Data Management Guidance Document

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Version 1

Supporting Implementation of Maritime Spatial Planning in the Western Mediterranean region

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Version History

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Acronyms

AAMP: Agence des Aires Marines Protégées
AFB: Agence Française pour la Biodiversité (previously AAMP)
ArcSDE: Spatial Database Engine (produced and marketed by Esri)
CSW: Catalogue service for the web
CRS: Coordinate Reference System
DG Mare: Directorate General for Maritime Affairs and Fisheries
EMODnet: European Marine Observation and Data Network
FTL: FreeMarker Template Language
GIS: Geographic Information System
GML: Geography Markup Language
HTTP: HyperText Transfer Protocol
IHO: International Hydrographic Organisation
INSPIRE: Infrastructure for spatial information in Europe
ISO: International Organisation for Standardisation
KML: Keyhole Markup Language
MMO: Marine Management Organisation
MPA : Marine protected area
MSDI: Marine Spatial Data Infrastructure
MSP: Maritime Spatial Planning
OGC: Open geospatial Consortium
OSPAR: OSLO-Paris Convention (for protection and conservation of North-East Atlantic)
PHP: Hypertext Preprocessor
SDI: Spatial Data Infrastructure
SLD: Styled Layer Descriptor
SDP: SIMWESTMED Data Portal
Shom: French public establishment in charge of description and forecasting of ocean, from littoral to offshore
SIMCelt: Supporting Implementation of Maritime Spatial Planning in the Celtic Seas
SIMNORAT: Supporting Implementation of Maritime Spatial Planning in the Northern European Atlantic
SIMWESTMED: Supporting Implementation of Maritime Spatial Planning in the Western Mediterranean Region
SLD: Style Layer Descriptor
SOAP: Simple Object Access Protocol
UKHO: United Kingdom Hydrographic Office
URL: Uniform Resource Locator
WCS: Web Coverage Service
WFS: Web Feature Service
WMS: Web Map Service
WMTS: Web Map Tile Service
WPS: Web processing service
XML: Extensible Markup Language

About SIMWESTMED

SIMWESTMED- Supporting Implementation of Maritime Spatial Planning in the Western Mediterranean region is a two-year project co-financed by DG Mare EMFF Funds and focussed on promoting the development of transnational cooperation to support the implementation of EU Directive 2014/89/EU in the Western Mediterranean Sea. Led by Shom, the project consortium comprises both planners and researchers from eleven public bodies, from France, Italy, Malta and Spain and international organisations. This consortium is particularly interested in developing meaningful cooperation between neighbouring Member States to support implementation of spatially coherent plans across transboundary zones of the Western Mediterranean Sea, building on previous work and leveraging new opportunities to identify and share best practice on technical, scientific and social aspects of transboundary MSP.

Introduction

The implementation of Maritime Spatial Planning (MSP), defined in the MSP Directive 2014/89/EU requires high quality maritime spatial data and information. Data sharing is favoured by Maritime Spatial Data Infrastructures (MSDI). This type of infrastructure improves access to data and provides information on the MSP policies implemented in the neighbouring countries. MSDIs contribute to enable access to data and information. It is a basis for discussion and exchange and promotes cross-border cooperation.

Regarding environmental data, the INSPIRE Directive was published in 2007 by the European Commission in order to create a European Spatial Data Infrastructure to ensure interoperability between databases and to facilitate geographic data dissemination, availability and use. It provides standards and protocols to exchange data and metadata across Europe. MSP is taking advantage of this conducive environment as over the last few years the amount of available datasets has been constantly increasing, published by national producers as well as European projects (e.g. EMODnet). Despite this fact, some key data and information are not accessible yet. There is therefore a need to pursue the effort on data sharing, as well as providing clear information on data through INSPIRE metadata.

In this European framework, technical requirements for data and information to implement MSP in a transboundary context, especially regarding interoperability, are investigated, specifically in the Western Mediterranean sea under the SIMWESTMED project. The “Data and Information Requirements for MSP” component, led by Shom, is a technical study to identify, analyse and address technical challenges and gaps in data and information, encountered when displaying and disseminating relevant Maritime Spatial Planning data on both sides of maritime boundary. This component involves marine planners and experts of Geospatial data, working together in SIMWESTMED Task Group on Data. To achieve these objectives, not only data and information requirements for MSP were examined, but also the actual situation of Marine Spatial Data Infrastructures in order to determine optimisation possibilities. A special interest has been given on interoperability regarding metadata, data and portals, and Web Services availability for transboundary MSP. This study led to produce two main deliverables:

- Analysis of Data Needs and Existing Gaps – Specifically Relating to Transboundary Working ;
- Data Management Guidance Document.

The *Analysis of Data Needs and Existing Gaps* report describes the state of current data needs and gaps linked to MSP in a transboundary context. It is based on an

inventory of datasets selected because they met a series of technical requirements identified by the Task Group on Data, particularly regarding interoperability. Therefore the objective is not to realise an exhaustive data collection, but to point out the relevant datasets in order to give an overview of the data situation in the Western Mediterranean Region in terms of availability and interoperability. This panorama allows highlighting the main challenges and opportunities linked to transboundary data interoperability.

The second deliverable, called “Data Management Guidance Document” is the subject of this report. It aims to build up on SIMWESTMED experience by sharing technical knowledge and processes required to set up and manage a data portal like SIMWESTMED demonstrator. The idea is to allow users to set up software components to develop SDI using open-source tools. Therefore the Data Management Guidance Document describes SIMWESTMED data portal infrastructure and its administration procedures. It focuses on challenges encountered and solutions to overcome them.

This document is divided into three parts. Firstly, the description of the data portal demonstrator architecture and its major functionalities are described. Then the different processes implemented to build this infrastructure are detailed. Finally, an analysis of gaps and possible solutions to overcome them will be provided.

Part 1. SIMWESTMED Data Portal

1. Objectives

As part of SIMWESTMED project, Shom was in charge of setting up a data portal as a demonstrator to share transboundary MSP Knowledge on the Western Mediterranean sea. It is also a decision support tool designed for different audiences:

- GIS experts or data experts to experiment datasets interoperability and to address needs and gaps ;
- All the stakeholders involved in the MSP to display and to use datasets in transboundary context.

In order to improve the browsing experience for such a diverse audience, a specific effort was made on visual appearance to build up a portal as user-friendly as possible.

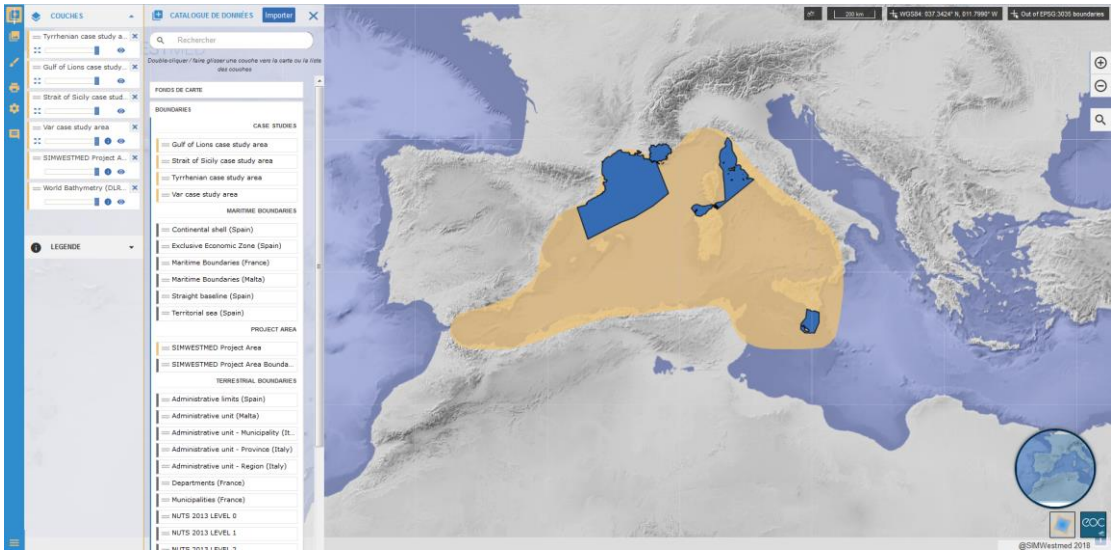


Figure 1: SIMWESTMED Data Portal

SDP is also meant to serve as a technical environment dedicated to identifying data gaps and possible solutions to overcome them in support of the "Data and Information Requirements for MSP" Component. It is used to experiment and improve interoperability between datasets coming from different producers or countries, provided through various protocols or formats, represented with different symbologies, and containing heterogeneous attribute information. There are therefore no intentions either to constitute an exhaustive data catalogue or to maintain the portal after the end of SIMWESTMED project.

Another guiding idea when building SIMWESTMED Data portal was to ensure that an organisation willing to replicate it would be able to. In order to achieve this goal, only

components either under open-source licenses or already developed through other European projects were used. If it has been sometimes the occasion to add new functionalities to these existing tools, no new developments from scratch have been led during SIMWESTMED project.

Last but not least, a choice was made to build the portal data catalogue by focusing on INSPIRE web services. This brings several benefits:

- Data is stored by the producer. It avoids unnecessary duplication and lowers the administration processes ;
- Latest available data are always displayed, without any additional manipulation.

The following figure explains the concepts developed by this portal demonstrator and the associated technical answers.

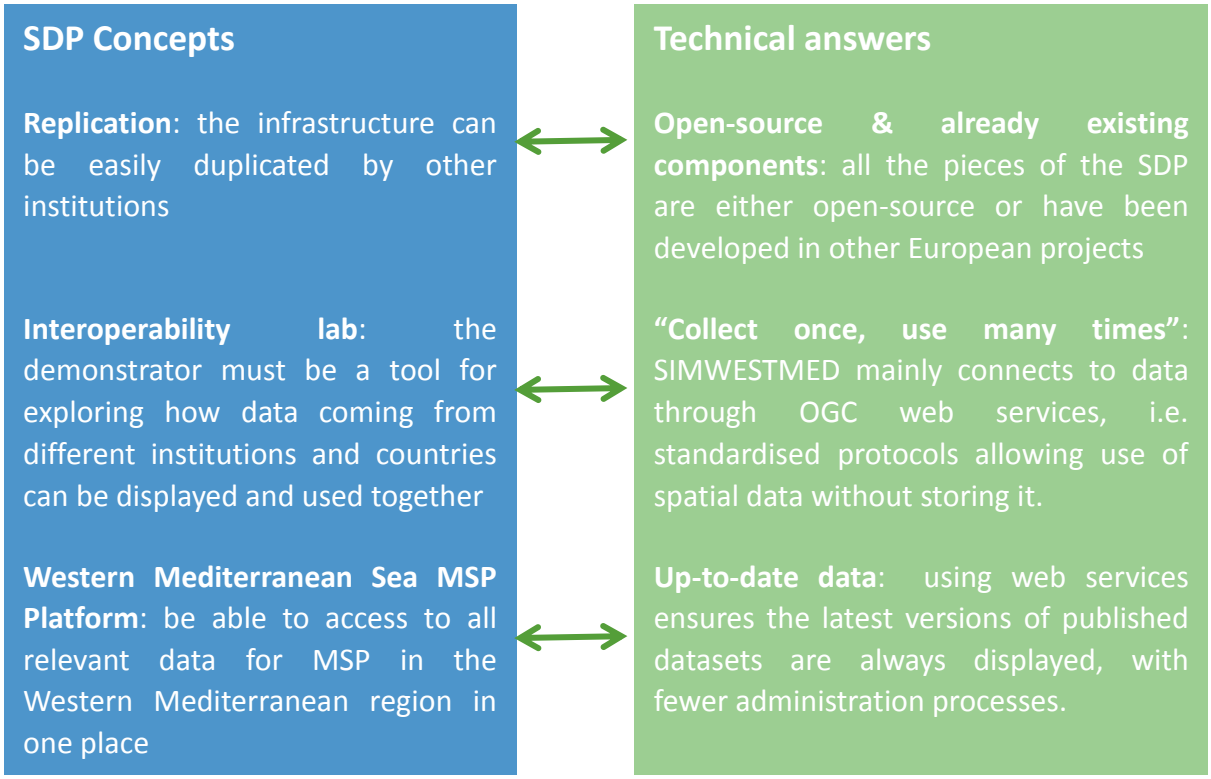


Figure 2: SIMWESTMED Data Portal Concepts and Answers

2. Architecture

SIMWESTMED Data Portal is based on a spatial data infrastructure (SDI). This SDI is made up of four components.

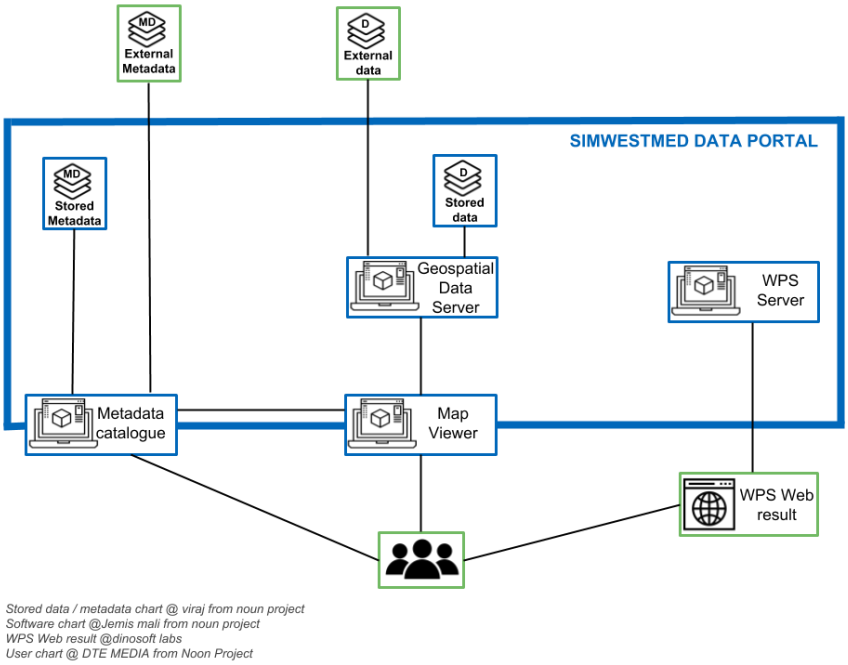


Figure 3: SDP technical infrastructure

- **The metadata catalogue**: The metadata catalogue is used for the publication of information on data like its producers or date of creation. The open-source application Geonetwork 3.0.2 has been chosen in SIMWESTMED project. SIMWESTMED metadata catalogue gathers metadata records associated with all the datasets relevant for MSP in the Western Mediterranean Sea which are INSPIRE compliant. Although it hosts some metadata records locally, the major part is harvested from external catalogues.
- **The geospatial data server**: this component allows publishing geographical data on the web through OGC protocols. If in most cases, its vocation is to spread data (either vector or raster) stored on a local server, it was used in a different way in SIMWESTMED project. Experimentations were led to make this tool act as an intermediate between producers' data infrastructures and SIMWESTMED Map Viewer, by directly connecting to the partners' web services. The Open-source software Geoserver 2.8 is used for this task.

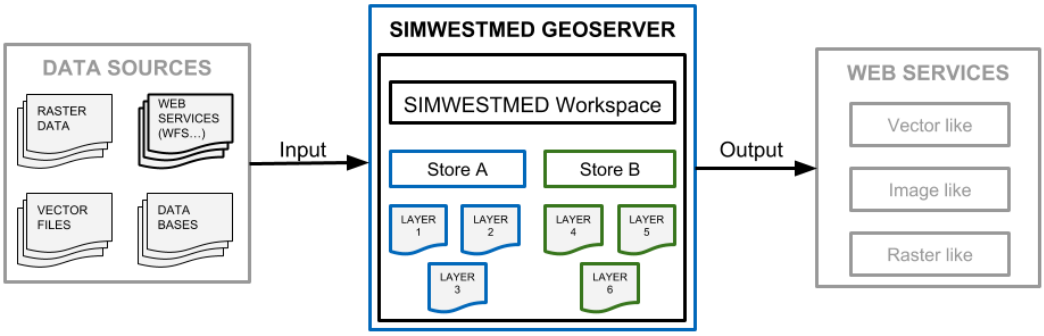


Figure 4: Geoserver Harvesting Process

The harvesting concept

The harvesting concept can be summarised as "collect once, use many times". Metadata available in SIMWESTMED catalogue are created either in SIMWESTMED Geonetwork or in external catalogues.

Indeed, as illustrated on Figure 5, metadata catalogues can communicate with each other; SIMWESTMED Data Portal can gather and disseminate metadata from external catalogues. External metadata can be grouped in virtual nodes. SIMWESTMED Demonstrator can request these nodes to harvest, and then disseminate external metadata. If necessary, only one part of external catalogue node can be harvested: SIMWESTMED administrator can filter metadata harvested from a node: For example, the http://services.data.shom.fr/geonetwork/ node counts 88 parent metadata and above 20000 metadata. If the request is "all the metadata where the title is "cable", 2 metadata are harvested.

SIMWESTMED metadata can be gathered into one or many nodes in order to be harvested by external metadata or consulted by external users.

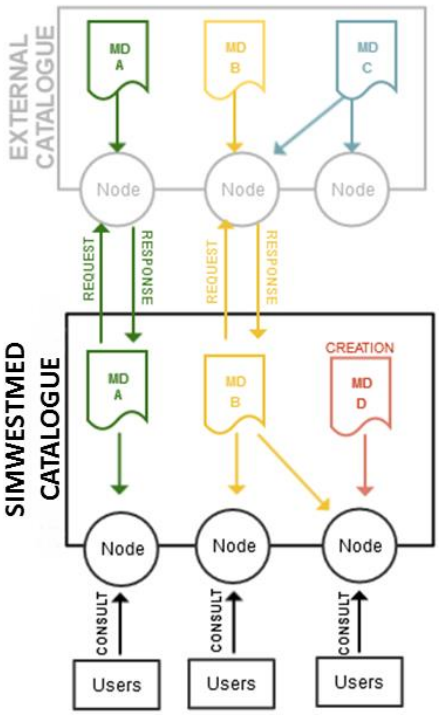


Figure 5: Metadata Harvesting Concept

- **Map Viewer (front end):** It is the main access point to SIMWESTMED Data Portal. It is an interactive mapping application connected to the metadata catalogue and to the geospatial data server. It allows displaying selected data together on a map. It also has some specific features like a preconfigured map catalogue, drawing tools and time series. The Map Viewer is developed by a private subcontractor, based on the viewer previously used in EMODnet Coastal Mapping project. Its use is described in the part two of this document for information. The detailed technical elements are specific to this map viewer. Therefore, the process implementation has to be adapted according to the viewer used.

- **Web Processing Service (WPS) Server:** This component is dedicated to publish tools as Web Services. In this way, it is possible to use those tools directly from a web browser or any GIS desktop application able to read WPS protocol (such as QGis).

3. Interface and Functionalities

SIMWESTMED Data portal interface has been thought out to leave to the map as much space as possible, in order to improve user comfort. It includes basic features from geoportals like navigation tools as well as more advanced tools. The scheme below details different components of this interface.

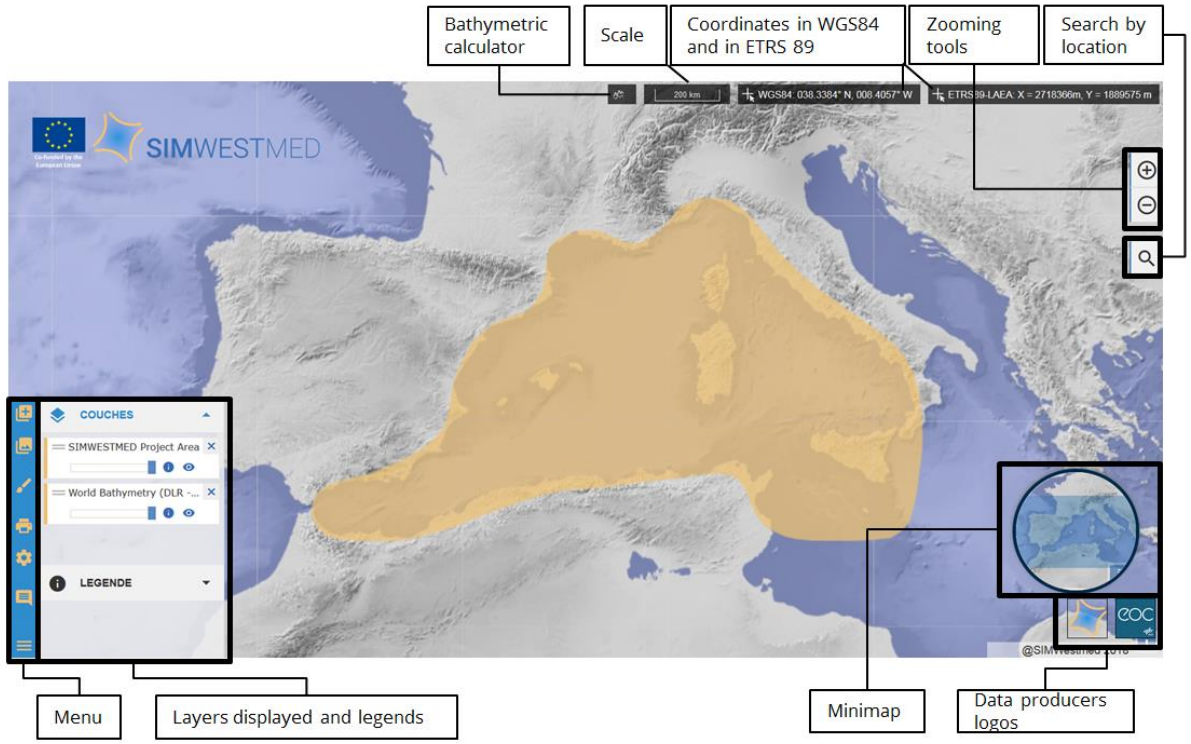


Figure 6: SIMWESTMED Data Portal Interface

A number of specific features are dedicated to displaying spatial maritime data in a cross-border area, as the map catalogue. The table below summarises the main user functionalities of SIMWESTMED portal.

	Basic features: Map navigation, consult data and metadata, export a map, customisation (projection, language, interface)
	Responsive design: Most of the SDP functionalities are optimised to be displayed in different types of devices (computer, phone…)
	Data catalogue: all the datasets available on the SDP, organised by category. A search box can be used to filter datasets by name. WMS / WFS / KML layers can be imported in the SDP.
	Map Catalogue: set of pre-configured maps (with selected layers, zoom level and geographic extent) on a specific subject or areas.
	SIMWESTMED dashboard: hideable panel with information like help for navigation and last updates on the SDP.
	Time series: tool for exploring datasets varying over time (see schema below). 
	Drawing tools: set of tools for adding custom graphic objects to the map. The drawing can be exported / imported in KML format and printed as a PDF document.
	Search by location: search box for locating a place by entering its name.
	Bathymetry calculator: Calculate automatically bathymetric depth by moving the navigation cursor on the map.

Table 1: SIMWESTMED Data portal Main Functionalities

4. Technical Requirements

The data catalogue constituted in SDP is mostly based on the data selection from the **Analysis of Data Needs and Gaps Report**. This list of datasets organised by category and sub-category are available in appendix. Each dataset has been first examined independently according to a set of technical criteria. Then all the datasets belonging to the same category have been studied together, in order to keep the best available datasets.

Below are the technical criteria used to select the datasets integrated in SIMWESTMED Data Portal.

- Only spatial datasets **relevant for the MSP in a transboundary context** have been considered ;
- When possible chosen datasets **cover the whole project area** or at least either France, Italy, Malta and Spain. The goal was to ensure a minimal level of consistency across the project area ;
- **Partners data** were favoured because they could beneficiate of time commitment for data harmonisation ;
- Priority was given to **datasets needed for Case studies** to support work in these regions ;
- SIMWESTMED data demonstrator uses as much **official data** as possible ;
- Priority was given to **datasets that are OGC and INSPIRE compliant** regarding particularly **metadata** format and contents. Data must also be available in **Web Services** because these do not require storage, guarantee access to the most up-to-date version, and avoid duplicating the maintenance work done by the data producer.
- In terms of **data licensing,** SIMWESTMED inventory distinguishes open, shared and closed datasets. As far as possible open data was favoured.

4.1. Inspire compliance

The harmonisation of exchange protocols at European scale facilitates the implementation of the Web Services. Indeed, the INSPIRE Directive 2007/2/EC issued on March 14th, 2007 established an Infrastructure for Spatial Information in the European community in order to favour the protection of the environment.

This Directive requires public authorities to publish their geographical environmental data and services on the Web and to share them. The objective is to favour dissemination, availability, quality, accessibility, use and reuse of geographical data and services at European scale. The INSPIRE directive aims to organise the data opening and the availability by relying on the infrastructures of the Member States so that users and decision-makers can easily have access to reliable geographical information.

The INSPIRE Directive builds on several principles:

- Geographic data must be collected once (to avoid duplication and storage) and

be provided and updated by the competent authority.

- It must be possible to combine easily information from heterogeneous source and disseminate them.
- The information collected by public authority that are within the INSPIRE Directive framework must be shared to all other public bodies.
- Geographical information must be available for an extensive use.
- It must be easy to know what information is available, what needs it can meet and under what conditions it can be acquired and used.

As a result, public data producers have to produce as much as possible data and services that respect these principles, which is referred to as INSPIRE compliant data.

Therefore, in this Directive and regarding Data and Information Requirements for MSP component, the main elements that influence the data selected in the inventory are metadata and discovery, displaying and download services. The interest brings especially on the Web Services technology.

4.1.1. Metadata

The INSPIRE Directive aims to ensure the interoperability between databases. Inspire compliance of metadata involves standardisation of datasets and services description.

Metadata aims to describe datasets associated producer, date of production, access constraints and how were they created and why...Metadata interest is to ensure the reliability and the good use of data. Completed metadata improves the referencing and therefore the sharing of the datasets.

Guidelines have been prepared to support public authorities in the establishment of the directive. These documents explain how to write metadata and how to manage metadata catalogues. Indeed, the directive relies on ISO standards (ISO 19115 and ISO 19139) for metadata elaboration of data and services. The requirements concern both the container and the contents of the metadata records.

4.1.2. OGC Web Services

What is it about?

A Web Service is a protocol dedicated to exchanging data between heterogeneous computer systems and applications. Data is prepared in a standardised format in order to be understandable by the receiving system and read on the fly. This way of sharing and accessing data brings several advantages:

- enhanced interoperability,
- Possibility to always access to the most up-to-date data

As far as spatial data is concerned, specific interoperable web services have been adopted, supported by the Open Geospatial Consortium (OGC). They allow the

exchange of data, metadata and processes. In the European Union, the Inspire Directive sets OGC web services as the standard for sharing geographic data.

Why focusing on web services?

"**Collect once, use many":** There are plenty of MSP data producers at different scales (from local to world scale). But how to ensure that data used in the portal is the latest available version and has not been transformed? Web Services follow the paradigm "collect once, use many".

Data is published from the producer database. It can be used and reused remotely at the same time by several clients/users. Users can gain access to this data by a Web Service protocol (WMS, WFS). If a change occurs in the producer database, data sent by Web Service protocol will also change.

In a transboundary context, Web Services bring the following advantages:

- To improve interoperability by facilitating the dissemination, the availability to use or reuse the information
- To ensure that the most up-to-date published datasets are being used
- To improve the skills of sharing and collaborative work
- To avoid storing data in each user server / computer. Only Web Services Requests are stored

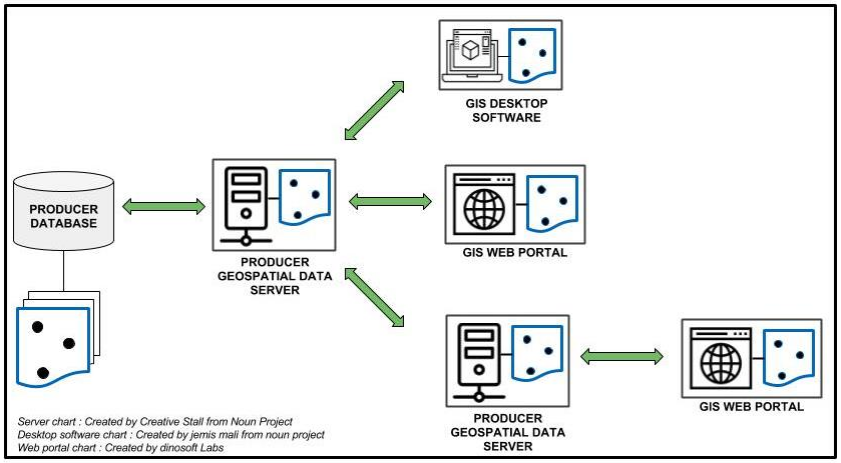


Figure 7: Collect Once, Use Many Times

How does it work?

OGC web services allow exchanging data through HTTP protocol. In practice, a client will send to the server an URL containing the request to the server, in order to get back a response. This response will usually be structured in XML format, but can also be an image output for example. Every web service comprises a GetCapabilities operation, which will inform on the requests that can be sent to the server.

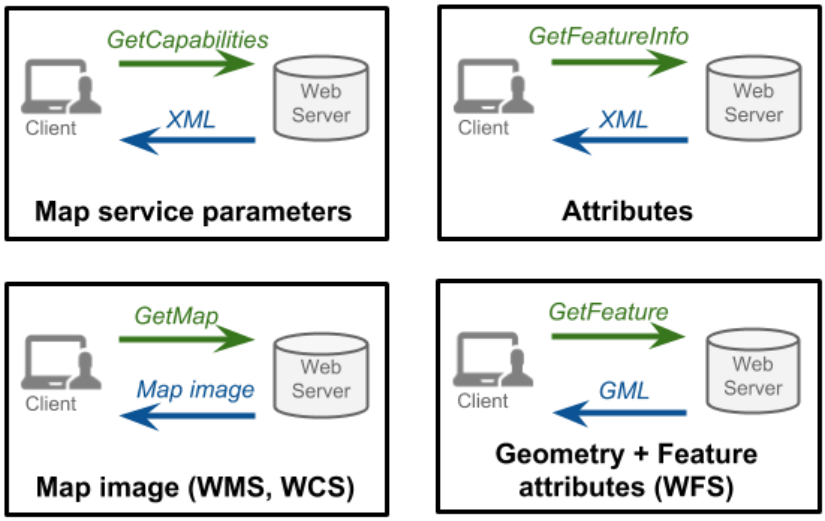


Figure 8: Web Services requests (examples)

A Web Services Typology

In geomatics, Web Services are normalised because they use XML and HTTP standards to exchange data according to international and standardised protocols of the Open Geospatial Consortium (OGC). Indeed, the syntax of the requests and responses needs to be consistent and thoroughly described. The Web services represent an efficient and fast way of sharing.

According to specifications of the OGC, the web services can belong to three categories that are either data services or metadata services or processing services.

Indeed, OGC has produced a series of specifications for GIS web services named in the format "Web ___ Service" either for simple map display or to manipulate geographical objects or for remote processing.

The web services provide data from several data stores like vector (shapefile, ArcSDE…) and raster (Geotiff, JPG or PNG…).

The present paragraph gathers Web Services into 3 categories:

- Data Web Services
- Metadata Web services
- Processes Web Services

4.1.2.1. Data Web Services

The most commonly encountered data Web Services (WMS, WFS, WCS and WMTS) are listed below:

- Web Feature Service (WFS): WFS corresponds to the download service for vector datasets in INSPIRE terminology. It gives access to the whole feature of a dataset, including the attribute table. The standard format for downloading data is the GML (Geography Markup Language), which is a variation of XML dedicated to

geographical datasets, but it is also possible to select other output formats.

- Web Coverage Service (WCS): WCS is similar to WFS, but is specific for raster datasets (e.g. elevation data). As such, it provides features like multi-band support.

- Web Map Service (WMS): WMS is a service for displaying geographic data. Requested datasets are returned as a georeferenced map. WMS requests allow to set many parameters such as extent, display style, or coordinates reference system. In some cases it is also possible to get the feature information by clicking on an object on the map.

- Web Map Tile Service (WMTS): WMTS is similar to WMS, with one major difference: it generates the response by using tiles. This enhances the display speed but reduces flexibility and does not allow as many operations on data as WMS.

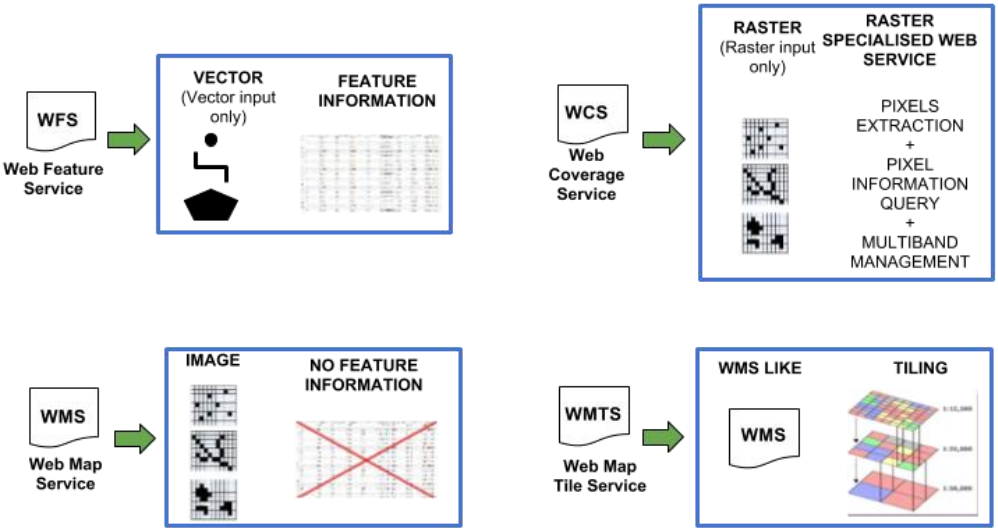


Figure 9: Data Web Services

4.1.2.2. Metadata Web Services

The Catalogue Service for the Web is a web service dedicated to metadata publication. It allows a metadata catalogue to be harvested by another catalogue or application. Harvesting can be done on all the metadata records present in the catalogue, or based on research criteria (title, keyword, etc.). CSW also offers the possibility to directly manage metadata (add, delete, etc.).

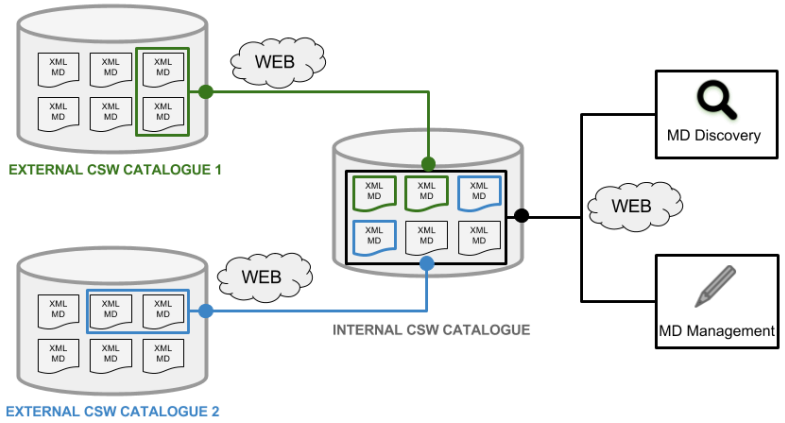


Figure 10: Catalogue Service for the Web

4.1.2.3. Processes Web Services

WPS is the OGC standard for sharing processes. It is thus possible to execute tools directly on the server, and then to download the result of the process. Input data can also be a WFS or a WCS request.

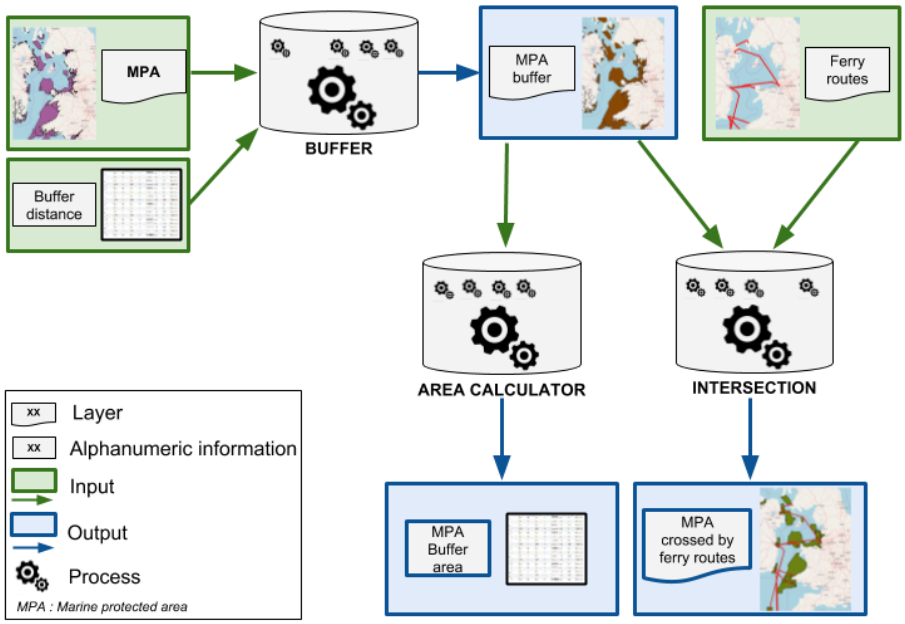


Figure 11: Web Processing Services

4.2. Licenses

A data licence is meant to protect the intellectual property of a dataset, by defining rules to set how a third-party can make use of it. For example, one may be authorised to publish a dataset on a map, but must cite the producer in the sources, and must request approval for putting it on a web portal. Usually, several elements are defined by

a data licence, such as:

- Data usage and distribution
- Data modification
- Commercial and non-commercial exploitation
- Attribution (acknowledging the data source)

The combination of rules applied to these elements leads to a wide range of existing data licenses, from the most permissive to the most restrictive. In order to improve readability, the licenses on data encountered during SIMWESTMED project were classified into 3 categories: Open data, shared data and closed data.

4.2.1. Open licenses

Open licenses constitute the most permissive kind in terms of user rights. They were mainly brought by the open source movement, and the idea that data and software should be available for everyone, with the only constraint to cite the origin of data. In practical terms, a user is free to:

- copy, publish, distribute and transmit the Information;
- adapt the Information;
- exploit the Information commercially and non-commercially for example, by combining it with other Information, or by including it in your own product or application.

A user must:

- Acknowledge the data source by including the statement specified by the provider.

Data published under open licenses include several benefits, especially in the public sector:

- It increases its reusability;
- More data openly available means more possibilities to develop innovations;
- Efficiency in public action can be drastically improved by sharing data between organisations;
- Open data brings transparency, and can favour citizens understanding and involvement.

The European Union has been supporting open data in the public sector since 2003 and the Directive 2003/98/EC on the re-use of public sector information, updated in 2013. Most Member States provide to public organisations their own open licence, like the “Licence Ouverte” in France, or the “Open Government Licence” in the United Kingdom.

4.2.2. Shared licenses

Shared licenses include all the licence types with more restrictions than open data licenses, but still authorising to use data in the scope of SIMWESTMED. This comprises a wide range of licenses, from ones similar to open data but preventing commercial use to others only specifically shared to SIMWESTMED project.

4.2.3. Closed licenses

Finally, some datasets encountered during SIMWESTMED project could have been of great interest, but licence restrictions prevented from using them. It is the case for example for a lot of data concerning fishing activity in France.

Part 2. SIMWESTMED Data Portal Administration Processes

This second part of this document describes the general organisation and the administration processes for three main components of the architecture: GeoNetwork, GeoServer and the Map Viewer. The aim is to share the technical knowledge and processes required to build up a portal demonstrator, using open tools as far as possible. The description of administrative processes demonstrates the user requirements and steps to set up an SDI using free tools and an existing viewer. Only the viewer is not an open source. This document part focuses on technical problems encountered and solutions to overcome them.

The SDP management processes are presented in the form of technical sheets. They detail the methodology and the tools used. When needed, the sheets focus on gaps and the possible solutions to overcome them. The guide for reading the technical sheet is described below.

1. Geonetwork

One challenge of the SIMWESTMED is to experiment with the metadata harvesting process in the SIMWESTMED Metadata Catalogue. The open-source catalogue application used is Geonetwork.

The first steps are the creation of a new user (TS1.) and a new group (TS2.). Each user is assigned a profile defining what tasks he can perform on the system or on metadata records. A group of users corresponds to logical units within an organization with specific privileges, like for example data thematic.

Geonetwork catalogue can be populated with 3 different metadata inputs:

- Harvested from an external metadata catalogue (TS3.)
- Imported from an XML file (TS4.)
- Created in the local Geoserver (TS5.).

Then the metadata catalogue is harvestable by external catalogues using the Catalogue Service for the Web. Additional nodes – virtual CSW - can be set by filtering the CSW catalogue (TS6.).

The Geonetwork gives the possibility to publish a metadata or a template (TS7) and to use the template to create new metadata records (Create a template TS8. and Create a metadata from a template-TS9.).

The metadata records harvest or create in the Geonetwork catalogue can be translated by the administrator to ease their comprehension by users (Translate a metadata -TS10).

The following chart illustrates the harvesting process with reference to technical sheets associated with each action.

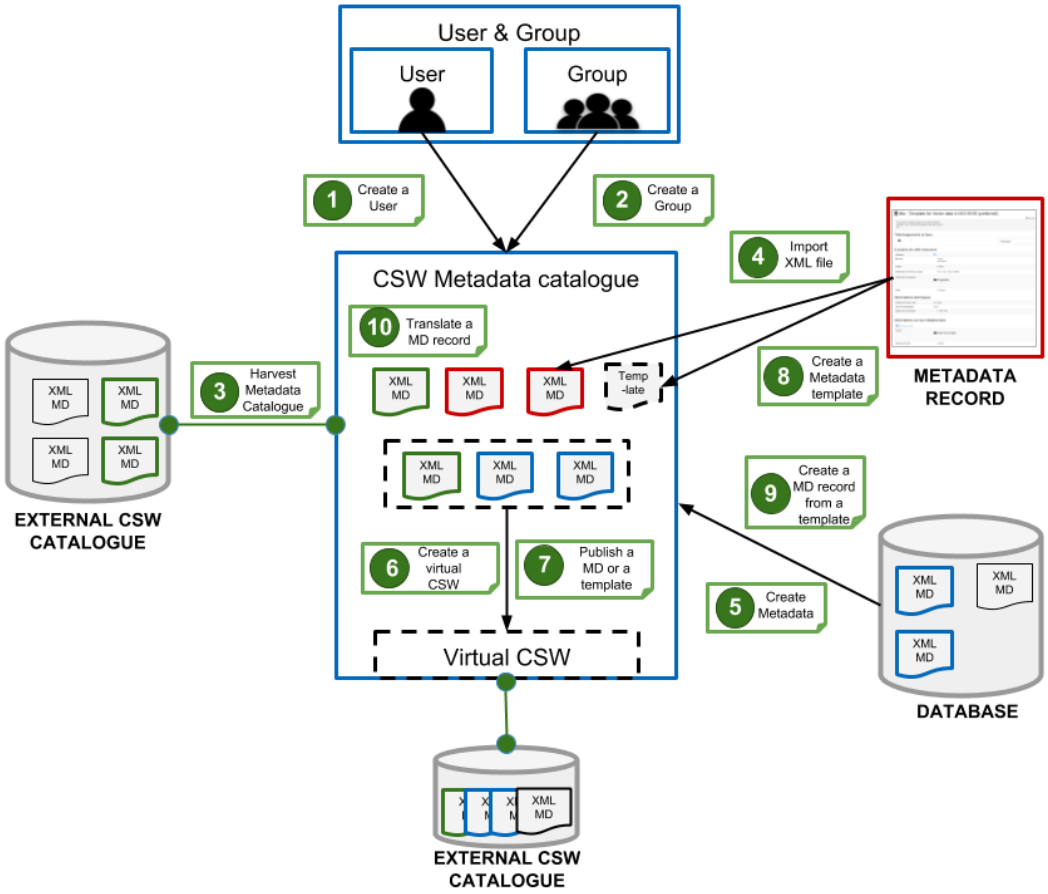


Figure 12: Geonetwork Processes

How to read the technical sheets

- Technical sheet components

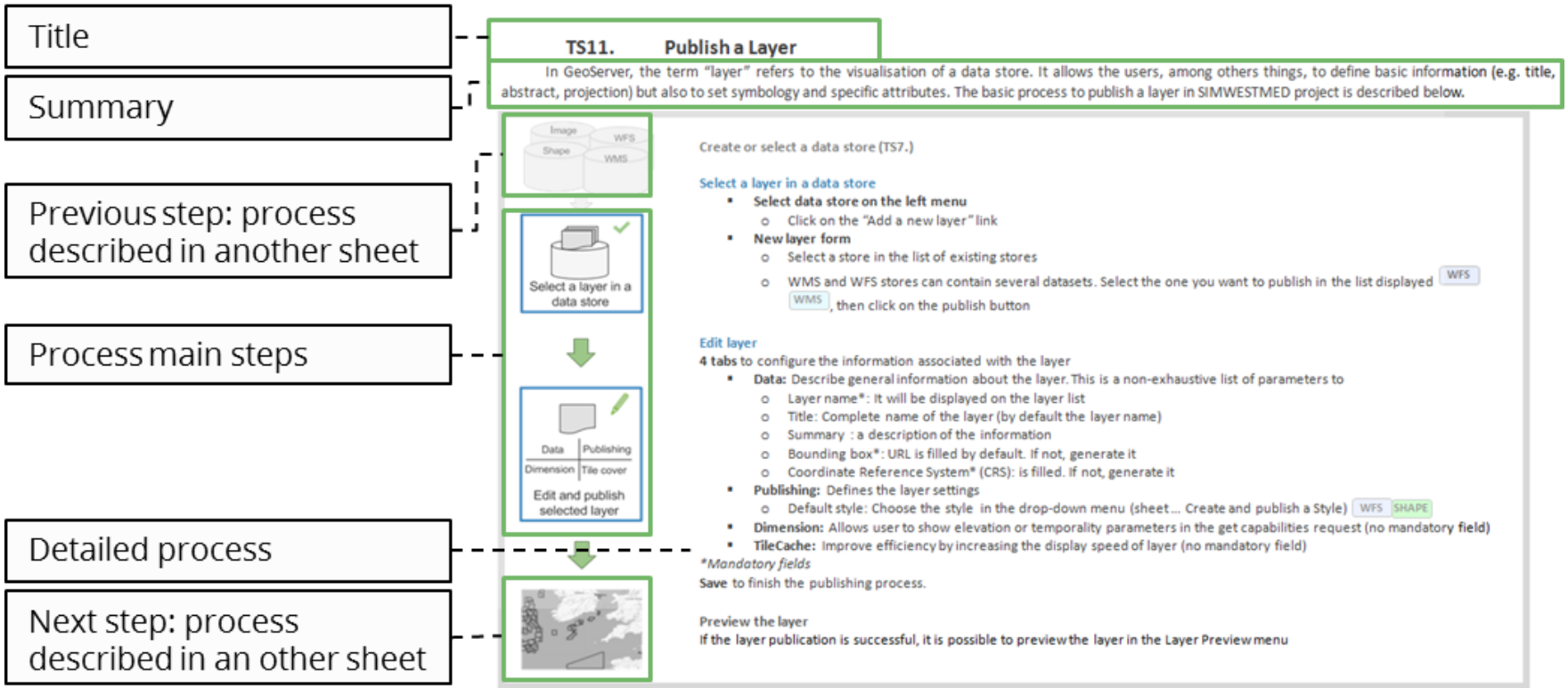


Figure 13: Technical Sheet Components

- Action icons

In the conceptual scheme of technical sheets, several icons are represented. They represent the main actions of the process described in the sheet. They are gathered in the list below with their meaning in the frame of this document.

ICON	ACTION	ICON	ACTION
	Add a new object		Associate objects
	Edit object parameters		Test a process
	Upload a file		Launch a process
	Publish an object		Preview a layer
	Enable an object		Copy an object

Table 2: Technical Sheets Action Icons

- Tags

In processes, some parameters do not affect all data formats. For example, the action to choose a style is only possible for the Web Feature Service and Shapefiles. Therefore to help users, when necessary, tags are used in technical sheets. A tag mentions the specific data format for which the step is required or relevant. The four tags presents in this document are:

WMS : Web Map Service

WFS : Web Feature Service

SHAP : Shapefile

TIFF : Geotiff

TS1. Create a group

A Group can contain one or more users with different profiles. A group of users correspond to logical units within an organization for example data thematic. Access privileges can be set per metadata record and also per Group. Privileges can relate to visibility of the Metadata (Publish), data Download, Interactive Map access and display of the record.

Add a new group

- Select the administration button in the menu
- Select users and group menu
- Add new group

Edit the new group parameters :

Customise the new group parameters: This is a non-exhaustive list of parameters to describe:

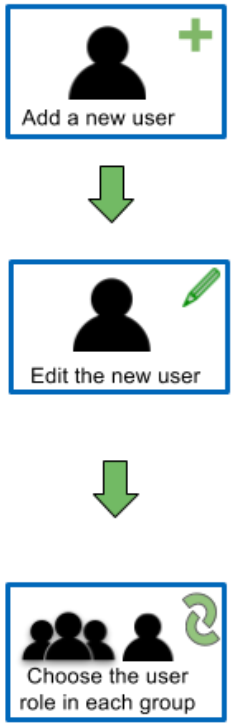
- Fill the name*
- Summary description
- Category: default category assigned to listings
- Email* to receive feedback on data download about resources that are part of group

Save to finish the process

Choose the user role in each group

TS2. Create a user

The User concept is related to Group concept because a User can be part of one or more Groups and a user can have different roles in different groups. A role or User Profiles defines what tasks the user can perform on the system or on specific metadata records.



Add a new user

- Select the administration button in the menu
- Select users and group menu
- Add new user

Edit the new user parameters

Customise the new user parameters: This is a non-exhaustive list of parameters to describe:

- User name: name to use for identification
- Password, name, surname, organisation, address

Choose the user role in each group

A profile set permission given to user in a group.

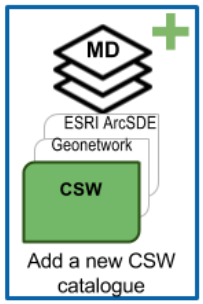
- Registered User: he has more access privileges than non-authenticated Guest users like right to download protected data
- Editor: the editor works on metadata like creating/editing/ delete data within the own group
- Content Reviewer: The content reviewer allows to give final clearance on the metadata publication on the Intranet and/or on the Internet
- User Administrator: is the administrator of his/her own group with the privileges like creating or to change users profiles creating editing deleting data
- Administrator: special privileges that give access to all available functions like
  - full rights for creating a new group or users
  - rights to change users/groups profiles
  - full rights for creating, editing, deleting new old metadata
  - perform system administration and configuration tasks

  The Administrator Role is not related to a Group

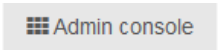
Save to finish the process

TS3. Harvest a CSW Metadata Catalogue

Harvesting is the process of collecting metadata from a remote source and storing it locally in GeoNetwork for a faster search. The process can be configured to launch automatically at regular intervals. It is possible to harvest multiple metadata catalogue types. This sheet details a Catalogue Service for the Web (CSW) metadata catalogue harvesting process. It is an Open Geospatial Consortium (OGC) standard that allows interaction with one or more resource catalogues. The basic process to harvest a CSW metadata catalogue in SIMWESTMED project is described below.



Add a new CSW metadata

- Click on the admin Console button at the top of the page 

- Click on the Harvesting menu button 

- Choose to harvest from OGC CSW 2.0.2

Complete the harvesting form

This is a non-exhaustive list of parameters to describe in the harvesting form

- **Node name and logo***: This is a short description of the remote site. It will be shown in the harvesting main page as the name for this instance of the CSW harvester.
- **Group***: A group of users correspond to logical units within an organisation. Populate the group if it already exists. If the group doesn't exist, administrator has to create it first.
- **Service URL***: The GetCapabilities URL of the CSW server to be harvested. (eg. http://services.data.shom.fr/geonetwork/srv/fre/csw-produits).
- **Search filter**: It is possible to filter metadata. If no filter is applied, Geonetwork will harvest all the metadata from the input node.
- **Frequency**: This parameter is used to set up an automatic harvesting at regular intervals.

Save parameters 

**Mandatory fields*

Launch the harvesting 

If the harvesting process runs successfully, the number of metadata records will be displayed in the log part of the harvesting form. This step can be more or less long depending on the number of harvested metadata records and conditions of access to the internet.

TS4. Import a metadata record from XML files

In case metadata external metadata exists in XMS or MEF format but cannot be gathered using CSW file import can be used in Geonetwork. In this technical sheet, it will detail only the process to import an XML files.

Upload a new XML file

- Click on the Contribute menu button at the top of the page
- Click on the "Import new records" button

Edit the form for import sheet

This is not an exhaustive list of parameters and options to import metadata record

- **Source* :** Choose the source of the file – there are 3 possibilities
  - **Upload a file from your computer :**
    Select the file : click on the button "select a file" to select the XML in our computer
    Specify the file format XML or ZIP/MEF
  - **Copy /paste:** Paste the XML code in the dedicated space as "Metadata contents"
  - **Import a set of files** from a folder on the server
    Indicate the directory in which the files are located and specify the file format XML or ZIP/MEF
- **Type of record*** : indicated the type of sheet :
  - **Metadata :** use when loading a normal metadata record
  - **Template:** use when loading a metadata record that will be used as a template to build a new record
  - **Directory entry:** use when loading a set of metadata record
- **Record identifier processing***: to manage potential clashes between ID of metadata records already present in the catalogue and new metadata records
  - **None:** the new ID is left unchanged. If a record already exists with the same ID, an error message will send.
  - **Overwrite metadata with same UUID**: any existing metadata record in the catalogue with the same ID as the new record will be replaced with the metadata record you are loading.
  - **Generate UUID for inserted metadata:** create new a ID for the new metadata records
- **Assign to a Group :** to select a user group in the list to assign to the imported metadata

**Mandatory fields*

Launch the import and check the result

TS5. Create a Metadata Record

Several SIMWESTMED metadata associated with dataset can neither be imported nor be gathered form external metadata catalogue (for example only available by download in XML format from the producer's SDI). In these cases, users need to create a new metadata record.

Create a new metadata record

- Select Add a new record button in the contribute section
- You can create a metadata from a new dataset, a feature catalogue, a map, a service and other.
- Choose a metadata template among pre-existing or created templates (TS8.), then a group associated with the new metadata record.
- Push the "Create" button to finish the metadata creation process

Edit the new metadata record

Customise in each category metadata fields: A metadata is composed of mandatory ("*" in the metadata sheet) and optional fields, aggregated into entity. This is a non-exhaustive list of entity to describe in the new metadata record form following the pre-existed template for vector data in ISO19139. Users can twist between simple and full view using the 👁 button at the top-right of the interface

- Identification info: This section is used to uniquely identify the data. It notably includes the title, contact information, date of the data.
- Spatial representation info: This package describes the mechanism used to represent spatial information.
- Distribution information: Distribution information and process to acquire the datasets.
- Data quality info: This entity provides information about the quality, the sources and the production process of the datasets.
- Reference System Information: Information about spatial and temporal referenced system used in the dataset
- Metadata: This package is used to uniquely identify and describe the metadata.

Save the metadata record to finish the process

Metadata record compliancy is evaluated in a window at the right of the interface.

Preview the metadata record

TS6. Create a virtual Catalogue Service for the Web (CSW)

A CSW gathers all the datasets of a catalogue. It can be composed of several virtual CSW. The virtual CSW is a harvesting node that is a filter set by the administrator on the catalogue CSW (e.g. thematic, metadata type). Using a virtual CSW reduces the harvesting time and improve datasets organisation.

Harvest a CSW Metadata Catalogue (TS3.) and/or import metadata records from XML files (TS4.)

Enable the CSW

- Select the administration button in the menu and then select the CSW button in the parameters menu
- **Enable***: This option allows opening the CSW services. If it is disabled, other catalogues cannot connect to the node using CSW protocol.
- Inserted metadata is public: If this option is checked, all the metadata inserted by CSW will be public.
- Save the CSW process

Create a new virtual CSW

- Select the administration button in the menu then select the parameters menu
- Open virtual CSW menu and click on new virtual CSW

Edit a new virtual CSW

- **Name***: fill the name of this virtual CSW. The format is mandatory as: csw-servicename, where servicename refers to the thematic or the subject of this virtual CSW.
- **Description** : fill a short description of this catalogue
- **Filter(s)***: to create a virtual CSW it is necessary to fill at least a filter of research.
  - Select the filter type: it refers to the title, the keywords or the summary in the metadata record…
  - Write the keyword associated at this filter
  - Specify whether the filter should contain or not contain the keyword
  - Click on this button + to add a new filter. It is mandatory to guarantee the record of the previous filter

  Explicit query *section can be used to filter the CSW catalogue using manual request.*
- Save to finish the publishing process.

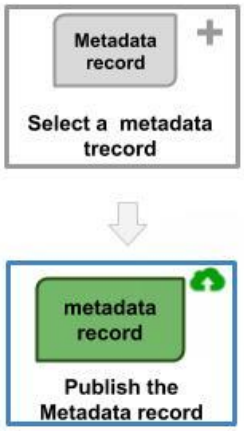
Test the virtual CSW

Click on CSW test menu and select the CSW to test, then choose a request and send it :

- csw-GetCapabilities. If an answer is returned with the global description then the virtual CSW working
- csw-GetRecord | no filter : The <csw: SearchResults numberOfRecordsMatched> parameters returns the number of records included in this virtual CSW.

TS7. Publish a metadata or a template

By default, a new metadata added in a catalogue is private, only the producer and the administrator have the right to view and modify it. The process of metadata publication is necessary to provide viewing access to a specific group or the public.



Open a metadata sheet created from (TS5.):

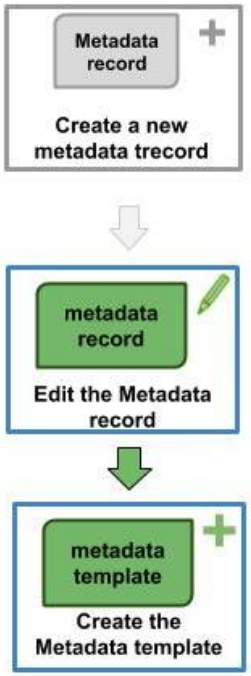
- An existing metadata of the catalogue
- A existing standard or template

Publish the new metadata

- At the top-right of the interface, select the “Privilege” button, then tick the groups associated with the “publish” column or
- At the top-right of the interface, select “publish”: The metadata can be displayed by all the users.

TS8. Create a metadata template

Thanks to the use of a template, contributors can create new metadata with a minimum of time. A metadata template contains already set with pre-filled-or not fields.



Create a new metadata record from (TS5.):

- A existing standard or template
- An existing metadata of the catalogue

Edit the new metadata record

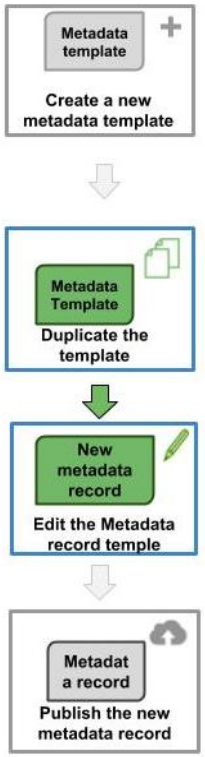
- Add/ Delete fields
- Fill fields when needed

Create the new template

In the "Save metadata" menu, select the "**Save as template**" button.

TS9. Create a metadata record from a template

Thanks to the use of a template, contributors can create new metadata with a minimum of time. A metadata template contains already set with pre-filled-or not fields.



The administrator creates a metadata template (TS9.)

Duplicate an existing metadata record template

When a metadata record is duplicated, the two records are identical but independent. The copy has its own identifier and keeps the information contained in the template. Therefore, it is possible to modify the copy without affecting the original form template.

- In the Geonetwork homepage, select **"contribute" menu**, search the template with the search bar and **duplicate** it or
- Use the search menu to display a metadata record, then select the **duplicate button** in the drop-down menu at top right

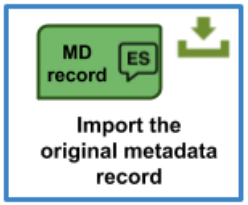
Edit the new metadata record

- Change the title to match with the associated data
- Complete the empty fields, edit the pre-filled fields if necessary
- Save the new metadata record produced from the template

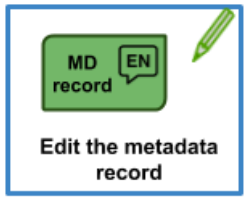
Publish if necessary the new metadata record (TS7.)

TS10. Translate a metadata record

The INSPIRE metadata template give the possibility to produce easily metadata records in several languages allowing as many people as possible to understand the information.

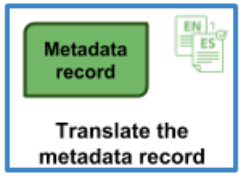


Harvest or import the original metadata record (TS3. or TS4.)



Edit the metadata record

- Select the original metadata record by title, by ID (preferred), by URL or by keyword
  By careful of the language when doing a search by keywords, it must correspond to the language of the Geonetwork application
- Open the metadata record in edit mode
- Add a new language in the last section of the form **"Localisation"**
  - Click on cross to add a localisation
  - Choose the new language and fill the fields
- Save the metadata record



Translate the metadata record

- Open the metadata record in edit mode
- Fill the fields in the second language
- Save the metadata record

Publish a metadata record (TS 7.)

2. Geoserver

The SIMWESTMED technical challenge consists of testing the harvesting and publishing process focusing on WebServices input in Geoserver.

The following chart illustrates the data publication process in Geoserver, referring to corresponding technical sheets.

The creation of a workspace is a necessary first step to organise elements like a store or dataset. Then, “create a store” and “publish a layer” technical sheets describe publication process. WFS or Shape like datasets publication requires style management. The technical sheet 11 “create and publish a style” describes the process implying the generation of an SLD file and its association with one / several layers.

In case an attribute table is associated with a published dataset, the GetFeatureInfo request can be customised using an FTL file as described in the technical sheet 13. SIMWESTMED project provides the opportunity to test the publication of raster temporal layers using Geoserver (TS 12: “publish a temporal layer). Then, the Data sheet 10 “publish a layer group” explains the process to gather and organise layers in a hierarchical structure using layer groups.

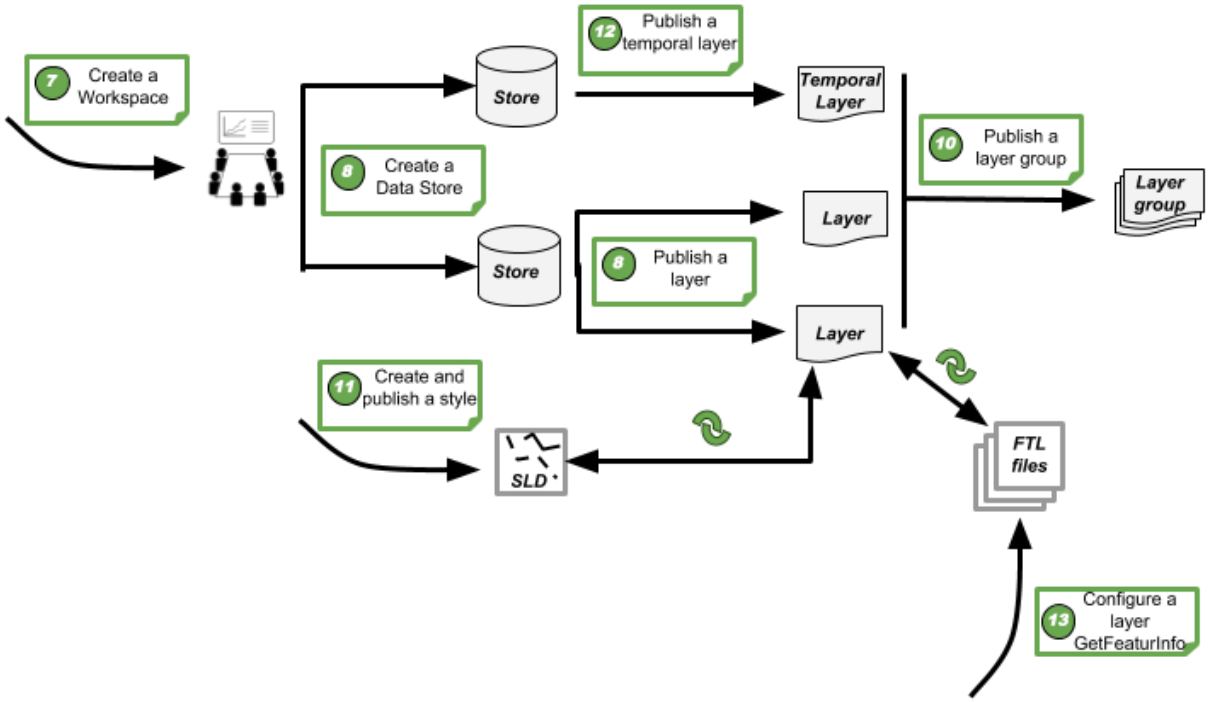


Figure 14: Geoserver Processes

TS11. Create a Workspace

This section describes how to view and configure workspaces. A workspace is a space or directory used to organise elements like store or datasets. In GeoServer, a workspace is often used to group similar layers together or to separate 2 layers with the same name but belong to different workspaces.

Add a new workspace

- Select the Workspace button in the menu
- Add a new workspace or choose an existing workspace in the list

Edit a new workspace

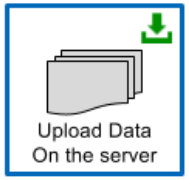
- Edit an existing workspace
  - Fill the workspace name
  - Fill the namespace URI (Uniform Resource Identifier)
  - Fill the character set: UTF-8
- Or add a new workspace
  - Select the Add new workspace button
  - Fill the namespace, it is a name describing the project
  - Inform URL: it is the URL associated with this project. It allows a quick and direct access to this workspace.

To finish save the process

Go to store menu to create or choose an existing store (TS8)

TS12. Create a data store

A data store is a connection to a data source, either from a file (e.g. Shape, GeoTIFF…) or Web Services (e.g. WMS, WFS). It is assigned to a workspace; and connects to a data source (e.g. Shape, WFS, WMS or GeoTIFF). The basic process to create a data store in SIMWESTMED project is described below.



Upload data on the server

Upload TIFF or SHAPE files in the appropriate folder of Geoserver server. TIFF SHAP

Add a new data store

Select “Store” on the left menu, then click on “Add a new store“

Then select which data store to add; 4 kinds of stores are mainly used in SIMWESTMED project :

- Web Feature Server WFS
- WMS (Web Map Service) WMS
- Shapefile SHAP
- Geotiff TIFF

Edit the data store parameters

This is a non-exhaustive list of parameters to describe in the Edit menu

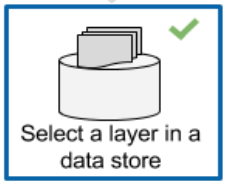
- **Workspace***: The store is assigned to the selected workspace
- **Data Source Name***: The store name as listed on the view page
- **Description**: A description is then displayed in the administration interface
- **Get Capabilities URL***: This URL returns WebServices parameters and available d WFS s WMS
- **URL / Shapefile location***: File location on Geoserver se TIFF SHAP
- **Enabled** (Activated by default): Enable or disable access to the store, along with all layers defined for it.

**Mandatory fields*

Save the store edits.

TS13. Publish a Layer

In GeoServer, the term "layer" refers to the visualisation of a data store. It allows the users to define basic information (e.g. title, abstract, projection) but also to set symbology and specific attributes. The basic process to publish a layer in SIMWESTMED project is described below.



Create or select a data store (TS7.)

Select a layer in a data store

- **Select data store on the left menu**
  - Click on the "Add a new layer" link
- **New layer form**
  - Select a store in the list of existing stores
  - WMS and WFS stores can contain several datasets. Select the one you want to publish in the list displayed WFS WMS, then click on the publish button

Edit layer

4 tabs to configure the information associated with the layer

- **Data:** Describe general information about the layer. This is a non-exhaustive list of parameters to
  - Layer name*: It will be displayed on the layer list
  - Title: Complete name of the layer (by default the layer name)
  - Summary : a description of the information
  - Bounding box*: URL is filled by default. If not, generate it
  - Coordinate Reference System* (CRS): is filled. If not, generate it
- **Publishing:** Defines the layer settings
  - Default style: Choose the style in the drop-down menu (sheet … Create and publish a Style) WFS SHAPE
- **Dimension:** Allows user to show elevation or temporality parameters in the get capabilities request (no mandatory field)
- **TileCache:** Improve efficiency by increasing the display speed of layer (no mandatory field)

**Mandatory fields*

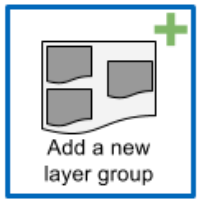
Save to finish the publishing process.

Preview the layer

If the layer publication is successful, it is possible to preview the layer in the Layer Preview menu

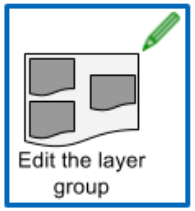
TS14. Publish a Layer Group

"A layer group is a container in which layers and other layer groups can be organized in a hierarchical structure. A layer group can refer to a single name in "WMS requests" (user manual 2.13). One layer group can be composed of several layers with different bounds and projections.



Add a new layer group

- Select "layer group" button on the menu on the left
- Choose to add a new layer group



Edit the layer group parameters

This is a non-exhaustive list of parameters to describe:

Data

- Name*: The Name of the layer group
- Working space: A layer group within a workspace cannot contain resources from other workspace
- Mode:*: The administrator can choose between 4 layer group mode: Single, Named tree, container tree, earth observation tree. Only the single mode has been used in SIMWESTMED portal. The layer group is exposed as a single layer with a name, acting as an alias for a list of layers. The layers are still showing up as top level entries in the WMS capabilities document (Geoserver usual manual)
- Bounds*: Bounding box can be generated from the layers used or from a SRC file. The bounding box generation requires firstly layers to be selected.
- Layers*: A layer group can be composed of one or several layers. The order of the layers can be changed for an optimal displaying.

Publishing: Define the layer group setting

TileCache: Improve efficiency by increasing the display speed of the layer group (no mandatory field)

**Mandatory fields*

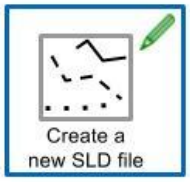
Save to finish the publishing process

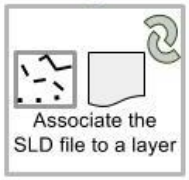
Preview the layer group

If the layer group publication is successful, it is possible to preview the layer

TS15. Create and Publish a Style (SLD) SHAPE WFS

The integration of hard data (shape, Postgis) and WFS flow requires style management. In GeoServer, styling is accomplished using a markup language called Styled Layer Descriptor, or SLD for short. SLD is an XML-based markup. This page provides an introduction to the capabilities of SLD and how it works within GeoServer. A complete description of SLD concept is available on the Geoserver official Web page (http://docs.geoserver.org/latest/en/user/styling/sld/introduction.html)





Create a new SLD file

There are 3 ways to generate a SLD file.

- **Write the SLD Use a text editor that support XML format (e.g. notepad++).** This method requires a well-knowledge of SLD syntax and a lot of time. On the other hand, this is the best way to use the language in its full extent.
- **Generate a SLD file in a GIS software (e.g. QGIS)**
  - Open the file / flow in the GIS Software
  - Change the file / flow style
  - Export the style in SLD

This method does not require a well-knowledge of SLD syntax. On the other hand, this feature is not available on all software. In case it is, compatibility gaps can occur.

- **Generate first the SLD file using a GIS software, then customize it using a text editor**

Add a new SLD file in Geoserver

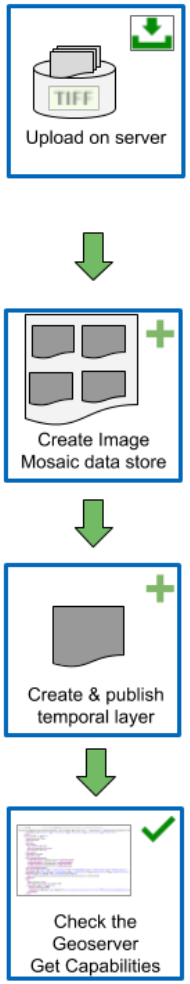
- Select “Styles” on the left menu, then click on “Add a new style“
- Past the SLD in the style editor box or load a SLD file
- Fill at least the name and the store associated with the style in creation
- Click on validate to check syntax errors
- Click on the “apply” button

Associate the SLD file to a layer

One style can be associated with several layers

TS16. Publish a Temporal Layer

In SIMWESTMED Map Viewer, it is possible to navigate into time datasets. In order to activate this feature on raster datasets (such as maritime traffic), it is needed to create a temporal image mosaic in Geoserver. The whole tutorial is available here: http://docs.geoserver.org/latest/en/user/services/wms/time.html



Store data on the server

- Name all the raster files in the same way: name_YYYYMMDD.
- Upload them on the server, in a dedicated folder (called in this sheet DATA_DIR)
- Create in DATA_DIR a file called indexer.properties
- Add the following lines in indexer.properties:

```
TimeAttribute=time
Schema=*the_geom:Polygon,location:String,time:java.util.Date
PropertyCollectors=TimestampFileNameExtractorSPI[timeregex](time)
```

When creating an image mosaic, Geoserver generates a shapefile. This code adds an additional attribute for storing time values

- Create in DATA_DIR a file called timeregex.properties. This file defines how the date is written in the file names
  - Add the following line in timeregex.properties:

```
regex=[0-9]{8}
```

It means that the date is written with 8 digits between 0 and 9

Create an Image Mosaic data store

- select “stores” in the left menu, then click on the “Add new store” link
- Select the Image Mosaic Data Store
- Main parameters to fill in:
  - Data source name: name of the image mosaic
  - URL: path to the data folder

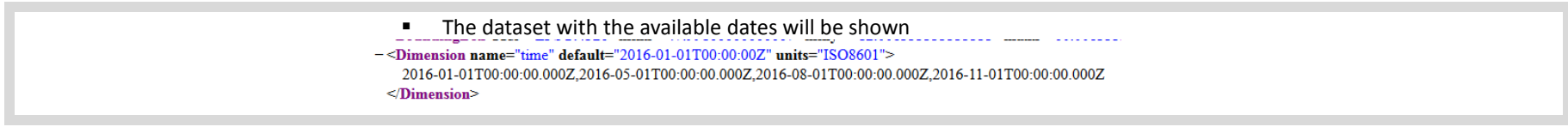
Create a layer using the mosaic data store

- select “layers” in the left menu, then click on the “Add a new resource” link
- Select the mosaic data store in the drop-down menu an click on “publish”
- See TS9 – Publish a layer for the main configuration details. The only specificity is on the “Dimensions” tab:
  - Time: tick the “enabled” checkbox
  - Presentation: choose “list”

Check the Geoserver GetCapabilities document

- In a web browser, connect to the Geoserver GetCapabilities address (for SIMWESTMED : http://services.data.simwestmed.eu/geoserver/wms?service=wms&request=GetCapabilities)

- The dataset with the available dates will be shown



TS17. Configure a Layer GetFeatureInfo

With Geoserver, clicking on a feature allows to get additional information. By default, it displays the attribute table, but it is also possible to configure it to present information in a different way. The whole tutorial is available here: http://docs.geoserver.org/latest/en/user/tutorials/GetFeatureInfo/index.html

TS9. Publish a layer on the GeoServer (TS9)

Create the FTL files associated with the dataset

- On Geoserver, each GetFeatureInfo is composed of 3 files. Those files are written in FreeMarker, which syntax is very close to HTML. The main difference is that with FreeMarker it is possible to use conditions and loops, and thus to create different displays for each feature.
- The 3 files to create are:
  - **Header.ftl**: Contains the <head> markup, and the styles definition
  - **Content.ftl**: The core of the GFI. It is where the display will be customised,
  - **Footer.ftl**: just closes the page
- Add the files to the server, in the Geoserver directory: workspaces/*workspace_name*/*store_name*/*layer_name*
- Examples of codes for the 3 files are given below

Check if the GetFeatureInfo is running

- In the Layer Preview menu, click on the OpenLayers link on the right dataset line. An interactive map should open in a new tab.
- Click on a feature on the map. The new GetFeatureInfo should be displayed under the map

Example of "header.ftl"

```
<html>
  <head>
    <style type="text/css">
      h2 {
        color: #006494;
      }
    </style>
  </head>
  <body>
```

Example of "content.ftl"

```
    <div>
      <#list features as feature>
        <ul>
          <li>Country: ${feature.COUNTRY.value}</li>
        </ul>
        <div>
          <#list feature.attributes as attribute>
            <#if attribute.value == "Yes">
              <div>
                <img src="finfish/${attribute.name}.jpg" /><br />
                ${attribute.name}
              </div>
            </#if>
          </#list>
        </div>
      </#list>
    </div>
```

Loop over the layer

Value of COUNTRY attribute

Condition on an attribute value

Name of an attribute

Example of "footer.ftl"

```
  </body>
</html>
```

3. Map Viewer

Data and metadata publication on Geonetwork and Geoserver described in the first and second paragraph constitute the primary processes to their publication on SIMWESTMED Map Viewer. Then the implementation of metadata and datasets in the data portal illustrator contains 2 processes: Add a layer in the XML file (TS14.) and implement a context in the data viewer (TS15.).

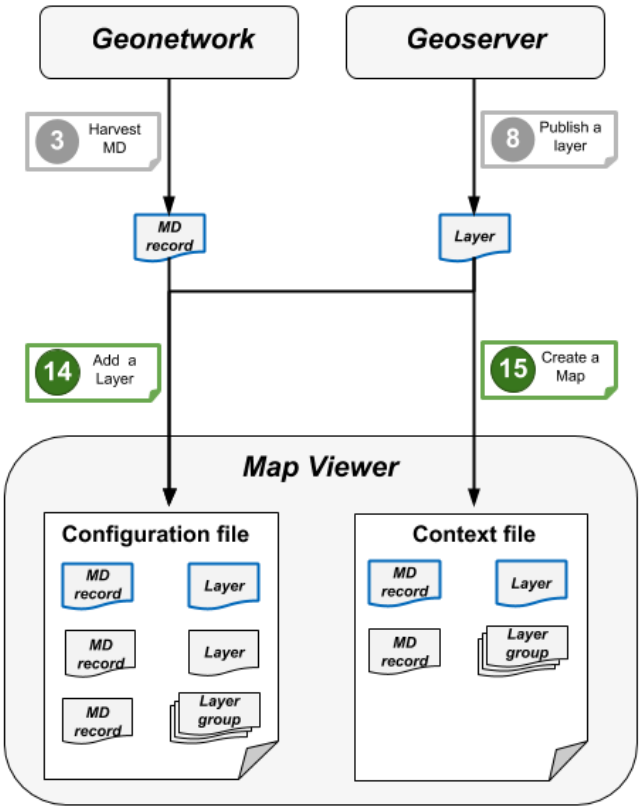
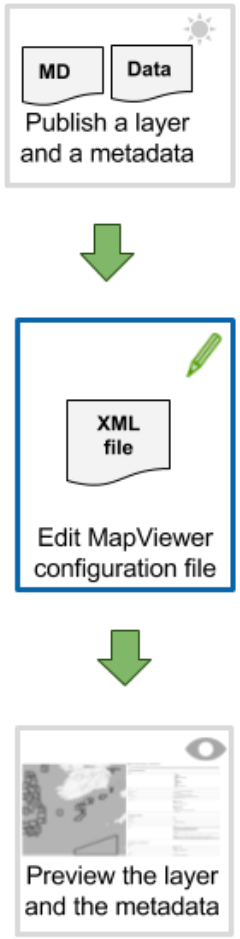


Figure 15: Map Viewer Processes

TS18. Add a Layer to the Map Viewer

Adding a layer to the map viewer refers to the operation of making a Web Service coming from SIMWESTMED Geoserver available with the associated metadata on SDP. This action is realised by manually editing an XML configuration file.



Publish a layer on the GeoServer (TS9)
Harvest a CSW Metadata Catalogue(TS3)

Edit the data catalogue configuration file (CONFIG/simwestmed.xml)

Open the XML configuration file. simwestmed.xml is the file used by the map viewer to generate the data catalogue.

Add a new item to the layer list in the xml

- Add the code provided next page to simwestmed.xml (after a </Layer>)Add the code provided next page to simwestmed.xml (after a </Layer>)
- Main parameters to configure:
  - <Name>: Layer name in SIMWESTMED Geoserver (usually under the format *workspace:layer_name*)
  - <Title>: Name displayed in the data catalogue
  - <simsp:Category>: Category in the data catalogue. Index parameter is used to set the order of categories
  - <simsp:Metadatas><simsp:URL>:Link to the metadata associated to the dataset
  - <simsp:LegendUrls>: For WMS datasets, it is necessary to provide a legend in an image file. For other types, this markup is not needed. WMS
  - <OnlineResource>: link to the legend image (uploaded on the server)
  - <simsp:Originators>: Information about the data producer.
    - <simsp:Logo>: link to the originator's logo
    - <simsp:URL>:link to the originator's website

⚠ *The markups are case-sensitive*

Upload simwestmed.xml on the server

Preview the layer

If the layer publication is successful, it is possible to add the layer to the map in the Map Viewer

Example of code to insert to simwestmed.xml

```
<Layer queryable="true" hidden="false">
  <Server service="OGC:WMS" version="1.3.0">
    <OnlineResource xlink:type="simple" xlink:href="http://wxs-simsp-eu.shom.as8677.net:80/geoserver/ows"/>
  </Server>
  <Name>simwestmed:french_maritime_boundaries</Name>
  <Title>Délimitations maritimes (France)</Title>
  <Abstract>abstract content</Abstract>
  <Extension>
    <simsp:Layer>
      <simsp:Category index="3">Boundaries#Maritime Boundaries</simsp:Category>
      <simsp:Downloadable>false</simsp:Downloadable>
      <simsp:Metadatas>
        <simsp:Metadata identifier="BDML_DELMAR.xml">
          <simsp:URL>
            http://services.data.simcelt.eu/geonetwork/srv/eng/catalog.search#/metadata/BDML_DELMAR.xml
          </simsp:URL>
        </simsp:Metadata>
      </simsp:Metadatas>
      <simsp:Opacity>1.0</simsp:Opacity>
      <simsp:LegendUrl>
        <OnlineResource xlink:href="http://services.data.simcelt.eu/legends/legendes/delmar3.png" xlink:type="simple"/>
      </simsp:LegendUrl>
      <simsp:Originators>
        <simsp:Originator Name="SHOM">
          <simsp:Logo>http://services.data.simcelt.eu/static/logo/SHOM/SHOM.gif</simsp:Logo>
          <simsp:URL>http://www.shom.fr/</simsp:URL>
        </simsp:Originator>
      </simsp:Originators>
    </simsp:Layer>
  </Extension>
</Layer>
```

TS19. Create a Map

Administrators can provide to users custom maps: preconfigured visualisations on a specific spatial extent, with some layers already loaded. Creating a map is done by creating a definition XML file associated with an image, and by adding it in the map catalogue definition file.

Add a layer to the map viewer (3.2.1)

Add a new Map

In the folder SIMSP_CONTEXT/CONTEXTS/, create a new document named context_name.xml)

- Example: fishing.xml. It will be the file defining the layers to be viewed on the predefined map.

In context_name.xml, add the selected layers

- Add the following lines to context_name.xml:
- Main parameters to configure:
  - <BoundingBox>: coordinates to set the initial map extent
  - <Layer>: copy a whole <Layer> block from the data catalogue file (simwestmed.xml) for each layer needed on the map

⚠ *The markups are case-sensitive*

Add a screenshot of the map

- Place the image in the folder SIMSP_CONTEXT/IMAGES
- The image will be used as an illustration in the Map Catalogue.
- Images must be on the format 350x85

Update the file SIMSP_CONTEXT/context_catalog.json

- Add the following lines to the file (just before the last square bracket):
- Items description:
  - title: map name displayed in the map catalogue (in French and English)
  - description: few lines to describe the map (in French and English)
  - image: name of the screenshot
  - file name of the map configuration file

Example of context_name.xml

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ViewContext xmlns:simsp="http://www.simsp.eu/context" xmlns:sld="http://www.opengis.net/sld"
xmlns="http://www.opengis.net/context" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" version="1.1.0" id="simsp_context" xsi:schemaLocation="http://www.opengis.net/context http://wxs-simsp-
eu.shom.as8677.net/schema/context/1.1.0/context.xsd http://www.simsp.eu/context http://wxs-simsp-
eu.shom.as8677.net/schema/simspcontext/1.4.0/context.xsd">
  <General>
    <BoundingBox minx="-2032737.45768780331" miny="5172066.08227026463" maxx="315408.051232811296" maxy="6333908.91220494360"
SRS="EPSG:3857"/>
    <Title>French Maritime Boundaries</Title>
  </General>
  <LayerList>
    <Layer queryable="true" hidden="false">
      <Server service="OGC:WMS" version="1.3.0">
        <OnlineResource xlink:type="simple" xlink:href="http://wxs-simsp-eu.shom.as8677.net:80/geoserver/ows"/>
      </Server>
      <Name>simwestmed:SIMWESTMED_Project_area</Name>
      <Title>SIMWESTMED Project Area</Title>
      <Abstract>abstract content</Abstract>
      <Extension>
        <simsp:Layer>
          <simsp:Category index="2">Boundaries#Project Area</simsp:Category>
          <simsp:Downloadable>false</simsp:Downloadable>
          <simsp:Metadatas>
            <simsp:Metadata identifier="LIM.xml">
              <simsp:URL>http://wxs-simsp-eu.shom.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/LIM.xml</simsp:URL>
            </simsp:Metadata>
          </simsp:Metadatas>
          <simsp:Opacity>1.0</simsp:Opacity>
          <simsp:Originators>
            <simsp:Originator Name="SIMWESTMED">
              <simsp:Logo>http://wxs-simsp-eu.shom.as8677.net/static/logo/simwestmed/simwestmed.png</simsp:Logo>
              <simsp:URL>http://www.simwestmed.eu/</simsp:URL>
            </simsp:Originator>
          </simsp:Originators>
        </simsp:Layer>
      </Extension>
    </Layer>
  </LayerList>
```

```
</ViewContext>
```

Contexts_catalog.json – code to add

```
,
{
"title": {
   "en": "Marine Protected Areas in SIMWESTMED Project Area",
   "fr": "Les aires marines protégées dans la zone de projet SIMWESTMED"
},
"description": {
  "en": "This map highlights the availability and representation of data related to marine protected areas in the Western
Mediterranean Sea",
  "fr": "Cette carte illustre la disponibilité et la représentation des données concernant les aires marines protégées en
Méditerranée de l'Ouest"
},
"image": "mpa.png",
"file": "mpa.xml"
}
```

Part 3. Challenges

The analysis and data needs and gaps report describes multiples barriers to overcome to increase data use and interoperability in a transboundary context. Then an action plan and architecture have been developed to achieve these objectives.

The quality of data exchange can be enhanced at each step of the data management process:

- The information flow corresponds to the step of collection (importation/exportation), request of data and associated metadata, publication and dissemination
- Understand: The way a dataset is created, associated or not with a metadata can ease the understanding of the dataset by the users.
- Represent means the quality of dataset displaying
- Enhance: Several tools and actions exist to increase the number and the quality of the datasets available for users: Besides the transformation of stored datasets into Web Services, the document describes how the datasets can be developed to access to complex, non-spatial or temporal layers for example.

The sheets below assess how the architecture solves or not the interoperability gaps and what solutions have been or will be developed in the future.

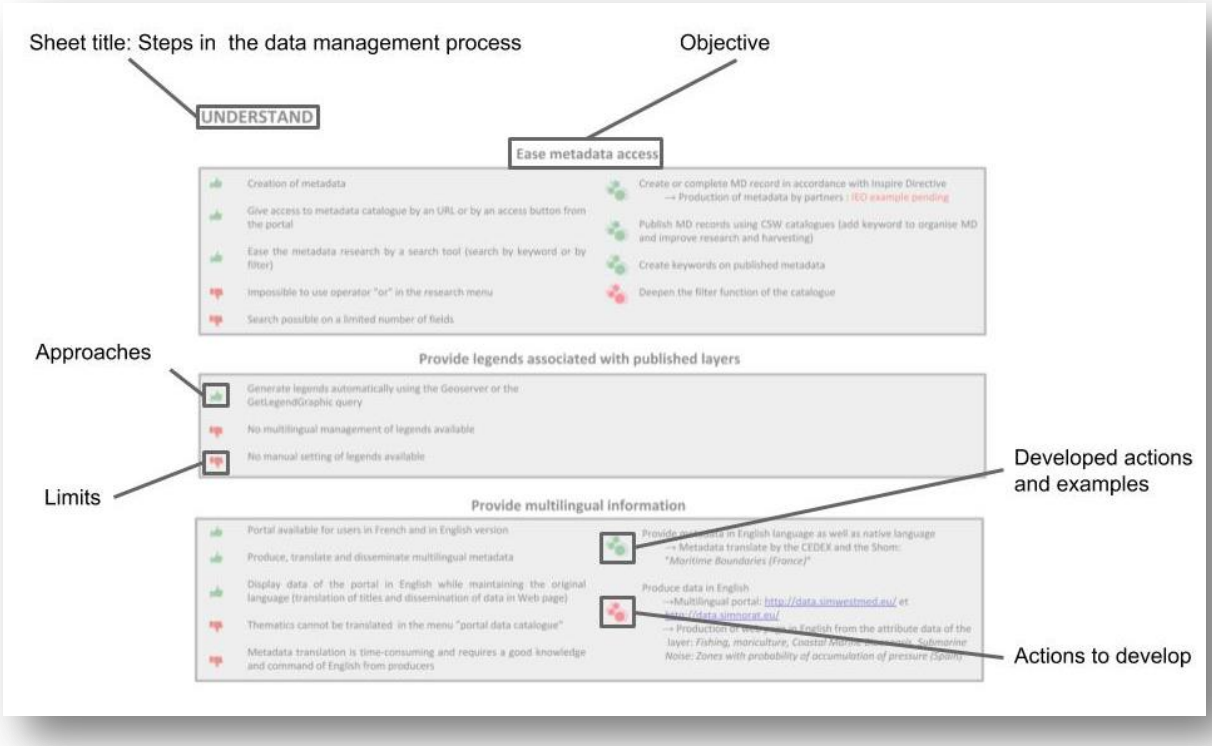


Figure 16: Sheet reading guide

INFORMATION FLOW

Organise metadata collection

Filter the producers CSWs to harvest relevant metadata	Deepen the filtering function of Geonetwork harvesting especially in the new version of the Geonetwork
Impossibility to filter on a field according to several modalities (and/or)	

Assess the compatibility of protocols and standards

Harvest Web services at WMS and WFS formats
Impossibility to harvest Web services at WCS, SOAP and WMTS formats
Compatibility issues of tools (implementation of the standard can be different), version issues. For example, some web services of type WMS, WFS do not work.

Organise metadata dissemination

Filter an harvested catalogue by keyword or by spatial extend	Publish MD records using CSW catalogues

Manage published WebServices instability

Geoserver doesn't manage the input Web Services problems : it can stop working in case the input GetCapabilities request does not work without warning	Develop a monitoring tool to check the correct functionning of the WebServices and the good setting of the tools → Test the GetMap and GetCapabilities request → Compare WebServices stored in Geoserver and set in the portals → Test whether WebServices set in Geoserver or enable or not.
	Automatisation of the script execution
	Implementation of an alert system
	Building up programs to check the correct functioning of harvested metadata

INFORMATION FLOW (2)

Organise data dissemination

👍 Building up and publish new Web Services 👎 Impossibility to disseminate a custom GetCapabilities 👎 Limitation in the hierarchy of the layers contained in the GetCapabilities. Only the creation of a layer group allows to add a level to the tree	Production of Web Services → Production of Web Services by CEDEX and IEO for the needs of the project → Production of Web Services by Shom: *Cases studies, SIMWESTMED project area* Implement a new button to download the dataset

Publish relevant datasets for the projects and the cases studies

👍 Establish a data inventory with partners collaboration 👍 Implementation of new datasets according to user needs 👎 Difficulties encountered to identify potential users needs	Populate the data portal demonstrator and enrich the inventory of datasets relevant for the project or the case studies → Create and/or publish new datasets like *Cases studies areas, MSFD Mediterranean Marine subregions*

UNDERSTAND

Ease metadata access

- Creation of metadata
- Give access to metadata catalogue by an URL or by an access button from the portal
- Ease the metadata research by a search tool (search by keyword or by filter)
- Impossible to use operator "or" in the research menu
- Search possible on a limited number of fields
- Create or complete MD record in accordance with Inspire Directive
  → Production of metadata by partners
- Publish MD records using CSW catalogues (add keyword to organise MD and improve research and harvesting)
- Create keywords on published metadata
- Deepen the filter function of the catalogue

Provide legends associated with published layers

- Generate legends automatically using the Geoserver or the GetLegendGraphic query
- No multilingual management of legends available
- No manual setting of legends available

Provide multilingual information

- Portal available for users in French and in English version
- Produce, translate and disseminate multilingual metadata
- Display data of the portal in English while maintaining the original language (translation of titles and dissemination of data in Web page)
- Thematics cannot be translated in the menu "portal data catalogue"
- Metadata translation is time-consuming and requires a good knowledge and command of English from producers
- Provide metadata in English language as well as in native language
  → Metadata translate by partners : Areas with high and moderate potential for underwater noise generation (Cedex), Maritime limits and boundaries (Shom)
- Produce data in English
  → Multilingual portal: http://data.simwestmed.eu/
  → Production of web page in English from the attribute data of the layer: EMODnet shellfish production areas, Coastal Marine Biocenosis, Fishing facilities

REPRESENT

Display transboundary dataset

👍 Portrayal management disconnected with the layer management (a style can be used for several layers)	Define and produce common symbology to improve understanding and use of datasets → Using INSPIRE specifications to harmonise data : production of "*Maritime Boundaries (France)*" layer
👍 Portrayal management not limited through a graphical interface (SLD language)	
👎 Difficulties to apply several custom styles in the layer groups	Establish common rules to define, structure and digitalize the data.
👎 Incompatibility of multiple SLD tags imported from other tools (e.g. hatches from Qgis)	Test the use of CSS to manage the portrayal in Geoserver
👎 Impossibility to combine the styles management by SLD language and graphic interface	Test more solution to manage the portrayal in a layer group

ENHANCE

Harness the full potential of the data

Use the FTL and Web page formats to represent the data to: -Manage non-spatial data -Display multiple dataset connected each others with attributes or spatial relationship) -Develop the means to represent the data (graphics, adding images, hyperlinks…)	Develop tools to enhance the information → Production of Web pages based on layers attributes *Ocean Energy Projects Locations (FTL), Submarine Noise: Zones with probability of accumulation of pressure (FTL)* → Production of Web pages based on external database *Test Parc Naturels Marins layers (Web) and the Shom has done work to explain the indicators of the MSFD, developed by the FBA in the Carpe Diem project*
Time-consuming process	
The rights management is complex	Think about other tools for managing relational and non-spatial data
Risk of error in case of change in the restructuring of source data	Deal with more complex relationships between tables

Manage temporal datasets

Use the Geoserver tool to manage rasters datasets with temporal dimension	Identify temporal layers in the study areas of the project (AIS)

Provide the access of multiple MSP data using thematics

Gather datasets in predefined contexts	Creating a map catalogue →The "*Raw material extraction*" map shows all the datasets dealing with the raw material extraction in the project area

Communicate about the content of the portal and its features, its evolutions

Display a dashboard at the start of the portal

Share the used tools

Set integrated Web Processing Services available on the data portal	Develop WPS for non spatial and spatial layers

Conclusion

The setting up and management of a MSDI demonstrator to share MSP knowledge on the Western Mediterranean Sea proved to be an ideal means to explore data interoperability across a transboundary area. It especially allowed validating the core principles supporting SDP. Among them, the use of web services directly harvested from the data producers' SDI tends to be the most efficient way to collect data from partner infrastructures. It also benefits from an evolving context, thanks to the INSPIRE directive. Nevertheless, when building SDP, many challenges have been encountered, and some solutions to overcome them are proposed.

Some of the difficulties encountered are technical gaps, partly due to interoperability issues. Despite the progress achieved so far, issues can arise from the interaction between different software solutions or protocols. Even when using the same protocols, the differences in protocol versions can generate errors. Other technical challenges lie in being able to take advantage of all the aspects of data, including non-geographical information. This is essential when dealing with time series. A possible solution is to add a web server to the SDI in order to permit more complex GetFeatureInfo requests.

Other challenges fall under organisational matters. The varying availability of web services is still an issue that can prevent access to data for whole areas or categories on SDP. Even when they are available, the durability of web services constitutes a major difficulty. One of the proposed solutions to overcome these difficulties relies on the support to the partner organisations from the resources of European projects. This has been partly applied during SIMWESTMED, and could be more intensively exploited in upcoming projects. For the abundance of different data licence policies among data producers, an agreement on a common data licensing at the beginning of a project could allow better use of data from the project partners.

The last kind of challenge encountered is directly linked to data. The most important of these is symbology harmonisation, which is essential when working with data coming from both sides of a boundary. Progressing on this point needs an increased access to Web Feature Services, and a convergence between representation standards on some specific categories.

At a more global scale, SIMWESTMED project initiated the cooperation around the Western Mediterranean Sea between stakeholders involved in marine data management in support of Maritime Spatial Planning. The work undertaken by the data and information requirements for MSP component during more than two years can now provide benefits at several levels. Firstly, this baseline information can be used by marine planners in France, Italy, Malta and Spain to start taking into account the

transboundary context when elaborating national marine plans. Then, at the European level, interactions have to be set with the EMODnet project. As the EMODnet harmonised datasets represented one of the major data sources used in SIMWESTMED, the work of inventory done around the Western Mediterranean Sea could be exploited to complete the coverage of EMODnet, especially concerning the human activities topic.

Finally, the SDI architecture built during the SIMCelt, SIMNORAT and SIMWESTMED projects will continue to be updated through another European project dedicated to MSP: SEANSE (North Sea). This will provide the opportunity to explore interoperability with other European countries, and to complete the data analysis on several European sea basins. It will also give the opportunity to try solving some of the identified challenges by implementing solutions that were imagined during SIMCelt, SIMNORAT and SIMWESTMED projects but could not be experimented.

Annex 1: List of Sources

The datasets selected in the **« Analysis on Data Needs and Existing Gaps »** report are considered relevant for the MSP because they comply with the requirements defined in this report. The selection criteria relate to the interoperability and the exchange of the data like; "Are they available in Web Services? Is there any associated metadata? Are the licenses open? …" The selected datasets are listed below and those that are visible in the SIMWESTMED portal demonstrator are pointed by the green tick (✓) in the table. However, because of incompatibility of standards or protocols and instability related to the web services, some layers may be temporarily unavailable on the SIMWESTMED demonstrator portal.

	Category	Sub category	Layer name	Producer	Portal	Metadata
✓	Administrative boundaries	Terrestrial boundaries	Communes	OSM	DATA.GOUV.FR	https://www.data.gouv.fr/fr/datasets/decoupage-administratif-communal-francais-issu-d-openstreetmap/
✓	Administrative boundaries	Terrestrial boundaries	Départements français	OSM	DATA.GOUV.FR	https://www.data.gouv.fr/fr/datasets/contours-des-departements-francais-issus-d-openstreetmap/
✓	Administrative boundaries	Terrestrial boundaries	Régions françaises	Mission etalab	DATA.GOUV.FR	https://www.data.gouv.fr/fr/datasets/contours-des-regions-francaises-sur-openstreetmap/
✓	Administrative boundaries	Terrestrial boundaries	Limites administrativas	IGN (Spain)	Institut Hydrographico Geoportal	http://www.ign.es/csw-inspire/srv/spa/main.home
✓	Administrative boundaries	Terrestrial boundaries	AdministrativeUnit	DEPARTMENT FOR LOCAL GOVERNMENT	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/4c949ce6-70aa-4b18-b806-2e5a1a9544f9
✓	Administrative boundaries	Terrestrial boundaries	Unita amministrative 2011 regioni	MATTM	Geoportale nazionale	http://www.pcn.minambiente.it/geoportal/catalog/search/resource/details.page?uuid=%7B8AD9BAEA-06E7-4A34-8929-3E927ED8DA64%7D
✓	Administrative boundaries	Terrestrial boundaries	SU. VectorStatisticalUnit.NUTS	NSO	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/b50b7a73-0c55-46f7-b0a2-dd62b8835391
	Administrative boundaries	Terrestrial boundaries	SU. VectorStatisticalUnit.LAU1	NSO	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/3609662c-41ef-4795-8394-7ff560563faa
	Administrative boundaries	Terrestrial boundaries	Administrative unit - level 0		Global administrative area	
✓	Administrative boundaries	Terrestrial boundaries	Unita amministrative 2001 - Province	MATTM	Geoportale nazionale	http://www.pcn.minambiente.it/geoportal/catalog/search/resource/details.page?uuid=%7B8AD9BAEA-06E7-4A34-8929-3E927ED8DA64%7D
✓	Administrative boundaries	Terrestrial boundaries	Unita amministrative 2001 - Comuni	MATTM	Geoportale nazionale	http://www.pcn.minambiente.it/geoportal/catalog/search/resource/details.page?uuid=%7B8AD9BAEA-06E7-4A34-8929-3E927ED8DA64%7D
	Administrative boundaries	Terrestrial boundaries	Maritime State Property Information System			
	Administrative boundaries	Terrestrial boundaries	osm	OSM		https://wiki.openstreetmap.org/wiki/Main_Page
✓	Administrative boundaries	Terrestrial boundaries	NUTS	EUROPEAN COMMISSION;Eurogeographics		https://ec.europa.eu/eurostat/web/nuts/background
✓	Administrative boundaries	Maritime boundaries	Delimitations maritimes	Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/BDML_DELMAR.xml
✓	Administrative boundaries	Maritime boundaries	Lineas de base recta	IHM	Geoportal de la Infraestructura de datos espaciales del Instituto Hidrografico de la Marina	ideihm.covam.es/servicios.html
✓	Administrative boundaries	Maritime boundaries	Mar Territorial	IHM	Geoportal de la Infraestructura de datos espaciales del Instituto Hidrografico de la Marina	ideihm.covam.es/servicios.html
✓	Administrative boundaries	Maritime boundaries	Plateforma continental	IHM	Geoportal de la Infraestructura de datos espaciales del Instituto Hidrografico de la Marina	ideihm.covam.es/servicios.html
✓	Administrative boundaries	Maritime boundaries	Zona Economica Excusiva del Mediterraneo	IHM	Geoportal de la Infraestructura de datos espaciales del Instituto	ideihm.covam.es/servicios.html

					Hidrografico de la Marina	
✓	Administrative boundaries	Maritime boundaries	Baseline_polygon_WGS84_region	MEPA		
✓	Administrative boundaries	Maritime boundaries	12_NauticalMile_WGS84_region	MEPA		
✓	Administrative boundaries	Maritime boundaries	24_NauticalMile_WGS84_region	MEPA		
✓	Administrative boundaries	Maritime boundaries	25_NauticalMile			
✓	Administrative boundaries	Maritime boundaries	SIMWESTMED Project Area	Shom	SIMWESTMED	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/1277536a-0467-462d-9b49-e09231924c9a
✓	Administrative boundaries	Maritime boundaries	SIMWESTMED Project Area Boundaries	Shom	SIMWESTMED	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/1277536a-0467-462d-9b49-e09231924c9a
✓	Administrative boundaries	Cases studies	Var case study area	IGN (France)		https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/IGNF_BDCARTOr_3-2.xml
✓	Administrative boundaries	Cases studies	Strait of Sicily case study area		SIMWESTMED	
✓	Administrative boundaries	Cases studies	Gulf of Lions case study area		SIMWESTMED	
✓	Administrative boundaries	Cases studies	Tyrrhenian case study area		SIMWESTMED	
✓	Physical, chemical & biological information	Physical characteristics	Pression en surface	Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/METEO_R1100_AROME-EURW1S100-MER_20161220.xml
✓	Physical, chemical & biological information	Physical characteristics	Vitesse et direction du vent	Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/METEO_R1000_ARPEGE-EURAT01-MER_20161212.xml
✓	Physical, chemical & biological information	Physical characteristics	Carte sédimentaire mondiale	Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/HOM_GEOL_SEDIM_MONDIALE.xml
✓	Physical, chemical & biological information	Physical characteristics	Trait de côte Histolitt	Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/BDML_TCH.xml
	Physical, chemical & biological information	Physical characteristics	EMODnet Digital Bathymetry (DTM)	EMODNET BATHYMETRY	Emodnet bathymetry Portal	http://www.emodnet-bathymetry.eu/metadata-amp-data/sextant-catalogue-service#/metadata/c7b53704-999d-4721-b1a3-04ec60c87238
	Physical, chemical & biological information	Physical characteristics	emodnet bathymetry source references	EMODNET BATHYMETRY	Emodnet bathymetry Portal	http://www.emodnet-bathymetry.eu/v_cdi_v3/browse_step.asp
✓	Physical, chemical & biological information	Physical characteristics	Linea de Costa	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/visorBase/limites_administrativos/MapServer/0
✓	Physical, chemical & biological information	Physical characteristics	Coast WGS84 Region	MEPA		

	Physical, chemical & biological information	Physical characteristics	Linea di costa aggiornata al 2009	MATTM	Geoportale nazionale	http://www.pcn.minambiente.it/geoportal/catalog/search/resource/details.page?uuid=%7BC49FEE18-000C-4B37-B062-E76BCAD5104F%7D
✓	Physical, chemical & biological information	Physical characteristics	Linea di costa	ISPRA	ISPRA Geoviewer	http://geoportale.isprambiente.it/dettagli/?uuid=ispra_rm%3A20101111%3A100000
✓	Physical, chemical & biological information	Physical characteristics	Land water boundary	IHM	Geoportal de la Infraestructura de datos espaciales del Instituto Hidrografico de la Marina	http://ideihm.covam.es/geonetwork/srv/spa/csw?REQUEST=GetCapabilities&SERVICE=CSW
✓	Physical, chemical & biological information	Physical characteristics	Nature du trait de côte	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=517516
✓	Physical, chemical & biological information	Physical characteristics	Litto3D - PACA 2015	IGN (France) ; Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/BATHYMETRIE_LITTO3D_PACA_2015.xml
✓	Physical, chemical & biological information	Physical characteristics	Salinité eau de mer	Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/HYDRODYN-SURF_HYCOM3D-SURF_R1000_MANGASC60_20170920.xml
✓	Physical, chemical & biological information	Physical characteristics	Température eau de mer	Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/HYDRODYN-SURF_HYCOM3D-SURF_R1000_MANGASC60_20170920.xml
✓	Physical, chemical & biological information	Physical characteristics	MNT Bathymétrique de façade du Golfe du Lion - Côte d'Azur	Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/MNT_MED100m_GDL_CA_HOMONIM_WGS84.xml
✓	Physical, chemical & biological information	Physical characteristics	Sea-floor geology lithology	Federal Institute for Geosciences and Natural Ressources	Emodnet Geology	http://egdi.geology.cz/csw/?service=CSW&request=GetRecordById&id=1a0d46d6-0f93-4564-9e19-de75480e160b&format=text/html&ElementSetName=brief&lang=en&template=iso2html&lang=en
✓	Physical, chemical & biological information	Physical characteristics	LITTO3D ® Languedoc Roussillon 2009	IGN (France), Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/BATHYMETRIE_LITTO3D_LR_2009.xml
✓	Physical, chemical & biological information	Physical characteristics	Zonas de afloramientos	CONSEJERIA DE MEDIO AMBIENTE Y ORDENACION DEL TERRITORIO - JUNTA DE ANDALUCIA	Infraestructura de Datos Espaciales de Espana (IDEE)	http://www.idee.es/csw-inspire-idee/srv/fre/catalog.search#/metadata/b0a32d0079a2de4a3fe1d7b6c4c709c98b486be7
✓	Physical, chemical & biological information	Physical characteristics	Coastal typology	CEDEX		no metadata
✓	Physical, chemical & biological information	Physical characteristics	World Bathymetry (DLR - EOC)	eoc - NASA		
	Physical, chemical & biological	Physical characteristics	Raster Marine	Shom	DATA.SHOM.FR	https://services.mspdata.eu/geonetwork/srv/fre/catalog.search#/metadata/804d20a5-0f3d-4780-9f6b-83b3ee537221

	information					
✓	Physical, chemical & biological information	Physical characteristics	Satellite Imagery (Blue Marble)	eoc - NASA		https://earthobservatory.nasa.gov/Features/BlueMarble/
✓	Physical, chemical & biological information	Physical characteristics	World Bathymetry (GEBCO)	gebco		http://www.gebco.net/data_and_products/gridded_bathymetry_data/gebco_30_second_grid/
✓	Physical, chemical & biological information	Physical characteristics	EMODnet Bathymetry - Mean depth in multi colour	Shom	Emodnet bathymetry Portal	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/e67f32d1-2e6a-4a6d-97e3-5a6c4704d5fb
✓	Physical, chemical & biological information	Physical characteristics	MNT de façadede la Corse	Shom	DATA.SHOM.FR	https://services.mspdata.eu/geonetwork/srv/fre/catalog.search#/metadata/MNT_MED100m_CORSE_HOMONIM_WGS84.xml
✓	Physical, chemical & biological information	Types of habitat	Modelled Spatial Distributions of Coralligenous Habitats	MEDISEH, VLIZ	Emodnet Seabed Habitats Portal	http://gis.ices.dk/geonetwork/srv/eng/catalog.search#/metadata/43c7ac30-04da-479d-b5c1-ba621f0981e4
✓	Physical, chemical & biological information	Types of habitat	Modelled Spatial Distributions of Maerl Habitats	MEDISEH, VLIZ	Emodnet Seabed Habitats Portal	http://gis.ices.dk/geonetwork/srv/eng/catalog.search#/metadata/43c7ac30-04da-479d-b5c1-ba621f0981e4
✓	Physical, chemical & biological information	Types of habitat	Modelled occurrence probability for Posidonia oceanica meadows across the Mediterranean Sea		Emodnet Seabed Habitats Portal	http://gis.ices.dk/geonetwork/srv/eng/catalog.search#/metadata/a93cffc8-8f45-47a4-a9bd-c8ffd9ad53fb
	Physical, chemical & biological information	Types of habitat	EUSeaMap2 (2016) Broad-Scale Predictive Habitat Map	EMODNET SEABED HABITATS	Emodnet Seabed Habitats Portal	http://gis.ices.dk/geonetwork/srv/eng/catalog.search#/metadata/02a444c8-bd2d-4e15-8e69-806059103760
✓	Physical, chemical & biological information	Types of habitat	Naturaleza Fondo Marino	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/visorBase/Naturaleza_del_Fondo_Marino/MapServer
✓	Physical, chemical & biological information	Types of habitat	Carte d'habitats physiques des fonds marins Méditerranée (échelle 1/300 000) version 2011	IFREMER	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/ff8d8cd6-c753-4581-99a3-af23fe4c996b
✓	Physical, chemical & biological information	Types of habitat	Marine Habitats Point Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/8
✓	Physical, chemical & biological information	Types of habitat	Marine Habitats Areas Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/15
✓	Physical, chemical & biological information	Types of habitat	Marine Habitats Facies Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/11
	Physical, chemical & biological	Types of habitat	EUSeaMap 2016 Habitat Descriptors - Substrate	EMODNET SEABED HABITATS	Emodnet Seabed Habitats Portal	

	information					
	Physical, chemical & biological information	Types of habitat	Broad-Scale Predictive Habitat Map - Confidence	EMODNET SEABED HABITATS	Emodnet Seabed Habitats Portal	http://geonetwork.vliz.be/geonetwork/emodnet/eng/catalog.search#/metadata/90454091-2136-4cb0-a14b-daf09ab20dd0
✓	Physical, chemical & biological information	Types of habitat	Presence of the Posidonia habitat	CEDEX		
✓	Physical, chemical & biological information	Biological characteristics	HB.Habitat.PosidoniaOceanicaOnRock.	MEPA	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/385d1f9e-6eaf-481a-8c64-0b0c4124c982
✓	Physical, chemical & biological information	Biological characteristics	HB.Habitat.PosidoniaOceanicaOnSediment.	MEPA	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/b71a1d5c-b78a-46f5-884b-a6539ac0f2e5
✓	Physical, chemical & biological information	Biological characteristics	Positions of Coralligenous point data	MITA	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/34fa7965-f053-49c9-992d-db4e6468dc62
	Physical, chemical & biological information	Biological characteristics	Occurrence of cetaceans	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/eng/metadata.show?uuid=81fbdcac-06eb-4be4-9738-c1be86912d49
	Physical, chemical & biological information	Biological characteristics	Occurrence of turtles	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/eng/metadata.show?uuid=8912733c-cae2-4734-baac-5b0d05c20b0e
✓	Physical, chemical & biological information	Biological characteristics	Maerl Bottom LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/6
✓	Physical, chemical & biological information	Biological characteristics	Caulerpa Posidonia Oceanica Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/12
✓	Physical, chemical & biological information	Biological characteristics	Laminarias Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/10
✓	Physical, chemical & biological information	Biological characteristics	Non-native points Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/3
✓	Physical, chemical & biological information	Biological characteristics	Cartographie de l'herbier de Posidonie de Toulon à Hyères (Var, France)	IFREMER	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/bf44e010-2354-11dd-aeec-000086f6a603
✓	Physical, chemical & biological information	Types of habitats	Biocenosi marine costiere	MATTM		http://sinva.ancitel.it/catalogometadati/srv/en/main.home
	Physical, chemical & biological	Biological characteristics	Posidonia oceanica	MEDISEH		http://data.adriplan.eu/layers/geonode%3Aposshp_0

	information					
✓	Physical, chemical & biological information	Biological characteristics	Sardina pilchardus (European pilchard) recruits	MEDISEH		http://data.adriplan.eu/layers/geonode%3Asard_pil_med_r_pers_jun_0#more
✓	Physical, chemical & biological information	Biological characteristics	Nephrops norvegicus (Norway lobster) spawners	MEDISEH		http://data.adriplan.eu/layers/geonode%3Anephnors_0
✓	Physical, chemical & biological information	Biological characteristics	Coralligenous communities (model)	MEDISEH		http://data.adriplan.eu/layers/geonode%3Acormed50_0#more
✓	Physical, chemical & biological information	Biological characteristics	Marine Mammals sightings	ISMAR		http://data.adriplan.eu/layers/geonode%3Amammals_sightings#more
✓	Physical, chemical & biological information	Biological characteristics	Répartition des Palinurus mauritanicus et des Palinurus elephas	IFREMER	SEXTANT	http://sextant.ifremer.fr/geoportail/sextant#/metadata/fa158330-2fbb-4075-9926-04460754377b
✓	Physical, chemical & biological information	Biological characteristics	Répartition des Isidella elongata	IFREMER	SEXTANT	http://sextant.ifremer.fr/geoportail/sextant#/metadata/a10af07b-6bb5-4a58-a520-2b8ab87ca04c
✓	Physical, chemical & biological information	Pressures	Zonas sensibles identificadas por poligonos	MAPAMA	Geoportal del Ministerio de Agricultura y Pesca Alimentacion medio ambiente (MAPAMA)	http://www.mapama.gob.es/ide/metadatos/index.html?srv=metadata.show&uuid=7ff2d39d-a5dc-4633-974e-9a3cd4335ba6
	Physical, chemical & biological information	Pressures	Potential fishing pressure along the Mediterranean Sea Coast	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/5f12865d-4982-451f-84f6-2514942893a4
	Physical, chemical & biological information	Pressures	Marine pressure of climate change	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/b060c352-e761-489c-93f0-b20c5c6a5c75
	Physical, chemical & biological information	Pressures	Oil spills density	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/9d50a367-0edd-4d74-968f-f58ef582432c
	Physical, chemical & biological information	Pressures	OSPAR Marine Contaminants - Water	OSPAR COMMISSION	ODIMS (OSPAR DATA PORTAL)	http://odims.ospar.org/layers/geonode:geonode_OSPAR_OSPAR_contaminants_CW_2015/metadata_detail
✓	Physical, chemical & biological information	Pressures	Data on transfers and release of pollutants to the environment	MITA	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/74b62525-0f16-4496-a985-eaa2e9260a93
✓	Physical, chemical & biological information	Pressures	Sites d'immersion des sédiments de dragages portuaires 2005-2015	DEB, DGITM, MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?fileIdentifier=8be02bea-2885-4944-8d95-2bfb4de853ab
	Physical, chemical & biological	Pressures	Cumulative Pressure Indicator: pressure categories	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/6bbb7f3d-699e-4a68-8fb3-a84698405a80

	information					
	Physical, chemical & biological information	Pressures	Marine exposure due to port activity in Mediterranean Sea	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/fd966672-5db0-4c96-bb9d-5f1362e21c7f
	Physical, chemical & biological information	Pressures	Marine litter by transport influence	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/65ac5d4e-e019-4e5a-b692-be390bef67b7
✓	Physical, chemical & biological information	Pressures	Contaminants in Mussel Distribution LBMD - SIMWESTMED	IEO		http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/2
✓	Physical, chemical & biological information	Pressures	Contaminants in Red Mullet Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/1
✓	Physical, chemical & biological information	Pressures	Contaminants in Sediments Distribution LBMD - SIMWESTMED	IEO	IEO Portal	barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/0
✓	Physical, chemical & biological information	Pressures	Marine Litter Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/16
	Physical, chemical & biological information	Pressures	indice de sensibilité morpho-sédimentaire de l'estran du littoral français	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?fileIdentifier=4eb7b281-e4cc-4b1f-9221-d30775d4b84a
✓	Physical, chemical & biological information	Pressures	Livello naturalita delle acque	MATTM	SINVA - Sistema Informativo Nazionale per le Valutazioni Ambientali	http://sinva.ancitel.it/catalogometadati/srv/en/main.home
✓	Physical, chemical & biological information	Pressures	Procedure VIA in corso - Opere puntuali	MATTM		http://www.va.minambiente.it/it-IT/DatiEStrumenti/MetadatoStrato/630171c8-4e50-8a15-254a-498664407515
✓	Physical, chemical & biological information	Pressures	Zonas con probabilidad de acumulacion de presiones : aloctonas	CEDEX		http://remro.cedex.es/WebCepyc/Demarcaciones.html
✓	Physical, chemical & biological information	Pressures	Zonas con probabilidad de acumulacion de presiones : aloctonas	MAPAMA		http://remro.cedex.es/WebCepyc/Demarcaciones.html
✓	Physical, chemical & biological information	Pressures	Mallado de acumulacion de presiones :aloctonas (	CEDEX		http://remro.cedex.es/WebCepyc/Demarcaciones.html
	Physical, chemical & biological information	Pressures	Dumping of dredged material - 2016	CEDEX		no metadata
✓	Physical, chemical & biological	Pressures	Zonas con probabilidad de acumulacion de presiones: Ruido Submarino	CEDEX		https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/eng/catalog.search#/metadata/ESMAGRAMAEMLEBAPREZORUIDO20121115001

	information					
✓	Physical, chemical & biological information	Pressures	Mallado de acumulacion de presiones - organismos patogenos	CEDEX		http://remro.cedex.es/WebCepyc/Demarcaciones.html
✓	Physical, chemical & biological information	Pressures	Zonas con probabilidad de acumulacion de presiones : patogenos	CEDEX		http://remro.cedex.es/WebCepyc/Demarcaciones.html
	Physical, chemical & biological information	Pressures	Mallado de acumulacion de presiones: ruido submarino	CEDEX		http://remro.cedex.es/WebCepyc/Demarcaciones.html
✓	Physical, chemical & biological information	Pressures	WFD CW Chemical Status	CEDEX		
✓	Physical, chemical & biological information	Pressures	WFD CW Ecological status - Fitoplancton	CEDEX		
✓	Physical, chemical & biological information	Pressures	Carpe Diem - Risque d'exposition écologique - ensemble des pressions	AFB		
✓	Spatial policy	Spatial policy	MSFD Regions and Subregions	ETC – UMA, EEA, EUROPEAN COMMISSION	EEA Discomap	http://marine.discomap.eea.europa.eu/arcgis/rest/services/Marine/Marine_regions_subregions/MapServer
✓	Spatial policy	Spatial policy	DCSMM - Sous régions marines	AFB	EEA Discomap, SEXTANT	http://sextant.ifremer.fr/geonetwork/srv/fre/md.format.html?uuid=fed29b44-a074-4025-a23c-dfa59942f458&xsl=mdviewer
✓	Spatial policy	Spatial policy	DCSMM - Sous régions marines (subdivisées)	AFB	EEA Discomap , SEXTANT	http://sextant.ifremer.fr/geonetwork/srv/fre/md.format.html?uuid=fed29b44-a074-4025-a23c-dfa59942f458&xsl=mdviewer
	Spatial policy	Spatial policy	Coastal and Marine Infrastructure as per SPED	Planning Authority	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/9cfed231-5a7f-4875-95be-78204920de2c
	Spatial policy	Spatial policy	Zones de compétence DIRM	IFREMER	SEXTANT	http://sextant.ifremer.fr/geonetwork/srv/fre/csw?SERVICE=CSW&REQUEST=GetCapabilities&VERSION=2.0.2
	Spatial policy	Spatial policy	Zones de compétence en mer du préfet de région	IFREMER		
✓	Spatial policy	Spatial policy	Dominio publico maritimo terrestre	MAPAMA	MAPAMA Acuivisor	http://www.mapama.gob.es/ide/metadatos/srv/spa/metadata.show?uuid=6bd4a451-4cc0-4ebb-9687-2119027fd12e
✓	Spatial policy	Spatial policy	Demarcaciones hidrograficas	MAPAMA	MAPAMA Acuivisor	http://www.mapama.gob.es/ide/metadatos/index.html?srv=metadata.show&uuid=95b8abce-2083-40b3-bd6b-83a7d8a72307
✓	Spatial policy	Spatial policy	Périmètre des SAGE en métropôle	Sandre, Office International de l'eau	SANDRE	http://www.sandre.eaufrance.fr/atlas/srv/fre/catalog.search;jsessionid=10ai1vvw2808ju7n8hcn9d7fi#/metadata/2faf7c9e-ad62-4137-b80b-8b0caa3609cb
✓	Spatial policy	Spatial policy	Mediterranean and black sea (Major Fishing Area 37)			http://www.fao.org/fishery/area/Area37/en
✓	Spatial policy	Spatial policy	Loi littoral - DREAL OCCITANIE	DREAL Occitanie	Picto-occitanie	https://www.picto-occitanie.fr/geonetwork/srv/fre/catalog.search#/metadata/37e6b738-2c3d-4a09-ac33-c9fe581388ce
✓	Spatial policy	Spatial policy	Banned anchoring areas	CEDEX		
✓	Spatial policy	Spatial policy	MSFD Marine Districts	CEDEX		
✓	Spatial policy	Spatial policy	Western Mediterranean (Subarea 37.1 of FAO Major Area 37)			http://www.fao.org/geonetwork/srv/en/main.home?uuid=ac02a460-da52-11dc-9d70-0017f293bd28
✓	Spatial policy	Spatial policy	MSFD Atlantic Marine subregions	EEA		http://marine.discomap.eea.europa.eu/arcgis/rest/services/Marine/Marine_regions_subregions/MapServer/0

✓	Spatial policy	Spatial policy	MSFD Mediterranean Marine subregions	EEA		http://marine.discomap.eea.europa.eu/arcgis/rest/services/Marine/Marine_regions_subregions/MapServer
	Spatial policy	Spatial policy	EMODnet Barcelona Convention	EMODnet Human Activities	EMODnet human activities Portal	http://www.emodnet.eu/geonetwork/emodnet/fre/catalog.search#/metadata/84af86e1-9d76-4739-b7f0-c9f2f3359419
	Spatial policy	Spatial policy	Demarcaciones marinas	MAPAMA	MAPAMA Acuivisor	https://www.mapama.gob.es/ide/metadatos/index.html?
✓	Spatial policy	Spatial policy	Marine area up to 25nm as covered by SPED	Planning Authority	Malta Spatial data Infrastructure (MSDI)	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/9732ab25-9577-4b4f-b375-ba2fe053cf73
✓	Spatial policy	Spatial policy	Schéma de Cohérence Territoriale (ScoT)	DREAL PACA	CRIGE PACA	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/fr-120066022-jdd-557e0ce3-6fce-43fe-84ff-e5ba943f7d4f
✓	Spatial policy	Spatial policy	Programme d'Action de Prévention des Inondations (PAPI)	DREAL PACA	CRIGE PACA	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/fr-120066022-jdd-5c1337ea-d4bf-495d-9140-6f0976788499
✓	Spatial policy	Spatial policy	Territoires à Risque Important d'inondation (TIR)	DREAL PACA	CRIGE PACA	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/fr-120066022-jdd-57ff3287-e2fe-4e66-be46-1a62c1db8e78
✓	Spatial policy	Spatial policy	Les documents d'objectifs en région PACA	DREAL PACA	CRIGE PACA	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/fr-120066022-jdd-6f0573aa-4268-4ebc-8999-600d7682e61d
✓	Spatial policy	Spatial policy	Contrats de milieux	DREAL PACA	CRIGE PACA	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/fr-120066022-jdd-3aed9a8a-477c-4ec1-afbb-c0642cca8312
✓	Spatial policy	Spatial policy	Contrats de milieu Métropole	Sandre	SANDRE	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/6fc5dd46-c608-4223-95e0-25b4cb4815f0
✓	Spatial policy	Land use	Mode d'occupation du sol sur le littoral (LittoMos)	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?fileIdentifier=f63f945a-8295-40b0-90e3-83c1cff208d4
✓ ✓	Spatial policy	Land use	Ortho littorale	MEDDE	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?fileIdentifier=99edfdf3-c1b2-4879-b58e-6b79a9e5c37c
✓	Spatial policy	Land use	Corine Land Cover 2012	MEEM	Geoportail	http://www.geocatalogue.fr/Detail.do?id=300875
✓	Spatial policy	Land use	Corine Land Cover 1990 / 2000 / 2006 /2012 Spain	IGN (Spain)	Instituto Geografico Nacional	http://centrodedescargas.cnig.es/CentroDescargas/linkMD
✓	Spatial policy	Land use	Corine Land Cover	ISPRA	ISPRA Geoviewer	http://geoportale.isprambiente.it/dettagli/?uuid=ispra_rm%3A20101019%3A110001
✓	Spatial policy	Land use	Corine land cover 2012	MITA	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/44180a2c-bdd9-4563-a713-532a386ed5da
✓	Socio-economic data	Socio-economic data	Employment by Port Authority	CEDEX		
✓	Socio-economic data	Socio-economic data	Density of population in municipalities - 2016	CEDEX		
✓	Socio-economic data	Socio-economic data	Population in municipalities - 2016	CEDEX		
✓	Socio-economic data	Socio-economic data	Demographic Vulnerability 2011	CEDEX		
	Human activities	Aquaculture	Finfish farming sites	EMODnet Human Activities	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Finfish+Production
✓	Human activities	Aquaculture	Shellfish production areas	EMODnet Human Activities	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Shellfish+Production
✓	Human activities	Aquaculture	Position of the Aquaculture boundary farms	MITA	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/fre/catalog.search#/metadata/f4403562-c0f4-46d0-83af-36e75507de27
✓	Human activities	Aquaculture	Pisciculture existante	IFREMER	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/ebcdaa60-ee0e-11dd-87c4-000086f6a603
✓	Human activities	Aquaculture	Cadastre aquacole	DDTM	SEXTANT	http://sextant.ifremer.fr/geonetwork/srv/fre/catalog.search#/metadata/95e65d50-88fd-11df-9d72-005056987263
✓	Human activities	Aquaculture	EUROSHELL - Shellfish farmer's organizations	IFREMER	SEXTANT	https://inspire.data.gouv.fr/datasets/f0eb264125e1f4642e12f06f004c4ee033c2947a
✓	Human activities	Aquaculture	Potentiel pisciculture	IFREMER	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/ebcdaa60-ee0e-11dd-87c4-

						000086f6a603
✓	Human activities	Aquaculture	Mollusc farming area	CEDEX		
✓	Human activities	Aquaculture	Fishing vulnerability due to aquaculture	CEDEX		
✓	Human activities	Aquaculture	Aquaculture facilities 2010-2011	CEDEX		
✓	Human activities	Aquaculture	EMODnet Finfish production	EMODnet Human Activities	EMODnet human activities Portal	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/fd893ee5-15ca-4035-bf0e-1cac6a8bfe9f
	Human activities	Fishing	Les cantonnements de pêche dans les eaux françaises	AFB	AFB Cartomer	http://cartographie.aires-marines.fr/geosource/apps/search/?uuid=17197870-0222-4f80-9961-0685dc7d06be
✓	Human activities	Fishing	Confraries de pescadors	Govern Illes Ballears	Infraestructura de dades espacials de les illes balears	
	Human activities	Fishing	Caladeros	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/visorBase/Usos_del_medio/MapServer/0
✓	Human activities	Fishing	Fisheries management conservation zone	MEPA		
✓	Human activities	Fishing	AF.AquacultureHolding.TrawlingSites	MITA	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/63fbe1df-3707-4677-9067-f193415c4d7b
	Human activities	Fishing	Subceptible Fishes Species LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/16
	Human activities	Fishing	Fishing Effort Bottom Trawl Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/25
	Human activities	Fishing	Fishing Effort Purse-Seine Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/20
	Human activities	Fishing	Fishing Effort Gillnets Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/19
✓	Human activities	Fishing	Fishing Effort Bottom Longline Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/24
✓	Human activities	Fishing	Fishing Effort Hand Lines Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/21
	Human activities	Fishing	Fishing Effort Traps Distribution LBMD - SIMWESTMED	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/22
✓	Human activities	Fishing	Zones de pêche et activité en mer	MEDOBS	SEXTANT	http://sextant.ifremer.fr/geonetwork/srv/fre/catalog.search#/metadata/db439bee-590a-431d-9f2d-ecd8080b7019
	Human activities	Fishing	Criées	IFREMER	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/d6d54f74-c463-43e4-99f3-d5ba43c1012e
	Human activities	Fishing	Zones d'autorisation de pàªche dans les eaux françaises par les navires étrangers (version SIH)	AFB	SEXTANT	http://www.ifremer.fr/services/wms/sih_referentiels?SERVICE=WMS&REQUEST=GetCapabilities
	Human activities	Fishing	Fishing Effort Top Longline Distribution LBMD - SIMWESTMED	IEO		http://barretosm.md.ieo.es/arcgis/rest/services/MSFD/IEO_MSFD_DMLB/MapServer/24
✓	Human activities	Fishing	Geographical subareas (GSAs)	GFCM		http://www.fao.org/gfcm/data/map-geographical-subareas/en/
✓	Human activities	Fishing	Fish markets	CEDEX		
✓	Human activities	Fishing	Total number of vessels 2016	CEDEX		
	Human activities	Renewable energies infrastructures	Ocean energy facilities	AZTI-TECNALIA	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Project+Locations
✓	Human activities	Renewable energies infrastructures	EMODnet Wind Farms	CETMAR	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Wind+Farms+%28Points%29
✓	Human activities	Renewable energies infrastructures	Ocean energy facilities : Project location	AZTI-TECNALIA	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Project+Locations
✓	Human activities	Renewable energies infrastructures	Eolien flottant : appel à projet 2015 (polygones)	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?fileIdentifier=a00c44c2-4965-48a4-9c6e-2cd586bc7e80
✓	Human activities	Renewable	Eolien flottant : Gisement technique	DGES, MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?fileIdentifier=88ce8c03-55ab-4693-a1cf-

		energies infrastructures				dd0a8bbfb543
✓	Human activities	Renewable energies infrastructures	Eolien posé : Gisement technique	DGES, MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?fileIdentifier=091faaeb-ed41-4947-a32f-2c42d142169e
✓	Human activities	Renewable energies infrastructures	Gisement technique pour le développement de l'énergie houlomotrice	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?fileIdentifier=8ed5490d-255c-44ec-ac57-abe44fed1f99
✓	Human activities	Renewable energies infrastructures	Wind zones	CEDEX		no metadata
	Human activities	Installations and infrastructure	Arrecifes Artificiales Zonas	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/visorBase/Usos_del_medio/MapServer/2
	Human activities	Installations and infrastructure	Arrecifes Artificiales Poligonos	IEO	IEO Portal	http://barretosm.md.ieo.es/arcgis/rest/services/visorBase/Usos_del_medio/MapServer/2
	Human activities	Installations and infrastructure	Mouillages ou abris	IFREMER	SEXTANT	http://sextant.ifremer.fr/geonetwork/srv/fre/catalog.search#/metadata/d2ac9538-ba63-46d3-9a36-8e1d1e046b26
✓	Human activities	Installations and infrastructure	Ouvrages et aménagements littoraux	MEEM, CEREMA	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=564691
✓	Human activities	Installations and infrastructure	Wrap Areas	CEDEX		
✓	Human activities	Installations and infrastructure	Desalinization plants	CEDEX		
✓	Human activities	Maritime transport routes and traffic flows	EMODnet Lighthouses	AMATEUR RADIO LIGHTHOUSE SOCIETY	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Lighthouses
✓	Human activities	Maritime transport routes and traffic flows	light	IHM	Geoportal de la Infraestructura de datos espaciales del Instituto Hidrografico de la Marina	ideihm.covam.es/servicios.html
	Human activities	Maritime transport routes and traffic flows	Harbour Approach routes and Communication infrastructure	MITA, DGITM	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/1bb1595b-a6e5-4f2e-bcaf-ff6fc72150fa
✓	Human activities	Maritime transport routes and traffic flows	Nombre estimé de cargos sur l'année 2016		GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=556519
✓	Human activities	Maritime transport routes and traffic flows	Nombre estimé de navires de' Class B' sur l'année 2016	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=556519
✓	Human activities	Maritime transport routes and traffic flows	Nombre estimé de navires de ' passagers' sur l'année 2016	DGITM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=556519
✓	Human activities	Maritime transport routes and traffic flows	Nombre estimé de navires de pêche sur l'année 2016	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=556519
✓	Human activities	Maritime transport routes and traffic flows	Nombre estimé de navires toutes catégories sur l'année 2016	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=556519
✓	Human activities	Maritime transport routes and traffic flows	Nombre estimé de tankers sur l'année 2016	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=556519
✓	Human activities	Maritime transport routes and traffic flows	Nombre estimé de yachts sur l'année 2016	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=556519
	Human activities	Maritime transport routes and traffic flows	Alerts and accidents between 2008 and 2014	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/c40ba87f-dee2-4a67-af5a-02f5372be1bd

✓	Human activities	Maritime transport routes and traffic flows	Chenaux d'accès aux ports	CEREMA	SEXTANT	http://sextant.ifremer.fr/geonetwork/srv/fre/catalog.search#/metadata/f3255cda-e0e0-476c-b7ca-41cf9ae2fd11
	Human activities	Maritime transport routes and traffic flows	Localisation des CROSS	CROSS	SEXTANT	http://sextant.ifremer.fr/geonetwork/srv/fre/catalog.search#/metadata/1a6fbfa4-24a2-4eae-b017-962145ce442d
✓	Human activities	Maritime transport routes and traffic flows	Motorways of the seas	EUROPEAN COMMISSION		http://data.adriplan.eu/layers/geonode%3Amotorways_seas_4326#more
✓	Human activities	Maritime transport routes and traffic flows	Anchorages	CEDEX		
	Human activities	Maritime transport routes and traffic flows	VTS - Vessel Traffic System			
✓	Human activities	Maritime transport routes and traffic flows	AIS signals in a month	CEDEX		
✓	Human activities	Maritime transport routes and traffic flows	Traffic separation schema	CEDEX		
✓	Human activities	Ports	EMODnet Main Ports	COGEA, EUROFISH	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Main+Ports
	Human activities	Ports	Cruise port index	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/1bd7a338-7d30-4f80-ad48-9a129c2a55e5
	Human activities	Ports	Ferry port index	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/32d4845d-789c-491b-9b4a-431bdfd60a5d
	Human activities	Ports	Goods transports index	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/b0d1fff2-91b7-402b-a853-3bf022f8e9c3
	Human activities	Ports	Fishing ports index	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/fre/catalog.search#/metadata/8c3927e4-ddae-496e-b654-7665c4b163df
	Human activities	Ports	Passengers port index	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/eng/metadata.show?uuid=93ebc827-68fc-4c6d-a86a-92cc66be6456
✓	Human activities	Ports	Ports (version SIH)	IFREMER	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/998f4c00-a7fa-11dc-bb52-000086f6a62e
	Human activities	Ports	Impianti di pesca, maricoltura e barriere di ripopolamento ittico	REGIONE LIGURIA	Region Liguria cartografia	http://geoportale.regione.liguria.it/geoportal/catalog/search/resource/details.page?uuid=r_liguri:D.911.2012-12-21
✓	Human activities	Ports	Total goods	CEDEX		
✓	Human activities	Ports	State Owned Ports	CEDEX		
	Human activities	Nature and species conservation sites & protected areas	Aire de protection du biotope	AFB	AFB Cartomer	http://cartographie.aires-marines.fr/geosource/apps/search/?uuid=5ec5bc51-3533-4648-a836-c72132199492
	Human activities	Nature and species conservation sites & protected areas	Réserve naturelle	AFB	AFB Cartomer	http://cartographie.aires-marines.fr/geosource/apps/search/?uuid=42f12513-a875-4172-8dfb-aca8cde12411
	Human activities	Nature and species conservation sites & protected areas	Site d'importance communautaire	AFB	AFB Cartomer	http://cartographie.aires-marines.fr/geosource/apps/search/?uuid=7624364c-e548-4298-af61-e318ef6ae055
	Human activities	Nature and species conservation sites & protected areas	Zone de protection spéciale	AFB	AFB Cartomer	http://cartographie.aires-marines.fr/geosource/apps/search/?uuid=f7e485d5-bd02-496c-a749-5af9505271a5
	Human activities	Nature and species conservation sites & protected areas	Zone spéciale de conservation	AFB	AFB Cartomer	http://cartographie.aires-marines.fr/geosource/apps/search/?uuid=7624364c-e548-4298-af61-e318ef6ae055
✓	Human activities	Nature and species	EMODnet Natura 2000 sites	COGEA	EMODnet human activities Portal,	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Natura+2000

		conservation sites & protected areas			SISTEMA NACIONAL INFORMACAO DE AMBIANTE	
✓	Human activities	Nature and species conservation sites & protected areas	EMODnet Nationally Designated Areas	COGEA	EMODnet human activities Portal, SISTEMA NACIONAL INFORMACAO DE AMBIANTE	http://77.246.172.208/geoserver/emodnet/wfs?VERSION=1.1.0&
✓	Human activities	Nature and species conservation sites & protected areas	Inventario Espanol de Zonas Humedas (IEZH_ES)	MAPAMA	Geoportal del Ministerio de Agricultura y Pesca Alimentacion medio ambiente (MAPAMA)	http://www.mapama.gob.es/ide/metadatos/index.html?srv=metadata.show&uuid=98a15f5f-666d-45d9-a972-ff3a73f8479b
✓	Human activities	Nature and species conservation sites & protected areas	Santuario per i mammiferi marini	MATTM	Geoportale nazionale	http://www.pcn.minambiente.it/geoportal/catalog/search/resource/details.page?uuid=%7BDEE8AFEE-7E8A-431A-AC01-DE8FE8936251%7D
✓	Human activities	Nature and species conservation sites & protected areas	Zone di Protezione Ecologica (ZPE)	MATTM	Geoportale nazionale	http://www.pcn.minambiente.it/geoportal/catalog/search/resource/details.page?uuid=%7B91721EF1-4C34-44AD-A95E-13C7DB526A5F%7D
✓	Human activities	Nature and species conservation sites & protected areas	Parcs naturels marins - métropole	MNHN	Inventaire National du Patrimoine Naturel	http://metadata.carmencarto.fr/geosource/119/fre/metadata.show?uuid=193b1776-420f-44eb-86c8-4144fda4b0ba
✓	Human activities	Nature and species conservation sites & protected areas	Sites Ramsar - métropole	MNHN	Inventaire National du Patrimoine Naturel	http://metadata.carmencarto.fr/geosource/119/fre/find?uuid=1DB87106-328F-4718-90B1-E0B3FE875B0C
✓	Human activities	Nature and species conservation sites & protected areas	Terrains du conservatoire du littoral - métropole	MNHN	Inventaire National du Patrimoine Naturel	http://metadata.carmencarto.fr/geosource/119/fre/find?uuid=3e79098c-6875-4442-a3e0-d1465471bddf
✓	Human activities	Nature and species conservation sites & protected areas	ZNIEFF 2 mer	MNHN	SISTEMA NACIONAL INFORMACAO DE AMBIANTE, Inventaire National du Patrimoine Naturel	
✓	Human activities	Nature and species conservation sites & protected areas	Wetland	MITA	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/4cc732d3-c205-4405-88b6-332f43d15daa
✓	Human activities	Nature and species conservation sites & protected areas	Zones humides d'importance majeure	ONZH	RPDZH	http://www.geosource.reseau-zones-humides.org/geosource/srv/fre/catalog.search#/metadata/c2110625-8942-463b-8cbd-c97578858592
✓	Human activities	Nature and species conservation sites & protected areas	Zone umide costiere	Regione Autonoma della Sardegna	SardegnaMappe	http://webgis2.regione.sardegna.it/catalogodati/card.jsp?uuid=R_SARDEG:d8631834-9f43-4959-95d9-0a21c046318c
✓	Human activities	Nature and species conservation sites & protected areas	Cetacean migration corridor	CEDEX		
	Human activities	Nature and species conservation sites & protected areas	Les Aires Marines Protégées françaises	AFB		
✓	Human activities	Nature and species conservation sites & protected areas	Suivi du Parc naturel marin d'Iroise - Lieux de surveillance des Contaminants	Shom		
✓	Human activities	Nature and species conservation sites & protected areas	Suivi du Parc naturel marin d'Iroise - Sites de suivi des macrodéchets	Shom		
	Human activities	Military	Dumped munitions - polygon	CETMAR	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Dumped+Munitions+%28Polygons%29
✓	Human activities	Military	Localisation des sémaphores	Préfectures maritimes, CEREMA	SEXTANT	http://sextant.ifremer.fr/geonetwork/srv/fre/catalog.search#/metadata/2471ba17-bc61-4308-9e99-1d0677d5d8fe
✓	Human activities	Military	Zone de tirs d'essais	CEREMA	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/f5fd6fef-433e-46d7-8a98-8e9a4c3756d8
✓	Human activities	Military	Zone de tir	CEREMA	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/606faadf-5538-496f-8894-2c37dea86ba8

✓	Human activities	Military	Munition disposal sites	CEDEX		
✓	Human activities	Military	Military zones	CEDEX		
	Human activities	Military	EMODnet Dredge dumping munition sites	EMODnet Human Activities		
✓	Human activities	Military	Dépose de munitions	CEREMA, Préfectures maritimes	SEXTANT	https://sextant.ifremer.fr/geonetwork/srv/fre/catalog.search#/metadata/1eb6de9e-a43f-4ec2-b7ca-3d9b59d9b435
✓	Human activities	Raw material extraction	EMODnet Aggregate Extraction Locations	AZTI-TECNALIA	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Aggregate+Extraction
✓	Human activities	Raw material extraction	EMODnet Hydrocarbon Extraction Offshore Installations	COGEA, EMODnet Human Activities	EMODnet human activities Portal	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/37d846d9-f056-4b91-887b-f918eb8ef5df
✓	Human activities	Raw material extraction	LU.ZoningElement.MarineFacilities	Planning Authority	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/cd55feff-6543-4aad-b08d-b840e7af51db
	Human activities	Raw material extraction	Zone marine	MISE	SINVA - Sistema Informativo Nazionale per le Valutazioni Ambientali	http://sinva.ancitel.it/mapviewer/action.php?method=catalogo&url=http%3A//sinva.ancitel.it/catalogometadati/srv/en/metadata.show%3Fid%3D904
✓	Human activities	Raw material extraction	Permessi di ricerca attivi al 31 gennaio 2016	MATTM, MISE	SINVA - Sistema Informativo Nazionale per le Valutazioni Ambientali	http://sinva.ancitel.it/catalogometadati/srv/en/main.home
✓	Human activities	Raw material extraction	Localisation des forages exploratoires d'hydrocarbures en mer	Ministère de l'Industrie	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/425cccc6-ddef-40e7-9a88-a19c50b669c5
✓	Human activities	Raw material extraction	Piattaforme_Oil&Gas_offshore	MISE		http://unmig.mise.gov.it/unmig/accordi/rse/ottimizzazione_energetica_piattaforme.pdf
	Human activities	Raw material extraction	mappa_eolica	MISE		http://unmig.mise.gov.it/unmig/accordi/rse/ottimizzazione_energetica_piattaforme.pdf
	Human activities	Raw material extraction	Mappa solare	MISE		http://unmig.mise.gov.it/unmig/accordi/rse/ottimizzazione_energetica_piattaforme.pdf
✓	Human activities	Raw material extraction	Sand extraction	CEDEX		
	Human activities	Raw material extraction	Natural gas storage platform	CEDEX		
✓	Human activities	Raw material extraction	Reserved area for capture and storage of atmospheric carbon	CEDEX		
	Human activities	Raw material extraction	Hydrocarbon concessions	CEDEX		
✓	Human activities	Raw material extraction	EMODnet Hydrocarbon Extraction Active Licences	EMODnet Human Activities	EMODnet human activities Portal	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/55bebb73-dd5e-405a-a653-37680b2c8dff
✓	Human activities	Raw material extraction	Emodnet Hydrocarbon Extraction Boreholes	EMODnet Human Activities	EMODnet human activities Portal	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/cbe07847-0c51-412d-b559-c2558587e0fe
✓	Human activities	Raw material extraction	Hydrocarbon exploration and exploitation	CEDEX		
✓	Human activities	Raw material extraction	Oil platform	CEDEX		
	Human activities	Scientific research	Lieux d'observation et de surveillance du réseau REPHY	IFREMER	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/aa8fe568-d2c0-4b53-a8bb-d9fcef2b5293
✓	Human activities	Scientific research	Lieux d'observation et de surveillance du réseau REMI	NSO	SEXTANT	http://sextant.ifremer.fr/fr/geoportail/sextant#/metadata/5626ebc2-709b-4fb1-b369-cda94a565c0d
✓	Human activities	Scientific research	Suivi des Posidonies en Méditerranée	IFREMER	SEXTANT	http://sextant.ifremer.fr/geoportail/sextant#/metadata/8db406fe-5b4f-46be-9e82-d110b15c3afe
✓	Human activities	Scientific research	Findings of an environmental monitoring survey in the SE Aquaculture Zone in Malta	MITA	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/4180cad7-9a9d-4175-99ea-b71528838b1c

✓	Human activities	Scientific research	Radiactivity monitoring network	CEDEX		
✓	Human activities	Submarine cable & pipeline routes	Cables et conduites	Shom	DATA.SHOM.FR	http://services.data.shom.fr/csw/ISOAP?service=CSW&version=2.0.2&request=GetRecordById&Id=BDML_CABLES.xml
✓	Human activities	Submarine cable & pipeline routes	SIGCables Submarine Cables Routes	COGEA	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=SIGCables+Submarine+Cables+Routes
✓	Human activities	Submarine cable & pipeline routes	EMODnet Landing stations	COGEA	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Landing+Stations
✓	Human activities	Submarine cable & pipeline routes	Kis orca Subsea Cables	COGEA	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Kis+Orca+Subsea+Cables
✓	Human activities	Submarine cable & pipeline routes	EMODnet Maltese Telecommunication Cables	COGEA, EMODnet Human Activities	EMODnet human activities Portal	https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/3b9f73d5-6aae-4f75-aa1d-c90b6f314641
✓	Human activities	Tourism & recreation	Marinas	boatlaunch	MMO MARINE PLANNING EVIDENCE	http://mmogis.services.defra.gov.uk/arcgis/rest/services/Recreation_national/MapServer
	Human activities	Tourism & recreation	Slipways	boatlaunch	MMO MARINE PLANNING EVIDENCE	http://mmogis.services.defra.gov.uk/arcgis/rest/services/Recreation_national/MapServer
	Human activities	Tourism & recreation	Marine exposure due to marinas and recreational shipping	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/eng/metadata.show?uuid=aa2fee2b-4188-4d9b-a274-8545575cc7ab
	Human activities	Tourism & recreation	Nights per km2 in coastal areas	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/eng/metadata.show?uuid=d39aa8f3-404e-4b71-8054-e8c6c36c2325
	Human activities	Tourism & recreation	Number of beds per km2 in coastal areas	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/eng/metadata.show?uuid=0a672abe-99de-4b24-8987-7ee9c3dd25e8
	Human activities	Tourism & recreation	Number of establishments per km2 in coastal areas	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/eng/metadata.show?uuid=85960efa-e68d-43d9-9eda-4f98428c495e
	Human activities	Tourism & recreation	Number of moorings per km in coastal areas	ETC - UMA	SDIMED	http://150.214.47.149:8080/geonetwork/srv/eng/metadata.show?uuid=c12eda37-d2b7-4aa5-b400-1354422cc02f
✓	Human activities	Tourism & recreation	Sentier du littoral français	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=546644
✓	Human activities	Tourism & recreation	Guia de Playas de Espana	MAPAMA	MAPAMA Acuivisor	http://www.mapama.gob.es/ide/metadatos/index.html?srv=metadata.show&uuid=d8db2101-16ba-4d75-8935-f511d15982a8
✓	Human activities	Tourism & recreation	Spiagge	REGIONE LIGURIA	Region Liguria cartografia	http://srvcarto.regione.liguria.it/geoservices/REST/metadata/scheda_xml/1219?type=DATA&
✓	Human activities	Tourism & recreation	Moorings in marinas	CEDEX		
✓	Human activities	Tourism & recreation	Touristic Vulnerability	CEDEX		
	Human activities	Tourism & recreation	Hotel beds	CEDEX		
✓	Human activities	Underwater cultural heritage	Epaves et obstructions	Shom	DATA.SHOM.FR	http://services.data.shom.fr/geonetwork/srv/fre/catalog.search#/metadata/BDML_EPAVES.xml
✓	Human activities	Underwater cultural heritage	wrecks	IHM	Geoportal de la Infraestructura de datos espaciales del Instituto Hidrografico de la Marina	
✓	Human activities	Underwater cultural heritage	PS.ProtectedSites.wrecks - Conservation area around wrecks	MITA	Malta Spatial data Infrastructure (MSDI)	https://msdi.data.gov.mt/geonetwork/srv/eng/catalog.search#/metadata/8687f15b-6bba-455c-9b62-03aea083405d
✓	Human activities	Underwater cultural heritage	Archeologia Subacquea - Riferimento Puntuale da Ordinanza	REGIONE LIGURIA	Region Liguria cartografia	http://geoportale.regione.liguria.it/geoportal/catalog/search/resource/details.page?uuid=r_liguri:D.1749:2016-06-13
✓	Human activities	Underwater cultural heritage	World Heritage Sites	VLIZ	MARINEREGIONS.ORG	http://www.marineregions.org/sources.php#heritage
✓	Human activities	Underwater cultural heritage	Aree di interdizione	REGIONE LIGURIA		https://wxs-simsp-eu.shom2.as8677.net/geonetwork/srv/fre/catalog.search#/metadata/r_liguri:D.1749:2016-06-13
✓	Human activities	Coastal Defence	EMODnet - Dredging	AZTI-TECNALIA	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-results.php?dataname=Dredging
✓	Human activities	Coastal Defence	EMODnet Dredge spoil dumping	CETMAR	EMODnet human activities Portal	http://www.emodnet-humanactivities.eu/search-

						results.php?dataname=Dredge+Spoil+Dumping+%28Points%29#ID0EADA
	Human activities	Coastal Defence	Communes avec des PPRL approuvés	CEREMA, MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?fileIdentifier=c1658b52-e2e3-43e4-b185-36e6278c5648
✓	Human activities	Coastal Defence	Indicateur national de l'érosion côtière (polygones)		GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=367700
✓	Human activities	Coastal Defence	Progetto coste - Principali variazioni della linea di costa (1960-2012)	MATTM	Geoportale nazionale	http://www.pcn.minambiente.it/geoportal/catalog/search/resource/details.page?uuid=%7BE7A49DBC-681E-4C07-BFF8-E05784293C9A%7D
✓	Human activities	Coastal Defence	Communes avec des PPRL prescrits	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?fileIdentifier=590dc1a3-0075-4f49-9ba6-21e7b87fdd8f
✓	Human activities	Coastal Defence	Hauteurs d'eau	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=367683
✓	Human activities	Coastal Defence	Commune progressant dans l'échelle d'intensité IBC	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=367670
✓	Human activities	Coastal Defence	Indicateur IBC	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=367671
✓	Human activities	Coastal Defence	Zones basses	MEEM	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=367679
✓	Human activities	Coastal Defence	Dates (indicateur national de l'érosion côtière)	MEEM, CEREMA	GEOLITTORAL	http://www.geocatalogue.fr/Detail.do?id=367696
✓	Human activities	Coastal Defence	Coastal Erosion trends	EEA		http://data.adriplan.eu/layers/geonode%3Aerosion_trend