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

Andrea Bordone e
Giancarlo Raiteri - ENEA
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
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
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.

What is SeaDataNet?

Physical oceanography
- Meteorology
- Chemistry
- Geophysics
- Marine Geology
- Biology

Selection of data along tracks
SeaDataNet started in the 90s and has been developing over the years. Thanks to EU funded projects:

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Project Description</th>
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<tbody>
<tr>
<td>90</td>
<td>Metadata directories Medar/MedAtlas</td>
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<tr>
<td>2002-2005</td>
<td>Sea-Search (FP5)</td>
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<td>2006-2011</td>
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<td>2011-2015</td>
<td>SeaDataNet II (FP7)</td>
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<td>2016-2020</td>
<td>SeaDataCloud (H2020)</td>
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Data Services
SeaDataCloud

http://www.seadatanet.org

Map tools

Data discovery interface

**Map**

**Tools**

**Position** | **Index**
--- | ---

**Datasets** | **Basket** | **Reset**
--- | --- | ---

**Layer Control**

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

**LAT/LONG**

**Upper-left** | **Lower-right**
--- | ---

**Search**

**Free search**

**Disciplines - Topics**
- Administration and dimensions

**Discovery parameters**
- Acoustic noise in the water column
- Air pressure
- Air temperature

**Search**

**Clear** | **?**
--- | ---

**Discipline** | **Cruise**
--- | ---

**Parameter** | **Country**
--- | ---

**Instrument** | **Platform**
--- | ---

**.............**
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

SeaDataCloud

EDMOS Organisations

EDMOS Projects

EDMOS Observing programmes

CDI Data index

CSR Research cruises

EDMED Data sets

COMPLIANT

Observing programmes

Data index
Data Products

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)
Controlled vocabularies used in all metadatabases and data formats (interoperability) organised with international governance, user interfaces and web services.
Software for data producers, data centres and data users

- To create metadata CDI, CSR, EDMO, EDIOS, EDMERP
- To present and analyse data
- To generate the spatial objects for CDI files
- To convert data file
- To convert to the internal formats
- To make available data in data centres
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

Presently 115 data centres are connected, some are still underway

European data sources

data centres ⇐ 650 originators

Metadata

Data centres

Search and Shop

sdn-userdesk@seadatanet.org – www.seadatanet.org
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)
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

CDI Data Discovery and Access service

NODCs; HOs; GEsOs; BIOs; ICES; PANGAEA

Approximately 650 European data originators

> 110 data centres

Aggregated collection

GEOSS portal

IODE ODP portal

Black Sea portal

Caspian portal

Geo-Seas portal

Regional subsets

Thematic portals

Bathymetry

Physics

Chemistry

Geology

Biology

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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
SeaDataCloud project activity

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

• 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 online video on Ocean 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

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