

Sea basin Strategy

North Atlantic - Western Channel Sea Basin Strategy Document



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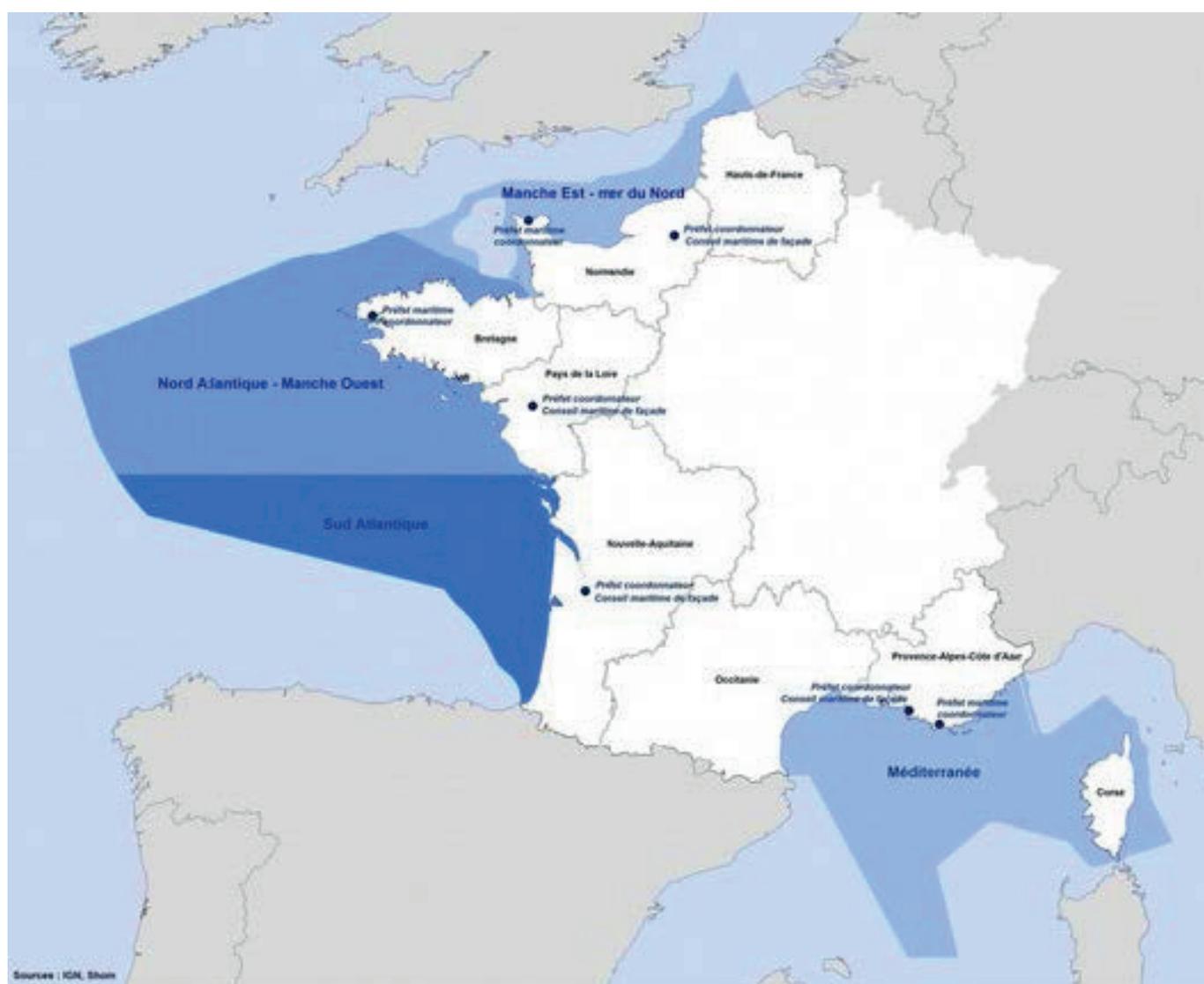
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PREAMBLE

France's maritime and coastal spaces combine outstanding natural heritage with significant social and economic development potential. France enjoys a worldwide reputation for the excellence of its oceanographic research; it has expertise in industries such as ship-building, goods transport and marine leisure. The French navy operates worldwide, and the French flag is recognised as a sign of the quality, technical capability and professionalism of vessels and crews. France also takes measures to support the transformation and development of traditional and emerging industries. Its expertise in managing protected marine environments is widely acknowledged around the world.

The sea and coast accommodate many different uses. They are also subject to numerous sources of pressure, as a result of urbanisation, concrete sprawl, climate change, land-generated pollution and the impact of activities. To ensure that the sea and coastlines continue to foster exchanges, wealth, sharing, knowledge and culture, France has since the early 2000's pursued a cross-sectoral maritime policy that reconciles preservation of the marine environment - the nation's shared national heritage - with economic development of maritime and coastal activities, while promoting integrated management of the land and sea.



1 The national and European framework established by the Sea Basin Strategy document

In February 2017, France published a **national strategy for the sea and coast (SNML)**, setting out its long-term goals in this area. This document forms the baseline for environmental protection, optimisation of marine resources and the integrated, consensus-based management of activities relating to the sea and coast. Bringing together elected officials and representatives of civil society, the **National Council for the Sea and Coastal Areas (conseil national de la mer et des littoraux)**, is directly involved in its preparation and its implementation, monitoring and assessing.

The national strategy for the sea and coast sets out four long-term objectives: deliver the essential **ecological transition**; develop a sustainable **blue economy**; restore **good environmental status** and uphold France's ability to wield **influence** as a seafaring nation.

It establishes a framework for action via four strategic orientations: building on **knowledge and innovation**; developing sustainable, **resilient maritime and coastal** spaces; supporting and promoting **initiatives** and clearing obstacles; promoting a **French vision** within the European Union and in international negotiations and upholding national interests.

For each sea basin in metropolitan France, a planning document – the **Sea Basin Strategy Document (document stratégique de façade - DSF)**, also known, in Overseas France, as the Sea Basin Strategy Document) - refines and supplements the general orientations established by the national strategy, reflecting the economic, social and ecological considerations specific to each sea basin.

Sea Basin Strategy is the French policy to fulfil the obligations of two European framework directives :

- The "**Marine Strategy Framework Directive**" (EU Directive 2008/56 of 17 June 2008), which aims to achieve or maintain "good environmental status" for marine environments by 2020.
- The "**Maritime Spatial Planning Directive**" (DCPEM - EU directive 2014/89 of 23 July 2014), which establishes a framework for maritime spatial planning and calls upon member States to coordinate their activities at sea.

2 North Atlantic Western Channel sea basin scale

The Sea Basin Strategy document addresses the **development of activities**, and controlling or **reducing the pressure** exerted by humans on marine and coastal environments. For the first time, a set of maps has been produced that give the general public an overview of the challenges and define preferential locations for activities and focus areas for conservation of the marine and coastal environment. This planning aims is to coordinate activities and **prevent conflicts** resulting from the diversification and densification of uses of the sea and coast. Combined development of human activities must not be allowed to compromise the objective of achieving or maintaining good environmental status.

Due to the **interactions between the land and sea**, solutions do not lie exclusively offshore. Catchment areas and onshore spaces influence maritime and coastal spaces via challenges relating to water quality, land use, large-scale urban, tourist and agricultural development, projects for offshore activities, etc. The Sea Basin Strategy document must be coordinated with other documents relating to catchment area and coastal management, such as strategies by local authorities, water development and management masterplans (schémas directeurs d'aménagement et de gestion des eaux - SDAGE, embodying the European framework directive), regional development, sustainable development and territorial equality programs (schémas régionaux de développement durable et d'égalité des territoires - SRADDET), regional integrated development plans (schémas de cohérence territoriale - SCOT) and local (or inter-communal) urban development plans (plans locaux d'urbanisme - PLUi).

On the North Atlantic - Western Channel sea basin, the Sea Basin Strategy document combines with regional and departmental strategies relating to the sea and coast.

Supported by dedicated governing bodies (the Regional Conference for the Sea and Coast of Bretagne (conférence régionale pour la mer et le littoral de Bretagne) and the Regional Assembly for the Sea and Coast of Pays de la Loire (assemblée régionale pour la mer et le littoral des Pays de la Loire)), the Bretagne (Brittany) and Pays de la Loire regions are developing local maritime and coastal strategies for their respective territories and populations. These regions' constituent departments (Finistère, Loire Atlantique, Vendée, etc) are also adopting blueprints and initiatives for the coming decades.

The **legal basis** for the Sea Basin Strategy document is as follows¹ :

- **At sea**, plans, programmes and projects for works, structures and developments shall be **compatible** (or be rendered compatible) with the objectives and provisions of the Sea Basin Strategy document. Compatibility implies not departing from the basic orientations, in this case the strategic objectives and designated uses map, while allowing some flexibility in terms of specifying their application.
- **On land** but with an influence at sea, they shall take the objectives and provisions of the Sea Basin Strategy document into **consideration**; specifically, they are subject to the compatibility requirement, with concessions possible where justified.

When dealing with **conflicts of use**, this document helps stakeholders and authorities to identify conciliatory solutions depending on the area in which are located, but rarely provides a clear verdict in favour of a particular solution, as such choices must also be informed by local analysis. The document provides guidance for growth activities, helping to determine areas in which their development will be appreciated (without granting them any form of exclusivity, however).

3 Production of the Sea Basin Strategy document

The Sea Basin Strategy document is produced by the **French State**. At national level, it is overseen by the Ministry for Ecological and Inclusive Transition. Locally, the Atlantique maritime prefect and the prefect of the Pays de la Loire region are tasked with its production, in their capacity as coordinating prefects.

These two prefects are supported by a unified **consulting body**, the **Maritime Council for the Coast (conseil maritime de façade)**, which is a forum for discussion between stakeholders with interests at sea, along the coast and on land. **The general public** was invited to contribute, via a preliminary consultation exercise supervised by the French National Commission for Public Debate.

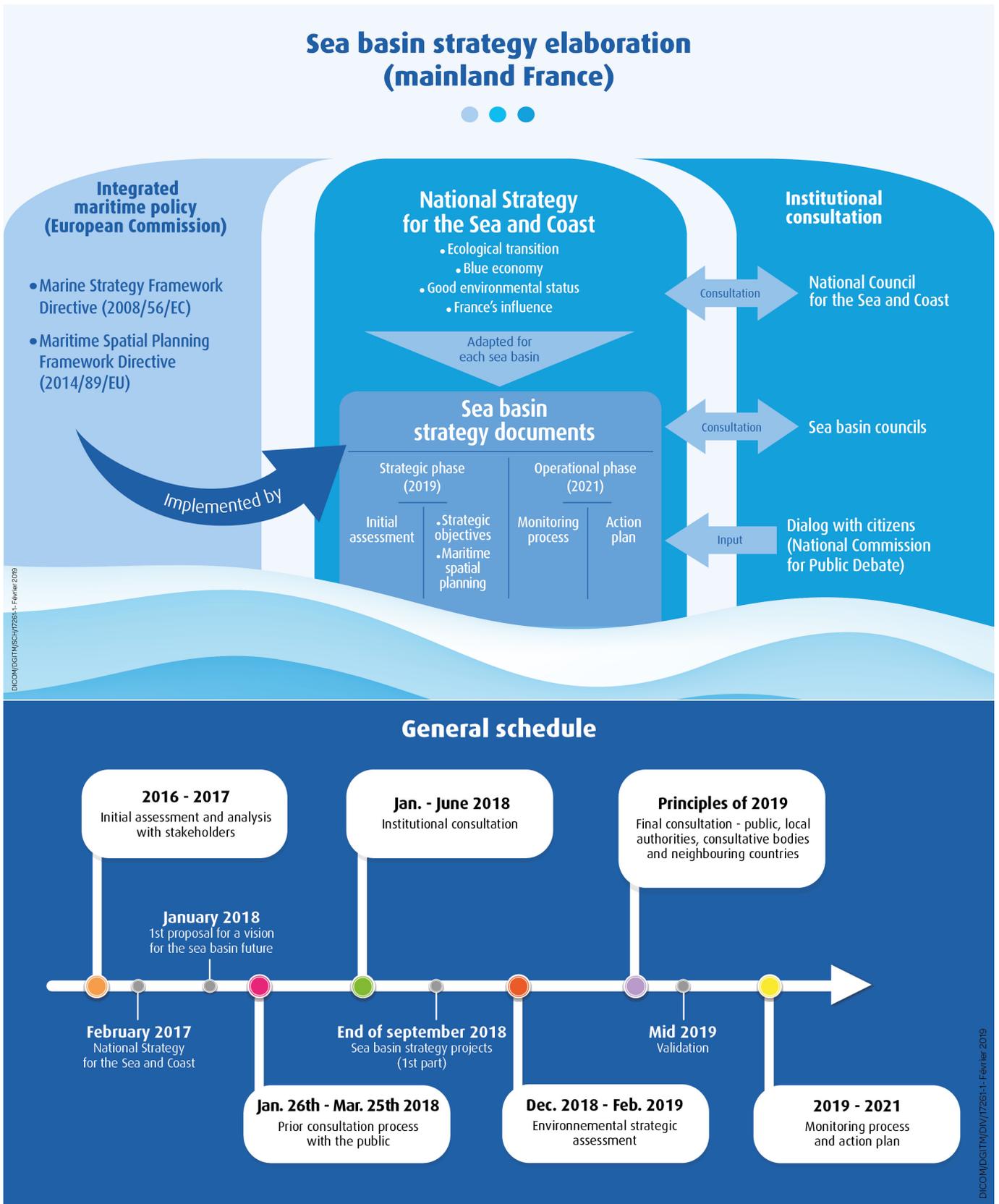
The Sea Basin Strategy document is organised in four parts, each intended to be enriched and amended in the light of improvements in available knowledge, and updated in subsequent six-yearly reviews of the document :

- **Situation review, challenges and a vision for the sea basin in 2030** (Part 1)
- **Strategic objectives** defined from an economic, social and environmental perspective, together with related performance indicators. These objectives are accompanied by a "designated uses map" that, for each maritime space, defines the areas consistent with the challenges and general objectives assigned to them (Part 2)
- **Evaluation procedure** for assessing implementation of the strategy document (Part 3)
- **Action plan** (Part 4)

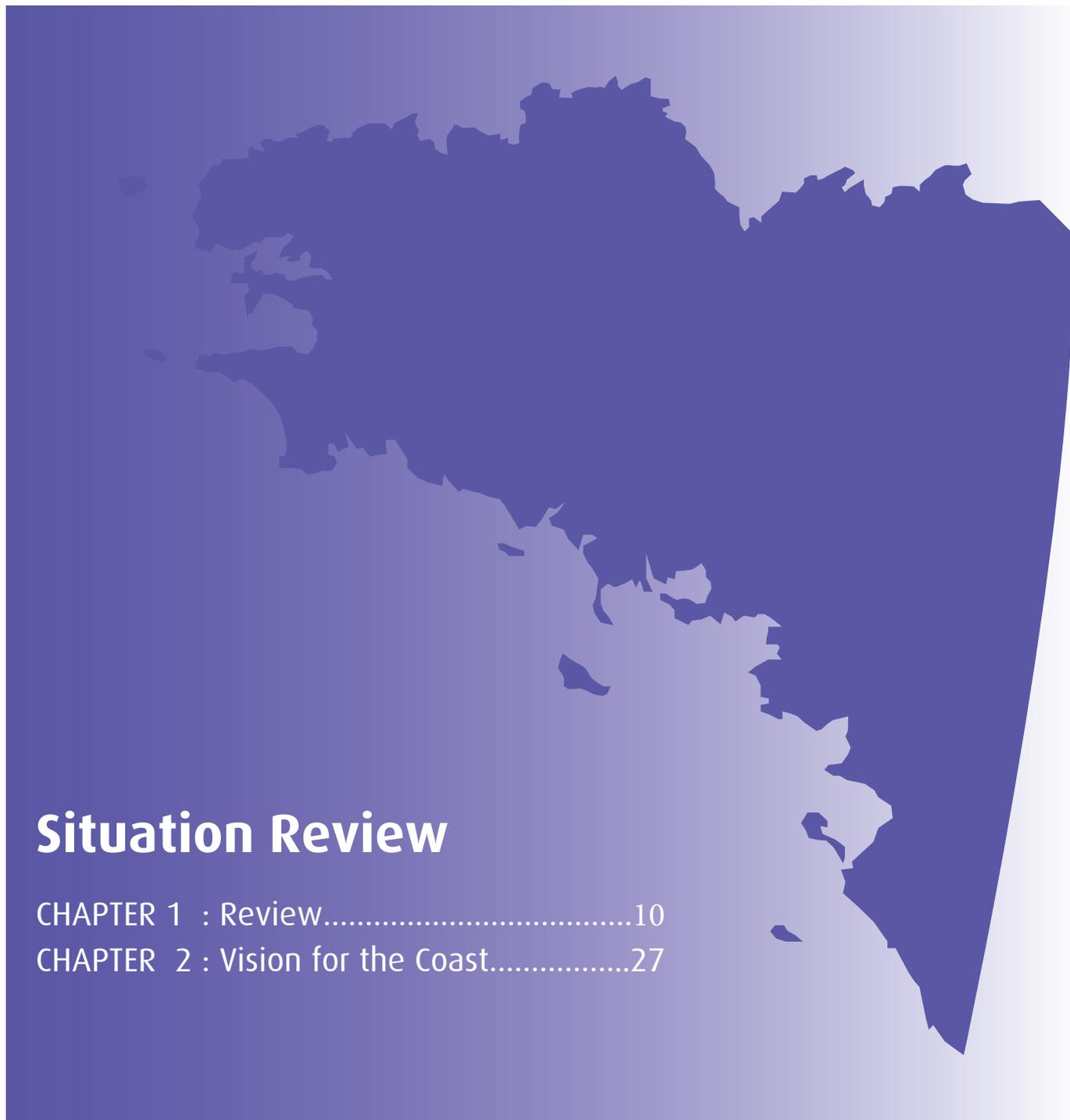
This Sea Basin Strategy document contains parts 1 and 2. In the second phase, at the latest at 2020 and 2021, Parts 3 and 4 will be designed. The Sea Basin Strategy comprises a main document providing an overview, and a series of appendices that contain detailed information relating to the scientific and technical analyses conducted for the initial assessment and to the content of the strategic objectives and planning.

¹ Article 219-4-C of the French Environmental Code

Overall calendar



PART 1



Situation Review

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CHAPTER 1 Review

Introductory presentation of the sea basin

Physical characteristics

The North Atlantic - Western Channel sea basin extends between the English Channel, the Iroise sea and the Atlantic Ocean, off the sea basin of the Bretagne and Pays de la Loire regions and the Loire basin. The identity of the six coastal departments strongly reflects their extensive natural public maritime domain, notable for its large tidal range (i.e. the difference in water level between successive high- and low-tides) and jagged coastal relief.

The sea basin features:

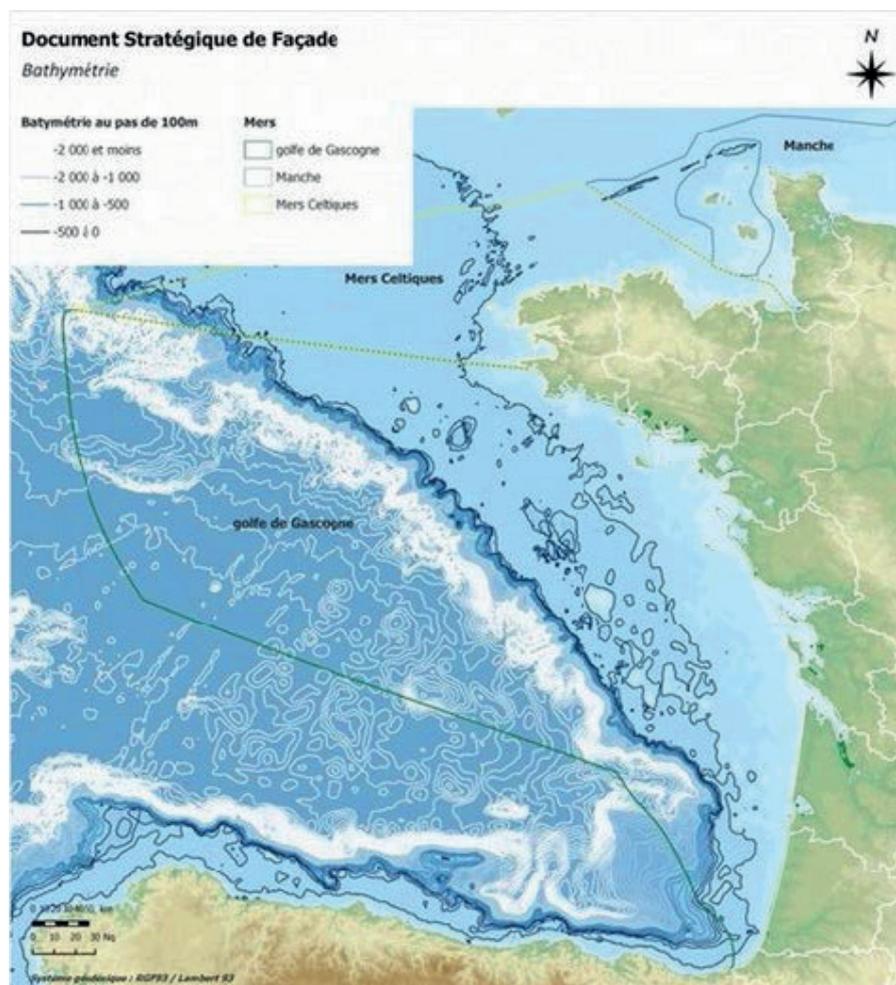
- a shallow-lying continental shelf (0 to -200m) that extends far offshore before giving way to a continental slope scarred with multiple canyons, leading down to the abyssal plain (-5000m);

- numerous roadsteads, bays, rias, the Gulf of Morbihan and extensive wetlands to the south, including the Loire estuary, the Guérande salt marshes, the Brière natural park and the Bretagne-Vendée marshland;

- around a dozen islands, some of which are located a significant distance from the coast (for example, île d'Yeu is more than 20 km from the mainland, and Belle-île lies 14 km off Quiberon).

Appendix 0 : Atlas

Bathymetry



■ Demographics and human activities

The entity formed by the Bretagne and Pays de la Loire regions is home to 7 million people, living in approximately 300 maritime coastal municipalities. The strong demographic appeal (led by tourists and retirees) of these coastal communities has spurred economic growth, resulting in multiple pressures (including concrete sprawl² and high water consumption) on the natural equilibria of the coast and sea.

As they involve, maritime activities (principally commercial fishing and aquaculture) find themselves competing with new industries (such as marine renewable energy (MRE)) for access to maritime and coastal spaces and resources, hence the heavy concentration of interactions between activities and the marine environment in the coastal strip and territorial waters (which extend 12 nautical miles from the coast).

The sea basin is home to numerous fishing ports and marinas, as well as trading ports such as the Grand Port Maritime de Nantes – Saint-Nazaire (GPMN-SN), the market leader in terms of Atlantic traffic, as well as the commercial ports of Brest, Lorient and Saint-Malo. The Saint-Nazaire industrial complex, which includes France's largest shipyard, continues to expand, and is the coast's number one employment area. The military port of Brest, with its related naval and naval air bases, is the largest such facility on the Atlantic coast.

A major shipping lane serving Northern Europe's large sea ports runs past the tip of Brittany, carrying dense traffic of hydrocarbon and chemical carriers in meteorological conditions that are frequently challenging in the winter.

There are active, well-structured research, innovation and training networks (with globally-recognised research and competitiveness clusters). Nevertheless, much still remains to be learned about the marine environment and interactions generated by human activities.

² *The Commissariat General for Sustainable Development reports more severe pressures on the sea front, particularly in rural and peri-urban areas, and defines "built-up areas" (in its publication Dtalab_juin 2017) as follows: built-up areas include urbanised areas (with a continuous or discontinuous urban fabric), industrial and retail parks, transport networks, mines and quarries, refuse disposal sites and construction sites, as well as built-up green spaces (e.g. city parks or sport and leisure facilities), in contrast to farmland, forests, natural environments, wetlands and water bodies.*

The North Atlantic - Western Channel sea basin is also notable for the strong engagement by sea and coast stakeholders; planning and integrated management topics are debated by the Maritime Council for the Coast (conseil maritime de façade - CMF) and are also addressed by the regional conference and regional assembly for the sea and coast of Bretagne and Pays de la Loire (CRML and ARML, respectively).

Appendix 0 : Geographical map atlas

■ Environmental characteristics

There are rich and varied ecosystems and marine and coastal landscapes. These attractive features are considered symbolic of the strong sense of local and regional identity. Due to our incomplete knowledge, it is hard to exhaustively assess the extent of these ecosystems and ascertain their "good environmental status". However, it is generally acknowledged that as-yet unexplored spaces (such as the abyssal plain) are particularly rich, and that the pressures exerted by human activities are many and varied, resulting in hard-to-assess cumulative impacts. The quality of water used in aquaculture appears to be deteriorating (resulting in eutrophication and green algal bloom, as well as sanitary quality challenges) as a result of pressures exerted by coastal farming and urbanisation.

The coastline is exposed to significant but unevenly distributed natural risks.

The quality of water used in aquaculture appears to be deteriorating (resulting in eutrophication and green algal bloom, as well as sanitary quality challenges) as a result of pressures exerted by coastal farming and urbanisation. This vulnerability is exacerbated by the consequences of climate change, particularly along low-lying and sedimentary coasts.

The ecosystems and landscapes are attractive, and considered symbolic of the strong sense of local and regional identity.

Annexe 0 : Geographical map atlas

Appendix 2a : Assessment of the status of marine waters

1.1. Maritime and coastal activities

■ Review

A set of 23 sheets has been produced, describing activities and uses of the maritime and coastal space.

Appendix 1 : Detailed description of activities and uses in the coastal and maritime space

■ Socioeconomic challenges

Cross-sectoral and common challenges arise with each activities. These challenges below, in no particular order of importance to the coast.

These challenges are represented spatially in an overview map on page 21 of Appendix 0 (Geographical map atlas)

14 common, cross-sectoral challenges

- **Water quality** on the mainland and in transitional, coastal and territorial waters, and the availability of fresh water, which are necessary conditions for certain activities (including commercial and recreational fishing, aquaculture, bio-resources, tourism, boating and coastal farming);
- **Good environmental status of the marine environment and its living resources**, which is a necessary condition for the development of certain activities (commercial and recreational fishing, aquaculture, salt production, bio-resources, tourism, boating, etc.);
- **Sustainability of living and other exploited resources** (commercial and recreational fishing, aquaculture, extractive industries, agribusiness, seaweed harvesting, thalassotherapy, etc.);
- **Economic performance** across all industries, including investment, research and innovation capabilities;
- **Sustainability and quality of jobs** (attractiveness, creation, new industries, training, etc.);
- **Digital transformation** of the economy, and implementation of innovation-driven industry 4.0;
- **Attractiveness of landscapes**, which underpin the coast's identity and support uses and/or activities (tourism, boating, recreational fishing, urbanisation, maritime cultural artefacts);
- **Accommodation capacity of and access to maritime spaces** (national and cross-border exclusive economic zone (EEZ)) and coastal spaces (coastal land, particularly in ports, the natural public domain, concrete sprawl in coastal hinterlands);
- **Social acceptability of activities, projects and stakeholders**, in particular where activities require space to be reserved, and efforts to generate synergies (MRE, aquaculture, marine aggregate extraction, creation/extension of ports, onshore and offshore events);
- **Responsibility of sea users** with regard to risks (such as maritime safety, or natural and technological risks), marine environment and marine resource preservation challenges, or cohabitation between recreational, productive and other uses;
- **Sound legal basis for projects** and/or experimentation at sea and on the coast (MRE, aquaculture, biotechnology, etc.);
- **Knowledge of the marine environment and impacts of activities on the marine environment;**
- **Maritime safety and security, and defence and national security activities;**
- **Consideration for Brexit and its consequences in policies.**

1.1.1 Challenges specific to maritime activities and uses

■ Socioeconomic challenges specific to MARINE RENEWABLE ENERGY (MRE)

- The designation of certain areas as conducive to³ MRE (including all MRE technologies, test sites, pilot farms and commercial facilities), in the light of multi-year energy planning, is a stated aim of the overall planning strategy set out in the Sea Basin Strategy document (designated uses map);
- **Enhanced visibility for industrials and maritime stakeholders** to facilitate investment (regulatory changes) and control the environmental and socioeconomic impacts of infrastructures (relating to production and connection);
- Conditions governing **cohabitation** with pre-existing activities, and in particular with commercial sea fishing;
- **Adoption/acceptance by all sea stakeholders**, particularly the commercial sea fishing industry;
- **Development and sharing of scientific understanding** relating to technologies (e.g. multi-purpose facilities, including research into energy storage solutions and the effects on the marine environment) and feedback (both domestic and international).

Appendix 0 : Geographical map atlas



³ The term covers all related vocabulary, including preferred areas, potential areas macro-areas, etc.

■ Socioeconomic challenges specific to PORTS

- **Changing business model** of all ports on the coast (whether fishing or trading ports or marinas);
- **Ecological and energy transition at all ports on the coast** (whether fishing or trading ports or marinas), particularly at the Grand Port Maritime Nantes – Saint-Nazaire, (harbour water quality, management of natural spaces, next-generation ships, emerging energy industry, innovation, intermodality with the hinterland);
- **Cooperation between ports**, including the major sea ports in the Bay of Biscay (Nantes-Saint-Nazaire, Bordeaux and la Rochelle) and the various decentralised trading ports and port communities along the coast (Brest, Saint-Malo & Lorient).



■ Socioeconomic challenges specific to the BOAT- AND SHIP-BUILDING INDUSTRIES

- **Competitiveness of an innovative industry** for high-tech, high value-added vessels and related infrastructures (whether for fishing, passenger transport, defence or recreational use);
- **Network of local expertise** well-suited to designing, building and repairing next-generation vessels;
- **Coordinated approach to capital investment** for ship repairs on the scale of the sea basin (covering the types of facilities and infrastructures required, costs, etc);
- **Digital transformation** at every level of the industry (including research and development, design, construction and decommissioning).



■ Socioeconomic challenges specific to SAILING, LEISURE, WATER SPORTS and TOURISM

- **Handover between generations** and consolidation of professional expertise, harnessing the training available in the area;
- **Promotion of this key component** of the coast's tourist appeal;
- **Future of existing port facilities and moorings** (including moorings not in ports), reflecting the needs of and emerging activities identified in each sailing area (sharing economy);
- **Affordability of marine leisure activities** for the general public and new users, as a lever for raising awareness of the sea and related challenges (e.g. environment, cohabiting uses, safety at sea, etc.).



■ Socioeconomic challenges relating to RECREATIONAL SEA FISHING (in boats and on foot)

- **management coordinated** with commercial fishing businesses;
- **Shared access** to the coast and resources, and in particular, the promotion of joint initiatives agreed with the commercial fishing industry;

⁴ Source: DIRM NAMO

- **Access to information for and accountability** of anglers with regard to protecting the marine environment and resources; understanding and promotion of the socioeconomic benefits associated with this activity sector.

■ Socioeconomic challenges relating to COMMERCIAL SEA FISHING (by boat or on foot)

- **Renewal of the fishing fleet**, currently made up of boats more than 25 years old on average⁴ (with safer, more energy-efficient and comfortable boats and next-generation craft);
- **Personnel renewal** (among crews and business owners), enhancing the **appeal of related professions (in response to hiring difficulties)**, predictive management of jobs and skills, with increased resources for the coast's vocational maritime training facilities, **occupational training** (safety, company management, etc.);
- **Modernisation of the downstream industry**, especially the network of fish markets, to consolidate the competitiveness of the coast's seafood industry;
- **Economic performance** of a fast-changing fishing industry (from fish to consumer, with a focus on recovering (by-products), access to finance, transfer of companies to new owners); adaptation of fisheries to changing fish stocks against a backdrop of climate change;
- **Selective targeting** of fished species and conservation of the marine environment and resources;
- **Ability of the fishing industry to adapt to climate change** (by diversifying activities and promoting, fishing and recovering new species);
- **Trophic index and sanitary quality of water**, and the performance and sustainability of related monitoring systems (covering the environment and shellfish, for example);
- **Access to spaces** (e.g. fishing areas, ports and onshore infrastructures).

Appendix 0 : Geographical map atlas

Beam trawler © Laurent Mignaux - TERRA



■ Socioeconomic challenges specific to AQUACULTURE

- Sustainable approach to aquaculture able to address health and epidemiological risks;
- Diversification of aquaculture production;
- Continued access to production and experimentation areas on the coast, in the hinterland and at sea for this activity, which has suffered from pollution and conflicts of use; trophic index and sanitary quality of water, and the performance and sustainability of related monitoring systems (covering the environment and shellfish, for example);
- Support for businesses on the sea basin (company creation and transfer, access to land and the shore (natural maritime public domain) etc.).



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■ Socioeconomic challenges specific to MARINE AGGREGATE EXTRACTION

- Objective quantification of marine aggregate requirements (via regional quarry plans and the marine aggregate guidelines and sustainable management document,

consistent with the national strategy for transition to the circular economy);

- Definition of an acceptable production capacity for the sea basin (in the DSF) ;
- Legal and fiscal stability.



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Appendix 0 : Geographical map atlas

Appendix 9 : Marine aggregate guidelines and management document (DOGGM)

■ Socioeconomic challenges specific to DEFENCE ACTIVITIES

- Maintaining designated zones of sufficient size for operational activities and military training, particularly for the navy;
- Development of the naval defence industry, which supports growth in high value-added technology industries, which export a large share of their production;
- Preserving jobs.

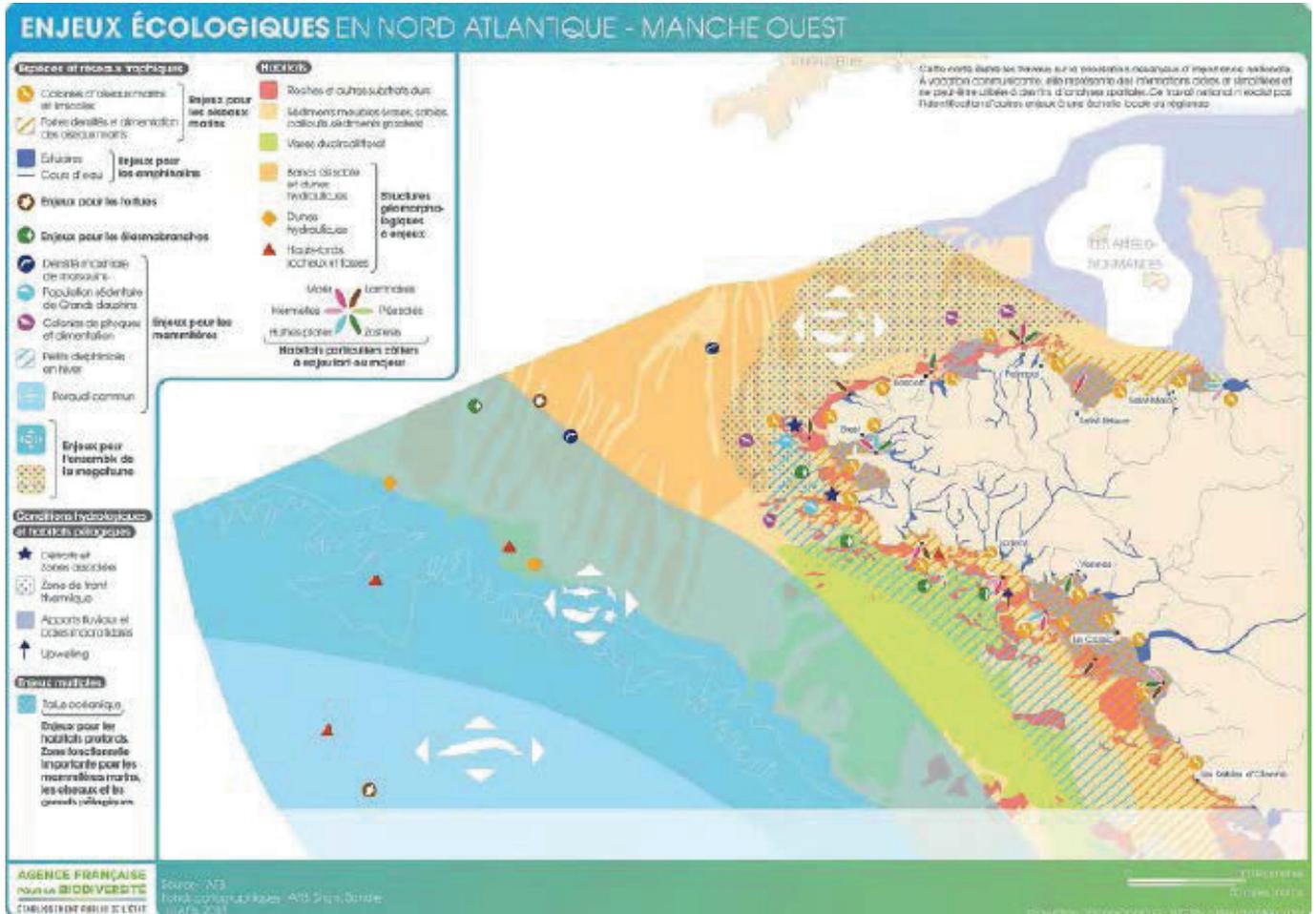


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Appendix 0 : Geographical map atlas

1.2. Marine and coastal ecosystems

A total of 16 large spaces concerned by ecological challenges have been identified along the North Atlantic - Western Channel sea basin. Certain challenges relating to roaming species are cross-sectoral, and may concern either the whole coast or only a particular section.



Such challenges may relate to marine ecosystem components or the need to maintain or restore good ecosystem status. Based on current knowledge, these environmental challenges are treated as priority challenges, based on their representativeness at the scale of the coast, their sensitivity and functionality.

■ Ecological challenges along the North Atlantic- Western Channel sea basin

- Hydrographic conditions, pelagic habitats and food webs, including special hydrological structures;
- Land-sea interface areas and river plumes;
- Primary and secondary producers, and forage species;
- Benthic habitats and geomorphological structures such as biogenic habitats, deep water

habitats, rocky habitats, sedimentary habitats and special geomorphological structures;

- **Narrow evolution areas** for benthic marine species⁵, fish and birds.

⁵ such as spawning grounds, nurseries, areas in which diadromous fish assemble and migrate, local populations of protected and/or targeted benthic invertebrates, locally significant elasmobranchii populations; wading bird nesting sites and feeding areas, sea bird colonies and feeding areas, water bird overwintering sites, maximum density and functional areas identified for sea birds during their non-breeding season; home range of sedentary groups of large dolphins, seal colonies and their feeding areas, and maximum density areas of the harbour porpoise.

- Roaming species such as large diving whales, baleen whales, small toothed whales, sea turtles, commercial fish populations subject to the common fisheries policy, priority elasmobranchii species, priority sea bird species, tuna and swordfish, forage species and groundfish.

- **Water quality** on the mainland and in transitional, coastal and territorial waters;

- **Availability of fresh water** necessary for the good environmental status of the marine environment (particularly in the Normano-Breton Gulf, Morlaix Bay and Pays des Abers, the Iroise sea, between Quiberon and Le Croisic, in the Loire estuary, the Vendée coast and Aiguillon Bay).

- **Development and sharing of a common scientific understanding** relating to the marine environment and the pressures exerted by activities and uses, particularly in the coastal fringe.

Appendix 0 : Geographical map atlas

Key Points

- Geographic location on the boundary between distribution areas for marine and terrestrial, northern and southern, plant and animal species.
- Hydrodynamic and geomorphological properties conducive to a wide range of coastal landscapes and ecosystems.
- 54% of all coastal habitats of Community interest identified on the coasts of metropolitan France.
- Nationally protected plant species present in one-third of coastal municipalities.
- 68% of coastal waters and 57% of estuaries are in good environmental status, according to the criteria defined in the Water Framework Directive (WFD).
- 10 large areas subject to representative environmental challenges in the coastal fringe.
- 6 offshore areas subject to representative challenges.
- Numerous research institutions studying all aspects of coastal and marine biodiversity.
- Ecosystem management will be facilitated by continuously enriching our understanding, particularly with regard to combined impacts. Management approaches must also be adapted due to the complexity of the environment's functions, the importance of local contexts and natural seasonal and year-to-year fluctuations.

1.3. Sites, landscapes and cultural heritage

■ Landscape and cultural challenges along the North Atlantic - Western Channel sea basin

- Landscape value and heritage value of the marine, undersea and coastal spaces that are fundamental to the identity and appeal of the North Atlantic - Western Channel sea basin;
- Iconic sites and landscapes along the coast;

- Awareness of maritime and coastal challenges as a component of the shared culture of coastal populations.
- Built heritage.
- Floating heritage and nautical cultural events.

Appendix 0 : Geographical map atlas

Gulf of Morbihan © FV - DIRM NAMO



Aerial view of the Lorient coastline © Arnaud Bouissou - TERRA



Pointe Saint-Mathieu © Pixabay



Sinagots © FV - DIRM NAMO



Key Points

- Alternating hard and soft rock formations along the North Atlantic - Western Channel waterfront results in diverse coastal landscapes, ranging from low-lying coasts (featuring beaches, dunes, sand and shingle bars, as well as coastal marshland), to rocky coasts and cliffs, inset with deep estuaries, rias and gulfs.
- This coastal landscape is also structured by archipelagos of varying sizes, large islands and associated rocky outcrops, which are the visible portion of the submarine ridge between Rochebonne and the Glénan islands.
- In addition to possessing these natural characteristics, the landscape has been shaped by human activities such as fishing, aquaculture, coastal farming, salt production, shipping and boating, in often difficult sailing conditions (as a result of high tidal ranges and strong currents, rocky outcrops and the large number of coastal and offshore archipelagos).
- These activities have also resulted in a remarkable built and intangible cultural heritage.

1.4. Risks

The risks facing the North Atlantic - Western Channel sea basin are concentrated in areas subject to erosion and low-lying areas vulnerable to storm surges that contain environmentally-classified (SEVESO) facilities.

■ Risk-related challenges along the North Atlantic - Western Channel sea basin

- **Shared understanding of hazards** and related uncertainties and risks associated with the potentially affected territories;
- **Risk culture** among elected officials and year-round and seasonal coastal populations in a context of climate change, yielding more constructive feedback on events.
- **Differentiated management and regulation of existing and future urbanisation**, based on the nature of the exposed coastal and hinterland spaces, their resilience and temporality considerations (relating to electoral terms, service lives of structures, climate cycles, etc.);
- **Safety of people and property in areas subject to coastal risks** (low-lying and

erosion-prone areas, Bigouden coast, coastline in Loire-Atlantique and Vendée, etc) and where applicable, technological risks (e.g. in the industrial and port areas of Saint-Malo, Brest, Lorient, Saint-Nazaire, Nantes, Sables d'Olonne, etc);

- **Safety** of shipping as ships grow in size and numbers, and **maritime safety and security** as more inexperienced recreational boats and new activities (e.g. MRE, etc) compete for space;
- **Sanitary quality** of bathing water and sea food (in terms of microbiological agents and toxins);
- **Management of health risks** associated with certain macroalgae and waste washing onshore.

Appendix 0 : Geographical map atlas



Key Points

- Long and very varied coastline (featuring rocky and sandy shores, dunes and marshes), in places vulnerable to risks relating to coastal erosion, storms, storm surges and flooding, which weigh particularly heavily on the coast (which includes localised polders and areas of soft ground): 2,700 km of coastline, representing 40% of the total coastline of metropolitan France; 24% of the coastline is subject to erosion and 7% accretion.
- Intensive coastal urbanisation and the attractiveness of the coast resulting in concrete sprawl affecting the waterfront and land along the coastal fringe and in the hinterland: 13% of coastal land has been built-up or otherwise developed.
- Diverse range of major, genuine industrial risks concentrated in a few coastal areas: activities of SEVESO-classified hazardous industrial facilities; hazardous material shipping on land and by sea; storage and handling of materials in ports; activities of the French navy Marine involving nuclear propulsion and weapon systems; local dam failures).

1.5. Research, knowledge, innovation and training.

■ Knowledge-related challenges on the North Atlantic - Western Channel sea basin

- **"Maritime orientation" for initial and lifelong education**, whether general or specialised in the marine environment, coast and related activities;
- **Suitable training and qualifications** for maritime professions (particularly in science, MRE, biotechnology, aquaculture, commercial fishing and the boat- and ship-building industries);
- **Development of knowledge** (including local knowledge) and research relating to the marine environment



(e.g. resources and marine environment functions throughout the EEZ), activities and their interactions, in order to facilitate project impact assessments;

- **Sharing knowledge** relating to the marine and coastal environment with elected officials, the general public (popularisation initiatives, including for young audiences) and the international scientific community (publications);
- **Maintaining maritime innovation capabilities** (universities, institutes, businesses, clusters, the Bretagne Atlantique sea cluster, etc.).



Key Points

- Exceptionally density fabric of public and private-sector maritime expertise (Ifremer, French navy hydrographic and oceanographic department (Service hydrographique et océanographique de la Marine - SHOM), French biodiversity agency - protected marine areas (Agence française de la biodiversité des aires marines protégées - AFB - AMP), CEDRE, Centre for Studies on Risks, Environment, Mobility and Urban Planning (Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement - CEREMA), universities, etc.). Multiple tools available to coastal stakeholders: oceanographic vessels, submersibles, automated observatories (in buoys and floats), satellites, networks, the Ifremer high-power computing centre, laboratories and test facilities.
- Many awareness actions for all audiences relying on sea basin' rich maritime heritage, natural areas and museums, state-of-the-art research teams about specific themes like environments and resources, telecommunications, mathematics and medical researches;
- 10 competitiveness clusters like marine cluster Bretagne Atlantique and VALORIAL, both technology research institutes, specialised clusters and transfer and technical expertise centers;
- Universities active in marine research and innovation, technical means (research platform, engineering basin...);
- Formation ranging from the CAP professional degree (certificate of professional competence) to 8-year university degrees with specialised teaching equipments, in particular within maritime schools, the national maritime high school (ENSM), naval colleges, the Central School of Nantes and trainings of engineers specializing in maritimes industries...

1.6. Local planning or integrated management initiatives for the sea and coast

Along the North Atlantic - Western Channel sea basin, many stakeholders from across the maritime spectrum have long been active contributors to sea and coastal planning and management initiatives.

At institutional level, the Bretagne and Pays de la Loire regional authorities have set up twin maritime governing bodies (the Regional Conference [Bretagne] and Assembly [Pays de la Loire] for the Sea and Coast), which have produced a strategy for the sea and coast for each of the two regions. These authorities coordinate their activities with the Maritime Council for the Coast (CMF) and are co-chaired by the French State and the Region. The entire Bretagne coast is included in a locally-led integrated coastal management project.

Two active maritime development schemes (schéma de mise en valeur de la mer - SMVM) have been implemented (in Morbihan and Trégor-

--Goello), together with two marine natural parks (i.e. the Iroise park and the Gironde estuary and Pertuis d'Antioche strait park). The Gulf of Morbihan, Armorique and Marais Poitevin natural parks enhance the quality of the land-sea interface.

The departments of Finistère, Loire Atlantique and Vendée recently implemented a strategy for the sea and coast.

The sea basin's stakeholders have extensive operational and managerial experience, backed by multiple partnerships. A well-developed advisory network is also in place (featuring CESER and competitiveness clusters, including one inter-regional cluster devoted exclusively to the sea).

Appendix 0 : Geographical map atlas

1.7. Interactions between activities and between activities and the environment

■ Interactions between activities

Although the coast is long, with diverse ecosystems, spaces and uses, interactions between activities concern sometimes small areas. In particular, bays, rias, roadsteads and estuaries are areas in which intensive uses are often concentrated in vulnerable environments. The continental shelf and slope are also areas in which multiple professions interact. Roaming professions may interact with each other (such as transportation, commercial fishing and recreational boating) or with activities inherently linked to specific areas (e.g. extractive industries, cables, wind farms, etc.). As a result, multiple users may be obliged to share a particular space at the same or similar times of day, tide conditions, seasons or periods of the year. Such interactions are becoming more frequent as the number and diversity of uses of the sea increase.

Appendix 1 : Detailed description of activities and uses in the coastal and maritime space

Marine renewable energy

MRE operation and shore connections use a space already frequented by numerous actors, potentially leading to usage restrictions. This can be an

obstacle to the development of such technologies. Consultations conducted on the sea basin reveal that the prospect of additional new MRE farms raises difficulties in terms of acceptability by other activities, particularly commercial fishing, and is a source of concern for local residents and sea users.

Restrictions on sea uses associated with MRE projects may be either permanent (corresponding to the operating period) or temporary, concerning only installation and maintenance periods; similarly, they may concern either the whole area or specific locations (e.g. connection points) only, depending on the site's circumstances.

Particular attention must be paid to interactions and risks of conflicts with commercial fishing, relating to the use of space. Such interactions are greatest during the construction phase. During the operational phase, the use of towed gear may be prohibited inside the perimeter of the farm. Arrangements enabling MRE projects to cohabit with existing activities are examined on a case-by-case basis, via the relevant consultative bodies (e.g. consulting and monitoring departments and local and regional nautical commissions), resulting in a decision by the maritime prefect.

Some Marine Renewable Energies and technologies - such as wind power - alter the landscape, prompting conflicts with local residents concerned about the potential impact on tourism, a crucial sector of the sea basin's economy.

However, interactions are not always a source of conflict. For example, the presence of offshore MRE farms can offer career change or diversification opportunities to fishing professionals: maintenance ship building, industrial tourism, etc. In time, synergies between fishing and fish farming activities may emerge in areas used for marine energy production...

Mutual understanding of other activities, consultations and cross-sectoral analyses are among the factors that enable sea basin stakeholders to understand the constraints and challenges faced by all parties, thereby facilitating cohabitation between the sea basin's strategic activities.

Emerging new industries are bringing in new expertise, tie to specialist training provision.

Sea ports and shipping traffic

To facilitate their development, the coast's port complexes have large areas of building land, which are exposed to urban pressure on spaces near the sea and/or the region's major urban areas of Brest and Nantes - Saint-Nazaire. The conversion of certain brownfield dockland areas no longer used for fishing or shipping for alternative purposes (e.g. tourist facilities, recreational boating services, etc.) is another contributory factor in the fierce competition for land around ports.

Some ports manage natural spaces subject to significant environmental challenges (for example Grand Port Maritime de Nantes-Saint-Nazaire), with multiple stakeholders that often have diverging interests, including the French State, local and regional authorities, farmers, hunters, anglers, the coastal and lakeside protection agency (conservatoire du littoral et des rivages lacustres) and environmental protection charities.

Keeping harbour approaches clear by dredging and then dumping sediment at sea is a strategic challenge for estuarine ports, and the subject of

debate between shipping channel users, port authorities and environmental protection charities.

Note that the traffic separation system in operation off Ouessant keeps hazardous shipping traffic away from the coast. In practice, conflicts are rare, relative to the dense traffic, as a result of constant monitoring and the mandatory use of modern, high-performance navigation systems by all vessels passing through the area.

Boat- and ship-building industries

Expanding industrial premises used for boat- and ship-building is essential, in order to develop medium-sized shipyards. This industry is in competition with other industrial activities and development projects in port areas. As a result, gaining and maintaining access to the sea may become more problematic. This tension over land may prompt shipyards and subcontractors to relocate their activities to alternative sites.

From a social perspective, shipyards and dockland industrial estates are major sources of employment. Local and tourist populations identify strongly with them, and they can be instrumental in projecting a positive image of industrial facilities, ports and cities. For example, in addition to shipyard tours, Saint-Nazaire has a travel-themed tourist offering, featuring the "Escal'Atlantique" attraction that relives the history of ocean liners and the golden age of French ship-building. In the recreational boat-building sector, Bénétteau in Saint-Gilles-Croix-de-Vie and Jeanneau's boatyard in Les Herbiers also create jobs and project a positive image of the host region.

The conversion of brownfield industrial dockland sites has become a challenge, as larger cities face the need to "build the city over the city".

Tourist and leisure activities

The development of onshore storage of individual ships (in dry ports or at ship owners' premises) is freeing up port berths. However, the growing popularity of year-round leisure activities is creating additional needs in terms of yard space and access to water, raising the possibility of conflicts between private and professional users.

In coastal fishing and shellfish farming areas, commercial and recreational activities compete - especially during the summer - for space (commercial fishing/water sports, shellfish farming and rockpooling) or resources (commercial fishing/recreational fishing).

In ports, conflicts tend to relate more to development policies and the allocation of space to particular activities.

In order to address the needs of the tourist sector, a portion of coastal land is allocated to the construction of accommodation, tourist facilities and second homes. As a result, multiple stakeholders compete for land, which becomes unavailable to activities in the primary and secondary sectors and unaffordable for employees living in coastal commune.

It is important to encourage synergies between all sea and coastal stakeholders, and promote educational initiatives relating to the sea and sustainable development.

Commercial sea fishing

The development of the aforementioned new uses, combined with the increasing pressures on and necessary protection for the natural environment, are making the question of sharing space a central challenge across all activities. This is particularly sensitive matter for the commercial fishing industry, which is totally dependent on the marine environment's good environmental status.

Conflicts between fishing activities - with regard to fishing practices, species caught and areas of activity - now exist both on the scale of the coast and with other coasts (for example, access to the Bay of Biscay by Danish seine trawlers from the Pays de la Loire).

In time, it may be possible to generate synergies between fishing activities and MRE production areas (leveraging reef effects).

Aquaculture

Aquaculture (including shellfish farming and algaculture) occupy space both on land and at sea. They require facilities in immediate proximity to the sea, putting them in competition for space with all the other coastal activities. Preserving and developing the shellfish farming sector is being made more difficult by fierce competition from property development, recreational boating, tourism and other maritime activities.

Access to the maritime public domain is a sine qua non for maintaining and developing aquaculture activities along the North Atlantic - Western Channel sea basin. Note that there is particular competition with commercial and recreational rockpooling in these shared spaces.

The sanitary quality of sea water may be impaired by certain activities (e.g. urban development, agriculture or manufacturing) well upstream in catchment basins.

The development of aquaculture is heavily dependent on the acceptability of projects to seasonal and year-round residents.

As already indicated, it may be possible to generate synergies between fishing and offshore fish farming activities in marine energy production areas.

Recreational sea fishing enthusiast

The most frequent conflicts of use involve commercial fishing boats and recreational sea fishing enthusiasts. Recreational sea fishing is an activity affected by the full spectrum of interactions involving the many users of the sea (including anglers, sailors, etc.). Fishing near shellfish farming areas is generally prohibited (for example, in Brittany, fishing is banned within 15m of designated sea farming areas) and inside the administrative boundaries of ports.

The development of this activity is dependent on water quality and on consulting and informing all stakeholders, including matters relating to regulations and sharing the maritime domain.

Marine aggregate extraction

Marine aggregate extraction competes mainly with activities that are dependent on the sea bed, such as MRE, trawling and cables. It is not compatible with commercial fishing, especially bottom-trawling.

The development of extractive activities depends heavily on the nature of marine aggregate requirements and the acceptability of projects to local residents, environmental protection charities, local authority representatives and commercial fishing businesses.

Defence

Routine defence activities are non-exclusive and therefore generally have no impact on the activities of other users. Large-scale manoeuvres and special activities (such as mine clearance) may require temporary measures regulating the use of maritime spaces. Whenever possible, measures should be submitted for consultation.

Military ship-building has an economic impact in synergy with private-sector ship-building.

Agriculture

Agriculture interacts with other coastal and maritime activities through its effects on space, landscapes and water quality, as well as its needs in terms of sea-sourced inputs (e.g. aggregate, limestone and siliceous materials, seaweed, etc.). In particular, agriculture interacts with seaside recreational activities, tourism, the coastal residential economy, and fishing, shellfish farming and fishing-related activities.

Positive interactions exist, such as the development of agricultural products sold directly or through local retailers, or the upkeep and restoration of typical landscapes (featuring hedgerows and dry stone walls), which contribute to the coast's tourist appeal.

■ Interactions between activities and the environment

Dependency of activities on a good environmental status

Marine aquaculture, fish trading, recreational boating, water sports, commercial fishing (including harvesting marine plants) and tourism are heavily, and in some cases totally, dependent on the marine environment being in a good environmental status, with particular emphasis on water quality and effective catchment basin management.

Pressures exerted by activities

Maritime transport (shipping) and Ports (including transport infrastructure)	
Significant contribution by the activity	Introduction or spread of non-native species
	Physical loss (due to permanent changes to the substrate or sea bed morphology or extraction of sea bed material)
	Temporary or reversible physical disruption of the sea bed
Minor contribution by the activity	Introduction of nutrients - from diffuse or isolated sources or atmospheric deposits
	Anthropogenic sound (whether sporadic or continuous)
	Modification of hydrographic conditions

Power generation (wind, wave and tidal power), including infrastructures* but also energy production from non-renewable sources	
Potential contribution in case of development of the activity	Physical loss (due to permanent changes to the substrate or sea bed morphology or extraction of sea bed material)
	Temporary or reversible physical disruption of the sea bed
Minor contribution by the activity	Introduction or spread of non-native species
	Modification of hydrographic conditions

Marine works (including submarine cable-laying, polder and other land reclamation works, sea defences and flood protection, structures at sea other than for oil & gas exploration/production, renewable energy or sea bed morphology reshaping, including dredging and dumping*)	
Significant contribution by the activity	Physical loss (due to permanent changes to the substrate or sea bed morphology or extraction of sea bed material)
Minor contribution by the activity	Anthropogenic sound (whether sporadic or continuous)
	Introduction or spread of non-native species
	Modification of hydrographic conditions
	Temporary or reversible physical disruption of the sea bed

Commercial fishing including marine plant harvesting*	
Significant contribution by the activity	Introduction or spread of non-native species
	Physical loss (due to permanent changes to the substrate or sea bed morphology or extraction of sea bed material)
Minor contribution by the activity	Modification of hydrographic conditions
	Temporary or reversible physical disruption of the sea bed
	Catching or mortality/injuries among targeted or non-target wild species (by commercial and recreational fishing as well as other activities)

Oil and gas extraction, including infrastructures*	
Potential contribution in case of development of the activity	Physical loss (due to permanent changes to the substrate or sea bed morphology or extraction of sea bed material)
Minor contribution by the activity	Introduction of organic matter - from diffuse or isolated sources
	Introduction of nutriments - from diffuse or isolated sources or atmospheric deposits
	Anthropogenic sound (whether sporadic or continuous)

Marine aquaculture, including infrastructures*	
Significant contribution by the activity	Introduction or spread of non-native species
Minor contribution by the activity	Modification of hydrographic conditions
	Temporary or reversible physical disruption of the sea bed

Mineral extraction (rock, metallic ore, sand, gravel or shells)*	
Significant contribution by the activity	Physical loss (due to permanent changes to the substrate or sea bed morphology or extraction of sea bed material)
Minor contribution by the activity	Modification of hydrographic conditions
	Temporary or reversible physical disruption of the sea bed

Agriculture (including water extraction)	
Minor contribution by the activity	Introduction of organic matter - from diffuse or isolated sources
	Introduction of nutriments - from diffuse or isolated sources or atmospheric deposits

Industry and industrial uses	
Minor contribution by the activity	Introduction of organic matter - from diffuse or isolated sources
	Introduction of nutriments - from diffuse or isolated sources or atmospheric deposits
	Modification of hydrographic conditions

Concrete sprawl on coast (including land transport, urban uses and waste processing and disposal*)	
Minor contribution by the activity	Introduction of organic matter - from diffuse or isolated sources
	Introduction of nutriments - from diffuse or isolated sources or atmospheric deposits
	Modification of hydrographic conditions
	Physical loss (due to permanent changes to the substrate or sea bed morphology or extraction of sea bed material)

Recreational fishing	
Significant contribution by the activity	Introduction or spread of non-native species
Minor contribution by the activity	Temporary or reversible physical disruption of the sea bed
	Catching or mortality/injuries among targeted or non-target wild species (by commercial and recreational fishing as well as other activities)

Public sector research and development (including maritime training, studies and educational activities)	
Minor contribution by the activity	Anthropogenic sound (whether sporadic or continuous)
	Introduction or spread of non-native species
	Modification of hydrographic conditions
	Catching or mortality/injuries among targeted or non-target wild species (by commercial and recreational fishing as well as other activities)

Tourist and leisure activities (including beachfront activities, boating and water sports)	
Significant contribution by the activity	Introduction or spread of non-native species
contribution mineure de l'activité	Modification of hydrographic conditions
	Temporary or reversible physical disruption of the sea bed

Supervision, safety and public inspection at sea (including Defence activities relating to military operations)	
Significant contribution by the activity	Introduction or spread of non-native species
Minor contribution by the activity	Modification of hydrographic conditions

Air transportation	
Minor contribution by the activity	Introduction of organic matter - from diffuse or isolated sources
	Introduction of nutrients - from diffuse or isolated sources or atmospheric deposits

Fish and shellfish processing*	
Minor contribution by the activity	Introduction or spread of non-native species

Growing awareness of the need for sustainable development is leading to the implementation of policies and regulatory measures intended to improve the quality of the marine environment. The Common Fisheries Policy and implemented in the Marine Strategy Framework Directive (MSFD), the Water Framework Directive (WFD) and environmental protection measures such as protected marine areas bear witness of these policies.

2.1. Cross-sectoral analytical data, from sectoral to integrated

Drawing together the principal challenges relating to the environment, landscapes, maritime and coastal activities, (natural, health, technology and maritime safety) risks, training, research and development, knowledge and national defence, nine "integrative" challenges have been identified for the Northern Atlantic - Western Channel sea basin :

- Good environmental status of the marine environment;
- Quality of coastal waters;
- A strong maritime economy, committed to sustainable use of marine resources and spaces without damaging the environment, safe for the population and with a structural role in host communities;
- Safety of people, property and economic activities located in low-lying areas and/or areas subject to coastal erosion;
- Defence and security activities;
- Accommodation capacity of the coast, maritime spaces and islands, and related access challenges encouraging diverse populations and activities;
- Consideration for maritime affairs by civil society;
- Knowledge;
- Research and innovation.

These integrative challenges form the foundation of the vision for 2030 proposed for the North Atlantic - Western Channel sea basin. They are in step with global challenges and the long-term objectives set out in the SNML.

They are not uniformly spatially distributed, due to the locations of activities and the sea basin's physical and environmental characteristics.

Four different spaces can be distinguished:

- Territorial waters (extending to a distance of at least 12 nautical miles from the coast), from Mont-St-Michel bay to the Pertuis d'Antioche strait;

- Continental shelf, from the Western Channel to the Bay of Biscay;
- Continental slope;
- Abyssal plain.

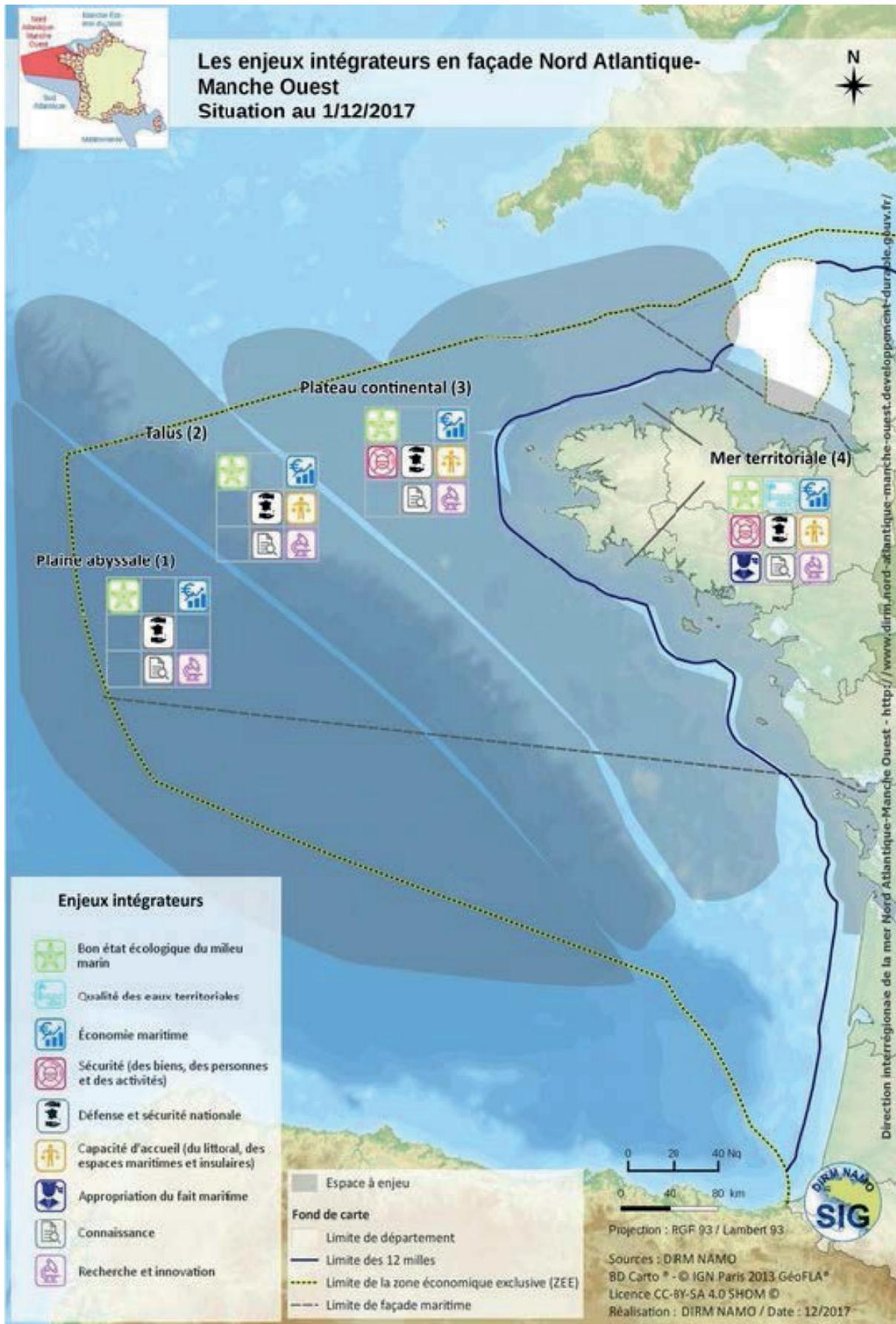
The number of challenges increases in density near the coast, reflecting the more frequent interactions between environments, activities and uses.

These four spaces, shown on the map below intentionally extend beyond the limits of the EEZ or the administrative scope of the North Atlantic - Western Channel sea basin, as the related challenges also extend beyond these arbitrary boundaries.

■ Four distinct spaces reflecting the integrative challenges

- **On the abyssal plain**, the key challenges concern the environment, national defence, knowledge and research and development.
- **On the continental slope**, the aforementioned challenges also apply, together with challenges relating to certain activities (e.g. commercial fishing, transport, and international communication cables).
- **On the continental shelf**, which accommodates intensive economic activity, the risks experienced include those already mentioned, plus maritime safety risks relating to the dense shipping traffic, abundant economic activities, including commercial sea fishing and "cross-Channel" and international goods and passenger transport.
- **In territorial waters**, the full range of challenges coexist, in subsets of varying intensity: economic activities, environment, landscapes, (natural, technological and maritime safety and security risks), knowledge, research and development, training and defence.

Nine integrative challenges



Good environmental status of the marine environment



Deeply impacted by the status of mainland waters, this is a major, consensual challenge along the North Atlantic - Western Channel sea basin, as it affects the uses made of the sea and coast, as well as territorial development, both today and for future generations. The drive to reclaim good environmental status requires the introduction of coordinated environmental policies.

To this end, preserving biodiversity, protecting hinterland wetlands and marshes, controlling the quality and quantity of water exiting sea outfalls and combating isolated maritime pollution incidents are particularly important for the coast.

Water quality in territorial waters



This challenge is influenced by onshore catchment basins and the quality of water exiting sea outfalls. It may also be affected by marine pollution (from shipping, pollution resulting from accidents, etc.).

It impacts a wide range of uses, including aquaculture, fishing and shore-based recreational uses in particular.

A powerful maritime economy, committed to sustainable use of marine resources, spaces and the good environmental status, safe for the population and with a structural role in host communities



This challenge covers the quality, safety and sustainability of maritime fishing, aquaculture and related industries. Furthermore, fishing and aquaculture businesses must address the need to renew their vessels, crews and other production facilities, and maintain the spaces they occupy at sea and on shore, at a time of considerable international uncertainty (exemplified by Brexit). The aim is to develop:

- marine renewable energy, by establishing a new industrial fabric that helps to achieve the objectives of the energy transition;
- centers of excellence in ship-building, boat-building and marine leisure;
- bioresources (e.g. medicinal products, nutraceuticals and food supplements);

- and conduct spatial and temporal planning for marine aggregate extraction activities that reflects actual needs and promotes sustainable extraction of mineral resources.

The key is to support the development of ports and related activities with a focus on synergies, optimisation and networking (via *feeder*⁶ and access to hinterlands⁷), and to maintain harbour approaches. Tourism and marine leisure must also play their part in the ecological and energy transition.

⁶ *Feeder* refers to transshipment between large container vessels (liners) that stop in a limited number of large ports (hubs) and smaller vessels (feeders) that carry offloaded freight to smaller ports not on the routes directly served by carriers.

⁷ Area of influence of port or waterway

Safety of people, property and economic activities located in low-lying areas and/or areas subject to coastal erosion (e.g. aquaculture, tourism, coastal farming, port and related industrial activities).



The most low-lying areas will be directly affected by rising sea levels and the risk of storm surges. Integrated management approaches strive to make territories resilient through coherent urban planning and sustainable development choices, risk prevention measures and, where applicable, relocation projects (adaptation strategy).

Defence and security activities



Such activities contribute not only to the defence-in-depth cover extending from international waters to the coast, but also to the French State's action at sea. This dual approach protects strategic, economic and environmental interests and ensures that the maritime supply chain operates without interruption, while also enforcing all applicable regulations. These activities require training and operations areas at sea, and are supported by an industrial fabric that is particularly well-developed along the sea basin.

Accommodation capacity of the coast, maritime spaces and islands, and related access challenges encouraging diverse populations and activities



These spaces are forecast to see their appeal increase by 2030. On the coast, it is therefore important to identify the means of reversing the trend towards socioeconomic imbalances in coastal areas (associated with tourism, the silver economy, second homes and related services) through initiatives in areas such as land management policy, urban planning and mobility. Such initiatives should support the development of less-seasonal primary and secondary activities in coastal communities. While limiting impacts on the landscape, it is also important to make rational and less monolithic use of space, taking care not to increase the vulnerability of territories in areas subject to coastal risks. These policies will also have to address new practices engendered by the functional economy*, particularly in the area of tourism and habitats (marine leisure and second homes). At sea, the challenge is to use maritime space planning instruments to promote cohabitation between the multiple uses over time, while maintaining access to resources, preserving the marine environment, upholding maritime safety and developing the blue economy.

* *The functional economy focuses on the use of assets rather than their sale.*

Consideration for maritime affairs by civil society



This ambition is driven in the national strategy for the sea and coast, regarding all aspects of value creation involving the sea. Achieving this goal will require a sustained, coordinated mobilisation by citizens as well as economic and political forces.

Greater consideration for the sea and its related challenges, functioning and hazards must be given by citizens, and occasional users in particular. This requires a focus on maritime affairs throughout the education system, from pre-school to higher education, and initial and lifelong training (including teacher training).

Knowledge



Improving our understanding of challenges relevant to the North Atlantic - Western Channel sea basin will shed light on the links between the pressures exerted and human activities (and combinations thereof), and help to better assess their direct and indirect impacts on ecosystems. It will also provides insights into the land-sea system in the context of climate change.

This knowledge must centre on the services provided by the sea, particularly along the shore and coastal area, which is subject to the greatest pressures and is host to outstanding habitats that are sensitive to the combined effects of long-term trends and severe weather events. Coastline dynamics and coastal erosion are also priority challenges for the North Atlantic - Western Channel sea basin.

Research and innovation



Research and innovation activities will provide an international platform for local expertise and know-how, with applications - in the digital age - in industry, materials, marine renewable energy, biotechnology, fishing, aerospace, marine leisure and ship- and riverboat building.

The Bretagne and Pays de la Loire regions benefit from exceptionally dense maritime expertise, backed by initiatives led by territorial stakeholders and non-profit organisations.

2.2. Desired future for the coast

These integrative challenges provide a foundation on which to build the vision for 2030 for the North Atlantic - Western Channel sea basin.

The proposed vision addresses the following three questions :

What coast and what development model do we want by 2030? What status for the marine environment and water bodies? What maritime economy for the sea basin? What priorities in terms of activities and uses?

It is the year 2030, and the men and women of the North Atlantic - Western Channel sea basin, inspired by their strong shared maritime culture, have resolved the antagonism between the economy and the environment by inventing a development model that addresses the major challenges associated with climate change and the ecological and energy transitions in their maritime, island and coastal areas.

Well-being and employment are recognised as prime objectives of the ecological transition; the ability to achieve this transition is dependent on the environment and its resources, which are the bedrock of and a catalyst for a dynamic, sustainable blue economy that creates value for society. The coast's stakeholders protect and uphold ordinary biodiversity, iconic and representative species, habitats and territories, environmental functionality and a network of sites and landscapes symbolic of the identities of Brittany and the Pays de la Loire.

The chosen model gives priority to sustainable recovery and use of marine resources (including energy, fishing, aquaculture and mineral resources) without compromising tourist, sporting and cultural activities. It aims to manage their coexistence in space and time, wherever possible promoting synergies between activities. It ensures that pressures exerted by activities are compatible with the good environmental status of the marine environment and good water quality, particularly in territorial waters and in the hinterland. It is based on a research and development effort with strong local roots, backed by public and private-sector expertise and investments under the Bretagne-Pays de la Loire banner. A network of diversified, complementary ports has been maintained, with more effective environmental and energy management of their activities, inspired by the example set

by Grand Port Maritime Nantes-Saint-Nazaire. The ship-building and repair sector and the marine leisure industry have maintained their standard of excellence.

What maritime and coastal territories, and what management and governance? What will climate change mean for life on the sea basin?

Aided by its framework of dynamic, complementary maritime and coastal territories, the sea basin benefits from cooperation between traditional and new industries that leverage the area's resources and good location.

Faced with rising sea levels, low-lying areas and areas vulnerable to coastal erosion, territorial policy makers have opted for a strategy of resilience (including social and political resilience), with strong commitments from the State and local authorities. This strategy aims to keep exposed populations safe and protect their activities. The urban fabric in areas exposed to storm surges and erosion is light and reversible.

Still attractive and well-suited for economic activities and leisure alike, the territories apply a balanced approach to managing their year-round accommodation capacity. The French State and local authorities define and implement a land development policy that makes efficient use of space and energy and preserves local landscapes. A specific approach to land management in the coastal fringe fosters social and generational diversity, local agriculture that preserves natural equilibria and water quality, and the installation and maintenance of infrastructure and facilities required for maritime activities (including aquaculture, fishing, tourism, boating and marine leisure, ship-building industries, biotechnology, etc.).

**What knowledge of the land-sea system?
What level of adoption of maritime challenges
by civil society?**

In 2030, terrestrial and maritime authorities coordinate their policies. The strong links between the land and the sea, both physically and in social and economic terms, are systematically taken into consideration. Onshore entities have taken effective action to decrease or eliminate the large fraction of marine pollution that originates onshore.

The Ponant Islands are the site of numerous innovative initiatives relating to the coast's ecological and energy transition, and are a showcase for North Atlantic - Western Channel success stories.

The digital transformation has enhanced our understanding and enables more detailed monitoring of marine ecosystems, species and resources in the exclusive economic zone, as well as the human activities that depend on them.

The North Atlantic - Western Channel scientific community is very active, playing an influential role in national, European and global marine and coastal research networks. Presented in layman's terms more easily understood by the public and maritime stakeholders, this knowledge helps governing authorities to make informed, joined-up decisions in a coordinated approach to marine and coastal management. Maritime safety and security is enhanced by intelligent automated systems.

In 2030, the North Atlantic - Western Channel sea basin provides a gateway to the world via its inter-regional and international partnerships. The French State, together with local and regional authorities, continue to invest in initial and lifelong training, empowering people to derive satisfaction and wellbeing from the sea.

Part 2



Strategic objectives and Planning for maritime Spaces

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CHAPTER 1 Environmental and socioeconomic strategic objectives

The North Atlantic - Western Channel sea basin situation review revealed a range of environmental and thematic challenges relevant to all maritime industries.

Based on this assessment, the vision for 2030 identifies a number of long-term strategic orientations for the sea basin's future, relating to four key areas reflecting the long-term goals set out in the SNML:

- reclaiming good environmental status for the marine environment and preserving an attractive coastline ;
- development of a sustainable blue economy ;
- ecological transition for the sea and coast ;
- France as a beacon.

To work toward this vision for 2030, a set of specific strategic objectives have been defined, to be achieved within six years to match the timeframe of the Sea Basin Strategy document. These objectives aim to preserve the marine and coastal environment and boost the maritime economy.

1.1. Environmental strategic objectives

A total of 15 environmental strategic objectives have been defined. Refining these strategic objectives, 56 specific objectives have been set, with related performance indicators and targets in order to assess, track and report on them to national and European institutions.

Descriptors of "good environmental status" as defined in the		Environmental strategic objectives
D1 Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions	Component: Benthic habitats	Limit or avoid anthropogenic physical disruption impacting the good environmental status of coastal benthic habitats, particularly special habitats
	Component: Benthic habitats	Limit or avoid anthropogenic physical disruption impacting the good environmental status of benthic habitats on the continental shelf or in deep water, particularly special habitats
	Component: Marine mammals and turtles	Reduce or avoid pressures resulting in direct mortality and disruption to marine mammals and turtles
	Component: Sea birds	Reduce or avoid pressures resulting in direct mortality, disruption or loss of functional habitats important to the life cycle of sea and shore birds, particularly in the case of vulnerable and endangered species
	Component: Fish	Limit pressures on vulnerable and endangered fish species, or promote their recovery, and limit pressure on important functional sea areas

<p>D2 Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems</p>	<p>Limit the risks of introduction and spread of non-native species as a result of human activities</p>
<p>D3 Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock</p>	<p>Encourage exploitation of fish and shellfish stocks at the maximum sustainable level</p>
<p>D4 All elements of the marine food webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring the long-term abundance of the species and the retention of their full reproductive capacity</p>	<p>Ensure that the environment contains the food web resources necessary for large predators</p>
<p>D5 Human-induced eutrophication is minimised, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters</p>	<p>Reduce excessive nutrient inputs and their transfer to the marine environment</p>
<p>D6 Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected</p>	<p>Avoid loss or physical disruption of marine habitats as a result of maritime and coastal activities</p>
<p>D7 Permanent alteration of hydrographical conditions does not adversely affect marine ecosystems</p>	<p>Limit changes in hydrographic conditions (caused by any kind of human activity) detrimental to ecosystem operation</p>
<p>D8 Concentrations of contaminants are at levels not giving rise to pollution effects</p>	<p>Reduce or eliminate accident-related or sustained releases of chemical contaminants into the marine environment, whether from land or sea</p>
<p>D9 Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards</p>	<p>Reduce microbiological, chemical and phycotoxic contaminations liable to degrade the sanitary quality of seafood, aquaculture and fishing areas or bathing areas</p>
<p>D10 Properties and quantities of marine litter do not cause harm to the coastal and marine environment</p>	<p>Reduce the introduction and presence of waste in the sea and on the coast, whether produced on land or at sea</p>
<p>D11 Introduction of energy, including underwater noise, is at levels that do not adversely affect the marine environment</p>	<p>Limit noise in the marine environment to levels harmless to marine mammals</p>

1.2. Socioeconomic strategic objectives

A total of 15 socioeconomic objectives have been defined, relating to 3 of the 4 long-term objectives set out in the national strategy for the sea and coast (SNML):

Long-term objectives in the SNML	Socioeconomic strategic objectives
Development of a sustainable blue economy	1. Support and promote research and innovation in all areas of the North Atlantic - Western Channel maritime economy
	2. Develop a competent, qualified work force for the North Atlantic - Western Channel blue economy
	3. Promote and support development of the maritime circular economy
	4. Develop marine renewable energy
	5. Accelerate the ecological and energy transition by the coast's ports
	6. Support and promote sustainable boat- and ship-building industries
	7. Encourage sustainable, universally affordable tourism and marine leisure
	8. Encourage sustainable, resilient fishing and aquaculture
	9. Stabilise marine aggregate procurement
	10. Accelerate development of marine biotechnology marines
Ecological transition for the sea and coast	11. Identify, prevent and adopt integrated management of maritime and coastal risks
	12. Promote resilient, balanced maritime, island and coastal territories
France as a beacon	13. Encourage people to understand and appreciate the sea
	14. Explore the sea

Refining these strategic objectives, 41 specific objectives have been set, with related performance indicators and targets in order to assess, track and report on them to national and European institutions. These specific objectives are described in Appendix 6B

The designated uses map for the Northern Atlantic - Western Channel sea basin, based on the situation review and the integrative challenges map, shows a total of 13 distinct maritime spaces. These are coherent areas corresponding to the challenges and strategic objectives assigned to them by the Sea Basin Strategy and other processes (strategies led by the Bretagne and Pays de la Loire territorial authorities, industries, in the SDAGE and SRADDET, etc.).

In all, 13 zones have been identified. They are based not only on administrative and geographic boundaries but also the presence of a uniform set of challenges and objectives :

- 5 zones on the abyssal plain, continental slope and continental shelf;
- 8 zone in territorial waters. Each zone is assigned a designated use, corresponding to a desired evolution of one or more activities and/or the quality of the marine environment an coastal waters. To ensure complementarity and subsidiarity, the designated uses map includes the designated uses established by existing planning measures such as marine natural parks and active maritime development schemes.

Depending on the area, priority is given to one or more activities or environmental requirements, in cohabitation with other activities. The aim is not to prevent but to encourage cohabitation between uses if it benefits the identified strategic objectives, while providing a basis for resolving any disputes based on the priorities determined for the area.

The known technical potential associated with the area (e.g. for MRE, marine aggregate, fishing and/or aquaculture) is described in Appendix 0 (Atlas) to Part 1 of the Sea Basin Strategy Document (Situation Review).

Uses not listed for a particular area may pre-exist the designated uses map or be introduced subsequently, but would not be able to assert a claim to strategic priority as defined herein.

Zone 1 : Abyssal plain

This zone hosts few activities other than shipping and submarine cables. However, a number of ecological challenges have been identified, relating to birds, fish, whales and dolphins in particular. This poorly known area also contains major nurseries (for mackerel, hake and jack mackerel).

Designated use: Use and possible exploitation of the marine environment and resources, subject to gaining a clearer understanding of the area and protecting large whales and their food resources.

This zone is shared with the Southern Atlantic (SA) Sea Basin.

Zone 2 : Continental slope

This zone contains numerous submarine canyons supporting a wide range of habitats (including deep-water coral reefs) that provide shelter for many species of fish, whales and dolphins. Fishing activities have developed at the upper end of the slope.

Designated use: Sustainable use of marine resources without jeopardising habitats or species of concern.

This zone is shared with the Southern Atlantic (SA) Sea Basin.

Zone 3 : Continental shelf

Commercial fishing and shipping are the principal activities in this zone. Any development of new activities (such as marine renewable energy or marine aggregate extraction) will have to make allowance for environmentally sensitive areas (such as the muddy fishing grounds of the Grande Vasière or the Rochebonne shoal).

Zone 3a : Northern continental shelf

Designated use: Priority to sustainable commercial fishing, taking care to enable cohabitation with, in order of importance, shipping and the development of marine renewable energy*; preserving habitats and species of concern.

Zone 3b : Central continental shelf⁸

Designated use: Priority to development of floating wind farms* and sustainable commercial fishing, taking care to enable cohabitation with, in order of importance, shipping and extractive industries; preserving habitats and species of concern.

This zone will be the first to study for the development of floating wind farms, in the light of research conducted at regional level. If necessary, projects may overlap with zone 3b.

This zone borders the Southern Atlantic (SA) Sea Basin.

Zone 4 : Western Channel⁹

The zone is notable for its very dense cross-Channel traffic and intercontinental shipping traffic, which raises significant maritime safety challenges, and for busy commercial fishing activities. Any development of new activities (such as MRE) will have to address the zone's maritime safety, fish-related and environmental challenges (underwater sand dunes, feeding areas for large wildlife, spawning areas for commercial species such as sole and seabass, etc.).

Designated use: Priority to shipping, taking care to enable cohabitation with, in order of importance, sustainable commercial fishing, marine renewable energy* and marine aggregate extraction; preserving sea birds and marine mammals.

In this zone, further research is required in order to accurately identify areas conducive to marine renewable energy projects, if necessary overlapping into other zones, based on the research conducted at regional level.

This zone borders the Eastern Channel - North Sea Basin (MEMN).

Zone 5 : Territorial waters

Numerous human activities and many environmental challenges are concentrated in this space. As a result, the full range of integrative challenges coexist, in subsets of varying intensity: environment, landscapes, natural and technological coastal risks, maritime safety and security, knowledge of the marine environment, research and development and training.

Furthermore, due to their location at the interface between land and sea, onshore pollution also collects in these spaces.

⁸ This zone will be the first to study for the development of floating wind farms, in the light of research conducted at regional level. If necessary, projects may overlap with zone 3b.

⁹ In this zone, further research is required in order to accurately identify areas conducive to marine renewable energy projects, if necessary overlapping into other zones, based on the research conducted at regional level.

Overall priority in zones 5a to 5h to reclaiming good environmental status of the marine environment and water quality (with careful consideration for sediment yields and the link between the land and sea) for the benefit of ecosystem services, and cohabitation between maritime and coastal uses and activities.

Zone 5a : Normano-Breton Gulf and Mont-St-Michel Bay

Mont-St-Michel Bay and the Rance estuary are this zone's standout features. This busy tourist area also plays host to significant shellfish farming activities, as well as commercial and recreational fishing. Special habitats (salt marshes, mud flats and honeycomb worm reefs) make it an important site for birds that must be managed with due consideration for conservation aspects.

Designated use: Priority to cultural heritage, sustainable fishing and aquaculture, in cohabitation with tourist activities and marine ecosystem conservation.

This zone borders the Eastern Channel - North Sea Basin(MEMN).

Zone 5b : Northern Brittany

This zone is characterised by its wide range of uses (including commercial and recreational fishing, aquaculture (including algaculture), marine aggregate extraction, MRE, boating and tourism, and maritime passenger transport); the numerous bays dotting the coastline make it an important site for marine wildlife (birds, fish and small whales). It is home to Batz and Bréhat, two islands in the Ponant island chain, which aims to become a centre for experimentation relating to the ecological and energy transition.

Designated use: Priority to sustainable fishing and aquaculture, taking care to enable cohabitation with, in order of importance, marine renewable energy*, sustainable marine leisure and tourism; preserving habitats of concern, sea birds and marine mammals.

This zone includes the Trégor-Goëlo active maritime development scheme, which defines designated use areas subject to special governance.

Zone 5c : Iroise marine natural park

This zone is notable for its very powerful hydrodynamic activity, offering potential that will be harnessed by the first tidal energy facility. It is home to two large archipelagos (Molène-Ouessant and Chaussée de Sein) in the Ponant island chain, which aims to become a centre for experimentation relating to the ecological and energy transition. A wide variety of activities are conducted in this zone. The marine natural park aims to maintain a harmonious balance between protecting the outstanding natural environment and supporting sustainable economic activities..

Designated use: Understanding of marine heritage, protection and sustainable development of the marine environment (cf. management guidelines defined in Article 6 of Decree 2007-1406 challenged on 28 September 2007, relating to the creation of the Iroise marine natural park).

Zone 5d : Rade de Brest

This zone contains one of the world's largest roadsteads, accommodating a naval base, a trading port specialising in services (repairs, deep-water towing, etc.) and marine renewable energy, as well as well-developed shellfish farming, fishing, boating and marine leisure activities. Its environmental importance derives in particular from the presence of a major maërl bed.

Designated use: Priority to port and related industrial and military activities, taking care to enable cohabitation with, in order of importance, fishing, aquaculture, boating and all sustainable marine activities and tourism; reclaiming good water quality and preserving habitats of concern.

Zone 5e : Southern Brittany

This zone is home to the coast's largest fishing ports, a structurally important shellfish farming industry, shipbuilding and repair yards, as well as a dense marine leisure industry. It also offers opportunities to develop its considerable MRE potential. This is also a major fishery (Grande Vasière), owing in part to the diversity of habitats found in the zone. It contains Groix, Houat, Hoedic and Belle Ile en Mer, four islands in the Ponant island chain, which aims to become a centre for experimentation relating to the ecological and energy transition.

Designated use: Priority to sustainable fishing and aquaculture, taking care to enable cohabitation with, in order of importance, marine renewable energy*, sustainable marine leisure and tourism; preserving sand dunes, habitats of concern and sea birds.

This zone includes the Gulf of Morbihan active maritime development scheme, which defines designated use areas subject to special governance, as well as part of the territory of the Grand Port Maritime.

Zone 5f : Loire estuary

This zone features the mouth of France's largest river and the Grand Port Maritime de Nantes – Saint-Nazaire, a port and industrial complex of global significance, particularly for the cruise liner, aerospace and marine biotechnology industries. Several marine aggregate extraction sites and a wind farm project are located in the zone. These activities must be coordinated with the need to preserve an outstanding natural heritage (featuring mud flats, tidal marshland and salt marshes).

Designated use: Priority to port and related industrial activities and shipping, taking care to enable cohabitation with, in order of importance, sustainable fishing and aquaculture, sustainable marine leisure and tourism, marine renewable energy* and marine aggregate extraction; preserving estuarine and tidal habitats of concern and ensuring that the land-sea interface functions correctly.

Zone 5g : Bourgneuf Bay and the Vendée coastline

This zone is noted by a bay of great importance for zosteria meadows, honeycomb reefworms and kelp. It is home to Île d'Yeu, an island in the Ponant island chain, which aims to become a centre for experimentation relating to the ecological and energy transition. Its dynamic local economy is driven by a prestigious boat-builder, along with tourism, aquaculture and commercial and recreational fishing. Several marine aggregate extraction sites and a wind farm project are located in the zone. There are numerous seaside resorts along this coast, which is very popular with tourists.

Designated use: Priority to sustainable fishing and aquaculture, taking care to enable cohabitation with, in order of importance, marine renewable energy⁹, sustainable marine leisure and tourism; preserving the dunes and habitats and species of concern.

Zone 5h : Gironde estuary and Pertuis d'Antioche strait marine natural park

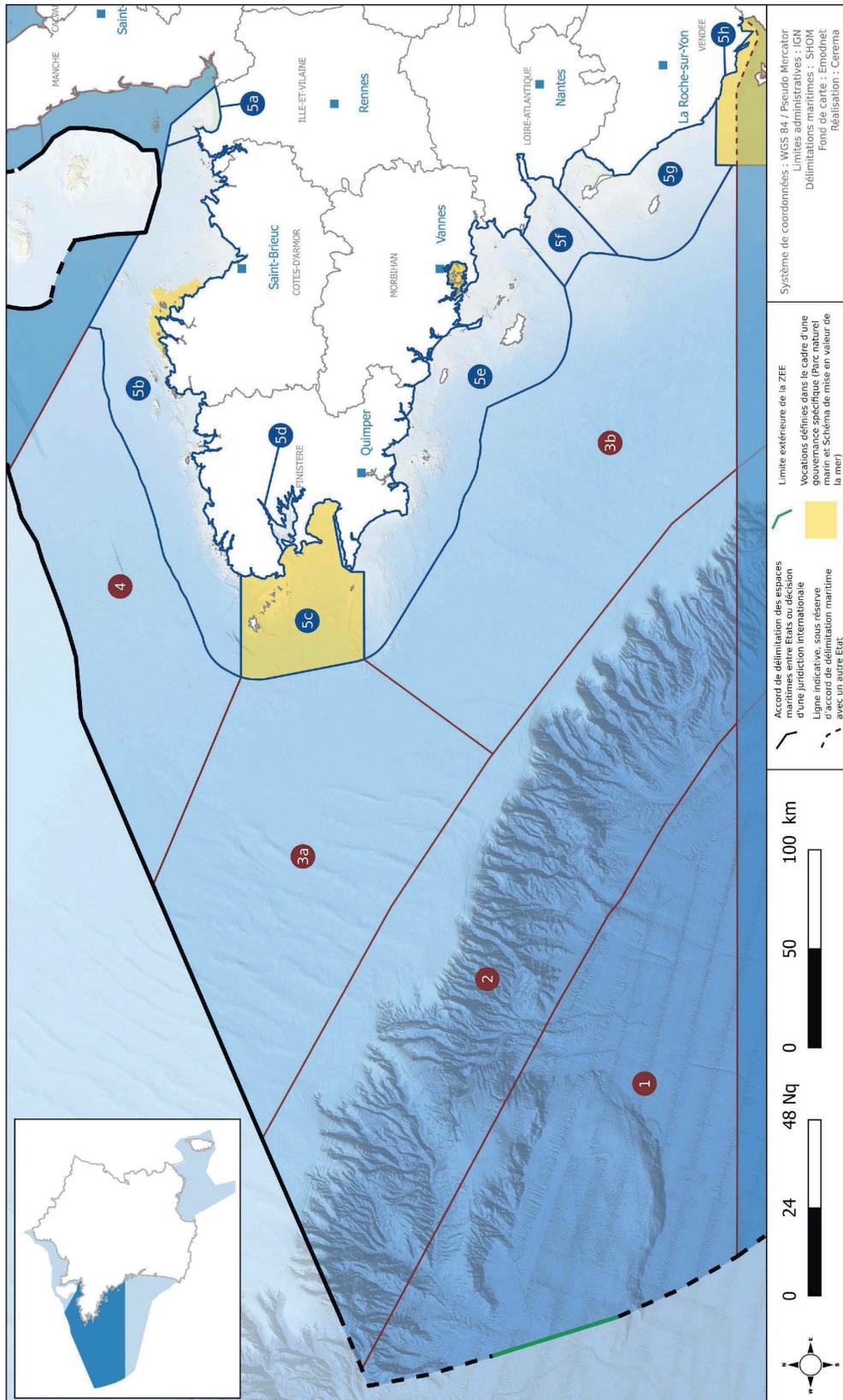
This zone is notable for the number of activities carried out, including fishing, aquaculture, shipping, recreational boating and tourism. These activities must be managed with careful consideration for special habitats (salt marshes, mudflats, etc.) and species of concern (especially diadromous fish).

Designated use: Understanding of marine heritage, protection and sustainable development of the marine environment (cf. management guidelines defined in Article 8 of Decree 2015-424 challenged on 15 April 2015, relating to the creation of the Gironde estuary and Pertuis d'Antioche strait marine natural park).

This zone is largely shared with the Southern Atlantic (SA) sea basin.

A description sheet has been produced for each zone, accompanied by two detailed maps showing the relevant maritime planning information on a more local scale.

The description sheet also identifies the activities present in the zone, any ecological specificities, any planning documents requiring compatibility with or consideration for the Sea Basin Strategy Document and related strategic objectives.



LIST OF ABBREVIATIONS :

- **AFB** : Agence française de la biodiversité (French biodiversity agency)
- **AMP** : Aire marine protégée (Protected marine area)
- **ARML** : Assemblée régionale mer et littoral (Regional assembly for the sea and coast)
- **BEE** : Bon état écologique (Good environmental status)
- **CEREMA** : Centre for Studies on Risks, the Environment, Mobility and Urban Planning
- **CRML** : Conférence régionale mer et littoral (Regional conference for the sea and coast)
- **DCE** : Water Framework Directive
- **DCSMM** : Directive cadre stratégie pour le milieu marin (Marine strategy framework directive - MSFD)
- **DPM** : Maritime Public Domain
- **DSF** : Document stratégique de façade (Sea Basin Strategy document)
- **DST** : Traffic separation system
- **EMR** : Marine renewable energy
- **GPMN-SN** : Grand port maritime Nantes - Saint-Nazaire
- **MEMN** : Manche Est – Mer du Nord (Eastern Channel - North Sea)
- **NAMO** : Nord Atlantique – Manche Ouest (North Atlantic - Western Channel)
- **SA** : Sud Atlantique (Southern Atlantic)
- **SDAGE** : Schémas directeurs d'aménagement et de gestion des eaux (Water development and management masterplan)
- **SHOM** : Service hydrographique et océanographique de la Marine (French navy hydrographic and oceanographic department)
- **SMVM** : Schéma de Mise en Valeur de la Mer (Active maritime development scheme)
- **SRADDET** : Schémas régionaux de développement durable et d'égalité des territoires (Regional scheme for planning, sustainable development and territorial equality)
- **ZEE** : Exclusive Economic Zone

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