

## SeaDataNet: a Pan-European Infrastructure and a strategic asset for the future

Regional Conventions, Environmental Agencies, Scientific Investigators supported by funding agencies, etc. have several reporting obligations with respect to data collected, generated, or analyzed during their funded activities. These obligations, in turn, encourage the use of good data management practices and procedures. Data are collected by many organisations and could be used by many other communities (researchers, environmental agencies, policy makers, general public, etc.). Once created, data are valuable resources that can be used and re-used for future environmental, scientific, management and educational purposes. Sharing data facilitates new scientific inquiry, avoids duplicate data collection and provides rich real life resources for well defined objectives (e.g. environmental protection, education and training).

SeaDataNet is a standardized system for managing the large and diverse data sets collected by the oceanographic fleets and the automatic observation systems. The SeaDataNet infrastructure network and enhance the currently existing infrastructures, which are the national oceanographic data centres of 35 countries, active in data collection. The networking of these professional data centres in a unique virtual data management system provide integrated data sets of standardized quality on-line. As a research infrastructure, SeaDataNet contributes to build research excellence in Europe.

As an Integrated Research Infrastructure Initiative (IRI), SeaDataNet carries out different types of interrelated activities to reach its objectives:

- 1) **The Coordination activities (COORD)** include management and coordination of the project, education and capacity building, the management of SeaDataNet catalogues (CSR, EDIOS EDMED, EDMERP, EDMO and CDI), training and capacity building and communication.
- 2) **The Support activities (SUPP)** provide continuous access to the national marine data and information services, which are the 45 National Oceanographic Data Centres (NODC or Designated National Agencies for International Exchange) from 35 countries.
- 3) **The Research and Technical Developments activities (RTD)** develop the SeaDataNet Virtual Data Centre to get the on line integrated access to qualified, compatible and coherent meta-data, data sets and products:
  - the **technical development** activities will make the distributed system operationally robust and state-of-the-art Pan-European infrastructure
  - the **scientific data products development** will contribute to the data quality control protocol, insure the overall functioning of the system and serve a larger community of users.



IFREMER (France), *Coordinator*  
MARIS (Netherlands), *Deputy & Technical coordinator*  
HCMR/HNODC (Greece)  
ULg (Belgium)  
OGS (Italy)  
NERC/BODC (UK)  
BSH/DOD (Germany)  
SMHI (Sweden)  
IEO (Spain)  
ENEA (Italy)  
INGV (Italy)  
METU-IMS (Turkey)  
CLS (France)  
AWI (Germany)  
IMR (Norway)  
NERI (Denmark)  
ICES (International)  
IES-JRC (International)  
MI (Ireland)  
IHPT (Portugal)  
NIOZ (Netherlands)  
RIHMI/WDC (Russia)

MRI (Iceland)  
FMI (Finland)  
IMGW (Poland)  
MSI (Estonia)  
LHEI (Latvia)  
EPA (Lithuania)  
SIO/RAS (Russia)  
MHI-DMIST (Ukraine)  
IO-BAS (Bulgaria)  
NIMRD (Romania)  
TSU-DNA (Georgia)  
VLIZ (Belgium)  
IOLR (Israel)  
CNR (Italy)  
IBSS (Ukraine)  
UniHB (Germany)  
TUBITAK (Turkey)  
RBINS/MUMM (Belgium)  
IOF (Croatia)  
NIB (Slovenia)  
UOM (Malta)  
OC-UCY (Cyprus)

**SeaDataNet** PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

[www.seadatanet.org](http://www.seadatanet.org)



## Pan-European Data Infrastructure

SeaDataNet has developed an efficient distributed Marine Data Management Infrastructure for the management of large and diverse sets of data deriving from in situ and remote observation of the seas and oceans. Professional data centres, active in data collection, constitute a Pan-European network providing on-line integrated databases of standardized quality.

SeaDataNet infrastructure is **based on a semi-distributed system** that incorporates and enhance the existing NODC network and satellite data centres. It enables the data centres to interact as a virtual **data centre, able to deliver integrated data, meta-data and products** of controlled quality through a **unique portal**.

Access to marine data is of vital importance for marine research and a key issue for various studies, from the climate change prediction to off shore engineering. The marine observing system is highly fragmented: in the countries bordering the European seas of the partnership, more than 600 scientific data collecting laboratories from governmental organizations and private industry have been identified. They collect data by using various sensors on board of research vessels, submarines, fixed and drifting platforms, airplanes and satellites, to measure physical, geophysical, geological, biological and chemical parameters, biological species etc. The collected data are neither easily accessible, nor standardized. They are not always validated and their security and availability have to be insured in the future.

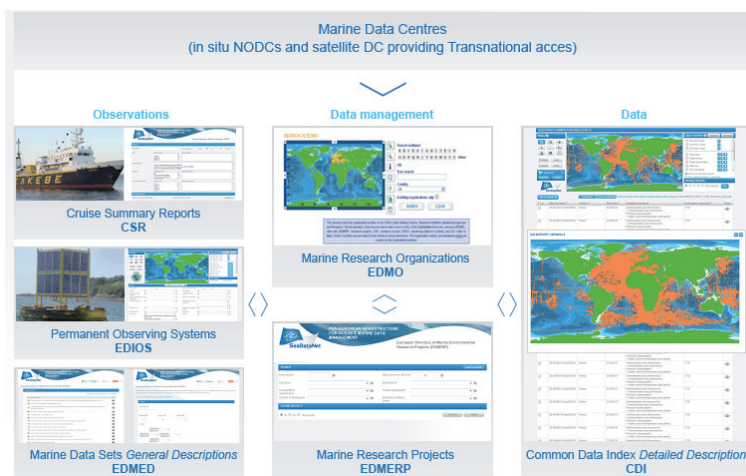
## Standards and Tools

The main SeaDataNet accomplishments are:

- Development of common standards:
  - Vocabularies
  - Transport formats
  - European catalogues with standardised XML ISO-19115 descriptions
- Set of tools to be implemented in each data centre:
  - MIKADO: generator of XML descriptions of SeaDataNet catalogues
  - NEMO: reformatting software to SeaDataNet formats
  - Download Manager: downloading software
  - ODV: Ocean data view adapted to SeaDataNet needs
  - DIVA: for product generation adapted to SeaDataNet needs

## Metadata services

- European Directory of Marine Organisations (EDMO): Inventory of organisations working in marine research; the primary objective is to support users in identifying interesting research organisations in connecting them to involved research managers and project results like data, models, publications, etc. across Europe.
- European Directory of Marine Environmental Data sets (EDMED): Comprehensive reference to marine data sets and collections in Europe; On-line query & browse; Simple or advanced query interface to specify a combination of search criteria.
- European Directory of Marine Environmental Research Projects (EDMERP): Inventory of marine research projects undertaken by European research laboratories; the primary objective is to support users in identifying interesting research activities and in connecting them to involved research managers and project results like data, models, publications, etc. across Europe.
- Cruise Summary Reports (CSR): Conceived by IOC, ICES acting as focal point; documenting data collected on scientific research cruises operated by European vessels.
- European Directory of the initial Ocean-observing Systems (EDIOS): Inventory of organisations working in marine research; the primary objective is to support users in identifying interesting research organisations in connecting them to involved research managers and project results like data, models, publications, etc. across Europe.
- Common Data Index (CDI): Index to individual data sets; On-line searchable directory; Direct access to on-line data sets, catalogues or e-mail request.



All these Directories have been harmonised and mutually tuned in format, syntax and semantics (common vocabularies), a common XML editor (MIKADO), online CMS and online user interfaces.

SEADATANET metadata are OGC, ISO, and INSPIRE compliant

## SeaDataNet visualization and analysis tools

### Ocean Data View (ODV)

- General data analysis and visualization software
- > 10,000 registered users
- ODV software upgraded to ODV4 for:
  - Extending ODV's graphical display capabilities and interactive controls for automatic and visual quality control and data quality flagging
  - Seamless connection to SeaDataNet output: SDN ODV4 data formats, quality flag scale
  - Integration of DIVA gridding software
  - Important tool for the SeaDataNet regional Data Products

### DIVA software (Data-Interpolating Variational Analysis)

Allows to spatially interpolate observations on a regular grid in an optimal way. The analysis is performed on a finite element grid allowing for a spatial variable resolution and a good representation of the coastline and isobaths.

