
Marine Spatial Data Infrastructure Hidrográfico +

Hydrographic Information for society

EuroGeographics KEN Webinar
08 of july of 2021
antunes.nunes@hidrografico.pt



Agenda



IH – Marine Data Producer



MSDI Hidrográfico +



Marine data for Society



MSDI H+ Preparing the future



MSDI H+ In Inspire Context

Agenda



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Marine data for Society

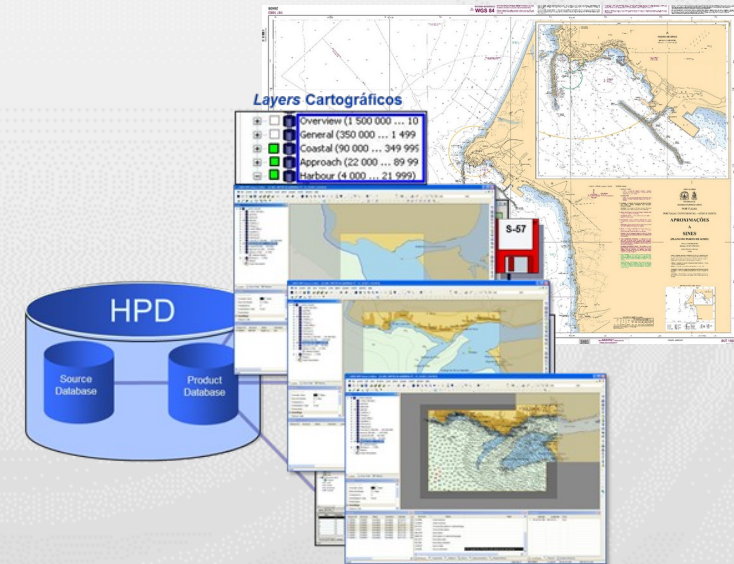
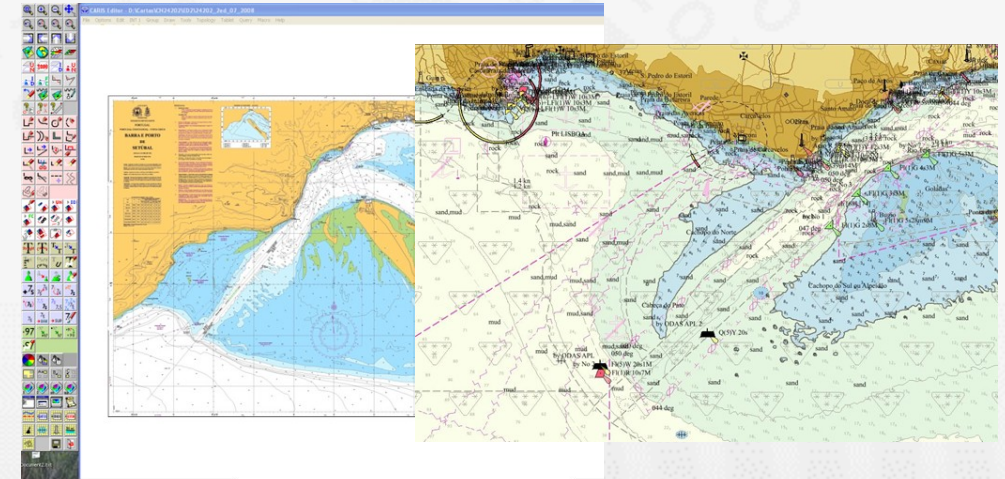
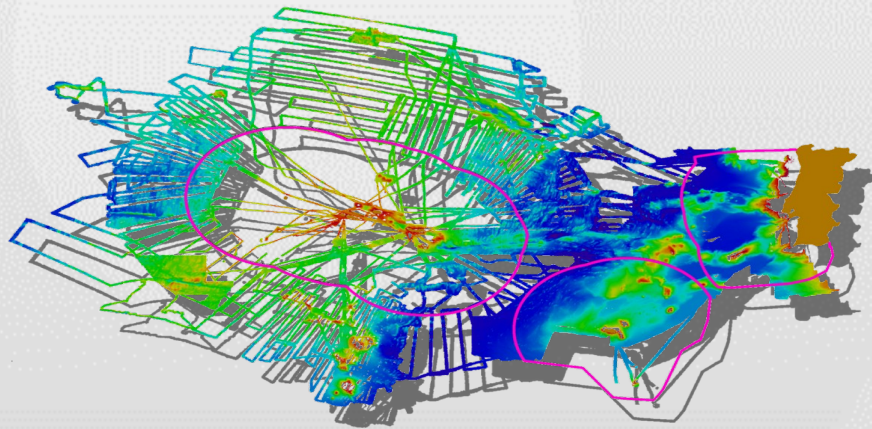
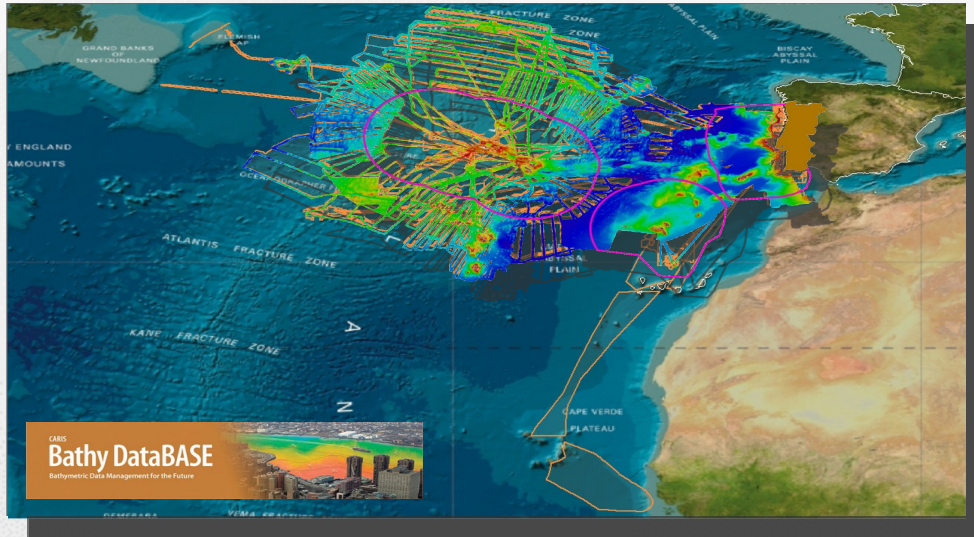


MSDI H+ Preparing the future



MSDI H+ In Inspire Context

Bathymetric Data and Nautical Charts (official navigation maps)

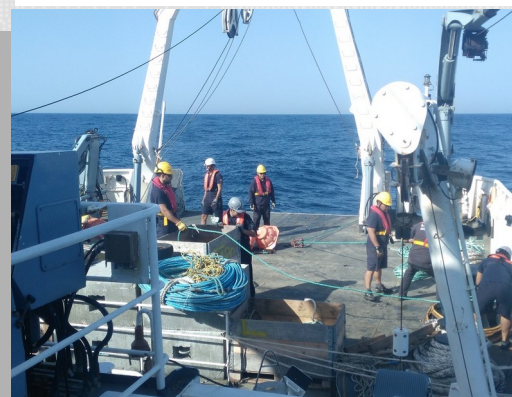
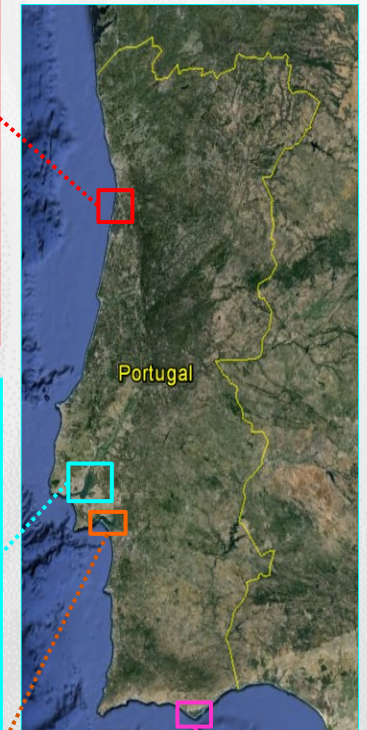
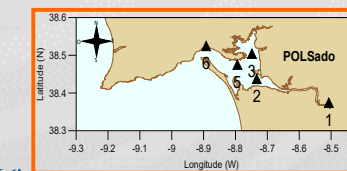
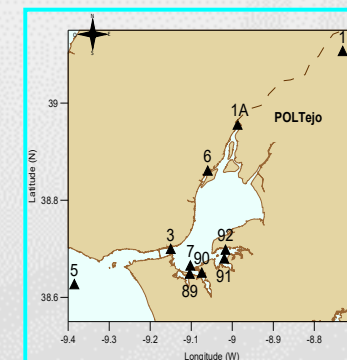
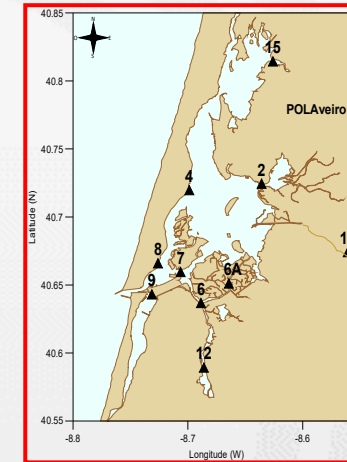
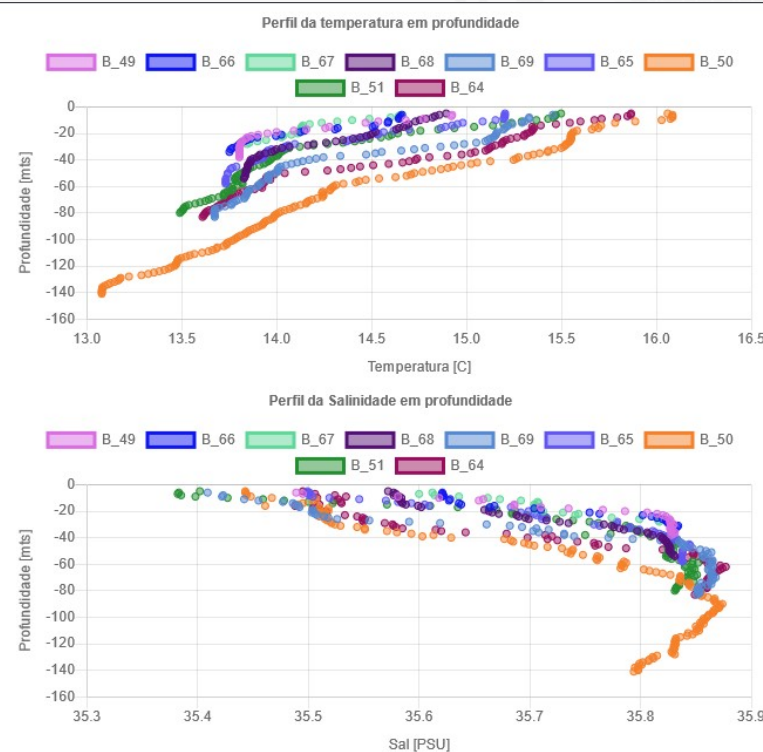
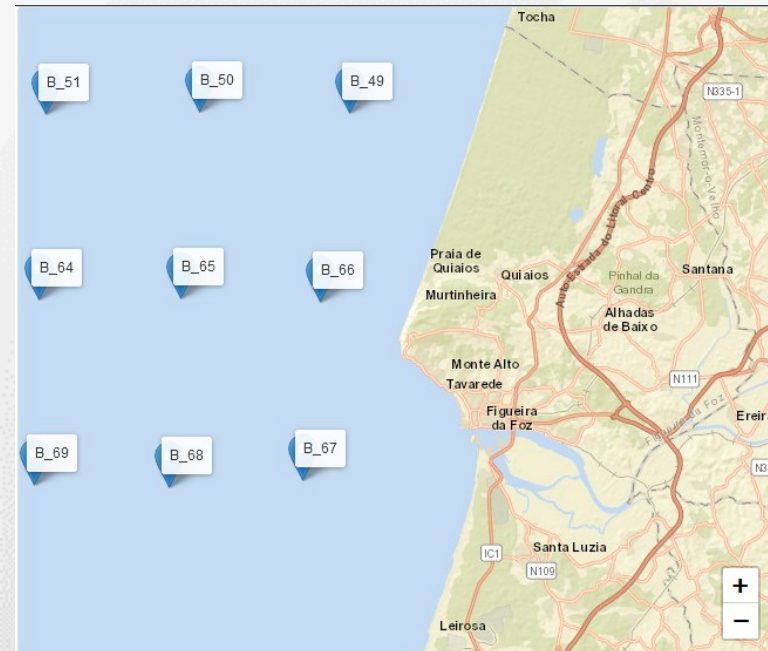


Marine Chemistry – Environment Status Monitoring

AQUIMAR (coastal areas characterization – in situ observations).

Environment Status Monitoring
programs (riverine and at sea)

1980-2010



Marine Geology

Program SEPLAT – Sediments mapping in Portuguese Continental Shelf

21 de junho

1974

Vila Real de S. António

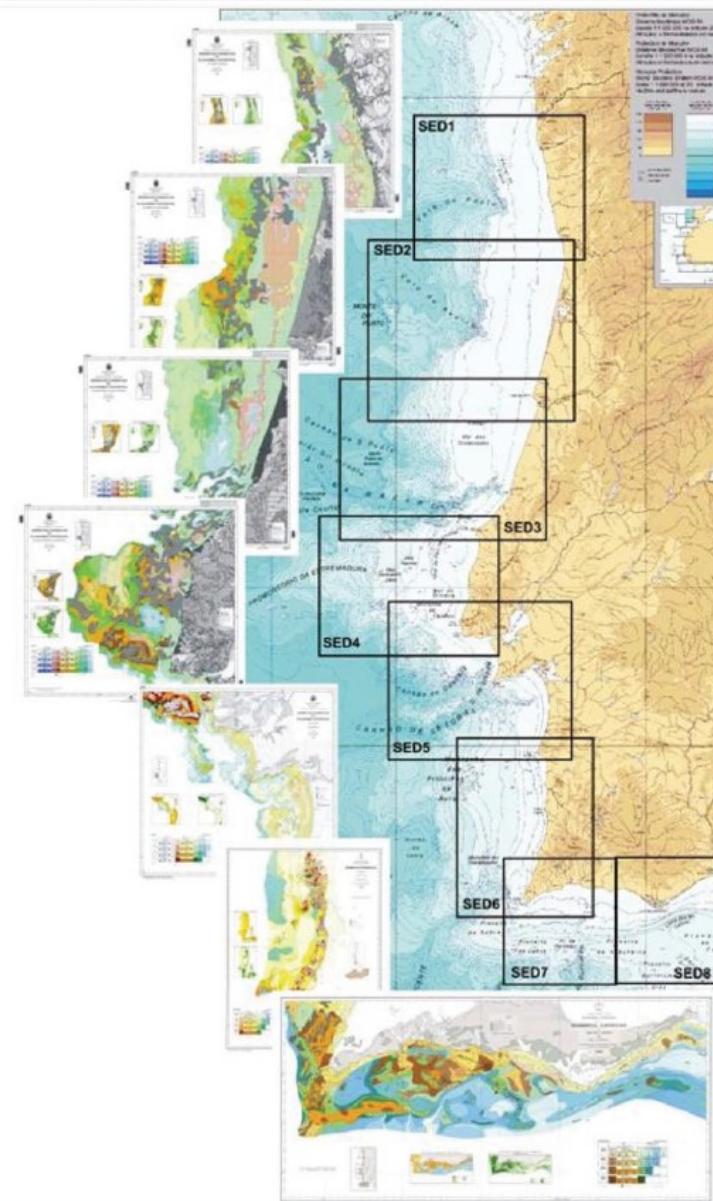
12 de maio

2005

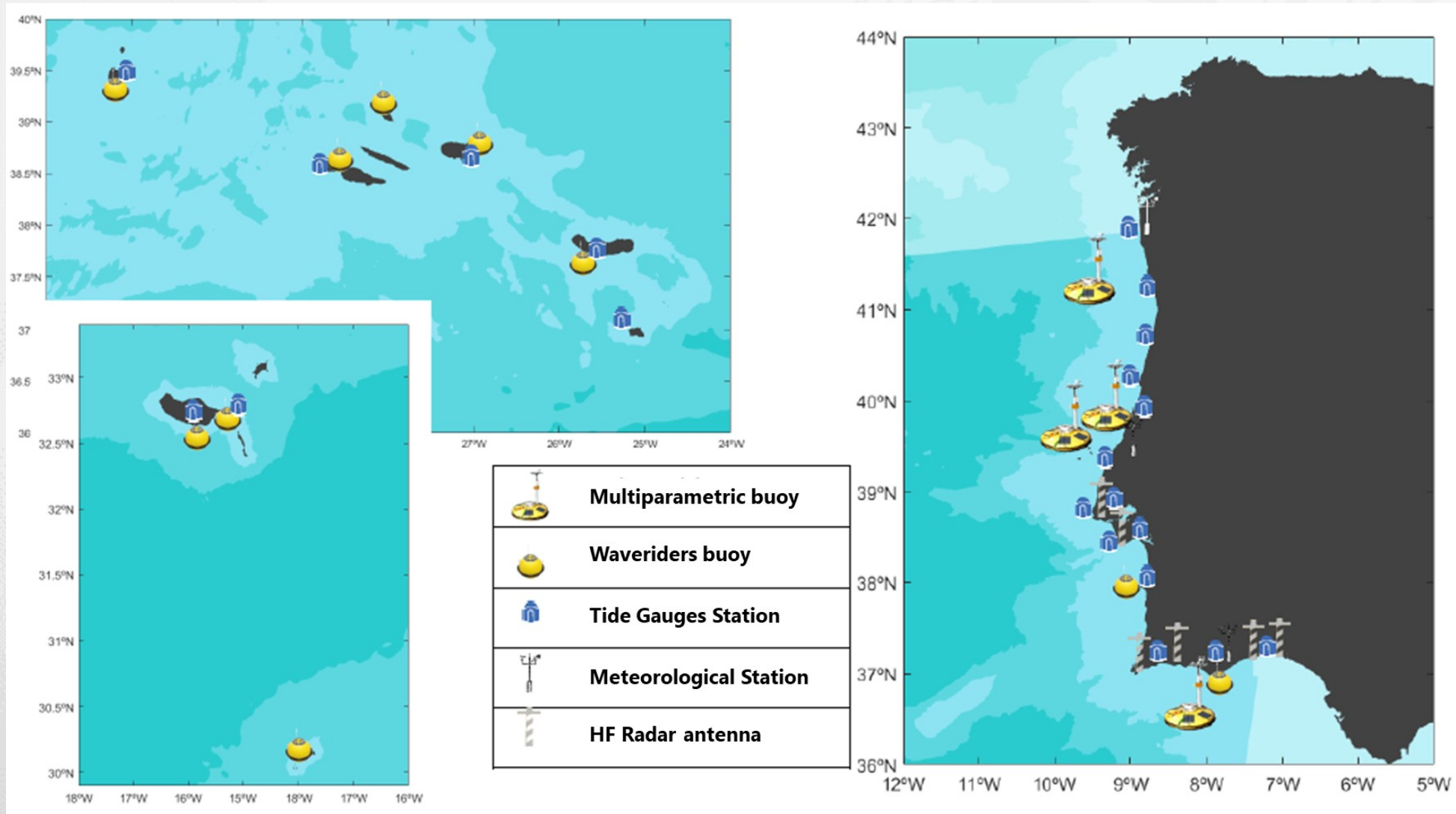
Costa Nova

SED 7/8
1985

SED 1 a 4
2010



Oceanography



New horizons

Autonomous Vehicles

- All kind of autonomous sensors

Remote Sensing

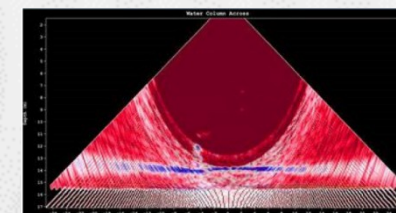
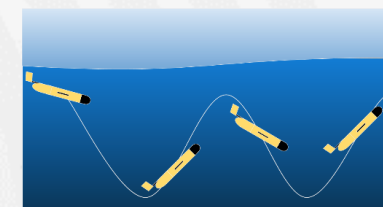
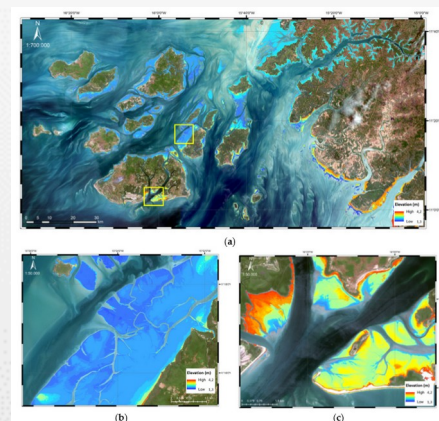
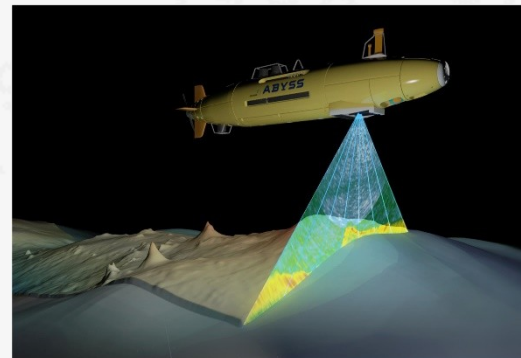
- Topographic data
- Satellite Derived bathymetry

Multibeam Echosounder

- Water Column
- Backscatter

ENC S-100

- New data services based on maritime information

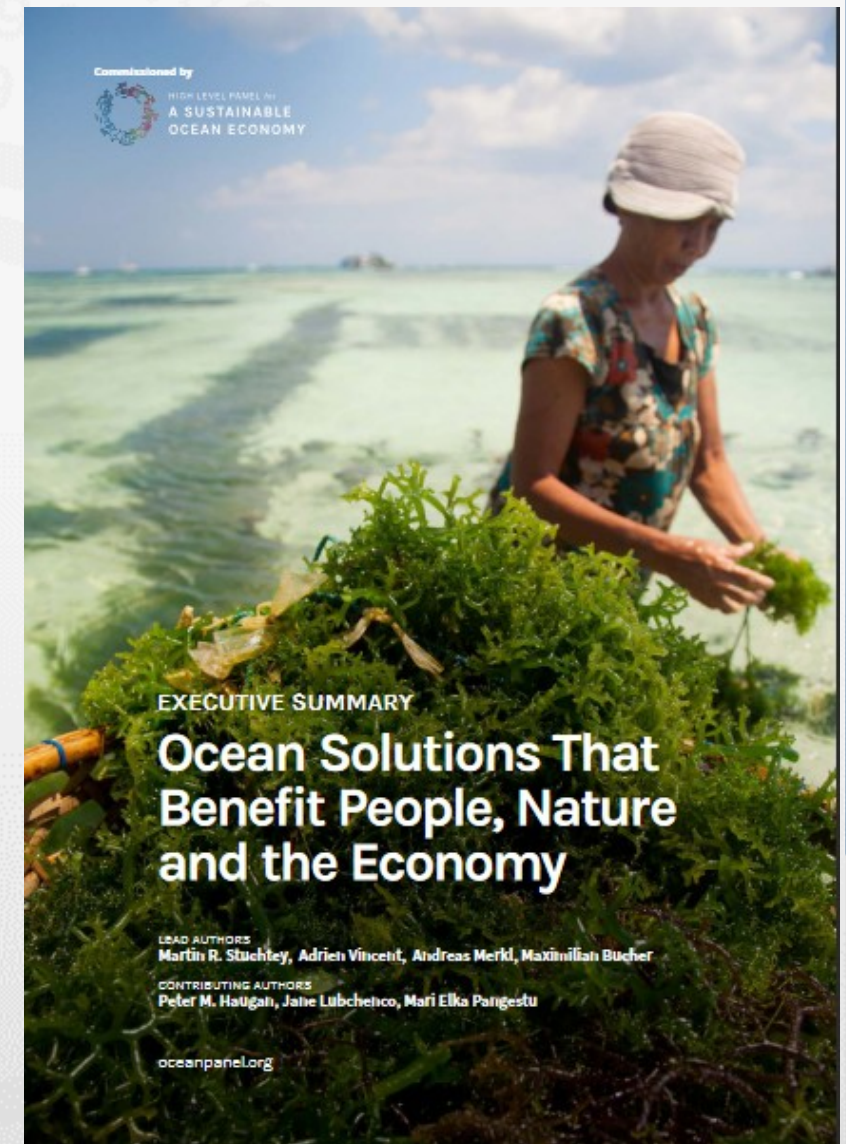


Marine Knowledge

Figure ES.3. Five Building Blocks Are Key to Creating a Sustainable Ocean Economy



Source: Authors.



<https://www.oceanpanel.org/ocean-action/files/executive-summary-ocean-solutions-report-eng.pdf>

Hydrographic information for society

How do you expect hydrography to evolve over the coming years?

Hydrography will continue to expand into new areas. The report commissioned by the 'High level panel for a sustainable ocean economy' illustrates how a sustainable ocean economy in which protection and prosperity go hand in hand can create a healthy ocean that provides solutions to global challenges. To achieve the goals described in the report, data about the ocean and the seafloor is essential. **The trend that started several years ago of going from our classical role of serving the professional mariner with official products and services to serving the entire blue economy with valuable knowledge of the ocean floor will further expand.** The same applies to the transition from a product approach to a more data-centric approach. All of this will require more outreach and interaction with other maritime and marine stakeholders. This is echoed in goals two and three of the IHO strategic plan concerning the increased use of hydrographic data (including our role to facilitate a functional MSDI environment) and being an active player/contributor to international initiatives, with regards to knowledge and the sustainable use of the oceans.

Birte Noer Borrevik, Director Hydrographic Services at the Norwegian Mapping Authority



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Marine Spatial Data Infrastructure

hidrográfico

<https://geomar.hidrografico.pt>

Funding: POCI-02-0550-FEDER-035422

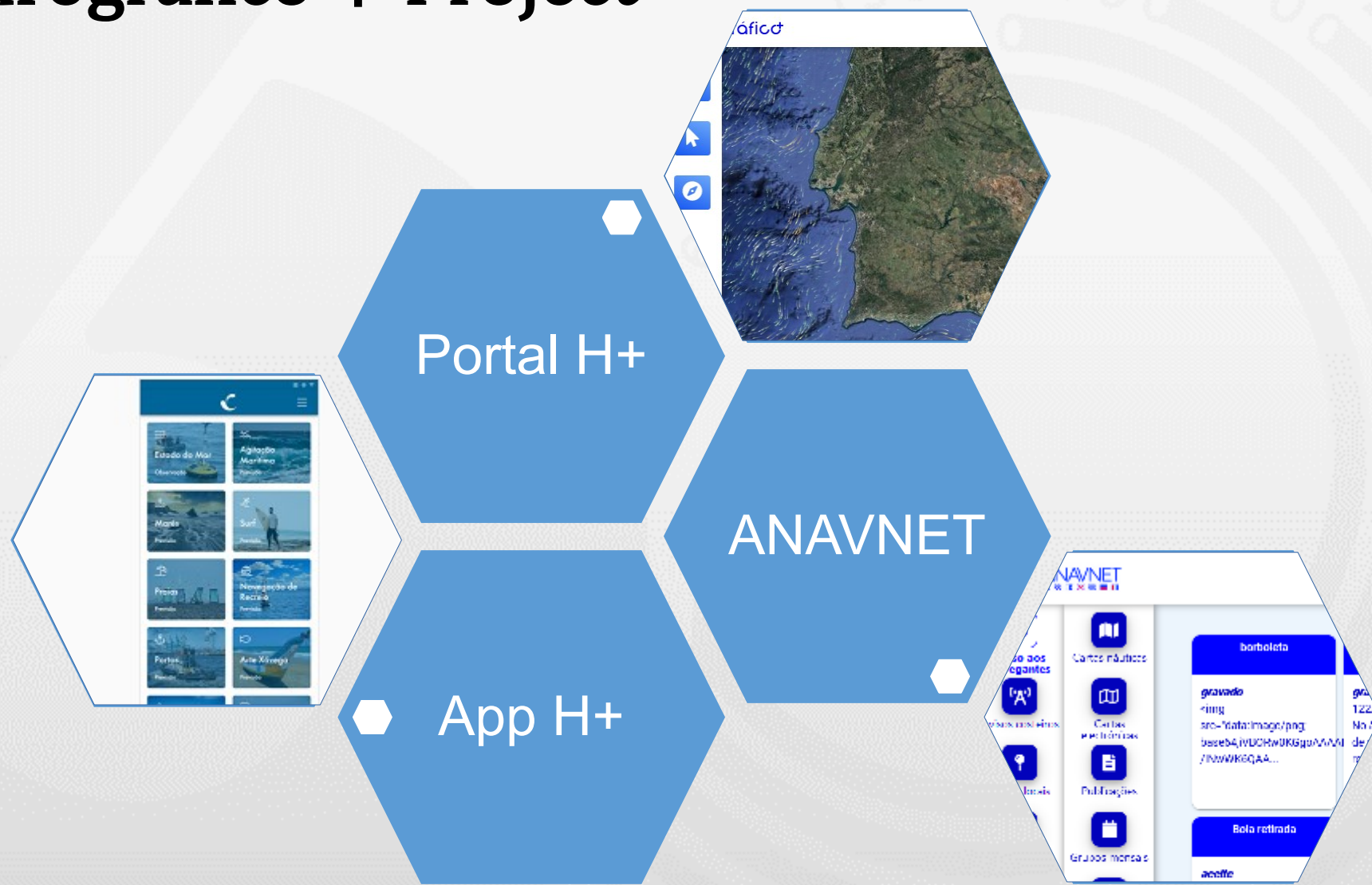
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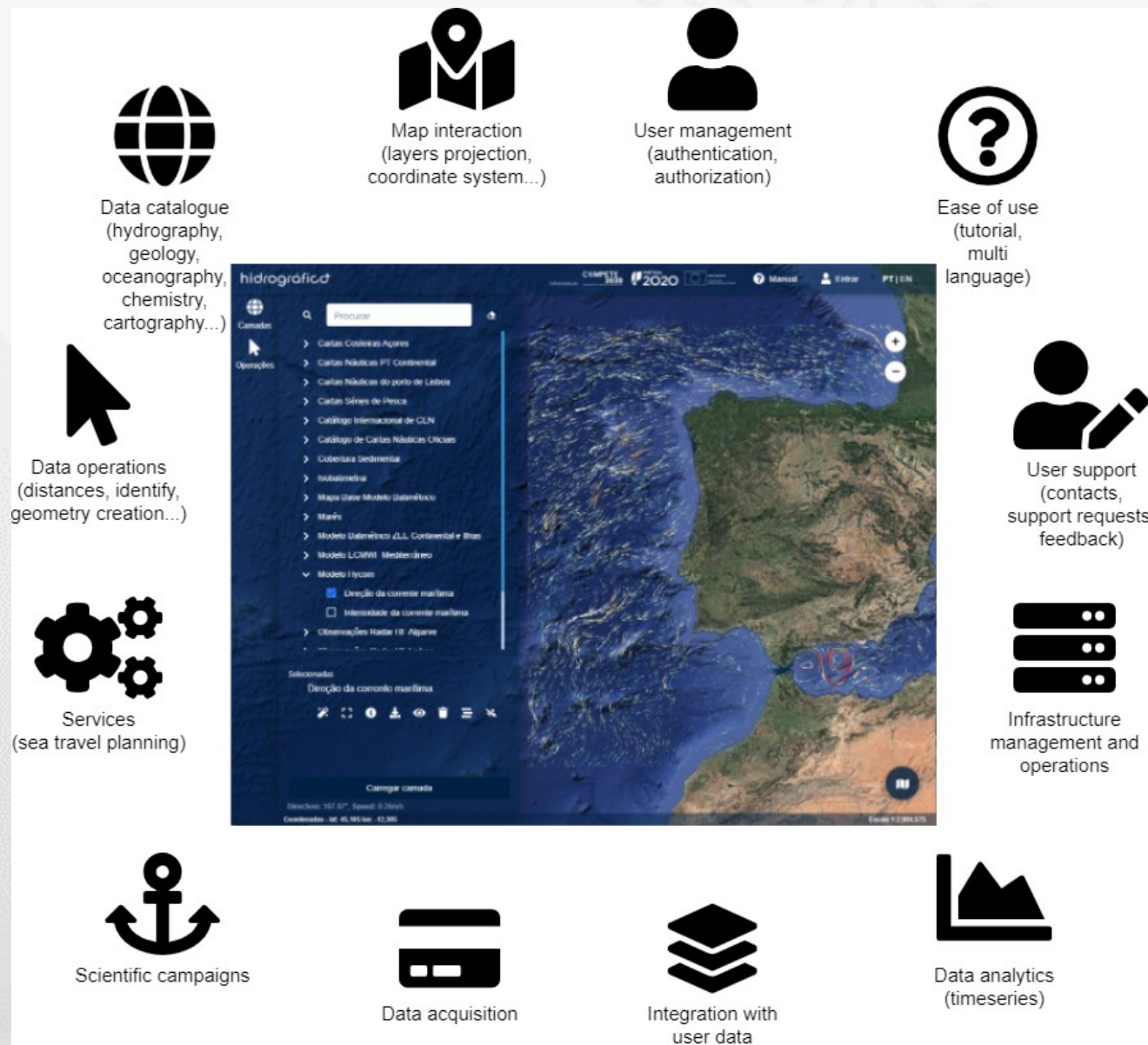
UNIÃO EUROPEIA
Fundo Europeu
de Desenvolvimento Regional



Hidrográfico + Project



Functionalities



MSDI architecture

CATALOGUE

Geo catalogue



IH catalogue



GEOSERVERS

ncWMS



ncWMS



GeoServer



GeoServer



BACKEND

Geo processing services

Geo data services

Metadata search services

User services

Scalability

Modularity

Interoperability
INSPIRE Rules



USER MANAGEMENT



USER CONTACTS



ANALYTICS AND OPERATIONS



IH GEO DATABASES



GEO DATABASE



Agenda

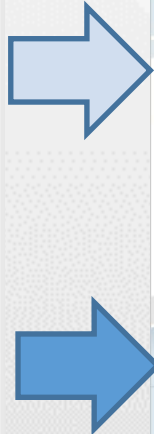
IH – Marine Data Producer

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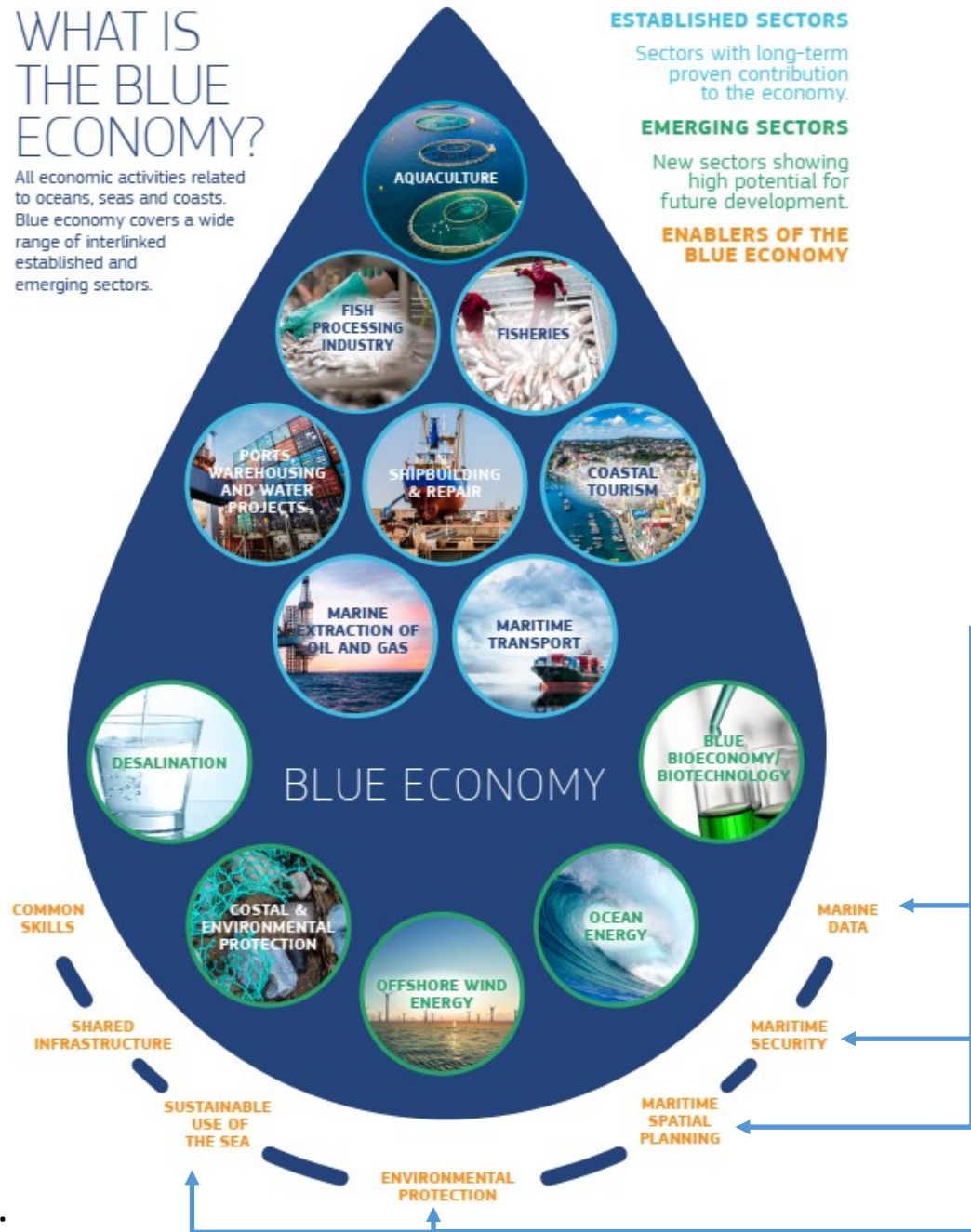
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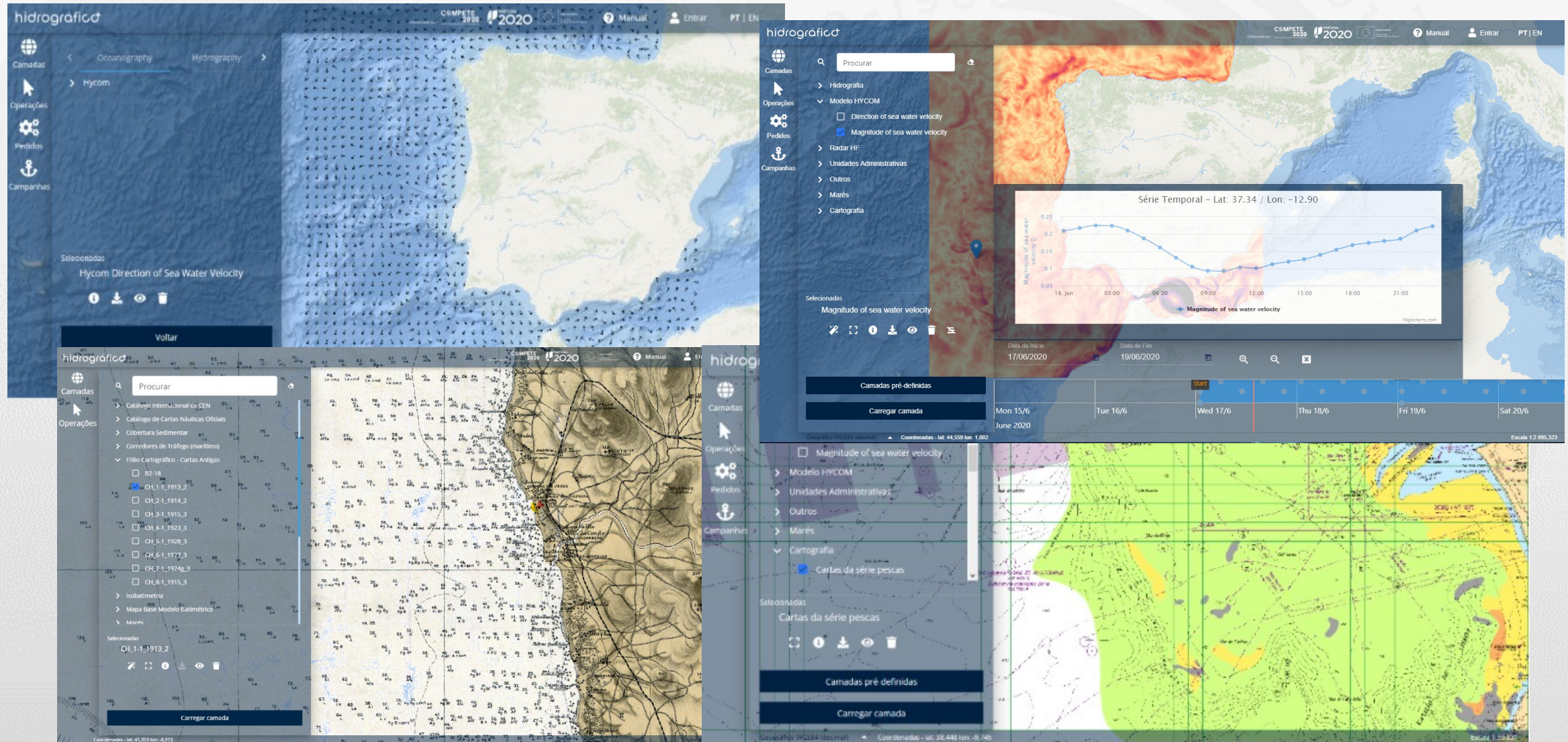


WHAT IS THE BLUE ECONOMY?

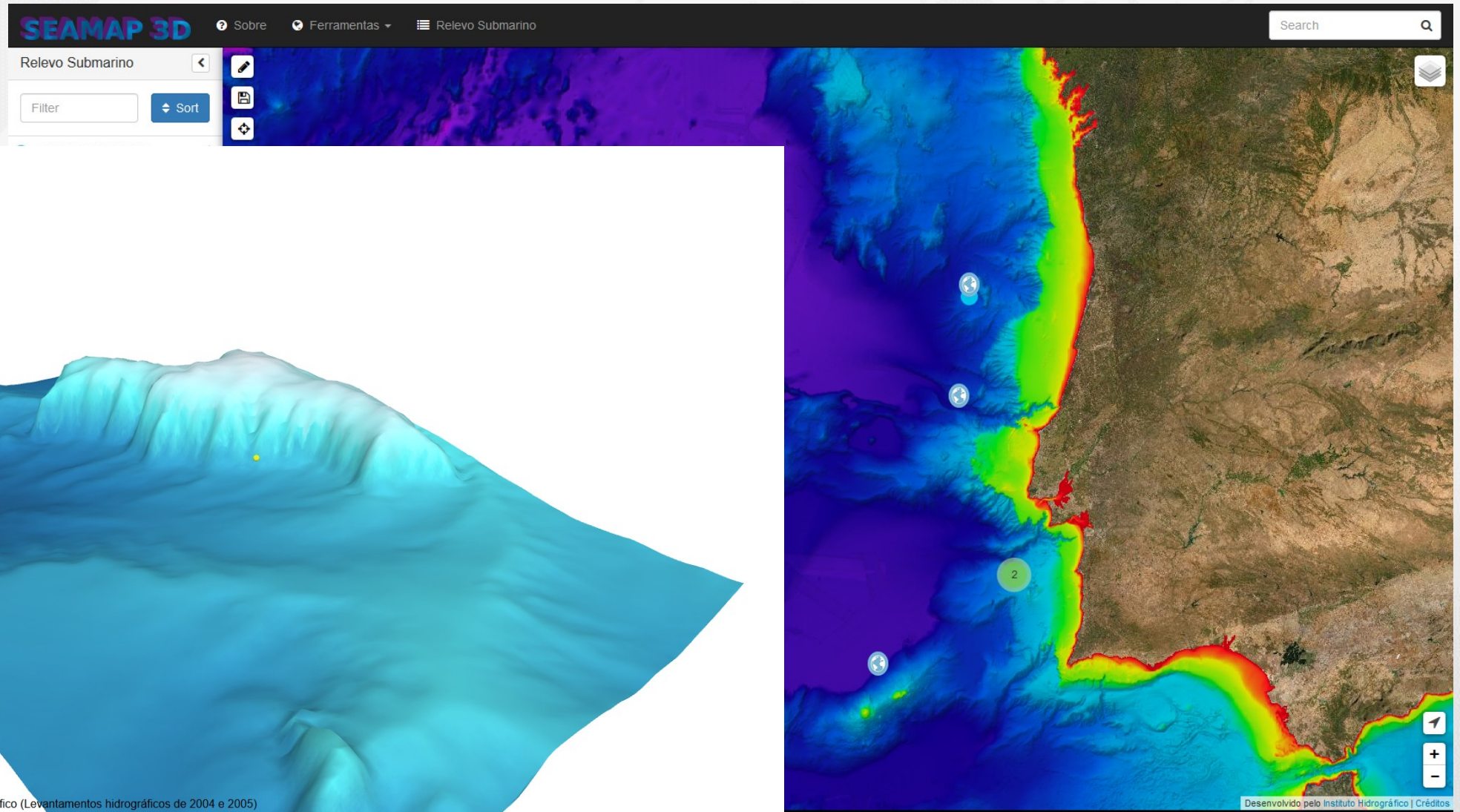
All economic activities related to oceans, seas and coasts. Blue economy covers a wide range of interlinked established and emerging sectors.



Multiple Data formats, products and services



Visualization e interaction



External stakeholders integration

Site: Surftotal.com

https://surftotal.com/camaras-report/minho/moleado

Notícias ▾ Câmaras & Report ▾ Entrevistas ▾ Vídeos ▾ Fotogaleria ▾ Classificados ▾ Guia De Praias ▾ Loja ▾ Jeep ▾ Parceiros ▾

EVOLUÇÃO DAS MARÉS

11 h 10 h 9 h 8 h 7 h

BÓIA ONDÓGRAFO

DADOS: HIDROGRÁFICO

Local	Leixões
Data	24-05-2021 09:35
Altura significativa	2.75 m
Altura máxima	5.18 m
Período médio	7.1 s
Período de onda máxima	8.6 s

Previsão de Marés - Viana do Castelo

DADOS: HIDROGRÁFICO

Data	Altura	
23-05-2021 13:23	3.19 m	Preia-mar
23-05-2021 19:27	0.82 m	Baixa-mar
24-05-2021 01:39	3.36 m	Preia-mar
24-05-2021 07:56	0.57 m	Baixa-mar
24-05-2021 14:09	3.41 m	Preia-mar
24-05-2021 20:16	0.6 m	Baixa-mar
25-05-2021 02:28	3.52 m	Preia-mar
25-05-2021 08:42	0.43 m	Baixa-mar

Costa Nova
Vagueira
Mira

NAZARÉ

Nazaré panorâmica praia norte
Nazaré HD
Nazaré Praias Sul

PENICHE

Peniche - Consolação Norte
Peniche Lagido
Peniche Super Tubos

ERICEIRA

Ericeira HD

SINTRA

Praia Grande Panorâmica

LINHA DE CASCAIS/ESTORIL

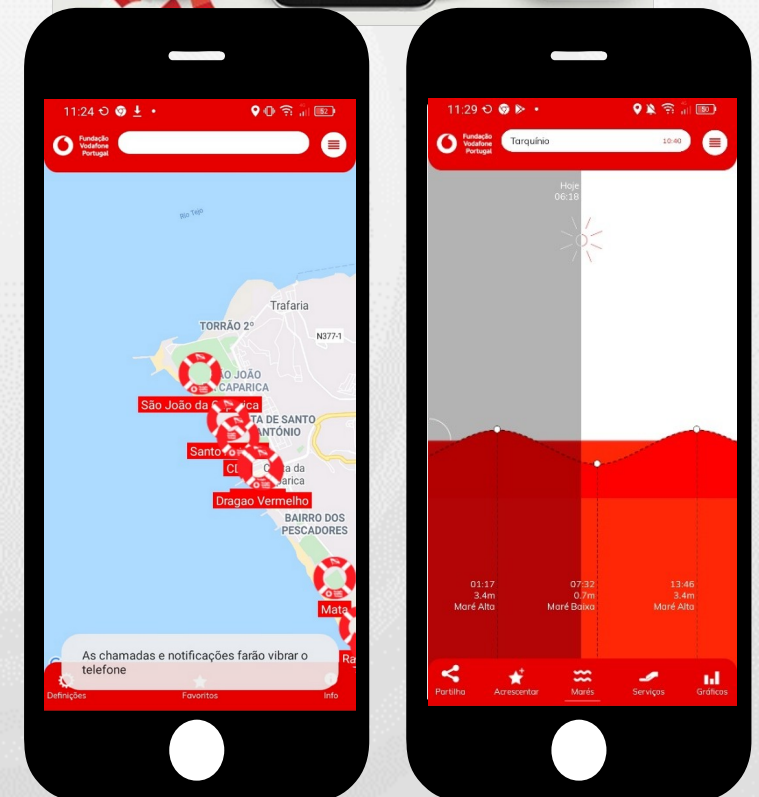
Guincho Norte
São Pedro do estoril
Parede
Carcavelos HD

COSTA DA CAPARICA

Costa da Caparica - C.I.Surf
Caparica Praia Norte HD
Costa da Caparica - Praia CD5
Caparica Praia Nova
Fonte da Telha

ALENTEJO / ALGARVE

Monte Clérigo - O sargo
Quarteira
Faro HD
Faro Surf Spot



Vodafone & ISN : App Praia em direto



Re-use of data services

hidrográfico

Planeamento de viagem

Data estimada de partida

Horario da partida AM

Data estimada de chegada

Horario da chegada AM

Velocidade



Desenhar trajetória

Calcular estudo de viagem

Planeamento de Viagem

Origem: lat: nn°nn'nn"N lon: nn°nn'nn"E (Porto de Leixões)
Destino: lat: nn°nn'nn"N lon: nn°nn'nn"E (Porto de Lisboa)
Distância: 300 nmi
ETA: dd/mm/yyyy
ETA: dd/mm/yyyy
Velocidade: nnn.nn km

Cartografia náutica

carta náutica 123
 carta náutica 456
 carta náutica 789

Publicações

publicação 1_nome 1_autor 1_data 1
 publicação 2_nome 2_autor 2_data 2
 publicação 3_nome 2_autor 2_data 2

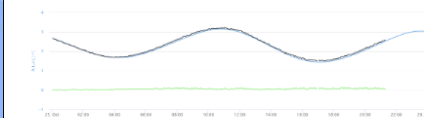
Percurso

1. lat: nn°nn'nn"N lon: nn°nn'nn"E
Porto de Leixões
2. lat: nn°nn'nn"N lon: nn°nn'nn"E
3. lat: nn°nn'nn"N lon: nn°nn'nn"E
4. lat: nn°nn'nn"N lon: nn°nn'nn"E
5. lat: nn°nn'nn"N lon: nn°nn'nn"E
Porto de Lisboa

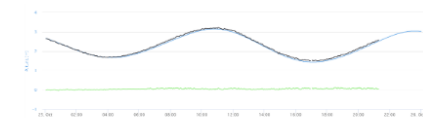
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	dd/mm/yyyy	Temp. (°C)	Pressão atm. (hPa)	Prob. preci. (%)	Direção	Veloc. (km/h)	Direção	Altura (m)	Período (s)
1. lat: nn°nn'nn"N lon: nn°nn'nn"E Porto de Leixões	dd/mm/yyyy	20 20	1013 1013	17 17	03 03	20 20	03 03	20 20	10 10
2. lat: nn°nn'nn"N lon: nn°nn'nn"E	dd/mm/yyyy	24 24	1013 1013	48 48	03 03	25 25	03 03	25 25	10 10
3. lat: nn°nn'nn"N lon: nn°nn'nn"E	dd/mm/yyyy	20 20	1013 1013	52 52	03 03	22 22	03 03	22 22	11 11
4. lat: nn°nn'nn"N lon: nn°nn'nn"E	dd/mm/yyyy	17 17	1013 1013	25 25	03 03	20 20	03 03	20 20	11 11
5. lat: nn°nn'nn"N lon: nn°nn'nn"E Porto de Lisboa	dd/mm/yyyy	18 18	1013 1013	22 22	03 03	22 22	03 03	22 22	11 11

Previsão de marés

Origem: lat: nn°nn'nn"N lon: nn°nn'nn"E (Porto de Leixões)
ETA: dd/mm/yyyy



Destino: lat: nn°nn'nn"N lon: nn°nn'nn"E (Porto de Lisboa)
ETA: dd/mm/yyyy



Avisos à navegação

Zona 123 - dd/mm/yyyy
 Aviso 123, atividade 123, limitação 123, condicionante 123, período 123, descrição 123

Zona 456 - dd/mm/yyyy
 Aviso 456, atividade 456, limitação 456, condicionante 456, período 456, descrição 123

Zona 789 - dd/mm/yyyy
 Aviso 789, atividade 789, limitação 789, condicionante 789, período 789, descrição 123

Perfil batimétrico



Agenda

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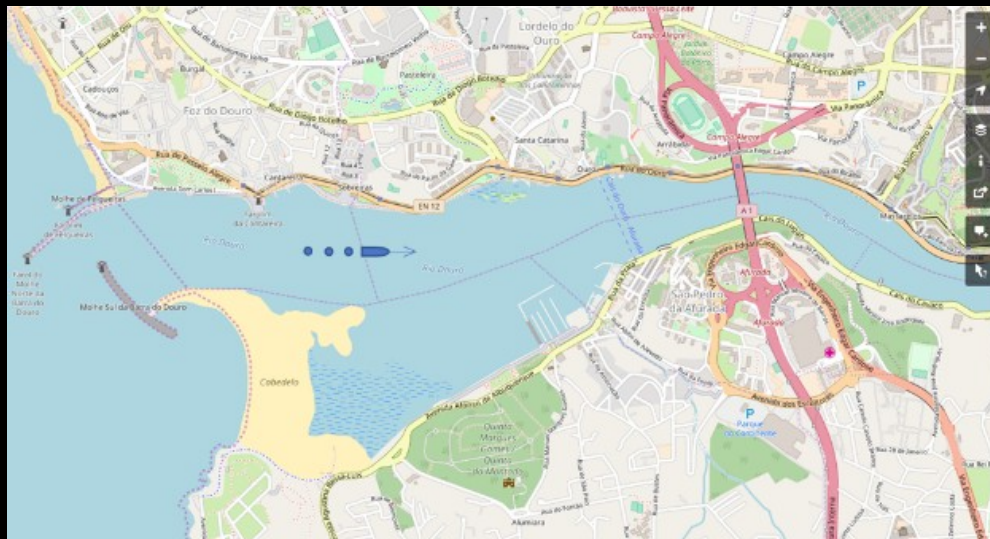
MSDI Hidrográfico +

Marine data for Society

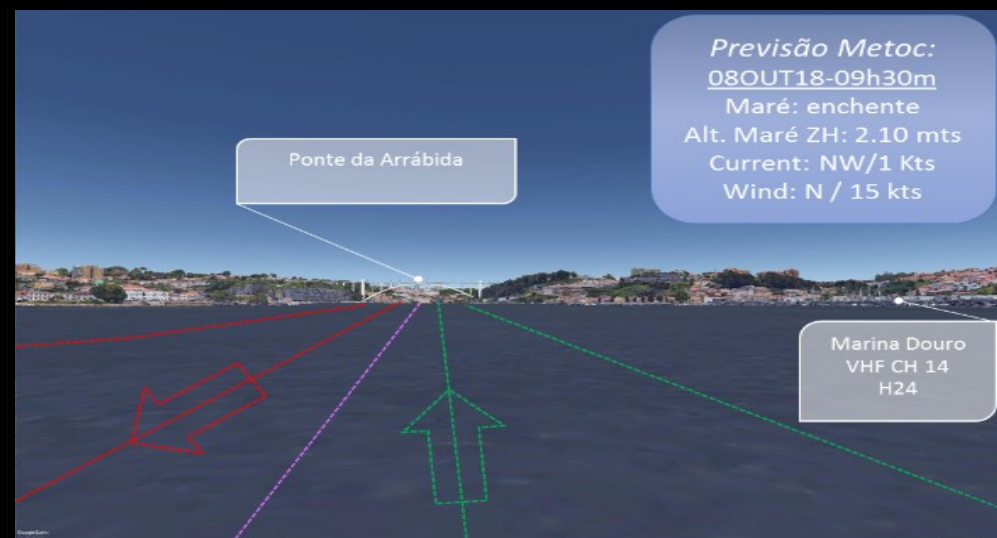
MSDI H+ Preparing the future

MSDI H+ In Inspire Context

Augmented Reality Navigation



Mobile app augmented navigation



Maritime Navigation in future...



<http://blog.geogarage.com/2014/03/tomorrows-cargo-ships-will-use.html>

OHI Goals

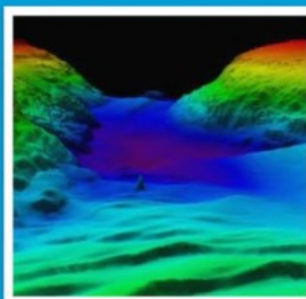
Alignment with goals defined in the IHO Strategic Plan 2021 - 2026

International
Hydrographic
Organization



Goal 1

Evolving the hydrographic support for safety and efficiency of maritime navigation, undergoing profound transformation



Goal 2

Increasing the use of hydrographic data for the benefit of society



Goal 3

Participating actively in international initiatives related to the knowledge and the sustainable use of the Ocean



SDG and Ocean Decade goals



SDG 1, 2, 3, 6, 7, 12, 13, 14 are directly related with ocean status and their assessment relies in high-quality marine data and the best available knowledge.

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INSPIRE Alignment



INSPIRE GEOPORTAL

Enhancing access to European spatial data

European Commission > INSPIRE > Geoportal

[Home](#) [Priority Data Sets Viewer](#) [Thematic Viewer](#) [Harvesting status](#) [Find out more about](#)

Unidades Administrativas Marítimas

[Metadata](#)

Country: [Portugal](#)

Show metadata fields in:

[original MD language](#)

[Download Options](#)

[View Options](#)

[Data set Metadata](#)

Resource Title

Unidades Administrativas Marítimas

Resource Abstract

Portugal Continental - Linhas de fecho e de normal ; Limite exterior do mar territorial ; Li da zona económica exclusiva. Legislação: DF Fixa a largura do mar territorial e estabelece Português ; DR 1ª Série nº 125, Decreto-Lei Exclusiva – Relação de coordenadas dos cen



Aceder



Partilhar



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[Recolher](#)

POLÍTICA DE DADOS

[Dados abertos](#) (1)

SERVIÇOS

[Visualização e descarregamento](#) (1)

[Visualização](#) (1)

[Descarregamento](#) (1)

TEMAS

[Limites Administrativos](#) (1)

ENTIDADE RESPONSÁVEL

Unidades Administrativas Marítimas

Instituto Hidrográfico

Data de Referência (Revisão): 24-04-2020

Tema(s): Limites Administrativos

Cobertura: Local

Portugal Continental - Linhas de fecho e de base reta que suplementam a linha de base normal ; Limite exterior do mar territorial ; Limite exterior da zona contígua ; Limite exterior da zona económica exclusiva. Legislação: DR 1ª Série nº 124, Lei nº 33/77, maio de 1977 – Fixa a largura do mar territorial e estabelece uma Zona Económica de 200 milh... mais

[Metadados](#)



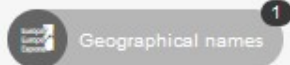
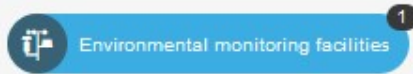
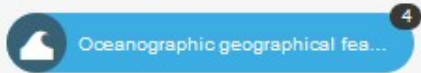
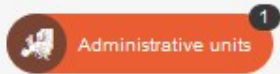
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Dados abertos

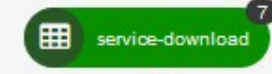
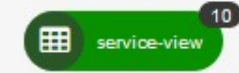
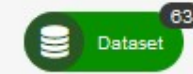


Metadata – all starts here!

Browse by ☒ INSPIRE themes ☐ Topics



Browse resources



Latest news

Most popular

Comments



Previsão de agitação marítima - domínio global



Previsão de agitação marítima - Aveiro



Previsões de agitação marítima - domínio regional



Previsão da circulação superficial - HYCOM



INSPIRE Interoperability Example

Welcome to the INSPIRE Validator

The purpose of the INSPIRE validator is to help data providers, solution providers and national coordinators to check whether data sets, network services and metadata meet the requirements defined in the INSPIRE Technical Guidelines. The validator provides detailed test reports to help implementers understand how well their data, services, metadata or software solutions are doing (or where improvements may be needed).

The validator is based on the [Abstract and Executable Test Suites](#) agreed between Member States and the Commission in the INSPIRE Maintenance and Implementation Group, and includes a [helpdesk](#) to address feedback, bug reports and feature requests from the INSPIRE community. See the [changelog](#) of the current and past releases and the [release planning strategy](#) for the plan of future releases of the INSPIRE Validator.

The validator has been developed under [ARE3NA](#) and [ELISE](#) Actions of the ISA/ISA2 Programmes.



Test your data, services or metadata

Pick your resource (data, services or metadata), select the test(s) to launch and check the results to see how well you are doing (or where you need to improve).

[Start a test](#)



API

If you are a developer, you can access and call the operations of the validator API to power your own applications.

[Try the API](#)



Want more?

Download the software, deploy it in your own infrastructure and customise it to fit your specific needs.

[Get the software](#)



Feedback

Use the Community space to provide your feedback or proposals on the ATS, ETS or the ETF test framework.

[Provide your feedback](#)

INSPIRE Interoperability Example

Resource linkages checker tool

Emulate the checks by the INSPIRE Geoportal

This application may be used by INSPIRE data and service providers to emulate the checks executed by the INSPIRE Geoportal during its harvesting process. It reports potential issues, related to correctly established MD linkages among MS resources (Data set, View and Download services) identified during the harvesting, when the Geoportal is extracting and enriching the MD information found in the MS resources.

[Click here](#) for the detailed documentation about this process.



Check new metadata

Use this option if you want to check a newly created metadata record



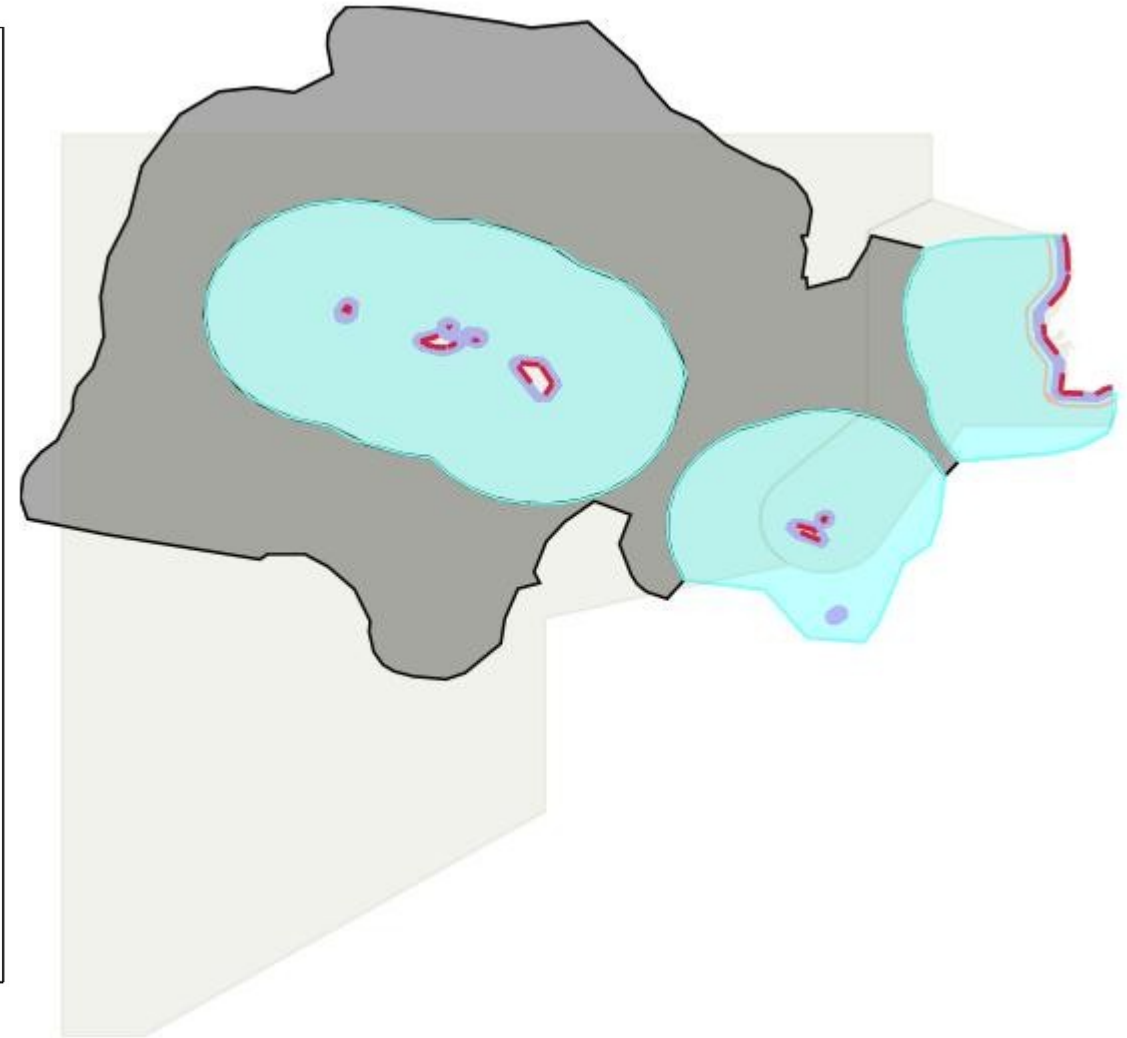
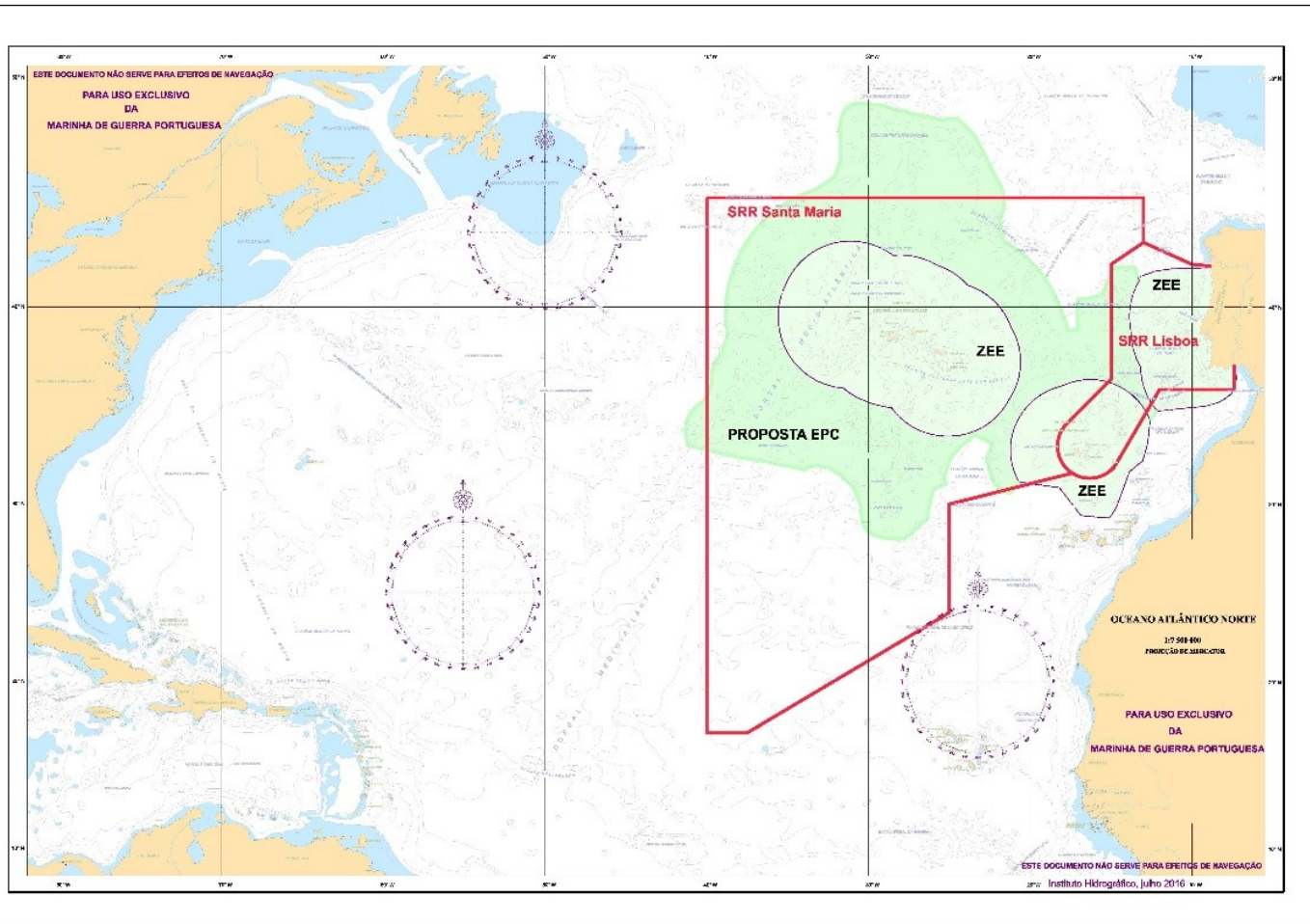
Check existing metadata

Use this option if you want to check a metadata record that is already available through the INSPIRE Geoportal

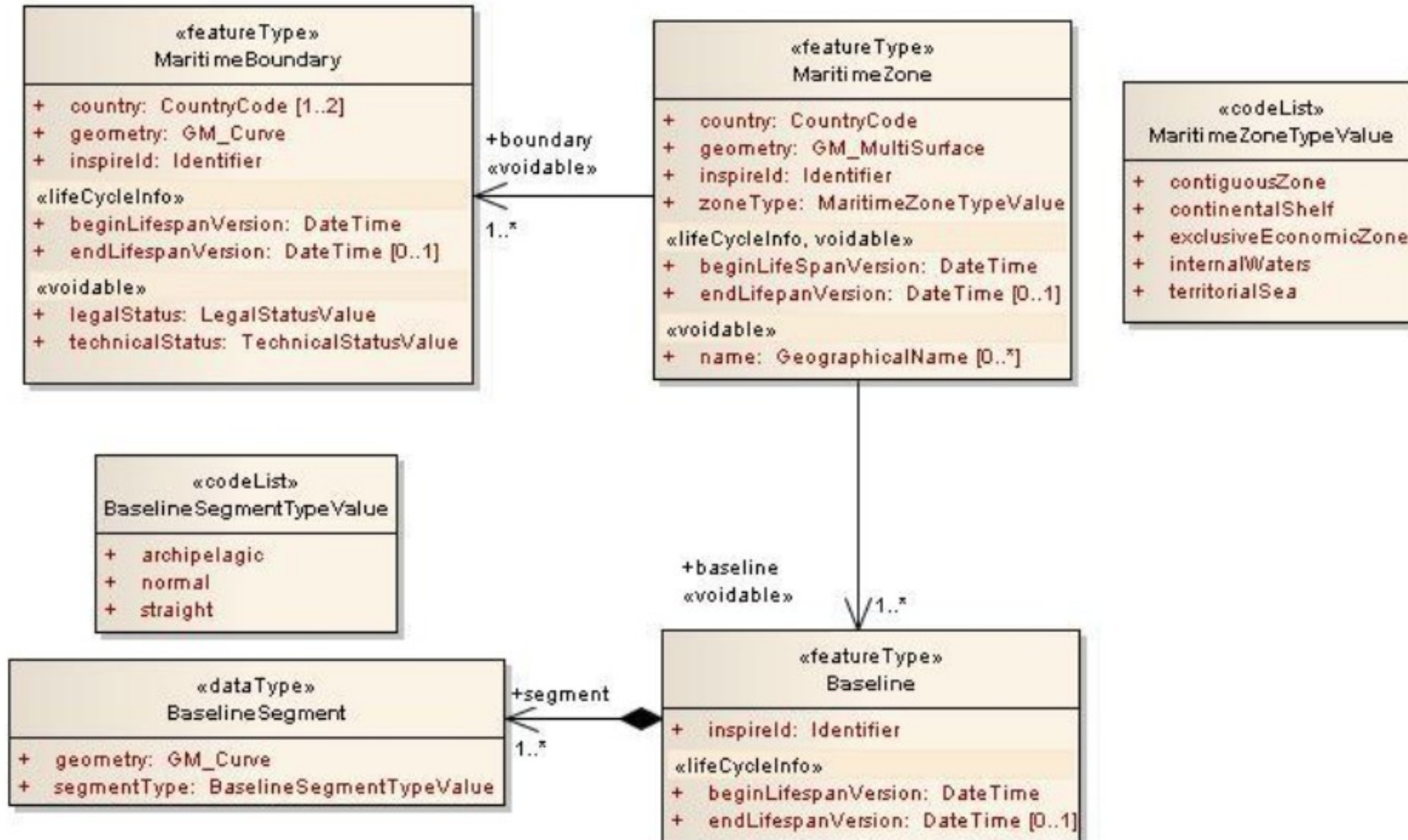
For security reasons, HTTP resources using ports other than 80 and 443 cannot be contacted.

DISCLAIMER: This web application is used in the context of supporting MS data providers with publishing their resources (Data Sets / Services) in the INSPIRE Geoportal. It cannot be considered as a full INSPIRE compliance test. For checking the compliance with INSPIRE Technical Guidelines, only the [INSPIRE Reference Validator](#) should be used. If inconsistencies found between the checks performed by the INSPIRE Geoportal and the Reference Validator, [please report them here](#).

Maritime Administrative Units

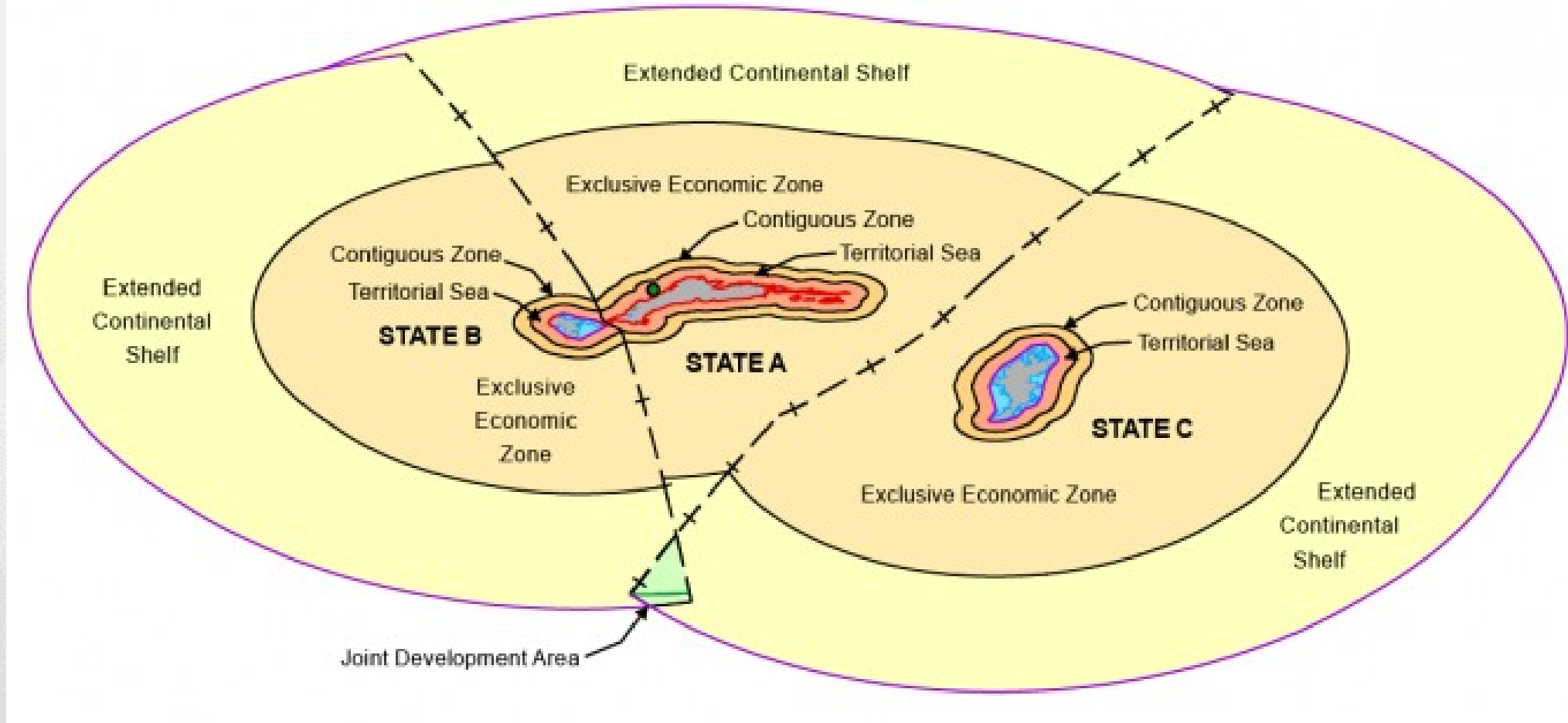


INSPIRE Maritime Administrative Units



Maritime Administrative Units – Maritime Limits and Boundaries

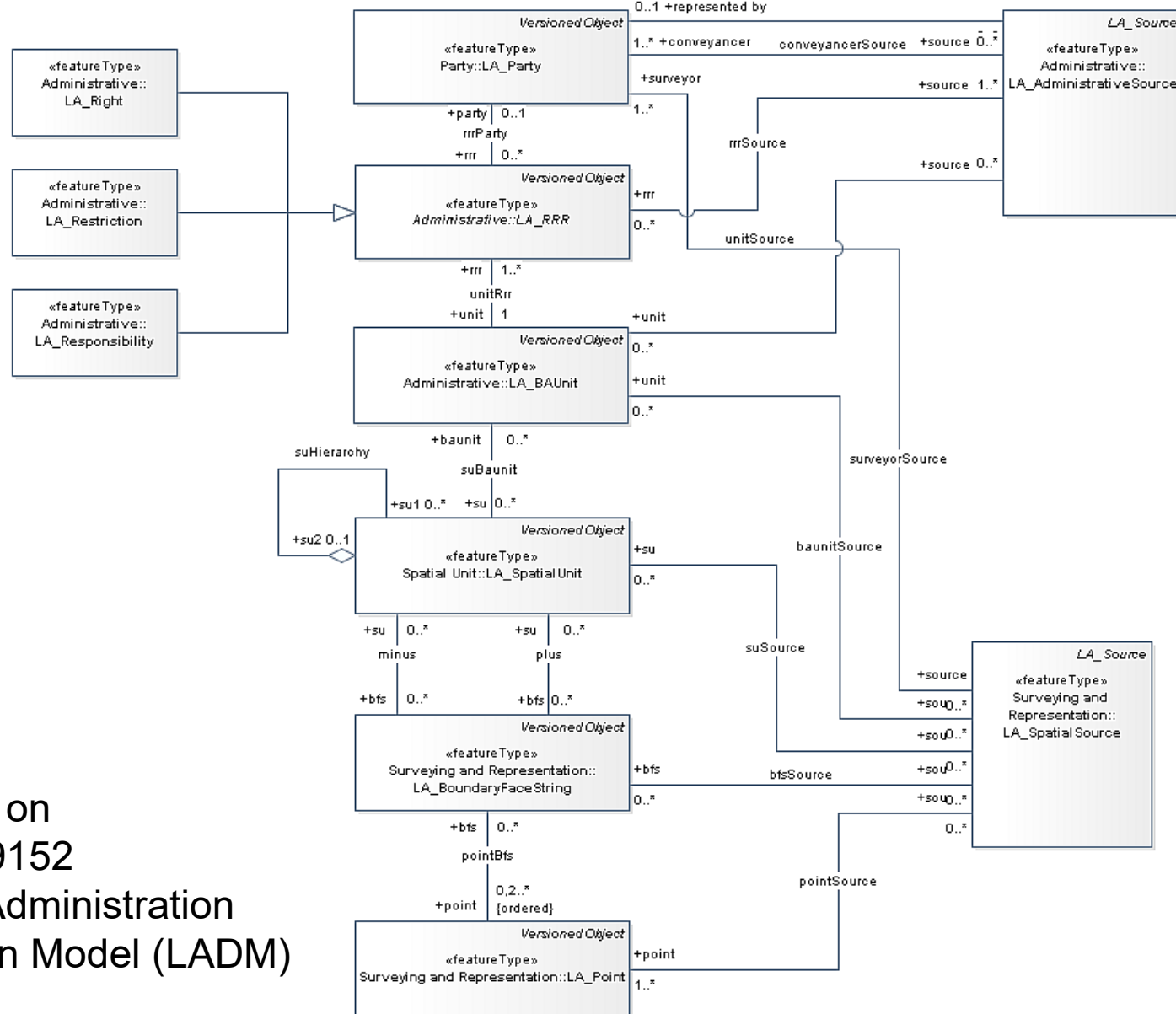
S-121 EXAMPLE DATASET



Source:

<https://www.hydro-international.com/content/article/s-121-a-new-standard-for-maritime-limits-and-boundaries>

S-121 Standard - Maritime Limits and Boundaries



Combine Legal data and Geographic Representation of Objects

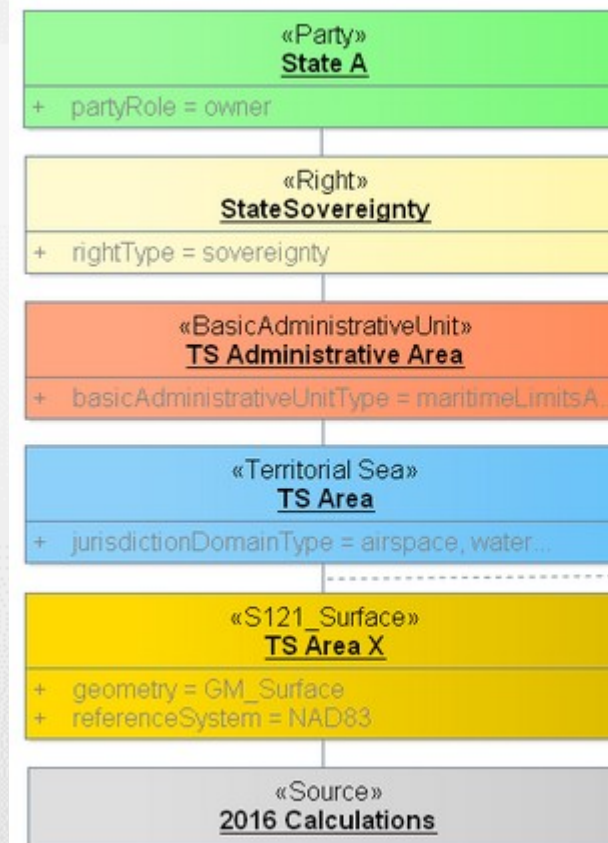
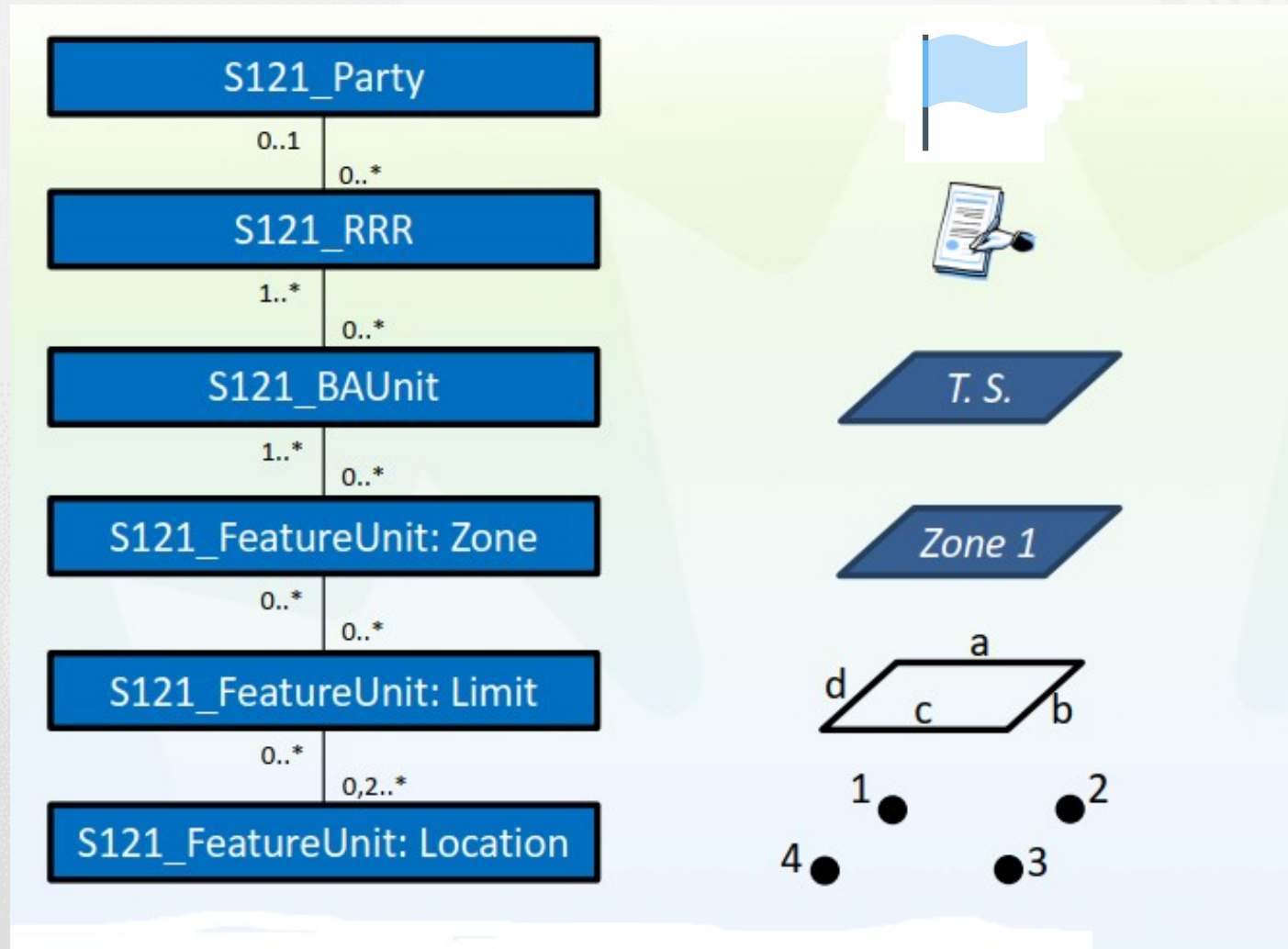


1. Support MLB Rights, Responsibilities and Restrictions;
2. Respect the relevant provisions of UNCLOS;
3. Design to be the common deposit format for UNCLOS outer limits in DOALOS;

Based on
ISO 19152
Land Administration
Domain Model (LADM)

http://www.s-121.com/docs6/1.0.0/S121_V1_HTMLModel/

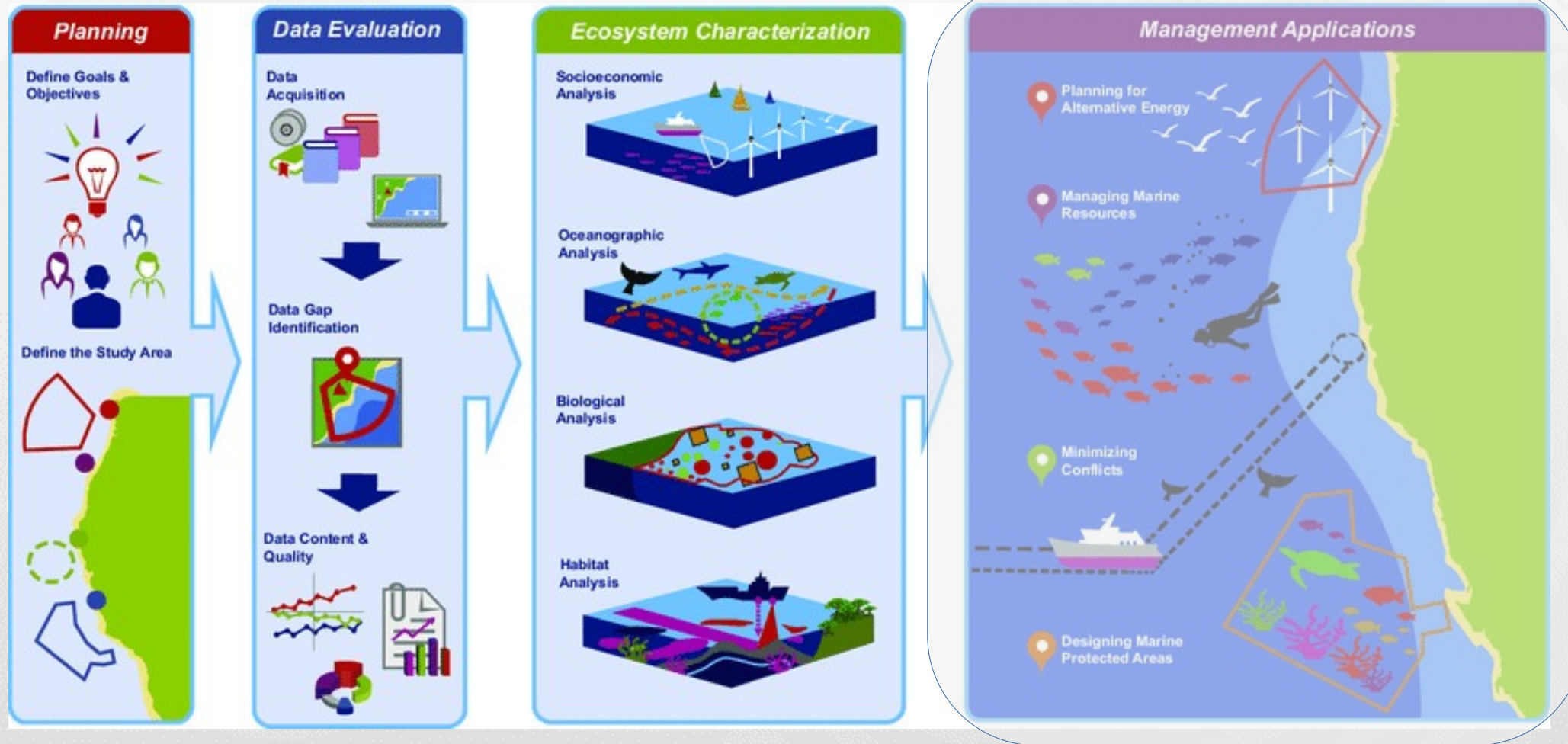
S-121 Standard - Maritime Limits and Boundaries



Case where we do have a surface geometry

https://na.eventscloud.com/file_uploads/5619328316b44a38ca9665aa990be995_6PaulEggesborgWednesdaymorning.pdf

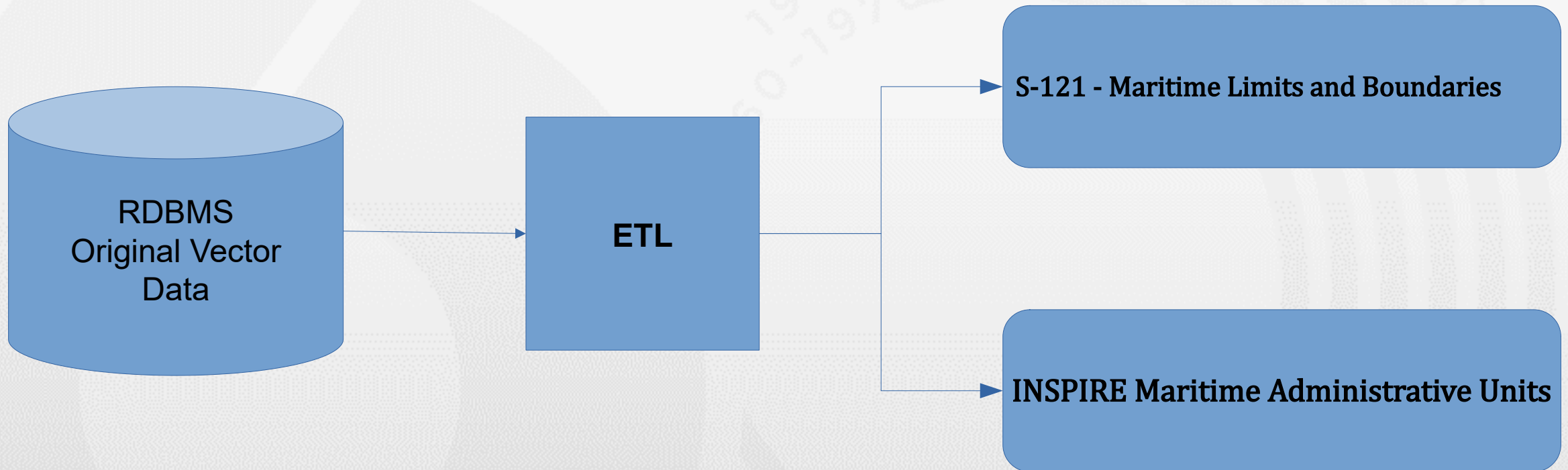
Future - Extension of S-121 for Marine Spatial Planning



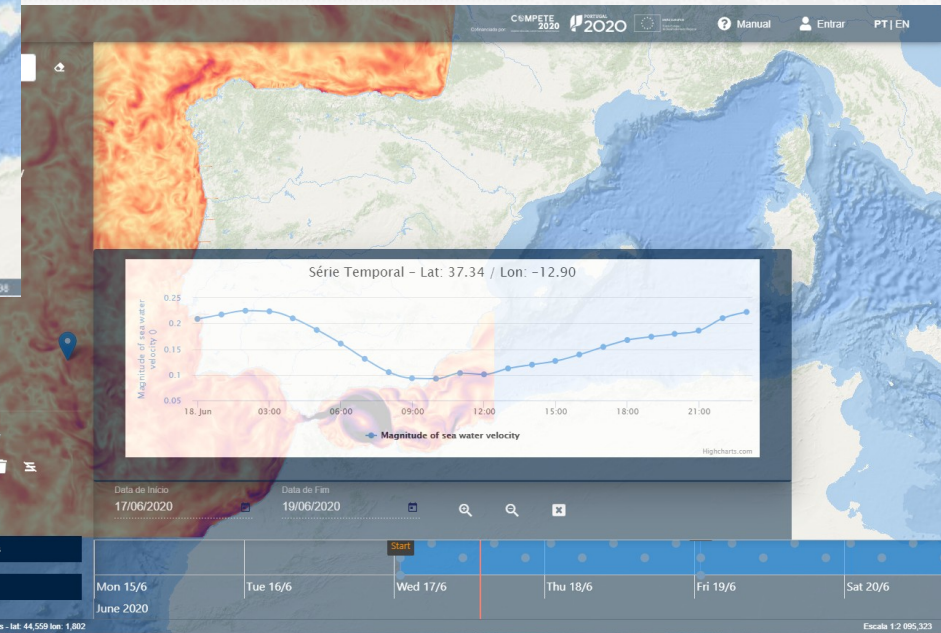
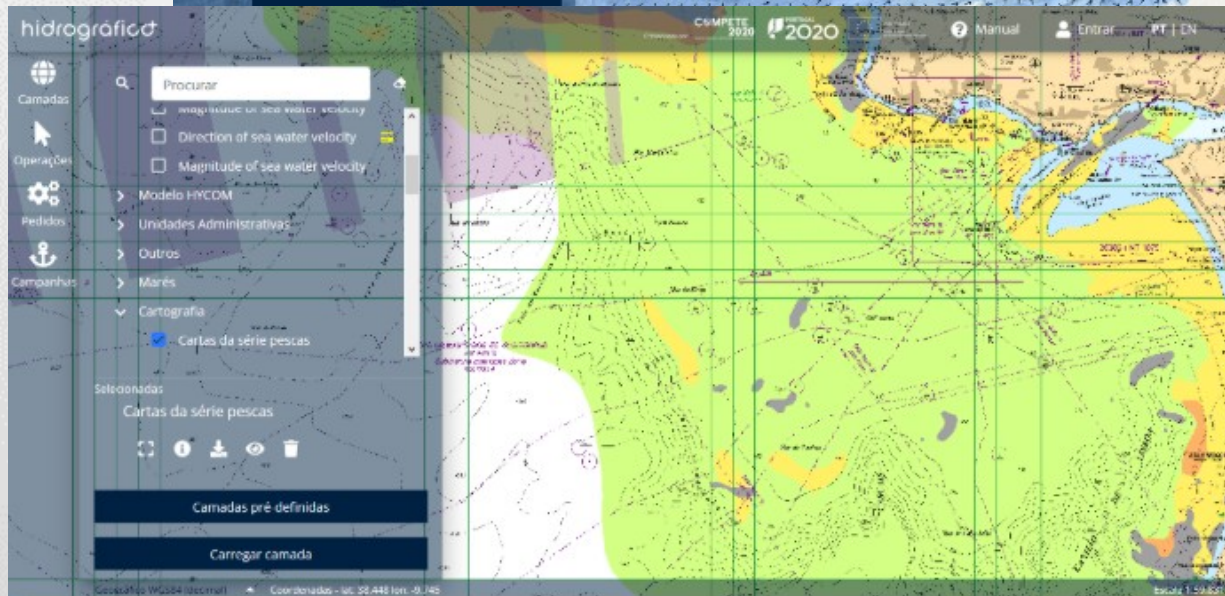
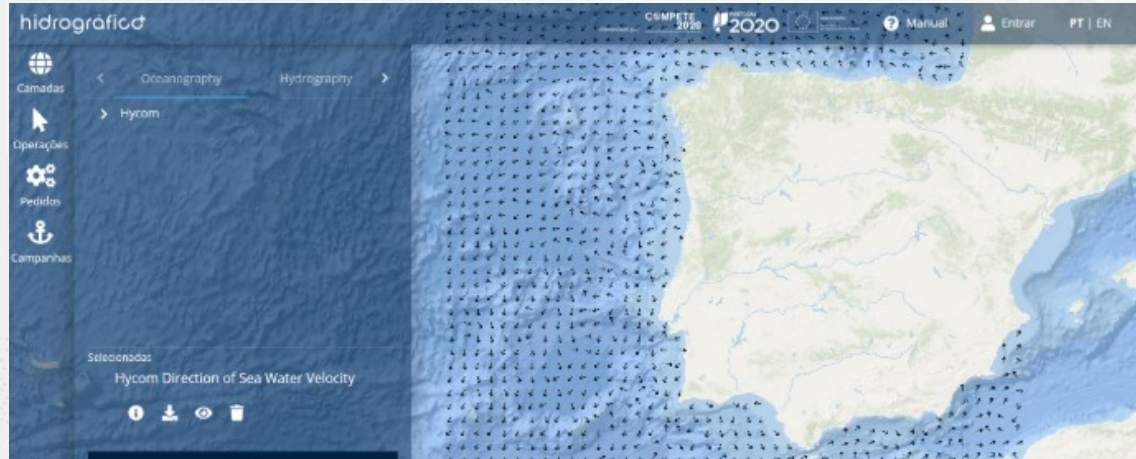
NOAA's Biogeographic Assessment Framework (BAF) to support marine spatial planning

<https://coastalscience.noaa.gov/news/innovative-management-approach-aids-marine-spatial-planning/>

Challenges H+ – one source for multiple data models



Live demo



Cofinanciado por:



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Thanks

hidrográfico

<https://geomar.hidrografico.pt>

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