



IN SITU OCEAN DATA MANAGEMENT HANDBOOK



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HANDBOOK

Version 1.1

Abstract:

The ‘In situ ocean data management handbook’ has been drafted as an internal milestone within WP3 of the FP7 PERSEUS project. The objective of this document is to give practical information to an in situ data provider to answer the following question: “How do I submit my in situ data in near real time and in delayed mode?”

This document will be updated in 2015, will remain accurate beyond the end of PERSEUS, and hopefully will be applicable to future EU projects.

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1 Introduction

The objective of this in situ ocean data management handbook is to provide a simple guide that will enable PERSEUS ocean data providers to upload their in situ ocean data to the existing SES data management system, with the data acknowledged as a PERSEUS data contribution.

The archive, availability and distribution of the ocean data collected within the framework of PERSEUS is a key issue for the success of the project, and the exchange, archiving and cataloguing of such data is therefore an important component of the research project. All PERSEUS partners have committed to the PERSEUS aim of a truly open data access policy with the goal of maximising the exploitation and impact of data collected for both the generation of new knowledge and sustained operations and downstream services. The PERSEUS data policy is intended to increase the success of the project, ensuring that the valuable data collected by researchers are properly archived so they can be effectively analysed, referenced and re-used in future research projects. For further details on the PERSEUS data policy see 'PERSEUS Intellectual Property Rights, Use and Dissemination Rules and Data Policy' (see PERSEUS Description of Work 3.2).

A key focus of the PERSEUS Data policy is the sharing of data and metadata, and the responsible archiving of data and metadata inventories. In this context "metadata" is defined as descriptive information that characterises a set of measurements, distinguishing that dataset from other similar measurement sets. As described within this document, the data collected under specific programs with associated funds, in this case PERSEUS, are identified at a European and Global Ocean data management level as a contribution from a specific program through the allocation to the PERSEUS Project within the metadata.

This handbook covers the protocols for the submission or sharing of both near Real Time (nRT) and Delayed Mode (DM) data, across the range of ocean observing platforms within the PERSEUS Project. Although this handbook is produced within the framework of PERSEUS, the data submission and sharing protocols are based on existing European infrastructure thus this handbook can also act as a general guide for the submission of nRT and DM in situ ocean data across Europe for regional, national or EU projects. The handbook also covers the protocols for retrieving the available PERSEUS data from the PERSEUS data archive, either through the nRT or DM data management systems, or directly from the PERSEUS website (www.perseus-net.eu).

The available PERSEUS data can also be downloaded or retrieved from the PERSEUS data archive, either through the nRT and DM data management systems, as described in the relevant sections, or directly from the PERSEUS website (<http://www.perseus-net.eu>).

The handbook is organized as follows: Section 2 contains an overview of ocean data management systems within European context, Section 3 describes the protocols for nRT data submission and access across the different observing platforms, Section 4 describes the protocols for DM data submission and access across the different observing platforms, Section 5 describes the links between the two data systems, and finally Section 6 contains a summary table for the nRT and DM data submission procedures.

Any suggestions as to changes, improvements or enhancements to this document can be sent to Loic Petit de la Villeon (Loic.Petit.De.La.Villeon@ifremer.fr). The latest version of this handbook will always be available on the PERSEUS website at the following location: http://www.perseus-net.eu/site/content.php?locale=1&locale_j=en&sel=449

2 Ocean Data Management: the European context

Within Europe, high importance has been placed on the collection and distribution of ocean data. Copernicus¹, a programme for the establishment of the European capacity for Earth Observation, promotes the access, use and sharing of information and data on a full, free and open basis. The reasons for this are clear and are embedded in the Copernicus strategy.

‘Environmental information is of crucial importance. It helps to understand how our planet and its climate are changing, the role played by human activities in these changes and how these will influence our daily lives.

The well-being and security of future generations are more than ever dependent on everyone's actions and on the decisions being made today on environmental policies. To take the right actions, decision makers, businesses and citizens must be provided with reliable and up-to-date information on how our planet and its climate are changing.’

The Copernicus data policy states the following:

- No restriction on use or users (commercial and non-commercial)
- A free of charge version of any dataset is always available
- Worldwide access without limitation in time

PERSEUS Data Policy follows that of Copernicus:

- Recommendation of a “truly open data access policy” [see PERSEUS WP3 (task 3.4)]
- “Data will be available primarily to the Consortium, as well to any interested parties, upon granted permission following the PERSEUS Intellectual Property Rights Policy-Data Policy and Publication strategy” (see PERSEUS WP9 Description of Work).

Several initiatives exist within Europe for ocean data management, which are now coordinated under the umbrella of EuroGOOS (European Global Ocean Observing System). EuroGOOS is committed to developing operational oceanography capacity within Europe, within the context of the intergovernmental Global Ocean Observing System (GOOS). The scope of EuroGOOS is wide and its needs are only partially addressed by the ongoing development within Copernicus, SeaDataNet and other EU initiatives. It was therefore agreed at the annual EuroGOOS meeting in 2010 in order to improve the quantity, quality and accessibility of marine information, for decision making and to open up new economic opportunities in the marine and maritime sectors of Europe, for the benefit of European citizens and the global community. It is essential that the following needs are met:

- Easy access to data through standard generic tools: easy means of using the data without having to be concerned about data processing provided this is done in a coherent way and that adequate metadata are available to provide information on how the data were processed.
- To combine in situ observation data with other information (e.g. satellite images or model outputs) in order to derive new products, build new services or take decisions.

¹ Copernicus was previously known as GMES (Global Monitoring for Environment and Security)

The ocean data management and exchange process within EuroGOOS is intended to reduce duplication of effort among agencies, improve quality and reduce costs related to geographic information, thus making oceanographic data more accessible to the public and helping to establish key partnerships to increase data availability. In addition, a EuroGOOS data management system will deliver a system that will fit European needs, in terms of standards and the structure of the contributing organisations. Elements of this structure will include:

- Observation data providers, which can be operational agencies, marine research centres, universities, national oceanographic data centres and satellite data centres.
- Integrators of marine data such as the MyOcean in-situ data thematic centre or the SeaDataNet National Data Centres Network SeaDataNet and the new European Marine Observation and Data Network (EMODnet) portals.
- These integrators support data providers who are willing to share their observation data and users who want to access a range of oceanographic data, encompassing more than one region, a range of data variables and a range of providers. They also develop new services to facilitate access and increase the use of both existing and new observational data.

EMODnet is an initiative from the European Commission Directorate-General for Maritime Affairs and Fisheries (DG MARE) as part of the [Marine Knowledge 2020 strategy](#), a consortium of organisations within Europe that assembles marine data, data products and metadata from diverse sources in a uniform way. Currently it is made up of 6 portals: bathymetry, geology, physics, chemistry, biology, and seabed habitats. An additional portal on Human Activities is under construction. The primary portal for in situ oceanographic data, the EMODnet Physical portal is based on three data infrastructure pillars (see fig. 1):

- The **SeaDataNet** infrastructure, for quality controlled, long-term time series acquired by all ocean observation initiatives, missions, or experiments
- The **MyOcean in situ Thematic Assembling data Centre (TAC)**, for access to near real-time data acquired by continuous, automatic and permanent observation networks
- The **EuroGOOS regional operational observing systems (ROOSES)**

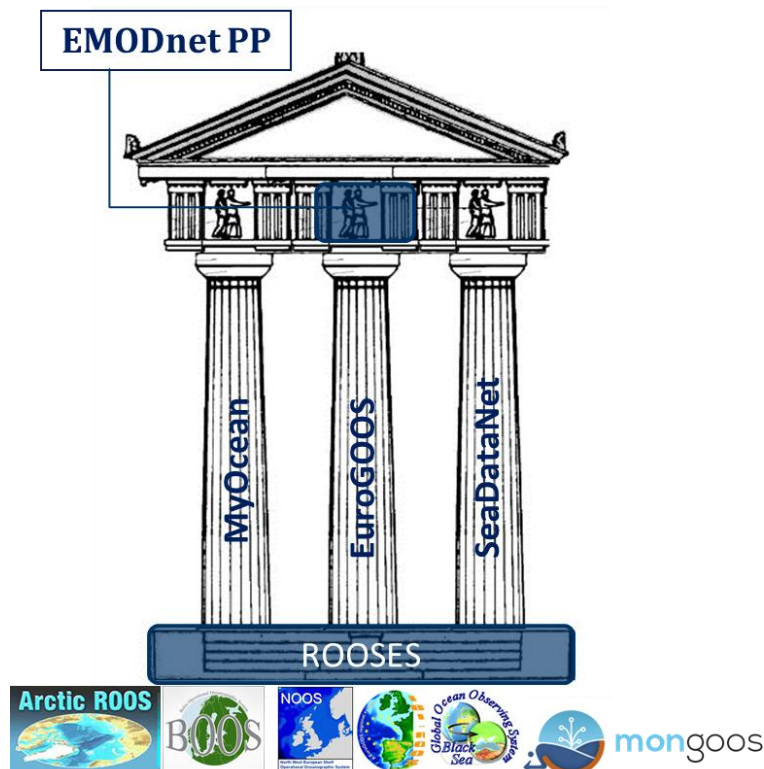


Figure 1: Relationship between SeaDataNet infrastructure, MyOcean in situ TAC, EuroGOOS and EMODnet Physical portal.

The PERSEUS data management system takes advantage of these existing and now cooperating infrastructures for the submission, distribution and access to ocean data collected under the PERSEUS Project. PERSEUS also plays an important role in proving a working model for the coordination of observational oceanographic data submission and access across the SES in nRT and DM:

- NRT data will generally be provided to and by the MyOcean/ROOS Thematic Assembly Centres.
- DM data will be shared with and through the National Data Centres of the SeaDataNet infrastructure, which has the capability to preserve this data for future use. A cornerstone of this data submission and access model is the identification, as the data is submitted, of the project under which the data is collected. This information travels with the data, in the form of a Metadata field, and enables the identification of data that may have been collected within the framework of specific programs. This data can then be identified at a Global DAC level as a contribution from a specific program. In this manner the data submission process outlined for in situ ocean observations provides a model that is sufficiently general to last beyond the end of PERSEUS project and thus be applicable for future EU projects.

3 Near Real Time data system

3.1 Data description

Near real-time data may have several meanings: 1) data that circulate from the originator to the data centre from a few hours to no later than 30 days after data collection (definition of the WMO – World Meteorological Organization) 2) data acquired by continuous, automatic and permanent observation networks (MyOcean) 3) data that have been passed through an initial quality control check. Their quality can be later enhanced by using more accurate quality checks and and/or calibrations the data may be re-submitted as delayed mode data (see section 4).

3.2 Data management

The MyOcean in situ Thematic Assembling CentreTAC organisation has been developed jointly with the EuroGOOS ROOSes and is in charge of aggregating both near real-time quality controlled observations (within a few hours after data acquisition) for forecasting activities and aggregated historical products (1990-2012) for re-analysis.

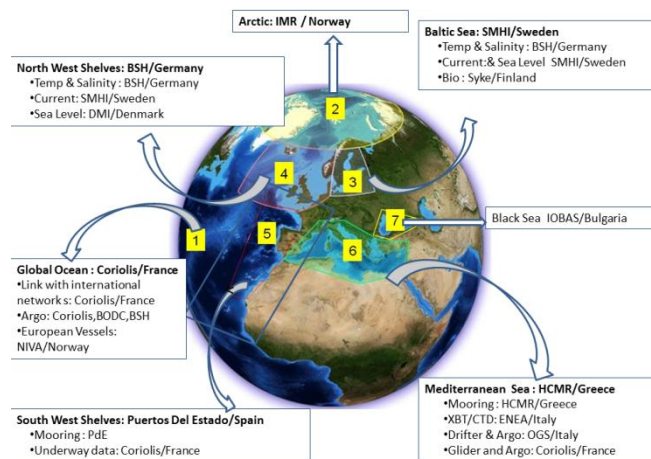
The *in-situ* TAC comprises 7 components: a global *in-situ* centre and 6 regional *in-situ* centres.

The global centre is hosted by Coriolis (France) and covers the global ocean and the European seas. It acts as a backup of the regional components.

The regional centres are organised by European seas and may overlap with each other to better serve the ROOSes they are addressing:

- *Baltic Sea (hosted by SMHI/Sweden)*
- *Arctic (hosted by IMR/Norway)*
- *North West Shelves (hosted by BSH/Germany)*
- *Black Sea (hosted by IOBAS/Bulgaria)*
- *Mediterranean Sea (hosted by HCMR/Greece)*
- *South West Shelves (hosted by Puertos Del Estado/Spain)*

The regional centres are responsible for integrating observation data from ROOS providers into consistent products within a region and ensuring that the service is reliable and monitored. They operate what is called, in the MyOcean terminology a Distribution Unit –DU-.



**Fig.2: The in situ TAC global and regional components
Institute responsibilities inside each component**

3.3 How to upload near real-time data to the in situ TAC?

It depends on what kind of platform the data is originated.

Depending on the platform type, the data are managed differently therefore the methods depend on the kind of platform from which the data originates:

- Argo floats: it is the responsibility of the global in situ TAC (Coriolis)
- Ferryboxes: it is the responsibility of NIVA (Norway) to aggregate FerryBox data from the North European area.
- Most other platforms: it is the responsibility of one of the Regional Centres
- Sea level and tide gauges: there are national coordinated actions but as yet no European approach
- Sea mammals data: there is no coordination at European level
- Therefore for most platforms, a new data provider will contact the regional data managers or the MyOcean TAC help desk. Generally a new data provider will have to provide access to his data via an FTP server without changing his in house format as long as it contains enough metadata information to generate the standard NetCDF files. The basic information in this metadata is generally: what (platform name, institution, WMO number when available, type of platform, etc.), where (space coverage), when (time coverage), who (data provider, contact, PI, Data Center, etc.), how (update interval, QC information), in addition some per platform specifics may be recommended (see details below).

There is no requirement for data providers to transform their data into an OceanSites NetCDF format as this activity is performed by the MyOcean INS TAC ROOSES.

3.3.1 Argo floats

The Argo project has its own data management system. Details on Argo data management scheme and related documentation are available at: <http://www.argodatamgt.org/>

To set up a data stream related to a new Argo float, contact must be made before any deployment, with one of the Argo DACs which is then able to insert Argo data in the Argo data streams. These are British Ocean Data Centre (BODC) for Argo floats from Great Britain and Ireland- and Coriolis for Argo floats from other European countries. The Argo data are distributed to the MyOcean data structure by the way of the Coriolis data centre as a Global Data Assembling Centre (GDAC) for Argo.

Metadata:

See the Argo users' manual version 3.1 on <http://www.argodatamgt.org/>

Note that metadata must be submitted prior to any data submission.

Data:

See the Argo users' manual version 3.1 on <http://www.argodatamgt.org/>

Contacts:

- BODC: Justin Buck (juck@bodc.ac.uk)
- Coriolis data centre: codac@ifremer.fr

3.3.2 CTD data from research vessels

Metadata:

The following meta-data are mandatory:

- ship name
- ship call sign
- institute name
- project name (optional but mandatory if the data must be linked to a project and indexed under this project in the global MyOcean distribution)

Data:

The common agreed format for transmitting CTD data to the Regional centre is the SeaBird format (.cnv). The file should contain all the parameters measured and can be transmitted either in full resolution or decimated (i.e. one measure every 10 dbar). Note: PIs and scientists can decide to provide decimated data but the minimum requirement is 10 dBar. For detailed transmission protocol from sea to shore, contact the regional centres.

Contacts:

ROOSES contacts

Global TAC in situ: codac@ifremer.fr

IMPORTANT NOTE FOR PERSEUS data providers: *As few CTD data are circulating in nRT it has been decided that PERSEUS CTD data can be submitted to Israel Marine Data Centre (ISRAMAR) which will then push this data to SeaDataNet.*

For this specific case the data format and metadata requirements are as follows:

Metadata:

The following metadata are required:

- Dataset name — A text string identifying the set of data in submission.
- Project — A text string identifying the project.
- Ship — A NERC Vocabulary Server (NVS) code from [Cruise Summary Report ship metadata vocabulary \(C17\)](#). In case of the time series and trajectory observations, the “Unknown” ship code can be set.
- Data Center — An EDMO code from the [European Directory of Marine Organisations](#) vocabulary. For example: EDMO code for Ministry of Energy and Water Resources is 3004.
- Country — A NVS code from [International Standards Organisation countries \(C32\)](#) vocabulary. For example: Israel code is IL.
- Availability — The access to each dataset is defined by the data provider during the data submission procedure.

Data:

The recommended format for data submission is the ODV (Ocean Data View) format

The data submission can be done on line using the ISRAMAR interface

http://isramar.ocean.org.il/perseus_data/

Other documents:

- “PERSEUS data transport formats” released 28/09/2014 by ISRAMAR.

Contacts:

Isaac Gertman: isaac@ocean.org.il

Yevgeniya Krivenko (yegeniya@ocean.org.il)

3.3.3 XBT data

Metadata:

The following meta-data are mandatory:

- ship name
- ship call sign
- institute name
- instrument_type (T5, T7 and the corresponding fall rate equation)
- project name (optional but mandatory if the data must be linked to a project and indexed under this project in the global MyOcean distribution)

Data:

The common agreed format for transmitting XBT data to the Regional centre is the Sippican(.edf)

format.

Some XBT may have been acquired with the Australian Devil system. In this case the format used is the Devil NetCDF format.

For detailed transmission protocol from sea to shore, contact directly the regional centres which have their own data transmission protocol.

In case a regional centre is not able to deal with the NetCDF files from the Devil system, it is possible to ask the Global TAC in situ to integrate these data.

Contacts:

ROOSES regional centres

Global TAC in situ: codac@ifremer.fr

3.3.4 Gliders

A data glider provider should follow the EGO recommendations developed during the FP7 GROOM project (see www.ego-network.org/ and the following link details the procedure to provide gliders data through the near real time data circulation structure.

<http://www.coriolis.eu.org/Observing-the-Ocean/GLIDERS/EGO-gliders/EGO-Glider-data-management/How-to-provide-glider-data-to-operational-oceanography-users>

Details for submitting glider data are also described at: <http://www.coriolis.eu.org/Documentation/on-Gliders>

Metadata:

A glider data provider must provide at least the following information:

```
"global_attributes" : {
    "platform_code_#M"      : "eudoxus",
    "date_update_#CM"       : "20140908100949",
    "institution"           : "CNRS / Division Technique Insu",
    "institution_references" : "http://www.ego-network.org
http://www.dt.insu.cnrs.fr/gliders/gliders.php",
    "contact"               : "bernardet@dt.insu.cnrs.fr",
    "principal_investigator" : "",
    "principal_investigator_email" : ""
},
"glider_sensor" : [
    {
        "SENSOR_MAKER" : "Sea-Bird Electronics",
        "SENSOR_MODEL" : "CTD 41cp",
        "SENSOR_SERIAL_NO" : "147",
        "parametersList" : [
            {
                "variable_name" :
"rawData.vars_sci_time.sci_water_pressure"
            },
            {
                "variable_name" :
"rawData.vars_sci_time.sci_water_temp"
            }
        ]
    }
]
```

```

        {
            "variable_name"
"rawData.vars_sci_time.sci_water_cond"
        }
    ]
},
{
    "SENSOR_MAKER" : "WET Labs",
    "SENSOR_MODEL" : "ECO Puck bb2fls v1",
    "SENSOR_SERIAL_NO" : "997",
    "parametersList" : [
        {
            "variable_name"
"rawData.vars_sci_time.sci_bbfl2s_chlor_scaled"
        },
        {
            "variable_name"
"rawData.vars_sci_time.sci_bbfl2s_bb_scaled"
        },
        {
            "variable_name"
"rawData.vars_sci_time.sci_bbfl2s_cdom_scaled"
        }
    ]
},
{
    "SENSOR_MAKER" : "Aanderaa",
    "SENSOR_MODEL" : "Optode 5013",
    "SENSOR_SERIAL_NO" : "1266",
    "parametersList" : [
        {
            "variable_name"
"rawData.vars_sci_time.sci_oxy3835_wphase_oxygen"
        }
    ]
}

],

"glider_characteristics_data" : {
    "TRANS_SYSTEM_ID" : ["300224010731840"],
    "PLATFORM_TYPE" : "Slocum",
    "PLATFORM_MAKER" : "Teledyne Webb research",
    "FIRMWARE_VERSION_NAVIGATION" : "7.10",
    "FIRMWARE_VERSION_SCIENCE" : "7.10",
    "GLIDER_SERIAL_NO" : "136",
    "LANDSTATION_SOFTWARE_VERSION" : "7.4",
    "PROJECT_NAME" : "PERSEUS",
    "PI_NAME" : "",
    "GLIDER_OWNER" : "Ecole Nationale Supérieure de Techniques Avancées, ENSTA",
    "OPERATING_INSTITUTION" : "CNRS / Division Technique Insu"
}

```

},

```
"glider_deployment_data" : {  
    "DEPLOYMENT_START_DATE"           : "20130124130134",  
    "DEPLOYMENT_START_LATITUDE"       : 42.9909,  
    "DEPLOYMENT_START_LONGITUDE"      : 5.99436666667,  
    "DEPLOYMENT_PLATFORM"             : "",  
    "DEPLOYMENT_CRUISE_ID"            : "perseust02_01",  
    "DEPLOYMENT_END_DATE"             : "20130208130239",  
    "DEPLOYMENT_END_LATITUDE"         : 42.9909,  
    "DEPLOYMENT_END_LONGITUDE"        : 5.99436666667,  
    "DEPLOYMENT_OPERATOR"             : "Karim Bernardet"  
}
```

}

As the sensor installed on glider can change from a mission to another, a metadata file must be submitted for each mission.

The meta data listed above must be ready to be integrated in the data files (version 1.1 see section “data” of the GROOM handbook).

Data:

The glider data must be prepared in EGO NetCDF format (version 1.1) as described here http://www.coriolis.eu.org/content/download/22398/154432/file/groom_gliderns_user_manual-version1.1-sandiego.pdf as described in the GROOM handbook.

Note: in case the data provider is not able to provide the EGO NetCDF files (version 1.1) the Coriolis data centre (or the glider DAC) can also transform the above listed information from a .json file and process the glider data to the EGO NetCDF files (version 1.1) format.

Contact:

codac@ifremer.fr

note: for glider data the only contact is the Coriolis data centre as EGO GDAC codac@ifremer.fr

3.3.5 Moorings

At European and world wide level, moorings data management is coordinated within the OceanSites and EuroSites communities. See <http://www.oceansites.org/> especially the “data” section.

Metadata:

The metadata required to describe Moorings data are detailed in chapter 3 “metadata” of the http://www.oceansites.org/docs/oceansites_user_manual_version1.2.pdf

Data:

Data should be prepared using the Oceansites format (preferred solution)

http://www.oceansites.org/docs/oceansites_user_manual_version1.2.pdf

In some cases it could be possible to provide data to HCMR in Medatlas format.

http://www.ifremer.fr/sismer/program/formats_phy/formats_UK.htm

Contact:

- ROOSES regional centres to submit data in NetCDF files
- HCMR in Medatlas format

3.3.6 Surface drifters

The main surface drifter data flow scheme is based on the WMO Global Telecommunication System (GTS):

Metadata:

- Unique Identifier: WMO number is strongly recommended
- Instrument type
- Parameters list
- Anchor depth

Data:

Data are generally transmitted through Argos satellite link to CLS –France- which then insert the data directly into the GTS. Some drifters send their data via the Iridium satellite system and Meteo France is helping to push their data on the GTS.

Data are processed following Global Drifter Program (GDP) standards tailored/improved for the European seas.

Contact:

In priority: the ROOSES regional centers

In Italy: Pierre Marie Poulain –OGS- is the suggested contact (ppoulain@ogs.trieste.it)

In France: Pierre Blouch –Meteo France- is the suggested contact

Otherwise: Coriolis data centre: Loic.petit.de.la.Villeon@ifremer.fr

3.3.7 Tide gauges

The tide gauges data acquisition and dissemination activities are coordinated within the Global Sea Level Observing System (GLOSS) –project (see <http://www.gloss-sealevel.org/>)

The data repository is maintained at the PSMSL (Permanent Service for Mean Sea Level-
<http://www.psmsl.org/>)

Metadata:

‘TBC’²

Data:

‘TBC’

Contact:

‘TBC’

² 'to be completed' when data standards, protocols and/or contacts are established

3.3.8 Thermosalinographs

The thermosalinograph activity is coordinated at global level within the Global Ocean Surface Underway Data (GOSUD)- project(see <http://www.gosud.org>)

Metadata:

- Ship Name
- Call Sign
- Instrument manufacturer
- Parameter list
- Intake depth

Data:

In nRT the recommended submission format color format (<http://www.gosud.org>)

3.3.9 Ferrybox data

The FerryBox data activity is coordinated by NIVA / Norway for the MyOcean Project. NIVA is also in charge of feeding the global data centre (Coriolis) for the broader distribution of the data. A coordinated action to set up a consistent approach to manage the FerryBox data is planned.

Metadata:

‘TBC’

Data:

‘TBC’

Contacts:

Pierre Jacquard (NIVA) during the MyOcean project
Beng Carlson or Loic petit de la Villeon

3.3.10 FOS –Fishery Observing Systems

‘TBC’

3.3.11 HF Radar

‘TBC’

3.3.12 Sea Mammals

‘TBC’

3.3.13 Others platforms

‘TBC’

3.4 Contacts for data submission

3.4.1 Global distribution Unit is hosted by Coriolis / France

PIs: Thierry Carval Thierry.Carval@ifremer.fr

Loic Petit de la Villéon Loic.Petit.De.La.Villeon@ifremer.fr

Contact with the centre: codac@ifremer.fr

3.4.2 Baltic Sea activity is coordinated by SMHI/Sweden

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3.4.3 Arctic activity is coordinated hosted by IMR/Norway

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Sjur.Ringheim.Lid Sjur.Ringheim.Lid@imr.no

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3.4.4 North West Shelves activity is coordinated hosted by BSH/Germany

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3.4.5 Black Sea activity is coordinated by IOBAS/Bulgaria

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3.4.6 Mediterranean Sea activity is coordinated by HCMR/Greece

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Antonis Chalkiopoulos achalk@hcmr.gr

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3.4.7 South West Shelves activity is coordinated hosted by Puertos Del Estado/Spain

PIs: Marta de Alfonso mar@puertos.es

Fernando Manzano Muñoz fmanzano@puertos.es

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3.4.8 FerryBox coordination: Niva/Norway

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Anna Birgitta Ledang AnnaBirgitta.Ledang@niva.no

Contact with the centre: myocean-service@niva.no

3.5 How to download data from the near Real Time data network?

The data archived in the MyOcean data structure can be downloaded either through the Regional centres ftp sites (if you need data from a specific region) or through the global data centre ftp site if you need data from various regions

3.5.1 Register as a MyOcean new user

Access to the FTP portals is available after user authentication managed by MyOcean. The registration is simple and described at <http://www.myocean.eu/web/56-user-registration-form.php> . The advantage of being registered is that you are informed on any issues that may impact the MyOcean service or product quality as well and on the improvement provided by the new product releases.

3.5.2 Get the data from the global distribution centre

When you get the data from the global date centre you have access to specific indexes linked to a project.

```
ftp vftp1.ifremer.fr
```

```
user, password : your MyOcean personal login and password
```

```
cd INSITU_GLO_NRT_OBSERVATIONS_013_030
```

More details on the MyOcean “User Manual for In Situ Near Real Time Products” version 1.1 october 2012 <http://www.coriolis.eu.org/content/download/5682/42222/file/MYO-INS-PUM-001-V1.1.pdf>

The data will be distributed on the ROOSes portals in OceanSites NetCDF format according to the FTP organisation described in the MyOcean *in-situ* TAC documentation available at <http://www.coriolis.eu.org/Data-Services-Products/MyOcean-In-Situ-TAC/Documentation> and shown in the figure below.

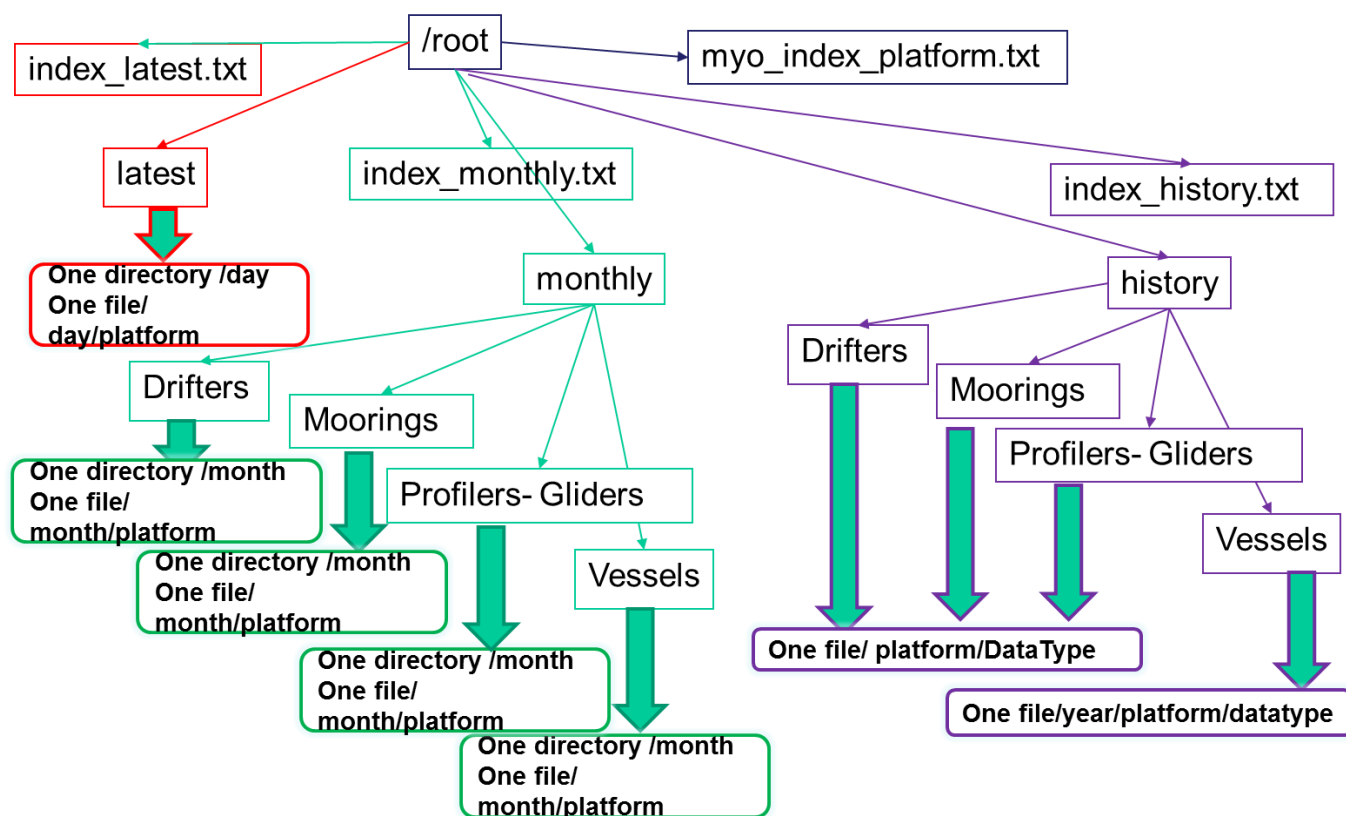


Fig.2: MyOcean data circulation scheme

The list of the parameter codes used for Near real-time data circulation is described on

<http://www.coriolis.eu.org/Data-Services-Products/MyOcean-In-Situ-TAC/MyOcean-In-Situ-parameter-codes>

3.5.3 Get the data from one of the regional data centres

See the MyOcean Users manual

<http://www.coriolis.eu.org/content/download/5682/42222/file/MYO-INS-PUM-001-V1.1.pdf>

4 Delayed mode data system

4.1 Delayed mode data description

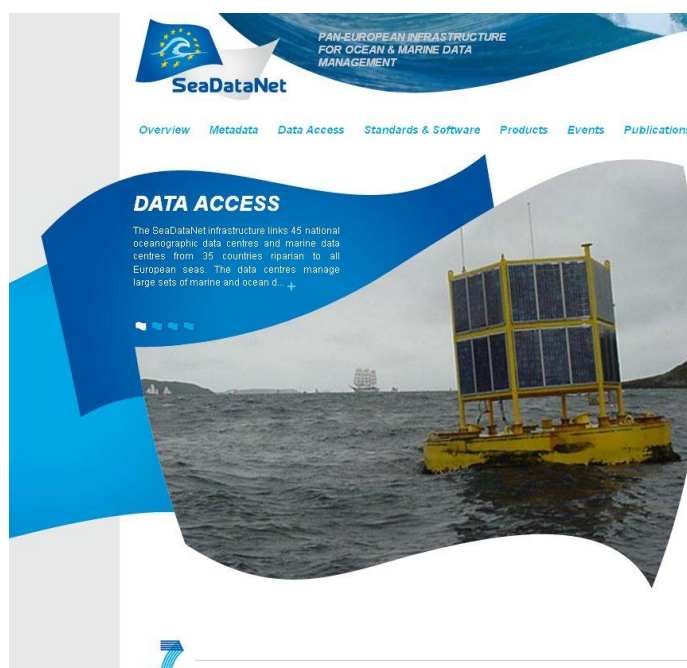
Delayed-Mode (DM) data means that the data have been submitted to a data management structure more than 30 days after data collection. This also means that the data have been submitted to accurate quality control checks. Most of the time, the delayed mode datasets should be considered as reference datasets, with the appropriate quality control and calibration procedures applied. If the data has not yet undergone full data calibration and quality control procedures perhaps it should be submitted as near real Time data (see section 3).

It is important that the effort taken to acquire, calibrate and quality control data sets is recognized and acknowledged. It is also important and increasingly required that data can be cited in publications. For this purpose, it is also recommended that a DOI (Digital Object Identifier) is obtained for the data submitted in DM. This item will be addressed in a future version of the handbook..

4.2 Delayed mode data management structure

The SeaDataNet structure relies on long term ocean data infrastructures hosted at national levels: National Ocean Data Centres (NODCs).

Each NODC is in charge of making the data available from its own country to SeaDataNet. A NODC is normally not allowed to share through SeaDataNet the data from another country, although some exceptions may be considered when a whole project dataset is available from a single repository. In such cases, prior contact must be made with the SeaDataNet Project coordinator (<mailto:sdn-userdesk@seadatanet.org>)



The SeaDataNet data access mechanism relies on a set of meta-data catalogues that are shared within the Project and that allow a user to discover which datasets are available through the SeaDataNet portal. In a second step, the users query is addressed to each NODC concerned and in a final step the whole data set required is made available to the user.

4.3. How to share data within the delayed mode data infrastructure

As SeaDataNet relies on NODCs, the easiest way to proceed is to contact your NODC or a data centre which is able to implement the different SeaDataNet components. Contact points may be found at <http://www.seadatanet.org/Overview/Partners>.

Consequently, two possibilities are offered to a new data provider to share delayed mode data through the SeaDataNet data management system:

1. By asking the National Oceanographic Data Centre (NODC) of the provider's country to manage, quality control, archive and provide long term stewardship of the data sets and including these in the SeaDataNet CDI Data Discovery and Access service for providing access to data.
2. By interfacing and connecting the new provider data system with SeaDataNet. The CDI V3 Data Discovery and Access service facilitates connecting the data provider databases to the SeaDataNet infrastructure and its portal.

SeaDataNet is able to deal with most of the platforms and most parameters. The recommended and most efficient way to share data is to rely on the NODCs experience. However, in very few cases such as Argo, the GDAC is able to share the whole dataset within SeaDataNet.

The procedure to share data is the same for an individual data provider as for a connected data centre.

4.4. SeaDataNet main principles

As introduced above, the catalogues on which SeaDataNet relies must be completed by any data provider:

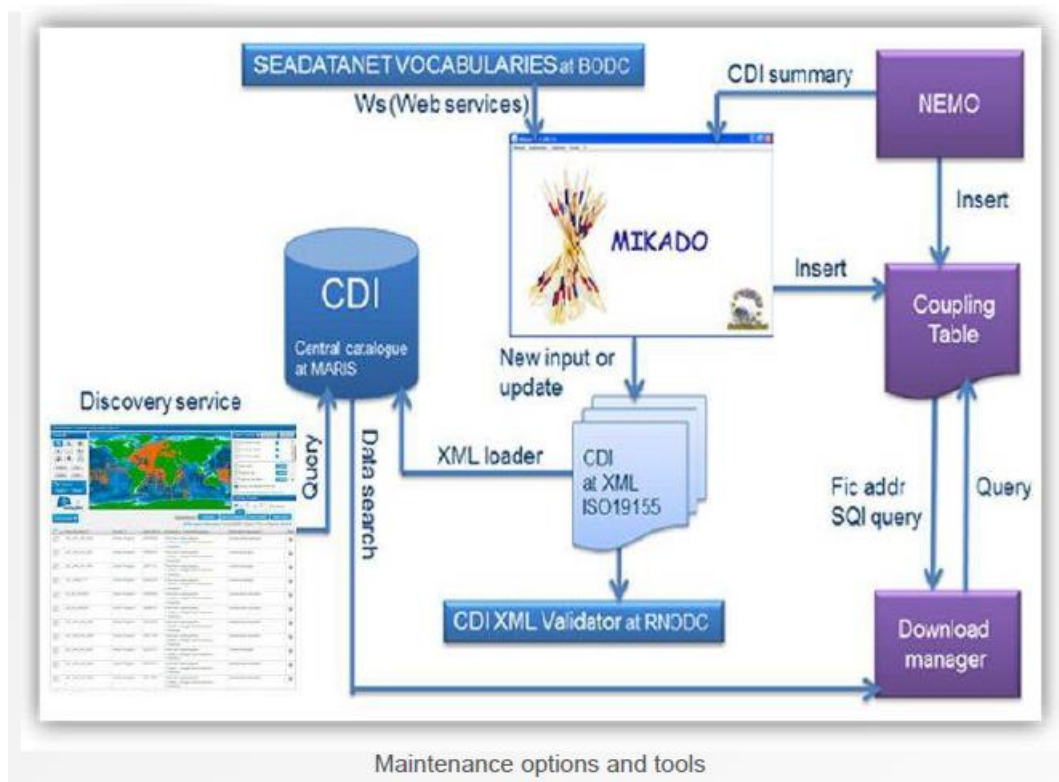
- Observations related catalogues
 - CSR: Cruise Summary reports
 - EDMED: Marine Data Sets General description
 - EDIOS: Permanent Observing Systems
- Data management related catalogues
 - EDMERP: Marine Research Projects
 - EDMO: Marine Research Organizations
- Data related catalogue
 - CDI: Common Data Index

4.5. Practical procedure to submit data to SeaDataNet

Interfacing a data provider system with SeaDataNet implies the following actions:

- To manage and to format delayed mode data in accordance to SeaDataNet, adopted common formats
- To describe the data sets with metadata using the SeaDataNet Common Data Index format which is based upon the ISO 19139 content standard and to encode these as XML files following the SeaDataNet CDI ISO19139 XML Schema and its controlled vocabularies. The CDI Schema is fully INSPIRE Compliant. It is recommended to make use of the [Mikado](#) software tool for automatic encoding of the CDI XML files which can be set up in batch mode after an initial mapping analysis;
- To install SeaDataNet download manager (<http://www.seadatanet.org/Standards-Software/Software/Download-Manager>) in order to establish an interface between the data provider's data repository and the SeaDataNet web portal (actually the Request Status Manager - RSM service).

This process for generating CDI entries and linking these to the local data sets is illustrated in the following image.



The data provider can work with pre-processed files in the SeaDataNet format (ODV, MEDATLAS or SeaDataNet NetCDF (CF)) or with database queries to generate the data sets on-the-fly. For historical data sets it is suggested to organise the files as validated time

series per year.

Detailed guidelines about connecting to the CDI service can be found at the SeaDataNet portal at: “[Data access: How to contribute?](http://www.seadatanet.org/Data-Access/How-to-contribute?)” link (<http://www.seadatanet.org/Data-Access/How-to-contribute>).

Anyway it is strongly recommended to read the guidance manuals thoroughly in order to get a good insight in the components of the CDI system, how it works and how to undertake action step by step. Moreover, it is very important to contact the CDI support desk at MARIS (cdi-support@maris.nl) at an early stage when a data provider wants to start its connection to give access to its archived data sets. The CDI support will give assistance at every step and is also the contact point for CDI updates. In addition, the CDI supports will communicate with the data provider to set the secure configurations by which the SeaDataNet portal can exchange messages with the Download Manager that is locally configured at the data provider centre.

4.6. Documentation

User manual and instructions for updating EDMED, EDMERP, EDOS, EDMO and CSR

http://www.seadatanet.org/content/download/11284/75105/file/SDN2_D46_NC_UserManualforUpdatingMetadataDirectories.pdf

User manual and instructions for compiling the CDI metadata, coupling table and associated data

http://www.seadatanet.org/content/download/11663/77627/file/SDN2_D57_TC_UserManualforUpdatingCDI-Data-Access-Service.pdf

4.7. Contact

SeaDataNet users desk: sdn-userdesk@seadatanet.org

4.8. How to download data from the delayed mode network

The SeaDataNet portal enables users to freely search for data sets, submit requests for data sets, after one-time registration, and download data sets from the distributed data centres via a unique CDI user interface at the SeaDataNet portal. In practice, the user downloads data sets directly from the relevant data centres, but the communication is facilitated through the SeaDataNet portal.

5. *Links between nRT, DM and global ocean data management systems*

This section explains the links between the nRT (MyOcean) data management system and the DM (SeaDataNet) data management system, and between these and other European and global ocean data management infrastructures.

Data submitted to the NRT (MyOcean) data management system are shared with the DM (SeaDataNet) data management system on a regular basis, in order to crosscheck for duplication, duplicate copies of data are removed. In some cases where the entire dataset from a project lies in a unique repository location, the metadata generation (CDI) of each data file may be generated from the information contained in the MyOcean NetCDF files and in the MyOcean projects indexes files.

Most data submitted to the nRT (MyOcean) data management system are shared with the global Telecommunication System (GTS) and become available for use/assimilation within global forecasting models.

Data submitted to the nRT (MyOcean) data management system and the DM (SeaDataNet) data management systems are made available to EMODnet Physics Portal.

MyOcean and SeaDataNet have agreed on a MoU – Memorandum of Understanding. This formalises the links between the two projects and defines the conditions of data exchanges. By aggregating data from the two projects, MyOcean and SeaDataNet are able to distribute common products.

6. Summary of data submission, by platform, for near Real-Time and Delayed Mode data

Table 1: Summary of data submission, by platform, for near Real-Time and Delayed Mode data, see section 3 (nRT) and section 4 (DM) for more details

Near real time data				
Platform	Submit to	Data format	Contact	Section
Argo Floats	MyOcean Global Distribution Unit (Coriolis) or BODC (UK and Ireland only)	netcdf (note metadata must be submitted prior to data)	codac@ifremer.fr or TBC (UK and Ireland only)	3.2.1
Research Vessels CTD	MyOcean Regional Distribution Units	.cnv	see section 3.3 for contacts by region	3.2.2
XBT Data	MyOcean Regional Distribution Units	.edf or Devil NetCDF	see section 3.3 for contacts by region	3.2.3
Gliders	MyOcean Global Distribution Unit (Coriolis)	data in EGO NetCDF v1.1 (possibly also .json metadata only)	codac@ifremer.fr	3.2.4
Moorings	EuroGOOS ROOS regional centres	NetCDF Oceansites format (also Medatlas format, HCMR only)	see section 3.3 for contacts by region	3.4.5

Near real time data				
Platform	Submit to	Data format	Contact	Section
Surface Drifters	Most data are transmitted through Argos to CLS (France) and then to GTS. Some data are transmitted with Iridium and then to GTS	Improved GDP standards	EuroGOOS ROOS (see section 3.3), or for Italy Pierre Marie Poulain (OGS), or for France Pierre Blouch (Meteo France) or Coriolis (Loic.petit.de.la.Villeon@ifremer.fr)	3.2.6
Tide Gauges	TBC	TBC	TBC	3.2.7
Thermosalinograph	TBC	colcor format	TBC	3.2.8
Ferry Box	NIVA Norway (to mid 2015, MyOcean project period)		Pierre Jacquard (NIVA)	3.2.9
Fishery Observing Systems	TBC	TBC	TBC	3.2.10
HF Radar	TBC	TBC	TBC	3.2.11
Sea Mammals	TBC	TBC	TBC	3.2.12
Other platforms	TBC	TBC	Loic.Petit.De.La.Villeon@ifremer.fr	3.2.13

Delayed Mode Data				
Platform	Share with		Contact	Section
Argo Floats	MyOcean Global Distribution Unit (Coriolis)	NetCDF	codac@ifremer.fr	4.2.1
Research Vessel CTD	National Oceanographic Data Centre (NODC) or direct to SeaDataNet	. metadata only - SeaDataNet metadata catalogues	SeaDataNet users desk: sdn-userdesk@seadatanet.org	4.2.2
XBT Data	National Oceanographic Data Centre (NODC) or direct to SeaDataNet	metadata only - SeaDataNet metadata catalogues	SeaDataNet users desk: sdn-userdesk@seadatanet.org	4.2.3
Gliders	National Oceanographic Data Centre (NODC) or direct to SeaDataNet	metadata only - SeaDataNet metadata catalogues	SeaDataNet users desk: sdn-userdesk@seadatanet.org	4.2.4
Moorings	National Oceanographic Data Centre (NODC) or direct to SeaDataNet	metadata only - SeaDataNet metat data catalogues	SeaDataNet users desk: sdn-userdesk@seadatanet.org	4.2.5

Surface Drifters	National Oceanographic Data Centre (NODC) or direct to SeaDataNet	metadata only - SeaDataNet metat data catalogues	SeaDataNet users desk: sdn-userdesk@seadatanet.org	4.2.6
Tide Gauge	National Oceanographic Data Centre (NODC) or direct to SeaDataNet	TBC	SeaDataNet users desk: sdn-userdesk@seadatanet.org	4.2.7
Delayed Mode Data				
Platform	Share with		Contact	Section
Thermosalinograph	National Oceanographic Data Centre (NODC) or direct to SeaDataNet	TBC	TBC	4.2.8
Ferry Box	TBC	TBC	TBC	4.2.9
Fishery Observing Systems	TBC	TBC	TBC	4.2.10
HF Radar	TBC	TBC	TBC	4.2.11
Sea Mammals	TBC	TBC	TBC	4.2.12
Other platforms	TBC	TBC	TBC	4.2.13

