

## Red, White, and Blue: Environmental Distress among Water Stakeholders in a U.S. Farming Community

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**ABSTRACT:** This paper explores environmental distress (e.g., feeling blue) in a politically conservative (“red”) and predominantly white farming community in the southwestern United States. In such communities across the United States, expressed concern over environmental change—including climate change—tends to be lower. This is understood to have a palliative effect that reduces feelings of ecoanxiety. Using an emotional geographies framework, our study identifies the forms of everyday emotional expressions related to water and environmental change in the context of a vulnerable rural agricultural community in central Arizona. Drawing on long-term participant-observation and stakeholder research, we use data from individual ( $n = 48$ ) and group ( $n = 8$ ) interviews with water stakeholders to explore reports of sadness and fear over environmental change using an emotion-focused text analysis. We find that this distress is related to social and material changes related to environmental change rather than to environmental change itself. We discuss implications for research on emotional geographies for understanding reactions to environmental change and uncertainty.

**KEYWORDS:** Social Science; North America; Watersheds

### 1. Introduction

Distress over environmental change is reported globally. The phenomenon is considered to be so common that the term “solastalgia” was coined in 2005 to describe the experience of maintaining a close relationship to the land while feeling emotionally displaced due to environmental change (Albrecht 2005). Globally, scholars have documented environmental distress among people working with natural resources in diverse ways: worry among commercial fishers in the Pacific Ocean region (du Bray et al. 2017), suffering among water provisioners in Bangladesh (Sultana 2011), and frustration among scientists in Western contexts (Pihkala 2020). Despite the apparent universality of environmental distress, such distress seems to be particularly pronounced among farmers experiencing drought; where other groups express emotional distress, farmers have experienced psychological conditions, including heightened anxiety, depression, and suicidality (Alston 2012; Bryant and Garnham 2014; den Besten et al. 2016; Wutich et al. 2020a).

What, exactly, causes distress? The earliest scholarship on environmental distress among farmers suggested that distress may be linked to loss of property, caretaking responsibilities, and a deterioration of perceived masculinity (Berry et al. 2011). In other words, factors related to disruption of how people identify with their place and lifeways, rather than environmental change itself, often provokes distress. These factors may produce threats to social identity, including social failure

and associated shame. As Wutich et al. (2020a) note, the material, social, and environmental forces that produce environmental distress do not necessarily operate one at a time, or in a vacuum; often, these are interlocking or compounding mechanisms that co-occur and exacerbate how distress is experienced. At present, little research explores how material, social, and environmental factors operate in relation to each other. Given that emotion can be an important motivator for change, understanding the relationship between these factors is necessary to motivate and support community efforts to address environmental change.

This paper explores how community members in a “red” (i.e., politically conservative) and white (predominantly identified with whiteness as a racial category) community express emotion (e.g., feeling blue) in normal, professional conversation. The Verde Valley is a rural, transitioning agricultural region of Arizona where water rights are undergoing adjudication. We use a systematic ethnographic approach to explicate how those engaged in water-related activities express (or not) emotional distress around water issues, particularly in the context of a changing landscape and increasing environmental insecurity. Rather than taking a psychiatric approach (as in early studies of environmental distress), we take an emotional geographies approach and focus on small and everyday ways that climate-related emotional distress is expressed, rather than acute or severe (e.g., suicidal ideation). We achieve this using systematic word-based text analysis of guided conversations supplemented with observations from long-term participant-observation and stakeholder research. We conclude that expressions of distress among agricultural

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stakeholders in the Verde Valley are related to anticipated sociopolitical upheavals in response to environmental change rather than to environmental change itself, and these expressions inform how people engage in addressing water conflicts.

## 2. Theoretical framework: Emotional geographies of working landscapes experiencing human-environmental change

While much of the early research on environmental distress focused on solastalgia, or the longing for meaningful places as they were before environmental change (Albrecht 2005; Albrecht et al. 2007) or psychological categories like suicide and depression (Alston 2012; Bryant and Garnham 2014; den Besten et al. 2016; Wutich et al. 2020a), emotional geographies examine how relationships between people and landscapes create emotionally significant landscapes (Anderson and Smith 2001). Emotional geographies focus on forms of everyday emotional expression and trace their origins to feminist political ecology.

Research such as Ennis-McMillan's (2001, 2006) work identifying the profound distress associated with water insecurity in a rural Mexican farming community provided an entry point for scholars focused on the emotional dimensions of water access. Political ecologists then identified similar distress-related effects in other water-scarce settings, including Bolivia (Wutich and Ragsdale 2008), Bangladesh (Sultana 2011), the United States (du Bray et al. 2017), and elsewhere (Wutich et al. 2020a). The lens of emotional geographies recognizes that people form close connections with their surroundings, often through the use of or reliance on resources like water. While the emotional geographies framework views interactions with the natural world as fundamental to how individuals and groups develop their identities, it emphasizes working landscapes and the emotional consequences individuals experience as a result of their interactions with landscapes and others in that landscape (Eaton et al. 2019). Environmental change, then, may provoke emotional distress.

Using the emotional geographies framework, we build on the literature of environmental change, livelihoods, and emotion in several key ways. First, much of the early research on environmental distress among farmers focused on psychological categories like suicide and depression. This is an important strand of research that is highly shaped by psychiatric categories and methods. Specifically, a limited set of studies have shown death by suicide can increase dramatically among land-owning family farmers in the wake of serious droughts (Hanigan et al. 2012). Such extreme internalized emotional response to inadequate water access is suggested to be tied to the erosion of core masculine social identities as both farmers and family providers (Alston 2012; Berry et al. 2011; Bryant and Garnham 2014; den Besten et al. 2016; Sartore et al. 2008). Other studies point to the emotional distress individuals and communities face when feeling threatened by, or experiencing, loss of access to resources (e.g., Sultana 2011; Wutich and Ragsdale 2008). Some scholars have proposed that what makes such situations so particularly emotionally threatening is how they counter cultural ideals of self-reliance and independence (Erikson 1978); relatedly, this is key to the

denial of mental health issues or refusal to seek support services (Alston 2012). However, few studies have investigated less severe manifestations of this emotional stress. The emotional geographies approach focuses on how environment-related emotions and distress are expressed in smaller, more subtle ways, such as in how people talk about human-environmental change to others. This more qualitative, exploratory approach, rather than a structured, emotions-focused elicitation, allows scholars to identify unexpected emotional expressions, and new connections between the material, social, and environmental factors that may produce these emotional expressions.

Our study considers the emotional responses of those in the farming community, as well as the community of professionals engaged in water resource decisions including government officials and local conservation groups. Just as farmers express extreme emotional distress as a result of drought, professional identity can impact the emotional responses to lived and imagined experiences of environmental change for others working in those landscapes. For example, recent reports explore the emotional responses among environmental scientists (Head and Harada 2017; Gordon et al. 2019; Usher et al. 2019; Attanasio 2020; Kearns 2021; Renouf 2021). For those who are closely engaged in research on environmental change, alongside other communities who are closely connected with landscape processes, distress can be elevated (Clayton 2018). For example, repeated exposure to climate change provokes a range of emotional expressions, including ecological grief; this and other emotional responses to environmental change may lead to poor mental health outcomes among conservation practitioners and other professional communities with close connections to landscapes (Cunsolo and Ellis 2018). Farmers exist within professional and proximate networks that share many of the same environmental concerns and worries; these worries may threaten core identities.

Farming in places like Arizona's Verde Valley—the site of our study—remains a masculinized profession; this profession is strongly shaped by, and reflects, cultural ideals of self-reliance (Berry et al. 2011; Hull et al. 2017). Research has shown that, in the United States and other Western contexts, it is often more socially acceptable for women to express emotion; by comparison, men are encouraged to suppress emotional responses to trauma and hardship (Fantini-Hauwel et al. 2015; Galasinski 2004; Levant 2011). Yet, research shows that men engaged in land-based livelihoods cultivate a strong emotional connection to the land (Barlett and Conger 2004; du Bray et al. 2017; Filteau 2014; Nightingale 2013; Sherman 2011). Thus, studying emotional responses in a masculinized profession may provide additional insight into how men, in particular, describe the social, material, and environmental factors that contribute to emotional distress.

Understanding these emotional geographies can inform more effective approaches to stakeholder engagement by revealing perceptions of risk and water decision-making in the context of climate change. Of all occupations globally, farming is arguably the most immediately vulnerable to unpredictable, inadequate, or unreliable water availability (an existing challenge expected to worsen as a result of climate

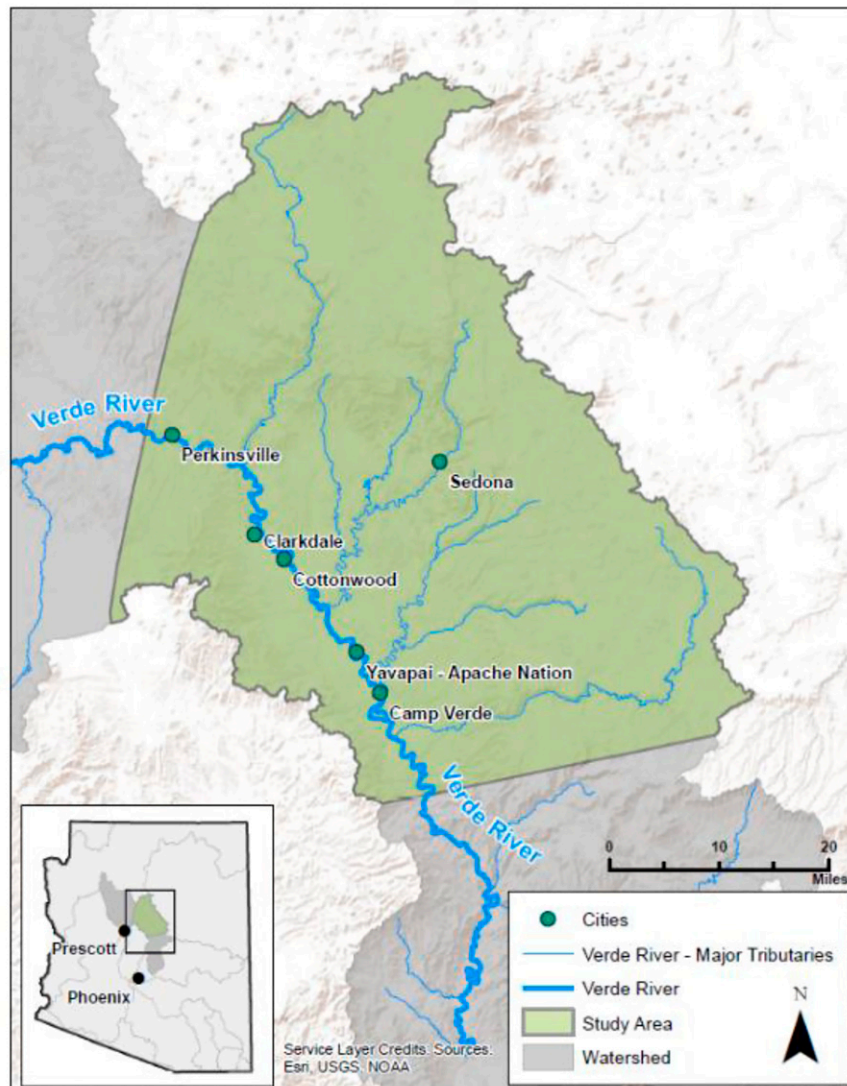


FIG. 1. The study area.

change). Engaging farming communities in productive discussions about adaptation to environmental change and associated shifts in resource management requires greater understanding of their emotional responses to such change, and their associated willingness to participate in cooperative resource management (Nightingale 2011). Thus, we engage the emotional geographies literature to understand how changing social, material, and environmental conditions provoke emotional responses among a masculinized profession in a desert landscape.

### 3. Materials and methods

#### a. Site selection

The Verde Valley is an arid, high-altitude zone in central Arizona defined by the Verde River watershed. It includes

many rural municipalities and the Yavapai–Apache Nation (see Fig. 1). The area around the Verde River has been home to people for at least 11 000 years, with archaeological evidence indicating occupation by the Hohokam people and later the Southern Sinagua people (Abbott 2003). The Yavapai and Apache peoples historically occupied the region. These groups were displaced by the U.S. Army when white settlers arrived in the Verde Valley in the 1860s (Ayers 2010). However, they were later allowed to return to the area to live on reservations, and the Yavapai–Apache Nation received federal recognition in 1934 (Bureau of Indian Affairs 2016). Today, 93% of Yavapai County is white (U.S. Census 2019), and it is politically conservative: 49% of registered voters are Republicans, 29% were independent, and 21% were Democrats (Arizona Secretary of State 2021).

Private land in the Verde Valley (20%) is held by residents of Camp Verde, Cornville, Cottonwood, and Oak Creek,

whereas 78% of the valley is public land, including the Prescott National Forest (Arizona Department of Water Resources 2009). Cornville is where deceased Senator John McCain's family ranch is located and was his political home base in Arizona (McCain and Salter 2019). In recent decades, the region has experienced a transition from primarily rural agriculture to a more diversified economy, including shifts in agricultural products and production methods. Community members in the valley involved in agriculture produce beef, barley, corn, hay, horses, pecans, vegetables, wine grapes, and more. As the economy has changed, so too have farmers' outreach strategies; producers have begun to market to local restaurants in an effort to maintain profit margins and develop community coherence (Bausch et al. 2019). Residential development is also rising rapidly, and farms and ranches are increasingly divided into 1–2-acre (0.4–0.8 ha) properties and sold for single-family homes.

As land use in the Verde River watershed has changed, divisions of property and shifts away from agriculture have created further uncertainty around surface water rights. Arizona water rights are determined by the doctrine of prior appropriation, giving priority to senior users with older claims, regardless of their location along the river's flow. An adjudication process, by which the court identifies and prioritizes surface water rights for users on the Verde River and other Arizona waterways, is currently ongoing (Kyl Center for Water Policy 2020). The abundance of wells drilled in the area has also led to concerns that they are diverting subflows of surface water and surreptitiously drawing from the Verde River; where this is the case, these wells would also be subject to adjudication.

The Verde Valley is currently in its 26th year of drought, and despite significant precipitation in 2021, much of the state remains under severe drought conditions (Arizona State University Climate Center 2021). In 2021, as water levels in reservoirs dipped to record lows, the Colorado River Drought Contingency Plan was activated, adding further strain to water conflicts (U.S. Bureau of Reclamation 2020). As urbanization increases and farmers across the United States shift to more profitable (and often water-intensive) crops, water rights and access are also shifting (Eakin et al. 2016; du Bray et al. 2018; Niles and Hammond Wagner 2019). Research has found that growers in the Verde Valley have some adaptive capacity for dealing with these changes; however, as small-scale producers, they are often overlooked by government and nonprofit agencies and may not qualify for the resources available to large-scale producers (Douglass-Gallagher and Stuart 2019). The Yavapai–Apache Nation—for whom water is central to culture, identity, and knowledge systems—faces compounding drivers of water insecurity due to discriminatory policies that disregard their historic water rights, along with prolonged drought and water extraction (Chief et al. 2016; Cozzetto et al. 2013). The impacts of drought on housing, transportation, and livelihoods are already a concern (Cozzetto et al. 2013).

#### b. Data collection

This research was conducted as part of long-term stakeholder research and participant-observation in the Verde

Valley. This study is designed to capture the normative expressions of emotion among agricultural stakeholders. Accordingly, the stakeholder recruitment strategy included farmers and ranchers, along with closely aligned agricultural stakeholders in connected occupations like ditch managers, residential irrigators, government officials, consultants, and conservation advocates (Wutich et al. 2020b). We reached out to key stakeholders for interviews and asked them to recommend others in the community who would be willing to be interviewed. In total, 50 stakeholders (including 12 women) were recruited and completed extended interviews between March 2018 and June 2019. Interviews ranged from 45 min to 3.5 h. Through the interview process, we also identified a group of 15 stakeholders who were willing to participate in a collaborative process to address local water issues. This allowed for subsequent participant-observation of eight stakeholder meetings between November 2019 and April 2021, which typically lasted 1.5 h.

An open-ended interview protocol guided the conversation of participants' roles in water and agriculture in the Verde Valley. Respondents identified important water issues in the region, relevant stakeholders and organizations in the Valley, information sources, and explained how stakeholders address water issues (Beresford et al. 2020). Our strategy for investigating emotional distress was to allow respondents to freely volunteer emotional responses in the context of broader conversations about the environment. This is standard practice in the emotional geographies literature (e.g., Sultana 2011) and has helped to address difficulties in the elicitation of reliable self-report data on emotions (e.g., Fantini-Hauwel et al. 2015; Galasinski 2004; Levant 2011). Interviews were audio recorded and subsequently transcribed.

Of the eight stakeholder meetings, six took place through a web conferencing “app” because of coronavirus disease 2019 (COVID-19). The participating social scientist recorded observations with jottings and wrote up notes following the meeting, rather than recording verbatim quotes; discussions were not video recorded, to help participants speak freely. Participants include farmers, ranchers, conservationists, ditch bosses, municipal leaders, development officers, and educators, with most claiming multiple subjectivities across these categories. We supplement these data with notes and observations during in-person visits to the Verde Valley, conducted over 4 years, to meet with stakeholders, visit irrigation ditches, and observe the broader community and sociopolitical landscape.

#### c. Data analysis

Transcripts from interviews were analyzed using MAXQDA 2020. We applied a specialized lexical, or word-based coding technique, known as keywords-in-context analysis, which we selected a priori to capture a range of expressions of distress using validated lists of English emotion words (du Bray et al. 2017; Ryan and Weisner 1998; Seale et al. 2006; Saldaña 2009; Taylor et al. 2015). Data were coded at the word level, meaning that a single interview might contain multiple instances of the same emotion term. Upon

TABLE 1. Emotion words chosen on the basis of the emotional geography literature, the frequency in which they occurred, and the most common themes with which they were associated. Relevance was indicated by the word referring to water issues, determined by an analysis of the context.

Emotion word	Total	Selected for relevance	Most common context
Sad (specifically about water)	6	6	Change to local landscape and culture
Afraid	53	19	Positive: changes to water rights and fear of monitoring and interference; negative: no fear of scarcity
Angry	3	3	Anger related to socioenvironmental change and water issues
Un/worried	33	17	Positive: worry about rights and adjudication; negative: identifying groups (or self) who are not worried and topics they are not worried about (i.e., development)
Hope	40	26	Positive: community engagement, economic gain, adjudication, and hope for the future; negative: hope expressing concern or fear, along with conflict

completing a first round of lexical coding for five emotion words selected to capture a range of distress—specifically, variants of “worry,” “afraid,” “hope,” “sad,” and “anger”—we reviewed our analysis to ensure appropriate capture of emotion words. We also removed any instances in which emotion words were used in an idiomatic expression (e.g., “I’d be happy to help”) and instances in which the reviewer asked a direct question with an emotion word involved (e.g., “Did you feel sad about that?”), because the latter often primes respondents to respond in kind. Our initial count yielded 282 segments, of which 135 were relevant. Our final analysis focused on 71 of these segments. We then reviewed the context in which each emotion word was used, and inductively developed themes around these lexical codes (see Table 1) (Ryan and Bernard 2003; Bernard et al. 2016). Two researchers reviewed each other’s analysis to confirm agreement on the capture of thematic categories. These themes are discussed, with typical exemplars provided, in each results section. Data used in analysis were collected from interviews, and field notes, including observations from the eight stakeholder meetings, were used to assist with clarifying theme identification and data interpretation.

#### 4. Results and discussion

Most of the emotion words presented in this analysis appeared in relation to discussions of water rights and the ongoing adjudication process; this was the focus of our interview protocol, and our analysis accordingly focused on emotions expressed around these dynamics. However, we found that many of these emotional expressions occurred in contexts of concern over sociopolitical changes in the Verde Valley, rather than environmental or climatic drivers of water scarcity (see Table 1). Given the threat climate change poses to local water resources, remarkably little emotion was expressed around climate change, and it was not farmers or ranchers, but rather educators, community leaders, or conservationists that expressed emotions in contexts of climate change. This contrasts sharply with our past findings from research with other Arizona water stakeholders (e.g., du Bray et al. 2017; White et al. 2010; Wutich et al. 2010), in which

conversations center heavily on the changing climate, mega-drought, dropping rainfall and river flows, and resulting water shortages. In the sections that follow, we focus on expressions of emotional distress from agricultural stakeholders and address themes identified around the discussion of the following emotions: sadness, worry, fear, anger, and hope.

##### a. Sad: Sadness over sociopolitical and environmental changes

Participants used “sad” to describe their feelings about water resources and changes to the local economy and land use, as well as choices made by other stakeholders to manage or use their water. In other words, respondents referred to social and environmental factors as the source of their sadness.

Several participants indicated sadness related to the condition of the local landscape, or changes to it. One participant expressed sadness about the status of the Verde River: “I think about that, how sad it is that that resource ecologically, economically, has been wiped out. If we were able to maintain those resources by us, I think it would afford our valley a lifestyle, and a—it [would] just be an invaluable resource in so many ways.” Another participant focused their sadness on the decline of agriculture in the Verde Valley. This stakeholder attributed some of those changes to preservation and conservation movements and noted that agriculture itself is shifting in the Verde Valley; more historical crops have been replaced with vineyards and other new crops over the last decade. In focus group meetings, participants expressed concerns about water use by these new industries, and their lack of historical connection to the local community.

Perceived changes and decisions by other stakeholders related to water were a source of sadness for some. One participant, for example, felt sadness due to economic hardship and difficult management decisions made by another stakeholder: “I just spoke on the phone with a—a rancher. He said they’re in the process of thinning their herd, ’cause they’re out of water. It’s really sad.” Although this type of emotional response was rarely expressed among our participants, it is certainly not unprecedented in the emotional geography literature. As scholars (Sultana 2011; Wutich et al. 2020a) note,

material deprivation of water is an important source of environmental distress. This particular response is notable because the stakeholder is not expressing emotional distress on one's own behalf but rather for a fellow community member. Although expressing sympathy is a normative response, stakeholders in an agricultural community nevertheless often viscerally understand this particular risk, making the expression of sadness particularly emotionally resonant.

Sadness was also expressed around the water rights adjudication process. Some worried it might result in the commodification of water. There are conflicts over water rights between different stakeholders in the adjudication process; as we note later, this discord often occurs between water users from the Verde Valley and the Phoenix Valley. In this case, however, the stakeholder's comments were focused on the Yavapai–Apache Nation: “And you know. They're—They're taking out water. Well, that water, it's rights, and it's, it's kind of sad, because they're giving it to the Indians or whatever, but the Indians don't really want the water. They just want the money for the water.” This participant went on to express a belief that the Yavapai–Apache Nation does not use its water but rather sells it to the Salt River Project (a utility that services the Phoenix, Arizona, metropolitan area). In reality, however, the Yavapai–Apache Nation is one of the largest agricultural producers in the area; material reinstatement of the Yavapai–Apache Nation's water rights and access is necessary for Indigenous sovereignty (Chief et al. 2016; Cozzetto et al. 2013; Redsteer et al. 2013). For some stakeholders in the Verde Valley, however, their perception that water is being reallocated to the Yavapai–Apache Nation and sold for use outside the Verde Valley is distressing, particularly when they felt that their own livelihoods could be impacted.

#### *b. Fear: Afraid of losing water rights*

Responses using “fear” or “afraid” generally fell into two thematic categories: fear of changes to water rights and fear of government intervention or action (especially in the form of metering). Additional responses described fears about their representation in decision-making processes and in local and national government. “Afraid” could describe express personal fears or relate the fears of other community members.

The most common use of fear was in reference to community members potentially losing water rights through the pending adjudication process. Prior appropriation is based on the principle of “use it or lose it”: if land owners do not use their full allocation of acre-feet per year, they risk losing some water rights. As the adjudication process begins to address disputes around the Verde River, some participants expressed fear that there will be winners and losers based on historical precedent. As this participant said, “If your historical water right is higher (a greater allocation), and when the adjudication comes down, then you have a higher water right. So there, yeah, it's like . . . It's real or perceived, there's a fear of use it or lose it.” Material use, in this case, is directly related to fears of adjudication; water conservation is hard to prioritize if water users feel that conservation will lead to long-term losses and feel insecure that the water will stay in the Verde

River. One participant explained: “The largest ones [ditch companies] . . . feel, I'm not speaking for them, but it seems that they feel that, um, Verde River Conservation is a slippery slope to taking away their water rights, so they have fear, and they're letting that fear, uh, guide their participation and decisions, I think.” This same participant went on to say that ditch companies and farmers are guided more by their own fears of losing their water rights than by thinking about the importance of ensuring that water remains in the Verde River. In meetings, efforts to develop tools for improving water management have been met with concern that locals will feel a need to expand their operations to maintain their current water demand rather than to keep water in the river.

Changes to, and the potential loss of, water rights and/or allocation are a highly motivating concern for many stakeholders in the Verde Valley. The possible changes that might result from increased monitoring are an important part of that. Many identified the possibility that their water use might be metered or otherwise monitored, as has become increasingly common in other water-scarce agricultural communities (du Bray et al. 2018; Niles and Hammond Wagner 2019). Use of meters might lead to stakeholders to paying more for water, or having their actual water use and/or formal water allocation reduced. Such changes could affect both land use and property values. Water-use metering provokes concern for producers and stakeholders when it comes to water rights. Participants are aware of existing metering within Arizona: “Yeah, they are metering in Graham County, and they're metering in all of the AMAs [Active Management Areas] as well, and then some other wells' land owners voluntarily decided they want to do that. So any type of compulsory metering is what they're afraid of.” Metering in the AMAs is necessary to ensure that groundwater levels are remaining at sustainable levels (Arizona Department of Water Resources 2016); in regions reliant primarily on surface water, however, metering is uncommon and, for some stakeholders, represents a threat to their water rights.

Because Arizona and California are both reliant on water from the Colorado River and are both water scarce states with a large amount of water devoted to agricultural production, Verde Valley stakeholders pay close attention to what is happening in its neighboring state. Many of the fears that emerged during interviews are based on observations of changing water rights, regulations, and perceived hardships to growers in California, as this participant described:

But, um, you know, they've taken the water from the farmers. The orchards are going dry because they've cut the water from the farmers, and put them out of business, and they all . . . All this horrible stuff is going on in their water, while monitoring in California. So I think the fear is, for people that have seen that scene going on, that everybody's gonna come in, the state's gonna come in and slap a water monitor on ever well in, everywhere, and make the, you know, the owner of the well pay for that monitor, and then make you pay for the water that they think you shouldn't be using, or something like that.

Several participants expressed fear of water demand from the growing Phoenix metropolitan area, and the major water

utility for that area, the Salt River Project (SRP). SRP has a contentious past in the Verde Valley, having sued residents over water rights (Bausch et al. 2019). The water utility is seen as having deep pockets and a vested interest in ensuring that the adjudication process benefits the Phoenix metropolitan area. This participant identifies the intersection of several fears: “And a lot of that is, you know, this ongoing fear or unwillingness to address [water rights and use]. Either at an individual level or at a ditch level. And some fear and apprehension about SRP as an entity.” It is hard for many individual stakeholders in this region to address their concerns about SRP in the adjudication process, because, as individuals, they do not have the same degree of representation and power that they perceive SRP has. In general, however, many stakeholders fear the growth of Phoenix overall, and the challenges that could pose to their water rights: “The biggest fear is that . . . uh, you know, Phoenix is growing and growing and growing, and they don’t care who they [take advantage of] to get water. And that’s the biggest fear for people like us.” Depending on the outcome of adjudication, and the possible changes to water rights, some stakeholders see not only material loss of their rights, but significant shifts in the social arrangement, provoking feelings of powerlessness in the face of an uncertain adjudication process that individual users may perceive as stacked against them.

While these fears were not uncommon, at least one participant indicated that this fear was misplaced: “Some people do kind of freak out about [water rights] because of the fear of the government, um, you know, taking away something from them. There’s always the rumor going around depending on the argument you want to make that, you know, SRP is going to be able to put a meter on your well and somebody will charge you, whether it’s SRP or whoever.” As this participant went on to say subsequently, however, “there’s people out there selling fear,” and these fears are not always necessarily based in the material reality of water rights and water use in the Verde Valley.

While participants routinely described material and social factors as the source of their fear, few participants expressed fear on their own behalf. Most expressed fears that others will lose their water rights; stakeholders generally said they believe their personal stake to be secure. These fears, then, are ultimately an expression of concern about broader sociopolitical changes. In particular, stakeholders fear the movement away from rural livelihoods, namely, farming and ranching, toward a community built around periurban residences.

#### *c. Anger: An absence of emotion to galvanize political action*

Overall, very little anger was expressed by Verde Valley farmers and community members. We might have expected that speaking to “legacy” families who have been connected to this place for generations would produce more expressions of anger about the future of their own farms. Instead, such emotional expressions were more focused on neighbors. In meetings, participants expressed dismay about the loss of

farmland to development as older farmers retire and few in the next generation choose to continue to farm.

Scholars have suggested that anger can serve a crucial function in motivating people to make change and galvanize political action (Holmes 2004; Henderson 2008; Bryant and Garnham 2014; Reese and Jacob 2015; Luxon 2016). The absence of anger in this particular situation thus raises several further questions: Is the adjudication process well established enough that stakeholders trust the process and assume it does not need to change? Are stakeholders satisfied with the potential outcomes? The lack of anger suggests a possible lack of motivating concern or the presence of resignation about the outcomes of the adjudication process.

#### *d. Worried and unworried: Worry as a marker of water savvy in the Verde Valley*

Expressions of worry focused on both social and material factors. Physical water availability is already shaping social and political change in the Verde Valley; this has implications for the future of farming in the region. Additionally, participants noted a problematic *lack* of worry expressed by some Verde Valley residents. While the respondents themselves were aware of physical water scarcity in the Verde Valley, they worried that others were not invested in water conservation and the adjudication process.

One source of worry for participants was the conflict between development and water conservation in their area. Participants observed that some Verde Valley residents express too little worry over water and its future. One participant, for example, described the attitude of a real estate developer working in a nearby county: “We want development. We don’t want any of that changes stuff. It’s only water, don’t worry about it.” While the stakeholder expressed incredulity at the developer’s attitude, they were clearly aware that others in the area were similarly unworried about the increased demand for water that would accompany additional development. Another participant expressed a similar concern about people who are new to the Verde Valley: “Depending on who you talk to, they’ll—they’ll say, ‘Oh, we’ve got plenty of water. We’ve got the Verde River. You don’t have to worry about it.’” These participants often attributed *unworried* feelings about water security and water rights to those who are newer to the area: those who have not necessarily lived and breathed the doctrine of prior appropriation and who have not yet reckoned with the idea of water scarcity in a desert landscape.

When it comes to describing how they and others *do* worry, respondents describe the material and social drivers, which are similar to those expressed in the context of fear. As this participant describes, “He’s [acquaintance] worried about being monitored, or his water being taken.” There is a general sense that stakeholders in the Verde Valley worry about not having enough water, either because of the adjudication process, or because of other factors, including pumping water out of aquifers and changing river flow patterns. When it comes to the adjudication process, respondents in stakeholder meetings often described worry for others who postdate SRP’s

claim to Verde River water but felt little worry for their own rights that predate SRP's claim. Prior appropriation and water right dates were therefore a particular material reason that some respondents were unworried.

For other respondents, even growth within the agricultural sector can be worrying due to concerns about aquifers and water availability: "You start promoting lots of agriculture, uh, you impact, you potentially impact the river if you start pumping like crazy. And where we're at now, I worry about it." While urban development and population growth in Phoenix is a significant concern for many of the stakeholders in the Verde Valley, this participant points to changes in the Verde Valley itself as worrisome. Without all parties in the area being equally aware of and worried about water issues, there are significant concerns around water rights and the longevity of this resource. The Verde Valley is a transitional, historical agricultural area; yet, there is ongoing pride in the occupation of farming. For those involved in agriculture in the region, there are worries about shifting material (i.e., water availability) and social (i.e., adjudication and newcomers to the region who lack knowledge) factors that cause this particular manifestation of environmental distress.

*e. "I only hope . . .": Hope as an expression of pessimism*

Participants often used hope to express negative (and, occasionally, positive) feelings about water. While typically a positive emotion, hope was often used to convey concern, cynicism, and skepticism. Respondents used "hope" to express concerns about changes to material and social factors when it comes to water and agriculture in the Verde Valley.

Some comments about "hope" expressed cynicism about future water management arrangements and concerns about potential conflicts. When asked about what could be done to address water conflicts, for example, one stakeholder said, "I only hope I don't have to live to see the anarchy that ensues. I, I know that sounds pessimistic, but I am just scared to death of what . . . In other words, I've got assets up here, okay, I've got that piece of property . . . how do you protect your assets?" This stakeholder expresses helplessness and fear of change, including political change and the encroachment of urban areas, and the demands that might place on rural lands.

Hope was also used to express skepticism about other stakeholders' knowledge of water best practices and uncertainty about water futures given local growth and demands from the Phoenix area. One participant, for instance, expressed that they see few changes toward conservation, even as they hope for them: "And this has gone on for decades. And I, you know, as an environmentalist for the last 50 years, I take real exception to that. And uh, uh, because of the power that they're able to maintain, I don't see that changing in the near term, but I hope it will." Participants also used hope to express concerns about new residents' lack of awareness, as well as concerns that some community members believe urban centers benefit from water savings more than local users. Where hope is generally expected to indicate optimism, Verde Valley participants more often expressed a negative, cynical take on the future, even as they hope for

something different. These expressions particularly focus on the ways in which social arrangements are shifting alongside material concerns of water access in the Verde Valley.

A few participants expressed genuine hope. One hoped for adjudication to prevent junior water users from expanding their use. Another hoped for recognition of historic water uses. In general, however, hope was generally used in contexts of pessimism and existential fear about social and political changes.

## 5. Reflections on emotional geographies of water in the Verde Valley

Drawing on analysis of individual and group conversations about water, climate, and agriculture, we find that farmers and other rural stakeholders' emotions are overwhelmingly negative. Even stakeholders' discussions of hope are overwhelmingly pessimistic. These negative emotions largely center on the *social and material outcomes of environmental change*, rather than concerns about the environment itself. Thus, our work signals a possible need to shift from focusing on sadness over the land, water, or environment to a focus that encompasses distress over changes to human-environment interactions more broadly. This is particularly true given previous research (Wutich et al. 2020a) that shows that material, social, and environmental factors often co-occur to produce or exacerbate environmental distress.

Two key themes emerged from the contextual analysis of our primary emotion terms: 1) the future of rural communities and livelihoods (i.e., social factors), and 2) adjudication and water rights (material and environmental factors). Taken in total, participants' emotional responses point to a diverse group invested in caring for the Verde Valley's water future, but face collective uncertainty—and related sadness, fear, and hopelessness—about the security of their livelihoods and the future of their rural community, driven by concerns about water availability and access. These responses illustrate emotional distress among an agricultural community experiencing rapid development and pressures from urban areas. Development presents a concern for many participants. Many of our respondents noted that newcomers to the community do not worry about water scarcity; while the adjudication process represents one threat to water rights for local stakeholders, the lack of awareness and corresponding worry from newcomers presents another important, perceived threat. While some participants indicated that the adjudication process might lead to more long-term certainty about their water rights and allotment, others are wary of government interventions and their negative impacts.

The emotional geography of the Verde Valley is, for water stakeholders, imbued with risk; stakeholders have much to lose in terms of their future livelihoods. Prior research has demonstrated that self-employed farming is a precarious lifestyle that is vulnerable to environmental change. Mental health issues related to this precarity and vulnerability—including elevated suicide risk—have been documented in farming communities internationally, and particularly among farmers in Australia and India (Alston 2012; Bryant and Garnham 2014; den Besten et al. 2016; Hanigan et al. 2012;



Sartore et al. 2008). Here, rather than focusing on the psychological dimensions of environmental distress, we focus on emotional geographies. We find that distress around environmental change is more focused on feared economic, political, and cultural shifts than sadness over the land itself. Like initial research on solastalgia (Albrecht et al. 2007), emotional geographies of the Verde Valley are connected to the loss of status as land custodians.

Farmers and other agricultural stakeholders were willing to articulate emotional geographies of environmental change in their region; indeed, discussions of concern and worry for what the future looks like are not uncommon. However, even where distress over environmental change is high among such politically conservative groups, the concerns expressed differ starkly from conventional climate change concerns about global warming, habitat loss, and species extinction (du Bray et al. 2017; White et al. 2010). In our study, environmental distress was tied to the immediate ability of Verde Valley residents to continue their rural livelihoods and lifeways. Threats to water rights posed by the adjudication process, as well as the sociopolitical upheavals expected as a result of environmental change, were particularly distressing. Concerns expressed by white farmers that the Yavapai–Apache Nation would sell water rights also indicates anxiety over loss of power, suggesting the perceived precariousness of white settlers' claims on the landscape. In the Southwest, settlers' distress and solastalgia can serve as a frame that erases the critical legacies of water use and reliance among Indigenous communities (Chief et al. 2016; Cozzetto et al. 2013). Given that farmer/producer identity is typically associated with fierce self-reliance and still tends to be a masculinized profession (Berry et al. 2011; Hull et al. 2017), it is possible that white, male producers in the Verde Valley would suppress emotion in response to the challenges they face (Fantini-Hauwel et al. 2015; Galasinski 2004; Levant 2011). While expressing their concern, many of these participants talk about their concerns for others, rather than their personal concerns for themselves; this may be indicative of discomfort in expressing one's own emotions and, concomitantly or conversely, a genuine expression of meaningful social connection to others in their community.

## 6. Conclusions

Farming (and other) communities all over the world report distress over the threat and experience of environmental change. The literature suggests that distress, anxiety, and even suicide risk is a potentially serious concern, so the stakes can be very high indeed. In addition to the psychological dimensions of environmental distress, the emotional geographies approach offers the opportunity to understand the social, material, and environmental factors that lead to emotional distress in communities vulnerable to future water scarcity. This paper demonstrates the effectiveness of an emotional geography approach to capture the more subtle expressions of distress and experiential dimensions of human–environment relationships.

Our research in the Verde Valley shows that agricultural stakeholders in this community are experiencing emotional distress related to environmental change; specifically, shifts in social and sociopolitical arrangements, material concerns, and evolving

social dynamics. These emotional expressions were not only linked to one's own self, family, or farm; respondents regularly expressed worry and sadness for others in the community. Concern for others is woven into sociopolitical values of the region; this adds a layer of complexity for wider conversations about, and efforts to improve, climate mitigation. Community connectedness and shared sense of threat or loss can provide support, perhaps mitigating against the psychological dimensions of environmental distress (Alston 2012; Bryant and Garnham 2014; den Besten et al. 2016; Sartore et al. 2008). While this shared sense of community may explain the absence of anger, a shared lack of alternatives to addressing water scarcity may also be contributing to paralysis, rather than action (Holmes 2004; Henderson 2008; Norgaard 2011; Bryant and Garnham 2014).

While this study cannot be taken as representative of the experiences or emotional distress of every person in the Verde Valley given the focus on agricultural stakeholders, it nevertheless offers insight into the overlap between emotional geography and professional identity and the importance of understanding this overlap in the context of environmental change. Although agricultural producers in the Verde Valley and elsewhere are notably at risk from the effects of climate and other environmental change, many people in this profession, particularly in the United States, remain skeptical of climate change (Chatrchyan et al. 2017; Doll et al. 2017). Nevertheless, as they are in positions (as long-term farmers) to watch environmental change happen on emotionally significant landscapes, they describe worry, fear, and sadness—"feeling blue"—about the changes that will occur. They express these concerns in the context of social and material change, rather than environmental change, as a loss of identity and meaning. This provides a fundamental entry point for wider conversations around climate change and support for threatened communities, which can be reframed around identity (e.g., "loss of family traditions").

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*Data availability statement.* The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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