

# Analysis of Data Needs and Existing Gaps

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Version 1



Supporting Implementation of Maritime Spatial Planning in the  
Western Mediterranean region

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# Component 1: Supporting Implementation of MSP

## Sub-component 1.3.3: Data and 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  
**CDD:** Common Database on Designated Areas  
**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 – Fundación (Spain)  
**CORILA:** Consorzio per il coordinamento delle ricerche inerenti al sistema lagunare di Venezia (Italy)  
**CROSS:** Centres régionaux opérationnels de surveillance et de sauvetage (France)  
**CPMR/CRPM:** Conference OF Peripheral Maritime Regions / Conférence des Régions Périphériques Maritimes  
**CSW:** Catalog Service for the web  
**DCSMM:** Directive cadre Stratégie pour le milieu marin  
**DG Mare:** Directorate General for Maritime Affairs and Fisheries  
**DIRM:** Direction Inter-Régionale de la Mer (France)  
**DDTM:** Direction départementale des territoires et 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  
**EMODnet:** European Marine Observation and Data Network  
**EPCI:** Etablissement public de coopération intercommunale (France)  
**ETC – UMA:** European Topic Center - University of Malaga (Spain)  
**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  
**IDEE:** Infraestructura de Datos Espaciales de España (Spain)  
**IDEIB:** Infraestructura de dades espacials de les Illes Balears (Spain)  
**IEO:** Instituto español de oceanografía (Spain)  
**IFREMER:** Institut français de recherche pour l'exploitation de la mer (France)  
**IGN:** Institut Géographique National (France)  
**IGN:** Instituto Geografico Nacional (Spain)

**IHM:** Geoportal: Geoportal de la Infraestructura de datos espaciales del IHM (Spain)

**INPN:** Inventaire National du Patrimoine Naturel (France)

**ISO:** International Organisation for Standardisation

**ISPRA:** Istituto Superiore per la Protezione e la Ricerca Ambientale (Italy)

**IUAV:** Istituto Universitario di Architettura di Venezia - Università de Venezia (Italy)

**LBMD:** Levantino-Balear Marine Demarcation (Spain)

**MATTM:** Ministero dell'Ambiente e della Tutela del Territorio e del Mare (Italy)

**MAPAMA:** Ministerio de Agricultura y Pesca Alimentación Medio Ambiente (Spain)

**Med-IAMER:** Integrated Actions to Mitigate Environmental Risks in the Mediterranean Sea

**MEDISEH:** Mediterranean Sensitive Habitats

**MEDOBS:** Observatoire aérien de la Méditerranée

**MEEM:** Ministère de l'Environnement, de l'Energie et de la Mer (France)

**MEPA:** Malta Environment and Planning Authority (Malta)

**MESH-Atlantic:** Mapping Atlantic Area Seabed Habitats for Better Marine Management

**MIT:** Ministero delle Infrastrutture e dei Trasporti (Italy)

**MITA:** Malta Information Technology Agency

**MSDI:** Malta Spatial Data Infrastructure (Malta)

**MSDI:** Maritime Spatial Data Infrastructure

**MSFD:** Marine strategy framework Directive

**MSP:** Maritime Spatial Planning

**MTES:** Ministère de la Transition écologique et Solidaire (France)

**NSO:** National Statistics Office

**NUTS:** Nomenclature of territorial units for statistics

**OGC:** Open Geospatial Consortium

**ONZH:** Observatoire National des Zones Humides (France)

**PA:** Planning Authority of Malta (Malta)

**PACA:** Provence-Alpes-Côte d'Azur (France)

**PPRL:** Plans de prévention des risques naturels (France)

**REMI:** Réseau national de contrôle microbiologique des zones de production conchylicoles (France)

**REPHY:** Réseau national de surveillance du phytoplancton et des phycotoxines

**REST:** Representational State Transfer

**ROCCH:** Réseau national d'Observation de la Contamination Chimique du littoral (France)

**RPDZH:** Réseau Partenarial des Données sur les Zones Humides (France)

**SAGE:** Schéma d'aménagement et de gestion des eaux (France)

**SANDRE:** Service d'administration nationale des données et référentiels sur l'eau (France)

**SDI:** Spatial Data Infrastructure of MED

**SDI-MED platform:** Spatial Data Infrastructure of MED (Med-IAMER)  
**SEXTANT:** Infrastructure de données géographiques marines et littorales (France)  
**SHAPE:** Shaping an Holistic Approach to Protect the Adriatic Environment  
**Shom:** Service hydrographique et océanographique français (France)  
**SIH:** Systèmes d'Informations Halieutiques  
**SIMNORAT:** Supporting Implementation of Maritime Spatial Planning in the Northern European Atlantic  
**SINVA:** Sistema Informativo Nazionale per le Valutazioni Ambientali (Italy)  
**SLD:** Style Layer descriptor  
**SOAP:** Simple Object Access Protocol  
**SPED:** Strategic Plan for the Environment and Development (Malta)  
**UNEP-WCMC:** United Nations Environment Program - World Conservation Monitoring Centre  
**VIA:** Valutazione d'Impatto Ambientale (Italy)  
**VLIZ:** Vlaams Instituut Voor De Zee  
**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

# INTRODUCTION

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## **SIMWESTMED project**

Supporting Implementation of Maritime Spatial Planning in the Western Mediterranean region (SIMWESTMED) 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, Italy, Malta and Spain and international organisations. SIMWESTMED 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 (e.g. Malta Spatial Data Infrastructure - MSDI).

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

In the Western Mediterranean area, the data and information requirements for MSP are a technical study<sup>1</sup> of the SIMWESTMED project aiming to support access to and use of maritime spatial data in the waters of France, Italy, Malta and Spain. This study is focusing 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 SIMCelt project, this action identifies the data and information requirements for MSP in a transboundary context. It examines existing infrastructure arrangements in the Western Mediterranean 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

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

data portal experts issued from the partnership. This group plays a major role in 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 Western Mediterranean. This initial information, gathered at the beginning of the SIMWESTMED project, is aimed to guide the implementation of the second part of the action item (in the SIMWESTMED 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 Western Mediterranean 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 SIMWESTMED Task Group on Data (Saint-Mandé, France, 22-23 June 2017) and of the analysis of the inventoried data and information in the Western Mediterranean 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 SIMWESTMED 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 Western Mediterranean 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 SIMWESTMED 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 Western Mediterranean 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 Western Mediterranean region, the data and information requires:

- To cover either France, Italy, Malta and Spain 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 SIMWESTMED 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).

Malta has already developed a maritime spatial plan which is currently in a revision process. Spain, France and Italy 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 yet been elaborated by Spain, France, Italy and Malta.

- 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

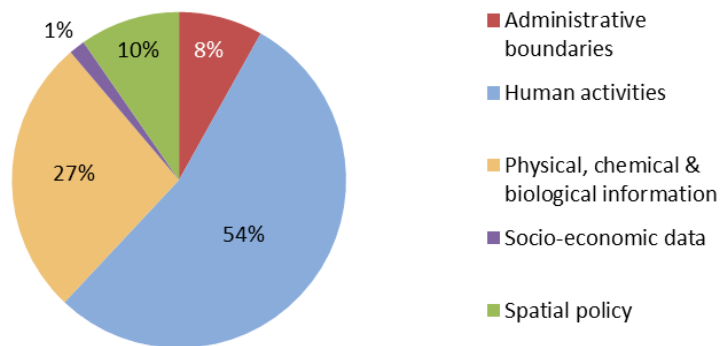
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The following figures present an overview of the inventory of data, on a quantitative point of view. Qualitative information on the data inventoried is brought up in the fifth part of this document (Analysis), for each dataset and its associated metadata.

As explained above, the data inventory presented in this report is based on the spatial data and sources knowledge of the Partnership. 64% of the datasets presented in this report have been identified thanks to its contribution.

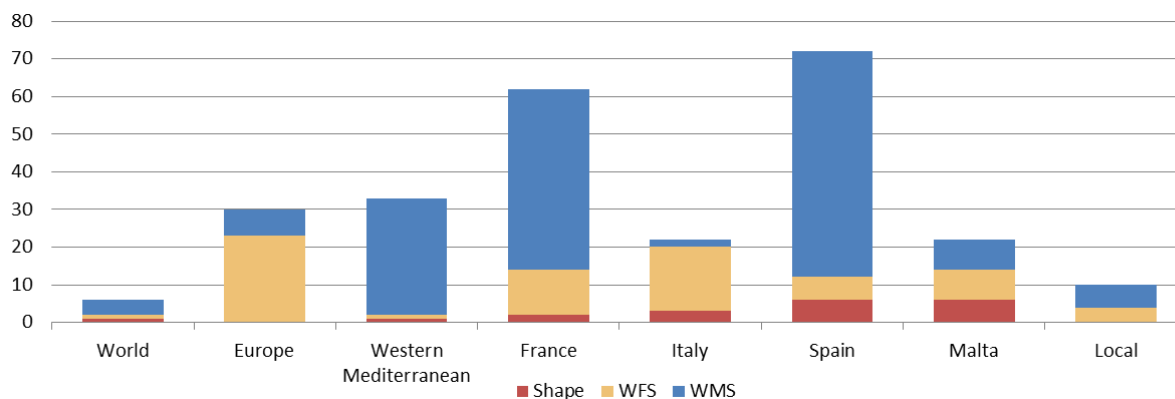
260 datasets corresponding to SIMWESTMED area of interest are presented in this analysis. They fulfil the main criteria of the data and information requirements for MSP in a transboundary context defined in the first part of the report and allow to highlight the data needs and gaps. These datasets come from 33 different spatial data portals and 54 different producers.

116 of these datasets, as 53%, are open datasets so their use is easy. Open data means datasets that are free to use, reuse and publish without restriction.



**Chart 1: Data distribution by category**

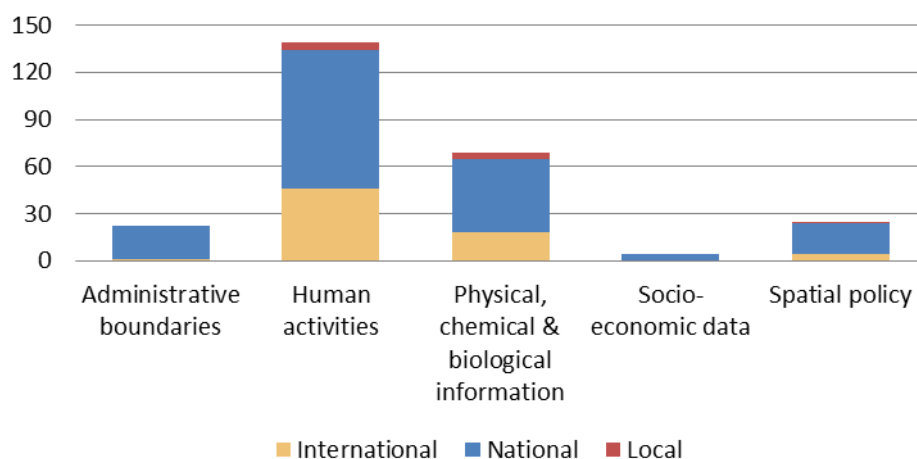
An important imbalance is visible between categories. The *Human activities* category gathers half of the selected datasets. Only four layers have been found in the *Socio-economic data* category probably because it makes in general reference at alphanumeric information with no spatial representation (Chart 1).



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

The Western Mediterranean 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 65% 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 coverage**

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 (Chart 3).

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 SIMWESTMED 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 Malta, the Strategic Plan for Environment and Development (SPED, developed in 2015) is the overarching document for planning issues on land and sea in an integrated manner. It constitutes the national MSP Plan. The datasets used in the SPED are gathered in a spatial data infrastructure dedicated to maritime spatial planning, entitled Malta Spatial Data Infrastructure (MSDI), developed by the MITA (Malta Information Technology Agency). This governmental institution is the single data source providing available data in Web Services. Indeed, the Planning Authority of Malta has developed a Geoportal, but the datasets are only viewable. Web Services and downloading are not possible. Therefore, there is a lack of data for some categories.
- In Italy, the process of organizing existing data begins. Indeed, to implement the MSP Directive, Italy must define the relevant datasets and indicators and then update them.
- Many MSP projects have been developed and have produced maritime spatial data. Most of them concern the Eastern Mediterranean area, like ADRIPLAN, SHAPE. Consequently, only few data are currently identified for the MSP directive and gathered in a geoportal. Some of them are nevertheless produced at large scale in the local institutions.
- 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 them. Internal databases have been realised but the datasets are not yet published on a spatial data infrastructure. In the framework of SIMWESTMED, 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 Mediterranean level via MSDI like EMODnet, FAO, SDIMED (Med-IAMER). They provide an overview of the situation even if the MSP categories are not exhaustive.

## 5. Analysis

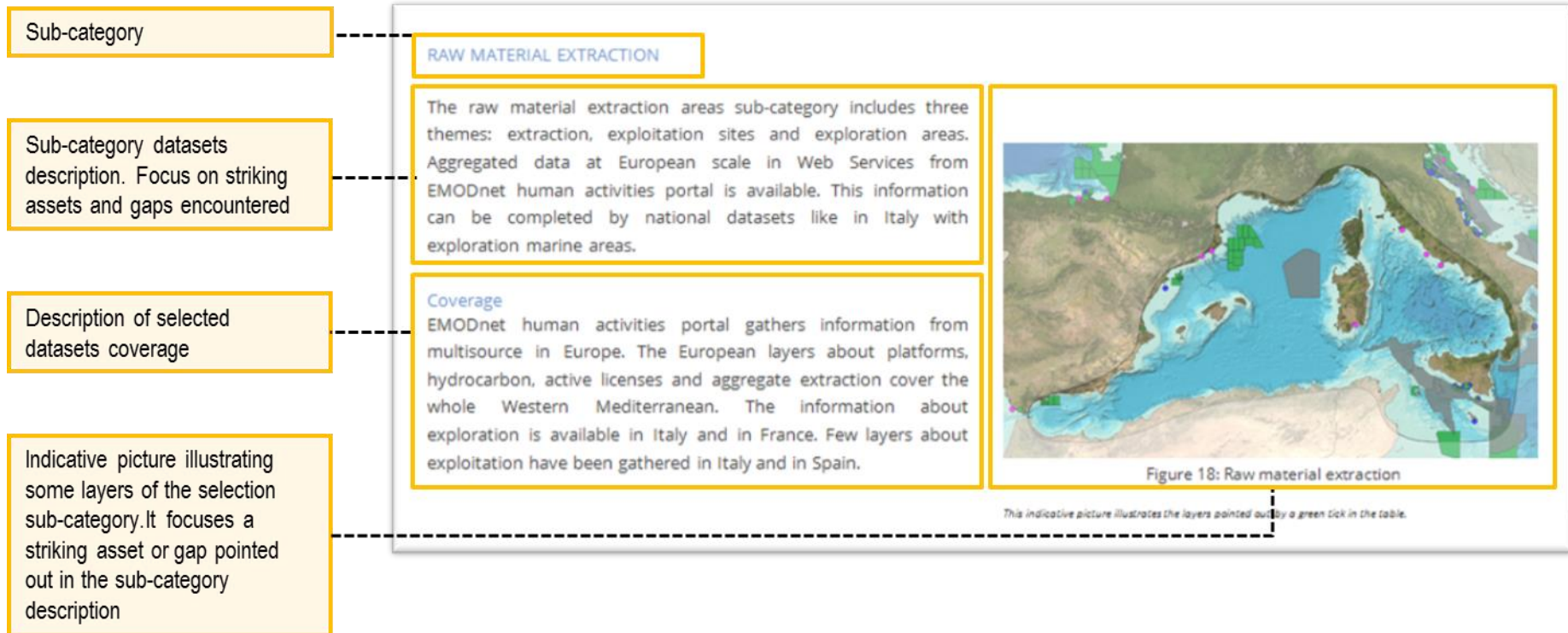
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An overview and a detailed technical description of the data fulfilling the requirements detailed above in the Western Mediterranean area are provided in this part.

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 items describe selected datasets. Each item 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 Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Extraction	<ul style="list-style-type: none"> <li>Hydrocarbon extraction</li> <li>Hydrocarbon</li> <li>Platforms</li> <li>Active license</li> </ul>	Europe		COGEA	EMODnet Human Activites portal	Yes	WFS / WMS	Open	
Extraction	<ul style="list-style-type: none"> <li>Aggregate</li> </ul>	Europe		AZTI-Tecnalia	EMODnet Human Activites portal	Yes	WFS / WMS	Open	
Exploration	<ul style="list-style-type: none"> <li>Localisation des sites de forages exploratoires</li> </ul>	France		Ministère de l'Industrie	SEXTANT	Yes	WMS	Shared	Yes
Exploration	<ul style="list-style-type: none"> <li>Permessi di ricerca attivi al 31 gennaio 2016</li> <li>Zone marine</li> </ul>	Italy		MISE	SINVA	Yes	WFS	Open	Yes

Table 18: Selected datasets for Raw material extraction subcategory

### Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>&gt; Coverage on whole the area</li> <li>&gt; All European datasets are in WFS</li> <li>&gt; Web Services are created by CEDEX</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Missing data in Malta</li> <li>&gt; Incoherence between European and Spain datasets</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Find more datasets</li> <li>&gt; Work on the openness of datasets</li> </ul>

## Items 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

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

**Coverage:** Illustration of the dataset coverage. In several cases, the coverage is not displayed (e.g. dataset cannot be displayed at a large scale, the dataset covers a very little area, multiple layers displayed together...)

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

**SDI:** Spatial Data Infrastructure where datasets have been gathered.

**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 of datasets are concerned: 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.

**Official:** The word “official” has different meanings depending on the country it is related to. In case of Italy, the MSP data is considered official when it is approved by the Government. In general, the data is considered official when it is used or will be used to implement the national maritime plans in accordance with European Directive. This is the case, for example, of indicators defined at European level in the framework of the MSFD. The data is also considered official when it is a data of reference like maritime delimitations of sovereignty or jurisdiction provided by the hydrographic offices of the countries.

## Note:

**PA** refers to Planning Authority named previously MEPA – Malta Environment and Planning Authority. The document uses MEPA when the data or the metadata characteristics still used MEPA.

**MATTM** which means Ministero dell’Ambiente e della Tutela del Territorio e del Mare also refers to ISPRA

**MTES** refers to Ministère de la Transition écologique et Solidaire previously named MEEM - Ministère de l'Environnement, de l'Energie et de la Mer.

# 1. ADMINISTRATIVE BOUNDARY

## TERRESTRIAL BOUNDARY

In each country, datasets about terrestrial boundary are available.

The datasets selected are official data. Their access can be done by Web Services or shape. An issue in this sub-category is the geometric coherence of the layers: overlapping is met in transboundary areas. Another issue is the impossibility to compare different administrative levels between countries.

A specificity of Malta is the unique administrative level, which correspond to NUTS 3.

Spain provides several levels of terrestrial limits in a unique data layer in WMS available depending on the zoom.

In Italy, Maritime State Property information System-Sea Portal is created by MIT for classification of state property goods in a specific administrative and cartographic database. The information is available in WMS, WFS, SHAPE, CSV and XML modality. The system is shared as support for Public Administrations (Ministries, Regions, Municipalities, Port Authorities).

### Coverage

The coverage of the area is complete on Western Mediterranean through a multiplicity of sources.

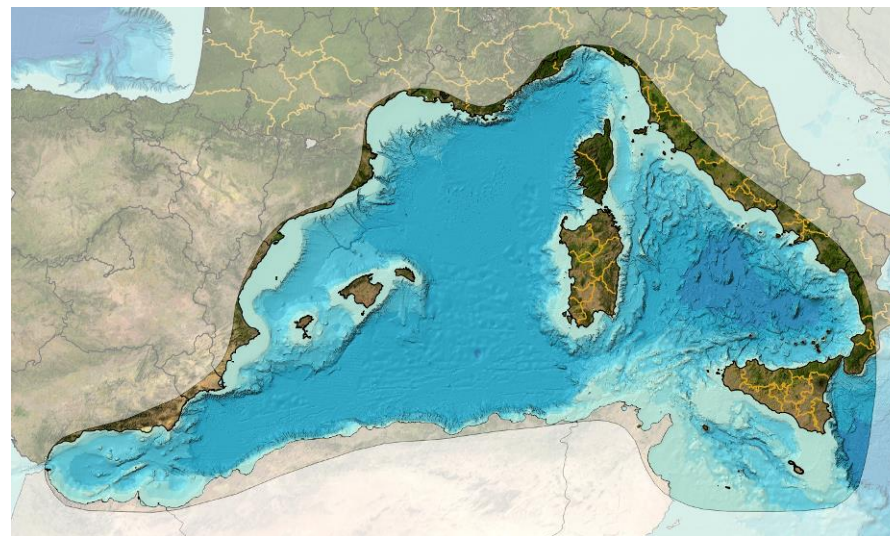



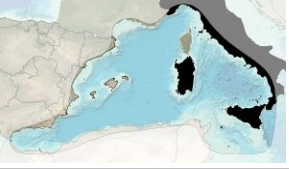


Figure 1: Terrestrial Boundary

*This indicative picture illustrates the layers pointed out by a green tick in the table.*



## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Terrestrial boundaries</b>	<ul style="list-style-type: none"> <li>Administrative unit - level 0</li> </ul>	World (on layer by country)		GADM Global administrative areas	GADM Global administrative areas		SHAPE	Shared	No
<b>Terrestrial boundaries</b>	<ul style="list-style-type: none"> <li>Region</li> <li>Departement</li> <li>Commune</li> </ul>	France		IGN	GEOBRETAGNE	Yes	WFS	Open	Yes
<b>Terrestrial boundaries</b>	<ul style="list-style-type: none"> <li>Limites administrativas</li> </ul>	Spain		IGN Spain	IGN Geoportal	Yes	WMS	Shared	Yes
<b>Terrestrial boundaries</b>	<ul style="list-style-type: none"> <li>Regioni</li> <li>Province</li> <li>Communi</li> </ul>	Italy		MATTM	GEOPORTALE NAZIONALE	No	WFS	Open	Yes
<b>Terrestrial boundaries</b>	<ul style="list-style-type: none"> <li>Maritime State Property Information System-Sea Portal</li> </ul>	Italy	Coverage not available : The area of intervention concerns the maritime state-owned area of the whole national territory for a development of about 7,500 km of coastline with a cadastral cartography mapping	MIT	SID IL Portale del Mare	Yes	WMS, WFS and Shape	Shared	Yes



<b>Terrestrial boundaries</b>	<ul style="list-style-type: none"> <li>Administrative : Local Councils Units</li> </ul>	Malta		DEPARTMENT FOR LOCAL GOVERNMENT	MSDI	Yes	WMS	Open	Yes
<b>Terrestrial boundaries</b>	<ul style="list-style-type: none"> <li>SU. VectorStatisticalUnit.NUTS</li> <li>SU. VectorStatisticalUnit.LAU1</li> </ul>	Malta		National Statistic Office	MSDI	Yes	WMS	Open	Yes

Table 1: Selected datasets for Terrestrial Boundary subcategory

### Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>Datasets available in each country</li> <li>Official data available</li> </ul>	<ul style="list-style-type: none"> <li>Difference of administrative structure between countries – no possibility to compare administration boundaries</li> <li>Geometric issues: overlapping, shift, resolution</li> <li>Different type of Web Services – hard to harmonise data</li> <li>EPCI centralised by Web Services not found in France</li> <li>Data portrayal: each layer has its own symbology</li> </ul>	<ul style="list-style-type: none"> <li>Portrayal harmonisation: improve symbology</li> <li>Improve datasets production with common parameters: projection, resolution, boundary...</li> </ul>

## MARITIME BOUNDARY

There is an imbalanced availability of maritime boundaries data depending on the country.

Maritime delimitations datasets are available for 3 out of 4 Member States. They are provided by the reference institutes for maritime boundary, hydrographic offices, for 2 out of 4 Members states. In some other cases, some Partners can provide maritime delimitations corresponding to their country's official claim.

The access modalities (open or shared) and the format are different (web services or files).

For example in Malta, layers included in the Strategic Plan for Environment and Development of 2015 are official and open, but available only in shape format.

### Coverage

The coverage of the area is incomplete because there is no official datasets available in all the countries although this information cannot be replaced or completed by indicative limits.

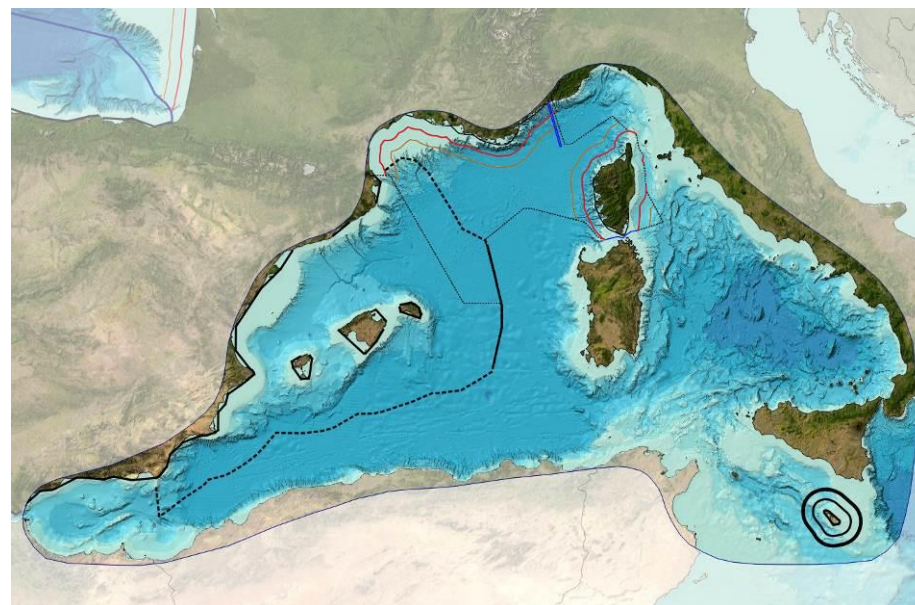


Figure 2: Maritime Boundary

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets




Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Maritime boundaries</b>	Baseline Territorial sea Contiguous zone Agreed maritime boundary between 2 states Unilaterally claimed by France Economic Exclusive Zone ✓	France		Shom	Data.shom.fr	Yes	WMS-V / WMS	Shared	Yes
<b>Maritime boundaries</b>	Straight baselines Territorial waters 24 nm - Contiguous zone 25 nm Fisheries Management Conservation Zone ✓	Malta		MEPA	/	No	SHAPE	Shared	Yes
<b>Maritime boundaries</b>	Lineas de base recta Mar territorial Zona Economica Exclusiva del Mediterraneo ✓	Spain		IHM	IHM Geoportal	No	WFS	Shared	Yes

Table 2: Selected datasets for Maritime boundary subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ Data produced by maritime hydrographic institutes (France and Spain)</li> <li>▪ Web Services in Vector WMS version are provided by Shom – Request Get Feature Information is possible</li> </ul>	<ul style="list-style-type: none"> <li>▪ Data provided by Partner but not disseminated by the reference institute (Malta)</li> <li>▪ Official datasets not available for Italy</li> <li>▪ Different type of Web Services – hard to harmonise data</li> <li>▪ Data portrayal: each layer has its own symbology</li> </ul>	<ul style="list-style-type: none"> <li>▪ Produce official data</li> <li>▪ Open datasets in WFS</li> <li>▪ Portrayal harmonization: improve symbology</li> </ul>

## 2. PHYSICAL CHEMICAL BIOLOGICAL INFORMATION

## PHYSICAL CHARACTERISTICS

This sub-category is very large and covers physical characteristics like bathymetry, sedimentology, coastline, oceanography...

All layers selected are produced by European projects or by SIMWESTMED Partners. Therefore opportunities to undertake actions to improve the interoperability of these layers with Partners' support during the SIMWESTMED project will be explored in the next step of the project.

Information exists at very large scale which can be used in the case studies.

EMODnet portal provide some compilation layers covering the entire area which give comparable information in the countries and in the transboundary areas. Nevertheless, the datasets used to produce this overview is not homogeneous as the different sources used are not based on same criteria (accuracy, resolution...).

### Coverage

The coverage of the area is complete on the Western Mediterranean through global and European data for bathymetry and sedimentology. At national scale, the coastline is available but not always complete, updated and official.

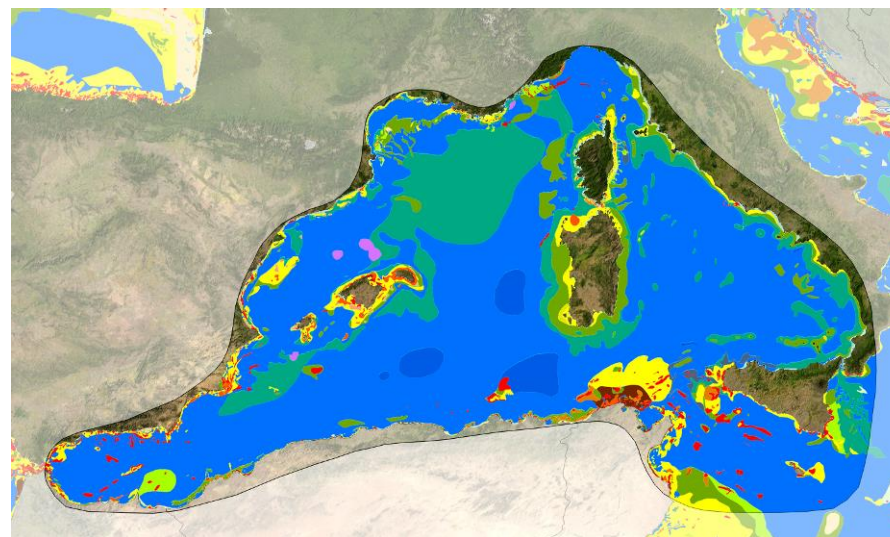



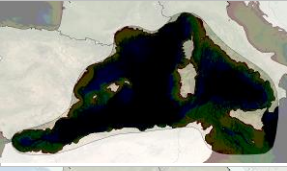















Figure 3: Physical characteristics

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Sedimentology</b>	<ul style="list-style-type: none"> <li>Carte sédimentaire mondiale</li> </ul>	World		Shom	Data.shom.fr	Yes	WMS-V / WMS	Shared	Yes
<b>Lithology</b>	<ul style="list-style-type: none"> <li>Sea-floor geology lithology</li> </ul>	World		Federal Institute for Geosciences and Natural Ressources	EMODnet Geology	Yes	WMS	Shared	
<b>Sea physical characteristics</b>	<ul style="list-style-type: none"> <li>Temperature</li> <li>Salinité</li> <li>Pression en surface</li> <li>Vitesse et direction du vent</li> </ul>	France, Italy and Spain		Shom	Data.shom.fr	Yes	WMS Temporal	Open	Yes
<b>Bathymetry</b>	<ul style="list-style-type: none"> <li>EMODnet Digital Bathymetry (DTM) - mean depth in multi-colour</li> <li>EMODnet bathymetry – Source Reference</li> </ul>	Europe		EMODnet	EMODnet Bathymetry	Yes	WFS / WMS / WMTS	Shared	
<b>Bathymetry</b>	<ul style="list-style-type: none"> <li>Litto 3D PACA 2015</li> <li>Litto 3D Languedoc-Roussillon 2009</li> </ul>	PACA/ Languedoc-Roussillon		Shom - IGN	Data.shom.fr	Yes	WMS	Shared	Yes

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Bathymetry</b>	<ul style="list-style-type: none"> <li>MNT Bathymétrique de façade du Golfe du Lion - Côte d'Azur</li> </ul>	Golfe du Lion - Côte d'Azur		Shom	Data.shom.fr	Yes	WMS	Shared	Yes
<b>Water column</b>	<ul style="list-style-type: none"> <li>Zonas de afloramientos</li> </ul>	Andalucia		CONSEJERIA DE MEDIO AMBIENTE Y ORDENACION DEL TERRITORIO - JUNTA DE ANDALUCIA	IDEE	Yes	WMS	Shared	
<b>Coastline</b>	<ul style="list-style-type: none"> <li>Linea de Costa</li> </ul>	Spain		IEO	IEO Geoportal	No	WMS/Rest	Shared	No
<b>Coastline</b>	<ul style="list-style-type: none"> <li>Coastal Tipology</li> </ul>	Spain				No	WMS	Shared	
<b>Coastline</b>	<ul style="list-style-type: none"> <li>Land water boundary</li> </ul>	Spain		IHM	IHM Geoportal	Yes	WMS	Open	Yes
<b>Coastline</b>	<ul style="list-style-type: none"> <li>Trait de côte HISTOLITT</li> </ul>	France		Shom	Data.shom.fr	Yes	WMS	Open	Yes

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Coastline	<ul style="list-style-type: none"> <li>Nature du trait de côte</li> </ul>	France		MEEM	GEOLITTORAL	Yes	WMS	Open	
Coastline	<ul style="list-style-type: none"> <li>Linea di Costa aggiornata al 2009</li> </ul>	Italy		MATTM	GEOPORTALE NAZIONALE	Yes	WFS	Open	
Coastline	<ul style="list-style-type: none"> <li>Linea di Costa</li> </ul>	Italy		ISPRA	ISPRA Geoviewer	Yes	WMS	Open	Yes
Coastline	<ul style="list-style-type: none"> <li>Maltese coast</li> </ul>	Malta		MEPA	/	/	SHAPE	Shared	Yes
Coastal erosion	<ul style="list-style-type: none"> <li>Coastal Erosion trends</li> </ul>	Europe		EEA	ADRIPLAN	Yes	WFS / WMS	Open	
Coastal erosion	<ul style="list-style-type: none"> <li>Principali variazioni della linea di costa (1960-2012)</li> </ul> <p style="text-align: center;">✓</p>	Italy		MATTM / CEREMA	GEOPORTALE NAZIONALE	Yes	WFS	Open	


Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Coastal erosion indicators	<ul style="list-style-type: none"> <li>Indicateur national de l'érosion côtière</li> <li>Dates (indicateur national de l'érosion côtière)</li> </ul>	France		MEEM / CEREMA	GEOLITTORAL	Yes	WFS / WMS	Shared	Yes

Table 3: Selected datasets for physical characteristics subcategory

### Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>Data available at Global and European scales</li> <li>Relevant Web Services provided by partners which will make it easier to provide updates to datasets</li> <li>Information can be compared between country because it is general information</li> <li>Data very accurate at local scale (Litto3D) relevant for case studies</li> <li>Web Services in Vector WMS version are provided by Shom - Request Get Feature Information is possible</li> </ul>	<ul style="list-style-type: none"> <li>Few data at national scale</li> <li>Data portrayal: each layer has its own symbology especially for Coastline layers</li> </ul>	<ul style="list-style-type: none"> <li>Find more datasets in each country</li> <li>Improve the harmonisation of information / Produce same datasets in each country</li> <li>Open datasets in WFS</li> <li>Portrayal harmonization: improve symbology</li> </ul>

## TYPE OF HABITAT

In this sub-category, general layers describe habitats on whole as predictive map or models. More information is provided at national scale in specific areas for example benthic, pelagic or coastal habitats.

Several issues are met when comparing the information by States: differences in scale, definition, overlapping and lack of information...

### Coverage

The coverage of the area is complete on the Western Mediterranean. Indeed EMODnet project produces marine habitats models and predictive models.

Concerning the seabed, the information is available in 3 countries out of 4 but this information is not comparable (accuracy, classification).

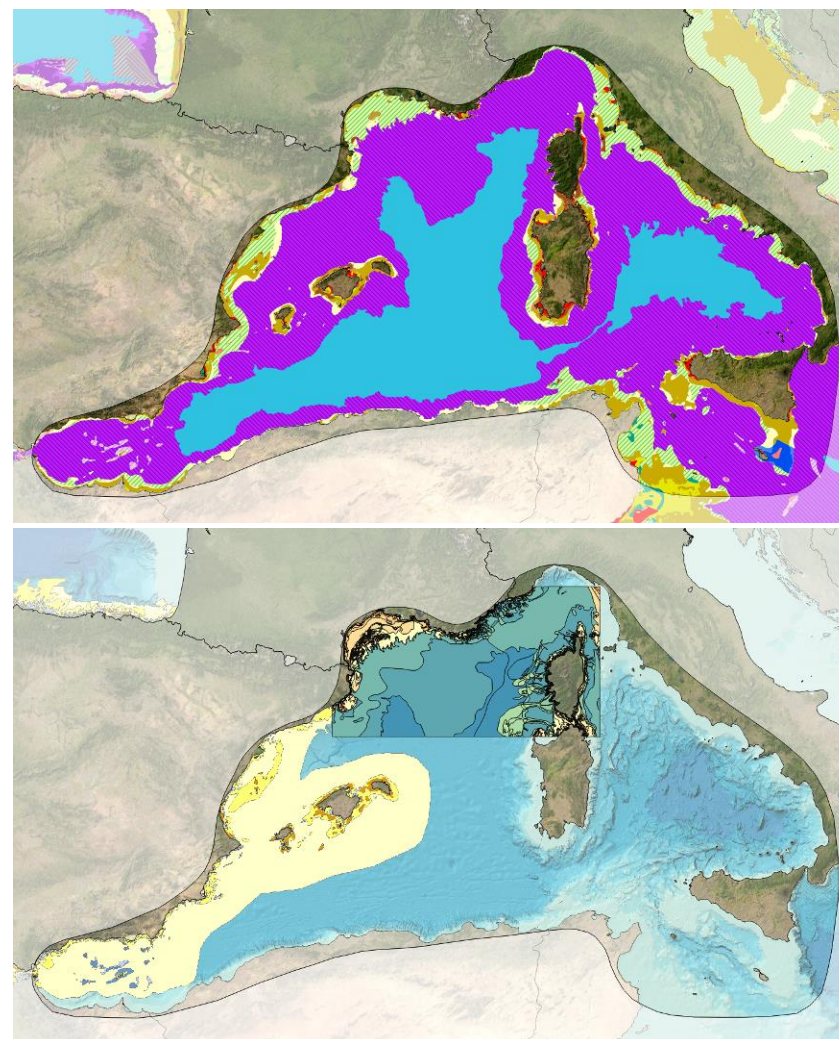








Figure 4: Type of Habitat

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Habitats	<ul style="list-style-type: none"> <li>Habitat descriptors – Substrate</li> <li>Broad-scale Predictive Habitat</li> <li>Broad-Scale Predictive Habitat Map - Confidence</li> </ul>	Europe		EMODnet Seabed Habitats	EMODnet Seabed Habitats Portal	Yes	WMS	Open	
Habitats	<ul style="list-style-type: none"> <li>Biocenosi marine costiere</li> </ul>	Italy		MATTM	SINVA	Yes	WFS	Open	
Habitats	<ul style="list-style-type: none"> <li>Marine Habitats Areas Distribution</li> <li>Marine Habitats Point Distribution</li> <li>Marine Habitats Facies</li> </ul>	Spain		IEO	IEO Geoportal	No	SOAP / WMS	Shared	
Seabed	<ul style="list-style-type: none"> <li>Modelled spatial distribution of Maërl Habitat</li> <li>Modelled spatial distribution of Coralligenous Habitats</li> </ul>	Mediterranean		VLIZ - MEDISEH	EMODnet Seabed Habitats Portal	Yes	WMS	Open	
Seabed	<ul style="list-style-type: none"> <li>Modelled spatial distribution of Posidonia oceanica Habitat</li> </ul>	Mediterranean		VLIZ - MEDISEH	EMODnet Seabed Habitats Portal	Yes	WMS	Open	
Seabed	<ul style="list-style-type: none"> <li>Naturaleza Fondo Marino</li> </ul>	Spain		IEO	IEO Geoportal	No	SOAP / WMS	Shared	

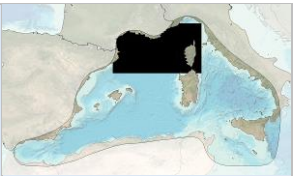
<b>Seabed</b>	<ul style="list-style-type: none"> <li>Carte d'habitats physiques des fond marins ✓</li> </ul>	France		IFREMER	SEXTANT	Yes	WFS	Open	
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Table 4: Selected datasets for Type of habitat subcategory

### Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>Coverage on the whole area</li> <li>Official data available</li> <li>Web Services are created by IEO for the project gathering official data for the MSP</li> <li>Concerning habitats of seabed related to France and Spain, the same information is available</li> </ul>	<ul style="list-style-type: none"> <li>Missing data in Malta</li> <li>No data concerning water column</li> <li>Data portrayal: each layer has its own symbology especially for French and Spanish habitats of seabed layers, maps cannot be compared</li> <li>Geometric issues: overlapping</li> <li>Datasets contained in the IEO Web Services are disconnected from the databases. Loss of automatic data updating and incomplete metadata for the moment.</li> </ul>	<ul style="list-style-type: none"> <li>Find datasets more accurate especially in transboundary areas</li> <li>Provide datasets with the same classification and at the same scale</li> <li>Portrayal harmonization: improve symbology</li> <li>Improve data production with common parameters: projection, resolution, boundary...</li> </ul>

## BIOLOGICAL CHARACTERISTICS

Datasets related to native or non-native species distribution and representative or protected species like Coralligenous or Posidonia are gathered in this thematic. Many datasets on species are available. In this report, only a couple are described as examples of the group.

The available layers result of surveys and punctual analysis. Consequently, in general the information covers a very small area. However the Mediterranean Spatial Data Infrastructure, SDIMED produces models of spatial distribution of some species in the Mediterranean basin.

### Coverage

Information covering the whole Mediterranean is obtained by the project Med-IAMER (SDIMED). A lot of data layers are available for specific areas in each country produced through specific surveys or studies. Therefore the information is quite inhomogeneous.

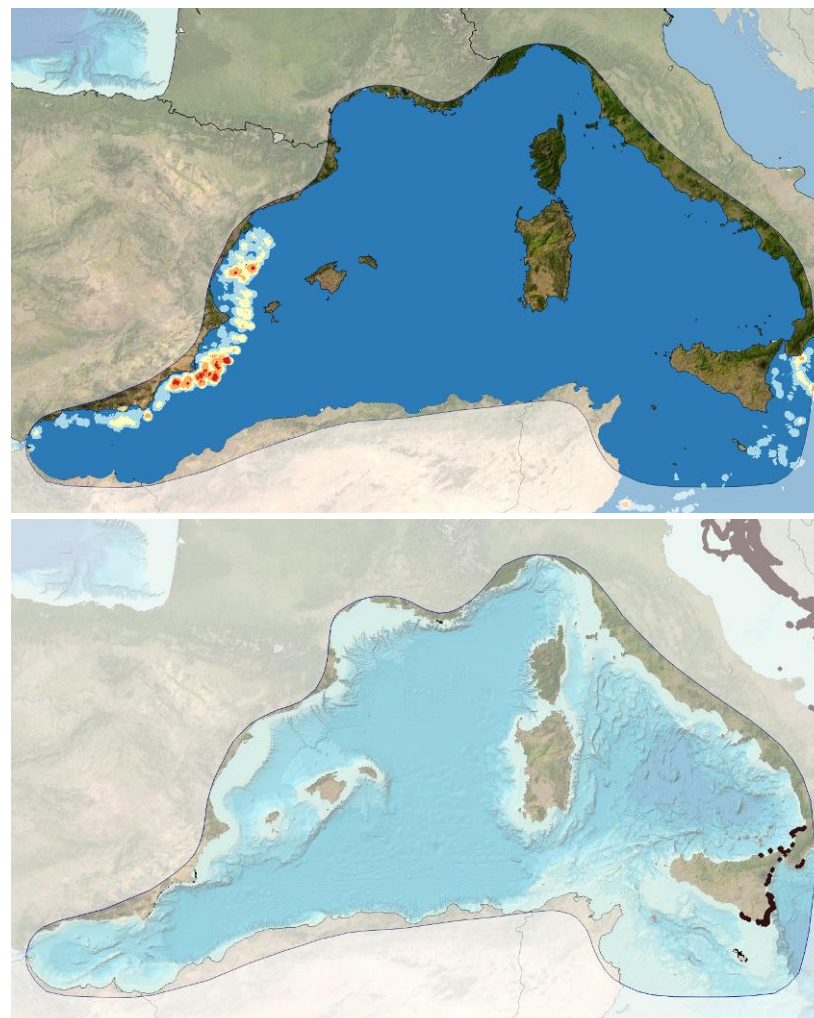









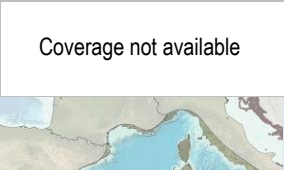


Figure 5: Biological characteristics

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Fauna	<ul style="list-style-type: none"> <li>Occurrence of Cetaceans (model)</li> <li>Occurrence of Turtle (model)</li> </ul>	Mediterranean		ETC - UMA	SDIMED	Yes	WMS	Open	
Fauna	<ul style="list-style-type: none"> <li>Marine mammals sightings</li> </ul>	Italy		CNR-ISMAR	ADRIPLAN	Yes	WFS / WMS	Open	
Fauna	<ul style="list-style-type: none"> <li>Répartition des Palinurus mauritanicus et des Palinurus elephas</li> <li>Répartition des Isidella elongata</li> </ul>	France		IFREMER	SEXTANT	Yes	WMS	Shared	
Fauna	<ul style="list-style-type: none"> <li>Position of Coralligenous point data</li> </ul>	Mediterranean		MITA	MSDI	Yes	WMS	Open	Yes
Fauna	<ul style="list-style-type: none"> <li>Coralligenous communities (model)</li> <li>Sardina pilchardus (European pilchard) recruits</li> <li>Nephrops norvegicus (Norway lobster) spawners</li> </ul>	Italy		MEDISEH	ADRIPLAN	Yes	WFS / WMS	Open	

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Fauna</b>	▪ Peces sensibles	Spain		IEO	IEO Geoportal	No	SOAP / WMS	Shared	
<b>Minerals</b>	▪ Maerl Bottom LBMD	Spain		IEO	IEO Geoportal	No	WMS	Shared	
<b>Flora</b>	▪ Laminarias Distribution LMBD	Spain		IEO	IEO Geoportal	No	WMS	Shared	
<b>Flora</b>	▪ Posidonia Oceanica on sediment ▪ Posidonia Oceanica on rock ✓	Malta		MEPA	MSDI	Yes	WFS	Open	Yes
<b>Flora</b>	▪ Herbier de Posidonie fonds marins de Toulon à Hyères ✓	Var	Coverage not available	IFREMER	SEXTANT	Yes	WMS	Open	
<b>Flora</b>	▪ Posidonia Oceanica ✓	Italy		MEDISEH	ADRIPLAN	Yes	WFS / WMS	Open	



Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Flora	<ul style="list-style-type: none"> <li>Posidonia Oceanica Distribution LBMD</li> </ul>	Spain		IEO	IEO Geoportal	No	WMS	Shared	
Non-indigenous species	<ul style="list-style-type: none"> <li>Non-native points distribution LBMD</li> <li>Non-native lineal distribution LBMD</li> </ul>	Spain		IEO	IEO Geoportal	No	WMS	Shared	

Table 5: Selected datasets for Biological characteristics subcategory

### Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>Coverage of the whole area with distribution models</li> <li>A lot of datasets available for species, for the analysis only a couple of layers have been selected for example. If case studies needs target a specific species, it is possible to add new relevant layers (e.g. datasets from IEO )</li> <li>Data partly come from SIMWESTMED partners which will make it easier to provide updates to datasets</li> </ul>	<ul style="list-style-type: none"> <li>Difference in the amount of datasets available between Member States</li> <li>Data gathered by national authority. possible heterogeneity between detection and monitoring methods</li> <li>In each MS, data concerning the presence of Posidonia have been inventoried. Therefore, there is no layer on Posidonia covering the entire region.</li> <li>Missing metadata record (e.g. data from IEO)</li> <li>A lack of information concerning license and openness level</li> <li>Data portrayal: each layer has its own symbology</li> </ul>	<ul style="list-style-type: none"> <li>Portrayal harmonisation: improve symbology</li> </ul>

## PRESSURES AND IMPACTS

In this sub-category, datasets inventoried are pressures indicators, marine litter and pollutant elements, dredging. This subcategory is characterised by the heterogeneity in the information (theme, sources accuracy).

At European scale, multiple datasets concerning Mediterranean marine exposure are available. To be synthetic, only a couple of available layers illustrate the theme in this report.

At national scale, there are datasets for each country but the information is very different. For example, in Spain there are official shapefiles produced in 2012 for the “Analysis of pressures and impacts” in the Initial Assessment of the Marine Strategies. The equivalent of this information for other countries was not inventoried in this analysis.

### Coverage

There is no data at global or European level whereas there is a Mediterranean portal, SDIMED platform supported by Med-IAMER project to mitigate environmental risks in the Mediterranean Sea.

It provides data on the Western Mediterranean basin by grid datasets. The Mediterranean datasets are completed by national datasets.

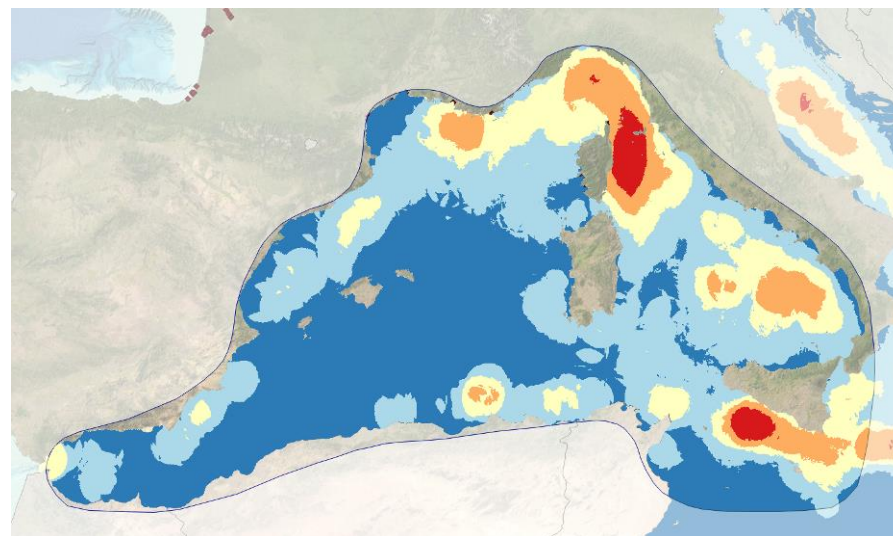







Figure 6: Pressures and impacts

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Pressures indicators	<ul style="list-style-type: none"> <li>▪ Marine exposure due to port activity</li> <li>▪ Oil spill density</li> <li>▪ Cumulative Pressure indicator : pressure categories</li> <li>▪ Potential fishing pressure</li> <li>▪ Marine pressure of climate change</li> <li>▪ Marine litter by transport influence</li> </ul>	Mediterranean		ETC-UMA	SDIMED	Yes	WMS	Shared	
Pressures indicators	<ul style="list-style-type: none"> <li>▪ Acumulación de presiones que pueden causar la entrada de:               <ul style="list-style-type: none"> <li>○ especies invasoras</li> <li>○ patógenos</li> <li>○ ruido submarino</li> </ul> </li> </ul>	Spain		IEO		No	SHAPE	Shared	Yes
Sensitive area	<ul style="list-style-type: none"> <li>▪ Zonas con potenciales de entrada de:               <ul style="list-style-type: none"> <li>○ especies invasoras</li> <li>○ patógenos</li> <li>○ ruido submarino</li> </ul> </li> </ul>	Spain		IEO		No	SHAPE	Shared	Yes
Sensitive area	<ul style="list-style-type: none"> <li>▪ Zonas sensibles identificadas por poligonos</li> </ul>	Spain		MAPAMA	MAPAMA Geoportal	Yes	WMS	Open	
Sensitive area	<ul style="list-style-type: none"> <li>▪ Sensitive Area</li> </ul>	Malta		MITA	MSDI	Yes	WMS	Open	Yes





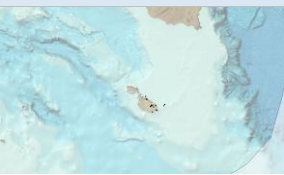

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Environmental quality</b>	<ul style="list-style-type: none"> <li>Chemical status of Coastal Waters according to the WFD</li> <li>Fitoplanton status according to the WFD</li> </ul>	Spain			CEDEX	No	WMS	Shared	Yes
<b>Environmental quality</b>	<ul style="list-style-type: none"> <li>Qualità delle acque in base ad indici di naturalità</li> <li>Procedure VIA in corso - Opere puntuali</li> </ul>	Italy		MATTM	SINVA	Yes	WFS	Open	
<b>Pollution</b>	<ul style="list-style-type: none"> <li>Marine Litter Distribution LBMD - SIMWESTMED</li> </ul>	Spain		IEO	IEO Geoportal	No	SOAP / WMS	Shared	
<b>Pollution</b>	<ul style="list-style-type: none"> <li>Contaminants in Mussel Distribution</li> <li>Contaminants in Red Mullet Distribution</li> <li>Contaminants in Sediments Distribution</li> </ul>	Spain		IEO	IEO Geoportal	No	SOAP / WMS	Shared	
<b>Pollution</b>	<ul style="list-style-type: none"> <li>Data on transfers and release of pollutants to the environment</li> </ul>	Malta		MEPA	MSDI	Yes	WMS	Open	Yes
<b>Dredging</b>	<ul style="list-style-type: none"> <li>Sites d'immersion des sédiments de dragages portuaires 2005-2015</li> </ul>	France		MEEM	GEOLITTORAL	Yes	WMS	Shared	Yes
<b>Dredging</b>	<ul style="list-style-type: none"> <li>Dumping of dredged material - 2016</li> </ul>	Spain	Coverage not available			No	WMS	Shared	

Table 6: Selected datasets for Pressures and impacts subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ Coverage of the whole area with distribution models</li> <li>▪ Mediterranean scale for datasets is better for MSP</li> <li>▪ Data partly come from SIMWESTMED partners which will make it easier to provide updates to datasets</li> <li>▪ A lot of datasets available for pressures indicators, for the analysis only a few pressures indicator datasets have been selected for example. If case studies needs target a specific species, it is possible to add new relevant layers (e.g. datasets from IEO )</li> <li>▪ Web Services are created by IEO and CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Heterogeneity of datasets due to different pressures in each country</li> <li>▪ Few data in France and Italy</li> <li>▪ For the same information, datasets not available in the same web service(e.g. sensitive area)</li> <li>▪ Data on the Mediterranean are models and not raw data so their use when the construction methodology is not detailed is not easy.</li> <li>▪ Datasets contained in the IEO Web Services are disconnected from the databases. This means the loss of automatic data updating and incomplete metadata.</li> <li>▪ Datasets included in Web Services created by IEO and CEDEX for the project remain shared data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Find datasets in each country at local scale which can be compared</li> <li>▪ Improve the harmonisation of information</li> <li>▪ Open datasets in WFS</li> </ul>

### 3. SPATIAL POLICY

## SPATIAL POLICY

Spatial policy makes reference to planning documents, planning authorities, administrative and regulation limits, natural delimitations or priority areas which are submitted to reservation or exclusion for some activities/uses.

The datasets inventoried at European level concern mainly maritime spatial delimitations. At national scale the themes are more varied and very different from one country to another. In this theme regional spatial policy especially in France is also met. Multiple sources and contents reflect heterogeneous spatial planning organisation.

### Coverage

Most of the spatial policies are defined at national scale. It exists also some international regulations datasets available, therefore covering the whole Mediterranean area, like the FAO areas.

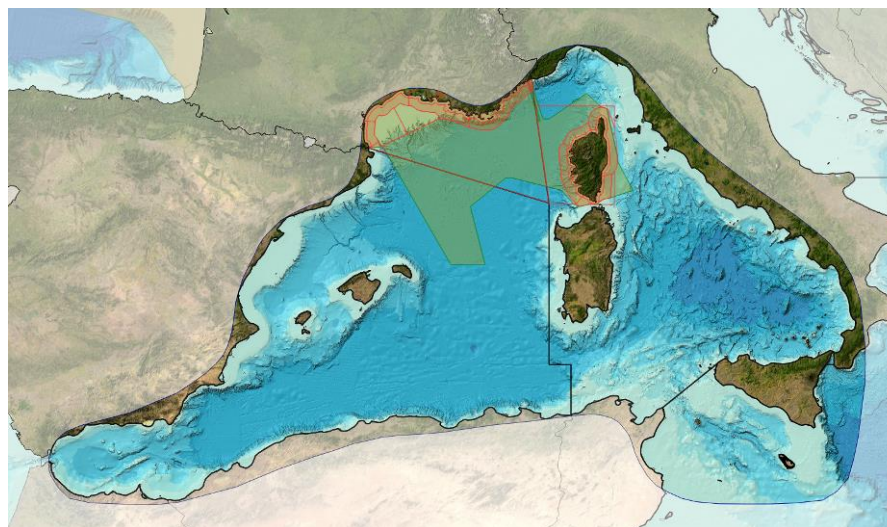



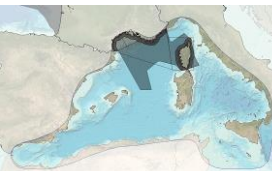



Figure 7: Spatial policy

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of selected datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Planning authority	<ul style="list-style-type: none"> <li>Western Mediterranean (Subarea 37.1 of FAO Major Area 37)</li> <li>Mediterranean and black sea (Major fishing area 37) ✓</li> </ul>	Europe		FAO		No	WMS	Open	Yes
Planning document	<ul style="list-style-type: none"> <li>MSFD Marine regions sub-regions</li> </ul>	Europe		EUROPEAN COMMISSION - EEA ETC-UMA	EEA Discomap	No	WMS	Shared	
Planning document	<ul style="list-style-type: none"> <li>DCSMM – Régions Marines</li> <li>DCSMM – Sous régions marines</li> </ul>	France		AFB	SEXTANT	Yes	WFS / WMS	Open	Yes
Planning document	<ul style="list-style-type: none"> <li>Zones FAO - Secteurs méditerranée (version SIH)</li> <li>Zones de compétences des DIRM</li> <li>Zones de compétences en mer du préfet de région ✓</li> </ul>	France		IFREMER	SEXTANT	No	WMS	Shared	Yes
Planning document	<ul style="list-style-type: none"> <li>Loi littoral</li> </ul>	Languedoc-Roussillon		DREAL OCCITANIE	Picto-occitanie	Yes	WMQ	Open	





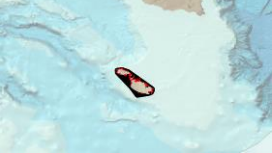
Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Planning document</b>	<ul style="list-style-type: none"> <li>▪ Périimètre des SAGE en Métropole</li> </ul>	France		SANDRE - OFFICE INTERNATIONAL DE L'EAU	SANDRE	Yes	WFS WMS SHAPE	Open	Yes
<b>Natural delimitation</b>	<ul style="list-style-type: none"> <li>▪ Demarcaciones hidrograficas</li> </ul>	Spain		MAPAMA	MAPAMA Acuivisor	Yes	WMS	Open	
<b>Planning authority</b>	<ul style="list-style-type: none"> <li>▪ Dominio publico maritime terrestre</li> </ul>	Spain		MAPAMA	MAPAMA Acuivisor	Yes	WMS	Open	
<b>Planning authority</b>	<ul style="list-style-type: none"> <li>▪ MSFD Marine Districts</li> <li>▪ Banned anchoring areas</li> </ul>	Spain		CEDEX		No	WMS	Shared	No
<b>Planning authority</b>	<ul style="list-style-type: none"> <li>▪ Competent Authority for the Water Framework Directive (✓)</li> <li>▪ Coastal and Marine infrastructure as per SPED</li> </ul>	Malta		MEPA	MSDI	Yes	WMS	Open	Yes

Table 7: Selected datasets for Spatial policy subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ Coverage of the whole area</li> <li>▪ A lot of information in France</li> <li>▪ Web Services are created by CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Heterogeneity of datasets due to different policies in each country</li> <li>▪ Missing metadata</li> <li>▪ No harvestable metadata</li> <li>▪ Datasets included in Web Services created by CEDEX for the project remain closed data</li> </ul>	<ul style="list-style-type: none"> <li>▪ No action plan defined yet</li> </ul>

## LAND USE

This sub-category focuses on terrestrial uses. Normalised datasets according to the European standard Corine Land Cover are produced in each country.

These datasets are therefore particularly interesting because they are high resolution and comparable. Moreover there are temporal datasets allowing to display the evolution through time, for example using a tool dedicated to temporal data on a Maritime Spatial Data Infrastructure.

### Coverage

Regarding the Corine Land Cover datasets, the coverage of the Mediterranean area is complete. In France, more information is found.

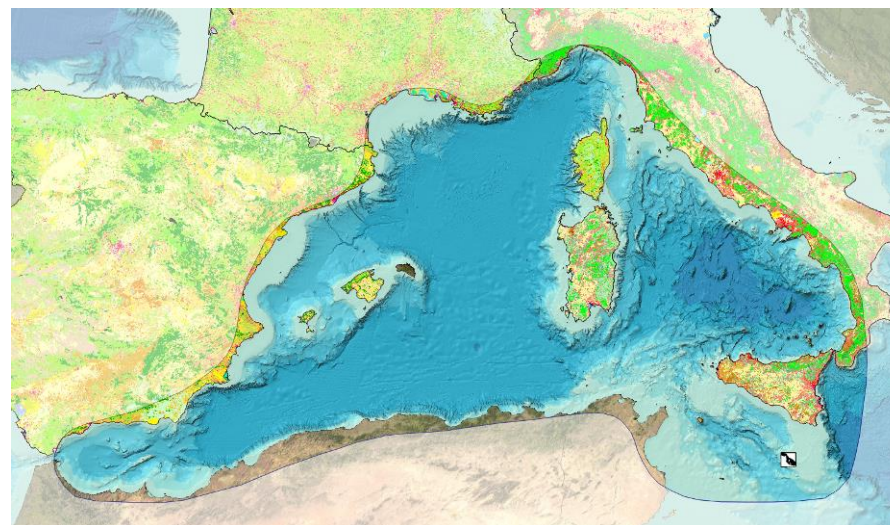


Figure 8: Land use

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets





Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Land use	<ul style="list-style-type: none"> <li>Mode d'occupation du sol sur le littoral (LittoMos)</li> <li>Ortho littorale 2000 / 2014</li> </ul>	France	Coverage not available	MEEM	GEOLITTORAL	Yes	WMS	Shared	Yes
Land use	<ul style="list-style-type: none"> <li>Corine Land Cover 2006 / 2012</li> </ul>	France		MEEM	GEOLITTORAL	Yes	WMS / WFS / SHAPE	Open	Yes
Land use	<ul style="list-style-type: none"> <li>Corine Land Cover 1990 / 2000 / 2006</li> </ul>	Spain		IGN	IGN	/	WMS	/	Yes
Land use	<ul style="list-style-type: none"> <li>Corine Land Cover 2000 / 2006</li> </ul>	Italy		ISPRA	ISPRA Geoportal	Yes	WMS	Open	Yes
Land use	<ul style="list-style-type: none"> <li>Corine Land Cover 2012</li> </ul>	Malta		MITA	MSDI	Yes	WMS	Open	Yes

Table 8: Selected datasets for Land use subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"><li>▪ Datasets very accurate / at a high resolution</li><li>▪ Temporal datasets are interesting to implement the portal demonstrator and perhaps to develop tool</li><li>▪ Efforts have been already undertaken in order to harmonise data at European scale</li></ul>	<ul style="list-style-type: none"><li>▪ Datasets not provide by partners</li><li>▪ Difficult to exploit the Maltese WMS Corine Land Cover: information not classified and presence of white background</li></ul>	<ul style="list-style-type: none"><li>▪ Find more datasets</li><li>▪ Work on Web Services stability</li><li>▪ Use temporal datasets</li><li>▪ Ease the use of Maltese Web Services and its displaying</li></ul>

## 4. SOCIO-ECONOMIC DATA

## SOCIO-ECONOMIC DATA

This theme gathers information about demography, employment, turnover of maritime activities... Only a few socio-economic Web Services has been inventoried.

It generally consists in not spatialized alphanumeric information. Spatialized socio-economic data has been inventoried only in Spanish waters.

### Coverage

A few Web Services are found in Spain, none in France, Italy and Malta. It is difficult to identify data covering the whole area of interest because the socio-economic data is often produced at large scale with regional or local institutions.

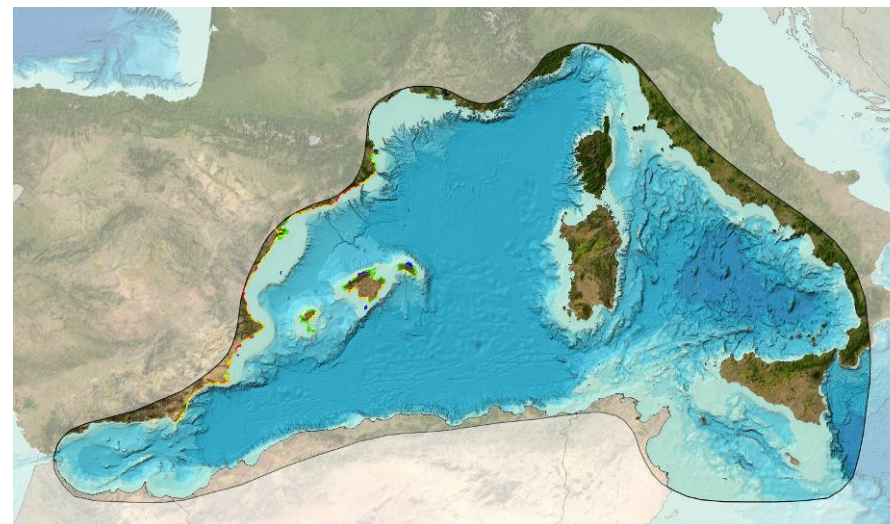


Figure 9: Socio-economic data

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of selected datasets



Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Population	<ul style="list-style-type: none"> <li>Population in municipalities – 2016</li> <li>Density of population in municipalities – 2016</li> <li>Demographic vulnerability</li> </ul>	Spain		CEDEX		No	WMS	Shared	Yes
Employment	<ul style="list-style-type: none"> <li>Employment by Port Authority</li> </ul>	Spain		CEDEX		No	WMS	Shared	Yes
Population	<ul style="list-style-type: none"> <li>Recensement population 2001</li> </ul>	Italy		MATTM / CEREMA	GEOPORTALE NAZIONALE	Yes	WFS	Open	

Table 9: Selected datasets for Spatial policy subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>Web Services are created by CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>No data on the whole area</li> <li>Missing metadata in France, Italy and Malta</li> <li>No harvestable metadata</li> <li>Datasets in WMS</li> <li>Datasets included in Web Services created by CEDEX for the project remain closed data</li> </ul>	<ul style="list-style-type: none"> <li>Produce harvestable metadata</li> </ul>

## 5. ACTIVITIES / USES

## AQUACULTURE

The EUROSHELL and EMODnet Human activities projects provide harmonised information concerning finfish and shellfish production at European level. National datasets are identified in addition. In some cases, for example aquaculture farming datasets, there is incoherence between information provided by European datasets and the national sources.

### Coverage

A large coverage of the area of interest at European or national scale is provided by the datasets inventoried.

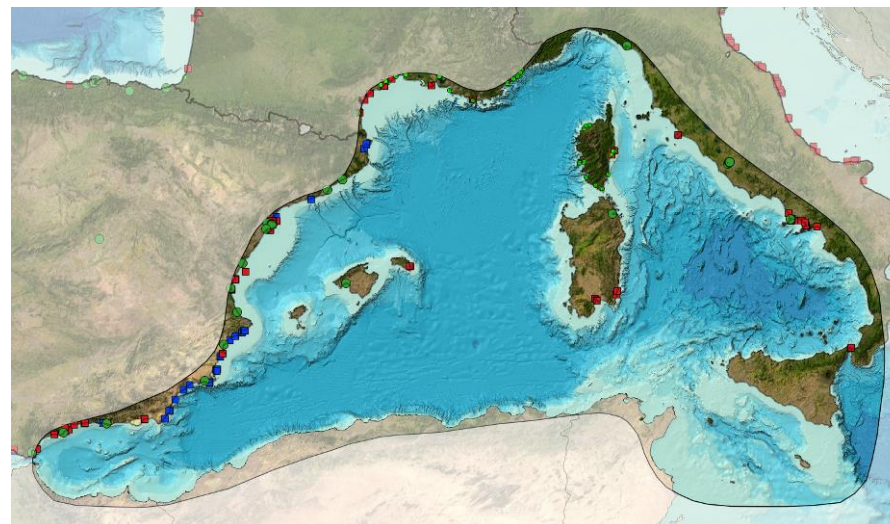







Figure 10: Aquaculture

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Shellfish	<ul style="list-style-type: none"> <li>Shellfish production</li> </ul>	Europe		EMODnet Human Activities	EMODnet Human Activities portal	Yes	WFS / WMS	Open	
Shellfish	<ul style="list-style-type: none"> <li>EUROSHELL - Shellfish farmer's organisations</li> </ul>	Italy; Spain		IFREMER	SEXTANT	Yes	WFS	Open	
Shellfish	<ul style="list-style-type: none"> <li>Aquaculture facilities 2010-2011</li> <li>Mollusc farming area</li> <li>Fishing vulnerability due to aquaculture</li> </ul>	Spain		CEDEX		No	WMS	Shared	
Shellfish	<ul style="list-style-type: none"> <li>Position of the Aquaculture boundary farms</li> </ul>	Malta	Coverage no available	MITA	MSDI	Yes	WMS		Yes
Shellfish	<ul style="list-style-type: none"> <li>Impianti di pesca, maricoltura e barriere di ripopolamento ittico</li> </ul>	Liguria		Region Liguria	Region Liguria cartografia	Yes	WFS / WMS	Shared	
Finfish	<ul style="list-style-type: none"> <li>Finfish farming sites</li> </ul>	Europe		EMODnet Human Activities	EMODnet Human Activities portal	Yes	WFS / WMS	Open	



Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Finsfish</b>	<ul style="list-style-type: none"> <li>Piscicultures existantes ✓</li> <li>Potentiel pisciculture</li> </ul>	France		IFREMER	SEXTANT	Yes	SHAPE	Shared	
<b>Aquaculture planning</b>	<ul style="list-style-type: none"> <li>Cadastre aquacole (polygons)</li> </ul>	France		DDTM	SEXTANT	Yes	WMS	Shared	Yes

Table 10: Selected datasets for Aquaculture subcategory

### Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>Data available at European scale</li> <li>European and national data go together</li> <li>Efforts have been already undertaken in order to harmonise data at European scale</li> </ul>	<ul style="list-style-type: none"> <li>European layers not exhaustive (e.g. not cover Malta)</li> <li>Incoherence between European and Spain datasets</li> <li>Some datasets not available in web services</li> <li>Few data provide by partners</li> <li>Updating issues: EUROSHELL project finished in 2014 – Data is not updated anymore</li> </ul>	<ul style="list-style-type: none"> <li>Produce a complete datasets on the whole area</li> </ul>

## FISHING

This sub-category is sensitive and the data is not easily available in the countries.

It is a large theme where datasets identified in each country are specific and cannot be identified in another country.

All the available data are in WMS and mostly are shared.

### Coverage

Fishing data is mainly available at national or local scale but it exists also datasets on the whole area of interest like FAO datasets.

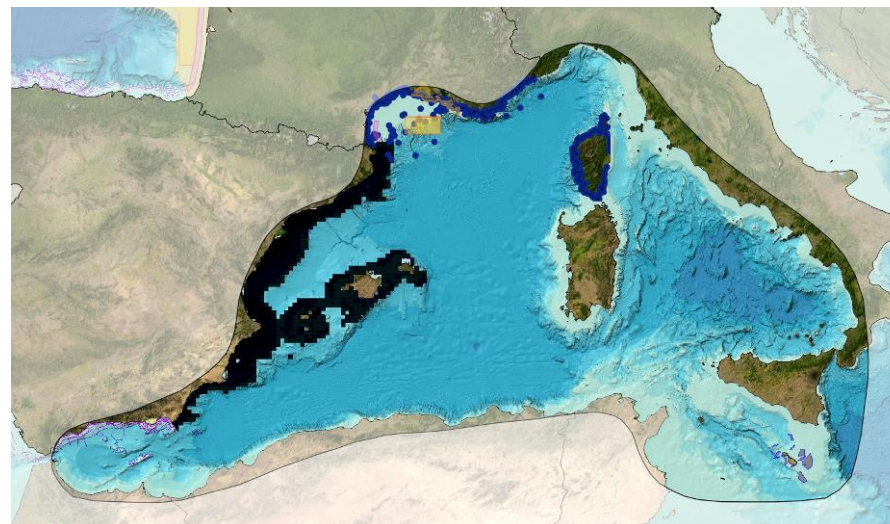








Figure 11: Fishing

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Regulation	<ul style="list-style-type: none"> <li>Geographical Subareas (GSAs)</li> </ul>	Europe		GFCM		No	SHAPE	Open	Yes
Regulation	<ul style="list-style-type: none"> <li>Zone d'autorisation de pêche dans les eaux françaises par les navires étrangers (version SIH) ✓</li> </ul>	France		AFB	SEXTANT	Yes	WMS	Shared	Yes
Fishing production and exploitation	<ul style="list-style-type: none"> <li>Zones de pêche et activité en mer ✓</li> </ul>	France		MEDOBS	SEXTANT	Yes	WMS	Shared	
Fishing production and exploitation	<ul style="list-style-type: none"> <li>Fish markets</li> <li>Total number of vessels 2016</li> </ul>	Spain		CEDEX		No	WMS	Shared	
Fishing production and exploitation	<ul style="list-style-type: none"> <li>Distribucion des Esfuerzo pesquero (✓), Arrastre de Fondo, arte de trampa, arte de cerco, arte de enmalle, arte de palangre, arte de lineas de mano</li> </ul>	Spain		IEO	IEO portal	No	SOAP / WMS	Shared	
Regulation	<ul style="list-style-type: none"> <li>Caladeros ✓</li> </ul>	Spain		IEO	IEO portal	No	WMS	Shared	



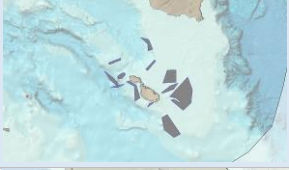

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Regulation	<ul style="list-style-type: none"> <li>Confraries de pescadors</li> </ul>	Balearic islands		GOVERN ILLES BALLEARS	IDEIB		WMS		
Regulation	<ul style="list-style-type: none"> <li>Criées – (version SIH)</li> </ul>	France; Spain		IFREMER	SEXTANT	Yes	WMS	Shared	
Regulation	<ul style="list-style-type: none"> <li>Trawling sites</li> </ul>	Malta		MITA	MSDI	Yes	WMS	Open	Yes
Regulation	<ul style="list-style-type: none"> <li>Fisheries management conservation zone (25nm)</li> </ul>	Malta		MEPA	/	/	SHAPE	Shared	Yes

Table 11: Selected datasets for Fishing subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ A lot of information in France and in Spain</li> <li>▪ Web Services are created by IEO and CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sensitive thematic - difficult to obtain open data</li> <li>▪ No Italian datasets and no VMS data</li> <li>▪ Spanish datasets from IEO provided as grids without thematic analysis : WFS or thematic associated with WMS would improve datasets exploitations</li> <li>▪ French and Spanish datasets do not concern the same information (France = fishing area and Spain = fishing method)</li> <li>▪ Datasets contained in the IEO Web Services disconnected from the databases. Loss of automatic data updating and incomplete metadata for the moment.</li> <li>▪ Datasets included in Web Services created by IEO and CEDEX for the project remain closed data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Find Italian datasets</li> <li>▪ Work on the openness of datasets</li> <li>▪ Try to connect IEO Web Services at the database</li> <li>▪ Produce harvestable metadata</li> </ul>

## MARINE RENEWABLE ENERGIES

This sub-category is related to an activity in development covering different energies like wave energy, wind or tidal energy. In the Western Mediterranean it concerns suitable areas for the implantation of renewable activities or calls for proposals in progress.

Renewable energy planning is recent due to strong development potential. Consequently we can foresee that more web services will be available in future.

Some information is available at European scale by EMODnet Human Activities project but currently the web services are not stable. In France, the main producer of information is the MTES, previously named MEEM, through the GEOLITTORAL portal. In Spain, the Wind farms are available in WMS but without metadata. For the moment no datasets are available in the other Members States.

### Coverage

No information is available regarding Malta and Italy.

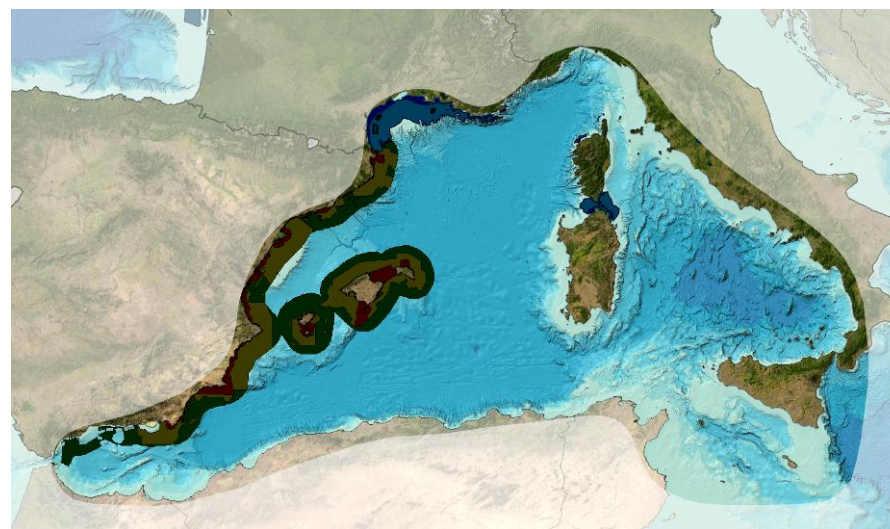


Figure 12: Marine Renewable Energies

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets





Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Ocean energy</b>	<ul style="list-style-type: none"> <li>Ocean Energy Facilities</li> <li>Ocean Energy Facilities – Project Locations</li> </ul>	Europe	Coverage not available	AZTI-TECNALIA	EMODnet Human Activities portal	Yes	WFS / WMS	Open	
<b>Wind energy</b>	<ul style="list-style-type: none"> <li>Wind farms (point)</li> </ul>	Europe		CETMAR	EMODnet Human activities	Yes	WFS / WMS	Open	
<b>Wind energy</b>	<ul style="list-style-type: none"> <li>Wind zones</li> </ul>	Spain		CEDEX		No	WMS	Shared	
<b>Wind energy</b>	<ul style="list-style-type: none"> <li>Eolien flottant : appel à projet 2015 (polygons)</li> <li>Eolien flottant : Gisement technique</li> <li>Eolien posé : Gisement technique</li> </ul>	France		MEEM	GEOLITTORAL	Yes	WMS	Shared	Yes
<b>Ocean energy</b>	<ul style="list-style-type: none"> <li>Gisement technique pour le développement de l'énergie houlomotrice</li> </ul>	France		MEEM	GEOLITTORAL	Yes	WMS	Shared	Yes

Table 12: Selected datasets for Maritime renewable energies subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ European, French and Spain datasets available</li> <li>▪ Web Services are created by IEO and CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Missing data in Italy, Malta</li> <li>▪ Web services unstable (EMODnet)</li> <li>▪ Homogenisation of European data can cause a loss of information</li> <li>▪ Datasets included in Web Services created by CEDEX for the project remain closed data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Find more datasets</li> <li>▪ Work on Web Services stability</li> </ul>

## INSTALLATIONS AND INFRASTRUCTURES

Maritime spatial installations relevant for the MSP are electricity cables, safety zones, construction fields, platforms...

Few datasets have been inventoried in this sub-category and concern very different topics.

### Coverage

There is no layer covering the whole area in this category. Information is available regarding only France and Spain.

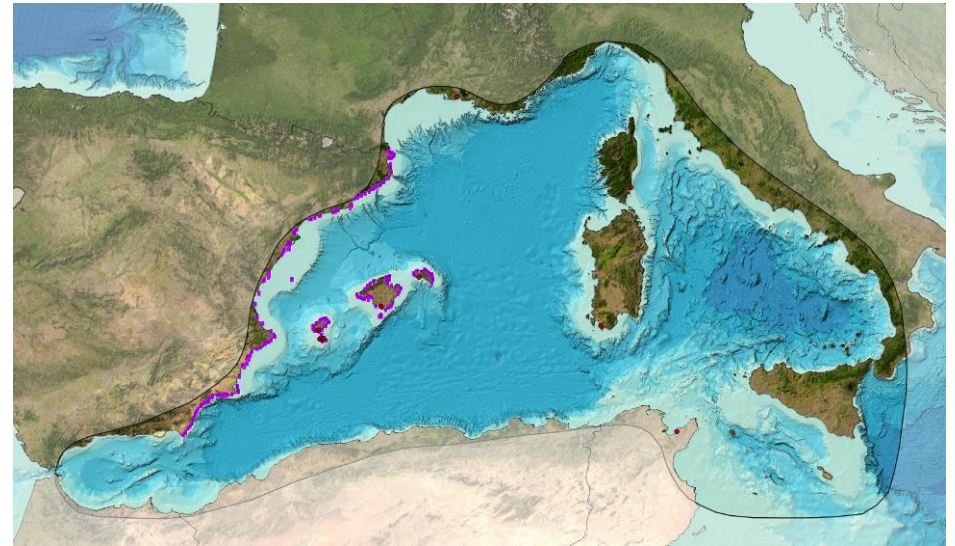


Figure 13: Installations and infrastructures

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets





Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Construction fields</b>	<ul style="list-style-type: none"> <li>Arrecifes Artificiales zones</li> <li>Arrecifes Artificiales poligonos</li> </ul>	Spain		IEO	IEO Portal	No	WMS / SOAP	Shared	
<b>Construction fields</b>	<ul style="list-style-type: none"> <li>Desalinisation plants</li> </ul>	Spain		CEDEX		No	WMS	Shared	
<b>Construction fields</b>	<ul style="list-style-type: none"> <li>Ouvrages ou aménagements littoraux</li> </ul>	France	Coverage not available	MEEM; CEREMA	GEOBITTORAL	Yes	WMS	Open	Yes
<b>Safety zones</b>	<ul style="list-style-type: none"> <li>Mouillage ou abris</li> </ul> <p style="text-align: center;">✓</p>	France		IFREMER	SEXTANT	Yes	WMS	Open	
<b>Safety zones</b>	<ul style="list-style-type: none"> <li>Wrap areas</li> </ul> <p style="text-align: center;">✓</p>	Spain		CEDEX	CEDEX	No	WMS	Shared	

Table 13: Selected datasets for Installations and infrastructures subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ Same information in France and in Spain</li> <li>▪ Web Services are created by CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>▪ No data the on whole area and no Italian and Maltese data, which makes the analysis more complicated</li> <li>▪ Different type of Web Services – difficulties to harmonise data</li> <li>▪ No harvestable metadata (REST format)</li> <li>▪ Datasets included in Web Services created by CEDEX for the project remain closed data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Produce harvestable metadata</li> <li>▪ Open datasets in WFS</li> <li>▪ Produce harvestable metadata</li> </ul>

## MARITIME TRANSPORT ROUTES AND TRAFFIC FLOWS

Maritime transport routes is a large sub-category. It includes maritime routes, AIS data, elements for the navigation (lights, anchorages), nautical charts...

Sources to access the data are varied. Only one layer of data is identified at the European scale (lighthouses).

The French Ministry of Ecological Transition and Solidarity provides relevant datasets about the maritime traffic density. It is a raster representing static traffic covering the French waters and partly Spanish and Italian waters. In Spain, it exists also the AIS signal in WMS. In Italy, Vessel Traffic System data are managed by General Command of Port Authorities Body Coast Guard to ensure a safer and more efficient conduct of the navigation but dataset are internally shared by respective VTS reference Authorities / Centres.

### Coverage

In this sub-category, AIS datasets are really relevant but not easily available in Web Services in all the countries.

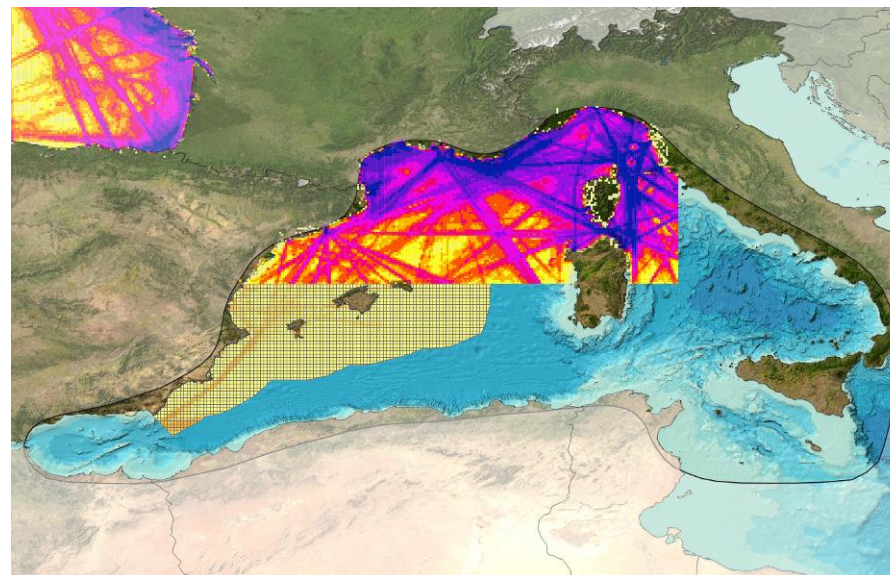

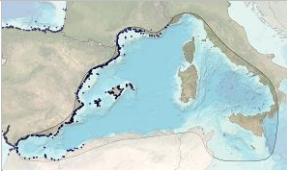






Figure 14: Maritime transport routes and traffic flows

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Safety navigation	▪ Lighthouses	Europe		AMATEUR RADIO LIGHTHOUSE SOCIETY	EMODnet Human activities portal	Yes	WFS / WMS	Open	
Safety navigation	▪ Lights	Spain		IHM	IHM Geoportal	No	WFS	Shared	Yes
Safety navigation	▪ Chenaux d'accès aux ports	France		CEREMA	SEXTANT	Yes	WMS	Shared	
Safety navigation	▪ Localisation des CROSS	France		CROSS	SEXTANT	Yes	WMS	Shared	Yes
Safety navigation	▪ Harbour Approach routes and Communication infrastructure	Malta		MITA	MSDI	Yes	WFS	Open	Yes
Traffic	▪ Motorways of the Sea - European Atlas of the Seas	Europe		European Commission	ADRIPLAN	Yes	WFS / WMS	Open	

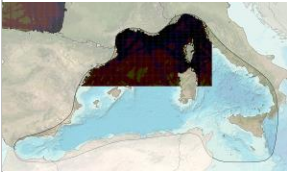


Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Traffic	<ul style="list-style-type: none"> <li>Nombre estimé de navires toutes catégories ; navires de pêche, navires de passagers, tankers, cargos, yachts, navires classe B, sur l'année 2016 (AIS)</li> </ul>	Italy; France, Spain		MEEM	GEOLITTORAL	Yes	WMS	Open	Yes
Traffic	<ul style="list-style-type: none"> <li>Vessel Traffic System (VTS)</li> </ul>	Italy		Coast Guard		No – not available information		Closed – internal use	Yes
Traffic	<ul style="list-style-type: none"> <li>Alerts and accidents between 2008 and 2014</li> </ul>	Mediterranean		CROSS	SEXTANT	Yes	WMS	Shared	Yes
Traffic	<ul style="list-style-type: none"> <li>Traffic separation schema</li> <li>AIS signals in a month</li> </ul>	Spain		CEDEX		No	WMS	Shared	Yes
Anchorage	<ul style="list-style-type: none"> <li>Anchorage areas</li> </ul>	Spain	Coverage no available	CEDEX		No	WMS	Shared	

Table 14: Selected datasets for Maritime transport routes and traffic flows subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ Harvestable metadata for mostly datasets</li> <li>▪ AIS data available in France / Spain</li> <li>▪ VTS data available in Italy</li> <li>▪ Web Services are created by CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Diversity of sources</li> <li>▪ Heterogeneity of datasets due to different themes in each country</li> <li>▪ Partial AIS data for Italy</li> <li>▪ Datasets included in Web Services created by CEDEX for the project remain closed data</li> <li>▪ Vessel Traffic System is a service managed by Coast Guard (in case of Italy) for monitoring maritime traffic and safety but the datasets are available and shared among VTS reference Authorities / Centres</li> </ul>	<ul style="list-style-type: none"> <li>▪ Toward temporal AIS data in Web Services</li> <li>▪ Produce harvestable metadata</li> </ul>

## PORTS

This sub-category is very specific but could be large because there are a lot of port definitions but only few are easily available. Datasets inventoried are data at large scale: global, European at Mediterranean scale.

### Coverage

In the available layers the information can be redundant and is not exhaustive. For example, the layer "Ports (version SIH)" available in web services provided by IFREMER represents only ports which are strategic stop places for French boats. This layer is not exhaustive and for a specific use. To assess the information on the Mediterranean area EMODnet layer is more useful.

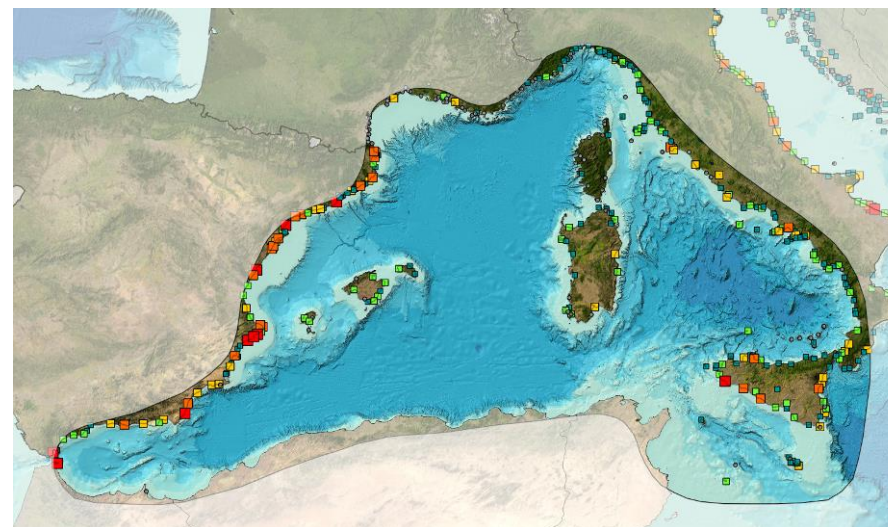


Figure 15: Ports

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets





Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Ports	<ul style="list-style-type: none"> <li>Ports (version SIH)</li> </ul>	World		IFREMER	SEXTANT	Yes	WMS	Open	
Ports	<ul style="list-style-type: none"> <li>Ports location ; ports vessels ; port passengers ; ports goods</li> </ul>	Europe		EUROFISH - COGEA	EMODnet Human Activities portal	Yes	WFS / WMS	Open	
Ports	<ul style="list-style-type: none"> <li>Fishing ports index ; Good ports index ; Ferry port index ; Cruise ports index</li> </ul>	Mediterranean		ETC-UMA	SDIMED	Yes	WMS	Open	
Ports	<ul style="list-style-type: none"> <li>State Owned Ports</li> <li>Total goods - tonnes - 2015</li> </ul>	Spain		CEDEX		No	WMS	Shared	Yes

Table 15: Selected datasets for Ports subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ Datasets homogeneous covers the whole area of interest</li> <li>▪ Efforts have been already undertaken in order to harmonise data at European scale with EMODnet which provides aggregate data in WFS</li> <li>▪ Harvestable metadata</li> <li>▪ Web Services are created by CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Web services unstable (Med-IAMER and EMODnet)</li> <li>▪ Data portrayal: each layer has its own symbology</li> <li>▪ French datasets - Ports (version SIH), can be used for French shipping analysis. In others case it is less relevant</li> <li>▪ Datasets include in Web Services created by CEDEX for the project remain closed data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Work on Web Services stability</li> <li>▪ Portrayal harmonisation: improve symbology</li> <li>▪ Produce harvestable metadata</li> </ul>

## NATURE AND SPECIES CONSERVATION SITES AND PROTECTED AREAS

This sub-category concerns marine protected areas and species. EMODnet portals data provide a lot of information.

National datasets are more accurate and complete than European layers.

Datasets are available in each country.

There is a multiplicity of categories of conservation and protection measures. Thus the comparison of the information through this data only is difficult.

In SIMWESTMED project the AFB has led an analysis of the marine protected areas of the project countries providing more information to compare the categories.

### Coverage

The coverage is complete through European datasets provided by EMODnet human activities and EMODnet Seabed Habitat.

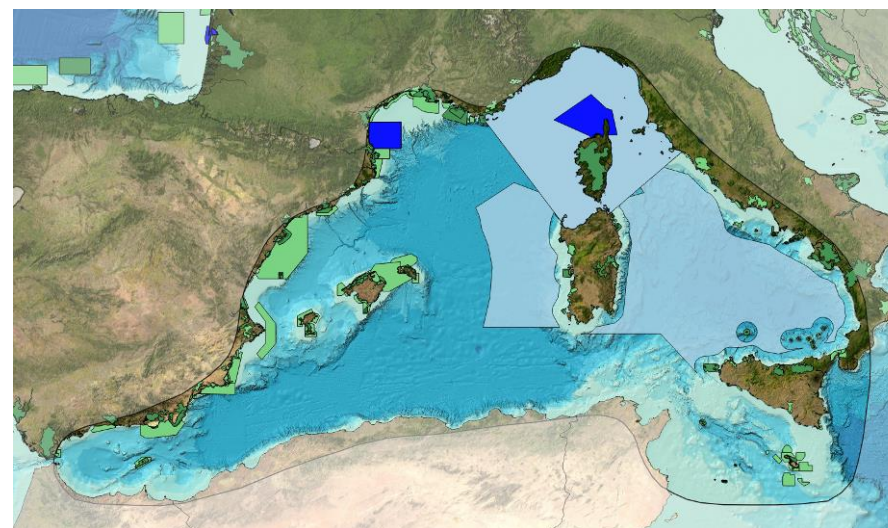
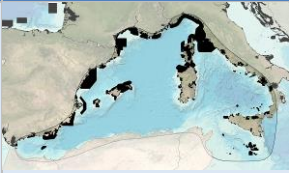


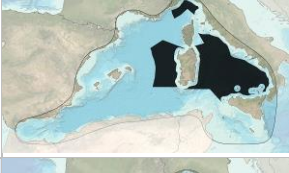




Figure 16: Nature and species conservation sites and protected

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Marine protected areas	<ul style="list-style-type: none"> <li>Natura 2000</li> <li>CDDA Nationaly Designated Areas</li> </ul>	Europe		COGEA	EMODnet Human Activities portal	Yes	WFS / WMS	Open	
Marine protected areas	<ul style="list-style-type: none"> <li>Parcs naturels marins ✓</li> <li>ZNIEFF 2</li> <li>Site RAMSAR</li> <li>Terrains du Conservatoire du Littoral</li> </ul>	France		MNHN	INPN	Yes	WFS	Open	Yes
Marine protected areas	<ul style="list-style-type: none"> <li>Santuario per i mammiferi marini</li> </ul>	Italy; France		MATTM	GEOPORTALE NAZIONALE	Yes	WFS	Open	Yes
Marine protected areas	<ul style="list-style-type: none"> <li>Zone di Protezione Ecologica (ZPE)</li> </ul>	Italy		MATTM	GEOPORTALE NAZIONALE	Yes	WFS	Open	Yes
Marine protected areas	<ul style="list-style-type: none"> <li>Inventario Espanol de Zonas Humedas</li> </ul>	Spain		MAPAMA	MAPAMA Acuisvisor	Yes	WMS	Open	Yes
Marine protected areas	<ul style="list-style-type: none"> <li>Zones humides d'importance majeure</li> </ul>	France		ONZH	RPDZH	Yes	WMS	Open	Yes


<b>Marine protected areas</b>	▪ Wetland	Malta	Coverage not available	MITA	MSDI	Yes	WMS	Open	Yes
<b>Marine protected areas</b>	▪ Zone umide costiere	Sardegna		Regione Autonoma della Sardegna	Sardegna Mapped	Yes	WFS / WMS	Shared	

Table 16: Selected datasets for Nature and species conservation sites and protected areas subcategory

### Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ Coverage of whole the area</li> <li>▪ All selected data on marine protected areas are open</li> </ul>	<ul style="list-style-type: none"> <li>▪ Much information at local scale</li> <li>▪ Imbalanced datasets on protected species between country</li> </ul>	<ul style="list-style-type: none"> <li>▪ No action plan defined yet</li> </ul>

## MILITARY

Military sub-category includes information about military areas, military infrastructures or munition dumping.

At European scale, EMODnet Human activities data portal is a source for this sub-category. At national scale only French and Spanish datasets have been identified.

### Coverage

The coverage is unbalanced.

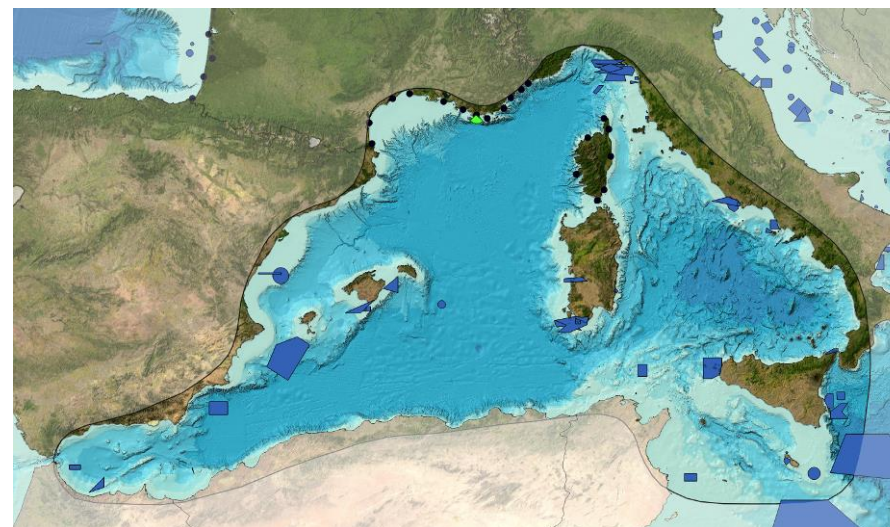


Figure 17: Military

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

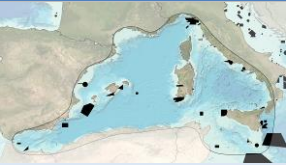



Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Munitions dumping</b>	<ul style="list-style-type: none"> <li>Dumped munitions (polygons) ✓</li> </ul>	Europe		CETMAR	EMODnet Human Activities portal	Yes	WFS / WMS	Open	
<b>Munitions dumping</b>	<ul style="list-style-type: none"> <li>Munition disposal sites</li> </ul>	Spain				No	WMS	Shared	
<b>Military infrastructures</b>	<ul style="list-style-type: none"> <li>Localisation des sémaphores ✓</li> </ul>	France		Préfectures Maritimes - CEREMA	SEXTANT	Yes	WMS	Shared	Yes
<b>Military areas</b>	<ul style="list-style-type: none"> <li>Zone de tirs ✓</li> <li>Zone de tirs d'essais</li> </ul>	France	Coverage not available	CEREMA	SEXTANT	Yes	WMS	Shared	
<b>Military areas</b>	<ul style="list-style-type: none"> <li>Military zones</li> </ul>	Spain				No	WMS	Shared	

Table 17: Selected datasets for Military subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ Coverage of whole the area</li> <li>▪ Same information in France an in Spain</li> <li>▪ Web Services are created by CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Few information in countries except France and Spain</li> <li>▪ Many datasets located on coastline</li> <li>▪ French and Spanish datasets in WMS</li> <li>▪ Different type of Web Services – hard to harmonise data</li> <li>▪ Datasets included in Web Services created by CEDEX for the project remain closed data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Find more datasets</li> <li>▪ Find national datasets similar to the French and Spanish datasets</li> <li>▪ Open datasets in WFS</li> <li>▪ Produce harvestable metadata</li> </ul>

## RAW MATERIAL EXTRACTION

The raw material extraction areas sub-category includes three themes: extraction, exploitation sites and exploration areas. Aggregated data at European scale in Web Services from EMODnet human activities portal is available. This information can be completed by national datasets like in Italy with exploration marine areas.

### Coverage

EMODnet human activities portal gathers information from multisource in Europe. The European layers about platforms, hydrocarbon, active licenses and aggregate extraction cover the whole Western Mediterranean. The information about exploration is available in Italy and in France. Few layers about exploitation have been gathered in Italy and in Spain.

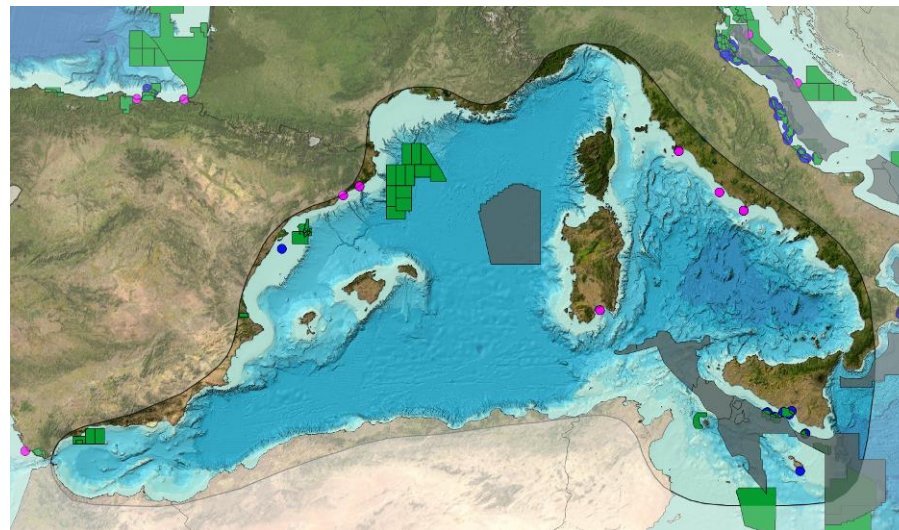
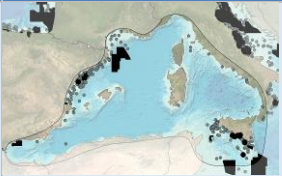
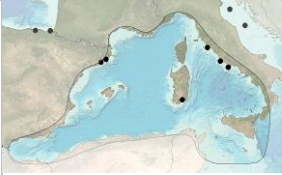


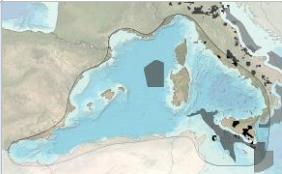


Figure 18: Raw material extraction

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Extraction</b>	<ul style="list-style-type: none"> <li>Hydrocarbon extraction</li> <li>Hydrocarbon</li> <li>Platforms</li> <li>Active license</li> </ul>	Europe		COGEA	EMODnet Human Activities portal	Yes	WFS / WMS	Open	
<b>Extraction</b>	<ul style="list-style-type: none"> <li>Aggregate</li> </ul>	Europe		AZTI-Tecnalia	EMODnet Human Activities portal	Yes	WFS / WMS	Open	
<b>Extraction</b>	<ul style="list-style-type: none"> <li>Sand extraction</li> <li>Hydrocarbon concessions</li> </ul>	Spain				No	WMS	Shared	
<b>Exploration</b>	<ul style="list-style-type: none"> <li>Localisation des sites de forages exploratoires</li> </ul>	France		Ministère de l'industrie	SEXTANT	Yes	WMS	Shared	Yes
<b>Exploration</b>	<ul style="list-style-type: none"> <li>Permessi di ricerca attivi al 31 gennaio 2016</li> <li>Zone marine</li> </ul>	Italy		MISE	SINVA	Yes	WFS	Open	Yes



<b>Exploitation</b>	<ul style="list-style-type: none"> <li>▪ Piattaforme_Oil&amp;Gas_offshore</li> <li>▪ Mappa eolica</li> <li>▪ Mappa solare</li> </ul>	Italy		MISE		No	SHAPE	Shared	Yes
<b>Exploitation</b>	<ul style="list-style-type: none"> <li>▪ Natural gas storage platform</li> <li>▪ Reserved area for capture and storage of atmospheric carbon</li> </ul>	Spain		CEDEX		No	WMS	Shared	Yes

Table 18: Selected datasets for Raw material extraction subcategory

### Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ Coverage on the whole area</li> <li>▪ All European datasets are in WFS</li> <li>▪ Web Services are created by CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>▪ Missing data in Malta</li> <li>▪ Incoherence between European and Spain datasets</li> <li>▪ Datasets include in Web Services created by CEDEX for the project remain closed data</li> </ul>	<ul style="list-style-type: none"> <li>▪ Find more datasets</li> <li>▪ Work on the openness of datasets</li> <li>▪ Produce harvestable metadata</li> </ul>

## SCIENTIFIC RESEARCH

This sub-category is very large and generally concerns a multitude of topics. It is difficult to identify data belonging to this sub-category. Maltese, French and Spain datasets have been identified. The layers concern specific questions or research projects at national or large scale.

### Coverage

The Western Mediterranean is not covered due to a lack of datasets and because the information gathered is very different depending on the country.

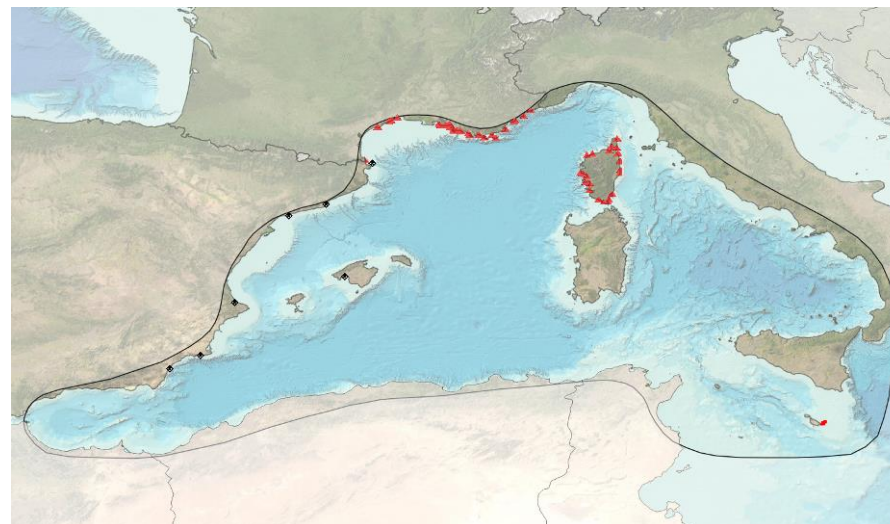


Figure 19: Scientific research

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets





Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Network monitoring	<ul style="list-style-type: none"> <li>Findings of an environmental monitoring survey in the SE Aquaculture Zone ✓</li> </ul>	Malta		MITA	MSDI	Yes	WMS	Open	Yes
Network monitoring	<ul style="list-style-type: none"> <li>Suivi des posidonies en Méditerranée ✓</li> </ul>	France		IFREMER	SEXTANT	Yes	WMS	Shared	
Network monitoring	<ul style="list-style-type: none"> <li>Lieux d'observation et de surveillance du réseau REMI</li> <li>Lieux d'observation et de surveillance du réseau REPHY</li> <li>Lieux d'observation et de surveillance du réseau ROCCH</li> </ul>	France		NSO	SEXTANT	Yes	WMS	Shared	
Network monitoring	<ul style="list-style-type: none"> <li>Radioactivity monitoring network ✓</li> </ul>	Spain		CEDEX		No	WMS	Shared	

Table 19: Selected datasets for Scientific research subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"><li>▪ Web Services are created by CEDEX for the project gathering official data for the MSP</li></ul>	<ul style="list-style-type: none"><li>▪ Few datasets due to the subcategory is large</li><li>▪ Missing data in Italy</li><li>▪ Heterogeneity of datasets because each country conducts its own studies and research.</li><li>▪ Datasets included in Web Services created by CEDEX for the project remain closed data</li></ul>	<ul style="list-style-type: none"><li>▪ Target relevant datasets</li><li>▪ Find comparable information</li></ul>

## SUBMARINE CABLE AND PIPELINE

The two main sources identified are Shom and COGEA from EMODnet Human Activities project. Additional datasets listed in the table below can complete the information additional. This information is managed by a multiplicity of operators and professionals and makes it difficult to guarantee exhaustive information at national level.

### Coverage

Using EMODnet and Shom datasets, it is possible to obtain a complete coverage on the Western Mediterranean but without the completeness.

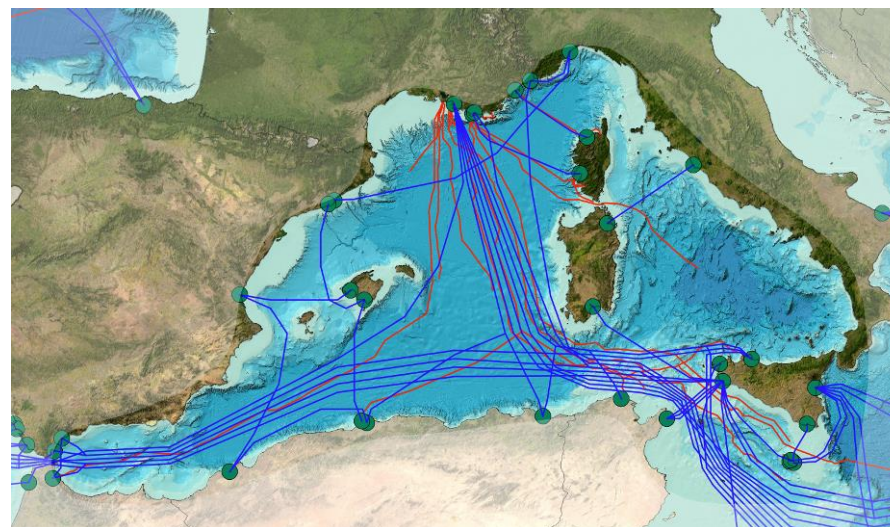


Figure 20: Submarine cable and pipeline

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Dataset



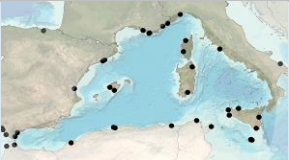
Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Cables and pipelines</b>	<ul style="list-style-type: none"> <li>Cables et conduites</li> </ul>	Europe		Shom	Data.gouv.fr	Yes	WMS-V / WMS	Shared	
<b>Cables and pipelines</b>	<ul style="list-style-type: none"> <li>SIGCables Submarine Cables Routes</li> <li>Telecommunication cables (schematic routes) ✓</li> </ul>	Europe		COGEA	EMODnet Human Activities portal	Yes	WFS / WMS	Open	
<b>Stations</b>	<ul style="list-style-type: none"> <li>Landing stations ✓</li> </ul>	Europe		COGEA	EMODnet Human Activities portal	Yes	WFS / WMS	Open	

Table 20: Selected datasets for Submarine cable and pipeline routes subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>Coverage of whole of the area</li> <li>Web Services in Vector WMS version are provided by Shom – Request Get Feature Information is possible</li> </ul>	<ul style="list-style-type: none"> <li>Different type of Web Services – hard to harmonise data</li> <li>No information at national level</li> <li>Completeness: Cables and pipelines routes datasets are build up from multiple sources. Features can be missing</li> </ul>	<ul style="list-style-type: none"> <li>Open datasets in WFS</li> <li>Produce harvestable metadata</li> </ul>

## TOURISM AND RECREATION

Tourism and recreation sub-category bring together: recreation and tourism area, sporting activity sites, marina, distribution of activities and tourists.

The datasets are heterogeneous because they are multisource. The same information is hardly found in each country.

Touristic activity is more coastal area than maritime. The Med-IAMER project (SDIMED) highlights this trend providing some indicators about the distribution of recreation and tourism activities on basin Mediterranean.

### Coverage





Med-IAMER indicators cover the whole Western Mediterranean area. In the countries there is a lack of information. No data has been identified at the project scale.



Figure 21: Tourism and recreation

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Nautical activities - Yachting</b>	<ul style="list-style-type: none"> <li>Marinas</li> </ul>	Europe		BOATLAUNCH	MMO MARINE PLANNING EVIDENCE	No	WMS	Shared	
<b>Indicators and statistics</b>	<ul style="list-style-type: none"> <li>Nights per km2 in coastal areas</li> <li>Number of moorings per km in coastal areas</li> <li>Number of beds per km2 in coastal areas</li> <li>Number of establishments per km2 in coastal areas</li> <li>Marine exposure due to marinas and recreational shipping ✓</li> </ul>	Mediterranean		ETC-UMA	SDIMED	Yes	WMS	Open	
<b>Indicators and statistics</b>	<ul style="list-style-type: none"> <li>Moorings in marinas</li> <li>Touristic Vulnerability</li> <li>Hotel Beds</li> </ul>	Spain				No	WMS	Shared	
<b>Coastal activities</b>	<ul style="list-style-type: none"> <li>Guia de playas de España</li> </ul>	Spain		MAPAMA	MAPAMA Acuivisor	Yes	WMS	Open	Yes



Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Coastal activities	<ul style="list-style-type: none"> <li>Sentier du littoral français</li> </ul>	France		MEEM	GEOLITTORAL	Yes	WFS / WMS	Shared	Yes
Coastal activities	<ul style="list-style-type: none"> <li>Spiagge</li> </ul>	Liguria		Region Liguria	Region Liguria Cartografia	Yes	WFS / WMS	Shared	

Table 21: Selected datasets for Tourism and recreation subcategory

### Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>Coverage of whole the area with data models</li> <li>Web Services are created by CEDEX for the project gathering official data for the MSP</li> </ul>	<ul style="list-style-type: none"> <li>Incomplete datasets(e.g. Marinas)</li> <li>Italy only datasets at regional scale</li> <li>WMS Web Services - hard to harmonize</li> <li>Heterogeneity of datasets ( sources, types) – hard to compare information</li> <li>Incomplete metadata (e.g. Spatial distribution model)</li> <li>Datasets included in Web Services created by CEDEX for the project remain closed data</li> </ul>	<ul style="list-style-type: none"> <li>Portrayal harmonisation: improve symbology</li> </ul>

## UNDERWATER CULTURAL HERITAGE

Underwater cultural heritage brings together world heritage sites, monuments, wrecks or historic sites. Little information is available in Web Services. The only theme available is wrecks and obstructions.

Producers are the reference marine institutions of Spain, France and Malta. The symbology is not harmonised.

### Coverage

It exists a European layer about wrecks but this layer does not cover the project area. The coverage is not complete.

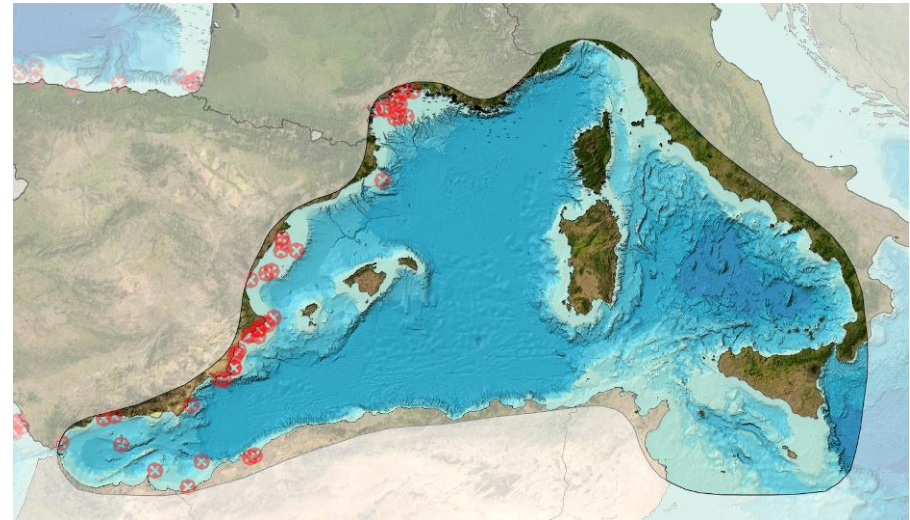


Figure 22: Underwater cultural heritage

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

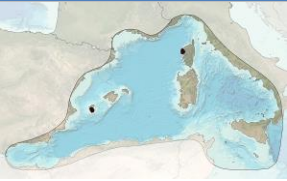



Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Heritage sites</b>	<ul style="list-style-type: none"> <li>World Heritage Sites</li> </ul>	World		VLIZ	Marineregions.org	No	WFS	Open	
<b>Wrecks</b>	<ul style="list-style-type: none"> <li>Epaves et obstructions</li> </ul>	France		Shom	Data.shom.fr	Yes	WMS-v / WMS	Shared	Yes
<b>Wrecks</b>	<ul style="list-style-type: none"> <li>Conservation area around wrecks</li> </ul>	Malta	Coverage not available	MITA	MSDI	Yes	WMS	Open	Yes
<b>Wrecks</b>	<ul style="list-style-type: none"> <li>Wrecks</li> </ul>	Spain		IHM	IHM Geoportal	No	WMS	Shared	Yes
<b>Underwater archeology</b>	<ul style="list-style-type: none"> <li>Archeologia Subacquea</li> </ul>	Liguria		Region Liguria	Region Liguria cartografia	Yes	WFS / WMS	Shared	

Table 22: Selected datasets for Underwater Cultural Heritage subcategory

## Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>▪ Authoritative data for some of them</li> <li>▪ Data partly come from SIMWESTMED partners which will make it easier to provide updates to datasets</li> <li>▪ Web Services in Vector WMS version are provided – Request Get Feature Information is possible</li> </ul>	<ul style="list-style-type: none"> <li>▪ No data covering whole the area</li> <li>▪ Italian datasets only at regional scale</li> <li>▪ Missing metadata</li> <li>▪ WMS Web Services - hard to harmonise</li> <li>▪ Data portrayal: each layer has its own symbology</li> <li>▪ No harvestable metadata (e.g. Spanish data)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Portrayal harmonisation: improve symbology</li> <li>▪ Produce harvestable metadata</li> </ul>

## COASTAL DEFENSE

Coastal defence is a large category including coastal risk and areas used for dredging, managed realignment schemes and coastal protection schemes.

It is a sub-category managed at national scale. There is an imbalance between Member States. The datasets are European or French and provide by EMODnet Human activities or French Ministry of the Environment.

### Coverage

There are aggregated European data regarding the dredging and coastline erosion themes. For the other themes, there is a need for more datasets in each country.

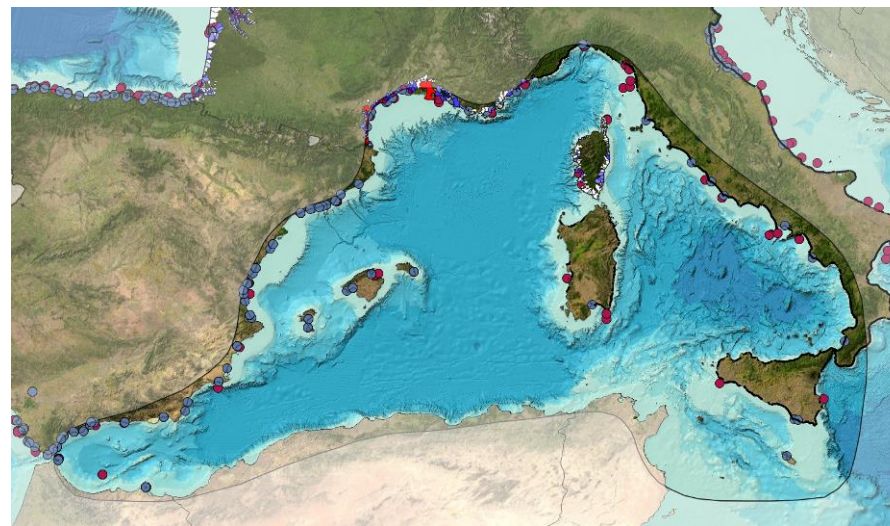







Figure 23: Coastal defence

*This indicative picture illustrates the layers pointed out by a green tick in the table.*

## List of Selected Datasets

Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
Dredging	<ul style="list-style-type: none"> <li>Dredge spoil dumping</li> </ul>	Europe		CETMAR	EMODnet Human Activities portal	Yes	WFS / WMS	Open	
Dredging	<ul style="list-style-type: none"> <li>Dredging</li> </ul>	Europe		AZTI-TECNALIA	EMODnet Human Activities portal	Yes	WFS / WMS	Open	
Coastal erosion	<ul style="list-style-type: none"> <li>Coastal Erosion trends</li> </ul>	Europe		EEA	ADRIPLAN	Yes	WFS / WMS	Open	
Coastal erosion	<ul style="list-style-type: none"> <li>Principali variazioni della linea di costa (1960-2012)</li> </ul>	Italy		MATTM / CEREMA	GEOPORTALE NAZIONALE	Yes	WFS	Open	
Coastal erosion indicators	<ul style="list-style-type: none"> <li>Indicateur national de l'érosion côtière</li> <li>Dates (indicateur national de l'érosion côtière)</li> </ul>	France		MEEM / CEREMA	GEOBITTORAL	Yes	WFS / WMS	Shared	Yes
Coastal vulnerability	<ul style="list-style-type: none"> <li>Zones basses</li> </ul>	France	Coverage not available	MEEM	GEOBITTORAL	Yes	WMS	Shared	
Coastal vulnerability	<ul style="list-style-type: none"> <li>Hauteurs d'eau</li> </ul>	France	Coverage not available	MEEM	GEOBITTORAL	Yes	WMS/ WFS	Shared	



Theme	Layers	Area	Coverage	Producer	SDI	Harvestable metadata	Diffusion	Openness	Official
<b>Coastal vulnerability indicators</b>	<ul style="list-style-type: none"> <li>Nombre de catastrophes naturelles liées à la mer par commune ✓</li> <li>Communes progressant dans l'échelle d'intensité IBC</li> <li>Indicateur IBC</li> </ul>	France		MEEM	GEOLITTORAL	Yes	WMS	Shared	
<b>Littoral protection plan</b>	<ul style="list-style-type: none"> <li>Communes avec des PPRL prescrits</li> </ul>	France		MEEM / CEREMA	GEOLITTORAL	Yes	WMS	Shared	

Table 23: Selected datasets for Coastal Defence subcategory

### Selection of Datasets Analysis

Assets	Barriers	Actions
<ul style="list-style-type: none"> <li>European data are available</li> <li>Efforts have been already undertaken in order to harmonise data at European scale with EMODnet activities project</li> </ul>	<ul style="list-style-type: none"> <li>Heterogeneity of datasets due to different information and characteristics like accurate, diffusion, openness level</li> <li>Missing datasets in Malta and Spain</li> <li>Incomplete metadata: Coastal vulnerability does not precise the interval of time of the indicator associated</li> <li>Different type of Web Services – difficulties to harmonise data</li> <li>Displaying issue: MEEM coastal limits web services not displayer below 1:2 000 000</li> </ul>	<ul style="list-style-type: none"> <li>Open datasets in WFS</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 Western Mediterranean region. In some cases there are meaningful and comparable information available at the European, the Mediterranean 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 Sub-region” 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 SIMWESTMED 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 SIMWESTMED are gathered in an Action Plan presented at the end of this report. The SIMWESTMED 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 differences between organizations**

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 SIMWESTMED 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). However sometimes metadata are not completed. This is notably the case of metadata published by ArcGIS software in its REST version. If necessary, SIMWESTMED 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:
  - 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 SIMWESTMED metadata catalogue.
  - Alternatively the producers provide the Shom with the required information on the datasets. The Shom then creates and publishes the metadata record in the SIMWESTMED 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, Géolittoral, ABF, Med-IAMER, MSDI).

In the SIMWESTMED 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 datasets producer.

#### Web Services standards

The inventory fosters WFS when available as WMS is more restrictive. Indeed WFS provides information in a vector version which makes it possible to access the information associated with geometry.

For example, "Tourism and recreation" and "underwater cultural heritage" sub-categories give good examples of symbology gaps encountered when using WMS. Indeed, multiple layers, treating the same topic can be displayed differently. Consequently, it is harder for users to understand the maps.

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 crucial because users can access the information associated with data geometries (GetFeatureInfo request). In addition, WMS is also used for Raster datasets.

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

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

#### Up-to date Web Services

The SIMWESTMED 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 Orthophotography 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 SIMWESTMED 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 Western Mediterranean region

This data portal is a decision support tool which faces a twofold challenge because it targets:

- All the stakeholders involved in MSP with the objective to visualise and to use datasets in a transboundary context.
  - 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 SIMWESTMED 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 connect the Web Services to 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 datasets.

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 SIMWESTMED. 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
<b>Enhance Web service quality</b>	Produce metadata and data in several languages (give priority to English)
	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
<b>Portrayal</b>	Develop tools to enhance the information (to explain MSFD indicators, to disseminate non-spatial data, to display regulatory information...)
	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

SDI	LINK
ADRIPLAN data portal	<a href="http://data.adriplan.eu/">http://data.adriplan.eu/</a>
Cartomer	<a href="http://cartographie.aires-marines.fr/?q=carto/simple">http://cartographie.aires-marines.fr/?q=carto/simple</a>
MMO MARINE PLANNING EVIDENCE	<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>
/	<a href="http://www.cedex.es/CEDEX/lang_castellano//">http://www.cedex.es/CEDEX/lang_castellano//</a>
Infraestructura de Datos Espaciales de Espana (IDEE)	<a href="http://www.ideo.es/visualizador/">http://www.ideo.es/visualizador/</a>
SIG de Acuicultura -Junta de Andalucia	<a href="http://www.juntadeandalucia.es/agriculturaypesca/sia/index.xhtml">http://www.juntadeandalucia.es/agriculturaypesca/sia/index.xhtml</a>
Picto-Occitanie	<a href="https://carto.picto-occitanie.fr/1/visualiseur_de_donnees_publicues.map">https://carto.picto-occitanie.fr/1/visualiseur_de_donnees_publicues.map</a>
GADM	<a href="http://www.gadm.org/">http://www.gadm.org/</a>
/	<a href="http://www.fao.org">http://www.fao.org</a>
IDEIB	<a href="http://ideib.caib.es/visualitzador/visor.jsp?lang=es">http://ideib.caib.es/visualitzador/visor.jsp?lang=es</a>
EEA Discomap	<a href="http://discomap.eea.europa.eu/">http://discomap.eea.europa.eu/</a>
SDIMED	<a href="http://www.medmaritimeprojects.eu/section/med-iamer-redirect/outputs">http://www.medmaritimeprojects.eu/section/med-iamer-redirect/outputs</a>
EMODnet Bathymetry	<a href="http://portal.emodnet-bathymetry.eu/">http://portal.emodnet-bathymetry.eu/</a>
EMODnet Human activities	<a href="http://www.emodnet-humanactivities.eu/view-data.php">http://www.emodnet-humanactivities.eu/view-data.php</a>
	<a href="http://www.fao.org">http://www.fao.org</a>
SEXTANT	<a href="http://sextant.ifremer.fr/">http://sextant.ifremer.fr/</a>
IEO Geoportal	<a href="http://www.ideo-base.ieo.es/">http://www.ideo-base.ieo.es/</a>
Geobretagne	<a href="https://geobretagne.fr/mapfishapp/">https://geobretagne.fr/mapfishapp/</a>

IGN Geoportail	<a href="http://www.ign.es/web/ign/portal">http://www.ign.es/web/ign/portal</a>
IHM Geoportal	<a href="http://ideihm.covam.es/visor.html">http://ideihm.covam.es/visor.html</a>
ISPRA Geoviewer Geoportale Nazionale	<a href="http://www.geoviewer.isprambiente.it/">http://www.geoviewer.isprambiente.it/</a> <a href="http://www.pcn.minambiente.it/mattm/">http://www.pcn.minambiente.it/mattm/</a>
/	/
MAPAMA Geoportal Acuivisor	<a href="http://sig.mapama.es/geoportal/">http://sig.mapama.es/geoportal/</a> <a href="https://servicio.pesca.mapama.es/acuivisor/">https://servicio.pesca.mapama.es/acuivisor/</a> <a href="http://sig.mapama.es/dpmt/">http://sig.mapama.es/dpmt/</a>
GEOLITTORAL	<a href="http://cartelie.application.developpement-durable.gouv.fr/cartelie/voir.do?carte=Visualiseur_donnees_geolittoral&amp;service=CEREMA">http://cartelie.application.developpement-durable.gouv.fr/cartelie/voir.do?carte=Visualiseur_donnees_geolittoral&amp;service=CEREMA</a>
Sistema Informativo Nazionale per le Valutazioni Ambientali (SINVA)	<a href="http://sinva.ancitel.it/catalogometadati/srv/en/main.home">http://sinva.ancitel.it/catalogometadati/srv/en/main.home</a>
Malta Spatial Data Infrastructure (MSDI)	<a href="https://msdi.data.gov.mt/">https://msdi.data.gov.mt/</a>
Inventaire National du Patrimoine Naturel (INPN)	<a href="https://inpn.mnhn.fr/accueil/index">https://inpn.mnhn.fr/accueil/index</a>
Réseau Partenarial des Données sur les Zones Humides (RPDZH)	<a href="http://sig.reseau-zones-humides.org/">http://sig.reseau-zones-humides.org/</a>
OSM	<a href="https://www.data.gouv.fr">https://www.data.gouv.fr</a>
Planning Authority Geoserver	<a href="http://geoserver.pa.org.mt/publicgeoserver">http://geoserver.pa.org.mt/publicgeoserver</a>
Sardegna Mappa	<a href="http://www.sardegna.geoportale.it/webgis2/sardegnamappa/?map=base">http://www.sardegna.geoportale.it/webgis2/sardegnamappa/?map=base</a>
Region Liguria Cartografia	<a href="http://www.cartografia.regione.liguria.it">http://www.cartografia.regione.liguria.it</a>
SANDRE	<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>
Data.shom.fr	<a href="http://data.shom.fr">data.shom.fr</a>
Marineregions	<a href="http://marineregions.org/">http://marineregions.org/</a>
EMODnet Seabed Habitat	<a href="http://www.emodnet-seabedhabitats.eu/default.aspx?page=1934">http://www.emodnet-seabedhabitats.eu/default.aspx?page=1934</a>

