AGU Fall Meeting
Invited Talk

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Session Title: Helping Disasters Management through the Use of Remote Sensing
Observational Data and their underlying Cyberinfrastructures

Aggregation Tool to Create *Curated Data* albums to Support Disaster Recovery and Response

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Despite advances in science and technology of prediction and simulation of natural hazards, losses incurred due to natural disasters keep growing every year. Natural disasters cause more economic losses as compared to anthropogenic disasters. Economic losses due to natural hazards are estimated to be around $6-$10 billion dollars annually for the U.S. [2] and this number keeps increasing every year [1]. This increase has been attributed to population growth and migration to more hazard prone locations such as coasts. As this trend continues, in concert with shifts in weather patterns caused by climate change, it is anticipated that losses associated with natural disasters will keep growing substantially. One of challenges disaster response and recovery analysts face is to *quickly* find, access and utilize a vast variety of *relevant* geospatial data collected by different federal agencies such as DoD, NASA, NOAA, EPA, USGS etc. Some examples of these data sets include high spatio-temporal resolution multi/hyperspectral satellite imagery, model prediction outputs from weather models, latest radar scans, measurements from an array of sensor networks such as Integrated Ocean Observing System etc. More often analysts may be familiar with limited, but specific datasets and are often unaware of or unfamiliar with a large quantity of other useful resources. Finding airborne or satellite data useful to a natural disaster event often requires a time consuming search through web pages and data archives. Additional information related to damages, deaths, and injuries requires extensive online searches for news reports and official report summaries. An analyst must also sift through vast amounts of potentially useful digital information captured by the general public such as geo-tagged photos, videos and real time damage updates within twitter feeds. Collecting and aggregating these information fragments can provide useful information in assessing damage in real time and help direct recovery efforts. The search process for the analyst could be made much more efficient and productive if a *tool could go beyond a typical search engine* and provide not just links to web sites but actual links to specific data relevant to the natural disaster, parse unstructured reports for useful information nuggets, as well as gather other related reports, summaries, news stories, and images.

This presentation will describe a semantic aggregation tool developed to address similar problem for Earth Science researchers. This tool provides automated curation, and creates "Data Albums" to support case studies. The generated "Data Albums" are compiled collections of information related to a specific science topic or event, containing links to relevant data files (granules) from different instruments; tools and services for visualization and analysis; information about the event contained in news reports, and images or videos to supplement research analysis. An ontology-based relevancy-ranking algorithm drives the curation of relevant data sets for a given event. This tool is now being used to generate a catalog of Hurricane Case Studies at Global Hydrology Resource Center (GHRC), one of NASA's Distribute Active Archive Centers. Another instance of the Data Albums tool is currently being created in collaboration with NASA/MSFC's SPoRT Center, which conducts research on unique NASA products and capabilities that can be transitioned to the operational community to solve forecast problems. This new instance focuses on severe weather to support SPoRT researchers in their model evaluation studies

References
[1] S. Cutter and C. Emrich, "Are Natural Hazards and Disaster Losses in the U . S . Increasing ?," vol. 86, no. 41, pp. 2003–2005, 2005.
[2] D. S. Mileti, Disasters by Design: A Reassessment of Natural Hazards in United States, no. 1975. Joseph Henry Press, Washington D.C., 1999, pp. 1–16.