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Title: Linked Open Data in the Global Change Information System (GCIS)

Abstract:

The U.S. Global Change Research Program (<http://globalchange.gov>) coordinates and integrates federal research on changes in the global environment and their implications for society. The USGCRP is developing a Global Change Information System (GCIS) that will centralize access to data and information related to global change across the U.S. federal government. The first implementation will focus on the 2013 National Climate Assessment (NCA). (<http://assessment.globalchange.gov>)

The NCA integrates, evaluates, and interprets the findings of the USGCRP; analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years. The NCA has received over 500 distinct technical inputs to the process, many of which are reports distilling and synthesizing even more information, coming from thousands of individuals around the federal, state and local governments, academic institutions and non-governmental organizations.

The GCIS will present a web-based version of the NCA including annotations linking the findings and content of the NCA with the scientific research, datasets, models, observations, etc. that led to its conclusions. It will use semantic tagging and a linked data approach, assigning globally unique, persistent, resolvable identifiers to all of the related entities and capturing and presenting the relationships between them, both internally and referencing out to other linked data sources and back to agency data centers. The developing W3C PROV Data Model and ontology will be used to capture the provenance trail and present it in both human readable web pages and machine readable formats such as RDF and SPARQL. This will improve visibility into the assessment process, increase understanding and reproducibility, and ultimately increase credibility and trust of the resulting report.

Building on the foundation of the NCA, longer term plans for the GCIS include extending these capabilities throughout the U.S. Global Change Research Program, centralizing access to global change data and information across the thirteen agencies that comprise the program.