Information Modeling and Semantic Web Application For National Climate Assessment [1]

Abstract:
Every four years, Earth scientists work together on a National Climate Assessment (NCA) report which integrates, evaluates, and interprets the findings of climate change and impacts on affected industries such as agriculture, natural environment, energy production and use, etc. Given the amount of information presented in each report, and the wide range of information sources and topics, it can be difficult for users to find and identify desired information. To ease the user effort of information discovery, well-structured metadata is needed that describes the report's key statements and conclusions and provide for traceable provenance of data sources used. We present an assessment ontology developed to describe terms, concepts and relations required for the NCA metadata. Wherever possible, the assessment ontology reuses terms from well-known ontologies such as Semantic Web for Earth and Environmental Terminology (SWEET) ontology, Dublin Core (DC) vocabulary, and Global Change Master Directory (GCMD) vocabulary. We have generated sample National Climate Assessment metadata conforming to our assessment ontology by decomposing the document of the report and extracting the meaningful concepts. The metadata are publicly exposed via a SPARQL-endpoint and website. We have also modeled provenance information for the NCA writing activities using the W3C recommendation-candidate PROV-O ontology. Using this provenance the user will be able to trace the sources of information used in the assessment and therefore make trust decisions. In the future, we are planning to implement a faceted browser and keyword based searcher over the metadata to enhance metadata traversal and information discovery.

Collaboration Area: Earth Science Collaboratory [3]
Energy and Climate [4]
Semantic Web [5]

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