ADC-IARPC-SCADM Vocabularies and Semantics Working Group

Ruth Duerr and members of the working group

ARCTICDATACOMMITTEE

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Outline

- Overview
- Activities
  - Resource compilation
  - GCW vocabulary
  - YAMZ
  - ENVO/SWEET, etc.
  - YOPP

Overview - Vocabularies and Semantics Working Group

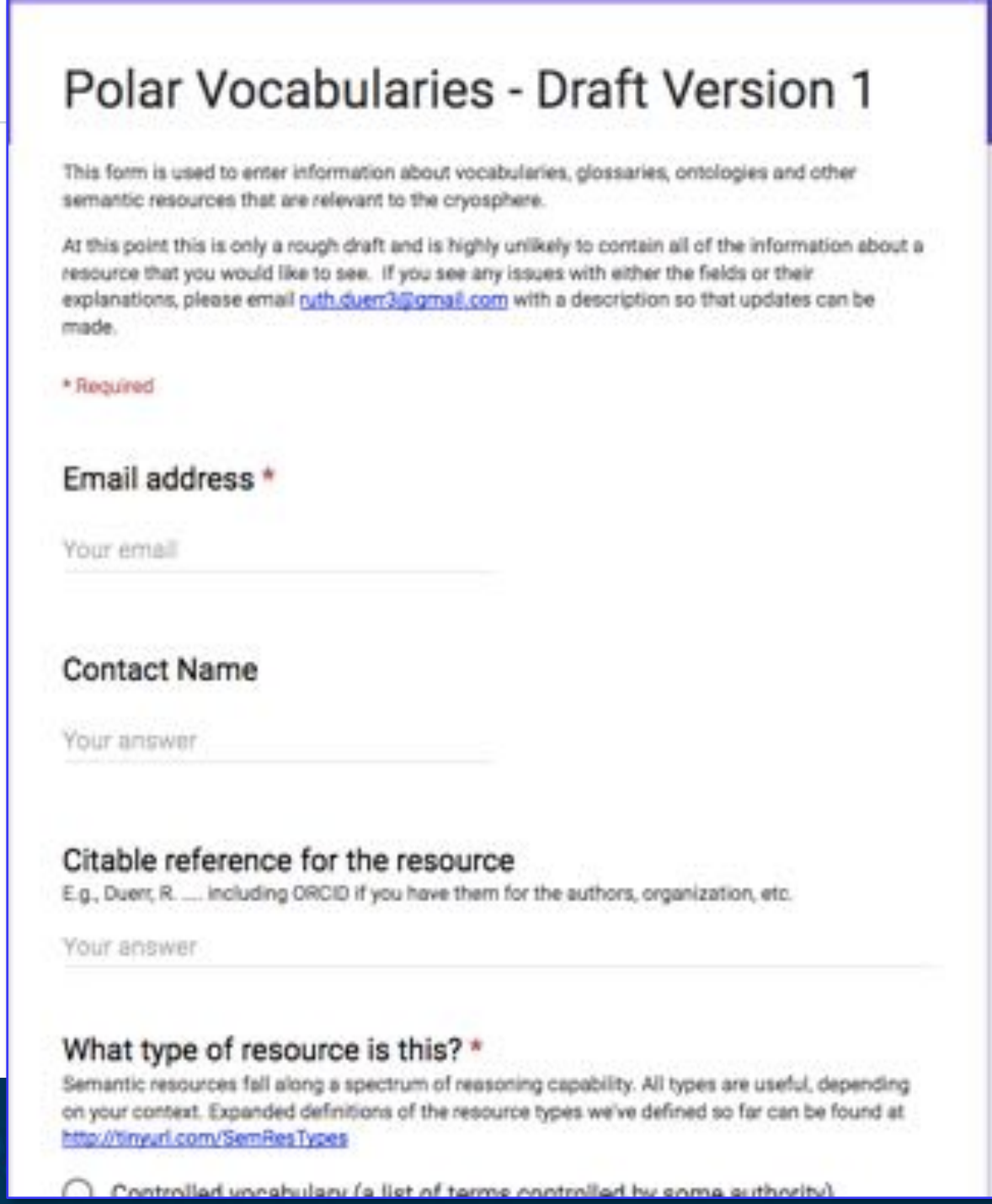
- A joint effort between the Arctic Data Committee and the Arctic Data Sub Team of the U.S. Interagency Arctic Research Policy Committee
- Open to any interested party
- Virtual meetings every third Tuesday via Zoom
- https://arcticdc.org/activities/core-projects/vocabularies-and-semantics-wg
- Send email to polarsemantics@gmail.com to join email list

Overview – Purpose of the Group

- Promote awareness of existing vocabularies and semantics initiatives to increase effectiveness and reduce or eliminate redundancy
- Coordinate vocabularies and semantics development activities across the polar information community
- Enable and organize regular communication within the community
- Help members of the community connect to useful and interoperable vocabularies
- Inform the polar community about broader activities (e.g. ESIP, RDA), and act as ambassadors from the polar community to other initiatives

Activities

- Compiling a list of polar related semantic resources in the form of a questionnaire
- Compiling information on the wide variety of activities



Polar Vocabularies - Draft Version 1

This form is used to enter information about vocabularies, glossaries, ontologies and other semantic resources that are relevant to the cryosphere.

At this point this is only a rough draft and is highly unlikely to contain all of the information about a resource that you would like to see. If you see any issues with either the fields or their explanations, please email ruth.duerr3@gmail.com with a description so that updates can be made.

* Required

Email address *

Your email

Contact Name

Your answer

Citable reference for the resource

E.g., Duerr, R. .... including ORCID if you have them for the authors, organization, etc.

Your answer

What type of resource is this? *

Semantic resources fall along a spectrum of reasoning capability. All types are useful, depending on your context. Expanded definitions of the resource types we've defined so far can be found at http://tinyurl.com/SemResTypes

Controlled vocabulary (a list of terms controlled by some authority)

Activities - GCW Glossary

Two reports:

1. An assessment of existing terminology in the Global Cryosphere Watch (GCW) Glossary indicating terms:
   - that are **not problematic** from a semantic standpoint,
   - where multiple definitions can be **coalesced** into a single definition,
   - where the terminology is **inconsistent** and therefore problematic from a semantic standpoint, and
   - where **community resolution** is needed to either agree on a definition or to split the terms up into separate entities.
2. An assessment of how these terms align with concepts in a set of leading semantic resources including the SWEET, ENVO, and Geoscience ontologies and makes recommendations on addressing overlaps and discrepancies

Activities - GCW Glossary - First report

Type of Term	Number of Items	Number of Unique Items
Original spreadsheet	4,141	2,230
Not problematic terms	1,076	1,076
Terms to coalesce	2,033	728
Inconsistent terms	502	131
Community resolution needed	582	269
New Totals	**4193**	**2,204**

Activities - GCW Glossary - Example term to coalesce

Term	Source	Topic	Definition	Suggested Definition (needs community vetting)
Ablation area	NSIDC accessed 2016	Glaciers	The area of a glacier where more glacier mass is lost than gained.	A synonym of ablation zone.
	Molnia USGS 2004	Snow	Ablation area is the lower region of a glacier where snow ablation exceeds snowfall. A line that marks the limit on a mountain above which snow persists from one winter to the next is called the annual snowline, and this line on a glacier is called the firnline. Above the firnline, snow that falls each year packs down and changes into glacier ice as air is slowly forced out of it. This part of the glacier is its accumulation area where more snow falls each year than is lost by melting. Below the firnline is the ablation area, where melting predominates.	
	Cogley et al. IACS-UNESCO Glacier Mass Balance 2011	Misc	A synonym of ablation zone.	
	AMS - glossary of meteorology	Glaciers	That portion of a glacier surface below the firn line where ablation exceeds accumulation; the opposite of accumulation area.	
	Swisseduc - Photo glossary of glaciological terms	Glaciers	That part of a glacier's surface, usually at lower elevations, over which ablationexceeds accumulation.	

Activities - GCW Glossary - Problematic & Community Res.

Bergschrund	NSIDC accessed 2016	Glaciers	Crevasse that separates flowing ice from stagnant ice at the head of a glacier.	The issue here is that depending on whether you are interested in ice dynamics or in hydrology (and other disciplines) a glacier either contains the bergschrund and any stagnant ice above it or not. Either the ice dynamics folks need to change their definition of a glacier or two definitions should be included each with their own permalink.	In ice-dynamics, a single large crevasse or series of sub-parallel crevasses that develop at the head of a cirque or valley glacier which separates the moving glacier ice from the rock wall and the ice apron (stagnant ice) attached to it. The bergschrund is the headward boundary of the glacier. Bergschrund is an Anglicized word of German origin. In hydrology and other non-ice dynamics fields, a single large crevasse or series of sub-parallel crevasses that develop at the head of a cirque or valley glacier which separates the moving glacier ice from the rock wall and the ice apron (stagnant ice) attached to it. The stagnant ice above the bergschrund is part of the glacier. Bergschrund is an Anglicized word of German origin.
	Molnia USGS 2004	Snow	A single large crevasse or series of sub-parallel crevasses that develop at the head of a glacier. The location where ice pulls away from the bedrock wall of the cirque against which it accumulated. In winter, the crevasse fills with snow. In spring or summer, it reopens. (Originally a German term).		
	Cogley et al. IACS-UNESCO Glacier Mass Balance 2011	Glaciers	A crevasse at the head of a glacier that separates flowing ice from stagnant ice, or from a rock headwall. From an ice-dynamical point of view the bergschrund is the headward boundary of the glacier, while for hydrological and other purposes, including glacier inventory, the stagnant ice above the bergschrund is part of the glacier. Bergschrund is an Anglicized word of German origin.		
	Swisseduc - Photo glossary of glaciological terms	Glaciers	[from the German] An irregular crevasse, usually running across an ice slope in the accumulation area, where active glacier ice pulls away from ice adhering to the steep mountainside		
	PhysicalGeography.net	Glaciers	A deep crevasse commonly found at the head of an alpine glacier. Forms when the glacial ice pulls away from the mountain side.		
	Illustrated Glossary of Snow and Ice	Glaciers	The crevasse which occurs at the head of a cirque or valley glacier and which separates the moving glacier ice from the rock wall and the ice apron attached to it. When the ice apron is absent the gap is known as a randkluft.		

Frost creep	NSIDC accessed 2016	Misc	The net downslope displacement that occurs when a soil, during a freeze-thaw cycle, expands normal (perpendicular) to the ground surface and settles in a nearly vertical direction.	The issue here is that none of these definitions is clear enough to explain frost creep to someone who isn't already familiar with the term. I've taken a stab at it; but surely someone can do better.	Slow mass movement of soil downslope that is initiated by freeze-thaw action. Forming ice lenses expand, pushing the soil out perpendicular to its surface. When the ice thaws again, gravity causes the soil to drop straight down, thus moving downhill slightly. Occurs where the stresses on the slope material are too small to create a rapid failure.
	Van Everdingen International Permafrost Association 2005	Permafrost	The net downslope displacement that occurs when a soil, during a freeze-thaw cycle, expands normal to the ground surface and settles in a nearly vertical direction		
	Trombotto et al. 2014	Misc	The net downslope displacement that occurs when a soil, during a freeze-thaw cycle, expands normal to the ground surface and settles in a nearly vertical direction.		
	PhysicalGeography.net	Misc	Slow mass movement of soil downslope that is initiated by freeze-thaw action. Occurs where the stresses on the slope material are too small to create a rapid failure.		

Activities - GCW Glossary: Report 2

Resources assessed:

- GCMD science keywords
- CF Metadata conventions
- GeoSciML
- Geoscience ontology
- SWEET (Semantic Web for Earth and Environmental Terminology) ontology
- ENVO (Environment Ontology)

Activities - GCW Glossary - Report 2 Recommendations

- Monitoring developments and contributing Cryospheric input to the relevant community as warranted (all).
- Reviewing current status (GCMD, SWEET, ENVO).
- Suggesting updates:
  - Adding GCW Glossary definitions to GCMD, CF conventions, Geoscience ontologies, SWEET, ENVO,
  - Adding instruments and projects to GCMD,
  - Possibly suggesting tweaks to the hierarchy of the GCMD Science Keywords, and
  - Suggesting modifications to the hierarchies and axioms in SWEET and ENVO (examples, adding/updating properties and relationships).
- Working with the GeoSciML communities to develop a series of controlled vocabularies for subsets of the GCW Glossary (e.g., a sea ice subset, a glacier subset, etc.).