Ontology Alignment with Mappings Published in the Purdue Research Repository

Winter
Meeting
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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

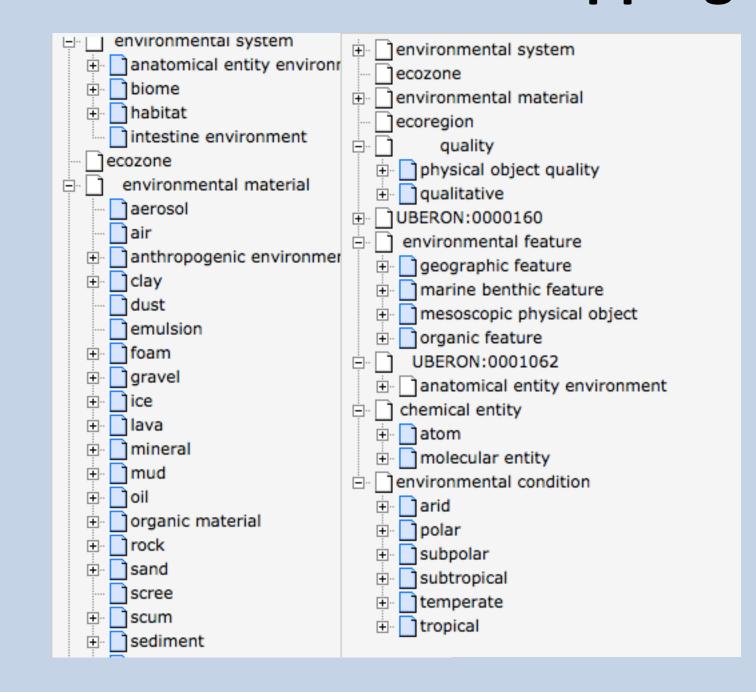
€SIP-Portal Browse Access all ontologies that are available in the ESIP Ontology Portal You can filter this list by category to display ontologies relevant for a certain domain or belonging to a certain group. You can subscribe to feeds for a specific ontology at the individual ontology page You can add a new ontology by using the Submit New Ontology link (please sign in to use this link). FILTER BY CATEGORY All Categories 💠 Submit New Ontology All Groups 😊 💰 FILTER BY GROUP FILTER BY TEXT **ONTOLOGY NAME** Annotations ANNOTATIONS BasicFormalOntology BFO Environment Ontology ENVO ESIP Data Types Ontology ESIPDATA Geographical Entity Ontology GEO Ice of Land Origin ILO Plant Environment Ontology EO Plant Trait Ontology TO PlantOntology PO ♥ ♥ Vertical Tree Layout ▼ ● ● Filters: ♥ ● Semantic Web for Earth and Environment Technology Sea 🖩 🌖 data:Character ✓ — owl:equivalentClass ✓ — subClassOf form:ByteOrde Hide Orphans form:File ✓ Arc Labels 🗄 🌘 form:Format ✓ Rotate Labels form:Header **▼** Node Types http://sweet.jpl.nasa.gov/2.3/huma http://sweet.jpl.nasa.gov/2.3/repr.ov http://sweet.jpl.nasa.gov/2.3/repr.o Add Node Filter http://sweet.jpl.nasa.gov/2.3/repr.ov http://sweet.jpl.nasa. ov/2.3/matrEnergy.owl 🗄 🥚 http://sweet.jpl.nasa.gov/2.3/reprSci ▼ http://sweet.jpl... 🕝 🔽 math:NumericalEntity ID http://sweet.jpl.na sa.gov/2.3/matrEn prod:Profile ergy.owl#EnergySto prov:Metadata 🥛 repr:Dimension □ ● comp:Component Comp:SystemComponent 🗄 🥚 comp:Component http://sweet.jpl.nasa. gov/2.3/matrEnergy.owl 🗄 🥚 comp:Environment comp:Externality comp:Input comp:Output 🖃 🥚 comp:Reservoir comp:Sink 🗄 🥚 comp:Reservoir 🖃 🥚 http://sweet.jpl.nas gov/2.3/matrEnergy.owl http://sweet.jpl.na ov/2.3/matrEnergy.ow #Biomass http://sweet.jpl.na 🗄 🌘 http://sweet.jpl.na http://sweet.jpl.nas hvdr:GroundwaterStor comp:Source data:Column

Contains ▼ Search by: Name ▼ ♣ Search

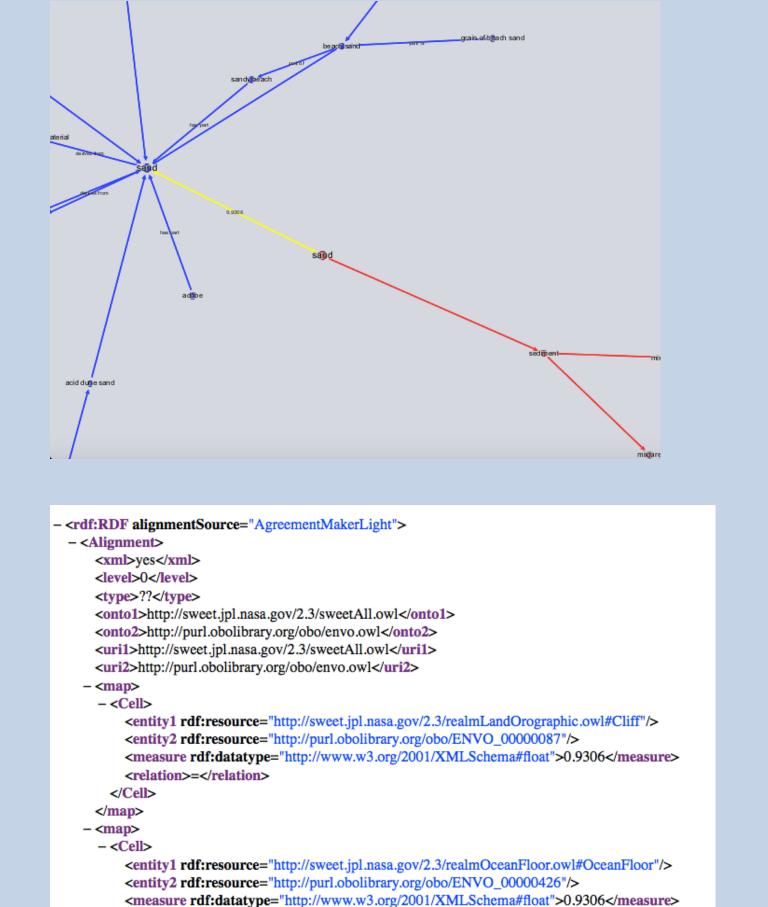
Approach to Create Alignments

- 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



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

<relation>=</relation>

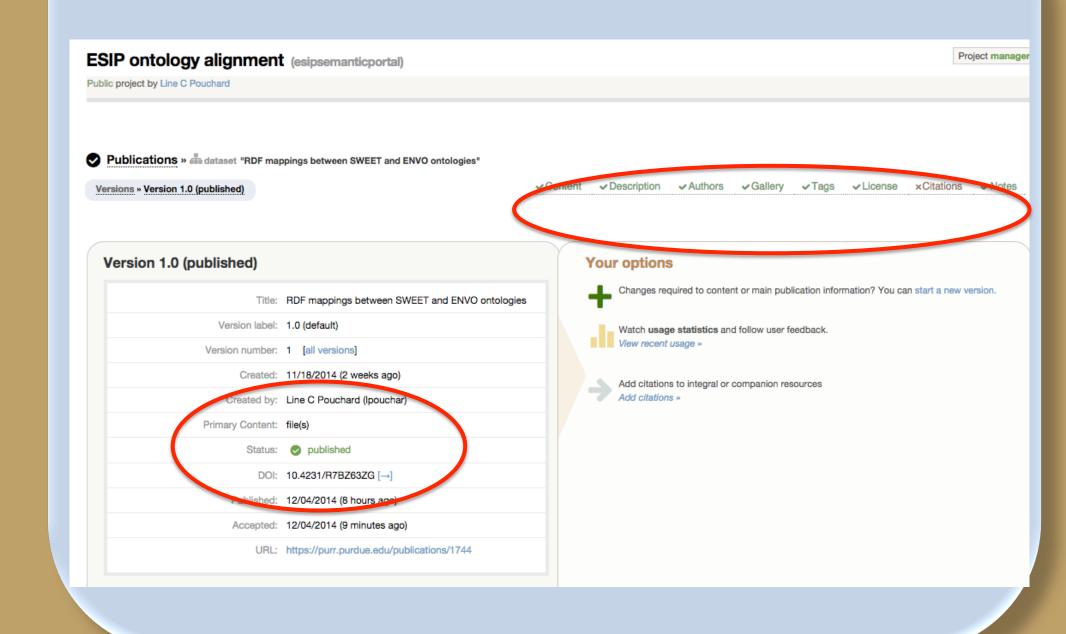
Semantic Sea Ice Interoperability Initiative (NSIDC)

Filename	SWEET-to-EGG:	18
README.txt	EGG-to-SWEET:	18
Sea-Ice-Chart-Regions.rdf		
annotations.owl	SWEET-to-Iceoflandorigin:	5
egg.omn	Iceoflandorigin-to-SWEET:	5
egg.owl	CAMEET La constant and a constant a	42
ice-of-land-origin.omn	SWEEt-to-seaiceconcentration:	12
ice-of-land-origin.owl	seaiceconcentration-to-SWEET:	12
seaice-concentration.omn	SWEET-to-seaicedevelopment:	1
seaice-concentration.owl	seaicedevelopment-to-SWEET:	1
seaice-development.omn		
seaice-development.owl	SWEET-to-seaiceform:	9
seaice-form.omn	seaiceform-to-SWEET:	9
seaice-form.owl	SWEET-to-seaice:	15
seaice.omn	seaice-to-SWEET:	15
seaice.owl	Sedice-to-SVVLLT.	13
sigrid3.omn	SWEET-to-sig3:	20
sigrid3.owl	Sig3-to-SWEET:	20
sweet_cryo.owl		

Purdue University Research Repository

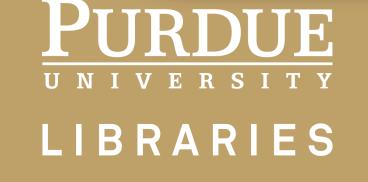
- A collaboration platform where participants can share files by projects
- Project manager needs to be affiliated with Purdue
- Collaborators can be anywhere
- Curate and disseminate research data for up to 10 years (2 years in existence)
- A published dataset obtains a DOI
- Open access to published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

Dataset Publication



Future Research

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



data:Parameter



