

**INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION**  
**(of UNESCO)**

**Twenty-first Session of the IOC Committee on International Oceanographic  
Data and Information Exchange (IODE-XXI)**

**Liège, Belgium, 23-26 March 2011**

**IODE Ocean Data Portal**

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**Summary of the document**

The document provides information on the progress in the implementation of the IODE Ocean Data Portal including the Ocean Data Portal version 1 status and the Ocean Data Portal version 2.

The committee is invited to consider the results of this project and work plan for the future Ocean Data Portal development and wide extension of the Ocean Data Portal nodes and data providers.

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Appendices: A. Cooperation with WIGOS

B. Cooperation with WMO/WIS

C. Cooperation with SeaDataNet

**1. REPORT ON ACTIVITIES CARRIED OUT DURING THE INTER-SESSIONAL PERIOD**

This agenda item was introduced by Dr. Sergey Belov. He recalled that the IODE Ocean Data Portal (ODP) project was targeted to follow the IODE-XX recommendations. He noted that a high priority has been assigned to invoke new data providers from NODCs, DNAs, and other IODE related projects. During the reported period 10 data providers have been connected supplying access to the 55 datasets with more than 800 000 profiles. US NODC and ISDM (Canada) supplied their data using ODP light Data Provider software running in IOC Project Office for IODE, Ostende. In order to respond to security concerns expressed by some Members/Members States the light Data Provider (LDP) has been developed for the ODP. The LDP is an extension of the Data Provider functionality of the ODP which allows integration of data from data centres unable to install the Data Provider software. LDP offers remote registration of local datasets and provides deployment of the ODP distributed data system without software installation at the data centre side. The LDP allows participating organizations to generate the appropriate discovery metadata files and to remotely load local data into ODP distributed data system, thus providing interoperability with the IODE ODP and the WMO WIS. See *Annex A* for details.

The IODE ODP has been designed to be interoperable with the WIS as a Data Collection or Production Centre (DCPC). See **Annex B** for details.

Following the IODE-XX recommendation to provide interoperability arrangements with the SeaDataNet, project draft technical specifications of the IODE ODP and SeaDataNet interoperability have been created. Draft technical specifications of the IODE ODP and SeaDataNet interoperability were developed. In the document it was proposed to focus currently the challenge of interoperability between SDN and ODP on the interaction between systems based on interoperability of portal to portal interaction of these systems. Following interoperability arrangements were outlined: a) metadata exchange; b) data discovery; c) data access and delivery to users; d) system monitoring and report. Tasks for the implementation phase include common vocabularies adoption, discovery metadata harmonization for ODP-SDN exchange, Harmonization of user identification and role data between systems and technical procedures and tools for ODP-SDN interaction. See **Annex C** for details.

Documentation and two web sites have been developed for the IODE Ocean Data Portal, the ODP website [www.oceandataportal.org](http://www.oceandataportal.org) which provides basic information for general users, technical information (Data Provider software, manuals and documentation, services, formats and dictionaries), a discussion forum, Frequently Asked Questions (FAQ) and training materials; and the ODP portal site <http://odp.oceandataportal.net> which provides access to data from the contributing organizations, including the discovery service, viewing service, analysis service and download service.

During the intersession period new versions of the ODP software components have been released. Latest software updates and technical documentation are available at [www.oceandataportal.org](http://www.oceandataportal.org) web site.

## 2. PROPOSED WORK PLAN AND TIME TABLE FOR THE NEXT INTER-SESSIONAL PERIOD

NN	Action item description	Due by date	To be implemented by	Comments
<i>1 Requirements and documents</i>				
1.1	Review of Ocean Data Portal V2 technical specification whitepaper	May 2011	ODP team, SG ODP, ETDMP chair	Distributed before IODE-21
1.2	Updated ODP booklets (user oriented, data provider oriented) + leaflet + PPT template	Feb 2011 (v.1) 2012 (v.2) 2013 (v.3)	IODE PO and contractors	IODE PO and contractors
1.3	IODE ODP guidelines and procedures	May 2011 (v.0.9)  Feb 2012 (v.1.0)	ETDMP chair, SG ODP,	Will aim to deliver this by ETDMP-IV and SG ODP-II
1.4	Revised technical documentation on the ODP components (Wiki, documentation on Integration Server, Data Provider & Light Data	March 2011	ODP team	Will aim to deliver this by IODE-21

	Provider)			
<i>2 ODP Data Providers and regional ODP nodes</i>				
2.1	Preparation and review work plan for ODP data providers expanding taking account ODP and ODP-WIGOS Pilot Project progress in 2010	March 2011	ODP team, SG ODP	Will aim to deliver this by IODE-21
3.2.2	The ODP data providers installations and operations basis on work plan (item 2.1.) expanding taking account ODP and ODP-WIGOS Pilot Project progress in 2010	2011 - 2013	IODE/JCOMM data centers, SG ODP, ODP team,	The progress will be considered by ETDMP-III and IV, SG ODP II
2.2	The ODP regional nodes installations and start of operations basis on ODP V.2 Toolbox: <ul style="list-style-type: none"> <li>• ODINBlackSea (SDN compatible))</li> <li>• ODINWESTPAC</li> <li>• ODINAfrica</li> <li>• ODINCARSA LA</li> </ul>	2011 2 <sup>nd</sup> half 2012 1 <sup>st</sup> half 2013 2 <sup>nd</sup> half 2013	IODE/JCOMM data centers, SG ODP, ODP team	The progress will be considered by ETDMP-III and IV, SG ODP II
<b>3. ODP V1 tools</b>				
3.1	ODP indicator module + image tools	Feb 2011	ODP team, SG ODP	The progress will be considered by IODE-21
3.2	ODP GeoNetwork, THREDDS implication	March 2011	ODP team, SG ODP	see above
3.3	ODP Service Bus, ODP Services updates	March 2011	ODP team, SG ODP	see above
<i>4 ODP V2</i>				
4.1	Technical specifications on ODP V2	June, 2011	ODP team, SG ODP	The progress will be considered by ETDMP-III
4.2	ODP V2 metadata service (ISO 19xxx, FGDC, MCP, SDN, etc.)	Mid 2011	ODP team, SG ODP	see above
4.3	ODP V2 Portal toolkit (alpha)	Sep 2011	ODP team, SG ODP	see above
4.4	ODP V2 toolbox (for distribution as regional/specialized ODP nodes)	Mid 2012	ODP team, SG ODP	The progress will be considered by SG ODP II
4.5	ODP V2 toolbox (updated version)	Mid 2013	ODP team, SG ODP	The progress will be considered by ETDMP-IV
<b>5. Interoperability components</b>				
5.1	Technical specifications (operational version) and tool of ODP – SDN communication service	Mid 2011	ODP team, SDN TTG	The progress will be considered by ETDMP-III
5.2	Technical specifications (operational version) and tool of ODP – WIS	Mid 2011	ODP team, WIS TT	see above

	communication service and			
5.3	Technical specifications (operational version) and tool of ODP – OBIS communication service*	Beg 2012	ODP team, OBIS TT	see above

### 3. REQUESTED FUNDING FOR THE NEXT INTER-SESSIONAL PERIOD

Action item description	To be implemented by	Deadline date	Requested from UNESCO RP	Requested from other sources
Establishment of the ODP regional node in Argentina (workshop + training courses)	ODP team	2Q 2011	10 000 USD	
Installation software ODP (v.2) and training courses for ODP nodes <ul style="list-style-type: none"> <li>• ODINBlackSea</li> <li>• ODINWESTPAC</li> <li>• ODINAfrica</li> <li>• - ODINCARSA LA</li> </ul>	ODP team, IODE Project Office	2Q 2011 2Q 2012 1Q 2013 3Q 2013	10,000 15,000 15,000 15,000	

### 4. TEXT FOR THE ACTION PAPER

## Appendix A: Cooperation with WIGOS

IODE Ocean Data Portal is contributing to the WMO Integrated Global Observing System (WIGOS) Pilot Project for JCOMM, thereby also providing a bridge between oceanography and meteorology. One of the main goals was to increase accessibility of data and making appropriate identified datasets interoperable with the wider WMO and IOC communities through the WMO Information System (WIS) and the Ocean Data Portal (ODP) of the International Oceanographic Data and Information Exchange (IODE6) of the IOC.

As a part of the ODP contribution to the JCOMM Pilot Project for WIGOS ([http://www.wmo.int/pages/prog/www/wigos/marine\\_pp.html](http://www.wmo.int/pages/prog/www/wigos/marine_pp.html)) for providing interoperable access, through the WIS and the IODE ODP, to historical and recent data holdings in ocean data centres, key datasets have been identified.

Regarding provision of interoperable datasets via the ODP, the primary focus has been on contributions from the NODC of the IODE. Following a joint WMO-IOC letter proposed by the Pilot Project, commitments were made by a number of countries and agencies for connecting ocean datasets to the ODP and/or WIS. ODP and WIS experts have also been providing technical assistance to agencies, including visits and workshops. The list of datasets that will be contributed to the IODE ODP and/or WIS by partner organizations and programmes as part of the JCOMM Pilot Project for WIGOS is provided in the table below:

<b>Datasets</b>	<b>Agency(ies)</b>	<b>Target/status</b>
Global Temperature and Salinity Profiles from the GTSP	US NODC	Done
World Ocean Atlas	US NODC	2011/Submitted
Surface currents from HF radar	US NDBC	2011
High Resolution Sea Surface Temperature from GHRST	US NODC	2011/ Submitted
Data extracted from ESIMO – real-time GTS data and product (air temperature, wind, wave, sea level, current, water temperature, salinity, oxygen)	Russian Federation NODC	Done
Upper ocean T & S gridded in situ fields	Canada ISDM	Done
Ocean surface observations measured from surface drifters	Canada ISDM	End Feb 2011
Sea level data from PSMSL	UK BODC	2011
Marine Climatological Summaries and Global Collecting Centres (GCCs)	UK Met Office, and DWD, Germany	Done
Blended-quality climatology products (COADS monthly summaries) – currently extending through May 2007 in NetCDF	US NOAA, NCDC and NOAA/ESRL	2011/Under discussion
Ocean datasets from AODN	AODCJF	2011
The Ocean Data Acquisition System (ODAS)	China NMDIS	Done
Argo profiling float T&S data	France&US GDACs	2011

## Appendix B: Cooperation with WMO/WIS

### 1 The ODP interoperability issues

ODP should be interoperable with other information systems. Following aspects should be envisaged: metadata compatibility, data access regulations and service interaction layer.

#### 1.1. Metadata compatibility

ODP metadata model has been built on ISO 19115 metadata standard with some additional elements to meet the needs of several important data features. Main feature is *data granularity* which reflects aspects on how the data is structured from its original nature and how the data will be structured in output data flow. ODP metadata model also consider following features: data origination (instrument and platform types), access and use constraints. Metadata compatibility should be agreed on following levels:

- Format to format conversion;
- The routines to provide metadata conversion like style sheets and/or specific software are required.
- Crosswalk mapping rules;

The rules how to map particular element of one metadata format to another should be defined taking into account code lists, keywords and vocabularies used. When no definite mapping can be found the element should be omitted.

#### 1.2. Data access regulations

For those information systems who applies security restrictions on data specific regulations should be agreed. Metadata should be available for inter-system exchange without any restrictions. Restrictions on data should not be able to migrate into the ODP either the specific agreements should be work out. These agreements can include specific list of data sets which has open access constraints and procedures to affiliate ODP as a specific user with required data sets can be accessed. Data sets from other system published and available via ODP should not have any access constraints either.

#### 1.3. Service interaction layer

Implements a set of interfaces for ODP metadata and data provision to the interconnected system and as well as to access metadata and data from the ODP. Service layer should be presented by W3C Web services or API's.

Following ODP services already implemented and provides the listed functionality:

- Access to the ODP metadata – data descriptions, vocabulary, code lists;
- Access to the ODP data by request.

Services available in form of W3C web services and HTTP API services.

Metadata provision services should endorse CSW catalogues to extend the way other system can harvest the metadata.

Interaction level between two connected systems can be provided on:

- Portal to portal level;

ODP portal as well as other system portal hosts a set of services to provide specified functionality. The simplest option from the development prospective.

- Specific data access software component level.

Interaction scheme implemented on data access level and can be implemented as joint data access component (e.g. SDN Download Manager – ODP Data Provider). More complicated option.

## 2 The ODP and WIS GISC interaction framework

The ODP contributes to the WMO Information System (WIS) as one of the WIS prototype components, which ensures the operation of the JCOMM Data Collection and Processing Centre (DCPC) of the WMO Information System.

Metadata compatibility is provided by an ODP-WMO conversion service library. It provides two-way export process from one metadata format into another. Metadata as output is stored in XML structure. Output metadata files are published into the GeoNetwork services which supports a number of protocols to make them available for WIS metadata ingestion. All metadata records are accompanied by links on data files.

Data access regulations are avoided as all provided data has open access.

Service interaction level is presented by GeoNetwork as a publicly available metadata catalogue and service for transferring accompanied data files to the GISC FTP.

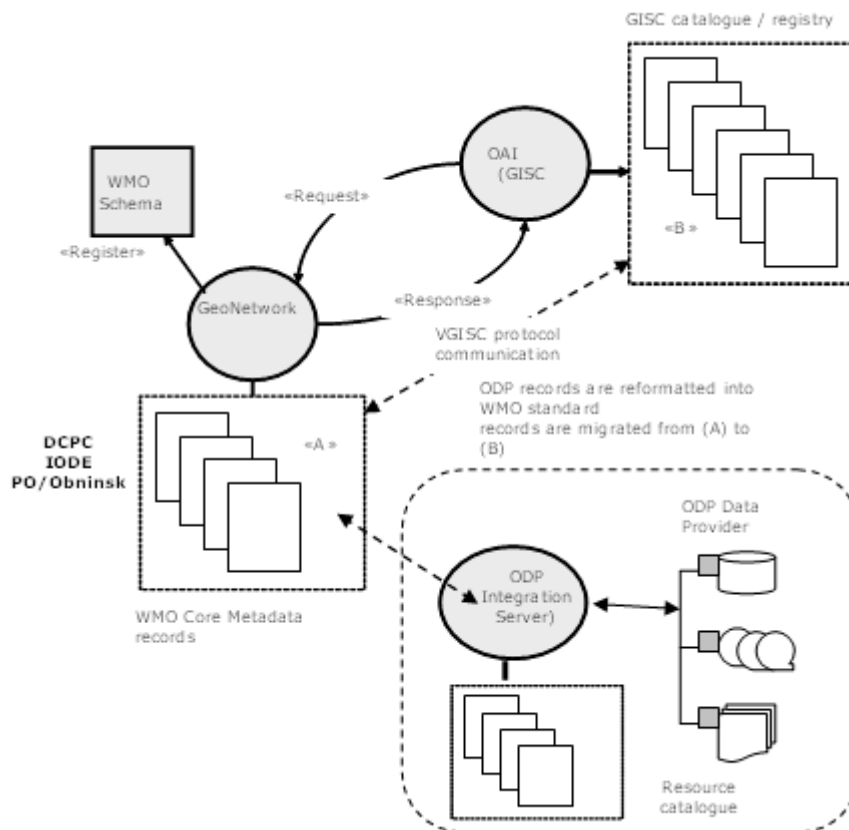


Figure1. ODP-WIS general communication scheme

### Appendix C: Cooperation with SeaDataNet

The IODE/JCOMM ETDMP and SeaDataNet have discussed the compliance issues of the ODP and SDN and proposed specifications of the ODP-SDN interoperable interfaces based on portal to portal interaction. These proposals are summarized in the document “Technical Specifications of the IODE Ocean Data Portal and Sea Data Net interoperability” (draft version 1.1.a). The interoperability arrangements will be based on the interoperability to the portals: achieving a communication between the SDN V1 portal and the ODP V1. Basic approach is following:

- arrange that the ODP/SDN portals have an up-to-date overview of the datasets, that are managed and available for delivery by the ODP/SDN infrastructures and its data providers;
- arrange that ODP/SDN users can request and if ok, get access to these ODP/SDN datasets, in an efficient way.

The data submission from SDN to ODP can be done as follows. The SDN portal contributes metadata to the ODP portal, so that users of the ODP portal can identify the datasets as managed by SDN data centres. For requesting data access the users are referred to the SDN CDI V1 service with a dedicated link, so that users can have their actual data access requests and delivery be executed by the SDN CDI V1 service. Once in the SDN CDI V1 service they can shop for additional datasets from SDN, without having to jump up and down between ODP and SDN.

To realize this interaction framework it is required to solve 3 issues:

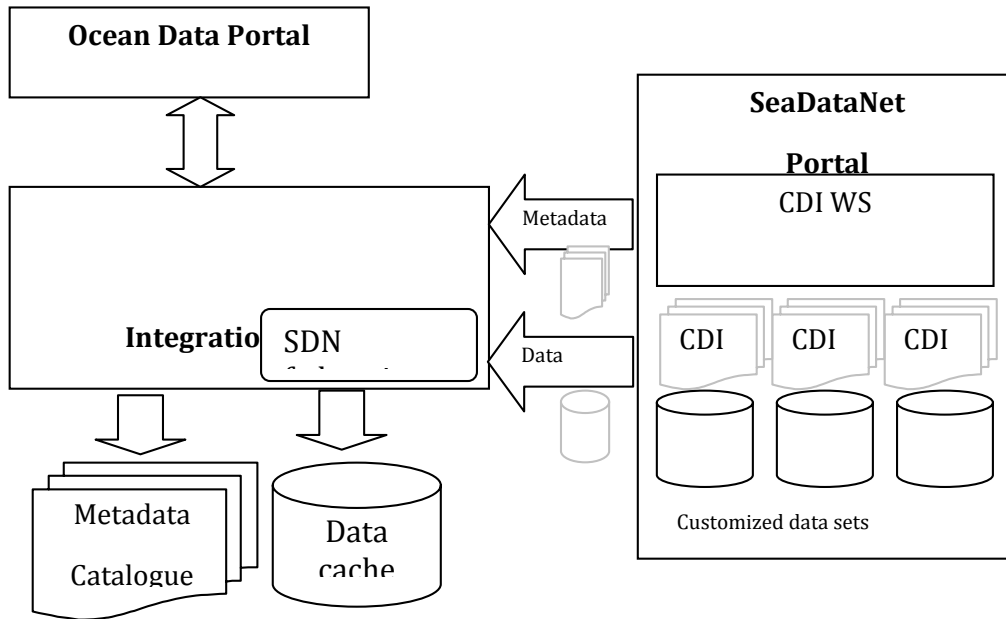
- data granularity. The SDN CDI service covers more than 1 million metadata entries based on a fixed rule: one profile – one entry (metadata record and transport data file). It is considered the SDN tool development to combine the metadata/data entries into data/metadata sets – by organizations, by cruise or other;
- resource registration. The ODP (V1) is based on the concept that data sets which are managed by ODP should be registered by dedicated Data Provider via web-forms and following generation and supporting the metadata are provided automatically. There are 2 options to solve this problem: 1) the manual registration of data set by DP administrator. This option can be realized by existing DP functionality and additional software development is not required. 2) automated registration on defined rules by new DP software component.
- data access. The SDN uses the data policy based on agreement that each data provider (NODC) will give users a role respectively its data set access. The solving this problem can be done on basis following options: 0) users register at SDN website independent of ODP; or 1) achieve an exchange of user registration data from ODP to SDN, so that ODP registered users are also registered at SDN, with common roles. The second option is used by V-GISC to interconnect with external users and looks more effective. But it is required to develop tool for synchronization of user registration metadata and their role list.

Few technical scenarios of the ODP – SDN interaction can be proposed:

#### **Option 1: Metadata and unrestricted data set exchange**

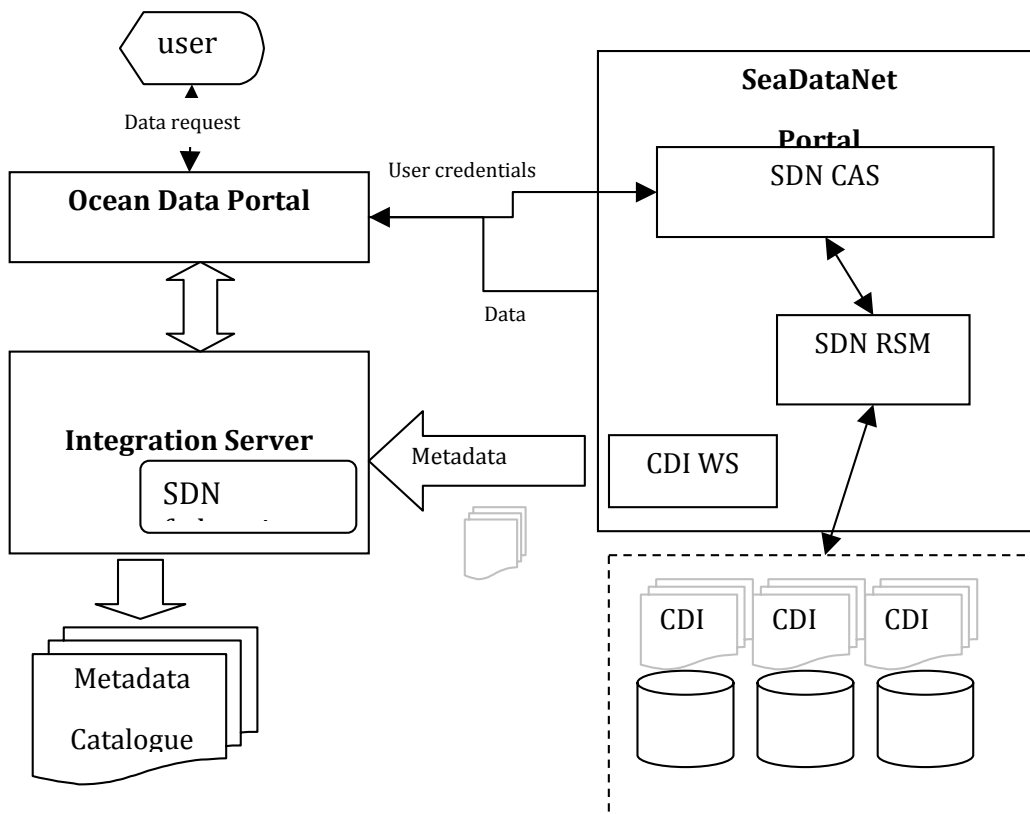
Integration level – metadata/data. Data level: Customized unrestricted data sets.





**Option 2: Metadata and data exchange**

Integration level – users/metadata/data. Data level: On-demand request transfer directly into the SDN



For ODP v.1. and SDN v.1 interaction It is proposed to concentrate on option 1 “Metadata and non restricted data exchange” realizing the submission of such metadata/data from SDN to ODP.

The data sets for exchange are the SDN ocean data sets for Black Sea submitted by:

- National Institute for Marine Research and Development “Grigore Antipa”, Romania;
- Marine Hydrophysical Institute, Ukraine;
- Institute of Biology of the Southern Seas of National Academy of Sciences of Ukraine, Ukraine;
- Tbilisi State University, Georgia;
- Institute of Oceanology, Bulgarian Academy of Sciences, Varna;
- All-Russian Research Institute Hydrometeorological Information - World Data Center, Russian Federation.

The actions from SDN side are required (should be agreed):

- combine the CDI metadata/data entries of above-mentioned data centers into data/metadata sets – by cruise or other;
- publish the metadata catalogue and data files in ODV format on URL accessible for ODP service;
- update metadata catalogue and data files when local data will be changed.

The actions from ODP side are required:

- development software for reformatting the CDI format into ODP format;
- development WS communication of Data Provider/Integration Server with metadata catalogue and data files basing on “light” DP function.

The development of specification and tools for interaction option 2 is proposed to be implemented under SeaDataNet 2 programme.

[end]