FOCUS AREA

ENSURING EQUITY IN DROUGHT MONITORING AND ASSESSMENT

The ability to monitor, model, assess, and understand drought relies on *in situ* and remotely sensed observations. It is important that ground-based, remotely sensed, and modeled information is collected and provided at sufficient density to represent drought. While there has long been a need to ensure long-term observation networks are fully funded, a larger problem is monitoring gaps—both spatial and temporal—that impact assessments in diverse ways. These monitoring gaps can present equity issues. For example, modeled weather products have been shown to perform better over regions with a dense observation network than those with sparse ones (Bárdossy & Das, 2008). In the U.S., station density is lower in higher terrain, under forest canopies, and arid regions of the West, which could disproportionately affect the performance of models in underserved communities. This regional disparity in network density might increase discrepancies between localized experiences and generalized assessment of drought and access to assistance and resources when droughts occur (USDA, 2023). It is also important to note varying levels of capacity in some regions, states, and communities to contribute to drought assessment efforts. This applies not only to geographies, but also sectors, leading to questions about the ability to assimilate, summarize and deliver information that is useful and targeted to all sectors impacted by drought. These issues become even more apparent when considering how non-stationarity influences drought assessment. Addressing these issues is critical to decision-making and require considerations of data sovereignty, reciprocity in data sharing agreements, other knowledge systems, and capacity to understand and use information. Technological advances in modeling and remote sensing and co-created products and tools could assist in addressing these challenges moving forward, but ultimately *in situ* sensors are needed in sufficient density to represent conditions.

Priority Actions:

1. Establish a baseline assessment describing gaps in observations and monitoring networks that includes consideration for local socio-economic and environmental knowledge and experience, with the goal of improving drought assessment in areas underrepresented by networks or stations.
2. Maintain and fully fund existing monitoring and observation networks that measure variables to inform high quality drought assessments, with a consideration of areas and communities underserved by these networks.
3. Increase the use of satellite observations as technology and analysis advances to augment surface-based networks. Satellite observations can potentially provide high resolution information related to vegetation condition and water availability, and coverage of areas underserved by other monitoring and observation networks.

4. Identify and contextualize “hotspots” where changes in precipitation characteristics overlap with economic sectors sensitive to those changes, and where communities have been underserved or under-resourced.

Research

1. Where are there persistent monitoring inequities—spatially and temporally—across meteorological, hydrological, soil moisture, and snowpack monitoring networks? Have these led to economic impacts in specific regions, and if so, how? How do these inequities vary across sectors, socioeconomic status, and political boundaries?
2. What regions and/or sectors will likely be exposed to drought, and how vulnerable are these communities?
3. Can improved monitoring lead to increased adaptive capacity in underserved communities, if resources are lacking to build that capacity? If infrastructure, staffing, etc. are lacking can improved information alone provide an adaptive capacity benefit?
4. How can our drought monitoring infrastructure advance to properly address the need to incorporate non-stationarity into our drought indices and assessments, while addressing existing inequalities in terms of station locations (e.g., monitoring infrastructure gaps in underserved locations)?
5. How can existing climate change and drought impact data across disciplines (e.g., public health, economic, social sciences) and knowledge systems be incorporated in a way that is equitable to improve drought assessment?
6. How can remote sensing of the environment promote equitable monitoring of parameters that inform drought assessment and climate change impact characterization? Will this approach provide data at locations and in communities historically underserved by environmental monitoring programs?
7. How can we create partnerships with communities to share data and information while advancing knowledge ownership and stewardship?
