

Data use and sharing to facilitate cross-border Maritime Spatial Planning cooperation



Supporting Implementation of Maritime Spatial Planning
In the Atlantic region

WP.3 – Theme 3: Data use and sharing



European Commission
Directorate-General for Maritime Affairs and Fisheries



EUROPEAN PROJECTS SUPPORTING MSP



The EC/DG Mare EMFF co-funded cross-border projects on Maritime Spatial Planning (MSP), bring together a partnership of countries sharing the same sea basin. They aim to support the elaboration of plans, and to develop the cooperation between countries. This cooperation intends in particular to ease the consideration of the relations and impacts of national plan on activities and uses and the environment, beyond the limits of national sovereignty and jurisdiction.

Since 2016, thanks to SIMCelt, SIMNORAT, SIMWESTMED and SEANSE, France has been involved in cross-border European projects regarding all the French sea basins.

These projects have contributed to:

- Develop a common cross-border knowledge on the scope and the requirements of the MSP Directive
- Identify cross-border issues related to MSP
- Develop skills and mechanisms for the implementation of the Directive, including for cross-border cooperation

The SIMAtlantic project (July 2019 – June 2021) follows on the work and partnerships of the SIMNORAT and SIMCelt projects, in the Atlantic, in the waters of Portugal, Spain, France, Ireland, England and Northern Ireland.



IMPROVE DATA USE AND SHARING

The MSP Directive requires Member States to organise the use and sharing of the data necessary to establish the plans. By doing so, the existing mechanisms related to the INSPIRE Directive are used. The implementation of this organisation is an opportunity to contribute to cross-border cooperation, which is also required by the Directive, in order to ensure that transnational issues are taken into account in the preparation of the plans.

Cross-border MSP projects are an opportunity to experiment with the pooling of digital spatial data relating to the MSP.

Member States are then facing the challenge of sharing digital spatial data to produce understandable cartographic information.

WORK CARRIED OUT



The co-viewing and sharing of data relevant to the MSP were therefore tested. The data collected were selected when they are available according to the web services exchange protocols in accordance with INSPIRE, when they are sufficiently informed by metadata and when they allow to describe the situation of the sea basins, with regard to land and sea boundaries, regulatory limits, environmental, physical and biological characteristics, uses and activities, and national plans.

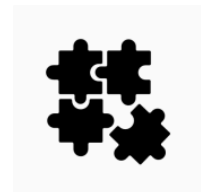
Gaps between the characteristics of these were analysed and demonstrations on data and metadata interoperability, quality of web services, representation of information were carried out. The results of this work are as follows:

- ✓ Identification of existing national geoportals
- ✓ Identification of data shared by web services
- ✓ Identification of national data producers for the MSP
- ✓ Establishment of a spatial data architecture enabling the dissemination and sharing of data and the testing of their interoperability
- ✓ Definition of an action plan to improve the availability of geographical information, in particular to facilitate access and understanding. These improvements concern each step of the data management process:
 - **The information flow**, including collection, data and metadata request, publication and dissemination.
 - **The understanding** by associating the data with a metadata record and translating the information into different languages
 - **The representation** by working on the quality of the display
 - **The access** by increasing the number and quality of data available to users: web services but also tools to describe complex data, for example by creating descriptive web pages.

LESSONS LEARNED

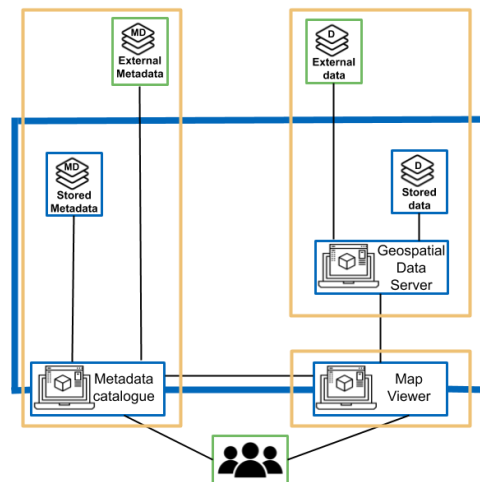
Data analysis

- Availability of geographical data related to MSP is heterogeneous, due to different data sharing organisation, and heterogeneous methodologies and progress in the implementation of the MSP in the different countries
- Lack of spatial data regarding some themes
- Heterogeneity of data models: geometry, representation, etc...
- Language barrier of the information dissemination making it difficult to access and understand
- Absence or incompleteness of metadata
- Lack of identification of reference producers
- Low web services availability of data
- Non-interoperability of information dissemination systems
- Instability of web services



IN SPITE OF THE LARGE AMOUNT OF DATA AVAILABLE, WHICH ARE CONSIDERED TO BE COMPATIBLE, THE REQUIREMENTS FOR PRODUCING COMMON MAPS FOR MSP FROM INFORMATION SOURCES IN NEIGHBOURING COUNTRIES ARE NOT MET, INCLUDING WITH REGARD TO THEMES OF CROSS-BORDER INTEREST.

Marine Spatial Data Infrastructure (MSDI)



MSDI of SIMAtlantic project



- Important knowledge transfer thanks to a replicable geoportal based largely based on open source applications
- Centralisation and visualisation of data for the MSP in the absence of dedicated European geoportal
- Data centralisation for the MSP using national reference data
- Data collection through the use of web services. The advantages are:
 - Limit the work of data administration and monitoring
 - Avoid a duplication of the management effort
 - Guarantee of the user access to the most up-to-date data
- Highlighting interoperability issues between software and protocols
- Highlighting data sharing and organisation issues (not accessible in WFS, display issues, language, legends, representation...)



- Partially open architecture: the cartographic viewer is based on a paid web solution
- Little documentation available on the applications used, and on the harvesting process
- Limitations were encountered (e.g. management of styles on Geoserver, connection of the interface to several Geoservers, Geonetwork organisation ...)
- Applications not systematically interoperable with all existing applications and software
- Harvesting process increases the risk of interoperability issues between the data server used to harvest and the technical solution used by the client to read the web service and the management of operations
- In case of desired evolutions of the free software used, it is necessary to either:
 - develop them alone, which requires software development skills
 - have them developed by a service provider
 - work with the Geoserver or Geonetwork community which may take time

A MSDI BASED ON THE USE OF WEB SERVICES IS A RELEVANT SOLUTION FOR SHARING THE NATIONAL REFERENCE DATA BETWEEN STATES. THE TECHNICAL BARRIERS ARE STILL NUMEROUS AND NEED TO BE OVERCOME BY THE IMPLEMENTATION OF COMMON PRACTICES, OPERATING MODES AND SPECIFICATIONS TO GUARANTEE A LONG-TERM TOOL.



RECOMMENDATIONS

Data and metadata

- Identify the priority types of data to be shared among States on which to focus the sharing effort
- In particular, identify those concerning transboundary issues. These may differ from a sea basin to another.
- Spatialize the plans and develop a data model and common specifications for their sharing and dissemination
- Develop visibility of data producers to facilitate expert use guidance
- Produce harmonised data where they do not exist, at the international level or at the scale needed for considering cross-border issues
 - Develop a common methodology and specifications to guide the data production
 - Define data processing to harmonize existing data
- Disseminate data processing in vector format (WFS) to allow users to harmonise symbology
- Develop solutions to enable access to information in several languages, in English and in the languages of neighbouring countries
- Encourage the production of metadata, including in English and in the languages of the neighbouring countries

Web services

- Develop **the culture of spatial data sharing** at national level and between neighbouring countries
- Strengthen **knowledge of web services** to develop data dissemination through the OGC¹ protocols
- Include in the requirements of European Commission funded projects the **publication of data in web services**
- Develop **tools for the management and monitoring** of web services (e.g. monitoring and warning tools)

European geoportal

- Design the specifications for the establishment of an European geoportal displaying data and plans from the Member States, for example :
 - Gather a multiplicity of data formats (stored and in web services)
 - Clearly display data producers
 - Provide access to data content (attributes) and metadata
 - Organise datasets by theme, country or maps
 - Choice of the language of the general interface (layer names, metadata or features)
 - Display time data, using a time series tool
 - Connect data to specific tools such as dynamic web pages to improve understanding of complex data.

Cross-border working group

- Establish technical collaboration between GIS specialists, data experts and MSP planners in order to identify priority actions and pursue the dialogue between States, in particular by relying on common tools.

¹ Open Geospatial Consortium (OGC) : <https://www.ogc.org/>



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EMODnet project

The **European Marine Observation and Data Network** (EMODnet) is a network of organisation working on marine observation and data processing according to international standards. It works to make its information freely available in the form of interoperable data layers and data products.

EMODnet provides access to data on the marine environment around seven disciplines: bathymetry, geology, seabed habitats, chemistry, biology, physics and human activities.

Thus, this project constitutes **a primary source** for accessing or collecting relevant data to the MSP because, it :

- Disseminates, through geoportals, data with a European or even global coverage allowing cross-border comparative analysis for the MSP
- Sometimes compensates for the lack of national or local data
- Disseminates data in web services, so it can be displayed in other GIS tools

However, **some points of vigilance** are to be considered, in particular:

- An update delay linked to the aggregation time of the national layers when they are not homogeneous
- A loss of information and / or accuracy with respect to the national reference data in the case of aggregation and harmonisation when layers are not produced homogeneously
- Information dissemination needs to be consistent and up to date with that from national sources. For example, in the case of MREs, the status of sites (planned, installed, in operation, being dismantled and abandoned project) is essential information that changes regularly.

To respond to the needs expressed by stakeholders in cross-border projects on the MSP for a common tool to disseminate spatial data , in particular as regards the provision of information of a transnational nature, the EMODnet spatial data architecture could be supplemented in order to:

- disseminate the spatial plans of the States
- disseminate the data used to develop the plans
- disseminate homogeneous geographical layers for information of a transnational nature
- allow access to data by geographical sea basin
- support the definition of common data models for the production of data in compliance with existing standards
- disseminate methodologies and guides for the provision of relevant information on the MSP
- contribute, together with stakeholders from the Member States, to the definition of an action plan for the provision of data for the MSP in the sea basins, within a European working group for example



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INSPIRE DIRECTIVE (2007/2/EC)

The INSPIRE Directive establishes an Infrastructure for Spatial information in European Community with the aim of making data harmonised and published in an open standard format, e.g. INSPIRE compliant web services such as WMS, WFS, WCS. More broadly, this Directive promotes the dissemination, availability, quality, accessibility, use and reuse of data and services at European level.

The MSP Directive provides for the organisation of data use and sharing to use the instruments mentioned in the INSPIRE Directive. In this context, the implementation of MSP contributes to the developments of openness and data availability while relying on the infrastructures of the Member States, to disseminate reliable geographical information.

However, **the link between these two directives still needs to be strengthened**. Indeed, the INSPIRE data model for **existing and planned land use** of the Land Use² theme, can be used to map MSP data. However, it tends to lose details and specific information on marine use. Therefore, in order to be used for MSP and in particular for the planning of marine activities, it needs to be adapted and extended³.

Furthermore, some INSPIRE Directive requirements contribute little to the understanding of information in cross-border analysis for MSP. The following are few examples:

- The common rules of representation are adapted to terrestrial data and some of them are not suitable for common mapping at the scale of a transboundary sea basin. This is the case for example, of the “Maritime boundaries” whose representation does not allow the different boundaries to be differentiated because they are all the same colour.
⇒ These **common rules of representation** could be adapted to specific maritime characteristics **taking into account possible uses in a transboundary area**.
- Similarly, the INSPIRE Directive sometimes provides for several spatialisation possibilities, which implies encountering major differences concerning the geometry for the same theme, depending on its producer (e.g. areas located by points, or polygons or raster) and the structuring of the data. This makes cross-border analysis complex.
⇒ **The rules for data production could also be expanded to produce** comparable data at European level.
- There is a great heterogeneity in the information contained in the metadata records, often leading to confusion between the meaning of certain fields and the interpretation of usage, which differs from one State to another, or from an individual to another.
⇒ **Support for producers in the production of metadata** for pooling on themes of cross-border interest for the MSP would make it possible to improve the quality of the

² Land Use : <http://inspire.ec.europa.eu/theme/lu/>

³ Abramic A and all. 2019. Data specification for Maritime Spatial Planning INSPIRE data model. Deliverable -D.5.1., under the WP5 of MarSP: Macaronesian Maritime Spatial Planning project (GA n°EASME/EMFF/2016/1.2.1.6/03SI2.763106).

produced metadata records, as well as their understanding. Consideration could also be given to defining a **simplified version of the metadata models**, bringing together the mandatory categories of information and the minimum necessary information.

- It is difficult to identify **the reference data** because until now the metadata models recommended by the Directive did not allow to clearly fill in this information.
 ⇒ For proper use in transboundary areas, this information must **appear clearly on the metadata records**.

SOURCES: MSP projects

	Web site	Geoportal
SIMCelt	http://www.simcelt.eu/	https://simcelt.mspdata.eu/
SIMNORAT	https://www.msp-platform.eu/projects/supporting-implementation-maritime-spatial-planning-north-atlantic-region	https://simnorat.mspdata.eu/
SIMWESTMED	https://www.msp-platform.eu/projects/supporting-maritime-spatial-planning-western-mediterranean-region	https://simwestmed.mspdata.eu/
SEANSE	https://northseaportal.eu/	https://seanse.mspdata.eu/
SIMAtlantic	http://www.simatlantic.eu/	https://simatlantic.mspdata.eu/

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