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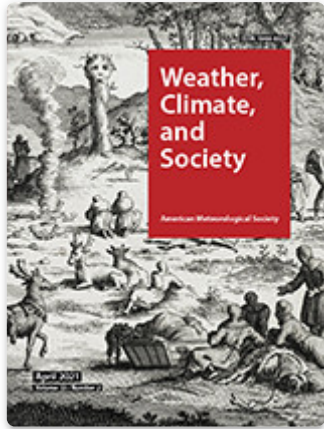
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Whose Ground Truth Is It? Harvesting Lessons from Missouri's 2018 Bumper Crop of Drought Observations

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SMITH ET AL.

Whose Ground Truth Is It? Harvesting Lessons from Missouri's 2018 Bumper Crop of Drought Observations

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ABSTRACT: Drought-related decision-making and policy should go beyond numeric hydrometeorological data and incorporate information on how drought affects people, livelihoods, and ecosystems. The effects of drought are nested within environmental and human systems, and relevant data may not exist in readily accessible form. For example, drought may reduce forage growth, compounded by both late-season freezes and management decisions. An effort to crowdsource drought observations in Missouri in 2018 yielded a much higher number of observations than did related efforts. Here we examine 1) the interests, circumstances, history, and recruitment messaging that could produce a high number of reports in a short time; 2) whether and how information from volunteer observers was used by state decision-makers and to U.S. Drought Monitor (USDM) authors; and 3) potential for complementary use of volunteer and citizen science reports in assessing trustworthiness of volunteer-provided information. State officials from the Cattleman's Association made requests for reports, clearly linked to improving the accuracy of the USDM and the financial benefit. Well-timed requests provided a focus for people's energy and a reason to invest their time. State officials made use of the dense spatial coverage that observers provided. USDM authors were very cautious about a surge in reports coinciding closely with financial incentives linked to the Livestock Forage Disaster program. An after-the-fact comparison between stakeholder reports and parallel citizen science reports suggests that the two could be complementary. Potential for developing protocols to facilitate real-time use.

KEYWORDS: Social Science; North America; Communications/decision making; Damage assessment; Societal

Like the tree falling in the forest, does drought occur if there is no human to record or experience it? . . . What serves as 'ground

truth' is understood and described in context of meteorology or hydrology, triggers socioeconomic or ecological impacts (Crausbay et al. 2017; Ding et al. 2011; V 2016a,b). Impacts result from interactions of nat


Whose Ground Truth Is It? Harvesting Lessons from Missouri's 2018 Bumper Crop of Drought Observations in: Weather, Climate, and So...
truth?' What if there are many ground truths to choose from?—Kelly Redmond (Redmond 2002)

1. Why track drought impacts?

No single numeric definition of drought is applicable for all places and circumstances. Measurements of different aspects of the hydrologic cycle may not tell the same story and do not necessarily reflect the full range of circumstances (Svoboda et al. 2002). Most conceptual definitions involve a water balance, factoring in the difference between supply and expectations (Redmond 2002). A physical water shortage, typically

impacts result from interactions of vulnerability/adaptive capacity, social or environ and more (Kallis 2008). Being able to describe a tify the impacts of drought—such as reduced crop an increase in dust-related respiratory problems, f intense wildfires—can focus drought response (Lackstrom et al. 2013). As a warming climate br hydrologic extremes, compounded by the drying effective drought response and mitigation can r communities, health, livelihoods, and environmen productive capacity (Reidmiller et al. 2018)

Drought researchers advocate calibra logical indices by comparing them with et al. 2016; Blauhut et al. 2015; Lackstrom et al. 2013; Redmond 2002; Van Loon et a comparison of indices and impacts requir

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