



SeaDataNet

Further developing the SeaDataNet
pan-European infrastructure for
marine and ocean data management

Michèle Fichaut and the SeaDataNet Consortium

IQUOD workshop, Brest, 31 October 2019

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What is SeaDataNet?



A pan-European infrastructure set up and operated for managing marine and ocean data in cooperation with the NODCs and data focal points of 34 countries bordering the European seas

90s	Metadata directories Medar/MedAtlas
2002-2005	Sea-Search (FP5)
2006-2011	SeaDataNet (FP6)
2011-2015	SeaDataNet II (FP7)
2016-2020	SeaDataCloud (H2020)

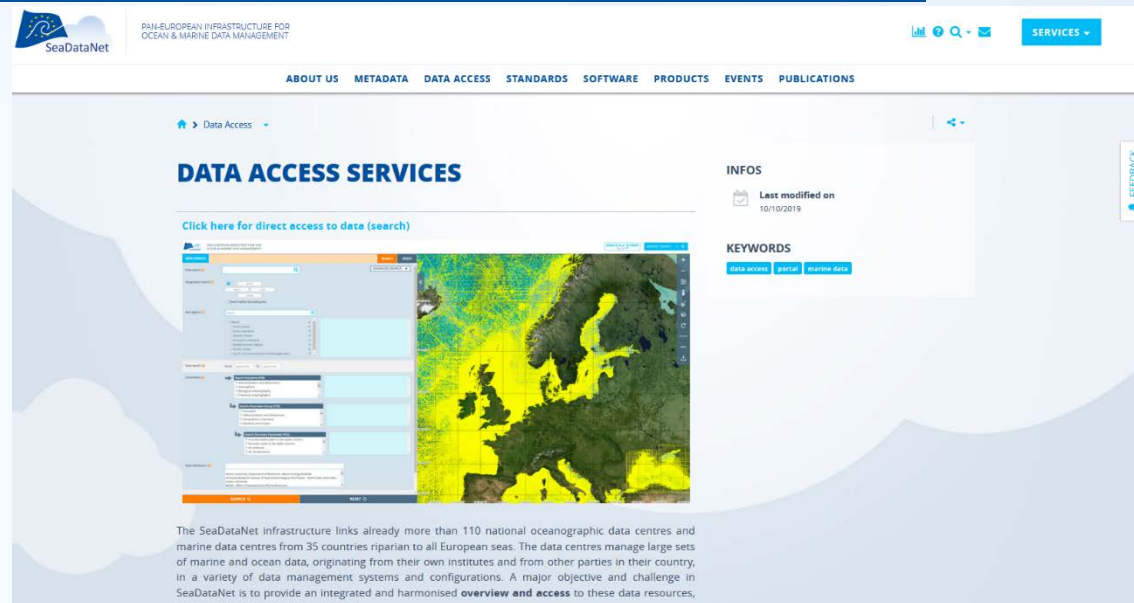
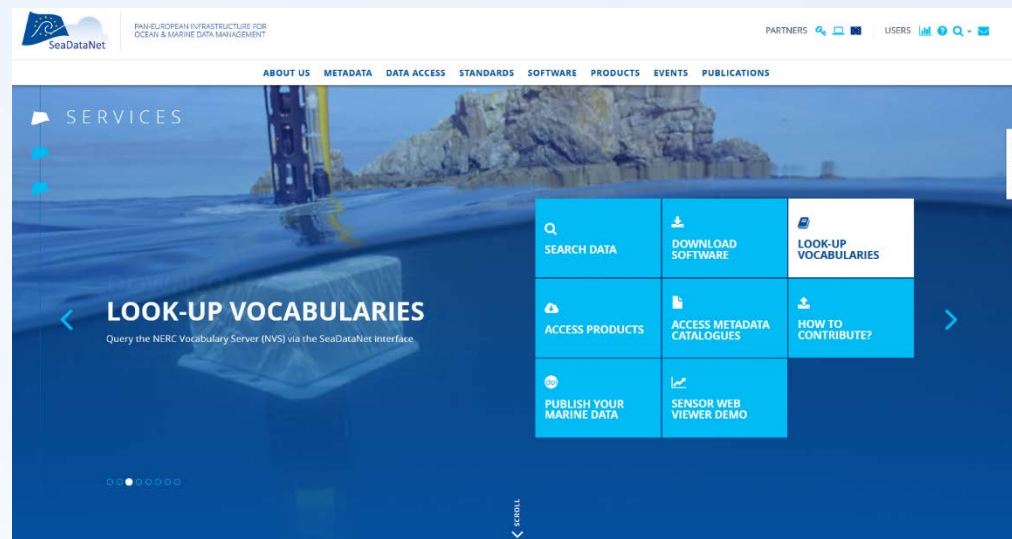
A legal entity : SeaDataNet AISBL for sustainability of the Consortium (same structure than EuroGoos)

SeaDataNet portal

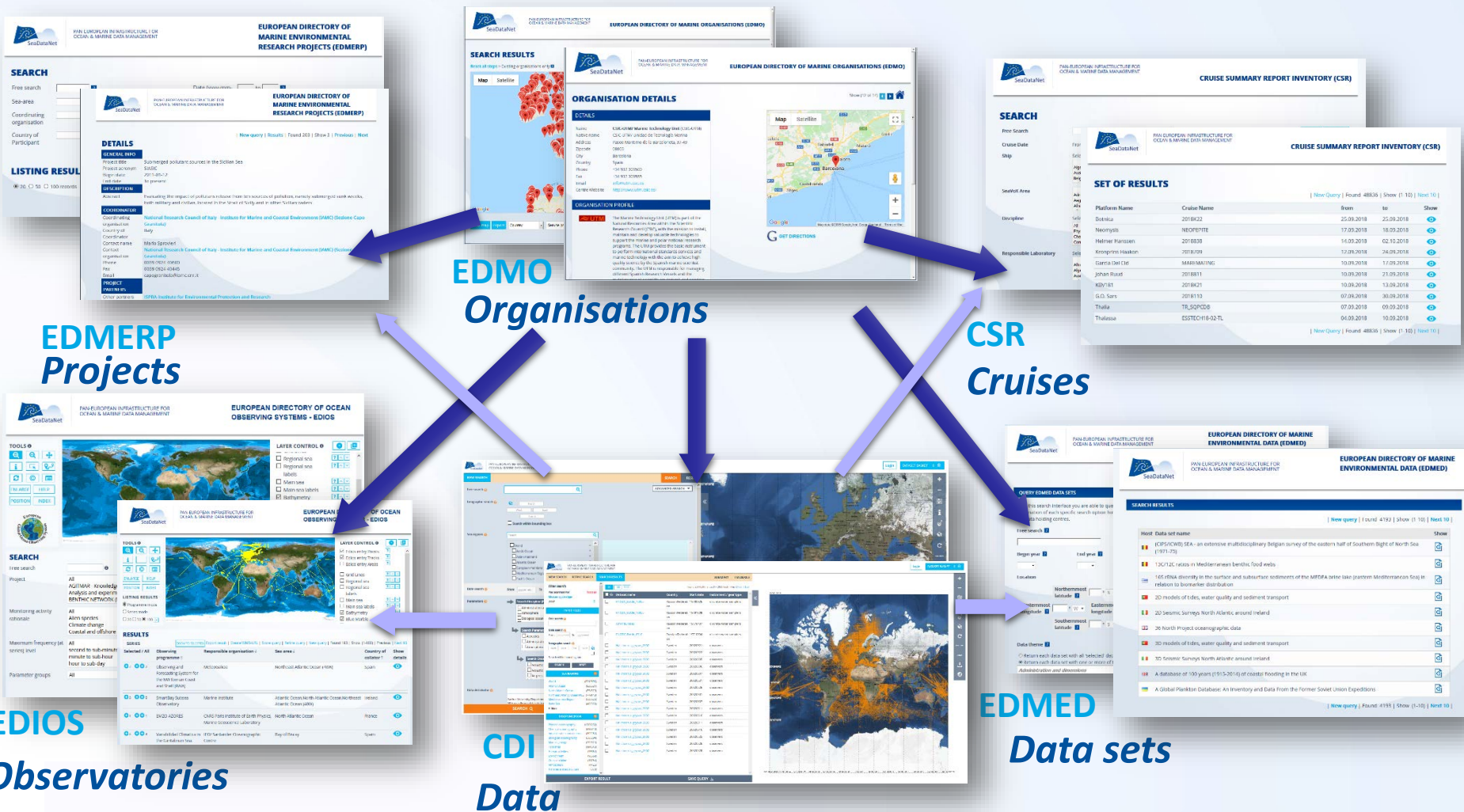
With access to services

- Standards & common vocabularies
- Software tools both for data centres and users
- Data and metadata
- Products

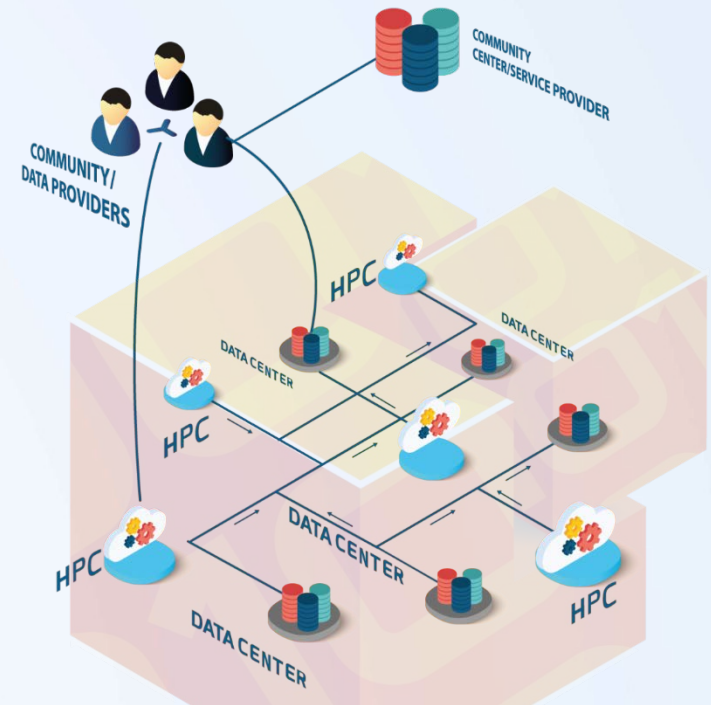
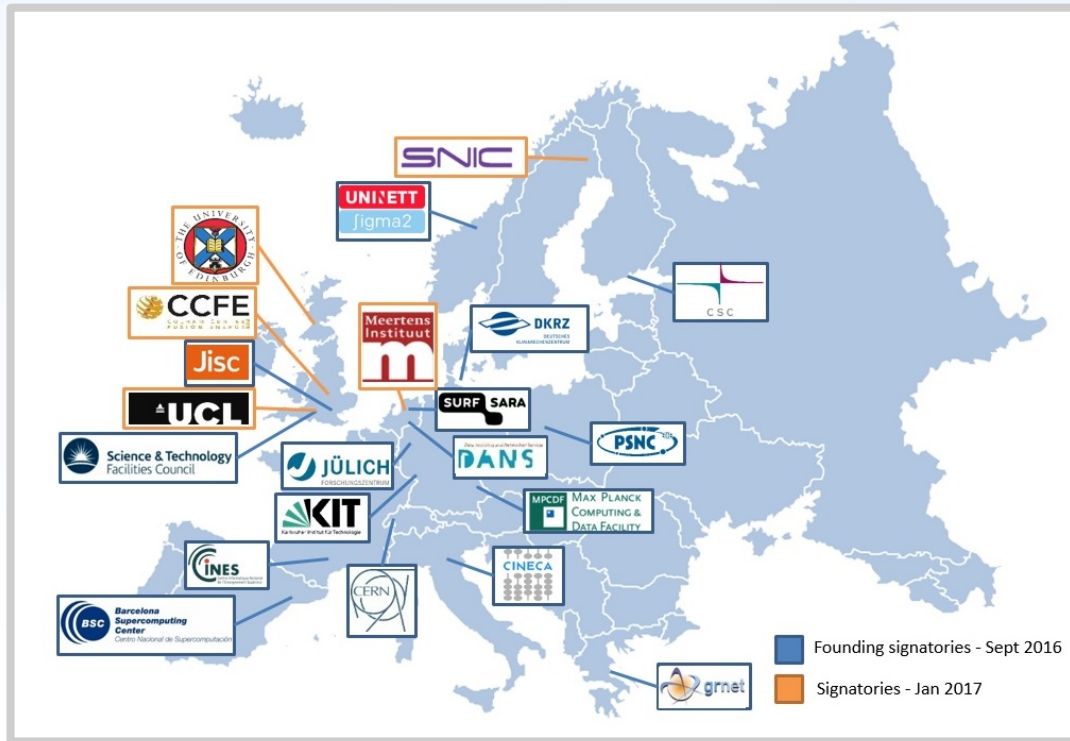
<http://www.seadatanet.org>



SeaDataNet metadata directories



SeaDataCloud - Cooperation with EUDAT



A consortium of 20 High Performance Computing (HPC) centres offering also storage resources

5 EUDAT members are partners of SeaDataCloud

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CDI catalogue: discovery and access to data



IQUOD workshop, Brest, 31 October 2019

Service for discovery and
unified data access

cdi.seadatanet.org/search

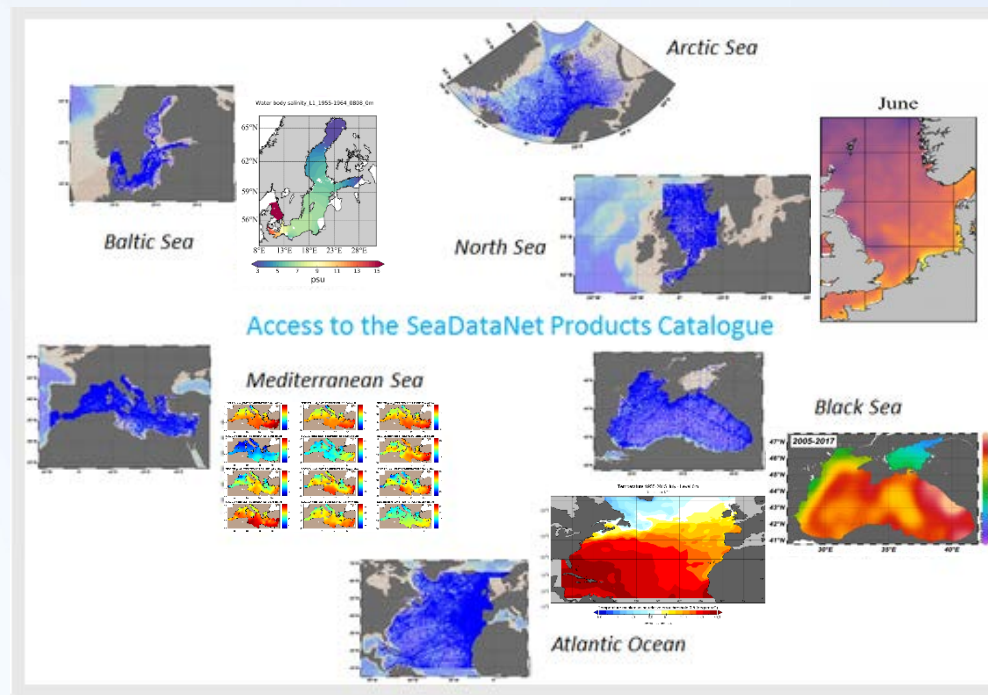
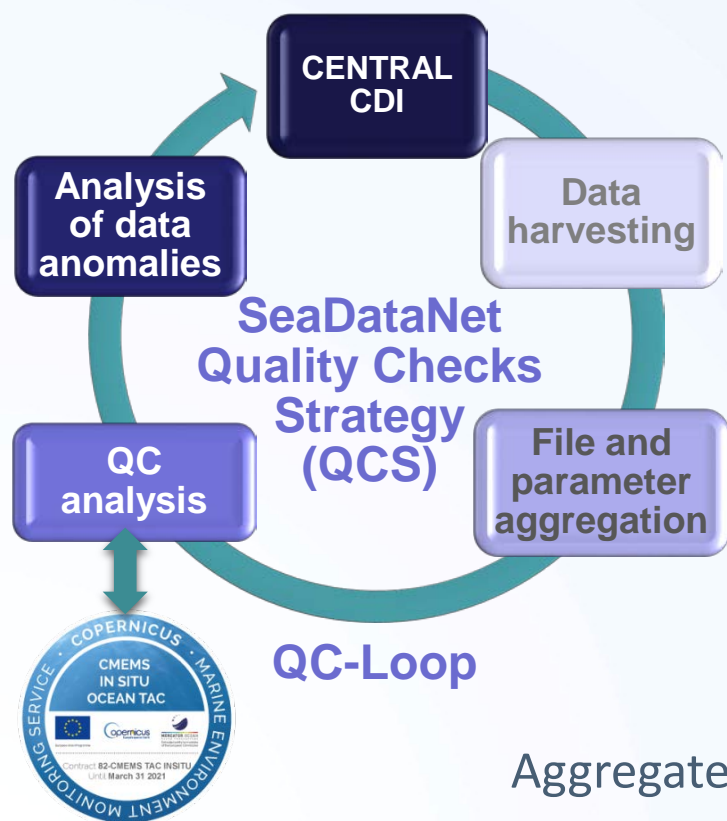
Areas

Trajectories

Vertical profiles or time series

- since 1800 → 2019
- 2.3 M of CDIs for physical, chemical, biological, geosciences data
- 87 % of unrestricted or SDN license data

SeaDataNet products

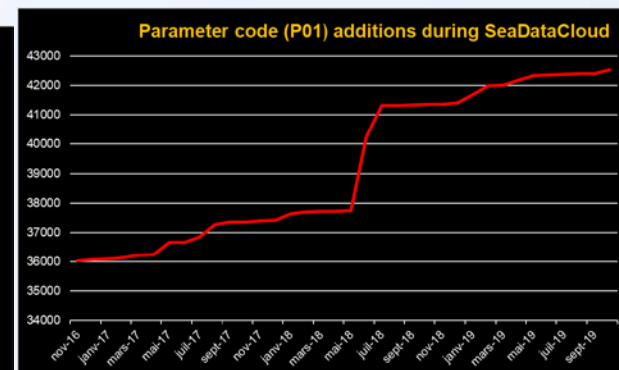
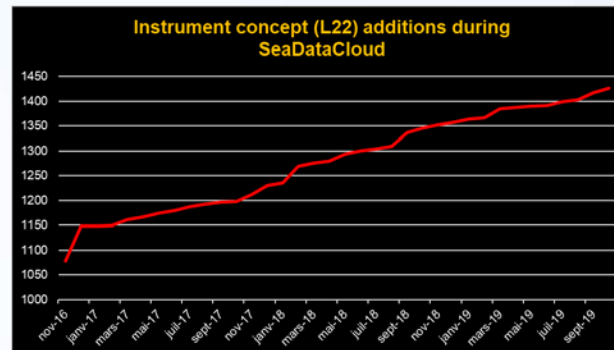


Aggregated datasets and climatologies
Improvement of the data quality

SeaDataNet standards

- Metadata formats for all catalogues
 - ISO19115 and ISO19139
- SeaDataNet data transport formats
 - ASCII (Ocean Data View, and MedAtlas)
 - NetCDF (CF compliant)

➔ Relying on controlled vocabularies governed by NERC-BODC (UK) and used in many other international or national initiatives



SeaDataNet software Tools (1)

- Tools for the data centres – data managers
 - To be connected to the infrastructure and to be able to duplicate data in the cloud (Replication manager)
 - To follow the data downloading by users : MySeaDataCloud



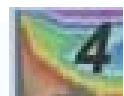
To generate the metadata at the SDN standards : MIKADO



To generate the data files at the SeaDataNet standards :
NEMO



To check the compliance of the data files : OCTOPUS

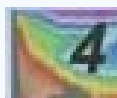


To quality check the data: ODV

SeaDataNet software Tools (2)

- Tools for the users and data scientist

- All catalogue search interfaces



To visualise data, plot, analyse : ODV

DIVA To interpolate data : DIVA

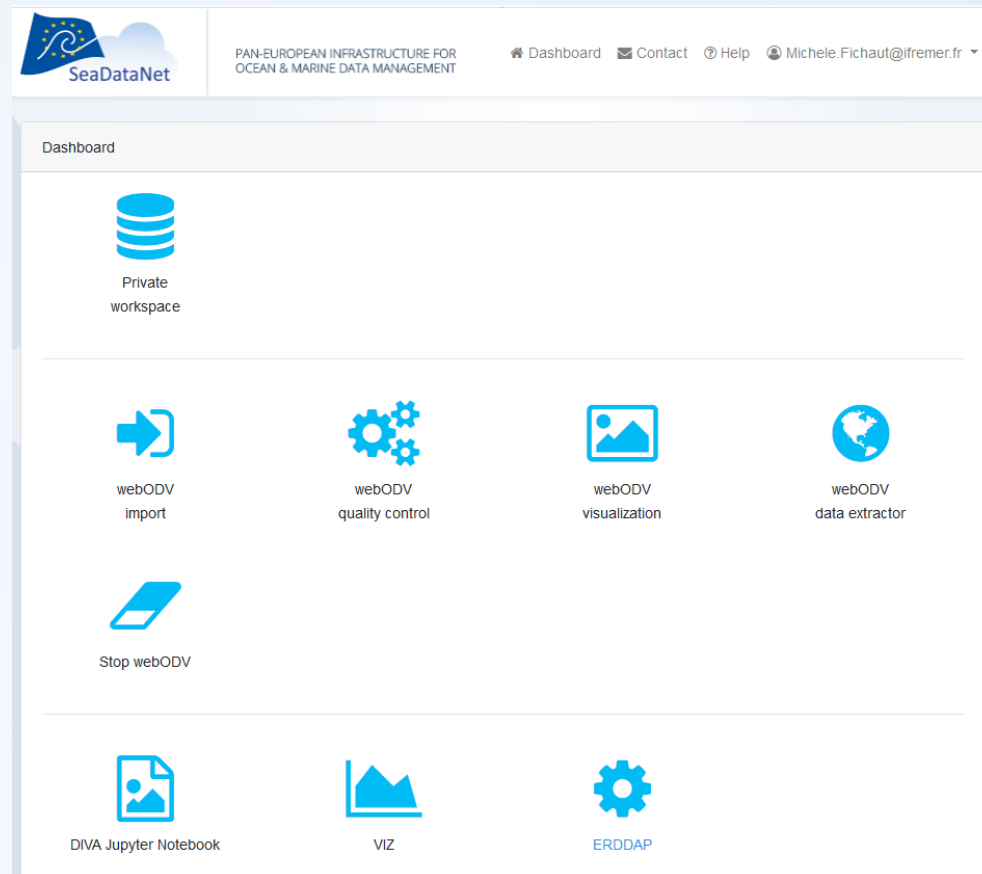
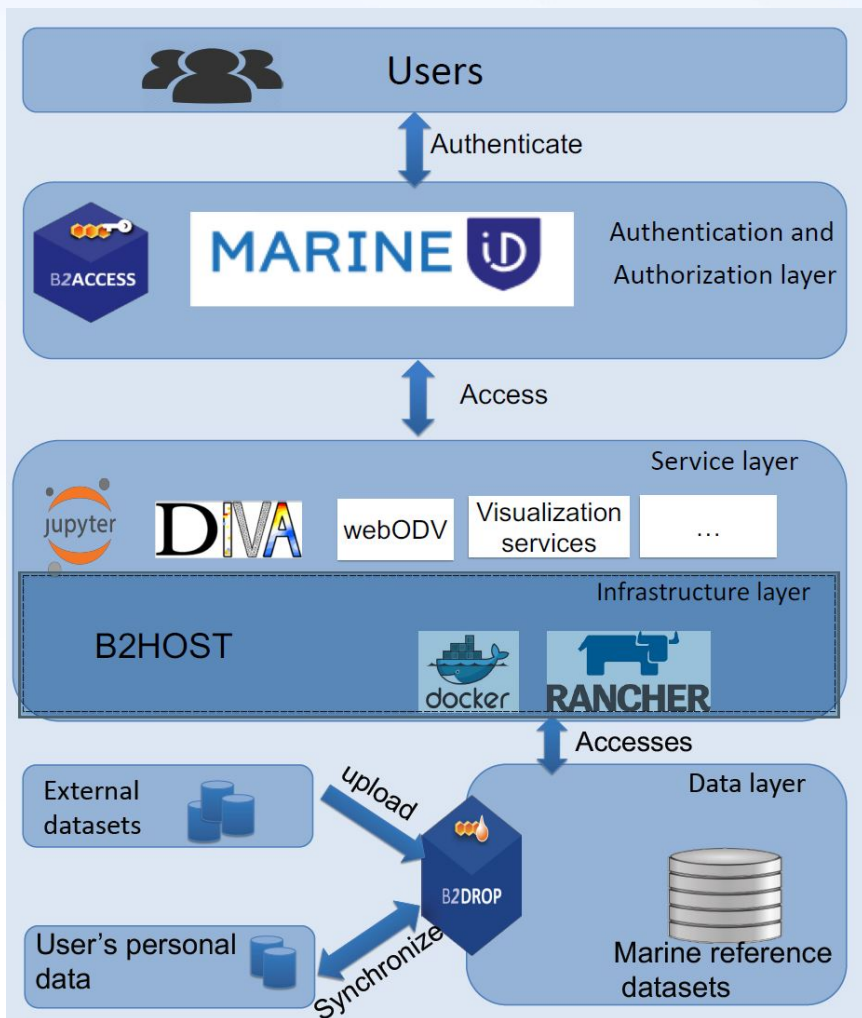
- to publish your data using Sensor Web standards



To publish marine data (and get a DOI) : SEANOE



- To work on datasets in the cloud environment : SDN Virtual Research Environment (VRE)
 - prototype available and used by the regional product leaders of the SDC project

Overall architecture for the SDC VRE



FAIRness of SeaDataNet data (1)

Challenge: make SDN data and metadata and related services more FAIR, both for **machines** and people

- Enriching CDI metadata by data centres and their data originators
 - Adding more information on QA-QC activities
 -  Adding extra information about data collection, in particular instruments using SDN vocabulary
 -  Including, where applicable, links to projects (EDMERP), cruises (CSR), data collections (EDMED)
 - Including, where applicable, links to 'standard data processing methods' like laboratory tests, using the Ocean Best Practices repository of IODE (<https://www.oceanbestpractices.net/>)

FAIRness of SeaDataNet data (2)

- Applying Linked Data principles to all services by their managers



Publishing SDN directories as SPARQL services as RDF resources following existing models



Use Schema.org for Search Engines

- Harmonising the URLs of the SDN services (GUI and SPARQL) by their managers :



EDMO, EDMED and EDMERP



EDIOS and CDI

– CSR

FAIRness of SeaDataNet data (3)

- Ensuring SDN data file format conformance by data centres



Use SeaDataNet tools for preparing SeaDataNet data files (ODV, NetCDF (CF))



Follow examples of SeaDataNet data files for specific data types



Make sure that all declared parameters have one or more values

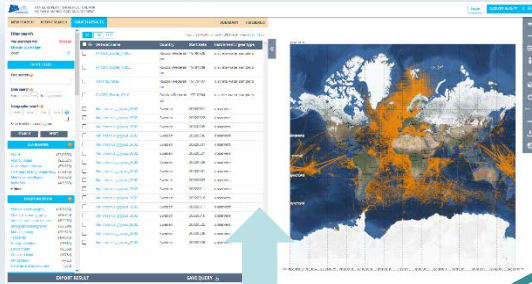


Make sure that the correct primary variables in ODV are defined and filled with values considering the specific data types



Check the syntax and semantics of ODV and NetCDF files, using SDN OCTOPUS software

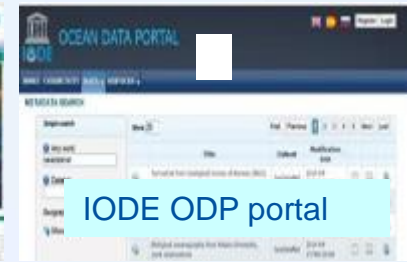
Aggregated collection



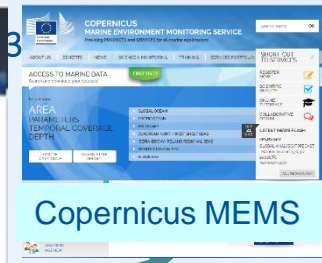
Data discovery
and access



GEOSS portal



IODE ODP portal



Copernicus MEMS



Black Sea portal



Caspian portal



Geo-Seas portal

Regional subsets



> 110 data centres



NODCs; HOs; GEOs; BIOs; ICES

≈ 730 European
data originators

General context
and cooperation

Thematic portals



Bathymetry

Physics

Chemistry

Geology

Biology

Memorandum of Understanding between CMEMS and SeaDataNet

- Signed in June 2018, “to cooperate in strategy, research, and operation, where mutually beneficial and desirable.”
- Seven cooperation areas have been identified:
 - Development, maintenance, adoption and promotion of standards
 - Development, adoption and promotion of QA-QC methodologies
 - Metadata and data exchange from SeaDataNet to CMEMS INSTAC
 - Metadata and data exchange from CMEMS to SeaDataNet
 - Development of products
 - Distribution of products
 - Teaming up in relevant projects

And in practice... Cooperation is just starting

- Data sets are complementary
 - More data from CMEMS, for a limited number of variables
 - Much more variables for SDN
 - Offshore data from CMEMS
 - Coastal data from SDN
- Both experiences are valuable
 - Comprehensive metadata management in SDC
 - Efficient (automatic and real time) QC/QA in CMEMS
 - Larger spectrum of QA/QC in SDC
- But, there are still issues for a real cooperation
 - Data exchanges must be technically optimized
 - Some necessary metadata are missing
 - Some discrepancies in data models, formats, data organization, common vocabularies

