

# CDI Monthly Meeting 20211013

October 13, 2021: Forecasts of Ecological Drought, CDI Tips

The Community for Data Integration (CDI) meetings are held the 2nd Wednesday of each month from 11:00 a.m. to 12:30 p.m. Eastern Time.

## Connection information

Join on your computer or mobile app

[Click here to join the meeting](#)

Or call in (audio only)

[+1 202-640-1187](tel:+12026401187), [209207438#](tel:+1209207438) United States, Washington DC Phone Conference ID: 209 207 438#


Connection information is sent to the [cdi-all mailing list](#).

## Meeting Recording and Slides

Recordings and slides are available to CDI Members approximately 24 hours after the completion of the meeting.

These are the publicly available materials. Log in to view all meeting resources. If you would like to become a member of CDI, join at <https://listserv.usgs.gov/mailman/listinfo/cdi-all>.



 During the call, you can ask and up-vote questions at [slido.com](https://www.slido.com), event code #CDIOCT.

## Agenda (in Eastern time)

11:00 am Welcome and Opening Announcements

11:15 am Working Group Announcements

11:25 am **CDI Pop-up Lab - Tips: Data Management Tips; Teams Tip; How to participate and learn during the CDI RFP Process - CDI facilitators**

11:45 am **Long-term update on a past CDI project: Seasonal forecasts of ecological drought to inform dryland restoration** - John Bradford, USGS

12:30 pm *Adjourn*

## Abstracts

The USGS Cloud Environment Cookbook presentation will be presented at a future date.

**Long-term update on a past CDI project: Seasonal forecasts of ecological drought to inform dryland restoration** - John Bradford, USGS

Restoring native plants in dry environments is a major land management challenge that is expected to grow in coming decades. Capitalizing on wet periods can enhance restoration success, and CDI funded a project to develop a decision support tool to build and deliver seasonal forecasts of potential seed establishment. This talk will briefly introduce the challenge of dryland restoration and the opportunity represented by short-term drought forecasts, describe our approach to generating these forecasts, present the current online tool that delivers forecasts to resource managers, and discuss possible next steps.

## Highlights

1. The FY22 CDI Request for Proposals closes Friday, October 15th. Learn more about the process and next steps for the community [here](#).
2. [Submit](#) your data management tip for CDI's [Twitter series!](#)
3. See the recording and notes for an update on long-term management of a CDI FY19 project.

## Notes

### Welcome and Opening Announcements

1. The **ESIP Data Help Desk** is happening during the Geological Society of America meeting.
  - a. #DataHelpDesk at <https://twitter.com/hashtag/DataHelpDesk> and <https://www.esipfed.org/data-help-desk-at-gsa-2021>
  - b. Project Pythia: <https://projectpythia.org/gallery.html> is a collection of resources to help users get started with Python.
  - c. rspatialdata: <https://rspatialdata.github.io/> is a similar collection of resources for R
  - d. The help desk is also sharing domain-specific resources, like Deep Time Knowledgebase: <https://www.deeptimekb.org/>
2. **Advancing data equity** is a theme for our FY22 CDI request for proposals
  - a. See slides for comments and discussion on this theme.
3. RFP submissions are due **Friday, October 15th**.
  - a. For more information on the **2022 Proposals process**: <https://doimsp.sharepoint.com/sites/CommunityforDataIntegration/Proposals/SitePages/2022-Proposals.aspx>
  - b. **Learn with the community**
    - i. Read the statements of interest
    - ii. Discuss ideas on the commenting site
    - iii. Submit your ballot

### Working Group Announcements

1. For more information on any of the collaboration areas, see <https://my.usgs.gov/confluence/x/yhv11>
2. Usability
  - a. Next event: **October 20, User Centered Design Process – Evaluation technique demos (first click testing and impression testing)**
3. Data Visualization
  - a. Next event: TBD
  - b. **Recording available from last meeting: Beyond Bars and Box Plots**
  - c. <https://my.usgs.gov/confluence/display/cdi/Data+Visualization+Meetings>
  - d. <https://www.youtube.com/watch?v=WBA04fjTVU0>
4. Data Management
  - a. Next event: **November 8, Future of CSGDM Metadata Tools at the USGS and Science Data Catalog Dashboard**
5. Tech Stack
  - a. Next event: **October 14, OpenTopography – High Resolution Topography Data & Tools**
6. DevOps
  - a. Next event: **December 7, Building Fast and Secure CI/CD Pipelines for Kubernetes Using GitLab**
7. eDNA
  - a. Next event: **October 19-21, 5th annual eDNA technical exchange workshop (5eDTEW)**
8. Imagery
  - a. Next event: **October 14, Introducing the Hydrologic Imagery Visualization and Information System (HIVIS)**
9. Geomorphology
  - a. Next event: **October 26, Global Hydrography**
10. Inland/Coastal Bathymetry
  - a. Next event: **October 25, Bathymetry Research Coordination Meeting**
11. New USGS CoP: Tribal Relations
  - a. First event: **October 20**

### CDI Pop-up Lab - Tips: Data Management Tips; Teams Tip; How to participate and learn during the CDI RFP Process - CDI facilitators

1. Find **data management tips**: [Twitter](#)
  - a. Submit your data management tip: <https://app.sli.do/event/7wrp9mag>
2. **Teams Tips**
  - a. See slides to learn how to mute notifications, rename chats, reorder Teams, and more!
3. How to **participate and learn during the CDI RFP process**
  - a. Timeline
    - i. Oct 19 – commenting opens
    - ii. Oct 20 – SOI Lightning Presentations
    - iii. Oct 27 – Nov 12
4. Process
  - a. Members of the cdi-all mailing list receive a ballot
  - b. Consider all statements of interest before voting
  - c. Distribute 15 votes among SOIs, maximum of 3 votes to a single SOI

5. By participating, you can learn about...
  - a. New USGS priorities
  - b. Data needs across the USGS
  - c. Peers working on similar data topics
  - d. Templates and methods for sharing information

## Long-term update on a past CDI project: Seasonal forecasts of ecological drought to inform dryland restoration - John Bradford, USGS

1. Long term update on a CDI FY19 project
2. **90% of seeds in drylands do not establish**
  - a. Restoration of drylands is likely to get worse under climate change
  - b. Low and erratic precipitation and temperature extremes have a huge effect on success or failure of a revegetation practice
  - c. **Can we forecast moisture and temperature information so that we can revegetate at ideal times?**
3. What controls dryland restoration success?
  - a. What are the environmental conditions that determine seed establishment in drylands?
  - b. **"Regeneration niche"** - the conditions that enable an individual to establish is different from the conditions needed for an existing individual to survive.
  - c. See slide for graph example.
  - d. Focus is on soil moisture.
  - e. Regeneration niche does not equal meteorological drought metrics. The soil moisture dynamics deviate from drought events.
4. How do we forecast soil moisture?
  - a. Integrate temperature and precipitation anomaly forecasts from NOAA
  - b. Generate forecasts of soil moisture conditions
  - c. Calculate establishment potential
  - d. **Deliver to users to inform decisions** – LTET
5. Forecasting dryland restoration seeding success
  - a. See slide for graphical representation.
  - b. Result is the probability of plants establishing if seeded in the coming year
6. Short-term drought forecaster
  - a. See recording for demo.
7. Next steps for drought forecasts
  - a. **Stakeholder engagement**, internally and externally
  - b. Internal
    - i. Ecosystems mission area: Land Management Research Program
    - ii. USGS Rocky Mountain Region's integrated drought science
    - iii. Climate Adaptation Science Centers
  - c. External
    - i. Bureau of Land Management
    - ii. US Fish & Wildlife Service
    - iii. US Forest Service
    - iv. National Park Service
    - v. Local/regional resource management and/or restoration groups
  - d. Future directions based on feedback
    - i. In progress
      1. **Wall to wall maps of forecasts each month when temperature and precipitation anomalies are updated**
      2. Synthesize regeneration niche requirements and include establishment potential for more species
      3. Quantify how establishment potential (frequency of successful years) varies geographically and under climate change
    - ii. Future ideas
      1. Incorporate the influence of innovate restoration treatments (seed coatings, plantings, etc)
      2. **Increase transparency about uncertainty in both forecasts of soil moisture and ecological impacts**
      3. Expand management relevant information beyond plant establishment... potentially grazing
8. Long term needs
  - a. Develop a maintenance plan (\$) for the drought forecaster
  - b. **Integrate monitoring results of seeding outcomes to iteratively improve forecasts – better predictions of seed survival**
  - c. Use manipulative experiments to quantify the regeneration niche requirements for critical restoration species

## Questions

1. How do projects like this play into USGS strategies like the Landscape Science Strategy that we heard about last month?
  - a. This app was designed to address one of the most pressing challenges dryland resource managers have. I don't think this specific need was not identified in the Landscape Science Strategy, but it is relevant to their project.
  - b. Matthew Germino: The topic of restoration of sagebrush and tools for it is generally covered in the IRFMS, rangeland fire management strategy
2. Increasing Transparency about uncertainty means communicating about that in the app with a visualization?
  - a. Uncertainty is shown on maps, but it's not crystal clear where these uncertainties are coming from. Would be good to have a clickable box that explains how uncertainties are represented.
3. Amazing work! What was the backend software for the app (sorry I might have missed it)?
  - a. App is in R, water balance model is in C with an R wrapper.
4. do you see this could also be used to predict areas sensitive to invasive species incursion
  - a. It could. In terms of timing treatments to avoid competition, and in evaluating how some places are more invadable than others over time.
5. I learned about VMAP, BLM integration and this component via FRESC and BLM interactions...project massive! how many ppl, how many years to make this happen?
  - a. Pretty much the whole backend was built with funds from CDI. Wasn't up and running until about a year ago. Maintenance has required programmatic resources;
6. How many people worked on this project?

- a. A couple developers from a few different groups were responsible for building the app; the usefulness of this is dependent on field work. If you expand to that, it gets quite big.
- 7. Going from a point to wall-to-wall maps of forecasts - do you have an estimate of the increase in effort/cost of your project team? Wall-to-wall = regional?/ What is your target spatial resolution for wall to wall soil moisture grids as soil moisture can vary dramatically on a fine scale.
  - a. Building on the gridnet framework. It's going to be a big enough challenge to do this on a 4km resolution. We don't know how much more time/resources we'll need. Trying to find computing time to allocate to this every month. The current app went through an approval process to be publicly available. If we go to these monthly updates, do we need to get each month's maps approved before dissemination? This could be a challenge.