



Macaronesian Maritime Spatial Planning

MARSP & PLASMAR CAPACITY BUILDING WORKSHOP

MarSP Deliverable: Capacity building sessions on geographical data and metadata harmonization - 1st session
D.5.2(A-SMG)/D.7.6./D7.7

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Coordinated by



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Partners



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Summary
<p>Capacity building session was held on 20th April 2018, at Lagoa, São Miguel, Azores. It was delivered as a collaboration of two projects that deal with the Maritime Spatial Planning thematic in the Macaronesian region - MarSP & PLASMAR. Capacity building 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, 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.</p>

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MarSP & PLASMAR 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 need to identify, and if needed, extend INSPIRE data model applicable for MSP and case-study of Macaronesia. For this objective, the findings delivered in the keystone paper “Maritime spatial planning supported by infrastructure for spatial information in Europe (INSPIRE)” published in January 2018 will be used:

<https://ec.europa.eu/jrc/en/publication/maritime-spatial-planning-supported-infrastructure-spatial-information-europe-inspire>

Further, 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 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. First workshop was organized within first four months of the MarSP project and it was held on the 20th of April, at Lagoa, Sao Miguel, Azores.

Logistic was done by FRCT & DRAM, that organized invitations on the level of the MarSP project, venue, meeting room, projector, WiFi internet and coffee breaks, while IEO & ULPGC were responsible for the workshop content, agenda, presentations, classes and hands on sessions. The workshop was attended by 18 applicants involved in PLASMAR and/or MarSP project.

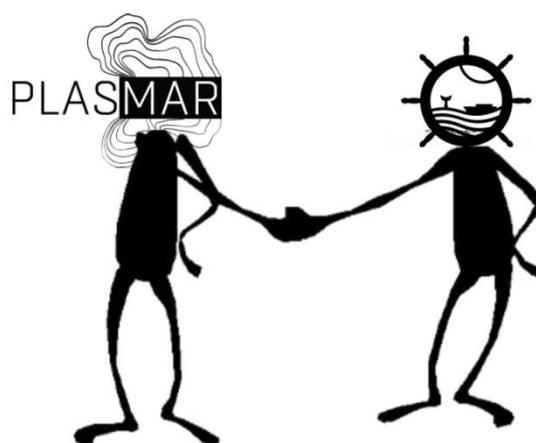


Figure 1- MarSP & PLASMAR collaboration workshop doodle

Capacity building workshop – MSP data management

This workshop focused on the basics of data management, techniques included in development of the spatial data infrastructures (SDI) that can improve if applied in MSP process. It was presented basic concepts on SDI & interoperability applied in marine data management, including issues and benefits. Further, was presented techniques for data & metadata harvesting, identifying European or global data initiatives. Participants gain theoretical knowledge on metadata development and spatial data sharing, including the “Hands-on” sessions. During the hands-on sessions, participants had an opportunity to use project PLASMAR spatial data infrastructure, hosted on the ULPGC University Institute ECOAQUA, for development of the data flows between the project partners. Second Hands on session used IEO metadata editor, included at IEO SDI for practical exercise on metadata development.



Figure 2 - Welcome & Introduction by FRCT/ULPGC

Data management within MSP

Spatial Data Infrastructures, European data initiatives, INSPIRE, data standards

First session discussed with participants requirement for the marine and maritime data within the MSP process. Followed the identification of the data nodes, established by number of global data, European, national and regional initiatives as European Marine Observation and Data Network (EMODnet), Water Information System for Europe (WISE) Marine, European Environment Information and Observation Network (EIONET), Copernicus, Global Ocean Observing System (GOOS), International Oceanographic Data & Information Exchange (IODE), Regional Sea Conventions as OSPAR, HELCOME, Barcelona and Black Sea Convention ...

It was explained the data interoperability concept, what are the main issues related to the MSP process and how to overcome it, applying INSPIRE principles and standard data models. It was provided two examples:

1. North Sea interoperability issue with maritime spatial plans developed by Germany, Netherland, Belgium & UK, including the solution with INSPIRE data model, that will be applied in the MarSP project.
2. Interoperability issue on Habitat maps delivered for Canaries archipelago - delivered harmonization applying INSPIRE data model on Habitats and Biotopes, in the scope of the PLASMAR project.

Further was presented marine & maritime data availability trough INSPIRE data portal as techniques for data collecting – as crowdsourcing and citizen science.

Finally, it was presented concepts of the Spatial Data Infrastructures – as discovery network services, view network services and download network services. These concepts were in more detail explained in following sessions, including the “Hands on” practical exercise.

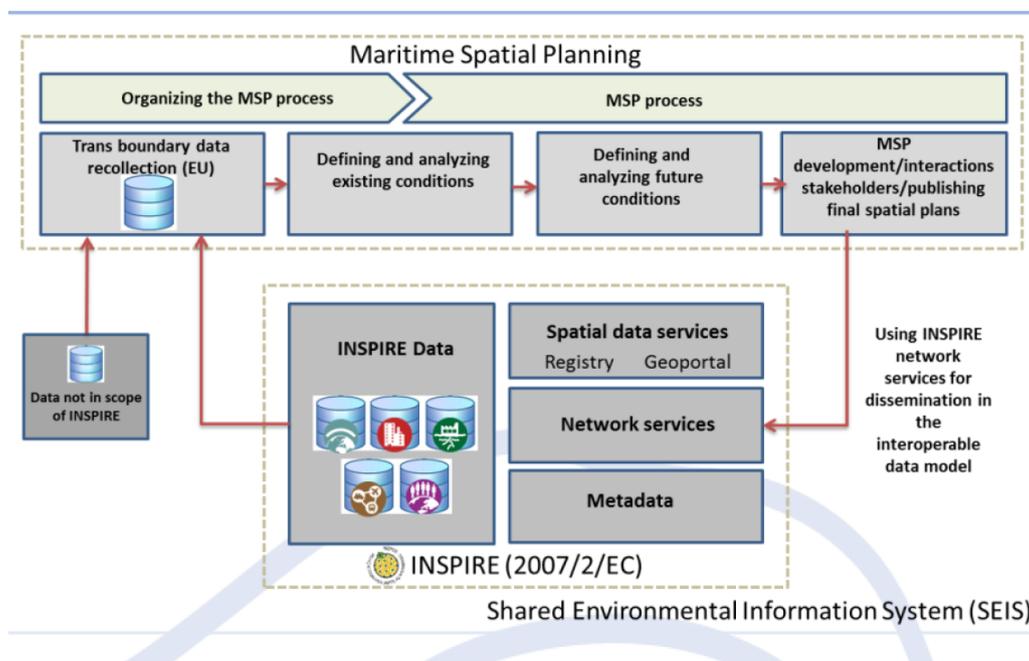


Figure 3 -MSP in the context of the INSPIRE and Shared Environmental Information System framework

Introduction to the GeoServer and practical “Hands on” session

Participants will try to share and receive spatial data sets using the GeoServer software hosted on the ULPGC server. If participants have an access to their own GeoServer, they are encouraged to use it.

The first part of the session consisted of a short presentation about geographic data sharing on the Internet, data formats, OGC protocol and the different services. Afterwards, the different applications that currently exist were discussed, as well as the advantages and disadvantages of each one.

Finally, was presented GeoServer, its application and role in the ULPGC Spatial Data Infrastructure for sharing/harvesting data and MSP process in Macaronesia. Within PLASMAR project, were delivered separate GeoServer applications for Madeira, Azores and Canarias, that were used in “Hands on” practical part of the session.

In the second part, the participants were asked to carry out a practical exercise consisting of sharing a data set through Geoserver using standard view/download Open GeoSpatial Consortium (OGC) services. It began by distributing the necessary software and data, including user names and passwords to use a specific version of Geoserver installed on the server of the ECOAQUA University Institute. The exercise consisted of 7 steps, and for each of them the procedure to be followed was explained in detail. Correspondingly were explained different options of the application, giving the participants time to complete the task and to leave their doubts or comments. In the final part of the exercise, set up services were checked, and it was proposed to update the original dataset. In this way, participants could see how fast and easy it is to set up a standard data service for sharing data, as well as the subsequent updates.



Figure 4 - Hands on session on sharing data using GeoServer

ESRI solutions for sharing data

Participants will explore the ArcGIS for Server architecture. They learn concepts in order to share information creating GIS services and manage GIS services, applications, and users with ArcGIS for Server.

In this session about ESRI solutions was presented tools for sharing data on the internet. First, was presented a description about architecture of ArcGIS for Server. ArcGIS Server is a software that makes your geographic information available to others in your organization and optionally anyone with an Internet connection. Further, was presented a short description about installation process and a comparative with other software solutions to generate GIS services (as GeoServer). Afterwards also was described ArcGIS online as cloud platform to share data, services and applications.

Finally, several applications as examples developed with ESRI tools (API for Javascript) was shown.



Figure 5 - Presented architectures with ArcGIS online

Introduction to the metadata management

Participants will be able to create and edit metadata following INSPIRE standards, using GeoNetwork software, through the Metadata catalogue hosted in IEO.

This session consisted in a presentation to introduce to the geospatial data users in the metadata world. First, a brief introduction was presented about metadata, explaining that it is an essential part of geographical data and geospatial resources.

To continue, the presentation was focus on the interoperability, explaining that the use of metadata improves interoperability, consequently the metadata should be create according to a common methodology using the standards established by ISO and adapt to INSPIRE. The ISO about metadata are: ISO 19115 with the parts: ISO 19115-1 (fundaments), ISO 19115-2 (extension for image and grids) and ISO 19139 (scheme of implementation).

The second part of this presentation was about Web metadata catalogues and Catalogue Service Web (CSW). It was explained that the metadata files usually are consulted in web metadata catalogues. The communication between metadata files and Web metadata catalogues is making through a Catalogue Service Web. A brief introduction about CSW was made and later on the presentation was focused on the GeoNetwork application. This tool allows to create CSW and to publish the metadata through metadata catalogue.

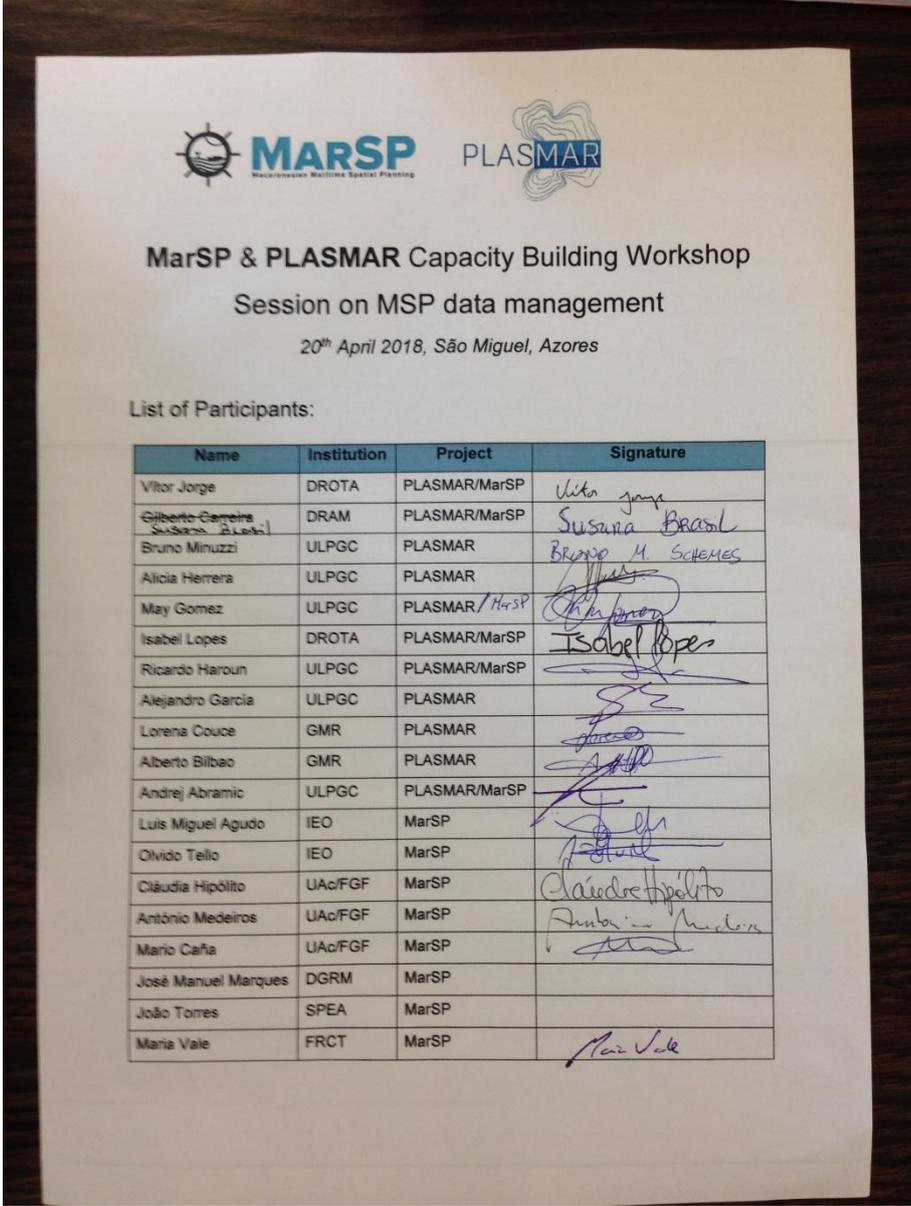
Finally, the participants carried out a brief practical exercise about creation and edition of metadata with GeoNetwork.



Figure 6 – Participants during the session

Annexes

List of participants






MarSP & PLASMAR Capacity Building Workshop
Session on MSP data management
 20th April 2018, São Miguel, Azores

List of Participants:

Name	Institution	Project	Signature
Vitor Jorge	DROTA	PLASMAR/MarSP	<i>Vitor Jorge</i>
Gilberto Carneiro	DRAM	PLASMAR/MarSP	<i>Susana Brasil</i>
Bruno Minuzzi	ULPGC	PLASMAR	<i>Bruno M. SICHES</i>
Alicia Herrera	ULPGC	PLASMAR	<i>[Signature]</i>
May Gomez	ULPGC	PLASMAR/MarSP	<i>[Signature]</i>
Isabel Lopes	DROTA	PLASMAR/MarSP	<i>Isabel Lopes</i>
Ricardo Haroun	ULPGC	PLASMAR/MarSP	<i>[Signature]</i>
Alejandro Garcia	ULPGC	PLASMAR	<i>[Signature]</i>
Lorena Couce	GMR	PLASMAR	<i>[Signature]</i>
Alberto Bilbao	GMR	PLASMAR	<i>[Signature]</i>
Andrej Abramic	ULPGC	PLASMAR/MarSP	<i>[Signature]</i>
Luis Miguel Agudo	IEO	MarSP	<i>[Signature]</i>
Olvio Tello	IEO	MarSP	<i>[Signature]</i>
Cláudia Hipólito	UAo/FGF	MarSP	<i>Cláudia Hipólito</i>
António Medeiros	UAo/FGF	MarSP	<i>António Medeiros</i>
Mario Caña	UAo/FGF	MarSP	<i>[Signature]</i>
José Manuel Marques	DGRM	MarSP	
João Torres	SPEA	MarSP	
Maria Vale	FRCT	MarSP	<i>Maria Vale</i>

Figure 7 - List of participants

Agenda

Presentations

MarSP & PLASMAR Capacity Building Workshop

Session on MSP data management

20th April 2018, São Miguel, Azores

Capacity building workshop is a collaboration of two projects that deal with the Maritime Spatial Planning thematic in the Macaronesian region. Both projects identified relevance of data & information flows, which are crucial for the success of the MSP process. This workshop will focus on the basics of data management applied in MSP, how to find data products provided by global/European data initiatives and what are the current standards/protocols for data/information sharing.

This Capacity building workshop includes “Hands on” session where participants will have a possibility to use GeoServer software (hosted on the ULPGC server - PLASMAR data infrastructure), to learn how to share and harvest data, using standard Open Geospatial Consortium network services.

Following will be presented ESRI products tools for data management that can be applied in MSP. Finally will be presented how to develop metadata and catalogue services using the GeoNetwork software.

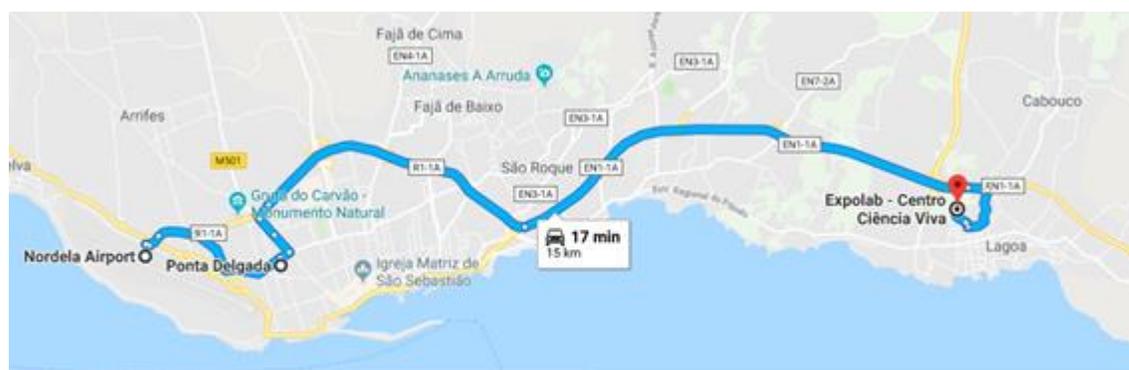
This Capacity building workshop is prepared for 10-15 participants (max 20). Participants will be MarSP & PLASMAR project partners, and depending on the interest, invitations can be send to students, local MSP stakeholders and/or data providers.

Logistic will done by FRCT & DRAM (meeting room, projector, Wi-Fi & coffee breaks).

IEO & ULPGC will organize a workshop content, presentations, classes and hands on session.

Venue: **EXPOLAB**

Address: Avenida da Ciência - Beta nº8, Rosário, 9560-421 Lagoa, São Miguel - Azores



Google Maps Nordela Airport a Expolab - Centro Ciência Viva
De carro 15,0 km, 17 min

Agenda - Friday - 20. April. 2018

- 09:00 **Welcome and introduction (FRCT, DRAM, IEO, & ULPGC)**
Background of MarSP & PLASMAR – collaboration.
Participants from DROTA, DRAM, IEO, GMR, University of Azores, FRCT, ULPGC, etc.
- 09:15 **Data management within MSP introduction (ULPGC)**
Spatial Data Infrastructures, European data initiatives, INSPIRE, data standards, etc.
- 11:00 **Coffee**
- 11:30 **Introduction to the GeoServer and practical “Hands on” session (ULPGC)**
Participants will try to share and receive spatial data sets using the GeoServer software hosted on the ULPGC server. If participants have an access to their own GeoServer, they are encouraged to use it.
- 14:30 **Lunch**
- 15:30 **ESRI solutions for sharing data (IEO)**
Participants will explore the ArcGIS for Server architecture. They learn concepts in order to share information creating GIS services and manage GIS services, applications, and users with ArcGIS for Server.
- 16:30 **Coffee**
- 16:45 **Introduction to the metadata management (IEO)**
Participants will be able to create and edit metadata following INSPIRE standards, using GeoNetwork software, through the Metadata catalog hosted in IEO.

Participants should bring their own laptop, to participate actively in the hands on session. It is required to have installed qGIS or ARCGIS software.

PLASMAR

Bases para la planificación sostenible de áreas marinas en la Macaronesia

Data management within MSP Introduction

MarSP & PLASMAR Capacity Building Workshop,
Ponta Delgada, Portugal, 20. April. 2018



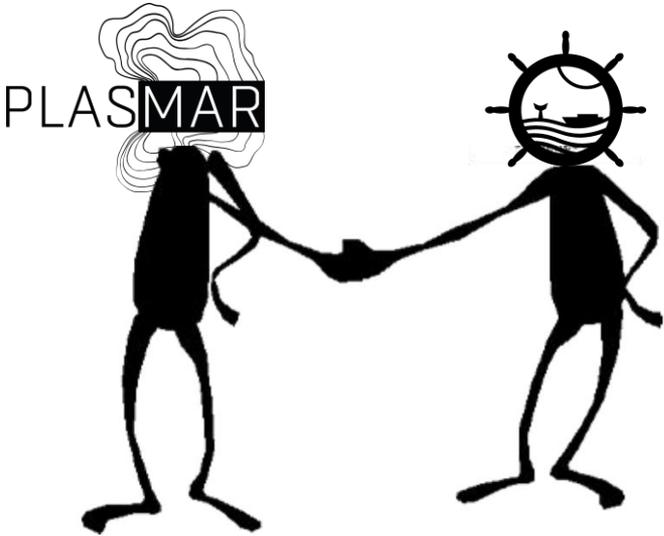
Secretaria Regional
do Ambiente e Recursos Naturais



Consejería de Agricultura,
Ganadería, Pesca y Aguas



Secretaria Regional
de Agricultura e Pescas



Wellcome on MarSP & PLASMAR Capacity Building Workshop session on MSP data management

Capacity building workshop is a collaboration of two projects that deal on Maritime Spatial Planning thematic in Macaronesian region. Both projects identified relevance of data & information flows, which are crucial for the success of the MSP process. This workshop will focus on the basics of data management applied in MSP, how to find data products provided by global/European data initiatives and what are the current standards/protocols for data/information sharing & data flows.

Welcome and introduction

(FRCT, DRAM, IEO, & ULPGC)

9:00

Coffee

11:00

Lunch

14:30

Coffee

16:30

9:15

Introduction - Data management within MSP (Andrej Abramic, ULPGC)

11:30

Introduction to the GeoServer and practical "Hands on" session (Alejandro Garcia Mendoza, ULPGC)

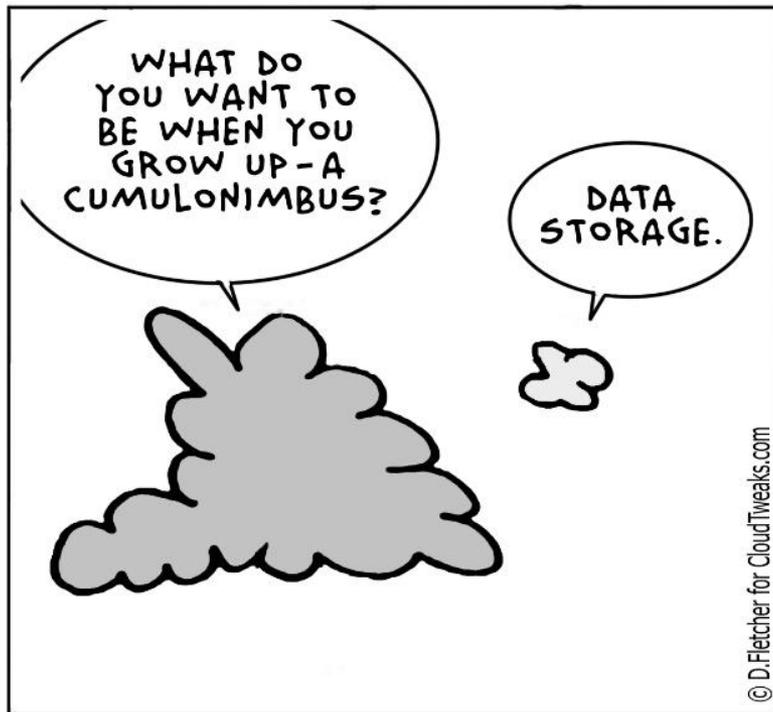
15:30

ESRI solutions for sharing data (Luis Miguel Agudo, IEO)

16:45

Introduction to the metadata management (Olvido Tello Antón, IEO)

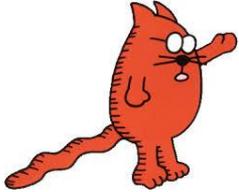
Agenda



MSP Data Management Introduction Session

- Why data is necessary for MSP process;
- Data sources, data initiatives, RSC...
- INSPIRE & data interoperability;
- Spatial Data Infrastructures;
- Metadata, editors and catalogues;
- Internet registers;
- Download services

Why data is compulsory in MSP process



*We can seat stakeholders in the room, discuss and resolve spatial planning problems, so we do not need data at all !!!
(MSP Stakeholder Series 6th Conference: Maritime Spatial Planning Worldwide, Azores, 2016)*

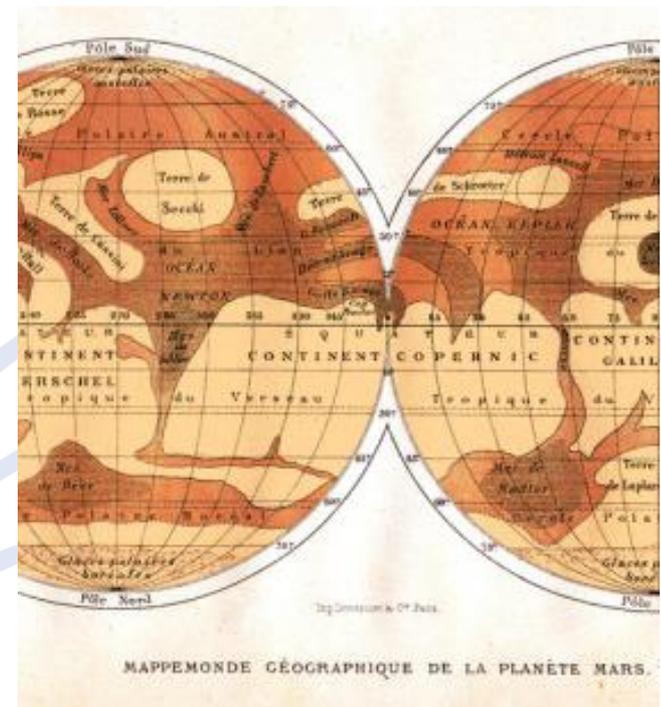
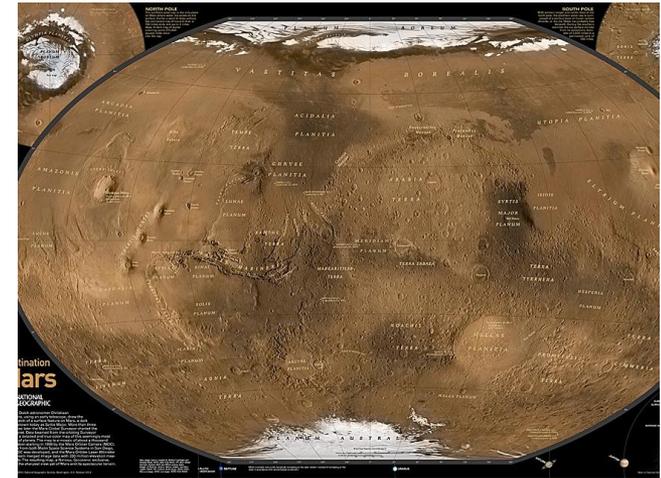
We need Marine & Maritime data:

- that we can make **decisions based on (scientific) facts** – support MSP process;
- that we can **manage marine environment** (env. planning, biodiversity conservation, etc.) **& maritime activities** (avoiding the conflicts, manage multiple use, etc.);
- **to define what is sustainable (threshold)** – what level of pressure ecosystem can support;
- **modeling**
- **develop planning scenarios...**
- ...

(Data gathering, access to data, share the data, fast analysis, DSS...)

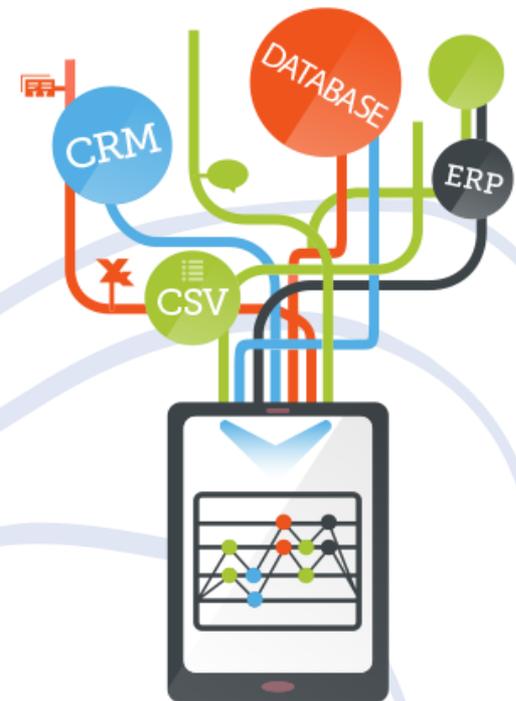
Claim for marine spatial information

“We have better maps of Mars! ... We need to map the ocean, because it is totally unmapped. We don't know what's there: Every time we map it, we find something new. It's our Earth; it's where we live. It's 70% of the surface of the Earth.” GEBCO, 2011



(Marine) data sources

- **Data initiatives**, established data flows ...do you know???
- **Spatial Data Infrastructures (SDIs)** for enabling data flows, between users, nodes of SDIs
- **Crowd-sourcing data, citizen science** platforms...



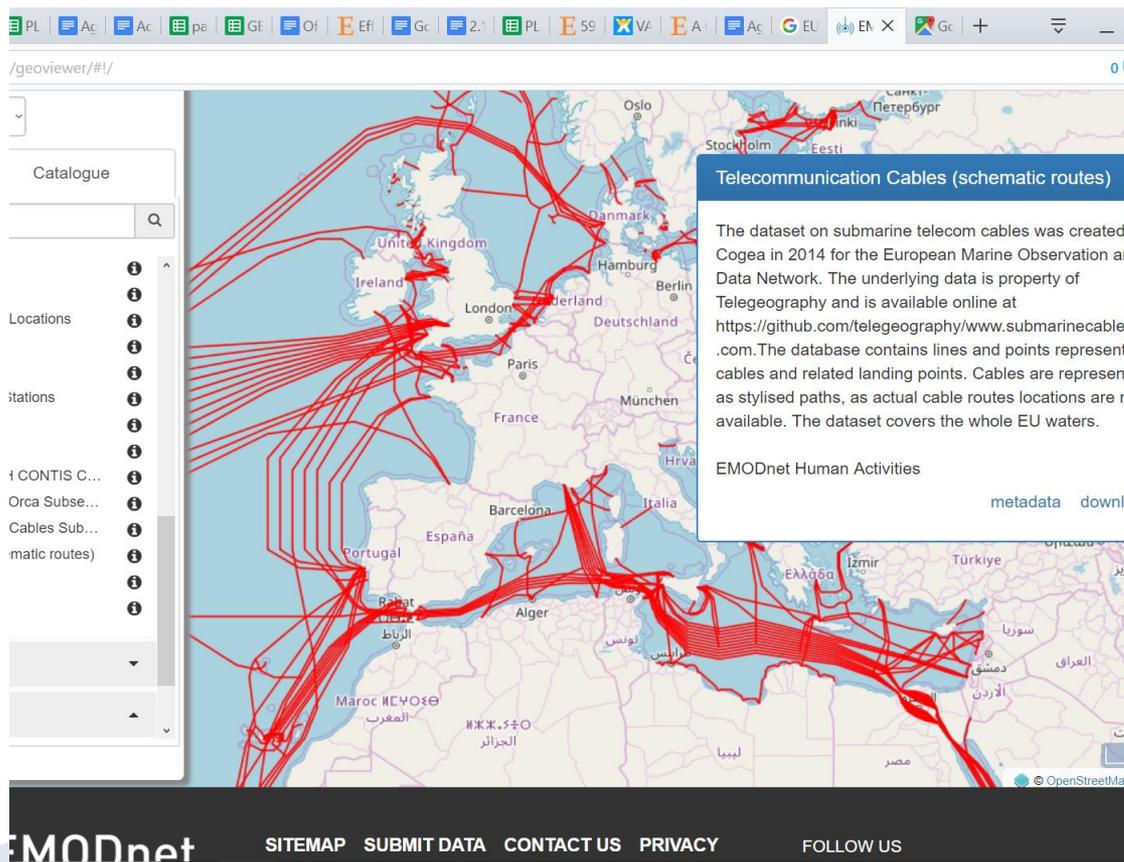


- “EMODnet is a valuable source of marine data (data, metadata, products) relevant to MSP freely accesible through its **7 EMODnet thematic portals**” Belén Martín Míguez, MaPSIS conference, Las Palmas de Gran Canaria 2017;
- **Initiated in 2009** development plan for 2020...
- Financed data initiative by DG MARE
- Very **dynamic system** – constant development; frequent modifications
- **European data gathering system** - huge consortium that provides data to central portals,
- *If data do not exist locally, it is impossible that will exist on EMODnet*
- Data coming form consortium are **quality checked, harmonized and assembled into products**
- Available products for the European sea regions, sub-regions, seas....
- Data and products are **available for download**

- **8 data portals/lots** with different thematic + central data portal
- Each portal is different as **use different technology**



Bathymetry	Geology	Seabed habitats	Chemistry	Biology	Physics	Human activities
<p>Bathymetric Data and metadata from surveys</p> <p>Bathymetry layers: average, minimum, maximum water depths</p> <p>Higher resolution data layers in coastal areas</p> <p>Underwater features</p> <p>Shipwrecks</p>	<p>Coastal behaviour (migration)</p> <p>Geological events and probabilities (volcanoes, landslides)</p> <p>Minerals (gas hydrate deposits, sulphides, phosphorite, cobalt)</p> <p>Seabed substrate (gravel, sand, mud)</p> <p>Seafloor geology</p> <p>Seismology</p>	<p>Depth</p> <p>Seabed substrate Energy at seabed (waves & current)</p> <p>Salinity</p> <p>Temperature</p> <p>Light at seabed</p> <p>Oxygen at seabed</p>	<p>DDT PCB TBT TPT</p> <p>Oxytetracycline Mercury Cadium Lead Anthracene Fluoroanthene Cs137 Pu239 Nitrogen (Din, TN) Phosphorus (DIP, TP) pH,pCO2,alkalinity O2,CO2 Polyethylene Polypropylene Chlorophyll Silicates Organic Matter</p> <p>10-y running averages</p>	<p>Biomass Abundance Gridded Abundance (DIVA)</p> <p><i>species groups</i> phytoplankton zooplankton angiosperms macro-algae invertebrate bottom fauna</p> <p>birds mammals reptiles Fish</p> <p>Temporal evolution in species distribution and abundance</p>	<p>Waves</p> <p>Water temperature</p> <p>Water salinity/conductivity/density</p> <p>Currents</p> <p>Light attenuation/fluorescence</p> <p>Sea level</p> <p>Wind</p> <p>Underwater noise</p> <p>River</p> <p>Ice</p>	<p>Aggregate Extraction Dredging</p> <p>Fisheries</p> <p>Hydrocarbon Extraction Main Ports</p> <p>Mariculture</p> <p>Ocean Energy Facilities</p> <p>Pipelines and Cables</p> <p>Protected Areas</p> <p>Waste Disposal</p> <p>Wind Farms</p> <p>Other Forms of Area Management /</p>



EMODnet
European Marine
Observation and
Data Network

- Developed products search machine based on metadata
- Success to harmonize system central Map Viewer that include products from all EMODnet lots
- Most of the products are available for download

Central portal



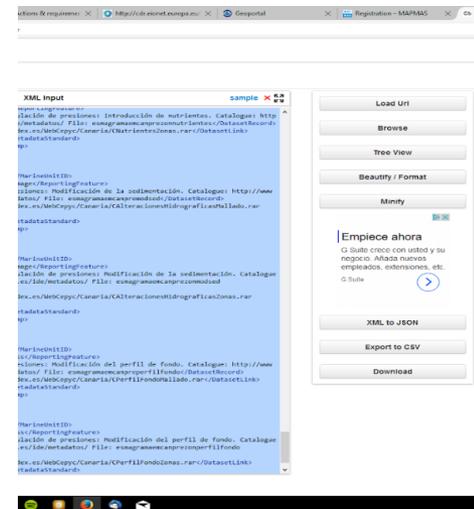
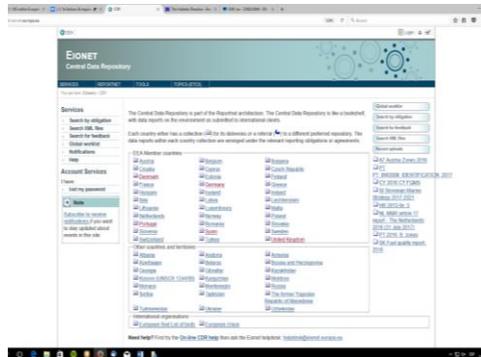
European Environment Agency



- The European Environment Agency provides independent information on the environment:
 - Air & climate, nature, sustainability & economics
- Delivers and provides products (European, regional...) from reported data – implementation of the environmental legislation, conventions... :
 - Datasets, maps, statistics, dashboards, graphs...
- [Water Information System for Europe \(WISE\) & Marine WISE](#)
- [Nationally designated areas \(CDDA\)](#)
- [External datasets catalogue](#)

European Environment Information and Observation Network

- EIONET support and improve the environmental data and information flows,
- REPORTNET is a environmental reporting document repository –
- Textual and XML structured reports, including geospatial information and metadata



- **Global Monitoring for Environment and Security (GMES)**
- Observations through **satellites and *in situ***
- Set of dedicated satellites (the Sentinel families) and contributing missions (existing commercial and public satellites)
- Optical sensors, Synthetic Aperture Radar, Altimetry systems, Radiometers....
- Copernicus share products, not raw data
- Products are available in the digital catalogues of 6 portals

Copernicus Services

Copernicus services address six main thematic areas:



Atmosphere
(CAMS)



Marine
(CMEMS)



Land
(CLMS)



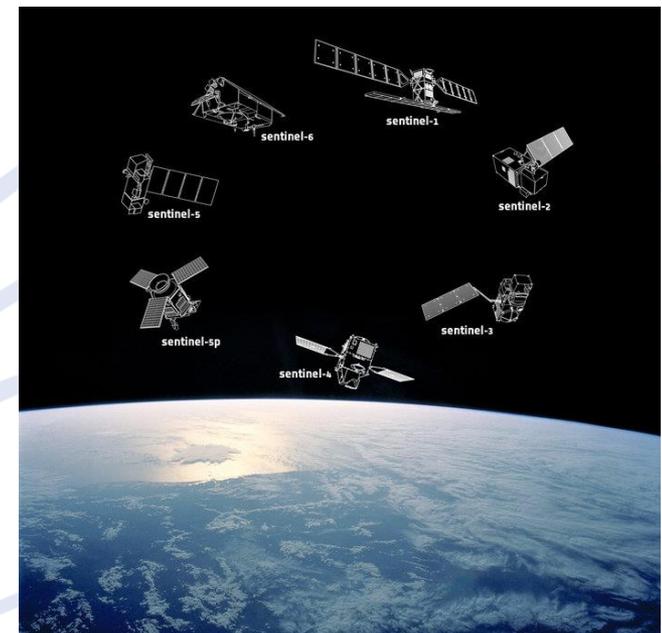
Climate
(C3S)



Emergency
(EMS)



Security



Data available from number of WW data initiatives

UNESCO Intergovernmental Oceanographic Commission supports number of WW data initiatives

- Ocean Observations & Services initiatives
- Global Ocean Observing System (GOOS)
- International Oceanographic Data & information Exchange (IODE)
- The International Coastal Atlas Network (ICAN)



Regional Sea Conventions

Regional Sea Conventions (RSC) for protecting the ocean/sea environment - **hubs for gathering data** :

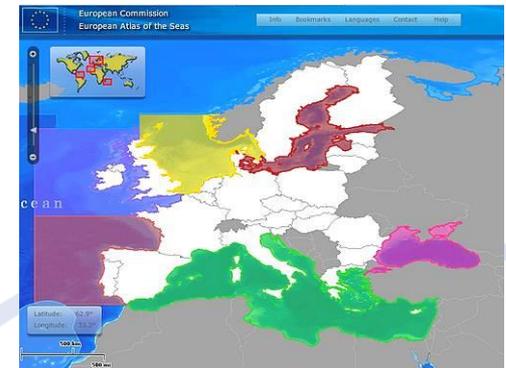
- **Oslo- Paris convention (OSPAR)** – North East Atlantic
 - OSPAR Data and Information Management System ([ODMIS](#))
- **Helsinki convention (HELCOM)** – Baltic - [Map and Data service](#)
- **Barcelona convention** – Mediterranean Action Plan
- **Bucharest Convention** – Black Sea convention



OSPAR



Other data initiatives & data sources



Environmental Marine Information System
Navigating the European Seas and the Oceans



Claim for marine Interoperability

“While there are thousands of moored and free floating data buoys in the world's oceans, thousands of land-based environmental stations, and over 50 environmental satellites orbiting the globe, all providing millions of data sets, most of these technologies do not yet talk to each other”

USGeo, 2012



HEY,_WHAT_ARE_YOU
DOING_TONIGHT_?



....well, moored
in front the harbor

Example - Harmonization of benthic habitats cartography

- “Estudios Ecocartográficos de Canarias”: benthic habitats cartographies for all islands and depths 0-50m.

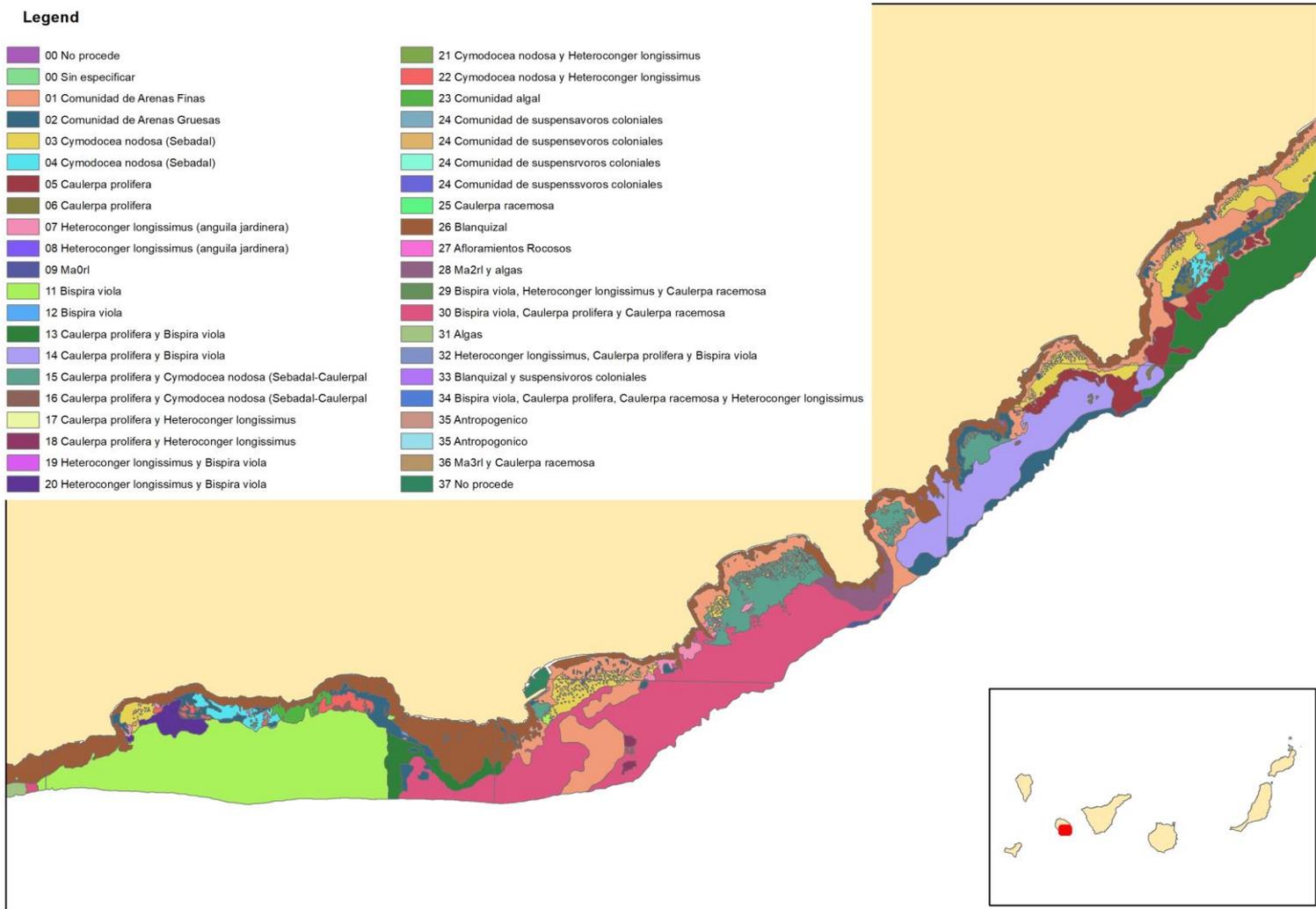
Table 1: Main characteristics of the benthic habitats cartographies of the Canary Islands. Contractor: ¹Ministerio de Medio Ambiente; ²Cabildo Insular de Tenerife. Own elaboration.

Island	Years	Authors	Nr. cats. legend
Lanzarote, Graciosa y Alegranza ¹	2000 (2000-2003)	UTE: HIDTMA, IBERINSA, CIS y TOPONORT	39
Fuerteventura y Lobos ¹	2003 (2003-2006 8??)	UTE: HIDTMA e IBERINSA	12
Gran Canaria ¹	Norte 2005 (2006-2007)	TYPSA	20
	Sur 2001 (2000-2002)	UTE: INTECSA-INARSA, TECNOAMBIENTE y GEOMY TSA	16
Tenerife ²	2001-2006 - Buenavista-Arona 2001-2002 - Arona-Fasnia 2003 - Fasnia-R. Anaga 2004-2005 - R. Bermejo-Buenavista: 2006	UTE: LA ROCHE CONSULTORES, S. L., ESTUDIO ITAC S.L.	25
La Palma ¹	2003 (2003-2004)	UTE: ALATEC, ESGEMAR S.A., GRUPO INTERLAB S.A.	13
La Gomera ¹	2003 (2003-2006)	UTE: INTECSA-INARSA, TECNOAMBIENTE y GEOMY TSA	38
El Hierro ¹	2003 (2003-2006)	UTE: INTECSA-INARSA, TECNOAMBIENTE y GEOMY TSA	12
			176

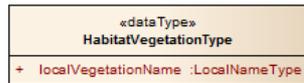
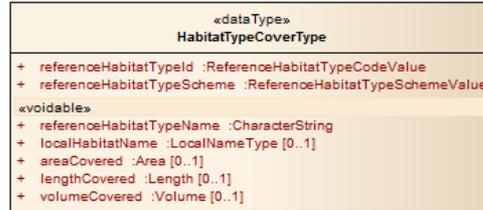
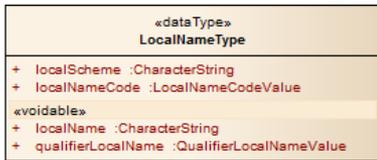
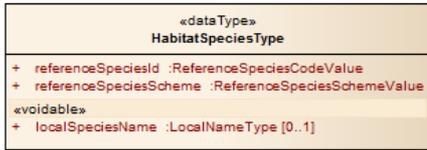
La Gomera - 38 different habitat classification

Legend

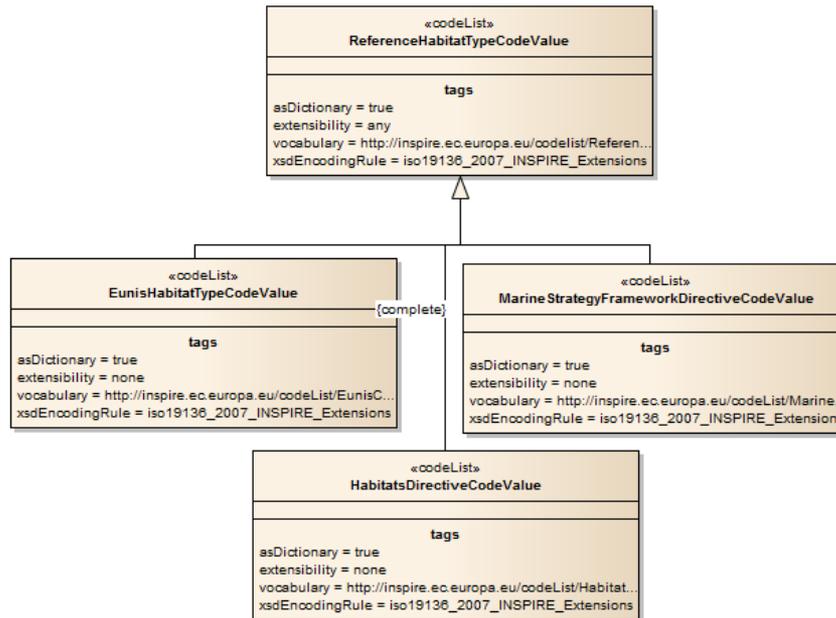
- | | |
|--|--|
| 00 No procede | 21 Cymodocea nodosa y Heteroconger longissimus |
| 00 Sin especificar | 22 Cymodocea nodosa y Heteroconger longissimus |
| 01 Comunidad de Arenas Finas | 23 Comunidad algal |
| 02 Comunidad de Arenas Gruesas | 24 Comunidad de suspensivoros coloniales |
| 03 Cymodocea nodosa (Sebadal) | 24 Comunidad de suspensivoros coloniales |
| 04 Cymodocea nodosa (Sebadal) | 24 Comunidad de suspensivoros coloniales |
| 05 Caulerpa prolifera | 24 Comunidad de suspensivoros coloniales |
| 06 Caulerpa prolifera | 25 Caulerpa racemosa |
| 07 Heteroconger longissimus (anguila jardinera) | 26 Blanquizal |
| 08 Heteroconger longissimus (anguila jardinera) | 27 Afloramientos Rocosos |
| 09 MaOri | 28 Ma2r1 y algas |
| 11 Bispira viola | 29 Bispira viola, Heteroconger longissimus y Caulerpa racemosa |
| 12 Bispira viola | 30 Bispira viola, Caulerpa prolifera y Caulerpa racemosa |
| 13 Caulerpa prolifera y Bispira viola | 31 Algas |
| 14 Caulerpa prolifera y Bispira viola | 32 Heteroconger longissimus, Caulerpa prolifera y Bispira viola |
| 15 Caulerpa prolifera y Cymodocea nodosa (Sebadal-Caulerpal) | 33 Blanquizal y suspensivoros coloniales |
| 16 Caulerpa prolifera y Cymodocea nodosa (Sebadal-Caulerpal) | 34 Bispira viola, Caulerpa prolifera, Caulerpa racemosa y Heteroconger longissimus |
| 17 Caulerpa prolifera y Heteroconger longissimus | 35 Antropogenico |
| 18 Caulerpa prolifera y Heteroconger longissimus | 35 Antropogonico |
| 19 Heteroconger longissimus y Bispira viola | 36 Ma3r1 y Caulerpa racemosa |
| 20 Heteroconger longissimus y Bispira viola | 37 No procede |



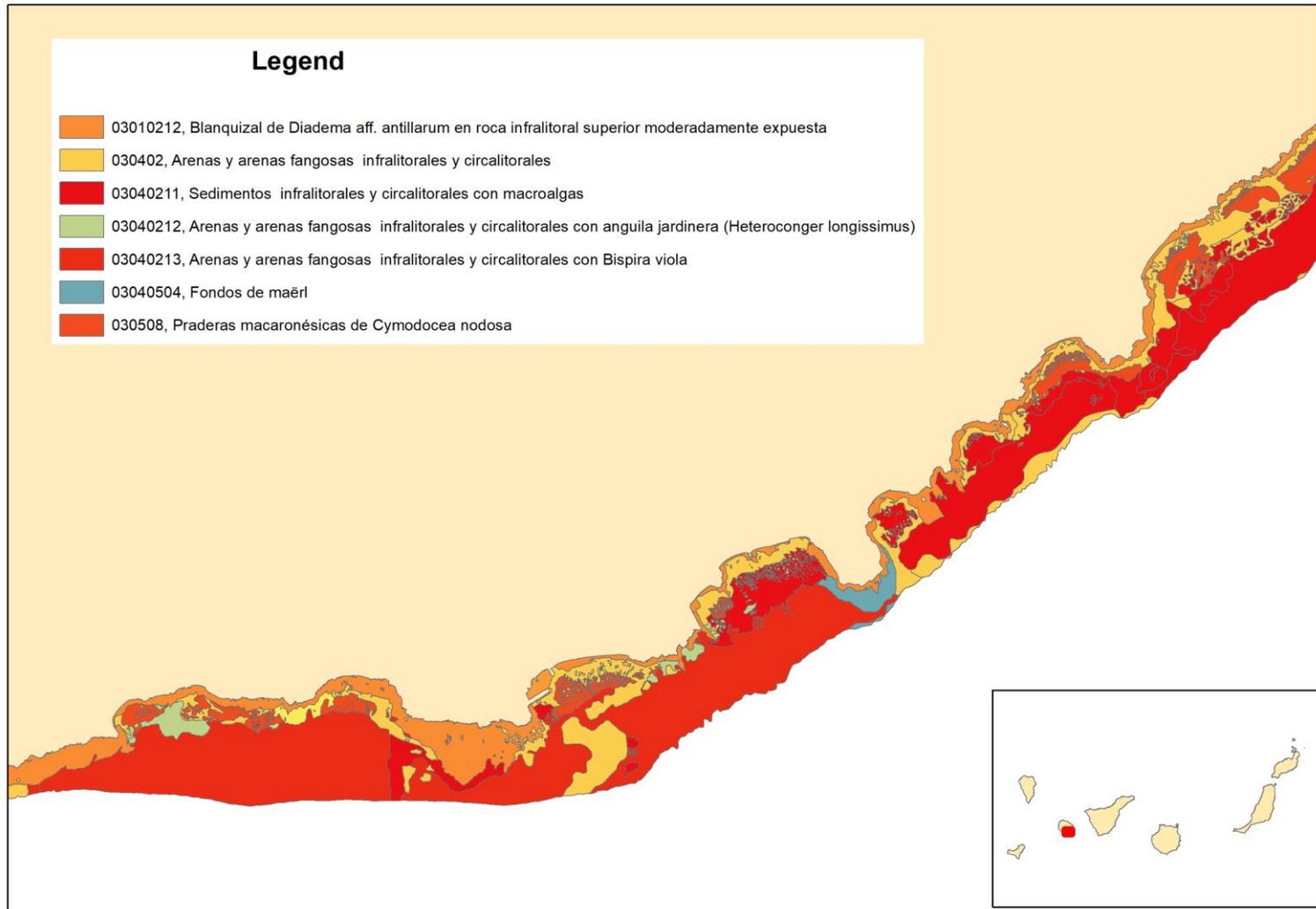
Data model on Habitat



- We applied one data model
- Common symbology
- Common classification
 - EUNISI, Inventario Español de Habitats Marino - Spanish National Habitat Classification

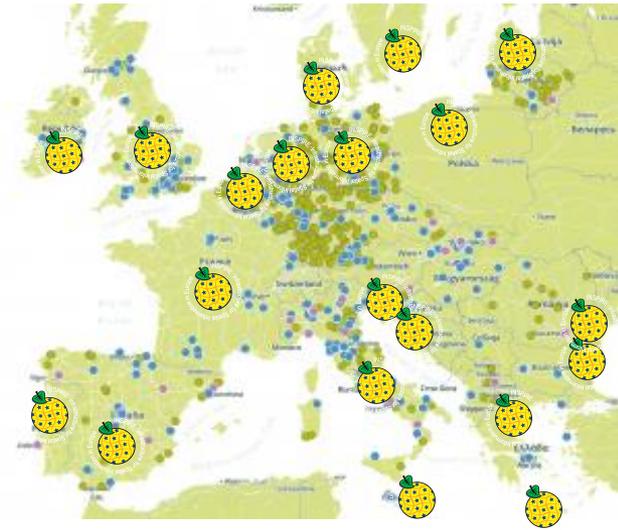


La Gomera. 14 habitats IEHE



Infrastructure for spatial information in Europe - INSPIRE

- **Legal data initiative** – based on the Directive (2007) on European Spatial Data Infrastructure (SDI)
- Requires to share ***data on environment or data that can have effect on environment***
- **Roadmap for INSPIRE 2010 – 2020:** Metadata, metadata catalogues, share data through internet data services, share harmonized data – interoperability
- **Data should be shared through decentralized system** where each country **establish own SDI**
- Data : **discover, view, download** – through interoperable INSPIRE compliant network services – set of rules



INSPIRE VS MSP

- Analyzed relationship of MSP & INSPIRE directives
- Analyzed how and if the implementation of INSPIRE can support and benefit MSP and related data management processes



Maritime spatial planning supported by infrastructure for spatial information in Europe (INSPIRE)



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^b *Wageningen University, Laboratory of Geo-Information Science and Remote Sensing, Deenvoedlaan 3, 6708 PB, Wageningen, The Netherlands*

^c *Direzione D. Sussidiarie, Risorse, Jaki, Ricerca Centro, European Commission, Ispira, Italy*

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Spatial data infrastructure
Data model
Data availability
Reporting

ABSTRACT

The implementation of Directive 2007/2/EC - INSPIRE can improve and actually strengthen the information management and data infrastructures needed for setting up Maritime Spatial Planning (MSP) processes. Evidence for this comes from three parallel analyses: links between the MSP Framework Directive and INSPIRE components and implementation; the availability of marine and maritime data through the INSPIRE Geo-Portal; and the adequacy of using an INSPIRE data model for mapping maritime spatial plans. The first item identifies INSPIRE as a relevant instrument not only for data collection, but additionally for increasing transparency of the MSP processes, using already operational national and European data infrastructure. The marine/maritime data availability analysis highlights a significant difference in data sharing within European marine regions. Finally, the INSPIRE data model is adequate for mapping maritime activities and for the integration of sea and land planning in an overview of cross-border planning for a given sea region.

Please check Appendix 2 for definitions of the terminology used.

1. Introduction

Ancient sea maps have been traditionally populated by giant serpents and octopuses wrapped around ships, fierce-toothed animals clashing in the waves, deceptively beautiful mermaids and a variety of other chimeric beings.¹ European map makers used such monstrosities to enchant viewers, but also to educate them about the dangers of the marine environment, dangers that could obstruct maritime activities like shipping, fishing or traveling. Sea monsters were not just mere playful illustrations, they were symbols trying to describe the main traits of a bizarre territory, made of a treacherous liquid element, and difficult to chart because of its featureless, and yet dynamical, nature (Ellis, 1994).

Sea monsters started to disappear from maritime maps at the end of the 17th century. As European understanding of the oceans and navigation advanced, more emphasis was placed on the ability of people to

master the watery element, to sail on it and conduct trade on it. Illustrations still appeared on maps, but for more pragmatic reasons: drawings of ships indicated areas of safe passage, while whales or other creatures pointed to good fishing areas (Bagrow, 2010). Some of the mystery was now gone and the sea was becoming yet another cradle of natural resources, rather than a churning darkness to be feared. However, the sense of awe captured in the old maps lingers on, to this very day, as many dangers and obstacles to maritime endeavours are still with us.

Modern maps of marine regions are free of sea monsters, but do point to a set of problems which are difficult to solve. Today, the main obstacle to human activities at sea is primarily competition for maritime space. Moreover, an increasing hunger for the many resources still available in the sea is placing a heavy burden on the preservation of the marine ecological balance. A management effort is required (JCG, 2006; Ardron et al., 2008; Day, 2008; Douere and Ehler, 2009; EC, 2010) to avoid potential conflicts and create synergies between different activities (Suarez de Vivero and Rodriguez Mateos, 2012; Brennan et al.,

* Corresponding author.

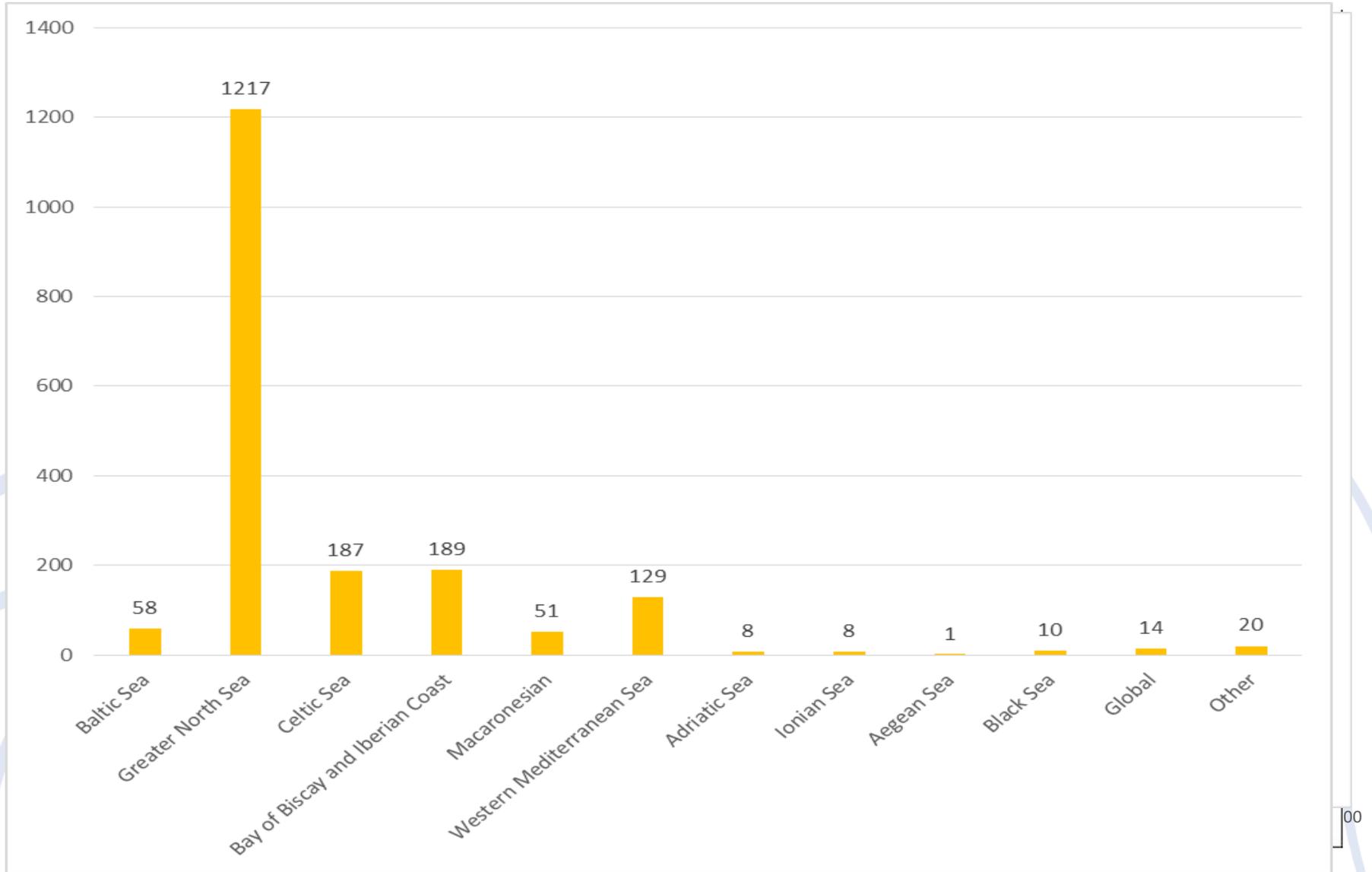
E-mail address: abramic@vik.iugm.ba (A. Abramic).

¹ See e.g. Olase Magnus, *Carra marines et description septentrionalis terrarum ac meridionalium partem in eis contentarum, diligenter elaborata Anon. Dantis 1539 Veneti: librali itate Rovenensis: Dantis Ieronis Quidam*, published in Venezia (Venice), 1539.

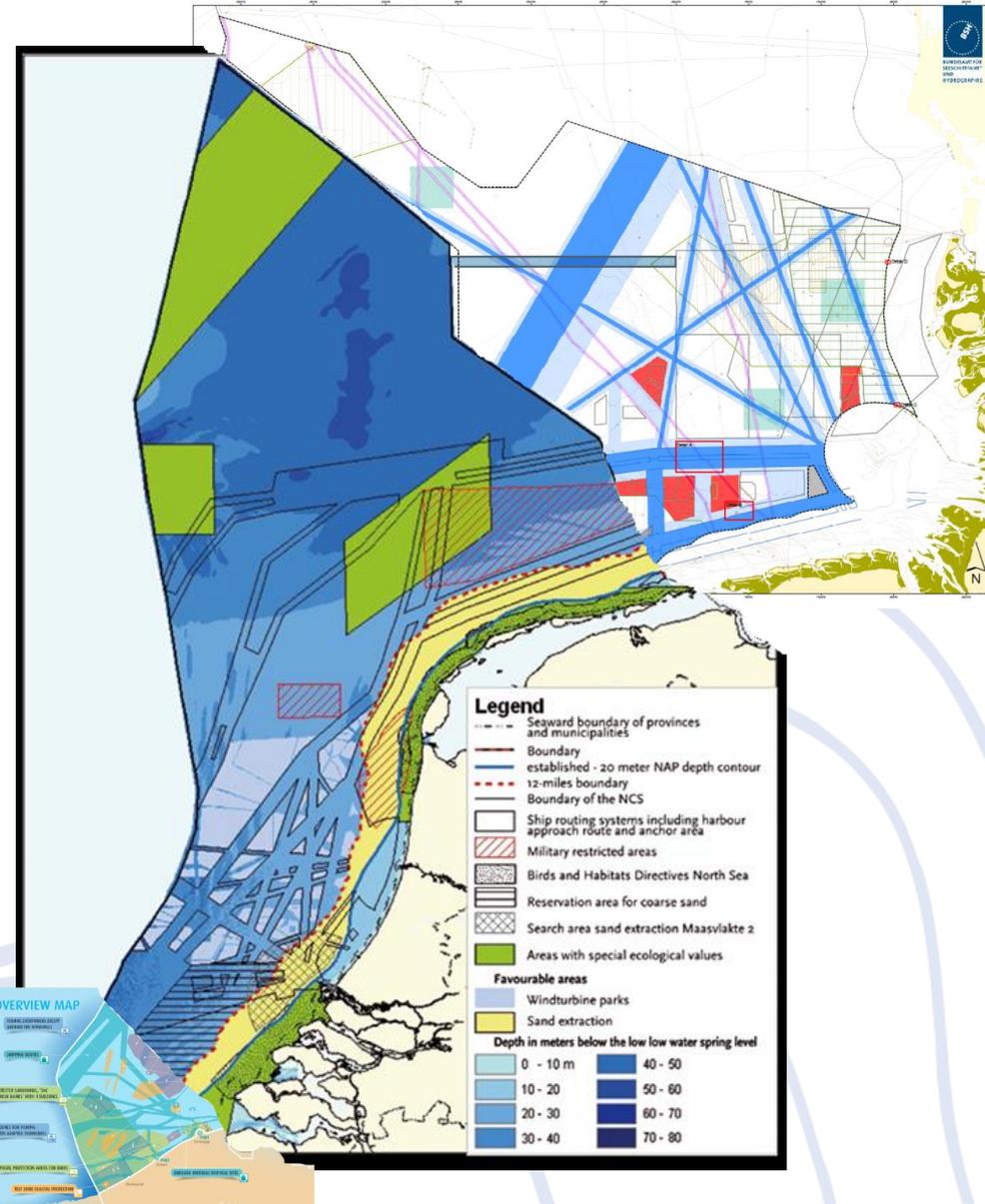
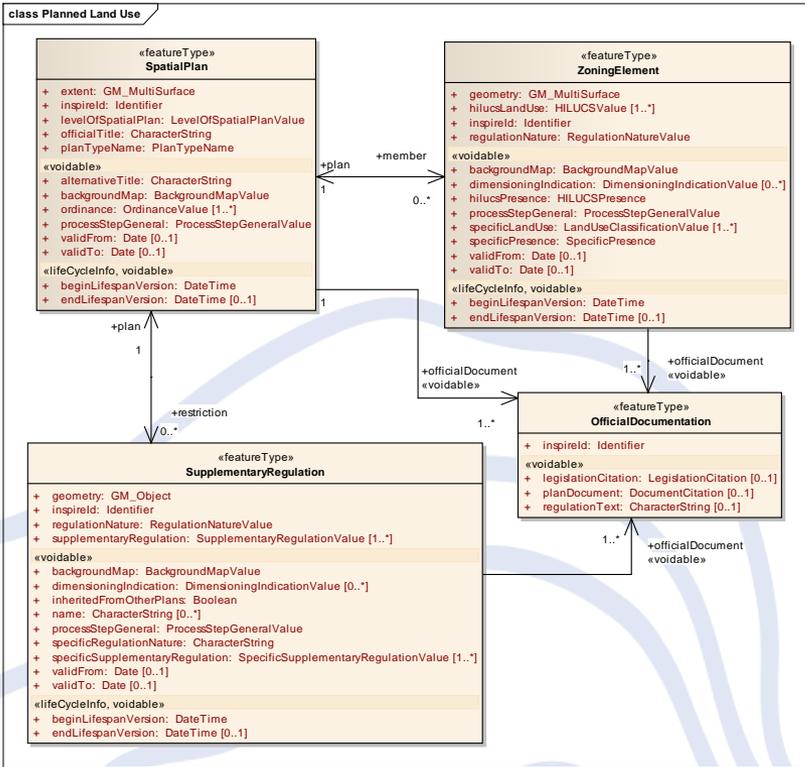
<https://doi.org/10.1016/j.ocecoaman.2017.11.007>

Received 1 September 2016; Received in revised form 14 November 2017; Accepted 14 November 2017
0964-5691/© 2017 Elsevier Ltd. All rights reserved.

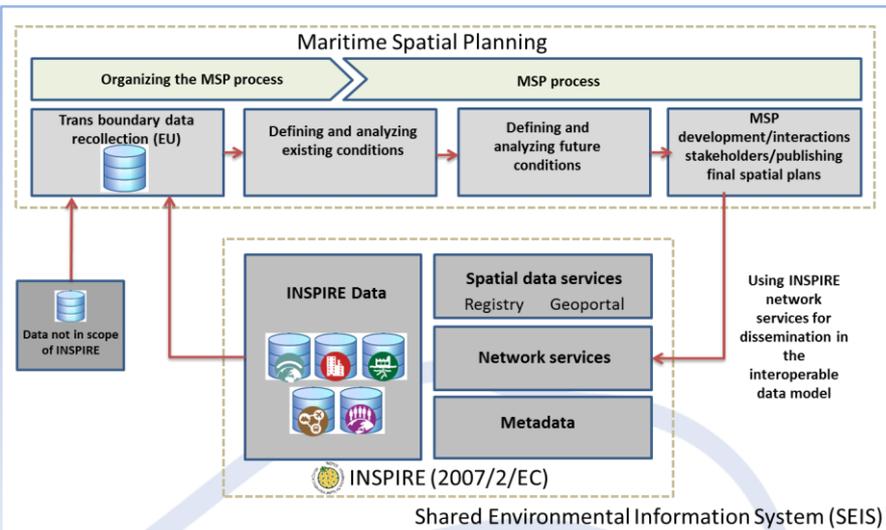
Analysis of maritime/marine data availability



INSPIRE data model used for mapping maritime spatial plans



Use of INSPIRE network services within MSP process



- Sharing marine spatial plans or/and scenarios increase transparency of MSP process
- Final plans should be provided to EC **until 2021**
- paper-based requirement could be **replaced by e-reporting**
- sharing MSP in **INSPIRE data model** through the **already operational (N)SDI** – **avoiding multiple non-updated copies**

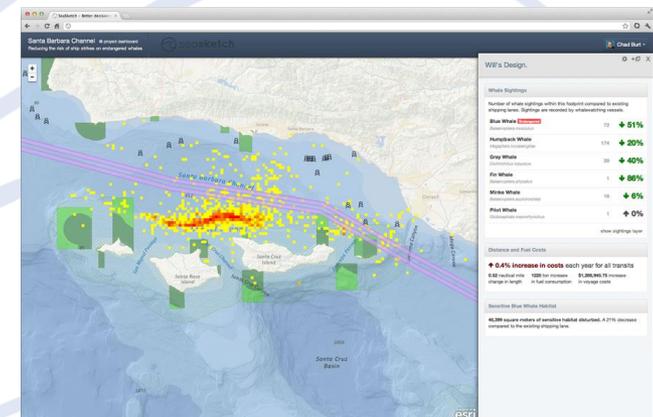
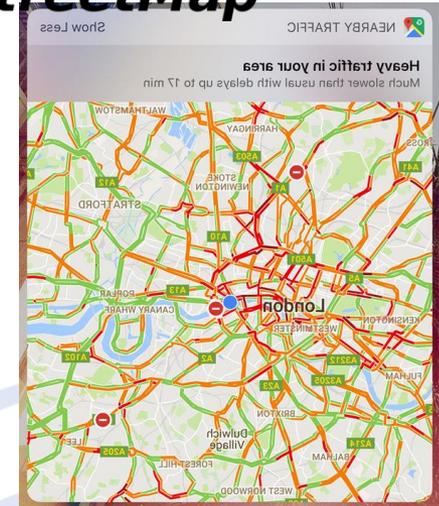
Crowdsourcing data

Crowdsourcing is the practice of turning to a body of people to obtain needed knowledge, goods or services.

- Crowdsourcing data – *OpenStreetMap*, Google traffic...
- Within MSP - to obtain data&information directly form stakeholders, that share their own ideas of planning, location of maritime activities and providing their own (spatial) data.
- Some crowdsourcing tools that can be used for the MSP:
 - SeaSketch*, *ArcGIS online*, *WikiMapping*, *Open Data Kit*...



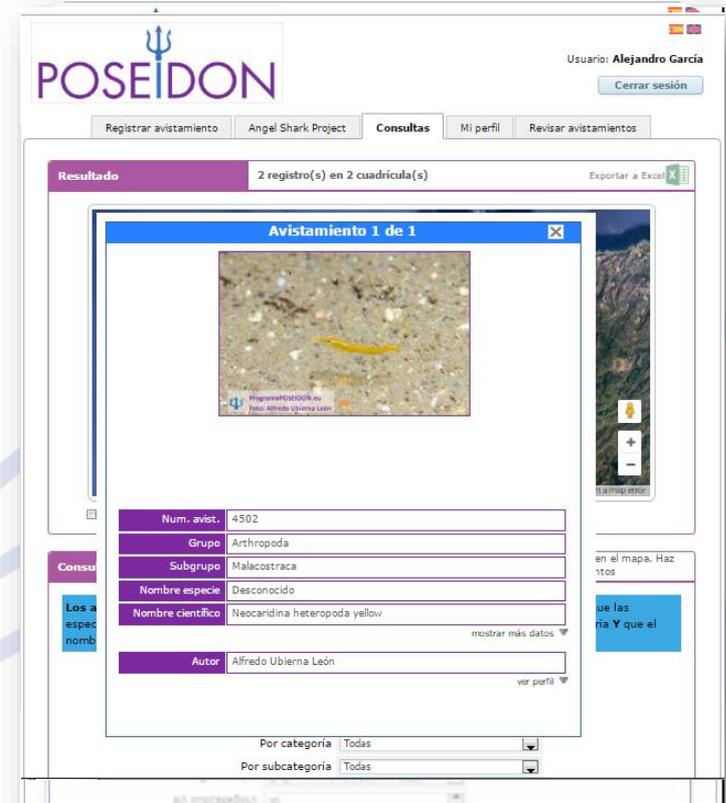
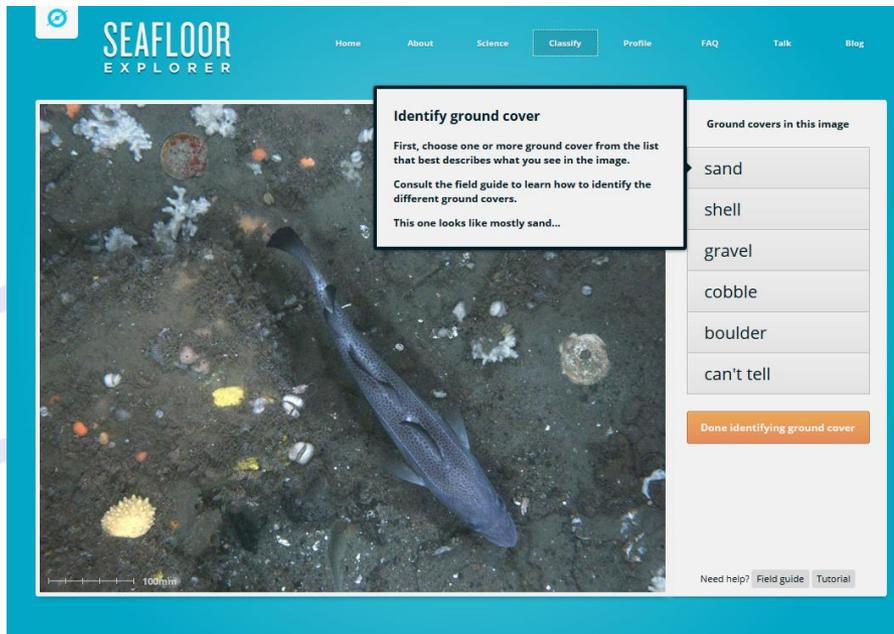
OpenStreetMap



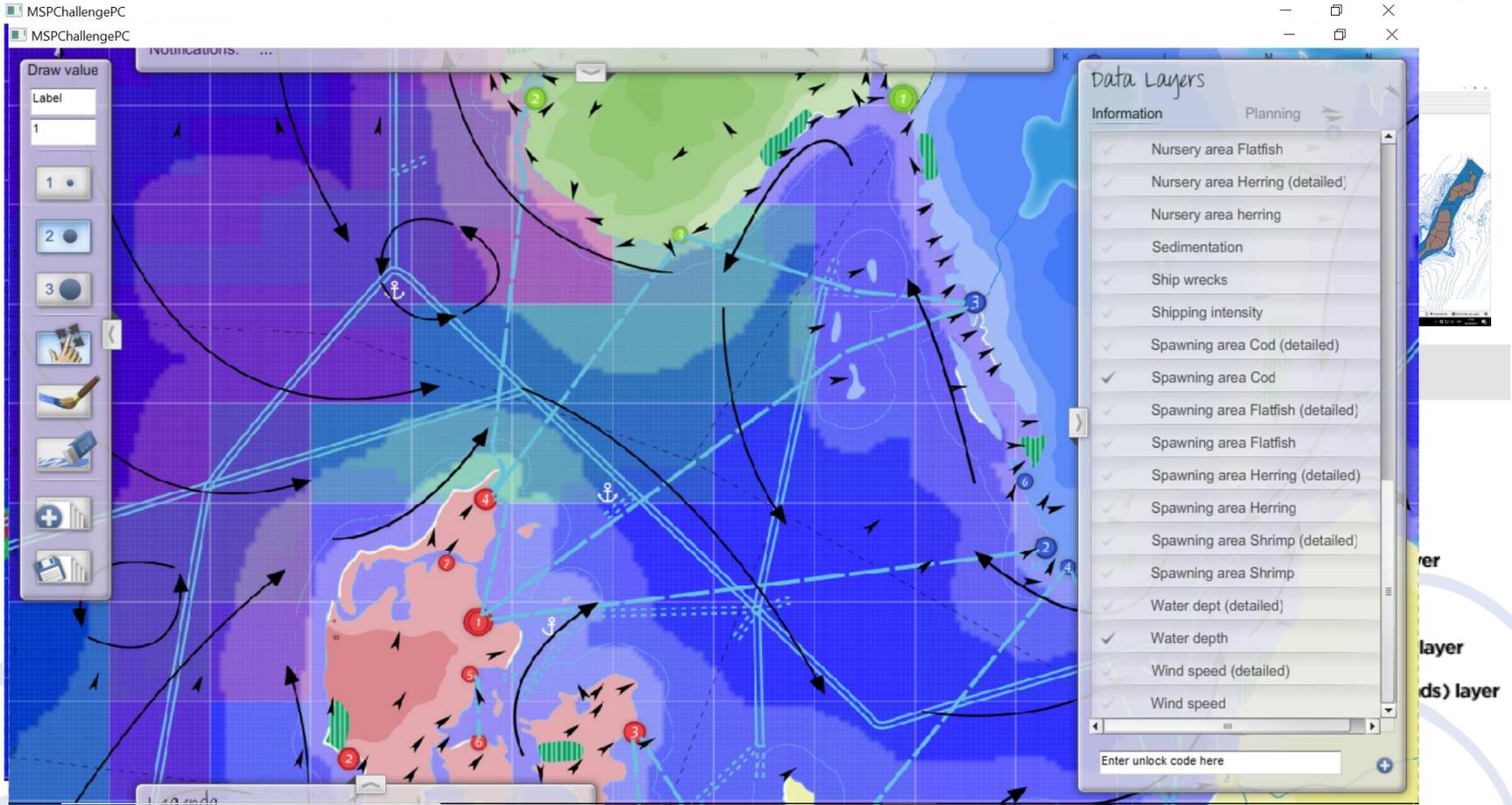
& Citizen Science Platforms

Citizen science is a narrower subset of crowdsourcing collaboration in which members of the public participate in the scientific process, including identifying research questions, collecting and analyzing data, interpreting results, and solving problems.

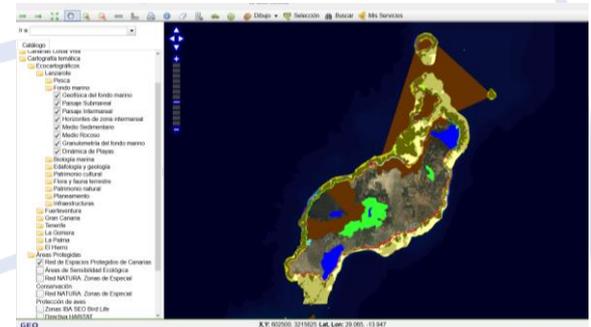
- Examples: **SeafloorExplorer**, **Programma Poseidon...**

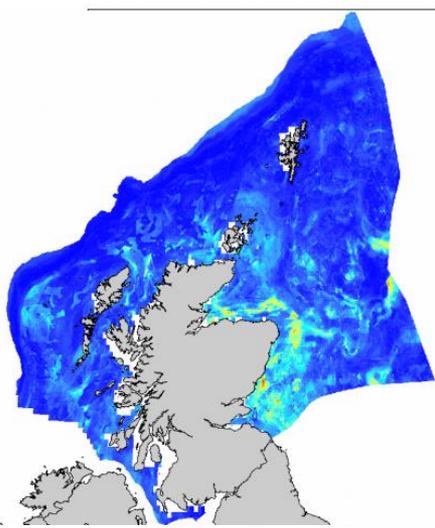


Geographical Information Systems (GIS)

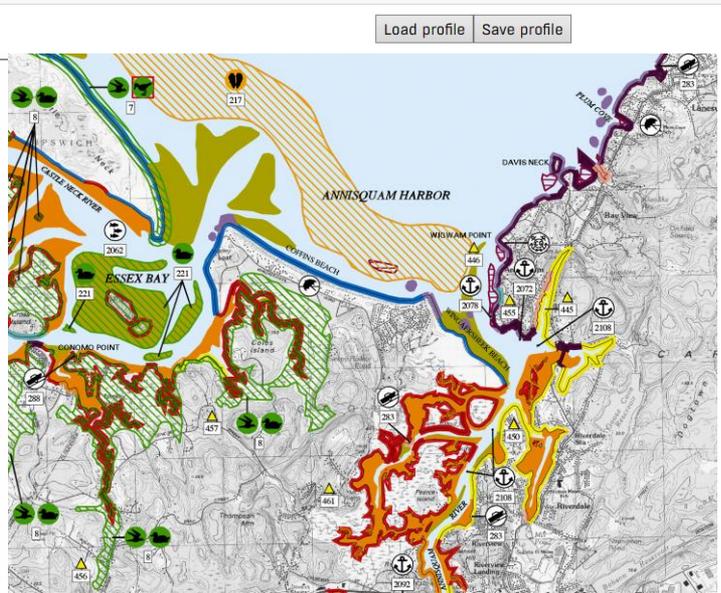


- GIS packages includes standard protocols to connect to remote servers (support number of protocols) – browsers





Use **ctrl** to mark area



Load profile Save profile

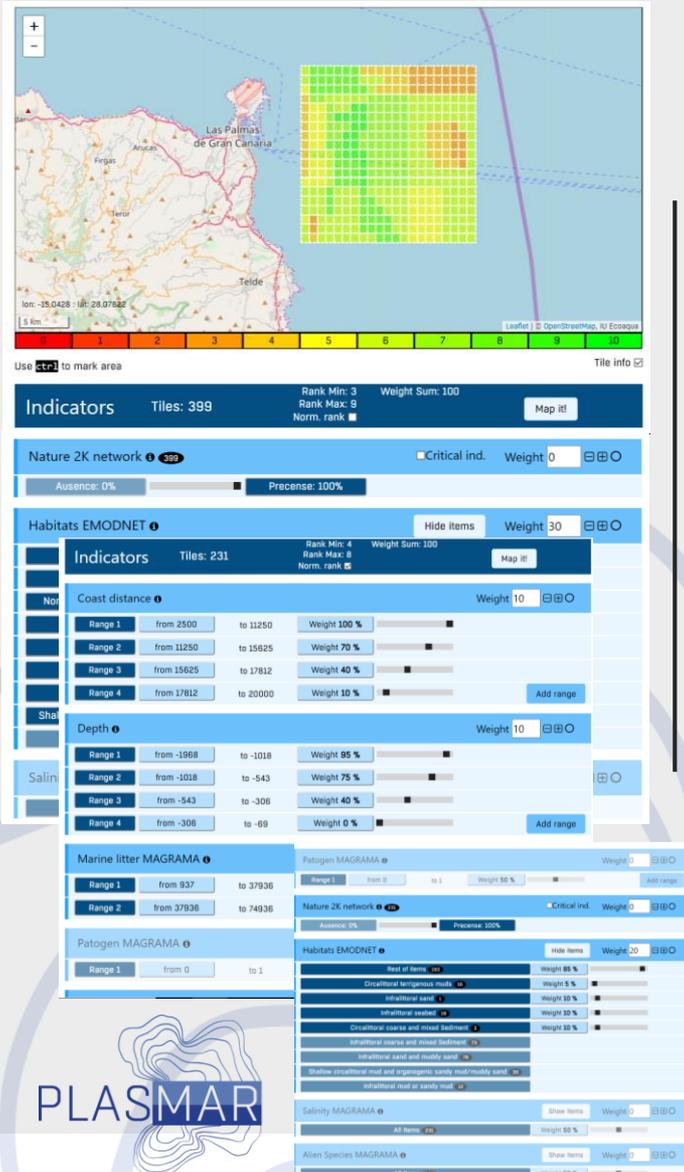
Indicators Tiles: 725 Rank Min: 5 Rank Max: 6 Norm. rank Weight Sum: 100 Keep Weight Map it!

- Multi- parameter analyses
- To identify areas that are most proper (less environmental impact) for identified maritime sectors:
 - aquaculture,
 - offshore wind installations
 - maritime traffic routs
 - Fishery
 - maritime tourism
 - mineral extraction

Example of multiparameter analysis – PLASMAR Project

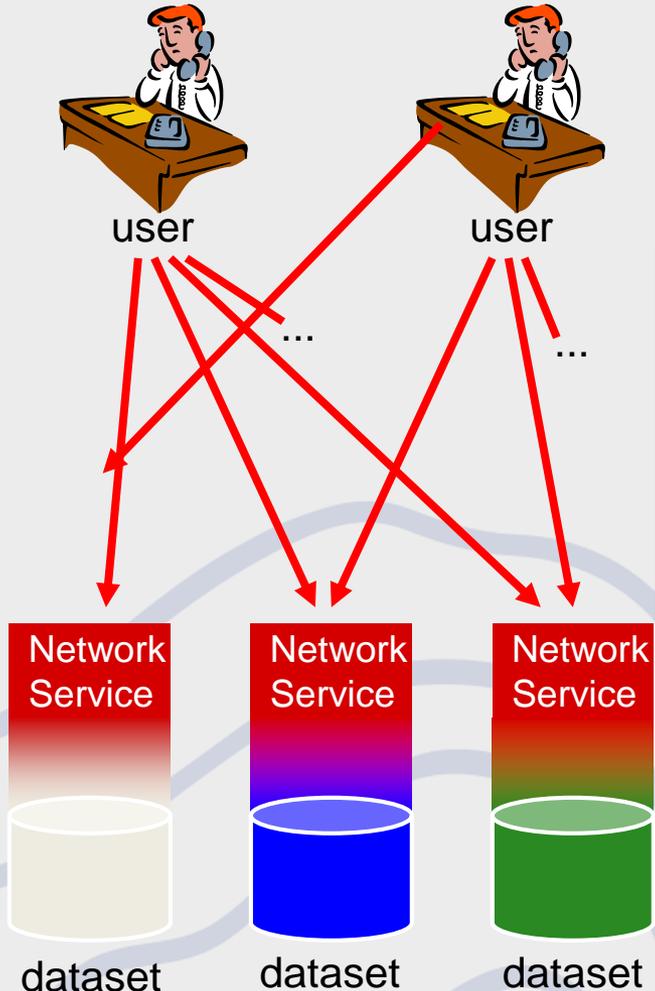
- Type of sensitivity maps
- We need to fill with data
- Establish relations with parametres to deliver methodology

INDIMAR – Decision Support System



- Developed tool - testing phase – empty shell/engine
- We need to feed tool with data - following PLASMAR data framework :
 - Marine data – following MSFD GES
 - Marine Protected Areas
 - Coastal zone Land use
 - Oceanography
 - Maritime Activities – human uses
- Methodology - We need to **define weights** and relation **per each parameter**
- Results will be used to **establish new methodology for zoning**
- We need data flows established within the project, that we can have updated data sets.

Establishing data flows



- **Avoid “walking network”**
- Connect to **remote servers**
- Provide **access** to (spatial) **data via network services** – internet
- **Efficient** – especially for **datasets** (data basis) that are **update frequently**
- **“External” data set** is not downloaded on our machine, it is **sitting on the remote server** and **we used it when we need it**
- We use less memory, and **we have *last version*** of data set (includes all updates)
- Standards that define protocols: *machine to machine*

Spatial Data Infrastructure

(SDI)

Definitions:

- Is a framework of geographic data, metadata, users and tools that are interactively connected in order to use spatial data in an efficient and flexible way.
- the technology, policies, standards, human resources, and related activities necessary to acquire, process, distribute, use, maintain, and preserve spatial data
- a coordinated series of agreements on technology standards, institutional arrangements, and policies that enable the discovery and use of geospatial information by users and for purposes other than those it was created for. Kuhn (2005)

Spatial Data Sets

Data provider

Network services
server

Discover

Users

Download

Standards

The OGC (**Open Geospatial Consortium**) is an international non profit organization, committed to making quality open standards for the global geospatial community. These standards are made through a consensus process and are freely available for anyone to use to improve sharing of the world's geospatial data.



Some relevant for MSP OGC standards:

Network Common Data Form (**netCDF**)

Geography Markup Language (**GML ...XML**) – INSPIRE 3.

Observations and Measurements (**O&M**) – stable

Sensor Observation Service (**SOS**) – in development

WaterML – in discussion **WaterML 2**

Web Coverage Service (**WCS**)

Web Feature Service (**WFS**)

Web Map Service (**WMS**) - stable & in use

Catalog Service for Web (**CSW**) –stable & in use



GeoNetwork

- **GeoNetwork** is a catalog application for metadata management. It provides powerful metadata editing and, web accessible catalogue including search functions;
- Provides an easy to use web interface to search geospatial data across multiple catalogs;
- GeoSpatial layers, but also services, maps or even non geographic datasets can be described in the catalog.

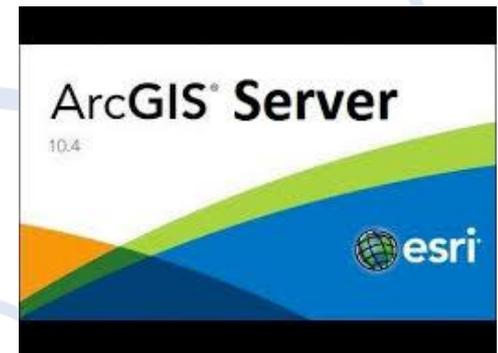
A screenshot of the GeoNetwork web interface dashboard. It features a grid of nine navigation tiles with icons and labels: "metadatasAndTemplates" (blue), "harvesters" (blue), "statisticsAndStatus" (green), "reports" (green), "classificationSystems" (light blue), "standards" (light blue), "usersAndGroups" (white), "settings" (orange), and "tools" (orange). To the right of the grid are two summary boxes: the top one shows "6 Service" and "4 Conjunto de datos", and the bottom one shows "10 totalNumberOfRecords".

6 Service
4 Conjunto de datos
10 totalNumberOfRecords

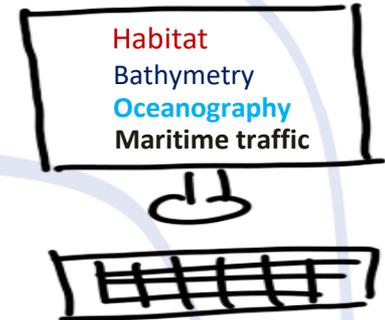
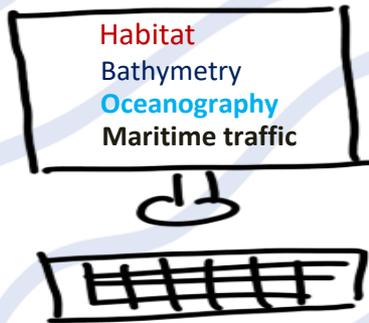
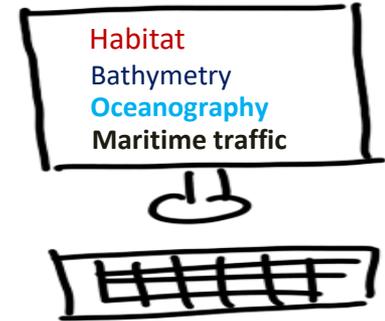
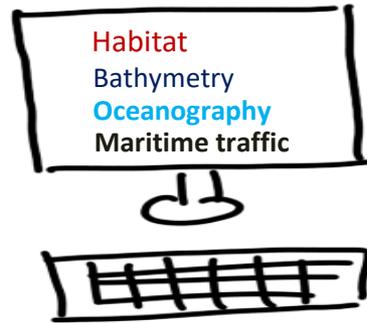
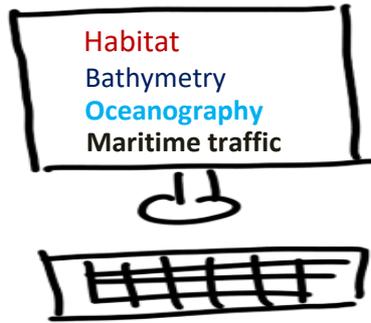
Marine data server



- X - Server is **software for managing your spatial data base** and **makes it available** to the others in your organization (e.g. MSP team), optionally to all partners, or/and stakeholders or/and anyone with an internet connection (public access) . This is **accomplished through web services**, which allow server to receive and process requests for information sent by other devices.
- ArcGIS Server, MapServer, GeoServer....
- <http://www.geoportal.ulpgc.es/geoserver/web/>

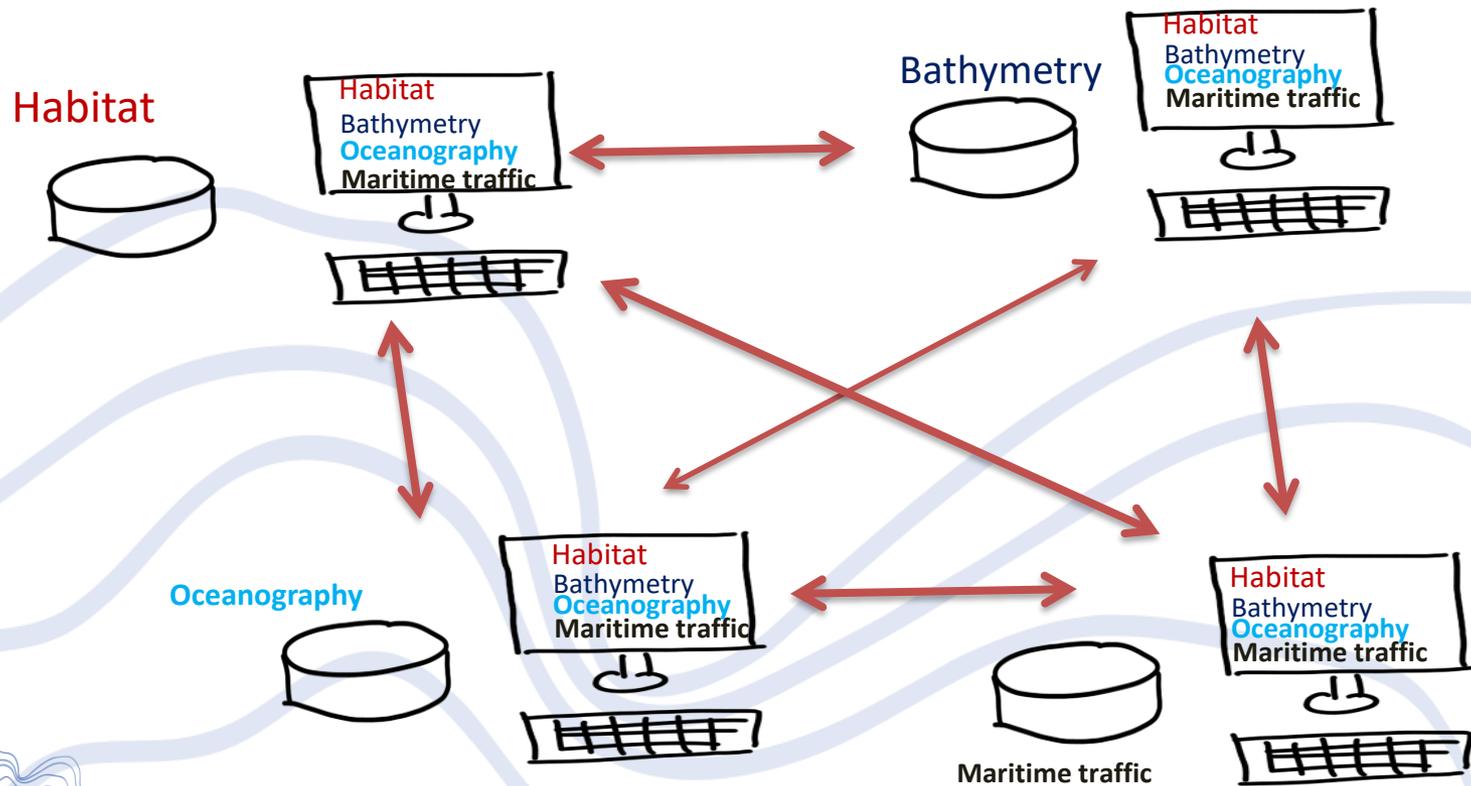


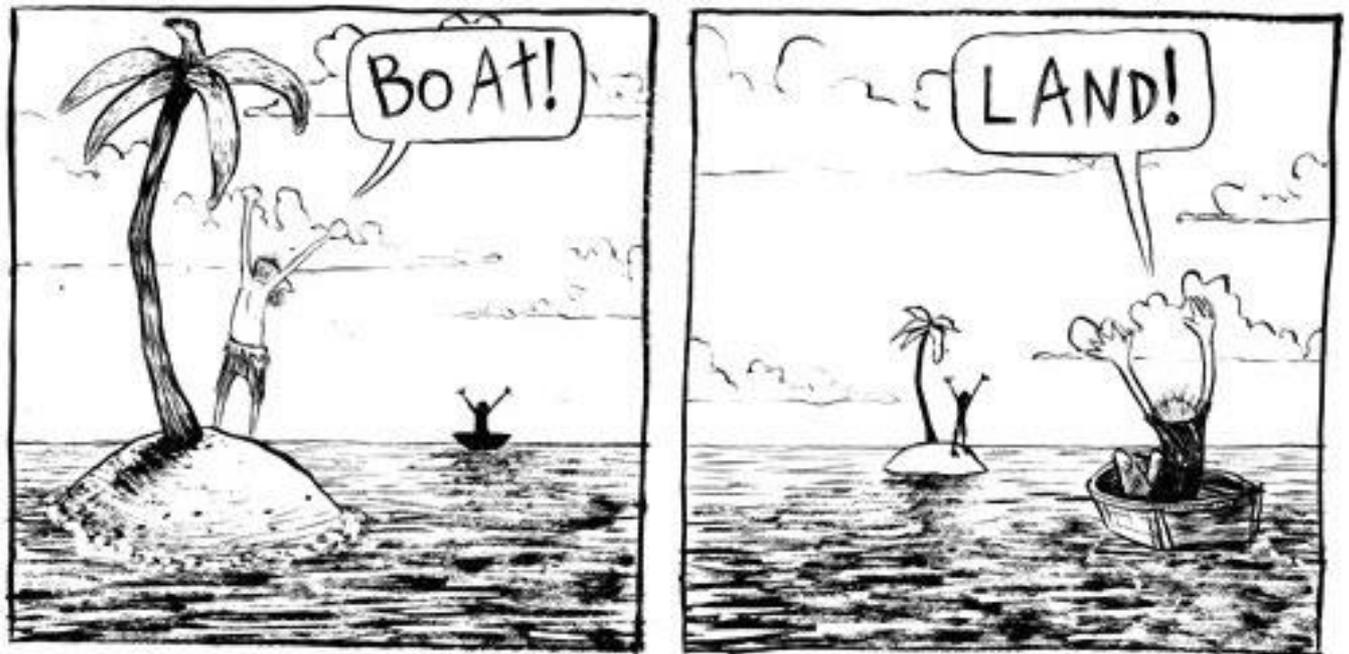
Centralized system



Decentralized system

- data is managed & shared in the house
- Data user is also data provider

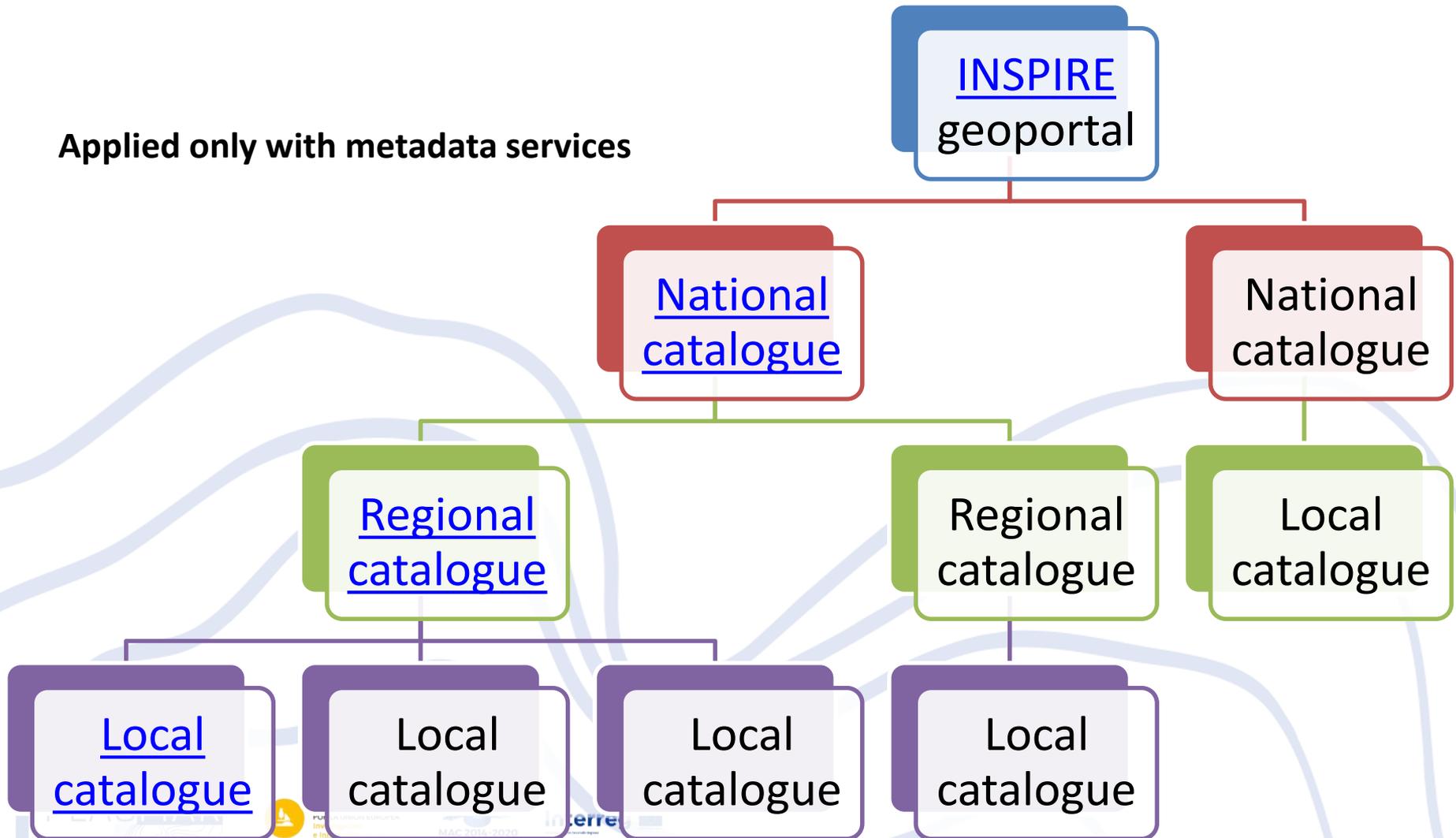




Contact e-mail: andrej.abramic@ulpgc.es

Hierarchical architecture of the web services

Applied only with metadata services



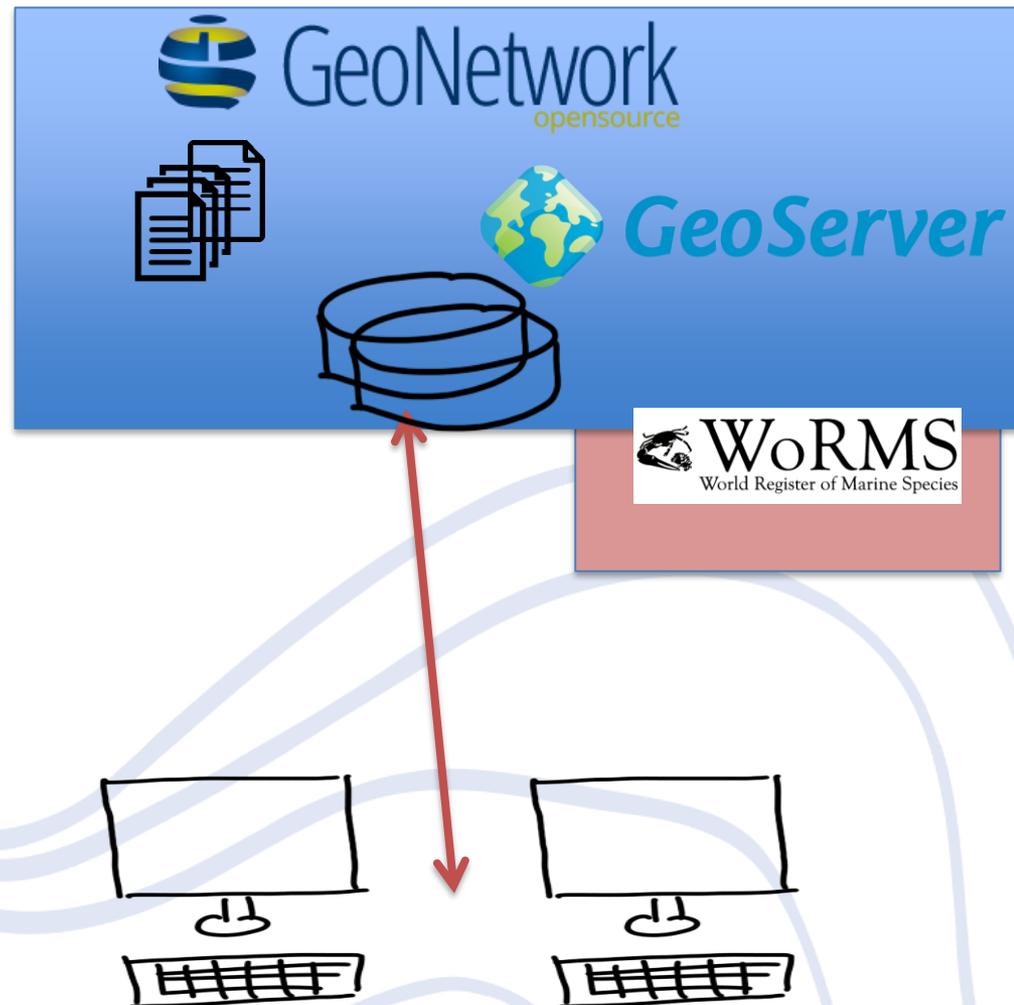
Metadata

- **data about data** –
- Development of metadata with editor *As fill the form document*
- Standards – ISO 19015 & ISO 19019 –
 - **Standardized forms/templates,**
 - Metadata Editors – you can make template or you can import already developed template
 - INSPIRE metadata editor (ISO 19015) – web application- : <http://inspire-geoportal.ec.europa.eu/editor/>
 - XML - *EXtensible Markup Language* – *human-readable and machine-readable* – *structured information* -
 - Including XML files in catalogue - **Discovery Service, enabled search**
 - Catalogues communicate and exchange metadata between them self (OGC standard CSW) – automatic metadata harvest – update

Marine SDI architecture

- example -

- Components of the Marine Spatial Data Infrastructure (SDI):
 - Data base(s),
 - Metadata,
 - Metadata catalogues
 - Use of registers
 - Server - Network services for access to (sharing/data flows) marine data



New Open Validate Save Save as template Help About | INSPIRE Spatial Dataset - en

Metadata Identification Classification Keyword Geographic Temporal Quality&Validity Conformity Constraints Responsible

IDENTIFICATION

▼ Resource title (*) 

▼ Identifier (*)  

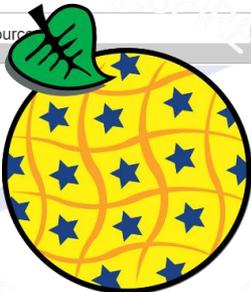
▼ Identifier 1 (*)

▼ Code (*)

▼ Codespace

▼ Resource abstract (*) 

▼ Resource  



[INSPIRE geoportal](#)



PLASMAR

Bases para la planificación sostenible de áreas
marinas en la Macaronesia

Introducing Geoserver

Alejandro García Mendoza
I.U. Ecoaqua ULPGC

MarSP & PLASMAR Capacity Building Workshop
Azores, April 2018

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Investigación
e Innovación

 **MAC 2014-2020**
Cooperación Territorial

 **Interreg** 

Sharing geographic data on internet

- Download files. Updating data.
- The OGC standards
 - WMS (web map service) view
 - WFS (web feature service) vectorial download
 - WCS (web coverage service) raster download
 - CSW (catalogue service web) discovery - metadata
 -
- Atom services



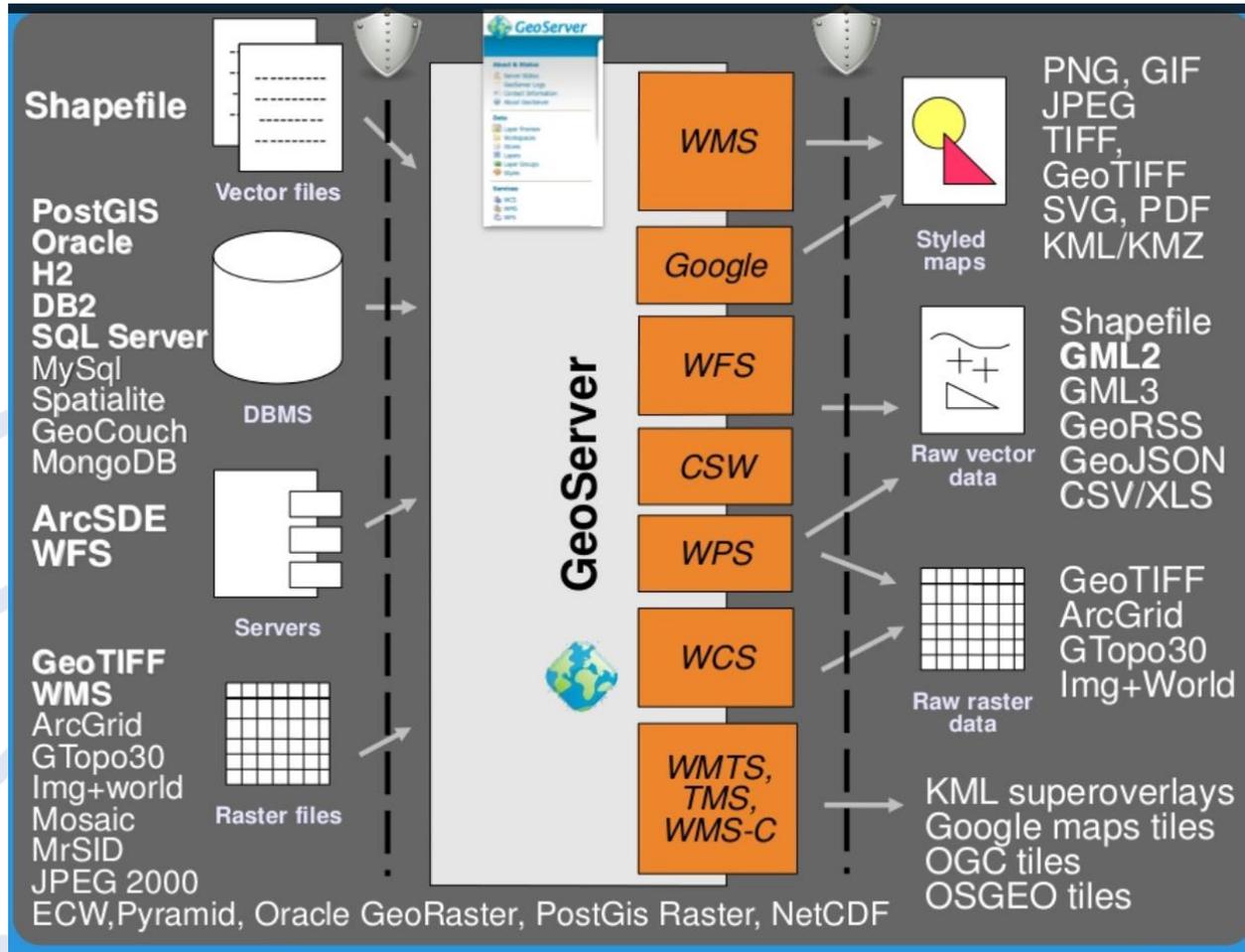
Sharing geographic data on internet

- OGC standards software servers

- MapServer
- Geoserver
- Deegree
- ArcGIS server
-



Geoserver formats and protocols



Geoserver Key Concepts

- **Workspace:** organizational structure/folder/virtual services
- **Stores:** connections to data sources
- **Layers:** the data and its configuration
- **Styles:** how to draw it
- **LayerGroups:** ready to use map

Geoserver practice. Starting.

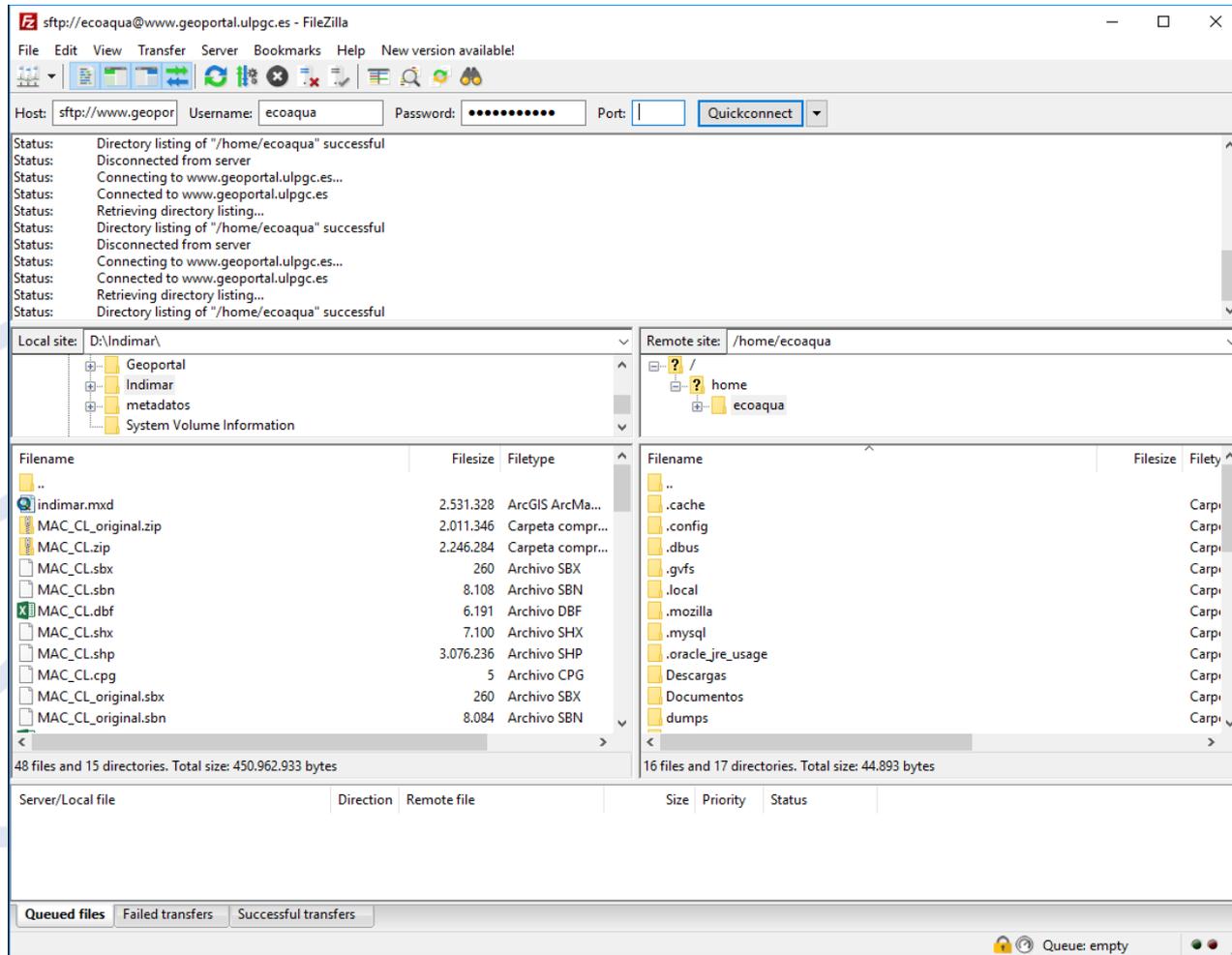
- Goal: publish a data set, setting up WMS and WFS services
- We need:
 - Datasets:
 - www.geoportal.ulpgc.es/portada/descarga/ejercicio1.zip
 - www.geoportal.ulpgc.es/portada/descarga/ejercicio2.zip
 - Geoserver:
 - www.geoportal.ulpgc.es/geoserverMad
 - www.geoportal.ulpgc.es/geoserverAzo
 - www.geoportal.ulpgc.es/geoserverGMR
 - FTP client:
 - <https://filezilla-project.org/download.php>
 - Qgis:
 - <https://qgis.org/es/site/forusers/download.html>

Geoserver practice. Steps

- 0. Copy dataset on server
- 1. Create Workspace
- 2. Create store
- 3. Create and config layers
- 4. Check wms and wfs links
- 5. Update dataset
- 6. Final check

Geoserver practice. Step 0

0. Copy dataset on server



The screenshot shows the FileZilla interface with the following details:

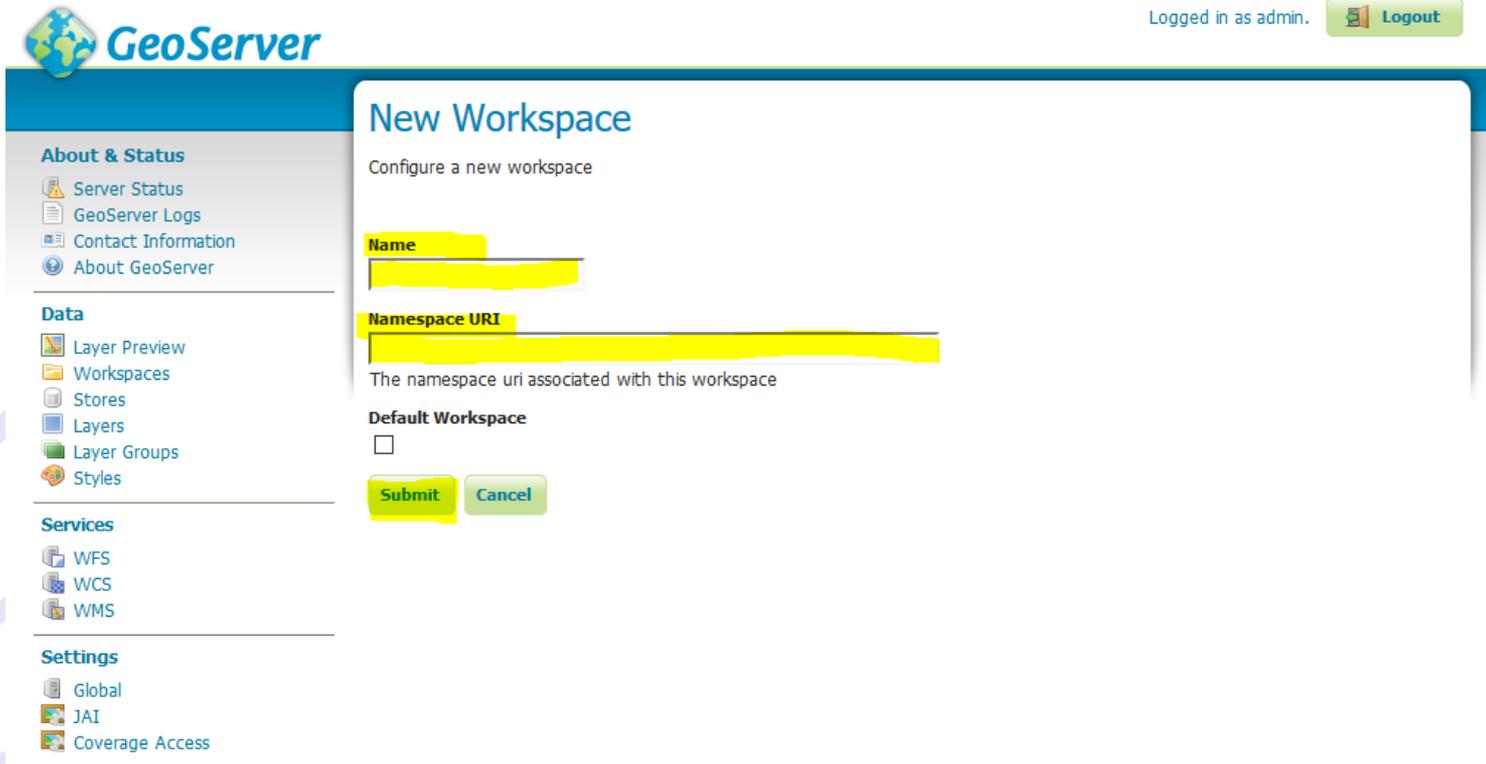
- Host:** sftp://www.geopor Username: ecoaqua Password: [redacted] Port: [empty] Quickconnect
- Status Log:** Directory listing of "/home/ecoaqua" successful
- Local site:** D:\Indimar\
- Remote site:** /home/ecoaqua
- Local Files:**

Filename	Filesize	Filetype
..		
indimar.mxd	2.531.328	ArcGIS ArcMa...
MAC_CL_original.zip	2.011.346	Carpeta compr...
MAC_CL.zip	2.246.284	Carpeta compr...
MAC_CL.sbx	260	Archivo SBX
MAC_CL.sbn	8.108	Archivo SBN
MAC_CL.dbf	6.191	Archivo DBF
MAC_CL.shx	7.100	Archivo SHX
MAC_CL.shp	3.076.236	Archivo SHP
MAC_CL.cpg	5	Archivo CPG
MAC_CL_original.sbx	260	Archivo SBX
MAC_CL_original.sbn	8.084	Archivo SBN
- Remote Files:**

Filename	Filesize	Filetype
..		
.cache		Carp
.config		Carp
.dbus		Carp
.gvfs		Carp
.local		Carp
.mozilla		Carp
.mysql		Carp
.oracle_jre_usage		Carp
Descargas		Carp
Documentos		Carp
dumps		Carp
- Transfer Queue:** Queued files, Failed transfers, Successful transfers

Geoserver practice. Step 1

1. Create Workspace



The screenshot shows the GeoServer web interface. At the top right, it says "Logged in as admin." with a "Logout" button. The main content area is titled "New Workspace" and contains the following fields and options:

- Name:** A text input field with a yellow highlight.
- Namespace URI:** A text input field with a yellow highlight. Below it, the text "The namespace uri associated with this workspace" is displayed.
- Default Workspace:** A checkbox that is currently unchecked.
- Buttons:** "Submit" (yellow highlight) and "Cancel" (green highlight) buttons.

The left sidebar contains a navigation menu with the following sections:

- About & Status:** Server Status, GeoServer Logs, Contact Information, About GeoServer.
- Data:** Layer Preview, Workspaces, Stores, Layers, Layer Groups, Styles.
- Services:** WFS, WCS, WMS.
- Settings:** Global, JAI, Coverage Access.

Geoserver practice. Step 2

2. Create store



Logged in as admin.

Logout

About & Status

- Server Status
- GeoServer Logs
- Contact Information
- About GeoServer

Data

- Layer Preview
- Workspaces
- Stores
- Layers
- Layer Groups
- Styles

Services

- WFS
- WCS
- WMS

Settings

- Global
- JAI
- Coverage Access

Tile Caching

- Tile Layers
- Caching Defaults
- Gridsets
- Disk Quota
- BlobStores

Security

New data source

Choose the type of data source you wish to configure

Vector Data Sources

- Application Schema DataAccess - Application Schema DataStore allows mapping of FeatureTypes to externally defined Output Schemas
- Directory of spatial files (shapefiles) - Takes a directory of shapefiles and exposes it as a data store
- MySQL - MySQL Database
- MySQL (JNDI) - MySQL Database (JNDI)
- PostGIS - PostGIS Database
- PostGIS (JNDI) - PostGIS Database (JNDI)
- Properties - Allows access to Java Property files containing Feature information
- Shapefile - ESRI(tm) Shapefiles (*.shp)**
- Web Complex Feature Server (NG) - Provides access to the Complex Features published a Web Feature Service (experimental), and the ability to perform transactions on the server (when supported / allowed).
- Web Feature Server (NG) - Provides access to the Features published a Web Feature Service, and the ability to perform transactions on the server (when supported / allowed).

Raster Data Sources

- ArcGrid - ARC/INFO ASCII GRID Coverage Format
- GeoTIFF - Tagged Image File Format with Geographic information
- Gtopo30 - Gtopo30 Coverage Format
- ImageMosaic - Image mosaicking plugin
- WorldImage - A raster file accompanied by a spatial data file

Other Data Sources

- WMS - Cascades a remote Web Map Service

Geoserver practice. Step 3

3. Create and config layers

GeoServer

Logged in as admin. [Logout](#)

Edit Layer

Edit layer data and publishing

bati:Islas00LIN

Configure the resource and publishing information for the current layer

Data **Publishing** **Dimensions** **Tile Caching**

Tile cache configuration

- Create a cached layer for this layer
- Enable tile caching for this layer
- Enable In Memory Caching for this Layer.

BlobStore

(*) Default BlobStore

Metatiling factors

4 tiles wide by 4 tiles high

Gutter size in pixels

0

Tile Image Formats

- image/gif
- image/jpeg
- image/png
- image/png8

Expire server cache after n seconds (set to 0 to use source setting)

0

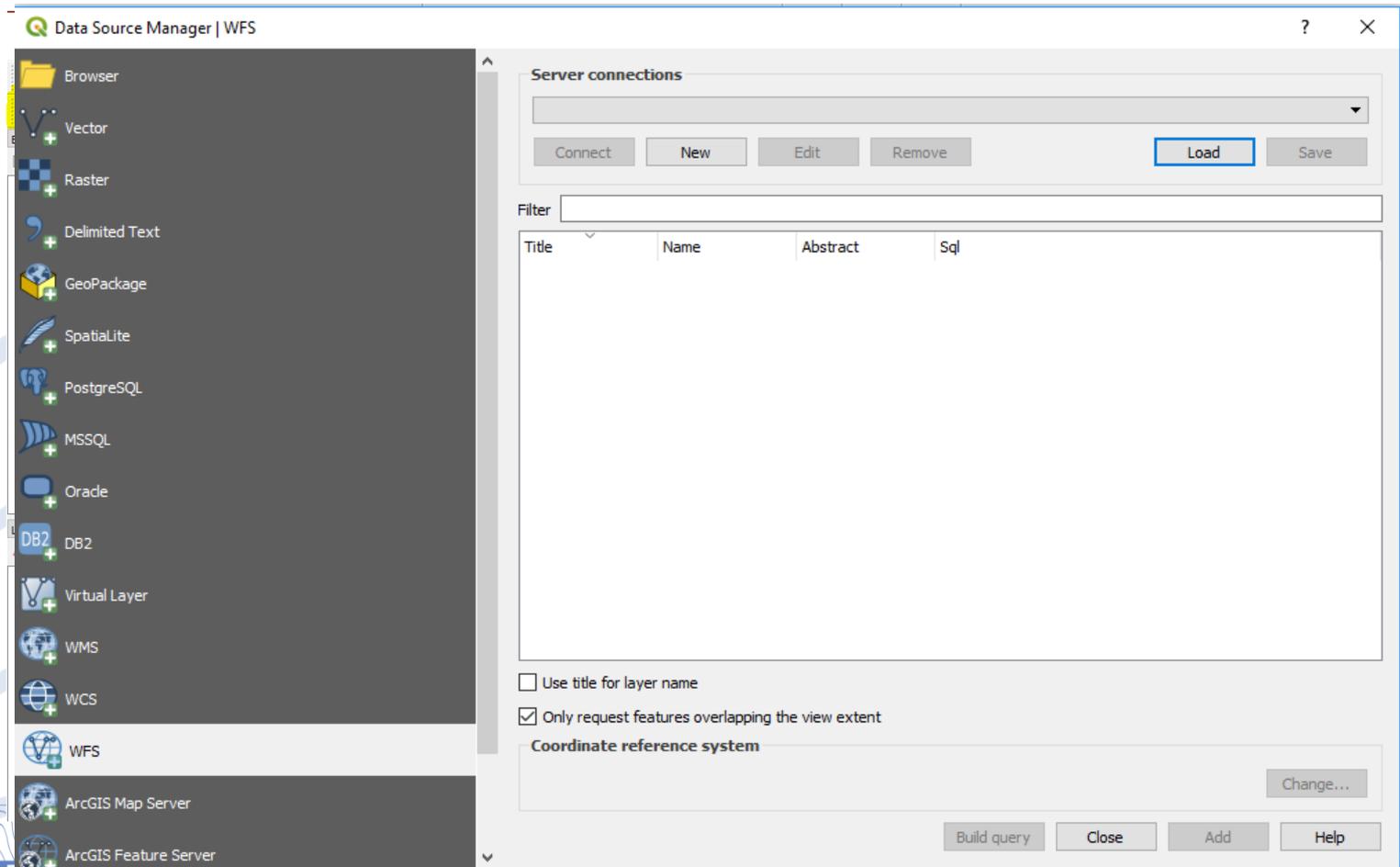
Expire client cache after n seconds (set to 0 to use server setting)

0

Parameter Filters

Geoserver practice. Step 4

4 Check wms and wfs links



Geoserver practice. Step 5

5. Update dataset

The screenshot shows the FileZilla SFTP client interface. The top bar indicates the connection is to `sftp://ecoaqua@www.geoportal.ulpgc.es`. The status log shows a successful directory listing of `/home/ecoaqua`. The local site is `D:\Indimar\` and the remote site is `/home/ecoaqua`. The remote directory listing shows a subdirectory `ecoaqua` and several system files and directories.

Local site: D:\Indimar\	Remote site: /home/ecoaqua																																																																														
<table border="1"><thead><tr><th>Filename</th><th>Filesize</th><th>Filetype</th></tr></thead><tbody><tr><td>..</td><td></td><td></td></tr><tr><td>indimar.mxd</td><td>2.531.328</td><td>ArcGIS ArcMa...</td></tr><tr><td>MAC_CL_original.zip</td><td>2.011.346</td><td>Carpeta compr...</td></tr><tr><td>MAC_CL.zip</td><td>2.246.284</td><td>Carpeta compr...</td></tr><tr><td>MAC_CL.sbx</td><td>260</td><td>Archivo SBX</td></tr><tr><td>MAC_CL.sbn</td><td>8.108</td><td>Archivo SBN</td></tr><tr><td>MAC_CL.dbf</td><td>6.191</td><td>Archivo DBF</td></tr><tr><td>MAC_CL.shx</td><td>7.100</td><td>Archivo SHX</td></tr><tr><td>MAC_CL.shp</td><td>3.076.236</td><td>Archivo SHP</td></tr><tr><td>MAC_CL.cpg</td><td>5</td><td>Archivo CPG</td></tr><tr><td>MAC_CL_original.sbx</td><td>260</td><td>Archivo SBX</td></tr><tr><td>MAC_CL_original.sbn</td><td>8.084</td><td>Archivo SBN</td></tr></tbody></table>	Filename	Filesize	Filetype	..			indimar.mxd	2.531.328	ArcGIS ArcMa...	MAC_CL_original.zip	2.011.346	Carpeta compr...	MAC_CL.zip	2.246.284	Carpeta compr...	MAC_CL.sbx	260	Archivo SBX	MAC_CL.sbn	8.108	Archivo SBN	MAC_CL.dbf	6.191	Archivo DBF	MAC_CL.shx	7.100	Archivo SHX	MAC_CL.shp	3.076.236	Archivo SHP	MAC_CL.cpg	5	Archivo CPG	MAC_CL_original.sbx	260	Archivo SBX	MAC_CL_original.sbn	8.084	Archivo SBN	<table border="1"><thead><tr><th>Filename</th><th>Filesize</th><th>Filetype</th></tr></thead><tbody><tr><td>..</td><td></td><td></td></tr><tr><td>.cache</td><td></td><td>Carp</td></tr><tr><td>.config</td><td></td><td>Carp</td></tr><tr><td>.dbus</td><td></td><td>Carp</td></tr><tr><td>.gvfs</td><td></td><td>Carp</td></tr><tr><td>.local</td><td></td><td>Carp</td></tr><tr><td>.mozilla</td><td></td><td>Carp</td></tr><tr><td>.mysql</td><td></td><td>Carp</td></tr><tr><td>.oracle_jre_usage</td><td></td><td>Carp</td></tr><tr><td>Descargas</td><td></td><td>Carp</td></tr><tr><td>Documentos</td><td></td><td>Carp</td></tr><tr><td>dumps</td><td></td><td>Carp</td></tr></tbody></table>	Filename	Filesize	Filetype	..			.cache		Carp	.config		Carp	.dbus		Carp	.gvfs		Carp	.local		Carp	.mozilla		Carp	.mysql		Carp	.oracle_jre_usage		Carp	Descargas		Carp	Documentos		Carp	dumps		Carp
Filename	Filesize	Filetype																																																																													
..																																																																															
indimar.mxd	2.531.328	ArcGIS ArcMa...																																																																													
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.cache		Carp																																																																													
.config		Carp																																																																													
.dbus		Carp																																																																													
.gvfs		Carp																																																																													
.local		Carp																																																																													
.mozilla		Carp																																																																													
.mysql		Carp																																																																													
.oracle_jre_usage		Carp																																																																													
Descargas		Carp																																																																													
Documentos		Carp																																																																													
dumps		Carp																																																																													

48 files and 15 directories. Total size: 450.962.933 bytes

16 files and 17 directories. Total size: 44.893 bytes

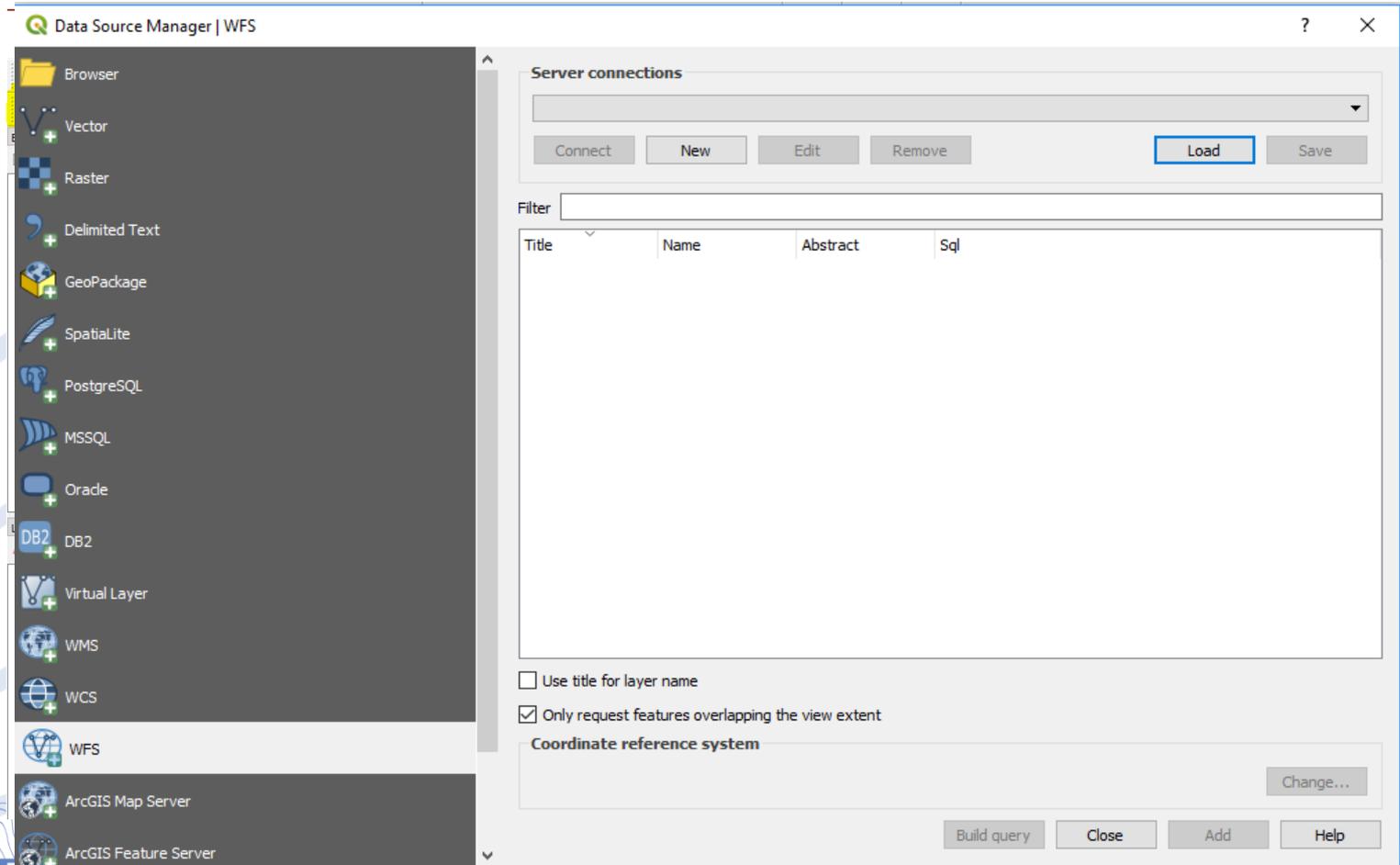
Server/Local file	Direction	Remote file	Size	Priority	Status
-------------------	-----------	-------------	------	----------	--------

Queued files | Failed transfers | Successful transfers

Queue: empty

Geoserver practice. Step 6

6. Final check



Bonus: OGC standards

- Diving in GetCapabilities file
 - WMS getCapabilities
 - WFS getCapabilities
- How share links



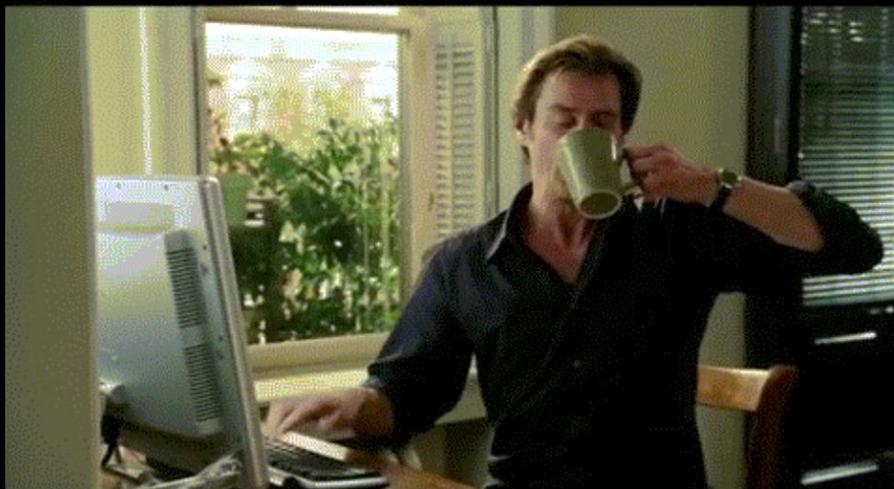
Solutions for sharing data (IEO)

PLASMAR & MarSP workshop

20 APRIL 2018



ALLOW ME INTRODUCE MYSELF...



LUIS MIGUEL AGUDO

** GIS DEVELOPER **

- INSTITUTO ESPAÑOL DE OCEANOGRAFÍA
- IOC/UNESCO
- JRC / EUROPEAN COMMISSION



2carto

WHERE PROJECTS TAKE PLACE



2carto.com



**Have you ever shared data
using ArcGIS?**

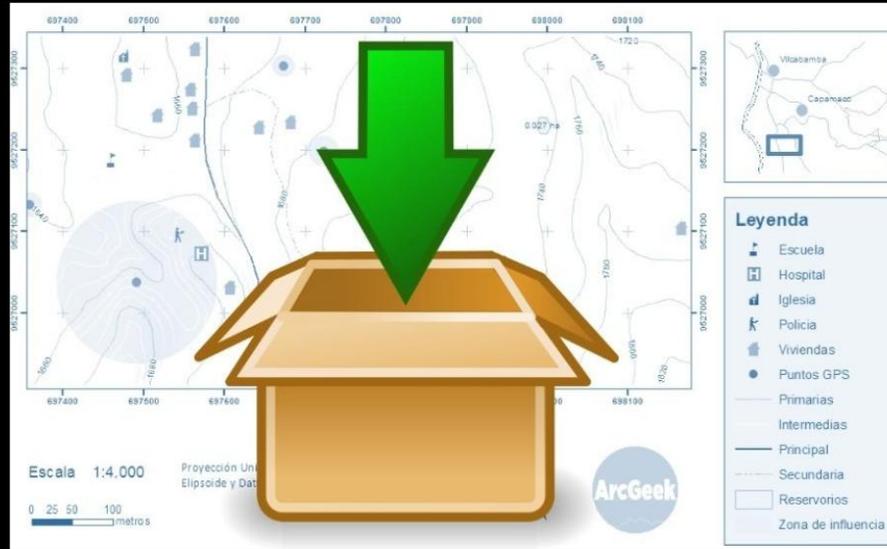




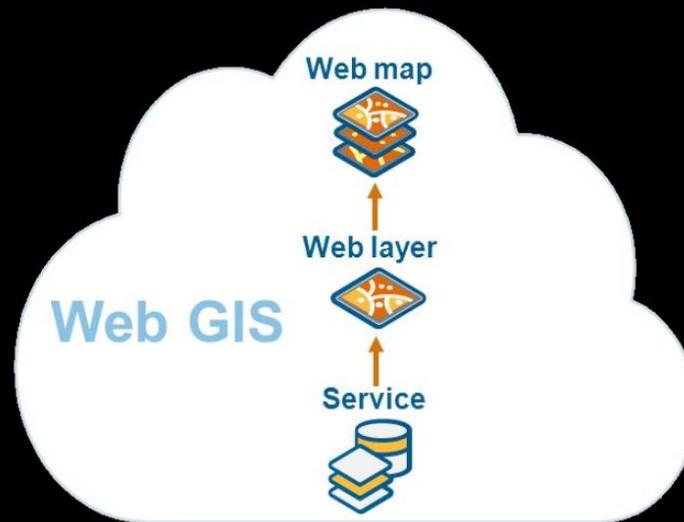
SHP

... TOO DISORGANIZED

MAP PACKAGES



... AND IN THE WEB?





WHAT IS ArcGIS SERVER?



ArcGIS Server **is software** that makes your geographic **information available** to others in your organization and optionally anyone with an **Internet connection**.

This is accomplished through **web services**, which allow a powerful server **computer to receive and process requests** for information sent by other devices. ArcGIS Server opens your GIS to tablets, smartphones, laptops, desktop workstations, and any other devices that can connect to web services



An iceberg floating in the ocean. The tip of the iceberg is above the water, and the much larger base is submerged. The scene includes a polar bear on the tip, penguins, and birds in the sky above, and sharks swimming in the dark water below. The text is overlaid on the image.

Front End and Back End

Web Development Comparison:
What's the difference?



WEB SERVICES



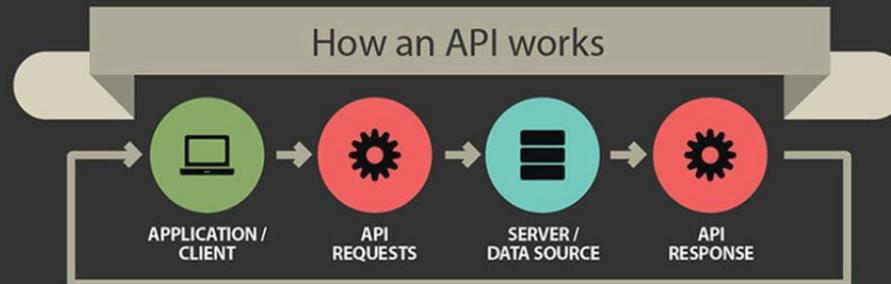
The API

Application Programming Interface

API Definition

An application program interface that provides a developer with programmatic access to a proprietary software application. A software intermediary that makes it possible for application programs to interact with each other and share data.¹

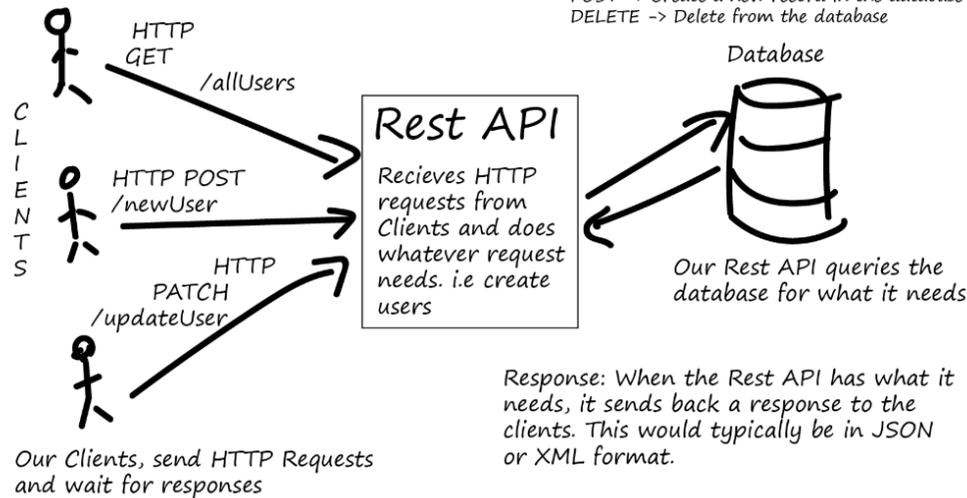
How an API works

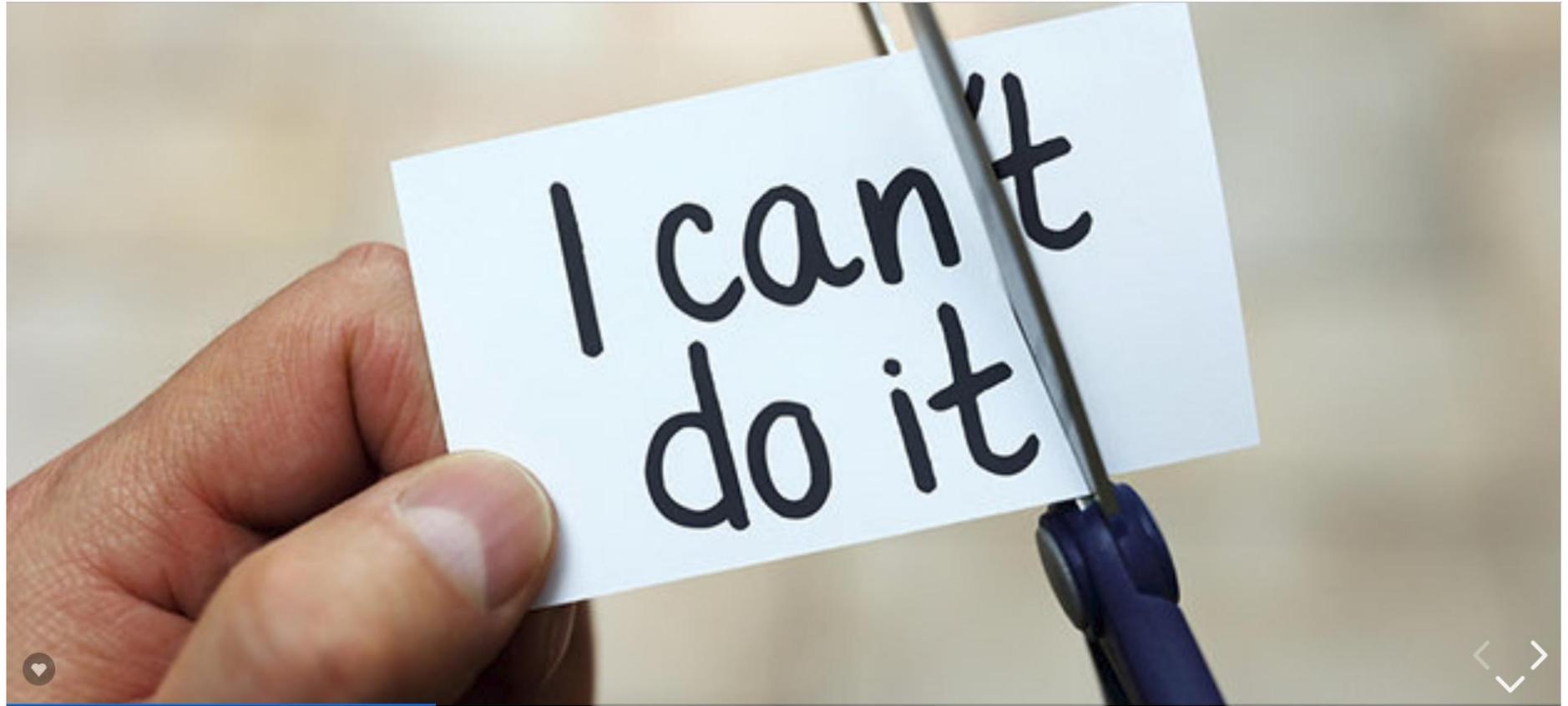


Rest API Basics



Typical HTTP Verbs:
GET -> Read from Database
PUT -> Update/Replace row in Database
PATCH -> Update/Modify row in Database
POST -> Create a new record in the database
DELETE -> Delete from the database

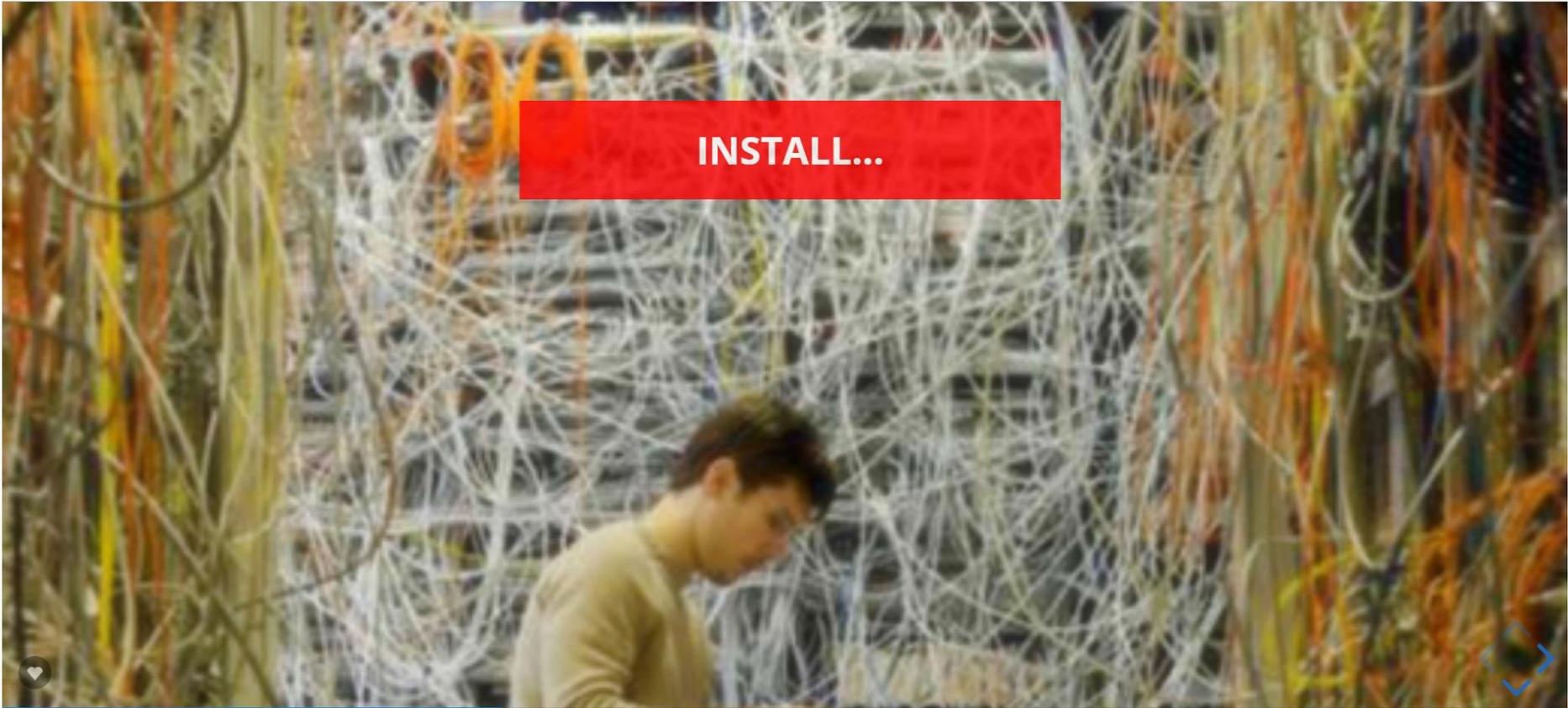






GIS resource	What it can do in ArcGIS Server	Which ArcGIS Desktop application creates it
Map document	Mapping, network analysis, Web Coverage Service (WCS) publishing, Web Feature Service (WFS) publishing, Web Map Service (WMS) publishing, Web Map Tile Service (WMTS) publishing, KML publishing, Geodatabase data extraction and replication, feature access publishing, schematics publishing	ArcMap
Address locator	Geocoding	ArcCatalog or the Catalog window in ArcMap
Geodatabase	Geodatabase query, extraction, and replication; WCS publishing; WFS publishing	ArcCatalog or the Catalog window in ArcMap
Geoprocessing model or tool	Geoprocessing, Web Processing Service (WPS) publishing	ArcMap (geoprocessing result from the Results window)
Raster dataset or mosaic dataset or layer file referencing a raster dataset or mosaic dataset	Image publishing, WCS or WMS publishing	ArcCatalog or the Catalog window in ArcMap
Folders and geodatabases of GIS content	Create a searchable index of your organization's GIS content	ArcMap





INSTALL...

SYSTEM ARCHITECTURE ...



SOFTWARE:

- ARCGIS Server (10.3)
- ARCGIS Desktop (10.3)
- RMDBS (Microsoft SQL Server 2012)
- Apache Tomcat 7 (Web Adaptor)
- Web Applications Server (IIS 8)



HARDWARE:

- Map Server
- DB Server
- Applications Server





- **MAP SERVICES** (including map services with WMS enabled)
- **FEATURE SERVICES** (map services with feature access enabled)
- **IMAGE SERVICES**
- **GEODATABASE SERVICES**
- **GEOPROCESSING SERVICES**
- **GEOMETRY SERVICES**
- **NETWORK ANALYSIS SERVICES**
- **GEOCODING SERVICES**



ArcGIS REST Services Directory

[Home](#) > [services](#) > [visorBase](#) > [reservas_marinas \(MapServer\)](#)

[JSON](#) | [SOAP](#)

visorBase/reservas_marinas (MapServer)

View In: [ArcGIS JavaScript](#) [ArcGIS Online map viewer](#) [Google Earth](#) [ArcMap](#) [ArcGIS Explorer](#)

View Footprint In: [ArcGIS Online map viewer](#)

Service Description: Reservas

Map Name: CAPAS

[Legend](#)

[All Layers and Tables](#)

[Dynamic Legend](#)

[Dynamic All Layers](#)

Layers:

- [Reservas Marinas \(Limitada\)](#) (1)
- [Reservas Marinas \(Usos\)](#) (1)

Description:

Copyright Text: Reservas

Spatial Reference: 4326 (4326)

Single Fused Map Cache: false

Initial Extent:

XMin: -16.742648487302528
YMin: 37.67607486773394
XMax: 2.2053149933214655
YMax: 47.16228110065544
Spatial Reference: 4326 (4326)

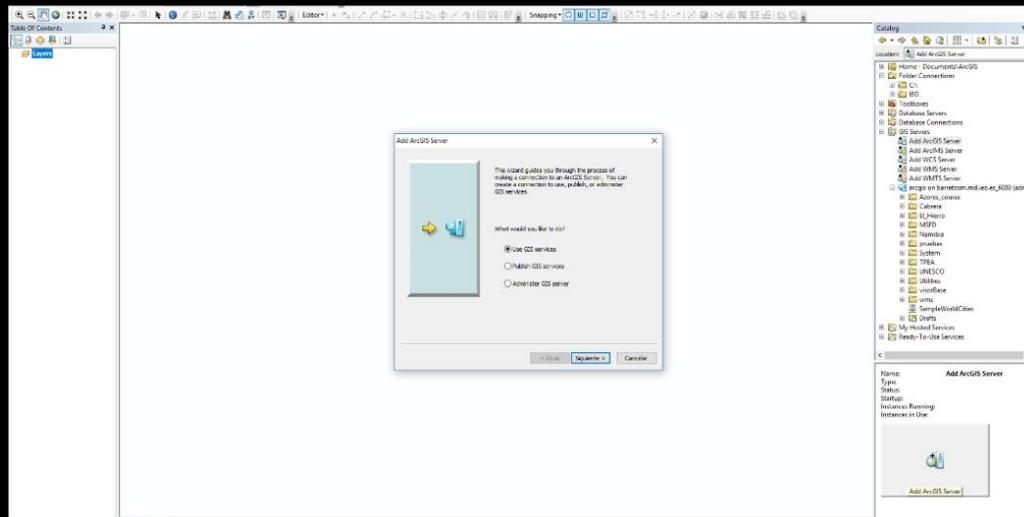
Full Extent:

XMin: -18.03733382019654
YMin: 27.610000120911536
XMax: 3.499998880385874
YMax: 42.36337288465165
Spatial Reference: 4326 (4326)

Units: esriDecimalDegrees

<http://barretosm.md.iao.es/arcgis/rest/services>

CONNECTING ArcMAP - ArcGIS Server



ArcGIS SERVER MANAGER



The screenshot displays the ArcGIS Server Manager interface. On the left, a tree view shows folders including 'UNESCO'. The main area lists several services with their status and instance counts:

Service Name	Service Type	Status	Instances Running	Instances in Use	Max Instances
Argo_Trajectory	(Servicio de mapas)	Iniciado	1	0	2
BathymetryGEBCO	(Servicio de mapas)	Iniciado	1	0	2
CCLME_Region	(Servicio de mapas)	Iniciado	1	0	2
CTD_NOAA_Layers	(Servicio de mapas)	Iniciado	1	0	2
DifferenceRaster	(Servicio de geoprocetamiento)	Iniciado	1	0	2

<http://barretosm.md.ieo.es/arcgis/manager>







WEB PROCESSING SERVICE



A web service interface to **standardize** the way that **(spatial) algorithms** are made available on the internet



maxSpeed - Long
Max speed of the object
55

maxT
Time :
120

buffer
Buffer

maxB
Num

gapFi
Meth

Proc
result
Output
 Ge

Authentication
 Authenticate (will ru

```
<?xml version="1.0" encoding="UTF-8"?><wps:Execute version="1.0.0" service="WPS" xmlns:xsi  
<ows:Identifier>geomesa:TubeSelect</ows:Identifier>
```



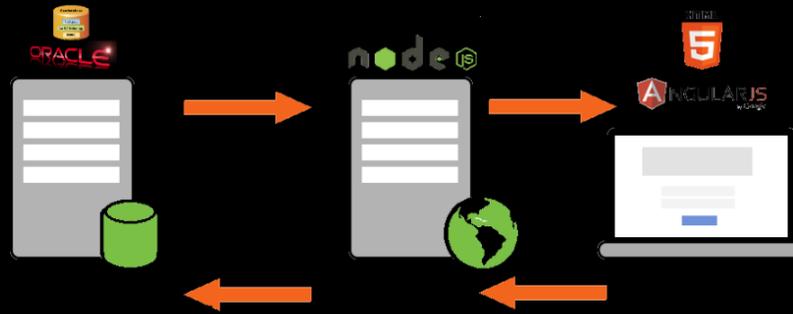
zoo
www.zoo-project.org

```
<wps:LiteralData>55</wps:LiteralData>  
</wps>Data>
```

Execute process Generate XML from process inputs/outputs

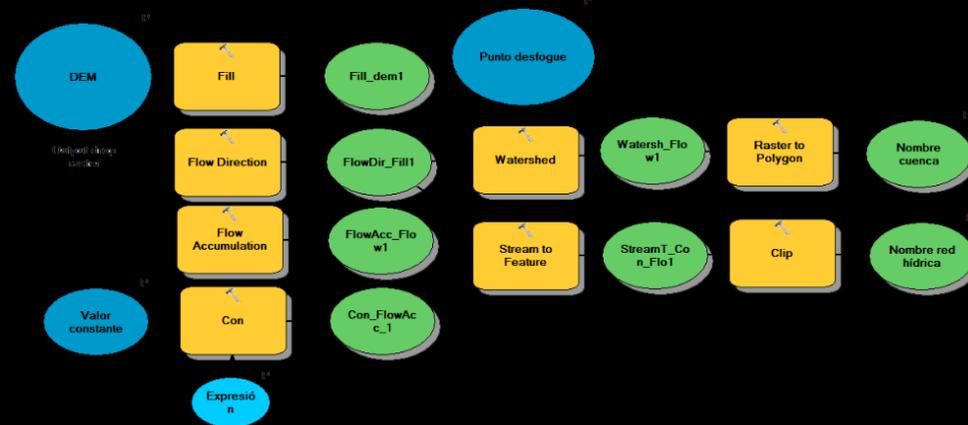


node JS™





GEOPROCESSING SERVICES MODEL BUILDER



GEOPROCESSING SERVICES



```
#####  
## 22/06/2016  
## Crear shapefile con re  
## Luis Miguel Agudo Bravo  
#####  
  
# Import arcpy module  
import arcpy  
from os import listdir  
from os.path import isfile, join  
import os  
import os  
  
# Check out any necessary licenses  
arcpy.CheckOutExtension("spatial")  
  
#Establezco las variables de entorno  
arcpy.env.overwriteOutput = True  
#pathSalida=arcpy.env.scratchFolder  
#pathSalida = "D:\\datos\\extradata\\IOC"  
  
# Parametros de entrada  
Raster1 = arcpy.GetParameterAsText(0)  
Raster2 = arcpy.GetParameterAsText(1)
```



GENERATE A NEW GEOPROCESSING SERVICE

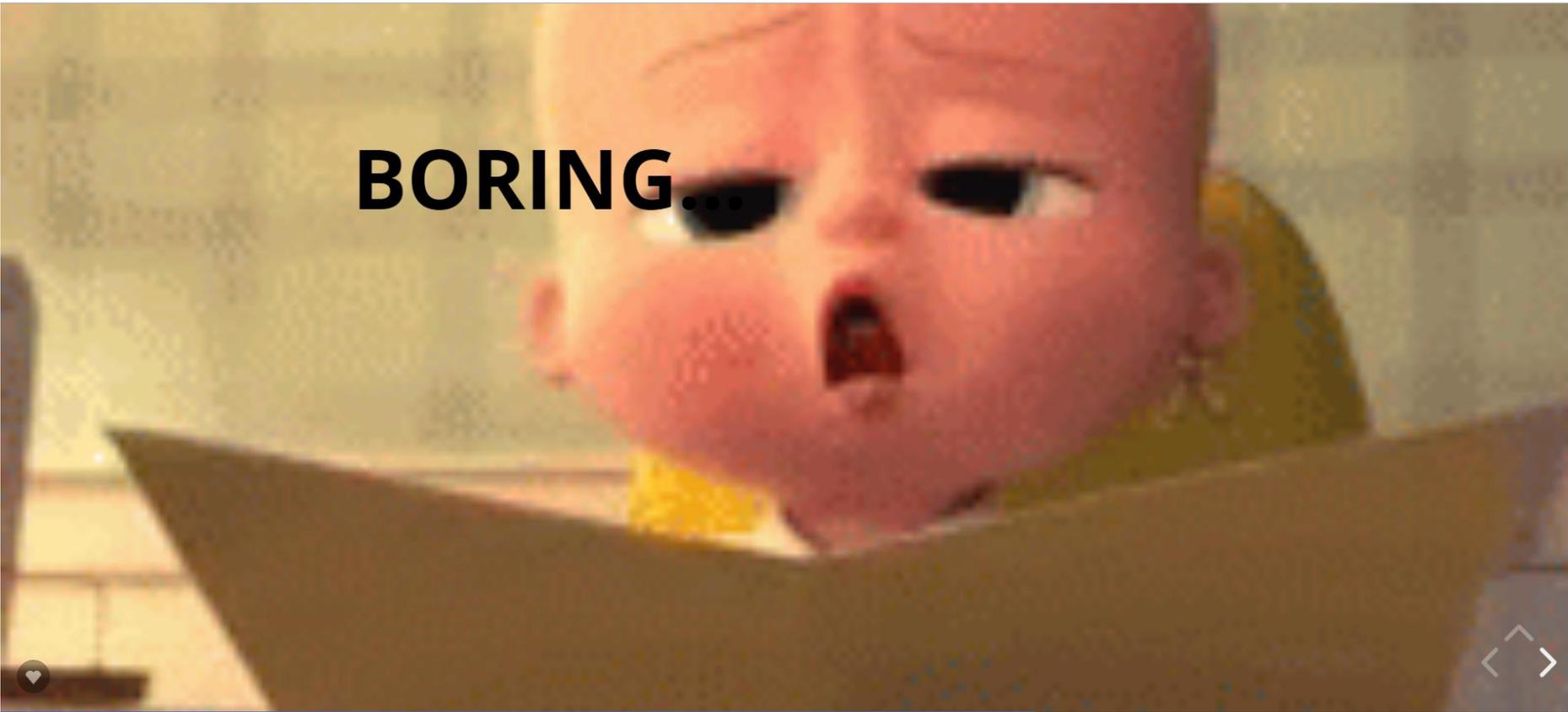


A screenshot of the ArcGIS Service Editor interface. The main window is titled "Service Editor" and shows the configuration for a "Buffer" service. The "Name" field is set to "buffer". The "Description" field contains the text: "Creates buffer polygons around input features to a specified distance." The "Input Features" section is currently empty. The "Output Feature Class" field is also empty. The "Distance (value or field)" field is empty. The "Side Type" is set to "Both", the "End Type" is "None", and the "Dissolve Type" is "None". The "Item Description" and "Sharing" sections are also empty. The "About link settings" link is visible at the bottom. The interface includes a "Table Of Contents" on the left, a "Results" pane on the right, and a "Prepare" section at the bottom with "Errors", "Warnings", and "Messages" tabs.





BORING...



USING SERVICES...





API FOR JAVASCRIPT



API FOR JAVASCRIPT



ArcGIS for Developers | Get Started | Documentation | Features | Pricing | Support

ArcGIS Web API / JavaScript API / 4.6

ArcGIS API for JavaScript



Home | Guide | API Reference | Sample Code | Community

<https://developers.arcgis.com/javascript/>

Build 3D web apps!

The 4.x series of the ArcGIS API for JavaScript is Esri's next-generation JavaScript API that integrates 2D and 3D into a single, easy-to-use, powerful API. Version 4.6 lets you build full-featured 3D applications powered by web scenes that can include rich information layers such as terrain, basemaps, imagery, features, integrated mesh layers, and 3D objects.

[Learn about 4.6](#)

```
// Reference the JavaScript API from our CDN and you are ready to get started:  
<link rel="stylesheet" href="https://js.arcgis.com/4.6/esri/css/main.css">  
<script src="https://js.arcgis.com/4.6/"></script>
```

Need to build a full-featured 2D web app with capabilities such as editing and support for all existing layer types?

[Go to 3.23](#)

Choosing a version ▶



API FOR JAVASCRIPT



```
// Reference the JavaScript API from our CDN and you are ready to get started:  
<link rel="stylesheet" href="https://js.arcgis.com/4.6/esri/css/main.css">  
<script src="https://js.arcgis.com/4.6/"></script>
```

```
require([  
  "esri/Map",  
  "esri/views/MapView",  
  "dojo/domReady!"  
], function(Map, MapView) {  
  var map = new Map({  
    basemap: "streets"  
  });  
  
  var view = new MapView({  
    container: "viewDiv", // Reference DOM node that will contain the view  
    map: map // References the map object  
  });  
});
```



API FOR JAVASCRIPT



MAP SERVICES

```
require(["esri/layers/MapImageLayer"], function(MapImageLayer){
  // points to the states layer in a service storing U.S. census data
  var layer = new MapImageLayer({
    url: "http://<hostname>/arcgis/rest/services/<service-name>/MapServer"
  });
  map.add(layer); // adds the layer to the map
});
```

FEATURE LAYER SERVICES

```
require(["esri/layers/FeatureLayer"], function(FeatureLayer){
  // points to the states layer in a service storing U.S. census data
  const f1 = new FeatureLayer({
    url: "http://<hostname>/arcgis/rest/services/<service-name>/MapServer/<number-layer>"
  });
  map.add(f1); // adds the layer to the map
});
```



API FOR JAVASCRIPT



GEOPROCESSING SERVICES

```
require(["esri/tasks/Geoprocessor"], function(Geoprocessor) {
  var gpUrl = "http://<hostname>/arcgis/rest/services/<service-name>/GPServer/<geopro-name>";
});

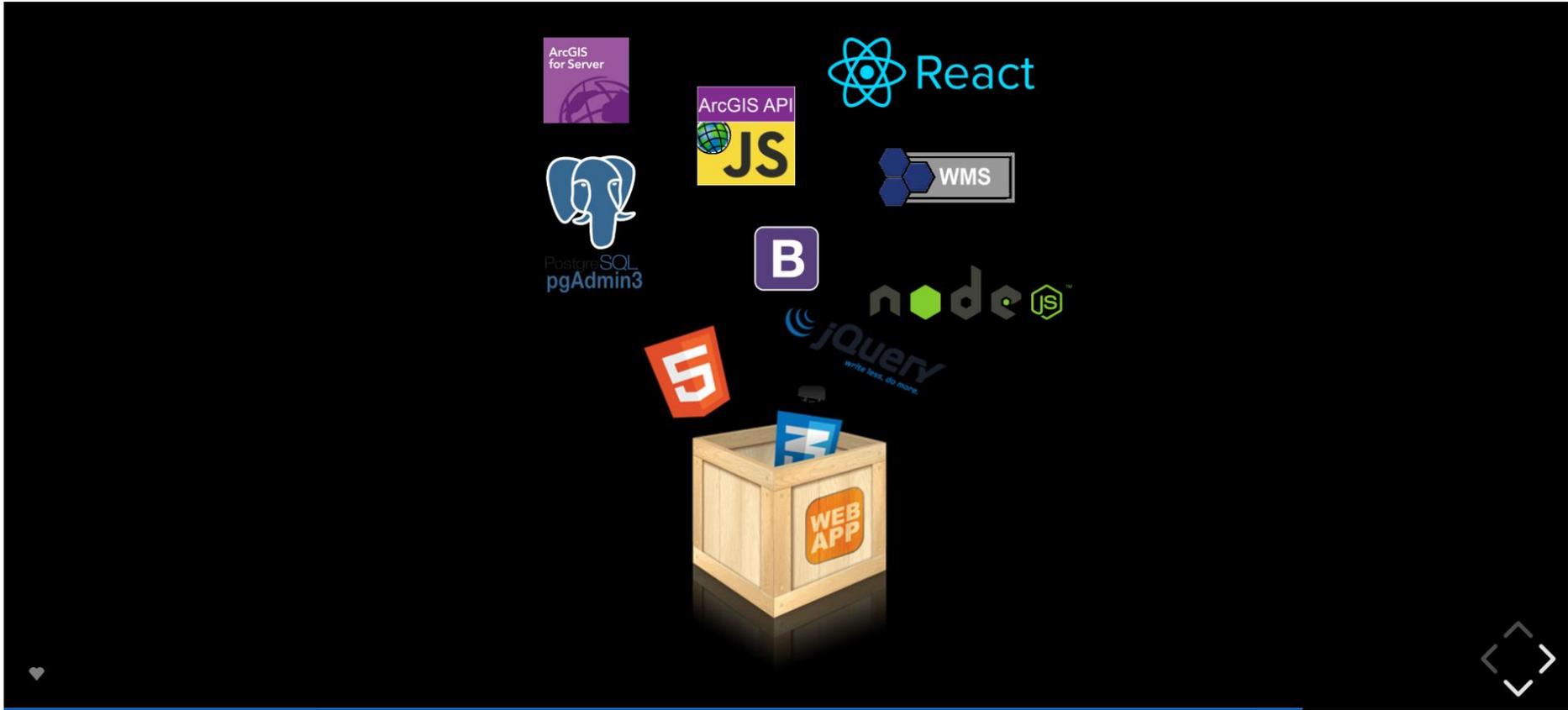
var gp = new Geoprocessor(gpUrl);
gp.outSpatialReference = {
  wkid: 102100
};

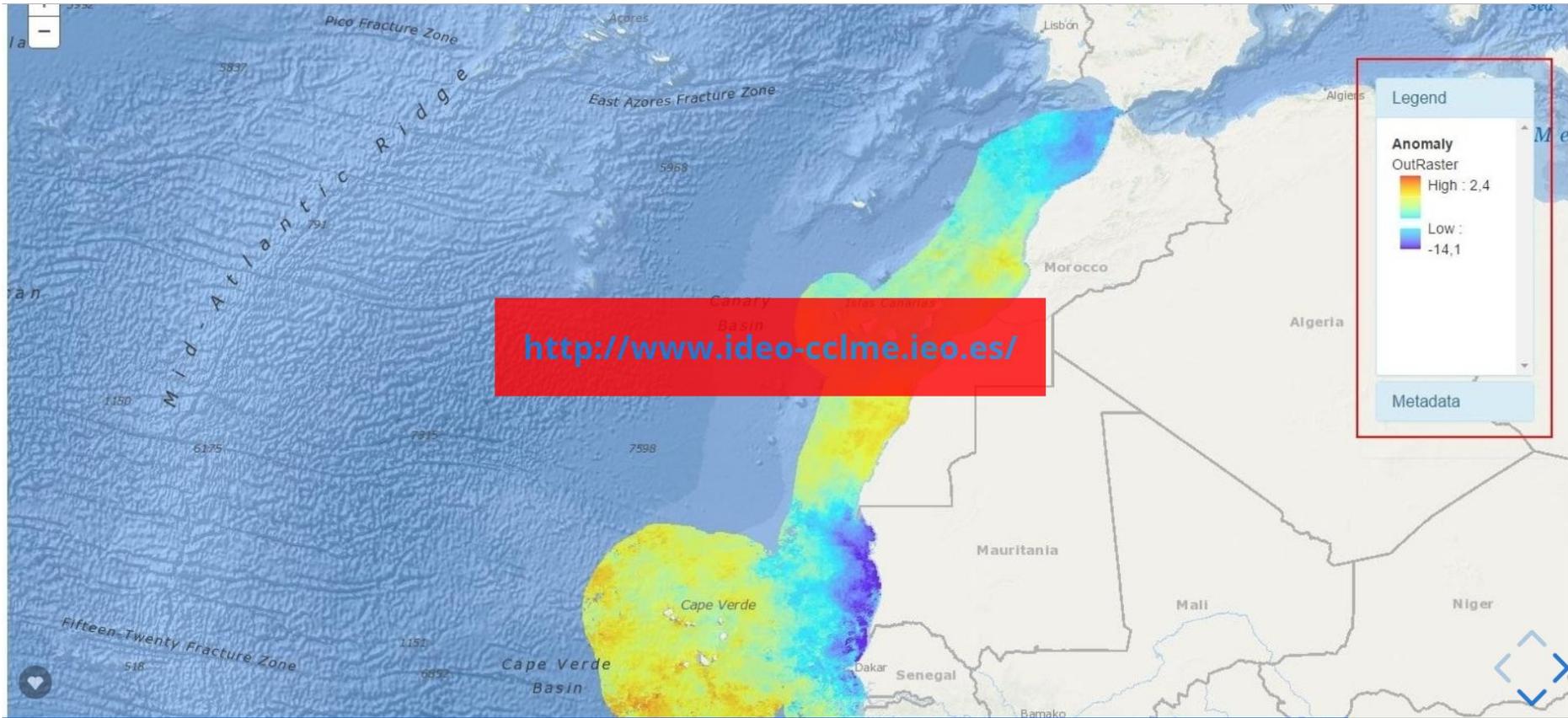
var params = {
  "param1": param1,
  "param2": param2
};

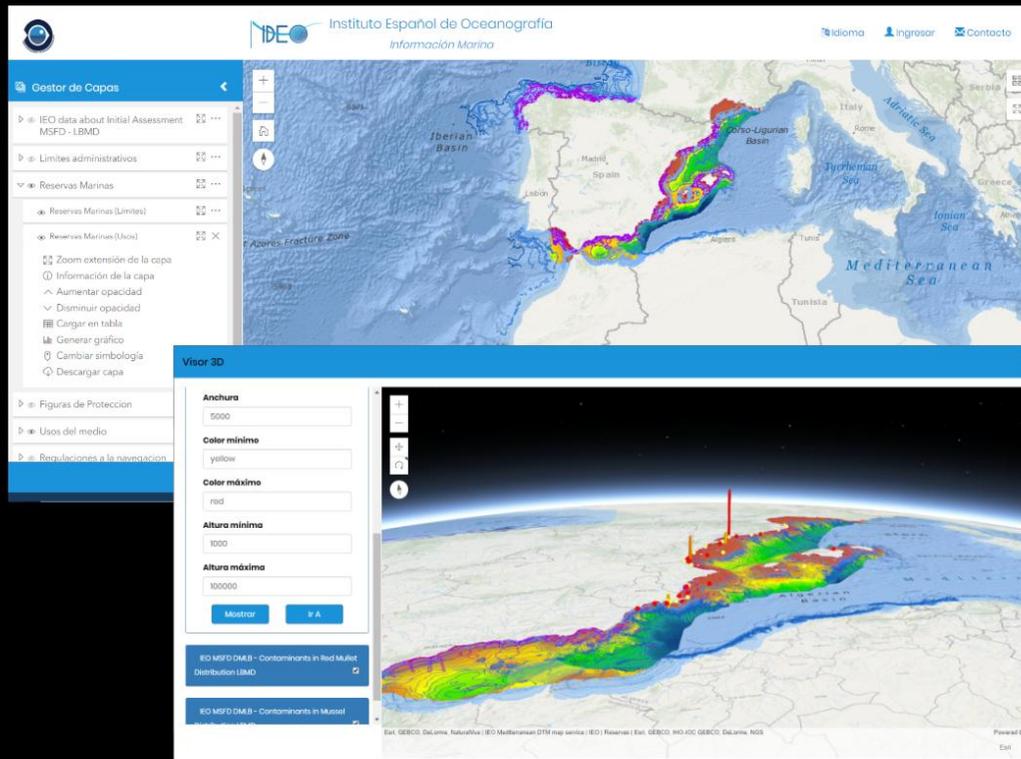
gp.execute(params).then(handleFunction);

function drawResultData(result) {
  //handle result
}
```











GIS CLOUD



<https://www.arcgis.com/home/index.html>

ArcGIS Características Planes Mapa Escena Ayuda Iniciar sesión

ArcGIS



Análisis con ArcGIS de las inundaciones por el

Búsqueda de gasolineras y precios

El Tiempo

Las mejores piscinas naturales de España

✓ **Regístrate ahora y:**
Obtén una cuenta gratuita de ArcGIS Online y empieza a crear mapas web.

🗺️ **Crear un mapa**
Crea un mapa que pueda visualizarse en un navegador.

👨‍💻 **ArcGIS for Developers**
Crea aplicaciones móviles y de

🎓 **Descubre las lecciones**
Completa lecciones prácticas basadas en problemas reales.



<http://ieo.maps.arcgis.com/home/index.html>

Inicio Galería Mapa Escena Grupos Contenido Organización IEO

Visor Cabrera - Cetáceos
Proyecto RAJA
Visor TPEA
Visor IEO

Eri.com | ArcGIS Marketplace | Ayuda | Términos de uso | Privacidad | Contacta con Eri | Comunicar abuso | Contacta con nosotros

NO: TIME



Luis Miguel Agudo
Imagudo@gmail.com



es.linkedin.com/pub/luis-miguel-agudo-bravo/7b/630/8b2/



PLASMAR & MarSP capacity building workshop session on MSP data management (Friday, 20th April 2018)

INTRODUCTION TO THE METADATA MANAGEMENT IEO

Olvido Tello

Coordinated by:



Partners:



Supported by:



Content:

- **What is a metadata?**
- **CSW - Catalogue Service Web**
- **GeoNetwork Catalog**
- **Metadata management**



Content:

- **What is a metadata?**
- **CSW - Catalogue Service Web**
- **GeoNetwork Catalog**
- **Metadata management**



METADATA

Metadata is data that describes other data.

Meta is a prefix that means "an underlying definition or description".

Metadata **summarizes** basic information about data, which allows the finding of the data easier. For example, the author, the date they were created and/or modified, the quality, etc.



INTEROPERABILITY

The use of metadata improves interoperability. Consequently, the metadata should/must be created according to a common methodology.

In this regard the **ISO** International Organization for Standardization established two standards about metadata:

- **ISO 19115** is the standard that defines what information should exist in a metadata document.
- **ISO 19139** produces an XML Schema defining how metadata conforming to ISO 19115 should be stored in XML format.



Metadata should be compliant with ISO metadata standards



ISO International Organization for Standardization

Standards | All about ISO | Taking part | **Store**

Standards catalogue | Publications and products

Home > Store > Standards catalogue > Browse by ICS > 35 > 35.240 > 35.240.70 > ISO 19115:2003

ISO 19115:2003

Geographic information -- Metadata

This standard has been revised by ISO 19115-1:2014.

<https://www.iso.org/standard/26020.html>

ISO 19115:2003

Geographic information -- Metadata

ISO/TS 19139-2:2012

Preview

Geographic information -- Metadata -- XML schema implementation -- data

Technical Information

ISO services and products



This standard was last reviewed and confirmed in 2016. Therefore this version remains current.

ISO publications

- the
- geographic information
- products

ISO 19139-2:2012 defines Geographic Metadata for imagery and gridded data (gmi) encoding. This is an XML Schema implementation derived from ISO 19115-2.

ISO publications

- metadata
- the
- (d)
- di

General information 

Current status : Published

Publication date : 2012-12

Edition : 1

Number of pages : 22

Technical Committee : ISO/TC 211 Geographic information/Geomatics

ICS : 35.240.70 IT applications in science

INSPIRE metadata standards

INSPIRE Directive (2007/2/CE) establishes that:

- The institutions/organizations responsible for geographic information must develop metadata at the level of data sets, series and spatial data services.
- The metadata should be compliant with the [INSPIRE metadata standard](#). This is based on international metadata standards ISO 19115 and ISO 19139.



INSPIRE developed a REGULATION on metadata

- To provide instructions
- To assign Rules
- To establish the minimum set of metadata elements required for compliance with the INSPIRE standard

L 326/12

EN

Official Journal of the European Union

4.12.2008

COMMISSION REGULATION (EC) No 1205/2008

of 3 December 2008

implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata

(Text with EEA relevance)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (Inspire) ⁽¹⁾, and in particular Article 5(4) thereof,

elements necessary to comply with Directive 2007/2/EC and does not preclude the possibility for organisations to document the information resources more extensively with additional elements derived from international standards or working practices in their community of interest. Nor does it preclude the possibility to adopt guidelines established and kept up to date by the Commission, in particular when it is necessary to ensure the interoperability of metadata.

- (3) Instructions are necessary for the validation of metadata in accordance with Directive 2007/2/EC with regard to the conditions and expected multiplicity of each metadata element, that is to say, whether values for each element are always to be expected in the metadata record, can occur only once, or can occur more than once.



To facilitate the implementation of metadata regulation a technical guideline was developed



INSPIRE KNOWLEDGE BASE
Infrastructure for spatial information in Europe

European Commission

European Commission > INSPIRE > Implement > Metadata

Home Learn **Implement** Participate Use Toolkit

Implement

- Guide for implementers
- Roadmap
- Data Specifications
- Monitoring & Reporting
- **Metadata**
- Network Services
- Data and Service Sharing
- Spatial Data Services
- INSPIRE Coordination
- Maintenance and Implementation Framework

Metadata

- Overview
- Technical Guidelines

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Metadata

According to [Article 5\(1\) of INSPIRE Directive 2007/2/EC](#), Metadata are created for the spatial data sets and service themes listed in [Annexes I, II and III](#), and that those metadata

The [Regulation as regards metadata \(and subsequent amendment guidelines\)](#) set out the requirements for the creation and maintenance

Category:
[Metadata](#)



INSPIRE
Infrastructure for Spatial Information in Europe

INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119

Title	INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119
Creator	Drafting Team Metadata and European Commission Joint Research Centre
Creation date	2007-10-26
Date of latest revision	2013-10-29
Subject	INSPIRE Implementing Rules for Metadata
Status	V. 1.3
Publisher	European Commission Joint Research Centre
Type	Text
Description	Guidelines based on EN ISO 19115 and EN ISO 19119 for Commission Regulation (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata
Contributor	See Acknowledgements
Format	PDF
Source	European Commission Joint Research Centre
Rights	Public
Identifier	MD_IR_and_ISO_20131029.doc
Language	EN
Relation	Not applicable
Coverage	Not applicable

<http://inspire.ec.europa.eu/metadata/6541>



Specifications on the content of the **METADATA**

- Each metadata should have a **unique identifier**.

Example: **ESIEORESERSVASMARINAS200806010002**

- INSPIRE recommends use:

namespace: <http://www.ieo.es/>
code: bathymetry_25

Example: http://www.ieo.es/bathymetry_25



- The metadata has **mandatory and optional elements**

Element name	INSPIRE multiplicity	INSPIRE obligation / condition / note
Resource title	1	Mandatory
Resource abstract	1	Mandatory
Resource type	1	Mandatory
Resource locator	0..*	Mandatory if a URL is available to obtain more information on the resources and/or access related services.
Unique resource identifier	1..*	Mandatory
Resource language	0..*	Mandatory if the resource includes textual information.
Topic category	1..*	Mandatory
Keyword value	1..*	Mandatory
Originating controlled vocabulary	0..1	Conditional: Mandatory for each keyword if the keyword value originates from a controlled vocabulary
Geographic bounding box	1..*	Mandatory
Temporal reference		At least one of Temporal extent, Date of publication, Date of last revision or Date of creation must be given
Temporal extent	0..*	Conditional
Date of publication	0..*	Conditional
Date of last revision	0..1	Conditional
Date of creation	0..1	Conditional
Lineage	1	Mandatory
Spatial resolution	0..*	Mandatory if an equivalent scale or a resolution distance can be specified
Conformity	1..*	Mandatory
Specification	1	Mandatory for each conformity statement
Degree	1	Mandatory for each conformity statement
Conditions applying to access and use	1..*	Special values for unknown conditions or no applying conditions may be used
Limitations on public access	1..*	Special value for no limitations may be used
Responsible organisation	1..*	Mandatory
Responsible party	1	Mandatory for each responsible organisation
Responsible party role	1	Mandatory for each responsible organisation
Metadata point of contact	1..*	Mandatory
Metadata date	1	Mandatory
Metadata language	1	Mandatory

Specifications on the content of the **METADATA**

- **Keywords**

They are very important. Keywords allow us to find the resource more quickly. It is very efficient to select these keywords using “Thesaurus”.

- **Thesaurus**

They are controlled and structured lists of terms for thematic search.

Thesaurus is a reference work that lists words grouped together according to similarity of meaning in contrast to a dictionary, which provides definitions for words, and generally lists them in alphabetical order.



Reference thesaurus are:

UNESCO Thesaurus is list of terms in the fields of education, culture, natural sciences, social and human sciences, communication and information.

GEMET 4.0. General Environmental Multilingual Thesaurus.

GEMET - INSPIRE themes.

GEOSS. Earth observation vocabulary.





Tesoro de la UNESCO

Lengua del contenido

español ▾



 Buscar

Alfabéticamente

Jerarquía

Grupos

 A Á B C D E É F G H I J K L M
 N O Ó P Q R S T U V W X Y Z

Abadía → Edificio religioso
Abandono de menores → Niño abandonado
Abandono escolar → Deserción escolar
Abandono infantil → Niño abandonado
Abastecimiento alimenticio → Suministro de alimentos
 Abastecimiento de agua
 Abastecimiento de energía
Abastecimiento de víveres → Suministro de alimentos
Abecedario → Alfabeto
Abogacía → Profesión jurídica
Abogado → Profesión jurídica
Abono → Fertilizante
 Aborto
Aborígenes → Población indígena
 Abreviatura
Absentismo → Permiso
Absolutismo → Totalitarismo
Abstentismo escolar → Ausencia injustificada
Abuso de autoridad → Opresión
Abuso de drogas → Toxicomania
Abuso de los derechos humanos → Violación de

Información del vocabulario

TÍTULO

Tesoro de la UNESCO

DESCRIPCIÓN

El Tesoro de la UNESCO es una lista controlada y estructurada de términos para el análisis temático y la búsqueda de documentos y publicaciones en los campos de la educación, cultura, ciencias naturales, ciencias sociales y humanas, comunicación e información. Continuamente ampliada y actualizada, su terminología multidisciplinaria refleja la evolución de los programas y actividades de la UNESCO.

DC:IDENTIFIER

<http://vocabularies.unesco.org/thesaurus>

EDITOR

UNESCO

DC:RIGHTSHOLDER

UNESCO

DERECHOS

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LICENCIA

<http://creativecommons.org/licenses/by-sa/3.0/igo/>


Tools for creating and editing Metadata

- INSPIRE metadata editor
- GeoNetwork
- EuroGEOSS Open Source Metadata Editor
- ArcCatalog (Esri)
- Others



The screenshot shows the INSPIRE Geoportal interface. At the top left is the European Commission logo. The main header reads "INSPIRE GEOPORTAL" and "Enhancing access to European spatial data". Below this is a breadcrumb trail: "EUROPEAN COMMISSION > INSPIRE > INSPIRE GEOPORTAL". A large white box contains a "Welcome to the INSPIRE geoportal" message, explaining that the INSPIRE Directive requires the Commission to establish a community geo-portal and that Member States shall provide access to their infrastructures through the geo-portal as well as through any access points they themselves decide to operate. A "More..." link is provided. Below the welcome message is a map of Europe. Two callout boxes are overlaid on the map: "Resource Browser" with the text "Technical insight into resource metadata" and "More ...", and "Metadata Editor" with the text "Create metadata according to the INSPIRE implementing rules." and "More ...". Both callout boxes include a small icon with the text "xsd:schema", "DocType", "xsd:element", and "ADI".



INSPIRE metadata editor

The screenshot displays the INSPIRE metadata editor interface. At the top, there is a menu bar with options: New, Open, Validate, Save, Save as template, Help, and About. The current document is titled 'INSPIRE Spatial Dataset - en'. Below the menu bar is a language selection bar with options: bg, cs, da, de, el, en (highlighted), es, et, fi, fr, hu, it, lt, lv, mt, nl, pl, pt, ro, sk, sl, sv. The main interface is divided into two tabs: 'Basic' (selected) and 'Advanced'. The 'Basic' tab contains a 'Refresh' button. The 'Metadata on metadata' section is expanded, showing the following fields:

- Metadata point of contact (*)**:
 - Point of contact 1**:
 - Organisation name (*)**:
 - E-mail (*)**:
- Metadata date**:
- Metadata language (*)**:

<http://inspire-geoportal.ec.europa.eu/editor/>

INSPIRE metadata validator

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The screenshot shows the INSPIRE Geoportal website. At the top left is the European Commission logo. The main header reads "INSPIRE GEOPORTAL" and "Enhancing access to European spatial data". Below this is a breadcrumb trail: "EUROPEAN COMMISSION > INSPIRE > INSPIRE GEOPORTAL".

The main content area has a white background with a blue border. It starts with a "Welcome to the INSPIRE geoportal" section, followed by a paragraph explaining the INSPIRE Directive and a "More..." link.

Below this is a "Discovery / Viewer" section with a map of Europe. The text says: "Search, discover and access geographic information provided by European governmental, commercial, and non-commercial organizations." There is a "More ..." link and a small inset map of the Iberian Peninsula.

To the right of the map is a "Validator" section. The text says: "The purpose of the INSPIRE Metadata Validator is to test the compliancy of INSPIRE metadata with the INSPIRE Metadata Regulation." There is a "More ..." link and a small inset showing an "Invalid Element" error message: "Invalid Element: number of occurrences (2.2.5) Unique identifier ('2005/gmd')['2005/gmd'] (2.4) For data from /www.iso.org".

<http://inspire-geoportal.ec.europa.eu/validator/>



Content:

- **What is a metadata?**
- **CSW - Catalogue Service Web**
- **GeoNetwork Catalog**
- **Metadata management**



A Spatial Infrastructure Data is composed of:

- Display services (WMS)
- Download services (WFS and WCS)
- Discovery services (CSW)



CSW

- Technology for locating, managing and maintaining distributed geo-resources (i.e. metadata, geospatial data, applications and services).
- Catalogue services support the ability to search and publish collections of descriptive information (metadata) for data, services, and related information objects.
- Catalogue services are required to support the discovery and binding to information resources within an information community.

- With CSW, client applications are able to search for geo-resources through standardised interfaces and operations.
- OGC analyzed and integrated the catalogue interface standards and profiles of implementation in the specification **CSW 2.0**.
- The overall goal of this specification is to improve interoperability between systems.
- These standards specify the interfaces, bindings, and a framework for defining application profiles required to publish and access digital catalogues of metadata for geospatial data, services, and related resource information.





Catalogue Service

- 1) Overview
- 2) Downloads
- 3) Related News

1) Overview

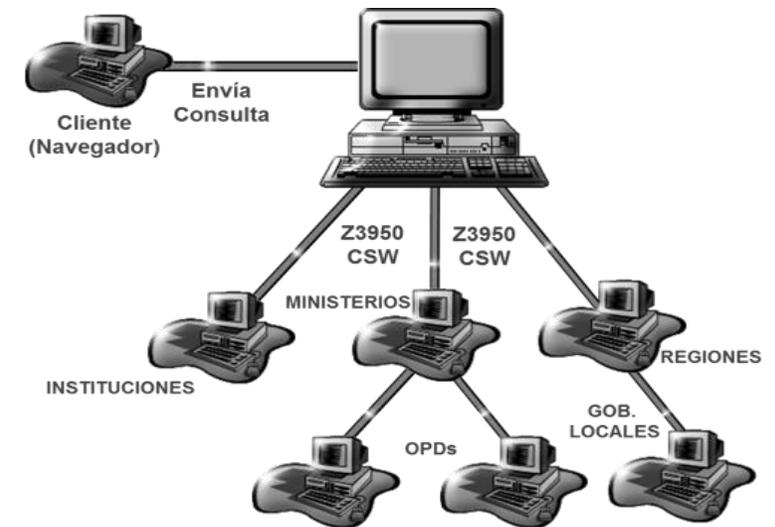
Catalogue services support the ability to publish and search collections of descriptive information (metadata) for data, services, and related information objects. Metadata in catalogues represent resource characteristics that can be queried and presented for evaluation and further processing by both humans and software. Catalogue services are required to support the discovery and binding to registered information resources within an information community.

- ▾ OGC® Standards
 - 3dP
 - ARML2.0
 - Cat: ebRIM App Profile: Earth Observation Products
 - Catalogue Service
 - CDB
 - CityGML
 - Coordinate Transformation
 - Filter Encoding
 - GML in JPEG 2000
 - GeoAPI
 - GeoPackage
 - GeoSciML

<http://www.opengeospatial.org/standards/cat>



- CSW allows access and consult the georesources of several public or private entities, through interconnected catalogs.
- The connection is be able to in two ways:
 - a) Through harvesting, in which the distributed catalog connects, collects and stores the metadata in its own database
 - b) By means of CSW requests to other catalogs



INSPIRE CSW

- Inspire defines an INSPIRE CSW profile that includes the entire CSW 2.0 and a series of specifications such as the additional language parameter and that the metadata is adapted to the INSPIRE metadata standard.
- The operations are called

Operación Inspire	Operación CSW OGC
<i>Get Discovery Service Metadata</i>	<i>GetCapabilities</i>
<i>Discover Metadata</i>	<i>GetRecords</i>
<i>Publish Metadata</i>	<i>Transaction o Harvest</i>
<i>Link Discovery Service</i>	<i>Capabilities+GetRecords o Transaction+Harvest</i>



Content:

- **What is a metadata?**
- **CSW - Catalogue Service Web**
- **GeoNetwork Catalog**
- **Metadata management**



Tools for the development a CSW



[News](#) | [Documentation](#) | [Download](#) | [Community](#) | [Gallery](#) | [Search](#)

GeoNetwork is a catalog application to **manage spatially referenced resources**. It provides powerful **metadata editing** and **search** functions as well as an interactive web map viewer. It is currently used in **numerous Spatial Data Infrastructure initiatives across the world**.

Find & get information

GeoNetwork provides an easy to use web interface to search geospatial data across multiple catalogs. The search provides full-text search as well as faceted search on keywords, resource types, organizations, scale, ... Users can easily refine the search and quickly get to the records of interest.

GeoSpatial layers, but also services, maps or even non geographic datasets can be described in the catalog. Easily navigate accross records and find sources or services publishing a dataset.



<https://geonetwork-opensource.org/>



Tools for the development of a CSW

- It is programmed in Java
- The operative system could be Linux, Ms-Windows, Mac, OS X.
- Web server Apache Tomcat.
- GeoNetwork includes a data base for store the metadata file and the information associated to it, call McKoiDDB (Mckoi Distributed Database). But we can work with other data base as PostgreSQL.



Content:

- **What is a metadata?**
- **CSW - Catalogue Service Web**
- **GeoNetwork Catalog**
- **Metadata management**



Get started

Search over **2803** data sets, services and maps, ...

Search ...

Instituto Español de Oceanografía Data Portal

Here you will find data, services and maps and more.

Browse by **INSPIRE themes** topics



Elevation
4



Geology
2



Area management/restricti...
1



Oceanographic geographi...
1405



Sea regions
4



Habitats and biotopes
2



Species distribution
1



Administrative units
4



Protected sites
2

Browse resources



Series
1402



Dataset
1395



Map
4



Interactive map
4



Service
2

Latest news

Most popular

<http://www.datos.ieo.es/>

The screenshot displays the INSPIRE Geoportal interface. At the top left is the European Commission logo. The main header reads "INSPIRE GEOPORTAL" and "Enhancing access to European spatial data". A breadcrumb trail shows "EUROPEAN COMMISSION > INSPIRE > INSPIRE GEOPORTAL". A central white box contains a "Welcome to the INSPIRE geoportal" message, explaining that the INSPIRE Directive requires the Commission to establish a community geo-portal and that Member States provide access to their infrastructures through this portal or their own access points. A "More..." link is provided. Below this, a map of Europe is shown with two callout boxes. The "Resource Browser" box, located over the Iberian Peninsula, offers "Technical insight into resource metadata" and includes a "More ..." link. The "Metadata Editor" box, located over Central Europe, states "Create metadata according to the INSPIRE implementing rules" and also includes a "More ..." link. Both callout boxes contain a small diagram of an XML schema structure with elements like `<-Doc!` and `<xsd:el`.

Introduction to the metadata management

Registro Inspire

Registro Inspire

- » **Registro Inspire:** Punto de acceso central a cierto número de registros Inspire gestionados de manera centralizada basado en la Directiva Inspire, las Normas de Ejecución y las Directrices Técnicas. Registros disponibles:
 - » **Inspire feature concept dictionary:** Términos y definiciones necesarias para describir los tipos de objetos espaciales temáticos que se emplean en las especificaciones de datos.
 - » **Esquemas de aplicación:** Esquemas de aplicación de los modelos UML de datos Inspire consolidados. Otros enlaces relacionados:
 - » **Diagramas UML:** están disponibles en una vista HTML interactiva que incluye definiciones detalladas de los tipos de objetos espaciales, tipos de datos, enumeraciones y listas de códigos y los diagramas de clases UML.
 - » **Esquemas XML (XML Schemas):** generados a partir de los diagramas UML, que se utilizan para codificar los objetos espaciales en GML están disponibles en el repositorio de esquemas Inspire.
 - » **Listas controladas:** Listas controladas y sus valores tal y como se definen en el Reglamento sobre interoperabilidad de datos y servicios espaciales (Reglamento (UE) N° 1089/2010). Nota: No incluye de momento referencias a listas controladas externas, listas controladas adicionales, ni a los valores extendidos propuestos en las Especificaciones de Datos.
 - » **Temas Inspire:** Temas de datos espaciales tal y como se definen en los Anexos de la Directiva Inspire.

- » **Lista de códigos de metadatos**
 - » **Conjunto de datos prioritarios:** Lista de conjuntos de datos relacionados con Directivas ambientales y que los Estados miembros deberían facilitar de forma escalonada.
 - » **Clasificación de los servicios de datos espaciales**
 - » **Categorías de temas conforme a la norma EN ISO 19115**
 - » **Función de la parte responsable**



Introduction to the metadata management

<http://inspire.ec.europa.eu/metadata-codelist/>

Comisión Europea

Registro

Comisión Europea > INSPIRE > Registro INSPIRE > INSPIRE metadata code list register

INSPIRE metadata code list register

Buscar...



Help us improving the **Re3gistry software!** Please fill our quick survey at <http://europa.eu/!Bn84Ct>

ID:	http://inspire.ec.europa.eu/metadata-codelist
Etiqueta:	INSPIRE metadata code list register
Sumario:	The INSPIRE metadata code list register contains the code lists and their values, as defined in the INSPIRE implementing rules on metadata (Commission Regulation (EC) No 1205/2008).
Propietario:	Unión Europea
Gestor de registro:	Comisión Europea, Centro Común de Investigación
Organismo de control:	Control body for the central INSPIRE registers and INSPIRE register federation
Submitter:	Nominated submitting organisations for the central INSPIRE registers and INSPIRE register federation
Punto de contacto:	JRC INSPIRE Registry Team
Licencia:	Europa Legal Notice

Otros formatos:



XML

Re3gistry



XML

ISO 19135



RDF/XML



JSON



Atom



CSV



MANY THANKS!!

MUITO OBRIGADA!!

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