



Project

MyOcean Information System and Service Desk specifications : Product and access Services Metadata

Reference: MYO-MIS-TN-INT-META

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INTRODUCTION

This document is the first version of MyOcean Information System and Service Desk technical specification.

It contains technical information on the metadata interfaces. Especially :

- what information is transmitted through these interfaces (Scope) ?
- How these interfaces connect the sub-system of myOcean (among MIS, Service Desk, Web portal, Dissemination units, Production Units) ?
- What is the Protocol/API/format of the interfaces ?
- What tools are recommended or mandatory for implementing the interfaces ?

The choices presented in the document are taken out of previous experiences (MERSEA, ECOOP, V0, product managers, SeaDataNet...) or existing standards (ISOTC211, OGC, ...) which are precisely listed in the document.

The choices are mainly taken from the following requirements :

- International directives (INSPIRE)
- External users (through web portal)
- External systems (WIS, HMA, CleanSeaNet, ...)
- Internal components (monitoring, ...)

TERMINOLOGY

external product catalogue

An "**External User Product**" is a "Product" delivered to external Users according to the "Catalogue" (which is aligned with the FTSS), as it is produced by TACs and MFCs within a "Product Line" and according to a "Product Specification".

See myOcean Concept Document file for more details.

intermediate product catalogue

An "**Intermediate Product**" is any "Product" that is not offered to external users (internal users only).

It does not appear in the "Catalogue" but is listed in the Intermediate Product Specification part of the FTSS, and is registered in the "Products Database". An intermediate product is managed in MyOcean System (in the "Products Database" with full meta data).

See myOcean Concept Document for more details.

Product Line

A "Product Line" is a group or family of potential "Products" (sharing common variations of characteristics). The "Product Line" has a commercial name and belongs to a "Production Unit" inside a "Production Centre".

See myOcean Concept Document for more details.

Product Specification

A "Product Specification" is the selection, in the potential of a "Product Line", of chosen characteristics, and ranges inside these characteristics, in order to physically build and deliver a usable "Product" (in the user perspective).

See myOcean Concept Document for more details.

Access Service

Distinct part of the functionality that is provided by an entity through **interfaces**.

Interface

Named set of **operations** that characterize the behaviour of an entity

Operation

Specification of a transformation or query that an object may be called to execute. It has a name and a list of parameters.

SCOPE

The scope of the metadata concerns the description of MyOcean products and network services, and what information is transmitted through these interfaces.

The product and access services metadata includes information for :

- product catalogue management (internal or external)
- portal configuration (internal or external)
- monitoring
- production incident reports (Not managed yet)

The scope is composed of two parts, first on the information itself that can be provided by the metadata interface, and a second one on request operations (API) that give access to the metadata information.

information provided by the interface

We consider 3 concepts to be described :

- **product lines**
- **product specifications**
- **access services** giving access to the product

The information related to the description of these concepts within myOcean is provided by the present interface : "product and access services metadata".

For each concept, the relevant fields composing their description are listed.

Product Line metadata

This part describe information present in a "product Line" metadata.

The list of the fields describing the "product line" is based on myOcean V0, and product managers requirements.

Info	Simple description	Vocabularies used
MIS ID	MIS internal id	
Customer product name	Public id	
Long name	Long label, title of the product	
Originator	Production Unit	YES
Custodian	Production Center	YES
Overview	Textual description of the product. (abstract) The overview use a convention that permit to extract a short description. (described in MyOcean profile).	
status	Status of the resource (in Life cycle) : <ul style="list-style-type: none"> • Ready (produced, available, but not yet managed (or authorized?) by MyOcean) • In demonstration (waiting for scientific qualification) • Operational (fully qualified, and satisfying Service Level Requirements) • Retired (removed from MyOcean "Products Database") NB. When product life cycle status is "in definition" it is not regisitered in MyOcean Information System yet.	YES
Product type	Type of the product (e.g. forecast, in situ, ...)	YES
Area of benefit	Among "search and rescue", "ship routing", "oil spill", ...	YES
Quick view url	Link to a quicklook of the resource (homogeneous plots, maps to be pre-generated on a static basis).	
Topic category	"Ocean" (static information)	YES (static)
resource constraints (access and use)	General MyOcean licence otherwise.	

	Should include different access services specificities, e.g. image delivery different from download delivery	
MIS Profile	eg : external product, intermediate product, product in validation,...	YES
Product Specifications	Reference to Product Specifications which belong to the product Line.	

Product specification metadata

This part describe information present in a “product specification” metadata.

This includes the list of access services plugged on that specific product specification.

This also includes links to external documentation.

The list of the fields describing the “product specification” is based on MERSEA, ECOOP, myOcean V0, INSPIRE requirements and myOcean product managers requirements.

Info	Simple description	Vocabularies used
MIS ID	MIS internal id	
Customer product name	Public id	
Product Line	Reference to the product line.	
Long name	Long label, title of the product	
Originator	Production Unit	YES
Custodian	Production Center	YES
Overview	Textual description of the product. (abstract) The overview use a convention that permit to extract a short description. (described in MyOcean profile).	
status	Status of the resource (in Life cycle) : <ul style="list-style-type: none"> ● Ready (produced, available, but not yet managed (or authorized?) by MyOcean) ● In demonstration (waiting for scientific qualification) ● Operational (fully qualified, and satisfying Service Level Requirements) ● Retired (removed from MyOcean "Products Database") NB. When product life cycle status is “in definition it is not registered in MyOcean Information System yet.	YES
Parameter	List of parameters	YES
Product type	Type of the product (e.g. forecast, in situ, ...)	YES
Area of benefit	Among “search and rescue”, “ship routing”, “oil spill”, ...	YES
Quick view url	Link to a quicklook of the resource (homogeneous plots, maps to be pre-generated on a static basis).	
Geographical coverage	Bounding box. (4 points)	
Area	Specific MyOcean Area. (eg : MED, GLO, NWS, ...)	YES
Geographical scale	e.g. : Global scale, Regional scale, local scale	YES
Spatial resolution	Spatial resolution of the resource	
Vertical coverage	Vertical coverage with meter min/max (eg : from -5000 to 0)	
Vertical scale	e.g. : Ocean surface, Water column, Atmosphere	YES
Temporal coverage	the whole time period covered by the dataset. (end date optional)	
delta time begin	slide windows of update (= analysis period)	

delta time end	slide windows of update (= forecasting period)	
Temporal scale	e.g. : Real time, Forecast, etc..	YES
Temporal resolution	Temporal resolution of the dataset (eg: daily mean fields)	
depth levels	Textual description of depth levels configuration.	
Horizontal projection system, datum	e.g. EPSG code 4326 (for WGS84)	YES
Product dependencies	Dataset source of the product, with a association type (upstream or validation).	
Topic category	"Ocean" (static information)	YES (static)
features type	Observation type contained in the product (profile, temporal series, ..). May be derived from CSML work.	YES
maintenance periodicity + date	Frequency of data update.	
resource constraints (access and use)	General MyOcean licence otherwise Better at product-access (ie association product-service), e.g. image delivery different from download delivery	
MIS Profile	E.g. external product, intermediate product, product in validation,...	YES
Data access		
*Format	including version e.g. : NetCDF 3.5, image,...	YES
*protocol	including version e.g. : ftp	YES
*Distributor organisation	Organisation which operates the access service	YES
*Conditions	Access condition depending on user's profiles (external users, product managers, ...)	
*Description	Free text for description of the data access (which subset of the product is available)	
*Transfer size	average size of data files	
*Link/resource	link to the data (URL), including useful information to download data (E.g. Regular expression to extract date from ftp files names.)	
Documentation		
*Title	Title of the resource document	
*link/resource	Link to the resource document (URL)	
*Date of publication	Date of the resource document publication	
Quality information		
External link	External link to myOcean quality management of products.	(static)

Service metadata

This output provide information about a dissemination services. The requirement are coming from :

- web portal configuration : e.g. a viewing portal based on OGC/WMS server will configure itself thanks to the list of the OGC/WMS service available in myOcean.
- system monitoring configuration : the access services provided by myOcean should be automatically monitored. The following information will help to configure the monitoring tool and when failure occurs, contact the organisation (email) who operates the access service.
- At last, general information which may be used by users (internal or external)

A general listing of the fields provided by this interface :

Information provided	Simple description	Referential used
Service title	Long label title of the service	
Service overview	Free text area to describe the service. (abstract)	
Organisation	Organization that operates the dissemination service.	YES
Use limitation	<i>Constraints (may change – may be not relevant for generally speaking about service. Better on couple product/service)</i>	
Other constraints (list)	<i>Constraints (may change – may be not relevant for generally speaking about service. Better on couple product/service)</i>	
Service type (protocol)	including version (eg : ftp) + inspire type (eg : viewing, download,..)	YES
Access condition	<i>Data policy management (may change – may be not relevant for generally speaking about service. Better on couple product/service)</i>	
maintenance periodicity + date	Frequency of data update.	
Operations ¹	eg : get dataset, getRecord, getStatus	YES
*Operation name	Name of the operation	YES
*Operation Description	Free text to describe the operation	YES
*Operation parameters (lists)	Parameter needed (or optional) to execute the operation	YES
operates on	product linked to this service.	
Format (list)	including version (eg: netcdf 3.5 / ascii)	YES
TransferOption (linkage)	Root URL	

The operation description is reference information depending on the type of access services. The main access services types considered in myOcean are : FTP, OpeNDAP, NetCDF subsetting (see MYO-MIS-INT-DOWN interface) and OGC/WMS (see MYO-MIS-INT-VIEW interface).

Interface functions (operations)

Different Operations can be made on the metadata interface.

We consider here, the usual operations that can be made.

Get records

Definition

Getrecords: This is the main request used to search and retrieve catalogue content. Response will give some information about the selected items (id, description, geographical coverage, etc...). You can search information about product metadata, or service metadata.

Filtering/Search Request parameters

The Getrecords operation can be requested on product line, product specification or access service. The parameter of the operation depends on the requested record type.

Filtering/search criteria on **product line** metadata:

Info	Simple description	Referential use
MIS ID	MIS internal id	
Customer product name	Public id	
Originator	Production Unit	YES
Custodian	Production Center	YES
Product type	Type of the product (e.g. forecast, in situ, ...)	YES
Area of benefit	(search and rescue, ship routing, ...)	YES

Filtering/search criteria on **product specification** metadata:

Info	Simple description	Referential use
MIS ID	MIS internal id	
Customer product name	Public id	
Product Line	Reference to the product line.	
Originator	Production Unit	YES
Custodian	Production Center	YES
Product type	Type of the product (e.g. forecast, in situ, ...)	YES
Parameter	List of product parameter	YES
Area	Specific MyOcean Area. (eg : MED, GLO, NWS, ...)	YES
Geographical coverage (geo limits)	Bounding box. (4 points)	
Geographical scale	(local, regional, global, ...)	YES
Temporal coverage	the whole time period covered by the dataset. (optional end date)	
Area of benefit	(search and rescue, ship routing, ...)	YES

Filtering/search criteria on **access service** metadata:

Information provided	Simple description	Referential use
Organisation	Organization that operates the access service.	YES
Service type (protocol)	including version (eg : ftp) + inspire type (eg : viewing, download,..)	YES
Format (list)	including version (netcdf 3.5 / ascii)	YES
Transfer option (linkage)	Root URL	
Others constraints	<i>Eg : temporal subsetting, geographical & temporal subsetting,..</i>	YES

Fields returned by getRecord request

Depending on the requested descriptions (product line, product specification, access services) the getrecords operation returns a different list of fields.

Fields returned by a **Product line** metadata search:

Info	Simple description	Referential used
MIS ID	MIS internal id	
Customer product name	Public id	
Long name	Long label, title of the product	
Originator	Production Unit	YES
Custodian	Production Center	YES
Overview	Textual description of the product. (abstract)	
Quick view url	Link to a picture that represent the resource	
Product type	Type of the product (eg forecast, in situ, ...)	YES
Area of benefit	(search and rescue, ship routing, ...)	YES
Product Specifications	Reference to Product Specifications related to the product Line.	

fields returned by a **Product specification** metadata search:

Info	Simple description	Referential used
MIS ID	MIS internal id	
Customer product name	Public id	
Product Line	Reference to the related product line.	
Long name	Long label, title of the product	
Originator	Production Unit	YES
Custodian	Production Center	YES
Overview	Textual description of the product. Abstract with specific format markers enabling to extract a "short description".	
Quick view url	Link to a picture that represent the resource	
Product type	Type of the product (eg forecast, in situ, ...)	YES
Area of benefit	(search and rescue, ship routing, ...)	YES
Geographical Area	Specific MyOcean Area. (eg : MED, GLO, NWS, ...)	YES

fields returned by a **access service** metadata search:

Information provided	Simple description	Referential used
Service title	Long label title of the service	
Service overview	Free text area to describe the service. (abstract)	
Organisation	Organization that manage the dissemination service.	YES
Service type	protocol and version (eg : ftp)	YES
Format (list)	(netcdf 3.5 / ascii) format name + version	YES
Transfer option (linkage)	Root URL	

Get Record by Id

Definition

GetRecordById: To get a full record information about a product or a service when you know its ID.

For the content of the descriptions see 2.1.

Depending on the profile of the user (external users, product managers, ...) the access services and external documentation shown together with a product specification may vary.

To have full details about CS-W standard see <http://www.opengeospatial.org/standards/cat>.

CONNECTED SUB-SYSTEMS

Client systems

MyOcean Information System hosts the metadata repository.

Monitoring (from several operators : service desk, MIS) uses the metadata interfaces to configure (services URL, expected update frequency, ...)

Web portal uses the metadata interface to configure and get information for it's portals (discovery, view, ...)

External systems may use the metadata interface, and harvest it to update their own catalogue or configure their tools (visualisation portal, ...).

In the mid-term, the **production unit** may provide their metadata (product and services) through this interface (with a transactional feature).

Provider systems

The metadata interface rely on reference information interface for :

- ocean variable list (official and pending)
- organizations

These inputs are managed by MIS and may rely on external reference systems (CF standard name table, SeaDataNet EDMO organization directory, ...).

PROTOCOLS, FORMATS, CONVENTIONS

Metadata profile definition

Introduction Such metadata are covered by ISO TC/211 specifications for geomatics, especially:

- ISO 19115, focused on geographic data
- ISO 19119, focused on services for geographic information

Both ISO 19115/19119 specifications are written using UML formalism; one official XML implementation encompasses these specifications : ISO 19139. MyOcean will use the ISO 19139 XML schemas to implement ISO19115 and ISO19119

As ISO 19115/19119/19139 focus on geographic information, there is a need to turn it into "oceanographic" information, and include MyOcean concepts.

This additional information is supported by reference vocabularies (see document [MYO-MIS-TN-INT-VOCA](#)).

Using ISO 19115/19119/19139 to make XML instances needs the definition of one profile which fits the requirements.

Since early 2009 INSPIRE has defined one profile based on ISO 19139, as myOcean is an european infrastructure providing geographic information, the myOcean metadata have to comply with the INSPIRE profile. (see document [MYO-MIS-INT-META-PROFILE](#))

In addition, to fit the project requirements, MyOcean needs a specific ISO 19139 profile

External references for metadata profile definition ISO 19115: Geographic Information – Metadata

- **ISO 19119: Geographic Information – Services**
- **ISO 19139: official implementation of ISO 19115/19119**

The choice of ISO 19139 is based on the ability for MyOcean Metadata Catalogue to be harvested and requested using OGC CSW specification.

- **INSPIRE Metadata Implementing Rules**

INSPIRE profile based on ISO 19115/19119 and implemented using ISO 19139. MyOcean metadata profile has to be compliant with INSPIRE.

Note that INSPIRE metadata profile do not contains huge amount of information, but only some discovery metadata to be identified as one INSPIRE resource.

- **Existing initiatives in metadata management relevant to MyOcean**

- SeaDataNet (ISO 19115): Pan-European Network using ISO 19115 documents for the description of Marine datasets. SeaDataNet CDI Catalogue is moving to ISO 19139.
- IOOS metadata (NOAA, ISO 19139)

- HMA ESA system uses ebRIM application schemes for its datasets. However, it seems to much business oriented and not mature enough for MyOcean. However, myOcean need to connect to HMA portal.

The myOcean ISO19139 profile based on ISO19139 is described in 6.

Operation

To manage operation, the interface will implement OGC Catalogue Services Interface Standard (CSW) version 2.0.2.

- **OGC: CSW**

Open Geospatial Consortium Catalogue Service Specification to publish and search collections of descriptive information (metadata) about geospatial data, services and related resources.

ADVISED SOFTWARE

This interface is based on :

- Constellation (for CS-W 2.0.2) at MIS level
- Camioon (Database repository, and XML Editor).

No software is needed for product managers at Production unit, production centres and top level to use this interface. The Product managers interact with the interface thanks to web forms (Graphical Unit Interface) provided by MIS.

The other connected subsystems use API to request the CSW server.

Some have been identified :

- OWSLib provides a python client library to CSW:
<http://trac.gispython.org/lab/wiki/OwsLib>
- Excat (Java)
<http://gdsc.nlr.nl/gdsc/tools/excat>
- GeoNetwork Opensource kit has a CSW client in it (in GUI form). It may be possible to dig around in the codebase and get at the csw client without the gui :
<http://geonetwork-opensource.org/>

The following frameworks may also manage CS-W client interface :

- Deegree (Java) :
<http://www.deegree.org/>
- 52 North (java) :
<http://52north.org/>

EXTERNAL REFERENCES

- ISO 19115:
http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=26020
- ISO 19119 :
http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=39890
- ISO 19139 :
<http://schemas.opengis.net/iso/19139/>
- INSPIRE metadata implementing rules :
http://inspire.jrc.ec.europa.eu/reports/ImplementingRules/metadata/MD_IR_and_ISO_20090218.pdf
- INSPIRE metadata editor :
<http://www.inspire-geoportal.eu/index.cfm/pageid/342>
- SeaDataNet CDI :
http://seadatanet.maris2.nl/v_cdi_v0/search.asp
- IOOS metadata WG :
https://www.nosc.noaa.gov/dmc/swg/wiki/index.php?title=IOOS_Metadata_Working_Group
- OGC-CSW : <http://www.opengeospatial.org/standards/cat>
- CSML: <http://csml.badc.rl.ac.uk/>
- OGC-EOP: http://portal.opengeospatial.org/files/?artifact_id=19094
- HMA Wiki: <http://wiki.services.eoportal.org/tiki-index.php?page=HMA%20Wiki>