

# Toward FAIR Semantic Resources



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DI4R area 1: Interoperability  
Brussels, 30/11/2017

# B2NOTE: a Semantic Annotation Service

- Associate additional information to data elements without changing the data element (W3C Web Annotation standard)
- Annotation used to retrieve and aggregate data elements from different sources
- B2NOTE is integrated with EUDAT B2SHARE service
- B2NOTE can be integrated by external data repositories
- B2NOTE is a pilot service. Production service will be released in upcoming months.

GO TO EUDAT WEBSITE



Search records for...

Q SEARCH

<https://b2note.bsc.es>

Login

RECORDS » 6346E397365B42D2886B043B5251E732

## Climate\_ENES reduced data set rico\_gcscs exper

by Rajapakse, Asela;

Nov 27, 2017

**Description:** ONLY FOR TESTING PURPOSES/INCOMPLETE DATA: Model output data archive of a rico\_gcscs experiment (<http://journals.ametsoc.org/doi/10.1175/JAS-D-16-0326.1>). Reduced to the li climate variable over 61 time steps only. Tar archive has been split into four parts and needs to be c can be unpacked.

**Disciplines:** 3.3.14 → Earth sciences → Meteorology;

**DOI:** [XXXX/b2share.6346e397365b42d2886b043b5251e732](https://doi.org/10.5281/XXXX/b2share.6346e397365b42d2886b043b5251e732)

**PID:** [0000/6346e397365b42d2886b043b5251e732](https://purl.org/urn:bnf:pid:0000/6346e397365b42d2886b043b5251e732)

### Files

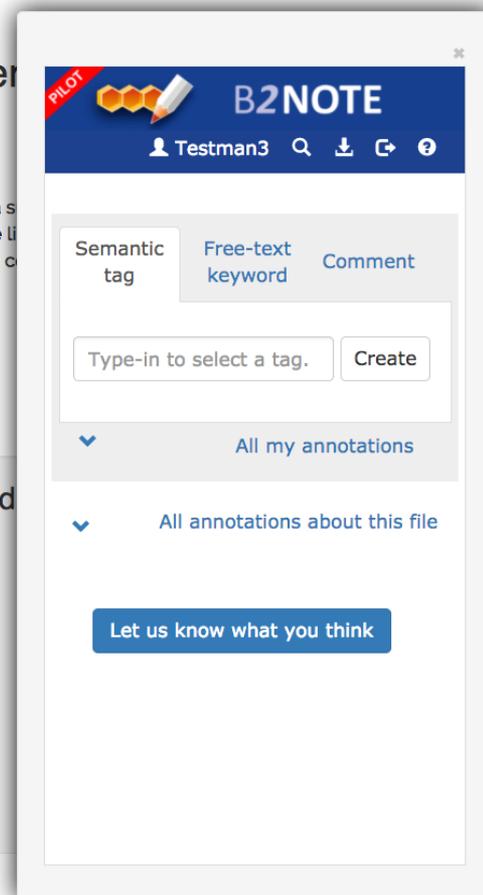
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<ul style="list-style-type: none"> <li>rico_gcscs_xy_lwp_1h.tar.partab</li> </ul>	4.00GB
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<ul style="list-style-type: none"> <li>rico_gcscs_xy_lwp_1h.tar.partad</li> </ul>	3.13GB

### Basic metadata

Open Access

License

Contact Email



**B2NOTE** (PILOT)

Testman3

Semantic tag | Free-text keyword | Comment

Type-in to select a tag.

All my annotations

All annotations about this file

GO TO EUDAT WEBSITE



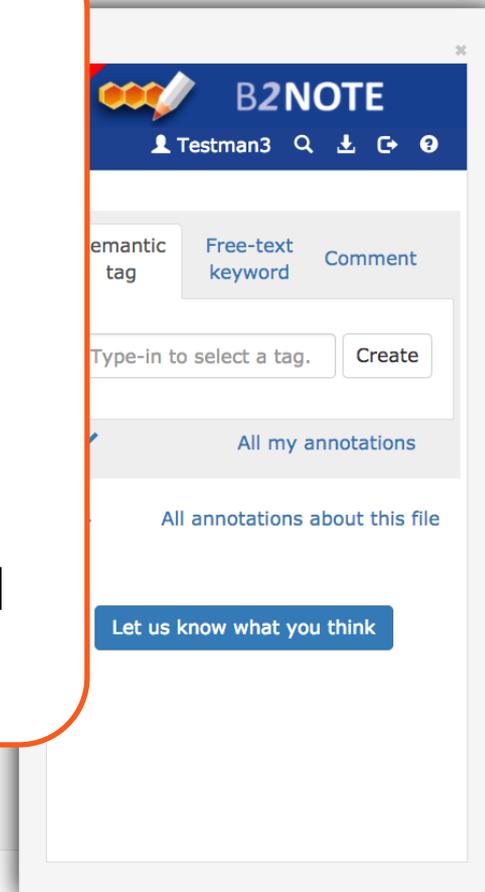
Search records for...

Q SEARCH

HELP COMMUNITIES UPLOAD CONTACT

Login

- Creation and management of annotations
- Three types of annotations:
  - Free text keyword annotation
  - Comment annotation
  - Semantic annotation
- Autocomplete function using indexed semantic resources



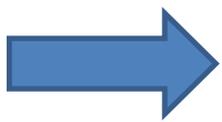
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- Support term/concept discovery for semantic annotations
- Build SolR index from Bioportal (434 ontologies and more than 5 millions of concepts)
- Restricted to biomedical domain
- **How can we extend this approach to other scientific domains ?**

# Semantic Index

- Support term/concept discovery for semantic annotations
- Build SolR index from Bioportal (434 ontologies and more than 5 millions of concepts)
- Restricted to biomedical domain
- **How can we extend this approach to other scientific domains ?**



**Extension to other domains requires the indexing of more semantic resources**

## ◆ **A definition:**

Individual semantic artifact (Ontologies, Vocabularies, Thesauri,...) and semantic repositories.

## ◆ **Landscape evaluation**

- ◆ Distributed over the web with limited visibility
- ◆ Different formats (OWL, SKOS, OBO, ...)
- ◆ Different metadata descriptions
- ◆ Different repository data models
- ◆ Different APIs

**F**indable

**A**ccessible

**I**nteroperable

**R**eusable

# Subjective FAIRness evaluation

**F**indable



Not easily

**A**ccessible



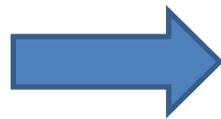
Most of the time

**I**nteroperable



No

**R**eusable



With limitations

# Subjective FAIRness evaluation

Findable



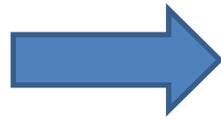
Not easily

Accessible



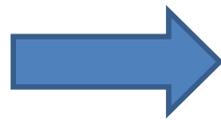
Most of the time

Interoperable



No

Reusable



With limitations



# Identified problems

- Metadata interoperability
- API interoperability
- Discoverability

# How can we improve the situation?

- Community engagement
- Design and development of a proof-of-concept aggregation service

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- Community engagement



EUDAT Semantic WG

- Design and development of a proof-of-concept aggregation service



Semantic Look Up Service

## Co-located EUDAT Semantic Working Group Workshop, 9th RDA Plenary, Barcelona 3-4 April 2017

[View](#) [Generate PDF](#)

Where: Barcelona

When: Monday, 3 April, 2017 to Tuesday, 4 April, 2017

### How to improve the discoverability and the interoperability of multi-disciplinary scientific semantic resources?



As co-located event with [RDA 9th Plenary in Barcelona](#), EUDAT hosted a Semantic Working Group Workshop on 3-4 April 2017.

The workshop was dedicated to discuss on how to enhance the discoverability and interoperability of the existing domain specific semantic resources i.e. ontologies/vocabularies and the existing repositories as well as the various type of scientific semantic resources (e.g. SPARQL endpoints, Linked Data endpoint, FAIR data points).

The aim was to improve the reuse of these resources for data annotations and interlinking with external data resources within

### Upcoming Events

- 30, Nov 2017 - [Save the Date: Digital Infrastr...](#)
- 22, Jan 2018 - [Save the Date: EUDAT Conferenc...](#)

### News

#### [EUDAT at the Digital Infrastructur...](#)

The DI4Rwill take place on November 30th and December 1st 2017 in Brussels, right after the EOSCpilot 1st Stakeholder Engagement Event, aiming to bring together researchers, developers and service...

#### [Meet EUDAT at DI4R!](#)

Brussels is getting ready to host the second edition of Digital Infrastructures for Research, a joint event organised by the major European e-Infrastructure initiatives (

#### [DI4R 2017 programme is now availab...](#)

EUDAT will contribute with 7 presentations, 2 interactive sessions and 2 posters. Make sure to check out the online programme and register by 3 November 2017 to

- 45 participants
- 3 working groups
  - Minimum common metadata for ontologies/vocabularies
  - Interoperability: metadata, data models and API
  - Semantic Marketplace
- Integration with RDA to support international and multi-disciplinary collaboration

endpoints, Linked Data endpoint, FAIR data points).

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## Workshop on Ontology & Semantic Web for Biodiversity & Ecosystem Research

[View](#)
[Generate PDF](#)

Where: Lecce, Italy

When: Tuesday, 11 July, 2017 to Friday, 14 July, 2017



From 11 to 14 July 2017, the EUDAT-LifeWatch Italy hosted a workshop on 'Ontology & Semantic Web for Biodiversity & Ecosystem Research', in Lecce (Italy).

Many different standards, approaches, and semantic tools have been developed to improve data sharing and interoperability. Semantic technologies provide a promising way to properly describe and interrelate these different data sources in ways that reduce barriers to data discovery, integration, and exchange among biodiversity and ecosystem resources and researchers.

LifeWatch Italy and EUDAT wanted to tackle these challenges through their workshop Ontology & Semantic Web for Biodiversity & Ecosystem Research, a forum for the semantic web and linked open data communities, where professionals from Academia, Research Infrastructures, Industries and others interested in these topics were welcome to present theoretical and applied research work, share experiences and discuss the latest scientific results and technology innovations around semantic technologies and linked open data in the field of Biodiversity and Ecosystem Research.

The event particularly revolved around the following main themes:

- Usages of semantic resources in Research Infrastructures (RIs)
- Comparison among vocabulary governances
- Alignment of vocabularies and ontologies

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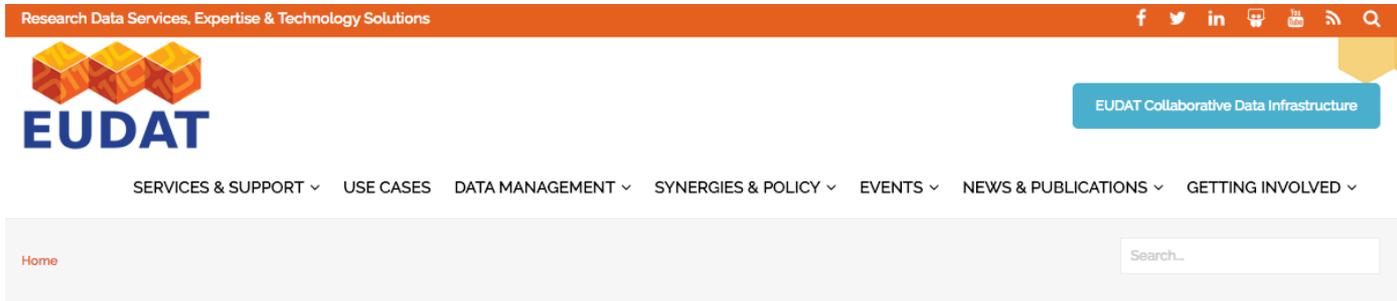
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### About EUDAT

- [What is EUDAT?](#)
- [EUDAT Partners](#)
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- Agreement on the issues
- Need of multi-disciplinary integration of semantic resources for biodiversity
- Interest for the semantic marketplace: list of functionalities to support ontologists and knowledge engineers

From Academia, Research Infrastructures, industries and others interested in these topics were welcome to present theoretical and applied research work, share experiences and discuss the latest scientific results and technology innovations around semantic technologies and linked open data in the field of Biodiversity and Ecosystem Research.

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## IG Vocabulary and Semantic Services - RDA 10th Plenary meeting

[Home](#)

### Meeting title:

Vocabulary services - re-boot and expansion of scope

### Meeting objectives:

To develop a work program around harmonization of key approaches and technologies in vocabulary and semantics services.

### Meeting agenda

- Chair - Adam Shepherd
- Introductions, new structure and scope - *Adam Shepherd* (10 minutes)
- Topics and VSSIG Vision (40 minutes)
  - REST APIs for vocabularies - *Simon Cox*
  - Case study: Biportal, Agroportal, ESIP Portal(s) - *John Graybeal*
  - Vocabulary aggregation and access - *Yann LeFranc*
  - Vocabulary governance patterns - *Simon Cox & Adam Shepherd*
- Plan work program (30 minutes)

### Target audience:

- Metadata experts
- Information scientists
- Ontologists
- Data service architects

### RDA News

**Call for Nominations for CODATA Officers (President and Vice-President(s)) and Executive Committee Members: Deadline 9 April 2018**

26 October 2017

Help CODATA deliver on its strategy to mobilise the data revolution for research!

[Read more](#)

**Northeast Big Data Hub Announces CRUX: The Collaborative Resource and Understanding Exchange Program**

24 October 2017

The Northeast Big Data Innovation Hub (NEBDIH) has recently announced the CRUX program: a...

[Read more](#)

**RDA-US Appoints Leslie McIntosh Borrelli, PhD, MPH, as Executive Director**



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- 5 working groups/task forces
- Topics were selected based on subscription of contributors
- Task forces outcome and dynamic will be evaluated at the next plenary

(NEDM) has recently announced the ERDA program: a...

[Read more](#)

**RDA-US Appoints Leslie McIntosh Borrelli, PhD, MPH, as Executive Director**



Semantic lookup service

Login with Google 

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Log in to register or manage your ontology repository.

<https://bsceudatwp8.bsc.es/>

Repository	Description	Domain	API	API doc
<a href="#">EBI-OLS</a>	The Ontology Lookup Service (OLS) is a repository for biomedical ontologies that aims to provide a single point of access to the latest ontology versions.	biomedical	<a href="#">REST API</a>	<a href="#">Link to the doc</a>
<a href="#">AgroPortal</a>	Use AgroPortal to access and share ontologies	agronomy	<a href="#">REST API</a>	<a href="#">Link to the doc</a>
<a href="#">BioPortal</a>	the world's most comprehensive repository of biomedical ontologies	biology	<a href="#">REST API</a>	<a href="#">Link to the doc</a>

This work has been supported by EUDAT, funded by the European Union under the Horizon 2020 programme - DG CONNECT e-Infrastructures (Contract No. 654065).

Goldfarb and Le Franc, 2017 – Enhancing the Discoverability and Interoperability of Multi-disciplinary Semantic Repositories; Conference: 2nd International Workshop on Semantics for Biodiversity co-located with 16th International Semantic Web Conference (ISWC 2017), At Vienna, Volume: 1933



Semantic lookup service

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- Registration of semantic resources
- Interface to provide mapping for aligning index with resource data model
- Publish list of resource

API	API doc
<a href="#">REST API</a>	<a href="#">Link to the doc</a>
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[BioPortal](#) the world's most comprehensive repository of biomedical ontologies

[biology](#)

[REST API](#) [Link to the doc](#)

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- Registration of semantic resources
- Interface to provide mapping for aligning index with resource data model
- Publish list of resource
- Wishlist**
  - Semi-automated harvesting of the resources**
  - Provide analytics on semantic resources**

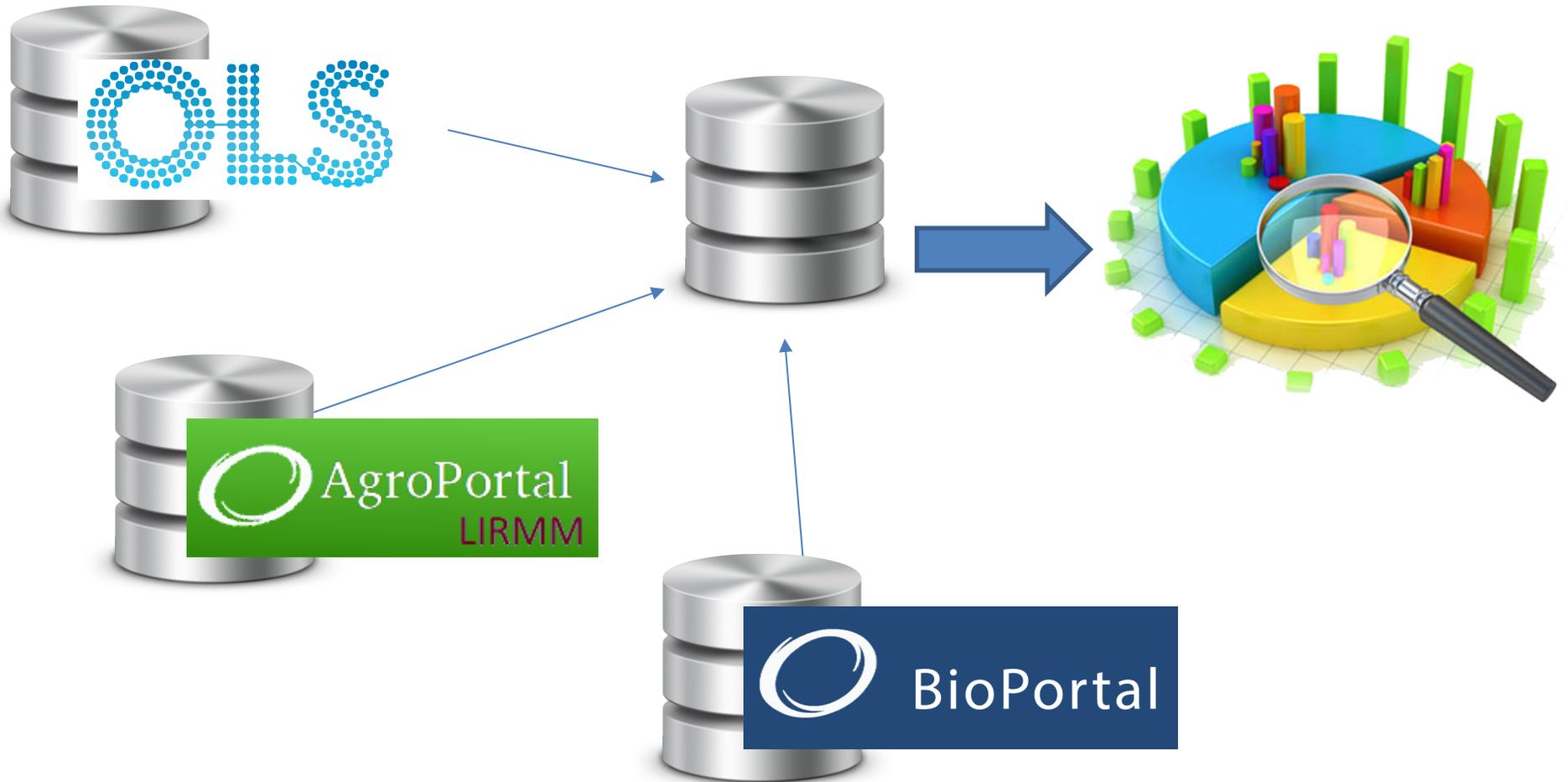
API doc

API [Link to the doc](#)

API [Link to the doc](#)

API [Link to the doc](#)

# Aggregating and analyzing multiple sources



# Conclusions

- An active international collaboration of experts has emerged to address the issues preventing FAIR semantic resources
- Proof-of-concept service:
  - Create and publish a list of multi-disciplinary semantic resources
  - Aggregate semantic resources
  - Provide analytics on the semantic resources
  - Create a multi-disciplinary semantic index



What's next ?

# Why should we continue this effort?

- There is a clear need for semantic services with multi-disciplinary coverage
- Semantic resources are first class citizen in the implementation of FAIR data management system (FAIR Data Point; Luiz Olavo Bonino da Silva Santos et al., 2016)
- Needs of communities like Biodiversity and Ecology for aggregating data from multiple disciplines.
- Needs for Knowledge Engineers/Ontologists to access, aggregate and analyze semantic resources.

# What would be the outcomes?

- A central hub for ontologist and knowledge engineers to access multi-disciplinary semantic resources and analytics.
- A multi-disciplinary curated semantic index that can be used by semantic tools (annotators, text miner,...)
- A set of recommendations and standards to ease the interoperability of semantic resources.
- Potential business applications that would guarantee the sustainability of the resources.

# What do we need?

- Community support
- Strategical positioning
- Financial resources

# What do we need?

- Community support → JOIN US in the RDA IG
- Strategical positioning → How can we integrate this work in the EOSC vision ?
- Financial resources → How can we fund the development of the semantic index ?

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## Your inputs

# Acknowledgements

- ◆ **EUDAT:** Doron Goldfarb, Barbara Magagna, Aymeric Rodriguez
- ◆ **RDA:** Simon Cox, Adam Shepherd, John Graybeal
- ◆ The experts who are contributing to the RDA VSIG
- ◆ The experts who did contribute to shape this project in Barcelona and in Lecce.