

LusTRE

Linked Thesaurus fRamework for the Environment

M. De Martino, R. Albertoni (CNR- IMATI)
A. Abecker (disy)

- ☐ LusTRE Overview

- Objectives
 - Strategy
 - Outcomes

- ☐ State of Play

- eENVplus activity
 - LusTRE state of play
 - LusTRE exploitation services

- ☐ Planned Next Activities and Conclusions

LusTRE Overview

■ General Objective

To provide a solution to the multilingual and multicultural issues in environmental data sharing

■ Specific Objectives

☐ A “common thesaurus” for the Environment

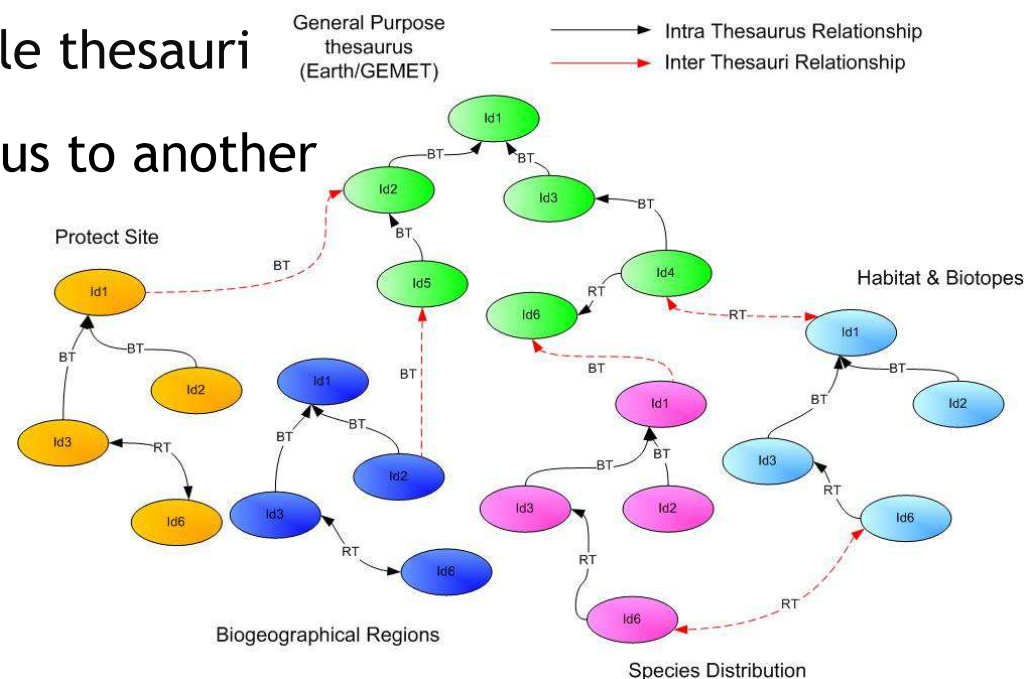
- ☐ to provide more widely shared concepts and to reduce language barriers
- ☐ to enable the joint exploitation of existing multilingual thesauri covering different INSPIRE data themes

☐ A set of software services for exploiting the “common thesaurus”

- ☐ to promote uniformity in data description during metadata provision
- ☐ to improve resource discovery across applications and platforms

- Not only one thesaurus ... but ...
- integration of different available thesauri
- cross-walking from one thesaurus to another

Thesaurus Framework

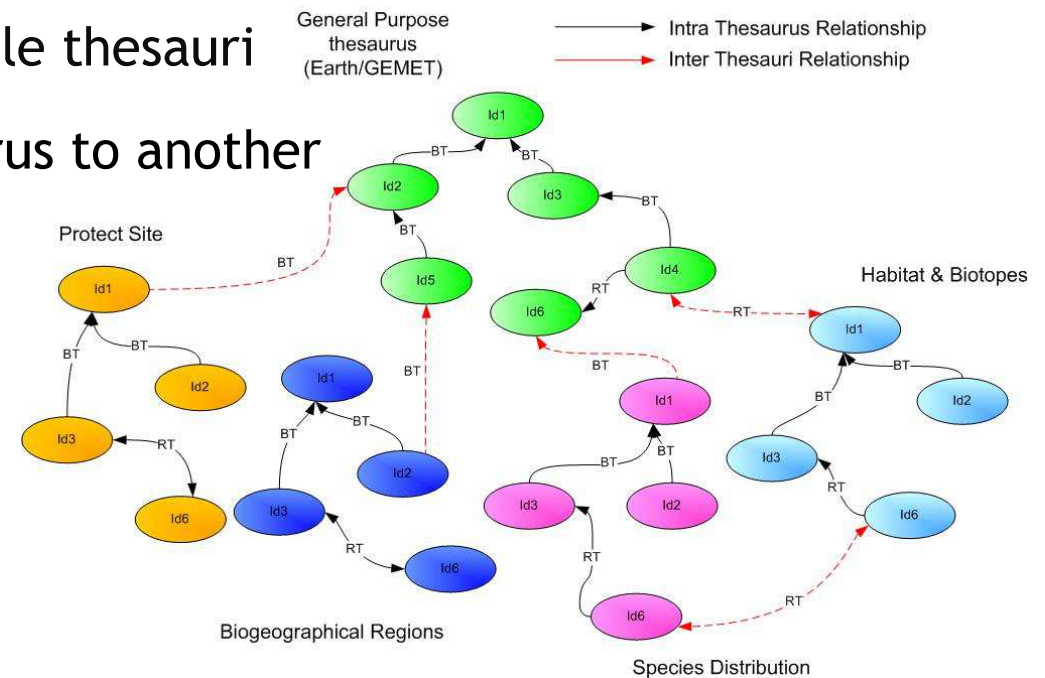


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Thesaurus Framework

Modularity

To add new KOS as a new module plugged in the set of thesauri in the TF



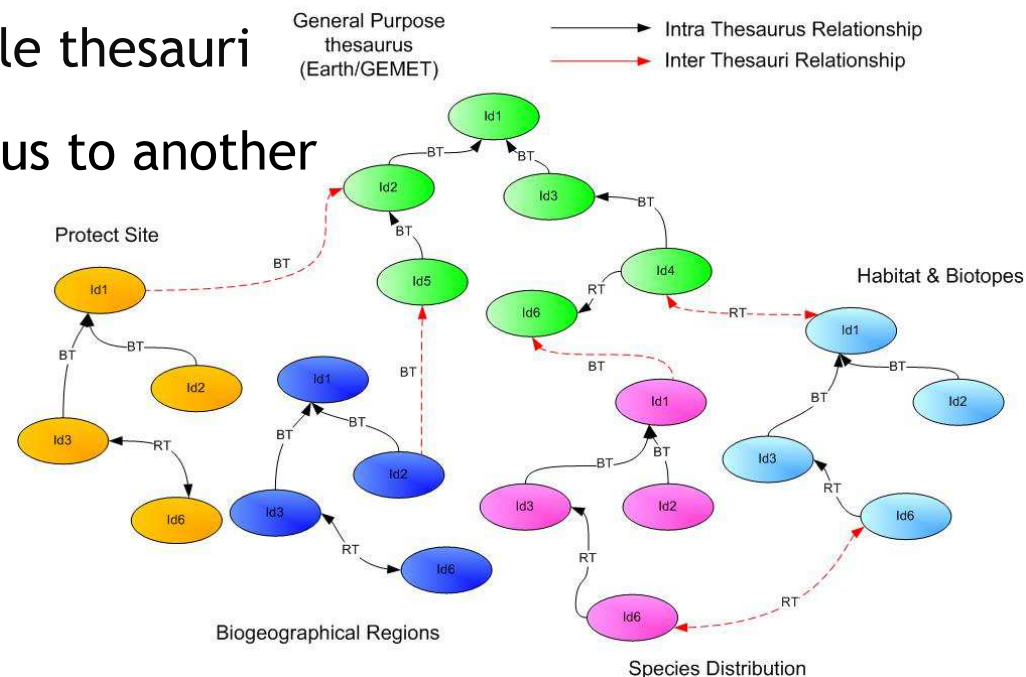
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Thesaurus Framework

Modularity

Openness

To easily extend each KOS keeping separated the original one



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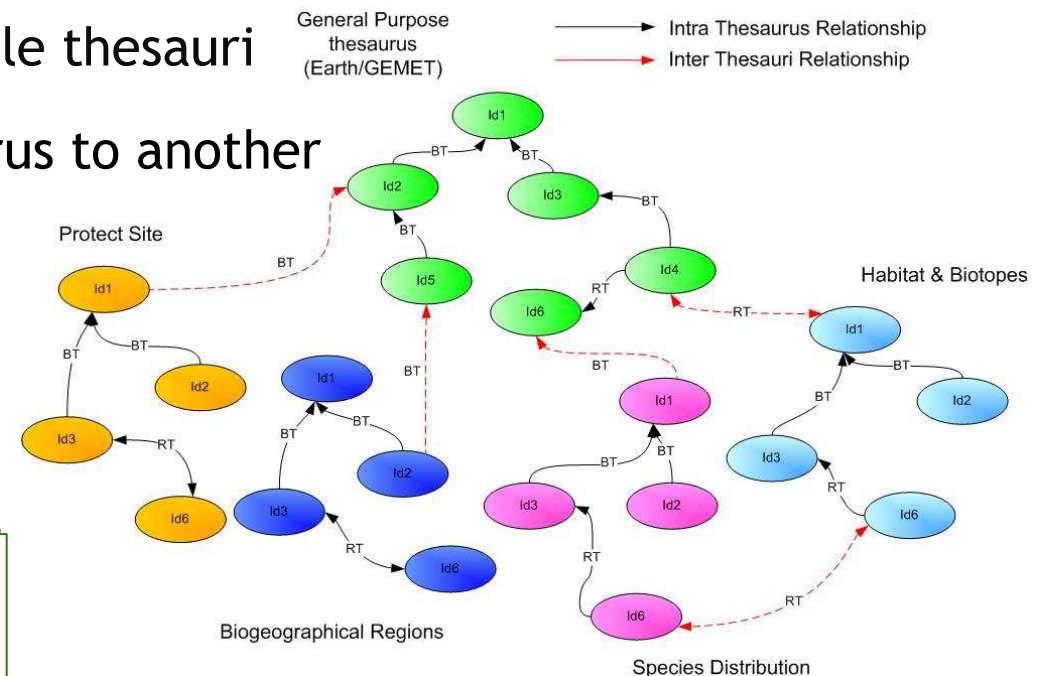
Thesaurus Framework

Modularity

Openness

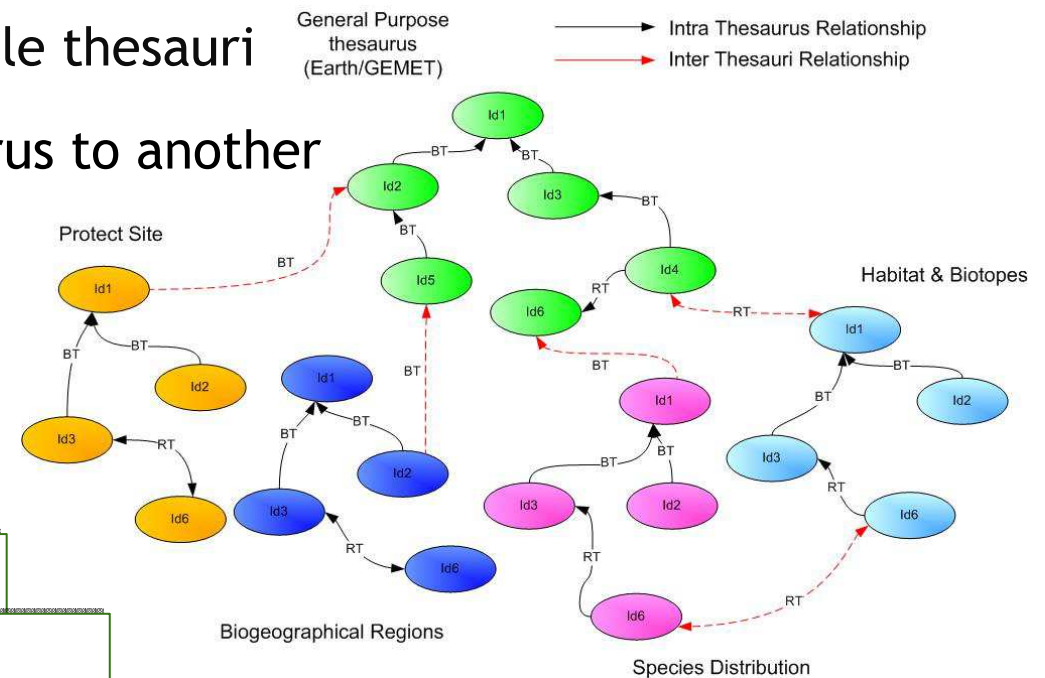
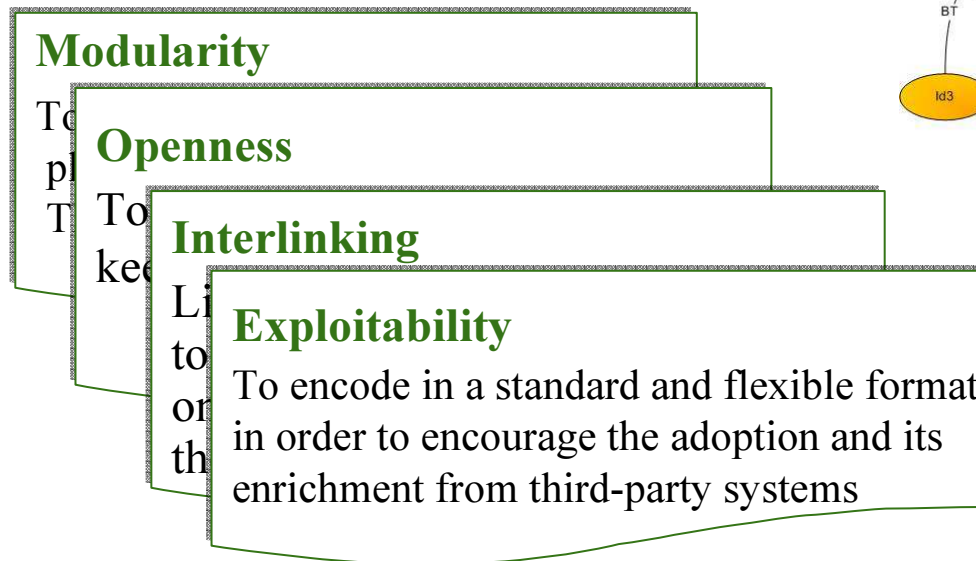
Interlinking

Linking among the terms referring to the same concepts in more than one thesaurus in order to harmonize their usage



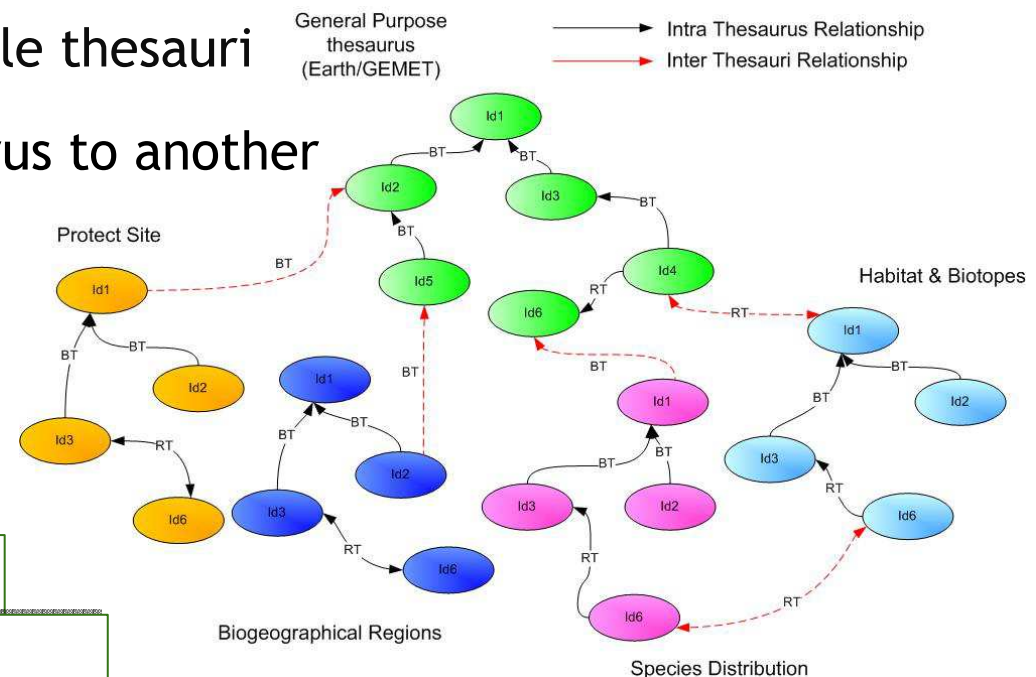
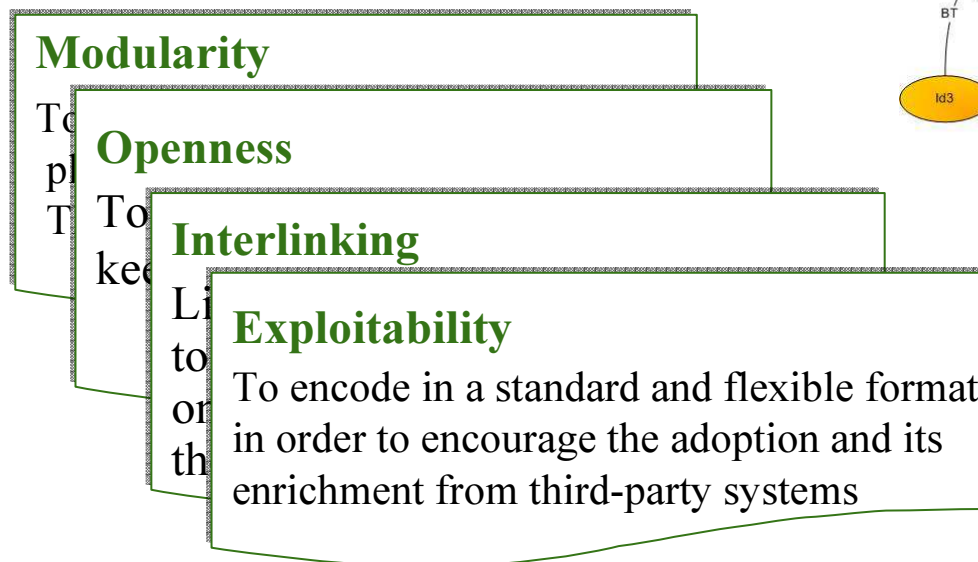
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Thesaurus Framework



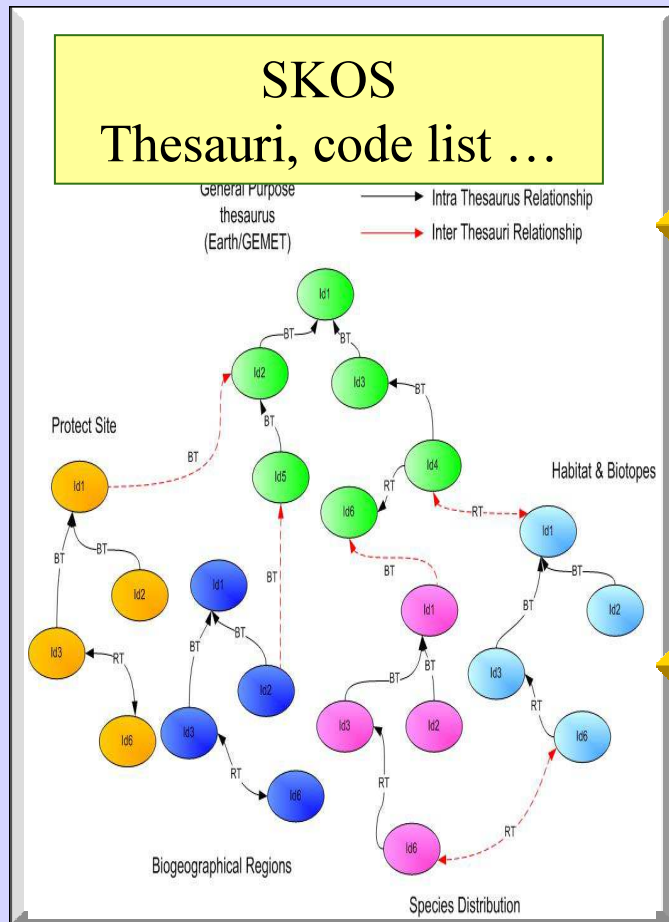
Design Principle

Simple Knowledge Organization System (SKOS) to encode the thesaurus content

Linked Data best practices

to publish the thesaurus in machine-understandable format

Vocabulary Content



Vocabulary Interlinking

Linksets

Quality evaluation:
(SKOS quality, Linkset Quality ...)

TF exploitation Services

Metadata Compilation

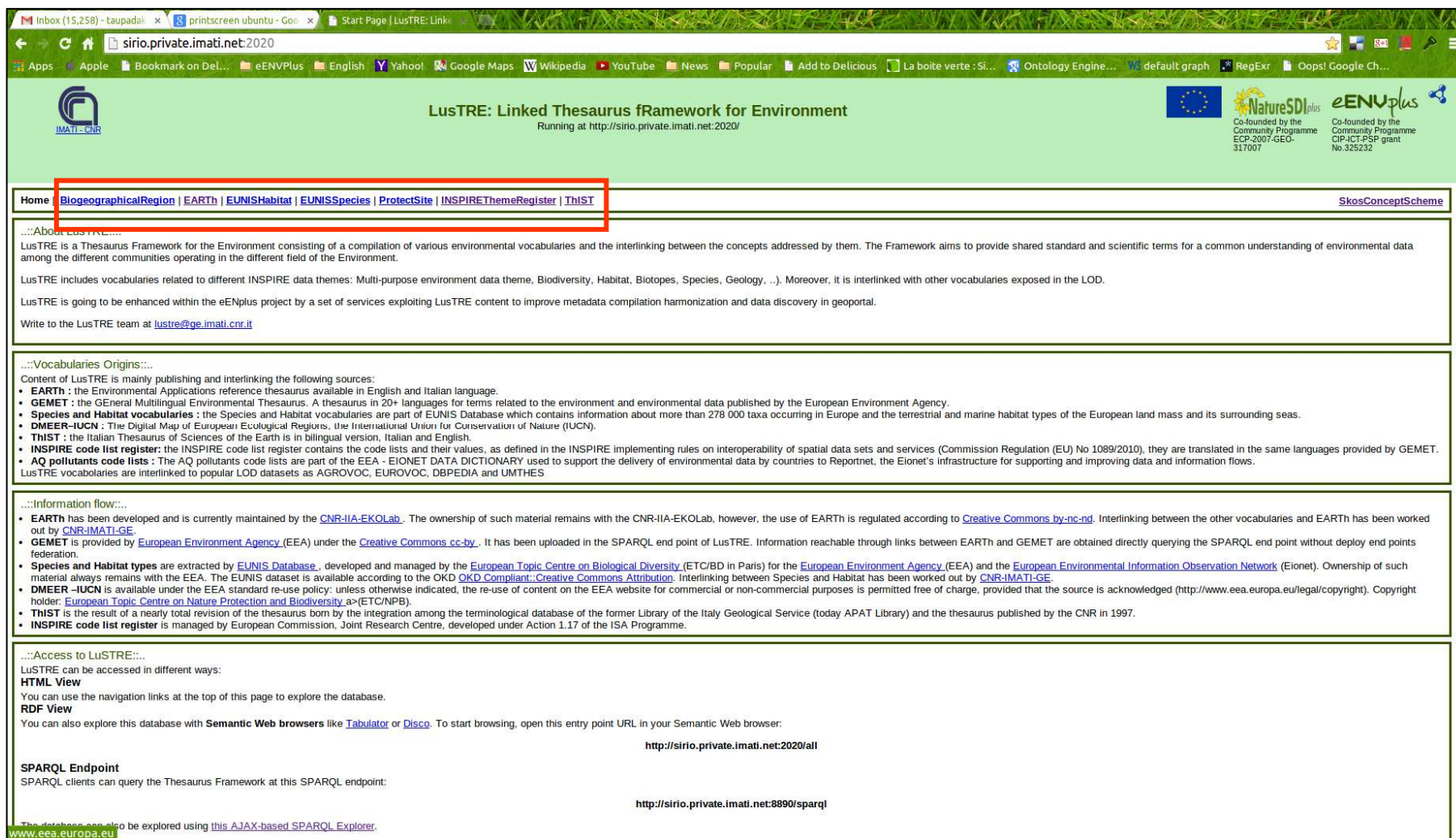
Data Discovery

Explorative Search

CROSS-WALKING

LusTRE

State of Play



LusTRE: Linked Thesaurus fRamework for Environment
Running at <http://sirio.private.imati.net:2020/>

Navigation links: [Home](#) | [BiogeographicalRegion](#) | [EARTH](#) | [EUNISHabitat](#) | [EUNISSpecies](#) | [ProtectSite](#) | [INSPIREThemeRegister](#) | [ThIST](#) | [SkosConceptScheme](#)

...About LusTRE...
LusTRE is a Thesaurus Framework for the Environment consisting of a compilation of various environmental vocabularies and the interlinking between the concepts addressed by them. The Framework aims to provide shared standard and scientific terms for a common understanding of environmental data among the different communities operating in the different field of the Environment.
LusTRE includes vocabularies related to different INSPIRE data themes: Multi-purpose environment data theme, Biodiversity, Habitat, Biotopes, Species, Geology, ...). Moreover, it is interlinked with other vocabularies exposed in the LOD.
LusTRE is going to be enhanced within the eENplus project by a set of services exploiting LusTRE content to improve metadata compilation harmonization and data discovery in geoportal.
Write to the LusTRE team at lustre@ge.imati.cnr.it

...Vocabularies Origins...
Content of LusTRE is mainly publishing and interlinking the following sources:

- EARTH**: the Environmental Applications reference thesaurus available in English and Italian language.
- GEMET**: the General Multilingual Environmental Thesaurus. A thesaurus in 20+ languages for terms related to the environment and environmental data published by the European Environment Agency.
- Species and Habitat vocabularies**: the Species and Habitat vocabularies are part of EUNIS Database which contains information about more than 278 000 taxa occurring in Europe and the terrestrial and marine habitat types of the European land mass and its surrounding seas.
- DMEER-IUCN**: The Digital Map of European Ecological Regions, the International Union for Conservation of Nature (IUCN).
- ThIST**: the Italian Thesaurus of Sciences of the Earth is in bilingual version, Italian and English.
- INSPIRE code list register**: the INSPIRE code list register contains the code lists and their values, as defined in the INSPIRE implementing rules on interoperability of spatial data sets and services (Commission Regulation (EU) No 1089/2010), they are translated in the same languages provided by GEMET.
- AQ pollutants code lists**: The AQ pollutants code lists are part of the EEA - EIONET DATA DICTIONARY used to support the delivery of environmental data by countries to Reportnet, the Eionet's infrastructure for supporting and improving data and information flows.

LusTRE vocabularies are interlinked to popular LOD datasets as AGROVOC, EUROVOC, DBPEDIA and UMTES.

...Information flow...

- EARTH** has been developed and is currently maintained by the [CNR-IIA-EKOLab](#). The ownership of such material remains with the CNR-IIA-EKOLab, however, the use of EARTH is regulated according to [Creative Commons by-nc-nd](#). Interlinking between the other vocabularies and EARTH has been worked out by [CNR-IMATI-GE](#).
- GEMET** is provided by [European Environment Agency \(EEA\)](#) under the [Creative Commons cc-by](#). It has been uploaded in the SPARQL end point of LusTRE. Information reachable through links between EARTH and GEMET are obtained directly querying the SPARQL end point without deploy end points federation.
- Species and Habitat types** are extracted by [EUNIS Database](#), developed and managed by the [European Topic Centre on Biological Diversity \(ETC/BD\)](#) in Paris for the [European Environment Agency \(EEA\)](#) and the [European Environmental Information Observation Network \(Eionet\)](#). Ownership of such material always remains with the EEA. The EUNIS dataset is available according to the OKD [OKD Compliant: Creative Commons Attribution](#). Interlinking between Species and Habitat has been worked out by [CNR-IMATI-GE](#).
- DMEER-IUCN** is available under the EEA standard re-use policy: unless otherwise indicated, the re-use of content on the EEA website for commercial or non-commercial purposes is permitted free of charge, provided that the source is acknowledged (<http://www.eea.europa.eu/legal/copyright>). Copyright holder: [European Topic Centre on Nature Protection and Biodiversity a>\(ETC/NPB\)](#).
- ThIST** is the result of a nearly total revision of the thesaurus born by the integration among the terminological database of the former Library of the Italy Geological Service (today APAT Library) and the thesaurus published by the CNR in 1997.
- INSPIRE code list register** is managed by European Commission, Joint Research Centre, developed under Action 1.17 of the ISA Programme.

...Access to LusTRE...
LusTRE can be accessed in different ways:
HTML View
You can use the navigation links at the top of this page to explore the database.
RDF View
You can also explore this database with **Semantic Web browsers** like [Tabulator](#) or [Disco](#). To start browsing, open this entry point URL in your Semantic Web browser:
<http://sirio.private.imati.net:2020/all>
SPARQL Endpoint
SPARQL clients can query the Thesaurus Framework at this SPARQL endpoint:
<http://sirio.private.imati.net:8890/sparql>
The database can also be explored using [this AJAX-based SPARQL Explorer](#).
www.eea.europa.eu

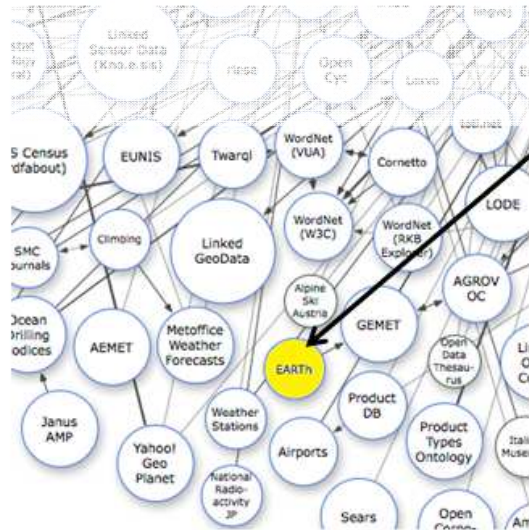
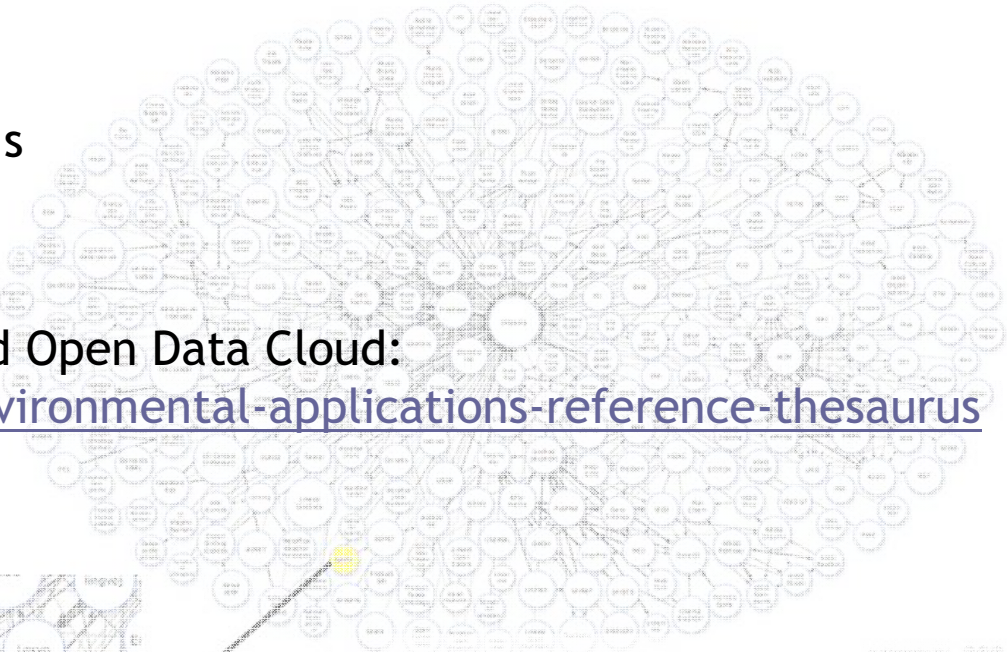
EARTH accessibility

■ EARTH accessible through

- HTTP dereferenceable URIs
- RDF/XML Dump
- SPARQL Endpoint

■ EARTH published into the Linked Open Data Cloud:

<http://datahub.io/it/dataset/environmental-applications-reference-thesaurus>



EARTH Interlinking

- GEMET
- AGROVOC
- UMTHES
- DBPEDIA
- EUROVOC

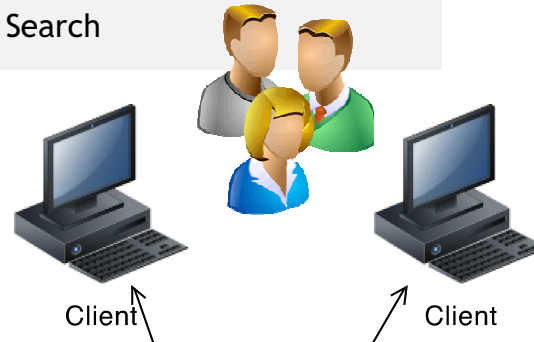
LusTRE

Exploitation Services

Usage Scenarios for LusTRE Exploitation Services

USE CASES

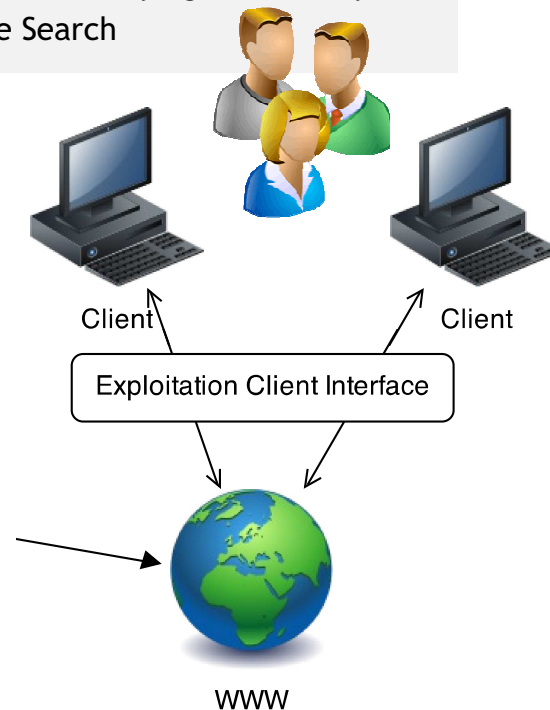
- Metadata Creation / Compilation
- Data & Service Querying / Discovery
- Explorative Search



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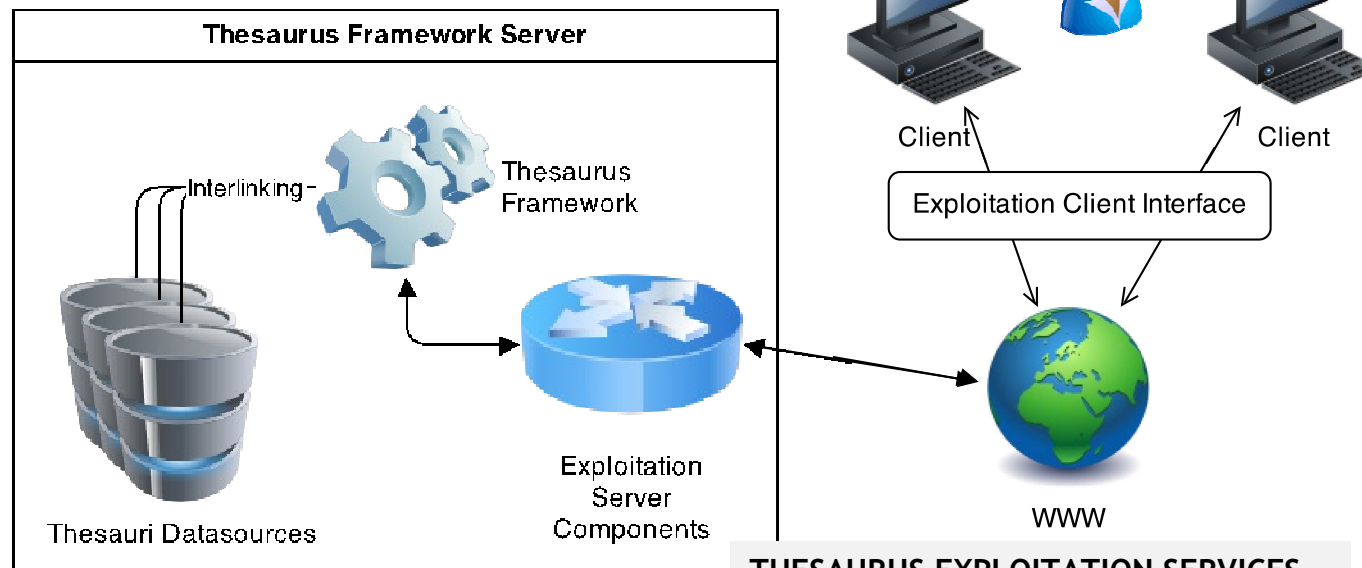
REST API

- GetCapabilities
- GetSuggestions
- GetSynonyms
- GetRelatives
- DescribeConcept
- SPARQL

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THESAURUS EXPLOITATION SERVICES

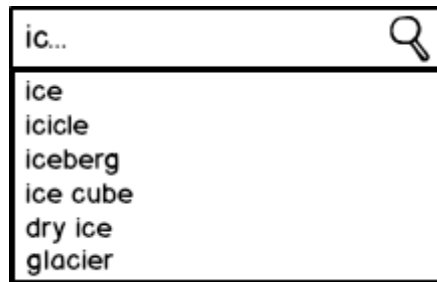
- KeywordCompletion
- KeywordExplanation
- KeywordTranslation
- QueryReformulation
- Keyword Validation
- ThesaurusVisualization
- ...

Simple Usage of KeywordCompletion, KeywordExplanations
and QueryReformulation for Improving Metadata Data Search

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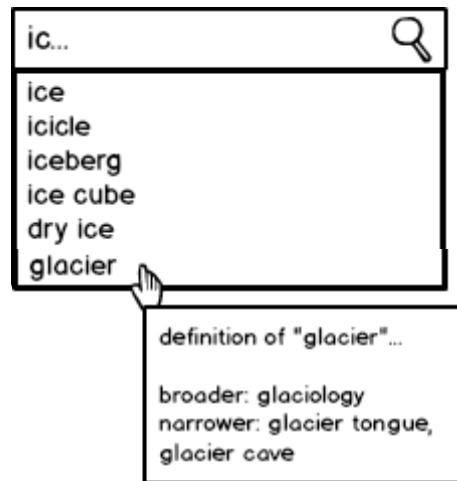
Simple Usage of KeywordCompletion, KeywordExplanations and QueryReformulation for Improving Metadata Data Search



A mock-up of a search input field. The input field contains the text "ic..." and a magnifying glass icon. Below the input field, a list of suggested keyword completions is displayed: "ice", "icicle", "iceberg", "ice cube", "dry ice", and "glacier".

Suggested keyword completions when typing

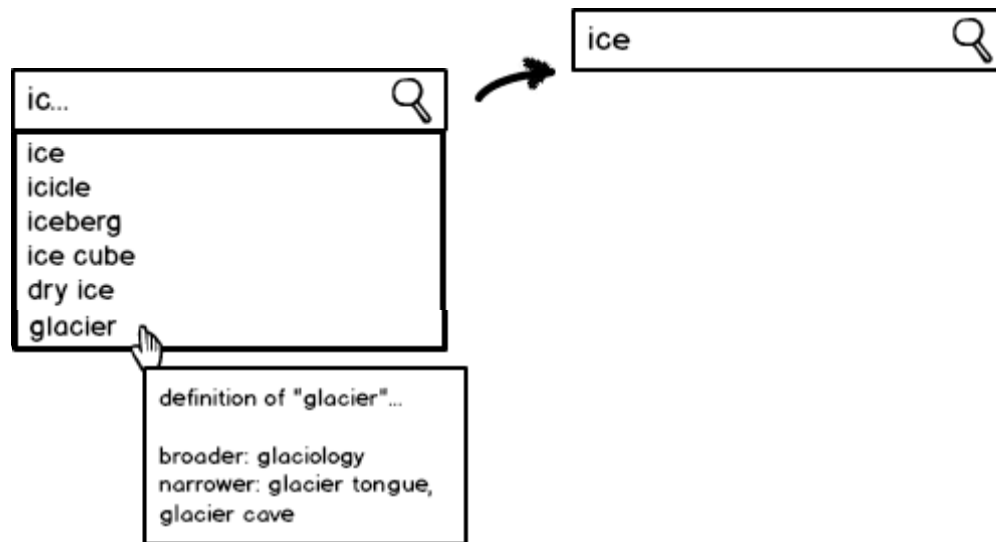
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Suggested keyword completions when typing

Further background information on demand

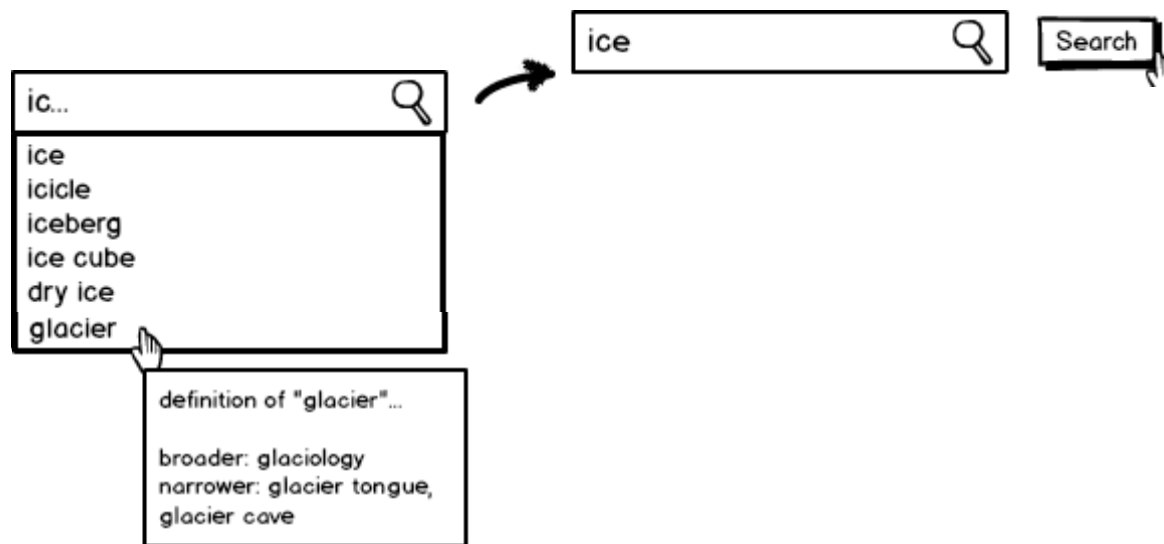
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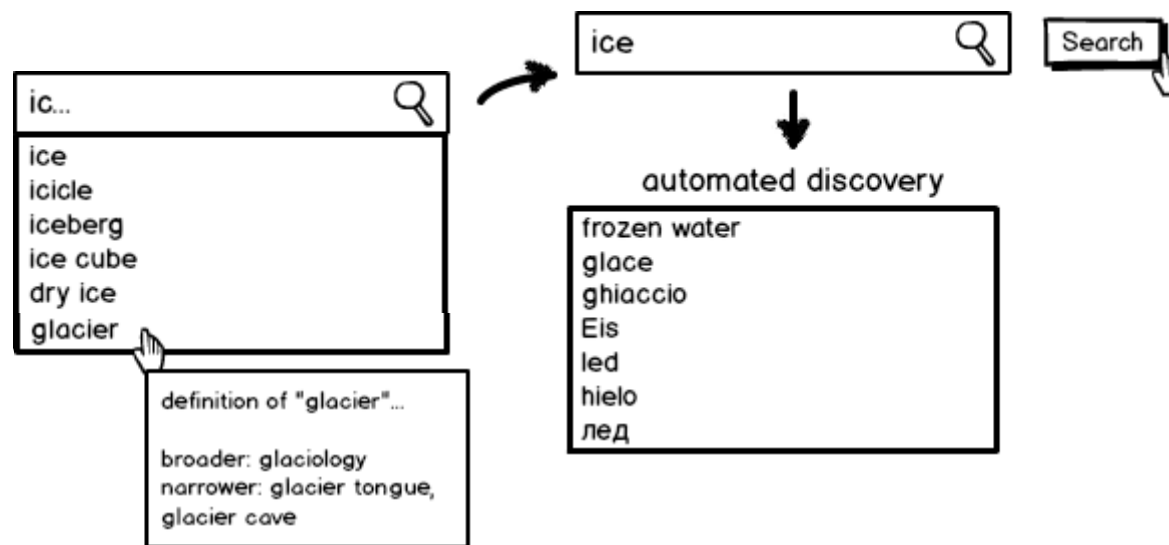
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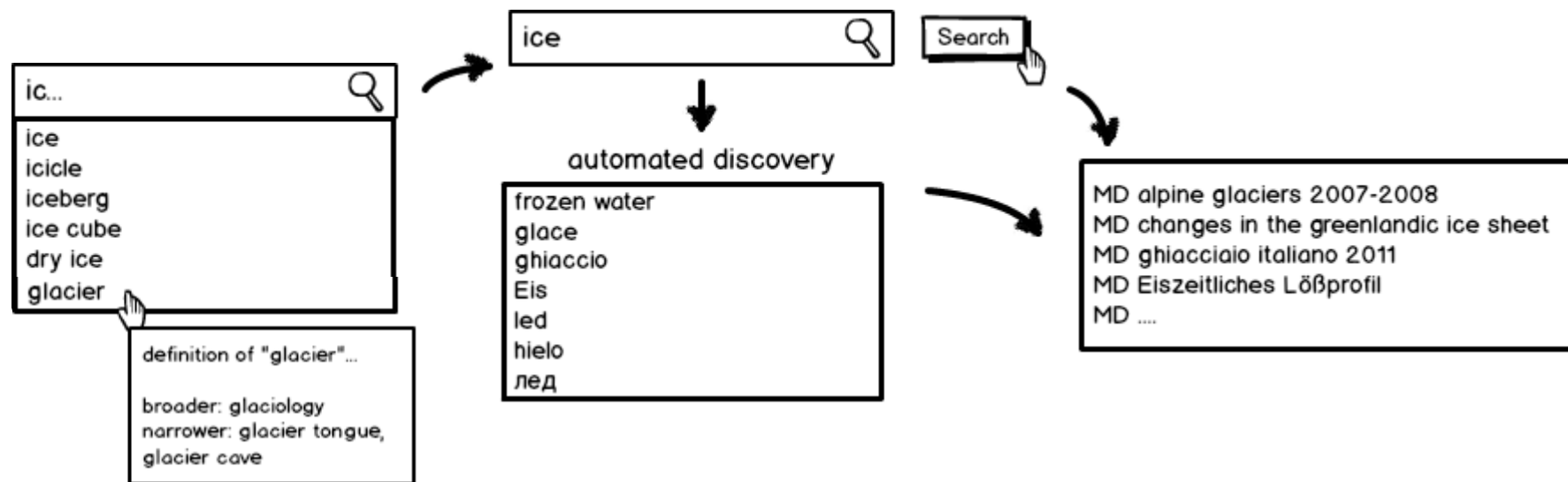


Suggested keyword completions when typing

Further background information on demand

Search terms automatically extended by synonyms, translations, identical concepts from other thesauri, ...

Simple Usage of KeywordCompletion, KeywordExplanations and QueryReformulation for Improving Metadata Data Search



Suggested keyword completions when typing

Further background information on demand

Search terms automatically extended by synonyms, translations, identical concepts from other thesauri, ...

Search results from different multilingual, cross-domain sources

Mock-Up: LusTRE Exploitation Services for Browsing Conceptual Spaces

Semantic explorative search:

- during metadata compilation or during manual data discovery
- browse through a visualization-based of interlinked thesaurus structures
- keyword translations by cross-walking

Mock-Up: LusTRE Exploitation Services for Browsing Conceptual Spaces

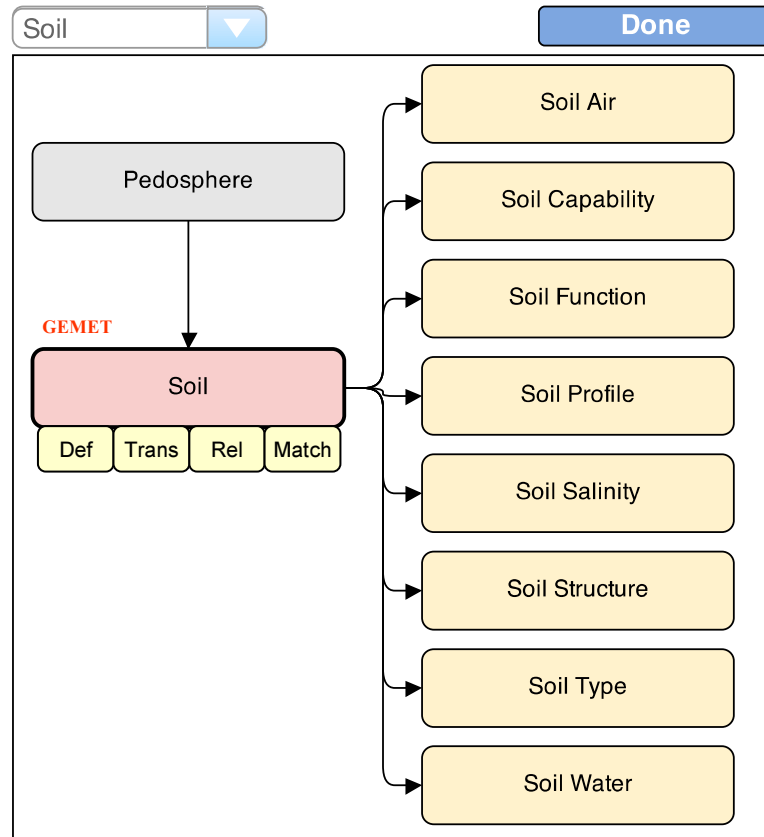
Semantic explorative search:

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A text input field with the word 'Soil' inside and a blue downward-pointing arrow button on the right side.

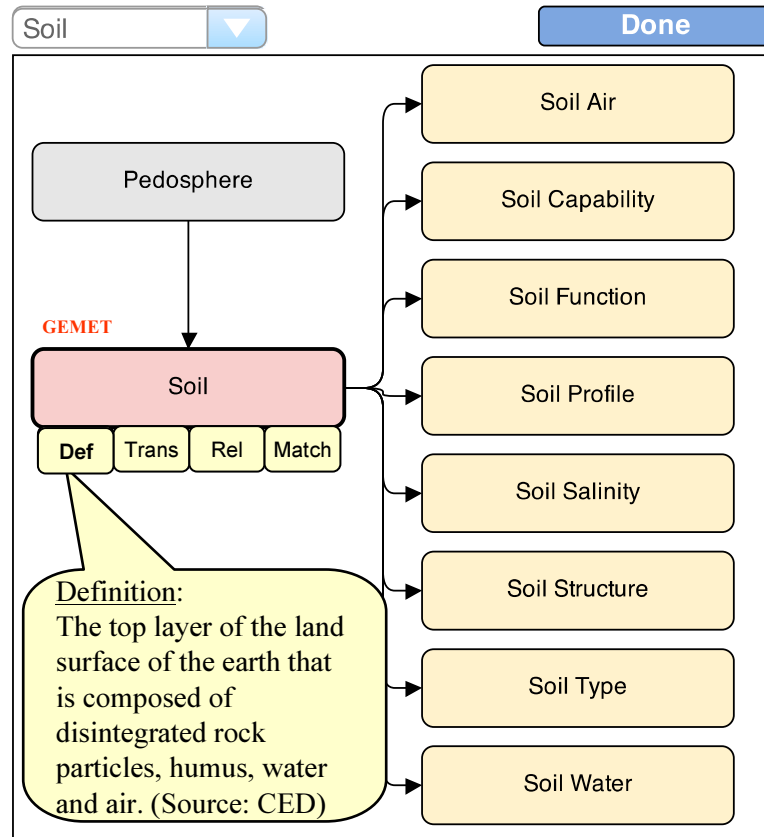
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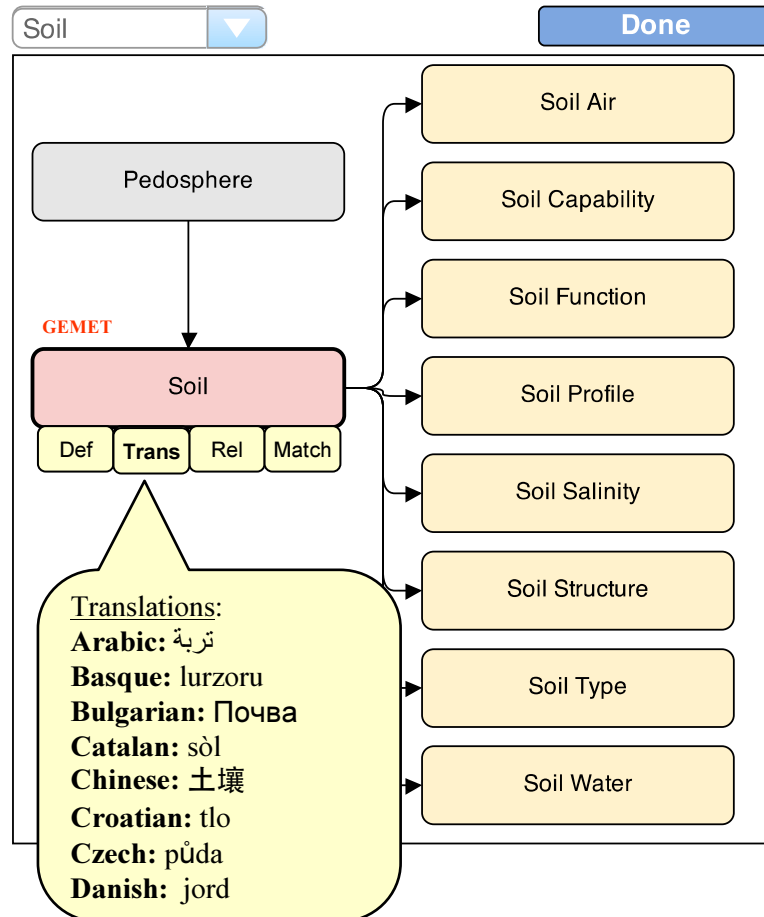
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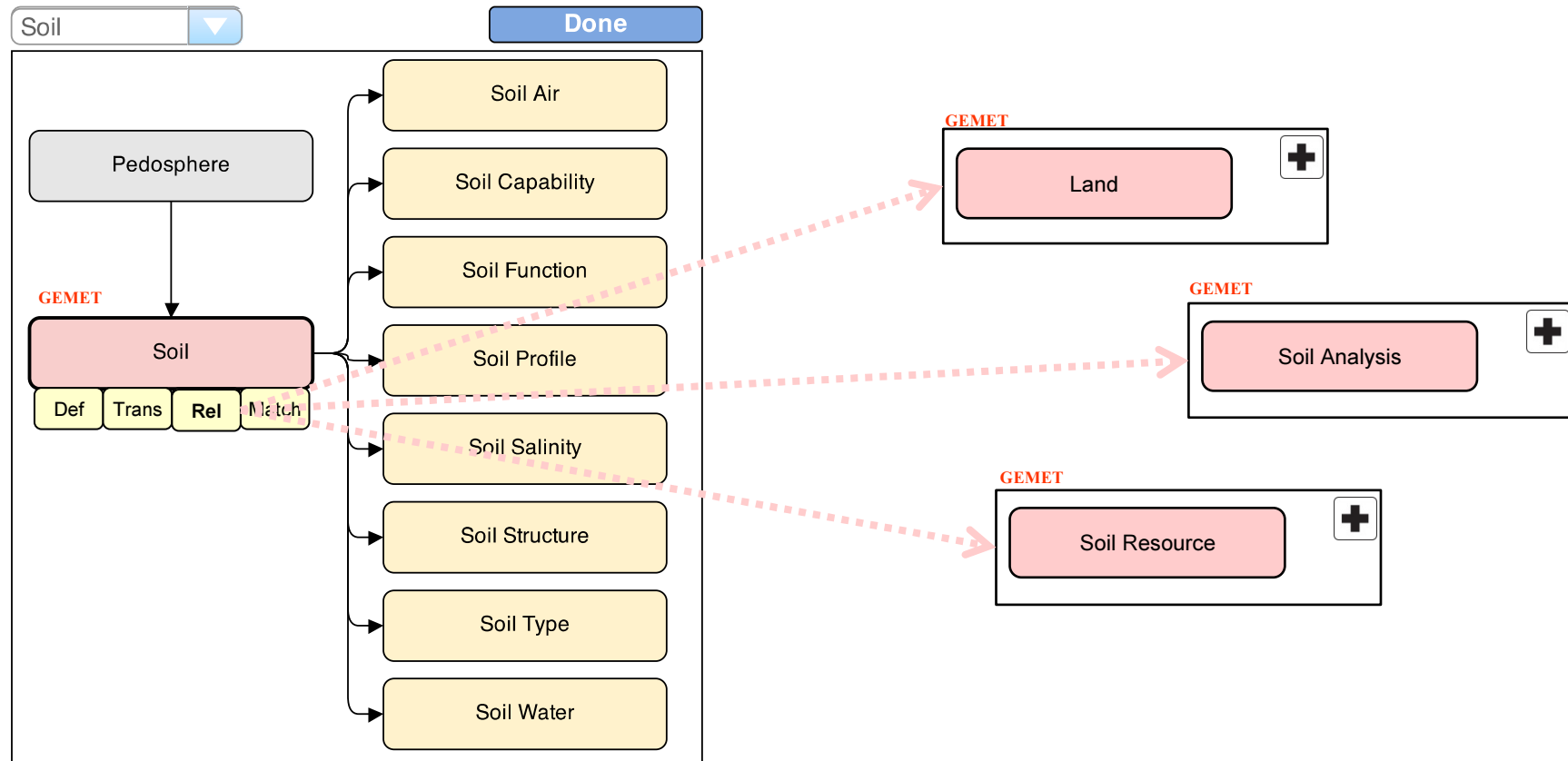
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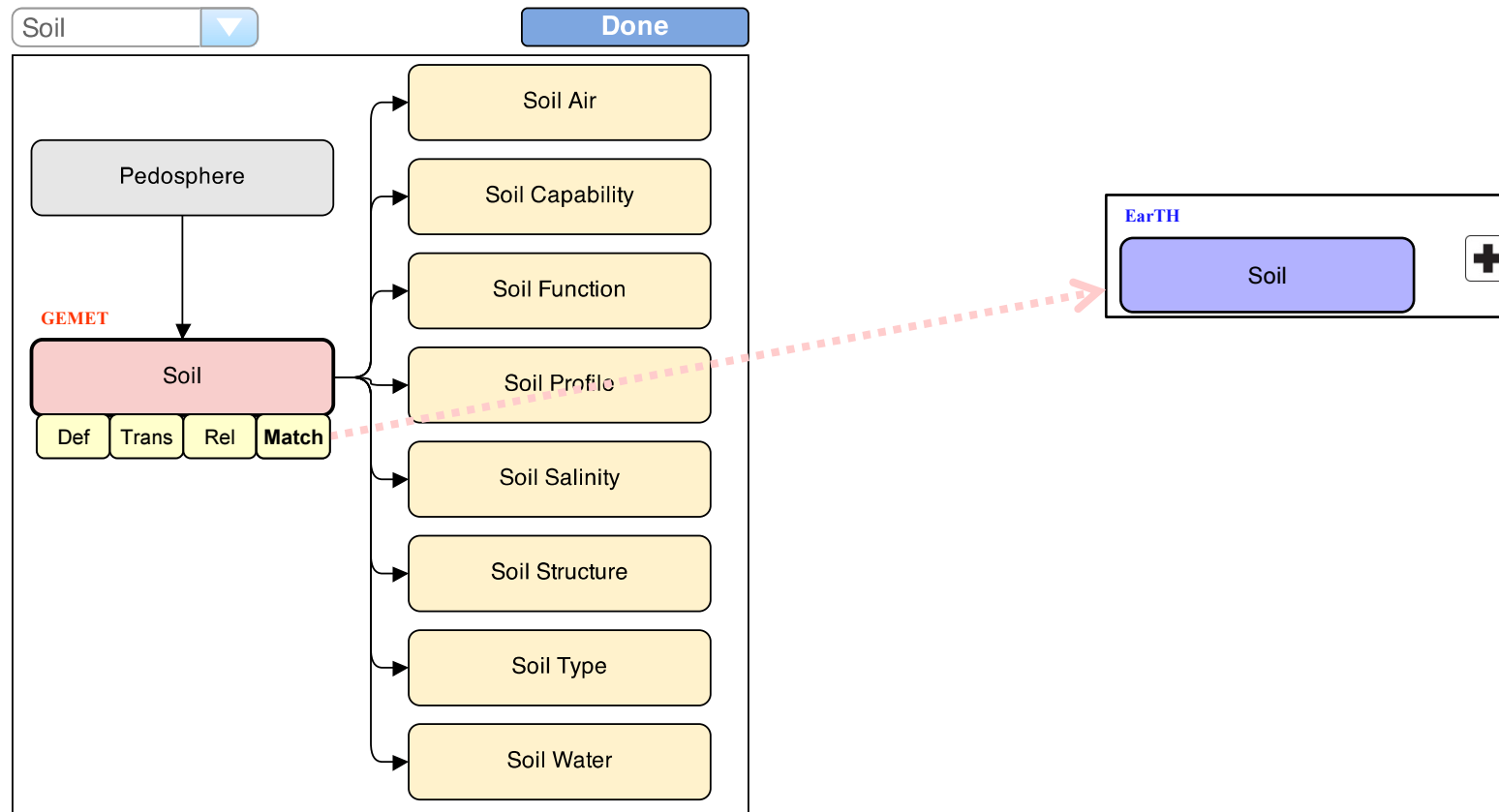
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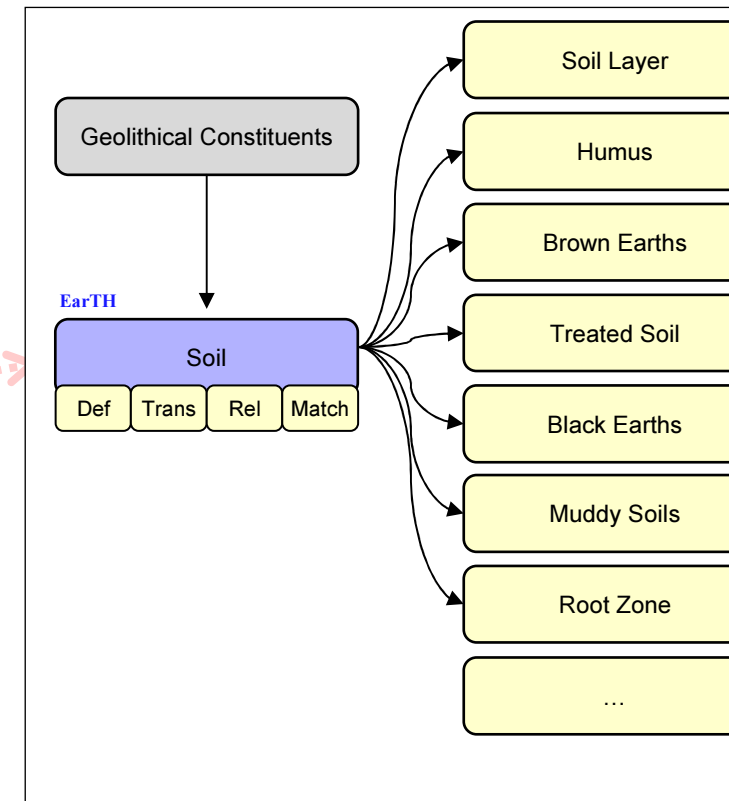
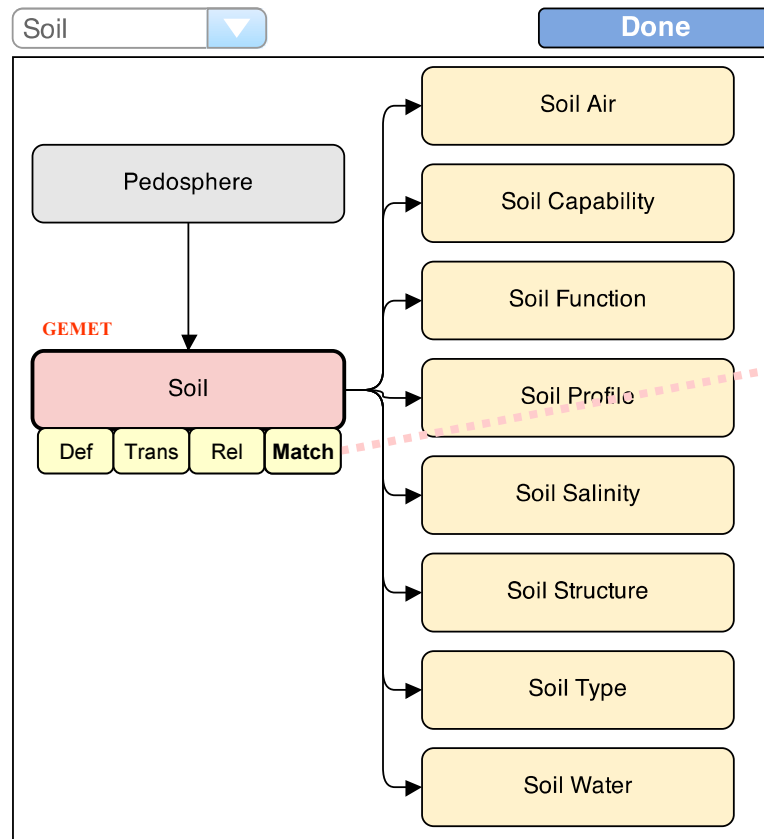
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Conclusions

- ☐ LusTRE new release available at the end of 2014
 - New content, new interlinking
 - Exploitation services implemented

- ☐ Exploitation of LusTRE within
 - INSPIRE Geoportal
 - INSPIRE Metadata Editor
 - eENVplus pilot

- ☐ More technical information at this conference
 - Whenever you meet us
 - Two more talks on Thursday - Room 5 - 11.40h and 12.00h

... Waiting for eENVplus - LusTRE outcomes ... We invite you:

☐ To take a look at the Thesaurus Framework at:

<http://linkeddata.ge.imati.cnr.it:2020>

☐ To check if a term is contained in TF at:

<http://linkeddata.ge.imati.cnr.it:8890/fct/>

☐ To access the SPARQL ENDPOINT at:

<http://linkeddata.ge.imati.cnr.it:8890/sparql>

☐ To querying thesaurus concepts, relationships thesaurus

☐ To mappings between EARTH to GEMET, AGROVOC, UMTES...

☐ To build your own services/application on the TF

☐ To interlink your vocabularies/thesauri with the LusTRE thesauri

Contact persons

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albertoni@ge.imati.cnr.it

disy: andreas.abecker@disy.net

... Thank you !