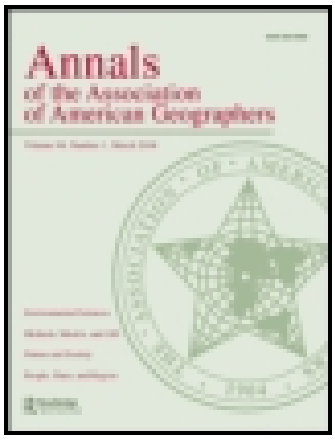

Annals of the Association of American Geographers
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/raag20

Knowing Climate Change, Embodying Climate Praxis: Experiential Knowledge in Southern Appalachia

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Published online: 28 Jan 2015.

Knowing Climate Change, Embodying Climate Praxis: Experiential Knowledge in Southern Appalachia

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Whether used to support or impede action, scientific knowledge is now, more than ever, the primary framework for political discourse on climate change. As a consequence, science has become a hegemonic way of knowing climate change by mainstream climate politics, which not only limits the actors and actions deemed legitimate in climate politics but also silences vulnerable communities and reinforces historical patterns of cultural and political marginalization. To combat this "post-political" condition, we seek to democratize climate knowledge and imagine the possibilities of climate praxis through an engagement with Gramscian political ecology and feminist science studies. This framework emphasizes how antihierarchical and experiential forms of knowledge can work to destabilize technocratic modes of governing. We illustrate the potential of our approach through ethnographic research with people in southern Appalachia whose knowledge of climate change is based in the perceptible effects of weather, landscape change due to exurbanization, and the potential impacts of new migrants they call "climate refugees." Valuing this knowledge builds more diverse communities of action, resists the extraction of climate change from its complex society–nature entanglements, and reveals the intimate connections between climate justice and distinct cultural lifeways. We argue that only by opening up these new forms of climate praxis, which allow people to take action using the knowledge they already have, can more just socioecological transformations be brought into being. *Key Words: climate governance, democratization, politics of knowledge, praxis.*

科学知识在今日，无论是用来支持或阻碍行动，皆较过往更作为气候变迁政治论述的首要架构。因此，科学成为主流气候政治用来理解气候变迁的霸权方式，而这不仅限制了在气候政治中被认可的行动者与行动，亦同时使得脆弱的社群维持沉默，并强化了文化与政治边缘化的历史模式。为了对抗此般"后政治"境况，我们透过涉入葛兰西主义政治生态学与女性主义科学研究，寻求民主化气候知识，并想像气候实践的可能性。此一框架，强调反阶层与经验性的知识形式，如何可能颠覆技术专家的治理模式。我们对阿帕拉契南部的人们进行民族志研究，以此描绘上述取径的潜能；该地人们的气候变迁知识，是根据可感知的天气效应、由超城市化所导致的地景改变，以及其所称之为"气候难民"的新移民所带来的潜在冲击。重视这种知识，可建构更为多元的行动社群、抵抗将气候变迁抽离自其复杂的社会—自然之交错，并揭露气候正义与特殊文化生活方式之间的亲密连结。我们主张，唯有透过开启此般让人们得以运用自身已拥有的知识进行行动的崭新气候实践形式，更多的公义社会生态变迁才能应运而生。 *关键词： 气候治理，民主化，知识的政治，实践。*

Bien que se utilice para apoyar la acción o para impedirla, más que nunca el conocimiento científico es ahora el marco primario para el discurso político sobre cambio climático. En consecuencia, la ciencia se ha convertido en una vía hegemónica para conocer el cambio climático a través de la corriente principal de la política climática, que no solo limita a los actores y acciones consideradas legítimas en política climática sino que también silencia comunidades vulnerables y refuerza patrones históricos de marginamiento cultural y político. Para combatir esta condición "pospolítica," buscamos democratizar el conocimiento climático e imaginamos las posibilidades de la práctica climática haciendo un compromiso con la ecología política gramsciana y con los estudios de ciencia feminista. Tal marco enfatiza la manera como pueden operar las formas de conocimiento antijerárquicas y experienciales para desestabilizar los modos tecnocráticos de gobernar. Ilustramos el potencial de tal enfoque por medio de investigación etnográfica con pobladores de los Apalaches meridionales, cuyo conocimiento del cambio climático se basa en los efectos percibidos del tiempo atmosférico, cambios del paisaje ocasionados por la exurbanización y los impactos potenciales de nuevos migrantes a los que ellos denominan "refugiados climáticos." Dándole valor a este conocimiento se construyen comunidades activas más diversas, se resiste la extracción del cambio climático desde su complejo entrelazamiento sociedad–naturaleza, y se revelan las íntimas conexiones entre la justicia climática y los distintos estilos culturales de vida. Sostenemos que solo abriendo estas nuevas formas de praxis climática, que le permiten a la gente actuar con el conocimiento que ya tienen, se pueden producir transformaciones socioecológicas más justas. *Palabras clave: administración climática, democratización, políticas de conocimiento, praxis.*

Annals of the Association of American Geographers, 105(2) 2015, pp. 1–10
Initial submission, November 2013; revised submission, May 2014; final acceptance, July 2014
Published by Taylor & Francis, LLC.

On 3 July 2012, North Carolina lawmakers approved House Bill 819 (HB 819), prohibiting the state's Department of Environment and Natural Resources from projecting sea level rise until 2016, thereby stalling regulatory action. Democrats attacked the bill and then-Governor Beverly Perdue declined to sign it, stating, "North Carolina should not ignore science when making public policy" (Gannon 2012). The media characterized the event as yet another antiscience tactic by climate skeptics (Glass and Pilkey 2013), and editorial pages erupted with letters written by or quoting scientific experts, explaining the physical processes that could produce up to three feet of sea level rise on North Carolina's coast by 2100 (Soucheray 2014). Supporters of HB 819 provided their own scientific interpretation, using historical analyses to predict sea level rise of only 8 inches by 2100 (Zucchino 2012), and Republican Senator David Rouzer "argued that House Bill 819 doesn't ignore the science, but rather requires that the state look at all available studies and data on the issue when it develops policies regarding sea-rise" (Gannon 2012).

Calls by those working against climate change policy to consider "all available studies" illustrate the extent to which climate politics has, like most environmental politics, become a politics of "expertise and counter-expertise" (Eden 1996, 193) and, as such, has become largely depoliticized. As Demeritt (2006, 468) argues,

> The case of climate change shows how a technically framed and expert-led politics of sound science can be debilitating. . . . The instrumental role of science in legitimating policy invites interest groups to contest political decisions by questioning science (and scientists), rather than debating the reasons for the policy itself.

This ethos means that much of mainstream climate politics seeks to influence decision making through science education and communication, based on the presumption that more relevant or "usable" science will change attitudes and behaviors (Moser 2010; McNie 2007). Swyngedouw (2013) argues that this is symptomatic of a wider "post-political" condition, which is characterized by a systematic failure to engage in debate about the fundamental moral, ethical, and economic foundations of climate change (see also Ranciere 2004; Mouffe 2005). Democracy, disagreement, direct action, and dissent have been replaced by a mode of politics where "scientific expertise [is] the foundation and guarantee for properly constituted politics/policies" (Swyngedouw 2010, 217). This mode of technocratic governing is "science-driven and expert-oriented" in its pursuit of technological (over social) solutions to climate change (Bäckstrand 2004, 696), and it becomes exclusionary through its dismissal of alternative ways of knowing.

We argue that mainstream attempts to respond to climate change are fundamentally limited because they do not directly confront the hegemonic conditions under which science dominates climate change politics. We are imagining a notion of "hegemony" here to be closely aligned with Gramsci (1971) but also Williams (1977) and Hall (1986). Swyngedouw (2010, 228–29) argues that a truly political politics "requires foregrounding and naming different socio-environmental futures and recognizing conflict, difference and struggle over the naming and trajectories of these futures." Climate politics urgently needs to be repoliticized to include more democratic debate and argument based in a wider discussion of values, norms, and experiences. This requires, among other things, a discussion of the politics of knowledge underpinning our current political condition.

To accomplish this, we use Gramscian political ecology and feminist science studies to show how nonhierarchical knowledge production can foster a more inclusive and egalitarian climate praxis. Empirically, we draw on our research in southwestern North Carolina, a region at the edge of politically conservative southern Appalachia, to solicit a more diverse set of epistemologies on climate change that are gained through experiential, placed-based, and nonscientific knowledge. Valuing people's everyday experiences of climate change and diverse ways of knowing climate (even when they might be scientifically imprecise) provides the possibility for people and communities to act on climate change through the knowledge and experience they already have. We show how in southern Appalachia, nonscientific ways of knowing include intimate experiences and family histories of changing weather, concerns for landscape changes associated with rapid exurban development, and threats to culturally valued, historical ways of life by an influx of climate migrants. Recognizing experiential ways of knowing has three advantages for climate praxis: It enables and legitimates more diverse communities of action, it resists the extraction of climate change from its complex socionatural entanglements that have place-based meaning, and it provides culturally specific understandings of what is at stake with climate justice.

Repoliticization Through Antihierarchical Knowledge Production

As scientific practice has become the hegemonic way of knowing climate, the processes through which knowledge hierarchies are produced deserve careful examination (Ekers, Loftus, and Mann 2009). This is especially the case because the individuals and communities most often marginalized through expert-only politics are often more likely to experience negative consequences from socioecological changes (Smith 2006). Confronting scientific hegemony is, therefore, a problem of both theory (understanding the causes and ramifications of hegemony) and practice (providing a pathway for those most vulnerable to participate). For these reasons, we claim that climate praxis, rooted in identifying and valuing alternative epistemologies, can counter post-political dynamics and help us imagine more just socioecological transformations. By contrast, socioecological transformations that retrench expert authority have the potential to reproduce the status quo.

Scientific and technical expertise construct knowledge about climate change as a globally scaled, mathematically modeled, carbon-centric problem (Demeritt 2001). Because science understands climate through earth system models, physical proxies, and technological observations, "we have universalized the idea of climate change, detached it from its cultural setting" (Hulme 2008, 9). This reification of technoscientific expertise often marginalizes nonscientific ways of knowing climate change that are meaningful to nonexperts (Geoghegan and Leyson 2012; Leyshon and Geoghegan 2012). The result is, according to Hulme (2008, 5), a "politics that is seemingly powerful, yet fundamentally fragile" because it depends on expanding the hegemony of positivist science and Western (neo)liberalism. Even where scientists have created more place-based, socially relevant information, science often provides the standard by which knowledge is judged valuable or legitimate.

The normatively, theoretically, and politically problematic hegemony of climate science can be countered, in part, through Gramscian political ecology, which points scholars toward praxis-oriented research "that would both make sense of the world and *help change* the situation under the microscope" (Ekers, Loftus, and Mann 2009, 288; see also Mann 2009). This involves, first, adopting Gramsci's approach to science, which "situates scientific practices on the same plane as all other acts involving knowledge production" (Wainwright and Mercer 2009, 247), such that "neither nature (the so-called real world) nor science (qua objective view of Nature) may be treated as unquestionable sources of truth" (352). Second, Gramscian political ecology aims for collective analysis of socionatural transformation and imaginations through counterhegemonic projects that respect "the struggles and conceptions of . . . 'subalterns'" (Loftus 2012, xxiv) and support ways of knowing that enable alternative forms of consciousness and action. Here, the Gramscian distinction between traditional intellectuals, whose knowledge is grounded in formal expertise and supportive of elite interests, and organic intellectuals, whose knowledge is grounded in the everyday experiences and interests of working-class life, is particularly useful (Gramsci 1971; see also Hall 1992). In the case of climate, organic intellectuals could articulate the knowledge of ordinary people and subalterns in place-based, culturally attuned ways that spark more inclusive and just climate actions, thus replacing traditional *intellegentsia* with a more egalitarian politics of knowledge.

Identifying climate science as a hegemonic way of knowing is not a critique of the practice of science itself, or of scientists as knowledge producers. The practice of climate science is diverse; for example, many scientists are providing place-based science at smaller scales and others are working to communicate science in accessible ways. We are concerned, however, that the way in which scientific thought comes to dominate political discourse, and the corresponding community of technical experts that is called into importance, provides a narrow pathway of understanding and action that is not sufficient to produce change because of its exclusionary politics. Marginalization is a complex process, furthermore, and we are concerned with one specific aspect of that process here—the ways in which mainstream climate politics marginalizes nonscientific ways of knowing that are often held by nonelites.

Gramscian attention to organic intellectuals is bolstered by feminist science studies, which opens up what we "honor as knowledge" (Harding 1986, 24) by recognizing that all knowledge is culturally and geographically situated (Haraway 1988; Merrifield 1995; Rose 1997; Nightingale 2003). Applying this to climate politics, Israel and Sachs (2013) suggest that "rethinking (but certainly not *dismissing*) the climate science that grounds concerns about global climate creates space for new ways of thinking about climate change and for new forms of activism" (34, emphasis in the original). This does not mean, however, that all

claims about climate change are equally true. Instead, feminists urge us to take seriously the experiential, embodied, and even contradictory ways that people understand the world and to ask "whose interests are served by the knowledge projects that are overlooked or ignored" (Tuana 2013, 18). Social scientists must engage, therefore, in new forms of praxis-oriented research that consider situated knowledge through a full accounting of the epistemologies and experiences through which people come to know climate change. In other words, it is necessary "to reclaim climate from the natural sciences and to treat it unambiguously as a manifestation of both Nature and Culture, to assert that the idea of climate can only be understood when its physical dimensions are allowed to be interpreted by their cultural meanings" (Hulme 2008, 6).

Brace and Geoghegan (2011) show that place-based knowledge of climate change "enables us to ask how a variety of publics make sense of climate change, as witnessed and responded to in ordinary, everyday-life scenarios, such as walking, gardening, fishing, sailing, and working on land" (289). Although these specific forms of knowledge are central, this also requires a broader political engagement with climate praxis as a method of challenging expert-oriented hierarchies of knowledge. To be clear, challenging knowledge hierarchies does not value experiential or place-based knowledge more than scientific knowledge. Instead, it requires that we be attuned to the ways that scientific and nonscientific ways of knowing develop political significance through their interactions. Ultimately, we must work harder to understand "how lay knowledges might ignore, resist or remain indifferent to science but still motivate people to act on climate change" (Brace and Geoghegan 2011, 296). To illustrate this, we turn to our engagement with experiential knowledge in southwestern North Carolina and the politics this knowledge enables.

Climate Change Knowledge in Southern Appalachia

Our research is part of the Coweeta Long Term Ecological Research (LTER) Program, a research network studying ecological processes in southern Appalachian forests. Southern Appalachia, and southwest North Carolina in particular, is experiencing dramatic changes due to exurbanization, driven by second home owners and retirees from Florida and Georgia (Kirk, Bolstad, and Manson 2011; S. Gustafson et al. 2014). Southern Appalachia is a valuable site for research on climate praxis and knowledge politics because it hosts a confluence of new residents from other regions, an upsurge in libertarian politics, and skepticism of formal government and scientific expertise informed by the historical political and economic marginalization of the region (Fisher and Smith 2012; Newfont 2012). On a more local level in southwestern North Carolina, uneven development is exemplified by the lower income levels of permanent residents of the region, when compared with higher income seasonal residents who are responsible for the newest and most ecologically disruptive forms of development (Pollard 2003; J. S. Gustafson 2014).

The Coweeta Listening Project (CLP) exists within the Coweeta LTER as an action-research collective that seeks to listen to residents of Southern Appalachia, integrate social and ecological science through the coproduction and democratization of knowledge, and build useful and meaningful connections between scientists and the public. The data for this article are based on CLP research with two informal environmental groups in southwestern North Carolina, conducted from March to October 2013, and broader ethnographic work in the region since 2010. The first group formed when we coorganized a series of four community dialogues about environmental stewardship and climate change at a historic general store. Each of the conversations included seven to ten people, mostly white, ranging in age from their early forties to late seventies, spanning lower to upper middle-class incomes. Some had lived in the region their entire lives, others moved to the area as adults (primarily from the southeastern United States, but also from Peru), and others were second home owners. The second group was initiated when a local artist assembled her environmentalist contacts to brainstorm strategies for climate resilience and adaptation in the region. The participants in these meetings were also mostly white, although slightly younger in age (ranging from their twenties to early fifties), low to middle income, with varied lengths of residency in the region. We acted as participant-observers during the first two meetings of this group, helped facilitate a third meeting to develop a mission and action plan, cosponsored two other events about local and scientific perspectives on weather and climate, and conducted interviews with some group members. Drawing on southern Appalachia's long history of popular education (Freire 1970; Horton 2003), we organized each meeting around a participatory

research activity, such as discussing "What environmental changes have you seen in the region?" and then mapping their causal connections or asking "What can we do to address climate change?" and developing an action plan. Although "climate change" denotes a complex, hybrid, and varied set of social and ecological processes operating at a variety of scales, we chose to use the term in our research because it is a widely recognizable discourse about the existence of those changes. All conversations and interviews were recorded, transcribed, and coded for instances of climate-related knowledge, weather and climate experiences, and community or government responses to climate change.

Here, we highlight three features of experiential ways of knowing climate change that are particularly salient for addressing science hegemony and climate praxis provided by our research participants. We do not want to suggest that these narratives represent all southern Appalachians or that the people we spoke with are not aware of climate science. What distinguishes these forms of knowledge, however, is that they challenge the globally scaled, carbon-centered discourses of climate change so often referred to by scientists, politicians, and activists and instead focus on embodied experiences and place-based accounts of socionatural change.

Experiences and Memories of Weather Through the Years

Many people we talked with concluded that the climate is changing based on their own long-term observations and stories passed down from ancestors, drawn from embodied, emplaced, and emotionally resonant experiences of weather through the years. Extreme weather events like floods, blizzards, and tropical storms leave particularly strong impressions, but people also perceive, remember, and even record subtle trends through a range of proxies: Clothes worn on the first days of school indicate changes in summer and fall weather. The depth at which one buries water pipes, the (in)ability to bury dead bodies, the fate of overwintering insects, and the extent to which snow remains on the ground all indicate the depth of hard frosts. School days missed, snowmen built, and other measures of the quantity and quality of snow suggest changes in winter moisture and temperature. Observations about the emergence of spring wildflowers, the patterns of migratory birds, the invasion of foreign plants and animals, and the behavior of salamanders signal environmental change.

Consider, for example, a weather memory shared by a recently retired woman, Ella, whose childhood fascination with weather led her to record old-timers' weather stories and to volunteer for more than twenty years as a certified weather observer for the National Oceanic and Atmospheric Administration.

> I've heard my mom, my dad, aunts and uncles talk about . . . snow storms. It was very rare in the winter that there were not big snowstorms, and there would be three feet and over. They said that there would be drifts that were higher than a six plus foot man. We lived out on Brush Creek. . . . The neighborhood boys congregated at our home on . . . Sundays. . . . Well we had a big snow, and how those boys got to our house that Sunday I don't know, because that snow was every bit two, two and a half feet. Well, they decided they were gonna build me a snowman . . . and back then snow would pack . . . you could actually roll it and [build] your snowman. . . . Well, it got to where that snowball for the base was higher than them . . . and it got momentum . . . and that snowball was rollin' away from them. . . . But those boys was so determined that I was gonna have a snowman that they all got down there and they rolled that ball of snow back up that bank into our yard and I, that was the prettiest snowman I've ever seen in my life. I've never seen one like that again. But that's just one of the many stories that I know and that I've heard family tell about the snow and everything.

Ella's story does more than claim that snowfall has decreased from the days of her childhood. What is so important is how she tells her story. Like many multigenerational residents of the region, Ella fills her story with extensive detail about the local environment and people that she considers important for making sense of the climate changes she has seen. She cannot tell the story of snow without embedding it within a dense web of genealogical and historical connections, emotionally rich accounts of community, and the daily rhythms and changing nature of rural life. For many we have talked to, weather memories and other environmental narratives are also memories of family, of connectedness to land and people, and of "where we come from" and "who we are." These place-based perceptions, experiences, and memories of weather permit people's acceptance that climate is changing. Many residents of southern Appalachia understand, and ultimately respond to, climate change through embodied experiences of dwelling in local places—places that are simultaneously social and natural, that are culturally and

historically meaningful, and that are seen as embedded in interconnected, regional socioecological systems.

Exurban Development and Landscape Change as Drivers of Climate Change

During an activity to map the causes of climate change, participants hardly mentioned carbon emissions and climate models. Instead, personal experiences of exurbanization were identified as key links to climate change, and altered mountain landscapes served as disturbing, visual evidence that climate change is happening. Participants discussed a variety of aspects of local development—road building, construction of the first Wal-Mart, loss of forested lands, new residential subdivisions built on mountainsides rather than valley bottoms—as contributors to climate change. The following exchange captures the ways that exurban development, spoken of here as the spread of "suburbia," symbolizes climate and landscape change:

> *Jerry:* I think suburbia is leading to climate change as well because you have, you know, man has gone from living in caves to moving into cities and now moving out of cities into suburbia and then that destroys the natural landscape when you do that. And that leads to development and so on.
>
> *Anna:* Suburbia people want to bring some of the city with them and that's the deal . . .
>
> *Richard:* They want the nice little yard, so on and so forth.
>
> *Anna:* They get the suburbia out there, but say, "Man, it's just too far to drive all the way into the city to go to Wal-Mart, we gotta have one out here and now."

Whereas this group continued discussing indirect impacts of development, such as land cover change and altered hydrologic regimes, Ella made the causal connection between development and climate change even more directly in a different meeting:

> [The mountains were] a fortress. And whatever weather hit those mountains . . . had to be strong enough to make it over. . . . When I went to school here in the 50s and 60s we'd be doin' good if we got four days of school in in January. . . . But then, in the 70s, we had . . . Highway 74. . . . You got Interstate 40, and look at the gorge that it cut in the mountains of Haywood County. And then over near Asheville you got I-26, and it cut a big gorge up through Madison County. . . . I believe that when those routes were cut in these mountains it broke down our solid fortress of weather . . . and that's when I started seein' our weather and our climate changing. It affected temperatures, it affected precipitation, it affected wind flow, and everything. . . . Construction and development . . . I think that's the big thing as far as our climate and weather.

These narratives show that residents are keenly aware of their region's connections to the outside, yet they emphasize the regional landscape changes and development processes that contribute to climate change and its impacts far more than distant and global processes. Disentangling climate change from social processes of exurbanization is not possible (or productive) for these individuals.

From Weather Migrants to "Climate Refugees": Cultural Impacts of Climate Change

Many residents we spoke with made predictions of climate impacts by linking environmental knowledge with knowledge of historical demographic and economic changes. From the international trade of deerskins, to the rise of mining, forestry, and agriculture, and now their replacement by the service economy, residents of the region have learned that economic and demographic shifts reshape local landscapes, often to the benefit of wealthy outsiders. The most significant changes today arise from what has been called "amenity migrants" (Gosnell and Abrams 2011), whose mark on the landscape has made development and its ecological impacts a well-known and controversial issue.

One of the most prominent conversations about the interactions between exurbanization and climate change came during highly contested public debates about how steep-slope development—a relatively new form of development driven primarily by amenity migrants—is made riskier by the region's heavy rainfall events. Perhaps most interesting, however, is how historical knowledge of regional connections and exurbanization have raised predictions that weather-based amenity migrants will increasingly transition into "climate refugees"—a term that originated from the people we spoke to, not our own research team. Keenly aware of the interactions between exurbanization and climate change, some residents are concerned that environmental hazards like heat waves, sea level rise, and deteriorating water quality and quantity will drive people from coastal regions toward southern Appalachia. Mark, a

participant in our climate adaptation meetings, identified this as one of his major concerns when he said:

> Um, climate refugees. People who will move to the mountains when sea level rises more and severe weather patterns are hitting the coast, and I'm concerned about the carrying capacity of the mountains. How much more development can we handle without losing our water table and, uh, taxing the water?

Maria also said extreme weather and water shortages are likely to drive more people to the region's mountains. She knows several people who came to southwestern North Carolina after Hurricane Katrina and have permanently relocated to the region. She and others worry that "climate refugees" will be a major element of future demographic and economic changes that negatively impact "old-timers" in the region through cultural disruptions. As another gentleman said, "Climate refugees from the coast is going to be an important thing. You know, head to the hills, run to the mountains."

Climate Praxis Through Engagements with Nonscientific Ways of Knowing

To illustrate how nonscientific knowledge can foster climate praxis, we turn to Adam, a local resident who is the director of a regional environmental organization. When we asked Adam whether the experiential knowledge of residents could generate effective climate action during an interview with him, he was skeptical. Instead, he emphasized the need for more education about the scientific causes of climate change to correct misunderstandings by people like Ella who blame road cuts in the mountainside over atmospheric concentrations of carbon dioxide. Although Adam's work is consistent with the dominant mode of politics, his approach overlooks how situated, embodied, and historical experiential knowledge are precisely what make climate an issue of concern to many people. When mainstream, expert-driven politics suppresses everyday climate knowledge in this way, it becomes oppressive, diminishing people's power to make decisions and pursue their own actions. This is especially troubling when the communities whose knowledge is marginalized are often the most vulnerable to climate change.

So, how can we imagine climate praxis becoming embodied through experiential knowledge? Consider, first, the importance of weather memories to people in the region. Although climate scientists are careful not to conflate short-term weather variability with long-term climate change, an emphasis on weather might be exactly what is needed. Discussing the ways that weather has changed can create a robust community of concern among farmers, gardeners, and other outdoor enthusiasts with intimate and everyday experiences of weather (Geoghegan and Leyson 2012). In fact, people in southwestern North Carolina are assembling in groups to discuss and validate local experiences and knowledge of weather, which is galvanizing broader networks that can empower people to act. During the time of this study, this included a meeting in Macon County called "Record Rainfall, but Is It Climate Change?" hosted by a local watershed association director, which focused primarily on people's experiences of changing weather. Acknowledging the importance of weather to individuals, and being careful not to dismiss their experiential knowledge through complex scientific explanations, can help facilitate action when people are not expected to fall in line with overly scientific ways of explaining the problem.

Second, the connections between exurbanization and climate change emphasized by residents also show the complex socioecological assemblages that make climate change culturally meaningful. Politicians and activists might leverage this complex entanglement of environmental, social, and economic processes of exurbanization in ways that galvanize communities to protect their natural environmental and social heritage through controls on development. This is not an uncontroversial topic in the region; a steep-slope building ordinance has been unsuccessfully pushed in Macon County based on technical and scientific aspects of landslide hazards (J. S. Gustafson 2014). Yet, reframing the issue to consider local concern for the changing social and ecological character of the region might spur wider concern, where trying to disentangle climate change out of this rich and complex socioecological context can be counterproductive (Leyshon and Geoghegan 2012). Although not directly about climate change, confronting the issue of exurban development as one with social, cultural, and community effects that are important to people in the region could generate support for local planning efforts that emphasize sustainable and compact growth and other climate-relevant actions.

Finally, the forms of climate praxis enabled by the use of the term "climate refugee" require careful consideration. Voluntary migration to rural mountain

communities by upper class individuals certainly does not fit the conditions of refugees, but it facilitates nontraditional engagement with climate politics through a consideration of the historical class politics of the region. As privileged individuals are able to cope with climate change through voluntary migration, the most vulnerable people already living in southwestern North Carolina have little political capacity to resist the accompanying socionatural transformations. As is the case in southern Appalachia, more broadly, government intervention to mitigate the associated socioecological impacts is not historically present, exacerbating uneven development of the region and increasing social stratification. This brings the issue of climate justice into view in new and nontraditional ways—many of the most vulnerable populations in southwestern North Carolina are rural, white, and older individuals (Pollard 2003). Discussing the accelerated migration to the region that could take place under a changing climate with the receiving communities who are concerned about it negatively impacting their local culture might make the importance of climate change more evident and incite more ethical and political (not scientific) debate on the issue.

Conclusion

Socioecological transformations have never been neutral or undeliberately orchestrated; they have always been first imagined and then enacted. Our analysis draws forth the experiential, place-based knowledges of climate change held by people in southern Appalachia as an example of culturally salient epistemologies of climate change and ways to imagine more egalitarian socioecological transformation moving forward. Soliciting and valuing marginalized knowledge of silenced communities helps us transcend the narrow politics exemplified by the North Carolina legislature and the climate debate more generally. Considering "all available studies," as North Carolina legislators have requested, will never mobilize broad constituencies toward unambiguous solutions, and it will only deepen historical patterns of exclusion and marginalization reflected in hierarchies of knowledge. By contrast, our approach seeks to enhance people's power to make decisions by destabilizing the dominance of scientific knowledge only to create space for more pluralistic knowledge of the problem, its effects, and possible solutions. In this way we are working toward new forms of climate praxis.

Engaging in this cultural politics of climate change presents several new opportunities for climate praxis that move us beyond debilitating and depoliticizing debates about science and technology. This approach enables more diverse communities of action when people are not expected to fully understand or accept scientific ways of explaining the problem. Experiential manifestations of climate change are important to people, and they are especially important when they allow concerned individuals to work within their own culturally specific socionatural entanglements to produce change. This approach also demands a reallocation of efforts and resources away from science education and toward facilitating democratic debate that involves dissent and disagreement about what the problem is and what its solution might be, privileging moral and ethical considerations, not techno-scientific ones.

Perhaps most important, expert-only politics runs the risk of excluding the knowledge of individuals who do not prioritize scientific explanations, who in some cases might also be the most vulnerable. Insisting on "climate literacy" might actually be a way of working *on* these communities rather than working *with* them. Any truly revolutionary politics that has the ability to confront our post-political condition and produce egalitarian socioecological futures must grapple not only with the physical drivers of climate change but also with the dynamics of political marginalization and silencing produced by techno-scientific hegemony. Moving away from universal ways of knowing climate change, such as those provided by scientific analysis, to more differentiated and embodied ways of knowing climate change helps combat the post-political condition through an explicit engagement with marginalized framings of the problem and its solutions.

Acknowledgments

The authors would like to thank four anonymous reviewers and Bruce Braun for their helpful comments, which greatly improved this article. We would also like to thank our research participants, who generously shared their time, knowledge, and experiences with us.

Funding

This research is supported by funding from the Coweeta Long Term Ecological Research Site (National Science Foundation DEB-0823293).

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