Ocean Data Interoperability Platform (ODIP) I & II

Collaborative project between Europe, USA, and Australia

FP7 Grant Number: 312492
1 October 2012 – 30 September 2015

FP7 Grant Number: 654310
1 April 2015 – 31 March 2018

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Presented at AGU 2017, December 2017
Marine Data infrastructures

- A number of regional initiatives have made significant progress in addressing discovery, access, and long term stewardship of ocean and marine data on a regional basis.

- ODIP is a community lead initiative to overcome barriers by exploring common standards and interoperability solutions for improving exchange between regional infrastructures and towards global infrastructures such as GEOSS, IODE – ODP, and POGO.
Europe: 19 EU-funded partners (9 countries)

NERC-BGS/BODC, MARIS, OGS, IFREMER, HCMR, ENEA, ULG, CNR, RBINS, TNO, AWI, BSH, RIHMI-WDC, VLIZ, UniHB, CSIC, 52°North, IEEE, SOCIB
Contributors

USA

- Scripps Institution of Oceanography (SIO)
- Woods Hole Oceanographic Institute (WHOI)
- Lamont-Doherty Earth Observatory (LDEO),
- Florida State University (FSU): Center for Ocean-Atmospheric Prediction Studies
- ESRI
- NOAA - NCEI
- US-IOOS
- UNIDATA
- MMI
Australia:
- University of Tasmania (IMOS)
- CSIRO
- Geoscience Australia (GA)
- NCI
- ANDS

International:
- UNESCO IOC-IODE
- POGO
- ICSU – WDS
- GEO/GEOSS

Canada
- Ocean Networks Canada
Objectives

- To provide a coordination platform to facilitate the establishment of interoperability between regional data infrastructures in Europe, USA and Australia and also with global systems e.g. IODE Ocean Data Portal, GEOSS, POGO.

- To demonstrate this co-ordination through the development of several joint prototype projects that allow effective sharing of marine and ocean data.

- To develop these prototype projects by largely leveraging on existing and ongoing regional projects and initiatives.

- To promote and disseminate ODIP approach and results widely for further uptake and feedback.
International data infrastructures

IODE  
GE OSS  
POGO

Data

Ocean Data Interoperability Platform

Prototype 1  
Discovery and access of marine data  
GEO DAB

Prototype 2  
Cruise summary reporting (CSR)

Prototype 3  
Sensor web enablement (SWE)

Regional data infrastructures

EUROPE  
SeaDataNet

AUSTRALIA  
AODN

USA  
IOOS
ODIP Prototype 1 - context

- **Marine Data Discovery & Access services (3 sources):**
  - Europe: Common Data Index (CDI) service, operated by SeaDataNet
  - USA: Data Discovery and Access service, operated by US NODC
  - Australia: Data Discovery and Access service, operated by AODN

- **Global Data Discovery & Access services (2 targets):**
  - GEOSS portal
  - IODE Ocean Data Portal (ODP)
The GEO-DAB Brokerage Service at CNR harvests XML entries and converts these following a Generic Brokerage Reference Schema, adopting prevailing vocabs.
pan-European infrastructure

December 2017: **109** data centres connected; > 2.0 million data sets
ODIP 1 prototype:

- Exchange at data collection level (ca. 2.0 million CDI metadata granules => ca 480 collections)
- Converted to Common Brokerage Model, and provided as OGC CS-W and OAI-PMH services
- Harvested by GEOSS and ODP
Node 2 (US NODC) and Node 3 (AODN)

- **US NODC** has CSW and OAI-PMH web services at collections level; also use of ISO19115 – 19139 metadata; ca **28,000** collections

- **AODN** uses GeoNetWork and has CSW and OAI-PMH web services; use of ISO19115 – 19139 metadata; ca **110** collections

- Converted to Common Brokerage Model, using the GEO-DAB Brokerage Service and provided as OGC CS-W and OAI-PMH services

- Harvested by GEOSS and ODP
Results: GEOSS portal – SDN, AODN and US-NODC entries

Results - ODP portal -- SDN, AODN and US-NODC entries

http://www.oceandataportal.net
ODIP 1 – SeaDataNet in ODP

DATA

SEADATANET COMMON DATA INDEX (CDI) V3

RESET BASKET

SEARCH BY:

GEOGRAPHICAL BOX

SEARCH BY:

AID TO NAVIGATION

LAYER CONTROL

GRID LINES

RIV. Keery Bathymetry

K13 03 Fastnet Rock

Administration and dimensions

Instruments / gear type

Differential Global Positioning System receivers: multi-beam

DATA
ODIP Prototype 1 - Architecture
ODIP Prototype 1+ - Development underway

- US NODC portal is being upgraded as part of the new NCEI organization with a new discovery and access service, including more harmonized vocabularies

- AODN portal also upgraded

- The core metadata model has been expanded to include more distinction for platforms, parameters, instruments

- New mapping analysis undertaken from 3 sources to new core metadata model

- Include semantic interoperability (‘Rosetta Stone’)
1. Access multiple, known existing vocabularies
   - The broker can browse vocabularies from the different organisations (SeaDataNet, NCEI, AODN) and different vocabularies:
     - Data organisation
     - Instrument
     - Platform
     - Measured attribute

2. Internal mapping between vocabularies available on request
   - The broker accesses the BODC Rosetta Stone service endpoint as developed and hosted by BODC
ODIP Prototype 1+ - Architecture

- ODIP Test Portal
- ODIP Broker
- APIs
  - JS API
  - SPARQL
- SeaDataNet CDI
  - HTTP (ISO CDI)
- USA NCEI (NODC)
  - CSW (ISO NCEI)
- IMOS AODN
  - CSW (ISO MCP)
- Rosetta Stone Translation Service

sdn-userdesk@seadatanet.org
ODIP Prototype 1+ - Portal interface

http://odip-prototype.essi-lab.eu/broker/odip/search
International data infrastructures

Data

Prototype 1
Discovery and access of marine data

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Ocean Data Interoperability Platform

Regional data infrastructures

EUROPE
SeaDataNet

AUSTRALIA
AODN

USA
IOOS

NCEI
rvdata.us
ODIP Prototype 4 development underway

- The ‘digital playground’: to explore, review, and formulate common solutions and best practices for setting up and configuring cloud based Virtual Research Environments in the marine domain. Considering:
  - existing and ongoing VRE’s
  - discovery and retrieval of data from data archives and SensorWeb systems
  - processing and product generation using workflow management systems (e.g. Kepler or Taverna), standard OGC interfacing and various tools
  - visualisation and publishing (incl metadata and DOIs) of created data products
  - Focus on methodology, not on completeness of data
• Data citation and publication
• Controlled vocabularies and ontologies; RDF, SPARQL endpoints
• Persistent identifiers: DOIs, ORCiDs, PIDs..
• Best Practices
ODIP – Conclusions

- ODIP is analyzing differences and commonalities between standards used by regional marine data management infrastructures.
- Differences are to be overcome by common standards or interoperability solutions, which is successfully implemented by prototypes.
- ODIP is leveraging on-going activities of regional and global marine data infrastructures, which facilitates uptake, integration and sustainability.
- Resulting standards, solutions and adoptions support the development of a common global framework for marine data management.
Welcome

The Ocean Data Interoperability Platform (ODIP) contributes to the removal of barriers hindering the effective sharing of data across scientific domains and international boundaries. ODIP includes all the major organisations engaged in ocean data management in EU, US, and Australia. ODIP is also supported by

www.odip.org