Oceanographic and Environmental Data Management

Dr. Luminita Buga

National Institute for Marine Research and Development "Grigore Antipa"

Romanian National Oceanographic and Environmental Data Center

Blvd. Mamaia 300, RO – 900581
Constanta, ROMANIA
Tel: +40 241 543288, 540870
Fax: +40 241 831274
E-mail: lbuga@web.de

- **Established in 1970,**

- ***NATIONAL INSTITUTE FOR MARINE RESEARCH – DEVELOPMENT "Grigore Antipa" (NIMRD) is the leading marine research institution in Romania, as well as national coordinator and focal point with respect to international research tasks and responsibilities in the field of marine science.***

- ***The NIMRD's research activities are mainly oriented towards supporting adequate marine and coastal environmental management and protection. NIMRD undertakes fundamental, applied and technological development research in oceanography, marine and coastal engineering, ecology and environmental protection, and management of living resources in the Black Sea and other ocean areas.***

MAIN OBJECTIVES

Fundamental, applied and technological research on:

- *Oceacnography*
- *Marine and coastal engineering*
- *Ecology*
- *Environmental protection*
- *Management of marine living resources*

SPECIFIC OBJECTIVES

The basic research fields include:

- *marine hydrology,*
- *marine physics,*
- *marine chemistry,*
- *marine biochemistry,*
- *sedimentology,*
- *coastal morphodynamics,*
- *marine biology, microbiology,*
- *marine living resources,*
- *coastal engineering and technology,*
- *ecological protection*

In 2007, following the IOC/IODE and IOC GOOS objectives and recommendations as well as the poor managing system of national marine data and information, NIMRD established the "**Romanian National Oceanographic and Environmental Data Center" (NOEDC),** which replaces the existing Designated National Agency.

The centre is officially recognized by the IOC/IODE (http://www.iode.org/) and IOC/GOOS (http://www.ioc-goos.org/) as Romanian Oceanographic Data Centre, replacing former Designated National Agency and is included in the list of world oceanographic data centers.

The decision was preceded by approaching a specific thematic in the National (**PN 2006; CEEX)** and International Projects (***NATO SfP ODBMS,*** **ESEAS; ARENA; ASCABOS; ECOOP; Sea SEARCH; Black Sea SCENE; SeaDataNet**)

RoNOEDC contributes to data management structures of several national and international scientific projects

Being the technical operator of the marine monitoring network (physical, chemical and biological) and for coastal erosion survey, NIMRD holds a comprehensive volume of marine data and information (stored in National Oceanographic and Environmental Data Center - NOEDC).

The main area of interest is Black Sea with special attention to the western part of Black Sea.

The national data collection of the NOEDC consists of:

Physical and chemical data

Air temperature
Sea water temperature,
Sea water salinity, density
Sea water transparency
Dissolved oxygen
Phosphorus
Nitrate
Nitrite
Ammonium
Silicate
Pesticides
Hydrocarbons
Heavy Metals

Biological data

Plankton
Benthos
Chlorophyll-a
Ichthyology

Hydrodynamic data

Sea waves
Sea level
Sea currents

Environmental data

Functional zones
Protected areas

Socio - economic data

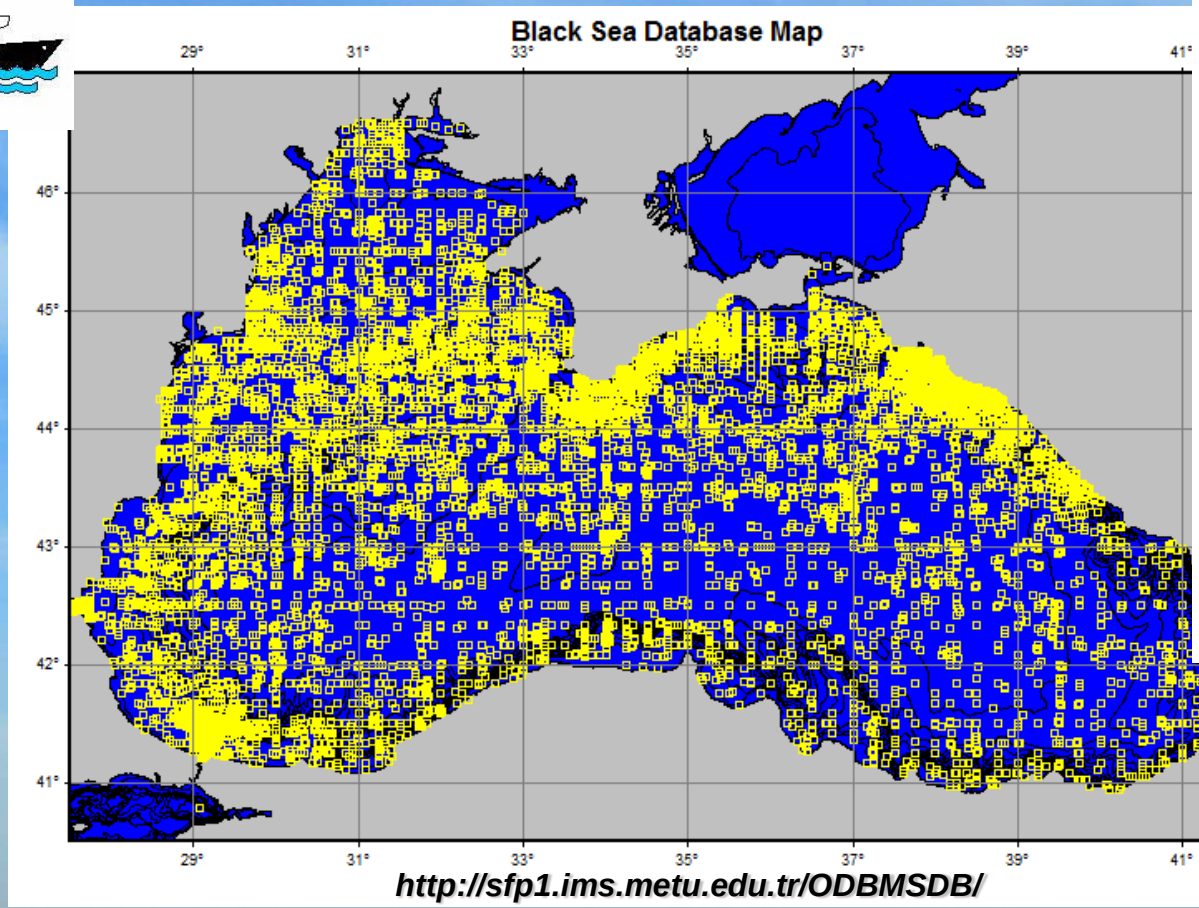
Digitized maps

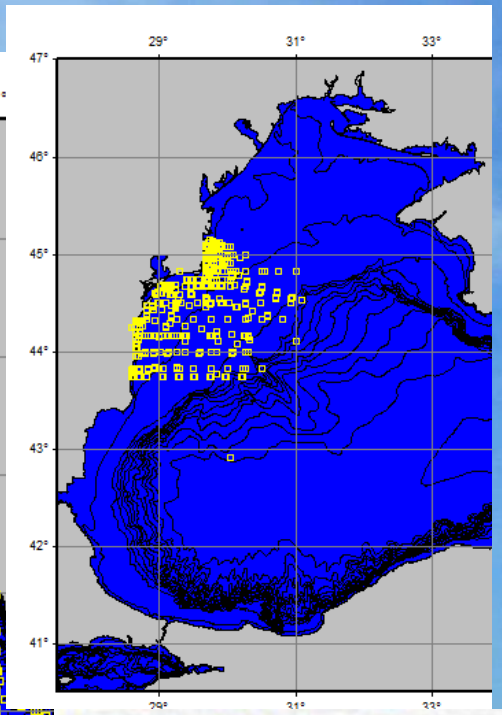
RoNODEC MISSIONS

- to design and operate scientific information systems and databases in the domain of the sea;
- to set the standards of quality to be respected for data storage;
- to maintain an inventory of information systems and databases, the responsible scientists and rules for their availability;
- to represent NIMRD within national and international authorities concerned with the management of sea data;
- to provide training and transfer of knowledge within its field of competence.

Current Objectives of Data Management

- to insure perennial safeguarding, access and promotion of the national data holdings
- to make available long time series of coherent and comparable observations of the same type
- to contribute to a better exploitation of the oceanographic work among scientific, engineering educational and decision maker community
- to have access to foreign data sets through data exchange
- to assist the scientists in preparing projects





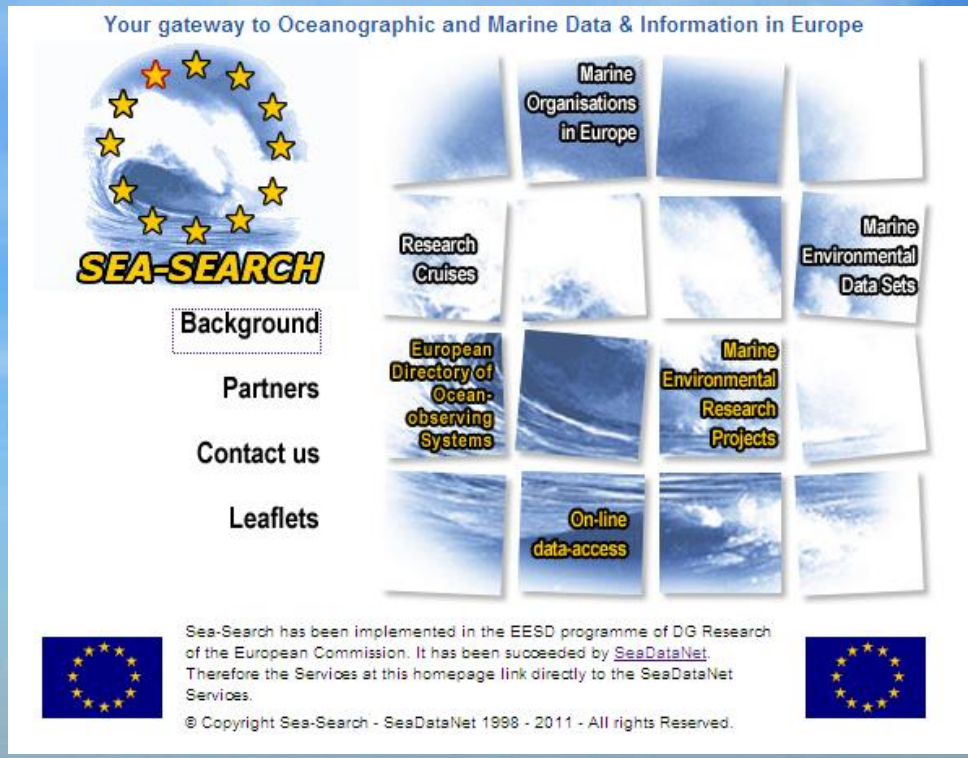
Organization Name: RMRI

Number of datasets: 17
Number of stations: 5108
Time period: 18/02/1963 - 20/10/1995

http://sfp1.ims.metu.edu.tr/ODBMSDB/

Black Sea inter-disciplinary historical database was created in framework of the NATO TU-Black Sea project in 1994-1997 (public released in 2003) and maintained in framework of the NATO SfP ODBMS Black Sea Projects. It includes all main physical, chemical and biological variables for the entire Black Sea basin and serves as a base line for contemporary and future research activities and management purposes in the region.

The primary goal of FP5 Project Sea-Search (**2002 – 2005**) has been to provide users with a central overview of ocean and marine data & information, collected and managed by research institutes, monitoring agencies and data holding centres in the countries bordering the European seas.



Sea-Search focused on metadata and has established and populated an array of directories and overviews of ocean and marine data & information resources from 30 countries in Pan-Europe.

The Sea Search partnership has brought together a unique group of 33 institutes /centres from 30 different European coastal states. The range of data disciplines includes physical oceanography, marine biology, marine chemistry, and hydrography. The majority of the partners are also participating in the global IOC-IODE system of national oceanographic data centres

It was concluded that: the marine observing system is highly fragmented. In the countries bordering the European seas more than 600 scientific data collecting laboratories from governmental organizations and private industry have been identified. They collect data by using various sensors 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 insure in the future.

Sea Search project has been succeeded by FP 6 Project: SeaDataNet (2006 -2011)

- **SeaDataNet has federated open digital repositories to manage, access and share data, information, products and knowledge originating from oceanographic fleets, new automatic observation systems and space sensors.**
- **By use of standards for communication and new developments in information technology, in-situ and satellite marine data platforms are providing metadata, data and products as a unique virtual data centre.**
- **The SeaDataNet partnership is assuring the archival and preservation of data for their re-use for new research, retention of unique observational data which is impossible to re-create; enhance existing data available for research projects as well for marine environment management, education, history and other uses**
- **SeaDataNet is including the important issues of trust which are addressed in data-based research: security, confidentiality, ownership, assured provenance, authenticity, as well as the quality of the data and the metadata**
- **Standards development and adoption for communication and Quality Assurance issues on data, meta-data and products are providing integrated data sets of assessed quality. The implementation of common QA procedure allows the preparation of common regional and global data products.**

Sea Search project has been succeeded by FP 6 Project: SeaDataNet (2006 -2011)

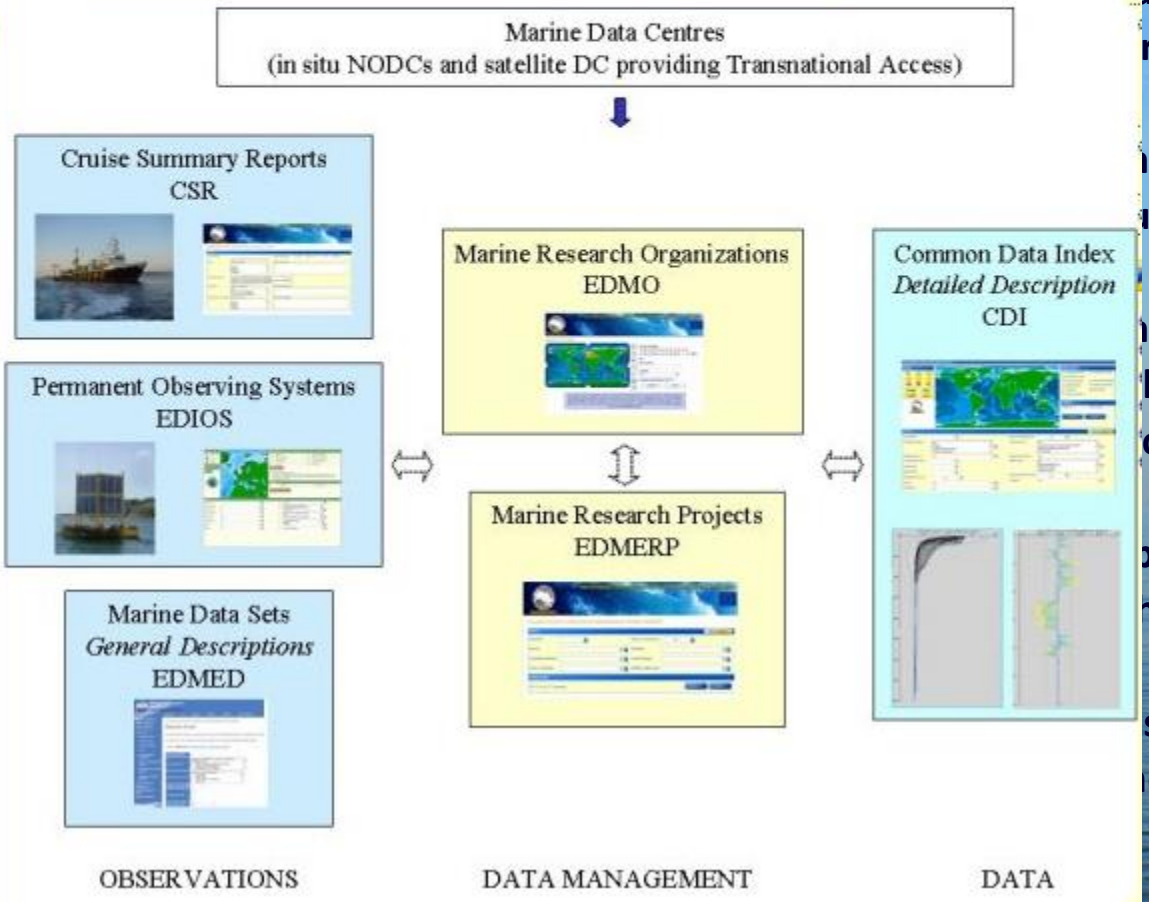
SeaDataNet

ata Management

Partners | Links | Extranet

The following Pan-European metadata services give overviews of marine organisations in Europe and their engagement in marine research projects, managing large datasets, and data acquisition by research vessels and monitoring programmes for the European seas and global oceans:

- European Directory of Marine Organisations (EDMO)
- European Directory of Marine Environmental Data sets (EDMED)
- European Directory of Marine Environmental Research Projects (EDMERP)
- Cruise Summary Reports (CSR)
- European Directory of the initial Ocean-observing Systems (EDIOS)



- SeaDataNet has f… …ata, information, products and know… …rvation systems and space sensors.
- By use of standar… …nology, in-situ and satellite marine dat… …e virtual data centre.
- The SeaDataNet p… …eir re-use for new research, retention … …hance existing data available for resear… …on, history and other uses
- SeaDataNet is inc… …based research: security, confider… …e quality of the data and the metadata…
- Standards develo… …sues on data, meta-data and products a… …entation of common QA procedure allow…

Sea Search project has been succeeded by FP 6 Project: SeaDataNet (2006 -2011)

- **SeaDataNet has federated open digital repositories to manage, access and share data, information, products and knowledge originating from oceanographic fleets, new automatic observation systems and space sensors.**
- **By use of standards for communication and new developments in information technology, in-situ and satellite marine data platforms are providing metadata, data and products as a unique virtual data centre.**
- **The SeaDataNet partnership is assuring the archival and preservation of data for their re-use for new research, retention of unique observational data which is impossible to re-create; enhance existing data available for research projects as well for marine environment management, education, history and other uses**
- **SeaDataNet is including the important issues of trust which are addressed in data-based research: security, confidentiality, ownership, assured provenance, authenticity, as well as the quality of the data and the metadata**
- **Standards development and adoption for communication and Quality Assurance issues on data, meta-data and products are providing integrated data sets of assessed quality. The implementation of common QA procedure allows the preparation of common regional and global data products.**

Sea Search project has been succeeded by FP 6 Project: SeaDataNet (2006 -2011)

The Common Data Index (CDI) service gives users a highly detailed insight in the availability and geographical spreading of marine data sets, that are managed by the SeaDataNet data centres. Moreover it provides a unique interface for requesting access, and if granted, for downloading data sets from the distributed data centres across Europe.

- Seal
produ
space
- By u
satelli
centre
- The
resea
availa
uses

- SeaDataNet is including the important issues of trust which are addressed in data-based research: security, confidentiality, ownership, assured provenance, authenticity, as well as the quality of the data and the metadata
- Standards development and adoption for communication and Quality Assurance issues on data, meta-data and products are providing integrated data sets of assessed quality. The implementation of common QA procedure allows the preparation of common regional and global data products.

Sea Search project has been succeeded by FP 6 Project: SeaDataNet (2006 -2011)

- **SeaDataNet has federated open digital repositories to manage, access and share data, information, products and knowledge originating from oceanographic fleets, new automatic observation systems and space sensors.**
- **By use of standards for communication and new developments in information technology, in-situ and satellite marine data platforms are providing metadata, data and products as a unique virtual data centre.**
- **The SeaDataNet partnership is assuring the archival and preservation of data for their re-use for new research, retention of unique observational data which is impossible to re-create; enhance existing data available for research projects as well for marine environment management, education, history and other uses**
- **SeaDataNet is including the important issues of trust which are addressed in data-based research: security, confidentiality, ownership, assured provenance, authenticity, as well as the quality of the data and the metadata**
- **Standards development and adoption for communication and Quality Assurance issues on data, meta-data and products are providing integrated data sets of assessed quality. The implementation of common QA procedure allows the preparation of common regional and global data products.**

Pan-European infrastructure for Ocean & Marine Data Management

Common Data Index (CDI) V2 - Access to Datasets

SeaDataNet

Cart: 0 Dataset(s) | Proceed to check out | Reset basket | Export | Store query | Summary | Hide map | ?

Reset all steps > Romania > National Institute for Marine Research and Development "Grigore Antipa"

Tools

Enlarge

Position

Index

Layer control | Expand | Add layer

- CDI entry Points
- CDI entry Tracks
- CDI entry Areas
- Grid Lines
- Regional sea
- Regional sea labels
- Main sea
- Main sea labels
- Bathymetry
- Blue Marble

Display all selected records

Only selected records in results list

Zoom to selected

Search by:

Geographical Box

Add to basket | 20 | 50 | 100 Records | Go

| Found 4211 | Show (1-20) | Previous | Next 20

#	Data set name	Variables measured	Instrument / gear type	Show
	PEST-S_200608	Chemical oceanography > PCBs and organic micropollutants	gas chromatographs	

Pan-European infrastructure for Ocean & Marine Data Management

Common Data Index (CDI) V2 - Access to Datasets

SeaDataNet

Cart: 0 Dataset(s) | Proceed to check out | Reset basket | Export | Store query | Summary | Hide map | ?

Reset all steps > Romania > National Institute for Marine Research and Development "Grigore Antipa"

Tools

Enlarge

Position

Index

Layer control | Expand | Add layer

- CDI entry Points
- CDI entry Tracks
- CDI entry Areas
- Grid Lines
- Regional sea
- Regional sea labels
- Main sea
- Main sea labels
- Bathymetry
- Blue Marble

Display all selected records

Only selected records in results list

Zoom to selected

Search by:

Geographical Box

Add to basket | 20 | 50 | 100 Records | Go

| Found 4211 | Show (1-20) | Previous | Next 20

#	Data set name	Variables measured	Instrument / gear type	Show
	PEST-S_200608	Chemical oceanography > PCBs and organic micropollutants	gas chromatographs	


Pan-European infrastructure for Ocean & Marine Data Management
Common Data Index (CDI) V2 - Access to Datasets
SeaDataNet
Cart: 0 Dataset(s)
Proceed to check out
Reset basket
Export
Store query
Summary
Hide map
?
Reset all steps > Romania > National Institute for Marine Research and Development "Grigore Antipa"
Tools
Enlarge
Position
Index
Step 1
Search
Step 2
Shop
Step 3
Order/Checkout
Step 4
Confirm your userid-password
Step 5
View progress online
Step 6
Data download
How does it work?
Layer control
Expand
Add layer
Display all selected records
Only selected records in results list
Zoom to selected
Search by:
Geographical Box
Add to basket
20
50
100 Records
Go
Found 4211 | Show (1-20) | Previous | Next 20
| Data set name | Variables measured | Instrument / gear type | Show
PEST-S_200608
Chemical oceanography > PCBs and organic micropollutants
gas chromatographs

www.seadatanet.org

Pan-European infrastructure for Ocean & Marine Data Management
SeaDataNet
Home | Overview | Metadata | Data Access | Products | Standards & Software | Education | Meetings | Publications | Partners | Links | Extranet
Standards & Software
» Common Vocabularies
» Metadata formats
» Data Transport Formats
» Data Quality Control
» Software
» AAA services
» SeaDataNet architecture
Tools
Site map
Links
Contact
Print
All the news
Search
OK
Advanced search
SeaDataNet > Standards & Software
Standards and Software
Interoperability is the key to distributed data management system success and it is achieved in SeaDataNet by:
Using common vocabularies
Adopting the ISO 19115 metadata standard for all metadata directories
Providing XML Validation Services to quality control the XML metadata maintenance
Using harmonised Data Transport Formats for data sets delivery
Using common quality control protocols and flag scale
Providing standard software tools
Providing a Central User Register and single-sign-on AAA Services
Using SOAP Web Services in the SeaDataNet architecture
News
» MIKADO new release
MIKADO 2.2.1 is available.
» SeaDataNet 2 - Kick-Off Meeting
19-20 October 2011, Athens
» EndsAndBends new release
The version 2.02 of EndsAndBends software is now available for download.
» NEMO new release (V1.4.0)
The version 1.4.0 of NEMO software is now available for download. version for windows 64 bits is now distributed
» Med2MedSDN new release (1.1.07)
Med2MedSDN V1.1.07 is now available for download
» Seadatanet Newsletter n°6 - March 2011
» NEMO new release (V1.3.1)
Newsletters

Sea Search project has been succeeded by FP 6 Project: SeaDataNet (2006 -2011)

www.seadatanet.org

Sea Search project has been succeeded by
FP 6 Project: SeaDataNet (2006 -2011)

www.seadatanet.org

And continue with FP7 Project:
SeaDataNet II (2011-2015)

Sea Search project has been succeeded by FP 6 Project: SeaDataNet (2006 -2011)

www.seadatanet.org

Necessity of participation to SDN :

- Harmonisation/connection of long term archives
- Document available observations and data sets (metadata)
- Improve coherence of data sets (references, quality, redundancy)
- Make data sets accessible easily (formats, on line distribution)

As partner, Romanian NOEDC is adopting **SeaDataNet data policy** which "is consistent with, and in the spirit of, national and international policies and laws" and "is intended to be fully compatible with the Directive of the European Parliament and of the Council on public access to environmental information, the INSPIRE Directive, IOC, ICES, WMO, GCOS, GEOSS and CLIVAR data principles."

As partner, Romanian NOEDC is adopting and adapting **SeaDataNet:**

- Common vocabularies
- ISO 19115 for metadata standard for all metadata directories
- Harmonised Data Transport Formats for data sets delivery
- Common quality control protocols and flag scale
- Standard software tools

Ocean Data View

http://odv.awi.de

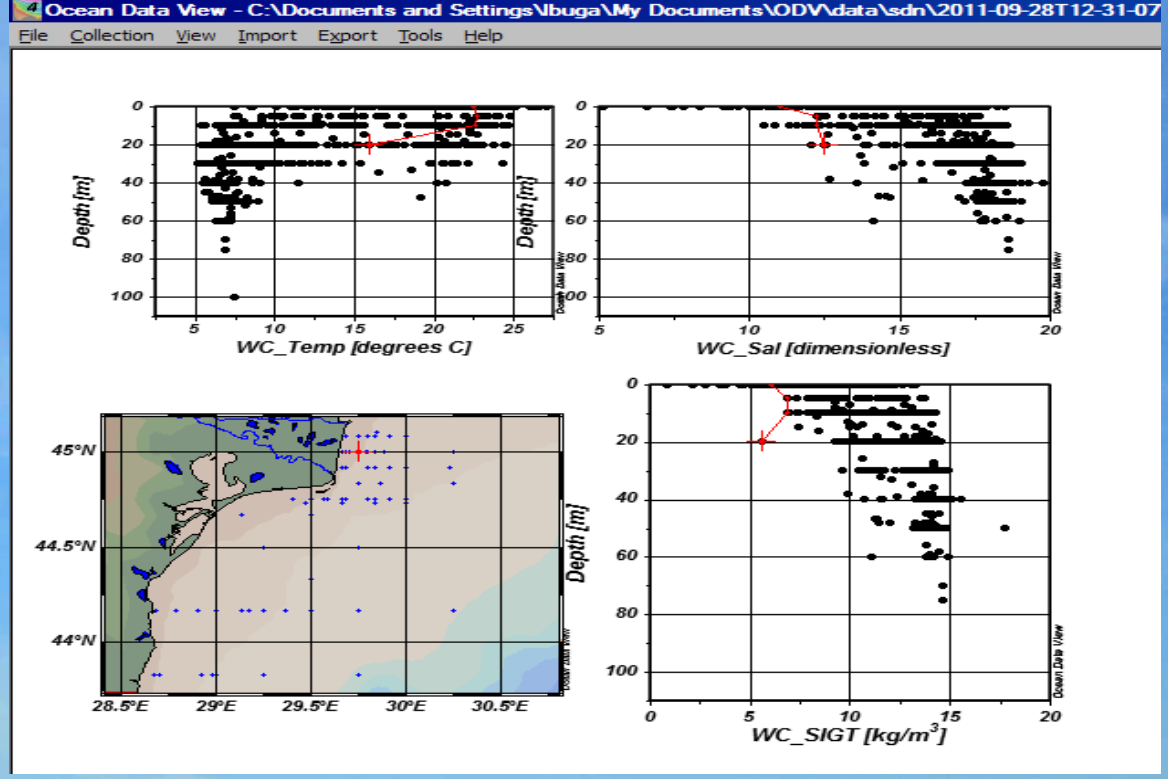
© 2011 Reiner Schlitzer

Software for easy access, interactive analysis and visualization of profile or sequence data.

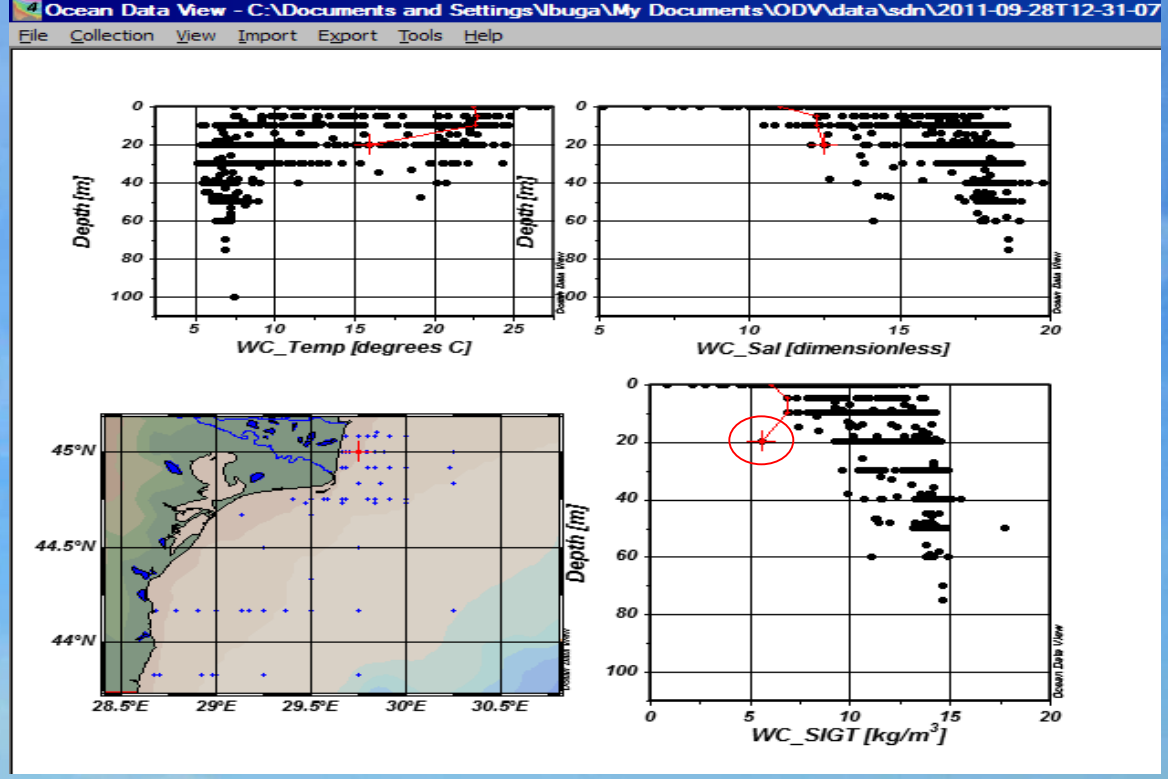
- Available for Windows, Mac OS X and Linux.
- Freely available for research and teaching.
- Supports native ODV collection format and netCDF.
- Maintains data quality flags.
- Reads and imports all major oceanographic data formats.


Ocean Data View
Manual
Quality Control

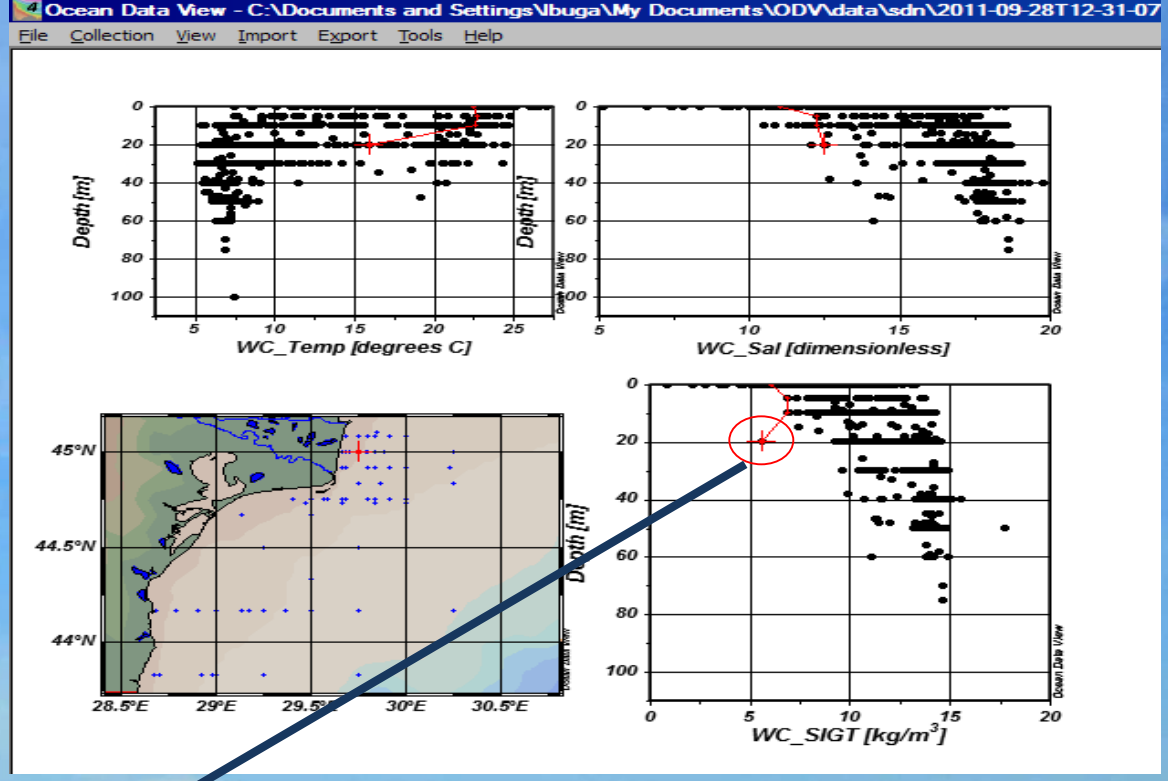
Ocean Data View
Manual
Quality Control

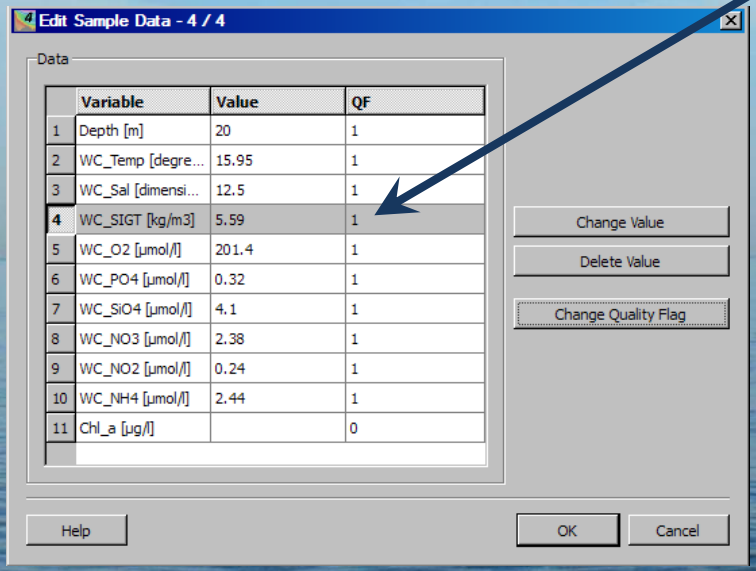


Ocean Data View Manual Quality Control

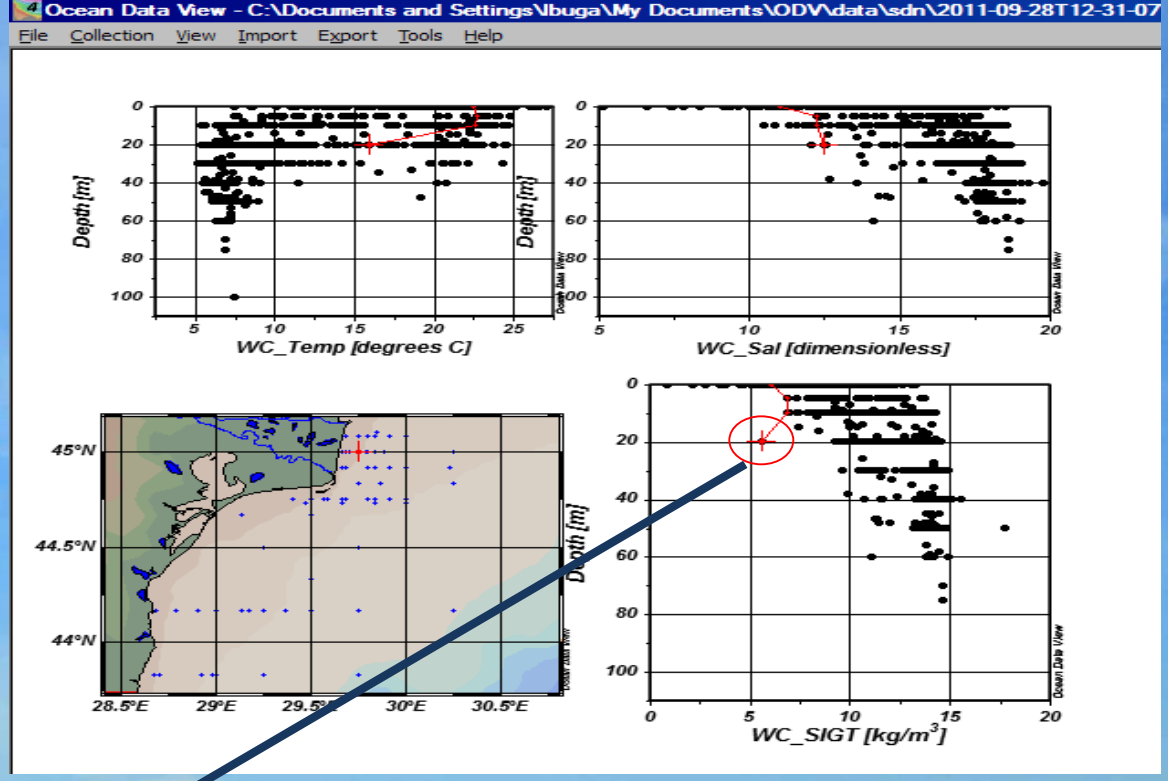


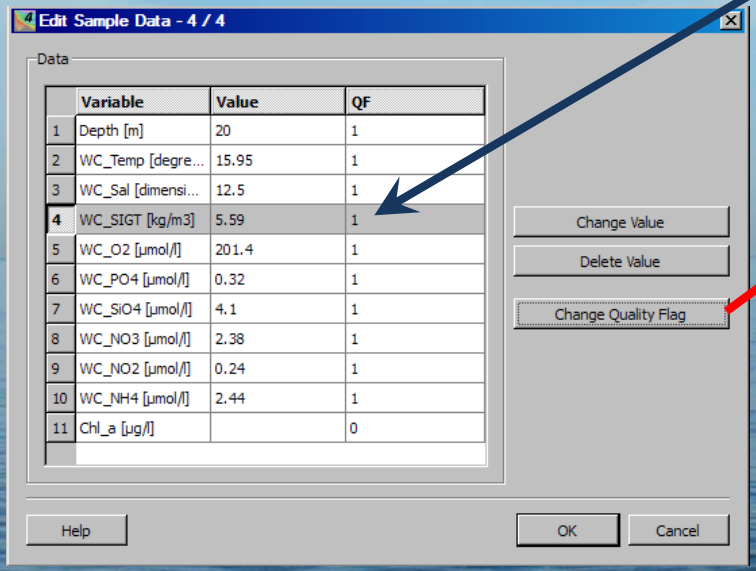
Ocean Data View Manual Quality Control



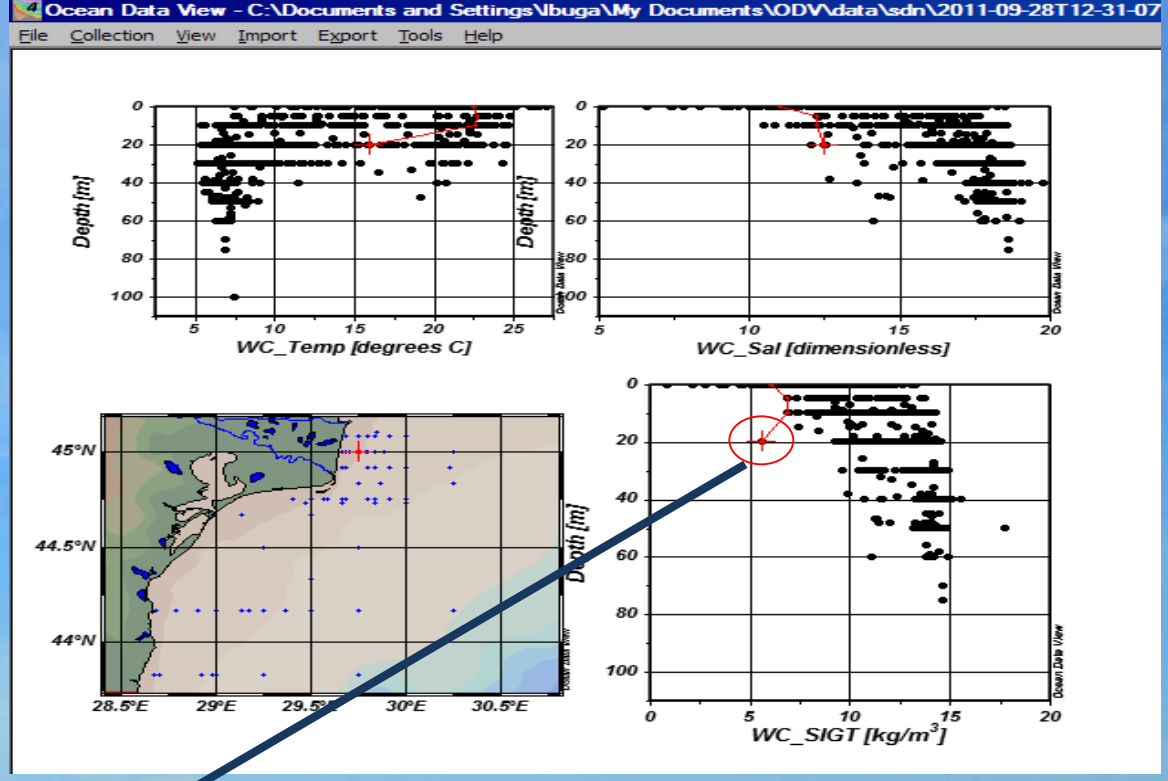


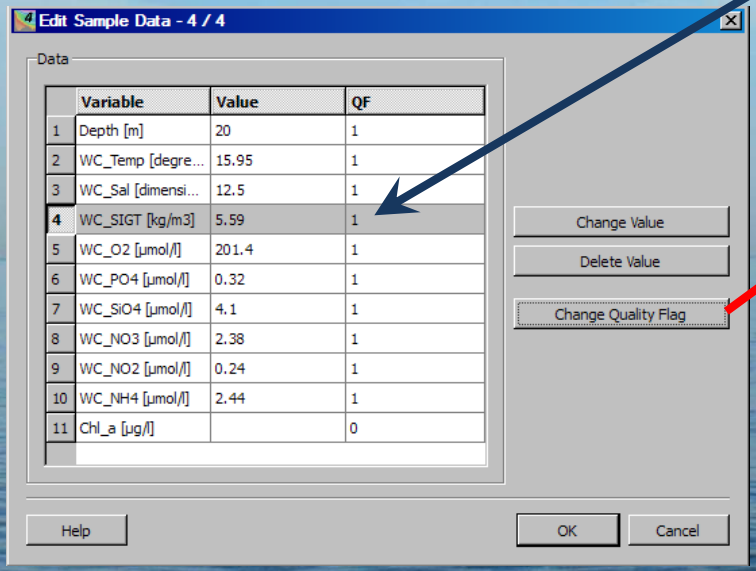
Ocean Data View Manual Quality Control

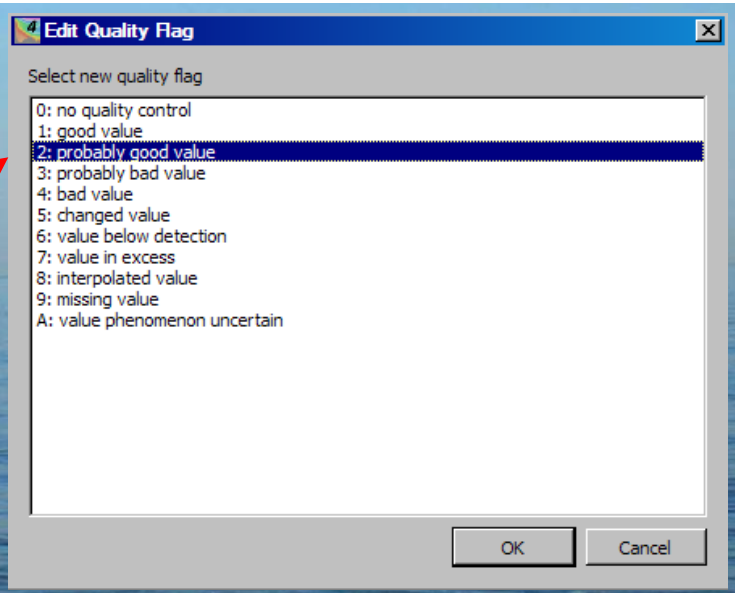




Ocean Data View Manual Quality Control







SeaDataNet quality flag scheme

Flag Description	ODVGENERICQF	GTSPP	ARGO	SEADATANET	ESEAS	WOD	WODSTATION	WOCEBOTTLE	WOCECTD	WOCESAMPLE	QARTOD	BODC	PANGAEA	SMHI
no quality control	1	0	0	0	0	0	0	5	5	5	0	Q	*	blank
good value	0	1	1	1	1	0	0	2	2	2	3	blank	blank	blank
probably good value	0	2	2	2	1	0	0	2	2	2	3	blank	blank	blank
probably bad value	4	3	3	3	3	4	3	3	3	7	2	K	?	?
bad value	8	4	4	4	4	4	3	4	4	7	1	K	/	B
changed value	1	5	5	5	2	0	0	5	5	5	0	R	*	|
value below detection	1	0	0	6	0	0	0	5	5	5	0	<	<	<
value in excess	1	0	0	7	0	0	0	5	5	5	0	>	>	>
interpolated value	1	0	8	8	2	0	0	5	5	5	0	T	*	|
missing value	1	9	9	9	9	4	3	9	9	9	9	N	*	B
value phenomenon uncertain	1	0	0	A	0	4	3	5	5	5	0	Q	*	B

SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE
FOR OCEAN & MARINE DATA
MANAGEMENT

Work flow from data collection to SDN

NIMRD data collection

Historical data (1963-1999)

text format, one file per cruise

physical / chemical data

Recent data (2000- present)

excel format

physical / chemical data

Historical data
1. Reformatting data files

Text files (NATO TU-BS format)

One cruise /file

```
D(m) T(degC) S(ppt) Sig-T DO(uM) PO4(uM) SiO4(uM) NO3(uM) NO2(uM) NH4(uM)
9999 1977  4 22  9 55 45  5.00 30  2.00   33 DA1 1
   0   8.39  14.76  11.38 399.3   0.48  20.3   4.19   1.51 -88.00
   5   7.75  14.76  11.45 398.4   0.19  17.2   3.64   1.47 -88.00
  10   6.67  16.20  12.68 306.8 -88.00 -88.0 -88.00 -88.00 -88.00
  20   6.61  18.31  14.34 292.1   0.15   6.3   3.49   1.81 -88.00
  30   6.59  18.33  14.36 284.9   0.05  12.5   4.66   1.89 -88.00
9999 1977  4 22  8 30 45  5.00 29 55.00   32 DA2 1
   0   8.41  13.06  10.06 383.6   0.34  25.0   3.81   1.43 -88.00
   5   8.21  13.75  10.61 395.2   0.38  25.0   3.49   1.54 -88.00
  10   7.94  14.45  11.19 402.8   0.15  15.6   3.03   1.31 -88.00
  20   6.98  18.31  14.31 285.4   0.15  14.1   3.81   1.94 -88.00
  30   6.61  18.57  14.54 282.7   0.10  11.0   3.86   2.25 -88.00
9999 1977  4 22  7  0 45  5.00 29 48.00   26 DA3 1
   0   9.74   1.85   1.18 322.0   0.24  75.1  10.24   1.87 -88.00
   5   8.60  12.00   9.21 294.3   0.19  42.2   4.54   1.65 -88.00
  10   8.39  12.45   9.58 376.0   0.15  43.8   4.23   1.51 -88.00
  20   6.78  17.81  13.93 280.9   0.10  15.6   3.35   1.99 -88.00
  25   6.64  18.57  14.54 272.9   0.10  14.1   3.81   2.11 -88.00
9999 1977  4 22  6  0 45  5.00 29 41.00   13 DA4 1
   0   8.94   9.18   6.98 337.2   0.15  56.3   6.31   2.23 -88.00
   5   9.88  11.20   8.45 338.1   1.10  48.5   4.86   1.56 -88.00
  10   8.45  11.91   9.15 347.9   0.19  43.8  13.70   1.36 -88.00
9999 1977  4 22 10 45 45  0.00 30  2.00   34 DB1 1
   0   8.82  13.80  10.59 -88.0   0.10  20.9   3.05   1.65 -88.00
   5   8.11  13.93  10.77 -88.0   0.24  20.9   4.97   1.67 -88.00
  10   7.11  15.32  11.95 -88.0   0.10  15.6   3.94   1.67 -88.00
  20   6.51  18.06  14.15 -88.0   0.34  13.0   2.87   1.79 -88.00
  30   6.43  18.51  14.51 -88.0   0.00  11.7   3.42   2.05 -88.00
9999 1977  4 22  9 35 45  0.00 29 55.00   33 DB2 1
   0   8.57  12.56   9.65 -88.0   0.19  20.9   2.93   2.45 -88.00
```

```
*Data files: gd-77xx.chm - gd-80xx.chm

*Format: Station data file format of the NATO TU-BS project.

*Ship name: Gilortul or Palamida (RMRI, Constantza, Romania).

*Expedition: 6 W-E transects in front of Danube mouths,
 twice a year between 1977 and 1980, sampling at the standard depths.

*Parameters: Temperature (deg. C), salinity (ppt), density (Sig-t),
 dissolved oxygen (uM), phosphates (uM), silicates (uM), nitrites (uM)
 and nitrates (uM).

*Instruments and methods: Nansen bottles with reversible thermometers,
 dissolved oxygen by standard Winkler titration, salinity by Mohr-Knudsen
 method, phosphates, silicates, nitrites and nitrates by methods given in
 "A practical handbook of seawater analysis" by J.D.H. Strikland &
 T.S. Parsons 1972 and "Methods of seawater analysis" by K.Grasshoff,
 M.Ehrhardt, K.Kremling 1976, using a spectrophotometer Beckman Model 25.

*Accuracy: 0.01 deg.C for temperature, 5uM for oxygen, 0.02ppt
 for salinity, 0.01uM for phosphates, 0.05uM for silicates, 0.01uM
 for nitrites and 0.05uM for nitrates.

*Processing (if applied):

*Principal investigators: Gheorghe Serpoianu, Adriana Cociasu
 Vasile Diaconu, (RMRI, Constantza, Romania).
```

Info per dataset

NEMO ifremer

\+

In house software

ODV / SDN format

```
//
//SDN_parameter_mapping
//<subject>SDN:LOCAL:PRES</subject><object>SDN:P011::PRESPS02</object><units>SDN:P061::UPDB</units>
//<subject>SDN:LOCAL:DEPH</subject><object>SDN:P011::ADEPZZ01</object><units>SDN:P061::ULAA</units>
//<subject>SDN:LOCAL:TEMP</subject><object>SDN:P011::TEMPPR01</object><units>SDN:P061::UPAA</units>
//<subject>SDN:LOCAL:PSAL</subject><object>SDN:P011::PSLTZZ01</object><units>SDN:P061::UUUU</units>
//<subject>SDN:LOCAL:DENS</subject><object>SDN:P011::SIGTEQ01</object><units>SDN:P061::UKMC</units>
//<subject>SDN:LOCAL:DOXY</subject><object>SDN:P011::DOXYZZXX</object><units>SDN:P061::UPOX</units>
//<subject>SDN:LOCAL:PHOS</subject><object>SDN:P011::PHOSZZXX</object><units>SDN:P061::UPOX</units>
//<subject>SDN:LOCAL:NTRA</subject><object>SDN:P011::NTRAZZXX</object><units>SDN:P061::UPOX</units>
//<subject>SDN:LOCAL:SLCA</subject><object>SDN:P011::SLCAZZXX</object><units>SDN:P061::UPOX</units>
//<subject>SDN:LOCAL:NTRI</subject><object>SDN:P011::NTRIZZXX</object><units>SDN:P061::UPOX</units>
//
```

Cruise	Station	Type	yyyy-mm-dd	Longitude	Latitude	LOCAL_CDI	EDMO_CDI	Bot. Depth	PRES [dec	QV:SEADA	DEPH [me	QV:SEADA	TEMP [Cel	QV:SEADA	P
GD77-04	DD2	B	1977-04-2	29.91667	44.83333	701403	697	42			9	0	0	8.82	0
											9	5	0	8.25	0
											9	10	0	7.75	0
											9	20	0	6.58	0
											9	30	0	6.58	0
											9	40	0	6.57	0

Coupling table

```
// LOCAL_CDI_ID;MODUS;FORMAT;FILENAME
70103;1;ODV;danube/GD77-04_00DA1_H09.txt
70203;1;ODV;danube/GD77-04_00DA2_H09.txt
70303;1;ODV;danube/GD77-04_00DA3_H09.txt
70403;1;ODV;danube/GD77-04_00DA4_H09.txt
70503;1;ODV;danube/GD77-04_00DB1_H09.txt
70603;1;ODV;danube/GD77-04_00DB2_H09.txt
70703;1;ODV;danube/GD77-04_00DB3_H09.txt
70803;1;ODV;danube/GD77-04_00DB4_H09.txt
70903;1;ODV;danube/GD77-04_00DC1_H09.txt
701003;1;ODV;danube/GD77-04_00DC2_H09.txt
701103;1;ODV;danube/GD77-04_00DC3_H09.txt
701203;1;ODV;danube/GD77-04_00DC4_H09.txt
701303;1;ODV;danube/GD77-04_00DD1_H09.txt
701403;1;ODV;danube/GD77-04_00DD2_H09.txt
701503;1;ODV;danube/GD77-04_00DD3_H09.txt
701603;1;ODV;danube/GD77-04_00DD4_H09.txt
701703;1;ODV;danube/GD77-04_00DE1_H09.txt
701803;1;ODV;danube/GD77-04_00DE2_H09.txt
701903;1;ODV;danube/GD77-04_00DE3_H09.txt
702003;1;ODV;danube/GD77-04_00DE4_H09.txt
```

Historical data
2. CDIs XML generation

Text files (NATO TU-BS format)

```
D(m) T(degC) S(ppt) Sig-T DO(uM) PO4(uM) SiO4(uM) NO3(uM) NO2(uM) NH4(uM)
9999 1977  4 22  9 55 45  5.00 30  2.00   33 DA1 1
   0   8.39  14.76  11.38 399.3   0.48  20.3   4.19   1.51 -88.00
   5   7.75  14.76  11.45 398.4   0.19  17.2   3.64   1.47 -88.00
  10   6.67  16.20  12.68 306.8 -88.00 -88.0 -88.00 -88.00 -88.00
  20   6.61  18.31  14.34 292.1   0.15   6.3   3.49   1.81 -88.00
  30   6.59  18.33  14.36 284.9   0.05  12.5   4.66   1.89 -88.00
9999 1977  4 22  8 30 45  5.00 29 55.00   32 DA2 1
   0   8.41  13.06  10.06 383.6   0.34  25.0   3.81   1.43 -88.00
   5   8.21  13.75  10.61 395.2   0.38  25.0   3.49   1.54 -88.00
  10   7.94  14.45  11.19 402.8   0.15  15.6   3.03   1.31 -88.00
  20   6.98  18.31  14.31 285.4   0.15  14.1   3.81   1.94 -88.00
  30   6.61  18.57  14.54 282.7   0.10  11.0   3.86   2.25 -88.00
9999 1977  4 22  7  0 45  5.00 29 48.00   26 DA3 1
   0   9.74   1.85   1.18 322.0   0.24  75.1  10.24   1.87 -88.00
   5   8.60  12.00   9.21 294.3   0.19  42.2   4.54   1.65 -88.00
  10   8.39  12.45   9.58 376.0   0.15  43.8   4.23   1.51 -88.00
  20   6.78  17.81  13.93 280.9   0.10  15.6   3.35   1.99 -88.00
  25   6.64  18.57  14.54 272.9   0.10  14.1   3.81   2.11 -88.00
9999 1977  4 22  6  0 45  5.00 29 41.00   13 DA4 1
   0   8.94   9.18   6.98 337.2   0.15  56.3   6.31   2.23 -88.00
   5   9.88  11.20   8.45 338.1   1.10  48.5   4.86   1.56 -88.00
  10   8.45  11.91   9.15 347.9   0.19  43.8  13.70   1.36 -88.00
9999 1977  4 22 10 45 45  0.00 30  2.00   34 DB1 1
   0   8.82  13.80  10.59 -88.0   0.10  20.9   3.05   1.65 -88.00
   5   8.11  13.93  10.77 -88.0   0.24  20.9   4.97   1.67 -88.00
  10   7.11  15.32  11.95 -88.0   0.10  15.6   3.94   1.67 -88.00
  20   6.51  18.06  14.15 -88.0   0.34  13.0   2.87   1.79 -88.00
  30   6.43  18.51  14.51 -88.0   0.00  11.7   3.42   2.05 -88.00
9999 1977  4 22  9 35 45  0.00 29 55.00   33 DB2 1
   0   8.57  12.56   9.65 -88.0   0.19  20.9   2.93   2.45 -88.00
```

```
*Data files: gd-77xx.chm - gd-80xx.chm

*Format: Station data file format of the NATO TU-BS project.

*Ship name: Gilortul or Palamida (RMRI, Constantza, Romania).

*Expedition: 6 W-E transects in front of Danube mouths,
 twice a year between 1977 and 1980, sampling at the standard depths.

*Parameters: Temperature (deg. C), salinity (ppt), density (Sig-t),
 dissolved oxygen (uM), phosphates (uM), silicates (uM), nitrites (uM)
 and nitrates (uM).

*Instruments and methods: Nansen bottles with reversible thermometers,
 dissolved oxygen by standard Winkler titration, salinity by Mohr-Knudsen
 method, phosphates, silicates, nitrites and nitrates by methods given in
 "A practical handbook of seawater analysis" by J.D.H. Strikland &
 T.S. Parsons 1972 and "Methods of seawater analysis" by K.Grasshoff,
 M.Ehrhardt, K.Kremling 1976, using a spectrophotometer Beckman Model 25.

*Accuracy: 0.01 deg.C for temperature, 5uM for oxygen, 0.02ppt
 for salinity, 0.01uM for phosphates, 0.05uM for silicates, 0.01uM
 for nitrites and 0.05uM for nitrates.

*Processing (if applied):

*Principal investigators: Gheorghe Serpoianu, Adriana Cociasu
 Vasile Diaconu, (RMRI, Constantza, Romania).
```

In house software

Excel metadata tables

STATION_NAME	STATION_DATE	STATION_LON	STATION_LAT	CDI_ID	STATION_water	DATASET_NAME	DATASET_ID
ConstantaE-1NM	2008-03-19T14:00	28.6833	44.1667	M_200803_1	16	MN-200803	200803
ConstantaE-5NM	2008-03-19T15:15	28.7833	44.1667	M_200803_2	32	MN-200803	200803
ConstantaE-10NM	2008-03-19T16:15	28.883	44.1667	M_200803_3	35	MN-200803	200803
ConstantaE-20NM	2008-03-19T18:00	29.1333	44.1667	M_200803_4	45	MN-200803	200803
ConstantaE-30NM	2008-03-19T19:30	29.3667	44.1667	M_200803_5	52	MN-200803	200803
VamaVeche-5m	2008-03-20T07:30	28.5963	43.7474	M_200803_6	5	MN-200803	200803
VamaVeche-20m	2008-03-20T07:45	28.6211	43.7512	M_200803_7	20	MN-200803	200803
Mangalia-5m	2008-03-20T08:15	28.5946	43.8	M_200803_8	5	MN-200803	200803
Mangalia-20m	2008-03-20T08:40	28.6366	43.8	M_200803_9	20	MN-200803	200803
Costinesti-5m	2008-03-20T11:00	28.6447	43.945	M_200803_10	5	MN-200803	200803
Costinesti-20m	2008-03-20T11:20	28.674	43.9312	M_200803_11	20	MN-200803	200803
Costinesti-30m	2008-03-20T12:00	28.72435	43.9357	M_200803_12	30	MN-200803	200803
EforieS-5m	2008-03-20T14:10	28.6534	44.0493	M_200803_13	5	MN-200803	200803
EforieS-20m	2008-03-20T14:35	28.678	44.0481	M_200803_14	20	MN-200803	200803
ConstantaS-5m	2008-03-20T15:15	28.6489	44.1383	M_200803_15	5	MN-200803	200803

CRUISE | DATASET | STATION | NIMRD_PARAMETER_GROUP | PARAMETER

MIKADO
(automatic)

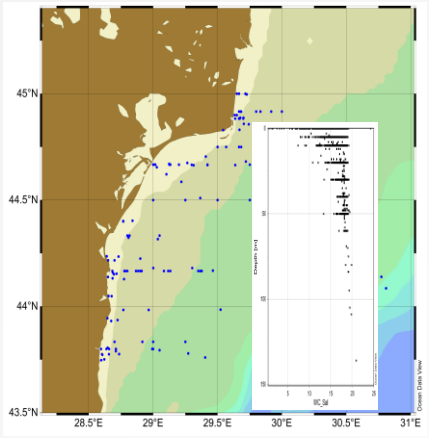
XML files

```
<?xml version="1.0" encoding="UTF-8" ?>
<!--  this file has been created using MIKADO version 2.5  -->
<Metadata xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:gml="http://www.opengis.net/gml"
 xsi:noNamespaceSchemaLocation="cdi_sdn_v1.6_gml_4.53.xsd">
 <mdFileID>SDN:CDI:LOCAL:M_200803_8</mdFileID>
- <mdLang>
   <languageCode value="en" />
  </mdLang>
- <mdChar>
   <CharSetCd value="utf8" />
  </mdChar>
- <mdHrLv>
   <ScopeCd value="dataset" />
  </mdHrLv>
 <mdHrLvName SDNIdent="SDN:L231:6:CDI">Common Data Index record</mdHrLvName>
- <mdContact>
   <rpOrgName SDNIdent="SDN:EDMO::697">National Institute for Marine Research and
    Development "Grigore Antipa"</rpOrgName>
  - <rpCntInfo>
    - <cntPhone>
       <voiceNum>40 241 543288</voiceNum>
       <faxNum>40 241 831274</faxNum>
      </cntPhone>
    - <cntAddress>
       <delPoint>300 Mamaia Blvd.</delPoint>
       <city>Constanta</city>
```

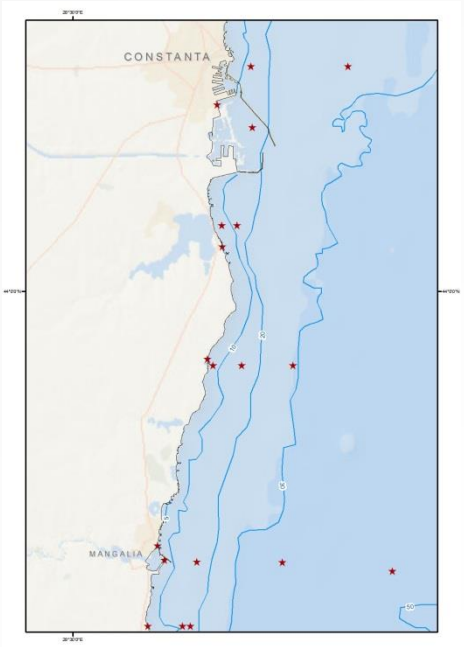
Historical data
3. Quality control

ODV / SDN data files
No QC

ODV software for
local climatology



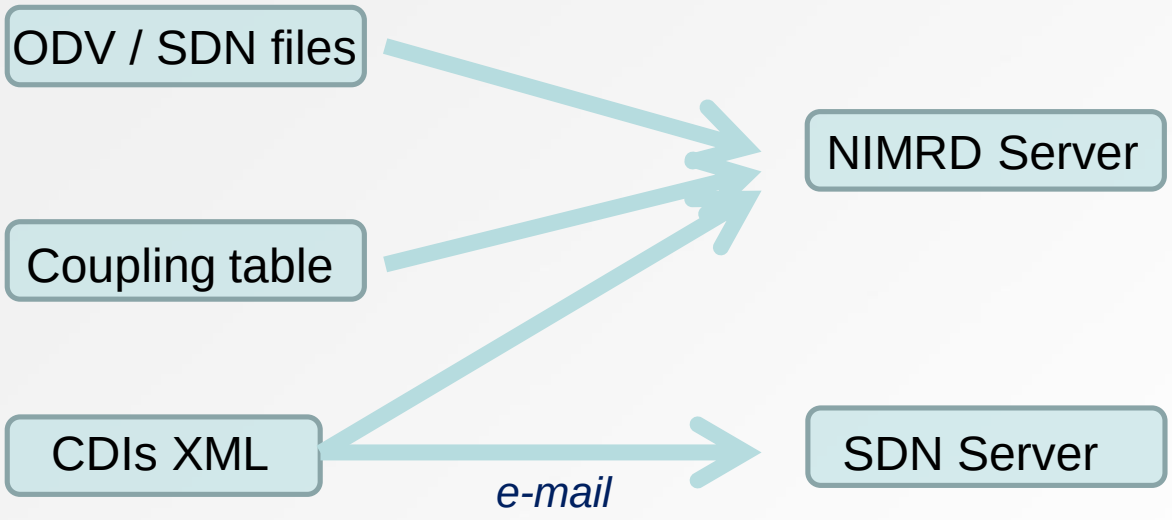
GIS for local bathymetry
and coast line



ODV / SDN data files
With SDN quality flags

Historical data

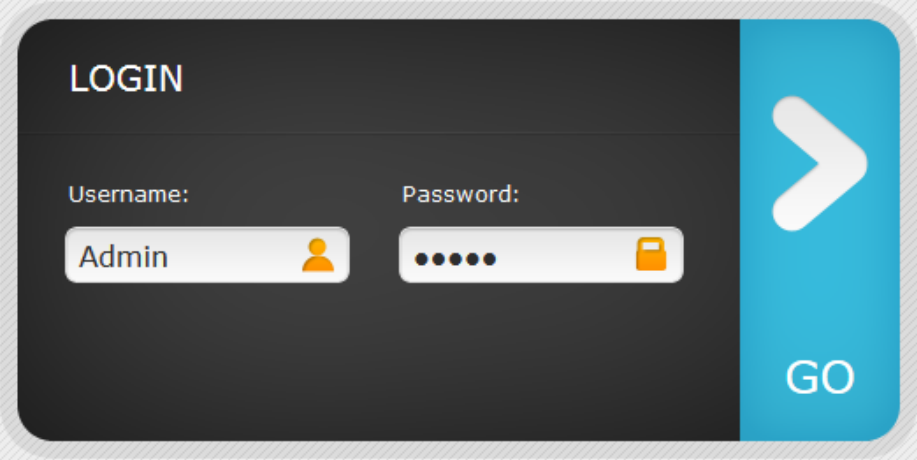
4. Archiving & submitting to SDN central CDI catalog



OCEANOGRAPHY DATABASE ADMINISTRATION

Recent data

1. ODV / SDN format & CDIs XML file generation



NIMRD internal DB

PAN-EUROPEAN INFRASTRUCTURE
FOR OCEAN & MARINE DATA
MANAGEMENT

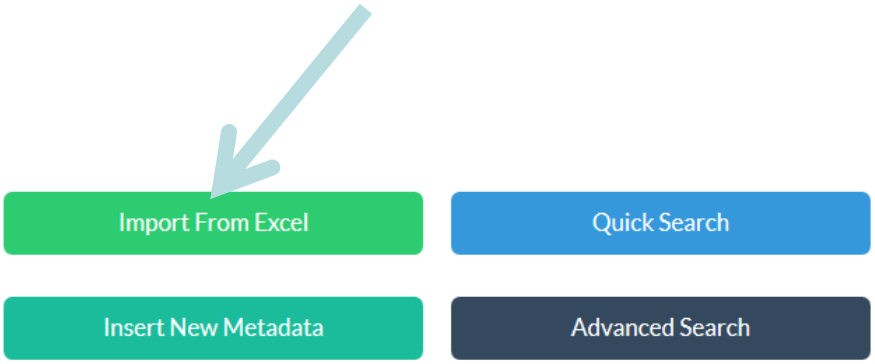
SeaDataNet

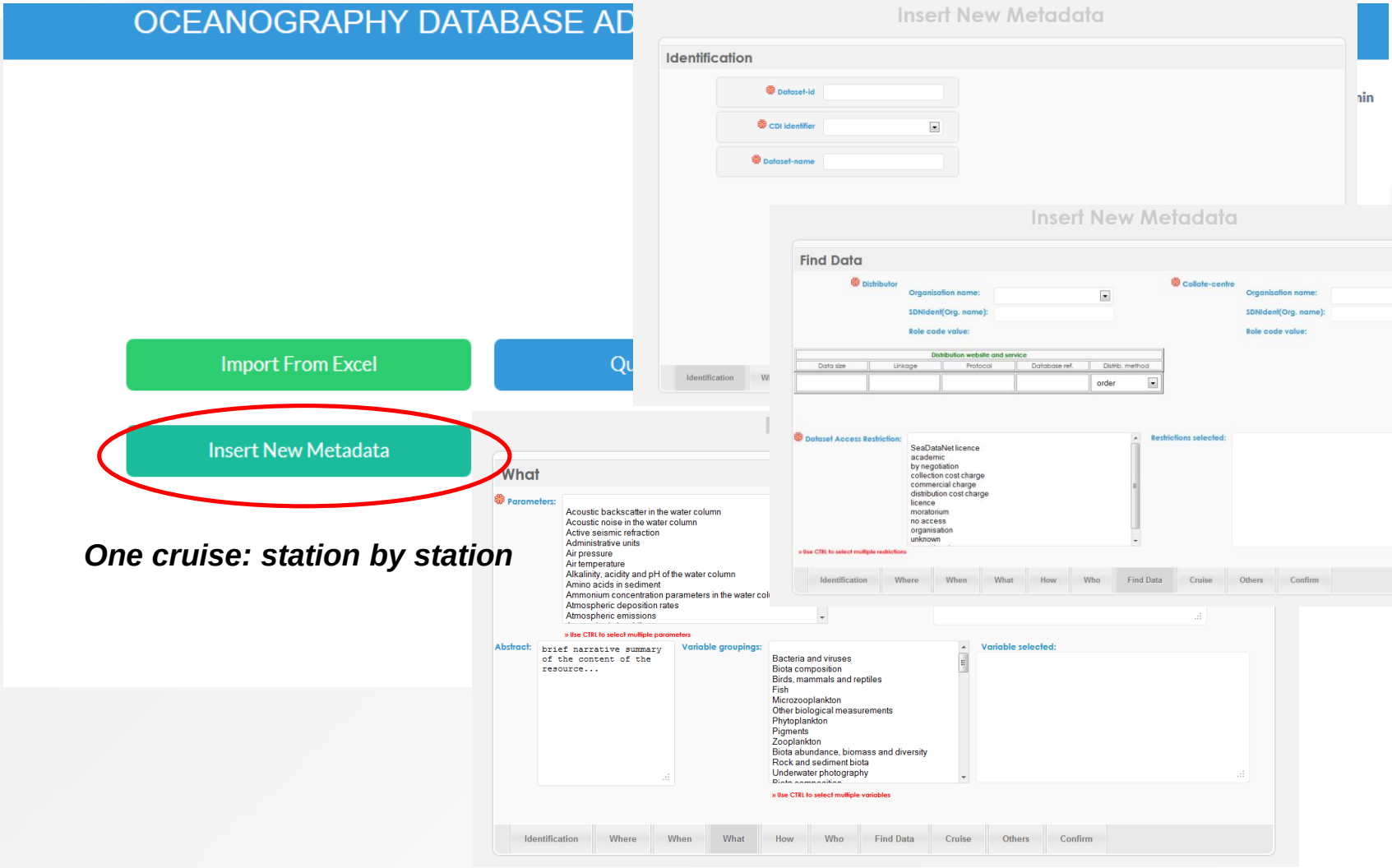
OCEANOGRAPHY DATABASE ADMINISTRATION

User Logged: Admin

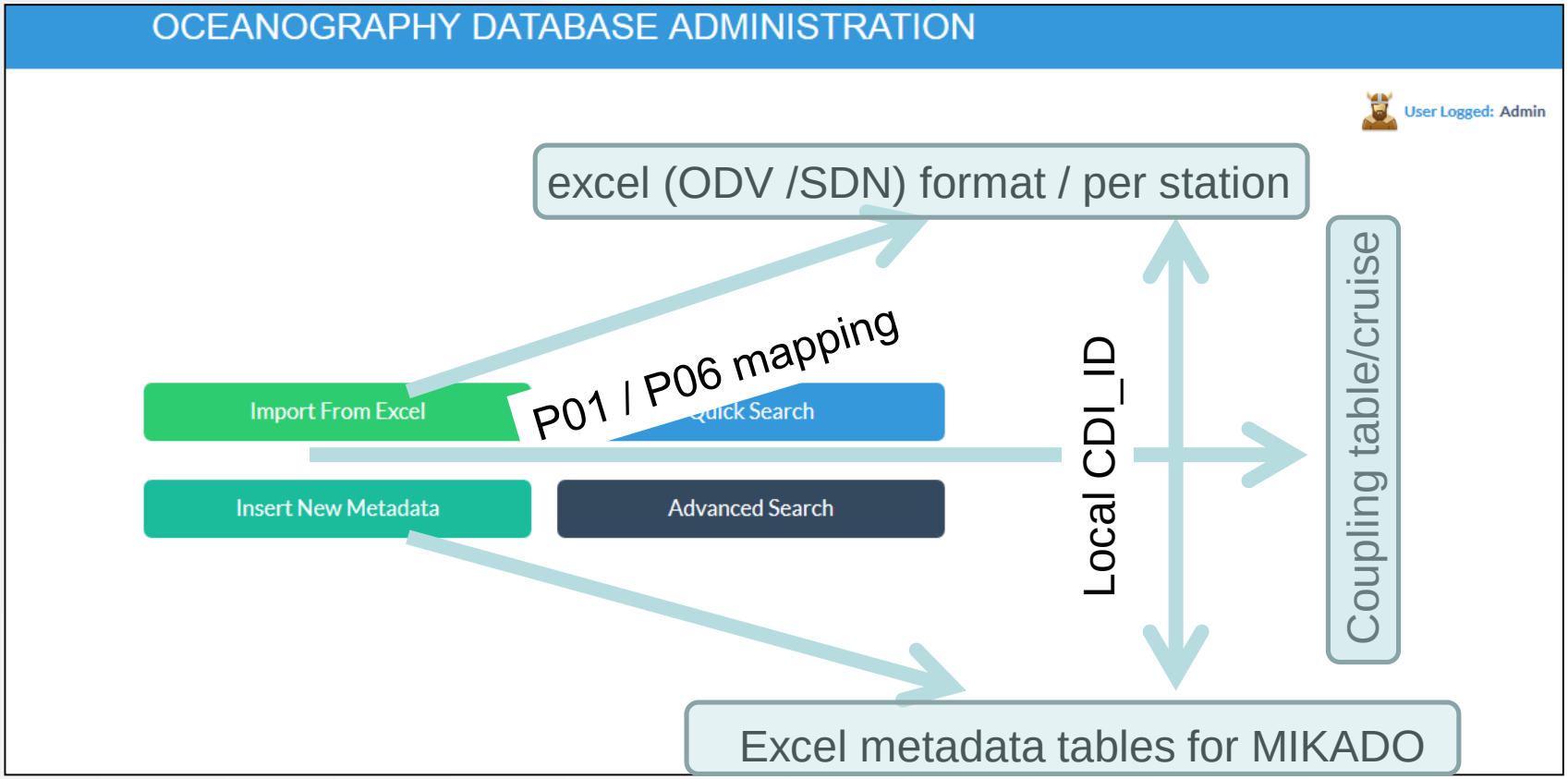
excel (ODV) format / per cruise

QC





One cruise: station by station

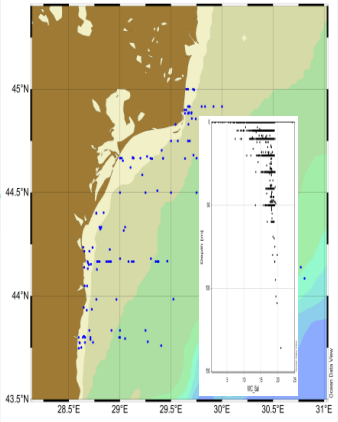

OCEANOGRAPHY DATABASE ADMINISTRATION
User Logged: Admin
excel (ODV /SDN) format / per station
P01 / P06 mapping
Import From Excel
Quick Search
Insert New Metadata
Advanced Search
Local CDI_ID
Coupling table/cruise
Excel metadata tables for MIKADO

2. Quality control

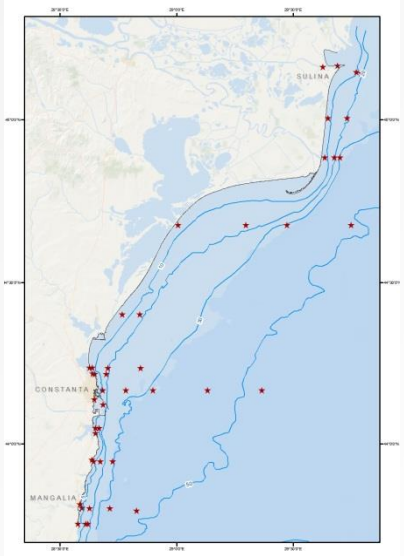
ODV / SDN data files
QC

ODV / SDN data files
Final QC

ODV software for
local climatology



GIS for local bathymetry
and coast line



Any possible QF change ⇒ report to data responsible

2. CDIs XML generation & submission to SDN

Excel metadata tables

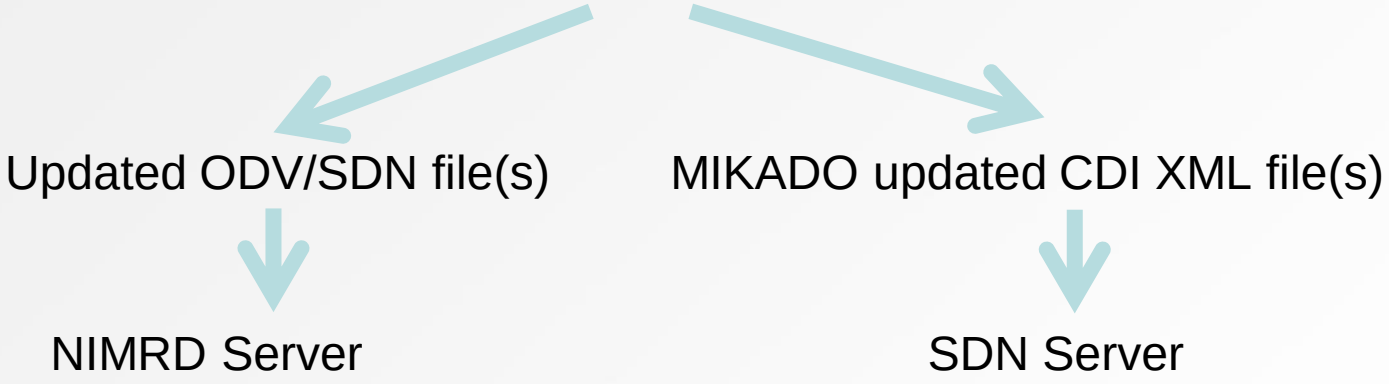
MIKADO
(automatic)

XML files

CDIs XML → *e-mail* → SDN Server

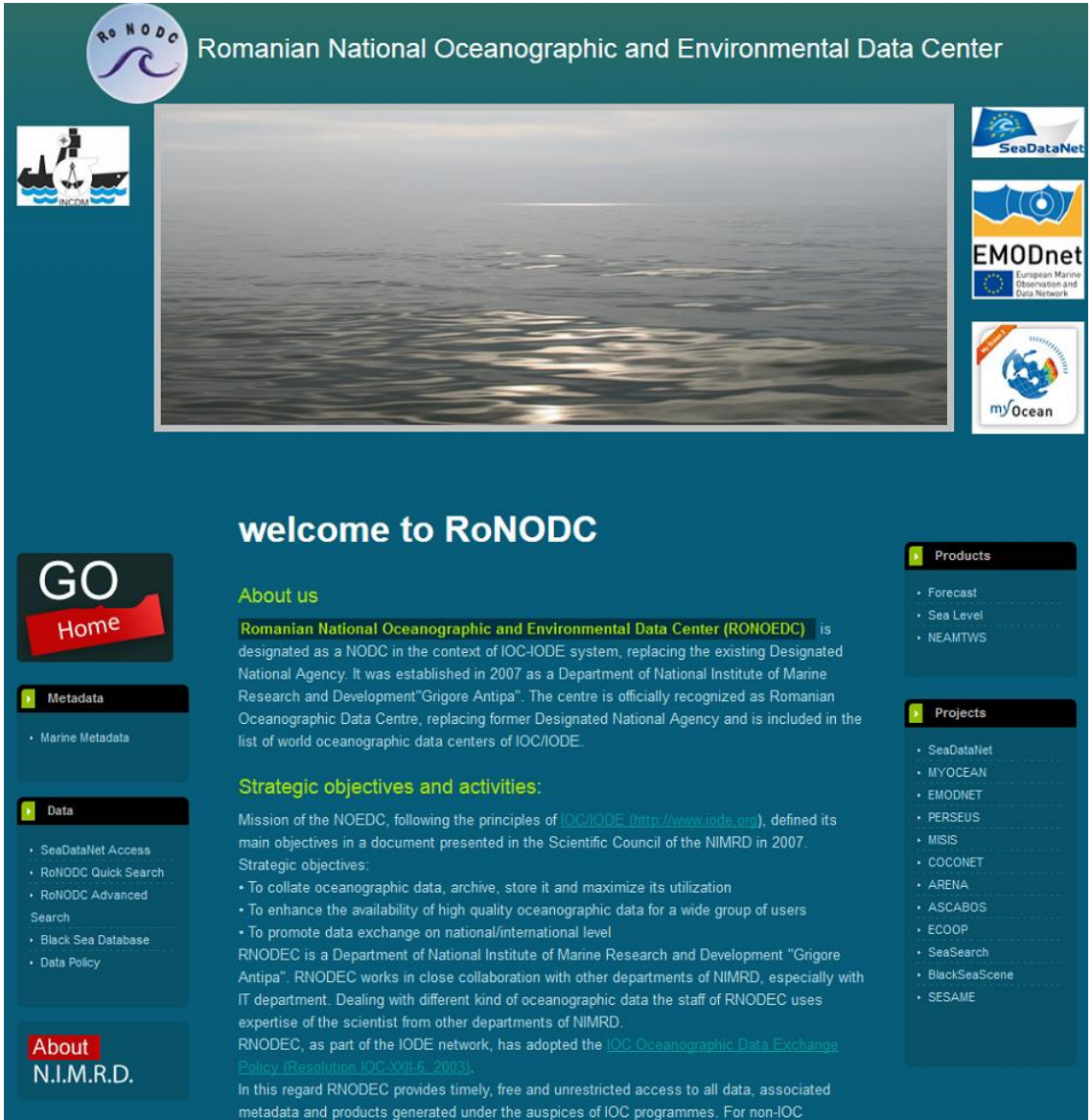
3. Data & CDIs XML Updates

Any data / metadata updates ⇔ inside NIMRD DB
(same LOCAL_CDI_ID)



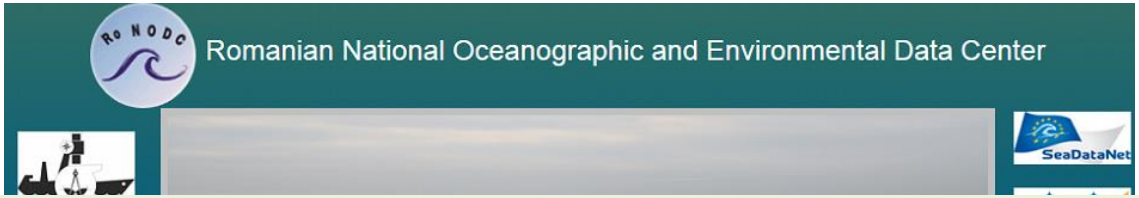
Centrul Național Român de Date Oceanografice și de Mediu

www.nodc.ro



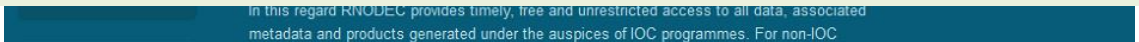
Centrul Național Român de Date Oceanografice și de Mediu

www.nodc.ro



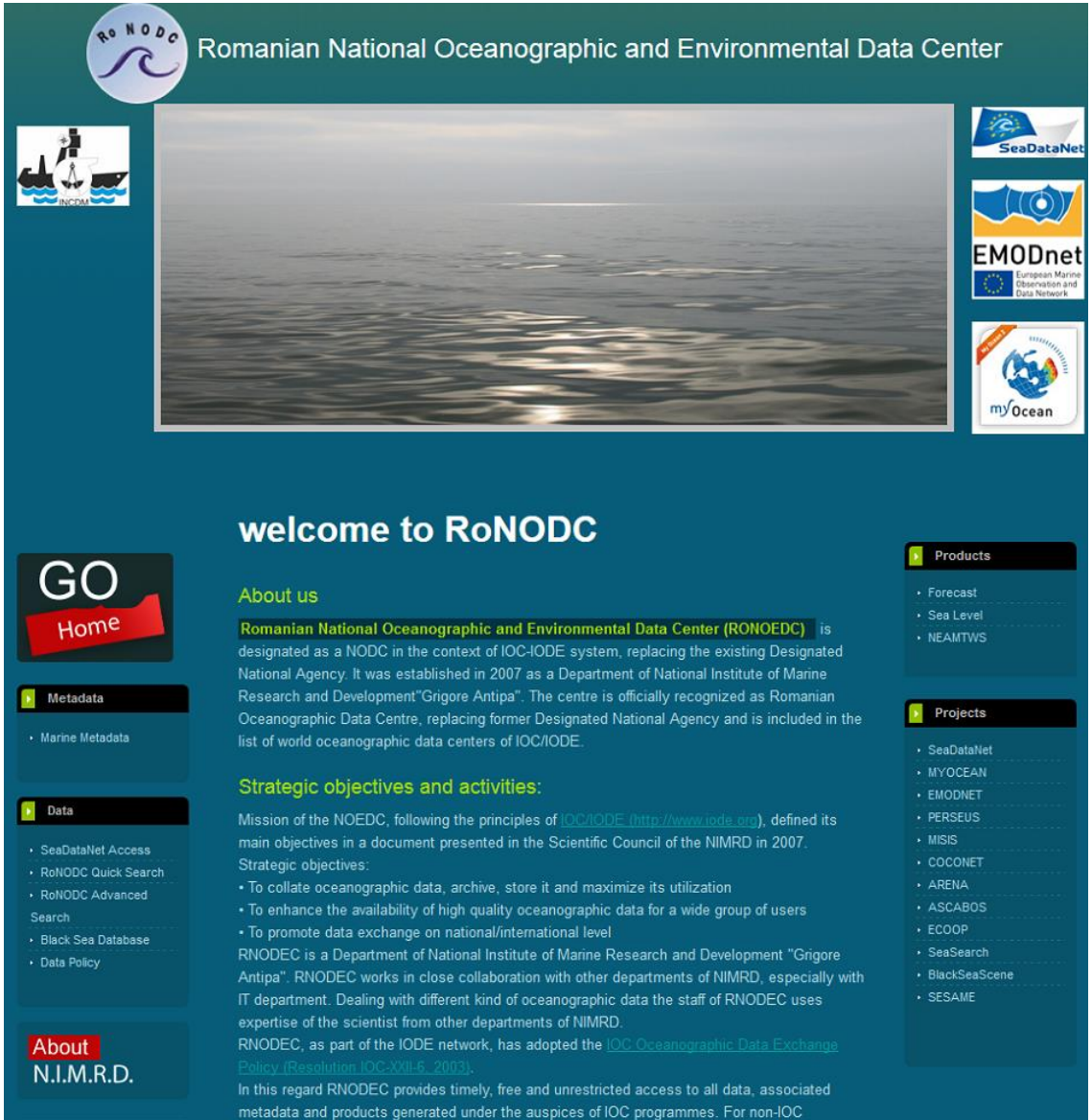
Obiective strategice:

- **Colectarea, arhivarea și păstrarea de date oceanografice, in scopul de a maximiza utilizarea acestora;**
- **Creșterea gradului de disponibilitate a datelor oceanografice pentru un grup cât mai mare de utilizatori;**
- **Promovarea schimbului de date la nivel național și internațional;**
- **Asigurarea transferului de date către diferiți utilizatori;**
- **Asigurarea transferului de date din diferite surse de date oceanografice;**
- **Furnizarea de date pentru implementarea politicilor UE în domeniul marin**



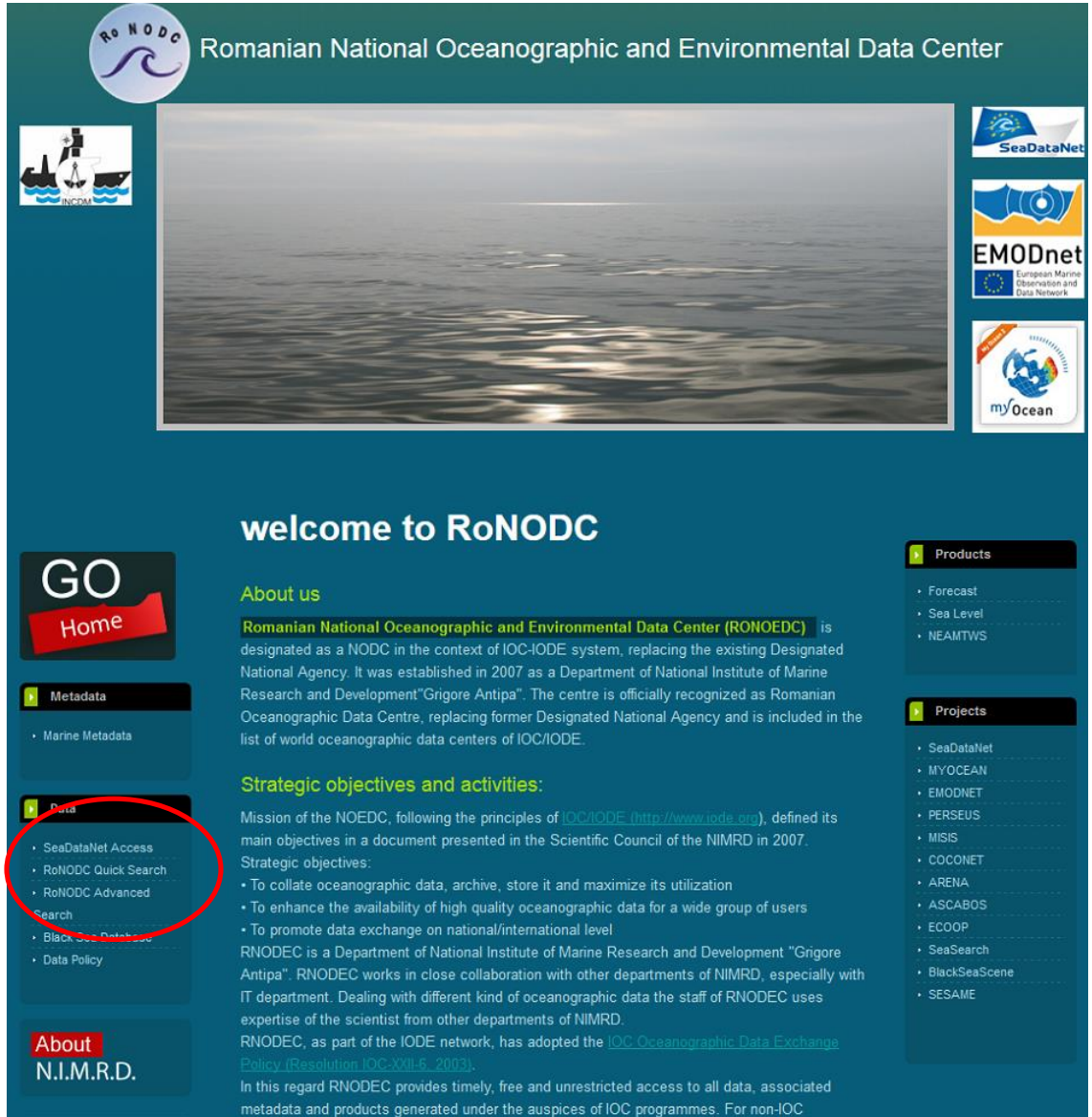
Centrul Național Român de Date Oceanografice și de Mediu

www.nodc.ro



Centrul Național Român de Date Oceanografice și de Mediu

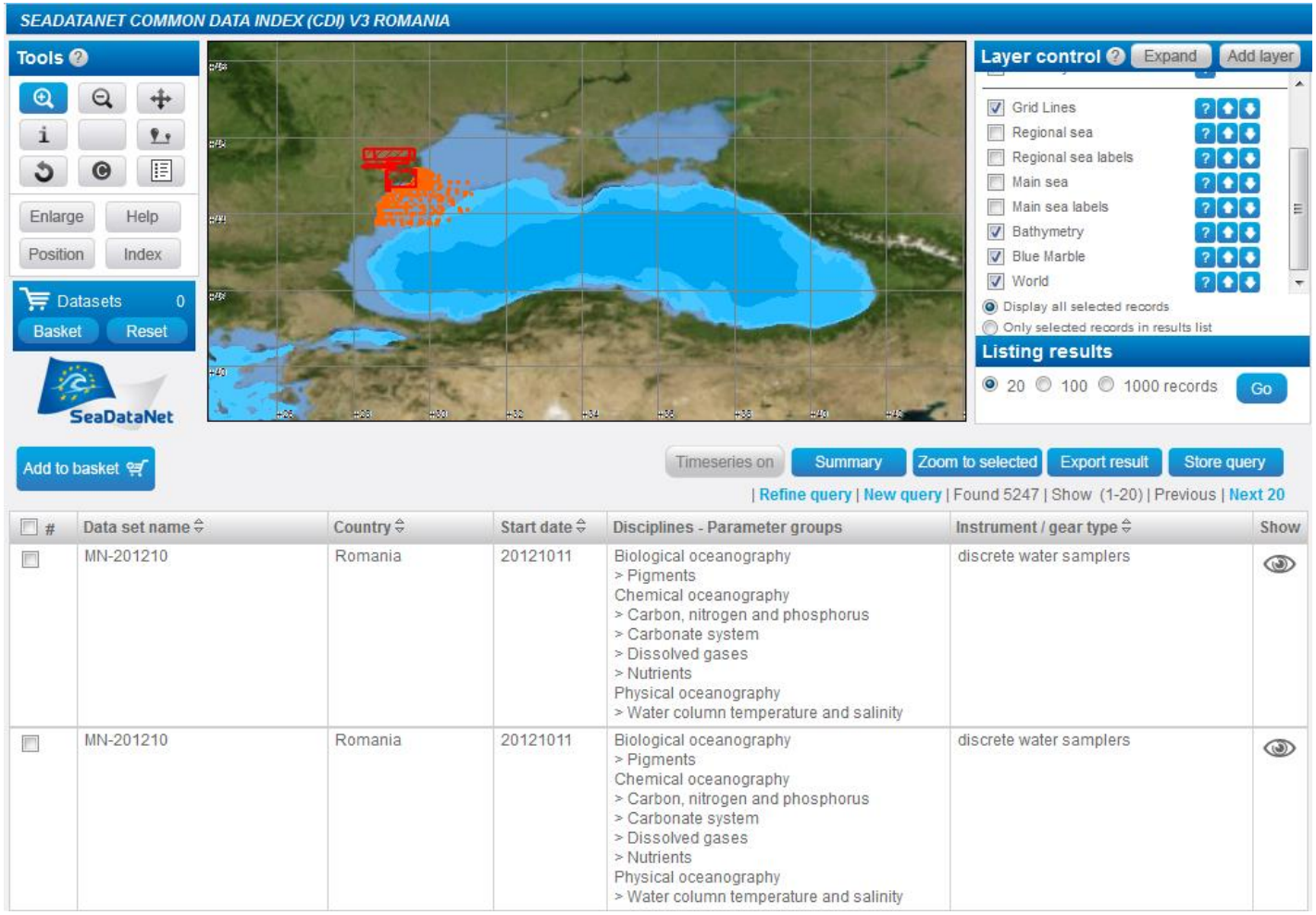
www.nodc.ro



Centrul Național Român de Date Oceanografice și de Mediu

www.nodc.ro

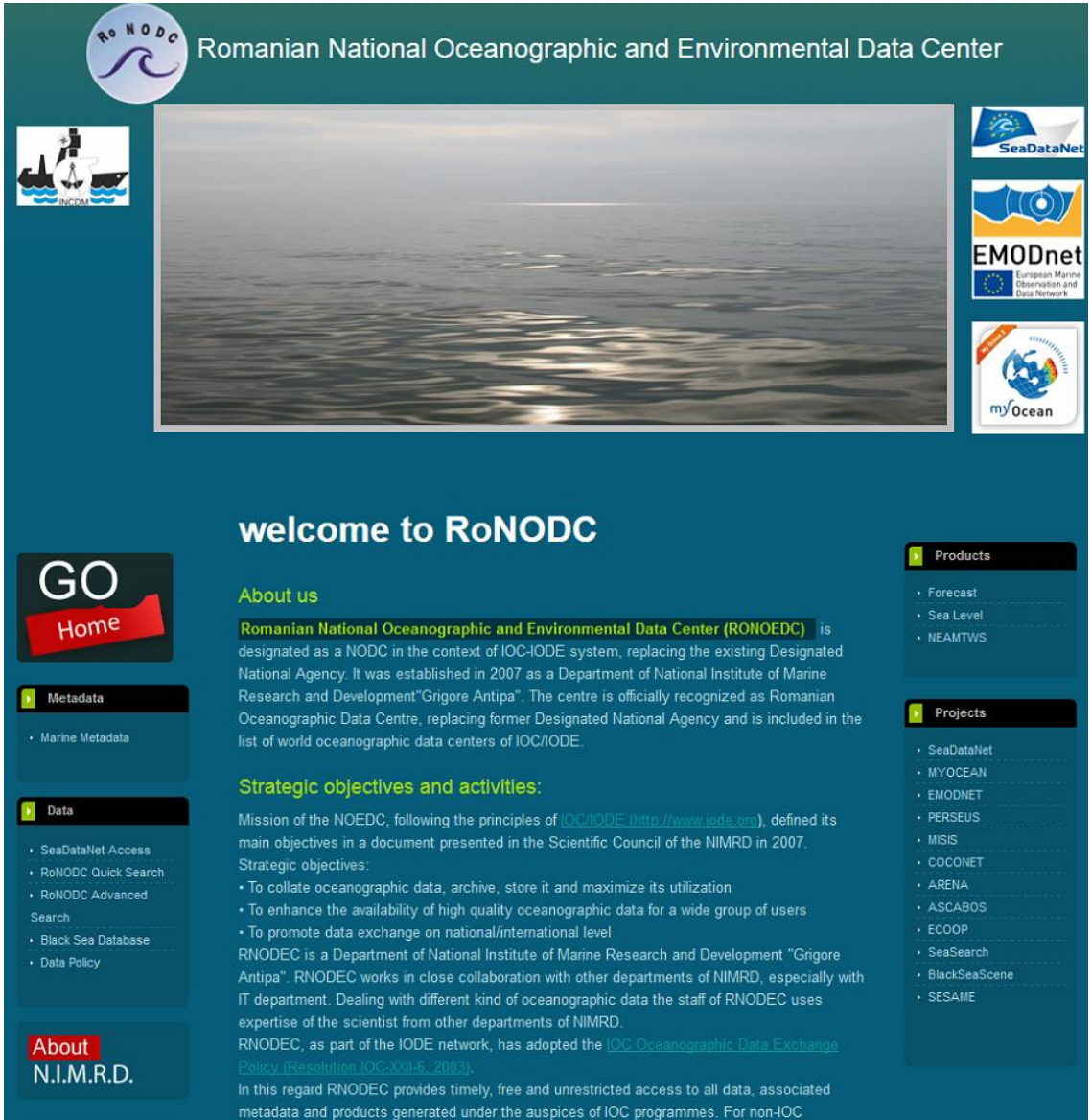
Bază de date oceanografice



#	Data set name	Country	Start date	Disciplines - Parameter groups	Instrument / gear type	Show
	MN-201210	Romania	20121011	Biological oceanography > Pigments Chemical oceanography > Carbon, nitrogen and phosphorus > Carbonate system > Dissolved gases > Nutrients Physical oceanography > Water column temperature and salinity	discrete water samplers	
	MN-201210	Romania	20121011	Biological oceanography > Pigments Chemical oceanography > Carbon, nitrogen and phosphorus > Carbonate system > Dissolved gases > Nutrients Physical oceanography > Water column temperature and salinity	discrete water samplers	

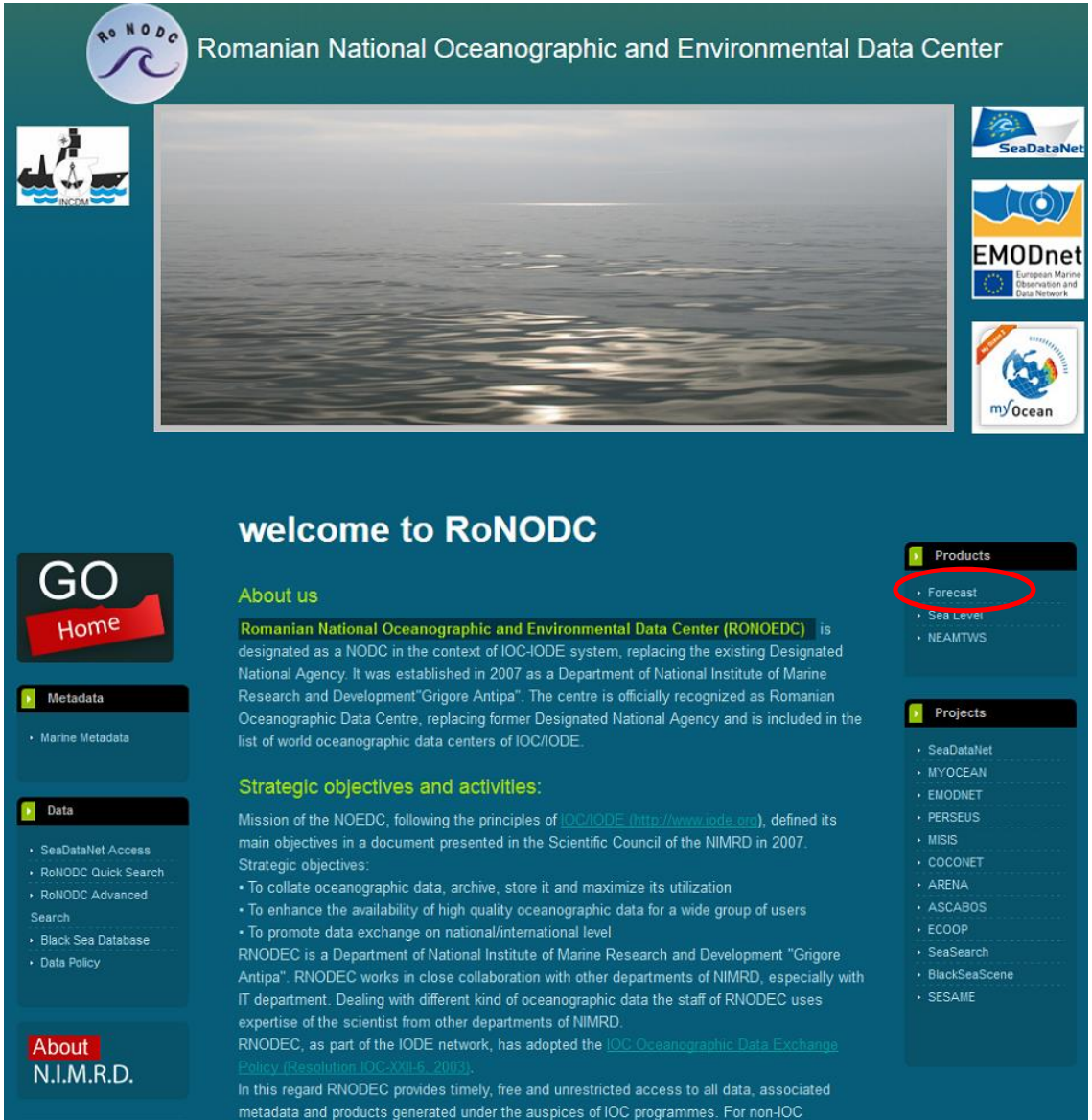
Centrul Național Român de Date Oceanografice și de Mediu

www.nodc.ro



Centrul Național Român de Date Oceanografice și de Mediu

www.nodc.ro

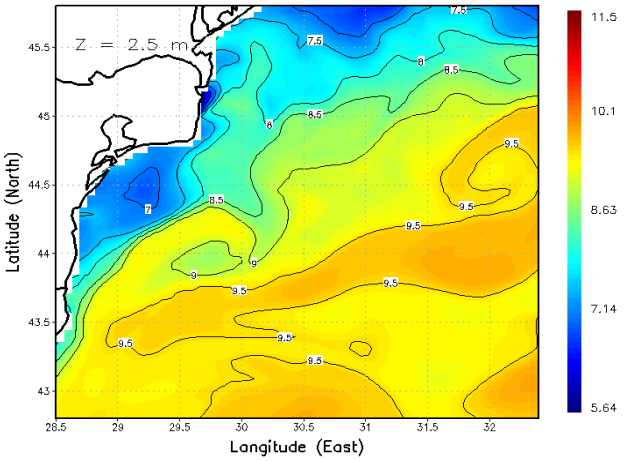


Centrul Național Român de Date Oceanografice și de Mediu

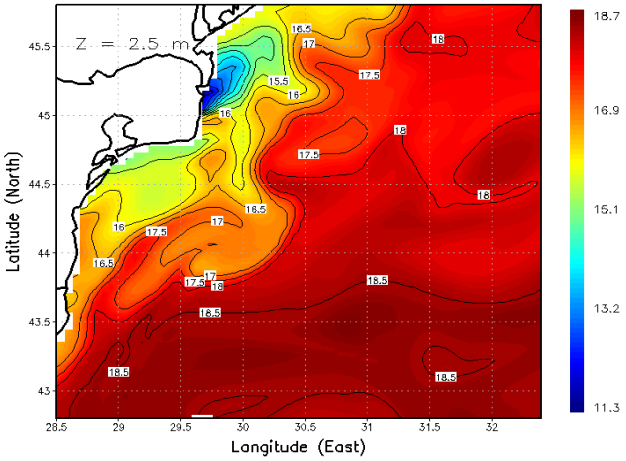
www.nodc.ro

Prognoza oceanografică

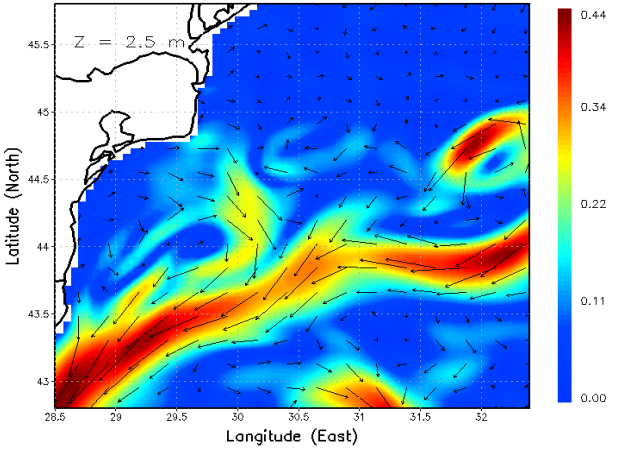
Temperature (Celsius). Date 2014.03.26. Time 00(h):00(m) GMT



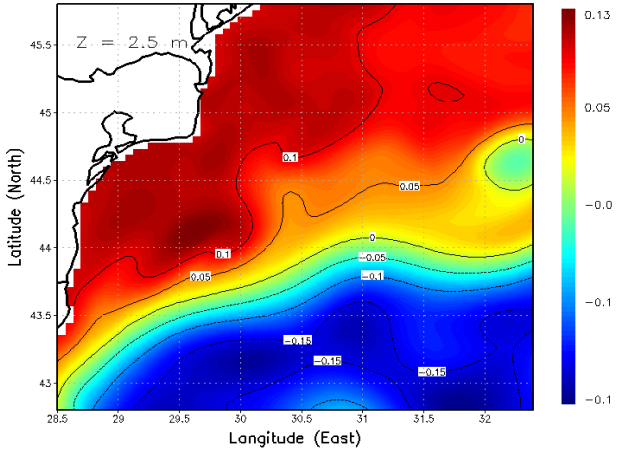
Salinity (ppt). Date 2014.03.26. Time 00(h):00(m) GMT



Current velocity (m/s). Date 2014.03.26. Time 00(h):00(m) GMT



Sea Level (cm). Date 2014.03.24. Time 00(h):00(m) GMT



Sistem European de monitorizare a Pământului

Copernicus constă dintr-un set complex de sisteme care colectează date din mai multe surse: de la sateliți de observare a Pământului precum și de la senzori în situ, cum ar fi stații terestre, senzori atmosferici și oceanografici. Prelucrează aceste date și oferă utilizatorilor informații fiabile și acualizate, printr-o serie de servicii legate de problemele de mediu și de securitate (www.copernicus.eu)

Sistem European de monitorizare a Pământului

Serviciul de monitorizare* marin *Copernicus oferă, regulat și sistematic, informații de referință cu privire la starea oceanelor și a mărilor regionale.

Observațiile și prognozele realizate sunt utilizate în toate aplicațiile marine. Produsele livrate sunt oferite gratuit pentru toți utilizatorii (înregistrați) printr-un catalog interactiv disponibil pe portalul web: http://marine.copernicus.eu/

European Commission

COPERNICUS
MARINE ENVIRONMENT MONITORING SERVICE

Providing PRODUCTS and SERVICES for all marine applications

Search terms OK

ABOUT US | BENEFITS | NEWS | SCIENCE & LEARNING | TRAINING | SERVICES PORTFOLIO

FIRST VISIT ?

ACCESS TO PRODUCTS

Search and download your datasets!

Select your:

AREA
PARAMETERS
TIME COVERAGE
OBSERVATIONS/MODELS

- MODEL
- SATELLITE OBSERVATIONS
- INSITU OBSERVATIONS

PDF CATALOGUE | OBSERVATIONS OVERVIEW
ONLINE CATALOGUE | MODELS OVERVIEW

SHORT-CUT TO SERVICES

REGISTER NOW

ONLINE TUTORIALS

COLLABORATIVE FORUM

2015 16 JUN

LATEST NEWS FLASH

CMEMS:2817

MEDSEA_ANALYSIS_FORECAST delayed

Resolved

ALL NEWS FLASH

28 MONDAY EVENTS AGENDA

SENTINEL 2A LAUNCH

The second satellite for Europe's Copernicus programme is set to launch from Europe's Spaceport in Kourou, French Guiana, on 23 June at 01:52 GMT (03:52

ONLINE CATALOGUE

CATALOGUE PDF

FIRST VISIT ?

MY CART 0

YOUR SEARCH

NEW SEARCH

AREA

- [ ] All areas
- [ ] Global Ocean (0)
- [ ] Arctic Ocean (0)
- [ ] Baltic Sea (1)
- [ ] European North-West Shelf Seas (1)
- [ ] Iberia-Biscay-Ireland Regional Seas (0)
- [ ] Mediterranean Sea (1)
- [x] Black Sea (6)

PARAMETER

- [ ] All parameters
- [ ] Ocean Temperature (1)
- [ ] Ocean Salinity (1)
- [ ] Ocean Currents (1)

Found **6 products** matching your criteria.

KEYWORD SEARCH

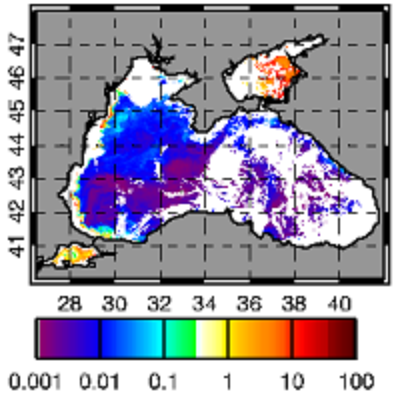
SEARCH

BLACK SEA MONTHLY AND WEEKLY INTERPOLATED MEANS OF SURFACE CHLOROPHYLL CONCENTRATION FROM SATELLITE OBSERVATIONS

Satellite-observation, Ocean-chlorophyll, Near-real-time, Black-sea

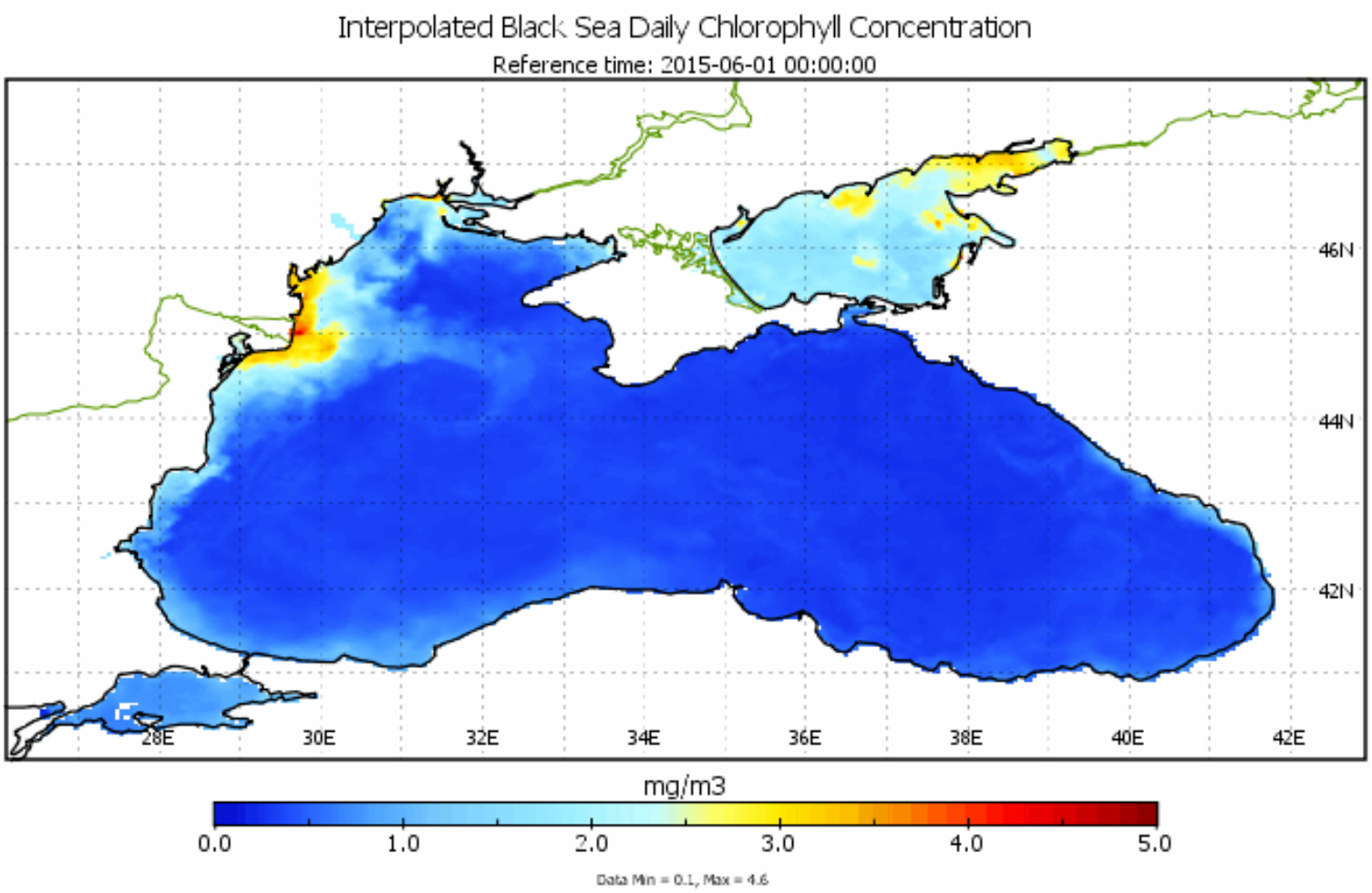
OCEANCOLOUR_BS_CHL_L4_NRT_OBSERVATIONS_009_045

For the Black Sea - Surface Chlorophyll (mg m-3) is operationally produced using regional ocean color algorithms. The Group for Satellite Oceanography (GOS-ISAC) of the Italian National Research Council (CNR), in Rome, uses the algorithm developed by Kopelevich et al. (2013, BSAlg) for near real time and delayed time data from MODIS-Aqua and NPP-VIIRS sensors.

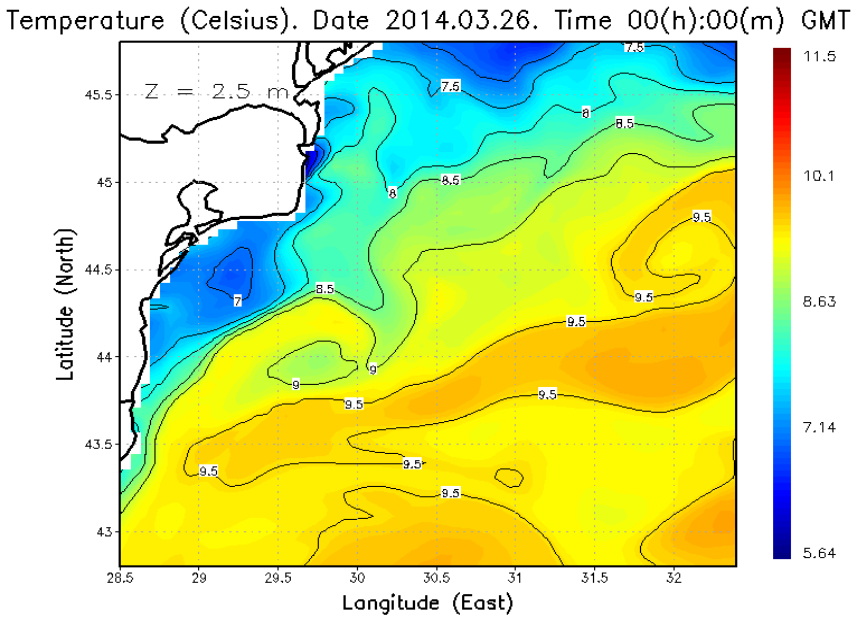


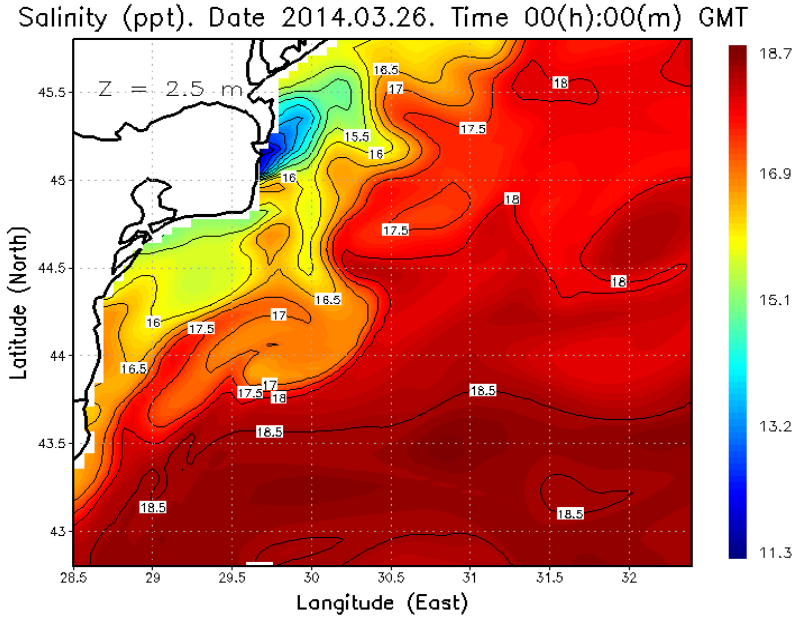
MORE INFO

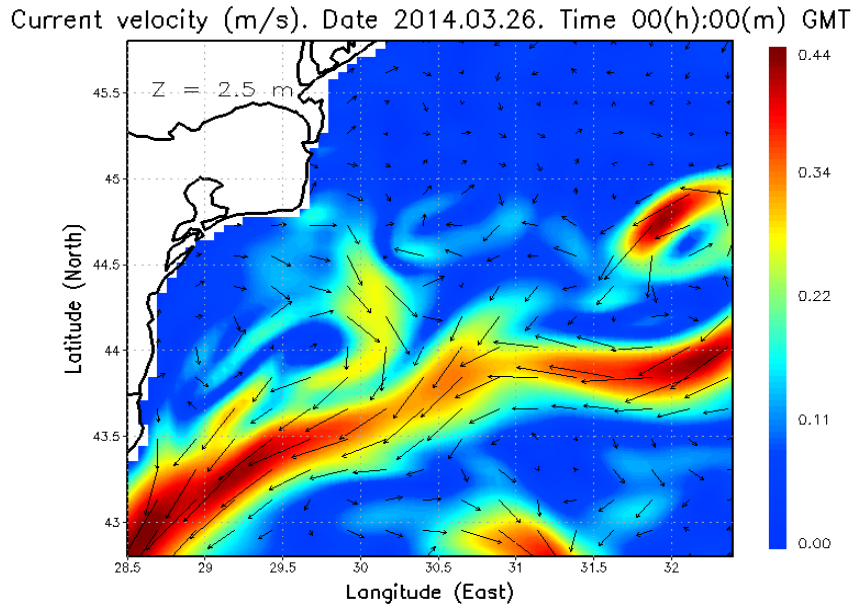
ADD TO CART

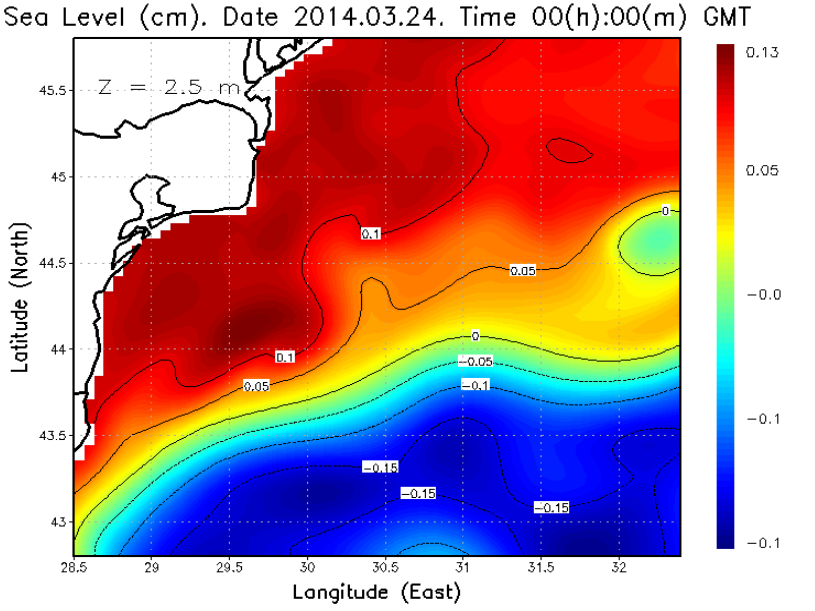

Interpolated Black Sea Daily Chlorophyll Concentration
Reference time: 2015-06-01 00:00:00
46N
44N
42N
28E
30E
32E
34E
36E
38E
40E
42E
mg/m3
0.0
1.0
2.0
3.0
4.0
5.0
Data Min = 0.1, Max = 4.6

Prognoza oceanografică



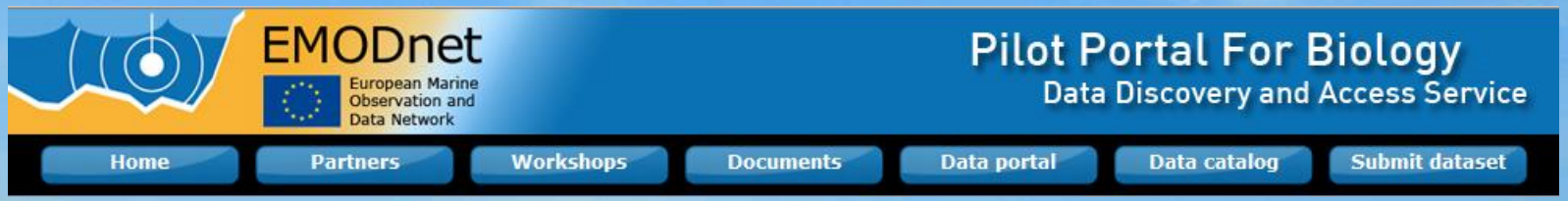




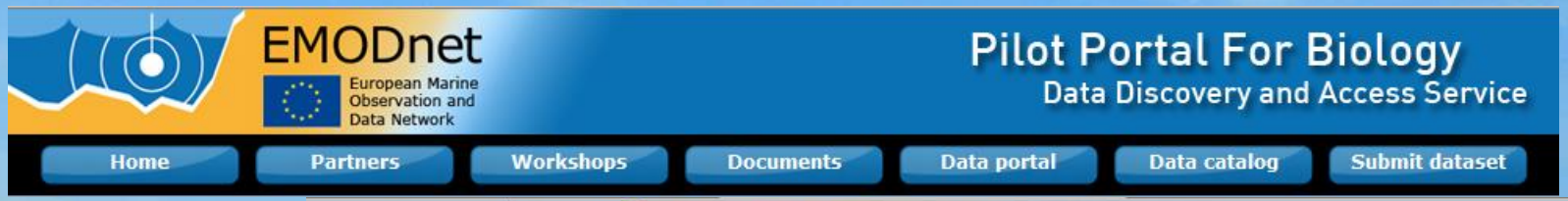


The European Commission proposed a new European Marine Observation and Data Network (EMODNET) in its Green Paper on maritime policy. Following an overwhelmingly positive response from stakeholders to its proposal, the European Commission, in its EU's Maritime Policy Blue Book, adopted in October 2007 and welcomed by the European Council in December 2007, undertook to take steps towards EMODNET in order to improve availability of high quality data.

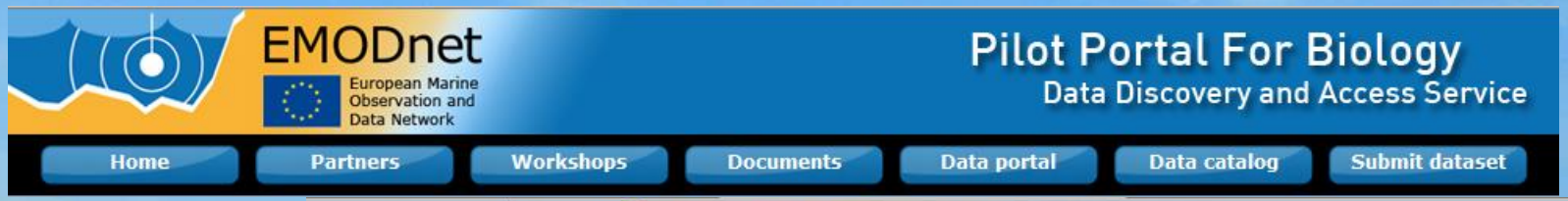
The European Commission proposed a new European Marine Observation and Data Network (EMODNET) in its Green Paper on maritime policy. Following an overwhelmingly positive response from stakeholders to its proposal, the European Commission, in its EU's Maritime Policy Blue Book, adopted in October 2007 and welcomed by the European Council in December 2007, undertook to take steps towards EMODNET in order to improve availability of high quality data.



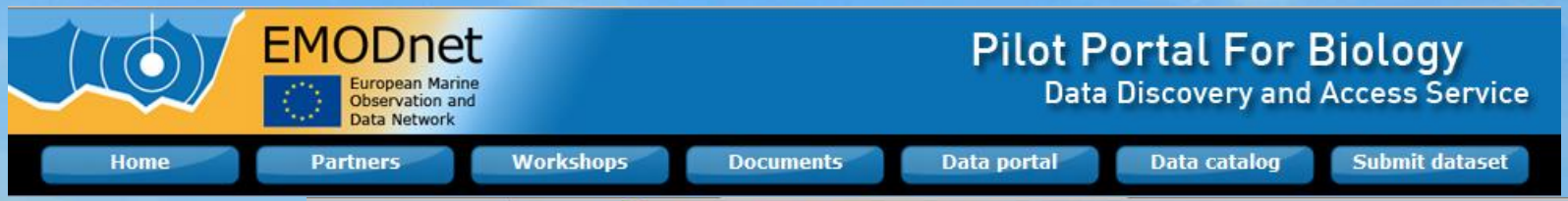
The European Commission proposed a new European Marine Observation and Data Network (EMODNET) in its Green Paper on maritime policy. Following an overwhelmingly positive response from stakeholders to its proposal, the European Commission, in its EU's Maritime Policy Blue Book, adopted in October 2007 and welcomed by the European Council in December 2007, undertook to take steps towards EMODNET in order to improve availability of high quality data.

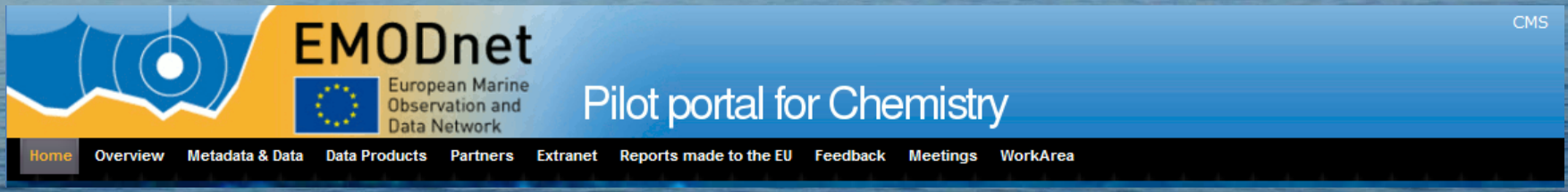


The European Commission proposed a new European Marine Observation and Data Network (EMODNET) in its Green Paper on maritime policy. Following an overwhelmingly positive response from stakeholders to its proposal, the European Commission, in its EU's Maritime Policy Blue Book, adopted in October 2007 and welcomed by the European Council in December 2007, undertook to take steps towards EMODNET in order to improve availability of high quality data.

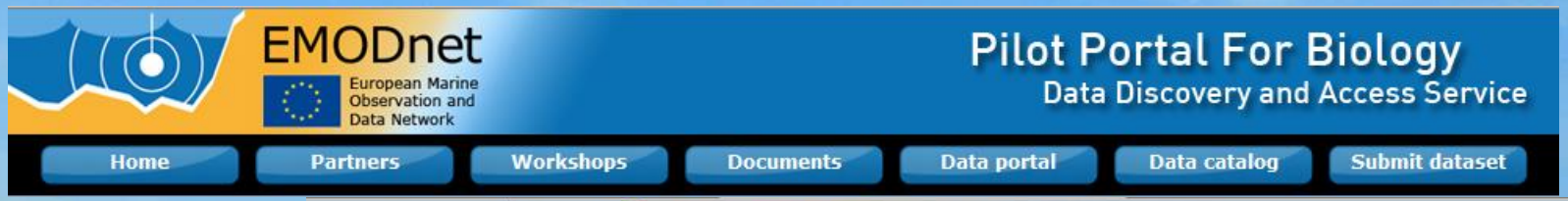


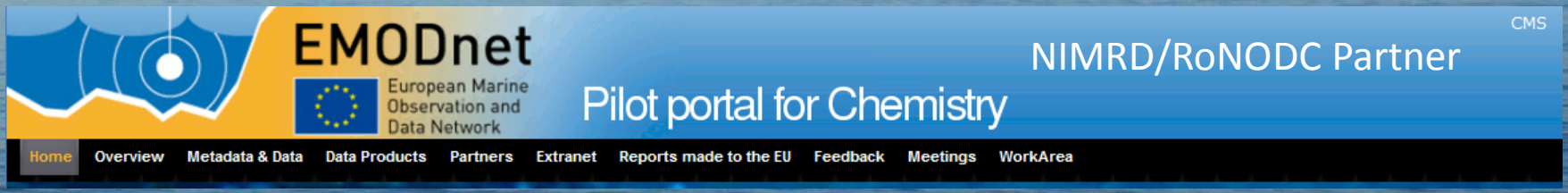
The European Commission proposed a new European Marine Observation and Data Network (EMODNET) in its Green Paper on maritime policy. Following an overwhelmingly positive response from stakeholders to its proposal, the European Commission, in its EU's Maritime Policy Blue Book, adopted in October 2007 and welcomed by the European Council in December 2007, undertook to take steps towards EMODNET in order to improve availability of high quality data.



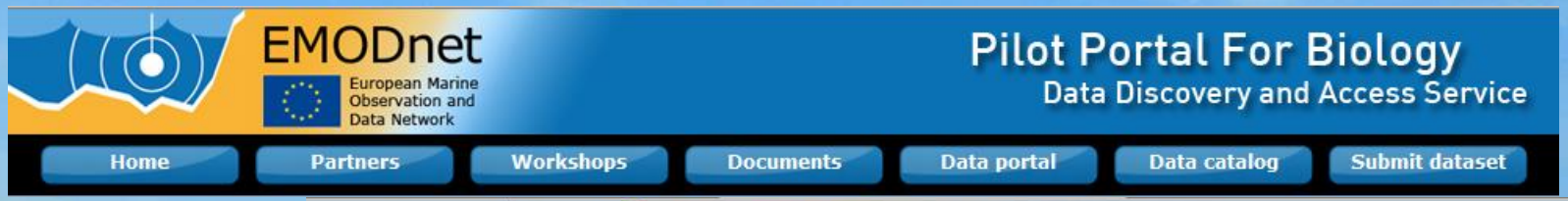


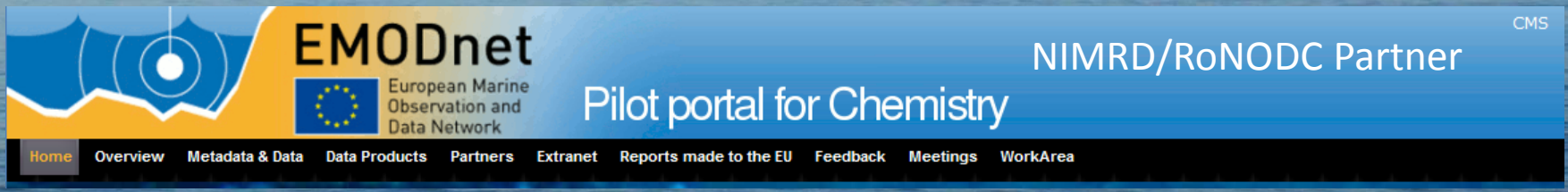
The European Commission proposed a new European Marine Observation and Data Network (EMODNET) in its Green Paper on maritime policy. Following an overwhelmingly positive response from stakeholders to its proposal, the European Commission, in its EU's Maritime Policy Blue Book, adopted in October 2007 and welcomed by the European Council in December 2007, undertook to take steps towards EMODNET in order to improve availability of high quality data.





The European Commission proposed a new European Marine Observation and Data Network (EMODNET) in its Green Paper on maritime policy. Following an overwhelmingly positive response from stakeholders to its proposal, the European Commission, in its EU's Maritime Policy Blue Book, adopted in October 2007 and welcomed by the European Council in December 2007, undertook to take steps towards EMODNET in order to improve availability of high quality data.





www.emodnet-chemistry.eu

EMODnet

European Marine Observation and Data Network

Pilot portal for Chemistry

EMODNET is using the SDN infrastructure

CMS

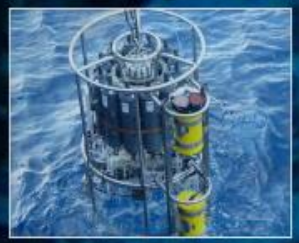
Home | Overview | Metadata & Data | Data Products | Partners | Extranet | Reports made to the EU | Feedback | Meetings | WorkArea

Go to homepage >>

European Marine Observation and Data Network on EU maritime forum

NEWS

- Newest version of the European Atlas of the Seas now online!
- EMODNET Chemistry Second year plenary meeting
- Emodnet chemical lot UBSS DQC workshop participation in Rhodes
- Presented the Chemistry Lot status during the fourth ur-EMODnet progress meeting 07th June 2011 in Bruxelles
- Emodnet Chemistry coordination group video conference 5th of July 2011



Welcome to EMODNET Chemical portal

EMODNET is a pilot component for a final operational European Marine Observation and Data Network , launched by the Directorate-General for Maritime Affairs and Fisheries (DG MARE).

EMODNET CHEMISTRY QUICK USERS GUIDE

EMODNET aims to assemble fragmented and inaccessible **marine data** into interoperable, continuous and publicly available data streams for complete maritime basins.

EMODNET Chemical pilot is focused on the marine data **groups of chemicals** required for monitoring the Marine Strategy Directive:

1. synthetic compounds (i.e. pesticides, antifoulants, pharmaceuticals),
2. heavy metals,
3. radionuclides;
4. fertilisers and other nitrogen- and phosphorus-rich substances;
5. organic matter (e.g. from sewers or mariculture);
6. hydrocarbons including oil pollution.

It concerns the following geographical regions:

EMODnet

European Marine Observation and Data Network

Pilot portal for Chemistry

EMODNET is using the SDN infrastructure

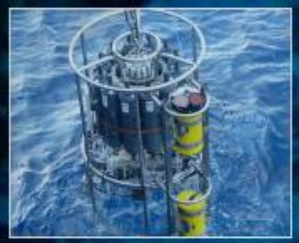
Home | Overview | Metadata & Data | Data Products | Partners | Extranet | Reports made to the EU | Feedback | Meetings | WorkArea

Go to homepage >>

European Marine Observation and Data Network on EU maritime forum

NEWS

- Newest version of the European Atlas of the Seas now online!
- EMODNET Chemistry Second year plenary meeting
- Emodnet chemical lot UBSS DQC workshop participation in Rhodes
- Presented the Chemistry Lot status during the fourth ur-EMODnet progress meeting 07th June 2011 in Bruxelles
- Emodnet Chemistry coordination group video conference 5th of July 2011



Welcome to EMODNET Chemical portal

EMODNET is a pilot component for a final operational European Marine Observation and Data Network , launched by the Directorate-General for Maritime Affairs and Fisheries (DG MARE).

EMODNET CHEMISTRY QUICK USERS GUIDE

EMODNET aims to assemble fragmented and inaccessible **marine data** into interoperable, continuous and publicly available data streams for complete maritime basins.

EMODNET Chemical pilot is focused on the marine data **groups of chemicals** required for monitoring the Marine Strategy Directive:

1. synthetic compounds (i.e. pesticides, antifoulants, pharmaceuticals)
2. heavy metals,
3. radionuclides;
4. fertilisers and other nitrogen- and phosph
5. organic matter (e.g. from sewers or maricu
6. hydrocarbons including oil pollution.

It concerns the following geographical regions:

Phase I (2009-2013) - developed a prototype (so called ur-EMODnet) with coverage of a limited selection of sea-basins, parameters and data products at low resolution

EMODnet

European Marine Observation and Data Network

Pilot portal for Chemistry

EMODNET is using the SDN infrastructure

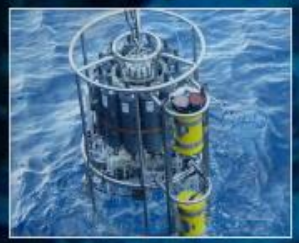
Home | Overview | Metadata & Data | Data Products | Partners | Extranet | Reports made to the EU | Feedback | Meetings | WorkArea

Go to homepage >>

European Marine Observation and Data Network on EU maritime forum

NEWS

- Newest version of the European Atlas of the Seas now online!
- EMODNET Chemistry Second year plenary meeting
- Emodnet chemical lot UBSS DQC workshop participation in Rhodes
- Presented the Chemistry Lot status during the fourth ur-EMODnet progress meeting 07th June 2011 in Bruxelles
- Emodnet Chemistry coordination group video conference 5th of July 2011



Welcome to EMODNET Chemical portal

EMODNET is a pilot component for a final operational European Marine Observation and Data Network , launched by the Directorate-General for Maritime Affairs and Fisheries (DG MARE).

EMODNET CHEMISTRY QUICK USERS GUIDE

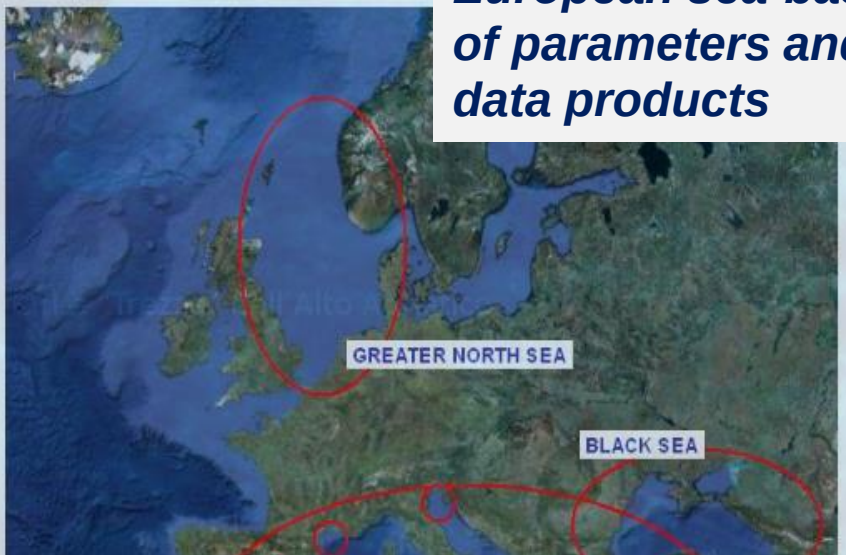
EMODNET aims to assemble fragmented and inaccessible **marine data** into interoperable, continuous and publicly available data streams for complete maritime basins.

EMODNET Chemical pilot is focused on the marine data **groups of chemicals** required for monitoring the Marine Strategy Directive:

1. synthetic compounds (i.e. pesticides, antifoulants, pharmaceuticals)
2. heavy metals,
3. radionuclides;
4. fertilisers and other nitrogen- and phosph
5. organic matter (e.g. from sewers or maricu
6. hydrocarbons including oil pollution.

It concerns the following geographical regions:

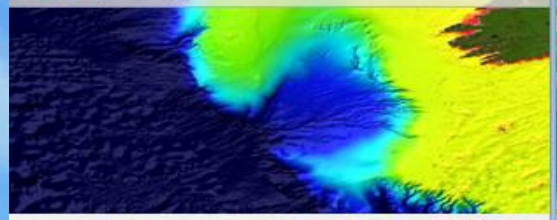
Phase II (2013-2016) - aims to move from a prototype to an operational service with full coverage of all European sea-basins, a wider selection of parameters and medium resolution data products



EMODnet Central Portal

European Marine Observation and Data Network

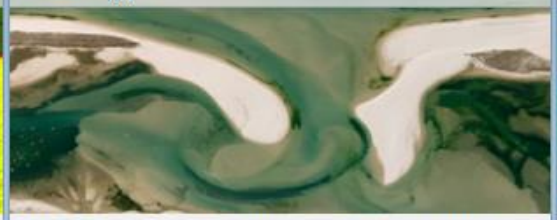
Bathymetry



Data on bathymetry (water depth), coastlines, and geographical location of underwater features: wrecks.

Read more | Portal

Geology



Data on seabed substrate, sea-floor geology, coastal behaviour, geological events, and minerals.

Read more | Portal

Seabed Habitats

Data on modelled seabed habitats based on seabed substrate, energy , biological zone, and salinity.

Read more | Portal

Chemistry

Data on the concentration of nutrients, organic matter, pesticides, heavy metals, radionuclides and antifoulants in water, sediment and biota.

Read more | Portal

Biology

Data on temporal and spatial distribution of species abundance and biomass from several taxa.

Read more | Portal

Physics

Data on salinity, temperature, waves, currents, sea-level, light attenuation, and FerryBoxes.

Read more | Portal

Human Activities

Data on the intensity and spatial extent of human activities at sea.

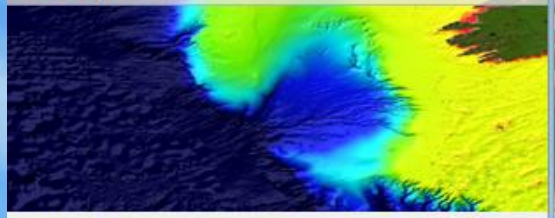
Read more | Portal

EMODnet Central Portal

European Marine Observation and Data Network

www.emodnet.eu

Bathymetry



Data on bathymetry (water depth), coastlines, and geographical location of underwater features: wrecks.

Read more | Portal

Geology

Data on seabed substrate, sea-floor geology, coastal behaviour, geological events, and minerals.

Read more | Portal

Seabed Habitats

Data on modelled seabed habitats based on seabed substrate, energy , biological zone, and salinity.

Read more | Portal

Chemistry

Data on the concentration of nutrients, organic matter, pesticides, heavy metals, radionuclides and antifoulants in water, sediment and biota.

Read more | Portal

Biology

Data on temporal and spatial distribution of species abundance and biomass from several taxa.

Read more | Portal

Physics

Data on salinity, temperature, waves, currents, sea-level, light attenuation, and FerryBoxes.

Read more | Portal

Human Activities

Data on the intensity and spatial extent of human activities at sea.

Read more | Portal

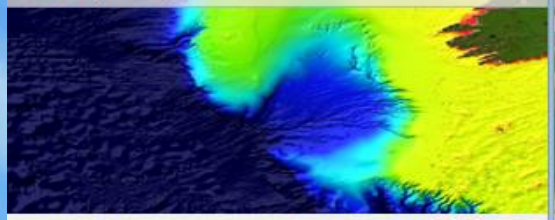
EMODnet Central Portal

European Marine Observation and Data Network

www.emodnet.eu

Home | Data Portals | Data Services | Sea Basin Checkpoints | Partners | About | Secretariat

Bathymetry



Data on bathymetry (water depth), coastlines, and geographical location of underwater features: wrecks.

Read more | Portal

Geology

Data on seabed substrate, sea-floor geology, coastal behaviour, geological events, and minerals.

Read more | Portal

Seabed Habitats

Data on modelled seabed habitats based on seadbed substrate, energy , biological zone, and salinity.

Read more | Portal

Chemistry

NIMRD/RoNODC Partner

Data on the concentration of nutrients, organic matter, pesticides, heavy metals, radionuclides and antifoulants in water, sediment and biota.

Read more | Portal

Biology

Data on temporal and spatial distribution of species abundance and biomass from several taxa.

Read more | Portal

Physics

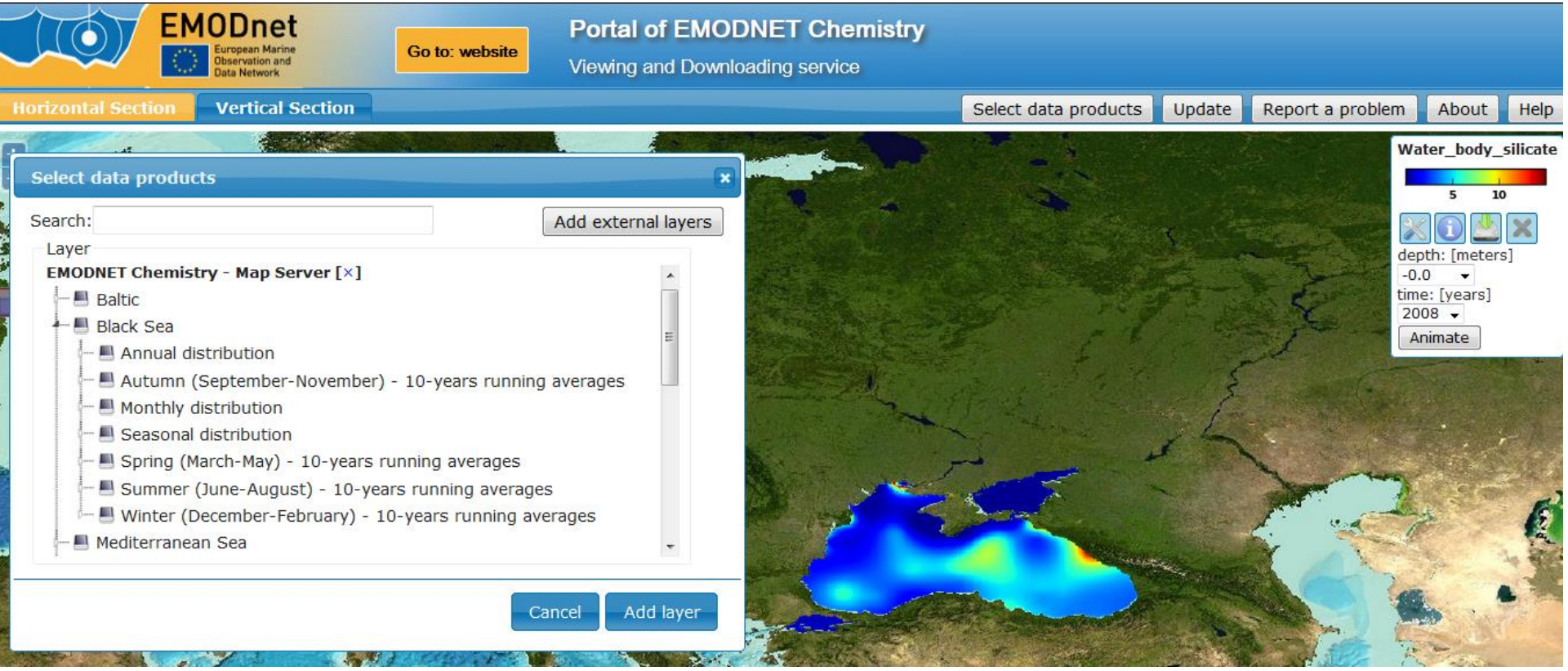
Data on salinity, temperature, waves, currents, sea-level, light attenuation, and FerryBoxes.

Read more | Portal

Human Activities

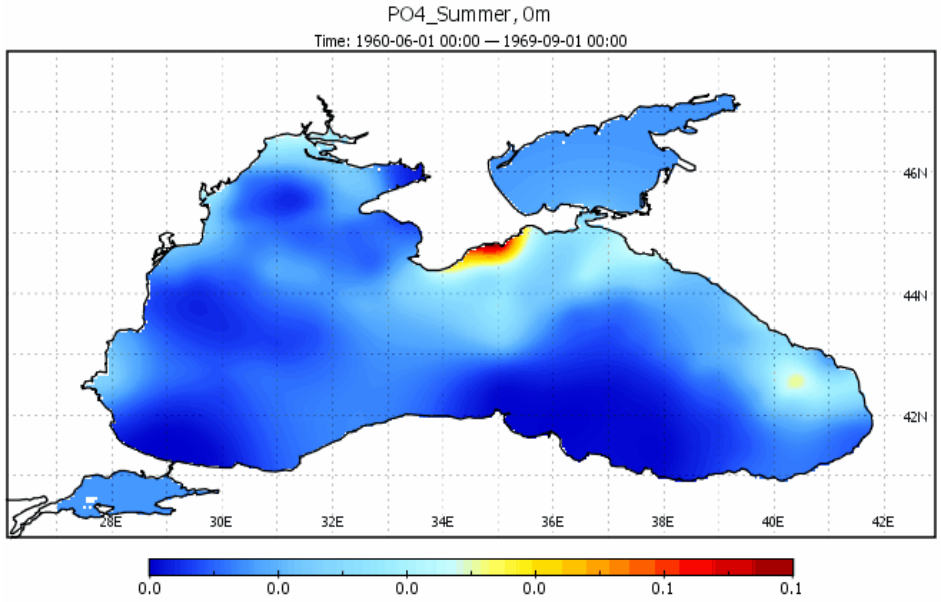
Data on the intensity and spatial extent of human activities at sea.

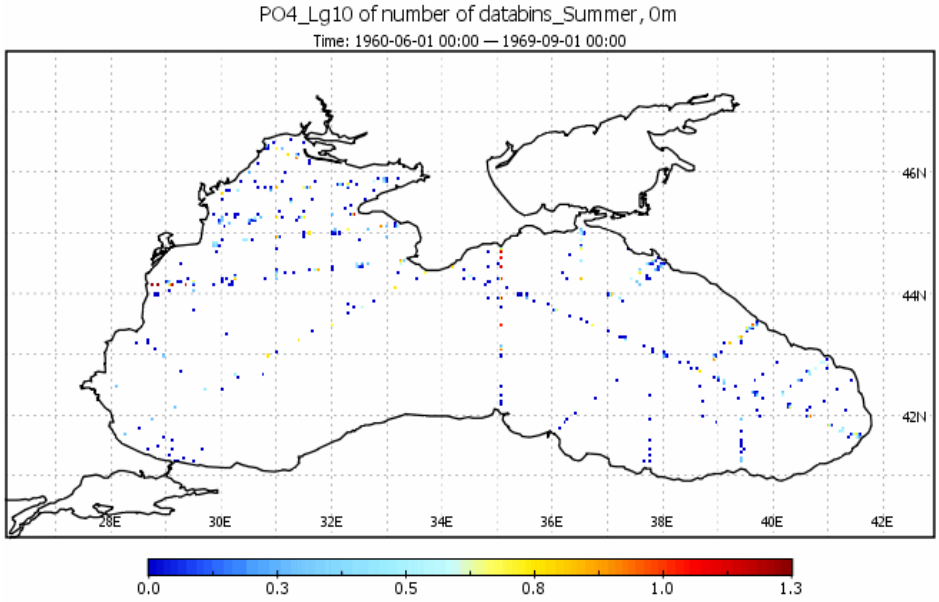
Read more | Portal

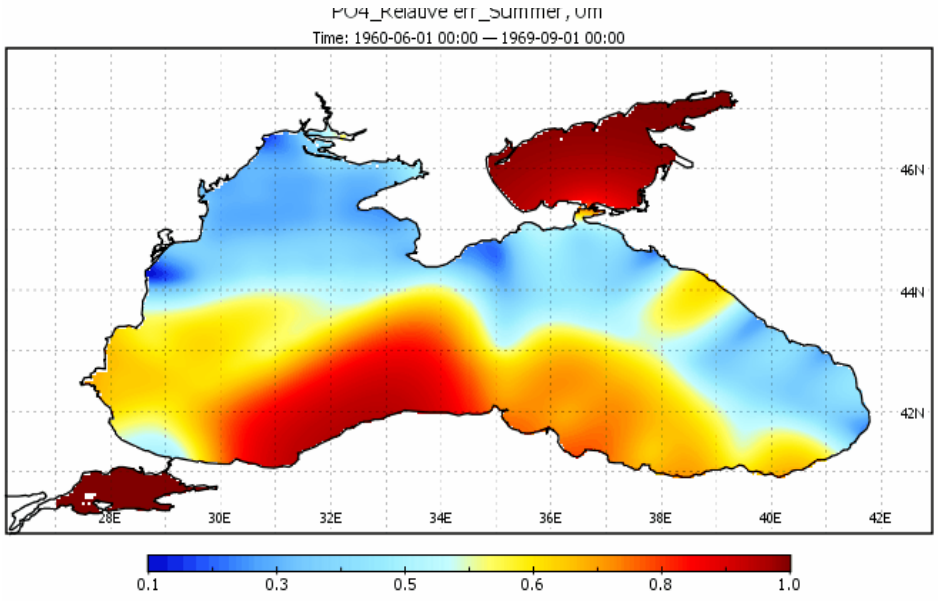

EMODnet
European Marine Observation and Data Network
Go to: website
Portal of EMODNET Chemistry
Viewing and Downloading service
Horizontal Section
Vertical Section
Select data products
Update
Report a problem
About
Help
Select data products
Search:
Add external layers
Layer
EMODNET Chemistry - Map Server [×]
Baltic
Black Sea
Annual distribution
Autumn (September-November) - 10-years running averages
Monthly distribution
Seasonal distribution
Spring (March-May) - 10-years running averages
Summer (June-August) - 10-years running averages
Winter (December-February) - 10-years running averages
Mediterranean Sea
Cancel
Add layer
Water_body_silicate
5
10
depth: [meters]
-0.0
time: [years]
2008
Animate

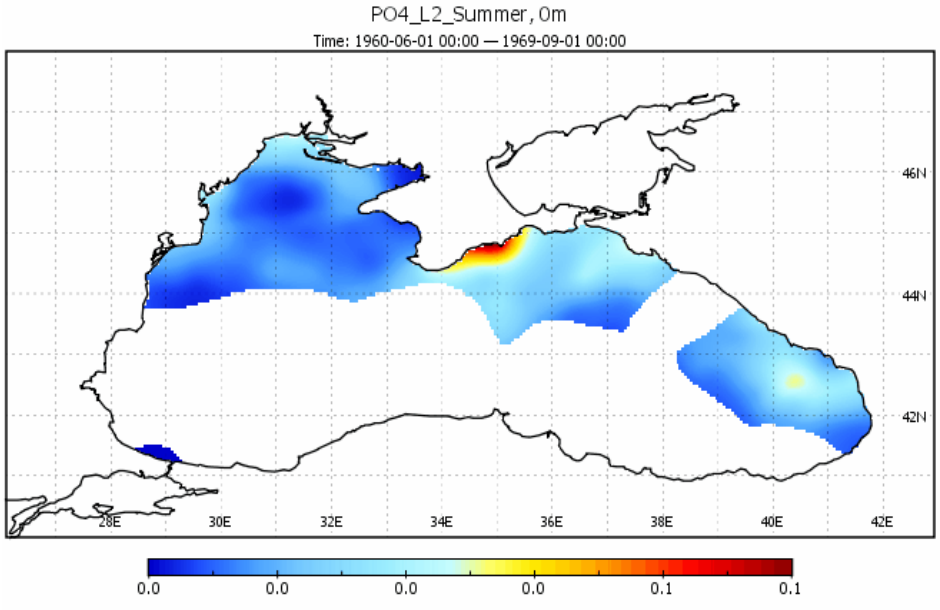
DIVA (Data-Interpolating Variational Analysis)

Water body phosphate - Summer, 0m

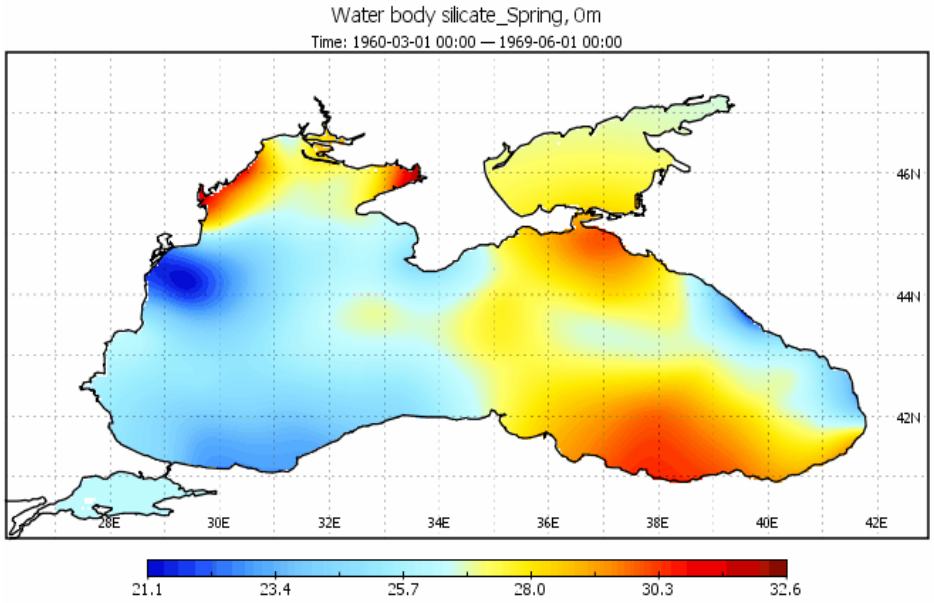


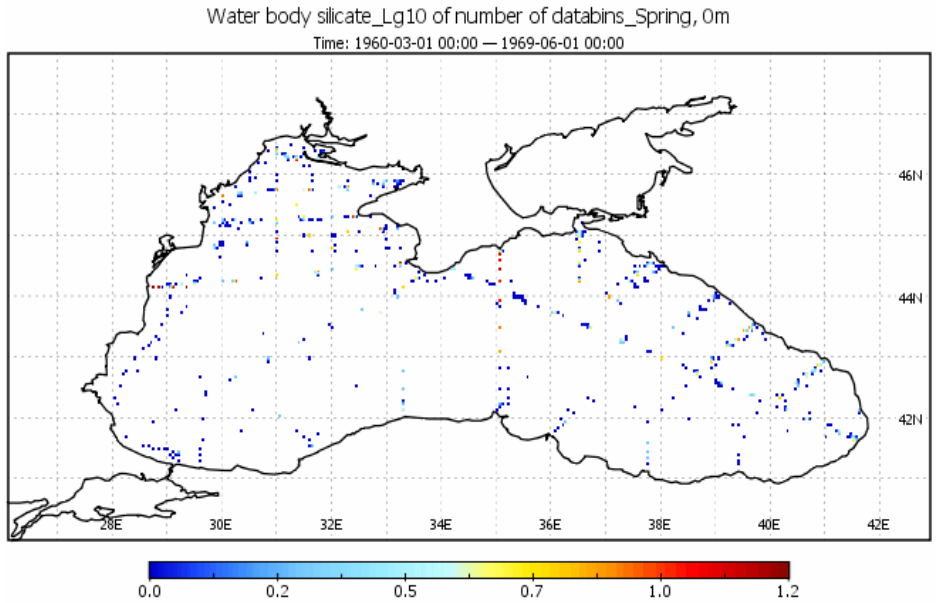


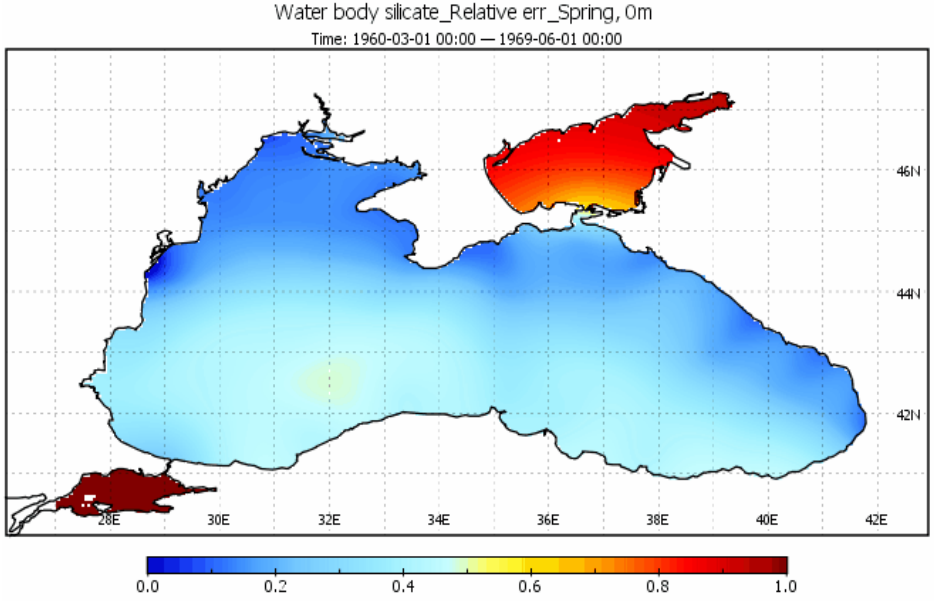


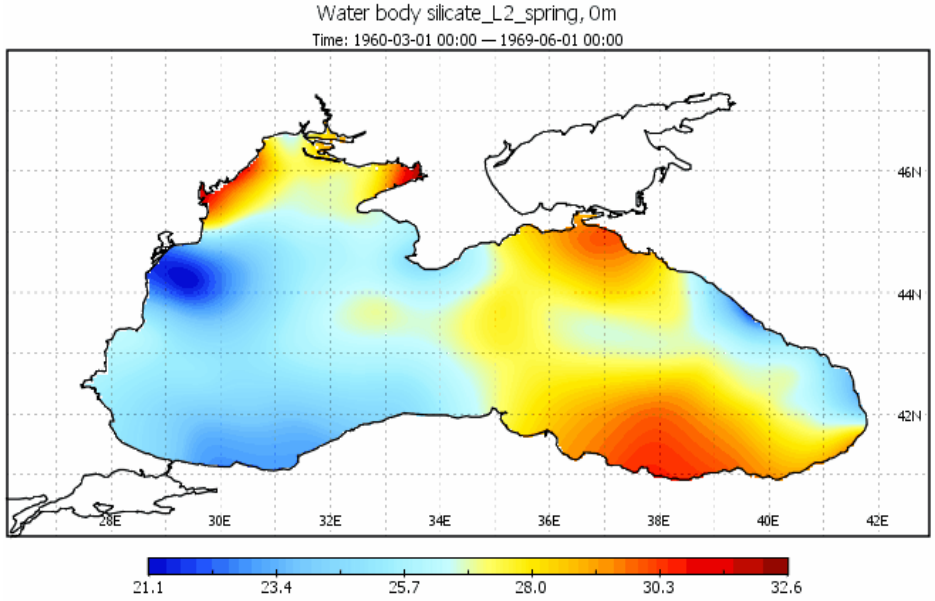


Water body silicate - Spring, 0m

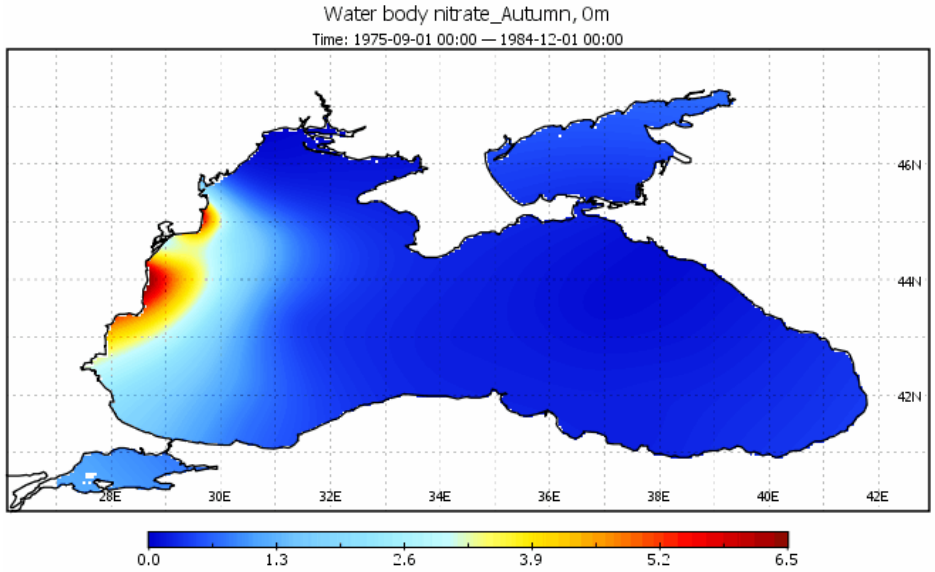


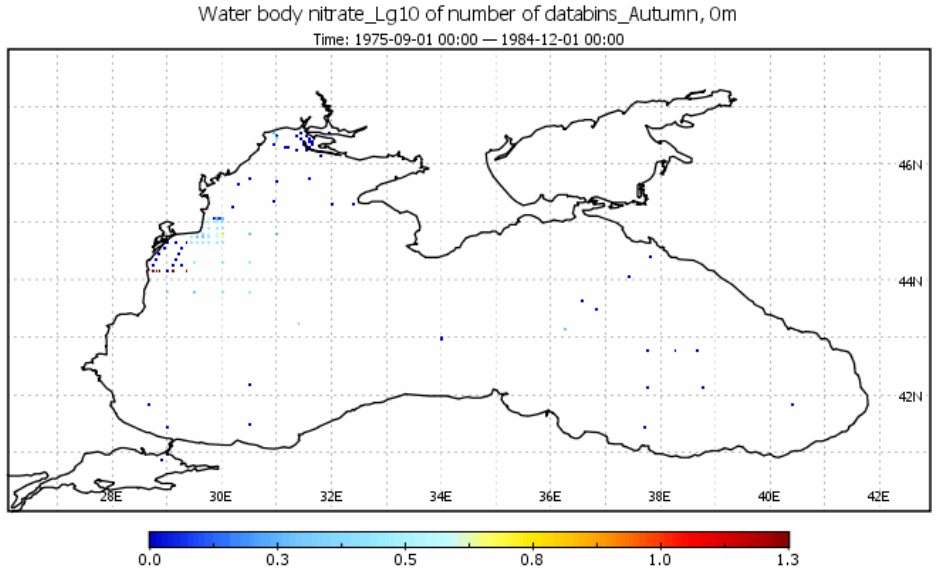


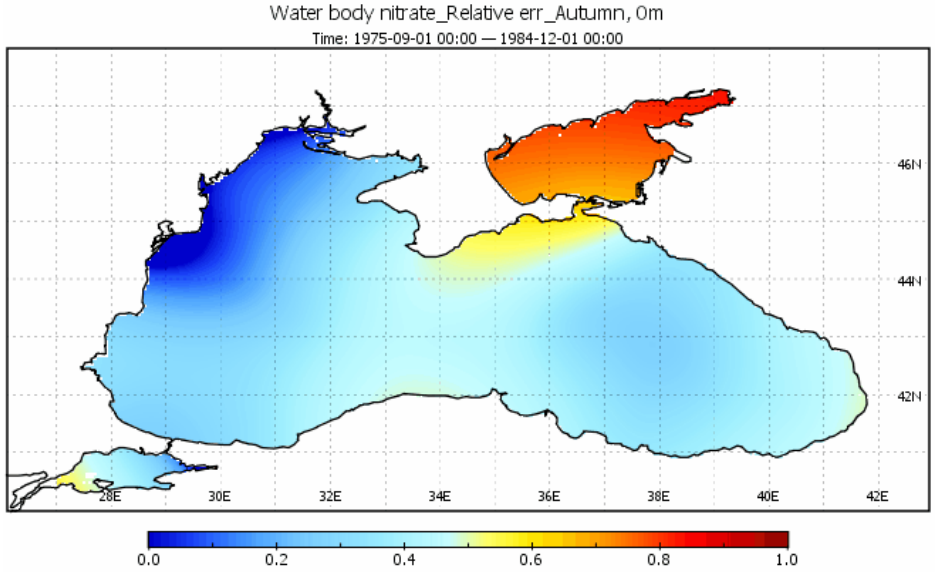


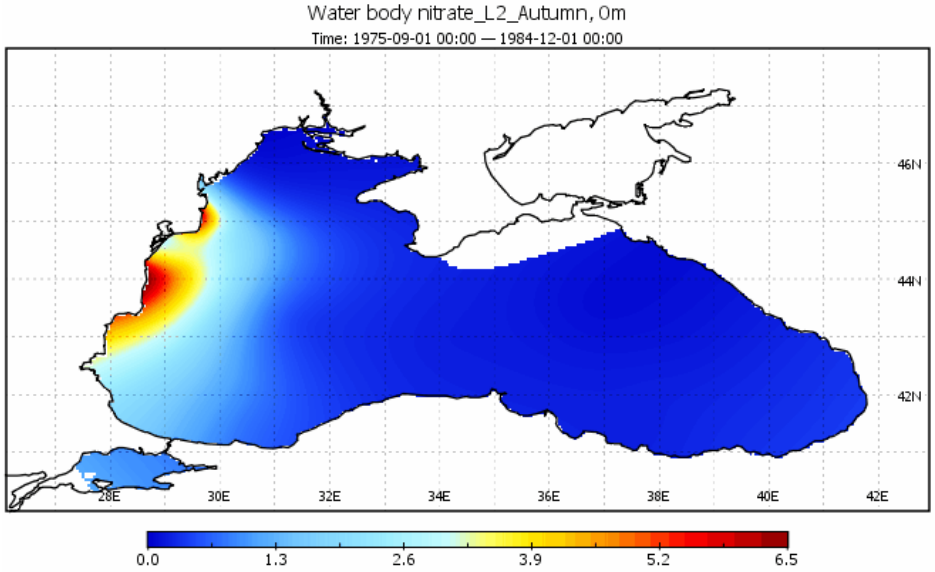


Water body nitrate - Autumn, 0m










THANK YOU FOR YOUR ATTENTION !