



The sociological imagination in a time of climate change

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ABSTRACT

Despite rising calls for social science knowledge in the face of climate change, too few sociologists have been engaged in the conversations about how we have arrived at such perilous climatic circumstances, or how society can change course. With its attention to the interactive dimensions of social order between individuals, social norms, cultural systems and political economy, the discipline of sociology is uniquely positioned to be an important leader in this conversation. In this paper I suggest that in order to understand and respond to climate change we need two kinds of imagination: 1) to see the relationships between human actions and their impacts on earth's biophysical system (ecological imagination) and 2) to see the relationships within society that make up this environmentally damaging social structure (sociological imagination). The scientific community has made good progress in developing our ecological imagination but still need to develop a sociological imagination. The application of a sociological imagination allows for a powerfully reframing of four key problems in the current interdisciplinary conversation on climate change: *why climate change is happening, how we are being impacted, why we have failed to successfully respond so far, and how we might be able to effectively do so*. I visit each of these four questions describing the current understanding and show the importance of the sociological imagination and other insights from the field of sociology. I close with reflections on current limitations in sociology's potential to engage climate change and the Anthropocene.

The changing climate poses an unprecedented challenge to the human imagination. It seems impossible to imagine the reality of what is happening to the natural world, impossible to visualize the social, political and economic consequences of these changes, and impossible to envision truly changing course. Imagination is power especially in a time of crisis. Right now in the face of climate change and the Anthropocene¹ more generally there are two forms of imagination that both the interdisciplinary community and the general public need. We need the ability to perceive the relationships between human actions and their effects on earth's biophysical system – call it an **ecological imagination**. And we need to be able to see the relationships within society that make up this environmentally damaging social structure. This second form of visualization – a central concept in the field of sociology – was first discussed over 70 years ago by C.W. Mills. Mills calls it the **sociological imagination**.

When it comes to our ecological imagination the scientific community has made great progress. Over four decades atmospheric scientists have progressively detailed increasingly grim assessments of how the changing climate is altering the biophysical world around which human social systems are organized. Natural scientists have specified reductions in greenhouse gases needed to circumvent

catastrophic climate change. Despite these warnings however, human social and political response to climate change remains wholly inadequate (Palsson et al., 2013). We have made little progress in understanding how to actually change our course. For this, we need the second form of imagination - the ability to see the relationships within society that make up our environmentally damaging social structure. In the words of C. W. Mills:

“The sociological imagination enables us to grasp history and biography and the relations between the two within society... No social study that does not come back to the problems of biography, of history and of their intersections within a society has competed its intellectual journey... For that imagination is the capacity to shift from one perspective to another – from the political to the psychological; from examination of a single family to comparative assessment of the national budgets of the world; from the theological school to the military establishment; from consideration of an oil industry to studies of contemporary poetry... It is the capacity to range from the most impersonal and remote transformations to the most intimate features of the human self – and to see the relations between the two” (1959, 3–7).

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¹ Discussions of climate change relate to the concept of the Anthropocene developed by natural scientists Crutzen and Stoermer (2000) to denote a new geological period in which human activity is a significant force in the shaping of the planet. The term Anthropocene (controversial within geology) draws attention in particular to the fact that human activity is now fundamentally transforming the natural world, modifying even the planet's basic geochemical and atmospheric cycles. While climate change is the most obvious aspect driving this change, developments including anthropogenic chemicals and genetic engineering may also be included.

But our ability to develop this form of imagination has been a harder nut to crack.

The work of natural scientists raises two kinds of questions for scholars in the social sciences and humanities. First, whether and how can we effect the needed change in emissions to avoid catastrophic climate scenarios? More specifically, what cultural, organizational and institutional shifts are needed to lower our carbon emissions? Can we tackle reducing our use of fossil fuels as a technical problem or does it involve a fundamental reorganization of society? And if so how do we begin? Secondly, how should we understand and evaluate the impacts of changes that will come and are already taking place? How is climate change exacerbating existing gender and racial inequality, and how will it do so in the near future? To what extent will climate change lead to economic and political instability? What does sea level rise mean for the future of cities? How for that matter, can we even begin to really imagine the reality of our present situation?

While these questions are addressed in part by the social science literature on climate change (itself hugely under-represented, see discussion by Hackmann et al., 2014), even here it is my hope that this explicit enunciation of this and a few other specific concepts from sociology will highlight the unique but as yet still omitted contributions of the discipline of sociology. For as much as knowledge and perspectives from many of the disciplines within the social sciences and humanities are imperative (Castree, 2014, 2015; Clayton et al., 2015; Hackmann et al., 2014; ISSC and UNESCO, 2013; Palsson et al., 2013), my focus here is upon the particular absence of and conceptual contributions of the discipline of sociology. Without a sociological imagination, most people in both the science community and the public at large currently lack the ability to see the social structure that surrounds us. And without being able to see social structure we have a very hard time answering any of the above questions. Without seeing the constraints coming from social structure we are having a hard time moving forward.

Despite appeals for both interdisciplinarity (Brondizio et al., 2016) and the need for social science knowledge in the face of climate change (ISSC and UNESCO, 2013), to date insufficient social scientific expertise has been brought to bear in the major climate reports. Few sociologists in particular have been engaged in the discussions about how we arrived at such dangerous climate scenarios, or how society can change course. With its attention to how individuals, social norms, cultural systems and political economy interact to generate social order, the discipline of sociology is uniquely positioned amongst the social sciences to bring valuable perspectives (Dunlap and Brulle, 2015). Yet there is only one sociologist on the Intergovernmental Panel on Climate Change, and a recent study by the International Social Science Council found that only 3% of publications in the field were by sociologists (ISSC and UNESCO, 2013).² As Erhardt-Martinez et al. (2015) write,

“neither the IPCC Assessments nor the America's Climate Choices reports consider the importance of the myriad other aspects of social organization and culture: governance, power structures, political activism, labor policies, the countless drivers of consumption, the force of social routines and expectations, systems of global production, cultural values and a range of other sociological factors that shape and constrain mitigation opportunities apart from technologically focused solutions.”

Progress is being made in important quarters. The International Social Science Council's 2012 report highlighting the “transformative cornerstones framework” with its six social frames in relation to global environmental change is gaining attention. Certainly the tone of the

social science critiques within the pages *Nature Climate Change*, *Global Environmental Change* and other leading interdisciplinary journals is one of increasing urgency. Without understanding relationships between the individual, cultural and political economic dimensions of social order the existing interdisciplinary conversation on social impacts and responses is best characterized by scientific imperialism, a fetishism of public opinion, and a psychological reductionism of social phenomena (Brulle and Dunlap, 2015). By contrast sociology and the sociological imagination in particular raise questions about the relevance of institutional and structural changes in economic, political and cultural systems. Paradigms are not only about theory and methods, but which theory and methods are congruent within existing political and economic interests. One symptom of this development of our ecological imagination relative to our sociological imagination is the recent finding that more Americans can imagine the “end of the world” than a switch from using fossil fuels or an economic order other than capitalism (Klein, 2014). But what do we need instead?

1. Sociological imagination and climate crisis

Modern society as most of us know it rests on the assumption that humans are separate from nature - even that we have risen above it and are no longer vulnerable or dependent (Plumwood, 1993). Technological transformation in the homes keep at least middle class Westerners warm and dry whether or not they know the source of their energy, food systems have been restructured so that families and local communities need not be responsible for cultivation, and people can easily move from one place to another using cars, trains and airplanes. The convenience of all these activities comes with a conceptual price. Most of us in modern “western” contexts are alienated from our ecological worlds. We now need an ecological imagination to understand the reality of our circumstances. Making visible these relationships between humans and nature has been the focus of crucial research activity in the climate arena. Atmospheric and ecological scientists have provided important descriptive evidence for the impacts of human actions on the natural world. Yet while the connection between burning fossil fuels and alteration of the climate is understood on a general level, it can still be a challenge to visualize the relationship between driving to work and increased risk of high intensity forest fires.

We are not only alienated from our ecological conditions – unaware for example of the relationship between personal automobile use and the changing precipitation in our local communities. We have also become alienated from our social conditions – seeing our dependence on automobiles as a function of poor choices rather than corporate lobbying by the auto industry, or how our ability to reduce our carbon footprint may be constrained by our nation's foreign policy. Essentially we lack the ability to imagine social structure. As a result, most people can only imagine their impacts on the planet in the form of individualized consumer actions (Shove, 2010; Webb, 2012).

The need to make this second set of relationships visible has received much less focus in the interdisciplinary conversation on climate change and the Anthropocene. While the insights from many disciplines in the social science and humanities are critically important in light of climate change, making visible the relationships the relationship between “micro,” “meso,” and “macro” dimensions of social order is the central project of the discipline of sociology. The application of a sociological imagination and a few other sociological concepts allows us to powerfully reframe four central questions in the current interdisciplinary conversation on climate change and the Anthropocene: *why climate change is happening, how we are being impacted, why we have failed to successfully respond so far, and how we might be able to effectively do so.* I visit each of these four questions describing the current understanding and show the importance of the sociological imagination and other insights from the field of sociology in providing fuller explanations. I close with some reflections on limitations in sociology's current potential to engage climate change and how sociologists might become

² Note that as we move towards a truly interdisciplinary conversation on climate change, it would not need to be sociologists per se espousing sociological concepts. Until we are in such a truly interdisciplinary scenario, the near total absence of sociologists in these key interdisciplinary spaces and the importance of the sociological concepts I emphasize here would seem to be important and worth underscoring.

more involved.

2. Four key sociological insights: #1 why is climate change happening?

Climate change is a result of high emissions of carbon dioxide and other greenhouse gases, but why are these emissions occurring? Despite the fact that this is a highly relevant question for social scientists generally and sociology in particular, the vast majority of theorizing and discussion on this question to date has come from natural scientists themselves. Furthermore, the vast majority of the few social scientists who are involved in this conversation come primarily from only two disciplines: economics and psychology (ISSC and UNESCO, 2013). This dominance of natural sciences is visible in the boards of prominent University programs on “climate change and society” that are led and staffed by people with PhD's in climatology or ecology (and maybe one economist), editorial boards of interdisciplinary journals³ with similar make ups, and the above mentioned composition of the IPCC and other large scale efforts. The result has been very technical answers to the question of why climate change is happening (e.g. where emissions come from by sector), but less assessment of political factors behind emissions trajectories (such as how the fossil fuel lobby shapes the carbon intensity of our energy grid, or how cultural imaginaries constrain decision making). Although there are a variety of theoretical orientations within psychology and economics, almost all research in both disciplines takes the individual as the unit of analysis and tend to assume biological (or otherwise pre-determined) explanations for perception, cognition, and emotions. Analyses from these presumptions tend to characterize human consumptive and political behaviors as universal and inevitable phenomena, making it even more difficult to imagine that we can change.

By theorizing macro level research questions and situating individual behavior and cognition in social contexts, sociologists emphasize the role of culture and social structure in cognition, perception and emotion with respect to climate change. For example, Ulrich Beck's (1992) concept of the **risk society** describes how we can no longer understand the risks of the world through direct experience, but they must instead be mediated by science and technologies. Schnaiberg's (1980) concept of the **treadmill of production** emphasizes the need for both continued growth under capitalism, and the fact that other sectors of society especially the state and labor are also structured to continue economic growth. With macro level concepts such as the notion of the risk society and treadmill of production we can see context for both why individuals would fail to understand risks or chose high carbon emissions behaviors, as well as why the state may be unwilling to put in place economic or political incentives to reduce them.

By contrast, from a sociological standpoint, high emissions result from the reinforcing growth logics of current economic, social, political and cultural systems (Rosa et al., 2015). Individuals participate in these systems, but individual understandings, values, risk assessments, actions, choices and so forth are critically constrained by their cultural, economic and political contexts. Here Durkheim's foundational term “**social fact**” is also helpful. For as Durkheim writes social facts are “external to the individual, but they are endowed with a compelling and coercive power by virtue of which ... they impose themselves ... Even when in fact I can struggle free from these rules and successfully break them, it is never without being forced to fight against them. Even if in the end they are overcome, they make their constraining power sufficiently felt in the resistance that they afford. There is no innovator, even a fortunate one, whose ventures do not encounter opposition of

this kind” (1982 [1938], 50–59). As Erhardt-Martinez et al. (2015) note “Social organization and culture produce variation in values among stakeholders and decision makers, variation in the perception of risks and uncertainties, differences in costs and benefits, and variation in the capacity of decision makers to implement mitigation policies” (see also Beck, 1992; Fisher, 2006; Roberts and Parks, 2006). Thus, in order to understand why climate change is happening we must employ a sociological imagination and address economic systems (see e.g. Clark and York, 2005; Foster and Clark, 2012; Foster et al., 2011; Jorgenson et al., 2016), the military (Nagel, 2011), institutional level interests (Bonds, 2016; Perrow, 2010), political structures (Ciplet et al., 2015; Roberts and Parks, 2006; Dryzek and Stevenson, 2011), and cultural systems (Shove, 2010; Norgaard, 2011). When it comes to why climate change is happening, sociological attention to the macro level of organization matters. Sociologists highlight complex patterns in the relationships between carbon dioxide emissions and economic growth (Jorgenson and Clark, 2012; York and McGee, 2017), and important variations in the carbon intensity of nations' economic trajectories (Jorgenson, 2014).

3. Sociological insight #2 how is society impacted?

The impacts of climate change on human societies are diverse and highly varied (Dunlap and Brulle, 2015). On the one hand, societies are not monolithic. The impacts of changing ecological conditions including unstable weather patterns, sea level rise, intensification of wildfires and increased storm intensity are experienced very differently by communities around the globe (Nagel, 2016). As a result, the ecological changes that undermine social activities and infrastructure simultaneously reproduce gender, racial and class inequalities in complex ways depending on social context. Much sociological attention has addressed the ways that class, gender, race, sexuality, region, and much more each influence the type and degree of exposure to direct or indirect impacts of climate change in complex ways across various scales (see e.g. Nagel, 2016; Pellow et al., 2015).

Climate impacts are varied not only along dimensions of inequality and vulnerability, but are also a function of interaction between material impacts and their cultural interpretations. On the material level alterations in snowpack, fire seasons and sea levels have numerous and widespread effects on human security from the expansion of diseases like malaria and increases in the intensity of natural disasters, to the creation of climate refugees. Social impacts obviously include such material threats to municipal infrastructure such as when heat waves lead to higher than expected electrical use and power grids fail. Here sociology points to the importance of factors including community cohesion or cultural attachment in shaping impacts (Bates, 2016; Klinenberg, 2015). At another level, sociology points us to consider the ways that climate change (and our various responses to it) may indirectly threaten democratic structures when corporate oil interests who benefit from continued high emission scenarios shape policy debates and public opinion (Brulle et al., 2012; Dunlap, 2013). Sociology also points to symbolic threats from climate change to collective identity and meaning systems (Norgaard, 2011). Ultimately, climate change threatens the legitimacy of our present economic and political systems (Klein, 2014).

4. Sociological insight #3 why we are not responding more effectively?

Amongst the most important questions related to climate change, the Anthropocene and the new human condition concern whether and how we can change our current course, and the related question of why we have thus far failed to do so. Climate change has already begun to jeopardize state economic resources, exacerbate social inequality, alter community structures and generate new patterns of economic and social conflict (Bates, 2016). Despite the extreme seriousness of this

³For example the boards of recently launched interdisciplinary journals such as *Anthropocene* and *Earth's Future* are composed almost entirely of natural scientists. *Nature Climate Change* by contrast, has a “Social Science and Policy Advisory Committee” that includes several sociologists, and has made a concerted effort to outreach to sociologists at ASA meetings.

global environmental problem, the pattern of meager public response – in terms of social movement activity, behavioral changes or public pressure on governments – exists worldwide. As scientific evidence for climate change pours in, public urgency and even interest in the issue fails to correspond (Norgaard, 2011).

For nearly twenty years the majority of research on climate change presumed information was the limiting factor in public non-response. Survey researchers repeatedly demonstrate minimal to modest levels of public interest in climate change (Shwom et al., 2015). Psychologists conduct experiments outlining conceptually flawed mental models and apply theories of cognitive dissonance and motivation to climate change. The thinking has been that, “if people only knew the facts,” they would act differently (Bulkeley and Strippel, 2013). Many studies also emphasized the complexity of climate science or political economic corruption as reasons people do not adequately understand what is at stake. Each of these efforts point to important answers. However, few of their findings support either the theory that people fail to respond because they are uninformed (the ‘information deficit model’), or the notion that people have stopped caring about the environment, future generations or people living in poor nations. Yet if our collective passivity comes from neither ignorance nor greed, it would seem even more irrational.

Here again, sociology's emphasis on the relationships between individuals, culture, and economic systems leads to uniquely important insights into why we have as yet been unable to respond. Social context itself can be a significant part of what makes it difficult to respond to climate change. Sociologists note how relationships between oil company executives and federal governments shape climate policy and public understanding, analyze climate skeptic misinformation campaigns and describe how even the notion of “balanced” media framing itself skews public understanding (Boykoff, 2008). My own work on the social organization of denial (2011) describes how in particular political economic contexts, people actually work to avoid acknowledging disturbing information in order to avoid emotions of fear, guilt and helplessness, follow cultural norms, and maintain positive conceptions of individual and national identity. Other scholarship on cultural inertia, culturally patterned receptivity (Fox, 2014; Fox and Rau, 2017) and the symbolic violence of consent in the Alberta Tarsands ‘petrostate’ (Haluzá-Delay, 2014) sheds much light on the profound potential for normalization of the climate threat across society. Taken together these approaches contribute important perspectives on our individual and collective ability to respond to climate change to date.

5. Sociological insight #4 how might we respond?

The ultimate question for human survival concerns whether we can reduce our greenhouse gas emissions, and if so how. Again, by far the majority of research on this question has focused on individual consumption and decision-making in the absence of social context. As Erhardt-Martinez et al., 2015 note, “Scholars in economics, psychology and science communication have placed the human response to climate change more centrally in their research agendas than have sociologists, with the overall result that within the larger interdisciplinary conversation about mitigation: 1) micro-level approaches have dominated the general policy and scientific discourse; 2) within this micro focus the potential role for individuals in mitigation has largely been construed in terms of their ability to reduce individual and household consumption, and 3) explanations for consumer behavior have undertheorized the role of social context in shaping consumption behavior.” As a result, the potential role of individuals and especially individual consumption in social change is drastically overemphasized (see also Maniates, 2002, Szasz, 2007, Szasz, 2011, Webb, 2012). Approaches emphasized within the IPCC, America's Climate Choices and other high profile interdisciplinary climate reports emphasize individual consumption and decision-making, often in the absence of social context. Yet when individuals are detached from their social context, we cannot

account for where values or beliefs come from, and thus how they might actually change. Instead, the potential role of individuals and especially individual consumption in social change is drastically overemphasized, and there is little to no discussion of whether or how institutional, political or economic transformation might be achieved. The focus on individuals is more than a theoretical choice, it has the political function of leaving government and corporations unaccountable. An individual can take shorter hot showers but the US military remains the biggest consumer of oil in the world. Social science disciplines such as economics and psychology are more able to fit into the scientific models not only because they use individuals as the unit of analysis, but more importantly because they are compatible with existing political and economic paradigms (Brulle and Dunlap, 2015).

In contrast, sociology points to the need for larger structural change in economic, political and cultural systems. Sociology tells us we need to be asking questions such as whether and under what circumstances social movements can mobilize citizen engagement and political pressure? Now in the face of the 2015 Paris agreement, how can communities mobilize to put pressure on city governments, local employers, and Federal entities? With sociological analyses the question becomes not how do we better educate and inform the public, but under what circumstances are people able to move beyond a sense of helplessness, guilt or fear of the future and take actions that are in their collective, long term survival interest? Climate change requires large-scale reduction of emissions, but our current political economic structure is intimately embedded in our petroleum-based economy. We need democratic engagement and response, yet individuals retreat out of a sense of helplessness. Part of what presently makes people feel helpless is an assessment of this very serious problem in a context where only individual action and not social structures are understood as shaping outcomes. We therefore need to develop a sociological imagination and focus more attention on the strategic opportunities that individuals may be able to employ to effect larger scale social change from their various social locations.

Individual people can get involved in local political efforts. Even talking about climate change with family and friends is an important way to break cultural norms of silence. Although they are insufficient in isolation, local efforts to make climate change visible in one's community such as developing climate ordinances, creating statewide carbon plans and other efforts to reduce emissions at the county and regional levels are important. Each of these actions strengthens existing community ties, identity and sense of place. As such they may provide a key for breaking through climate denial from the ground up. There is already a global movement building for communities to uncover how climate change is manifesting in their local contexts. Local political renewal cannot be enough to combat climate change on its own, but especially now in the context of large-scale international efforts, local mobilization is an important next step for individuals in renewing the democratic process on the ground. As people participate in thinking about what is happening in their own locale and how they will respond, they will begin to see why the facts of climate change matter to them and to develop a sociological imagination at the same time as they reconnect the rifts in time and space that have constructed climate change as only a distant issue. Working together, people can over time create the supportive community that is a necessary (though hardly sufficient) condition for facing large fears about the future and engaging in large-scale social change.

There may be some who read my reflections on the importance of sociology as an appeal for a return to disciplinarity. This is not my intention. Rather, in order for us to develop an effective response to climate change, there are key insights from the discipline of sociology that have not as yet been engaged, namely 1) the reality and operation of social structure at multiple dimensions of social order from the individual to the cultural and large scale, and 2) the ability to see the relationship between these so-called micro, meso and macro dimensions of social order. Such conversations about the nature and operation

of power in the shaping of culture, economics, values, beliefs or knowledge production have been less palatable for natural scientists especially. Yet without them, we cannot move forward.

6. A call for sociologists

Just as the interdisciplinary social science conversation has been slow to engage sociological approaches to climate inaction, the discipline of sociology has unfortunately been surprisingly silent on the implications of climate change for sociological theory and practice. As of this writing in 2017, climate change has only once been the subject of a plenary session at the American Sociological Association meetings (in 2014), was not mentioned in a Presidential address until 2016, and only a few sociologists outside of the subfield of environmental sociology have applied their expertise to the issue. We sit on the brink of the most profound social dislocation since the founding of our discipline, yet all but a few are doing “sociology as usual.” There is work to be done here as well.

There are historical reasons for sociology's short-sightedness. The discipline emerged at the height of the modernist myth that humans had overcome natural “limits.” It was presumed that the natural world was no longer a relevant influence on social outcomes (Brulle, 2015). The central concern of this new discipline was to understand the novel forms of social order that were emerging with modern capitalism – especially those in the rapidly growing urban areas. Founding father Emile Durkheim specifically called for a focus on “social facts.” But as the social dimensions of climate change become evident – thanks in large part to a still modest number of environmental sociologists – the lack of attention paid to this urgent situation by mainstream sociologists is appalling. Just as those in the scientific community struggle to see social structure, it is time now for sociologists to develop an ecological imagination. Things have recently begun to change. The American Sociological Association's Task Force on Climate Change released its important report *Climate Change and Society: Sociological Perspectives* (Dunlap and Brulle, 2015) at the 2015 annual meeting, and a solid collection of sociological work on climate change is emerging.

Given these factors - and assuming academic discourse can indeed influence public understanding or social policy - it would seem that our collective interdisciplinary task is twofold. First, the natural scientific community needs to move beyond scientific imperialism and truly engage sociologists and other scholars in the social sciences outside economics – in short to develop a sociological imagination. Our paradigms and methodologies are different, but they are urgently needed. Now is the time for natural scientists to read our task force report, consult with sociologists on policy directives and involve more sociologists and other social scientists on the IPCC, journal editorial boards and interdisciplinary academic institutes. Sociologists in turn, need to more broadly engage the material and symbolic importance of environmental problems, climate change and the Anthropocene in our research agendas, learn more about the natural science dimension of what we are up against, be more vocal in getting our research findings to the media and even perhaps invite a few more natural scientists to our meetings.

References

Bates, Diane, 2016. *Superstorm Sandy: The inevitable destruction and reconstruction of the Jersey Shore*. Rutgers University Press, pp. 2016.

Beck, Ulrich, 1992. *Risk Society: Towards a New Modernity*. Translated by Mark Ritter. Sage, London.

Bonds, Eric, 2016. Beyond denialism: think tank approaches to climate change. *Sociol. Compass* 10 (4), 306–317.

Boykoff, Maxwell, 2008. Lost in Translation? The United States television news coverage of anthropogenic climate change 1995–2004. *Climate Change* 86, 1–11.

Bronzizio, E.S., O'Brien, K., Bai, X., Biermann, F., Steffen, W., Berkhout, F., Cudenec, C., Lemos, M.C., Wolfe, A., Palma-Oliveira, J., Chen, C.T.A., 2016. Re-conceptualizing the Anthropocene: a call for collaboration. *Glob. Environ. Chang.* 39, 318–327.

Brulle, Robert J., 2015. Sociological theory after the end of nature. In: *Emerging Trends in*

the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource, pp. 1–14.

Brulle, Robert, Dunlap, Riley, 2015. “Introduction” to Dunlap. In: Riley, E., Brulle, Robert J. (Eds.), *Sociological Perspectives on Climate Change*. Oxford University Press, New York.

Brulle, Robert J., Carmichael, Jason, Craig Jenkins, J., 2012. Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the US, 2002–2010. *Clim. Chang.* 114 (2), 169–188.

Bulkeley, Harriet, Stripple, Johannes, 2013. Towards a critical social science of climate change? In: Stripple, Bulkeley (Eds.), *Governing the Climate: New Approaches to Rationality, Power and Politics*. Cambridge University Press, pp. 243–259.

Castree, Noel, 2014. Dangerous Knowledge and Global Environmental Change: Whose Epistemologies Count? *EnviroSociety* (14 November). www.envirosociety.org/2014/11/dangerous-knowledge-and-global-environmental-change.

Castree, Noel, 2015. Geographers and the discourse of an Earth transformed: influencing the intellectual weather or changing the intellectual climate? *Geogr. Res.* 53 (3), 244–254.

Ciplet, David, Timmons Roberts, J., Khan, Mizan R., 2015. *Power in a Warming World: The New Global Politics of Climate Change and the Remaking of Environmental Inequality*. MIT Press.

Clark, Brett, York, Richard, 2005. Carbon metabolism: global capitalism, climate change, and the biospheric rift. *Theory Soc.* 34 (4), 391–428.

Clayton, S., Devine-Wright, P., Stern, P.C., Whitmarsh, L., Carrico, A., Steg, L., Swim, J., Bonnes, M., 2015. Psychological research and global climate change. *Nat. Clim. Chang.* 5 (7), 640–646.

Crutzen, P.J., Stoermer, E.F., 2000. The ‘Anthropocene’. *Glob. Chang. Newsl.* 41, 17–18.

Dryzek, John S., Stevenson, Hayley, 2011. Global democracy and earth system governance. *Ecol. Econ.* 70 (11), 1865–1874.

Dunlap, Riley E., 2013. Climate change skepticism and denial: an introduction. *Am. Behav. Sci.* 0002764213477097.

Dunlap, Riley, Brulle, Robert, 2015. *Sociological Perspectives on Climate Change (Report of the ASA Task Force on Sociology and Global Climate Change)*. Oxford University Press, New York.

Erhardt-Martinez, Karen, Rudel, Thomas, Norgaard, Kari, Broadbent, Jeffrey, 2015. Mitigating climate change: sociological perspectives. In: Dunlap, Riley E., Brulle, Robert J. (Eds.), *Sociological Perspectives on Climate Change (Report of the ASA Task Force on Sociology and Global Climate Change)*. Oxford University Press, New York.

Fisher, Dana, 2006. Bringing the material back in: understanding the United States position on climate change. *Sociol. Forum* 21, 467–494.

Foster, John Bellamy, Clark, Brett, 2012. The planetary emergency. *Mon. Rev.* 64 (7), 1–25.

Foster, John Bellamy, Clark, Brett, York, Richard, 2011. *The Ecological Rift: Capitalism's War on the Earth*. NYU Press.

Fox, Emmet, 2014. *Society, Power and Climate Change Dissertation National University of Ireland, Galway*. pp. 2014.

Fox, Emmet, Rau, Henrike, 2017. Disengaging citizens? Climate change communication and public receptivity. *Ir. Pol. Stud.* 32 (2), 224–246.

Jorgenson, A.K., Schor, J.B., Knight, K.W., Huang, X., 2016. Domestic inequality and carbon emissions in comparative perspective. In: *Sociological Forum*, (Vol. 31, No. S1, pp. 770–786) (September).

Hackmann, Heide, Moser, Susanne C., Clair, Asuncion Lera St, 2014. The social heart of global environmental change. *Nat. Clim. Chang.* 4 (8), 653–655.

Haluza-Delay, Randolph, 2014. Giving Consent in the Petrostate: Hegemony and Alberta Oil Sands. 4. University of Toronto Information Technology Services, pp. 1.

ISSC, UNESCO, 2013. *World Social Science Report 2013: Changing Global Environments*. 142 OECD Publishing and UNESCO Publishing, Paris, France.

Jorgenson, Andrew K., 2014. Economic development and the carbon intensity of human well-being. *Nat. Clim. Chang.* 4 (3), 186–189.

Jorgenson, Andrew K., Clark, Brett, 2012. Are the economy and the environment decoupling? A Comparative international study, 1960–2005 1. *Am. J. Sociol.* 118 (1), 1–44.

Klein, Naomi, 2014. This changes everything: capitalism vs. the climate. In: Simon and Schuster.

Klinenberg, Eric, 2015. *Heat Wave: A social Autopsy of Disaster in Chicago*. University of Chicago Press.

Maniates, M., 2002. Individualization buy a bike, plant a tree, save the world? In: Princeton, T., Maniates, M., Conca, K. (Eds.), *Confronting Consumption*. MIT Press, pp. 43–66.

Nagel, Joane, 2011. Climate change, public opinion, and the military security complex. *Sociol. Q.* 52 (2), 203–210.

Nagel, Joane, 2016. *Gender and Climate Change: Impacts, Science, Policy*. Routledge.

Norgaard, Kari Marie, 2011. *Living in Denial: Climate Change, Emotions and Everyday Life*. MIT Press.

Palsson, G., Szerszynski, B., Sörlin, S., Marks, J., Avril, B., Crumley, C., Hackmann, Heide, Holm, Poul, Ingram, John, Kirman, Alan, Buendi'a, Mercedes Pardo, Weehuizen, Rifka, 2013. Reconceptualizing the ‘Anthropos’ in the Anthropocene: integrating the social sciences and humanities in global environmental change research. *Environ. Sci. Pol.* 28, 3–13.

Pellow, David, et al., 2015. Climate justice. In: Dunlap, Riley E., Brulle, Robert J. (Eds.), *Sociological Perspectives on Climate Change (Report of the ASA Task Force on Sociology and Global Climate Change)*. Oxford University Press, New York.

Perrow, Charles, 2010. Organisations and global warming. In: Constance Lever-Tracy (Ed.), *Routledge Handbook of Climate Change and Society*, Routledge, pp. 59–77.

Plumwood, Val, 1993. *Feminism and the Mastery of Nature*. Routledge, London.

Roberts, J.T., Parks, Bradley C., 2006. *A Climate of Injustice: Global Inequality, North-South Politics, and Climate Policy*. MIT Press, Cambridge, MA.

- Rosa, E.A., Rudel, T.K., York, R., Jorgenson, A.K., Dietz, T., 2015. The human (anthropogenic) driving forces of global climate change. In: Dunlap, R.E., Brulle, R.J. (Eds.), *Climate Change and Society: Sociological Perspectives*. Oxford University Press, New York, NY, pp. 47–91.
- Schnaiberg, Allan, 1980. *The Environment: From Surplus to Scarcity*. Oxford University Press, New York.
- Shove, Elizabeth, 2010. Beyond the ABC: climate change policy and theories of social change. *Environ. Plan. A* 42, 1273–1285.
- Swom, Rachel, McCright, Aaron M., Brechin, Steven R., Marquart-Pyatt, Sandra T., Hamilton, Lawrence C., 2015. Public opinion on climate change. In: Dunlap, Riley E., Dunlap, Riley E., Brulle, Robert J. (Eds.), *Sociological Perspectives on Climate Change (Report of the ASA Task Force on Sociology and Global Climate Change)*. Oxford University Press, New York.
- Szasz, A., 2007. *Shopping Our Way to Safety: How We Changed From Protecting the Environment to Protecting Ourselves*. University of Minnesota Press.
- Szasz, A., 2011. Is green consumption part of the solution? In: Dryzek, J.S., Norgaard, R.B., Schlosberg, D. (Eds.), *The Oxford Handbook of Climate Change and Society*. Oxford University Press, pp. 594–608.
- Webb, J., 2012. Climate change and sociology the chimera of behavior change techniques. *Sociology* 46 (1), 109–125.
- York, Richard, McGee, Julius Alexander, 2017. Does renewable energy development decouple economic growth from CO₂ emissions? *Socius* 3.