

ACTIONABLE SCIENCE

Developing a Tool to Help Decision-Makers Navigate Complex Drought Scenarios

 North Central
Climate Adaptation
Science Center



Effective drought response involves the expertise and experience of diverse actors, including private landowners, business owners, scientists, non-governmental organizations (NGOs), and managers and policymakers within Tribal, local, state, and federal government agencies. However, it is unclear how differing professional, cultural, educational, and jurisdictional expertise can complicate collaboration. As a result, a team of researchers funded by the Climate Adaptation Science Centers (CASCs) sought to understand the strengths, weaknesses, and outcomes of interdisciplinary collaborations addressing drought issues. Ultimately, the team created a typology to guide actors navigating complex drought decisions.



A Dry Riverbed/Gigi Richard/Fort Lewis College

KEY ISSUES ADDRESSED

From the start of drought management projects, it can be hard to know how various drought factors interact, leaving key actors out of decision-making processes. For instance, a National Park Service manager planning for drought could be constrained by the amount of water released upstream by the Bureau of Reclamation. How actors define the drought issue, and thus how one might respond, differs. For instance, actors might approach drought and its impacts based on the resources they manage and their management goals. While typologies describing climate vulnerability, climate adaptation, and water governance exist, none focus specifically on drought.

PROJECT GOALS

- Identify the social, institutional, cultural, and/or economic factors influencing drought management
- Understand the differences and commonalities in ways actors conceptualize drought decision-making
- Create a typology to help collaborations develop a shared mental model for approaching drought management together

SOCIAL LEARNING

Typologies have the power to guide collaborators to contribute their different perspectives to a project, creating group knowledge over time.



"Water Is Life"/Carlee McClellan/Navajo Nation Dept. of Water Resources

PROJECT HIGHLIGHTS

Interdisciplinary Approach: By synthesizing both workshop conversations and case studies, team members could connect decision-making factors discussed among workshop attendees with real-world examples from case studies to ground their analyses. Workshops convened social and natural scientists and practitioners, while case studies came from various geographies across the western US. This approach provided team members with a wide range of expertise and context to explore drought decision-making scenarios.

Themes to Guide Conceptualization: The team developed the typology to reflect four themes that emerged from analysis: problem framing; decision-makers; the actions, decisions, and outcomes; and the dynamic of the decision-making space, including both the relationships among actors and the scales at which they are operating.

Evolution to Guidebook: This work prompted the development of a guidebook to help actors rapidly assess the social dimensions of drought, some of which are not always incorporated into drought management plans, especially if drought is conceptualized as only an ecological issue. The guide describes the unique problems of drought, nine key social elements of drought, and two examples of how this guide can be used.

Collaborators

- US Geological Survey, Fort Collins Science Center
- National Drought Mitigation Center
- See online for full list of partners

CART Author: Sam Cohen, Drought Learning Network, July 2023.

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Visit CART:



LESSONS LEARNED

While typologies provide insight into how to think systematically, they cannot capture every factor that is influential in a system. Thus, typologies risk excluding critical details. Further, the typology does not provide causal explanations as to how social factors, like politics, might affect a decision. However, the typology aids thought processes to identify a more comprehensive list of factors and prompt deliberation of potential impacts.

The team developed the typology with the intention of broad application. Not only can actors apply it across diverse geographies, but it can aid in bridging disciplines necessary for drought management. For instance, with the typology's inclusion of social and institutional aspects, it can aid natural scientists to think about factors outside their wheelhouse and reveal where additional partner expertise could complement their efforts.

The guidebook is not a prescriptive list of methods, but rather offers flexible approaches to fit the specific context. Much like a travel guide that does not fully plan a tourist's trip, the guidebook provides information for practitioners and researchers to make faster, informed decisions.

NEXT STEPS

- Encourage others to build upon the typology based on their geographical or experiential context
- Pursue developing different types of typologies, such as explanatory typologies that provide causal explanations for decisions

For more information on this project, contact Amanda Cravens: aecravens@usgs.gov



Regrowth Post-Fire in Santa Catalinas/Miles Fule/University of Arizona