



SeaDataCloud

SeaDataNet experience and contribution

Alexandra Kokkinaki

Home Organisation: The British Oceanographic Data Centre, NOC, UK

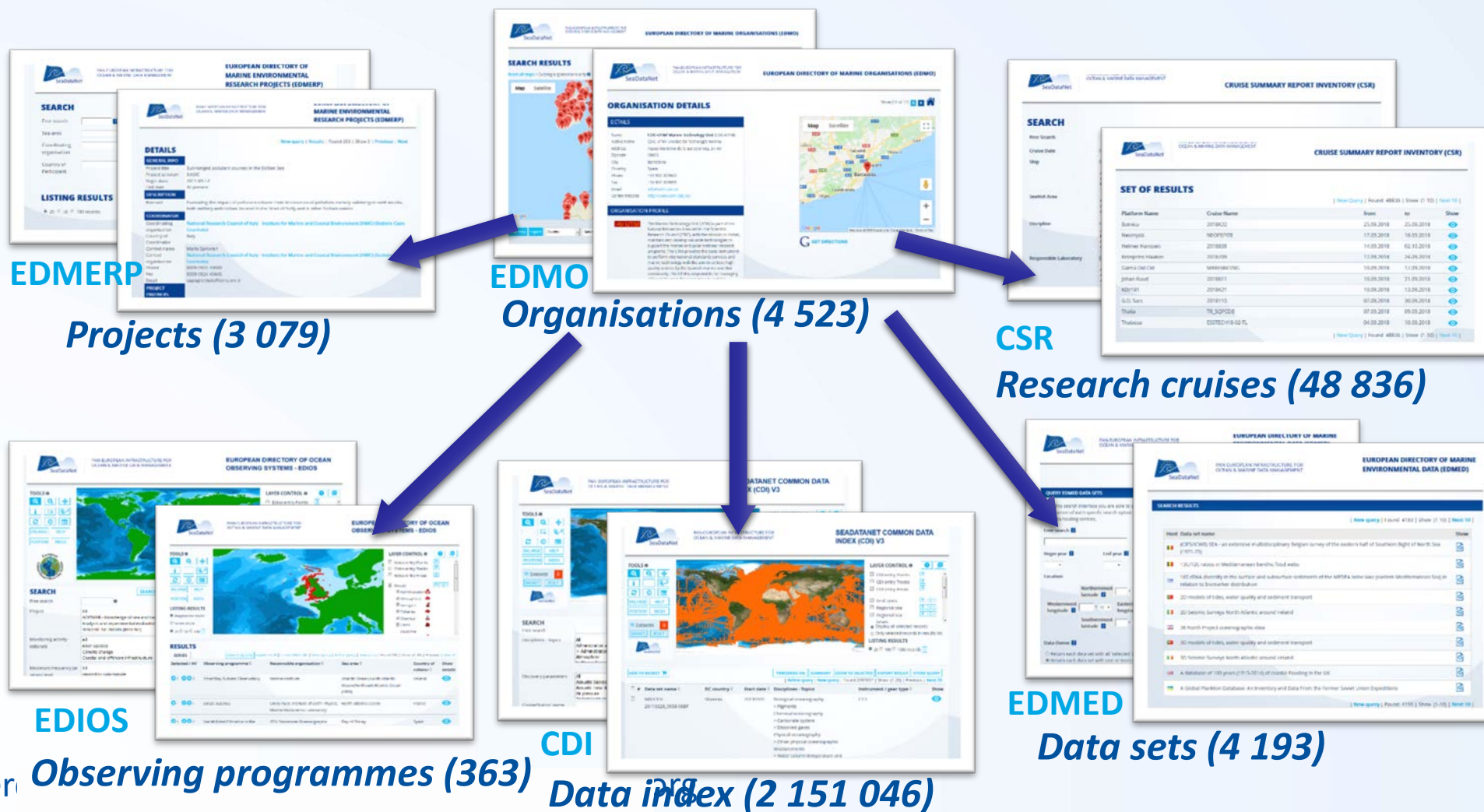
sdn-userdesk@seadatanet.org – www.seadatanet.org

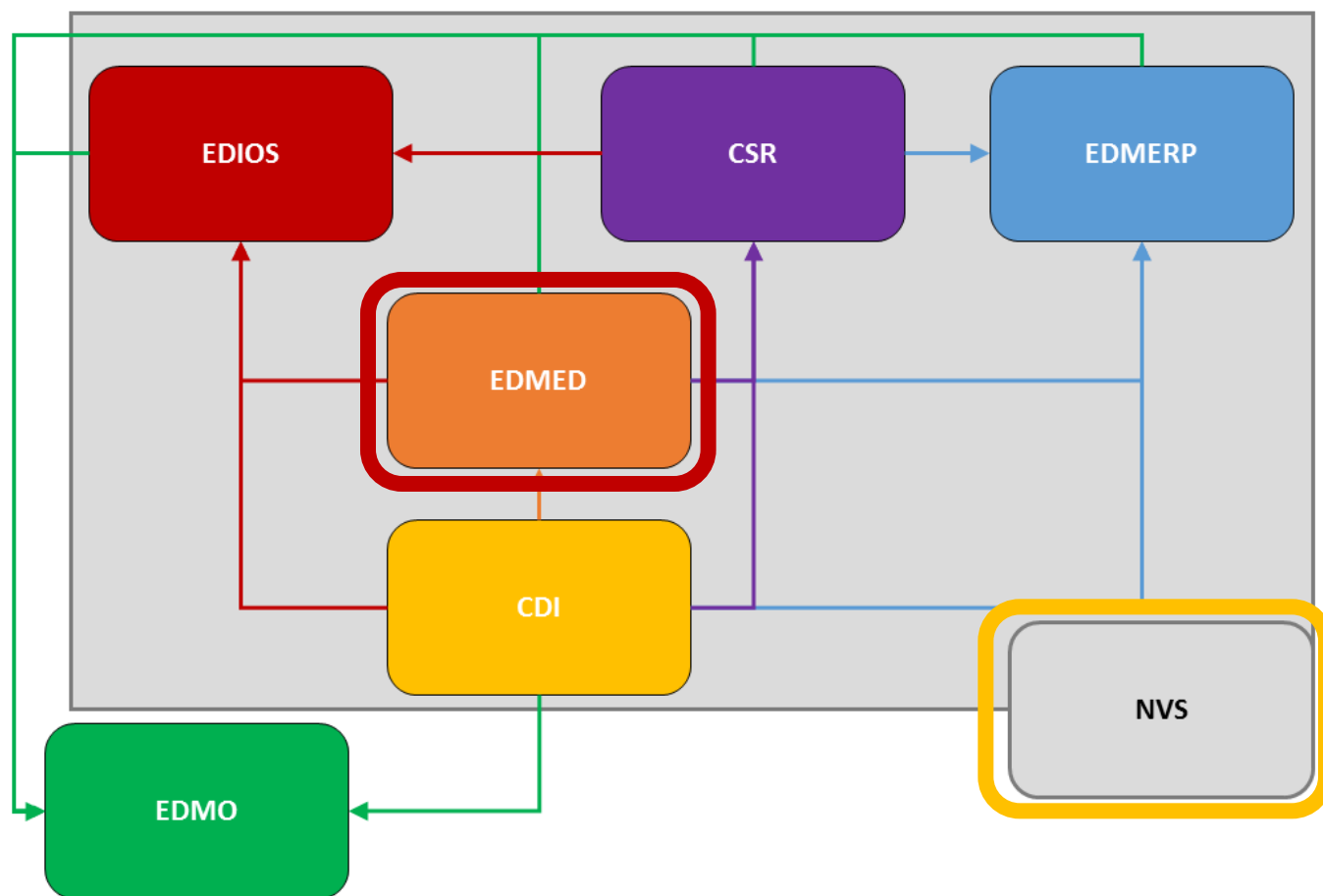
SeaDataNet

- A pan-European infrastructure set up and operated for managing **marine** and **ocean** data in cooperation with the NODCs and data focal points of 34 countries bordering the European seas



Metadata services





QUERY EDMED DATA SETS

<https://www.bodc.ac.uk/resources/inventories/edmed/report/6178/>

With this search interface you are able to query the or
explanation of each specific search option hover over
data holding centres.

Free search ?

Begin year ?

End year ?

Location

Northernmost
latitude ? ° N ▼Westernmost
longitude ? ° W ▼Easternmost
longitude ?Southernmost
latitude ? ° S ▼

Data theme ?

- ☐ Return each data set with all 'selected' data themes
- ☒ Return each data set with one or more of the 'selected' data themes

Administration and dimensions

Administration and dimensions - Date and time

Administration and dimensions - Engineering parameters

Administration and dimensions - Horizontal platform reference

Administration and dimensions - Horizontal spatial coordinates

Administration and dimensions - Metadata parameter

Administration and dimensions - Moored instrument coordinates

Administration and dimensions - Platform or instrument identifier

Administration and dimensions - Quality control flags

Administration and dimensions - Reference numbers

Administration and dimensions - Unspecified

Instrument theme ?

GENERAL

Data set name	Atlantic meridional overturning circulation observed by the RAPID-MOCHA-WBTS array at 26°N from 2004 to 2017
Data holding centre	British Oceanographic Data Centre
Country	United Kingdom 
Project	Rapid Climate Change
Time period	01 April 2004 to 28 February 2017
Ongoing	No
Geographical area	North Atlantic across 26.5N from Florida Straits to African coast

OBSERVATIONS

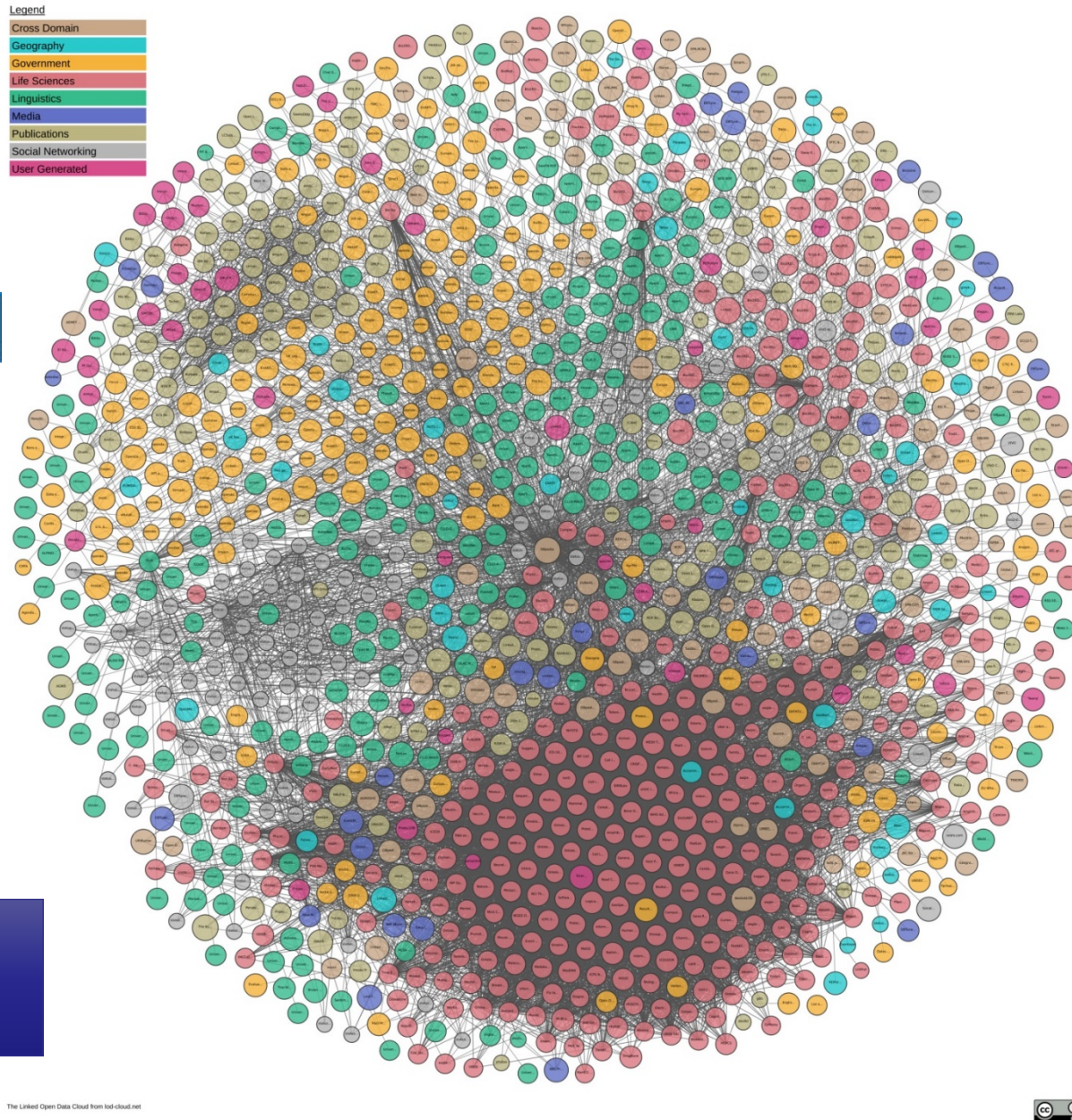
Parameters	Vertical spatial coordinates; Date and time; Lagrangian currents and transport rates in the water column; Salinity of the water column; Temperature of the water column; Transport in the water column
Instruments	Current profilers; submarine cables; CTD; current meters

DESCRIPTION

Summary	<p>The RAPID-MOCHA-WBTS dataset comprises measurements of current velocity, temperature, salinity and pressure. Oceanic volume transports are calculated from these variables resulting in continuous measurements of the Atlantic Meridional Overturning Circulation (AMOC). Data collection is obtained from a mooring array across 26.5N in the Atlantic Ocean and cable measurements across the Florida Straits. The measurement array extends from the Bahamas to the African coast. The data have been measured continuously between April 2004 and February 2017. The data are collected periodically (currently every 18 months) from various UK and USA research cruises. Measurements between the Bahamas and Africa were made using a variety of MicroCat CTD sensors, various current meters and ADCP. All instruments are located on 18 moorings in various locations at 26.5N. An undersea cable makes current velocity measurements across the Florida Straits. The RAPID-MOCHA-WBTS programme aims to deliver a multi-decadal time series of observations of AMOC. The observations will be used with data from other sources to determine and interpret recent changes in the AMOC, to assess the risk of rapid climate change due to changes in the MOC, and to investigate the potential for predicting the MOC and its impacts on climate. The RAPID-MOCHA-WBTS programme is a joint effort between NERC in the UK (the UK Principal Investigator is David Smeed), NOAA (Chris Meinen) and RSMAS (Prof. Bill Johns) in the USA. The Atlantic MOC transport (and its components), calculated from the above data, and</p>
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Annotated NERC
Vocabulary Server (NVS)EDMED metadata
format, based on ISO
19115 content modelMACHINE
READABLE

HUMAN



Set of best practices for publishing and interlinking **structured** data for access by both **humans** and **machines**

Steps

- Reusing existing patterns
 - Better understanding outside of SDN
 - Better interoperability with other organisations
 - FAIRer

Catalogues vs existing patterns


- EDMO –W3C Organisation
- EDMED –W3C DCAT / W3C Prov
- EDMERP –W3C Prov/ DBPediaResearch Project
- CDI –W3C DCAT
- ODV metadata to INSPIRE / ISO O&M
- CSR -*Liaised with US-NSF Rolling Deck to Repository & with Australia (through ODIP/SDC)*
- EDIOS –INSPIRE Environmental Monitoring Facilities

URIs

- <https://edmed.seadatanet.org/>
 - <https://edmed.seadatanet.org/search/>
 - <https://edmed.seadatanet.org/sparql/>
 - <https://edmed.seadatanet.org/report/<ID>>
- <https://edmo.seadatanet.org/>
 - <http://edmo.seadatanet.org/sparql/>
- <https://edios.seadatanet.org/>
 - <http://linked.bodc.ac.uk/sdn/edios/>
- <https://edmerp.seadatanet.org/>
- <https://cdi.seadatanet.org/>

edmed.seadatanet.org/sparql/

bernate Projects BODCInternal Q&D-RDF RDF study PHD Vocabularies rdf_staff medepad Q&D-RDF

 PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN & MARINE DATA MANAGEMENT

EUROPEAN DIRECTORY OF MARINE ENVIRONMENTAL DATA (EDMED)

[Query EDMED data sets](#) | [Query EDMED organisations](#) | [SPARQL endpoint](#)

SPARQL ENDPOINT

SPARQL query


```
select ?EDMEDRecord ?Title where {?EDMEDRecord a
<http://www.w3.org/ns/dcat#Dataset> ;
<http://purl.org/dc/terms/title> ?Title .}
```

Output:

If XML output, add XSLT style sheet (blank for none):

☐ Force the accept header to text/plain regardless.

SEARCH **RESET**



Page dynamically generated:

2019 | Madrid, Spain

Wood et al, 2018, Exposing the SeaDataNet metadata catalogues via SPARQL endpoints, IMDIS Conf, Barcelona.

Dataset Search

toolbox.google.com/datasetsearch/search?query=edmed&docid=xL2%2BQH7DWj%2BXTTJBAAAAA%3D%3D

AppsBookmarksHibernateProjectsBODCInternalQ&D-RDFRDF studyPHDVocabulariesrdf_staffmedepadQ&D-RDFSuggested SitesImported From IEAcerBODCOther bookmarks


Google Dataset Search

edmed


About

Feedback

100+ results found



Liverpool Bay/Irish Sea Coastal Observatory Data Set
www.bodc.ac.uk



ORCHESTRA Project
Oceanographic data set (201...
www.bodc.ac.uk
edmed.seadatanet.org

E


World Ocean Isopycnal-Level Velocity Inverted from GDE...
www.bodc.ac.uk

E

Global surface warming response datasets in terms o...
www.bodc.ac.uk
edmed.seadatanet.org

F



EDMED Metadata profile format
fairsharing.org
Published Oct 11, 2018



UK Admiralty Sailing Directions
www.bodc.ac.uk
edmed.seadatanet.org

E

ATLAS - Interactive GIS map service for the NW Black Sea...
www.bodc.ac.uk
edmed.seadatanet.org



PML
Plymouth Marine Laboratory

Liverpool Bay/Irish Sea Coastal Observatory Data Set

Explore at European Directory of Marin...

Data set provided by

Met Office

Proudman Oceanographic Laboratory

Plymouth Marine Laboratory

University of Liverpool Department of Earth and Ocean Sciences

National Oceanography Centre, Southampton

University of Wales, School of Ocean Sciences

National Oceanography Centre, Liverpool

Centre for Environment, Fisheries and Aquaculture Science, Lowestoft Laboratory

Department of Agriculture and Rural Development for Northern Ireland

University of Liverpool, Port Erin Marine Laboratory

Environment Agency Head Office

Bangor University School of Ocean Sciences

Licence

SeaDataNet licence

Time period covered


Jan 1, 2001 - Sep 20, 2011

Area covered

Irish Sea

Map

Satellite



Google


Map data ©2019 GeoBasis DE AG (©2009), Google

Terms of Use

Description

What is NVS

- A Vocabulary server
- Provides access to lists of standardised terms related to the oceanographic and wider community
- Term = unique URI with which people refer to it
- URI: resolves to machine/human readable standard formats (Linked Data)
- Unperpins SDN infrastructure




OceanObs'19
Terminologies for Ocean Observations: the NERC Vocabulary Server
Gwenaelle Moncolle¹, Alexandra Kokkinaki¹, Louise Darroch¹, Justin Buck¹
¹The British Oceanographic Data Centre (BODC), National Oceanography Centre, UK

#1 The NERC Vocabulary Server (NVS)


What is NVS?

- A thesauri and controlled vocabulary server for the marine community and related domains
- Serves the SeaDataNet (SDN) Common Vocabularies
- Community-driven, used globally
- Linked Data
- Machine Readable
- Interoperable


Who uses NVS?



Last 12 months stats



Publication



<http://vocab.nerc.ac.uk/usage/>

<http://vocab.nerc.ac.uk/linkeddata/>


key usage vocabularies

Expressing **What** variable (P01) was observed by **which** instrument (L22) in machine readable, unambiguous terms is crucial for making ocean observations FAIR


#2 L22: The SeaVoX Device Catalogue

- Used for identifying instrument provenance in databases and data files
- >1,400 unique and persistent identifiers (L22 code URI)
- easily integrated into workflows
- supports instrument granularities and web publications (e.g. SensorML, SSN)

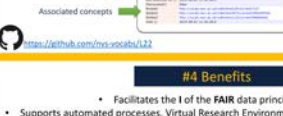
Association of concepts



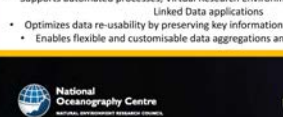
Granularities




NVS Web publication




Resolvable persistent identifier



Detailed instrument description



Versioning




Associated concepts

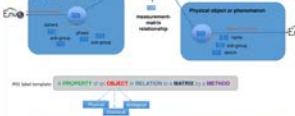
#3 P01: The BODC Parameter Usage Vocabulary

- Used for labelling variables in databases and data files
- >40,000 unique and persistent identifiers (P01 code URI) attached to structurally logical labels and textual definitions
- a P01 label is constructed from the following association of concepts defined in controlled vocabularies


Property




Biological entity




Physical object or phenomenon




Measurement process



Measurement data




Measurement data




#4 Benefits


- Facilitates the 1 of the FAIR data principles
- Supports automated processes, Virtual Research Environments, fast data exchange, Linked Data applications
- Optimizes data re-usability by preserving key information close to the data values
- Enables flexible and customisable data aggregations and discovery pathways

#5 Acknowledgements






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NERC SCIENCE OF THE ENVIRONMENT



IMD2018:165
Building trust through transparency in the NERC Vocabulary Server (NVS)
Alexandra Kokkinaki¹, Gwenaelle Moncolle¹, Quyen Luong¹, Adam Leadbetter², Rob Thomas³, Simon Cox³
¹The British Oceanographic Data Centre (BODC) (UK)
²Marine Institute (Ireland)
³CSIRO Land and Water (Australia)


#1 NERC Vocabulary Server (NVS)

What is NVS?

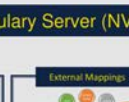
NVS has been serving the marine and wider community with controlled vocabularies for over a decade. NVS provides access to standardized lists of terms which are used for data mark-up, facilitating interoperability and discovery in the marine and associated earth science domains.

- Linked Data
- Unique URIs
- SKOS
- SPARQL
- RDF/XML
- SPARQL
- SOAP
- W3C
- REST


Who uses NVS?



External Mappings



Publication



<http://vocab.nerc.ac.uk/usage/>

<http://vocab.nerc.ac.uk/linkeddata/>

<http://vocab.nerc.ac.uk/vocabulary/>

#2 Trust

Governance transparency

Creation of GitHub repositories for collaborative NVS vocabularies to:


- capture discussions and governance decisions
- be publicly available
- Support the expansion of the Semantic governance group

Versioning


Version control on the concept level

- Users access previous versions of a concept
- Model based on IRV ontology provenance, authoring and versioning
- <http://port.org/irv/>

Concept Versioning




Provenance of mappings



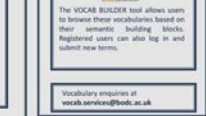
Mappings

To ensure that there is confidence in NVS mappings, information relating to who has carried out the mappings and when is stored alongside the mappings. Each mapping is associated with a unique URI and resolves to RDF that reflects the mapping and includes the additional provenance information

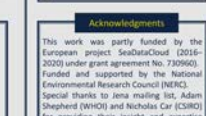
Governance transparency




Concept Versioning



Provenance of mappings



Mappings



#3 Collaborative tools

vocab editor

The VOCAB EDITOR allows external authorities to edit their vocabularies and associated mappings and submit for publication to the NVS. Within the Vocab Editor authorized editors may maintain lists under their governance

Vocab Builder


The VOCAB BUILDER tool allows users to browse their vocabularies based on their semantic building blocks. Registered users can also log in and upload new terms

Vocabulary requires at


vocab.nerc.ac.uk

Acknowledgements

This work was partly funded by the European project SeaDataNet (2015-2020) under grant agreement No. 730660. Funded and supported by the National Environmental Research Council (NERC). Special thanks to Iona Mailing, Adam Shepherd (WHOI) and Nicholas Car (CSIRO) for providing their insight and expertise when needed.



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NERC SCIENCE OF THE ENVIRONMENT



IMD2018:142
Rosetta Stone Service: A success story of standards, controlled vocabularies and communication
Alexandra Kokkinaki¹, Gwenaelle Moncolle¹, Dick Schaap², Enrico Boldrin³, Fabrizio Papeschi³, Stefano Nativi⁴
¹The British Oceanographic Data Centre (BODC) (UK)
²MARIS (Netherlands)
³National Research Council of Italy, Institute of Atmospheric Pollution Research (Italy)

Introduction

The marine community across Europe, US and Australia, appears to be well connected in terms of communication and standards applied. The use of controlled vocabularies for data mark-up, that are based on W3C's Simple Knowledge Organisation System (SKOS) and are exposed as Linked data is a great success achieved by real human communication, enabled by collaborative projects like the Ocean Data Interoperability Platform (ODIP). The scene seems very promising to move to the next level of global integration. But is it enough?





Discovery Category

Rosetta Stone Service back end

Rosetta Stone service leverages the mappings between NODC, NVS and AODN and translates terms in real time via SPARQL queries

Rosetta stone service in action


Rosetta Stone was successfully experimented to semantically enhance the ODIP broker discovery capabilities. ODIP users can now search the ODIP prototype 1+ portal using terms from a community vocabulary of choice: the ODIP broker engine leverages Rosetta Stone translation service capabilities to obtain translated (as well as related) query terms ready to be submitted and obtain results from all the heterogeneous ODIP data sources

<http://odip-prototype.esri-lab.eu/broker/odip/search>



Acknowledgements

This work was funded by the European project Ocean Data Interoperability Platform II (ODIP II) under grant agreement no [654310]. Special thanks to our project partners providing insight and expertise in this work.



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Interoperable Descriptions of Observable Property Terminology

- An RDA Working Group
- Within RDA Interest Group on Vocabulary and Semantic Services (VSSIG)
- RDA WG page:
 - <https://www.rd-alliance.org/groups/interoperable-descriptions-observable-property-terminology-wg-i-adopt-wg>
- Chairs:
 - Barbara Magagna, Michael Diepenbroek, Gwenaelle Moncoiffe, Maria Stoica

Creating a community-agreed framework for:

- representing observable properties
- by bringing together interested and experienced members
- to encode measured, observed, derived, and computed properties

In order to:

- Improve the “I” of FAIR on property description at large scale
- Align properties specified by various bodies
- Make properties machine-processable



WHAT?

Capturing complex and essential data information using semantic technology

HOW?

- Collaborative effort to connect existing semantic resources
- Strong network of
 - thesauri developers,
 - ontology creators
 - information managers
 - Data producers and publishers

Results

Workshop in Dublin, Ireland in March 2019 gathered technical & content experts:

Strategies for linking

- observations to authoritative thesauri
- authoritative thesauri to domain ontologies

Initiated alignment between:

- NERC Vocabulary Server
- Open Biological and Biomedical Foundry

Plan future alignments of well-adopted marine terminologies

Collective strategy for sustained interoperability

Use case featuring UNESCO-IOC Ocean Best Practices System

sdn-userdesk@seadatanet.org – www.seadatanet.org

Aligned semantics to advance data interoperability across the ocean value chain

- from raw data to societal goals **AUTHORS:** Adam Shepherd, Scott Caltagirone, Alexandra Kokkinaki, Adam Leadbetter, Gwen Moncoiffe, Pauline Simpson, Rob Thomas, Pier Luigi Buttigieg

Why?

We all use different labels to describe the same thing.

Aligning terms from controlled vocabularies, thesauri & ontologies helps software agents navigate the spaghetti of our natural language.

How?

Capturing complex and essential data information using semantic technology

Collaborative effort to connect existing semantic resources

By creating a strong open network of:

- data producers & publishers,
- thesauri developers,
- ontology creators
- information managers

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oceanbestpractices.org



Take a picture to visit the website

Linking authoritative thesauri
to domain ontologies is critical
in leveraging
ocean observation data & information
in response to the
grand challenges of the
UN Decade of Ocean Science.

Efficient data publication workflows require easily extensible authoritative thesauri able to support

- Complexity & diversity of scientific observations
- Novel methodology & techniques
- Operational terminologies & concepts
- Data transformation, aggregation & re-use

Data can be of maximum benefit to society if labelled using authoritative thesauri that are then connected to domain ontologies

- Greater interoperability across sources, systems & domains
- Easier to connect to broad concepts
 - GOOS' Essential Ocean Variables
 - UN Sustainable Development Goals
- Greater scope for developing trusted automated processing in software applications & VREs
- Easier access to related information & data

