Mapping Innovation Workshop Reporting Template

Name of Workshop: Community for Data Integration (CDI)-Theme Virtual Workshop

Date: August 29, 2016

Location: WebEx / Denver Fed Center Bldg 810 Rm 2500

Format: *Virtual with one in-person participant*

Host and Facilitators: Leslie Hsu, Madison Langseth

Participants: WebEx report

Kevin McKinney (in person), Sheryn Olson sherynolson@usgs.gov, John Parks jeparks@usgs.gov, Raad Saleh, rsaleh@usgs.gov, Madison Langseth mlangseth@usgs.gov, Rebecca Porinsky rporinsky@usgs.gov, Florence Thompson fethomps@usgs.gov, Jeanne Jones jmjones@usgs.gov, Rob rcrangle@usgs.gov, carolcreiss@usgs.gov, Jason Sherba jsherba@usgs.gov, Plato Smith plato.smith@ufl.edu, Greg Smoczyk gsmoczyk@usgs.gov, Katherine Chase kchase@usgs.gov, Dave Holtschlag dholtschlag@usgs.gov, cassandra ladino ccladino@usgs.gov, jg jgaddoura@usgs.gov, Mike T mtischler@usgs.gov, yvonne baevsky yhalpern@usgs.gov, Dalia Varanka dvaranka@usgs.gov, Marcia McNiff mmcniff@usgs.gov, Jayme Stone jmstone@usgs.gov, Ricardo McClees rmcclees-funinan@usgs.gov, Jeremiah Lant jlant@usgs.gov, Leslie Hsu lhsu@usgs.gov, Brigitta Urban-Mathieux burbanma@usgs.gov, Karen Adkins kadkins@usgs.gov, Annie Simpson asimpson@usgs.gov, Mike Wieczorek mewieczo@usgs.gov, Tim Quinn tsquinn@usgs.gov, ,Julie Binder Maitra jmaitra@usgs.gov, Darcee Killpack dkillpack@usgs.gov, geoff gphelps@usgs.gov, Steven Douglas sdouglas@usgs.gov, Mikki Johnson mrjohns@usgs.gov, Rob Miller rfmiller@usgs.gov, Paul Lemieux (NOAA) paul.lemieux@noaa.gov, carol reiss creiss@usgs.gov, John Aguinaldo jagui@usgs.gov, Sophia B Liu sophialiu@usgs.gov, Roy Sando tsando@usgs.gov, SC ngolden@usgs.gov, scott Winterrowd swinterrowd@usgs.gov, pat lineback pat_lineback@fws.gov, Chris Sanocki sanocki@usgs.gov, Colin Talbert talbertc@usgs.gov, Silvia Terziotti seterzio@usgs.gov, Elise ewatson@usgs.gov, Charley Hickman chickman@usgs.gov

Type of Workshop:

Informational (15 minute presentation) and Virtual Discussion via Google Forms

Overview: *(Summary of workshop in 1-2 paragraphs)*

- Workshop webpage

The workshop attracted an audience of ~50 participants dominantly composed of Community for Data Integration members, from all Mission Areas and all Regions except for Alaska. Before the workshop, Mapping Story slides were solicited from the participants, with a focus on CDI-funded projects. Most registrants marked that they wanted to join to “Learn

about innovative mapping tools and resources," and presentation of these slides helped to fulfill that need. A wide range of challenges were mentioned in the mapping stories, from dealing with disparate data types, to finding available programmers, to understanding Fundamental Science Practice requirements.

The discussion (~1.25 hours) revolved around three main themes: Data Interoperability, Data Discovery and Sharing, and Communication and Visualization. Google forms were used to gather responses from the virtual participants, then the facilitators discussed the submitted answers and asked for clarification when necessary. Participants identified topics for further discussion at future CDI monthly or annual meetings, including the semantic web and new mapping tools.

Chronological Summary of Workshop: *(What happened at the workshop)*

1. Motivation for the workshop and roadmap for the workshop (S Liu)
2. Google form feedback about the audience on the call
3. Brief discussion of what is the Community for Data Integration, what are the working groups (L Hsu)
4. Presentation of contributed slides of Mapping Stories (successes and challenges) (L Hsu)
5. Discussion themes (each had a google form, participants were given a few minutes to fill it out, then L.Hsu highlighted results.)
    a. Warm-up on Innovation and Mapping
    b. Data Interoperability
    c. Data Discovery and Sharing
    d. Communication and Visualization
    e. Wrap-up questions
6. Closing, information about how to stay in touch with CDI

Mapping Innovation Success Stories: *(Brief descriptions of successes)*

Stories were solicited from participants before the workshop. We targeted CDI-funded projects with a mapping component, but invited anyone to contribute.
cdi_mapping_innovation_stories_160829.pdf

Summary spreadsheet: Spreadsheet

Overall Conclusions:

Repeated challenges:

- financial and outreach/educational challenges to making data as interoperable as possible

There was widespread interest from the participants in learning more about:

- Semantic web
- Applications for mapping (e.g., Leaflet)

Content: *(Attach slides, provided materials, transcription of flip charts, etc.)*

- Summary spreadsheet of all google form responses

Mapping Innovations by Theme:

Data Interoperability

Google form responses

Challenges or Constraints Identified: some barriers in using open source tech with OGC standards for geospatial data delivery; USGS workflows are sometimes stuck using familiar format although it is proprietary or not standard, need to talk to our users more to improve on this; financial barriers to making data available openly; USGS system security is an obstacle; lack of buy-in from all employees to use consistent methods; Questions remain: where do I put the data? How do I ensure it is Google-able? Does it have the correct metadata?; FTEs and technical resources are needed to go through all the steps, creation, review, and serving of the data and metadata; resistance to change workflows; lack of clear policies to use as guidance, lack of knowledge of new tech and capabilities; some software vendors don't keep up with standards; determining how to release proprietary data as a by-product; the requirement for web mapping services sometimes in turn requires proprietary ESRI formats as opposed to other interoperable formats

Outcomes:

Important Lessons Learned:

Ideas or Strategies for Advancing Theme: need to inform the researchers on why open environments and standards are important; The Research Data Alliance has a metadata standards directory on GitHub, http://rd-alliance.github.io/metadata-directory/standards/

Data Discovery and Sharing

Google form responses

Challenges or Constraints Identified: we need to move beyond just sharing datasets through single reports and in journals/conferences, there should be databases and other open and accessible ways to access the data for the general public; we should tell better stories with our data so it can be discovered more easily and accessibly; how will we be handling this mass piecemeal dumping of small data parcels?

Outcomes: There is high interest in learning more about the semantic web and how it can be used to improve discovery and sharing; In this audience, there are many ScienceBase users for sharing data

Important Lessons Learned

Ideas or Strategies for Advancing Theme: harvesting metadata; invest at Bureau level in geospatial data discovery and retrieval tools, this requires strong metadata; improve the pubs site search toolbar; push/encourage scientists to use ScienceBase; consistency on how we publish data; make data more google-able; don't assume the public knows where to go to get the data; Interagency discovery/integration/interoperability would be good; outreach to scientists about databases and search options; better use of keywords; semantic web; work on enterprise policy; centralized USGS pages of info; outreach with a network of reps from all parts of the organization; write journal articles; these kinds of meetings and discussions; user experience research; a /data url that lists available web services; use the CDI RFP to form partnerships between USGS and external partners;

Communication and Visualization

Google form responses

Challenges or Constraints Identified: bridging the gap between scientists, geospatial experts, and web programmers seamlessly; TIME and skill to publish web maps; learning curve for programming; outreach without filling people's email inboxes; keeping up with changing technology and languages; IT security in USGS; lack of documented examples of how technologies are being used and lack of shared source code; lack of infrastructure to host interactive visualizations and applications; development funding; not enough time to build networks with other users to discuss this tech; communication between data managers and scientists to both understand the story to be told by the data; clear guidelines and policies on how to share data and information

Outcomes: Most participants need data to live in the cloud or on an enterprise system or anywhere accessible, with a DOI for reference;

Important Lessons Learned

Ideas or Strategies for Advancing Theme: Endorsed mapping visualization tools: leaflet, D3, polymaps, ESRI products, openlayers, agol, mapbox, ArcGIS Runtime, Cesium, python, R, Shiny, Bokeh, **Story Maps**, Earthvision, Carto, QGIS, kartograph; Use videos, 1 page summaries of projects and science, not just scientific papers; get into non-science

publications on work and implications to society; need face to face meetings and discussions; livestream events, hackathons, prize competitions; web and mobile-based data viz; communicate in a simple and relevant manner

Other Topics or Issues Discussed at Workshop

Challenges or Constraints Identified: (Brief statements of issues)
Outcomes: (Brief descriptions of proposed/enacted solutions or failures)
Important Lessons Learned
Ideas or Strategies for Advancing Theme

Questions posed by participants:

1. **Is anyone using RESTful web services?**
2. **Should scientists be learning javascript to do visualization?**

Other discussion topic highlights: (see the summary response sheet tabs 2 and 6)

1. What does innovation mean to you?
2. What aren't we (USGS) mapping that we should be?
3. How can we resolve the issue with dealing with ever-increasing volumes of data?
4. What mapping app do you wish existed that does not (yet)?
5. Are there topics or questions that you think CDI should follow up on in a Monthly Meeting or the Annual Workshop?

Raw Notes by Madison Langseth:

Warm up activity: No discussion

From Rob:
Suggestions: Enterprise beta application testing leveraging agency purchased evaluation API's or related geospatial software

Geospatial stacks in the cloud for hosting map/ geoprocessing services

Scott Winterrowd: Hi Madison - I wrote the comment about databases being proprietary. I think to make data easily accessable and queriable, the data needs to be in a database. However, just because a database is free, does not make it non proprietary.

KEvin: Cobban Shoreline Maps - Sky just made this available this week. Having the right connections is key to being able to develop the web maps (normalizing database, graphics, etc.)

Solutions to challenges making data interoperable and open:

More discoverable and Googeable - how to we make sure that we are able to find the data that we need?

Data Discovery and Sharing

Tell Stories: mapstory.org and ESRI story maps

CDI semantic web working group
CDI Event: Intro to the Semantic Web

from scott Winterrowd (privately):
They should also make the entire datasource used for the research available

Learn Javascript to develop better web maps. Is it feasible for all scientists to learn javascript?

Technical services

Week long javascript class this last spring. You can download the template and make them more user friendly and interactive.

from Steven Douglas to Everyone:
It would be nice to learn Javascript and other programming languages to improve our maps/apps/models, but I don't have the time or funding to invest in it fully.

from Steven Douglas to Everyone:
We have a guy who does use javascript and PHP and some similar languages to make excellent models, but he's just one guy in an office of over 100 people.

Sophia: We might not be hiring the right workforce and have the right position descriptions to support those positions. Chris Garrity pointed this out to Sophia.

from scott Winterrowd to Everyone:

Need to be able to query the data used to generate the map. Otherwise, how do you validate what you are looking at

from Leslie Hsu to Everyone:
Should scientists learn javascript? Weigh in:
https://docs.google.com/a/usgs.gov/forms/d/e/1FAIpQLSccmge1vY-3XRgS6wx1LlelKfSjuYf6_8qsRPA2QPMhjsjU9A/viewform

Chris Garrity: Writing good javascript takes years, you can't pick it up in a week. You could write hacky code or spend years learning it well. We are still hiring with 5 - 10 year tech stack performance standards. We get people who are hiring who are not up to speed with where the geospatial community is at. We need to get more up to speed with the state of the art in the geospatial community at the USGS.

Kevin: scientists didn't go to school to become javascript programmers...hire tech services to help out.

Future CDI Meeting: Have a discussion about all of the different mapping technologies.

More From the chat:

from Jeremiah Lant to Leslie Hsu (privately):
I am a self-taught programmer. I think that scientists need/should learn programming in order to increase their technical skills.

from Sheryn Olson to Leslie Hsu (privately):
Is anyone using RESTful web services?

from Jeremiah Lant to Leslie Hsu (privately):
I am a volunteer instructor for Software Carpentry (http://software-carpentry.org/) which has a mission of teaching scientists how to program.

from scott Winterrowd to Leslie Hsu (privately):
would have been nice to associate a reason with the answer. Scientist tend to want to do all there leg work. So they hack out solutios that are not as good as it could be