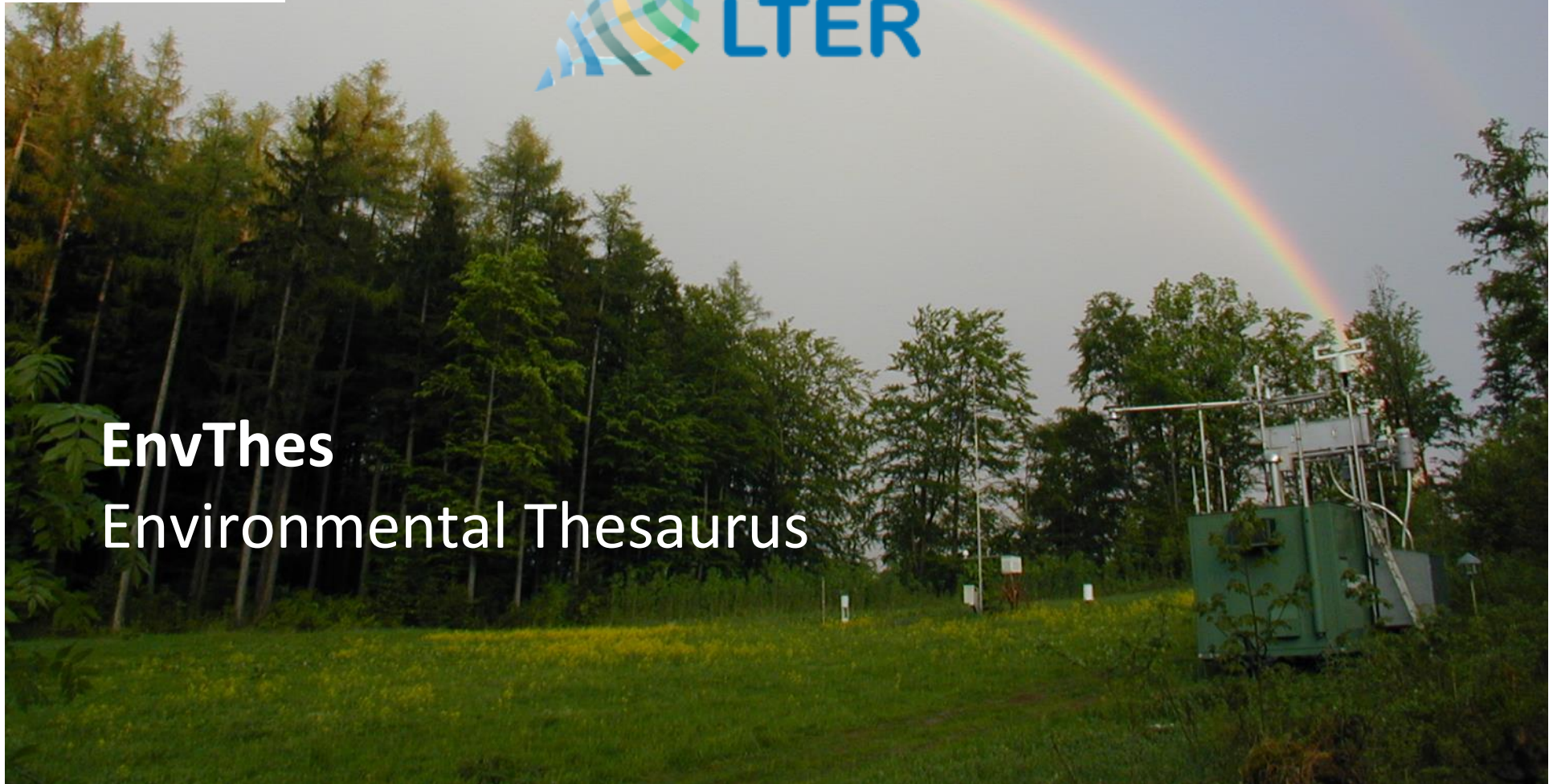




**EnvThes**  
Environmental Thesaurus



# Why you daily need controlled vocabulary

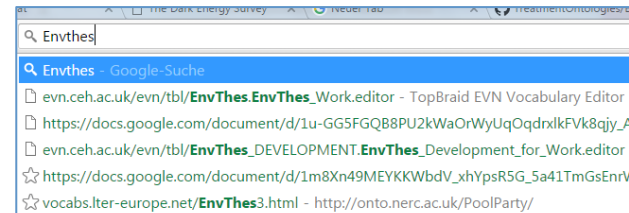
Our daily use controlled vocabularies:



The auto-complete function of your Smartphone

Because of the permanent development of science  
Because of the development of technologies  
Because of conceptual refinement  
Because of multidisciplinarity (we want to get in  
ion: stable core, extendible surroundings

The spellchecker .....

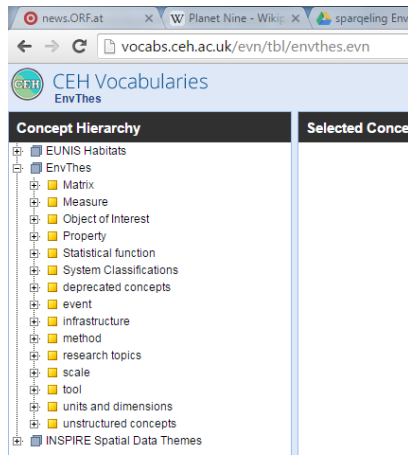


Support of search processes

*... in order to get harmonised information*



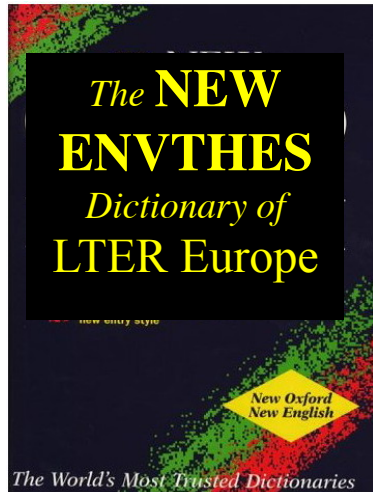
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# About EnvThes

EnvThes – Environmental Thesaurus is the controlled vocabulary for **Long Term Ecosystem Research**

- ... was developed as semantic backbone for describing data collected in the LTER context
- ... is based on the US LTER Controlled Vocabulary
- ... is a community effort
- ... is free and open
- ... can be queried via web endpoints (e.g. SPARQL)



EnvThes is the **‘dictionary’** if you want to speak a common language in data



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# EnvThes - LTER



- EnvThes is a result of a long ongoing process to establish a common language for the LTER community
- LTER-Europe lead by EAA, thesaurus development under the umbrella of the information management group leader Johannes Peterseil, coordinated by Herbert Schentz.



- ALTER-Net (2004-2009): need of a common approach to **describe in a harmonised way data resulting from observation and measurements of ecosystem processes across different domain specific sciences** result: the ontology SERONTO (Socio-Ecological and Ecological Research and Monitoring ONTOlogy) core and domain ontologies and a common metadata database to describe LTER sites and all the contextualized information



- EnvEurope (2010-2013): first steps towards a common vocabulary - EnvThes, based on the metadata collection experience of ALTER-Net, different editors for Thesauri in use: IQVoc, PoolParty, later TopBraid editor



- GsSoil: (2009-2012)experiences from SoilThes development, GEMET -> EnvThes



- Expeer (2010-2013)



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# EnvThes Thesaurus für LTER



T5.6 Data harmonisation



T3.3 (c) Defining standards for publishing data and exchange

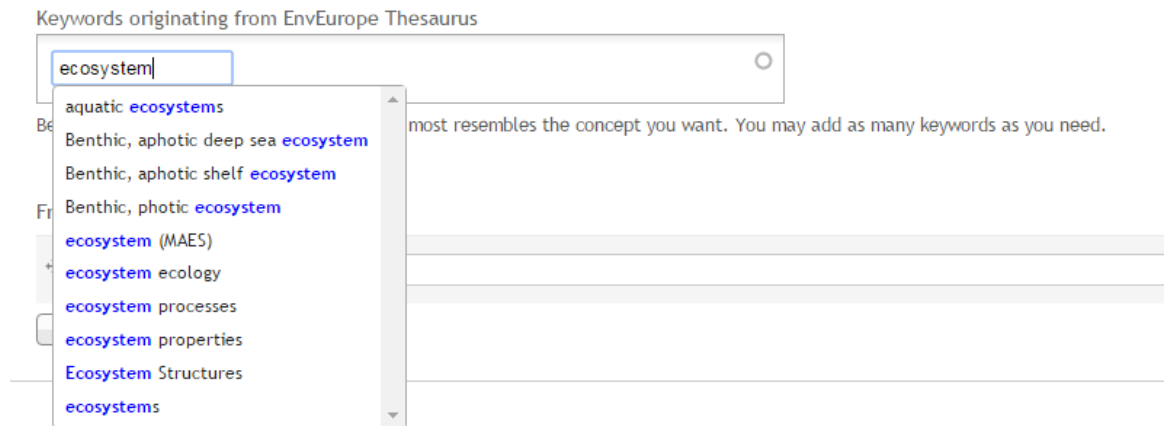


T9.1 Service validation – use case IC10 'Extension of Thesaurus'



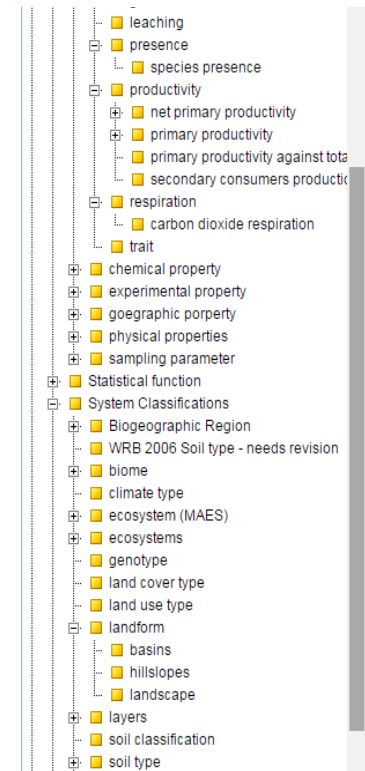
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# Why we need a controlled vocabulary in research



For **common** keywords in DEIMS when  
Annotation and quering **metadata** (on research  
sites and datasets)

e.g. <http://data.lter-europe.net/deims/>



For **common** naming of parameters,  
methods,...  
... when attributing data



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# Why we need a controlled vocabulary in research

- **Multilinguality** – helps when you need translations
- **Defintions and descriptions** – helps to understand concepts by using the scope and definitions
- Usage of EnvThes in research projects
  - keywords of DEIMS
  - data annotation (also for tracking provenance related issues), e.g. parameter naming and characterisation
  - reference in documents (if you enter the URL of a concept you can follow it like a hyperlink)



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# Viewing ENVTHES at CEH vocabularies server

<http://vocabs.ceh.ac.uk/evn/tbl/envthes.evn>

The screenshot displays the CEH Vocabularies EnvThes interface. On the left, a 'Concept Hierarchy' sidebar lists various categories, with 'parameter' highlighted. The main content area shows the details for the concept 'parameter', including its URI, labels, definition, and relationships. On the right, a 'Search for Concept' panel is visible, featuring a search input field and various filters. Red circles highlight the 'CEH Vocabularies EnvThes' logo, the 'Search for Concept' panel, the 'parameter' entry in the hierarchy, and the search input field. A red oval highlights the 'Concept description' text in the main content area. At the bottom, a red text box provides a note about the browser language.

**CEH Vocabularies EnvThes**

**parameter**

Concept uri: [http://vocabs.iter-europe.net/EnvThes/EnvEu\\_60](http://vocabs.iter-europe.net/EnvThes/EnvEu_60)

**Labels and Definition**

preferred label: parameter (en)

notation: [controlled by ] U Grandin, 2013-08-22

type: [Concept](#)

definition: [GEMET] 1) A quantity in an equation which must be specified beside the independent variables to obtain the solution for the dependent variables. 2) A quantity which is constant under a given set of conditions, but may be different under other conditions. (en)

**Standard Relationships**

has broader: [deprecated concepts](#)

**Matching Relationships**

has exact match: <http://linkeddata.ge.imati.cnr.it:2020/resource/EARTH/78930>  
<http://www.eionet.europa.eu/gemet/concept/6033>

**Search for Concept**

Search any Text

Case sensitive

**Labels and Definition**

preferred label:

alternative label:

hidden label:

notation:

definition:

top concept of:

**Standard Relationships**

has broader:

has narrower:

has related:

**Custom Properties**

Search Results

parameter

Concept description

For correctly seeing EnvThes you have to switch your browser to English!



# Editing ENVTHES (PW needed) TopBraid Editor

<http://evn.ceh.ac.uk/>

CEH Vocabulary Editor [Home](#) > [EnvThes](#) > [EnvThes Work](#) [log out](#)  
Version 5.0.1.v20150922-1655R [Help](#)



## EnvThes Work

[Edit Working Copy](#)

[View Change History](#)

Working copy for the creation, correction, definition, translation of concepts, their labels, position in the hierarchy and relation to other taxonomies

Workflow | [Comments](#) | [User Roles](#) | [Import](#) | [Reports](#) | [Export](#)

**Status: uncommitted**  
This Working Copy is uncommitted, which means that changes have not been written (published) to the production vocabulary, and further edits are possible. Only users with editor privileges on the vocabulary or managers of this working copy can change this status.

**Commit All Changes to Production**  
Committing a Working Copy will apply all its changes into the production copy. Use the [Comparison Report](#) or the [Change History](#) to commit individual changes.

**Freeze for Review**  
Changing the status to frozen for review means that the changes are not committed yet to the production vocabulary, and no further edits are permitted. Only users with editor privileges on the vocabulary or managers of this working copy can change this status.

**Reject All Changes**  
Changing the status to rejected means that changes will not be written to the production vocabulary. Only users with editor privileges on the vocabulary or managers of this working copy can change this status.

**Update Working Copy from Server**  
If multiple users work on the same working copy, changes made by one user will not always be immediately visible to other users. Use this link to see latest changes from other users.



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# Editing Concepts

**CEH Vocabulary Editor** Taxonomy [EnvThes](#) > [EnvThes\\_Work](#)

**Concept Hierarchy**

- EUNIS Habitats
- EnvThes
  - Matrix
  - Measure
  - Object of Interest
  - Property
    - agricultural property
    - biological property
      - Bio toxins
      - abundance
      - breeding
      - cover
      - deadwood
      - denitrification potential
      - diversity
      - drift rate
      - fixation
      - growth
      - growth rate
      - leaching
      - presence
      - productivity**
      - respiration
      - trait
    - chemical property
    - experimental property
    - geographic property
    - physical properties
    - sampling parameter
  - Statistical function
  - System Classifications
  - deprecated concepts
  - event
  - infrastructure
  - method
  - research topics
  - scale
  - tool
  - units and dimensions
  - unstructured concepts
- INSPIRE Spatial Data Themes

**productivity (Concept)**

Concept uri: [http://vocabs.lter-europe.net/EnvThes/USLterCV\\_450](http://vocabs.lter-europe.net/EnvThes/USLterCV_450)

**Labels and Definition**

preferred label: + productivity en x

alternative label: + x

hidden label: + x

notation: + [controlled by ] Giorgio Matteucci , 23/05/2013 x

type: + Concept x

definition: + [Henderson's] n. the amount of organic matter fixed by an ecosystem per unit time. see primary production. en x

top concept of: + Select Concept Scheme x

**Status**

deprecated: + x

**Standard relationships**

Used to link concepts in the same concept scheme

has broader: + biological property x

has related: + Select Concept x

**More relationships**

Used to link concepts in different schemes/taxonomies

para  Enter log message  Save Changes  Cancel (0)

SKOS elements:

- Preferred labels
- Alternate label
- Related label
- definition
- Has broader
- Has related
- Has exact match
- Scope note
- ...
- Status



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# SPARQLing EnvThes

<http://vocabs.ceh.ac.uk/evn/tbl/sparql>

## TopBraid Live SPARQL Endpoint

Query

```
select ?concept (str(?prefLab) as ?label) (str(?altlab) as ?code) (str(?p) as ?parent) (str(?pl) as ?parlab) ("EnvThes" as ?source)

where { ?concept <http://www.w3.org/1999/02/22-rdf-syntax-ns#type>
<http://www.w3.org/2004/02/skos/core#Concept>.

?concept <http://www.w3.org/2004/02/skos/core#prefLabel> ?prefLab.

FILTER(lang(?prefLab) = 'en').
```

Default Graph   Include Imports

Result Format

## Results

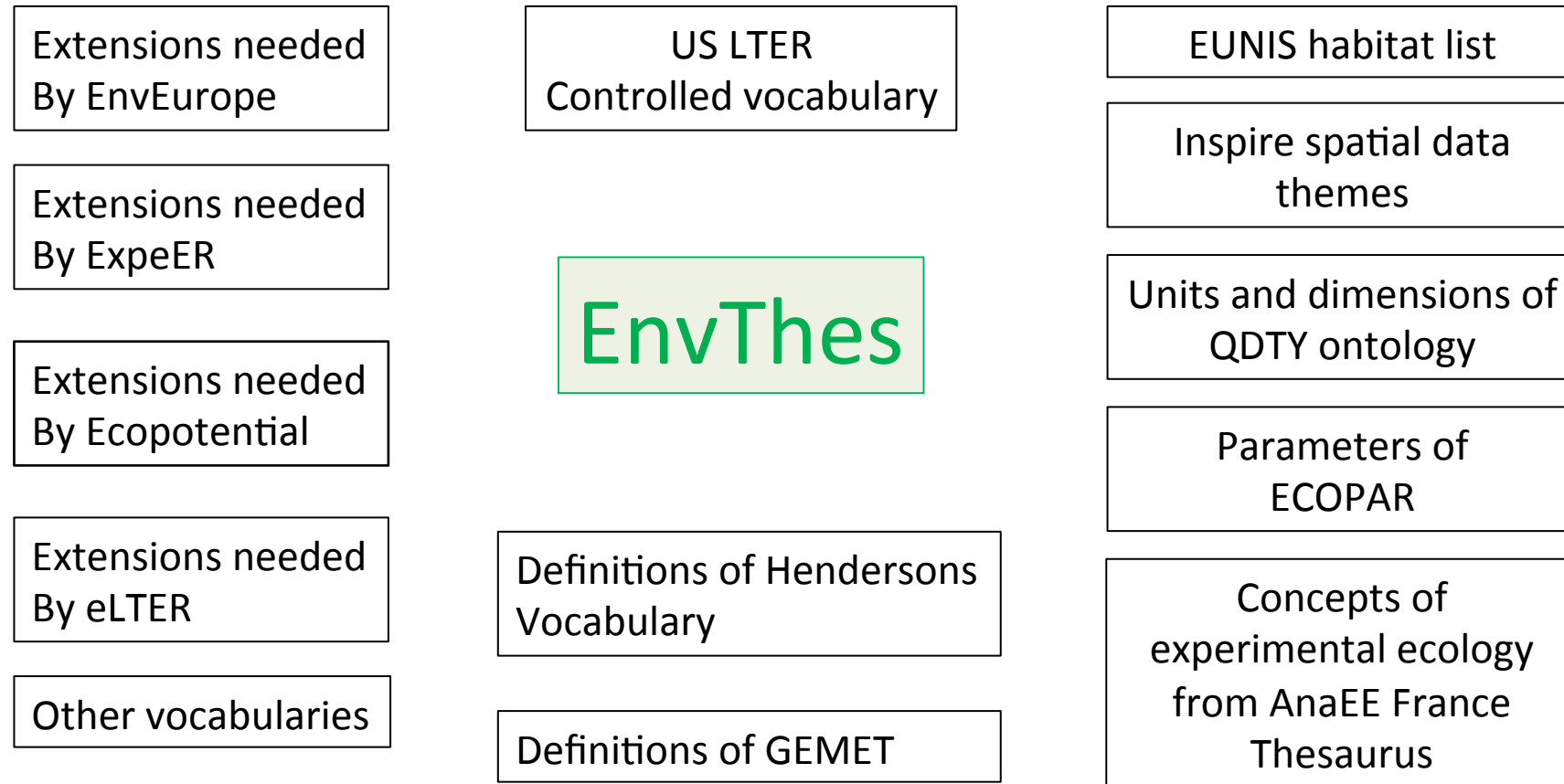
| concept   | label                             | code       | parent  |             |
|---|-----------------------------------|------------|---|-------------|
| <a href="http://vocabs.lter-europe.net/EnvThes/USLterCV_218">http://vocabs.lter-europe.net/EnvThes/USLterCV_218</a> | fungi                             | fungus     | <a href="http://vocabs.lter-europe.net/EnvThes/USLterCV_395">http://vocabs.lter-europe.net/EnvThes/USLterCV_395</a> | organism    |
| <a href="http://vocabs.lter-europe.net/EnvThes/USLterCV_42">http://vocabs.lter-europe.net/EnvThes/USLterCV_42</a>   | aquatic invertebrates             |            | <a href="http://vocabs.lter-europe.net/EnvThes/USLterCV_271">http://vocabs.lter-europe.net/EnvThes/USLterCV_271</a> | invertebra  |
| <a href="http://vocabs.lter-europe.net/EnvThes/EUUnits_73">http://vocabs.lter-europe.net/EnvThes/EUUnits_73</a>     | Gy                                | J/kg       | <a href="http://vocabs.lter-europe.net/EnvThes/EUUnits_005">http://vocabs.lter-europe.net/EnvThes/EUUnits_005</a>   | SI derivec  |
| <a href="http://vocabs.lter-europe.net/EnvThes/EUUnits_73">http://vocabs.lter-europe.net/EnvThes/EUUnits_73</a>     | Gy                                | gray       | <a href="http://vocabs.lter-europe.net/EnvThes/EUUnits_005">http://vocabs.lter-europe.net/EnvThes/EUUnits_005</a>   | SI derivec  |
| <a href="http://vocabs.lter-europe.net/EnvThes/EUNIS_X06">http://vocabs.lter-europe.net/EnvThes/EUNIS_X06</a>       | Crops shaded by trees             | X06        | <a href="http://vocabs.lter-europe.net/EnvThes/EUNIS_X">http://vocabs.lter-europe.net/EnvThes/EUNIS_X</a>           | Habitat cc  |
| <a href="http://vocabs.lter-europe.net/EnvThes/USLterCV_439">http://vocabs.lter-europe.net/EnvThes/USLterCV_439</a> | populations                       | population | <a href="http://vocabs.lter-europe.net/EnvThes/USLterCV_799">http://vocabs.lter-europe.net/EnvThes/USLterCV_799</a> | organizati  |
| <a href="http://vocabs.lter-europe.net/EnvThes/USLterCV_268">http://vocabs.lter-europe.net/EnvThes/USLterCV_268</a> | interception                      |            | <a href="http://vocabs.lter-europe.net/EnvThes/USLterCV_443">http://vocabs.lter-europe.net/EnvThes/USLterCV_443</a> | precipitati |
| <a href="http://vocabs.lter-europe.net/EnvThes/EUNIS_B2_6">http://vocabs.lter-europe.net/EnvThes/EUNIS_B2_6</a>     | Shingle and gravel beach woodland | B2.6       | <a href="http://vocabs.lter-europe.net/EnvThes/EUNIS_B2">http://vocabs.lter-europe.net/EnvThes/EUNIS_B2</a>         | Coastal s   |
| <a href="http://vocabs.lter-europe.net/EnvThes/bioGeo18">http://vocabs.lter-europe.net/EnvThes/bioGeo18</a>         | Regional seas_Mediterranean Sea   |            | <a href="http://vocabs.lter-europe.net/EnvThes/10198">http://vocabs.lter-europe.net/EnvThes/10198</a>               | Biogeogre   |



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# Components of EnvThes

EnvThes has not been developed from the scratch, but integrated a lot of existing Controlled vocabularies and added concepts, which were missing



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# Content of EnvThes

## Matrix

The medium in which the actual Object Of Interest is embedded

Air

Soil

Water

Vegetation

Plant tissue



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# Content of EnvThes

Matrix

The medium in which the actual Object Of Interest is embedded

Measure

A measure is a compound concept formed by determining an Observed Property for an Object Of Interest.

Agricultural Measure

Atmospheric Measure

Biological Measure

Ecosystem Measure

Experimental Measure

Genetic Measure

Landscape Measure

Soil Measure

Water Measure



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# Content of EnvThes

Matrix

The medium in which the actual Object Of Interest is embedded

Measure

A measure is a compound concept formed by determining an Observed Property for an Object Of Interest.

Object of Interest

The substance, taxon or other physical/chemical phenomenon of the Feature Of Interest that is being observed.

Climate

Indicator

Organism

Process

Substrate

Substance



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# Content of EnvThes

Matrix

The medium in which the actual Object Of Interest is embedded

Measure

A measure is a compound concept formed by determining an Observed Property for an Object Of Interest.

Object of Interest

The substance, taxon or other physical/chemical phenomenon of the Feature Of Interest that is being observed.

Property

The property or characteristic of the Object Of Interest that is observed during the act of observation.

Agricultural property

Biological property

Chemical property

Physical property

Experimental property

Geographic property

Sampling parameter



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# Content of EnvThes

Matrix

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Object of Interest

The substance, taxon or other physical/chemical phenomenon of the Feature Of Interest that is being observed.

Property

The property or characteristic of the Object Of Interest that is observed during the act of observation.

Statistical function

A statistical function qualifies an Observable Property and represents some aggregation or derivation

Model property

Sample

Statistics



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Property

The property or characteristic of the Object Of Interest that is observed during the act of observation.

Statistical function

A statistical function qualifies an Observable Property and represents some aggregation or derivation

Method

A way of proceeding or doing something, especially a systematic or regular one.

Estimation

IT Method

Laboratory Method

Field Method

Survey

Modelling

Mapping

Sampling Method

Treatment

.....



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Property

The property or characteristic of the Object Of Interest that is observed during the act of observation.

Statistical function

A statistical function qualifies an Observable Property and represents some aggregation or derivation

Method

A way of proceeding or doing something, especially a systematic or regular one.

Tool

Tool used for the execution of a certain method

Mobile Sensor

Onsite Sensor

Experimental device

Analytical tool

....



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# Content of EnvThes

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Method

A way of proceeding or doing something, especially a systematic or regular one.

Tool

Tool used for the execution of a certain method

Units and dimensions

Units and dimensions as defined by NASA and extended with special ones needed by LTER

Base dimension

Derived dimension

SI unit

Unit outside SI

ratio



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# Content of EnvThes

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Tool used for the execution of a certain method

Units and dimensions

Units and dimensions as defined by NASA and extended by special ones needed by LTER

System Classification

Ecosystem

land cover type

Biome

land use type

Biogeographic region

layer

Climate type

soil type

Geno type

sphere



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Matrix

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Method

A way of proceeding or doing something, especially a systematic or regular one.

Tool

Tool used for the execution of a certain method

Units and dimensions

Units and dimensions as defined by NASA and extended by special ones needed by LTER

System Classification

Event

disturbance  
Human induced event

natural induced event  
phenological stage



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# Content of EnvThes

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Statistical function

A statistical function qualifies an Observable Property and represents some aggregation or derivation

Method

A way of proceeding or doing something, especially a systematic or regular one.

Tool

Tool used for the execution of a certain method

Units and dimensions

Units and dimensions as defined by NASA and extended by special ones needed by LTER

System Classification

Event

Infrastructure

Site classification  
IT infrastructure

LTER Site declaration status  
measurement infrastructure



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# Content of EnvThes

Matrix

The medium in which the actual Object Of Interest is embedded

Measure

A measure is a compound concept formed by determining an Observed Property for an Object Of Interest.

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The substance, taxon or other physical/chemical phenomenon of the Feature Of Interest that is being observed.

Property

The property or characteristic of the Object Of Interest that is observed during the act of observation.

Statistical function

A statistical function qualifies an Observable Property and represents some aggregation or derivation

Method

A way of proceeding or doing something, especially a systematic or regular one.

Tool

Tool used for the execution of a certain method

Units and dimensions

Units and dimensions as defined by NASA and extended by special ones needed by LTER

System Classification

Event

Infrastructure

Research topic

academic field of study or profession.

Biology, chemistry, biodiversity, meteorology, geography, ecology, .....



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# Interlinkages of EnvThes

AGROVOC  
(vocabulary of FAO)

EUROVOC  
(vocabulary of EC)

GEMET  
(vocabulary of EEA)

? INSPIRE Registry ?

? Vocabulary of  
SeaDataNet ?

? Vocabulary of  
LifeWatch Italy ?

? ECOPAR ?

EnvThes

EUNIS habitat list  
(EEA)

QDTY Ontology  
(NASA)

? Other SKOS /RDF  
vocabulary ?

? Vocabulary  
Collections ?  
(bioportal, Lustre,  
Linked open  
Vocabulary



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# Different roles in EnvThes

- **Facilitator:** assists the overall EnvThes work
  - Support the editor team and the contributors
  - Organize the work
  - Preprocess lists of concepts
  - Commit a working copy, responsible for publishing
- **Editor Team:** fix members of EnvThes responsible for quality control
  - Identify tasks
  - Make final decisions on pending issues
- **Contributor:** do the actual work on specific tasks
  - Assisted by the facilitator
  - Controlled by the Editor Team



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# Working copies

- Are copies of the complete existing thesaurus
- you make changes, add concepts, definitions or translations without affecting the Thesaurus as it is seen by the public
- Only after the OK of the Editors' team the facilitator publishes the changes

-> **Helps to organize work in clearly arranged packages** (e.g. translations for each language in separate working copies)



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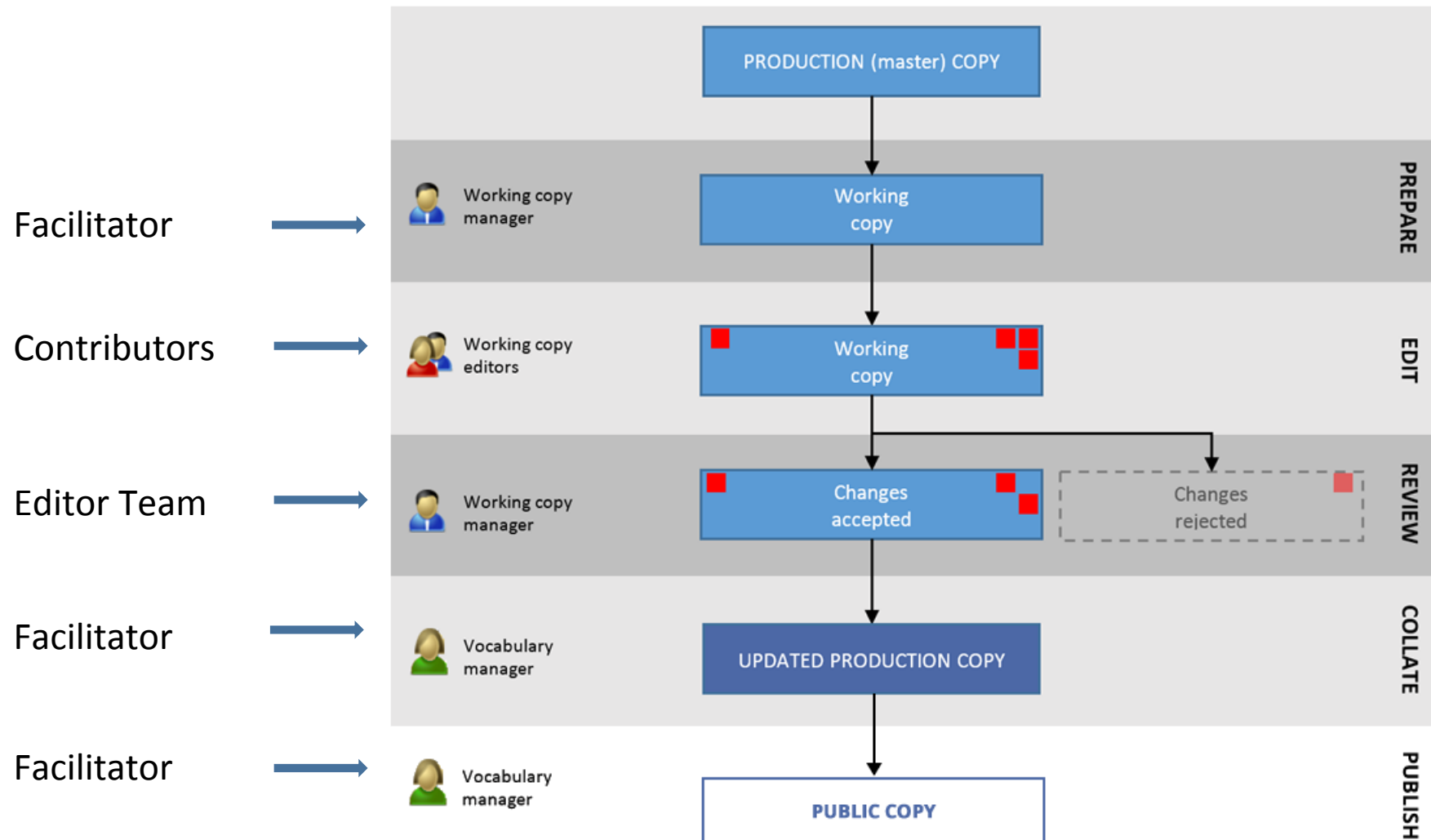
# From working copy to production

1. **contributors** make proposals in the working copy
2. **contributors** discuss by using “comments” the established proposal
3. **Editors’ team** monitor the process. They shall not be forced to do all the work themselves. They can discuss the proposals and change the proposals.
4. The **editors’ team** decides, that the whole working copy is fine and tells the **facilitator** to make it productive
5. The **facilitator** does the step of no return and makes the working copy productive



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# From working copy to public copy



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# Current work on EnvThes

## Improving quality

- Check and correct errors:
  - duplicates
  - misspellings
  - plurals
- Check hierarchy
- Check consistency of content
- Check completeness:
  - definitions – generate comparisons with GEMET and other vocabularies
  - translations of terms (Greek, Italian, French...) – Native speakers needed!!
  - Links
- Solve open issues:
  - Abbreviations
  - codes



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# Current work on EnvThes

- **Extension of vocabulary:**

- Comparisons with MS-Academic keywords
- Domain extensions needed for Ecopotential

- **Extension/Integration with other Thesauri:**

- LifeWatch Italy
- SeaDataNet

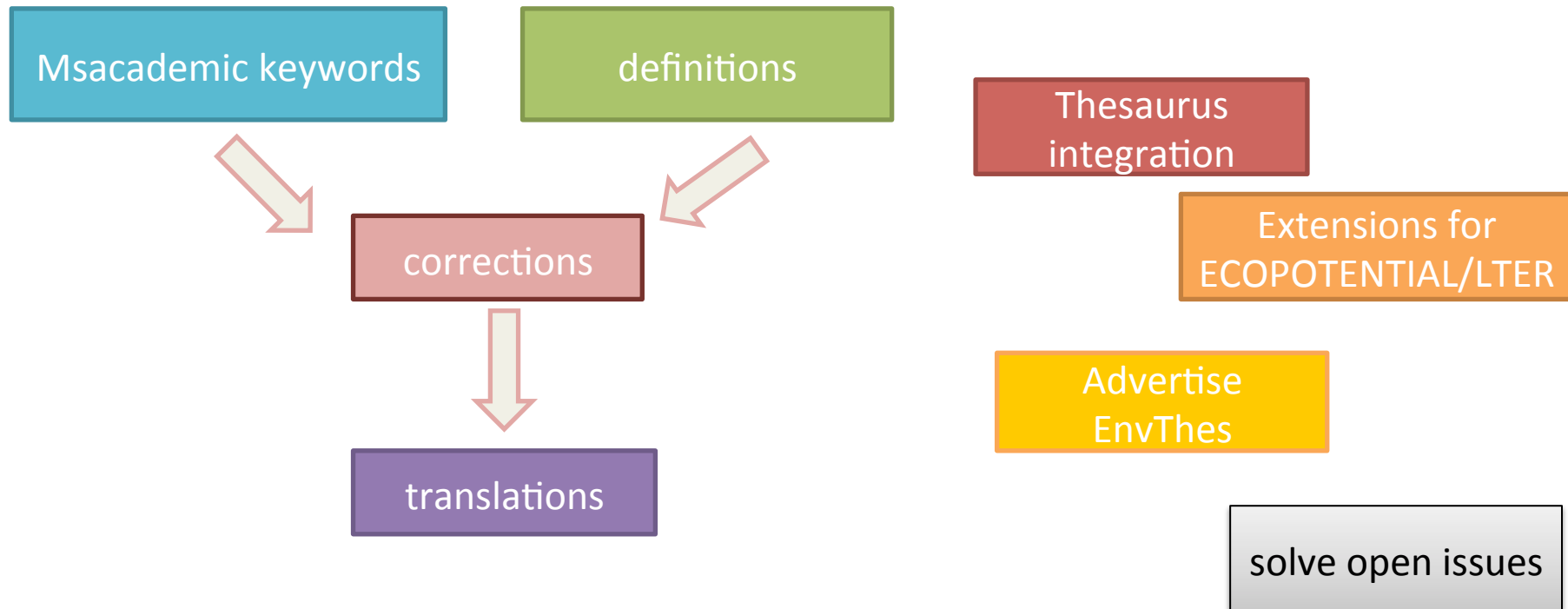
- **Public relations:**

- Advertise EnvThes (in workshops, conferences, publications)
- Add EnvThes to vocabulary registries
- Seek collaborations (with LifeWatch, SeaDataNet,...)
- Follow activities of RDA vocabulary services interest group



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# Focus of current work



This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 641762



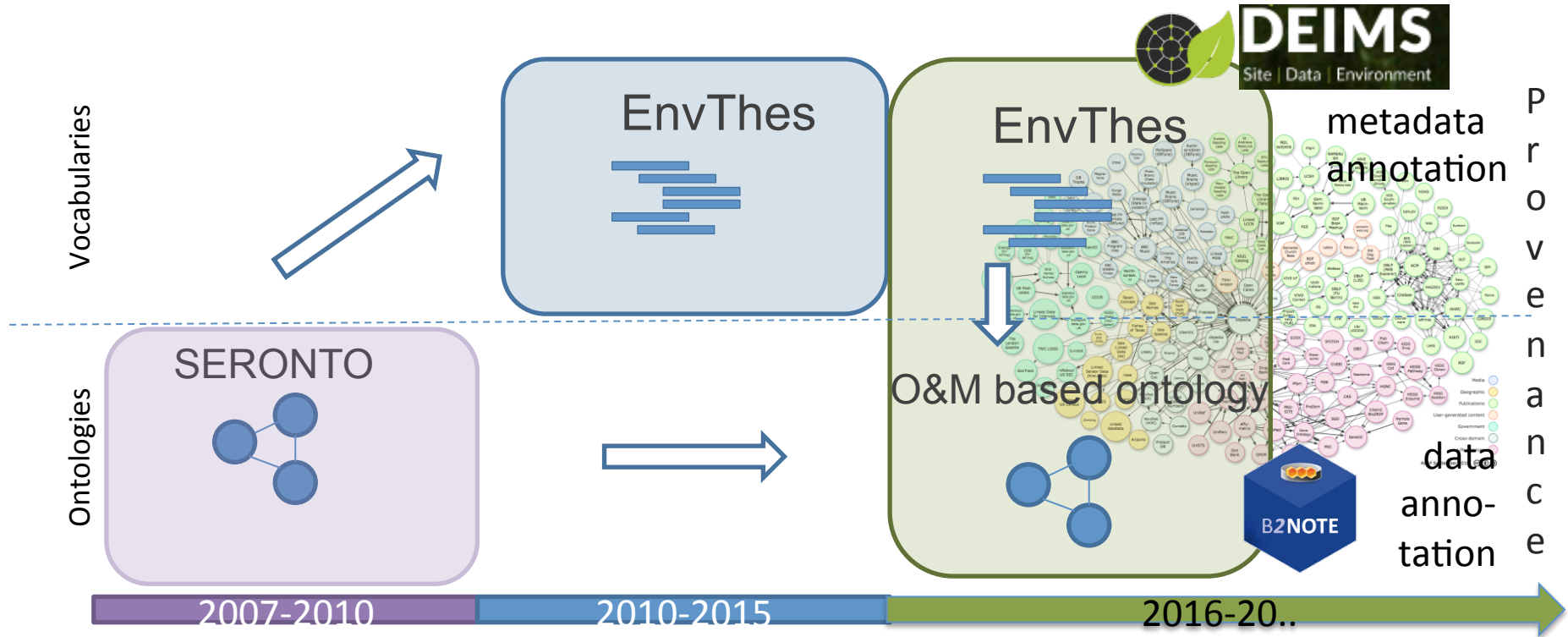
# Next steps..

- Being part of collections of vocabularies and ontologies:
  - Linked open vocabulary: <http://lov.okfn.org/dataset/lov/>
  - Bioportal : <http://bioportal.bioontology.org/>Just 2 examples, there are certainly more collections around
- Being integrated in a Linked data architecture like:
  - Smart open data <http://www.smartopendata.eu/>
  - Linked open data of ecology <https://datahub.io/de/dataset/linked-open-data-of-ecology>



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# Vision



... go beyond metadata  
towards collection of volabularies  
and linked data architecture



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