Oceans and seas are important

Climate, Energy, Food, Tourism, Shipping, Health, ....
Marine data relevant for many uses:

- Scientific Research to gain knowledge and insight
- Monitoring and assessment (water quality, climate status, stock assessment)
- Coastal Zone Management
- Modelling (including hindcast, now-cast, forecast)
- Dimensioning and supporting operations and activities at sea (shipping, offshore industry, dredging industry, ..)
- Implementation and execution of marine conventions for protection of the seas
- Implementation of international Directives, such as in Europe directives for water (WFD), marine strategy (MSFD), coastal zone management

Users originate from government, science sector, and industry, nationally and internationally.
Input for models: analyses and forecasts:

- Operational oceanography
- Physical and meteorological modelling
- Ecosystem modelling
Acquisition of ocean and marine data
Economy of data acquisition

- Data are collected by governments, research institutes, and private industry (in Europe already more than 1,000 organisations)
- Data for physics, geophysics, meteorology, chemistry, biology, geology, bathymetry
- Acquisition of oceanographic and marine data is expensive; annual costs in Europe estimated at 1.4 Billion Euro (1.0 = in-situ; 0.4 = satellites)

Professional data management is required with agreements on standardisation, quality control protocols, long term archiving, catalogues, and access
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.

<table>
<thead>
<tr>
<th>90s</th>
<th>Metadata directories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Medar/MedAtlas</td>
</tr>
<tr>
<td>2002-2005</td>
<td>Sea-Search (FP5)</td>
</tr>
<tr>
<td>2006-2011</td>
<td>SeaDataNet (FP6)</td>
</tr>
<tr>
<td>2011-2015</td>
<td>SeaDataNet II (FP7)</td>
</tr>
<tr>
<td>2016-2020</td>
<td>SeaDataCloud (H2020)</td>
</tr>
</tbody>
</table>

sdn-userdesk@seadatanet.org – www.seadatanet.org
SeaDataNet portal

Giving access to
• Standards, tools both for data centres and other users
• Data and metadata
• Products

http://www.seadatanet.org
SeaDataNet standards

- Set of common standards for the marine domain, adapting ISO and OGC standards and achieving INSPIRE compliance
  - Adoption of ISO 19115 – 19139 standard for describing metadata on data sets, research cruises, monitoring networks, and research projects => marine metadata profiles, schemas, schematron rules
  - Controlled vocabularies for the marine domain (>65,000 terms in 82 lists), with international governance and web services
  - Standard data exchange formats: ODV ASCII and NetCDF (CF) fully supported by controlled vocabularies
- Maintenance and dissemination of standard QA-QC procedures, together with IOC/IODE and ICES
SeaDataNet services and tools

- **Set of tools** to be used each data centre and freely available from the SeaDataNet portal: metadata editor, data conversion software, data analysis software (ODV), data interpolation software (DIVA)

- **Capacity building** by training workshops for uptake of standards and tools by the data centres in order to achieve standardisation

- **Pan-European services** for harmonised discovery, access, visualisation of data and data products

- **Common SeaDataNet Data Policy** and License
Pan-European metadata directories

- EDMERP Projects
- EDMO Organisations
- EDIOS Observing programmes
- CDI Data index
- CSR Research cruises
- EDMED Data sets

sdn-userdesk@seadatanet.org – www.seadatanet.org
CDI Data Discovery and Access service

SeaDataNet portal

Search and Shop

Metadata + transaction data

Already 110 data centres connected and more underway

European data sources

data centres ↔ ≈ 650 originators

sdn-userdesk@seadatanet.org – www.seadatanet.org
CDI Data Discovery and Access service
SeaDataNet as driver and contributing to many portals

Total collection

GEOSS portal

IODE ODP portal

Aggregated collection

Regional subsets

Black Sea portal

Caspian portal

Geo-Seas portal

Thematic subsets

Black Sea portal

Caspian portal

Geo-Seas portal

Thematic subsets

Thematic subsets

Thematic subsets

Thematic subsets

Thematic subsets

Thematic subsets

Thematic subsets

Thematic subsets

Cloud

SeaDataNet

NODCs; HOs; GEOS; BIOs; ICES;

> 110 data centres

> 650 European data originators

CDI Data Discovery and Access service
SeaDataNet directories increase
Data Products and viewers

SeaDataCloud

DATA 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.

SeaDataNet products
Viewing and Downloading service

Search...
SeaDataNet cooperation

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

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

- **GEOSS - EuroGEOSS:** Maintaining the GEOSS portal with SeaDataNet in-situ data collections from large community of European data holders

- **Copernicus:** Data exchange with Copernicus Marine Environmental Monitoring Services (CMEMS) and providing standards:
Cooperation SeaDataNet – Copernicus

Copernicus Marine Environmental Monitoring Services (CMEMS)

SeaDataNet providing long-term archives and standards

sdn-userdesk@seadatanet.org – www.seadatanet.org
Ocean Data Interoperability Platform (ODIP - ODIP II)

- European-USA-Australia collaborative project
- Supported by:
  - European Commission
  - National Science Foundation (NSF)
  - Australian Government
- Promoting the development of a common global framework for marine data management by developing interoperability between existing regional e-infrastructures of Europe, USA and Australia and towards global infrastructures such as GEOSS, IOC-IODE and POGO.
- In practice by organising international workshops with leading experts to present, compare and discuss approaches and standards applied.
- Developing prototypes for interoperability solutions or common standards to overcome identified differences. Prototypes projects are worked out in order to evaluate and test solutions.
ODIP – Prototype projects

- **Prototype 1**: Discovery and access of marine data
- **Prototype 2**: Cruise summary reporting (CSR)
- **Prototype 3**: Sensor web enablement (SWE)

Ocean Data Interoperability Platform

**International data infrastructures**
- IODE
- GEOSS
- POGO

**Regional data infrastructures**
- EUROPE
- AUSTRALIA
- USA

sdn-userdesk@seadatanet.org – www.seadatanet.org
SeaDataNet and EMODnet

- EU initiative for an overarching European Marine Observation and Data Network (EMODNet) driven by Marine Knowledge 2020 and Blue Growth

- SeaDataNet qualified as a leading infrastructure for the EMODnet data management component and is driving several thematic portals from the start in 2008

- ‘Bottom-up meets top-down’

- This synergy has resulted in many more data centres adopting SeaDataNet standards and connecting to the CDI Data Discovery and Access service while it gave a flying start to EMODnet
European Marine Observation and Data Network

- Central portal
- Thematic portals for physics, biology, geology, bathymetry, chemistry, seabed habitats and human activities
- Checkpoints for analysing fitness for purpose
## EMODnet thematic portals

### Bathymetry
- Minimum cell water depth
- Maximum cell water depth
- Average cell water depth
- Standard deviation of cell water depth
- Number of values used for interpolation of cell water depth
- Horizontal coordinate reference system
- Depth reference system
- Lowest Astronomical Tide

### Geology
- Seabed substrate
- Sediment accumulation rate
- Sea-floor geology
- Seabed lithology
- Stratigraphy
- Coastline migration
- Aggregate resources
- Geological events

### Seabed Habitats
- Data on modelled seabed habitats (depth, seabed substrate, broad scale biological zone, T, S, light, oxygen, energy due to waves & current)
- Broad-scale physical habitat map
- Detailed habitat maps from surveys
- Individual habitat modelling outputs
- Habitat point data

### Chemistry
- Pesticides & Biocides
- Antifoulants
- Pharmaceuticals
- Heavy Metals
- Hydrocarbons
- Radionuclides
- Fertilizers
- Acidity
- Dissolved Gasses
- Plastics
- Marine Litter Beach litter Seafloor litter Micro litter
- Chlorophyll Silicates Organic Matter

### Biology
- Biomass Abundance
- Grided Abundance maps species groups:
  - phytoplankton
  - zooplankton
  - angiosperms
  - macro-algae
  - invertebrate bottom fauna
    - birds
    - mammals
    - reptiles
    - Fish

### Physics
- Waves
- Water temperature
- Water salinity/conductivity/density
- Currents
- Light attenuation/fluorescence
- Sea level
- Atmospheric parameters
- Wind
- Underwater noise
- Rivers
- Ice

### Human activities
- Aggregate Extraction Dredging
- Fisheries
- Hydrocarbon Extraction Main Ports
- Mariculture
- Ocean Energy Facilities
- Pipelines and Cables
- Protected Areas
- Waste Disposal
- Wind Farms
- Other Forms of Area Management / Designation
Bathymetry CDI data discovery and access service

WHAT?
- Data set name
- Discipline
- Parameter groups
- Discovery parameters
- GEMET-INSPIRE themes
- Abstract

WHERE?
- Data format
- Data set creation date
- Map

TIR96
- Marine geology
- Terrestrial Gravity, magnetics and bathymetry
- Terrestrial Bathymetry and Elevation
- Oceanographic geographical features

The data have been acquired with a Simrad EM120 S Multi Beam echosounder aboard the Russian RV Gelandzhik in order to survey the Tyrrhenian sea for geological and seafloor mapping in the framework of an Italian project funded by CNR and APAT (Geological Survey Agency). Sea state was rough at times. Results, maps can be found in the book: Marani M. P., Gamberi F., Bonatti E. (2004). Editors: From seafloor to deep mantle: architecture of the Tyrrhenian backarc basin. Memorie Descrittive Della Carta Geologica d'Italia, (pp. 1-194).

Climate and Forecast NetCDF Version 3.5
20170831

GML id
- mc01

GML objects
- Name
- Description
- Track T960016 for TIR96
- Track T960017 for TIR96
- Track T960016 for TIR96
- Track T960017 for TIR96
EMODnet Physics

Oceans Physics at your fingertips
Pillars under EMODnet Physics

- The European Global Ocean Observing System, association and its regional components (ROOSs)

- Copernicus Marine Environment Monitoring System (CMEMS)

- SeaDataNet, pan-European marine data management infrastructure and network of NODCs
SeaDataCloud a new opportunity

• Standards and information technology are always evolving, there is a move towards cloud storage and cloud computing, and the SeaDataNet infrastructure must stay up-to-date to maintain and further expand its services to its leads customers and major stakeholders

• SeaDataCloud project, started Nov 2016 with 4 year run and 10 Meuro funding

• A strategic and operational cooperation between the SeaDataNet consortium of marine and ocean data centres and the EUDAT consortium of e-infrastructure service providers
Cooperation with EUDAT

EUDAT is European consortium of academic computing centres
What is it about?

- SDC is about **updating and further developing standards**
- SDC is about improving and innovating services & products
- SDC is about adopting and elaborating new technologies
- SDC is about giving more attention to users and putting the user experience in a central position

- SDC is also about developing a **Virtual Research Environment (VRE)** bringing data and applications together in the cloud and serving users
Towards a Blue Cloud as blue print for the European Open Science Cloud (EOSC)

- Cloud platform with common services for data pre-processing, analyses, visualizations, publishing, DOIs...
- Applying common standards and interoperability solutions for providing harmonised data and metadata
- Providing harmonised discovery and access to data output from multiple sources, European and international
Welcome to the EMODnet Data Ingestion portal

The European Marine Observation and Data Network (EMODnet) consists of more than 160 organisations that together work on assembling, harmonising and making marine data, products and metadata more available to public and private users. This Data Ingestion portal facilitates additional data managers to ingest their marine datasets for further processing, publishing as open data and contributing to applications for society.

Submit your data files
The online Data Submission service facilitates you to submit marine datasets by completing a form and

Ingest operational data
We are also interested in (Near) Real-Time ((N)RT) data streams from fixed and autonomous ocean

View submissions
View, search and download datasets that have been submitted by data providers using the Data
Submission service for offline data sets

DATA INGESTION PORTAL
Wake up your data - set them free for Blue Society
Data Submission Service

Dataset Identification

DATASET GENERAL INFORMATION
Title of dataset *:
2011-GEMS, Zone 8 - Bristol Channel Atlantic Array, Metocean assessment

Narrative summary of dataset *:
GEMS Survey Ltd. (GEMS) was awarded a contract by Channel Energy Limited to undertake metocean data collection in the Bristol Channel as part of the Atlantic Array wind farm development project. The scope of work includes the deployment of two acoustic wave and current (AWAC) units and one Directional Wave Rider Buoy. Ancillary work includes water and sediment sampling and water profiling. Following non-recovery of AWAC devices, TRIAXYS Directional Wave buoys were utilised for the rest of the survey. This series contains both reports and datasets associated with the Metocean Assessment.

DATASET FORMATS
Dataset format *:
Text or Plaintext
View submissions service ‘as is’

View submissions

This service allows users to search and download the datasets that have been submitted via the Submission service and that have been reviewed and completed in metadata by assigned data centers. These datasets are published "as-is" and will be further inspected and elaborated, where possible, for uptake in the national and European infrastructures supporting EMODNet.
Uptake of ingested data sets by European infrastructure
EMODnet Data Ingestion

WAKE UP YOUR DATA
Set them free for Blue Society

The Data Ingestion Portal facilitates submitting marine datasets for further processing. Open Data publishing and contributing to applications for society.

emodnet-ingestion.eu

Check out the video