



# Marine data and information

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## 15.1 Introduction

Few marine areas in the world are that well investigated as the Belgian part of the North Sea (BNS). This is partly due to a deep-rooted tradition and expertise in marine research in Belgium (**Chapter 1**), but is also a response to the intense use of the BNS (**Chapter 2**). This intensive use of space by a variety of economic activities results in new opportunities, which, however, are related to legislation, monitoring, enforcement and reporting. The policy instruments dealing with the protection of marine ecosystems (Marine Strategy Framework Directive (MSFD), *OSPAR Convention*, etc., see theme **Nature and environment**) increasingly determine the framework in which the maritime sectors can develop in these areas (*Verleye et al. 2015*, *Juridische Codex Kustzone*). The use of space in the BNS is regulated by the Marine Spatial Plan (MSP, RD of 20 March 2014, see also *Van de Velde et al. 2014*). By implementing the MSP and the MSFD, Belgium complies with the European guidelines for the Integrated Maritime Policy (IMP, COM (2007) 575) and lays the foundation for an ecosystem approach to the management of the BNS. Cooperation and coordination between the competent authorities, policy areas and sectors take place in terms of operational tasks, monitoring, enforcement, reporting, use of infrastructure, data collection, etc., within the BNS as well as across the borders (land-sea boundary included).

As one of the cornerstones of the IMP, the Marine Knowledge 2020 strategy (COM (2010) 461) is even more ambitious about an integrated approach. With Marine Knowledge 2020, the European Commission (EC) aims to centralise as well as disclose marine data from different sources. The ultimate goal is to increase efficiency in services to the industry, policy makers and scientists in order to develop new products and services and to deepen the marine knowledge.

## 15.2 Marine data and information management: infrastructures in Belgium

For Flanders and Belgium, the integration and harmonisation of existing scientific marine/maritime knowledge is not a new concept. The infrastructure for the management of marine research data in Belgium is based on two complementary centers:

- The Belgian Marine Data Centre (*BMDC*): part of the Royal Belgian Institute of Natural Sciences (RBINS), Operational Directorate Natural Environment (OD Nature, MUMM) (since 1997);
- The *VLIZ data centre*: part of the Flanders Marine Institute (VLIZ) (since 1999).

Both centres have been appointed as National Oceanographic Data Centres (NODC) in the programme for International Oceanographic Data and Information Exchange (*IODE*) of the IOC-UNESCO. They are international players in the collaboration concerning the management and exchange of oceanographic data and information. For these tasks, the BMDC and the VLIZ data centre rely on a set of data and information systems for the collection, storage, description, exploration, integration, redistribution and access to data, focussing on the BNS and adjacent areas (table 1).

These systems represent the infrastructural backbone for the management of data and information in the BNS and adjacent areas, and take care of the numerous Flemish and Belgian contributions and their inflow in European and global marine data systems. Some examples include: the IODE *Ocean Data Portal* (IOC-UNESCO); the global Ocean Biogeographic Information System (*OBIS*) and its European pillar (*EurOBIS*), which includes the biogeographical data for the BNS; SeaDataNet with its European catalogues for marine environmental datasets (*EDMED*) and research projects (*EDMERP*); and the European Marine Observation and Data Network (*EMODnet*). EMODnet is a cornerstone of the European Marine Knowledge 2020 strategy. The web portal unites marine metadata, data and data products in a standardised manner and has a data policy based on Open Access (OA). It focuses on data sources and information flows collected by EU Member States in a coordinated way, following legally anchored reports and other formal activities.

## 15.3 Marine data and information for the BNS and adjacent areas

Data collection is achieved through a wide range of research and monitoring activities with different objectives: single samplings within the frame of brief research projects (e.g. doctoral thesis); collection of economic and social data (port policy, recreational navigation, aquaculture, etc.); environmental impact assessments (EIAs) for interventions in the BNS (e.g. offshore wind farms); regular monitoring under formal reporting requirements (*Bonn Agreement*, *ASCOBANS*, OSPAR Coordinated Environmental Monitoring Programme (*CEMP*), Common Fisheries Policy (CFP),

Table 1. Overview of data and information systems managed by the Belgian NODC, concentrated on the BNS and adjacent areas. Note: Non-exhaustive list, focusing on publicly accessible data and information systems concerning marine research and management in the BNS and adjacent areas.

NAME (ACRONYM)	DESCRIPTION	SOURCE
Integrated Marine Information System (IMIS)	Marine expertise: institutes, people, publications, projects and datasets	VLIZ • <a href="http://www.vliz.be/imis">http://www.vliz.be/imis</a>
Marine Information and Data Acquisition System (MIDAS)	Data linked to scientific surveys and sampling: navigation, meteorology and underway oceanographic parameters measured aboard the RV Zeeleeuw and RV Simon Stevin	VLIZ • <a href="http://www.vliz.be/vmdcdata/midas">www.vliz.be/vmdcdata/midas</a>
Oceanographic Data Acquisition System (ODAS)	Physicochemical parameters, measurements of currents and waves and CTD-profiles measured aboard the RV Belgica	RBINS, OD Nature (MUMM) • <a href="http://odnature.naturalsciences.be/belgica/en/odas/1293">http://odnature.naturalsciences.be/belgica/en/odas/1293</a>
Integrated Dynamical Oceanographic Data Management (IDOD)	Data on the quality of the marine environment: concentrations of substances in water, air, sediments and biota; includes selection and analysis tools	RBINS, OD Nature (MUMM) • <a href="http://www.mumm.ac.be/datacentre">www.mumm.ac.be/datacentre</a> • <a href="http://dits.bmdc.be">http://dits.bmdc.be</a>
Data and Information Tracking System (DITS)	Metadata and data related to projects and datasets	
Integrated Marine Readings and Samples (IMERS)	Data on sampling campaigns and measurements (in water column, sediment and biota), linked to IMIS, MIDAS and Aphia	VLIZ • <a href="http://www.vliz.be/vmdcdata/imers">www.vliz.be/vmdcdata/imers</a>
Aphia World Register of Marine Species (WoRMS)	Taxonomic register of all known marine species worldwide, including the European (ERMS) and Belgian platform (BeRMS)	VLIZ • <a href="http://www.vliz.be/en/taxonomic-register-marine-species">www.vliz.be/en/taxonomic-register-marine-species</a> • <a href="http://www.marinespecies.org">www.marinespecies.org</a> • <a href="http://www.marinespecies.org/berms">www.marinespecies.org/berms</a>
Marine Data Archive (MDA)	Online platform for archiving data files in the context of data management within a project, institute or individually (private, shared and public)	VLIZ • <a href="http://www.vliz.be/en/marine-data-archive">http://www.vliz.be/en/marine-data-archive</a>
ScheldeMonitor	Data and information portal for the Scheldt Estuary: provides access to information, measurements and data products (commissioned by the Flemish-Dutch Scheldt Commission-VNSC)	VLIZ (commissioned by VNSC) • <a href="http://www.scheldemonitor.org">www.scheldemonitor.org</a>

MSFD, etc.); as well as extensive operational data streams regarding shipping movements (Scheldt Radar Chain (SRC) and Vessel Traffic Services (VTS), Dredging Information System (Baggerinformatiesysteem (BIS)), wave and tidal climate (Flemish Banks Monitoring Network)).

The ex post gathering and integration of data and information from various sources is not self-evident. It relies on cooperation for the development of standards, agreements and harmonisation for the benefit of interoperable data infrastructures (*inter alia* INSPIRE Directive 2007/2/EG), and a clear data policy (Aarhus Convention, Open Access movement). Despite the increased collaboration in order to efficiently collect data and make it available, it is not evident for professional users to get an overview of the available, digitally accessible data and information concerning the coast and sea. A non-exhaustive list of publicly accessible socio-economic, ecological and environmental data relevant to the BNS and the adjacent estuaries and coastal areas, is available in the annex. This list is largely classified according to the themes discussed in Chapter 2 ‘Use of the sea’.

## 15.4 Access and use

The extent to which information is freely available, can vary widely depending on the context and the purposes for which the data collection is intended. With the Marine Knowledge 2020 strategy, the EC strives for an Open Access policy (OA). OA means free online access to (scientific) information and data (Open Data). OA publications and data can easily be found online and are therefore readily available to researchers and other users, without requiring them to pay a fee. For marine scientists in Belgium, VLIZ manages the Belgian marine repository for literature: the Open Marine Archive (OMA). The Belgian Marine Bibliography<sup>1</sup> (BMB) is the reference list for all publications focussing on

<sup>1</sup> The definition of the BMB collection is more comprehensive than the publications of the marine research groups (MRGs) (see Chapter 1, Inventory marine research).

the Flemish coast and the BNS and all other marine, estuarine and coast related publications from Belgian authors and scientists, and from foreign scientists affiliated to a Belgian institute. About 60% of the publications in the BMB collection (34,225 records total) are digitally available through OMA (situation on 30/10/2015).

The most powerful model of OA publishing, however, is the fully digital and 100% OA journal title, for which the publication costs are taken on by the publisher and the authors. Analyses carried out in the Web of Science database based on the BMB collection, demonstrate that OA publishing presents the best result in terms of visibility and impact (Analysis VLIZ Information Management 2015).

In addition to publications, data should be made available as much as possible for scientific research, both on a national and an international level (Marine Knowledge 2020). When only limited access can be granted, the public disclosure of data descriptions allows an exploration of the existing datasets.

In line with the BMB collection, VLIZ also works on a collection of Belgian Marine Datasets (BMD)<sup>2</sup>. A first subset was disclosed as the datasets '[Belgian coast and sea](#)', an inventory of datasets specifically focussing on the Flemish coast, estuaries and the BNS. This collection provides access to 522 thematically searchable datasets (situation on 30/10/2015).

Scientific data are unique and valuable and must be preserved from loss. To this end, VLIZ developed the Marine Data Archive ([MDA](#)), a secure online system where researchers can archive and, if desired, publish their data files in a well-documented manner. Publishing data sets is increasingly taken into account as a citable contribution to the research curriculum. Citing research data is important, *inter alia* for the traceability and crediting (impact) of data. The VLIZ data centre provides assistance to researchers with regard to the publication of their data and to assign a DOI (Digital Object Identifier) under the care of [DataCite](#), which develops guidelines and standards for the traceable and citable publication of data (DOI [Manual](#) - <http://www.vliz.be/en/data-submission>).

Internationally accepted data standards and policies ([IOC data policy](#), [Ocean Data standards](#), [ICSU World Data System](#), [EU Open research data pilot](#), etc.) are also used as a base for the further promotion of efficient data streams. These data policies constitute the core service of the NODCs with regard to making data and information, provided by third parties, publicly available.

Table 2. List of data sets (situation on 30/10/2015) for the BNS and adjacent estuaries and coastal areas, which are disclosed in the BMD.

THEME	NUMBER
Species diversity	291
Physico-chemistry	126
Morphodynamics	89
Ecological functioning	81
Diversity habitats	49
Hydrodynamics	41
Fisheries	23
Methods and techniques	10
Shipping	4
Meteorology	3
Safety	3
Marine waste	2
Recreation and tourism	2
Socio-economic system	2

<sup>2</sup> The reference list of datasets on the Flemish coast and the BNS, and all the other marine, estuarine and coastal datasets of Belgian authors and scientists and foreign scientists affiliated to a Belgian institution.

This kind of immediate and unrestricted access to scientific publications and data promotes innovation, adds value to research, the economy and society in general and complies with the intentions of the European and international policy regarding marine knowledge.

## 15.5 Annex

**Table. Data and information sources focussing on the Belgian part of the North Sea and adjacent areas, by topic. A non-exhaustive list of digital and open sources, acknowledging the respective information managers and web page.**

THEME	DESCRIPTION	INFORMATION MANAGER	SOURCE
<b>General</b>			
Geography, location and administration	Marine Atlas: Geographical information on the BNS and the user functions	RBINS, OD Nature (MUMM)	<a href="http://odnature.naturalsciences.be/marine-atlas">http://odnature.naturalsciences.be/marine-atlas</a>
Geography, location and administration	The Coastal Atlas: geographic and administrative information on the BNS and the adjacent estuaries and coastal zones	Province of West Flanders – Coastal Territorial Cooperation	<a href="http://www.kustatlas.be">www.kustatlas.be</a>
Place names and geo-terms (sea)	Marine Regions, VLIMAR Gazetteer and VLIZ Maritime Boundaries Geodatabase: geographic descriptions and place names, including coordinates (sandbanks, areas, estuaries, exclusive economic zone (EEZ), etc.), with an initial focus on the BNS and adjacent areas	VLIZ	<a href="http://www.marineregions.org/about.php">http://www.marineregions.org/about.php</a>
General indicators administration, population, economy	National Statistics: economy, population, use of space, energy, etc. Local Statistics Flanders: population, economy, use of space, etc., at the municipal level, including coastal and polder municipalities	Directorate-General Statistics (ADSEI), Studiedienst van de Vlaamse Regering (SVR), in cooperation with the <i>Agentschap voor Binnenlands Bestuur</i> (ABB) and local authorities	<a href="http://statbel.fgov.be/en/statistics/figures/">http://statbel.fgov.be/en/statistics/figures/</a> <a href="http://www.lokaalstatistieken.be">www.lokaalstatistieken.be</a>
<b>Meteo-Physico-Hydro</b>			
Meteorology and hydrology	Flemish Banks Monitoring Network - oceanographic parameters: tide and tidal height, currents, waves and water temperature	Agency for Maritime and Coastal Services (MDK) - Flemish Hydrography	<a href="http://www.meetnetvlaamsebanken.be">www.meetnetvlaamsebanken.be</a>
Meteorology and hydrology	Operational models hydro-meteo	RBINS, OD Nature (MUMM)	<a href="http://www.mumm.ac.be/EN/Models/Operational/index.php">http://www.mumm.ac.be/EN/Models/Operational/index.php</a>
Characteristics of sea water	Flemish Banks Monitoring Network - temperature, salinity, oxygen concentrations and acidity	Agency for Maritime and Coastal Services (MDK) - Flemish Hydrography	<a href="http://www.meetnetvlaamsebanken.be">www.meetnetvlaamsebanken.be</a>
Historical time series	4 decades of Belgian marine monitoring - 4DEMON: data concerning water quality, eutrophication, ocean acidification, etc., collected over the past four decades in the BNS	BELSPO, Institute for Agricultural and Fisheries Research (ILVO), RBINS, OD Nature, VLIZ	<a href="http://4demon.be/">http://4demon.be/</a> <a href="http://4demon.be/data-products">http://4demon.be/data-products</a>
	Historical temperature and salinity measurements in the BNS and adjacent areas	ICES, VLIZ, RBINS	<a href="http://www.vliz.be/en/imis?module=dataset&amp;dasid=5096">http://www.vliz.be/en/imis?module=dataset&amp;dasid=5096</a>
Sea level and water levels	Operational data about tides, precipitation, water flows, water levels and drought, floods, sediment amounts based on field measurements (WISKI database); predictions concerning water levels and flow rates based on these data	Flanders Hydraulics Research – <i>Hydrologisch Informatie Centrum</i> (HIC)	<a href="http://www.waterinfo.be/">http://www.waterinfo.be/</a>
	Time series and historical sea level compared to a reference level on land: real-time monitoring of the sea level in monitoring stations in collaboration with GLOSS (Global Sea Level Observing System) and IOC (Intergovernmental Oceanographic Commission): station Ostend	MDK, LOSS (IOC-UNESCO) (VLIZ)	Ostend: <a href="http://www.ioc-sealevelmonitoring.org/station.php?code=oste">http://www.ioc-sealevelmonitoring.org/station.php?code=oste</a>
Climate, wind climate, solar energy	Climate atlas: temperature (air), pluviometry, solar radiation, duration of sun shine	Royal Meteorological Institute of Belgium (RMI)	<a href="http://www.meteo.be/meteo/view/ni/16788784-klimaatlas.html">http://www.meteo.be/meteo/view/ni/16788784-klimaatlas.html</a>

THEME	DESCRIPTION	INFORMATION MANAGER	SOURCE
<b>Use of space</b>			
Marine Spatial Plan (MSP) for the BNS	Overview of zoning and use of space in the BNS	RBINS, OD Nature (MUMM)	<a href="http://odnature.naturalsciences.be/marine-atlas/data">http://odnature.naturalsciences.be/marine-atlas/data</a>
Spatial plans – coastal zone	Spatial Implementation Plans (RUPs), maps and instructions available for coastal municipalities, including the RUPs 'beach and dike'  Spatial vision for agriculture, nature and forest for the region 'Coast, Polders and Westhoek area'	Province of West Flanders  RWO Flanders	<a href="http://www.west-vlaanderen.be/kwaliteit/Leefomgeving/rup/Paginas/default.aspx">http://www.west-vlaanderen.be/kwaliteit/Leefomgeving/rup/Paginas/default.aspx</a>  <a href="http://rsv.vlaanderen.be/RSV/RuimtelijkStructuurplanVlaanderen/Planningsprocessen/Landbouwnatuurenbos/KustPoldersenWesthoek">http://rsv.vlaanderen.be/RSV/RuimtelijkStructuurplanVlaanderen/Planningsprocessen/Landbouwnatuurenbos/KustPoldersenWesthoek</a>
Use of space and development projects (land)	Use of space all sectors – Overview of development projects: overall projects, rural projects, land development projects, land consolidation projects and nature development projects	Flanders Geographical Information Agency (FGIA – AGIV)  Flemish Land Agency (VLM)	<a href="http://www.geopunt.be/">http://www.geopunt.be/</a>  <a href="https://www.vlm.be/en">https://www.vlm.be/en</a>
<b>Nature and environment</b>			
Species Register BNS	Belgian Register of Marine Species (BeRMS): full list of species, taxonomic information and sources for all known species	VLIZ	<a href="http://www.marinespecies.org/berms">www.marinespecies.org/berms</a>
European Habitats and Birds Directives	Estuaries, mud flats and salt marshes, dune areas, polders and polder complexes	Environment, Nature and Energy department (LNE)	<a href="https://www.natura2000.vlaanderen.be/">https://www.natura2000.vlaanderen.be/</a> <a href="http://bd.eionet.europa.eu/activities/Natura_2000/index.html">http://bd.eionet.europa.eu/activities/Natura_2000/index.html</a>
LifeWatch	The Belgian LifeWatch project is part of the European LifeWatch infrastructure and was established as part of the European Strategy Forum on Research Infrastructure (ESFRI) and can be viewed as a virtual laboratory for biodiversity research	VLIZ, INBO, Hercules Foundation	<a href="http://www.lifewatch.be/">http://www.lifewatch.be/</a>
Invasive species	List of non-indigenous species in the BNS and adjacent estuaries, indicating the distribution and the year of the first observation	VLIZ Alien Species Consortium	<a href="http://www.vliz.be/en/non-indigenous-species">http://www.vliz.be/en/non-indigenous-species</a>
Biological valuation - sea	Biological valuation map for the BNS	BELSPO project consortium: Marbiol (UGent), INBO, Renard Centre of Marine Geology (RCMG) (UGent), ILVO and VLIZ	<a href="http://www.vliz.be/projects/bwzee/atlas.php">http://www.vliz.be/projects/bwzee/atlas.php</a>
Biological valuation (habitat and species) – coastal zone (land)	Biological valuation map – land side, including dune areas, mud flats and salt marshes	INBO	<a href="http://www.geopunt.be/catalogus/applicationfolder/biologische-waarderingkaart">http://www.geopunt.be/catalogus/applicationfolder/biologische-waarderingkaart</a>
Ecosystem services and products (land)	Nature value explorer: importance and economic valuation of ecosystem services for Flanders	Environment, Nature and Energy department (LNE), Flemish Institute for Technological Research (VITO), Antwerp University, Agency for Nature and Forest (ANB)	<a href="http://natuurwaardeverkenner.be/nwv2/">http://natuurwaardeverkenner.be/nwv2/</a>
Good environmental status (GES) of the marine waters (MSFD)	MSFD - Belgian marine monitoring programme aimed at MSFD descriptors and indicators for monitoring the GES: online search tool for all components of the monitoring programs of the Belgian coastal waters, as reported to the EC	RBINS, OD Nature (MUMM) With the support of the EU project JMPS-NS, and in broader collaboration with experts in Flanders and Belgium	<a href="http://www.msfd-monitoring.be/2014/public/explorePgms.xhtml">http://www.msfd-monitoring.be/2014/public/explorePgms.xhtml</a>
Good ecological and chemical status of the marine waters (Water Framework Directive, WFD)	WFD - focused on the monitoring of the good ecological and chemical status. For the good ecological status in marine waters, the WFD reaches to 1 nautical mile seawards of the low water mark. For the good chemical status, the WFD reaches to 12 nautical mile seawards of the low water mark.	Coordination Committee on Integrated Water Policy (CIW)	<a href="http://www.integraalwaterbeleid.be/en">www.integraalwaterbeleid.be/en</a>

THEME	DESCRIPTION	INFORMATION MANAGER	SOURCE
Water quality surface waters and nutrients	Measurements of nitrate and phosphate concentrations in surface waters in Flanders in the monitoring network for the observation of water quality (monitoring network in the framework of the Manure Action Plan)	Flanders Environment Agency	<a href="http://geoloket.vmm.be/Geoviews/">http://geoloket.vmm.be/Geoviews/</a>
Bathing water quality	Quality of the swimming water in bathing areas of the coast during bathing season, according to bacteriological standards of the European Bathing Water Directive	Flanders Environment Agency	<a href="http://www.kwaliteitzwemwater.be">www.kwaliteitzwemwater.be</a>
<b>Dredging and dumping</b>			
	Evolution of the amount of dumped dredged material in the BNS since 1991	RBINS, OD Nature (MUMM)	<a href="http://www.mumm.ac.be/NL/Management/Sea-based/table4.php">http://www.mumm.ac.be/NL/Management/Sea-based/table4.php</a>
	Location of the dumping ground for dredged material and the intensity of dredging in the BNS (see MSP)	Maritime Access division (aMT)	
<b>Fisheries</b>			
Belgian commercial fisheries activities	Supply and revenue Fisheries: Year reports and results of data collection in line with the Common Fisheries Policy (CFP): supply (ton), revenue (euros)	Agriculture and Fisheries department, Sea Fisheries service	<a href="http://lv.vlaanderen.be/nl/visserij">http://lv.vlaanderen.be/nl/visserij</a> <a href="http://www.vlaanderen.be/nl/visserij/jaarlijkse-overzichten">jaarlijkse overzichten</a>
Belgian fleet	Size and characteristics of the commercial fishing fleet Results of the fleet	FPS Mobility and Transport	Official list of the Belgian fishing fleet <a href="http://mobilit.belgium.be/nl/scheepvaart/zeeverij">http://mobilit.belgium.be/nl/scheepvaart/zeeverij</a>
History of the Belgian commercial fleet	An overview of the fishing vessels from 1929 onwards, at the level of individual vessels	VLIZ	<a href="http://www.vliz.be/cijfers_beleid/zeeverij/fleet.php">www.vliz.be/cijfers_beleid/zeeverij/fleet.php</a>
Total allowable catch and quota	The Flemish fisheries quota	Agriculture and Fisheries department, Sea Fisheries service	<a href="http://lv.vlaanderen.be/en/nieuws/visserij">http://lv.vlaanderen.be/en/nieuws/visserij</a>
Historical timelines fisheries	Historical landings, revenue, fishing grounds, fleet, etc. since 1929	VLIZ, 'A century of sea fisheries in Belgium'	<a href="http://www.vliz.be/cijfers_beleid/zeeverij/">www.vliz.be/cijfers_beleid/zeeverij/</a>
State of the fish stocks	Fish stock assessment and biological advice for EU fisheries management	ILVO – research group Fisheries biology, in cooperation with ICES	<a href="http://www.ices.dk/community/advisory-process">http://www.ices.dk/community/advisory-process</a> Versions advice for non-experts: <a href="http://www.ices.dk/publications/our-publications/Pages/Popular-advice.aspx">http://www.ices.dk/publications/our-publications/Pages/Popular-advice.aspx</a>
<b>Tourism</b>			
	Arrivals and overnight stays Residential tourism, day trippers and tourist spending	Westtoer Tourism Flanders	<a href="http://www.westtoer.be/nl/kenniscentrum">http://www.westtoer.be/nl/kenniscentrum</a> <a href="http://www.toerismedatabank.be">www.toerismedatabank.be</a>
<b>Aquaculture</b>			
Aquaculture areas	Areas reserved for aquaculture in the BNS	RBINS, OD Nature (MUMM)	See Use of space at sea
Sluice dock Ostend	Monitoring of the quality of shellfish waters (also see Nature and environment)	VLIZ	<a href="http://www.vliz.be/spuikom/doelstelling.php">www.vliz.be/spuikom/doelstelling.php</a>
Aquaculture production	Annual aquaculture production in Belgium	FAO	<a href="http://www.fao.org/fishery/statistics/global-aquaculture-production/en">http://www.fao.org/fishery/statistics/global-aquaculture-production/en</a>
Historical aquaculture production	History and production of the Belgian oysters farms	VLIZ	<a href="http://www.vliz.be/wiki/Historiek_van_de_Belgische_oesterweek">www.vliz.be/wiki/Historiek_van_de_Belgische_oesterweek</a>
<b>Offshore energy</b>			
Offshore wind energy	Overview of the sites and used area of the domain concessions for wind turbines in the BNS	FPS Economy RBINS, OD Nature (MUMM) and Belgian Offshore Platform (BOP)	<a href="http://www.mumm.ac.be/NL/Management/Sea-based/windmills_table.php">www.mumm.ac.be/NL/Management/Sea-based/windmills_table.php</a> <a href="http://www.belgianoffshoreplatform.be/nl/projects">www.belgianoffshoreplatform.be/nl/projects</a>

THEME	DESCRIPTION	INFORMATION MANAGER	SOURCE
<b>Sand and gravel extraction</b>			
Sand and gravel extraction	Amount of mined sediment and location of the domain concessions	FPS Economy, Continental Shelf Service	<a href="http://economie.fgov.be/en/entreprises/particular_domains/Marine_sand_and_gravel_extraction/">http://economie.fgov.be/en/entreprises/particular_domains/Marine_sand_and_gravel_extraction/</a>
<b>Maritime and coastal heritage</b>			
Maritime archaeological heritage	Shipwrecks (and their contents) in the North Sea and in Flanders, loose objects found at sea and maritime sites on land such as fishing villages and lighthouses	Flanders Heritage Agency Flemish Hydrography	<a href="http://www.maritieme-archeologie.be">www.maritieme-archeologie.be</a> <a href="http://www.vlaamsehydrografie.be/wrakkendatabank.htm">www.vlaamsehydrografie.be/wrakkendatabank.htm</a> <a href="http://www.wrecksite.eu">www.wrecksite.eu</a>
Historical fleet	Inventory historical fleet	Flanders Heritage Agency	<a href="https://inventaris.onroerendergoed.be/ivm/varend/zoeken">https://inventaris.onroerendergoed.be/ivm/varend/zoeken</a>
Architectural heritage	Inventory immovable heritage  Geoportal immovable heritage: an overview of the spatial distribution of the protected architectural heritage along the coast	Flanders Heritage Agency	<a href="https://inventaris.onroerendergoed.be">https://inventaris.onroerendergoed.be</a> <a href="https://geo.onroerendergoed.be">https://geo.onroerendergoed.be</a>
Underwater heritage	Geographic information system with the position of underwater cultural heritage in European seas  Interactive geoportal with respect to the underwater heritage (including prehistoric finds) in the BNS (under development)	<i>Archaeological Atlas of the 2 Seas</i>  SEARCH project consortium	<a href="http://www.atlas2zeen.eu/">http://www.atlas2zeen.eu/</a> <a href="http://www.sea-arch.be/en">www.sea-arch.be/en</a>
<b>Legal information</b>			
	Legal Codex Coastal zone: Coastal Codex	MDK – Coastal Devision	<a href="http://www.kustcodex.be/kustcodex-consult/">http://www.kustcodex.be/kustcodex-consult/</a>
	Manual 'Marine policy instruments and legislation for the Belgian part of the North Sea'	VLIZ	<a href="http://www.compendiumkustenzee.be/en">www.compendiumkustenzee.be/en</a>
<b>Operational data streams: (*) non-public data</b>			
Shipping movements (*)	Scheldt Radar Chain (SRC) and Vessel Traffic Services (VTS)	Agency for Maritime and Coastal Services (MDK)	<a href="http://www.scheepvaartbegeleiding.be/en/vts/tasks">http://www.scheepvaartbegeleiding.be/en/vts/tasks</a>
Dredging (*)	Dredging information system (Baggerinformatiesysteem (BIS))	Maritime Access division (aMT)	<a href="http://www.maritiemetoegang.be/het-baggerinformatie-systeem">http://www.maritiemetoegang.be/het-baggerinformatie-systeem</a>
Satellite observations	REMSEM remote sensing and ecosystem modelling tools, focused on the BNS: long time series of chlorophyll-a, total suspended matter, and surface water temperature, based on satellite observations MODIS, MERIS and SeaWiFS	RBINS, REMSEM-OD Nature	<a href="http://odnature.naturalsciences.be/remsem/software-and-data/timeseries">http://odnature.naturalsciences.be/remsem/software-and-data/timeseries</a>
LifeWatch – Bird migrations	Real-time tracking data of large sea birds (European herring gull and lesser black-backed gull)	VLIZ	<a href="http://www.lifewatch.be/en/real-time-data-birds">http://www.lifewatch.be/en/real-time-data-birds</a>



## Legislation reference list

Table with international agreements, conventions, etc.

INTERNATIONAL AGREEMENTS, CONVENTIONS, ETC.			
Abbreviations (if available)	Title	Year of conclusion	Year of entering into force
<i>Bonn Agreement</i>	Agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances	1983	1989
<i>ASCOBANS</i>	Agreement on the conservation of small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas	1991	1994
<i>OSPAR Convention</i>	Convention for the protection of the Marine Environment of the North-East Atlantic	1992	1998
<i>Aarhus Convention</i>	Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters	1998	2001

Table with European legislation. The consolidated version of this legislation is available on [Eurlex](#).

EUROPEAN LEGISLATION			
Abbreviations (if available)	Title	Year	Number
<b>Directives</b>			
<i>Habitats Directive</i>	Directive on the conservation of natural habitats and of wild fauna and flora	1992	43
<i>Water Framework Directive</i>	Directive establishing a framework for Community action in the field of water policy	2000	60
<i>Bathing Water Directive</i>	Directive concerning the management of bathing water quality and repealing Directive 76/160/EEC	2006	7
<i>INSPIRE Directive</i>	Directive establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)	2007	2
<i>Marine Strategy Framework Directive</i>	Directive establishing a framework for Community action in the field of marine environmental policy (Marine Strategy Framework Directive)	2008	56
<i>Birds Directive</i>	Directive on the conservation of wild birds	2009	147
<b>Regulations</b>			
<i>Common Fisheries Policy</i>	Regulation on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC	2013	1380
<b>Other (Decisions, Communications, White Papers, etc.)</b>			
<i>Integrated Maritime Policy</i>	Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - An Integrated Maritime Policy for the European Union	2007	575
<i>Marine Knowledge 2020</i>	Communication from the Commission to the European Parliament and the council: Marine Knowledge 2020 - marine data and observation for smart and sustainable growth	2010	461

