Ontology Alignment with Mappings Published in the Purdue Research Repository

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Line C. Pouchard* and Michael N. Huhns**

* Purdue University Libraries ** University of South Carolina

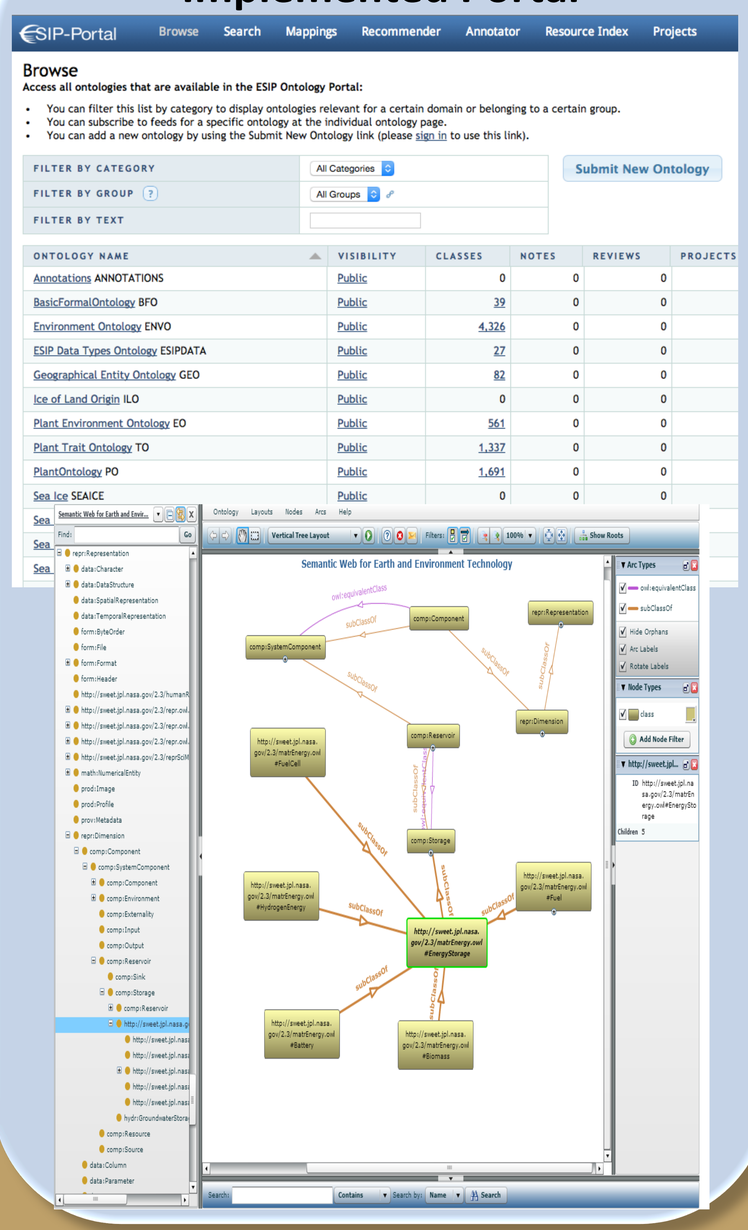
Objectives

- Provide a community-based ontology repository
- Provide class mappings between ESIP and other ontologies
- Extend ontology coverage through the mappings

Advantages of the Semantic Portal

- Programmatic access to ontologies via REST services
- Visualization of ontology entities in their hierarchical context
- Visualization of ontology entities in a graph
- Possibility to enter and edit annotations
- Automatic upload of mappings

Implemented Portal

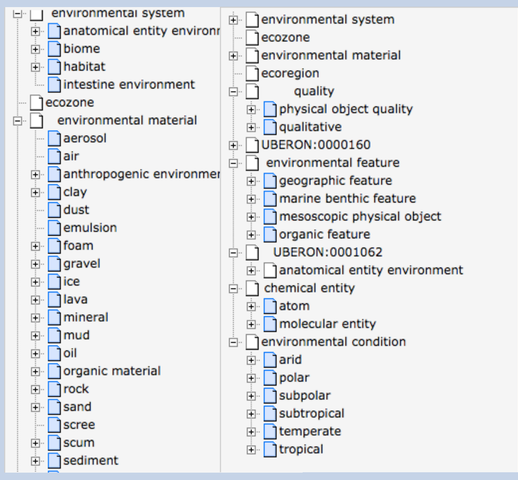


Approach to Create Alignments

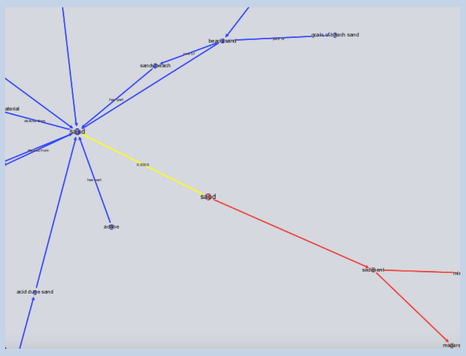
- We use Agreement Maker Light, an algorithm from the Ontology Alignment Evaluation Initiative.
- AML uses synonym properties between labels as determined by the TF-IDF measure
- Ranked first among 8 aligners for OAIE 2014 campaign

- **Agreement Maker Light Faria, D., Pesquita, C., Santos, E., Palmonari, M., Cruz, I. F., & Couto, F. M. (2013, January). The agreementmakerlight ontology matching system. In On the Move to Meaningful Internet Systems: OTM 2013 Conferences (pp. 527-541). Springer Berlin Heidelberg**

SWEET-to-ENVO Mappings



SWEET Summer 2014 version
4549 classes, 360 properties
ENVO
1911 classes, 60 properties




```
- <rdf:RDF alignmentSource="AgreementMakerLight">
  - <Alignment>
      <xml>yes</xml>
      <level>0</level>
      <type>??</type>
      <onto1>http://sweet.jpl.nasa.gov/2.3/sweetAll.owl</onto1>
      <onto2>http://purl.obolibrary.org/obo/envo.owl</onto2>
      <uri1>http://sweet.jpl.nasa.gov/2.3/sweetAll.owl</uri1>
      <uri2>http://purl.obolibrary.org/obo/envo.owl</uri2>
    - <map>
      - <Cell>
          <entity1 rdf:resource="http://sweet.jpl.nasa.gov/2.3/realmLandOrographic.owl#Cliff"/>
          <entity2 rdf:resource="http://purl.obolibrary.org/obo/ENVO_00000087"/>
          <measure rdf:datatype="http://www.w3.org/2001/XMLSchema#float">0.9306</measure>
          <relation>=</relation>
        </Cell>
      </map>
    - <map>
      - <Cell>
          <entity1 rdf:resource="http://sweet.jpl.nasa.gov/2.3/realmOceanFloor.owl#OceanFloor"/>
          <entity2 rdf:resource="http://purl.obolibrary.org/obo/ENVO_00000426"/>
          <measure rdf:datatype="http://www.w3.org/2001/XMLSchema#float">0.9306</measure>
          <relation>=</relation>
        </Cell>
      </map>
```


AML: 841 mappings
Comparison: Term mappings produced by LOOM (Bioportal): 242

Semantic Sea Ice Interoperability Initiative (NSIDC)

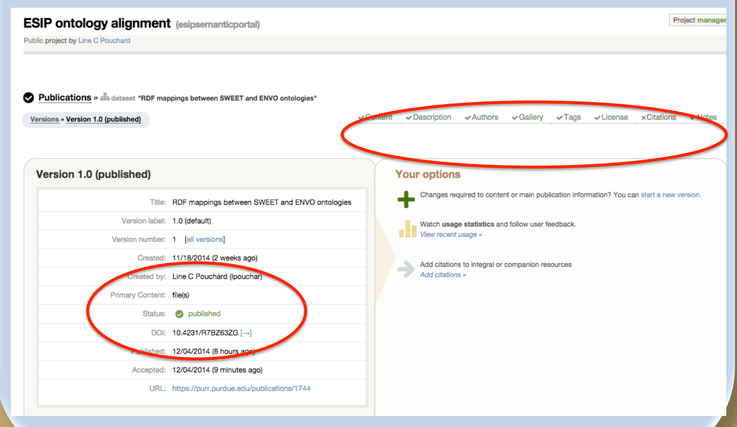
Filename
README.txt
Sea-Ice-Chart-Regions.rdf
annotations.owl
egg.omn
egg.owl
ice-of-land-origin.omn
ice-of-land-origin.owl
seaice-concentration.omn
seaice-concentration.owl
seaice-development.omn
seaice-development.owl
seaice-form.omn
seaice-form.owl
seaice.omn
seaice.owl
sigrid3.omn
sigrid3.owl
sweet_cryo.owl

SWEET-to-EGG:	18
EGG-to-SWEET:	18
SWEET-to-Iceoflandorigin:	5
Iceoflandorigin-to-SWEET:	5
SWEEt-to-seaiceconcentration:	12
seaiceconcentration-to-SWEET:	12
SWEET-to-seaicedevelopment:	1
seaicedevelopment-to-SWEET:	1
SWEET-to-seaiceform:	9
seaiceform-to-SWEET:	9
SWEET-to-seaice:	15
seaice-to-SWEET:	15
SWEET-to-sig3:	20
Sig3-to-SWEET:	20

Purdue University Research Repository

- A collaboration platform where participants can share files by projects
- Project manager needs to be affiliated with Purdue
- Collaborators can be anywhere
- Curate and disseminate research data for up to 10 years (2 years in existence)
- A published dataset obtains a DOI
- Open access to published data

Dataset Publication



Future Research

- Produce more *types* of mappings with latest version of SWEET
- Add more ontologies to portal
- Publish the mappings between SSIII and SWEET

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PURR Purdue University Research Repository http://purr.purdue.edu

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