



Enjeux de la Planification Spatiale Maritime (PSM) : la **sécurité maritime** comme « **couche manquante** » ?

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OCEANEXT 2024 - 13 juin 2024

Relever ensemble les défis des socio-écosystèmes maritimes et littoraux

Plan de la présentation :

- 1/ « Couches manquantes » : kezako ?
- 2/ Sécurité maritime : une « couche » *clef* de voûte
- 3/ Cas d'étude : le projet ReMAP
- 4/ Perspectives à considérer

➤ Un oubli...



Marine Policy



Volume 32, Issue 5, September 2008, Pages 779-786



The missing layer: Geo-technologies, communities, and implications for marine spatial planning

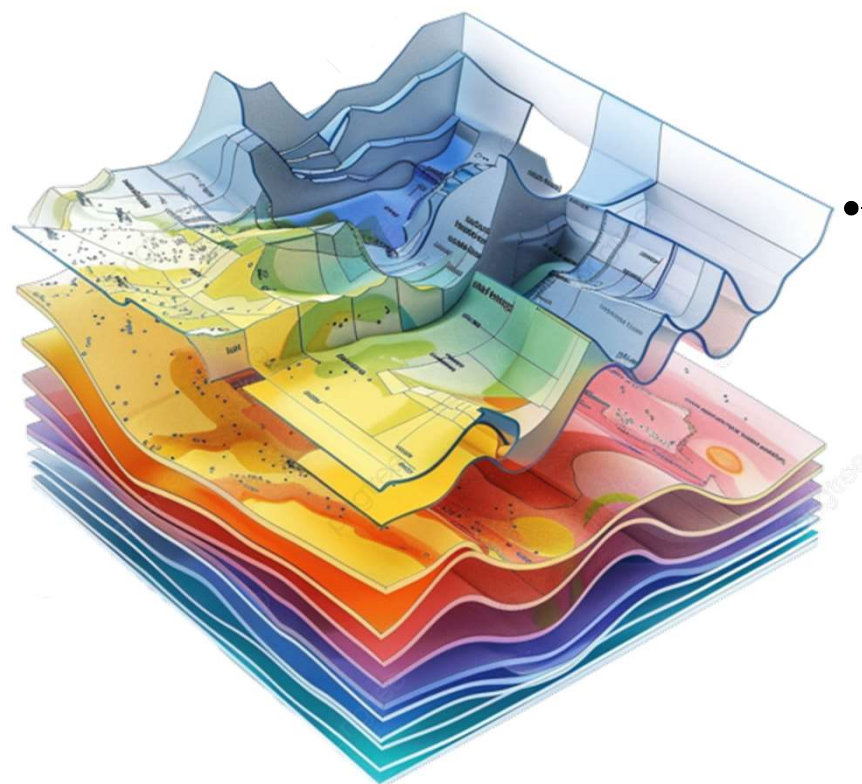
[Kevin St. Martin](#)^a  , [Madeleine Hall-Arber](#)^{b 1} 

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1/ « Couches manquantes » : kezaiko ?

➤ Un oubli...



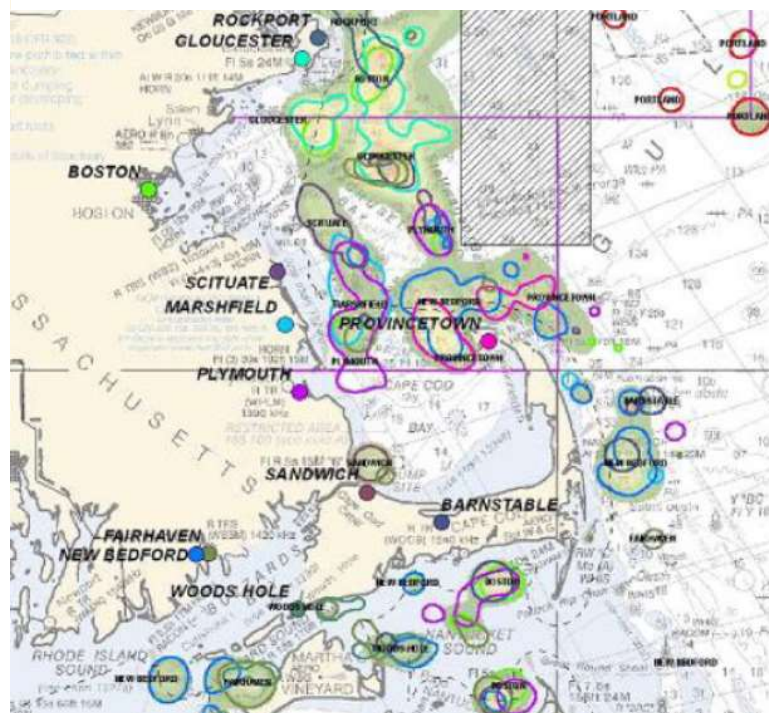
- ✓ « couche manquante » d'informations géographiques
- ✓ Configuration = SIG
- ✓ Statut = essentielle

Source: PngTree, 2024

1/ « Couches manquantes » : kezaiko ?

➤ Un oubli de taille

« [...] *the “social landscape” of fisheries and fishing communities remains largely undocumented. Detailed information concerning which fishing communities utilize, rely upon, and maintain local knowledge concerning which areas of the marine environment is only vaguely known.* ».

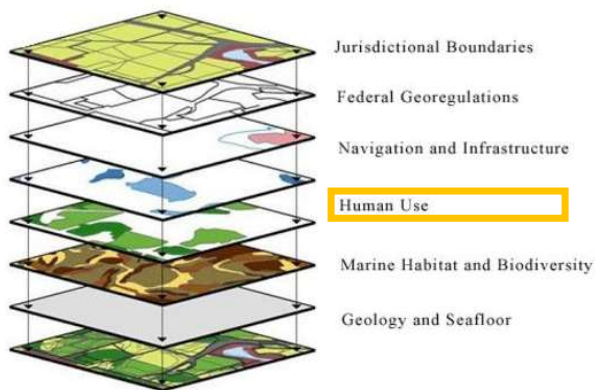


Source: St. Martin et Hall-Arber, 2008

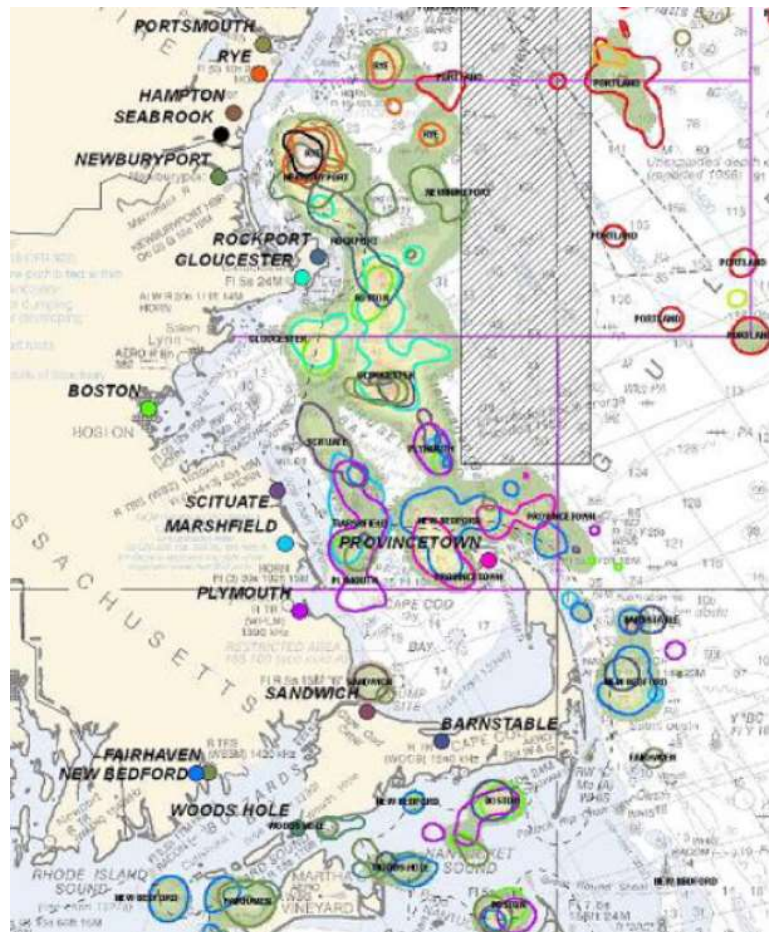
1/ « Couches manquantes » : kezaiko ?

➤ Deux composantes

Données en entrée >(É



Type	Format	Standard
Territoire de pêche	Vecteur - polygones	-
Aires de pêche	Vecteur - polygones	-
Port de pêche	Vecteur - points	-
Carte marine	Raster	S-57



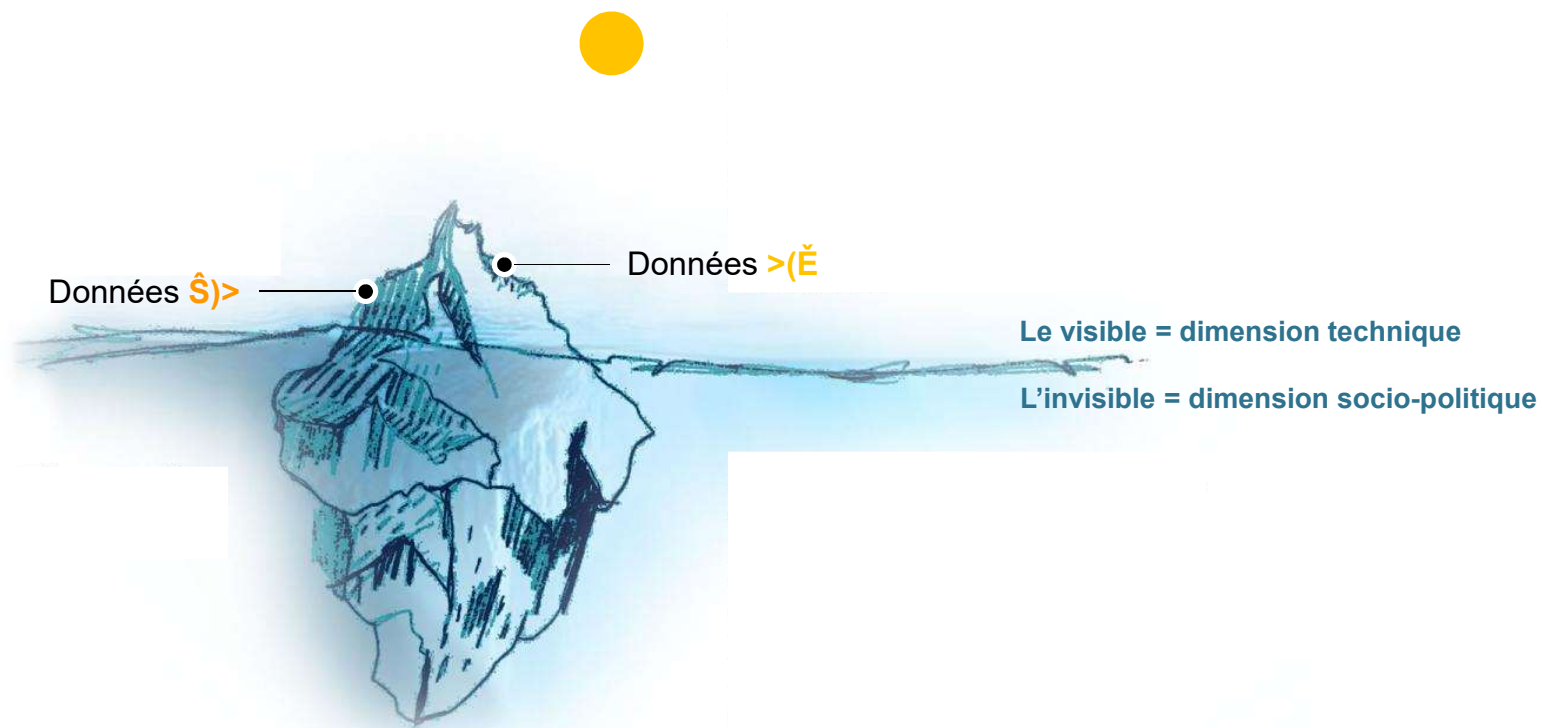
Données en sortie >(Ê

« [...] Human dimensions need to be thought of similarly through a similar understanding of processes (e.g., community and territory), connections (e.g., within and across communities, economies), space (e.g., territories, mappings, cultural perceptions) and scales (e.g., local, regional, national scales of society). »

Type	Format	Standard
Paysage social des pêches et des communautés de pêcheurs	Basemap/chart + Shapefiles	-

1/ « Couches manquantes » : kezako ?

➤ Iceberg de l'information géographique dans l'océan PSM



➤ Cadre EUR de la PSM = PEM

28.8.2014

EN

Official Journal of the European Union

L 257/135

DIRECTIVES

DIRECTIVE 2014/89/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 23 July 2014
establishing a framework for maritime spatial planning

➤ Cadre EUR de la PSM = PEM

Article 6

Minimum requirements for maritime spatial planning

1. Member States shall establish procedural steps to contribute to the objectives listed in Article 5, taking into account relevant activities and uses in marine waters.
2. In doing so, Member States shall:
 - (a) take into account land-sea interactions;
 - (b) take into account environmental, economic and social aspects, as well as safety aspects;
 - (c) aim to promote coherence between maritime spatial planning and the resulting plan or plans and other processes, such as integrated coastal management or equivalent formal or informal practices;
 - (d) ensure the involvement of stakeholders in accordance with Article 9;
 - (e) organise the use of the best available data in accordance with Article 10;
 - (f) ensure trans-boundary cooperation between Member States in accordance with Article 11;
 - (g) promote cooperation with third countries in accordance with Article 12.

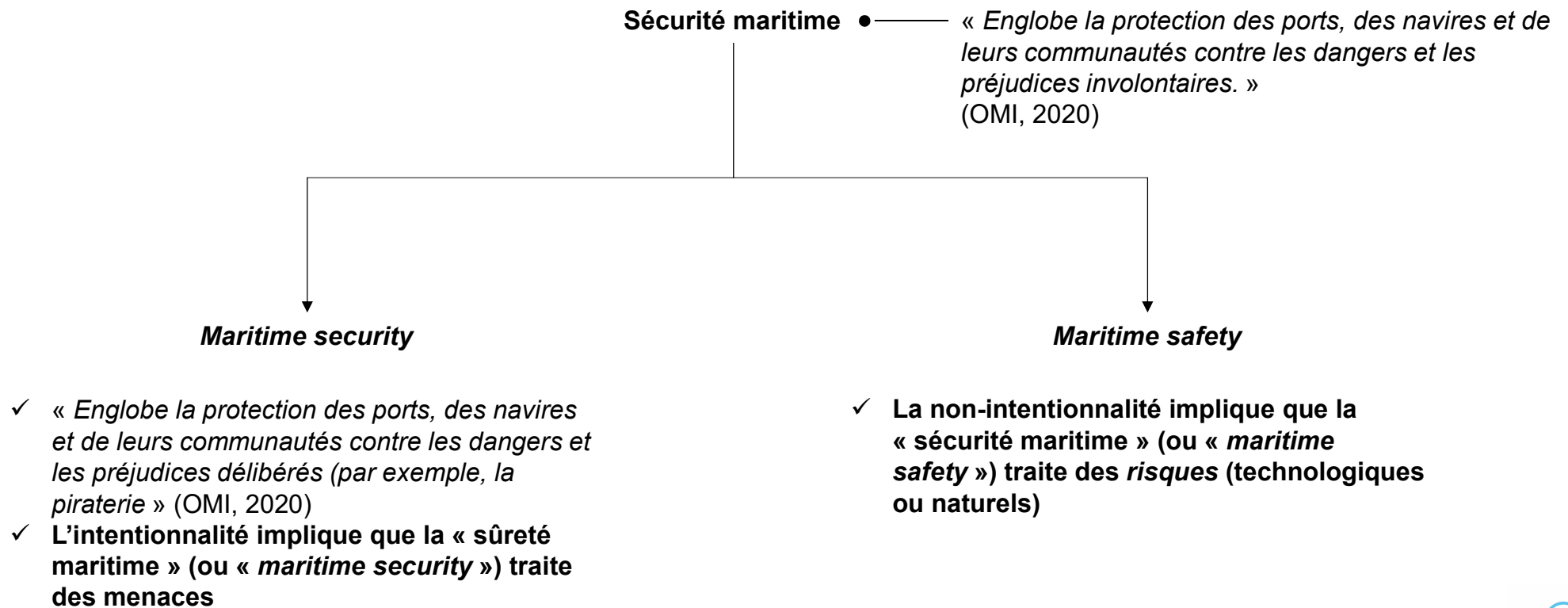
➤ Cadre EUR de la PSM = PEM

Article 10

Data use and sharing

1. Member States shall organise the use of the best available data, and decide how to organise the sharing of information, necessary for maritime spatial plans.
2. The data referred to in paragraph 1 may include, inter alia:
 - (a) environmental, social and economic data collected in accordance with Union legislation pertaining to the activities referred to in Article 8;
 - (b) marine physical data about marine waters.
3. When implementing paragraph 1, Member States shall make use of relevant instruments and tools, including those already available under the IMP, and under other relevant Union policies, such as those mentioned in Directive 2007/2/EC.

➤ Notion polysémique



➤ Notion polysémique



Sécurité maritime ● — « Englobe la protection des ports, des navires et de leurs communautés contre les dangers et les préjudices involontaires. » (OMI, 2020)

➔ **Maritime safety**

- ✓ La non-intentionnalité implique que la « sécurité maritime » (ou « *maritime safety* ») traite des *risques* (technologiques ou naturels)
- ✓ Sécurité de la navigation

➤ Dimension humaine de l'existant/futur maritime

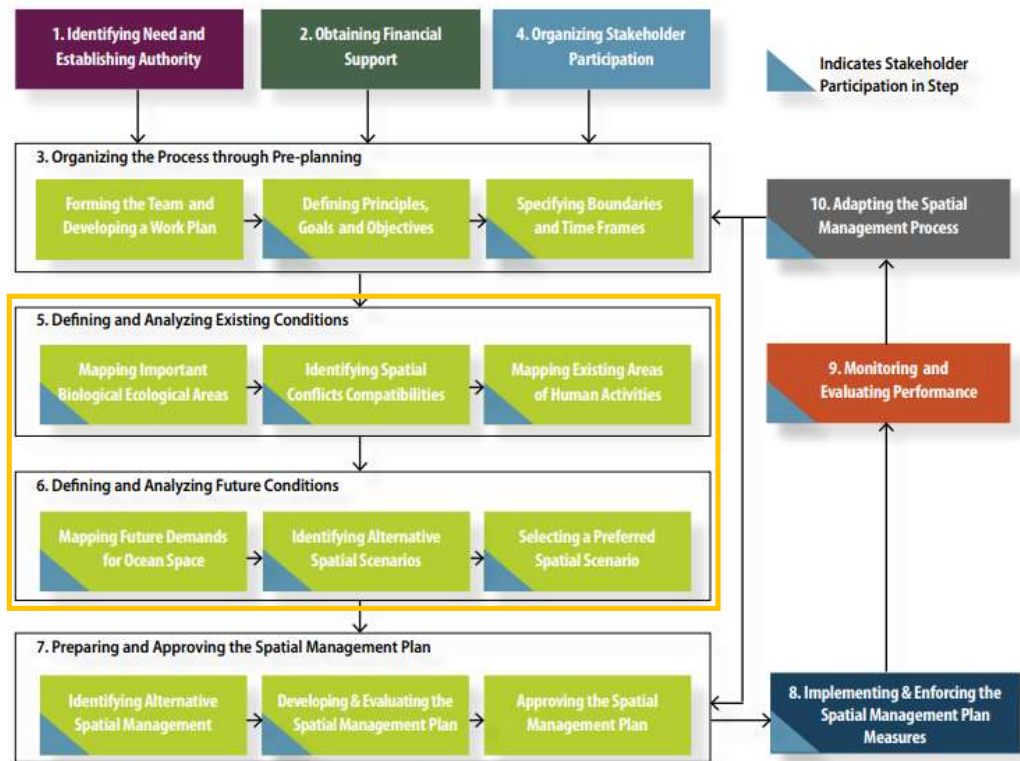
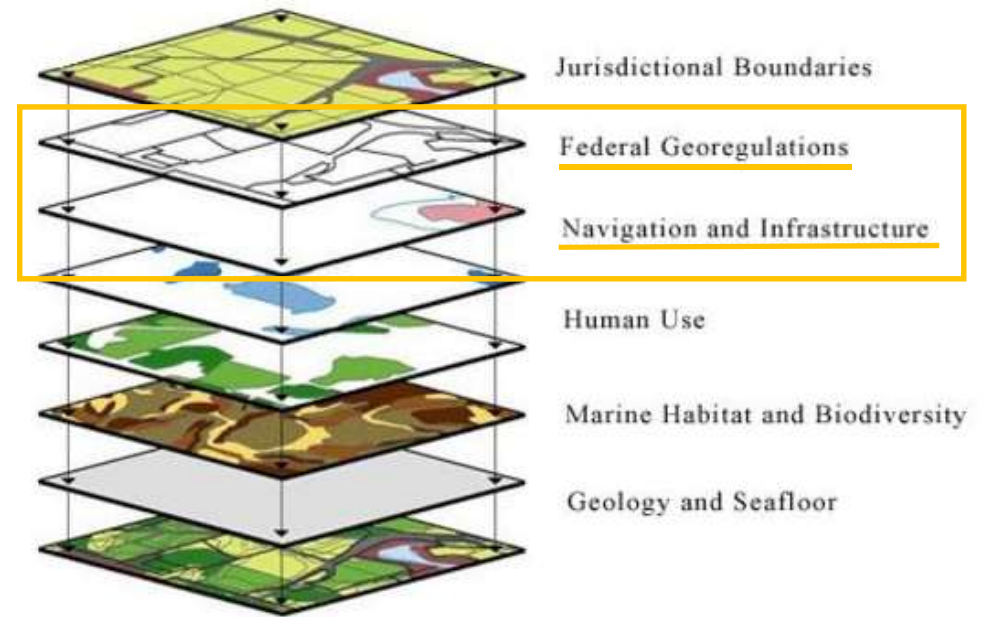
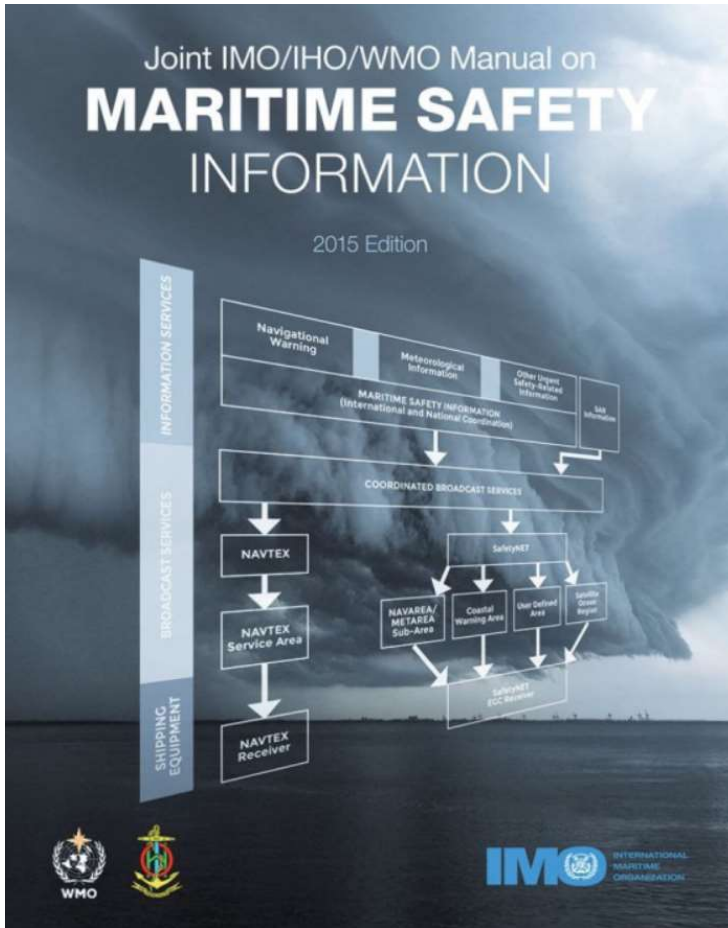


Fig. 1. A Step-by-Step Approach to Marine Spatial Planning

Source: Ehler et Douvère, 2009

➤ Méta-catégorie de données spatiales de référence

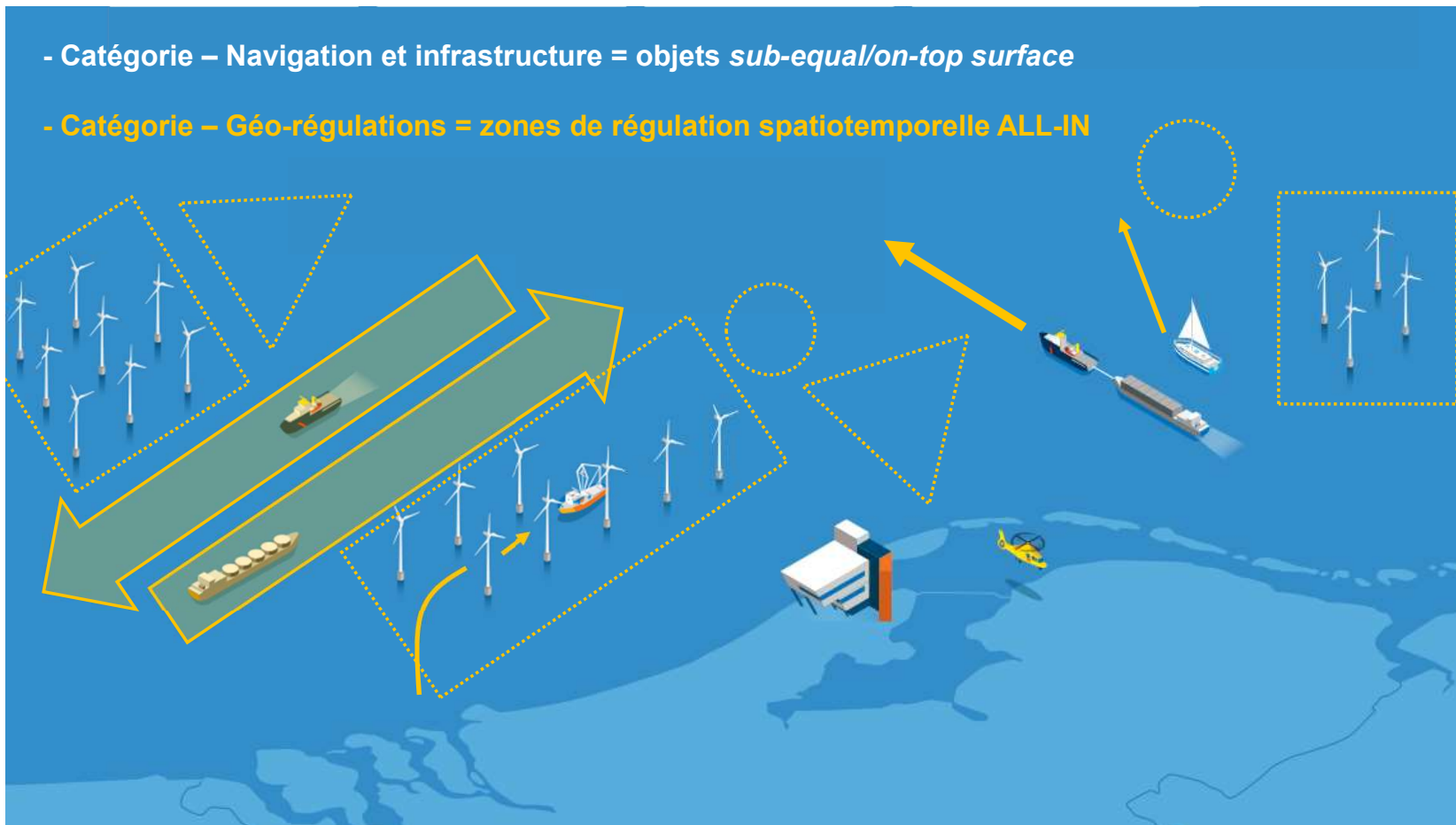


Source: MSDI's data layers – Fowler et al., 2010

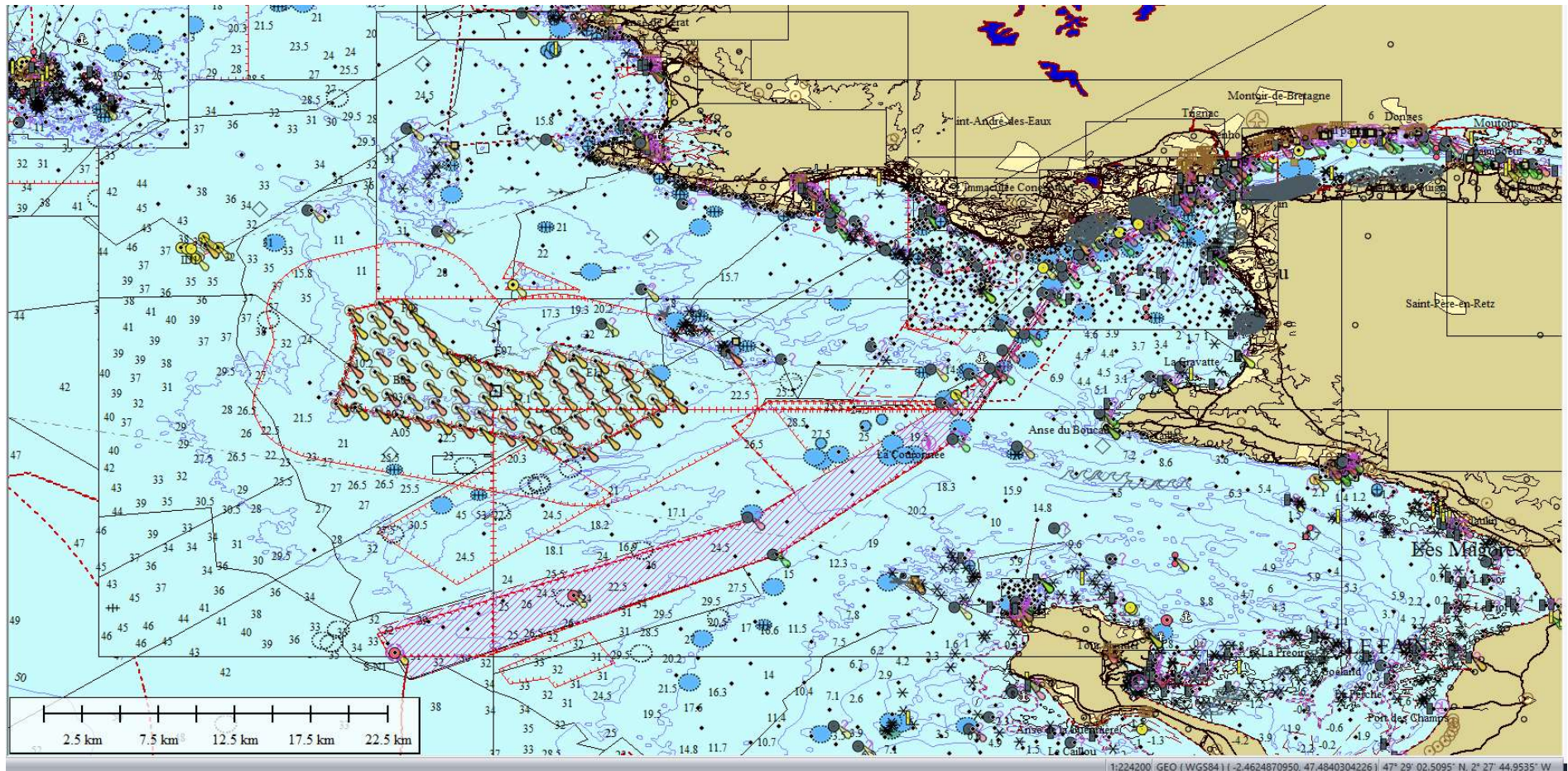
➤ Méta-catégorie de données spatiales de référence

- Catégorie – Navigation et infrastructure = objets *sub-equal/on-top surface*

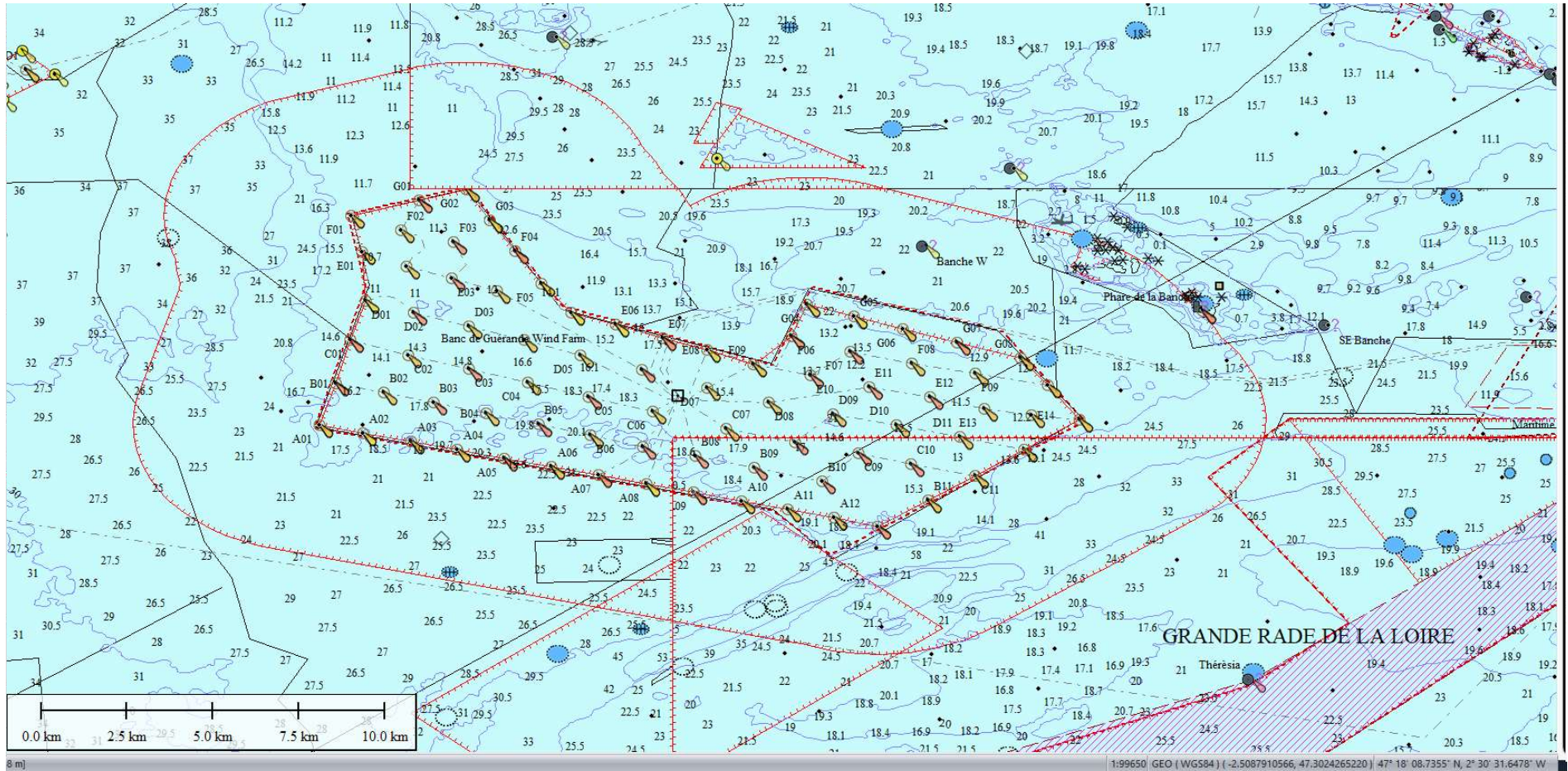
- Catégorie – Géo-régulations = zones de régulation spatiotemporelle ALL-IN



Source: MINI&W, 2023

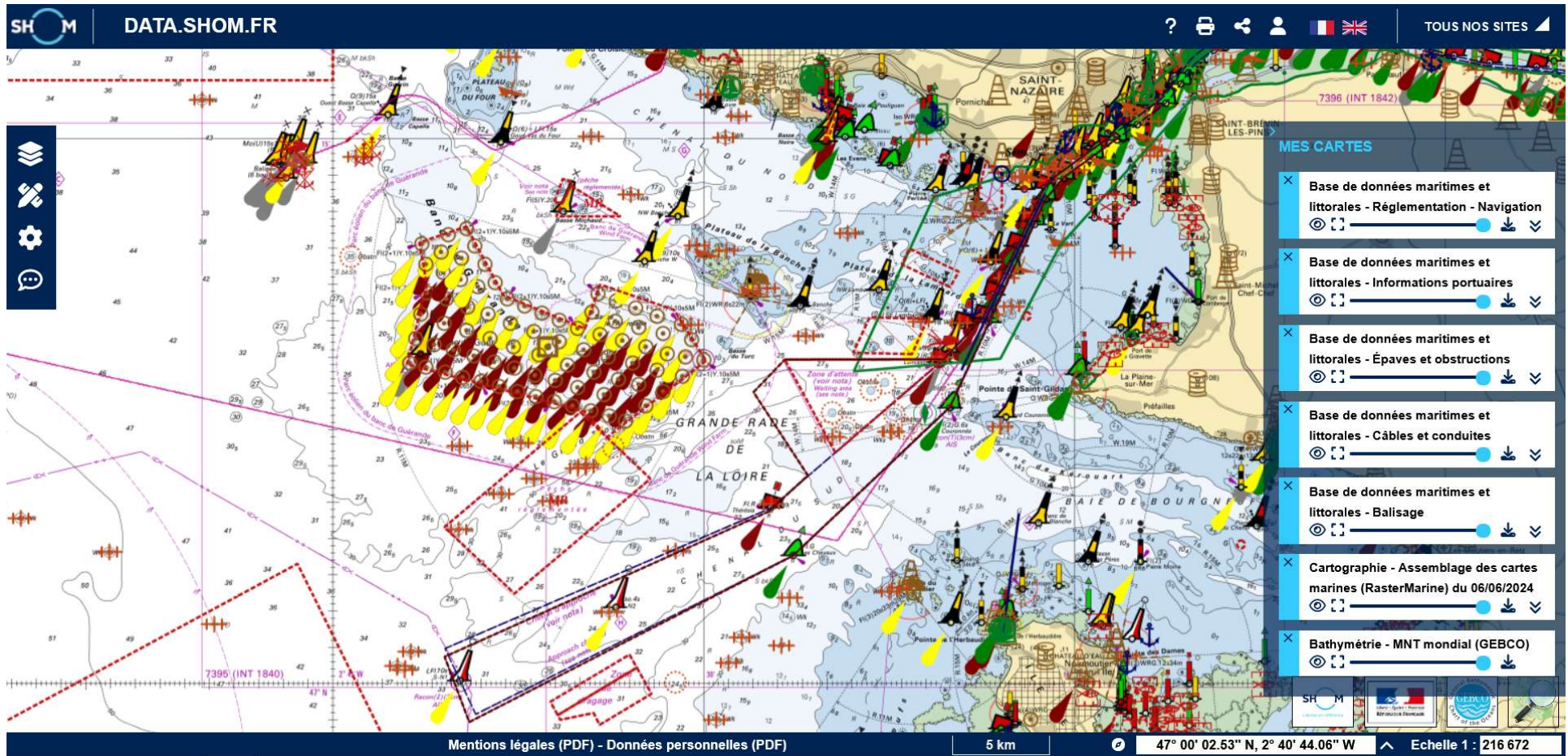
➤ **Electronic Nautical Chart = « couche » centrale**

Source: ENC PRIMAR-Shom

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Source: ENC PRIMAR-Shom

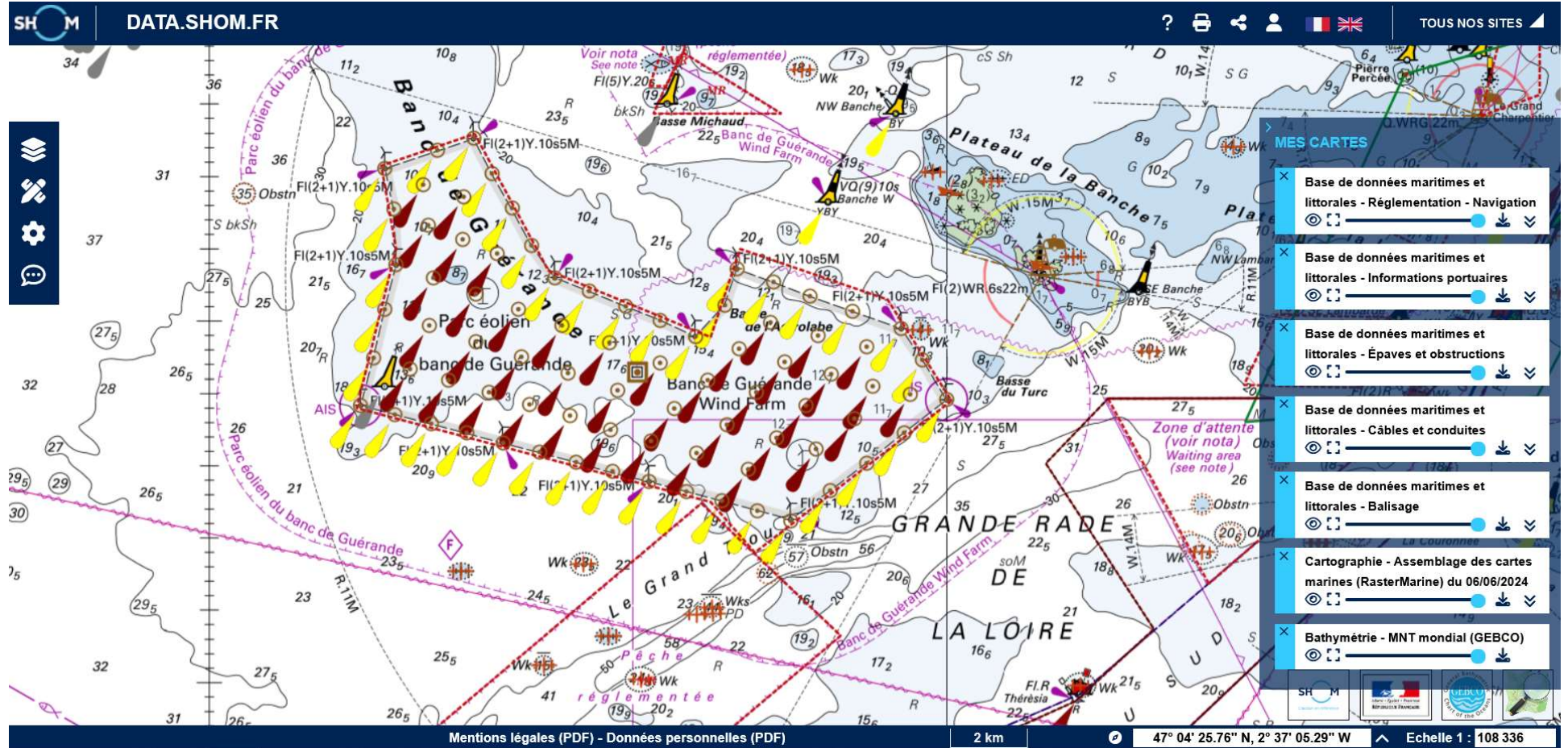
➤ Exemple de diffusion publique de cette « couche »



Source : DATA.SHOM.FR

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➤ Exemple de diffusion publique de cette « couche »



1-

2/ Sécurité maritime : une « couche » *clef* de voûte

➤ Paysage social de la « vie maritime du quotidien »



Source : Shom, 2023



Source : Shom, 2023

➤ Projet PSM EU (PEM) = défricher le terrain



Funding Programme:

European Commission

Sea Basin(s):



[Baltic Sea](#)



[Atlantic Ocean](#)



[West Mediterranean](#)

Countries:

[Finland](#)

[France](#)

[Italy](#)

[Spain](#)

Status:

Ongoing

Completion Year:

2025

Website/Source:

<http://www.geoportal.ulpgc.es/remap/>

Implementation Period:

November 2022 - January 2025

Specific Funding Programme:

EMFAF-2021-PIA-MSP

Budget:

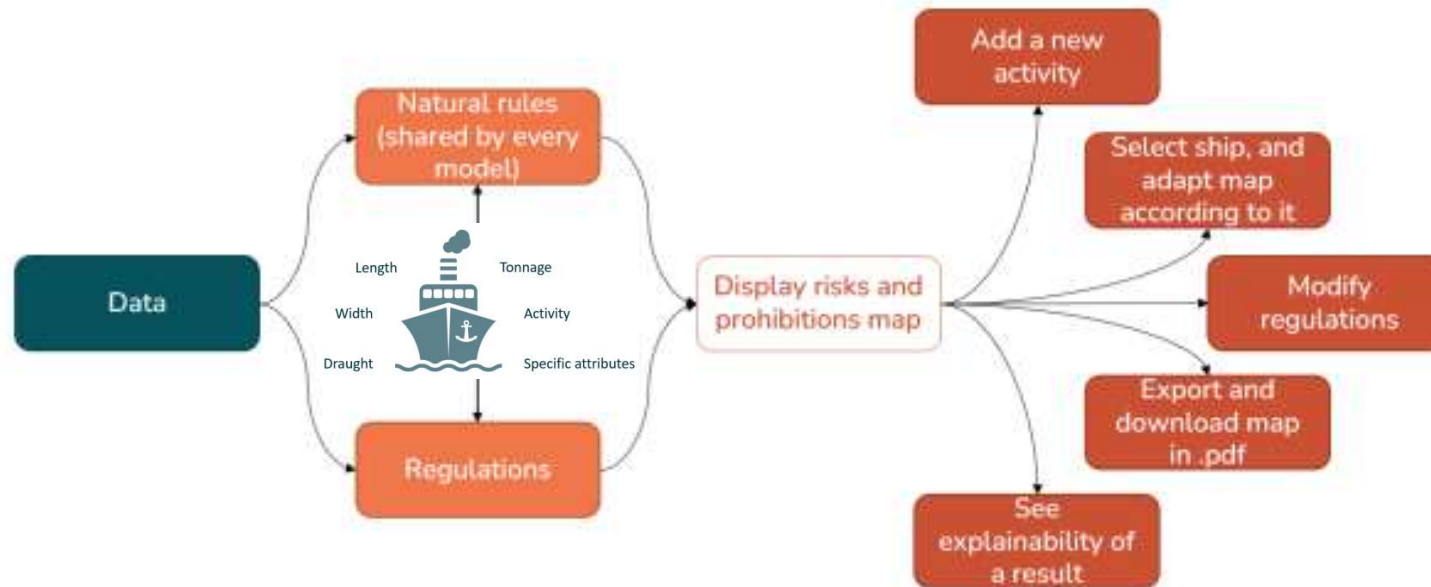
1,917,105.06 EUR

Objectif du projet :

- Renforcer les capacité d'évaluation et suivi des plans nationaux de PEM
 - **Développer des outils reposant sur un cadre technique innovant :**
 - ✓ Utiliser des standards d'interopérabilité et de partage de données efficaces et adaptés à la " vie maritime quotidienne
 - ✓ Utiliser les infrastructures de données spatiales marines opérationnelles (MSDI)
 - ✓ Utiliser les données spatiales de références
- Fournir 10+1 outils indépendants / réutilisables / combinables / opérationnels / accessibles au public
- **Shom = NaviSafe...**



➤ Module Navisafe



1/ Améliorer et optimiser l'intégration de l'environnement « navigation maritime » dans les initiatives de PSM

2/ Procéder à une évaluation exhaustive des facteurs de sécurité et des risques associés à la navigation maritime

→ 4+1 cas d'étude : 1/Mer Baltique 2/Galice 3/ Med Occidentale 4/France métro + Guyane

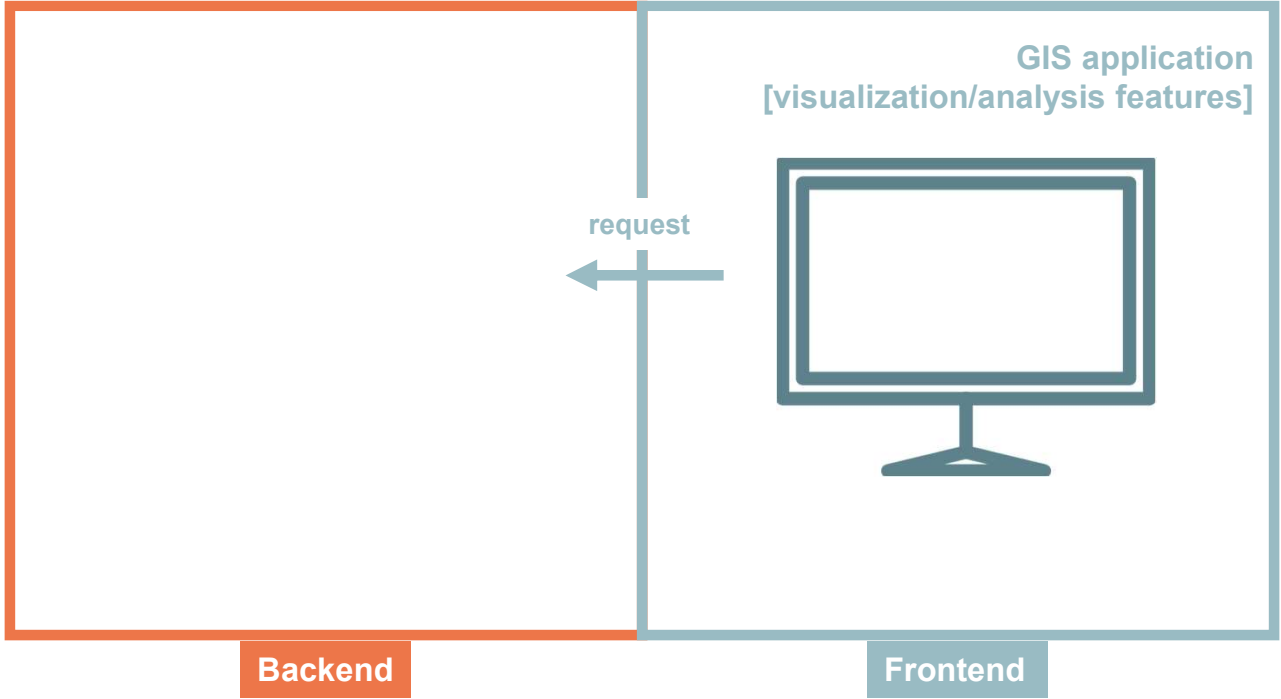
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Cas d'étude : le projet ReMAP

➤ NaviSafe : outil d'aide à la décision spatiale (*work in progress*)



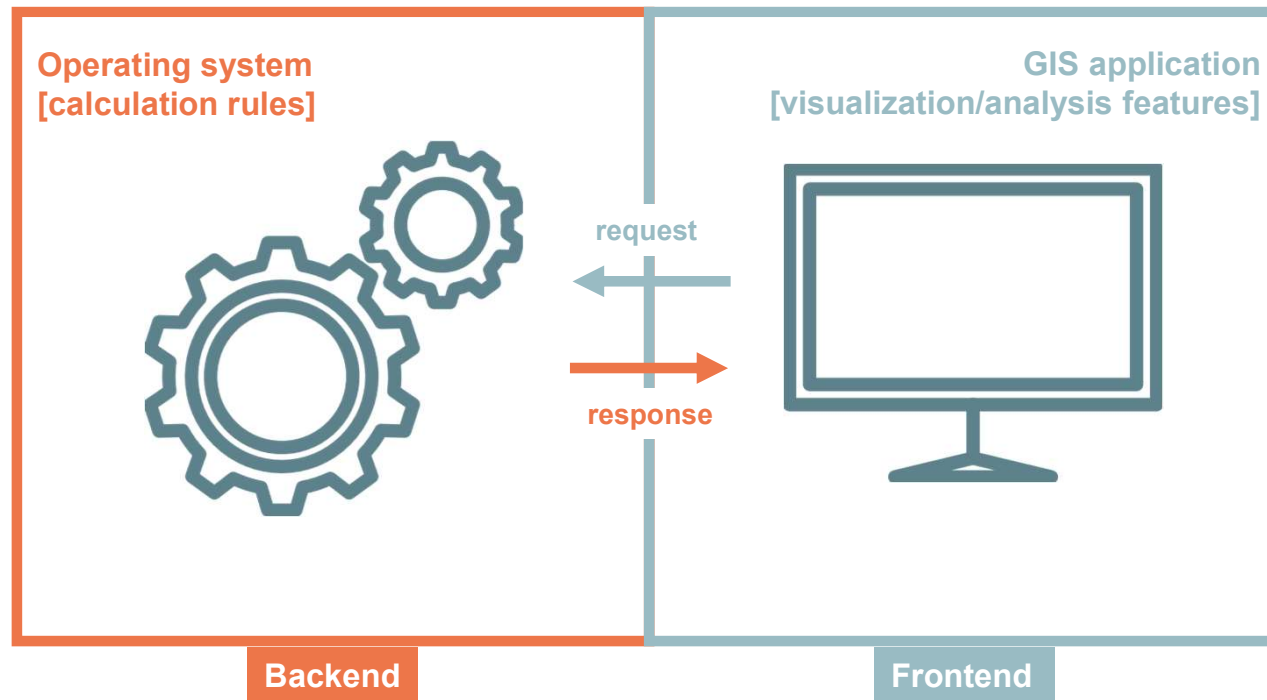
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Cas d'étude : le projet ReMAP

➤ *NaviSafe* : outil d'aide à la décision spatiale (*work in progress*)



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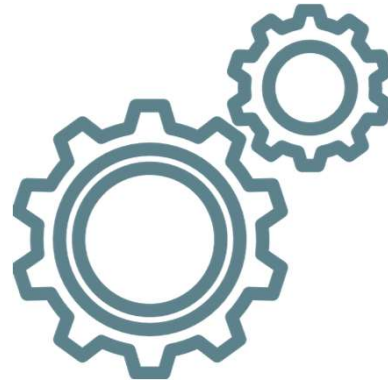
3/ Cas d'étude : le projet ReMAP

➤ *NaviSafe* : outil d'aide à la décision spatiale (*work in progress*)

Référentiel de données



Operating system
[calculation rules]



Backend

➤ NaviSafe : outil d'aide à la décision spatiale (work in progress)

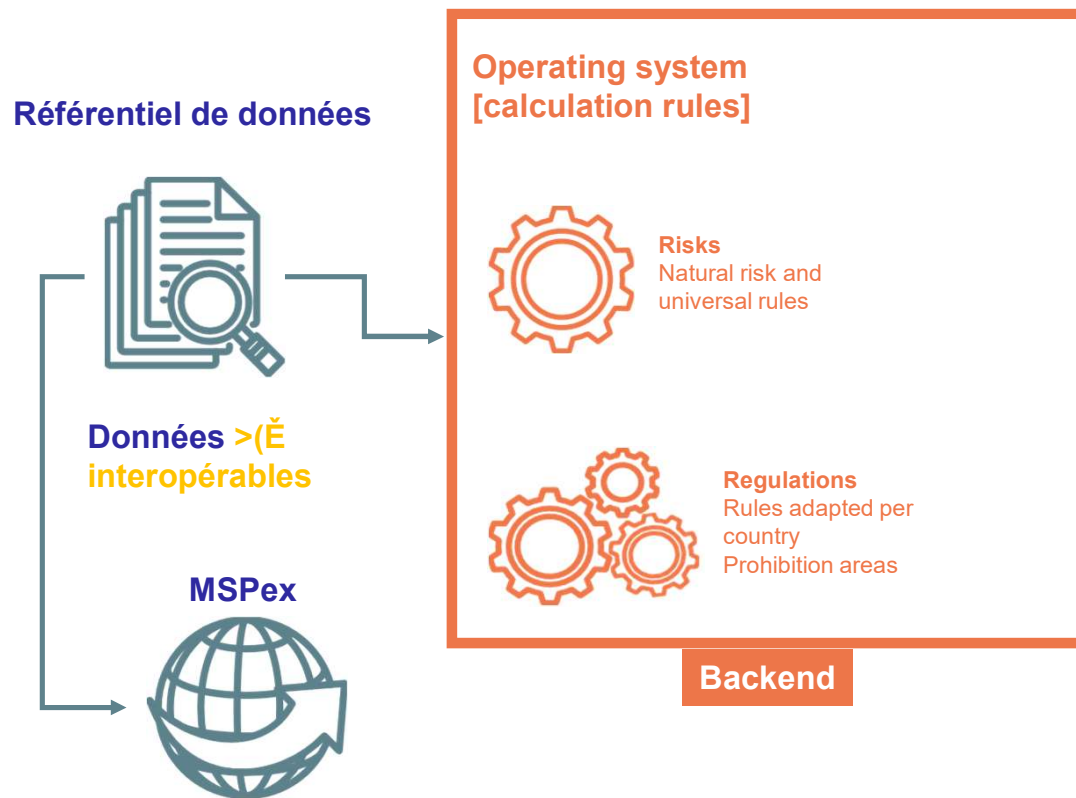
Données en entrée >(É

Référentiel de données

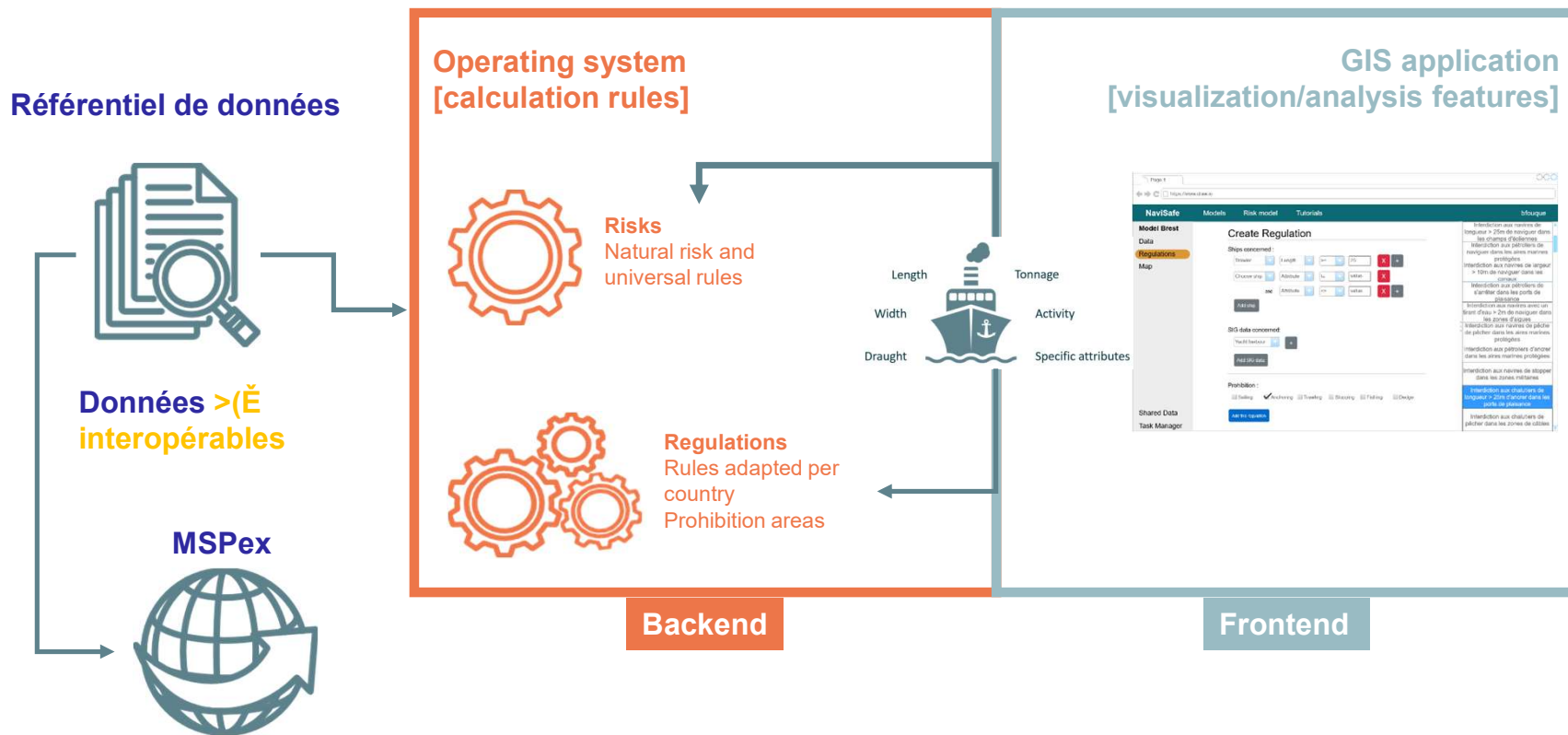


DATA			RISK			REGULATION		LAYER (WFS)	
Type	OHI standards	Link with other data	Type	Code in S-101	Criteria	Type	Text	Order	Data flux
Cable	S-101	Fishery (type and depth); marine protected area; bathymetry; anchorage	Catch on; risk of environmental deterioration	Cable	Function of the depth of the fishery and the type of fishery; fishery should not be allowed at the vicinity of the cable; type of fishery that are the most susceptible to catch on submarine cable: trawling, dredge box, bottom-set longline, anchor and fishing gipper; anchorage is not possible on cable zone	International convention for submarine cable protection; decree n° 2013-611 of the 10 of July 2013; relating to the regulations applicable to artificial islands, installations, structures, and their related facilities on the continental shelf and in the exclusive economic zone and ecological protection zone, as well as to the laying of submarine cables and pipelines [<i>Fielati à la réglementation applicable aux îles artificielles, aux installations, aux ouvrages et à leurs installations connexes sur le plateau continental et dans la zone économique exclusive et la zone de protection écologique ainsi qu'au tracé des câbles et pipelines sous-marins</i>]	Fishers have to exercise their work with caution to avoid submarine cables damage. This mean; no fishery at the vicinity of known cable area; need to analyse the main impacts susceptible to have consequences on marine environment due to cable installation	1	
Pipeline	S-101	Bathymetry; fishery; marine protected area; anchorage	Catch on; risk of environmental deterioration	PipelineSubmarineOnland	Anchorage and fishery restricted; risk of pipeline break	Decree of the 21/04/169; establishing safety regulations for pipelines carrying liquid or liquefied hydrocarbons (<i>Avant la réglementation de sécurité pour les pipelines à hydrocarbures liquides ou liquéfiés</i>); decree n° 2013-611 of the 10 of July 2013; relating to the regulations applicable to artificial islands, installations, structures, and their related facilities on the continental shelf and in the exclusive economic zone and ecological protection zone, as well as to the laying of submarine cables and pipelines [<i>relatif à la réglementation applicable aux îles artificielles, aux installations, aux ouvrages</i>	The beaconing maritime system flank the artificial structures signalisation at sea like pipelines	1	
Windfarm	S-101	TSS; road; fishery	Collision of different type; ship (ferry, fret, fishing ship) drifting due to damage or erroneous road, safety mean collision during an operation in the windfarm	OffshorePlatform	Regulated area; navigation, anchorage, sub-aquatic activity forbidden at a specific distance from the windfarm and the electrical substation (the geographical coordinates are given in the decree in latitude and longitude); trawling and piling forbidden; windfarms are forbidden in military exercise area and shooting zone. Windfarm prohibited at >5NM of a TSS and <2NM from navigational road	Ejlaw n° 2023/068 example of the decree: regulating maritime activities within and in the immediate vicinity of the offshore wind farm in the Banc de Guérande (<i>Règlement des activités maritimes au sein et aux approches immédiates du parc éolien en mer du Banc de Guérande</i>); Regional maritime conference: letter n° 25/15-2023/PRÉMAR_ ATLANTIAEKWMP; Ejlaw from the 30/11/2017; defining the maritime buoyage system and its nautical and technical reference framework. (<i>Fixant la définition du système de balisage maritime et de son référentiel nautique et technique</i>)	In the regulated area are specified in bjlaw: - all ship > 25m are not allowed to sail (except if it has a special authorization from the maritime prefecture); prohibition to penetrate in the 50m area around the wind turbine except urgent situation; - prohibition of anchorage except in case of emergency with special authorization from the maritime prefecture. Around the regulated area, sailing forbidden: - at less than 2miles for the ship with a gauge > 500LMS; - at less than 500m for passenger ship non-authorized (defined in article 7 of bjlaw); - at less than 200m for the ship with an overall length upper than 25m and less than 500LMS. Authorization for fishery with ballast bulb (straight thread, potting, line with hook). Prohibition of dredging, trawling, lining or seines in the regulated area and at less than 100m of this zone; passenger ship are prohibited except with special authorization from the maritime prefecture. Maritime security measures applicable to windfarm planification: no implementation of a windfarm <5NM from a TSS or <2NM from a navigation road. Beaconing obligation undertaken from the technical and nautical baseline attached to the below from the 30/11/2017	1	
Road	S-101	TSS; bathymetry; military area	Collision; stranding	RecommendedTrack	Recommended road; two way traffic circulation; these types of road specification will appear in the			1	
Bathymetry	S-101	Bathymetry is related to nearly all the category of data presented here	Stranding risk	DepthArea				1	data.shom.fr
Wreck	S-101	Anchorage; fishery; tourism; diving; bathymetry	Catch on; deterioration	Wreck	Specific for each wreck	Example of Valras beach MIMOSA wreck: prefectoral decree n°213/20219	Example of MIMOSA wreck: all ship and devices' navigation and anchorage are forbidden as well as submarine diving, dredging and bathing in a delimited circle of 100m radius from MIMOSA wreck location.	1	data.shom.fr
Restricted area	S-101			RestrictedAreaNavigational	Area restricted to all category except with Anchorage, search and pick up of shell and other animals, fishery, bathing, diving and submarine hunting; prohibited	Article R6332-37 - Transport Code (<i>Code des transports</i>)	Access to restricted area to only people, vehicle and merchandise	?	
Harbour infrastructure	S-101	Anchorage; tourism; fishery; diving; windfarm; offshore platform	Collision	HarbourAreaAdministrative		Decree N° DRIT SDP/2021/0120	Anchorage is forbidden inside the harbour; Prohibition: - to search and pick up plants, shell and other marine animals; - of fishery; - to bath; - to dive and to practice submarine hunt	1	
Maritime area world delimit	S-101			TerritorialSeaArea	Visibility of these limits in the software and possibility to define a study area by selecting these	Decree 2017-821 of the 05.05.2017		1	portal national des limites maritimes
Fishery regulation area	S-101	Tourism; cable; pipeline; military area; TSS; harbour infrastructure; windfarm; marine protected area; recreational nautical activity; military area	Collision; catch on cable; pipeline break; perturbation of marine protected area; recreational nautical activities and touristic area	FishingGround				1	

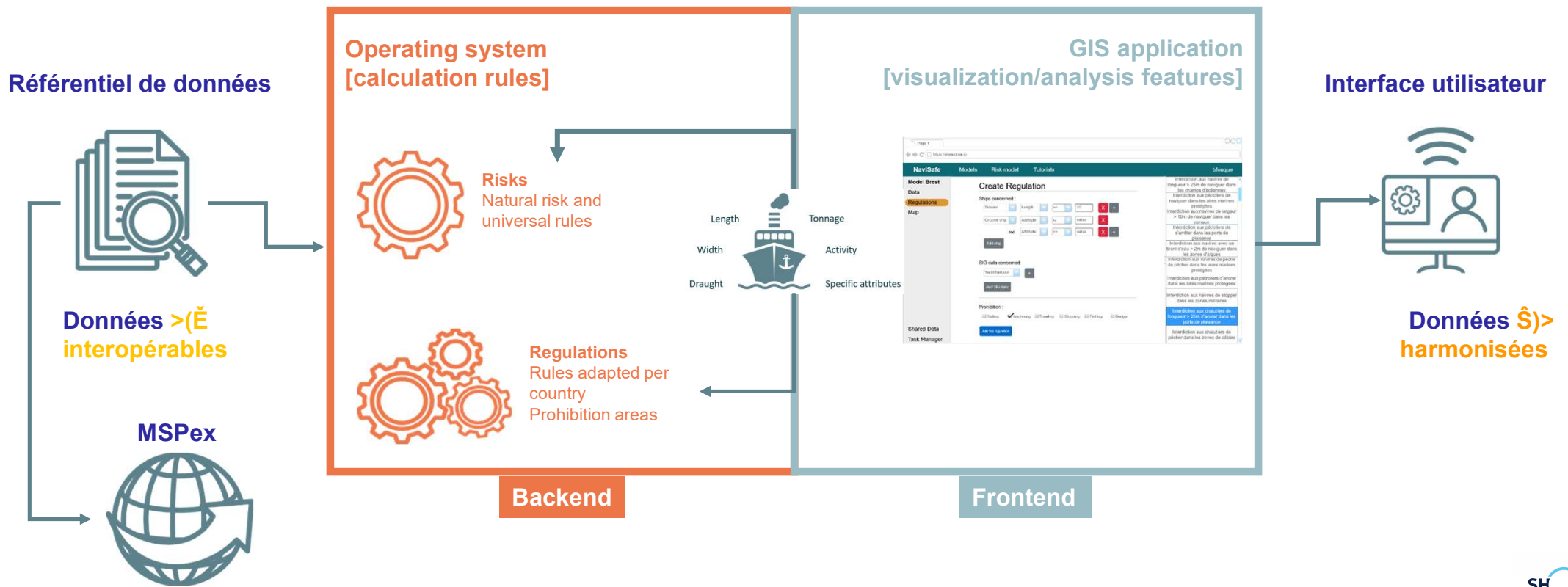
➤ **NaviSafe** : outil d'aide à la décision spatiale (*work in progress*)



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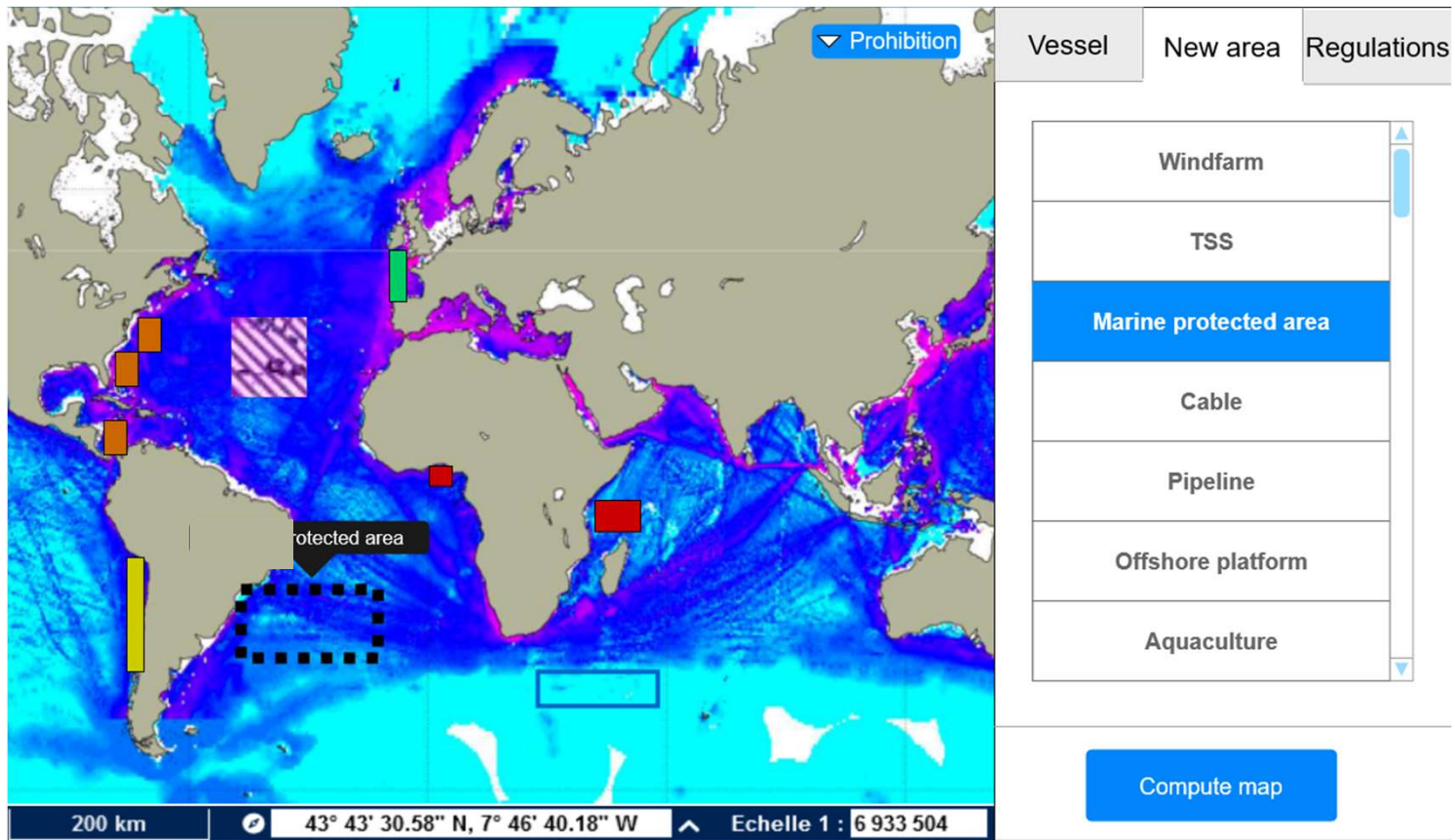
➤ NaviSafe : outil d'aide à la décision spatiale (work in progress)

The screenshot displays the NaviSafe web application interface. On the left, a map of the Mediterranean region is shown with various colored overlays (blue, purple, red, yellow) representing different risk levels or regulations. A 'Prohibition' dropdown menu is visible at the top right of the map. The map includes a scale bar (200 km) and coordinates (43° 43' 30.58" N, 7° 46' 40.18" W) with a scale of 1:6 933 504.

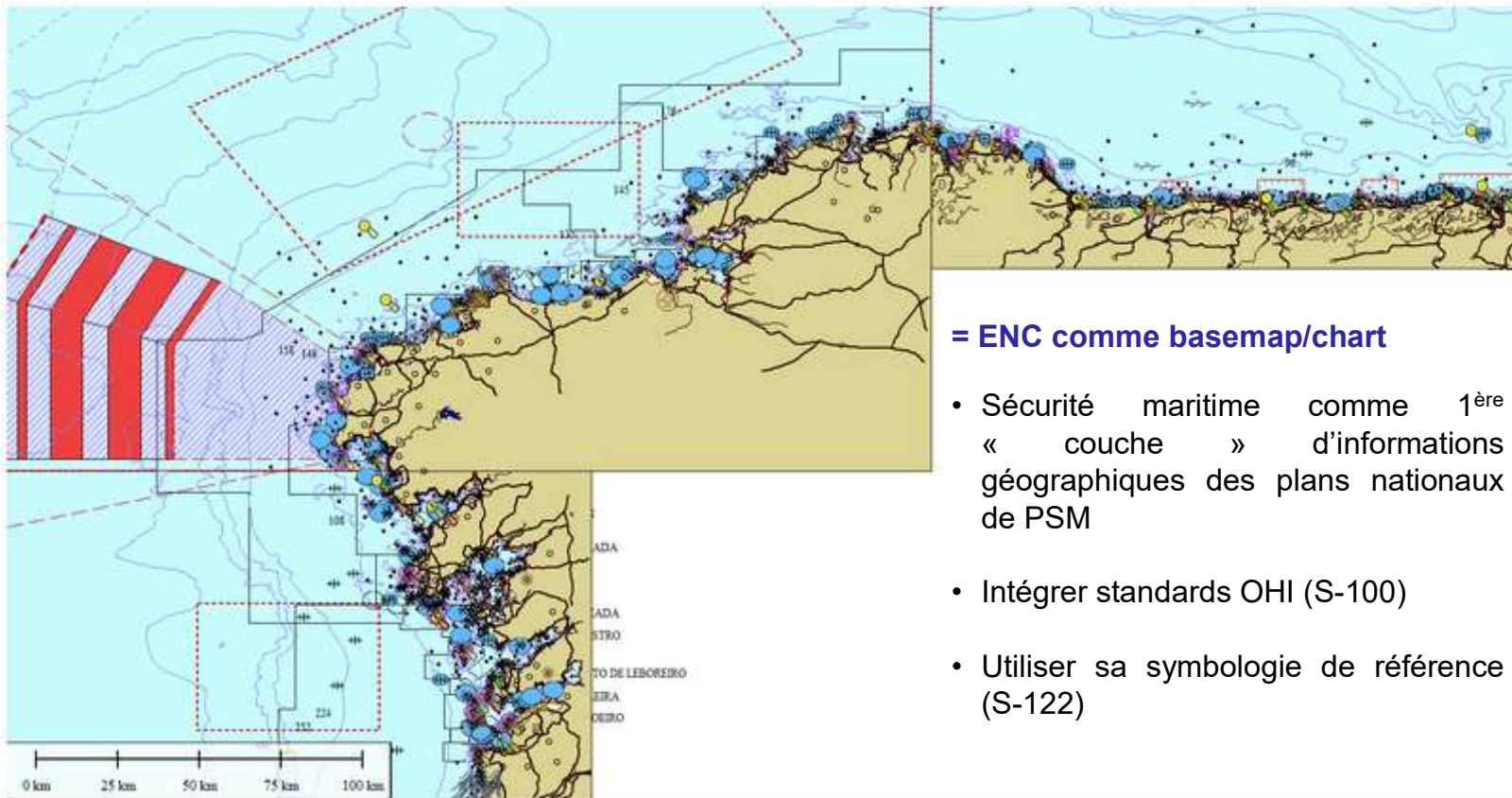
On the right side, there is a control panel with tabs for 'Vessel', 'New area', and 'Regulations'. Below these tabs, there is a 'Create Regulation' section with various input fields and buttons. A 'Compute map' button is located at the bottom right of the control panel.

At the bottom right of the interface, there is a 'Task Manager' section with a 'Compute map' button. Below this, there are icons for 'Length', 'Tonnage', 'Width', 'Activity', 'Draught', and 'Specific attributes'.

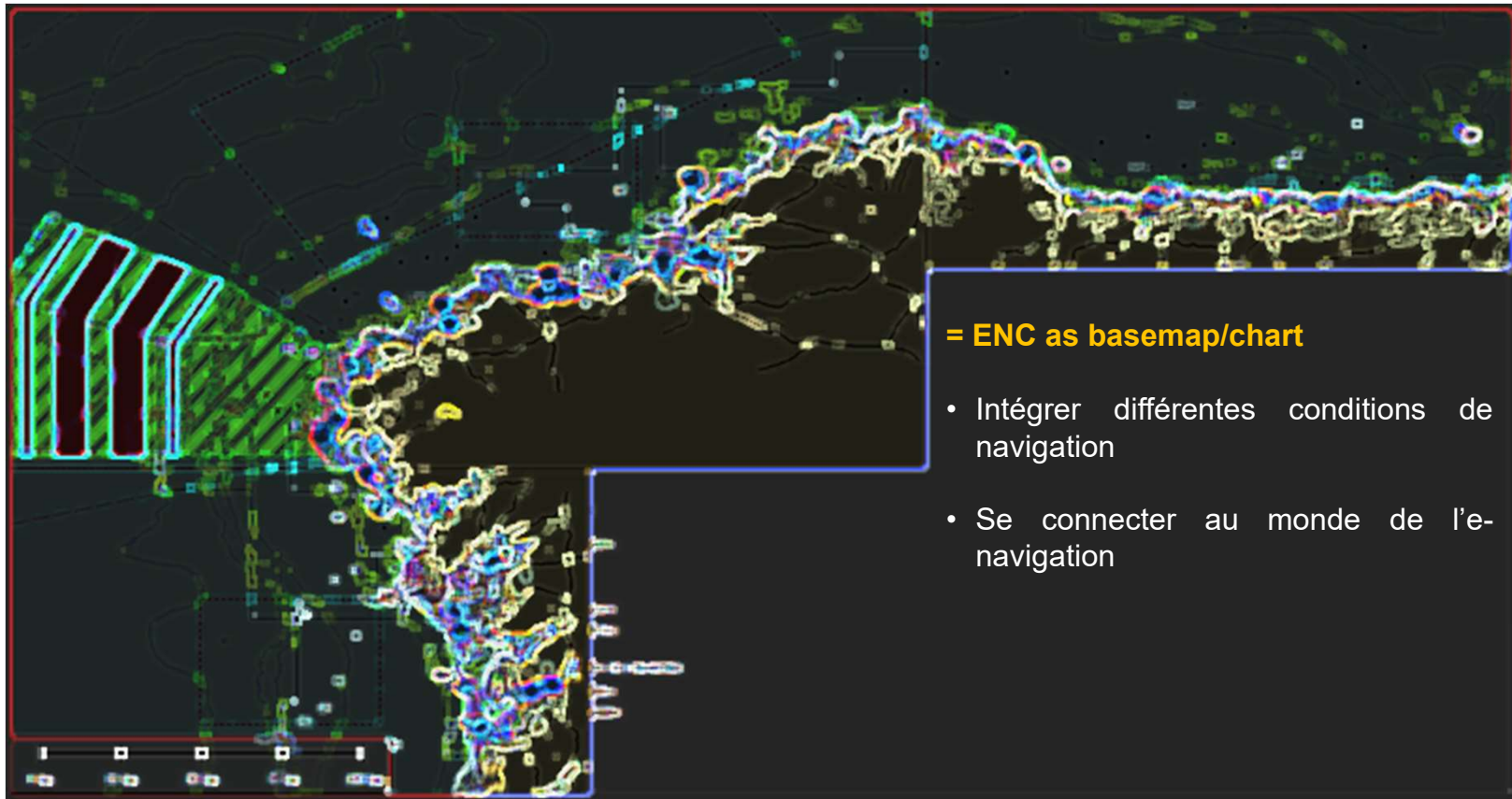
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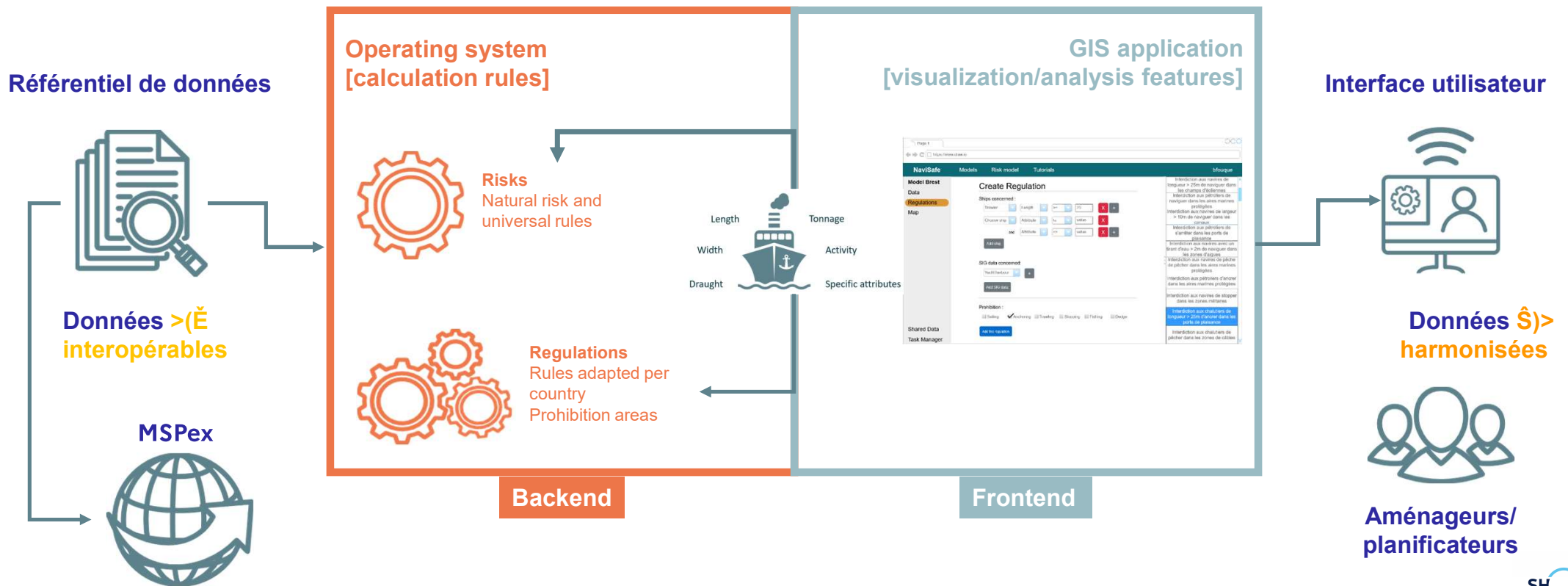
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➤ Echelle micro : penser « intelligence collective »...



Source : mc2i, 2024

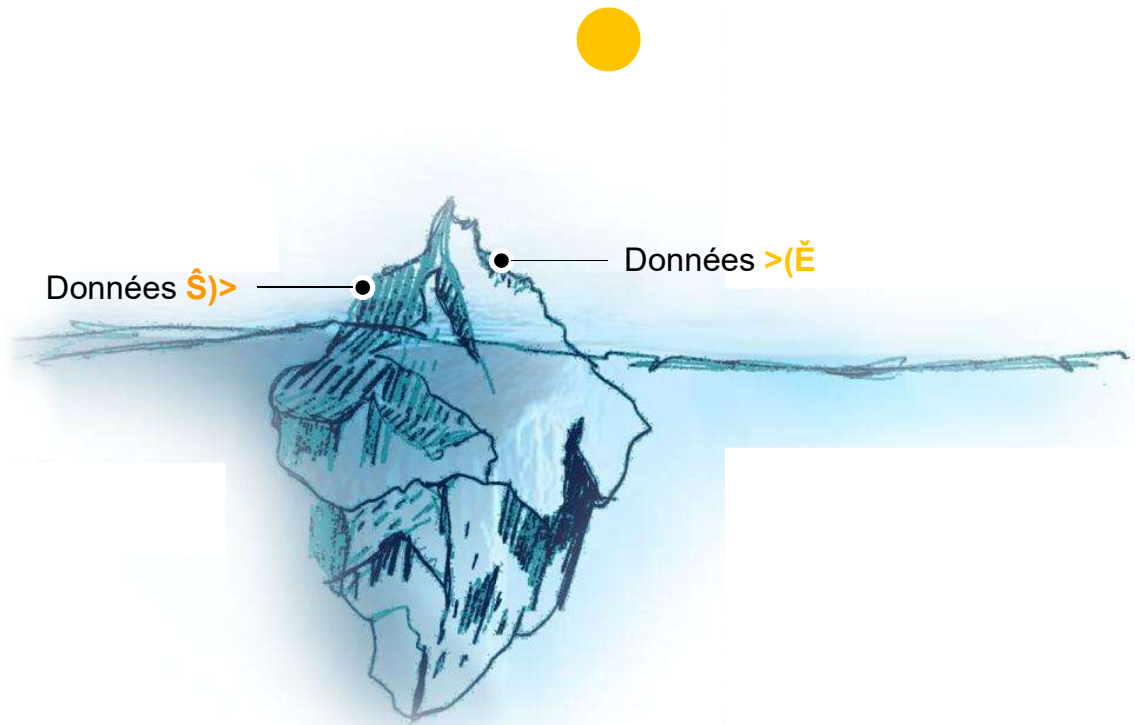
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4/ Perspectives à considérer

- Echelle micro : penser « intelligence collective » pour éviter les icebergs à la dérive



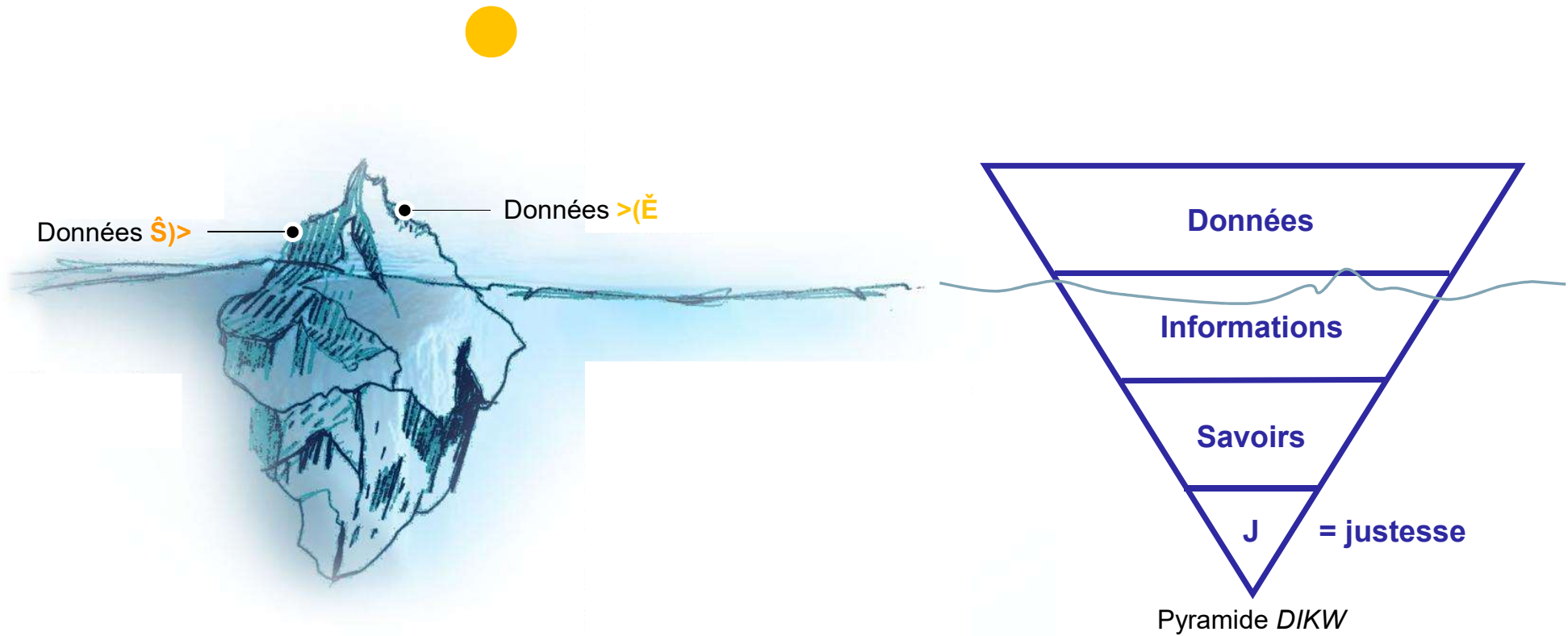
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4/ Perspectives à considérer

➤ Echelle micro : penser « intelligence collective » pour éviter les icebergs à la dérive



➤ Echelle méso : vers une PSM EU digitale et paneuropéenne

European Commission | EMODnet Map Viewer | EN English

Layers Catalogue

- Energy >
- Environment >
- Fisheries >
- Main Ports >
- Maritime Spatial Planning ▾
 - MSP Spatial Plan Area
 - MSP Zoning Areas
 - MSP Zoning Lines
 - MSP Zoning Locations
- Military Areas >

+ Add external layers

Marine regions Search for a region ... ▾

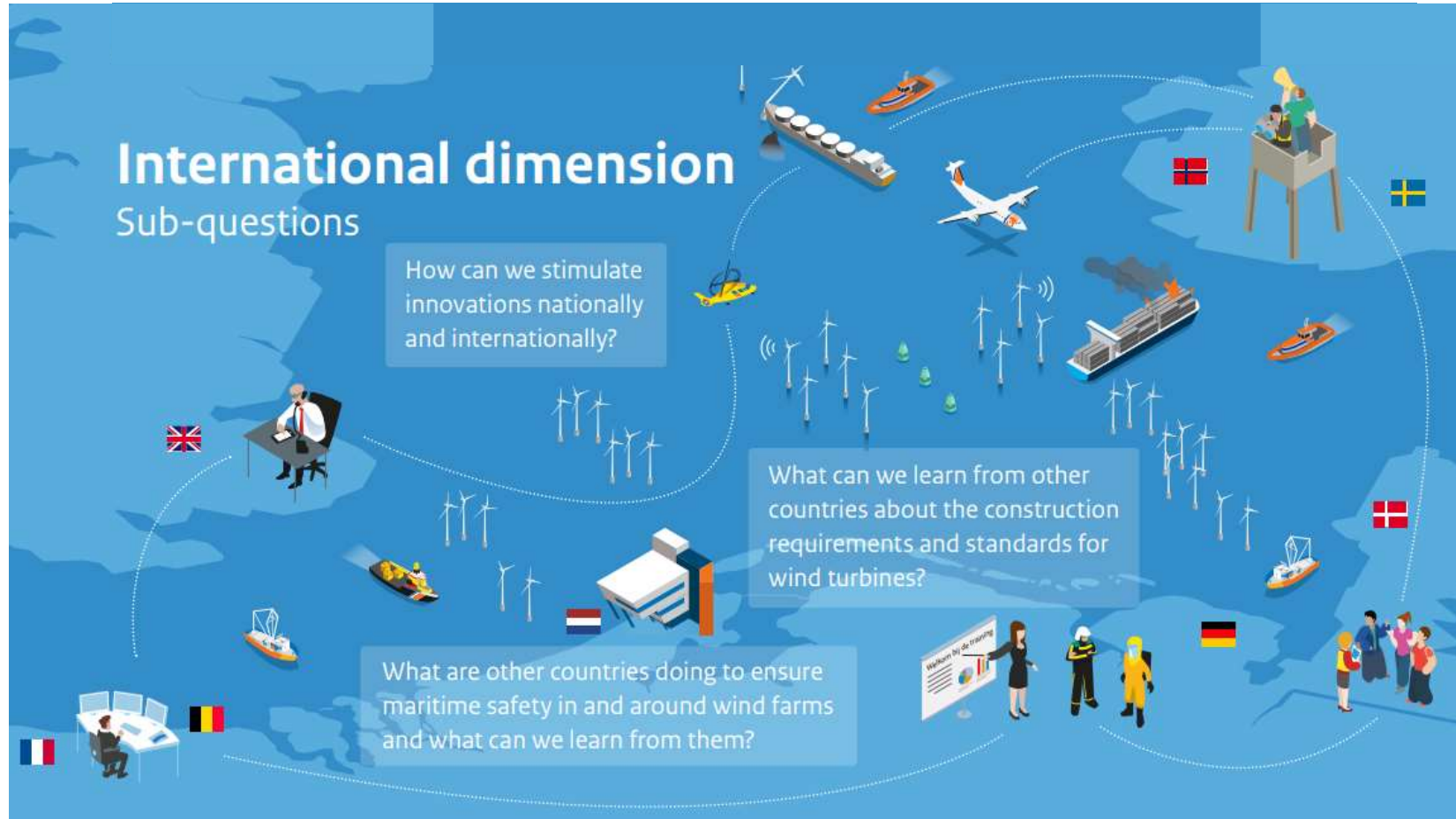
Change basemap Esri.Ocean ▾

EMODnet European Marine Observation and Data Network

Source : EMODnet, 2024

https://emodnet.ec.europa.eu/geoviewer/#

➤ Echelle méso : vers une PSM EU digitale et paneuropéenne



Source : MINI&W, 2024

➤ Echelle macro : SH et standards de l'OHI comme boussole pour la PSM



Source : <https://iho.int/fr/s100-project>

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4/ Perspectives à considérer

- Echelle macro : SH et standards de l'OHI comme boussole pour la PSM



PSM
fonctionnelle

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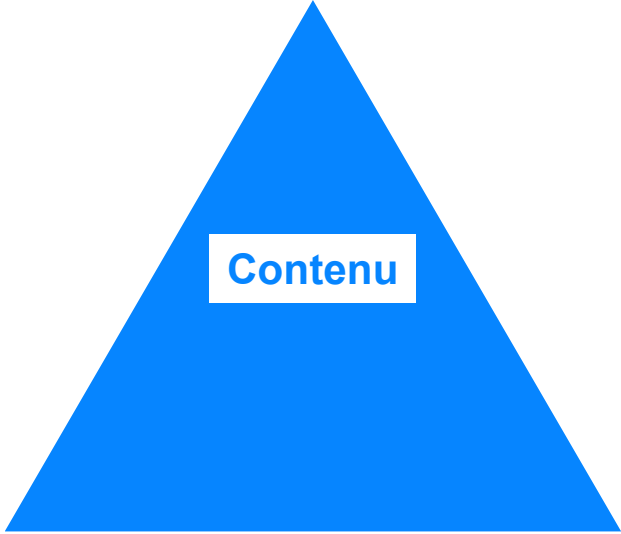
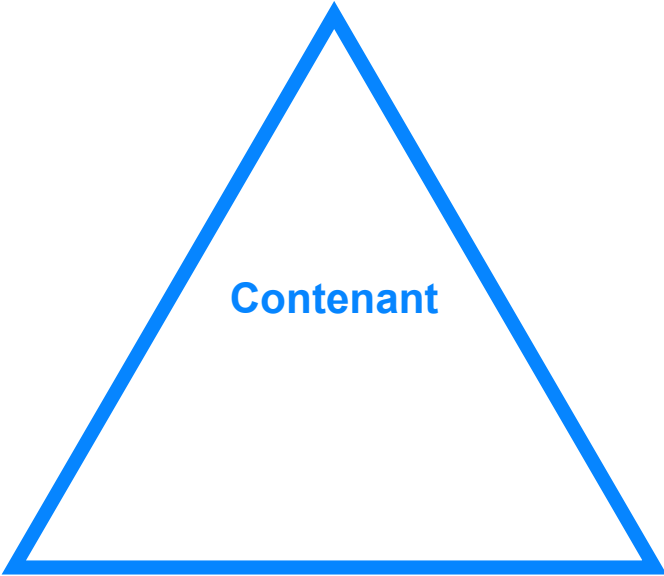
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Perspectives à considérer

➤ Echelle macro : SH et standards de l'OHI comme boussole pour la PSM



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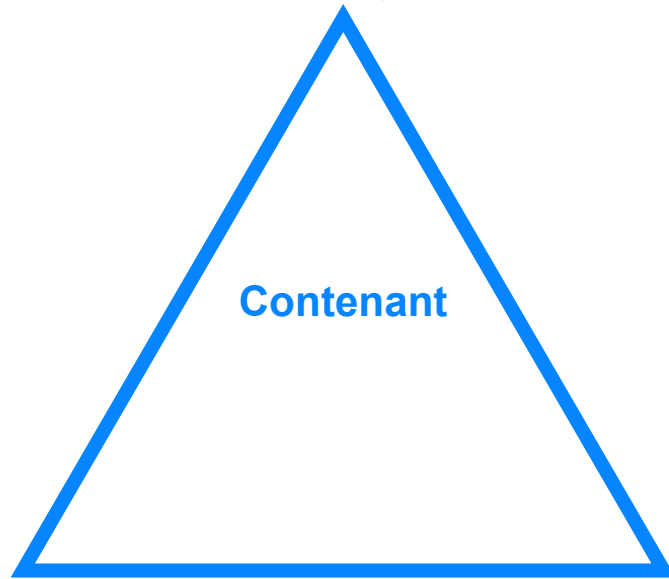
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4/

Perspectives à considérer

➤ Echelle macro : SH et standards de l'OHI comme boussole pour la PSM

~ Environnement physique marin ~



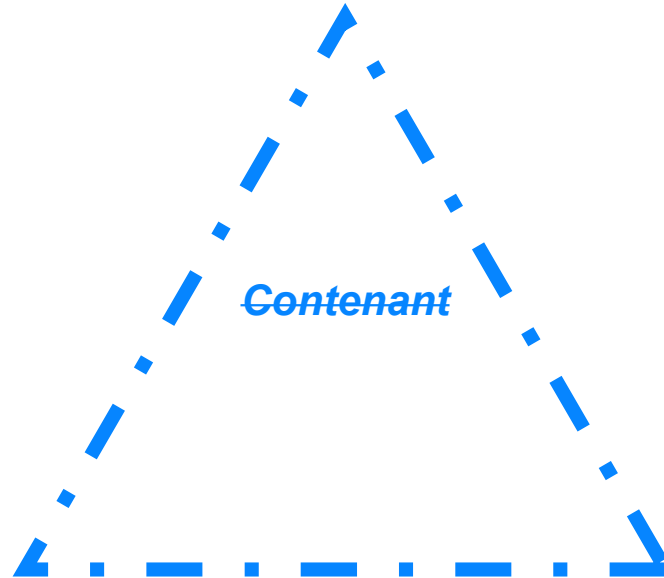
Contenant

!! Sécurité maritime !!

// Limites maritime //

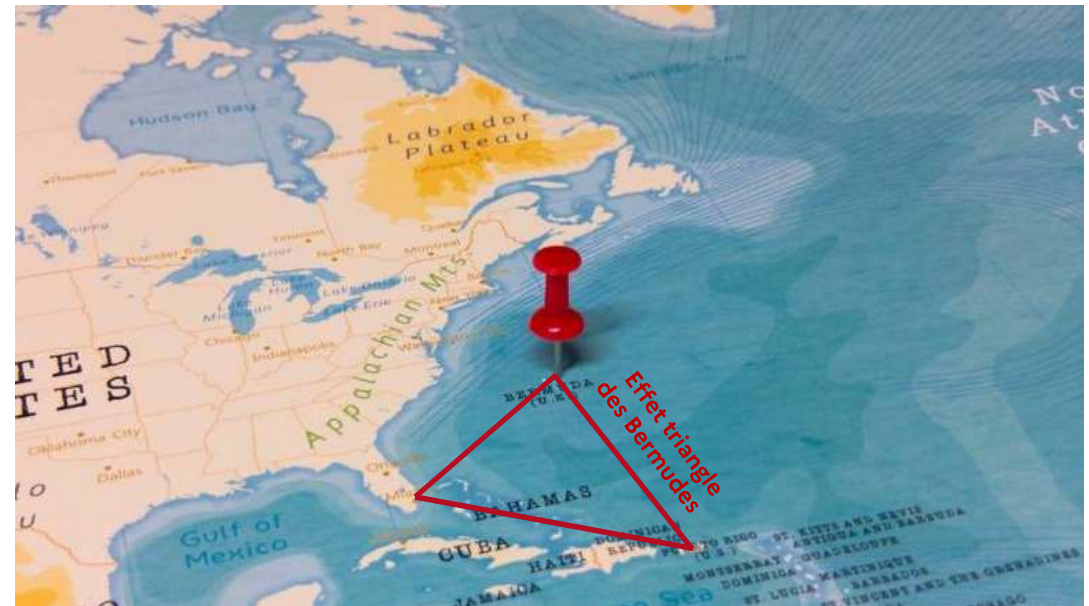
➤ Echelle macro : SH et standards de l'OHI comme boussole pour la PSM

— Environnement physique marin —



// Sécurité maritime //

// Limites maritime //





Merci à toutes et tous !

yannick.leroy@shom.fr

OCEANEXT 2024 - 13 juin 2024

Relever ensemble les défis des socio-écosystèmes maritimes et littoraux