

# Production of a search and browse interface to an environmental thesaurus

Oliver Clements, Adam Leadbetter and Roy Lowry  
British Oceanographic Data Centre, Liverpool



# Introduction

- Background to the NERC Vocabulary Server(NVS)
- Summary of the existing NVS client
- Design process for new NVS client
- Summary of key features of new NVS client



# NERC Vocabulary server

- ~10 years old in its current form
- Over 200,000 concepts
- ~170 lists/thesauri
- Over 100,000 relationships



# NERC Vocabulary Server API

SOAP web services as well as pseudo RESTful  
HTTP-POX

Methods include :-

- SearchVocab
- GetList
- GetMap
- GetRelatedByTerm



# Existing NVS client

- Has basic search interface



# searchVocab()

*No results available*

Error: 3

listKey:

searchTerm:

termType:

# Existing NVS client

- Has basic search interface
- Very simple results



# searchVocab()

Term URL	Term	Abbreviated term	Definition
<a href="http://vocab.ndq.nerc.ac.uk/term/S040/60/S04337">http://vocab.ndq.nerc.ac.uk/term/S040/60/S04337</a>	temperature probe on half tide pressure gauge		A temperature sensor mounted on the half-tide sensor (i.e. a sensor exposed for part of the tidal cycle to facilitate geodetic levelling) of a pressure-sensing tide gauge.
<a href="http://vocab.ndq.nerc.ac.uk/term/P071/17/CF12N596">http://vocab.ndq.nerc.ac.uk/term/P071/17/CF12N596</a>	temperature_flux_due_to_evaporation_expressed_as_heat_flux_out_of_sea_water		Evaporation is the conversion of liquid or solid into vapor. (The conversion of solid alone into vapor is called "sublimation".) The quantity with standard name temperature_flux_due_to_evaporation_expressed_as_heat_flux_out_of_sea_water is the heat energy carried by the transfer of water away from the liquid ocean through the process of evaporation. It is distinct from the transfer of latent heat and is calculated relative to the heat that would be transported by water evaporating at zero degrees Celsius. It is calculated as the product $Q_{evap}C_pT_{evap}$ , where $Q_{evap}$ is the mass flux of evaporating water ( $\text{kg m}^{-2} \text{s}^{-1}$ ), $C_p$ is the specific heat capacity of water and $T_{evap}$ is the temperature in degrees Celsius of the evaporating water. In accordance with common usage in geophysical disciplines, "flux" implies per unit area, called "flux density" in physics. The specification of a physical process by the phrase due_to_process means that the quantity named is a single term in a sum of terms which together compose the general quantity named by omitting the phrase.
<a href="http://vocab.ndq.nerc.ac.uk/term/P071/17/CF12N597">http://vocab.ndq.nerc.ac.uk/term/P071/17/CF12N597</a>	temperature_flux_due_to_rainfall_expressed_as_heat_flux_into_sea_water		The quantity with standard name temperature_flux_due_to_rainfall_expressed_as_heat_flux_into_sea_water is the heat energy carried by rainfall entering the sea at the sea surface. It is calculated relative to the heat that would be carried by rainfall entering the sea at zero degrees Celsius. It is calculated as the product $Q_{rain}C_pT_{rain}$ , where $Q_{rain}$ is the mass flux of rainfall entering the sea ( $\text{kg m}^{-2} \text{s}^{-1}$ ), $C_p$ is the specific heat capacity of water and $T_{rain}$ is the temperature in degrees Celsius of the rain water entering the sea surface. In accordance with common usage in geophysical disciplines, "flux" implies per unit area, called "flux density" in physics. The specification of a physical process by the phrase due_to_process means that the quantity named is a single term in a sum of terms which together compose the general quantity named by omitting the phrase.
			Runoff is the liquid water which drains from land. If not specified, "runoff" refers to

# Existing NVS client

- Has basic search interface
- Very simple results
- No concept browsing capabilities



```
<?xml version="1.0" ?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:skos="http://www.w3.org/2004/02/skos/core#"
xmlns:dc="http://purl.org/dc/elements/1.1/">
<skos:Concept rdf:about='http://vocab.ndg.nerc.ac.uk/term/S040/60/S04337'>
<skos:externalID>SDN:S040:60:S04337</skos:externalID>
<skos:prefLabel>temperature probe on half tide pressure gauge</skos:prefLabel>
<skos:altLabel></skos:altLabel>
<skos:definition>A temperature sensor mounted on the half-tide sensor (i.e. a sensor exposed for part of the tidal cycle to facilitate geodetic levelling) of a pressure-
<dc:date>2011-03-30T21:05:33.655+0000</dc:date></skos:Concept>
</rdf:RDF>
```



# End User Complaints

- Search too difficult to find needed concept
- No mechanism for cross-walk
- These issues were stopping new user from hosting their thesauri in the NVS



# Design of new client

- Need for end user consultation
- Initially focused on other NERC organisation
- Iterative approach of beta release followed by another round of feedback
- Back-end to use python WSGI with JQuery front-end



# Features of new client

- Very simple search





# Vocabulary Server

 

exact term only

# Features of new client

- Very simple search
- Rich results page





NATURAL  
ENVIRONMENT  
RESEARCH COUNCIL

# Vocabulary Server

results: 537 from 23 lists in 3.44s - displaying 10 per page

results/page

First ◀ 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 ▶ Last

## [Aanderaa RCM 4/5 temperature and salinity recorders \(RCM 4/5 TS\)](#)

Withdrawn RCM4 or RCM5 current meters fitted with conductivity and temperature sensors given a new lease of life as temperature and salinity recorders.

member of SeaVoX Device Catalogue (L221) [show tree](#)

## [Acclaim barometer temperature sensor \(none\)](#)

The temperature sensor fitted to the barometer of a Proudman Oceanographic Laboratory Acclaim experiment tide gauge.

member of BODC parameter semantic model analytical method entity descriptions (S040) [show tree](#)

## [Air Temperature \(none\)](#)

none

member of Global Change Master Directory Science Keyword variables (P141) [show tree](#)

## [Air Temperature Indices \(none\)](#)

none

member of Global Change Master Directory Science Keyword terms (P131) [show tree](#)

## [Air Temperature Reconstruction \(none\)](#)

none

member of Global Change Master Directory Science Keyword variables (P141) [show tree](#)

## [Air temperature \(Air temp\)](#)

Parameters quantifying the degree of hotness of the atmosphere. Specifically excludes indirect measurements of other parameters such as wet bulb temperatures.

member of SeaDataNet Parameter Discovery Vocabulary (P021) [show tree](#)

## [Antenna Temperature \(none\)](#)

none

member of Global Change Master Directory Science Keyword variables (P141) [show tree](#)

# Features of new client

- Very simple search
- Rich results page
- Term browser





**SeaVoX Device Catalogue > Aanderaa RCM 4/5 temperature and salinity recorders**

termKey  
TOOL0212

prefLabel  
Aanderaa RCM 4/5 temperature and salinity recorders

altLabel  
RCM 4/5 TS

description  
Withdrawn RCM4 or RCM5 current meters fitted with conductivity and temperature sensors given a new lease of life as temperature and salinity recorders.

last modified  
2010-05-18 15:10:58

**Mappings and related terms**

exact match  
broader terms

SeaDataNet sensor and instrument package categories (L054)

[salinity sensor](#)

[water temperature sensor](#)

narrower terms  
minor matches

**Gemet related terms +**



**Inspire related terms +**

**L051 (instruments) related terms +**

**ONE Geology related terms +**

**SeaDataNet sensor and instrument package categories > salinity sensor**

termKey  
350

prefLabel  
salinity sensor

altLabel

description  
Instrument that simultaneously measures electrical conductivity and temperature in the water column to provide temperature and salinity data

last modified  
2010-11-19 14:24:10

**Mappings and related terms**

exact match  
broader terms

**SeaDataNet device category types (L211)**

[SeaDataNet in-situ sensor and instrument package categories](#)

narrower terms

**SeaVoX Device Catalogue (L221)**

[Christian Albrechts University of Kiel Multisonde CTD profiler](#)

[Neil Brown MK3 CTD](#)

[Bissett-Bermann 9040 CTD system](#)

[Bissett-Bermann 9006 STD system](#)

[Plessey 9400 CTD](#)

[Sea-Bird SBE 37-SM MicroCAT C-T Sensor](#)

[Sea-Bird SBE 37-SMP MicroCAT C-T Sensor](#)

[Sea-Bird SBE 37-IMP MicroCAT C-T Sensor](#)

[Sea-Bird SBE 37-SIP MicroCAT C-T Sensor](#)

[Sea-Bird SBE 37-SMP MicroCAT C-T Sensor](#)

# Features of new client

- Very simple search
- Rich results page
- Term browser

These have been achieved by using the existing API with some background caching to speed it up



# Future enhancements

- Pre & Post search filtering
- Concept relationship visualisation
- API V2 being designed for release Q4 2011
- SPARQL back-end to speed up queries
- Release code as an example client



Thanks..  
Any Questions?