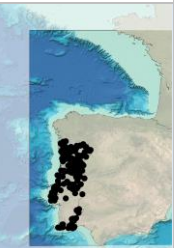
## RAW MATERIAL EXTRACTION AREAS

We can identify aggregate extraction, hydrocarbon, mineral and potential extraction dataset. The EMODnet Human Activities portal gathers Europe aggregate data. This sub-category gathers mainly open and WFS version Web Services. Although European covering data are favoured, it can be completed if necessary by data from national portals.

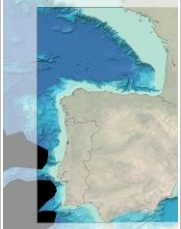

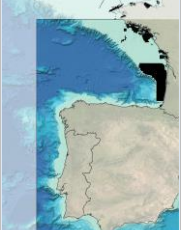
### Coverage

The EMODnet human activities portal gathers data from multiple sources in Europe. Nevertheless, offshore installation Web Service is available only in Spain. Aggregate extraction datasets are not available in Portugal.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Aggregate extraction	<ul style="list-style-type: none"> <li>Aggregate extraction</li> </ul>	Europe (France, Spain)		AZTI-TECNALIA	EMODnet human activities Portal	Yes	WFS / WMS	Open
Aggregate extraction	<ul style="list-style-type: none"> <li>Offshore installation</li> </ul>	Europe		COGEA	EMODnet human activities Portal	Yes	WFS / WMS	Open
Hydrocarbon extraction	<ul style="list-style-type: none"> <li>Hydrocarbon extraction - Platforms / active licences / hydrocarbon</li> </ul>	Europe	Coverage not available	COGEA	EMODnet human activities Portal	Yes	WFS / WMS	Open
Hydrocarbon extraction	<ul style="list-style-type: none"> <li>Hydrocarbons Concessions</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Mineral extraction	<ul style="list-style-type: none"> <li>Nascentes minerais usos / Mineral Springs</li> </ul>	Portugal		Agência Portuguesa Do Ambiente	SNIAMB	Yes	WFS	Shared



Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Mineral extraction	<ul style="list-style-type: none"> <li>Recursos Minerais Metálicos /Mineral Metallic resources potential areas</li> </ul>	Portugal		IPMA, EMEPC	Mar Português - Geoportal	Yes	WMS	Shared
Mineral extraction	<ul style="list-style-type: none"> <li>Sand extraction</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared
Carbon extraction	<ul style="list-style-type: none"> <li>Reserved area for capture and storage of atmospheric carbon</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared
Extractive Potential	<ul style="list-style-type: none"> <li>Zones d'intérêt (potentiel extractif) en Mer du Nord, Manche et Atlantique./ Ares of interest (extractive potential) in the North Sea, Manche and Atlantic</li> </ul>	France		IFREMER	SEXTANT	Yes	WMS	Open

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ Availability of EMODnet Human activities datasets in WFS and open</li> <li>➤ Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>➤ Exhaustivity : EMODnet Human activities Web Service doesn't always cover Ospar IV area</li> <li>➤ Several datasets available with missing metadata</li> </ul>	<ul style="list-style-type: none"> <li>➤ Publish Inspire compliant metadata when missing are uncomplete</li> </ul>

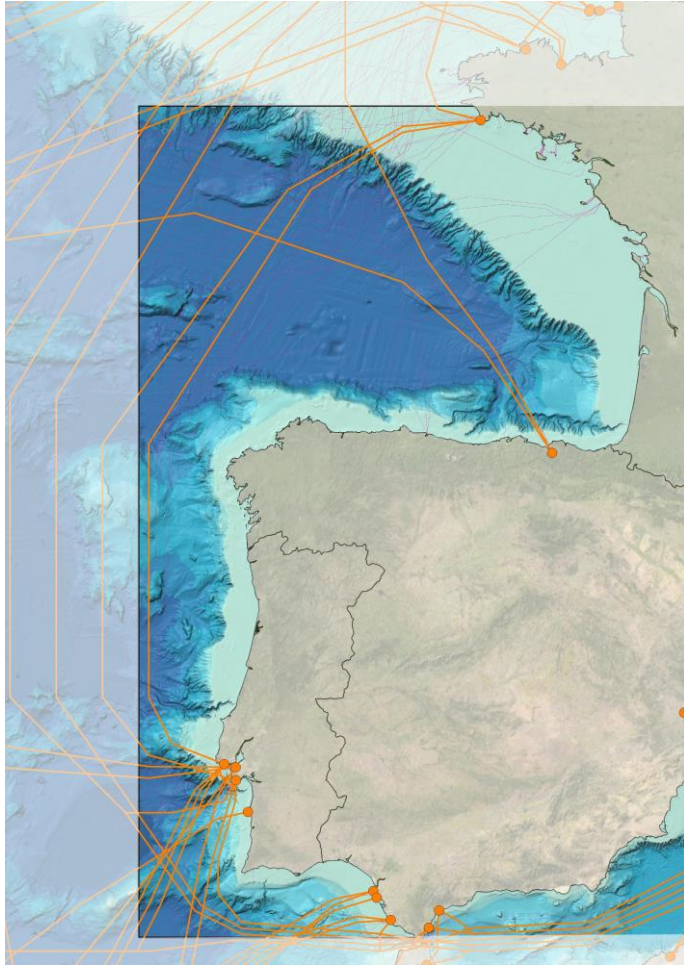


Figure 16: Cables and Pipeline Routes

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*

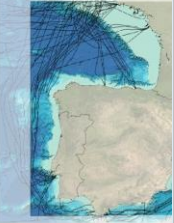

## SUBMARINE CABLE AND PIPELINE ROUTES

This topic brings together data from the EMODnet human activities portal and from one national source data, the Shom data portal. European scale data focuses on schematic routes and submarine cables, Shom dataset focuses on cables and pipeline routes. The evaluation of the geometric quality and quality of these datasets is difficult, they are managed by multiple operators and professionals

### Coverage

Both Web Services cover Ospar IV area. Nevertheless, Shom Web Services contain only cables and pipeline routes under French responsibility.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Cables and pipeline routes	<ul style="list-style-type: none"> <li>▪ Cables et conduits / cables and pipeline routes</li> </ul>	Europe (areas under French cartographic responsibility )		Shom	Data.shom.Fr	Yes	WMS / WMSv	Shared
Cables and pipeline routes	<ul style="list-style-type: none"> <li>▪ SIGCables Submarine Cables Routes</li> <li>▪ Telecommunication cables (schematic routes)</li> <li>▪ Télécommunication landing stations</li> </ul>	Europe		Cogea	EMODnet human activities Portal	Yes	WMS / WFS	Open

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ Availability of datasets at Ospar IV scale</li> <li>➤ Shom Web Service in WMS vector version: Get Feature Info request is available.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Exhaustively: Cables and pipeline routes Datasets are build up from multiple sources. Features can be missing.</li> </ul>	<ul style="list-style-type: none"> <li>➤ No action plan is defined yet.</li> </ul>

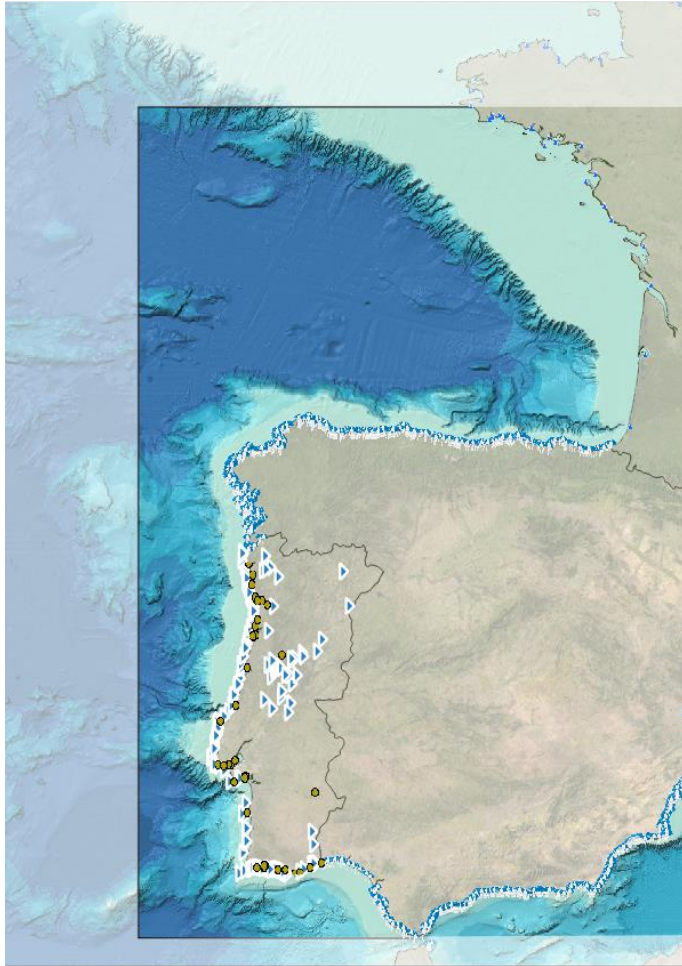


Figure 17: Tourism and Recreation

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*



## TOURIM AND RECREATION





Tourism and recreation category is composed of nautical, coastal activities, accommodation and touristic vulnerability sub-categories. Coastal activities Datasets found are mainly about coastal activities. Web Services are gathered from National portal, mainly WMS like Web Services. Consequently, data are not harmonised: For instance, MAPAMA Acuivisor provides all the beaches data, whereas Sistema Nacional Informação de Ambiente focuses on accessible beaches. The map on the left side of the page shows beaches and marinas from 4 sources, with one different symbol for each source.

### Coverage

Web Services are gathered from National portal from Spain, France and Portugal. No dataset has been found at a project scale.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Yatching / Nautical activities	<ul style="list-style-type: none"> <li>Marinas</li> </ul>	Europe (France)		Boatlaunch	MMO Marine Planning Evidence	No	WMS	Shared
Yatching / Nautical activities	<ul style="list-style-type: none"> <li>Atividades de desportos náuticos dentro da Rede Nacional de Áreas Protegidas / Nautic sports inside national protected areas</li> </ul>	Portugal		ICNF	SNIMAR Geoportal	Yes	WFS	Shared
Yatching / Nautical activities	<ul style="list-style-type: none"> <li>Marinas Portos de Recreio / Marinas recreational ports</li> </ul>	Portugal		Not specified	Mar Português Geoportal and PSOEM Geoportal	No	WMS	Shared
Yatching / Nautical activities	<ul style="list-style-type: none"> <li>Moorings in marina</li> </ul>	Spain (North)			CEDEX	No	WMS	Shared

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Coastal activities	<ul style="list-style-type: none"> <li>Bathing Waters</li> </ul>	Portugal		Agência Portuguesa Do Ambiente	SNIAMB	Yes	WMS	Open
Coastal activities	<ul style="list-style-type: none"> <li>Praia acessível / accessible beach</li> </ul>	Portugal		Agência Portuguesa Do Ambiente	SNIAMB	Yes	WFS	Shared
Coastal activities	<ul style="list-style-type: none"> <li>Sentier du littoral français / coastal footpath</li> </ul>	France		MEEM	GÉOLITTORAL	Yes	WMS / WFS	Shared
Coastal activities	<ul style="list-style-type: none"> <li>Guía de Playas de España / Spanish beaches guide</li> </ul>	Spain		MAPAMA	MAPAMA Acuivisor	Yes	WMS	Open
Accommodation	<ul style="list-style-type: none"> <li>Hotel Beds per lineal km of coast</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Touristic vulnerability	<ul style="list-style-type: none"> <li>▪ Vulnerabilidad Turistica / Touristic Vulnerability</li> </ul>	Spain (North)	Coverage not available		CEDEX	No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ Availability of multiple sources in France, Spain and Portugal</li> <li>➤ Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>➤ Uncomplete MMO Marine Planning Evidence and Portos de Recreio Metadata</li> <li>➤ WMS datasets : Hard to harmonise</li> <li>➤ Several datasets available with missing metadata</li> </ul>	<ul style="list-style-type: none"> <li>➤ Portrayal harmonisation</li> <li>➤ Publish Inspire compliant metadata when missing are uncomplete</li> </ul>



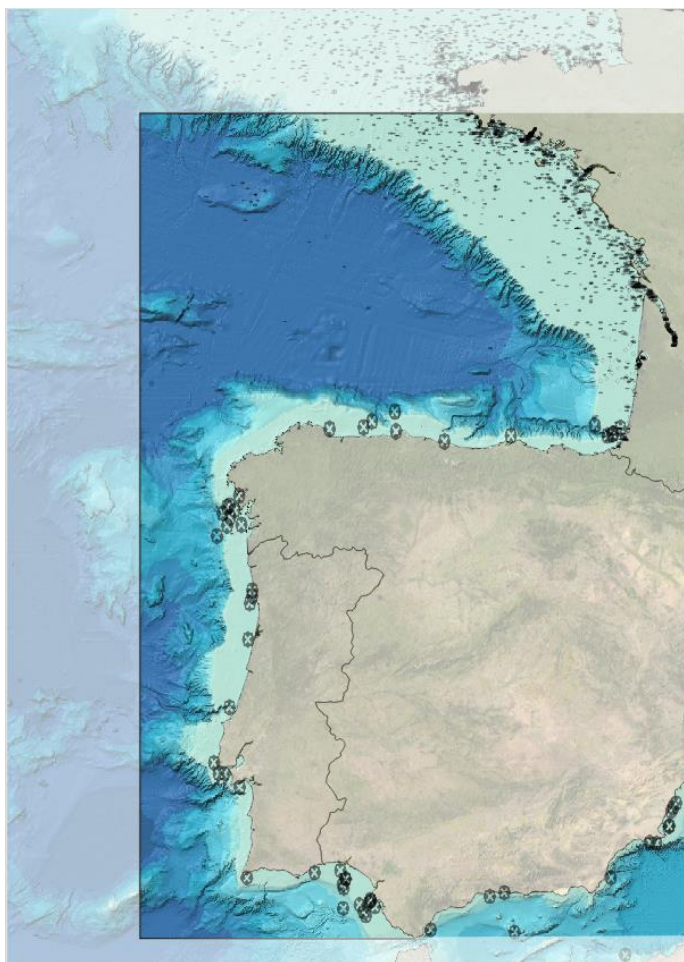


Figure 18: Underwater Cultural Heritage

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*

## UNDERWATER CULTURAL HERITAGE


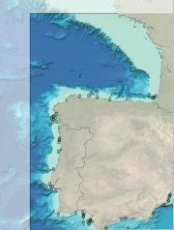
This sub-category focuses only on Wrecks and obstructions topic. Hydrographic institutes from Spain and France provide Wreck Web Services in WMS version, the symbology is not harmonized.

### Coverage

The EMODnet Human Activities portal provides European wrecks Web Service are harmonized at a European scale, but neither France nor Spain and Portugal are covered already. Web Services from French and Spanish hydrographic institute have been gathered in this inventory.



## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Wrecks	<ul style="list-style-type: none"> <li>Epaves et obstructions / Wrecks and obstructions</li> </ul>	France		Shom	Data.shom.fr	Yes	WMS / WMSv	Shared
Wrecks	<ul style="list-style-type: none"> <li>Wrecks</li> </ul>	Spain		IHM	Geoportal de la Infraestructura de datos espaciales del Instituto Hidrográfico de la Marina	No	WMS	Shared

## Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>Shom Web Service in WMS vector version: Get Feature Info request available.</li> <li>Relevant Web Services provided by partners</li> </ul>	<ul style="list-style-type: none"> <li>Web Services in WMS version: Each layer has his own symbology</li> <li>Uncomplete metadata from IEO</li> </ul>	<ul style="list-style-type: none"> <li>Portrayal harmonisation</li> <li>Publish Inspire compliant metadata when missing are uncomplete</li> </ul>

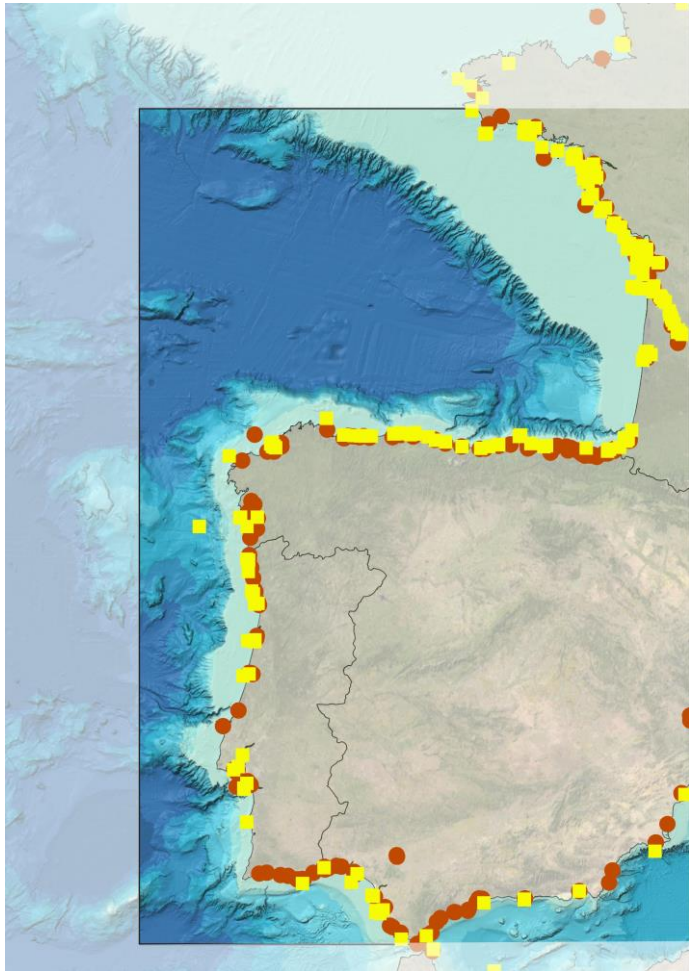


Figure 19: Coastal Defense

*This indicative picture illustrates some layers of the selection of the sub-category. These layers are pointed out by a green tick in the list of selected dataset table.*

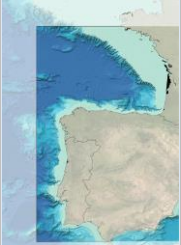
## COASTAL DEFENCE

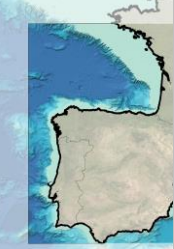

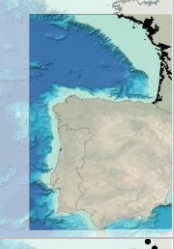
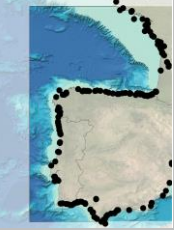
Dataset gathered in this thematic deal with coastal protection against sea risks in coastal areas and authorities planning documents to overcome it: 4 sub-categories are identified: Coastal vulnerability, coastal erosion indicators littoral protection plans, coastal vulnerability and dredging data.

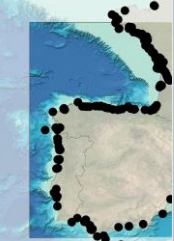
### Coverage

Dredging sub-category Web Services are aggregated and harmonised at a European scale. Others sub-category Web Services are only available in French area.

## List of selected dataset

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Coastal vulnerability	<ul style="list-style-type: none"> <li>Zones basses / representation of topographic zones located under the Century level of the sea</li> </ul>	France	Coverage not available	MEEM	Géolittoral	Yes	WMS	Shared
Coastal vulnerability	<ul style="list-style-type: none"> <li>Hauteur d'eau / Water level</li> </ul>	France	Coverage not available	MEEM	Géolittoral	Yes	WMS / WFS	Shared
Littoral protection plans	<ul style="list-style-type: none"> <li>Communes avec des PPRL approuvés / Municipalities with approved coastal risks prevention plans</li> <li>Communes avec des PPRL prescrits / Municipalities with prescribed coastal risks prevention plans</li> <li>Communes avec des PPRL non prescrits non approuvés/ Municipalities coastal risks prevention plans not prescribed, not approved</li> </ul>	France		MEEM / CEREMA	Géolittoral	Yes	WMS	Shared
Coastal erosion indicators	<ul style="list-style-type: none"> <li>Indicateur national de l'érosion côtière / National Indicator of Coastal Erosion</li> <li>Dates (indicateur nationale de l'érosion côtière) / Period ( National Indicator of Coastal Erosion)</li> </ul>	France	Coverage not available	MEEM / CEREMA	Géolittoral	Yes	WMS / WFS	Shared

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Coastal erosion indicators	<ul style="list-style-type: none"> <li>Coastal erosion trends</li> </ul>	Europe		MATTM / CEREMA	ADRIPLAN	Yes	WFS	Open
Coastal vulnerability indicators	<ul style="list-style-type: none"> <li>Nombre de catastrophes naturelles liées à la mer par commune / Number of natural disasters bound to the sea by municipality</li> </ul>	France		MEEM	GÉOLITTORAL	Yes	WMS	Shared
Coastal vulnerability indicators	<ul style="list-style-type: none"> <li>Indicateur IBC / IBC indicator</li> <li>Commune progressant dans l'échelle d'intensité IBC / Identification of municipalities progressing in intensity scale of IBC indicator</li> </ul>	France		MEEM	GÉOLITTORAL	Yes	WMS	Shared
Dredging	<ul style="list-style-type: none"> <li>Dredging</li> </ul>	Europe		AZTI-TECNALIA	EMODnet human activities Portal	Yes	WFS	Open

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness
Dredging	<ul style="list-style-type: none"> <li>▪ Dredge spoil dumping</li> </ul>	Europe		CETMAR	EMODnet human activities Portal	Yes	WFS	Open

### Selection of datasets analysis

Assets	Barriers	Action Needed
<ul style="list-style-type: none"> <li>➤ Aggregated and harmonised dredging data at a European scale and available in WFS version</li> </ul>	<ul style="list-style-type: none"> <li>➤ MEEM “coastal limits” Web Service not displayed beyond 1: 2 000 000</li> <li>➤ Coastal limits, coastal vulnerability, littoral protection plans Web Services only available in WMS version</li> <li>➤ Uncomplete coastal vulnerability metadata (it doesn't precise the interval of time of the indicator associated)</li> <li>➤ No national scale Web Service available in Spain and Portugal</li> </ul>	<ul style="list-style-type: none"> <li>➤ Publish Inspire compliant metadata when missing are uncomplete</li> </ul>

# CONCLUSIONS

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The study and datasets inventory show that a lot of data related to MSP are available in the Northern Atlantic region. In some cases there are meaningful and comparable information available at the European, the OSPAR IV or at National Scale.

This inventory is non-exhaustive even if datasets have been gathered for each category. The present study seeks to identify assets and barriers in accordance with the requirement criteria defined in the introduction of this report.

The analysis highlights positive elements capable of improving the exchange of datasets. In particular, the inventory gathers datasets with open or shared licences managed by the partners of the project, thus easy to work with in the project.

Moreover, usually the access to the metadata record is available.

In addition, sometimes datasets are produced at a European scale, for example when it implies European authorities such as the “MSFD Region and Subregion” Web Service from EEA Discomap SDI. Thus, it is possible to find data covering the whole project area.

The inventory also contains accurate information at a large scale that is potentially relevant for the case studies. The inventory gives only a few examples of such accurate data as it would be impossible to inventory all the accurate knowledge and not necessary to support the identification of existing technical assets and gaps.

As a result of this inventory and analysis, certain actions can be suggested in order to enhance the MSP data sharing in a transboundary context. As part of the framework of SIMNORAT project, under the C1.3.3 Component, some of these suggestions will be tested. The proposed measures to be undertaken with the support of the Task Group on Data of SIMNORAT are gathered in an Action Plan presented at the end of this report.

The SIMNORAT project provides the opportunity to increase the level of interoperability regarding the data and information managed by the Partners.

## 1. METADATA INTEROPERABILITY

### ANALYSIS OUTCOMES

#### **INSPIRE compliance difference between organisations**

An issue encountered during this project is the varying state of implementation of the INSPIRE Directive concerning the data by producing organisations. While some are pretty well advanced and can provide both ISO 19115-19139 metadata and WFS Web Services, others struggle to give access to minimal information regarding their datasets.

#### **Metadata Issues**

Dataset description is crucial when sharing data. It allows users to make better use of datasets. This is particularly essential in a transboundary context as users often need to use several datasets from different producers to work transnationally. For example, both port sub-category datasets from EMODnet human activities and Sextant portals are dealing with ports. By only consulting the metadata it is possible to differentiate international ports from strategic ports for French fishing vessels.

For a long time (in the past), producers provided hardly any metadata with the shared data. However, the SIMNORAT inventory gathers mainly datasets containing metadata. The inventory describes whether metadata is harvestable or not. In this study metadata is considered harvestable if its format is compatible with INSPIRE and if most of the mandatory fields are filled.

Several datasets without metadata have not been included in the inventory because it is difficult for planners to use these incomplete data. However, some datasets without any metadata associated were selected when they easily made sense due to their clear layer name and when they can be considered particularly relevant for MSP in a transboundary context (e.g. maritime delimitations). Sometimes metadata are not completed. This is notably the case of metadata published by ArcGIS software in its REST version. If necessary, SIMNORAT SDI will be used to create complete metadata.

### Language

The access to datasets can also be hindered by language barriers as a lot of datasets and metadata are neither available in the neighbouring country's languages, nor in English.

### SOLUTIONS

Regarding metadata improvements, the solutions below can be suggested:

- Produce metadata when not completed or missing.
- Produce a harvestable metadata catalogue to foster an automatic harvesting. The format considered is the CSW. This action can be performed:
  - o Either directly by the data producers: The Shom provides a metadata record model to the producers and the producers complete and publish a metadata record. Then the Shom embeds the metadata in the SIMNORAT metadata catalogue.
  - o Alternatively the producers provide the Shom with the required information on the datasets. The Shom then creates and publishes the metadata record in the SIMNORAT metadata catalogue.
- Produce metadata and data in several languages (give priority to English).

## 2. ENHANCE WEB SERVICE QUALITY

### ANALYSIS OUTCOMES

#### Web Services Instability

This inventory has been carried out from March to December 2017. During this period, the problem of instability of several Web Services has been raised. (e.g. EMODnet).

In the SIMNORAT project, this instability has occurred because:

- Web Services are reorganised by the producer
- Dataset names are updated
- Technical problems on the Web Service source (internet connection, server capacity...)

Consequently, a Web Service monitoring system is important when establishing a data portal. It limits data access errors for users and improves the administrator's efficiency. Another way to improve Web Service stability is to reduce the number of SDI involved by directly gathering the Web Service from the SDI of the datasets producer.

#### Web Services standards

The inventory favours WFS when available because WMS is more restrictive. Indeed WFS provides information in vector like version which makes it possible to access to information associated with geometry.

For example, "Tourism and recreation" and "underwater cultural heritage" sub-categories give good examples of symbology gaps met when using WMS. Indeed, multiple layers, treating the same topic can be displayed differently. Consequently, map understanding might be weakened. Therefore, it is difficult to re-use the information.

Nevertheless, WMS datasets are easy to manage (for example no thematic analysis to build) and WMS-V (i.e WMS in vector version) can be even more relevant because users can access to information associated with data geometries (GetFeatureInfo request). In addition, WMS is also used for Raster datasets.

Moreover, some datasets are provided in time-aware WMS version, such as Oceanographic Web Services from the Shom. This time information is interesting for planners and it could be particularly relevant to provide datasets like AIS in temporal WMS version.

Regarding Web Services speed, the access depends on Internet connection. WMTS Web Services can be a solution to optimise heavy raster Web Services.

#### Up-to date Web Services

The SIMNORAT inventory gathers multiple Web Services which are not directly connected to the producer database. Consequently, they do not always correspond to the last update in the producer database:

- Some Web Services can be considered non-progressive as no updating is undertaken by the producer after its creation. For example, "Littoral



Ortophotography 2000" datasets from the Spatial Policy category have been created in 2000, and have not been updated since. In this case, direct access to the producer database is not necessary.

- Costs of human, technical and organisational resources for a Web Service connected directly to the producer database can be higher than its benefits. For example, the French "Wrecks and obstructions" underwater cultural heritage dataset Web Service is updated once a year, whereas the production database is constantly updated.

To automate the publishing process of the Web Services from the databases can increase costs. These costs may seem too high considering the benefits of providing real time updating Web Service.

#### **SOLUTIONS:**

Regarding the quality of Web Service, the following solutions can be suggested:

- Increase the data access in web services by opening datasets in WFS. For example, an output of the SIMNORAT project is that some Partners have worked to open data in Web Services.
- Develop a data portal demonstrator to test the feasibility of sharing MSP data in a transboundary context in the Northern Atlantic region  
This data portal is a decision support tool which faces a twofold challenge because it targets:
  - o All the stakeholders involved in MSP with the objective to visualise and to use datasets in a transboundary context.
  - o GIS experts or data experts with the objective to test dataset interoperability and to address needs and gaps
- Test the use of some temporal web services as it can be relevant to publish temporal Web Services for example about AIS data through the SIMNORAT portal.
- Test solutions to improve the Web Services stability by reducing the number of intermediaries in the Web Services publishing chain.
- Guarantee the last update of the data by connecting the IEO Web Services to IEO database (automatic updating).

### **3. HARMONISATION**

#### **ANALYSIS OUTCOMES**

Harmonisation is a major issue when dealing with datasets in a transboundary context, concerning both format and content. A number of examples from the inventory illustrate this.

- Several environmental indicators have been identified as a reference to implement the MSFD. Consequently, the datasets used by Member States to implement the MSFD Directive were considered as referential data and thus official for MSP. They were integrated in the analysis, when it was possible. However, with regard to their metadata records, it appears that the methodologies used to produce

them are not consistent throughout the countries. Thus, it is not possible to obtain relevant information from their comparison. A solution would be to harmonise the methodologies of dataset production.

- The analysis highlighted geographic gaps in some datasets, in particular in overlapping ones. It occurs especially with boundaries (terrestrial and maritime) when datasets are produced with different accuracies.

Actions have already been undertaken in the Western Mediterranean area to deal with symbology and content harmonisation issues:

- Datasets sometimes are produced at a European scale, for example when it implies European authorities such as the “MSFD Region and Sub-region” Web Service from EEA Discomap SDI.
- When several datasets of the same topic are available in WFS, common symbology can be applied by the end user.
- European projects aim to provide harmonised datasets at a supra-national scale (e.g. EMODnet, Maia Network). Nevertheless, the harmonisation process causes loss of information from the data sources: national sources can complete harmonised data at a larger scale.
- Corine Land Cover European datasets are produced by national stakeholders. Nomenclature and portrayal rules have been established to harmonise datasets at a European scale. Consequently, data is even more relevant in a transboundary context, even if Web Services are provided in WMS.

Finally, the inventory gathers few regional or national datasets harmonised (harmonised datasets). Indeed, standardisation at an international scale is a complex process which can generate human, organisational and technical costs for multiple stakeholders. The datasets homogenisation can cause loss of information. Hence, it can be helpful to complete with local data and to have metadata records.

## SOLUTIONS

- Datasets format: Give preference to vector like format such as WFS.
- Datasets contents:
  - Several actions described above can be reproduced to enhance the datasets homogeneity.
  - Improve symbology by producing common style files. For example, symbology can be standardized through data specifications: For example, the data specification on administrative units from INSPIRE provides recommendations on the symbology to use to display maritime boundaries datasets.

- Use common geometric parameters like projection, resolution or accuracy.

## 4. DATA ORGANISATION

### ANALYSIS OUTCOMES

#### Relevant datasets

During the inventory, some difficulties encountered were to identify official data and to find exhaustive data. Indeed, at this stage MSP implementation is in progress in the countries of the area. Member States have not completely organised the use and sharing of data necessary to establish the maritime spatial plans yet. The ongoing implementation of the INSPIRE Directive in the Member States increases the level of data interoperability of official dataset

The inventory uses unofficial or non-exhaustive datasets.

But it is sometimes very difficult to identify the best data source for a given topic. For example, in the cables and pipeline subcategory there are two layers regarding the cables published by EMODnet and the Shom. In each of these databases, it is possible to find cables not present in the others. The same cable or pipeline can also have diverging geometries in the different sources, as well as different attribute information. Since both sources are official and are not exhaustive, keeping both of them is needed to obtain more complete information.

### SOLUTIONS

- Identify more datasets corresponding to each country and when possible identify a dataset covering the whole area to reduce interoperability issues.
- Identify more accurate datasets in transboundary areas.
- Publish official data because it serves as the administrative and official framework for the maritime spatial plans definition.
- Produce comparable datasets in each country especially at local scale in the transboundary area.
- Use of the same classification and common definition of terms.
- Define relevant datasets required for large subcategory.

## 5. LICENCE CRITERIA

### ANALYSIS OUTCOMES

One conclusion of the study is that data sharing is unbalanced between countries. There is indeed a large difference concerning the access to and the openness level of data.

Licence criteria can be also considered a major issue for sharing MSP data and information in a transboundary context.

This situation leads to several difficulties:

- No license available: Some organisations do not provide their data licence policies, or do not provide available metadata explaining the usage restrictions.
- Licences heterogeneity: The inventory shows a wide variety of licenses used by the different data producers. Each licence depends on the producer and on each dataset. With this variety of licences, it becomes tricky to accurately identify the limits concerning the uses and sharing of a specific dataset.

Consequently, the use of several datasets remains restricted, even for non-commercial use. Nevertheless, the tendency is to open datasets as the INSPIRE directive encourages data producers to do so.

## **SOLUTIONS**

Regarding license issues, improvements can be suggested:

- Create a license reference document / standard in order to clarify the different and main types of license.
- Increase the level of openness of datasets.

## **6. TECHNICAL INTEROPERABILITY**

### **ANALYSIS OUTCOMES**

From the large collection of datasets coming from a wide range of producers, some technical issues linked to interoperability have been identified. These issues can be classified in two categories:

- Interoperability between software programs/packages (compatibility between QGIS desktop software and Geoserver).
- Interoperability between protocols (compatibility between protocols which are not OGC Web Services like SOAP - Simple Access Object Protocol and Geoserver).

# ACTION PLAN

As part of this analysis, a number of measures addressing data needs and gaps have been identified in order to improve MSP data sharing among countries.

Some of them depend mainly on the data producers and on the cooperation among them. But some of them are to be tested in the C1.3.3 component of SIMNORAT. These actions will be undertaken with the support and contribution of the members of the Task Group on Data.

The recommendations are gathered in the Action Plan below and focus on improving the portrayal, interoperability of metadata and Web Services.

OBJECTIVE	ACTIONS
<b>Improve metadata and data interoperability</b>	Create or complete metadata (MD) record in accordance with INSPIRE directive
	Publish MD records using CSW catalogues
	Produce metadata and data in several languages (give priority to English)
<b>Enhance Web service quality</b>	Increase Web Services datasets availability
	Identify the original producers of dataset to limit data access errors for users and improve administrators' effectiveness.
	Implement Temporal Web Services in the data portal demonstrator (MSDI)
	Develop a data portal demonstrator
	Develop a monitoring tool to test web services stability
	Connect databases to Web Services for dynamic datasets to guarantee the last update of data - automatic update
	Develop tools to enhance the information (to explain MSFD indicators, to disseminate non-spatial data, to display regulatory information...)
<b>Portrayal</b>	Define and produce common symbology to improve understanding and use of datasets
<b>Data exhaustivity</b>	Populate the data portal demonstrator and enrich the inventory of datasets relevant for the project or the case studies

# Studied sources list

SOURCE	Complete name	COVERAGE	LINK
<b>ADRIPLAN Data Portal</b>	ADRIatic Ionian maritime spatial PLANning	Europe	<a href="http://data.adriplan.eu">http://data.adriplan.eu</a>
<b>AFB Cartomer</b>	French Agency of Biodiversity Cartomer	France	<a href="http://cartographie.aires-marines.fr">http://cartographie.aires-marines.fr</a>
<b>Catálogo de Serviços de Dados Geográficos</b>		Portugal	<a href="http://mapas.dgterritorio.pt/geoportal/catalogo.html">http://mapas.dgterritorio.pt/geoportal/catalogo.html</a>
<b>CEDEX</b>	Centro de Estudios y Experimentación de Obras Públicas	Spain	
<b>DATA.GOUV.FR</b>	French public open data	France	<a href="http://data.gouv.fr">http://data.gouv.fr</a>
<b>DATA.SHOM.FR</b>	Naval Hydrographic and Oceanographic Service portal	France	<a href="http://data.shom.fr">http://data.shom.fr</a>
<b>EEA Discomap</b>	European Environment agency portal	Europe	<a href="http://discomap.eea.europa.eu">http://discomap.eea.europa.eu</a>
<b>EMODnet bathymetry</b>	European Marine Observation and Data Network – bathymetry	Europe	<a href="http://portal.emodnet-bathymetry.eu">http://portal.emodnet-bathymetry.eu</a>
<b>EMODnet Geology</b>	European Marine Observation and Data Network – Geology	Europe	<a href="http://www.emodnet-geology.eu">http://www.emodnet-geology.eu</a>
<b>EMODnet human activities</b>	European Marine Observation and Data Network – Human activities	Europe	<a href="http://www.emodnet-humanactivities.eu">http://www.emodnet-humanactivities.eu</a>

<b>EMODnet Seabed Habitats</b>	European Marine Observation and Data Network – Seabed Habitats	Europe	<a href="http://www.emodnet-seabedhabitats.eu">http://www.emodnet-seabedhabitats.eu</a>
<b>GÉOBRETAGNE</b>		France	<a href="https://geobretagne.fr">https://geobretagne.fr</a>
<b>GÉOLITTORAL</b>	Sea and littoral portal	France	<a href="http://cartelie.application.developpement-durable.gouv.fr/cartelie/voir.do?carte=Visualiseur_donnes_geolittoral&amp;service=CEREMA">http://cartelie.application.developpement-durable.gouv.fr/cartelie/voir.do?carte=Visualiseur_donnes_geolittoral&amp;service=CEREMA</a>
<b>Geoportail</b>	the national portal of knowledge of the territory implemented by the IGN	France	<a href="https://www.geoportail.gouv.fr">https://www.geoportail.gouv.fr</a>
<b>Geoportal de la Infraestructura de datos espaciales del Instituto Hidrográfico de la Marina</b>		Spain	<a href="http://ideihm.covam.es/visor.html">http://ideihm.covam.es/visor.html</a>
<b>Geoportal do Instituto Hidrográfico</b>		Portugal	<a href="http://gis.hidrografico.pt/geoportal/catalog/main/home.page">http://gis.hidrografico.pt/geoportal/catalog/main/home.page</a>
<b>IEO Portal</b>	Visor Cartografía Base del Instituto Español de Oceanografía	Spain	<a href="http://www.ideo-base.ieo.es">http://www.ideo-base.ieo.es</a>
<b>IGN - Spain</b>	Instituto Geográfico Nacional	Spain	<a href="http://www.ign.es/web/ign/portal">http://www.ign.es/web/ign/portal</a>
<b>Inventaire National du Patrimoine Naturel</b>		France	<a href="https://inpn.mnhn.fr">https://inpn.mnhn.fr</a>
<b>Institut Hydrographico Geoportal</b>		Portugal	<a href="http://gis.hidrografico.pt/geoportal/catalog/main/home.page">http://gis.hidrografico.pt/geoportal/catalog/main/home.page</a>
<b>MAIA WEB GIS</b>	Marine Protected areas in the Atlantic Arc	Atlantic Arc	<a href="http://carto.maia-network.org/1/maia.map">http://carto.maia-network.org/1/maia.map</a>
<b>MAPAMA Acuivisor</b>	Ministerio De Agricultura Y Pesca , Alimentacion Y Medio Ambiente – Visor Acuicultura	Spain	<a href="https://servicio.pesca.mapama.es/acuivisor/">https://servicio.pesca.mapama.es/acuivisor/</a>

<b>MMO Marine Planning Evidence</b>			<a href="http://defra.maps.arcgis.com/apps/webappviewer/index.html?id=2c2f6e66c0464fa99d99fd6d8822ddef">http://defra.maps.arcgis.com/apps/webappviewer/index.html?id=2c2f6e66c0464fa99d99fd6d8822ddef</a>
<b>ODIMS</b>	OSPAR data and information system	International	<a href="https://odims.ospar.org">https://odims.ospar.org</a>
<b>PSOEM Geoportal</b>	Plano de Situação do Ordenamento do Espaço Marítimo/Mar Português	Portugal	<a href="http://webgis.dgrm.mam.gov.pt/arcgis/apps/webappviewer/index.html?id=df8accb510bc4f33963d9b03bf3674b8">http://webgis.dgrm.mam.gov.pt/arcgis/apps/webappviewer/index.html?id=df8accb510bc4f33963d9b03bf3674b8</a>
<b>SANDRE</b>	Service d'administration nationale des données et référentiels sur l'eau	France	<a href="http://www.sandre.eaufrance.fr/atlas/srv/fre/catalog.search#/home">http://www.sandre.eaufrance.fr/atlas/srv/fre/catalog.search#/home</a>
<b>Sextant</b>	Sextant – Infrastructure de données géographiques marines et littorales	France	<a href="https://sextant.ifremer.fr/fr">https://sextant.ifremer.fr/fr</a>
<b>SNIAmb</b>	Sistema Nacional Informacao De Ambiente	Portugal	<a href="https://sniamb.apambiente.pt">https://sniamb.apambiente.pt</a>
<b>SNIMAR Geoportal</b>	Sistema Nacional de Informação do Mar	Portugal	<a href="http://geoportal.snimar.pt">http://geoportal.snimar.pt</a>