

Um Oceano aberto e transparente

Telmo DIAS, Paulo NUNES, Sara ALMEIDA, Isabel BUÉ, Carlos MARQUES, João VITORINO

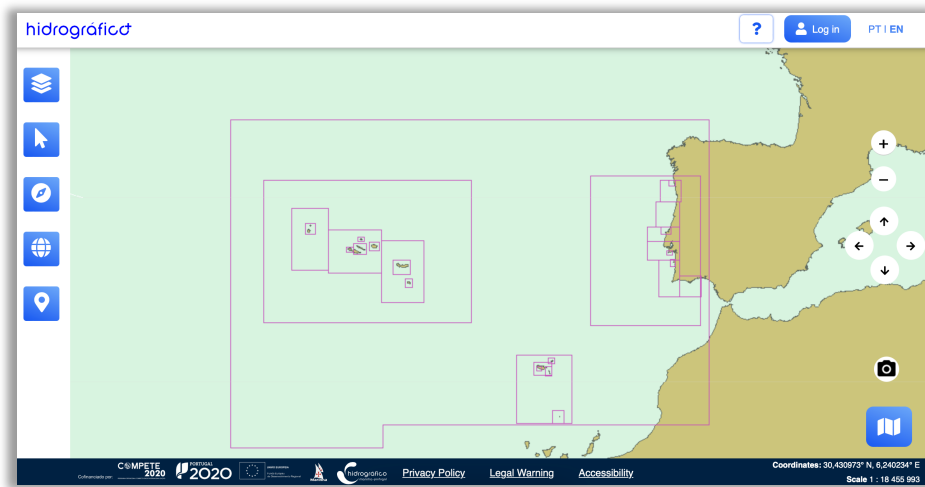
geraldes.dias@hidrografico.pt



XIV Jornadas Ibéricas de Infraestruturas de Dados Espaciais

6, 7 e 8 de novembro de 2023

hidrográfico



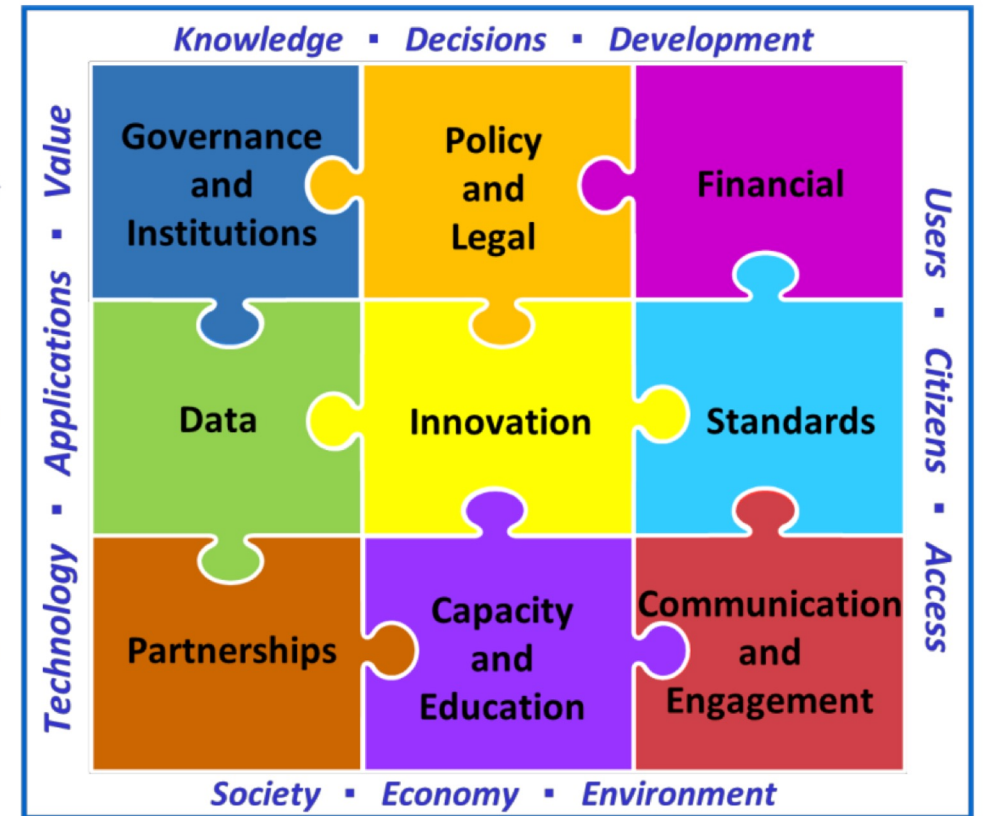
UN-GGIM

United Nations Integrated Geospatial Information Framework (UN-IGIF)

Governance →

Technology →

People →





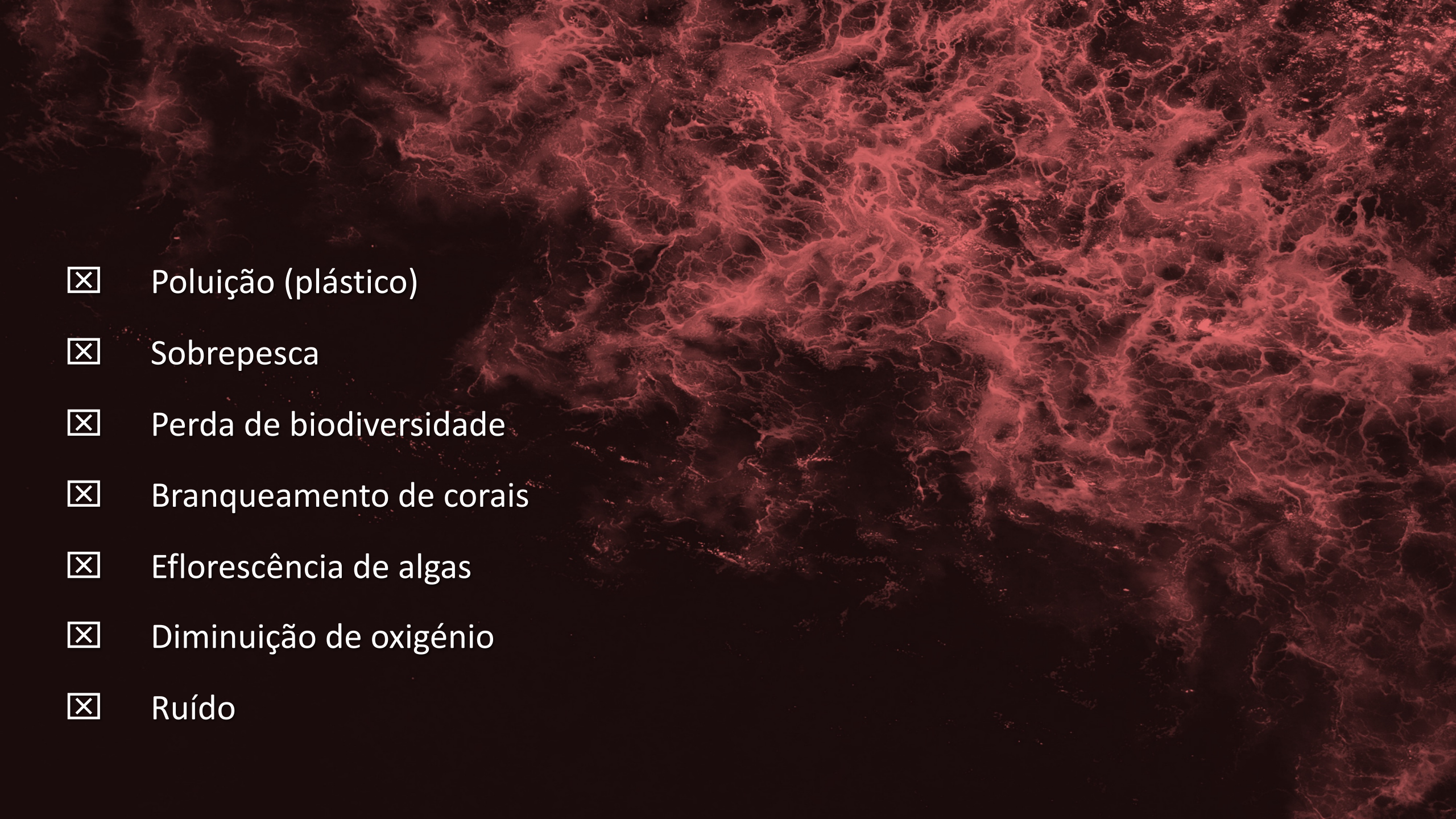
40%
População

50%
Oxigénio

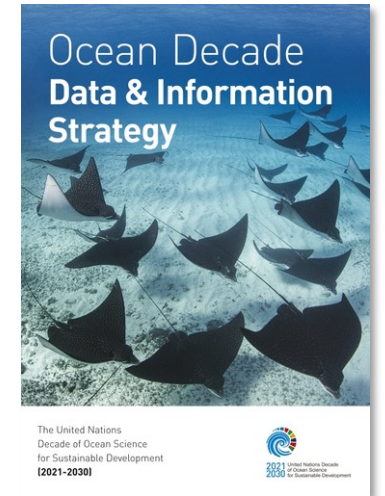
71%
Superfície

80%
Transporte

99%
Comunicações

- 
- ☒ Poluição (plástico)
 - ☒ Sobrepesca
 - ☒ Perda de biodiversidade
 - ☒ Branqueamento de corais
 - ☒ Eflorescência de algas
 - ☒ Diminuição de oxigénio
 - ☒ Ruído

OBJETIVOS DE DESENVOLVIMENTO SUSTENTÁVEL



Challenge 8

Create a digital representation of the ocean

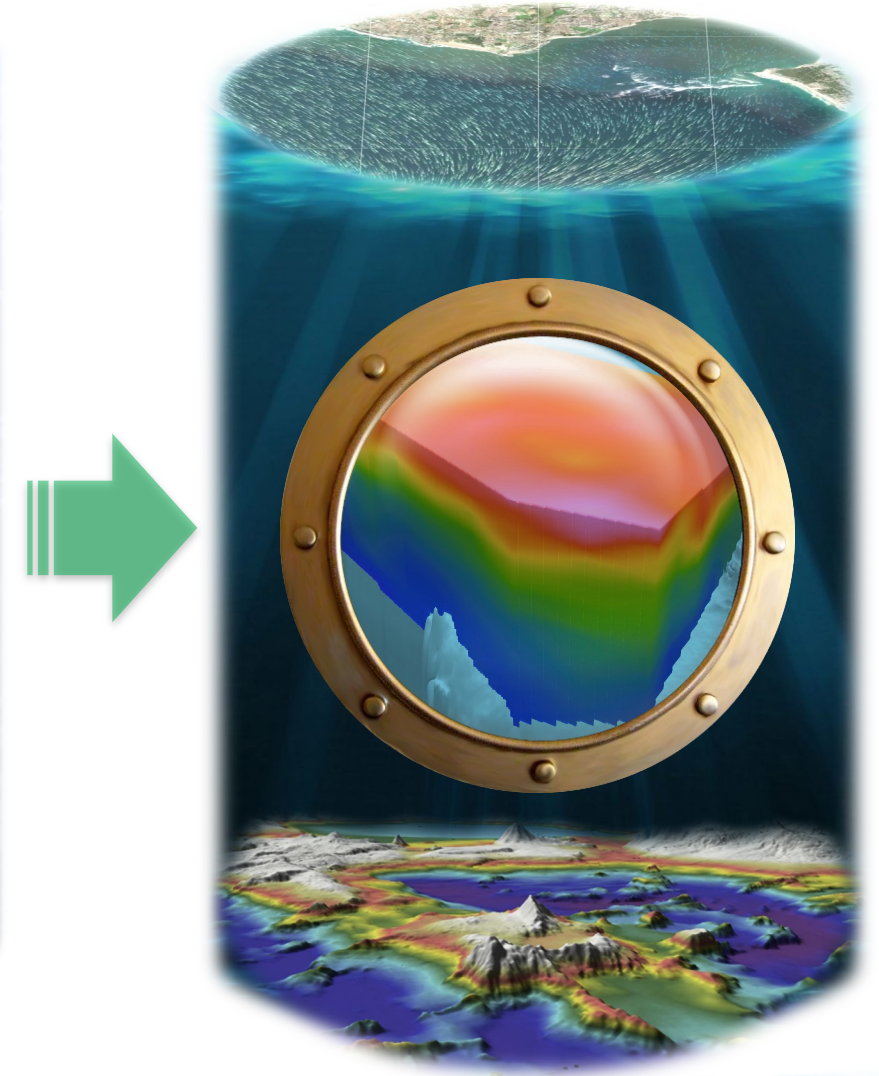
Through multi-stakeholder collaboration, develop a comprehensive digital representation of the ocean, including a dynamic ocean map, which provides free and open access for exploring, discovering, and visualizing past, current, and future ocean conditions in a manner relevant to diverse stakeholders.

Descoberta

Usabilidade

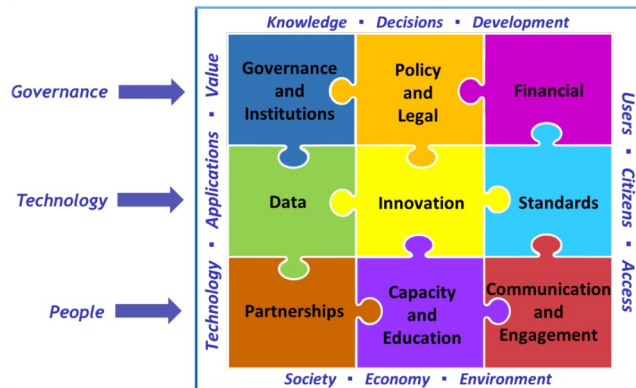
Interligação

IDE
hidrográfico





hidrográfico+



<https://ggim.un.org/UNGGIM-wg8>



<https://iho.int/msdiwg>

NODC-PT

<https://nodc-portugal.pt>



<https://blue-cloud.org>

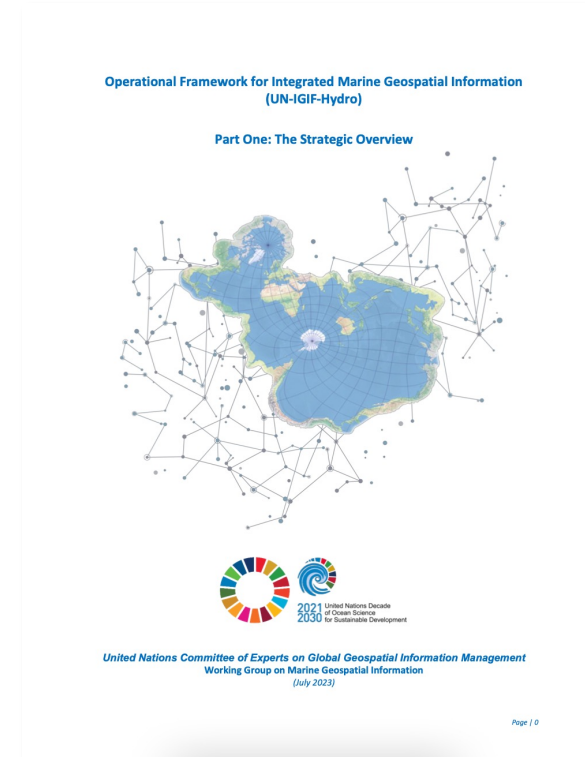


<https://ditto-oceandecade.org>

UN-GGIM – *Global Geospatial Information Management* *Working Group on Marine Geospatial Information*

➔ Objetivos:

- **Promover** a importância da informação geoespacial marinha **fiável, oportuna e adequada** à gestão do meio marinho;
- **Incentivar** a utilização de **normas e padrões** internacionais, relacionados com a informação geoespacial marinha.
- Apoiar o Comité de Peritos no desenvolvimento de **normas, princípios e guias**, no sentido de **aumentar a disponibilidade de informação** geoespacial marinha.



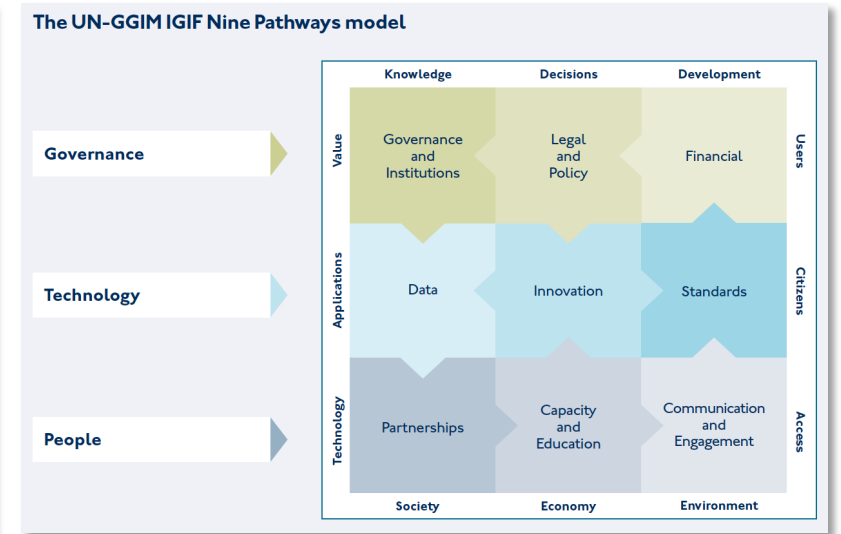
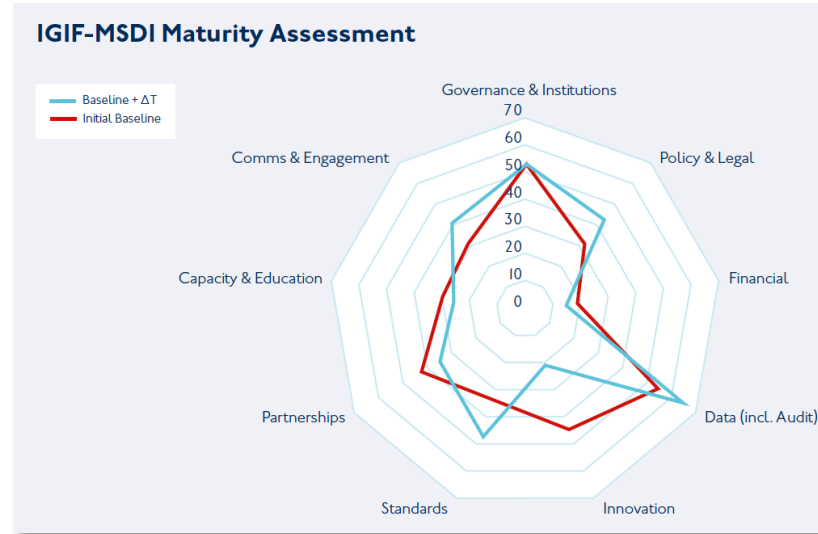
UN-IGIF-Hydro

Part 1 – Strategic Overview

Part II – The Strategic Pathways

UN-GGIM – Global Geospatial Information Management

Working Group on Marine Geospatial Information



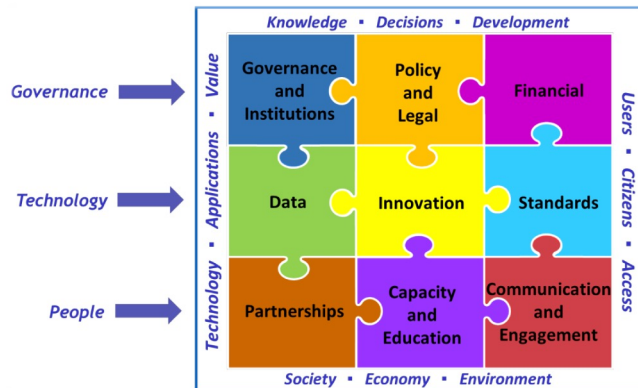
UN-GGIM
Working Group on Marine Geospatial Information

IHO
Marine Spatial Data Infrastructures Working Group

OGC
Marine Domain Working Group



hidrográfico+



<https://ggim.un.org/UNGGIM-wg8>



<https://iho.int/msdiwg>

NODC-PT

<https://nodc-portugal.pt>



<https://blue-cloud.org>

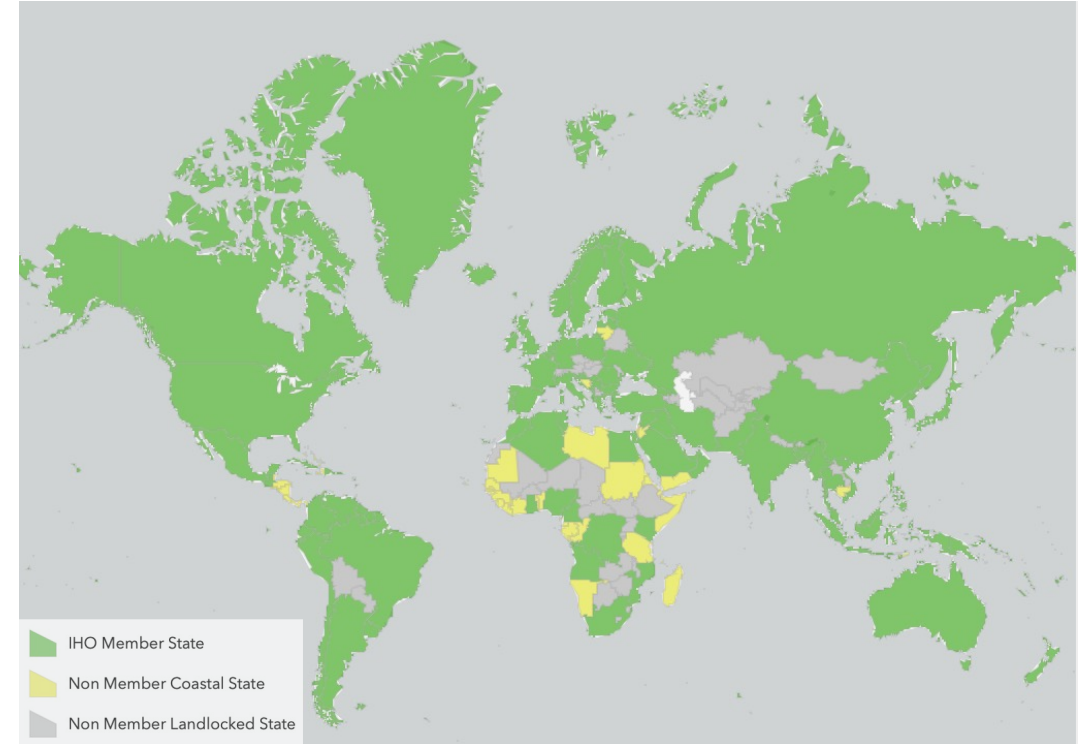


<https://ditto-oceandecade.org>

➔ Organização intergovernamental:

- **Levantamento e cartografia** de todos os mares, oceanos e águas navegáveis;
- **Uniformidade** das cartas e documentos náuticos;
- **Especificações técnicas** dos levantamentos;
- **Diretrizes** para maximização dos dados hidrográficos;
- Desenvolvimento das **capacidades** dos Membros.

➔ Estados representados pela entidade nacional responsável pelas **cartas e publicações náuticas**.

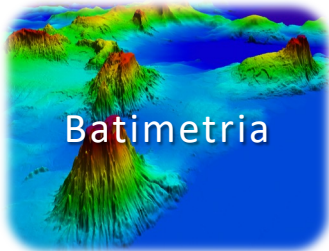


IHO – *International Hydrographic Organization*

Evolução do conceito e aplicação da Hidrografia

➔ Definição:

- Ramo das ciências aplicadas que se ocupa da **medição e descrição das características físicas** dos oceanos, mares, zonas costeiras, lagos e rios, bem como da **previsão das suas alterações ao longo do tempo**, com o objetivo principal de garantir a **segurança da navegação** e de **apoiar todas as outras atividades marítimas**, incluindo o desenvolvimento económico, a segurança e a defesa, a investigação científica e a proteção do ambiente.



Navegação



Comércio



Ambiente



Pesca



Recursos



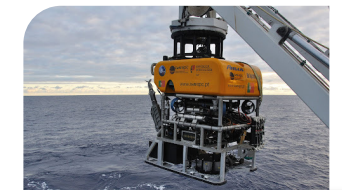
Infraestruturas



Defesa



Emergências



Investigação

Uniformidade Digital



*One standard
To rule them all...*



Interoperabilidade

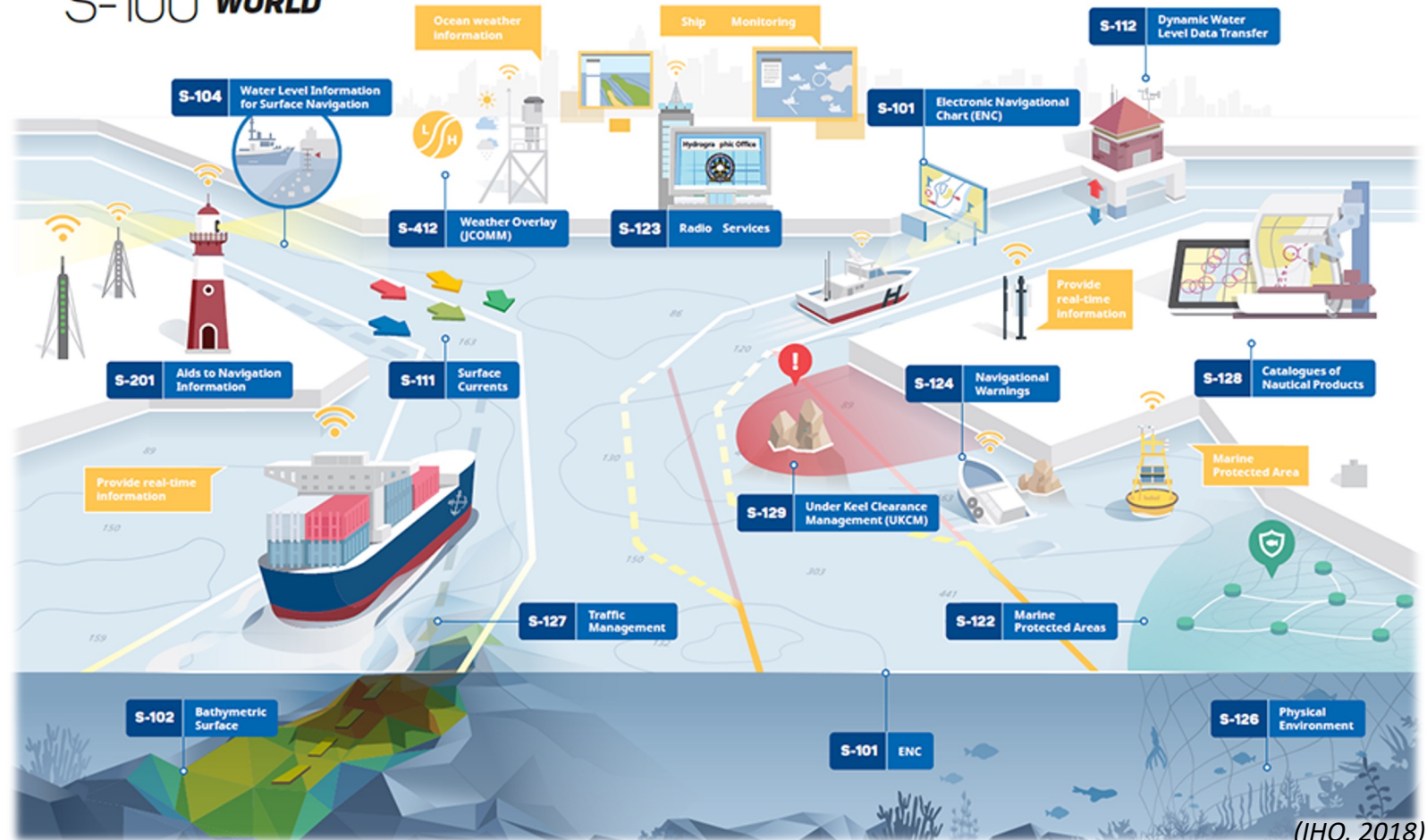


Rastreabilidade



Qualidade

S-100 **WORLD**



(IHO, 2018)

(UKHO, 2023)

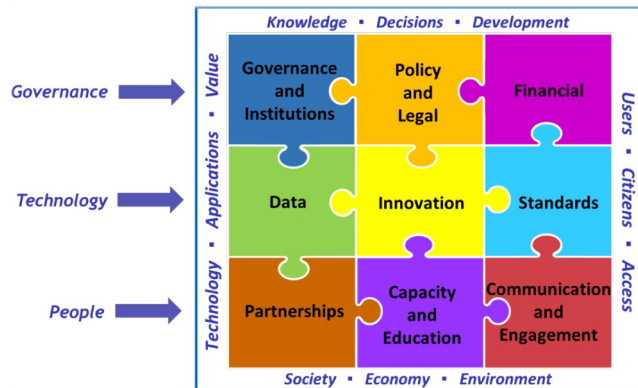
Navigational
Warnings

S-124

S-124 – Avisos à Navegação



hidrográfico+



<https://ggim.un.org/UNGGIM-wg8>



<https://iho.int/msdiwg>

NODC-PT

<https://nodc-portugal.pt>



<https://blue-cloud.org>



<https://ditto-oceandecade.org>

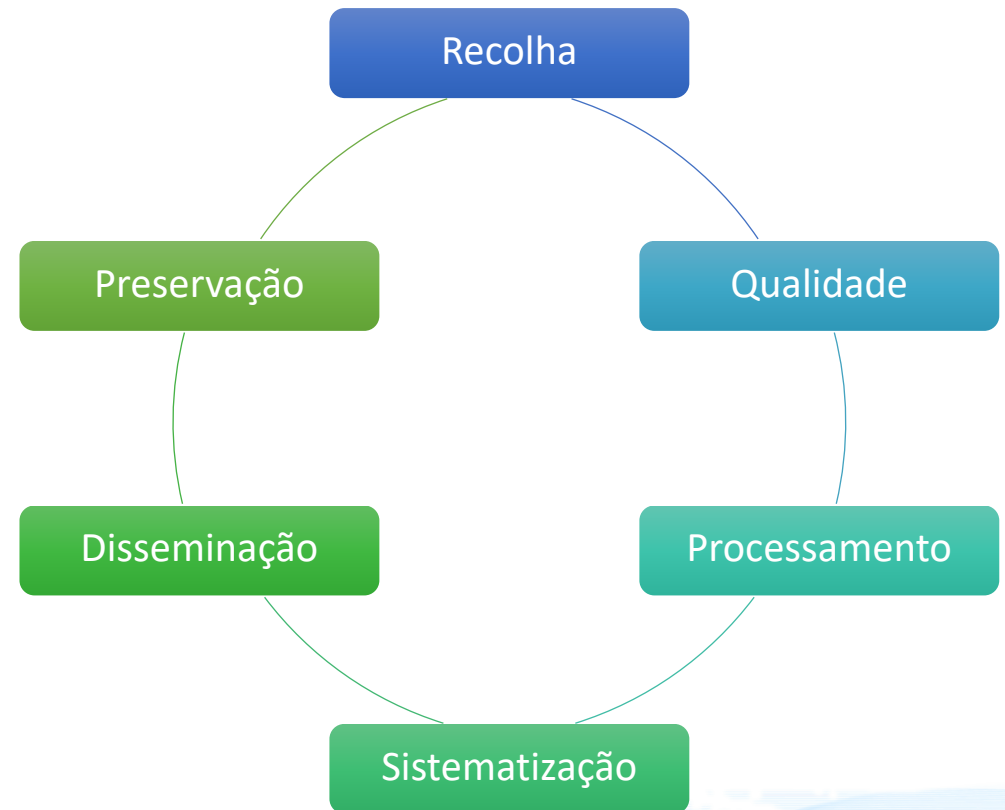


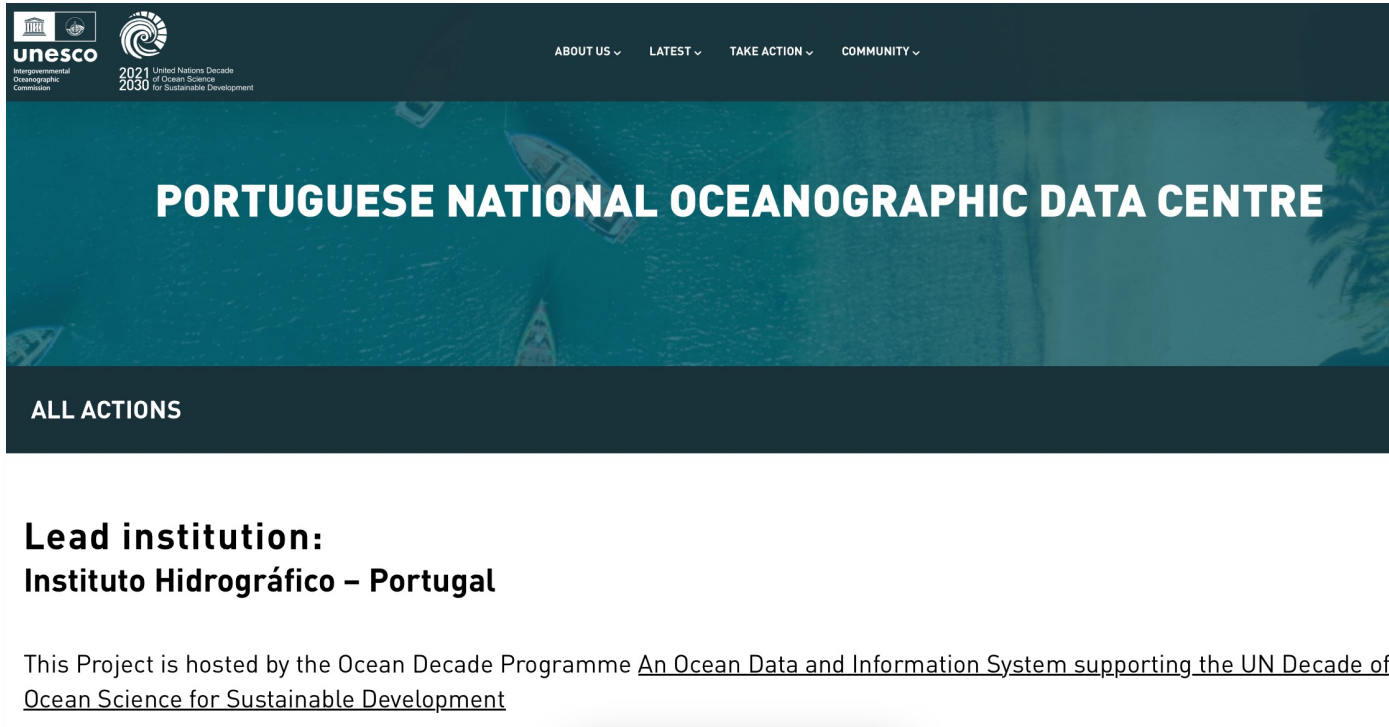
→ Elementos estruturais:

- **National Oceanographic Data Centre (NODC);**
- IODE Associate Data Unit (ADU);
- IODE Global Data Assembly Centre (IODE GDAC).

→ Missão:

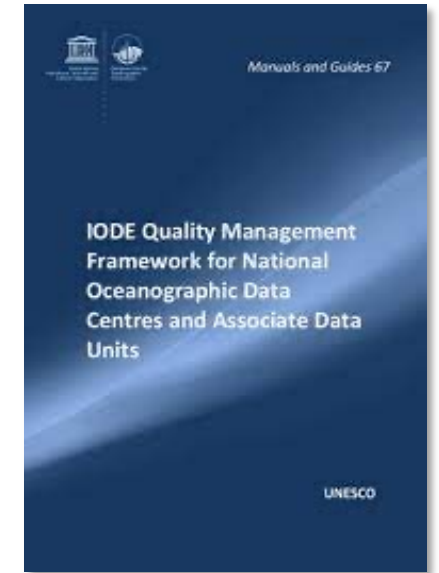
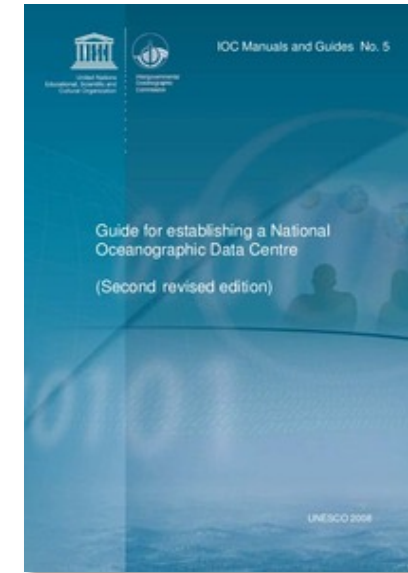
- Proporcionar **acesso** e **gerir** o repositório nacional de **dados oceanográficos**.





Lead institution:
Instituto Hidrográfico – Portugal

This Project is hosted by the Ocean Decade Programme An Ocean Data and Information System supporting the UN Decade of Ocean Science for Sustainable Development

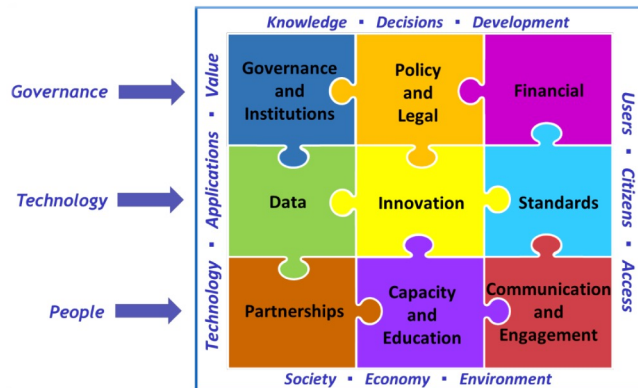


IPMA Instituto
Português
do Mar e da
Atmosfera





hidrográfico+



<https://ggim.un.org/UNGGIM-wg8>



<https://iho.int/msdiwg>

NODC-PT

<https://nodc-portugal.pt>



<https://blue-cloud.org>



<https://ditto-oceandecade.org>



A federated European FAIR and Open Research Ecosystem for oceans, seas, coastal and inland waters

➔ Objetivos:

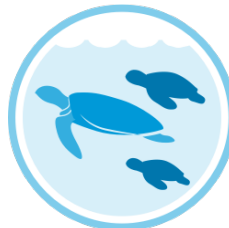
- **Estabelecer** um ecossistema Europeu federado;
- **Fornecer** dados *FAIR & Open*;
- **Providenciar** serviços de analítica;
- **Estender** o EOSC ao tema marinho;
- **Desenvolver** *open web-based science*.



Your unified access to the European hub of research data, tools and services for innovation and education



Economia Azul



Ambiente Marinho



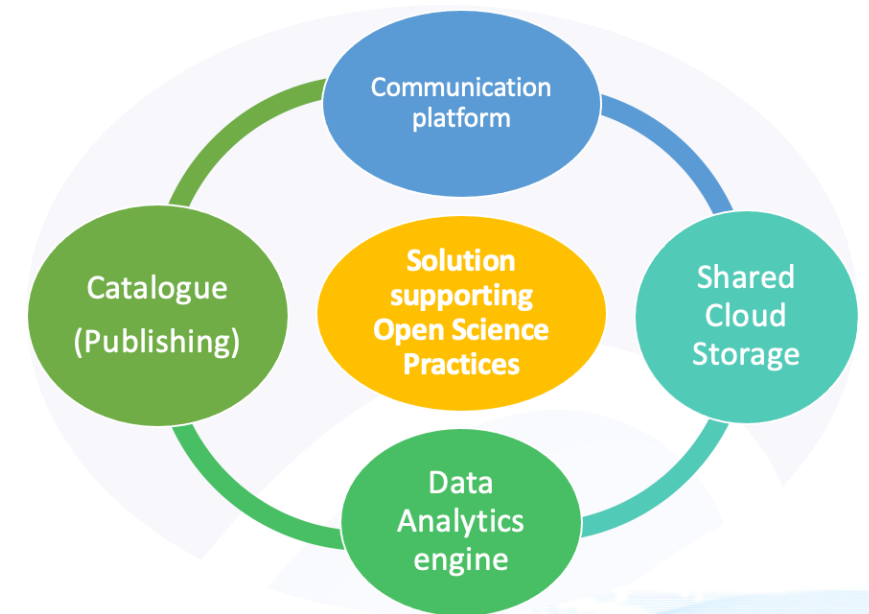
Conhecimento do Oceano

Blue-Cloud tools and services

- **Data Discovery & Access Service**: An easy and FAIR service for discovering and retrieving multi-disciplinary data sets and products managed and provided by Blue Data Infrastructures.
- **Virtual Research Environment**: An Open Science platform for collaborative marine research, using a wide variety of datasets and analytical tools, complemented by generic services.
- **Thematic Virtual Labs**: Researchers work closely together with the Blue-Cloud 2026 technical team to describe Virtual Lab workflows and technical requirements.
- **Workbenches for Essential Ocean Variables (EOVs)**: Ocean and data scientists will implement efficient workflows that allow them to harmonise, validate and qualify large and various in situ data sources, exploiting the services available in the Blue-Cloud VRE.
- **Data Catalogue**: The Blue-Cloud Data Catalogue includes data, products, and resources of interest for the Blue-Cloud community.

➔ Recomendação (EU) 2018/790:

*Open Science refers to a new approach to the scientific process based on **cooperative work** and **new ways of disseminating knowledge**, improving **accessibility** to and **re-usability** of research outputs by using digital technologies and new collaborative tools.*



Integration of coastal ocean observations along Europe

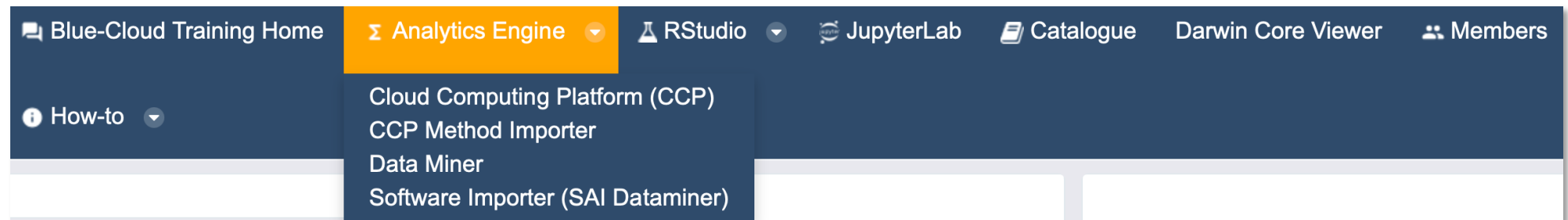


Virtual lab leader

- ➔ Integração de *datasets* heterogéneos (observações de variáveis oceânicas);
- ➔ Processamento e análise;
- ➔ Visualização.

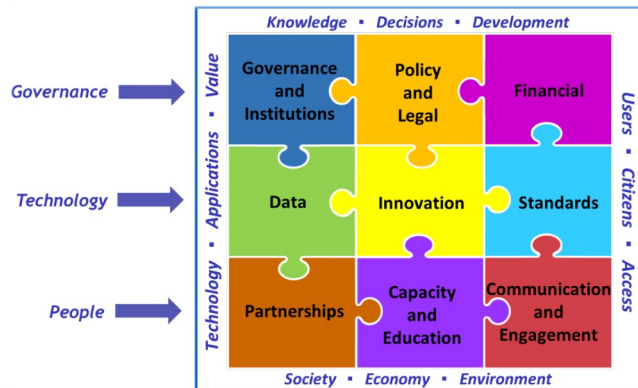


Virtual lab partners





hidrográfico+



<https://ggim.un.org/UNGGIM-wg8>



<https://iho.int/msdiwg>

NODC-PT

<https://nodc-portugal.pt>



<https://blue-cloud.org>



<https://ditto-oceandecade.org>

➔ Visão:

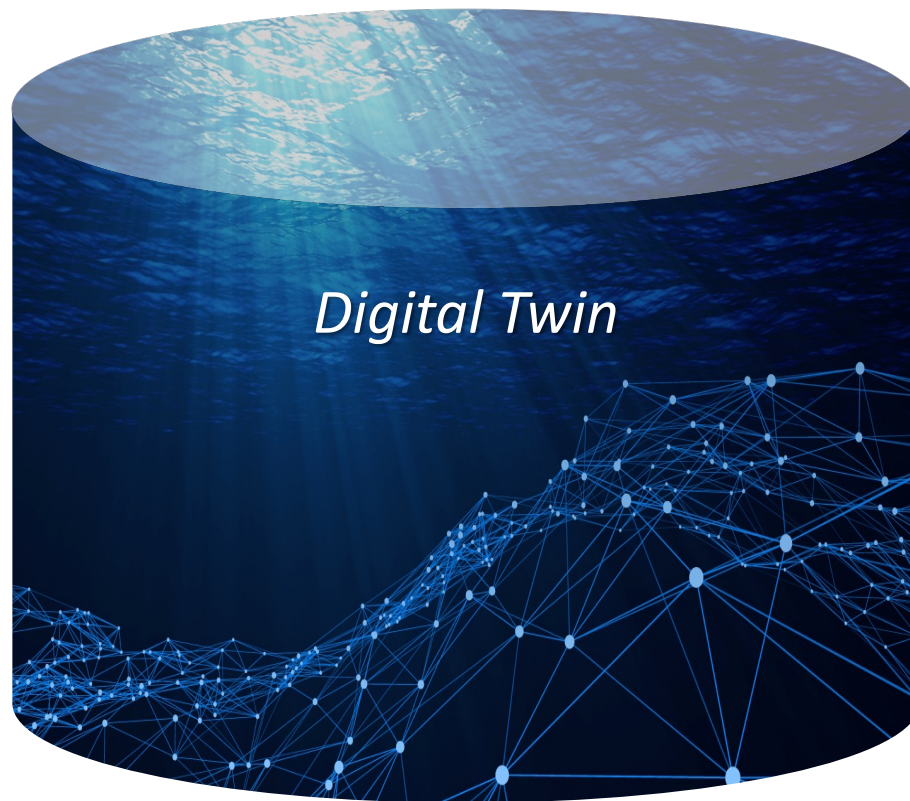
- **Proteção e governação** dos oceanos;
- **Economia Azul** sustentável.

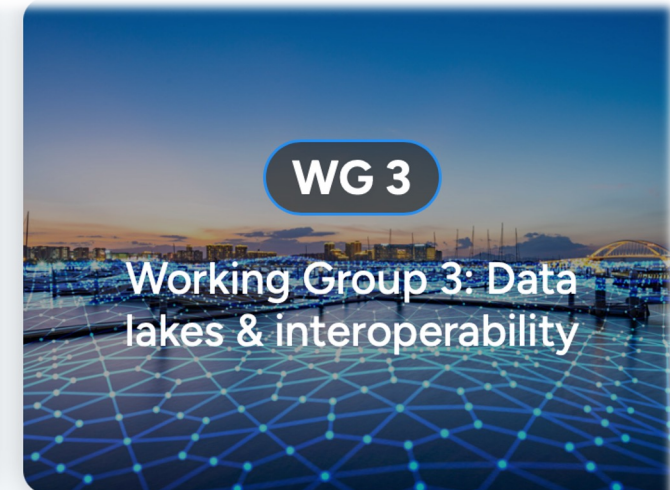
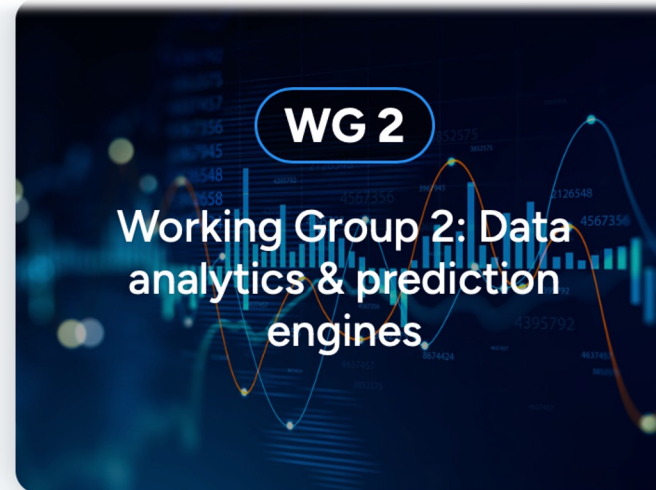
➔ Missão:

- **Desenvolver** e partilhar um entendimento comum sobre os *digital twins* do oceano (DTO);
- **Estabelecer** boas práticas no desenvolvimento de DTOs;
- **Promover** a capacitação dos atores do Oceano, no sentido de criarem e utilizarem DTOs.

Through extensive **observation** and analysis of **model data**, we generate the **knowledge** that drives progress forward

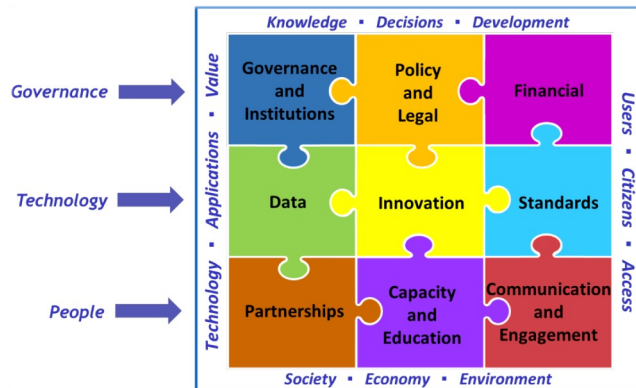








hidrográfico+



<https://ggim.un.org/UNGGIM-wg8>



<https://iho.int/msdiwg>

NODC-PT

<https://nodc-portugal.pt>

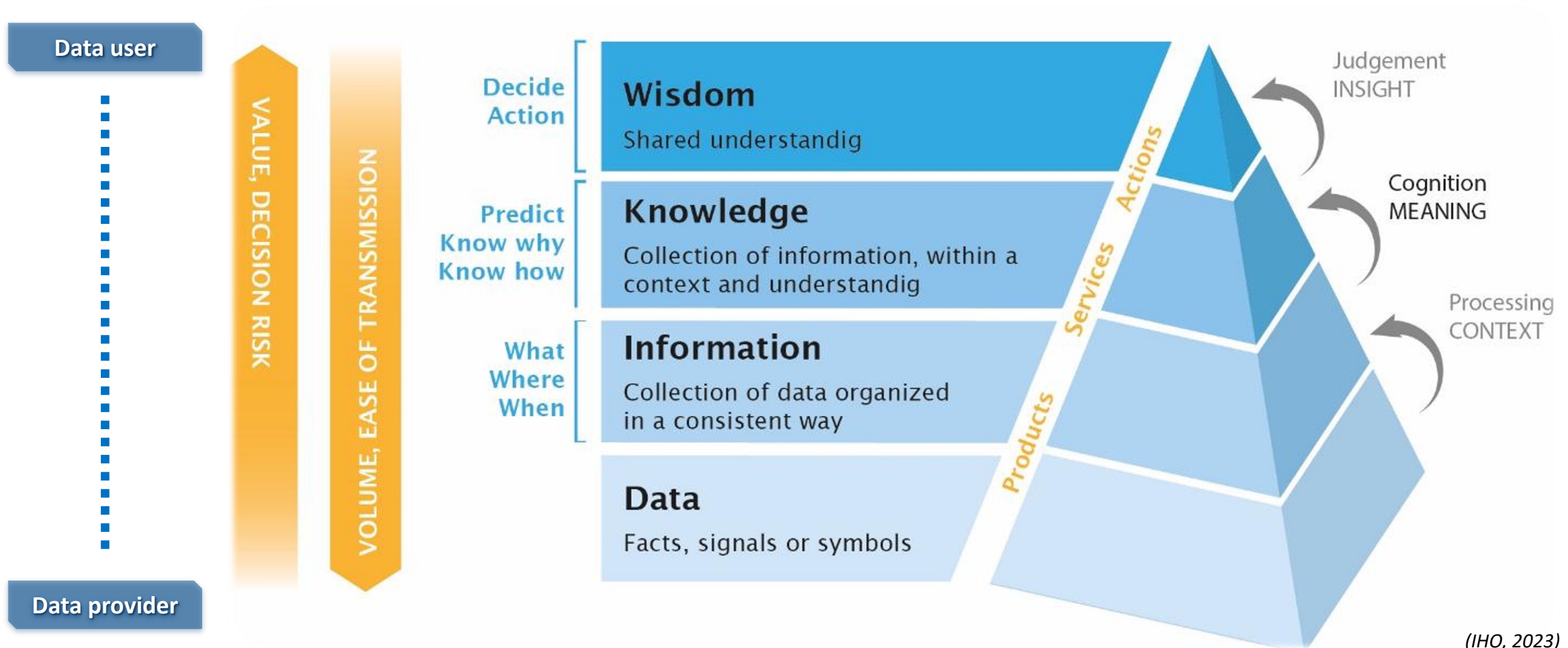


<https://blue-cloud.org>

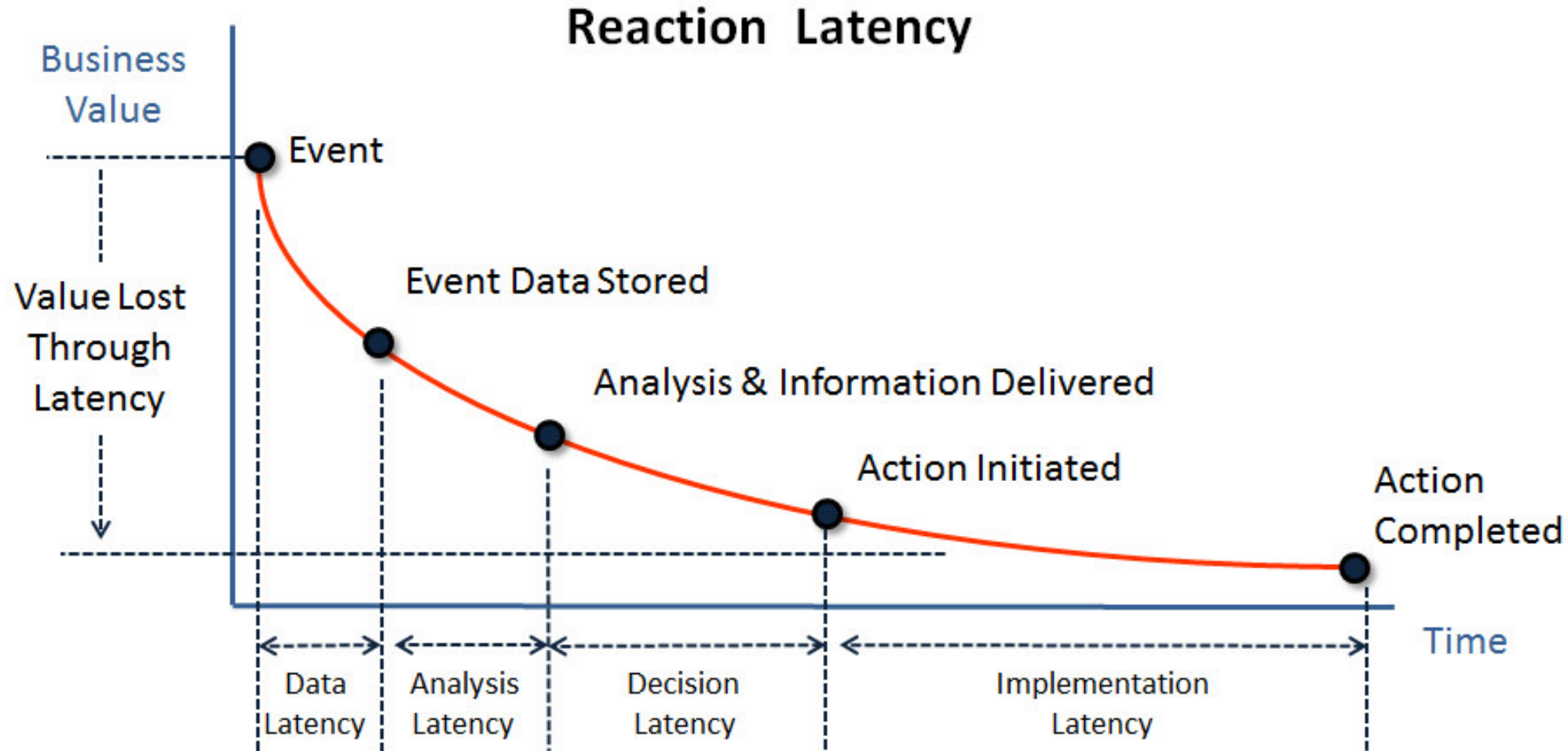


<https://ditto-oceandecade.org>

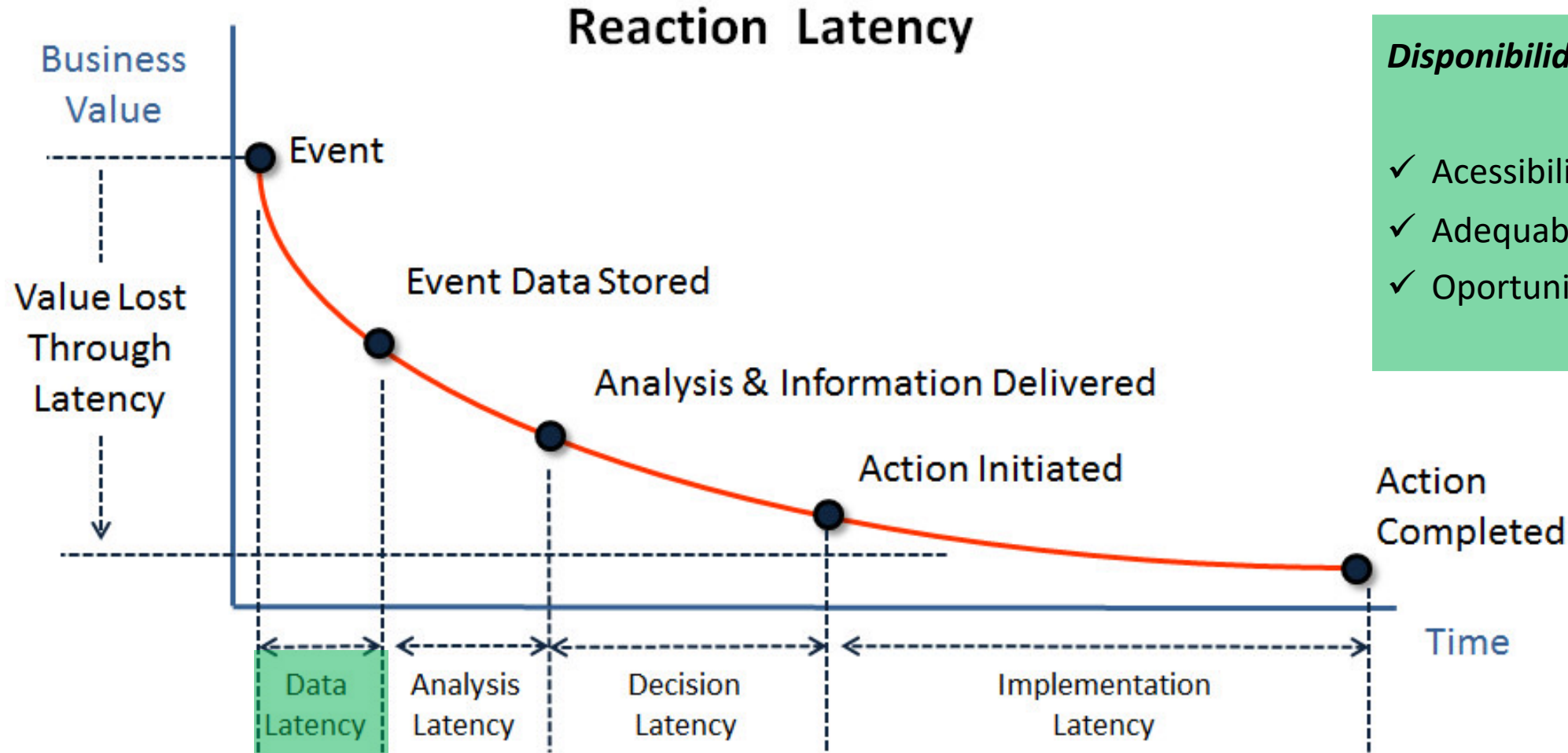
De infraestrutura de dados a infraestrutura de conhecimento



(IHO, 2023)



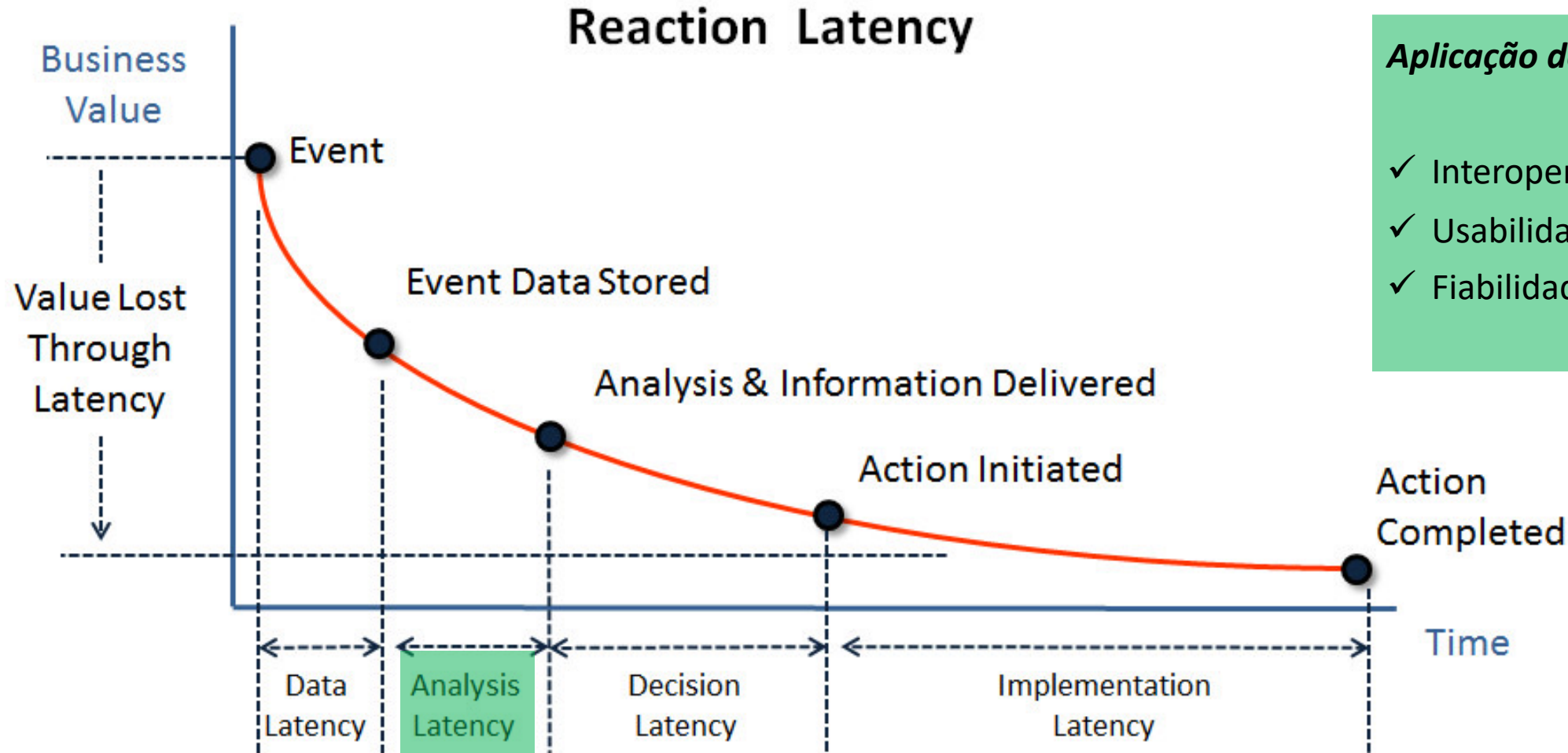
(Griffiths, 2015)



Disponibilidade dos dados

- ✓ Acessibilidade
- ✓ Adequabilidade
- ✓ Oportunidade

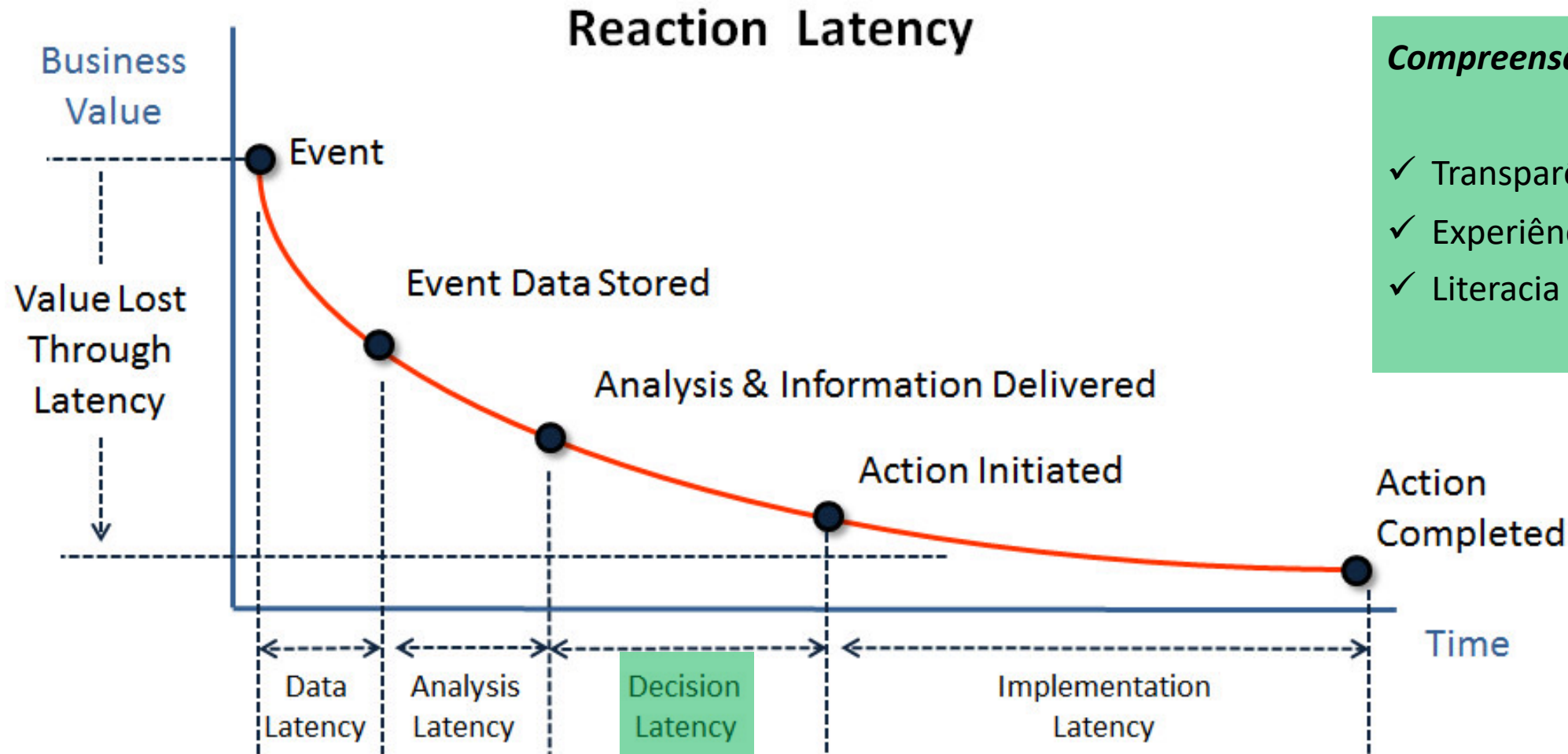
(Griffiths, 2015)



Aplicação dos dados

- ✓ Interoperabilidade
- ✓ Usabilidade
- ✓ Fiabilidade/Qualidade

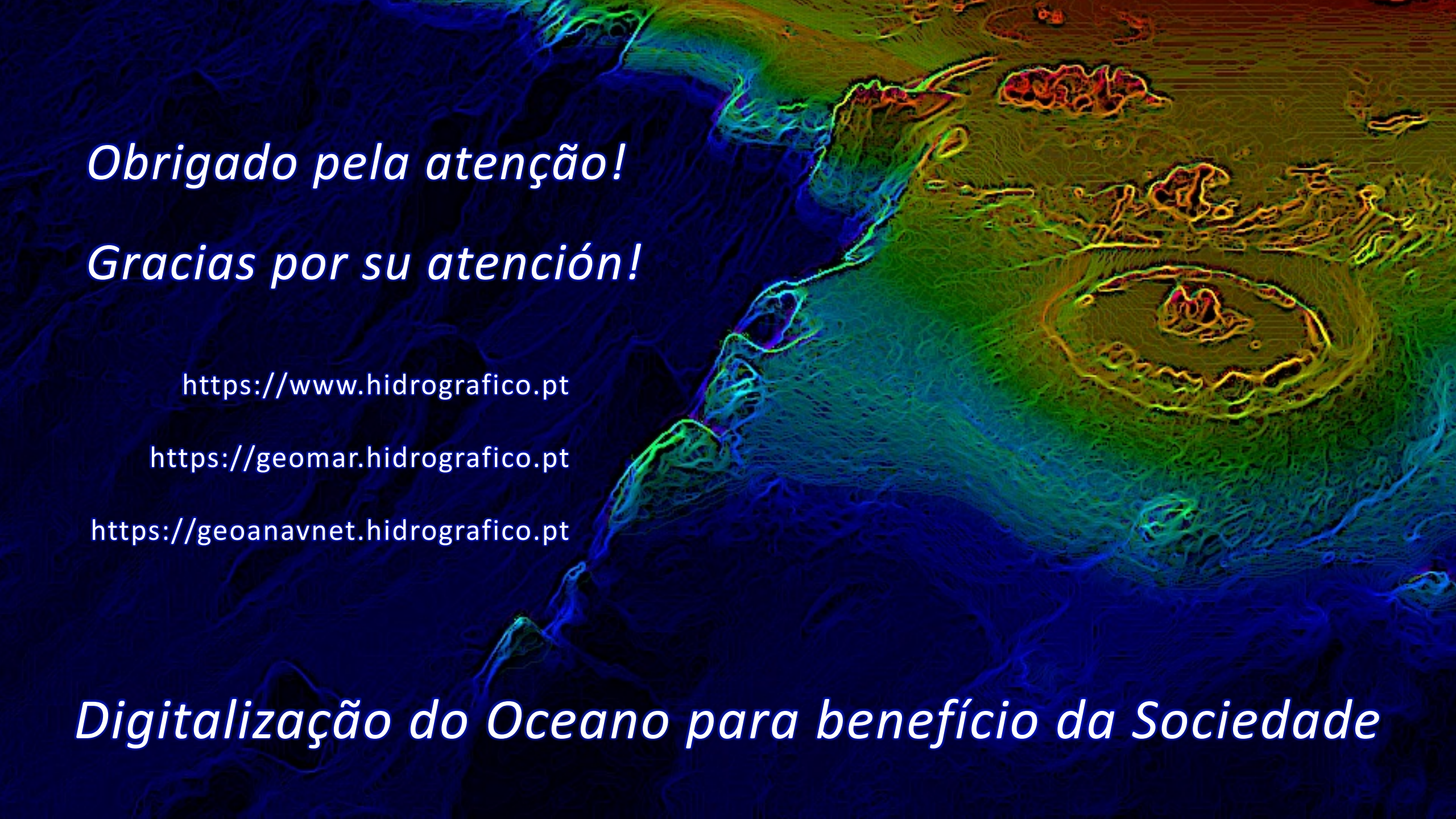
(Griffiths, 2015)



Compreensão dos dados

- ✓ Transparência
- ✓ Experiência
- ✓ Literacia

(Griffiths, 2015)



Obrigado pela atenção!

Gracias por su atención!

<https://www.hidrografico.pt>

<https://geomar.hidrografico.pt>

<https://geoanavnet.hidrografico.pt>

Digitalização do Oceano para benefício da Sociedade