

2 Navigating the Temporalities of Place in Climate Adaptation

Case Studies from the USA

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2.1 Introduction

Current trajectories of global climate change call for a dramatic rethinking of the ways in which human communities navigate their relationships with each other and the natural world. In lieu of global mitigation efforts, communities, governments and other resource managers around the world are consequently being forced to adapt their livelihoods, values and practices to a rapidly changing climate. As scholars increasingly recognise, responding to the impact of dramatic changes across scales, landscapes and communities requires substantial collaboration, and many have identified ‘place’ as a potentially powerful collaborative tool for aiding stakeholders in navigating the global challenge of climate adaptation (e.g. Masterson *et al.*, 2019; Chapin and Knapp, 2015; MacGillivray and Franklin, 2015; Wilbanks, 2015; Devine-Wright, 2013; Fresque-Baxter and Armitage, 2012).

At the same time, both climate change social scientists and scholars of place are calling for a deeper appreciation of the plurality of senses of place and a more robust understanding of how these pluralities create synergies as well as frictions that challenge the facilitative efficacy of place as a boundary concept (Williams, 2018; Castree *et al.*, 2014; Devine-Wright, 2013; Hulme, 2011). Reconciling this call for pluralism with the urgency of adaptive action requires a deeper engagement with how these pluralities play out in particular places. In this chapter, we aim to explore one highly overlooked dimension of this global challenge: the temporality of ‘place’ in climate change adaptation. Global climate change has disrupted both scientific and popular understandings of natural climate cycles and stationary models of environmental change. Concurrently, a substantial body of literature has sought to explore the temporal dimensions of the climate crisis (for a review, see Pahl *et al.*, 2014). However, little scholarship has explored the plural temporalities of sense of place in the context of climate change or sought to understand how diverse temporalities might challenge the utility of place as a platform for collaborative adaptation (for exceptions, see Marshall *et al.*, 2019; Devine-Wright, 2013; Lyon and Parkins, 2013).

In order to explore these dimensions of time in place-focused adaptation efforts, we draw on a series of case studies that utilise scenario-based futures methods – here

represented by the communities in the Arctic, Rocky Mountain and Appalachian regions of the USA. In them, we interrogate the temporal elements of sense of place, such as the temporalities of practice, social time, directionality, calendrical time and temporal ontologies, as well as their implications for understanding the plural forms of place-focused futuring represented by scenarios. By doing so, we also explore the challenges of implied temporalities and the unconscious ways in which particular temporalities of place come to power over others through climate adaptation planning.

2.2 Adaptation Planning, Scenarios and the Temporalities of Place

A considerable body of literature has explored the impacts and vulnerabilities of social groups and landscapes around the world to global climate change as well as potential responses through mitigation and adaptation (see IPCC, 2014). In addition to the loss of structures, livelihoods, physical health and the material environment, there has been a more recent and increasing focus on the threat that climate change poses to *place(s)* around the world and, as Tschakert *et al.* (2017, p. 1) note, how climate change-induced loss is ‘often given meaning through lived, embodied and *place*-based experience’. For example, disruptions of the people–environment relationships that constitute place can threaten the loss of a sense of ‘security-in-place’ or ontological security in ways that undermine individual mental health and community bonds (Marshall *et al.*, 2019; Agyeman *et al.*, 2009). Consequently, place is acquiring substantial attention as a potential platform for collaborative adaptation planning, given that climate change impacts across scales, landscapes and resource values. This perspective frames place as a ‘boundary object’ (also ‘device’ or ‘concept’); in other words, an idea or thing that permits collaboration or ‘coordination without consensus’ (for an introduction, see MacGillivray and Franklin, 2015).

A primary way this perspective on place has been used in climate adaptation planning is through the use of scenarios. We define these as qualitative narratives, whether visual or textual, of ‘plausible’ futures that run the gamut from science-heavy normative scenarios of singular futures (e.g. Intergovernmental Panel on Climate Change emission scenarios) to multiple, ‘out-of-the-box’ or ‘wild card’ scenarios unbounded by the rigours of risk and probability (for a review, see e.g. Bengston, 2019). Scenarios are simply a formalised and extended version of everyday anticipatory planning in which we imagine a future, create a context for that future, and develop a decision or action pathway through which to achieve some goal or avoid some consequence. Scenarios are particularly helpful when future contexts are highly uncertain (meaning less predictable) and/or highly complex (i.e. multitudes of drivers, actors, social forces, etc.). Given these attributes, scenarios are increasingly utilised at the local scale because they present a unique platform for implementing collaborative, ‘participatory’, stakeholder-driven processes that can incorporate place.

However, in a recent critique, Vervoort *et al.* (2015) argue that much of current scenario design does not rest on plural visions of the world and/or ways of being in the world (i.e. senses of place). Unpacking scenario processes, as Rickards *et al.* (2014,

p. 599) argue, exposes them as ‘non-innocent, historically specific, and performative framing acts’. In short, scenario-based adaptation planning can often reproduce a static, monolithic conception of place rather than represent and engage diverse senses of place. Moreover, the diverse temporalities in senses of place are important because time is ‘baked into’ the practice itself and as such remains largely unquestioned. Consequently, following Yusoff and Gabrys (2011, p. 518), we believe it is incumbent upon applied scholarship to critically unpack ‘the political and temporal logics that underpin current scenario trajectories and examine the descriptive crafts that produce them as spaces for imagination’.

This lacuna is critical, first because adaptation is necessarily temporal, indexing past, present and future, and second because it leaves the call to pluralism dangerously incomplete. In adaptation, time is often treated as an unvarying, fixed and universal measure of climatic, ecological and social change, as modern conceptions of time are rooted in a mechanistic, Newtonian world view. In contrast, attending to plural senses of place and time can reveal dissonant, discordant and disjunctive temporalities, thereby uncovering potential sources of disagreement, dispute and friction over adaptive futures more broadly. Foregrounding temporality in the application of place as a boundary concept, therefore, becomes critical to a robust reformulation of climate adaptation planning.

2.3 Case Studies

The data described below are derived first from three scenario-based research projects developed over a number of years as a collaboration between social scientists from the US Forest Service research programme and university researchers, including the authors. The first set of scenario projects consisted of a pilot in communities in Montana’s Big Hole Valley, Colorado’s Grand County and south-east Ohio. The authors and their collaborators developed a future-oriented climate change vulnerability assessment protocol referred to as ‘multi-scaled iterative scenario-building’ or MISB (for a full description, see Murphy *et al.*, 2016). The protocol consists of a series of in-depth one-on-one interviews, focus groups and community-wide discussions, with a central set of scenarios that are developed iteratively through rounds of interview feedback, thereby creating progressively more complex yet place-based narratives of future change. A second set of data comes from published scenario-based research conducted by an unaffiliated team of researchers from the University of Alaska in the Huslia region of the far north-west interior of the state. This project utilised scenarios to explore future vulnerabilities to health and subsistence from increased wildfire frequency and severity due to climate change.

Each case study exhibited similarities and differences in how individuals and groups perceived the unfolding future of climate change impacts and responses. In Montana, residents expressed significant concerns around the long-term viability of a ranching-based community, given the threats to water and deep uncertainty about the future actions of and relationships with federal agencies in land management. In

Colorado, participants described substantial concerns regarding cross-scale climate challenges with decision-makers and stakeholders outside of their immediate communities, particularly around water rights, as well as the impact of lost snowpack on winter tourism. In Ohio, as discussed below, climate change impacts were not perceived by participants as substantially place-altering or place-threatening, and participants' concerns were decidedly limited to local disaster management. In Alaska, the researchers noted a substantial and marked reluctance of Koyukon communities to engage with the scenario process because of the ontological status of weather and climate in the Koyukon knowledge system. Here, however, we use the results from the scenario processes to explore the ways scenarios illuminate diverse senses of place and time, and how the plurality of time in particular poses challenges or presents opportunities in fostering collaboration.

2.3.1 Working in Place

One of the primary ways in which participants rooted themselves to place was through work. As is well established by place scholars, the practice of work generates a connection to place through the material interactions inherent in the labour process (Cresswell, 2015). In rural environments such as those in our case studies, much of that work is directly connected to the surrounding landscapes, such as in ranching, agriculture or mineral extraction; but it is also connected through repeated interactions with the material world, whether through recreation or simply being in place. This tempo and rhythm of work extends out to planning, foresight and interpretations of probability (or risk) and possibility (or uncertainty). In other words, different kinds of work generate diverse senses of place, which in turn constitute diverse ways of interpreting and forging futures. Time horizons, for instance, are thresholds of memory (i.e. past) and foresight (i.e. future), and these can be different depending on the kind of change that is temporalised and, as we see here, the individual or group interpreting that change (or its potential). The initial base scenarios of climate change, which were generated by the natural science members of the study team, described conditions at a 20- to 30-year time horizon. This scale was chosen because current global scenarios tend to describe changes anywhere from 50 to 100 years ahead, beyond the future of most participants' lifetimes, and because changes within shorter timescales were too driven by weather rather than climate. In Colorado, however, we found many participants struggled to envision changes to place 20 years out, while in Montana this proved to be manageable.

Interviews with residents of Grand County, Colorado (see Wyborn *et al.*, 2015) expressed an array of livelihoods and place values, but with a strong core focused on the roles of tourism, landscape aesthetics and second or amenity homeownership in the local economy. Some participants engaged in ranching and other agricultural or natural resource livelihoods, but most were invested in the tourism industry, and a substantial number of participants owned and operated small businesses. They expressed difficulty imagining the 20- to 30-year timescale described in the scenarios and could offer little in terms of the impact on their business strategies or practices at that timescale,

favouring instead a much shorter five-year time horizon. Although they were invested in maintaining the status quo landscape aesthetic, their short-sightedness was rooted in how small businesses operate, including day-to-day challenges and short-term financial planning. Most small business owners are invested temporarily, given limited success rates, and must remain flexible in the near term to the point of exit. As one business owner stated:

I'm not thinking five years down the road. There's just too much that can happen . . . I think if you're conservative most of the time, with the way that you spend at least early on in the season, making sure that it's gonna work . . . then you start making some improvements . . . but if you're not gonna make it, you can hold back the improvement as well. (Business owner interview, 2013)

Additionally, because small business owners in this area are dependent on a more recent upsurge in tourism, most were transplants from other regions of the state and country and had not yet built up a reservoir of familiarity and memory in Grand County. This disjuncture between business time horizons and those required to adapt to long-term climate change challenged our capacities to leverage scenarios into planning.

In contrast, community members in Montana, particularly ranchers, were significantly more capable of envisioning the 20- to 30-year timescale presented in the scenarios. Partly this was due to the fact that many residents of the Big Hole Valley are long-term residents from multigenerational families, some of which arrived in the late nineteenth century. This depth of social and ecological memory exceeds an individual lifespan or even, in contrast to Colorado, a much shorter stage of a life course (e.g. retirement). The expanded temporal horizons of Big Hole residents, however, were also generated by a ranching livelihood, which is deeply entangled with long multigenerational histories rooted in place and community. The activities of ranching are not simply instrumental means to a short-term end, but rather reproduce the landscape and community, which sustains connections to both past and place (Figure 2.1). The everyday interactions with water irrigation, haying and calving are not simply the utilitarian means to an economic return; they are intimate, repeated encounters with the spaces that aggregate to form a deep temporal connection beyond one's immediate present. As such, the temporal horizons of ranching are long-term, with annual herd planning nested within longer time cycles extending out to generational change. These temporalities, in contrast to Colorado, meshed with the planning cycles needed for climate adaptation.

2.3.2 Golden Pasts, Golden Futures

Another way that temporal senses of place impacted on how participants engaged with the scenarios concerns how place-based narratives structure the flow of time, and how the narrativisation of time operates as a lens through which participants navigate and make sense of potential future climate change impacts. In other words, as participants considered the implications of the future climate change described in the scenarios,



Figure 2.1 A beaverslide hay stacker is an important marker of place identity in the Big Hole Valley. Figure credit: USDA Natural Resources Conservation Service.

they interpreted those changes and their repercussions through their own sense of the historical trajectory of each place. Research on the psychology of time in climate change has found, for instance, that conservative individuals tend to perceive futures through narrativised ‘golden pasts’ (Pahl *et al.*, 2014). These studies describe how politically conservative individuals discount future climate change because their understanding of past environments is rooted in a static perception of nature. However, in our research in Montana and Ohio we found that despite a general conservative political leaning among participants, interpretations of future changes, described below, were largely viewed through their particular sense of place as opposed to a politically motivated or media-focused one. In contrast to the psychological research, anthropological approaches to time have explored, for example, how place-based narratives of past or possible social and environmental change strongly shape interpretations of the future – demonstrating the rootedness of temporal narratives.

In Montana we found that individuals – in fact, most participants – interpreted all scenario descriptions through what some call ‘declensionist’ narratives of the past (i.e. marked by decline). Here, participants elaborated on a long history of social and environmental decline in the Big Hole, including a gradual process of depopulation brought about through economic crises and the consolidation of ranches, while environmental descriptions elaborated dramatic shifts in average seasonal temperatures, fire frequency, reduced snowpack, declines in river flow and significant impacts to wildlife and fisheries. For many, the Big Hole was best exemplified by its storied pioneer past and the decades of economic and social growth in the early twentieth century. This period was remembered as one of stable seasonality, plentiful snowpack and river flow, less frequent and severe fire events and abundant and accessible wildlife. Moreover,

the communities, where people were employed in the timber and milling industry and cattle and sheep ranching, were sufficient to support a robust population of single families. Towns had access to post offices, restaurants, groceries, newspapers, police and other social services. This period was for many a high point or golden age for the Big Hole Valley, and this past was mobilised to memorialise and celebrate their communities. Consequently, as participants analysed the scenario descriptions of climate change, they unfortunately found continual decline, and their responses were couched in this narrative of the valley's historical trajectory of decline.

In contrast, residents of south-east Ohio, in the region surrounding the Wayne National Forest, interpreted the future climate change impacts described in the scenarios in a nearly converse way. Even though many of the details in the scenario descriptions matched the range of environmental and ecological threats described in Montana, Ohio residents perceived these changes quite differently. As residents conveyed, the landscape of the region has experienced regeneration and renewal over the course of the latter twentieth century and into the twenty-first century. By the 1900s the entire region was largely devoid of natural forests due to the immense needs for wood and charcoal in the iron smelting industry. Moreover, as coal mining became dominant through the middle of the twentieth century, the economic and social impacts were exacerbated by significant environmental problems such as acid mine drainage (AMD). Participants described how, as children, they would colour streams orange in their schoolwork due to the toxic pollution from AMD. Yet with the establishment of the Wayne National Forest in 1934 and the diminished power of the extraction industry, the forests of the region regenerated and now provide substantial land cover in the region even beyond public lands. For many, the temporal trajectory of ecological change had been one for the better, and the future climate impacts contained in the scenarios did not present a radical departure from the trajectory. Shifts away from northern trees such as eastern cedar or maple to southern species did not cause deep concern as long as there were still forests. As one participant noted:

Overall things are really improving in south-east Ohio, things are up. When the Wayne National Forest bought up all the land, the abandoned coal mine land . . . it was poor quality, the environment was denuded and dead. I see this trend continuing on despite what's described in the scenarios. (NGO interview, 2015)

2.3.3 Wind Is a Person

The linkages between temporality and sense of place can also precede the positioned subject and their ability to make sense of the world through fundamental assumptions about the nature of being. In other words, prior to one's positioned view of the world or epistemological attempts at understanding it, one must necessarily make ontological claims about the nature of that world. These ontological claims make assumptions about not only the nature of things but also the metaphysics of space-time that constitute them. Time, again, is a quality or perception of change and fundamentally depends on the agency of 'things', some of which may be conscious and sentient and

some of which may not. As a considerable body of research in anthropology demonstrates, diverse cultures around the world ascribe such consciousness and sentience to objects, things and processes, which contrasts with the strong nature–culture dualism rooted in Western science. Ontological disjunctures in collaborative settings, then, are not simply disagreements about whose knowledge more closely represents the world, but rather concern the nature of the world itself.

Natcher *et al.* (2007) describe a scenario-based climate change project conducted in the Huslia region of north-west interior Alaska with Koyukon communities, and the series of critical ontological disagreements they faced. The goal of their project was to understand climate change impacts on health and subsistence through increasingly severe and frequent threats from wildfire. However, early on they faced considerable pushback on their assumptions about the nature of time. As they note: ‘Because much of the discourse used in futures research is grounded in a linear conception of time, the use of futures research may impose future-oriented behaviour on those who do not necessarily share the same temporal orientation’ (Natcher *et al.*, 2007, p. 114). As the authors further note, ‘aspects of the environment represent the transformed embodiments of formerly human spirits that are imbued with consciousness’ (p. 119). Koyukon residents of Huslia, they found, hold that features and qualities of their environment are not only driven by spirits but are constituted by them. For example, the earth spirit *sinh taala*’ and the wind spirit *alts’ eeyh doyeega* were particularly salient in discussions of potential fire or shifting wind patterns. These spiritual emanations of place not only populate the landscape with non-human agents, but also formulate a sense of place through individual orientations to time. For Koyukon people, human agency, itself deeply connected to the activities of hunting and gathering, inhabits an immediate present, while the distant future is an uncertain realm governed by the spirits, where environmental change is not a random occurrence but is caused by the moral desires of the spirits themselves.

Consequently, for the residents of Huslia, temporal orientations are not categorised into past, present and future, but are rooted in their significance and relation to the immediate present. Even seasonality, divided into 4 main seasons and 16 transitional seasons, varies from person to person depending on their own experience with events such as salmon runs or ice break-up. In contrast, the distant future, which includes things we might call ‘climate’, is given over to the spirits and is socially suppressed and minimised to prevent a tendency towards accumulation (e.g. through saving) and inequality. Because of the critical entanglement of spirits, livelihood and social cohesion, the moral ordering between people and spirits is transmitted through ‘distant time stories’ that instruct Koyukon people in the proper relations with the spirit world. To speak of these spirits in the ways represented by the climate scenarios was perceived as arrogant and presumptuous, and any attempt to tame these spirits through such futures methods ‘places research participants in situations that are potentially offensive to a sentient world – a world that can be highly sensitive, vindictive, and dangerous’ (Natcher *et al.*, 2007, p. 114). The ontological claims about the nature of time and being that are packaged in climate adaptation scenarios, themselves a particular universalising sense of place, essentially scuttled the engagement and discussion envisioned by the researchers.

2.4 Discussion

Each of these scenario-based projects clearly illuminates the critical role of time in understanding the challenges of place-based collaboration in climate adaptation, and they highlight the positional, epistemological and ontological axes of friction that can emerge in diverse, plural settings. Critical to adaptation, these differences articulate in uneven ways with scenario-based climate adaptation planning. The time horizons favoured by ranchers, for instance, were amenable to the 20- to 30-year timescale chosen by the researchers in consultation with natural scientists. Small business owners, on the other hand, perceived the future through substantially shorter time horizons that were not favourable to the aims of the project. This raises a series of questions about the utility in this instance of scenario methods based on singular or universal time horizons in contexts marked by diverse senses of place and time.

It is also evident that place-based temporal narratives of past and current social and ecological change shape how people make sense of future social and ecological change brought about by a changing climate. In Montana, senses of place marked by declensionist narratives of social and ecological decline might in fact make residents more likely to embrace adaptation efforts, in order to reverse those narratives or return to some 'golden past'. Conversely, in Ohio, the residents of the region did not perceive the described changes as particularly threatening, which may work to reduce the urgency and initiative to collaborate, and may make residents less motivated to take steps to respond to climate change and find more adaptive futures. This raises questions about how climate change is narrativised in particular places, how those narratives connect to particular senses of place, and how they articulate with or counter broader global narratives of climate change.

Lastly, and in a more fundamental sense, the pushback from Koyukon residents of Huslia, Alaska demonstrates how the temporalities of climate science, rooted in Newtonian world views and the singular, linear vision of Western time, are at odds with other claims about the nature of the world. This raises substantial questions not just about collaboration in adaptation, but also about broader matters of justice and whose place and times count.

Further, senses of place do not simply shape and filter perceptions of future climate change impacts; they too are threatened by a changing climate and the outcomes of adaptation decisions and actions. In each of these cases, the climate change impacts described in the scenarios not only threaten the ways people connect with their places but also their means to understand and come to know their places, whether through ranching, recreation, or subsistence-based knowledge systems created over millennia. Understanding how this sense of vulnerability further filters and shapes the ways participants and stakeholders understand and perceive future climate change is critical.

2.5 Conclusion

Despite these problematic findings, we still consider sense of place critical to successful collaboration in the context of climate adaptation, but only in its particular application to specific times and spaces – that is to say, in its plurality. In this sense, plural senses of future place function not to traverse boundaries but rather to illuminate them. Many of the boundaries that plague collaboration across cultures, communities and plural visions of the world can at times lie hidden behind the assumptions of a universalising, objectivist ‘view from nowhere’ world view. But they can also be hidden by universalising, objectivist views of the past, present and future. Yet given the future-oriented practice of climate change adaptation and the widespread use of techniques such as scenarios in those practices, sense of place narrowly conceived in its spatial elements is insufficient to operate as an effective boundary concept. Rather, sense of place must be understood through the dynamic and diverse temporalities that constitute it, necessitating a shift in understanding from ‘sense’ to ‘senses’ of place. Moving forwards, it is critical to craft new forms of adaptive practice that can recognise and account for this plural sense of time and place.

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