



Success Stories and Challenges contributed to the CDI-Theme Mapping Innovation Workshop

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Web-enabled Visualization and Access of Value-added Disaster Products (CDI FY15)

POC: Brenda Jones, USGS

- <http://hddsexplorer.usgs.gov>
- The HDDS system was modified to support map and vector ingest, which allows user discovery and visualization of disaster mapping products.
- One of the biggest challenges is handling the variety of product formats and metadata while maintaining a consistent look and feel to the HDDS map interface.

The screenshot displays the USGS Hazards Data Distribution System (HDDS) web interface. The top navigation bar includes the USGS logo, the text "science for a changing world", and the title "Hazards Data Distribution System (HDDS)". On the right side of the header, there are links for "USGS Home", "Contact USGS", and "Search USGS", along with a "Page Expires In 1:59:14" indicator.

The main content area is divided into two panels. The left panel, titled "4. Search Results", contains a search criteria summary and a list of search results. The search criteria include "Search Criteria", "Events", "Additional Criteria", and "Results". The search results list includes:

- Event: 201510_Volcano_Testing_MAP
- Item 6: ID: MRO0N30_532406W088_1099532015010000000000, Acquisition Date: 2015-01-00, Platform: MAP_PRODUCTS, Sensor: MAP, Agency: DOD, File Format: GEOPDF
- Item 7: ID: MRO0N32_750000W080_0000002015100600000000, Acquisition Date: 2015-10-05, Platform: MAP_PRODUCTS, Sensor: MAP, Agency: ANG, File Format: PDF
- Item 8: ID: MRO0N32_750000W079_8000002015100600000000, Acquisition Date: 2015-10-05, Platform: MAP_PRODUCTS, Sensor: MAP, Agency: ANG, File Format: PDF

The right panel, titled "Search Criteria Summary (Show)", displays a map of the Mississippi River Delta and Northern Gulf Coast. The map shows a large area of red and yellow, indicating a spill or hazard, with a blue area representing the Gulf of Mexico. The map includes a search bar with coordinates (30° 10' 42" N, 090° 29' 39" W) and options for "Options", "Overlays", "Map", and "Satellite". The map data is attributed to "Map data ©2015 Google Imagery ©2015 TerraMetrics".

Find-by-click and the National Biogeographic Map

POC: Sky Bristol, USGS

<https://my-beta.usgs.gov/biogeography/>

- People like to click on maps and have something happen. Rather than provide complicated navigation features, we are trying to simply show what we know about the biogeography of any click point.
- Usability Challenge - People are often interested in and think about things in terms of political boundaries or similar areas of interest; we are trying to help them understand the ecologically significant area that intersects with their frame of reference.
- Technical Challenge - We are working to fully separate map-based representations from the underlying content and configuration details, presenting what we call “Synthesis Compositions” of “Analysis Packages” – scientific workflows that interact with data services to provide reports and visualizations in maps and other venues.

Southern Rockies
Ocmernik Level III Ecoregion

Area: 36,003,642 acres

Summary: The Southern Rockies are composed of steep, rugged mountains with high elevations. Although coniferous forests cover much of the region, as in most of the mountainous regions ...
more...

Copy URL Download Report View Report

Protection Status of Ecological Systems by Ecoregion

Protection Status of Ecoregion Compared to the Continental United States

Legend for Protection Status:

- GAP Status 1 & 2
- GAP Status 3
- GAP Status 4
- GAP Status 5
- GAP Status 6

Protection Status of Ecological Systems (Click on a slice for more information)

Legend for Protection Status:

- < 1%
- 1 - 10%
- 10 - 17%
- 17 - 30%
- > 30%
- < 1%
- 1 - 10%
- 10 - 17%
- 17 - 30%
- > 30%

All Ecological Systems (100)

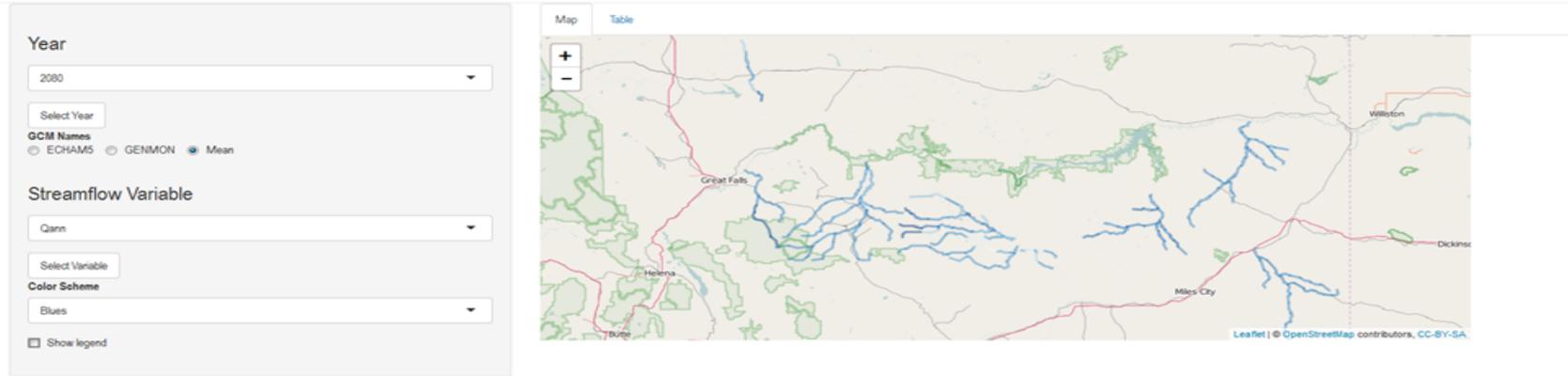
Ecological System	GAP 1 & 2 Protection (%)	GAP 1, 2 & 3 Protection (%)
Apacherian-Chihuahuan Mesquite Upland Scrub	2.41	3.93
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0.00	53.57
Chihuahuan Gypsophilous Grassland and Steppe	0.00	0.00
Chihuahuan-Sonoran Desert Rottendorf and Swale Grassland	0.00	0.00

Clear this selection

Coordinates clicked: 35.12154, -105.3

ScienceBase and Interactive Maps – Workflow and Publishing Options for U.S. Geological Survey Scientists (CDI FY16)

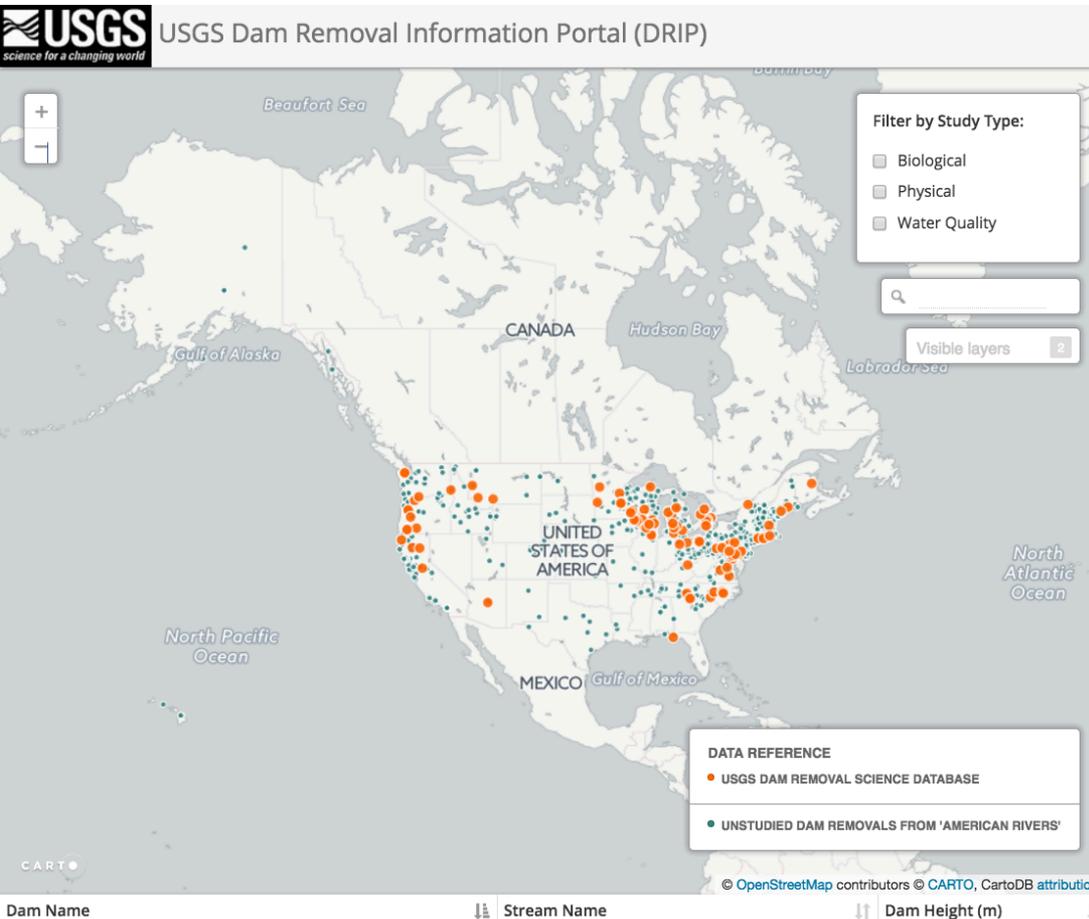
POC: Katherine J. Chase



- Chase, K.J. Haj, A.E. Regan, R.S. and Viger, R.J., 2016a, Potential Effects of Climate Change on Streamflow in Eastern and Central Montana: in Journal of Hydrology Regional Studies, Volume 7, September 2016, Pages 69 – 81, published online August 5, 2016, <http://dx.doi.org/10.1016/j.ejrh.2016.06.001>.
- USGS OFR documenting current (2016) work flow and options for U.S. Geological Survey scientists to organize and share data through interactive maps using ScienceBase .
- Biggest challenge is formatting and publishing data in a way that allows easy access/efficient programming.

USGS Dam Removal Information Portal (CDI FY15)

POC: Jeff Duda, USGS



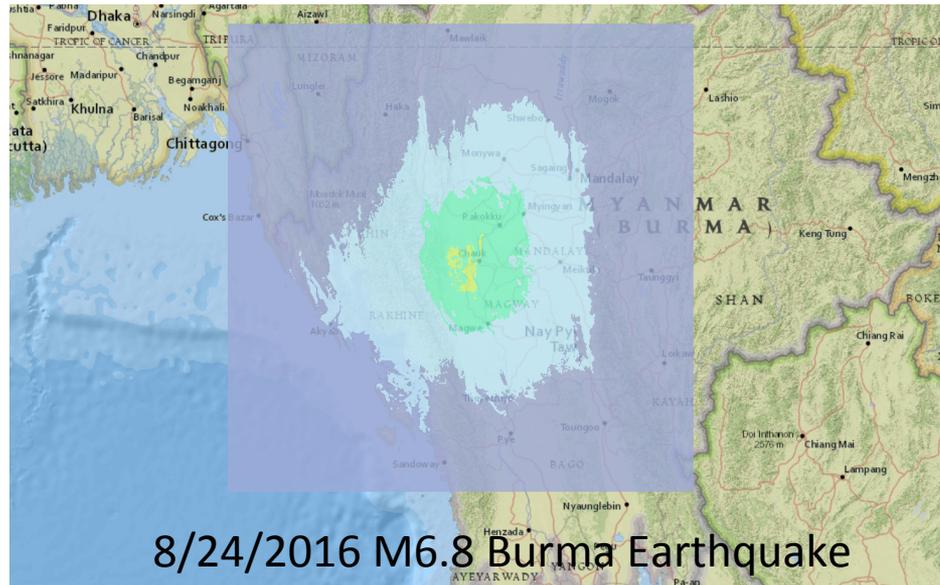
- <https://www.sciencebase.gov/drip/>
- An online, map-based visualization tool, DRIP represents a bibliographic database of scientific studies associated with dam removal projects in the US.
- Challenge: Adding additional capabilities to the interface to take advantage of linkage to the NHDPlusV2 and other USGS mapping assets desired for stage II of the project.

Duda, J.J., Wiefelich, D.J., Bristol, R.S., Bellmore, J.R., Hutchison, V.B., Vittum, K.M., Craig, L., and Warrick, J.A., 2016, Dam Removal Information Portal (DRIP)—A map-based resource linking scientific studies and associated geospatial information about dam removals: U.S. Geological Survey Open-File Report 2016-1132, 14p. <http://dx.doi.org/10.3133/ofr20161132>

Geologic Hazards Science Center: Near Real-time ShakeMap GIS Service

POC: Greg Smoczyk, USGS

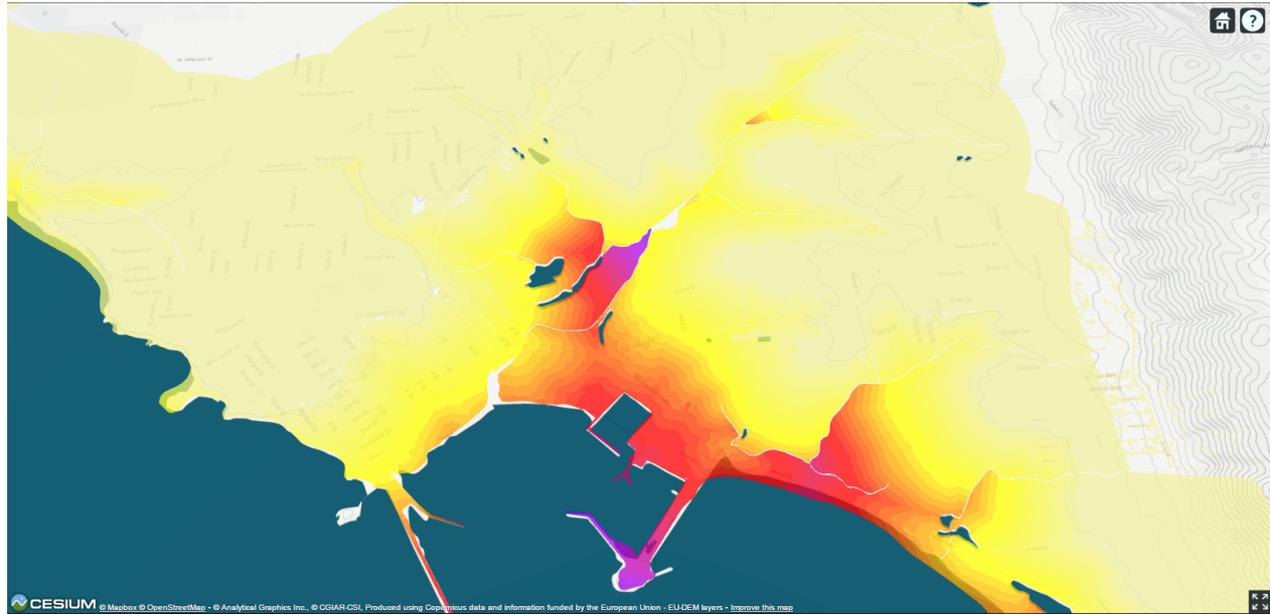
- http://earthquake.usgs.gov/arcgis/rest/services/eq/sm_ShakeMap30DaySignificant/MapServer
- Near real-time GIS Service feed containing significant ShakeMap event data for earthquakes in the last month.
- Creating a near “real-time” GIS service was difficult for a variety of reasons including data size, system architecture, and varying formats within source information.



A data management and visualization framework for community vulnerability to hazards (CDI FY16)

POC: Jeanne Jones, USGS

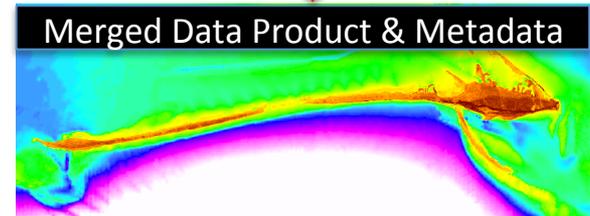
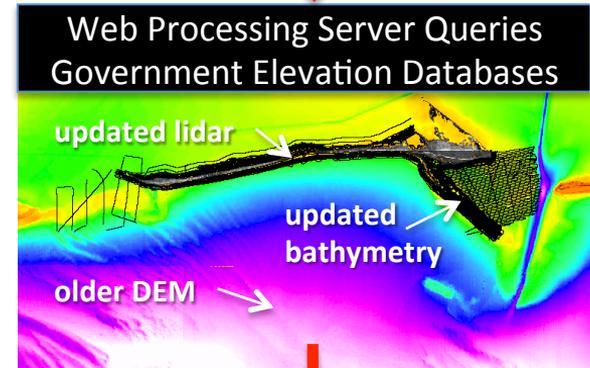
- <https://www.sciencebase.gov/catalog/item/56d87ebde4b015c306f6cff2>
- The project uses up-and-coming 3d map visualization platforms and modern geospatial data formats to explore novel methods to present existing scientific information.
- Due to the large size of geospatial data, unconventional methods for browser-based visualization were used, employing data formats such as topoJSON and custom application behavior built upon existing javascript visualization libraries.



Online Merging and Gridding of Topographic and Bathymetric Data Sources (CDI FY14)

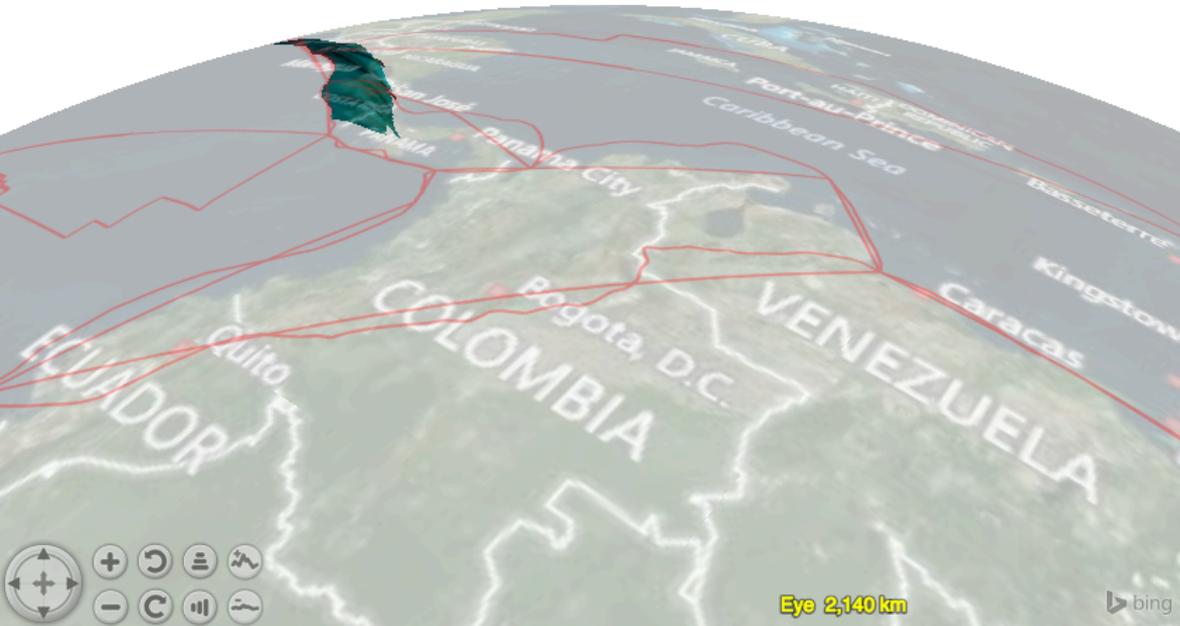
POC: Joseph Long, USGS

- <https://www.sciencebase.gov/catalog/item/53208d1fe4b0224be0a979e8>
- **Objective:** Develop a web processing service and geospatial interpolation algorithms to generate merged coastal DEMs from multiple published datasets covering different spatial and temporal scales.
- **Challenge:** Completed initial implementation of interpolation algorithms but progress was stalled by the inability for on-demand query and download of large data files (e.g. lidar).



Subsurface Cocos tectonic plate in NASA WorldWind Digital Globe, POC: Geoff Phelps, USGS

- <http://worldwindserver.net/webworldwind/apps/USGSSlabs.html>
- <http://worldwind.arc.nasa.gov/quakehunter/>



- NASA WorldWind is currently ***the only*** virtual globe capable of rendering data in Earth's subsurface, including tectonic plates and earthquake hypocenters.
- The biggest challenge is finding seasoned Javascript programmers willing to work on programming challenges: converting data to appropriate data types, rendering the data types with appropriate graphic primitives, working around software limitations, etc.

Geographic Searches for USGS Publications (CDI FY14-15)

POC: Rex Sanders, USGS

- <https://www.sciencebase.gov/catalog/item/5320a651e4b0224be0a97a20>
- Improves the USGS Publications Warehouse so that you can search for USGS publications by geographic region in addition to existing search criteria.
- Challenge: The immense number of legacy publications to assign a geographic area. Dealing with globally-relevant publications in search results.

Area of Interest



Search

Basic Search

9 results. [Download search results as RIS](#)

Page 1, results 1 - 9

[Effects of wildfire on sea otter \(*Enhydra lutris*\) gene transcript profiles](#)

Lizabeth Bowen, A. Keith Miles, Crystal A. Kolden, Justin A. Saarinen, James L. Bocklin, Michael J. Murray, M. Tim Tinker
2015, Marine Mammal Science (31) 191-210

Wildfires have been shown to impact terrestrial species over a range of temporal scales. Little is known, however, about the more subtle toxicological effects of wildfires, particularly in downstream marine or downwind locations from the wildfire perimeter. These down-current effects may be just as substantial as those effects within the...

[Energetic demands of immature sea otters from birth to weaning: implications for maternal costs, reproductive behavior and population-level trends](#)

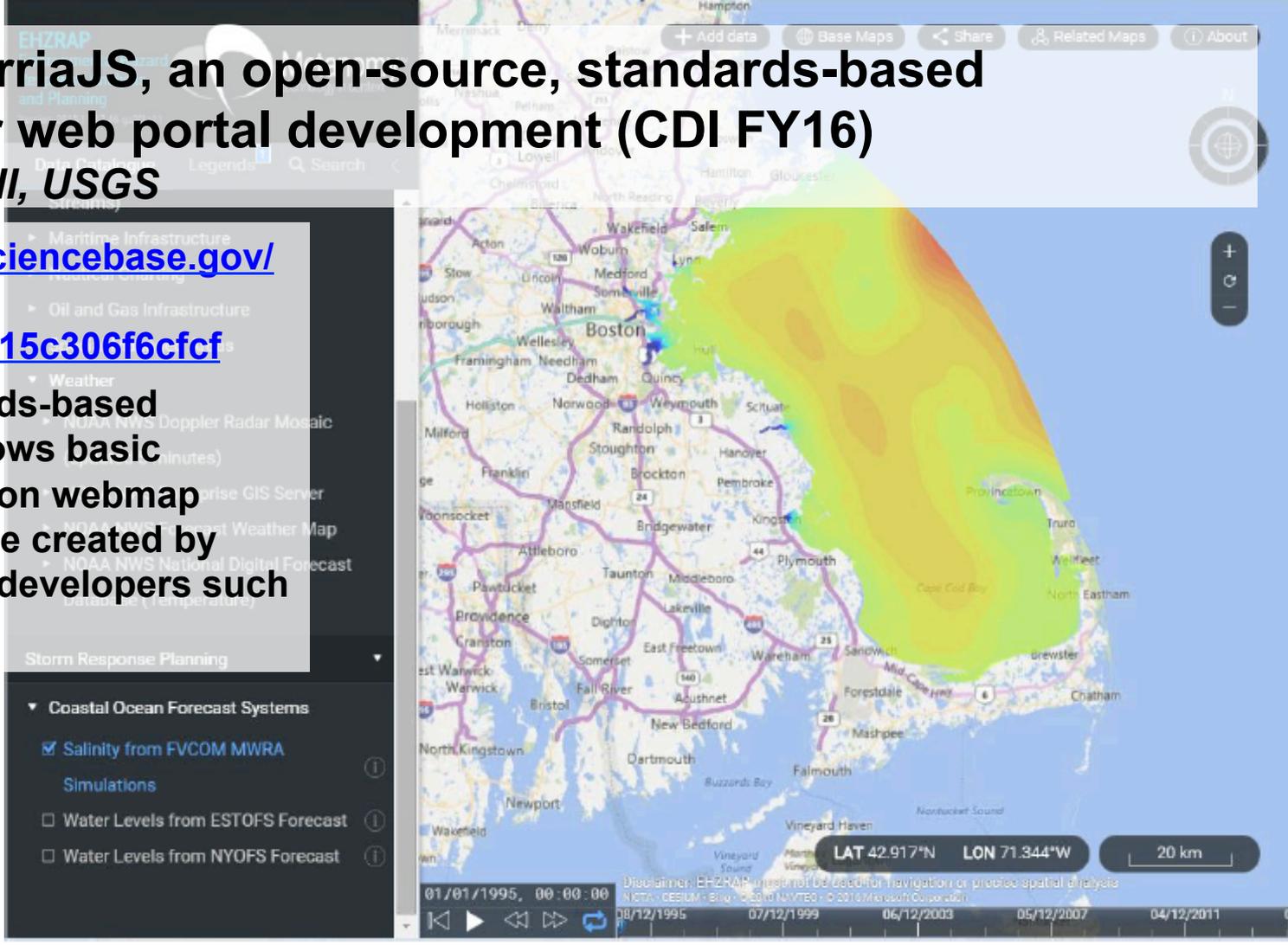
N.M. Thometz, M.T. Tinker, M.M. Staedler, K.A. Mayer, T.M. Williams
2014, Article, The Journal of Experimental Biology

Sea otters (*Enhydra lutris*) have the highest mass-specific metabolic rate of any marine mammal, which is superimposed on the inherently high costs of reproduction and lactation in adult females. These combined energetic demands have been implicated in the poor body condition and increased mortality of female sea otters nearing the...

Evaluating TerriaJS, an open-source, standards-based framework for web portal development (CDI FY16)

POC: Rich Signell, USGS

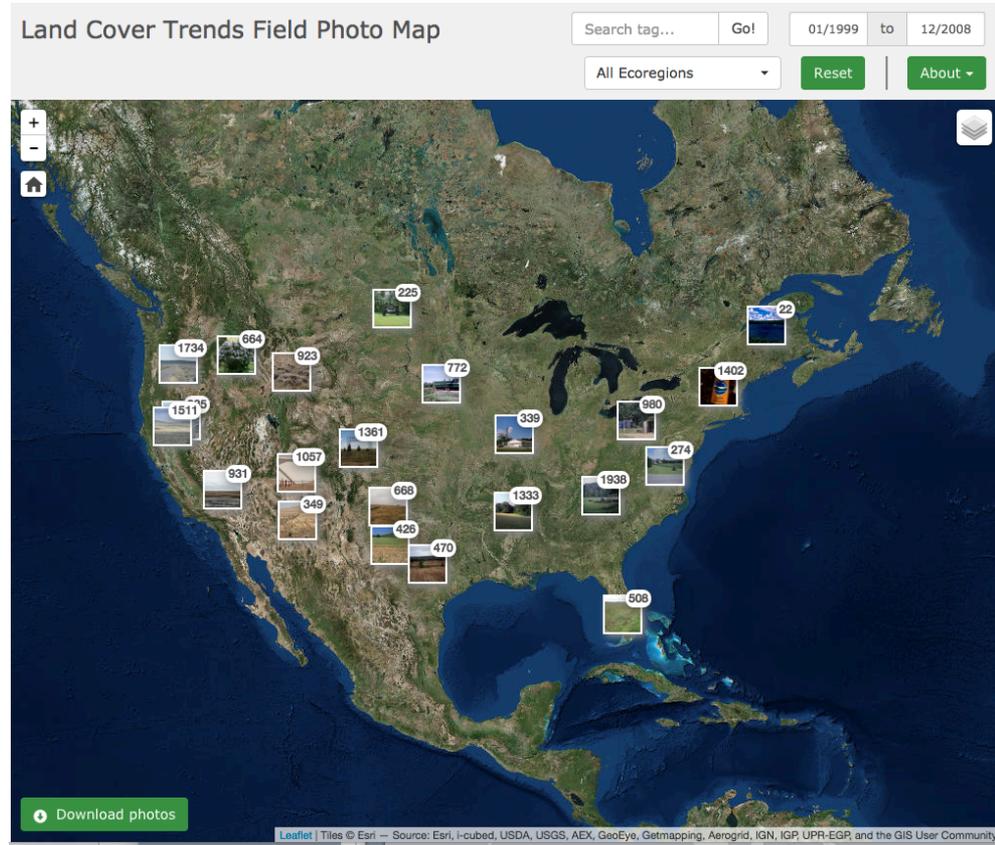
- <https://www.sciencebase.gov/catalog/item/56d87a7de4b015c306f6cfcf>
- Open, standards-based framework allows basic portals based on webmap services can be created by nonjavascript developers such as scientists.



Integration of Land Cover Trends Field Photos with an Online Map Service (CDI FY15)

POC: Chris Soulard, USGS

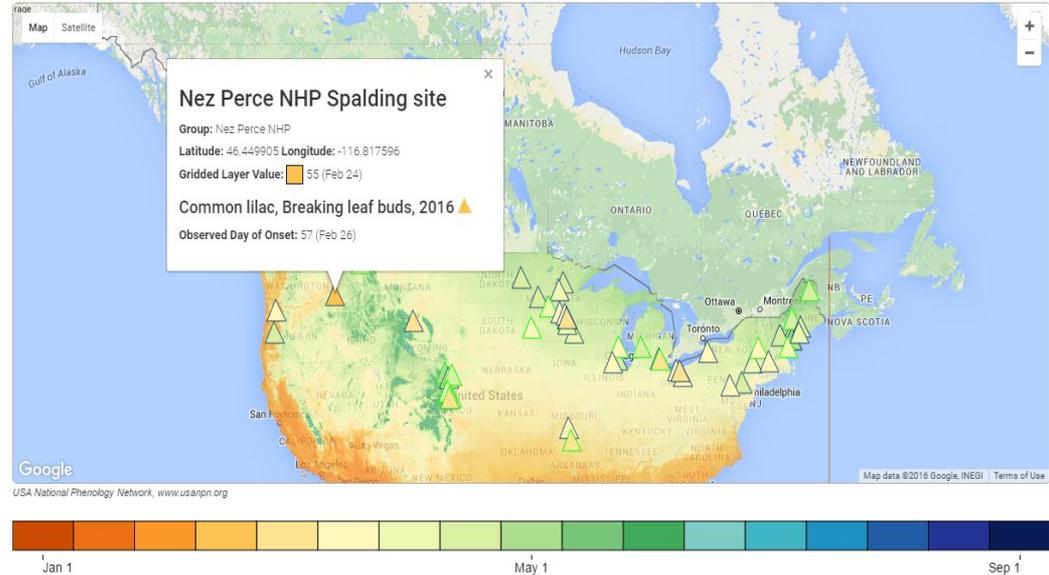
- <http://landcovertrends.usgs.gov/fieldphotomap/>
- A national repository of geographically referenced USGS field photographs is being made publicly available.
- The two greatest challenges are controlling the quality of photographic data and identifying a long term solution to file storage.



Integration of Phenological Forecast Maps for Assessment of Biodiversity: An Enterprise Workflow (CDI FY16)

POC: Jake Weltzin, USGS

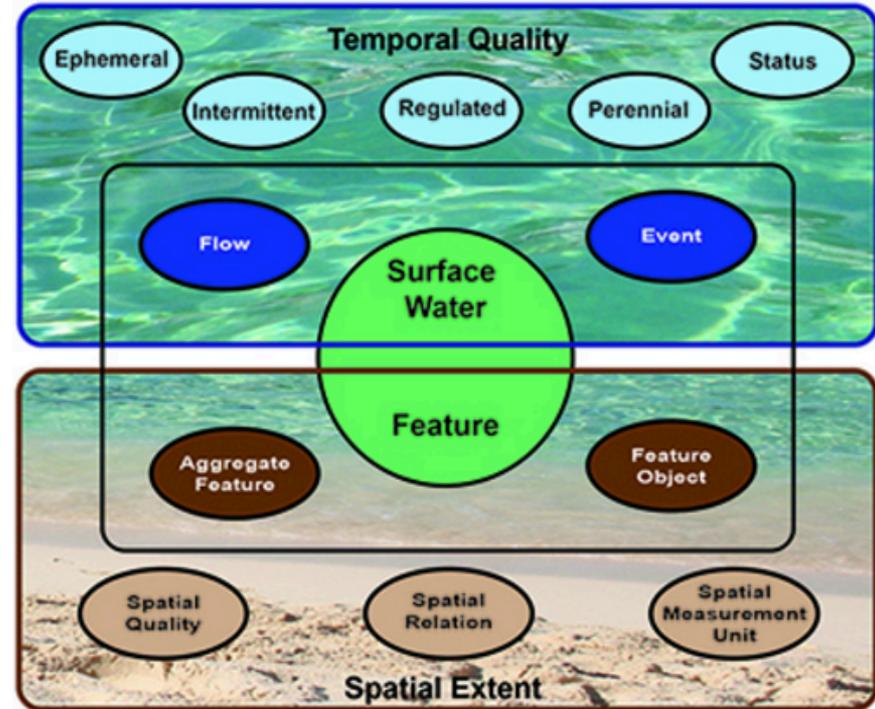
- Explore, visualize, and analyze USA National Phenology Network organismal (observed and modeled) phenology data and data products.
- Observational and modeled data are dynamic and real-time, plus 6-day forecasts
- Greatest challenge has been understanding and meeting requirements for FSP



Title: A Map as a Knowledge Base (CEGIS)

POC: Dalia Varanka, USGS

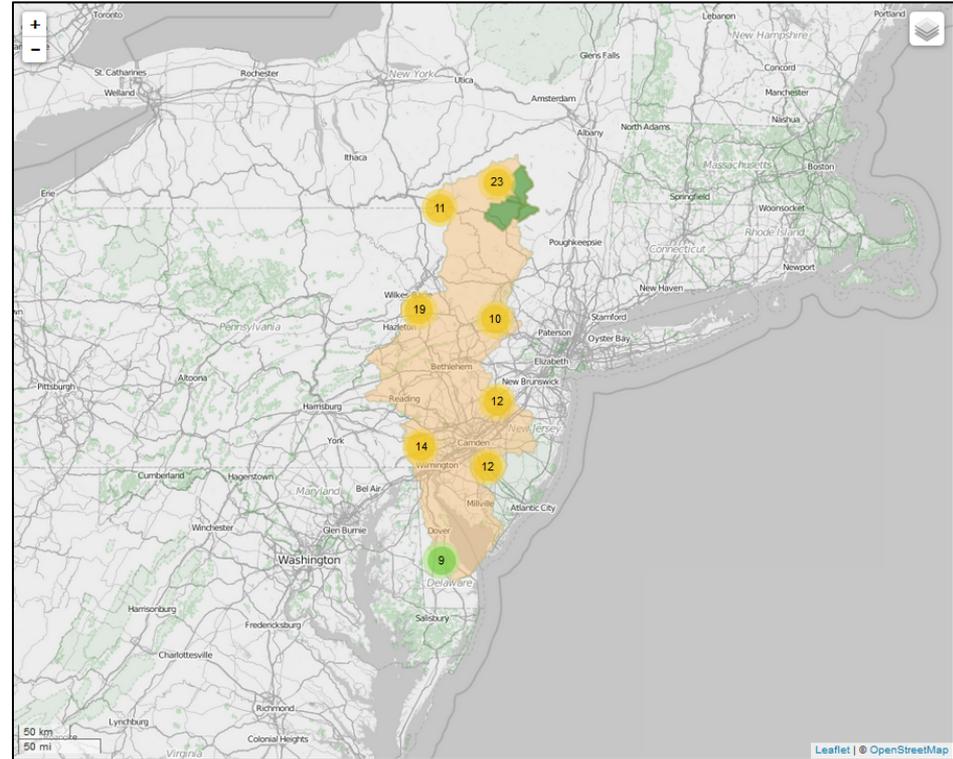
- <http://cegis.usgs.gov/ontology.html>
- Formal logic reflecting knowledge statements govern the use of graph-based data. Expressing the graph cartographically enables the map to store logical knowledge in addition to its visualization
- Challenge: To demonstrate how the map is an expression of all the logical data information rules involved in its design



Leaflet Interactive Web-based Maps

POC: Jeremiah Lant, jlant@usgs.gov

- <http://jlant.github.io/delaware-river-basin-map-leaflet/>
- **Leaflet** is a free, open-source, web-based, and mobile-friendly interactive mapping library that is easy to use, customize, and share.
- **Challenge: Where can maps be hosted? GitHub, Bitbucket?**



D3 Interactive Web-based Maps

POC: Jeremiah Lant, jlant@usgs.gov

- <http://jlant.github.io/wateruse-map-d3/>
- **D3** is a free, open-source, web-based, and mobile-friendly interactive data visualization library that can be used for mapping.
- **Challenge:** Where can maps be hosted? GitHub, Bitbucket? There is a learning curve.
- Another example - <http://staging-ky.water.usgs.gov/appalachianplateaus/>

