



The art of adaptation: Living with climate change in the rural American Southwest



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ABSTRACT

As adaptation has come to the forefront in climate change discourse, research, and policy, it is crucial to consider the effects of how we interpret the concept. This paper draws attention to the need for interpretations that foster policies and institutions with the breadth and flexibility to recognize and support a wide range of locally relevant adaptation strategies. Social scientists have argued that, in practice, the standard definition of adaptation tends to prioritize economic over other values and technical over social responses, draw attention away from underlying causes of vulnerability and from the broader context in which adaptive responses take place, and exclude discussions of inequality, justice, and transformation. In this paper, we discuss an alternate understanding of adaptation, which we label “living with climate change,” that emerged from an ethnographic study of how rural residents of the U.S. Southwest understand, respond to, and plan for weather and climate in their daily lives, and we consider how it might inform efforts to develop a more comprehensive definition. The discussion brings into focus several underlying features of this lay conception of adaptation, which are crucial for understanding how adaptation actually unfolds on the ground: an ontology based on nature–society mutuality; an epistemology based on situated knowledge; practice based on performatively adjusting human activities to a dynamic biophysical and social environment; and a placed-based system of values. We suggest that these features help point the way toward a more comprehensive understanding of climate change adaptation, and one more fully informed by the understanding that we are living in the Anthropocene.

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1. Introduction

As adaptation has come to the forefront in climate change discourse, research, and policy, much scholarly attention is being directed toward how the concept should be defined and understood by the climate change research community. Meanwhile, although it is widely recognized that adaptation is primarily a local process (e.g. Klein et al., 2007), investigating how local-level decision-makers, who are experiencing and responding to climate variability and change in their daily lives, understand the concept has been neglected. Working in the tradition of social constructivism, social scientists have demonstrated the power of discourses – understood as frameworks of meaning, consisting of concepts, attitudes, beliefs, and practices, that both enable communication among different

actors and systematically construct the subjects and worlds of which they speak – to frame environmental problems and their potential solutions (e.g. Darier, 1999; Demeritt, 2001; Dryzek, 1997; Forsyth, 2003). Because “language matters deeply for analysis, interpretation, and action” (Ribot, 2011, p. 1160), as the physical and social phenomenon of climate change is coming to be understood in human society, it is imperative that climate change researchers continue to question and ground-truth the formal concepts that will shape our understanding, and in particular, the direction and funding of research and the efforts of governments and intermediary organizations to address climate change.

To that end, this paper offers a view of adaptation that emerged from an ethnographic study of how rural residents of the U.S. Southwest, where climate changes have exceeded those in any region of North America except the Arctic (Overpeck and Udall, 2010), understand, respond to, and plan for weather and climate in their daily lives. It then compares this lay understanding of adaptation with that from the Intergovernmental Panel on Climate Change (IPCC) Third and Fourth Assessment Reports, the definition

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that currently dominates the climate change literature, in order to provoke reflection on the implications of the differences between them for adaptation research, practice, and policy

The paper is organized as follows. In Section 1, we describe the context of the study and the methodology used. In Section 2, we give some background on the development of the IPCC definition and summarize conceptual and empirical critiques of it. In Sections 3 and 4, we describe the approach to adaptation that emerged from our study. Section 3 describes how participants conceptualize the constant process of adjusting to the climate of the region and its extreme variability in their daily lives, an approach to adaptation we call “living with the climate.” This approach comes into focus further as they distinguish it from practices that characterized the dominant approach to adaptation to the climate of the Southwest in the twentieth century, which we refer to as “overcoming the climate.” This contrast brings to light fundamental differences between the ontologies, epistemologies, and value systems underlying these two approaches. This discussion also lays the groundwork for Section 4, where we show how, in the face of climate changes rural Arizonans are experiencing, participants extend “living with the climate” to “living with climate change.” Section 5 then compares “living with climate change” and the understanding of adaptation promoted by the IPCC definition, which we refer to as “adapting to climate change” and discusses the implications of fundamental underlying differences between them. We suggest that a more comprehensive understanding of climate change adaptation must be based on a recognition of the mutuality of ‘nature’ and ‘society’ in order to be able to encompass these differences and support more effective research, policy, and practice to address climate change.

1.1. Context of the study

The study took place in Arizona, which has a warm, dry climate characterized by two distinct wet seasons, creating exceptional variability in precipitation and temperature levels throughout the annual cycle (Sheppard et al., 2002). Dramatic topographic relief across the state adds to this variability. Higher elevation locations receive on average ten times more precipitation and are tens of degrees cooler than the lowest elevation areas of the state. Arizona also experiences high levels of interannual precipitation variability related to the El Niño–Southern Oscillation (ENSO). The frequency of El Niño and La Niña events also varies at decadal scales, producing longer-term pluvial and drought periods that can last for decades (Sheppard et al., 2002). Since the late 1990s, Arizona has been experiencing the most severe drought yet observed in the instrumental record (NCDC, 2009).

Arizona faces additional challenges from climate change. The Southwest has already experienced significant warming since the middle of the last century and temperatures are projected to continue to increase up to 3–6 °C by century’s end, along with aridity, more frequent, longer lasting, and warmer drought conditions, and more intense precipitation and flooding (Hoerling and Eischeid, 2007; Karl et al., 2009; Overpeck and Udall, 2010; Seager et al., 2007). This warming has reduced the proportion of precipitation falling as snow and late-season snowpack, affecting the average annual flow of the Colorado River, which could decrease by 20% or more by 2050 (Barnett et al., 2008; Pierce et al., 2008; Karl et al., 2009). While the development of large-scale, centralized, and federally subsidized water management systems has allowed agricultural production and urban concentrations to expand in unprecedented ways for such an arid region, there is mounting evidence that current water use in much of the region is unsustainable as water management systems are running up against physical, economic, and ecological limits that constrain the expansion of water supplies, while at the same time, climate

change and population growth heighten the threat to current supplies (Gleick, 2010; Overpeck and Udall, 2010). Despite these water resource challenges, the Southwest has the fastest growing population in the nation.¹

Within Arizona, the study focused on rural communities. (The USDA Economic Research Service uses several different definitions for “rural” in the statistics it provides. For the purposes of this study, we use a vernacular, rather than a technical definition. Rural areas are those that are not urbanized, have a low population density, and a high proportion of agricultural land, rangeland, or public lands.) Rural residents are a numerical minority in the U.S., and as a result their views and concerns tend to be underrepresented in national debates. The 2010 census showed that only about 17% of the U.S. population live in rural areas, while they occupy 80% of U.S. territory (Lal et al., 2011). Although most Americans associate rural areas with agriculture, agriculture-related jobs account for only 11.7% of rural employment (Kellogg, undated). In addition, median household income is less in rural than in urban areas – \$40,135 versus \$51,522 in 2009 – the poverty rate is higher – 16.5% versus 14.9% in 2010 (USDA Economic Research Service), and the rural–urban income gap has been widening in recent years (Lal et al., 2011). Rural residents often lack access to social services and local governments often lack access to financial and technical resources often widely available in urban areas (Lal et al., 2011). Studies conclude that rural communities tend to be more vulnerable than urban communities to climate change due to physical isolation, an aging population, lack of jobs, lower income levels, higher poverty rates, and dependence on government funds (Lal et al., 2011; NCADAC, 2013). Rural communities are also characterized by a distinct set of values, including those of hard work, self-reliance, and commitment to community and family (Brugger, 2009; Kellogg, undated).

In the western U.S., which is distinguished by a high proportion of public land, rural economies traditionally based on resource production are undergoing a shift to amenity consumption economies based on tourism, recreation, and real estate (Walker, 2003). This economic shift is accompanied by a demographic shift as ex-urban amenity migrants, whose worldviews and values differ from those of longtime residents, flock to rural areas for their lower cost of living and aesthetic landscapes, challenging established community identities. This influx of new residents, who are often retirees, lack experience living in the local environment, and have a lower degree of self-reliance than longtime residents, also increases the vulnerability of these communities to climate change (McLeman, 2009). Sections 2 and 3 will provide some examples of the ways that these political, economic, and social characteristics and shifts in the rural West interact with the ways rural Arizonans are adjusting to climate variability and change in their everyday lives.

1.2. Methodology

This article draws on qualitative data from a series of eight group discussions, conducted in nine predominantly rural Arizona counties in 2011, and designed to investigate how rural Arizonans understand, plan for, and respond to weather and climate in their daily lives. The research was carried out by an interdisciplinary team that included a climate scientist and an anthropologist, both of whom have extensive experience working with rural communities in the American West. The team worked with a University of Arizona Cooperative Extension county agent in each county to

¹ The population of Arizona grew 24% between 2000 and 2010 (only that of Nevada grew faster), 40% between 1990 and 2000, and 35% the decade before that, compared to 9.7%, 13%, and 9.7% for the U.S. as a whole for the same periods (USDA Economic Research Service).

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