

[EC Session II: Decision Support Catalog and Community of Practice \(DSTCCP\): Standardized APIs and Support for Extreme Weather/Climate Events \[1\]](#)

Submitted by shkumar on Mon, 2013-10-28 16:49 Wednesday, January 8, 2014 - 16:00 to 17:30

Event: [Winter Meeting 2014](#) [2]

Session Type: [Breakout](#) [3]

Collaboration Area: [Energy and Climate](#) [4]

Abstract/Agenda:

Abstract

Modifications to the Decision Support Catalog and Community of Practice (DSTCCP) prototype to make it more useful for integration with the ongoing and planned government agency programs will be reviewed and discussed. Key changes and updates under consideration are twofold:

- Provide APIs for access to and interaction with related government work including USGS's ScienceBase Platform and Schema.org and interaction with data.gov, Climate Resiliency Toolkit by USGCRP and CEQ, and NASA SERVIR Platform and Services.
- Implement a DSTCCP II prototype with a slant towards decision support for extreme weather and climate events that addresses key community needs, leverages access to agency data, and serves as a template for government agencies.

An implementation plan will be developed for building the DSTCCP II prototype while leveraging the ongoing Drupal and Semantic web work in ESIP.

Agenda

- NASA Data for Extreme Weather and Climate Events, Frank Lindsay (NASA HQ)
- USGS Requirements for integration with Data.gov, ScienceBase Platform and Schema.org - Sky Bristol (USGS)
- DSTCCP II Implementation Plan for extreme weather and climate events - Open Discussion

Notes:

Energy & Climate WG Breakout Session 2: Jan. 8, 2013

Focus on a Decision Support Tools Catalog (Phase 2) for Extreme Events

Session Context:

- How such a decision support catalog might serve the stakeholders in the extreme weather/disaster response communities
- Types of observations used and decision support tools needed
- Planning for resilience and responding to extreme events when they do happen to protect lives, minimize inconvenience and reduce loss of property/infrastructure
- How could NASA data have helped ease the pain of Sandy?
- What can be made available to entrepreneurs to build tools (working w/federal agencies) to advance ability to deal with such events?
- Data sources, models, real-time imagery, predictions, etc.

----- **First Presentation** -----

NASA Data for Extreme Weather and Climate Events

By: Francis Lindsay, Disaster Program Manager, NASA HQ

Frank discussed the many types of space-based observations being used and the DSTs that have been created to deal with disaster response.

Resilience is a large issue in this field.

Frank noted that NASA is not a first responder (e.g., taking place of FEMA or NWS). However, it's clear that NASA has experience that is valuable to other agencies. Unlike these other agencies, NASA is not in field working directly with the end users.

Some examples of the NASA program were described:

The NASA SPoRT facility in Huntsville, Alabama, has used VIIRS day-night band to identify power outages following Superstorm Sandy. These are better measurements than from DMSP. SPoRT may move this into their production stream. NASA has also worked with Defense Intelligence Agency to generate specific products.

The ARIA project (managed by JPL) is a collaboration with ASI (Italy) for space-based SAR measurements using COSMO-SkyMed (X-band) SAR data. It provides the ability to look at surface roughness (e.g., before and after Typhoon Haiyan) to assess and localize damaged infrastructure in the Philippines. The process is "disaster agnostic" in that it can be used for other extreme events.

Deep Water Horizon Oil Spill:

-Satellites monitored the extent of the spill daily. Used several satellite instruments and platforms including MODIS, ASTER, EO-1, MISR and CALIPSO/CALIOP.

-Airborne sensors: measured extent and oil volume: Data provided for use by first responders. NOAA used radiances to initialize trajectory models.

A USGS partnership was described: Hazards Data Distribution System (HDDS) at EROS data center, NASA's Data Repository for National/International Disaster Response.

NASA's Near Real-Time Data Systems

-EOSDIS Near Real-Time Data

-How can NASA do better at reducing data latency for certain products? e.g. forest fire vs drought.

Near real-time data systems:

e.g., LANCE Worldview (less than 3 hours latency) which covers the whole earth at 250m twice a day online.

Information Delivery:

-Fires can be detected from thermal anomaly data from Terra and Aqua. Information is sent out via email, SMS, images, and other formats.

-Challenge: fire managers need timely information on fires still burning in/around area of responsibility. TERRA&AQUA satellites possess sensors to ID thermal anomalies and active fire

locations.

-Fire info can be sent out via web interface and text message

Monitoring Levees and Subsidence in the Sacramento-San Joaquin Delta

-UAVSAR data to assess water infiltration under levees

-UAVSAR: L-band synthetic aperture radar optimized for small-scale surface change detection studies. Uses differential interferometry.

Whither a Decision Support Catalog (Frank's view):

-Aggregations/ collections of pertinent data and info are inherently useful. NASA has been an active promoter of the development of such systems.

-These systems need to have a means for outside users to leverage or build to these services via APIs, subscriptions, or other means.

-Despite our best intentions, there are gaps remaining regarding use, usefulness, understanding and latency of NASA data for disaster support.

Example: NASA/EPA air quality. EPA gets a file from NASA but what does this file mean? NASA says 'look at the readme file we put in there'. EPA says 'well, we never read that' or 'we still don't understand'.

----- Second Presentation & Discussion-----

1. ESIP can help in understanding the limitations of the data. Need to have scientists mediate and bridge this issue with end users. Expose products, rather than expose data. Frank suggests that a good approach would be to pick a mature community where we can usefully build a catalog
2. Shailendra Kumar, Decision Support Tools Catalog and Community of Practice (DSTCCP): Current Status

ESIP Support Tools Catalog and Community of Practice: DSTCCP Phase 2 (DSTCCP: Decision Support Tools and Community of Practice)

Phase 1: The initial impetus was an OSTP interagency activity to develop a tool catalog for renewable site selection. The American Wind Wildlife Institute (AWWI) stepped up to participate. Application #1: Renewables (DSTCCP-R).

Phase 2: Standard Methodology, Application #2: Extreme Events (DSTCCP-E), expand on Renewables

Western Governors Association (WGA) CHAT wants to be involved and populate the tool.

Standard APIs - Sky Bristol (USGS)

USGS Requirements for integration with Data.gov, ScienceBase Platform and Schema.org

-USGS ScienceBase: National Climate change and Wildlife Science Center, Wyoming Landscape Conservation Initiative, Millions of records accessed through a standard API, Same resources being made available to other applications and portals, Some through Drupal and some running as HTML/JavaScript

-Standalone Drupal application w/Drupal database is not a sustainable option

-Need APIs to connect to USGS ScienceBase, Data.gov, others...

-Explore set of frameworks for data-driven portals

DSTCCP: Goals and Questions for User Feedback

- 1)informs decision making
- 2)Support for variety of end user skill levels
- 3)Interactivity and accesibility
- 4)documentation
- 5)use cases and case studies
- 6)data exchange capability
- 7) needs addressed
- 8)clarity of communication

9) lifecycle

10) feedback mechanism

ECHO from NASA, ScienceBase from USGS.

A Drupal application with a Drupal database is not sustainable. Perhaps the Drupal site can consume records that exist elsewhere, interfacing with the ScienceBase API. Potentially hundreds of records in ScienceBase that are relevant to this activity. But, how do we tease them out? E.g., what is a tool?! This is hard to define. One person's tool is another person's model!

Who is the community that we are targeting with this tool? Who is the customer? Is it more than a few scientists in cubicles?

Discussion:

We need high level API and low level data. Is that something ESIP can help with?

-e.g. If I want a flood map for Haiti, it shouldn't matter what tool(s) it comes from as long as the end user gets the product they want.

Maybe build a matrix that looks on past disasters and queries a relevant product when a type of map is requested by a user.

This problem has likely been solved many times in the past by several agencies and groups on an event-by-event basis. Why keep reinventing solutions when they can be reused and adapted?

Standard APIs: Methodology

-Engineering problem

-Research:

--Dovetail other ESIP work (Semantic Web, Discovery Clusters, Drupal)

--How the "contextual knowledge" part can best be encoded and disseminated for broad consumption

Graphs: Geological events have stayed relatively constant over time but atmospheric events have increased, and continue to do so. Federal Disaster Declarations have increased along with projected losses from these events.

DSTCCP Going Forward:

-Provide APIs for access to and interaction with related government and NGO work (USGCRP, CEQ, USGS, NASA, AWWI, NWCC)

-Make platform more user friendly to serve as a template and enable ESIP to serve in an advisory role esp. in cross-agency efforts

-Applications

--DSTCCP for extreme events - harness ideas and needs inputs from city and local governments planning sustainability and resilience

--DSTCCP for renewables - engage developers, stakeholders and users in a dialog about usefulness and transparency, and continue work with WGA, NWCC

Further Audience Discussion

1. Kumar: AWWI was a customer/stakeholder with its constituency.

2. Sky Bristol –“Recommend your algorithm”. This could be of interest to the community. We could share feedback, collect comments outside of agency limitations.

3. Kumar –USGCRP and CEQ are very interested in this technology. They want to build a cross-agency catalog supporting NCA.

4. Pat Cappalaere (NRL) –We need a “use case”. This is important, e.g., end user needs flood map for disaster response. How can ESIP help to interpret request and serve up a relevant reply?

5. Chris Lenhardt –Catalog of natural disasters is not “infinite”. We could develop a list of relevant responses.

6. Sky - USGS ScienceBase has capability to bootstrap these contexts as needed.
7. Kumar - DSTCCP-E: build a prototype to support CEQ climate resilience kit
8. Sky -Two approaches:
 - a. Leverage tool match effort from ESIP
 - b. Provenance group: encode W3C provenance info. How do we get information back out, not just in a human readable way?
9. Karen Moe -Reiterates need for a use case. How will the tool be used?
10. Kumar -Each state is doing its own thing. But there are common factors among them.
11. Pat C.-Google has a good approach for ranking. Can we do something similar? Consensus from group - it's probably brute force ontology; we don't have the capacity to do that.
12. Ethan McMahon (EPA) -Survey users for needs?
13. Chris L. -We should be able to make a first cut of the needs for disasters, using DAAC resources. But, need to keep up to date.
14. Karen -CEOS did a survey of disaster response needs. Looking at characteristics of system for architecture: floods, earthquakes, volcanoes

Attachments/Presentations:  [ESIP W2014 EC_Attendees.pdf](#) [5]

 [ESIP2014_Lindsay.pdf](#) [6]

 [Kumar_DSTCCP Phase 2.pdf](#) [7]

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