



**DATA
TERRA**



ODATIS

Streamlining data and service centres for easier access to data
and analytical services:
the approach of the French Research Infrastructure Data Terra
and its marine pole ODATIS

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EPOC: Oceanic and Continental Environment and Paleoenvironment



Monbasa, Dec 13 2022

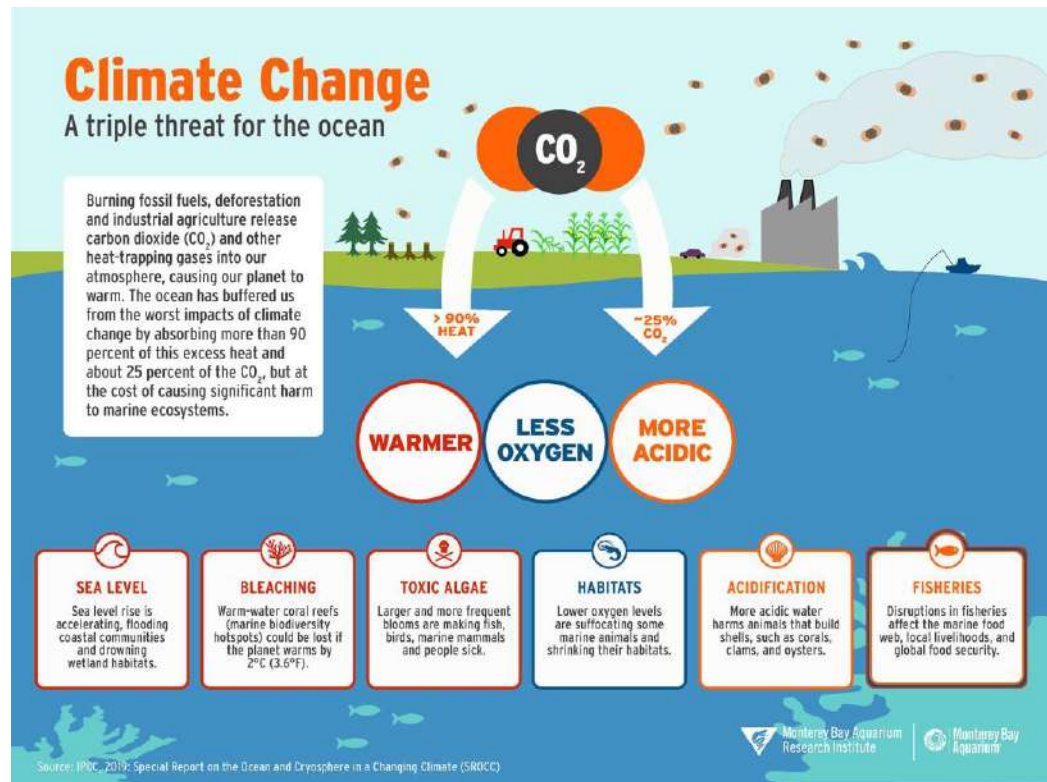
contact@odatis-ocean.fr | www.odatis-ocean.fr

Global change

Anthropocene Era:

since the industrial revolution, the imprints of human activities on the global environment have intensified.

The ongoing and expected consequences of the global change on the ocean are multiple.



A critical need to better understand and forecast the impacts of global change

Observations are needed at all the stages of the scientific process:
description, understanding, modelling and forecasting

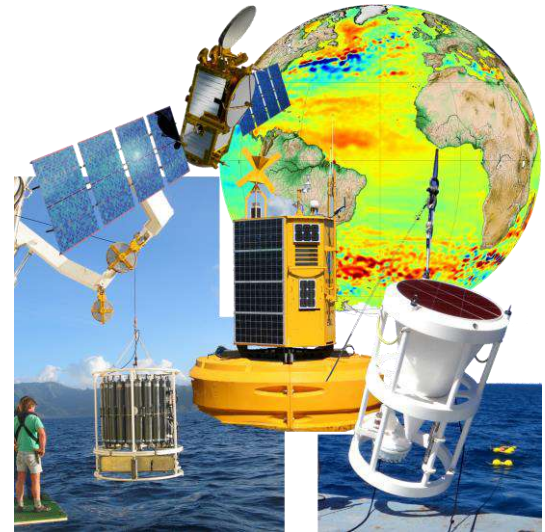
Considering that:

- the acquisition of marine data is difficult and expensive :
it requires access to remote sites and many technical tools (research vessels, instrumented sites, Argo float, gliders ...)
- without appropriate archiving, > 30% of the data are lost (somewhere on a labtop...) or unusable ten years after their acquisition (source: Ifremer).

➡ The preservation of marine observation is a major issue

Challenges for marine data access

A rise in the number of marine observations, (in situ and remote sensing) in the last decades.



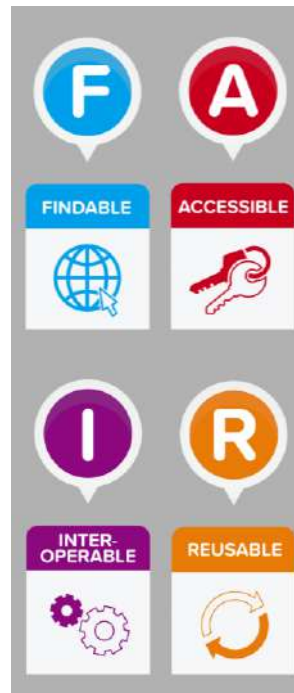
In order to make the most of this flow of data for the benefit of knowledge and society, data centers need to respect common principles.

Challenges for marine data access

Challenge 1: the data quality (FAIR principles)

Metadata and data must be easy to find and (re)use (describe your data, apply persistent identifiers)

To be integrated with other dataset (ie workflows for analysis/processing. (open format, consistent vocabulary, metadata standards)



To consider what will be shared and how it can be accessed

Data must be reusable, with well-described metadata and appropriate licence

Challenges for marine data access



Challenge 2: certification of data repositories

The Research Data Alliance (RDA) provides a common framework to implement and maintain digital repositories.

the CoreTrustSeal requirements

Certification is important to ensure:

- ✓ the reliability and durability of data repositories,
- ✓ the potential for sharing data over a long period of time

for both users and funders



www.coretrustseal.org

Challenges for marine data access

Challenge 3: to get people to share data

The International Council for Science (ICSU, 2011) already promoted “*full and open access to scientific data, especially when the research is publicly funded.*”

Researchers can be reluctant to share their data publicly because of real and/or perceived costs

- feeling of - loss of control over data,
- constraints that don't give back any value,
- inadequate - IT/human resources
- training.

**The data repositories need to make data sharing:
easier for the data owner
not just for the user/analyst.**



The french E-Infrastructure: Data Terra

To built a data system to provide access to data, products and services in order to facilitate understanding, monitoring and forecasting of the Earth system in a context of global changes:

- Facilitate data access for the 4 compartments whatever the observation systems and data sources : satellite, airborne, ground, marine and submarine drones;
- Improve the quality, the interoperability and the use of available data and products;
- Promote inter and multi-disciplinary approaches and studies at interfaces (ocean/atmosphere, shoreline...);
- Serve scientific community and also public decision and innovation actors.



ODATIS: Ocean DATA Information and Services

ODATIS is the ocean hub of Data Terra.

Launched in December 2017

www.odatis-ocean.fr
www.odatis-ocean.fr/en/

ODATIS has the ambition to become
the unique entry point
to access all the French open ocean and
coastal data.

DATA TERRA RESEARCH INFRASTRUCTURE
data-terra.org

ODATIS
OCEAN Hub
odatis-ocean.fr/en

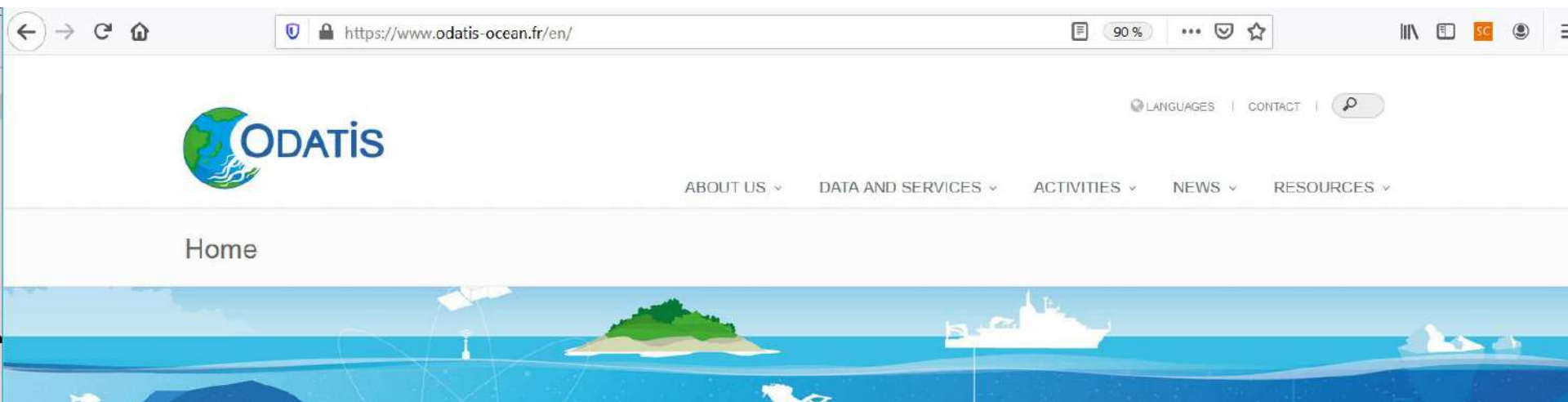
AERIS
ATMOSPHERE Hub
en.aeris-data.fr

ForM@Ter
SOLID Earth Hub
en.poleterresolide.fr/

Theia
LAND SURFACE Hub
theia-land.fr/en

ODATIS roadmap

- Offer a **global view** on in-situ and satellite observations and their products;
- Facilitate access, through a single portal, to **data, fully described and qualified** in agreement with the current standards (FAIR, TRUST);
- Ensure the **long-time preservation** of datasets;
- Ensure the **interoperability** of datasets across space, time and disciplines;
- Promote **combined uses** of data of different nature (in-situ/satellite) or origin (operational networks/scientific experiments);
- Provide the possibility to **explore, extract and analyze** data by offering **tools, and IT resources**.











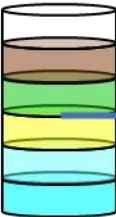


ODATIS structuration



Schmidt et al (2020) *Frontiers in Marine Science* 7: 548126. doi: 10.3389/fmars.2020.548126

The need to develop a typology of data centers

The implementation of such e-infrastructure requires to organize a typology of data centers in a network in order to optimize the required IT and human resources

SERVICE	data repository	production	on demand
Involved structures			 
USER	data repositories doi, licences reporting on data use	combination of different marine dataset (<i>in situ</i> / satellite) from the same thematic or area.	data analyses and interpretation cross analyses of different data from all Earth compartments
BACK OFFICE	<p>Data Assembling Centres</p> <ul style="list-style-type: none">  Close to the producer  Common catalogue and vocabulary servers  Long-term archive 	<p>Data & Service Centres</p> <p> National data hub Aggregates large collections at the national minimum level</p>	<p>Virtual Research Environments (VRE)</p> <p>data lake  or </p> <p> temporary personal storage</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>TOOL BOX</p> <p>softwares, machine learning, ...</p> </div>

ODATIS data catalog

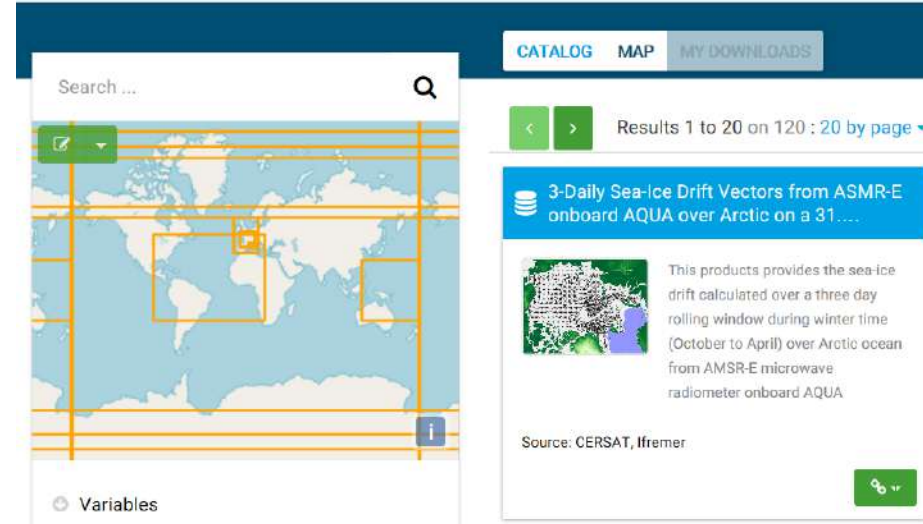
The catalog includes the variables of:

all the marine disciplines

physic, chemistry, biology...

whatever the technique used

satellites, in-situ observatories, field campaigns, lab analyses.



The catalog offers data access though different services:

- search with selection filters,
- data description (Preview or Complete),
- visualization,
- the possibility to download data (directly or via the local partner portals).

Services for Data Producers

www.odatis-ocean.fr



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Services for data producers

Provide a distributed data infrastructure and advanced services

The **ODATIS** Ocean Cluster federates data management and scientific expertise activities at the national level to **promote and facilitate** the use of **oceanographic observations**. ODATIS' [partner centres](#) offer guaranteed services on data management in terms of referencing, hosting, distribution and interoperability.

The challenge is therefore to **define common bases** for all **data producers** and to make **datasets interoperable** so that their resources are coherent, shareable, exploitable and in a multidisciplinary approach required to study the Earth system, so that the data can be combined with each other.

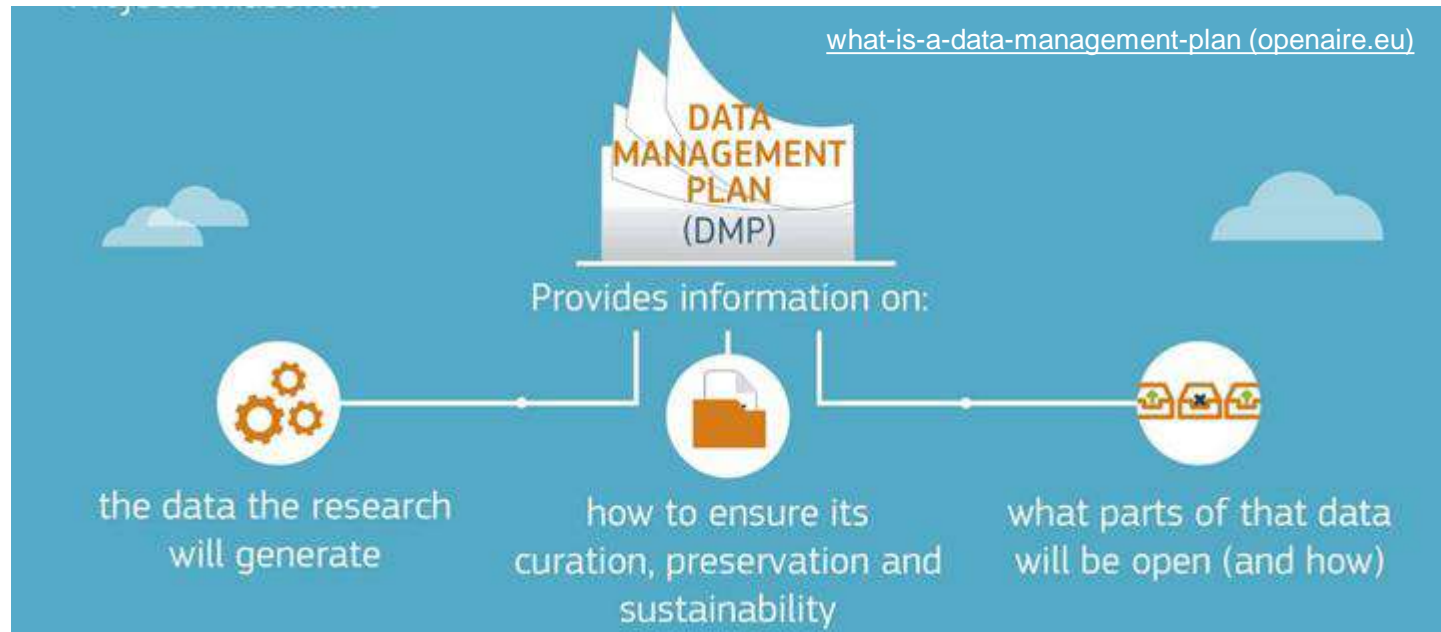


DMP: data management plan

Increase of *in situ* instrumentation (innovative sensors, drones, gliders, ...) :
production of very diverse data (fixed or Lagrangian stations, acquisition frequency, measured parameters)

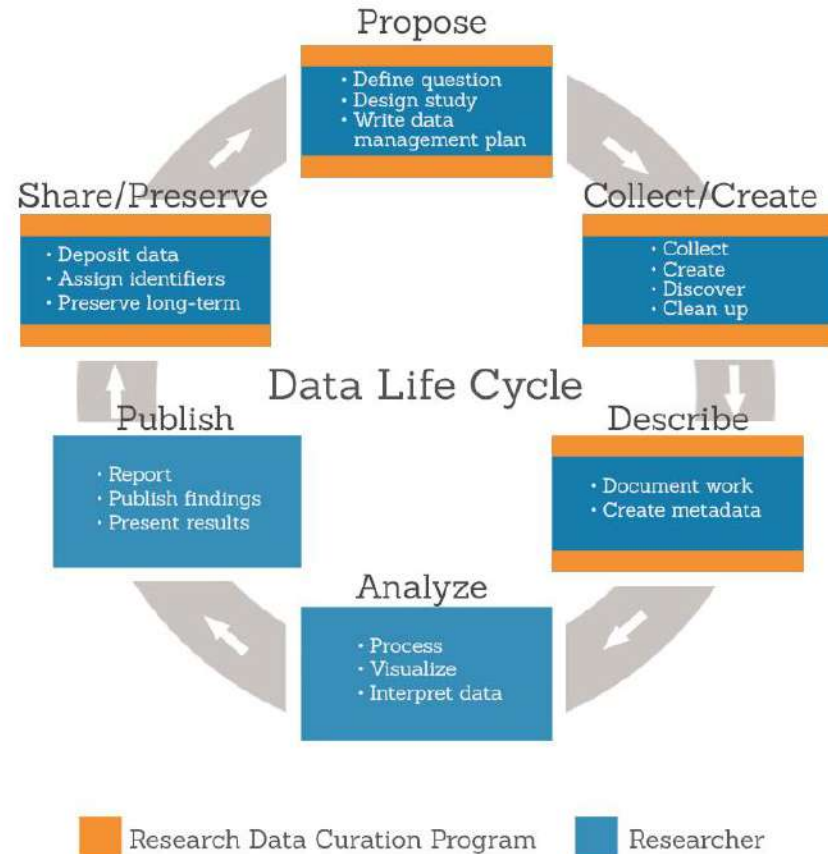
→ Critical to anticipate data workflow

to guarantee the acquisition of well-documented databases for future use, through appropriate archiving, interoperability and licensing policies.



DMP: data management plan

Data life



DMP: data management plan

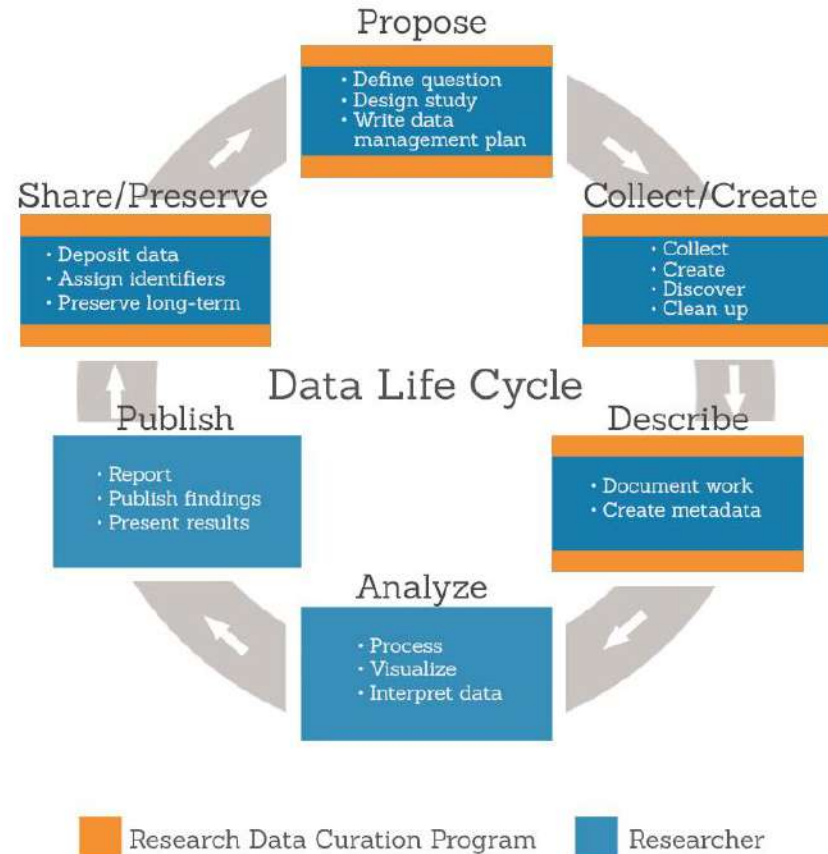
Before any experience (field work, cruise,...)

→ need to establish DMP on how the data will be managed

during the project

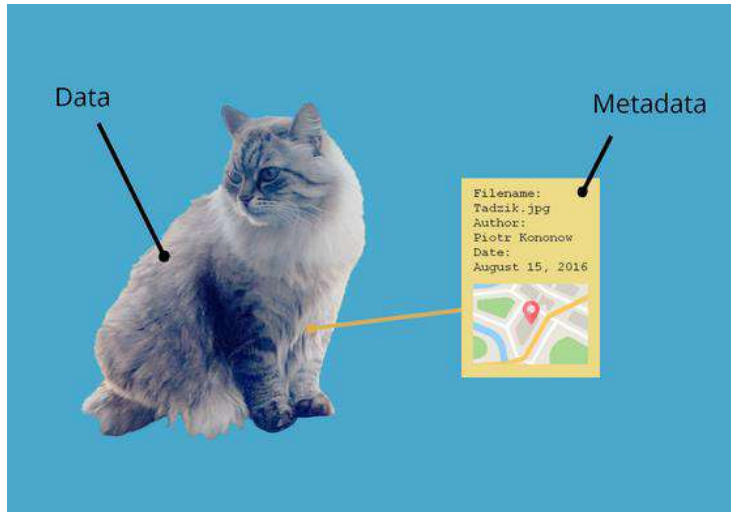
but especially at the end

metadata, banking, preservation for the future



How to define a data ?

Meta Data are informations on data:
Sensors, how is what acquired, precision

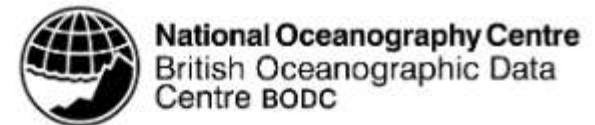


How to define a data → vocabulary

A parameter is defined by:

a controlled vocabulary and semantic model to facilitate data exchange and interoperability

Example of vocabulary server: British Oceanographic Data Centre-BODC) usually adopted by European / French projects)



The NERC Vocabulary Server (NVS)

Service Status

[NVS Home](#) | [Vocabularies](#) | [Thesauri](#) | [Search NVS](#) | [SPARQL](#) | [Other Tools](#) | [About NVS](#)

Search for a term in a vocabulary collection

Enter search string using % as wildcard if required. Example: chlorophyll%sediment.

Vocab ID

Search

Identifier Preferred label Alternative label Definition Exact match Case sensitive [toggle advanced options](#)

Search for a term across vocabulary collections

Enter search string

Search

The need for data repository:

The need for data repository

- To publish qualified and well-described data at the end of a project
- To publish: many journals require now to have data accessible
- The service offered by ODATIS :

accessible by all, French or not

www.seanoe.org/

Publish your marine data

SEANOE offers you the possibility of publishing free of charge your scientific data in the field of the marine sciences.

Each data set published by SEANOE has a DOI. Your data may well be cited in scientific articles in a reliable and sustainable way.

SEANOE offers a fast responding service : if your dataset is well described¹, **you should get a DOI within 24 hours.**

Possible embargo period (max. 2 years) to restrict access to data from publication under review, for example.

Vertical distributions of temperature, salinity, dissolved oxygen concentrations and saturations, Chl-a, turbidity and pH in the water column of the continental shelf off the Gironde (North East Atlantic, France)

Date 2022-07
Temporal extent 2016-10-25 -2021-10-28
Author(s) [Dubosq Nicolas](#)¹, [Schmidt Sabine](#)², [Deflandre Bruno](#)¹
Affiliation(s) 1 : Univ. Bordeaux, CNRS, Bordeaux INP, EPOC, UMR 5805, F-33600 Pessac, France
2 : CNRS, Univ. Bordeaux, Bordeaux INP, EPOC, UMR 5805, F-33600 Pessac, France
DOI [10.17882/89508](https://doi.org/10.17882/89508)
Publisher SEANOE
Keyword(s) continental shelf, Bay of Biscay, Riomar, West Gironde Mud Patch, water column, temperature, salinity, dissolved oxygen, Chl-a, turbidity, pH

Abstract The aim of this work was to document the seasonal and inter-annual dynamic of dissolved oxygen and ancillary data (T, S, Chl-a, turbidity, pH) along a cross-shelf transect off the Gironde estuary. This work has been motivated by recent simulations that suggest the occurrence of seasonal bottom deoxygenations in this River-dominated Ocean Margin (Riomar); but unfortunately there were no data sets to test this hypothesis until now. Profiles of temperature, salinity and dissolved oxygen were performed in the water column of the West Gironde Mud Patch off the Gironde estuary (from 45°46.383'N - 1°28.925'W to 45°35.524'N - 1°50.689'W) during seven cruises on the R/V Côte de la Manche (doi: [10.18142/284](https://doi.org/10.18142/284) ; [10.17600/18000861](https://doi.org/10.17600/18000861)) between 2016 and 2021 (October 2016, August 2017, January 2018, April 2018, July 2019, April 2021, October 2021). Turbidity was measured in January and April 2018, July 2019 and October 2021, Chl-a in October 2016, August 2017, January 2018, April 2018 and July 2019 and pH in October 2021. This dataset had permitted to validate the occurrence of bottom deoxygenations when the water column is stratified.

Licence 

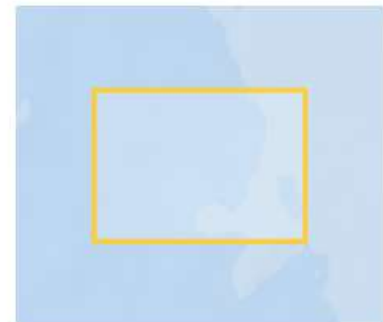
Acknowledgements We sincerely acknowledge the captains and crews of the R/V "Côtes de la Manche" (CNRS-INSU) for their great help during the cruises. This work was supported by: (1) the JERICO-NEXT project (European Union's Horizon 2020 Research and Innovation program under grant agreement no. 654410), (2) the LEFE- EC2CO VOG project, and (3) the MAGMA project (LabEx COTE, ANR-10-LABX-45; Nouvelle-Aquitaine Regional Council; French Biodiversity Agency). A doctoral fellowship was provided to N. Dubosq by the French Ministry of Higher Education, Research and Innovation.

Click
to download
the data

 DATA



Nicolas Dubosq (left) - University of Bordeaux (right) The multiparameter probes SeaBird SBE-19plus (left), Wimo Plus (right) and autonomous sensors fixed on the supports



Download metadata
TXT, RIS, XLS, RTF, BIBTEX

Oceanographic cruises
JERICOBENT, MAGMA

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SEANOE service (publisher of scientific data in the field of marine sciences)

Licence



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Sensor metadata

The measurements were performed using a SeaBird SBE-19plus, a Wimo Plus multiparameter probe (*NKE Instrumentation*) and autonomous sensors (STPS, SDOT and STBD, *NKE Instrumentation*). The measured parameters were temperature (SeaBird SBE-19plus: -5 to +35°C, $\pm 1\%$; STPS: -5 to +35°C, $\pm 1\%$; Wimo Plus: -2 to +35°C, $\pm 0.02^\circ\text{C}$), salinity (SeaBird SBE-19plus: 2 - 42, $\pm 1\%$; STPS: 2 - 42, $\pm 1\%$; Wimo Plus: 2 - 42, $\pm 0.1\%$), dissolved oxygen (SDOT: 0 - 500µM, 0 - 150%, $\pm 5\%$; Wimo Plus: 0 - 700µM, 0 - 250%, $\pm 1\%$), turbidity (STBD: 0 - 2000 NTU, $\pm 5\%$, Wimo Plus: 0 - 4000 NTU, $\pm 5\%$), Chl-*a* (SeaBird SBE-19plus: 0.03 - 75 µg/L, $\pm 5\%$) and pH (Wimo Plus: 0 - 14, ± 0.1). Turbidity sensors were intercalibrated using formazin, allowing to provide turbidity data in Formazin Nephelometric Units (FNU). Missing data are replaced by the value "-9999".

Data

File	Size	Format	Processing	Access
Vertical distributions of temperature, salinity, dissolved oxygen concentrations and saturations, Chl-a, turbidity and pH in the water column of the continental shelf off the Gironde	1 MB	CSV	Quality controlled data	Access on demand until 2024-07-01

Download metadata

TXT, RIS, XLS, RTF, BIBTEX

Oceanographic cruises

JERICOBENT, MAGMA

Project(s) FP7/H2020

JERICO-NEXT

References

Dubosq Nicolas, Schmidt Sabine, Sudre Joel, Rigaud Sylvain, Lamarque Bastien, Danilo Martin, Grémare Antoine, Deflandre Bruno (2022). First observations of seasonal bottom water deoxygenation off the Gironde estuary (Bay of Biscay, North East Atlantic). *Frontiers in Marine Science*, 9, 1006453 (10p.).

How to cite

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Thanks
for your attention

Questions ?



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