Vocabularies-SeaDataNet-SenseOCEAN

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PARTLY FUNDED BY

Overview

Vocabularies:

- What are they and why we need them
- NERC Vocabulary Server 2 (NVS2)

NVS2 in SeaDataNet:

- Progress Report

Progress on SenseOcean Project

Vocabularies

Free text descriptions

Dataset1 includes Oxygen Concetration (mM) and Air saturation (pecrent) measurements.

Dataset2 includes cO_2 (mmol/L) and air saturation (%) measurements.

Queries?

List datasets measuring O2 in mmol/L

Dataset2

Find datasets that measure percentage of air saturation

No available datasets

Find datasets with observed property Oxygen concentration

No available datasets

Conflicts

- Data-level conflicts are caused by differences occurring in data domains due to multiple possible representations and interpretations of similar data
- Misspellings

Oxygen

O2

Oxgen

Controlled vocabularies

- In information science controlled vocabulary is a carefully selected list of words and phrases, which are used to tag units of information (document or work) so that they may be more easily retrieved by a search
- They are important:
- capture expertise in agreed, well-defined descriptions
- enable population of a given field in a metadata model with standardised unambiguous terms
- enable records to be interpreted by computers
- promote consistency and interoperability

Machine readable Discoverable Interoperable

NVS2 Vocabulary Server

http://vocab.nerc.ac.uk/collection/{XXX}/current/

- Concept URIs
- Description based in Resource Description Framework (RDF) and (Simple Knowledge Organization System) SKOS

definition

  - Vocabularies are Collections http://vocab.nerc.ac.uk/collection/{XXX}/current/{XXX001}
  - Each Collection consists of many concepts

preferred label

  - A concept is a term that belongs to a collection

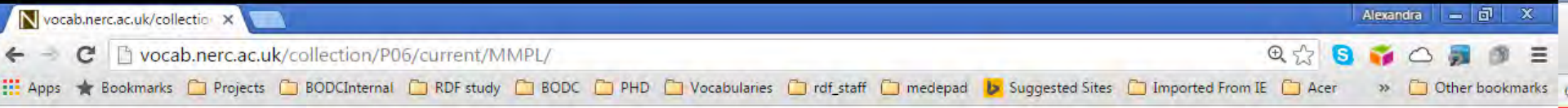
alternative label

http://vocab.nerc.ac.uk/collection/P06/current/MMPL/

-204 Vocabularies
-161.000 terms
-RESTFul interface
-NVS2 Search to search for vocabularies and into the vocabularies.
-NVS2 Editor to edit user vocabularies.
SeaVox

Mappings

Interlink data with a rich and fast-growing network of other data sources

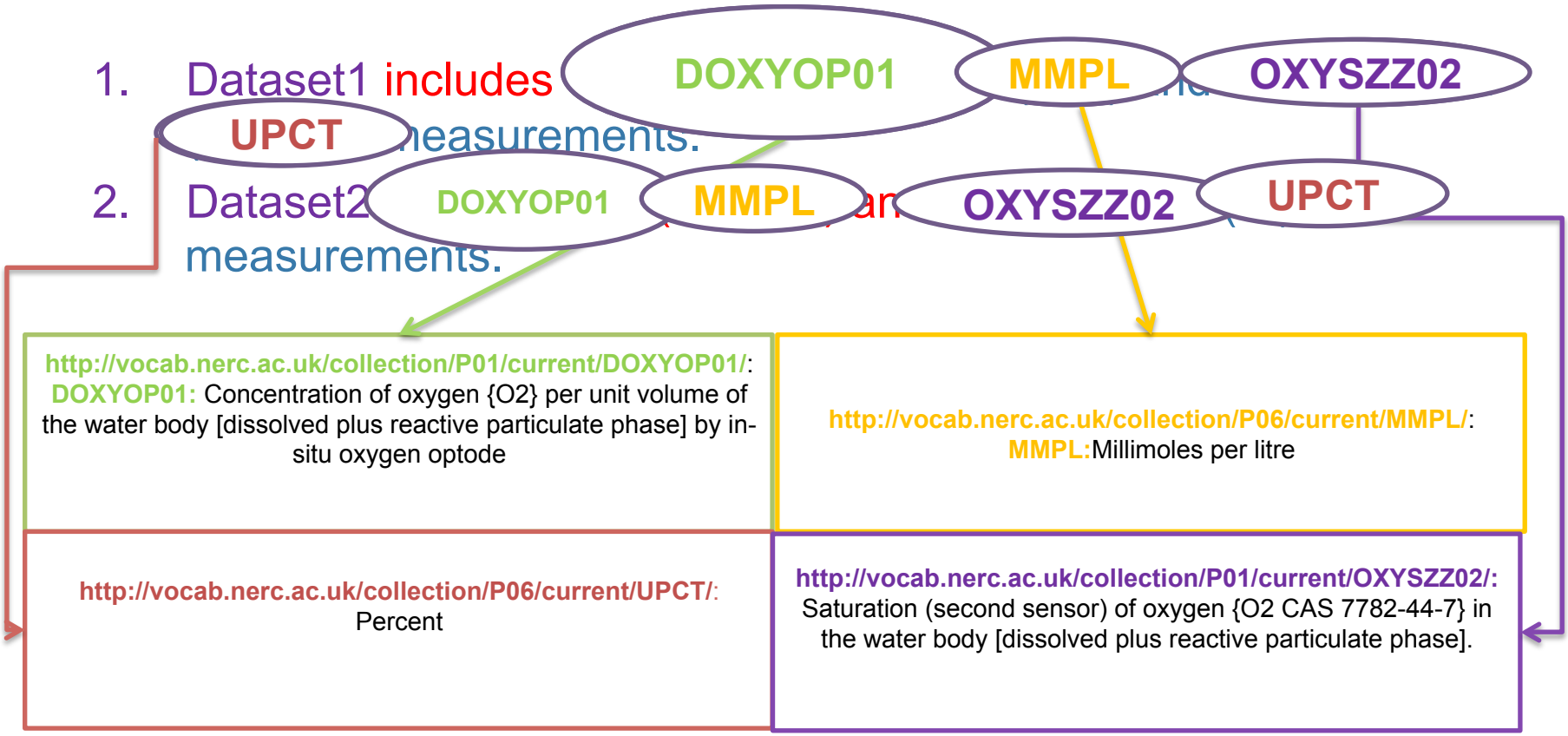


⇑ -- Millimoles per litre --

URI	http://vocab.nerc.ac.uk/collection/P06/current/MMPL/
Identifier ()	SDN:P06::MMPL
Preferred label (en)	**Millimoles per litre**
Alternative label (en)	mmol/l
Definition (en)	Unavailable
Version Info ()	1
Deprecated()	false
Related	http://vocab.nerc.ac.uk/collection/P09/current/TCO2/
Related	http://dbpedia.org/resource/Milli-
Related	http://dbpedia.org/resource/Mole_(unit)
Related	http://dbpedia.org/resource/Litre
Related	http://vocab.nerc.ac.uk/collection/P01/current/DOXYMMOP/
Date ()	2008-02-20 12:02:02.0

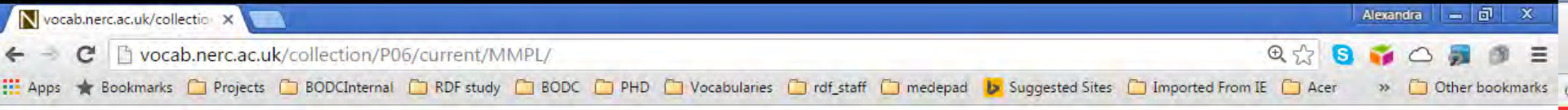
How can Controlled vocabularies help solve "wrong results"

1. Dataset1 includes DOXYOP01 MMPL and OXYSZZ02 measurements.
2. Dataset2 includes DOXYOP01 MMPL and OXYSZZ02 UPCT measurements.



⇑ -- Concentration of oxygen {O2 CAS 7782-44-7} per unit volume of the water body [dissolved plus reactive particulate phase] by in-situ oxygen optode --

URI	http://vocab.nerc.ac.uk/collection/P01/current/DOXYOP01/
Identifier ()	SDN:P01::DOXYOP01
Preferred label (en)	**Concentration of oxygen {O2 CAS 7782-44-7} per unit volume of the water body [dissolved plus reactive particulate in-situ oxygen optode**
Alternative label (en)	WC_dissO2_optode
Definition (en)	Unavailable
Version Info ()	3
Deprecated()	false
Broader	http://vocab.nerc.ac.uk/collection/P02/current/DOXY/
Broader	http://vocab.nerc.ac.uk/collection/P35/current/EPC00002/
Broader	http://vocab.nerc.ac.uk/collection/S26/current/MAT00633/
Related	http://vocab.nerc.ac.uk/collection/P06/current/UPOX/
Related	http://vocab.nerc.ac.uk/collection/L22/current/TOOL0101/
Related	http://vocab.nerc.ac.uk/collection/S02/current/S053/
Date ()	2015-08-26 15:08:03.0



⇑ -- Millimoles per litre --

URI	http://vocab.nerc.ac.uk/collection/P06/current/MMPL/
Identifier ()	SDN:P06::MMPL
Preferred label (en)	**Millimoles per litre**
Alternative label (en)	mmol/l
Definition (en)	Unavailable
Version Info ()	1
Deprecated()	false
Related	http://vocab.nerc.ac.uk/collection/P09/current/TCO2/
Related	http://dbpedia.org/resource/Milli-
Related	http://dbpedia.org/resource/Mole_(unit)
Related	http://dbpedia.org/resource/Litre
Related	http://vocab.nerc.ac.uk/collection/P01/current/DOXYMMOP/
Date ()	2008-02-20 12:02:02.0

vocab.nerc.ac.uk/collectio
vocab.nerc.ac.uk/collection/P06/current/UPCT/
Apps Bookmarks Projects BODCInternal RDF study BODC PHD Vocabularies rdf_staff medepad Suggested Sites Imported From IE Acer UMLS Terminology ... Kostis

⇑ -- Percent --

URI	http://vocab.nerc.ac.uk/collection/P06/current/UPCT/
Identifier ()	SDN:P06::UPCT
Preferred label (en)	**Percent**
Alternative label (en)	%
Definition (en)	Unavailable
Version Info ()	1
Deprecated()	false
Same as	http://dbpedia.org/resource/Percentage
Broader	http://vocab.nerc.ac.uk/collection/P24/current/DIMLESS/
Related	http://vocab.nerc.ac.uk/collection/P09/current/MCAS/
Related	http://vocab.nerc.ac.uk/collection/P09/current/TUR0/
Related	http://vocab.nerc.ac.uk/collection/P09/current/TUR3/
Related	http://vocab.nerc.ac.uk/collection/P09/current/LGH5/
Related	http://vocab.nerc.ac.uk/collection/P09/current/OPAP/
Related	http://vocab.nerc.ac.uk/collection/P09/current/CO3S/
Related	http://vocab.nerc.ac.uk/collection/P09/current/HEDE/
Related	http://vocab.nerc.ac.uk/collection/P09/current/LSCT/
Related	http://vocab.nerc.ac.uk/collection/P09/current/MFES/
Related	http://vocab.nerc.ac.uk/collection/P09/current/MPPS/
Related	http://vocab.nerc.ac.uk/collection/P09/current/OSAT/
Related	http://vocab.nerc.ac.uk/collection/P09/current/SIOS/
Related	http://vocab.nerc.ac.uk/collection/P09/current/CO3P/
Related	http://vocab.nerc.ac.uk/collection/P09/current/EF1W/
Related	http://vocab.nerc.ac.uk/collection/P09/current/H2OS/
Related	http://vocab.nerc.ac.uk/collection/P09/current/MALS/
Related	http://vocab.nerc.ac.uk/collection/P09/current/MKKS/
Related	http://vocab.nerc.ac.uk/collection/P09/current/MNAS/
Related	http://vocab.nerc.ac.uk/collection/P09/current/SAND/
Related	http://vocab.nerc.ac.uk/collection/P09/current/TCCS/
Related	http://vocab.nerc.ac.uk/collection/P09/current/TOMP/
Related	http://vocab.nerc.ac.uk/collection/P09/current/CLAY/
Related	http://vocab.nerc.ac.uk/collection/P09/current/D13C/
Related	http://vocab.nerc.ac.uk/collection/P09/current/EF2W/

⇑ -- Saturation (second sensor) of oxygen {O2 CAS 7782-44-7} in the water body [dissolved plus

URI	http://vocab.nerc.ac.uk/collection/P01/current/OXYSZZ02/
Identifier ()	SDN:P01::OXYSZZ02
Preferred label (en)	**Saturation (second sensor) of oxygen {O2 CAS 7782-44-7} in the water body [dissolved plus reactive**
Alternative label (en)	O2Sat_2
Definition (en)	The proportion of the expected oxygen concentration measured by a second sensor and computed using an unkn
Version Info ()	4
Deprecated()	false
Broader	http://vocab.nerc.ac.uk/collection/P02/current/DOXY/
Broader	http://vocab.nerc.ac.uk/collection/P35/current/EPC00003/
Broader	http://vocab.nerc.ac.uk/collection/S26/current/MAT00633/
Related	http://vocab.nerc.ac.uk/collection/P06/current/UPCT/
Related	http://vocab.nerc.ac.uk/collection/S02/current/S028/
Date ()	2015-08-26 15:08:03.0

F THE
MENT

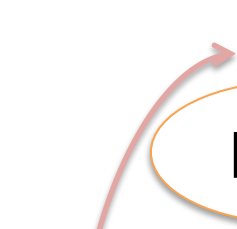
How can you help to be interoperable

- Participate in communities to create agreements
- Share knowledge and success stories
- Participate/organize events/interoperability efforts like:
- SWE Marine Profile (Simon Jirka)
- Oceanology workshop (Dick Schaap)
- ODIP (Ocean Data Interoperability Platform)

Seadatanet NVS services

NVS2.0 & EU SeaDataNet-2

Metadata creation Tool



NVS

Data source

Observing systems

Datasets

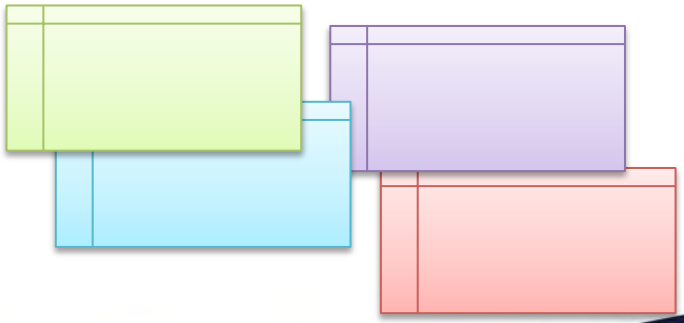
Cruises

Data

Projects

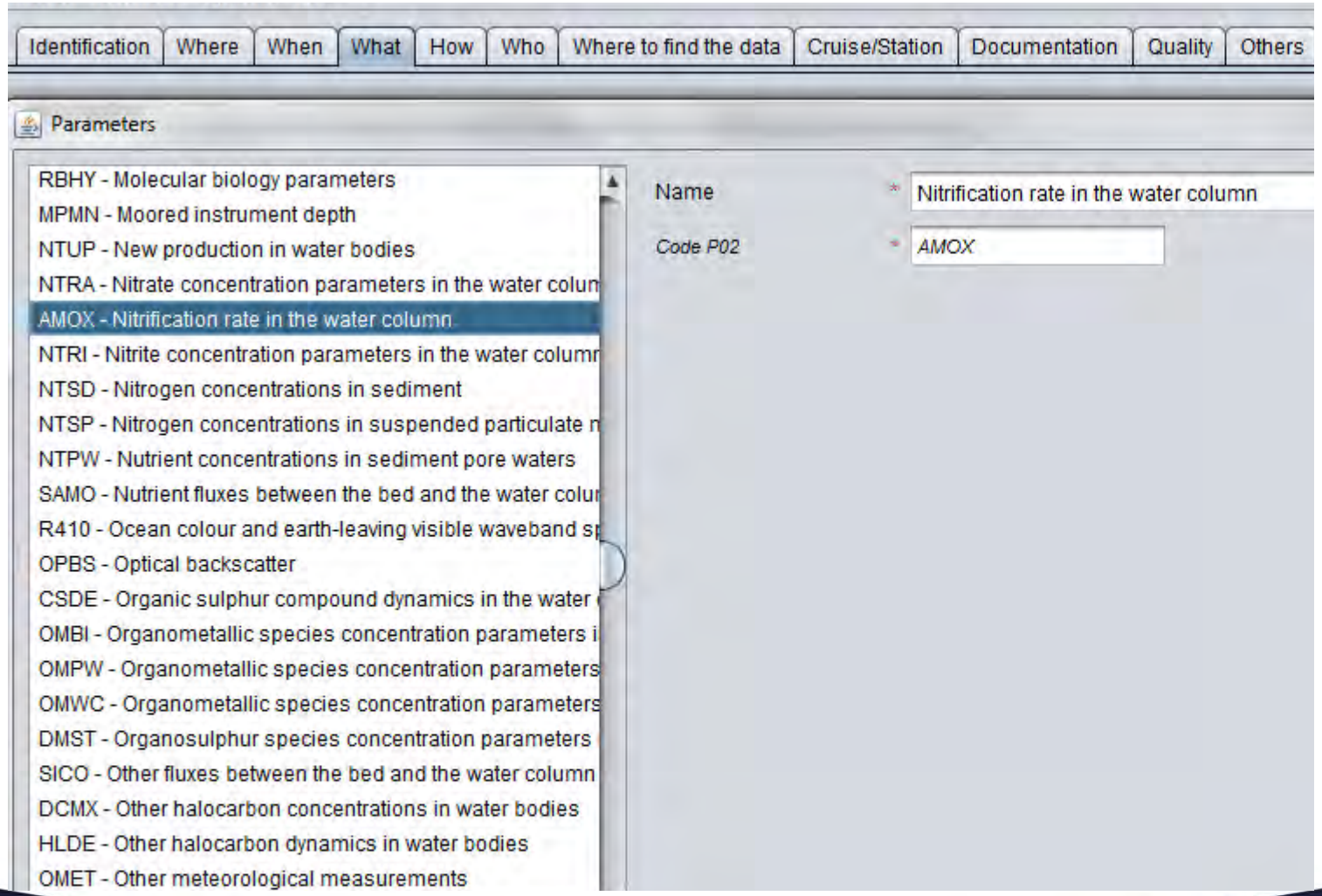
Organisations

Metadata Discovery

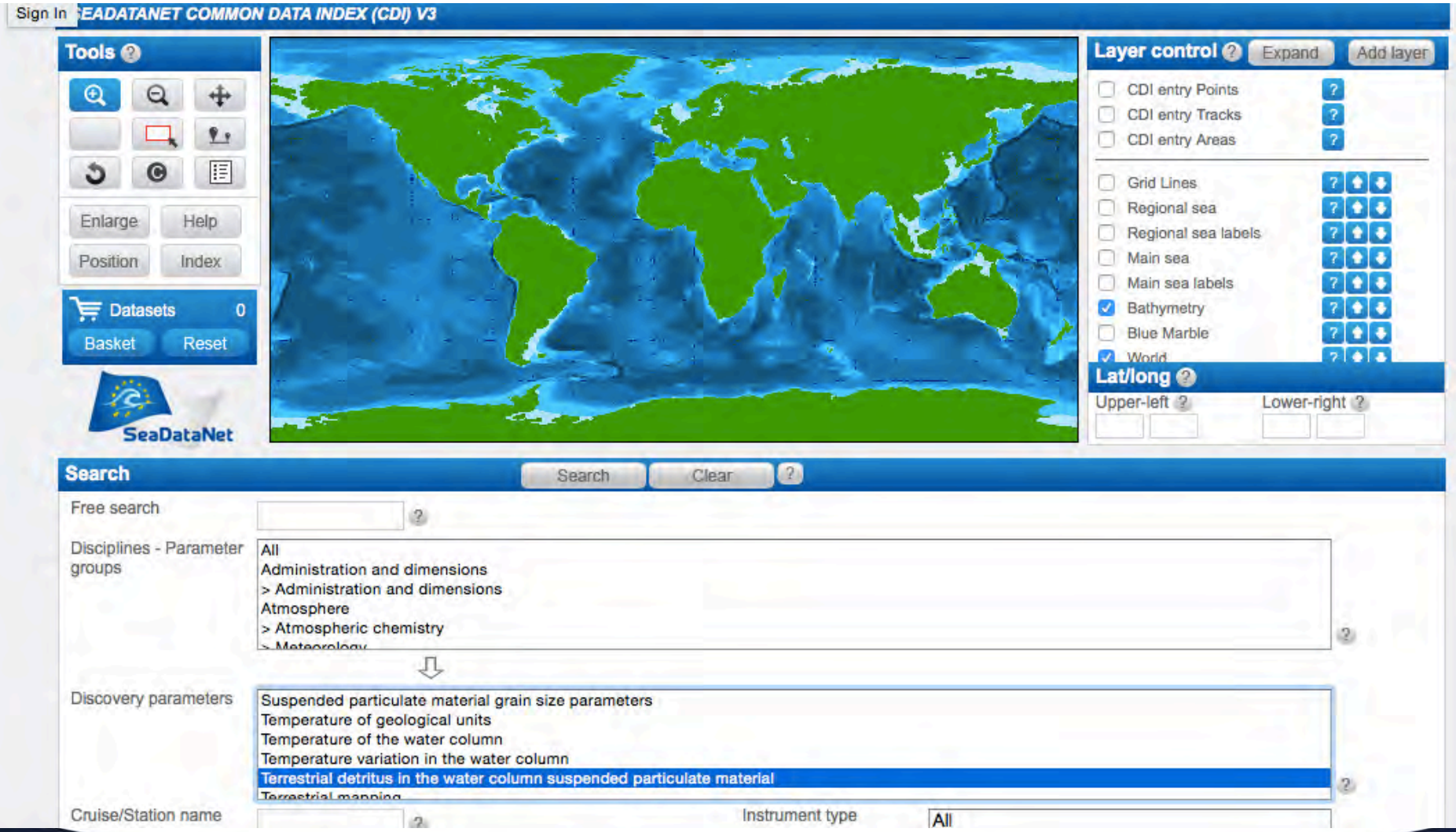


Map from http://www.seadatanet.org/Overview/Partners

NVS2.0 & EU SeaDataNet-2

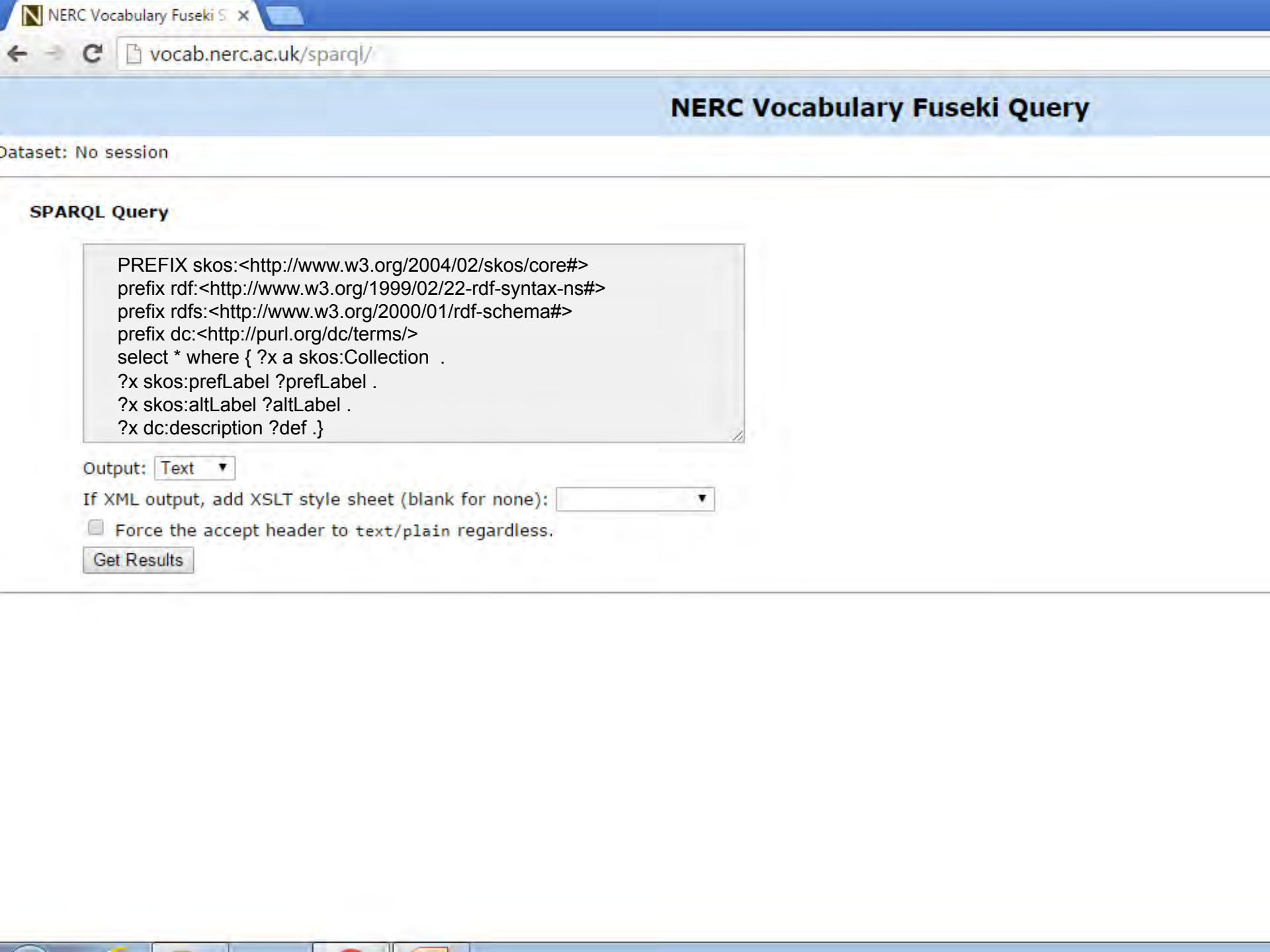


NVS2.0 & EU SeaDataNet-2



URI	http://vocab.nerc.ac.uk/collection/A01/current/
title-:	**International Coastal Atlas Network Coastal Erosion Global Thesaurus**
alternative-:	**ICAN Coastal Erosion Global Thesaurus**
description-:	**Terms used at all hierarchical levels in the ICAN global thesaurus for coastal erosion. Term discovery portals.**
creator-:	**International Coastal Atlas Network**
publisher-:	**Natural Environment Research Council**
date-:	**2011-08-16 02:00:06.0**
versionInfo-:	1
Broader:-	http://vocab.nerc.ac.uk/collection/A01/current/
Narrower:-	http://vocab.nerc.ac.uk/collection/A01/current/
Narrower:-	http://vocab.nerc.ac.uk/collection/A02/current/
Narrower:-	http://vocab.nerc.ac.uk/collection/A03/current/
Narrower:-	http://vocab.nerc.ac.uk/collection/A04/current/
Narrower:-	http://vocab.nerc.ac.uk/collection/I03/current/
Narrower:-	http://vocab.nerc.ac.uk/collection/P02/current/
RegisterOwner:-	**International Coastal Atlas Network**
comment-:	**International federation of coastal web atlases. Governance implemented through the Tec**
RegisterManager:-	**British Oceanographic Data Centre**

URI	http://vocab.nerc.ac.uk/collection/A02/current/
title-:	**Oregon Coastal Atlas Coastal Erosion Thesaurus markup terms**
alternative-:	**OCA Coastal Erosion markup terms**
description-:	**Terms used at all hierarchical levels in the Oregon Coastal Atlas for coastal erosion layers,**
creator-:	**Oregon State Coastal Management Program**
publisher-:	**Natural Environment Research Council**
date-:	**2016-01-14 02:00:02.0**
versionInfo-:	4


NERC Vocabulary Fuseki S
vocab.nerc.ac.uk/sparql/
NERC Vocabulary Fuseki Query
Dataset: No session
SPARQL Query
PREFIX skos:<http://www.w3.org/2004/02/skos/core#>
prefix rdf:<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
prefix rdfs:<http://www.w3.org/2000/01/rdf-schema#>
prefix dc:<http://purl.org/dc/terms/>
select * where { ?x a skos:Collection .
?x skos:prefLabel ?prefLabel .
?x skos:altLabel ?altLabel .
?x dc:description ?def .}
Output: Text
If XML output, add XSLT style sheet (blank for none):
Force the accept header to text/plain regardless.
Get Results

Where to find data
Online delivery
Published Data Library
Information and inventories
Code and format definitions
BODC parameter codes
BODC request (ASCII) format
Ocean Data View (ODV) format
QXF (a netCDF) format
CF netCDF format
AXF (historical) format
GEBCO grid formats
Sea level formats
SeaVoX
Vocabulary editor
Vocabulary search
Submitting data to BODC
Portals and links

Vocabulary search

help

Simple search for vocabularies

Advanced search for vocabularies

Simple search within a vocabulary

Advanced search within a vocabulary

Click search button with empty search text to get list of all available collections

Search text Search

SeaDataNet NVS2 services

Existing

- SeaDataNet Vocabularies
- NVS2 Search
- SPARQL endpoint
- NVS2 editor

New

- Vocabulary builder (ex One Armed Bandit)
- NVS2 Search new functionality (Search directly in a specific vocabulary)
- Working towards ICES Synchronization (Roy is working on extending the metadata of existing concepts, consistency check with WOD)
- The mapping between P07 and MMI ORR cf_standard names
- SKOS overlay with OWL (under discussions)
- Add more predicates

SensorML Candidate vocabularies

SensorML specific vocabularies

- **W01** - SeaDataNet Sensor Web Enablement and SensorML type vocabulary
- **W02** - SeaDataNet Sensor Web Enablement and SensorML sub-type vocabulary
- **GS1 -** Geo-Seas features of interest
- **GS2** - Geo-Seas observed property
- Feature of Interest

  GS1, S26 - matrix (BODC governed)
- Observable Property

  Fine granularity (usage metadata) - P01, P07 etc.

  Coarse granularity (discovery metadata) - GS2
- Characteristics&MeasurementCapabilities(weight, height, width, Frequency, Latency, Precision etc)

If additional new vocabularies are required then need to ascertain the content governance authority. NVS2 can deliver the technical governance.

Ongoing developments as part of the SenseOcean project

SenseOCEAN

SenseOCEAN draws together world leading marine sensor developers to create a highly integrated multifunction and cost-effective in situ marine biogeochemical sensor system.

Ensure that

- Key metadata and technical data from novel sensors are never lost
- Efficient data processing
- Efficient data archival
- Seamless data delivery

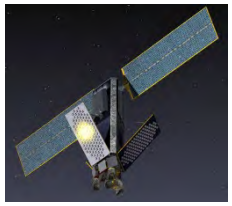
Interoperability … apply data standards from sensor through to delivery

Proposed approach

Sensor passes UUID through to base station

Platform

Satellite



Base station/ Data centre

NERC Linked data (RDF, SPARQL) server

UUID

SensorML SSN (OWL JSON LD

netCDF EGO 1.1, CF1.6,

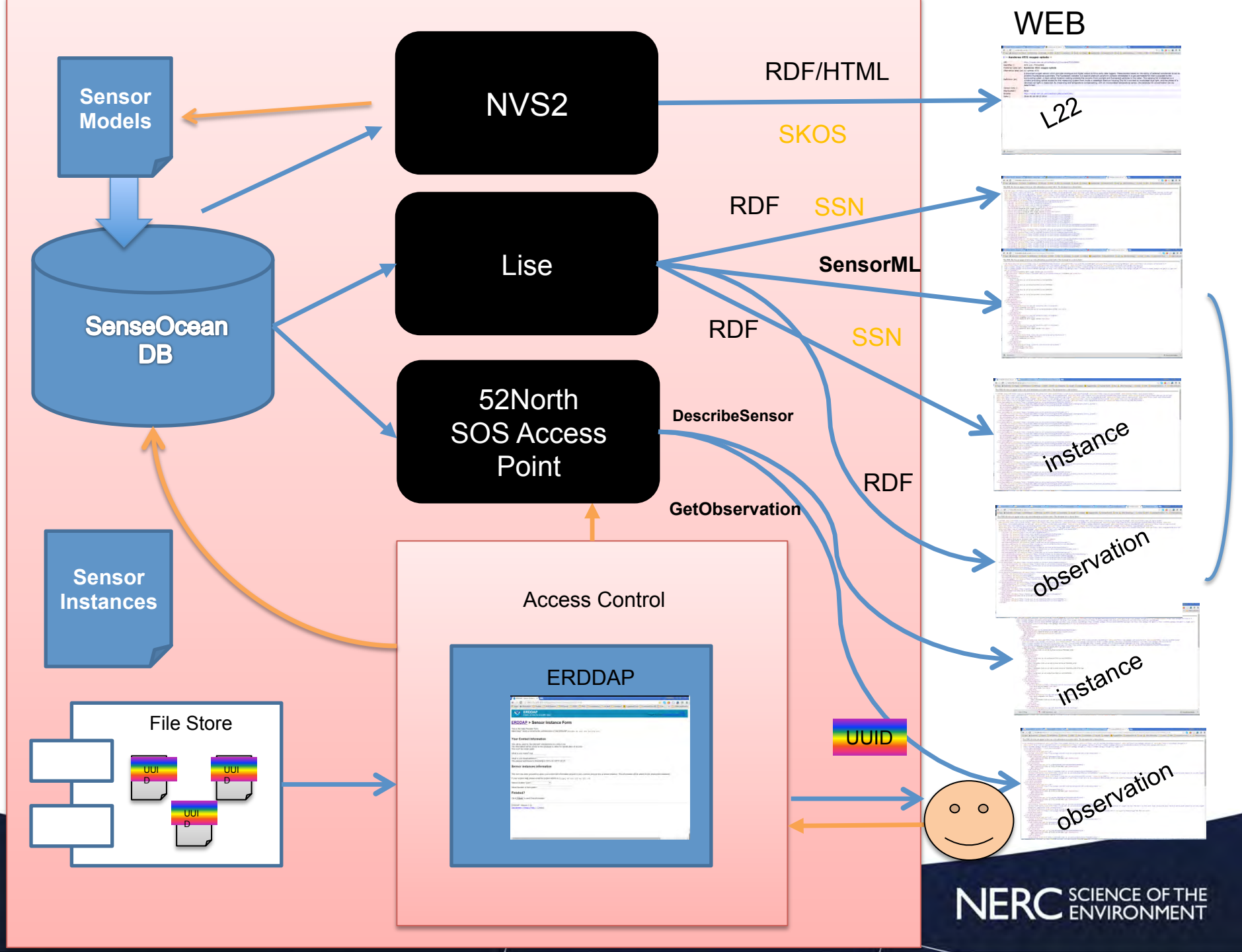
Data delivery by SOS service and linked ocean data library

Reference for netCDF Link Data conventions:

Yu J. et al. Towards Linked Data Conventions for Delivery of Environmental Data Using netCDF: pages 102-112; Springer., ISBN: 978-3-319-15993-5

Aanderaa Oxygen Optode 4531

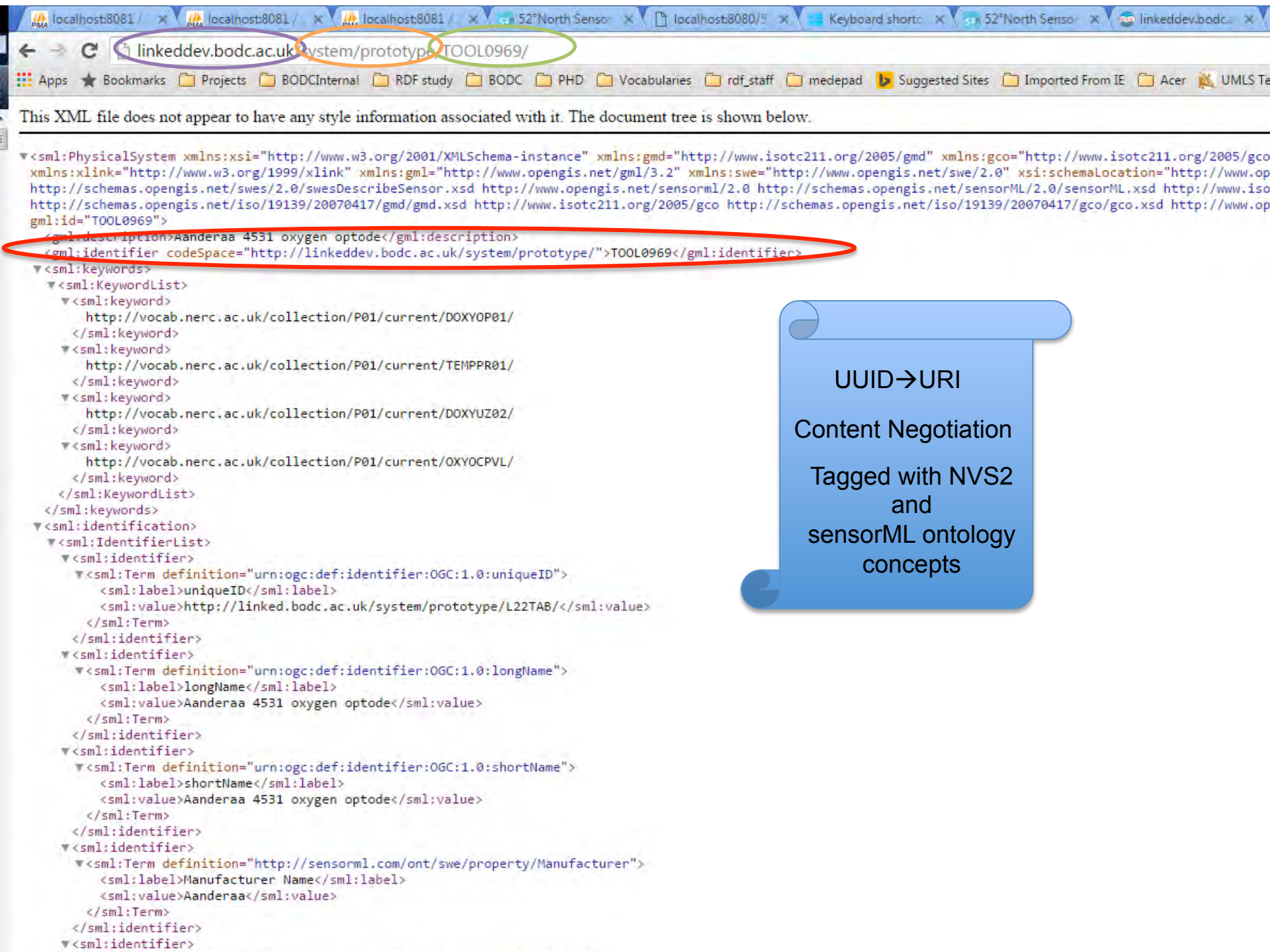
Oxygen:	O_2 Concentration	Air Saturation
Operation Range:	0 - 800 µM [1]	0 - 200%
Calibration Range:	0 - 500 µM [1]	0 - 120%
Resolution:	<1 µM	0.4%
Accuracy:	<8 µM or 5% [2] whichever is greater	<5% [3]
Response Time (63%):	<30 sec	
Temperature:		
Range:	-5 to +30°C (23 - 86°F)	
Resolution:	0.01°C (0.018°F)	
Accuracy:	±0.03°C (0.18°F) [4]	
Response Time (63%):	<2 sec	
Output format:	**4531A:** 0 - 5V, RS-232	
	4531B: 0 - 10V, RS-232	
	4531C: 4 -20mA, RS-232	
	4531A: RS-232	
Output Parameters:		
RS-232:	O_2 Concentration in µM, Air Saturation in %, Temperature in °C, Oxygen raw data and Temperature raw data	
Analog channel 1:	O_2 Concentration in µM, or Air Saturation in %,	
Analog channel 2:	Temperature in °C	
Sampling interval:	2 sec – 255 min	
Supply voltage:		
RS-232:	5 to 30Vdc	
Analog:	7 to 30Vdc, 12 to 30Vdc for 0-10V	

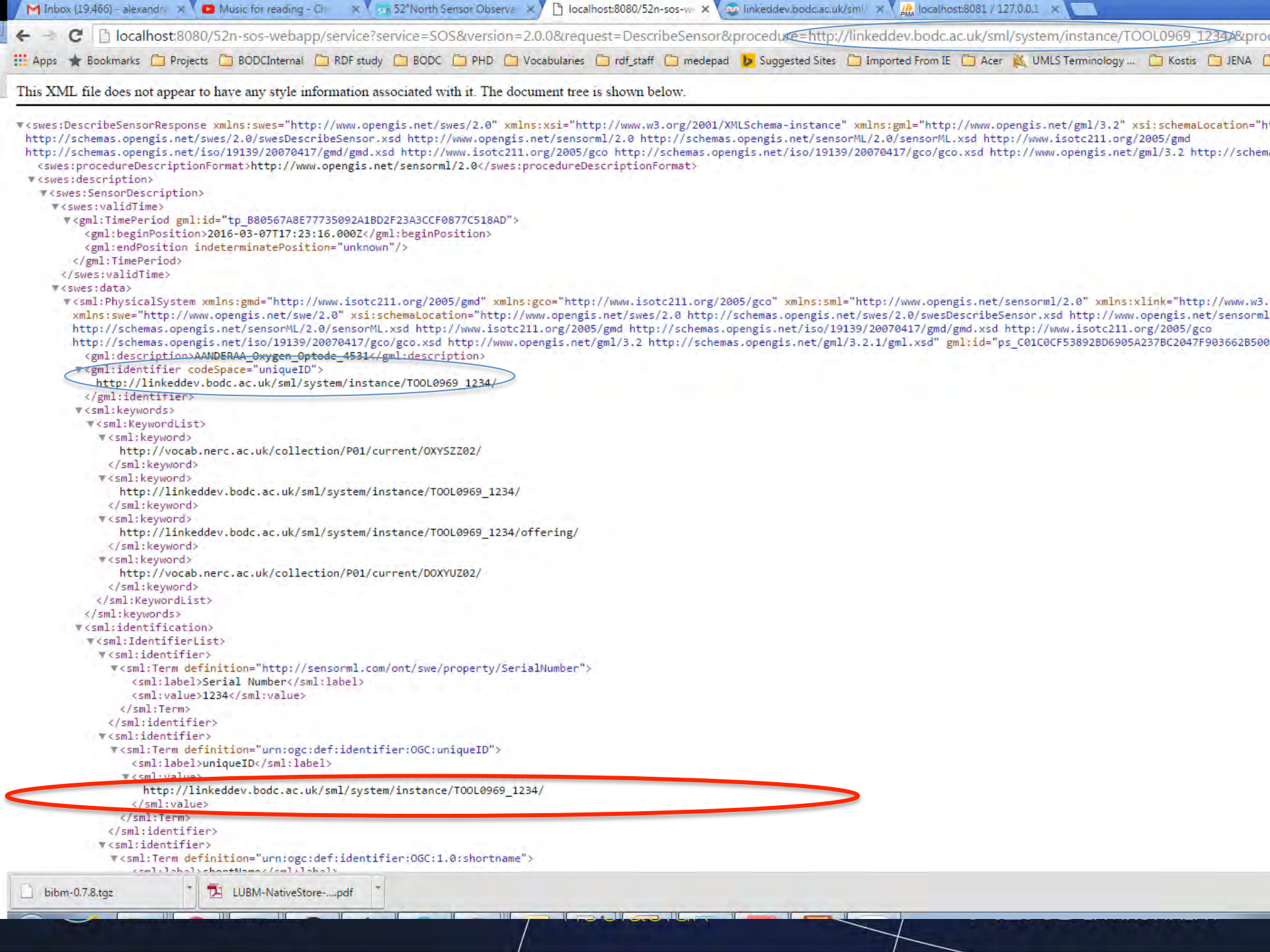

WEB
Sensor Models
NVS2
RDF/HTML
SKOS
L22
RDF
SSN
Lise
SensorML
SenseOcean DB
RDF
SSN
instance
52North SOS Access Point
DescribeSensor
RDF
GetObservation
observation
Sensor Instances
Access Control
instance
ERDDAP
File Store
UUID
observation
NERC SCIENCE OF THE ENVIRONMENT

Concentration Music
vocab.nerc.ac.uk/collectio
Alexandra
vocab.nerc.ac.uk/collection/L22/current/TOOL0969/
Apps Bookmarks Projects BODCInternal RDF study BODC PHD Vocabularies rdf_staff medepad Suggested Sites Imported From IE Acer

⇑ -- Aanderaa 4531 oxygen optode --

URI	http://vocab.nerc.ac.uk/collection/L22/current/TOOL0969/
Identifier ()	SDN:L22::TOOL0969
Preferred label (en)	**Aanderaa 4531 oxygen optode**
Alternative label (en)	AA optode 4531
Definition (en)	A dissolved oxygen sensor which provides analogue and digital output to third party data loggers. Measurem on the ability of selected substances to act as dynamic fluorescence quenchers. The fluorescent indicator is a platinum porphyrin complex embedded in a gas permeable foil that is exposed to the surrounding water. A bl optical isolation coating protects the complex from sunlight and fluorescent particles in the water. This sensir attached to a window providing optical access for the measuring system from inside a watertight titanium ho foil is excited by modulated blue light, and the phase of a returned red light is measured. By linearizing and temperature compensating, with an incorporated temperature sensor, the absolute O2 concentration can be determined.
Version Info ()	1
Deprecated()	false
Broader	http://vocab.nerc.ac.uk/collection/L05/current/351/
Date ()	2016-01-26 09:17:05.0


linkeddev.bodc.ac.uk/system/prototype/TOOL0969/
This XML file does not appear to have any style information associated with it. The document tree is shown below.
<gml:description>Aanderaa 4531 oxygen optode</gml:description>
<gml:identifier codeSpace="http://linkeddev.bodc.ac.uk/system/prototype/">TOOL0969</gml:identifier>
http://vocab.nerc.ac.uk/collection/P01/current/DOXYOP01/
http://vocab.nerc.ac.uk/collection/P01/current/TEMPPR01/
http://vocab.nerc.ac.uk/collection/P01/current/DOXYUZ02/
http://vocab.nerc.ac.uk/collection/P01/current/OXYOCPVL/
http://linked.bodc.ac.uk/system/prototype/L22TAB/
longName
Aanderaa 4531 oxygen optode
shortName
Aanderaa 4531 oxygen optode
Manufacturer Name
Aanderaa
UUID→URI
Content Negotiation
Tagged with NVS2 and sensorML ontology concepts


Inbox (19,466) - alexandre
Music for reading - Ch
52°North Sensor Observa
localhost:8080/52n-sos-w
linkeddev.bodc.ac.uk/sml
localhost:8081 / 127.0.0.1
localhost:8080/52n-sos-webapp/service?service=SOS&version=2.0.0&request=DescribeSensor&procedure=http://linkeddev.bodc.ac.uk/sml/system/instance/TOOL0969_1234/&proc
Apps
Bookmarks
Projects
BODCInternal
RDF study
BODC
PHD
Vocabularies
rdf_staff
medepad
Suggested Sites
Imported From IE
Acer
UMLS Terminology ...
Kostis
JENA
This XML file does not appear to have any style information associated with it. The document tree is shown below.
<swes:DescribeSensorResponse xmlns:swes="http://www.opengis.net/swes/2.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:gml="http://www.opengis.net/gml/3.2" xsi:schemaLocation="h
http://schemas.opengis.net/swes/2.0/swesDescribeSensor.xsd http://www.opengis.net/sensorml/2.0 http://schemas.opengis.net/sensorML/2.0/sensorML.xsd http://www.isotc211.org/2005/gmd
http://schemas.opengis.net/iso/19139/20070417/gmd/gmd.xsd http://www.isotc211.org/2005/gco http://schemas.opengis.net/iso/19139/20070417/gco/gco.xsd http://www.opengis.net/gml/3.2 http://schem
<swes:procedureDescriptionFormat>http://www.opengis.net/sensorml/2.0</swes:procedureDescriptionFormat>
<swes:description>
<swes:SensorDescription>
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<gml:TimePeriod gml:id="tp_B80567A8E77735092A1BD2F23A3CCF0877C518AD">
<gml:beginPosition>2016-03-07T17:23:16.000Z</gml:beginPosition>
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</gml:TimePeriod>
</swes:validTime>
<swes:data>
<sml:PhysicalSystem xmlns:gmd="http://www.isotc211.org/2005/gmd" xmlns:gco="http://www.isotc211.org/2005/gco" xmlns:sml="http://www.opengis.net/sensorml/2.0" xmlns:xlink="http://www.w3.
xmlns:swe="http://www.opengis.net/swe/2.0" xsi:schemaLocation="http://www.opengis.net/swes/2.0 http://schemas.opengis.net/swes/2.0/swesDescribeSensor.xsd http://www.opengis.net/sensorml
http://schemas.opengis.net/sensorML/2.0/sensorML.xsd http://www.isotc211.org/2005/gmd http://schemas.opengis.net/iso/19139/20070417/gmd/gmd.xsd http://www.isotc211.org/2005/gco
http://schemas.opengis.net/iso/19139/20070417/gco/gco.xsd http://www.opengis.net/gml/3.2 http://schemas.opengis.net/gml/3.2.1/gml.xsd" gml:id="ps_C01C0CF53892BD6905A237BC2047F903662B500
<gml:description>AANDERAA_Oxygen_Optode_4531</gml:description>
<gml:identifier codeSpace="uniqueID">
http://linkeddev.bodc.ac.uk/sml/system/instance/TOOL0969_1234/
</gml:identifier>
<sml:keywords>
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<sml:keyword>
http://vocab.nerc.ac.uk/collection/P01/current/OXYSZZ02/
</sml:keyword>
<sml:keyword>
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</sml:keyword>
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http://linkeddev.bodc.ac.uk/sml/system/instance/TOOL0969_1234/offering/
</sml:keyword>
<sml:keyword>
http://vocab.nerc.ac.uk/collection/P01/current/DOXYUZ02/
</sml:keyword>
</sml:KeywordList>
</sml:keywords>
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<sml:identifier>
<sml:Term definition="http://sensorml.com/ont/swe/property/SerialNumber">
<sml:label>Serial Number</sml:label>
<sml:value>1234</sml:value>
</sml:Term>
</sml:identifier>
<sml:identifier>
<sml:Term definition="urn:ogc:def:identifier:OGC:uniqueID">
<sml:label>uniqueID</sml:label>
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</sml:value>
</sml:Term>
</sml:identifier>
<sml:identifier>
<sml:Term definition="urn:ogc:def:identifier:OGC:1.0:shortname">
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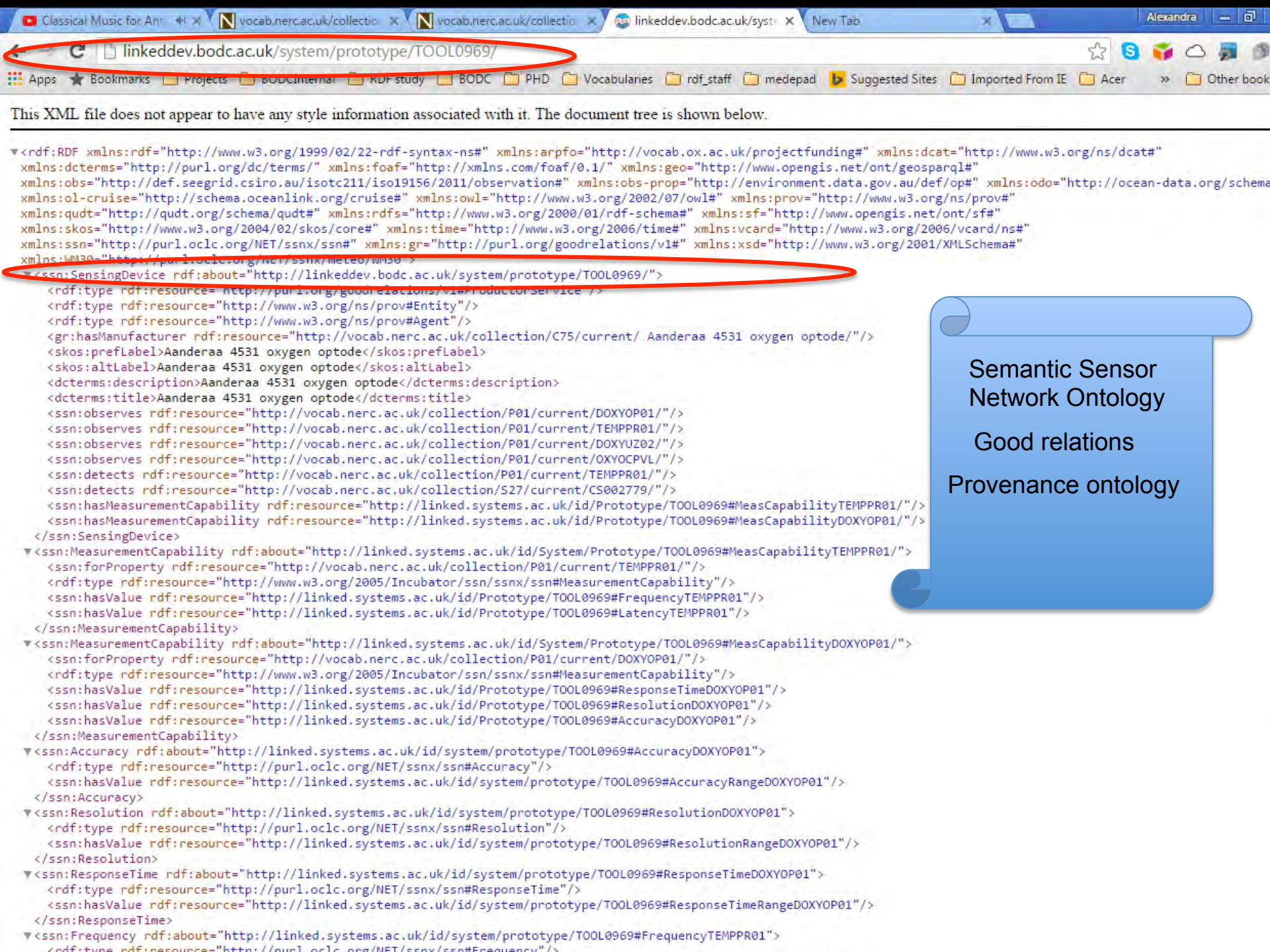
LUBM-NativeStore-....pdf


Classical Music for An
vocab.nerc.ac.uk/collectio
vocab.nerc.ac.uk/collectio
linkeddev.bodc.ac.uk/syst
New Tab
Alexandra
linkeddev.bodc.ac.uk/system/prototype/TOOL0969/
Apps
Bookmarks
Projects
BODCinternal
RDF study
BODC
PHD
Vocabularies
rdf_staff
medepad
Suggested Sites
Imported From IE
Acer
Other book
This XML file does not appear to have any style information associated with it. The document tree is shown below.
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:arpfo="http://vocab.ox.ac.uk/projectfunding#" xmlns:dcat="http://www.w3.org/ns/dcat#"
xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:geo="http://www.opengis.net/ont/geosparql#"
xmlns:obs="http://def.seegrid.csiro.au/isotc211/iso19156/2011/observation#" xmlns:obs-prop="http://environment.data.gov.au/def/op#" xmlns:odo="http://ocean-data.org/schema
xmlns:ol-cruise="http://schema.oceanlink.org/cruise#" xmlns:owl="http://www.w3.org/2002/07/owl#" xmlns:prov="http://www.w3.org/ns/prov#"
xmlns:qudt="http://qudt.org/schema/qudt#" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#" xmlns:sf="http://www.opengis.net/ont/sf#"
xmlns:skos="http://www.w3.org/2004/02/skos/core#" xmlns:time="http://www.w3.org/2006/time#" xmlns:vcard="http://www.w3.org/2006/vcard/ns#"
xmlns:ssn="http://purl.oclc.org/NET/ssnx/ssn#" xmlns:gr="http://purl.org/goodrelations/v1#" xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
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<rdf:type rdf:resource="http://www.w3.org/ns/prov#Entity"/>
<rdf:type rdf:resource="http://www.w3.org/ns/prov#Agent"/>
<gr:hasManufacturer rdf:resource="http://vocab.nerc.ac.uk/collection/C75/current/ Aanderaa 4531 oxygen optode/"/>
<skos:prefLabel>Aanderaa 4531 oxygen optode</skos:prefLabel>
<skos:altLabel>Aanderaa 4531 oxygen optode</skos:altLabel>
<dcterms:description>Aanderaa 4531 oxygen optode</dcterms:description>
<dcterms:title>Aanderaa 4531 oxygen optode</dcterms:title>
<ssn:observes rdf:resource="http://vocab.nerc.ac.uk/collection/P01/current/DOXYOP01/"/>
<ssn:observes rdf:resource="http://vocab.nerc.ac.uk/collection/P01/current/TEMPPR01/"/>
<ssn:observes rdf:resource="http://vocab.nerc.ac.uk/collection/P01/current/DOXYUZ02/"/>
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<ssn:detects rdf:resource="http://vocab.nerc.ac.uk/collection/P01/current/TEMPPR01/"/>
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<ssn:hasMeasurementCapability rdf:resource="http://linked.systems.ac.uk/id/Prototype/TOOL0969#MeasCapabilityTEMPPR01/"/>
<ssn:hasMeasurementCapability rdf:resource="http://linked.systems.ac.uk/id/Prototype/TOOL0969#MeasCapabilityDOXYOP01/"/>
</ssn:SensingDevice>
<ssn:MeasurementCapability rdf:about="http://linked.systems.ac.uk/id/System/Prototype/TOOL0969#MeasCapabilityTEMPPR01/">
<ssn:forProperty rdf:resource="http://vocab.nerc.ac.uk/collection/P01/current/TEMPPR01/"/>
<rdf:type rdf:resource="http://www.w3.org/2005/Incubator/ssn/ssnx/ssn#MeasurementCapability"/>
<ssn:hasValue rdf:resource="http://linked.systems.ac.uk/id/Prototype/TOOL0969#FrequencyTEMPPR01"/>
<ssn:hasValue rdf:resource="http://linked.systems.ac.uk/id/Prototype/TOOL0969#LatencyTEMPPR01"/>
</ssn:MeasurementCapability>
<ssn:MeasurementCapability rdf:about="http://linked.systems.ac.uk/id/System/Prototype/TOOL0969#MeasCapabilityDOXYOP01/">
<ssn:forProperty rdf:resource="http://vocab.nerc.ac.uk/collection/P01/current/DOXYOP01/"/>
<rdf:type rdf:resource="http://www.w3.org/2005/Incubator/ssn/ssnx/ssn#MeasurementCapability"/>
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<ssn:hasValue rdf:resource="http://linked.systems.ac.uk/id/Prototype/TOOL0969#AccuracyDOXYOP01"/>
</ssn:MeasurementCapability>
<ssn:Accuracy rdf:about="http://linked.systems.ac.uk/id/system/prototype/TOOL0969#AccuracyDOXYOP01">
<rdf:type rdf:resource="http://purl.oclc.org/NET/ssnx/ssn#Accuracy"/>
<ssn:hasValue rdf:resource="http://linked.systems.ac.uk/id/system/prototype/TOOL0969#AccuracyRangeDOXYOP01"/>
</ssn:Accuracy>
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<rdf:type rdf:resource="http://purl.oclc.org/NET/ssnx/ssn#Resolution"/>
<ssn:hasValue rdf:resource="http://linked.systems.ac.uk/id/system/prototype/TOOL0969#ResolutionRangeDOXYOP01"/>
</ssn:Resolution>
<ssn:ResponseTime rdf:about="http://linked.systems.ac.uk/id/system/prototype/TOOL0969#ResponseTimeDOXYOP01">
<rdf:type rdf:resource="http://purl.oclc.org/NET/ssnx/ssn#ResponseTime"/>
<ssn:hasValue rdf:resource="http://linked.systems.ac.uk/id/system/prototype/TOOL0969#ResponseTimeRangeDOXYOP01"/>
</ssn:ResponseTime>
<ssn:Frequency rdf:about="http://linked.systems.ac.uk/id/system/prototype/TOOL0969#FrequencyTEMPPR01">
Semantic Sensor Network Ontology
Good relations
Provenance ontology

linkeddev.bodc.ac.uk/syst
Getting S
Options
Connect USB Device
Send Ctrl-Alt-Delete
BODC_floating
linkeddev.bodc.ac.uk/system/instance/TOOL0969_1234/
This XML file does not appear to have any style information associated with it. The document tree is shown below.
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:arpfo="http://vocab.ox.ac.uk/projectfunding#" xmlns:dcat="http://www.w
xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:geo="http://www.opengis.net/ont/geosparql#"
xmlns:obs="http://def.seegrid.csiro.au/isotc211/iso19156/2011/observation#" xmlns:obs-prop="http://environment.data.gov.au/def/op#" xmlns:od
cruise="http://schema.oceanlink.org/cruise#" xmlns:owl="http://www.w3.org/2002/07/owl#" xmlns:prov="http://www.w3.org/ns/prov#" xmlns:qudt="
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#" xmlns:sf="http://www.opengis.net/ont/sf#" xmlns:skos="http://www.w3.org/2004/02/skos/core#
xmlns:vcard="http://www.w3.org/2006/vcard/ns#" xmlns:ssn="http://purl.oclc.org/NET/ssnx/ssn#" xmlns:gr="http://purl.org/goodrelations/v1#" xm
xmlns:wgs84_po
<ssn:SensingDevice rdf:about="http://linkeddev.bodc.ac.uk/system/instance/TOOL0969_1234/">
<rdf:type rdf:resource="http://def.seegrid.csiro.au/ontology/om/om-lite#ObservationProcess"/>
<gr:hasMakeAndModel rdf:resource="http://linkeddev.bodc.ac.uk/system/prototype/TOOL0969/"/>
<ssn:onPlatform rdf:resource="http://vocab.nerc.ac.uk/collection/L06/current/25/"/>
<gr:serialNumber>1234</gr:serialNumber>
</ssn:SensingDevice>
<ssn:Deployment rdf:about="http://linked.systems.ac.uk/id/System/instance/TOOL0969_1234/Deployment_3/">
<rdf:type rdf:resource="http://www.w3.org/ns/prov#Activity"/>
<ssn:deployedOnPlatform rdf:resource="http://vocab.nerc.ac.uk/collection/L06/current/25/"/>
<dul:TimeInterval rdf:resource="http://linked.systems.ac.uk/id/deployment/3/#deploymentDates"/>
</ssn:Deployment>
<ssn:Platform rdf:about="http://vocab.nerc.ac.uk/collection/L06/current/25/">
<skos:prefLabel>autonomous underwater vehicle</skos:prefLabel>
<prov:atLocation rdf:resource="http://linked.systems.ac.uk/feature/TOOL0969_1234"/>
<rdf:type rdf:resource="prov:Entity"/>
</ssn:Platform>
<prov:Location rdf:about="http://linked.systems.ac.uk/feature/TOOL0969_1234">
<rdf:type rdf:resource="geo:Feature"/>
<wgs84_pos:lat>47.6</wgs84_pos:lat>
<wgs84_pos:long>88.67</wgs84_pos:long>
</prov:Location>
</rdf:RDF>

This XML file does not appear to have any style information associated with it. The document tree is shown below.


```
<sos:GetObservationResponse xmlns:sos="http://www.opengis.net/sos/2.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:om="http://www.opengis.net/om/2.0" xmlns:gml="http://ww
xmlns:xlink="http://www.w3.org/1999/xlink" xsi:schemaLocation="http://www.opengis.net/sos/2.0 http://schemas.opengis.net/sos/2.0/sosGetObservation.xsd http://www.opengis.net/om/2.0
http://schemas.opengis.net/om/2.0/observation.xsd http://www.opengis.net/gml/3.2 http://schemas.opengis.net/gml/3.2.1/gml.xsd">
  <sos:observationData>...</sos:observationData>
  <sos:observationData>
    <om:OM_Observation gml:id="o_18">
      <om:type xlink:href="http://www.opengis.net/def/observationType/OGC-OM/2.0/OM_Measurement"/>
      <om:phenomenonTime>
        <gml:TimeInstant gml:id="phenomenonTime_18">
          <gml:timePosition>2012-11-19T11:33:00.000Z</gml:timePosition>
        </gml:TimeInstant>
      </om:phenomenonTime>
      <om:resultTime>
        <gml:TimeInstant gml:id="ti_47EBF263694BCC647CF39C8EDF589FB364490FD2">
          <gml:timePosition>2012-11-19T11:50:00.000Z</gml:timePosition>
        </gml:TimeInstant>
      </om:resultTime>
      <om:procedure xlink:href="http://linkeddev.bodc.ac.uk/sml/system/instance/TOOL0969_1234/"/>
      <om:observedProperty xlink:href="http://vocab.nerc.ac.uk/collection/P01/current/OXYSOP01/" xlink:title=" Saturation of oxygen {O2 CAS 7782-44-7} in the water body [dissolved plus re
      optode and computation from concentration"/>
      <om:featureOfInterest xlink:href="http://vocab.nerc.ac.uk/collection/GS1/current/" xlink:title="BODC"/>
      <om:result xmlns:ns="http://www.opengis.net/gml/3.2" uom="http://vocab.nerc.ac.uk/collection/P06/current/UPCT/" xsi:type="ns:MeasureType">82.593</om:result>
    </om:OM_Observation>
  </sos:observationData>
  <sos:observationData>
    <om:OM_Observation gml:id="o_20">
      <om:type xlink:href="http://www.opengis.net/def/observationType/OGC-OM/2.0/OM_Measurement"/>
      <om:phenomenonTime>
        <gml:TimeInstant gml:id="phenomenonTime_20">
          <gml:timePosition>2012-11-19T11:34:00.000Z</gml:timePosition>
        </gml:TimeInstant>
      </om:phenomenonTime>
      <om:resultTime>
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          <gml:timePosition>2012-11-19T11:50:00.000Z</gml:timePosition>
        </gml:TimeInstant>
      </om:resultTime>
      <om:procedure xlink:href="http://linkeddev.bodc.ac.uk/sml/system/instance/TOOL0969_1234/"/>
      <om:observedProperty xlink:href="http://vocab.nerc.ac.uk/collection/P01/current/OXYSOP01/" xlink:title=" Saturation of oxygen {O2 CAS 7782-44-7} in the water body [dissolved plus re
      optode and computation from concentration"/>
      <om:featureOfInterest xlink:href="http://vocab.nerc.ac.uk/collection/GS1/current/" xlink:title="BODC"/>
      <om:result xmlns:ns="http://www.opengis.net/gml/3.2" uom="http://vocab.nerc.ac.uk/collection/P06/current/UPCT/" xsi:type="ns:MeasureType">81.736</om:result>
    </om:OM_Observation>
  </sos:observationData>
  <sos:observationData>
    <om:OM_Observation gml:id="o_21">
      <om:type xlink:href="http://www.opengis.net/def/observationType/OGC-OM/2.0/OM_Measurement"/>
      <om:phenomenonTime>
        <gml:TimeInstant gml:id="phenomenonTime_21">
          <gml:timePosition>2012-11-19T11:35:00.000Z</gml:timePosition>
        </gml:TimeInstant>
      </om:phenomenonTime>
      <om:resultTime>
        <gml:TimeInstant gml:id="ti_5A3F3BD1999E3BFF2F45DC5D345DBAF0BE8712F4">
          <gml:timePosition>2012-11-19T11:50:00.000Z</gml:timePosition>
        </gml:TimeInstant>
      </om:resultTime>
      <om:procedure xlink:href="http://linkeddev.bodc.ac.uk/sml/system/instance/TOOL0969_1234/"/>
```
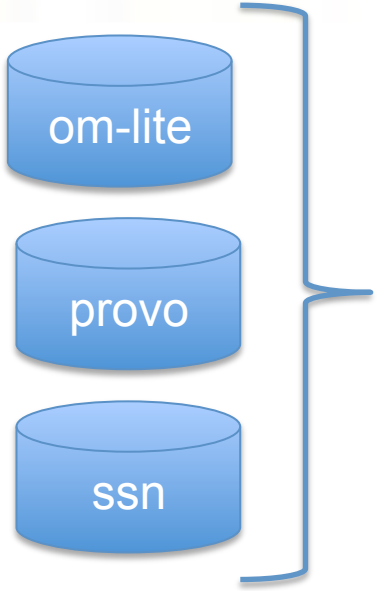

This XML file does not appear to have any style information associated with it. The document tree is shown below.


```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:lso="http://linked.bodc.ac.uk/ontology.df#" xmlns:arpfo="http://vocab.ox.ac.uk/projectfunding#" xmlns:
 xmlns:dcterms="http://purl.org/dc/terms/" xmlns:foaf="http://xmlns.com/foaf/0.1/" xmlns:geo="http://www.opengis.net/ont/geosparql#" xmlns:obs="http://def.seegrid.csiro.au/is
 prop="http://environment.data.gov.au/def/op#" xmlns:odo="http://ocean-data.org/schema/" xmlns:ol-cruise="http://schema.oceanlink.org/cruise#" xmlns:owl="http://www.w3.org/20
 xmlns:oml="http://def.seegrid.csiro.au/ontology/om/om-lite#" xmlns:qudt="http://qudt.org/schema/qudt#" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#" xmlns:sf="http://ww
 xmlns:skos="http://www.w3.org/2004/02/skos/core#" xmlns:time="http://www.w3.org/2006/time#" xmlns:vcard="http://www.w3.org/2006/vcard/ns#" xmlns:ssn="http://purl.oclc.org/NE
 xmlns:xsd="http://www.w3.org/2001/XMLSchema#" xmlns:WGS="http://purl.oclc.org/NET/ssnx/meteo/WGS30">
▼<oml:Observation rdf:about="http://linked.systems.ac.uk/observation/21/">
    <rdf:type rdf:resource="http://www.w3.org/ns/dcat#Dataset"/>
    <rdf:type rdf:resource="http://purl.oclc.org/NET/ssnx/lso#ActivityOfSensing"/>
    <rdf:type rdf:resource="http://ocean-data.org/schema/DeploymentDataset"/>
    <rdf:type rdf:resource="http://www.w3.org/ns/prov#Activity"/>
    <rdfs:comment>Observation instance with remote result</rdfs:comment>
    <rdfs:label>Observation instance with remote result</rdfs:label>
    <oml:featureOfInterest rdf:resource="http://vocab.nerc.ac.uk/collection/GS1/current/"/>
    <oml:observedProperty rdf:resource="http://vocab.nerc.ac.uk/collection/P01/current/DOXYOP01"/>
    <oml:result rdf:resource="paththothedatasetinERRDAP"/>
    <prov:generated rdf:resource="http://linked.systems.ac.uk/observation/SensorOutput"/>
    <oml:observationProcedure rdf:resource="http://linked.bodc.ac.uk/system/instance/TOOL0969_1234/"/>
    <oml:resultTime>2012-11-19 12:44:00</oml:resultTime>
    <oml:phenomenonTime rdf:resource="http://linked.bodc.ac.uk/series/1094427#timeInterval"/>
    <prov:qualifiedAssociation rdf:resource="http://linked.systems.ac.uk/observation/21#SensorPerformedSensing"/>
    <prov:qualifiedUsage rdf:resource="http://linked.systems.ac.uk/observation/21#SensingUsage"/>
    <prov:wasInfluencedBy rdf:resource="http://vocab.nerc.ac.uk/collection/P01/current/TEMPPR01/"/>
    <prov:wasInfluencedBy rdf:resource="http://vocab.nerc.ac.uk/collection/S27/current/CS002779/"/>
  </oml:Observation>
▼<ssn:SensorOuput rdf:about="http://linked.systems.ac.uk/observation/21#SenosrOutput">
    <prov:wasAttributedTo rdf:resource="http://linked.bodc.ac.uk/system/instance/TOOL0969_1234/"/>
    <ssn:isProducedBy rdf:resource="http://linked.bodc.ac.uk/system/instance/TOOL0969_1234/"/>
    <rdf:type rdf:resource="prov:Entity"/>
    <ssn:hasValue rdf:resource="pathToERDDAPFile"/>
  </ssn:SensorOuput>
▼<lso:SensorPerformedSensing rdf:about="http://linked.systems.ac.uk/observation/21#SensorPerformedSensing">
    <rdf:type rdf:resource="prov:Association"/>
    <prov:hadPlan rdf:resource="SensingURL"/>
    <prov:hadRole rdf:resource="http://linked.systems.ac.uk/observation/21#PerformedSensing"/>
    <lso:sensingAgent rdf:resource="http://linked.bodc.ac.uk/system/instance/TOOL0969_1234/"/>
  </lso:SensorPerformedSensing>
▼<time:ProperInterval rdf:about="http://linked.systems.ac.uk/observation/21#timeInterval">
    <time:hasBeginning rdf:resource="http://linked.systems.ac.uk/observation/21#timeBegins"/>
    <time:hasEnd rdf:resource="http://linked.systems.ac.uk/observation/21#timeEnds"/>
  </time:ProperInterval>
▼<time:Instant rdf:about="http://linked.systems.ac.uk/observation/21#timeBegins">
    <time:inXSDDateTime>2012-11-19 12:30:00</time:inXSDDateTime>
  </time:Instant>
▼<time:Instant rdf:about="http://linked.systems.ac.uk/observation/21#timeEnds">
    <time:inXSDDateTime>2012-11-19 12:44:00</time:inXSDDateTime>
  </time:Instant>
  <ssn:Stimulus rdf:about="http://vocab.nerc.ac.uk/collection/P01/current/TEMPPR01/"/>
  <ssn:Stimulus rdf:about="http://vocab.nerc.ac.uk/collection/S27/current/CS002779/"/>
</rdf:RDF>
```

ERDDAP > Sensor Instance Form

This is the Data Provider Form.
Need help? Send an email to the administrator of this ERDDAP (thogar at noc dot ac dot uk).

Your Contact Information

This will be used by the ERDDAP administrator to contact you.
The information will be stored in the database to allow for idenification of records
This won't be made public.

What is your name? null

What is your email address?

This dataset submission's timestamp is 2016-03-08T11:27:17.

Sensor instances Information

This form has been provided to allow you to enter the information require to turn a sensor protype into a sensor instance. This information will be added to the deployment database

If your require help please email the system admin at (thogar at noc dot ac dot uk).

Sensor System Type? Version_4_systems

Serial Number of the system:

**** No components were link to the system you have chosen ***

Finished?

Click Submit to send this information.

Waiting for 192.171.135.157...

ERDDAP - Ardbeg (SG545 | Reroute or move connect | ERDDAP - Information | ERDDAP - RESTful Web S... | Alexandra

192.171.135.157:8080/erddap/tabledap/C_Users_thogar_Desktop_data_b6f8_8385_4c41.graph?latitude,TEMP,time&time>=2015-08-12T00:00:00Z&time<=2015-08-19T00:00:00Z&.draw=mark

Apps | Bookmarks | Projects | BODCInternal | RDF study | BODC | PHD | Vocabularies | rdf_staff | medepad | Suggested Sites | Imported From IE | Acer | UMLS Terminology ... | Kostis | JENA | Imported From IE (1) | Other bookmarks

ERDDAP
Easier access to scientific data

log in
Brought to you by NOAA NMFS SWFSC ERD

ERDDAP > tabledap > Make A Graph

Dataset Title: **Ardbeg (SG545) glider data from Extended Ellett Line occupation #4** RSS
Institution: bodc (Dataset ID: C_Users_thogar_Desktop_data_b6f8_8385_4c41)
Range: longitude = -6.832658 to -6.830656°E, latitude = 56.780083 to 56.78132°N, depth = 2.393526 to 133.78505, time = 2015-08-18T13:19:00Z to 2015-08-18T13:19:00Z
Information: Summary | License | FGDC | ISO 19115 | Metadata | Background | Subset | Data Access Form

Graph Type: markers
X Axis: latitude
Y Axis: TEMP
Color: time

Constraints

	Optional Constraint #1	Optional Constraint #2
time	>= 2015-08-12T00:00:00Z	<= 2015-08-19T00:00:00Z
	>=	<=
	>=	<=
	>=	<=
	>=	<=

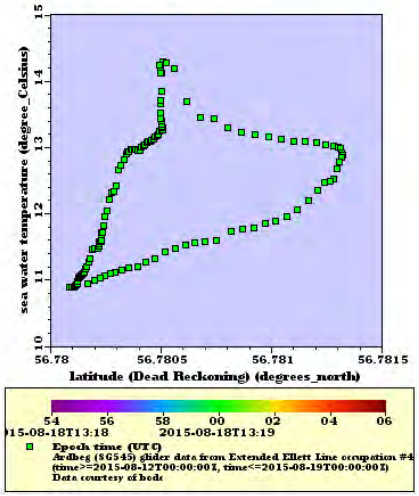
Server-side Functions
distinct()
orderBy ("")

Graph Settings
Marker Type: Filled Square Size: 5
Color:
Color Bar: Continuity: Scale:
Min: Max: N Sections:
Y Axis Minimum: Maximum:

Redraw the Graph (Please be patient. It may take a while to get the data.)

Optional:
Then set the File Type: .htmlTable and Download the Data or an Image
or view the URL: http://192.171.135.157:8080/erddap/tabledap/C_Users_thogar_Desktop_data_
(Documentation / Bypass this form) (File Type information)

Time range: 7 day(s)



Things You Can Do With Your Graphs

Well, you can do anything you want with your graphs, of course. But some things you might not have considered are:

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Conclusions

-Controlled vocabularies for

- Consistency
- Discoverability
- Machine & human readability

-Use of standards (RDF, SensorML, SPARQL) for sensors

-Participate in communities to create agreements

-Share knowledge and best practices

Thanks!