



# SeaDataCloud

***SeaDataNet, an enhanced ocean data infrastructure giving services to scientists and society***

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## Some uses of ocean and marine data for society

- Climate Change
  - Blue Economy (marine energy, aquaculture, tourism, coastal fishing, etc)
  - Marine Pollution
  - Marine ecosystems
- 
- The availability of great amount of high
  - quality ocean data allows a better understanding of the ocean and give the opportunity to scientists to support politicians for decision making



High tide in Venice (01dec2008)



Credit: Consorzio Venezia Nuova

## Economy of data acquisition

Data is collected by governments, research institutes and private industry (more than 1,000 organisations in Europe)

In situ sampling: water column measurements and water samples are collected from research vessels, ships of opportunity, small boats, moored buoys or drifting autonomous systems

Acquisition of marine data is expensive : annual cost in Europe estimated at

**1.4 Billion € (1 for in-situ data, 0.4 for satellite data)**

**Team of qualified people engaged from the data collection to the data dissemination**

# What is SeaDataNet?



SeaDataNet is a comprehensive Pan-European semi-distributed marine data infrastructure, providing access to multidisciplinary, integrated marine and ocean data and products of standardised quality, services, as well as an overview of marine organisations, research and monitoring activities related to the sea.

## Physical oceanography

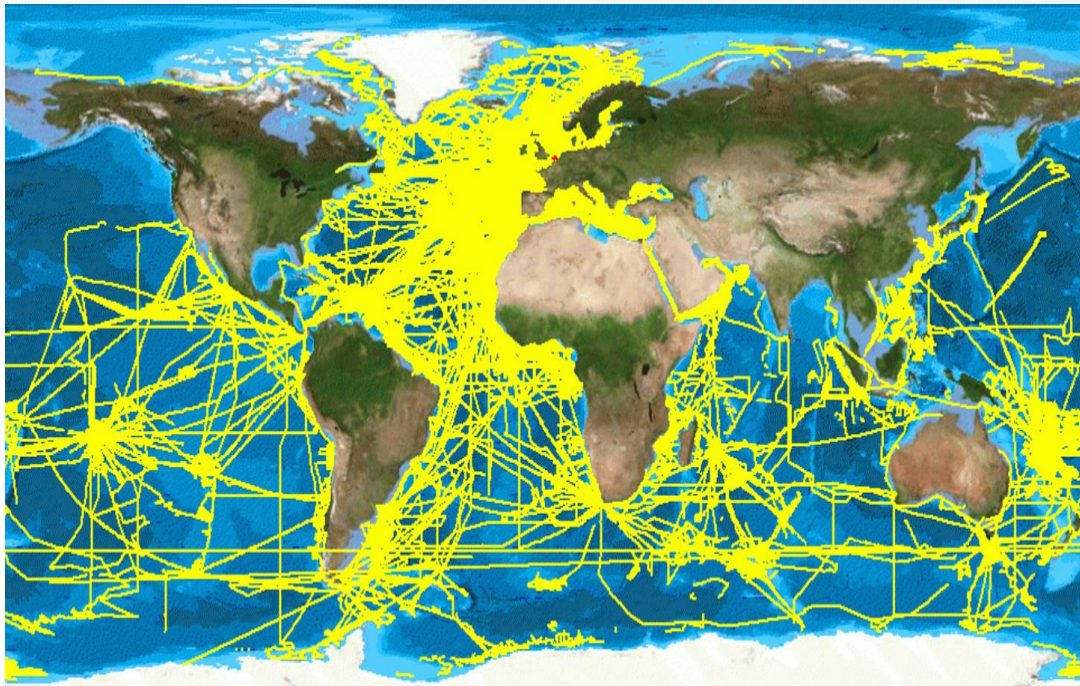
Meteorology

Chemistry

Geophysics

Marine Geology

Biology



sdn-usersdes

Selection of data along tracks



# Origins

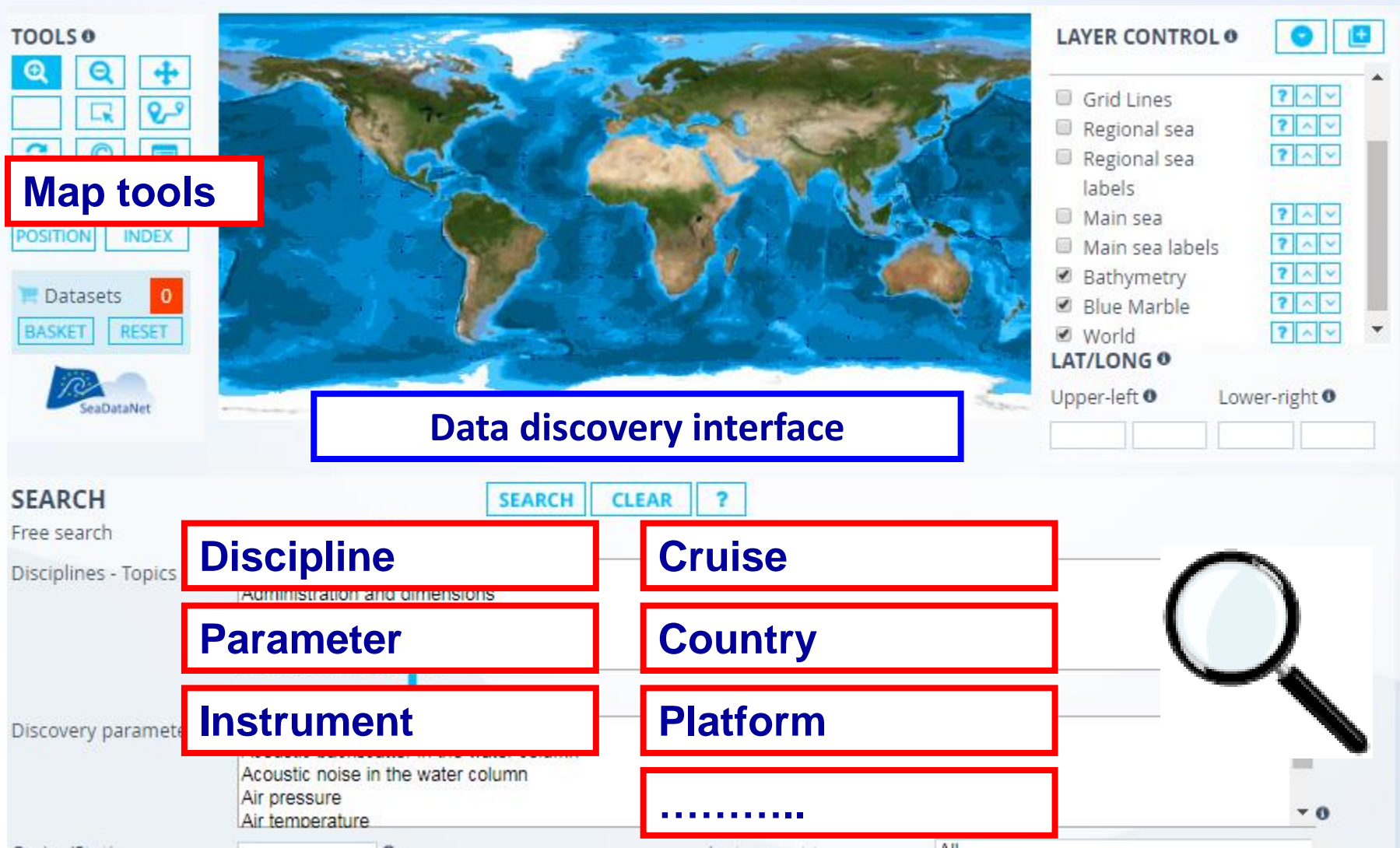


**De facto standards for data and metadata, a data quality check guideline, the use of standardised vocabularies**

SeadataNet started in the 90s and has been developing over the years. Thanks to EU funded projects:

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





The screenshot shows the SeaDataNet Data discovery interface. It features a central world map, a left sidebar with tools and search options, and a right sidebar with layer controls. The interface is designed for searching and discovering oceanographic data.

**Map tools**

**Data discovery interface**

**Search filters:**

- Discipline
- Parameter
- Instrument
- Cruise
- Country
- Platform
- .....

**Layer Control:**

- ☐ Grid Lines
- ☐ Regional sea
- ☐ Regional sea labels
- ☐ Main sea
- ☐ Main sea labels
- ☒ Bathymetry
- ☒ Blue Marble
- ☒ World

**Search:**

Free search

Disciplines - Topics

Discovery parameters

Acoustic noise in the water column

Air pressure

Air temperature

# Metadata Services



**SDN provides useful information to know the organisations that operate in marine environment, what they do and where, to give chances for future collaborations in research or in the private sector**

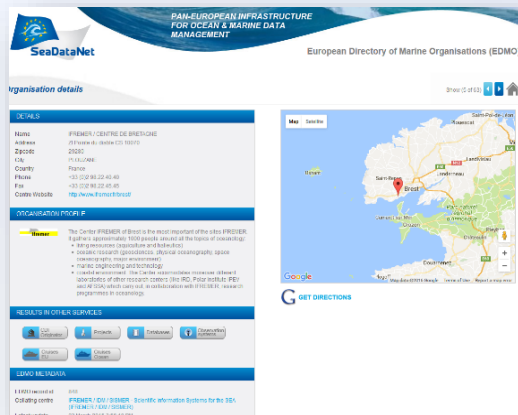




# Metadata Services

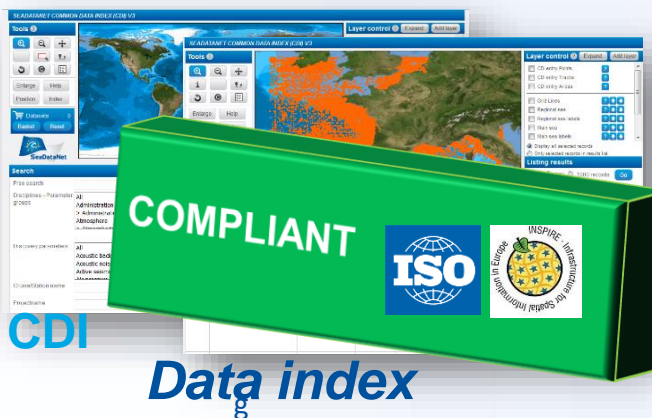


## EDMO Organisations



## CSR Research cruises

## EDMERP Projects



## EDMED Data sets

## CDI Data index

## EDIOS Observing programmes





# Data Products



PAN-EUROPEAN INFRASTRUCTURE FOR  
OCEAN & MARINE DATA MANAGEMENT

PARTNERS



USERS



ABOUT US

METADATA

DATA ACCESS

STANDARDS

SOFTWARE

PRODUCTS

EVENTS

PUBLICATIONS

## PRODUCTS

SeaDataNet provides aggregated datasets (ODV collections of all SeaDataNet measurements of temperature and salinity by sea basins) and climatologies (regional gridded field products based on the aggregated datasets) for all the European sea basins.

[Read more](#)

Aggregated datasets

Climatologies

Documentation

Catalogue

**Historical data collections** of all T and S measurements within SeaDataNet covering all EU sea basins (DOI)

**Gridded climatologies** (DOI)

**Reports** describing products' characteristics and quality (DOI)

# Products Catalogue



Search ...

Reset filters

CATALOG

MY DOWNLOADS

<

>

Results 1 to 17 on 17 : 20 by page -

Sort by : Popularity -

**NORTH ATLANTIC OCEAN - TEMPERATURE AND SALINITY OBSERVATION COLLECTION V1.1**

SeaDataNet Temperature and Salinity historical data collection, including revised quality flags after quality control with ODV. For data access please register at <http://www.marine-id.org>. The dataset format is ODV binary collections. You can read, analyse and...

Source: Seadatanet

**BLACK SEA - TEMPERATURE AND SALINITY OBSERVATION COLLECTION V2**

The Black Sea historical dataset includes all open access temperature and salinity in situ data from the Black Sea and Sea of Azov for period 1868-2014. The data were retrieved from the SeaDataNet infrastructure in the mid of 2015. Data quality has been analysed and checked...

Source: Seadatanet

**MEDITERRANEAN SEA - TEMPERATURE AND SALINITY CLIMATOLOGY V1.1**

Mediterranean Sea Climatology computed from the SeaDataNet V1.1 aggregated dataset. The version used for the DIVA software is the 4.6.9. The period covers 1900-2013. For data access please register at <http://www.marine-id.org> ...

Source: Seadatanet

**MEDITERRANEAN SEA - TEMPERATURE AND SALINITY OBSERVATION COLLECTION V1.1**

SeaDataNet Temperature and Salinity historical data collection contains all open access temperature and salinity in situ data retrieved from SeaDataNet infrastructure at the end of 2013. The data span between -9.25 and 37 degrees of longitude, thus including an Atlantic ...

Source: Seadatanet

# Vocabularies


Controlled vocabularies used in all  
metadatabases and data formats  
(interoperability) organised with international  
governance, user interfaces and web services



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**BODC VOCAB LIBRARY**

## BODC WEBSERVICES V2 (LIBRARIES) CL12

Library	Thesaurus	Title	Alt Title	Version	Members	Modified
<a href="#">C16</a>		SeaDataNet sea areas	SDN sea areas	9	127	11/7/2012 2:00:06 AM
<a href="#">C17</a>		ICES Platform Codes	ICES Platforms	709	5571	3/13/2018 2:00:03 AM
<a href="#">C19</a>		SeaVoX salt and fresh water body gazetteer	SeaVoX water bodies	17	263	2/21/2018 2:00:03 AM
<a href="#">C32</a>		International Standards Organisation countries	ISO countries	7	251	1/14/2016 2:00:02 AM
<a href="#">C34</a>		Activity purpose categories	Purpose categories	4	22	8/27/2011 3:00:05 AM
<a href="#">C35</a>		European Nature Information System Level 3 Habitats	EUNIS3 Habitats	1	56	2/19/2010 2:01:37 AM
<a href="#">C36</a>		Monitoring activity legislative drivers	Monitoring drivers	8	91	6/21/2017 3:00:03 AM
<a href="#">C37</a>		Ten-degree Marsden Squares	Marsden-10	3	612	1/9/2009 2:00:05 AM
<a href="#">C38</a>		SeaDataNet Ports Gazetteer	SeaDataNet Ports	61	4912	12/5/2017 2:00:02 AM
<a href="#">C39</a>		World Meteorological Organisation sea	WMO sea states	1	10	9/30/2009 3:01:08 AM

# Software for data producers, data centres and data users

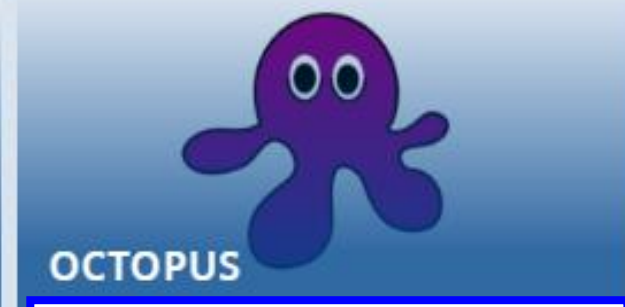
To create  
metadata CDI,  
CSR, EDMO, EDIOS,  
EDMERP



To convert data  
file



To convert to the  
internal formats



To present and analyse data



To make available  
data in data  
centres



To generate the  
spatial objects  
for CDI files





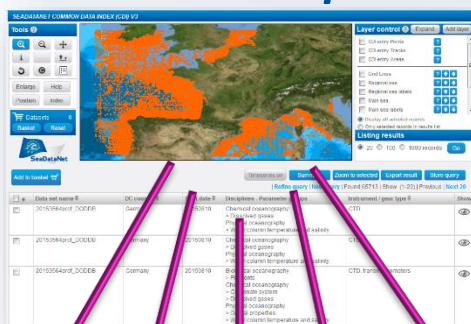
# CDI discovery and access service



→ a single access for a wide range of data of different types

> 2.3 Million  
of data sets

## SeaDataNet portal

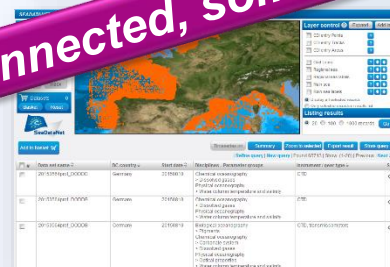


Search  
and  
Shop



Data  
add

Presently 115 data centres are connected, some are still underway



Metadata



European data sources

data centres ← ≈ 650 originators

# Cooperation and involvement



European Marine Observation and Data Network (EMODnet): driving and serving many EMODnet thematic portals

Copernicus Marine Environmental Monitoring Services (CMEMS): providing long-term archives and standards (MoU)

Marine Strategy Framework Directive (MSFD): providing infrastructure, standards and data collections for several indicators

Large ocean monitoring systems (EuroGOOS, AtlantOS, Euro-ARGO, JERICO-Next, EuroFleets, ..): providing standards and validation + long-term archiving services

## Cooperation and involvement

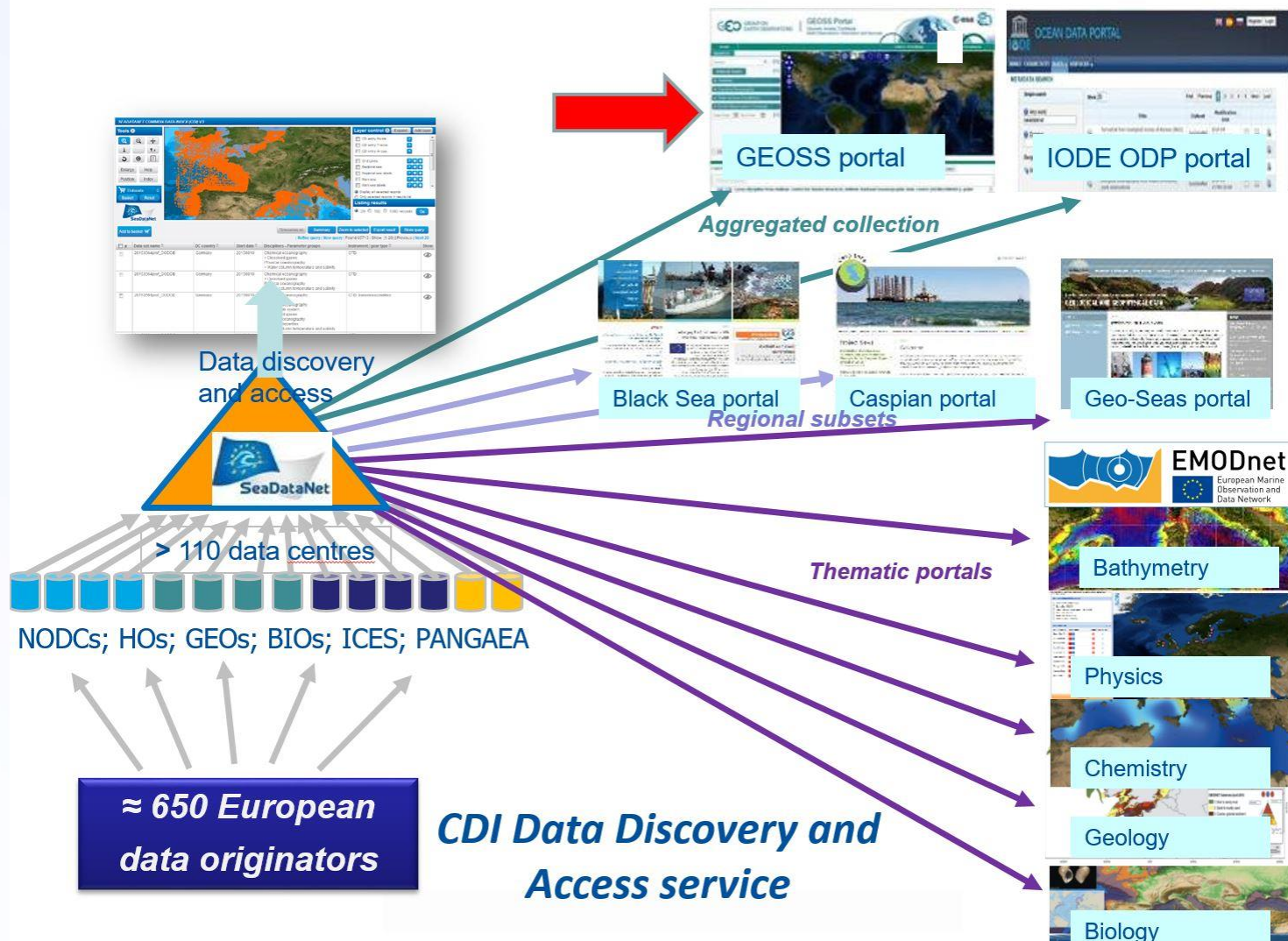


**Ocean Data Interoperability Platform (ODIP):** exploring and demonstrating common standards and interoperability with leading data management infrastructures in USA and Australia

**GEOSS - EuroGEOSS:** feeding GEOSS portal with SeaDataNet in-situ data collections from large community of European data holders (> 100 data centres; >600 data originators)

**European Open Science Cloud (EOSC):** shaping the pilot Blue Cloud

**CDI service**  
driving and  
serving many  
portals and  
communities





## SeaDataCloud project activity

This project has received funding from the European Union's Horizon 2020 Research Infrastructures programme, under the grant agreement No 730960”.



Upgrading and innovating existing services for users and data providers:

- Advancing the CDI service by adopting cloud
- Introducing 'Linked Data Principle' to catalogues for semantic web
- Adding transformation facility for INSPIRE compliance



Developing new services for users and data providers:

- SWE Ingestion service for Real Time data streams
- Brokerage service for mutual exchange with international data networks

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- Virtual Research Environment (VRE) with advanced services: subsetting, visualisation, online ODV, DIVA and data sharing
- Development of cloud-based services to facilitate individual and collaborative research (MySeaDataCloud)
- Make use of the cloud environment to improve the performance of the CDI data access and to improve capacities for data processing including additional quality checks
- Improve the data quality by implementing more checks on the data file and by improving the QC loop when generating the SeaDataNet products

## Services for data providers (\*)

- © Software to prepare data and metadata
- © Long term archiving
- © Data and metadata visibility
- © DOI minting service
- © Workshops and on line video on Ocen Teacher

## Services for data users (\*\*)

- © Catalogues of metadata

## Services for policy makers, \*, \*\*

- © Data services, visualisation, search and download
- © Data Products

### In the coming months:

Virtual Research Environment,  
My SeaDataCloud - New  
visualisation and analysis  
software on line  
More efficient data access –  
near real time data from  
sensors – Metadata services  
more findable