



Macaronesian Maritime Spatial Planning

MARSP 2ND CAPACITY BUILDING WORKSHOP

MSP INSPIRE data model

D.5.2/D.7.6./D7.7

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Summary

MarSP and PLASMAR projects in collaboration have been organizing a series of capacity building workshops that deal with data management related to the Maritime Spatial Planning. The MarSP project is a perfect opportunity to finalize MSP data model development and, what is more important, to test results and develop use cases in the Macaronesia, for the Canary Islands, Azores and Madeira archipelagos.

This second event is a technical workshop that proposes the discussion and testing of concepts and technical solutions on MSP data model, developed by University Las Palmas de Gran Canaria (ULPGC) and the Spanish Institute of Oceanography (IEO).

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MarSP 2nd CAPACITY BUILDING WORKSHOP

Introduction

The objective of the Work Package 5 - *MSP data interoperability and MSP Platforms* is to improve data management for the process of the Maritime Spatial Planning, applying INSPIRE Directive 2007/02/EC principles for sharing and collecting spatial data and information. This work package needs to identify already existing or developed INSPIRE data models applicable for MSP and case-studies of Macaronesia.

Project partners will be trained to use data model and to publish maritime spatial plans using operational data infrastructure, that will be delivered as a part of the MSP platforms. To achieve this goal, it is necessary to deliver during the project capacity building sessions, that will train project partners how to use data infrastructures and apply the delivered data model.

The first capacity building session was organized as a collaboration of two projects that deal with the Maritime Spatial Planning thematic in the Macaronesian region – MarSP and PLASMAR (Setting the bases for Sustainable Maritime Spatial Planning in Macaronesia). Both projects identified relevance of data & information flows, which are crucial for the success of the MSP process. The first workshop was organized within the first four months of the MarSP project and it was held on the 20th of April, at Lagoa (Sao Miguel Island, Azores). This organized session focused on the basics of data management applied in Maritime Spatial Planning, concepts of spatial data infrastructures, including identification of data collection nodes delivered by global/European data initiatives. Further, the capacity building workshop included “Hands on” sessions where participants had a possibility to use specialized software and to learn how to develop metadata, share and harvest data, using standards within INSPIRE network services.

This second event was a technical workshop that proposes the discussion and testing of concepts and technical solutions developed by the ECOAQUA University Institute of the University of Las Palmas de Gran Canaria (ULPGC) and by the Spanish Institute of Oceanography (IEO). During this two-day workshop participants had a chance to test the data model during a “Hands on” session, applying it to a real use case, and to discuss and propose modifications for final MSP data model product.

MSP data model development

In development of the INSPIRE *Planned Land Use data model*, as specified in the Technical Guidelines document on “*INSPIRE Data Specification on Land Use*” the uses and planning of the sea were considered, but not elaborated in detail. MSP data model concept has been developing from 2014, applying INSPIRE data management concepts for marine planning and data, through **Marine Pilot project (EC Joint Research Centre 2014-2016)** and continuing with project **PLASMAR (INTERREG–V 2017-2020)**. The results and findings delivered have been published in the paper “**Maritime spatial planning supported by infrastructure for spatial information in Europe (INSPIRE)**” (Abramic et al., 2018).

MarSP project is a great opportunity to finalize the development of the data model and, what is more important, to test the results and develop use cases in the Macaronesia, for the Canary Islands, Azores and Madeira archipelagos.

Conceptual development

The conceptual modeling was finalized by ULPGC, adapting the model of INSPIRE Planned Land Use, extending the *Zoning Element* Feature, adjusting it for MSP. The developed zoning element is called MSP_ Zoning Element with next extensions:

1. Extending *Zoning Element* feature with *hilucsMSP* additional attribute;
2. Defining specific values for classification of the maritime activities;
3. Defining the concept of *Maritime activities Vertical Distribution*;
4. Extending *Zoning Element* feature adding the *Vertical Distribution* attribute

«featureType» MSP_ZoningElement	«featureType» MSP_ZoningElement
+ inspireId: Identifier + geometry: GM_MultiSurface + hilucsLandUse: HILUCSValue [1..*] + hilucsMSP: marineNarrowerHILUCSValue [1..*] + regulationNature: RegulationNatureValue	+ inspireId: Identifier + geometry: GM_MultiSurface + hilucsLandUse: HILUCSValue [1..*] + hilucsMSP: marineNarrowerHILUCSValue [1..*] + regulationNature: RegulationNatureValue + verticalDistribution: verticalDistributionValue [1..4]
Voidable	Voidable
+ Valid from: Date [0..1] + Valid to: Date [0..1] + hilucsPresence: HILUCSPresence + specificLandUse: LandUseClassificationValue [1..*] + specificPresence: SpecificPresence + processStepGeneral: ProcessStepGeneralValue + backgroundMap: BackgroundMapValue + dimensioningIndication: DimensioningIndicationValue	+ Valid from: Date [0..1] + Valid to: Date [0..1] + hilucsPresence: HILUCSPresence + specificLandUse: LandUseClassificationValue [1..*] + specificPresence: SpecificPresence + processStepGeneral: ProcessStepGeneralValue + backgroundMap: BackgroundMapValue + dimensioningIndication: DimensioningIndicationValue
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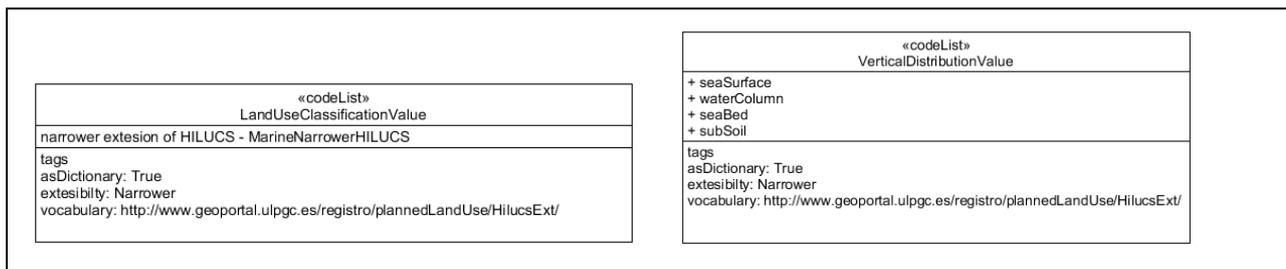


Figure 1 - Conceptual solution of the MSP INSPIRE data model

Technical Development

After the conceptual modelling, a register needed for MSP data model and including two code lists, was developed:

1. Development of [HILUCS Extended register](#) (ULPGC)
2. Development of [vertical distribution code list](#) (ULPGC)



HILUCS Extended register



Description: This is the HILUCS Extended register developed by Ecoaqua Institute in order to cover Marine Spatial Planning specific features. It includes original records referenced by original links and extended record clearly identified and explained.

Childs:

- primary production
- secondary production
- tertiary production
- transport networks logistics and utilities
- residential use
- other uses

Marine Spatial Planning Features:

This record doesn't have MSP features

Figure 2 - Screen shot of HILUCS Extended register

Further, there was a need for the data model templates:

1. Extended XSD template (file used to define what elements and attributes may appear in an GML document) for the INSPIRE compliant MSP data model – facilitated by JRC INSPIRE expert.
2. Extended ESRI format (shp) template for all features and related HALE transformation to comply with INSPIRE standards - Including simple example (ULPGC).
3. Extended GeoPackage (gpkg) template for development of the INSPIRE compliant spatial file - including simple example (IEO).
4. Extended GeoJSON format template for development of the INSPIRE compliant spatial file - including simple example (IEO).

In this moment IEO is finalizing the Styled Layer Descriptor (map style), that will be completed within the end of May.

MSP data model technical workshop – capacity building

Workshop/capacity building was organized on 14-15th March 2019, jointly by ULPGC and IEO. IEO offered their facilities at Tenerife for workshop venue and they covered local logistic. ULPGC was organizing thematic agenda and participants inscription. On dissemination of event was participating FRCT, IEO and ULPGC. Finally, the workshop was attended by 29 participants, GIS, SDI and MSP experts, governments bodies responsible for MSP process (and reporting), including marine and data scientists.

Olvido Tello (IEO), within the organizers, was selected for the workshop facilitator and was steering the meeting and sessions.

The workshop was opened by IEO/ Oceanographic Centre of Canary Islands director Luis López Abellán who gave the welcome to the participants. Following, Alejandro Iglesias (IOC-UNESCO) gave the plenary speech on view of data and information management applied in MSP, including data sharing importance. He also pointed out that IOC/UNESCO capacity building strategy, not only focus on developers but also on management stuff.

Introduction part was closed by Ricardo Haroun (ULPGC) who provided overview of the MarSP project, current status and future actions.

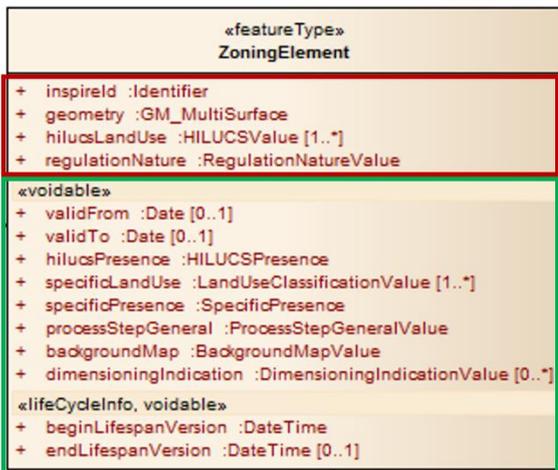


Figure 3 - Welcome & Introduction by Ricardo Haroun, Luis López Abellán and Alejandro Iglesias (from left to right).

Following, Andrej Abramic (ULPGC) gave presentation on concept and practical examples how MSP process can be supported by INSPIRE, what is *INSPIRE Planning Land Use* data model and how project PLASMAR applies INSPIRE concepts. Next was provided a short introduction and basics of Unified Modeled Language (UML) that is used for conceptual data modeling. The last presentation was on the concepts of MSP data model, how and why were applied extensions for the final product.

Features

Representation of real or abstract object on the map



- Feature include attributes:
 1. Compulsory attributes – core feature information
 2. Voidable attributes not obligatory, useful feature information



Figure 4 - A pizza analogy was used to explain basics of Unified Modeled Language.

During this session workshop, participants initiated discussions. Workshop participants accepted data model proposal, but before was discussed:

1. Questions on different INSPIRE data models that could be used for the MSP data model foundation – if *Area Management* data model is better than *Planned Land Use* data model;
2. Relevance of formats GML, shp...and difficulties to apply with no GIS/SDI experts;
3. If possible, to model temporal component of maritime activities;
4. Potential of MSP data model, to be used for Land sea interactions analysis
5. Potential of MSP data model to be used for MSP reporting scheduled for 2021;
6. Need that relevant institutions (responsible for MSP process and reporting) be properly informed on the model development and potential;
7. The same institutions should provide their support in development and implementing MSP data model.

Afternoon session started with presentations of Alejandro Garcia (ULPGC) on development of XSD, shp and GML templates/schemas and related data transformation processes. He showed how it works INSPIRE REGISTRY and how can be used developed HILUCS Extended register, needed for the MSP data model.

Luis Miguel Agudo (IEO) explained concepts and importance of the Styled Layer Descriptors (SLDs) in data models and how they should be managed within the spatial data sets. Also, he provided short course on different spatial data encodings, focusing on GeoPackage and GeoJSON.

At the end of the day, Alejandro Garcia (ULPGC) initiated "hands on" session, where participants needed to apply knowledge and tools presented, explained and discussed within the workshop. During the practical session a real use case was used: DROTA, partner in MarSP project, facilitated draft of the MSP of Madeira Region, providing real data to test the model application. Participants had a chance to discuss, propose modifications and finally test developed technical solution that includes a data model in different formats, applying developed tools for the MSP interoperability using standard GIS software.



Figure 5 - Hands on session steered by Alejandro Garcia (IU-ECOQUA, ULPGC).

The “Hands on” session was continued and finalized the following day in the morning (15th March 2019). After a coffee break, the MSP platforms session was initiated:

Aida Silva (DRAM) presented Azores MSP platform, including the application of the SeaSketch tool, used for spatial data crowd sourcing. Paulo Miranda (DRAM) presented “One stop shop” digital solutions for facilitating licences administrative processes.

Vitor Jorge (DROTA) presented Madeira MSP Centralized Management System, that will follow INSPIRE standards. One of the goals presented are INSPIRE courses for users, data providers and developers.

Andrej Abramic (ULPGC) presented MSP Platform Canarias as “land page” with access to developed tools and products.

After that, Felipe Fernández (IH Cantabria) did a presentation showing a development of the MSP Platform that includes RENAQUA Decision Support System, which uses Copernicus services and other available tools.

The final presentation was delivered by Yolanda Sagarminaga (AZTI Tecnalia), who is one of the developers of the Human activities EMODnet data portal. She showed development of EMODnet Human activities and efforts on INSPIRE compliancy. During her presentation she stated that attending the workshop was very useful and that she would try to adapt the obtained knowledge to Human activities within the EMODnet data portal.

The workshop was wrapped-up and finalized by 15:00.

Annexes

List of participants

1	Aida Silva	DRAM
2	Alejandro García Mendoza	IU-ECOQUA, ULPGC
3	Alejandro Iglesias Campos	IOC-UNESCO / Marine Policy and Regional Coordination Section
4	Andrej Abramic	IU-ECOQUA, ULPGC
5	Cristina Cervera Núñez	IEO
6	Enrique José Casas Mas	Universidad de La Laguna
7	Felipe Fernández Pérez	IHCantabria
8	Francisco David Melián Gómez	GOBCAN
9	Gerardo Bruque Carmona	IEO
10	Inmaculada Herrera Rivero	IU-ECOQUA, ULPGC
11	J. Ezequiel Rodríguez Riesco	IEO
12	Javier García Sanabria	UCA
13	Jorge Blanco	Oceana Europe
14	Juan Jorge Rosales	GRAFCAN
15	Laura Martín García	IEO
16	Luis J. López Abellán	IEO
17	Luis Miguel Agudo Bravo	IEO
18	María Gómez Ballesteros	IEO
19	Mario Caña Varona	IEO
20	Mónica Campillos	IEO
21	Olvido Tello Antón	IEO
22	Paulo Miranda	DRAM
23	Ricardo Haroun Tabraue	IU-ECOQUA, ULPGC
24	Sebastián Jiménez Navarro	IEO
25	Simone Phorè	ULPGC
26	Víctor Cordero Penín	UCA
27	Vítor Jorge	DROTA
28	Yaiza Fernández-Palacios Vallejo	IU-ECOQUA, ULPGC
29	Yolanda Sagarminaga	AZTI Tecnalia

Figure 6 - List of participants

Agenda

Agenda (6.02.2018)

1st Day, Thursday, 14 of March 2019

Workshop Facilitator: Olvido Tello, IEO/ Madrid

10:30. Registration and coffee

11:30. Welcome

- Luis J. López Abellán, director IEO/ Oceanographic Centre of Canary Islands

11:45. Data and Information management in support of marine spatial planning processes

- Alejandro Iglesias Campos, IOC-UNESCO / Marine Policy and Regional Coordination Section

12:00. Project Macaronesian Maritime Spatial Planning

- Ricardo Haroun Tabraue, deputy director University Institute ECOAQUA / ULPGC

12:15. Framework applying INSPIRE concepts for MSP process; Andrej Abramic, ULPGC

- MSP & INSPIRE
- Planning Land Use data model
- PLASMAR project that applies INSPIRE data management concepts

12:45. MSP INSPIRE data model concept development; Andrej Abramic, ULPGC

- Conceptual development of the MSP data model
- Potential of use of MSP data model
- Discussion

13:15. MSP data model development

- Developed SHP, XSD and GML schemas; Alejandro Garcia, ULPGC
- Maritime activities register - extended HILUCS; Alejandro Garcia, ULPGC

13:30. Lunch and coffee

15:00. MSP data model development (continuation of the session)

- Data transformation *.shp to *.gml INSPIRE compliant; Alejandro Garcia, ULPGC
- MSP data model Styled Layer Descriptor (SLD); Luis Miguel Agudo, IEO
- Different encodings GeoPackage & GeoJSON; Luis Miguel Agudo, IEO
- Discussion

15:30. MSP data model "hands on" session 1st part (ULPGC & IEO).

Exercise for the development of the MSP data model:

- Preparation of SHP file & Mapping marine activities in extended HILUCS; Alejandro Garcia, ULPGC
- Transformation of SHP file into an INSPIRE compliant GML; Alejandro Garcia, ULPGC
- Preparation of the GeoPackage & GeoJSON; Luis Miguel Agudo, IEO
- Application of Styled Layer Descriptor and serving file with GeoServer; Luis Miguel Agudo, IEO

16:30. Coffee

17:00. Continuation of the session

18:30. Session end

2nd Day, Friday, 15 of March 2019

9:00. MSP data model "hands on" session 2nd part (ULPGC & IEO)

11:00. Coffee

11:30. MSP Platforms Macaronesia

- Azores development, with focus on "One stop shop"; Aida Silva, Paolo Miranda, DRAM
- MSP Platform Madeira, cloud transformation; Vitor Jorge, DROTA
- MSP Platform Canarias; ULPGC
- SeaSketch crowdsourcing software applied in MSP Azores; Aida Silva, DRAM

12:20. Marine Spatial Planning Platform - RENAQUA DSS & ATLAS projects; Felipe Fernández Pérez, IH Cantabria

12:45. EMODNET human activities data models: towards compliance with INSPIRE DATA Specifications; Yolanda Sagarminaga, AZTI Tecnalia

13:00. Final discussion and wrap-up

13:30. Lunch and session ends



In collaboration with PLASMAR project

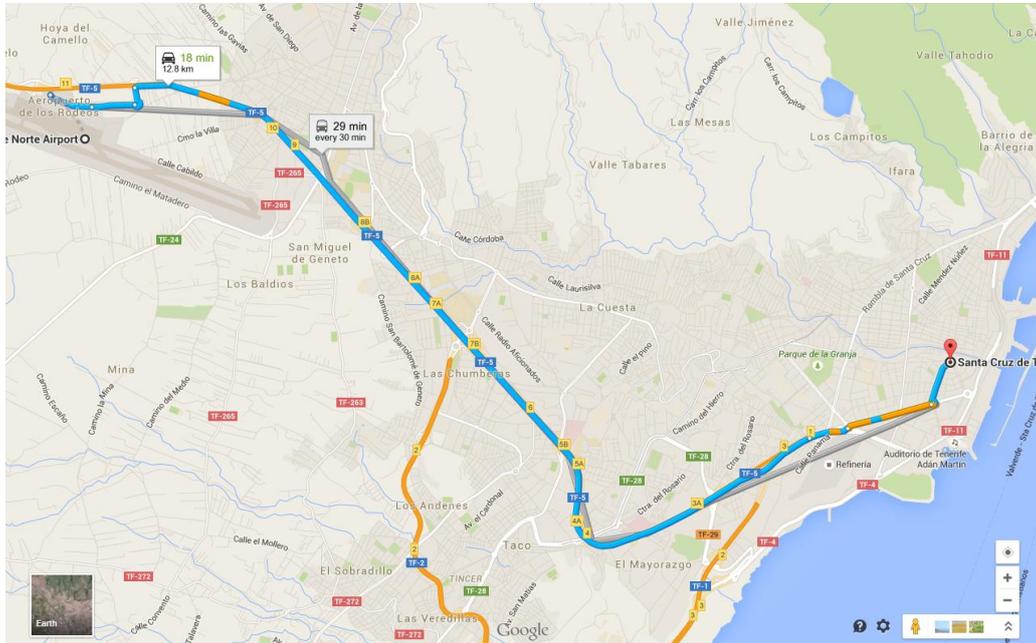


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Fondo Europeo de Desarrollo Regional

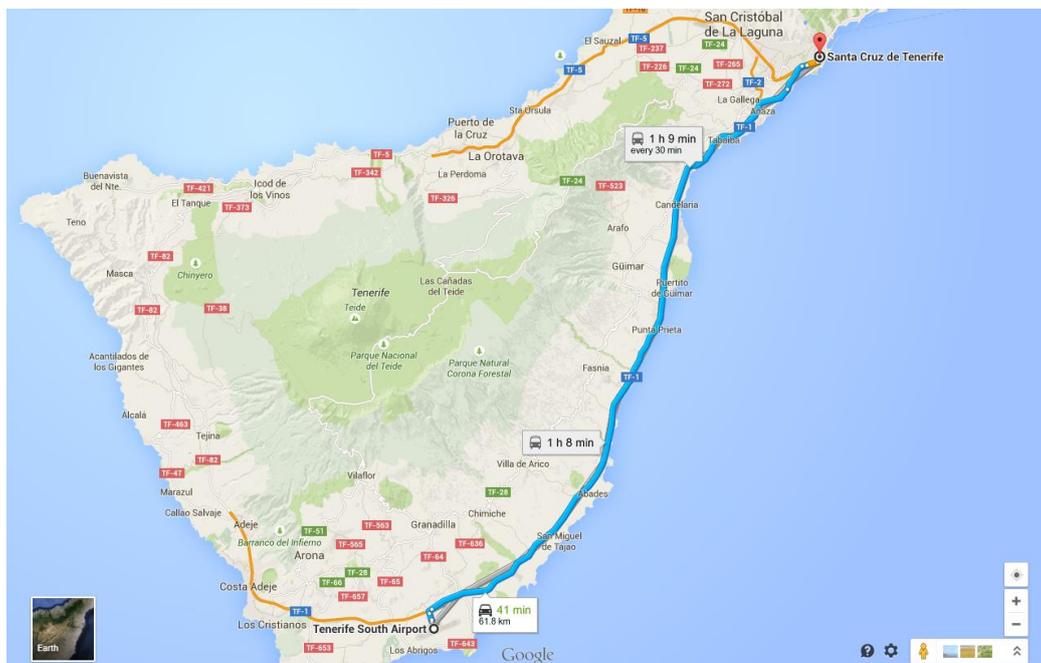


MAC 2014-2020
Cooperación Territorial

1. Map from "Los Rodeos" Tenerife Norte Airport to Santa Cruz de Tenerife



2. Map from "Reina Sofia" airport (Southern Tenerife) to Santa Cruz de Tenerife



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3. **Map from Santa Cruz de Tenerife to the meeting venue:** Centro Oceanográfico de Canaria-Instituto Español de Oceanografía (IEO), Dársena Pesquera, PCL 8. 38180 Santa Cruz de Tenerife

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