Drought Learning Network

Concept Paper

July 2019

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Introduction

The 2018 exceptional drought over the Colorado plateau led resource managers in the region to recall a similar trajectory from the recent past and worry about regional impacts, including the potential for wildfires similar to the Missionary Ridge fire in 2002. Partner calls led by National Integrated Drought Information System (NIDIS) and the SW Climate Hub (SoDRI) documented a need to capture lessons learned from previous droughts to assist resource managers in responding to a future crisis at various stages.

In 2019, the USDA Southwest Climate Hub and the National Drought Mitigation Center convened partners via webinar to conceptualize a Drought Learning Network (DLN) for retaining lessons learned from historic droughts in the region. This document provides a comprehensive summary of proposed DLN components, needs and next steps to build a DLN in the Southwest Climate Hub Region to serve as a model for expansion to other regions. In Appendix 1, we summarize the specific actions taken by a variety of community groups, resource managers and agencies to cope with the 2018 exceptional drought.

DLN Recommendations

A DLN is a resource to retain management lessons learned during historic drought events to inform future actions. In the DLN framework for local municipal managers, state land managers and federal land managers to share what was successful in preparing for, responding to and recovery from drought in the past to inform current and future response and mitigation. During initial DLN leadership team calls the team developed the following recommendations:

1. Focus on the Southwestern U.S. (Arizona, New Mexico, Nevada and Utah), as we build a prototype in parallel with the DLN being built in Hawaii and the DLN being built in the US Affiliated Pacific Islands. Our hope is that these three DLNs will provide invaluable lessons in drought knowledge exchange and will serve as exportable models for DLN development in other regions. The leadership team will develop metrics for evaluating the success of the DLN and its merit for expansion.

2. Organized by drought management phase to enable resource managers to access information related to specific needs such as: Mitigation, Preparedness, Response, Recovery, and Evaluation.

3. Specifically includes retrospective evaluation of drought response activities and the outcomes of those activities. Here we hope to capture specifically what happened (e.g. water shortage, crop failure, fire, wildlife impacts); how the manager responded to the event; and, the efficacy of the response. We use a variety of methods to capture what knowledge was useful to the manager in planning and preparing for, responding to and recovering from drought; what knowledge did managers wish they had either as they were going through the drought, or after the fact when reflecting back on how drought was managed.

   Leadership team members note that documenting and quantifying some of the impacts has been challenging in the past, leading to anecdotal or undocumented impacts. A discussion of the need to document impacts, best practices and possible methods will be a topic for the in-person meeting. Challenges in assembling these data have been previously [reported](). There is a need to identify the extent to which an inability to document impacts could impede DLN functionality, as well as creative means and resources to fill this knowledge gap, which may be situationally, if not consistently, important.

   In addition to capturing what was successful (and not successful) in the mitigation, preparedness, response, and recovery, we will seek to define explicitly at DLN formation the evaluation metrics associated with the efficacy of the response. Evaluations can range from qualitative interviews to more rigorous objective assessments that disentangle causal relationships and seek to establish attribution between the action and the outcomes. We will seek to identify what type of evaluation is necessary to generate sufficiently robust, credible evidence which resource managers and communities can apply in future drought situations.

4. Information should be accessible by the sector impacted by drought. For example, a resource manager should be able to quickly find information related to the area or sector of interest (e.g., wildfire, municipal water scarcity, agricultural water scarcity, crop production or failure, livestock impacts, wildlife impacts, recreation, and tourism).

5. Information should be accessible via a spatial framework. A spatial repository providing results and feedback from various drought activities over time will allow managers to access information based upon similarity (geography, land use type, etc.).

Network Components

The DLN team identified seven potential network components designed to facilitate the collection, storage and sharing of information about drought action and efficacy among resource managers.

1. **Case studies** designed to capture the specific event, action and effectiveness following a specified template and capturing specific information could be developed. These case studies could be written by resource managers/communities who recently experienced severe drought and resultant impacts, or they could be facilitated by a project coordinator. Next step: develop a case study template to include what information was helpful in responding to drought events, what specific impacts occurred, how the manager or community responded (including a cost estimate) and the results of the response. Specific attention would be placed on including recommendations for other managers or communities addressing a similar impact. Durango, Colorado or La Plata County could serve as an example location for case study development. Case studies would be stored in a spatial framework and accessible via key term search.

   Functional drought plans should have foundational material for case studies. And while there are not many functional drought plans, they should be evaluated to support this effort.

   Assessing how well drought plans worked during the 2018 event to evaluate needs and gaps could provide an alternate case study framework. There are a variety of different types of drought plans at different scales. Community water system drought plans are very different

from county-level emergency management type plans. Additionally, land managers typically rely on livestock producers to have their own drought plans.

2. **Resilience Reporter** is an on-line location for resource managers to report information similar to the information collected in the case studies (above). A web-form will allow resource managers, communities and DLN coordinator to readily report efforts and will be structured to capture specific information that may be helpful in the future as drought occurs, including cost, efficacy and evaluation. The resilience reporter will be stored/accessible in the same spatial framework as the Case Studies (above) and will be accessible via key term search.

   Leadership team members have had varied success in the use of a drought impact reporter framework for managers to self-populate. There was very little participation from the managers and limited options to incentivize their participation to contribute information. While managers initially expressed interest, they were unable to participate because of time limitations. Lessons learned are documented here. If a resilience reporter becomes a component of the DLN, then much of the data entry may fall to a coordinator to seek out the information and enter it into the reporter.

3. **Drought Management Database**: Since 2013, the National Drought Mitigation Center has maintained a searchable database of reports and news stories on drought mitigation and response actions implemented across the country (https://drought.unl.edu/droughtmanagement). The information in the database is organized by state, sector, management type (drought mitigation, planning, response, etc.), and resource type (news story, user input, website etc.). Information is also accessible by key term search. The database could be used as one source for archiving and sharing case studies and management activity reports developed as part of the project.

4. **Hive mind listserv** to serve as an *Ask An Expert* forum, with rapid responses from the community. A hive mind listserv could function somewhat like the drought monitor listserv for members of the public (city, county focus) and resource managers. An active example of such a listserv is used by the Conservation Coaches Network.

5. **Impact Calendar** would be designed to schedule knowledge exchange around a particular topic (rural communities and water shortage). During times of minimal drought, then focus could be on planning and recovery. Sharing of specific information could be planned around anticipated and observed impacts.

6. **Presentation library**: Webinars, presentations and workshop summaries designed to provide information about various components of drought or for specific phases (Planning, Response, Recovery, and Evaluation) could be linked (if they are hosted on drought.gov or NDMC) or provided if not otherwise hosted. Those specific to resource manager needs and responses to impacts would be highlighted. Where applicable, videos or presentations by managers could be commissioned and shared via the presentation library.

7. **Drought maps (Hawaii example) –** managers wanted drought progression links and how the current drought compared to historic drought in their area via maps and calendars.

8. A clear **organizational structure** that may include an implementation team and an advisory body, and which includes on the ground managers, agency leaders, and researchers/extension specialists.

9. Periodic **in-person meetings** including manager and research co-led field tours.

Participants

The DLN is ultimately a service for resource managers and communities to learn from one another about recommended actions in response to a variety of drought impacts. As such, it is intended for resource managers at city, county, state, and federal levels. At the same time, resource managers coping with recent events indicated the high value of information provided by drought information providers. As such, the DLN is envisioned to as a place for drought climate service providers (NIDIS, NDMC, State Climatologists, Climate Hubs, CASC, RISAS, Others) to: a) foster bidirectional knowledge exchange in learning about community and researcher needs, resources, responses and knowledge gaps; b) supporting the creation of a self-directed peer to peer learning network; c) establishing structures that are co-lead by the users to support the efficient and effective function of DLN to best respond to future drought.

Next steps

Four next steps were identified by the DLN team to establish a prototype DLN:

Workshop/write-shop to discuss ideas presented in this white paper and identify specific actions and responsibilities for network components. The workshop would focus on network structure, responsibility, evaluation of impacts and responses, communications and outreach, and potential funding/support of a long-term network (Hawaii example; $480K).

Identify information sources managers used in responding to drought via literature search, workshop and/or surveys and interviews. The goal of this effort would be to better understand what resources were used and what needs are not being met from the resource manager perspective.

Develop **case study** template and test with managers who recently (within past 5-10 years) responded to extreme/exceptional drought.

The DLN leadership team recommended that the DLN champion be consistent and infuse new ideas into the network to keep momentum and meeting the needs of resource managers. As such, the team will evaluate options to **hire a consistent network coordinator**.