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Ontology Alignment with Mappings Published in the Purdue Research Repository

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Winter
Meeting
2015

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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

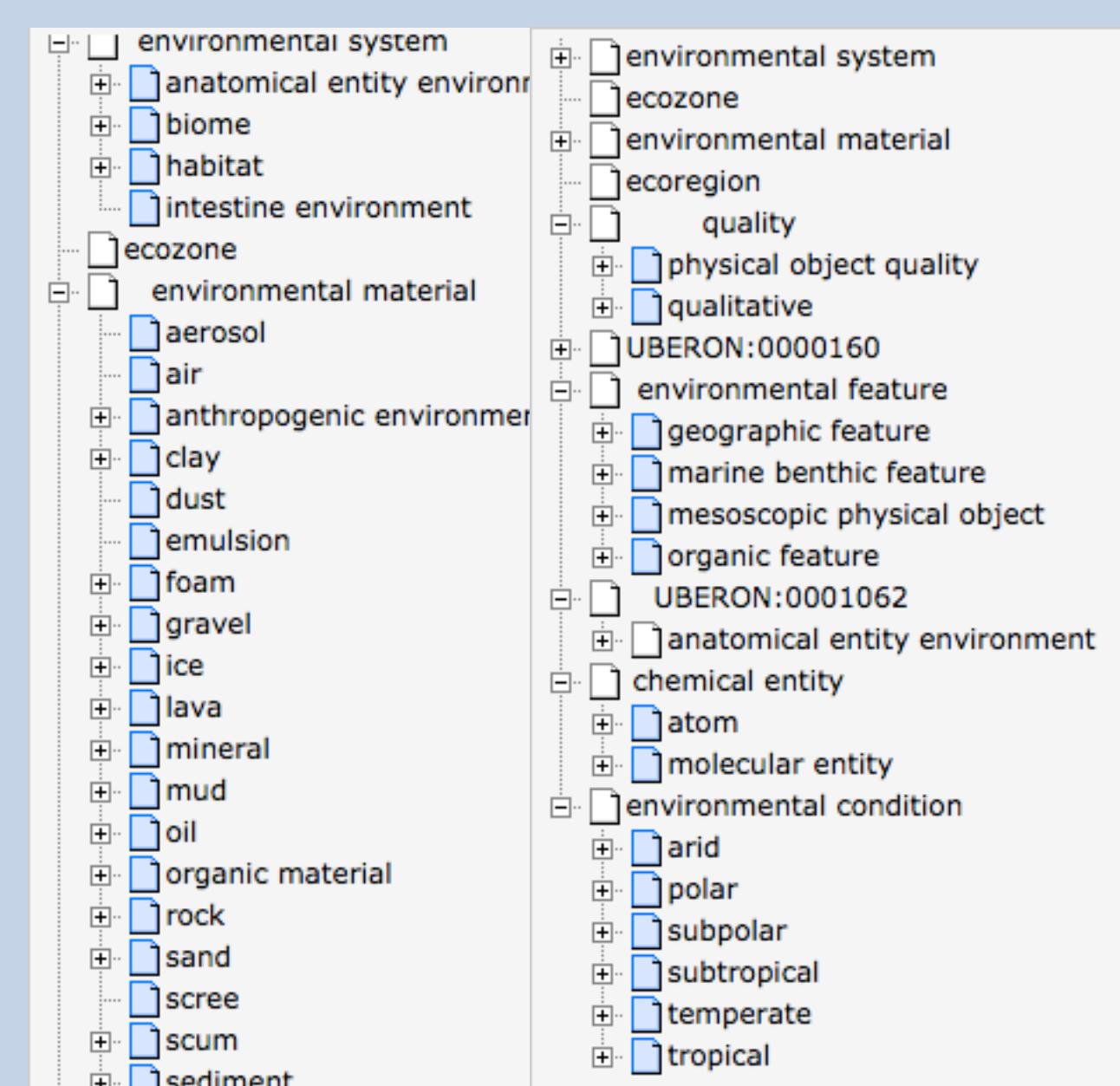
The screenshot shows the ESIP-Portal interface. At the top, there's a navigation bar with links for Browse, Search, Mappings, Recommender, Annotator, Resource Index, and Projects. Below the navigation is a search bar and a 'Submit New Ontology' button. The main area has sections for 'Annotations ANNOTATIONS' and 'BasicFormalOntology BFO'. A large window on the right displays a semantic web interface for 'Semantic Web for Earth and Environment Technology', showing various ontology classes like 'compSystemComponent', 'compReservoir', 'compStorage', and 'EnergyStorage' with their relationships and properties.

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

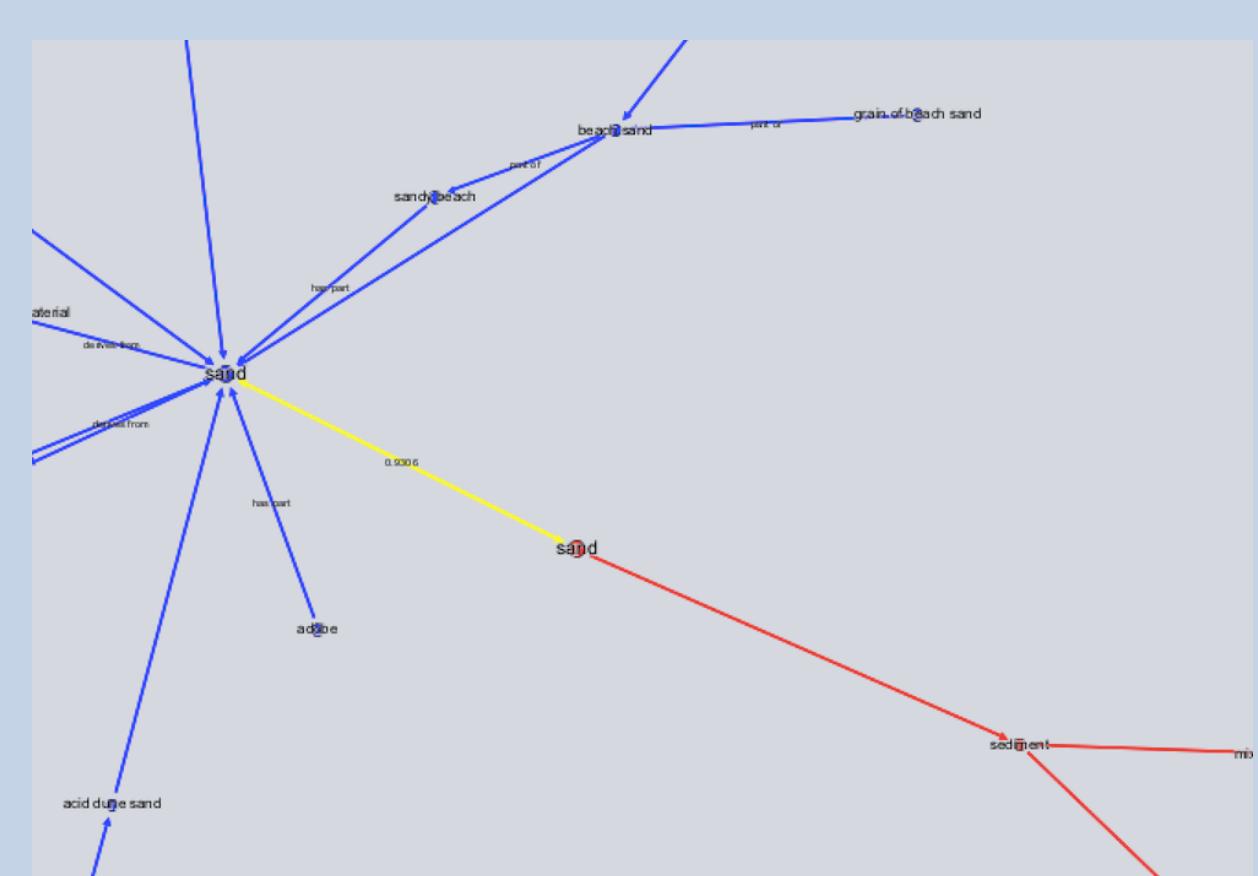


SWEET Summer 2014 version

4549 classes, 360 properties

ENVO

1911 classes, 60 properties



```
<rdf:RDF alignmentSource="AgreementMakerLight">
  <> <Alignment>
    <entity1>xmb</entity1>
    <entity2>xmb</entity2>
    <level>2</level>
    <type>??</type>
    <onto1>http://sweet.jpl.nasa.gov/2.3/sweetAll.owl#ento1</onto1>
    <onto2>http://sweet.jpl.nasa.gov/2.3/sweetAll.owl#ento2</onto2>
    <url1>http://sweet.jpl.nasa.gov/2.3/sweetAll.owl#url1</url1>
    <url2>http://purl.oclc.org/obo/envo.owl#url2</url2>
  </Alignment>
  <map>
    <Cell>
      <entity1>rdf:resource</entity1>"http://sweet.jpl.nasa.gov/2.3/realmLandGeographic.owl#Clif1"/>
      <entity2>rdf:resource</entity2>"http://purl.oclc.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</entity1>"http://sweet.jpl.nasa.gov/2.3/realmOceanFloor.owl#OceanFloor"/>
      <entity2>rdf:resource</entity2>"http://purl.oclc.org/obo/ENVO_00000046"/>
      <measure rdf:datatype="http://www.w3.org/2001/XMLSchema#float">0.9306</measure>
      <relation></relation>
    </Cell>
  </map>
</rdf:RDF>
```

AML: 841 mappings

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

Semantic Sea Ice Interoperability Initiative (NSIDC)

| Filename | |
|---------------------------|----|
| README.txt | 18 |
| Sea-Ice-Chart-Regions.rdf | 18 |
| annotations.owl | |
| egg.owl | |
| egg.owl | |
| ice-of-land-origin.owl | |
| ice-of-land-origin.owl | |
| seaice-concentration.owl | 5 |
| seaice-concentration.owl | 5 |
| seaice-development.owl | |
| seaice-development.owl | |
| seaice-form.owl | |
| seaice-form.owl | |
| seaice.owl | 12 |
| seaice.owl | 12 |
| sigrid3.owl | |
| sigrid3.owl | |
| sweet_cryo.owl | 1 |
| sweet_cryo.owl | 1 |
| SWEET-to-seaice: | 9 |
| seaice-to-SWEET: | 9 |
| SWEET-to-seaice3: | 15 |
| seaice3-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

The screenshot shows the 'Dataset Publication' page for the 'ESIP ontology alignment' dataset. It includes sections for 'Publications', 'Version 1.0 (published)', and 'Your options'. The 'Your options' section is circled in red, highlighting the 'Add citations to integral or companion resources' link.

Future Research

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