



# Introduction

## *On Constellations and Connected-Up Thinking in the Face of the Future*

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The processes of the Anthropocene have reversed the temporal order of modernity: those at the margins are now the first to experience the future that awaits all of us.

—Amitav Ghosh, *The Great Derangement*, 2016

This is a book about the experiences, hopes, fears, responses and reactions of Circumpolar people who are engaging with rapidly shifting environmental circumstances. As reflected in our opening quotation, these changing conditions herald futures that may well be global, but that Arctic inhabitants are trying to imagine even as they develop strategies to cope with today's events – the future-made-present.<sup>1</sup> The volume reflects a day-long workshop held at the British Museum in May 2016. The discussion was well attended – packed out even – over the course of all three sessions – ‘Because it was real’, according to one attendee. We hope to retain that immediacy here, in a way that gives space to the many kinds of perspectives that contributed to our original discussions : local practitioners and observers (some of whom are one and the same); anthropologists, reindeer herders, ecologists, commercial fishermen, media specialists, whalers, geographers, trappers and others. Both the issues under consideration and the terms in which they are explored evade easy categorization. One of our discussants, Michael Bravo (who has written the afterword), summarized the entire workshop as an exposition of ‘constellations of risks’. The editors have found the image compelling and encourage readers to see the whole as an exploration of the complexity of

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such constellations. We have divided our introductory remarks into two chapters: here we present the volume as a whole and explore a number of ideas which we feel have productively informed the anthropology of environmental processes in general. The first of these is an extended discussion about animacy, intimacy and vitalism, the combination which we suggest opens out an awareness of the multiple sensings of our surrounds; that awareness figures largely in the chapters to come. The second is a brief review of models of risk. Chapter 1 then sets out a series of concepts we feel are most pertinently relevant to imagining the possible futures that will envelop the lives of Arctic residents: the need to bring geo-politics and the cosmological into mutual view; the notion of the Anthropocene as a concept that is both powerful and another potential erasure of multiple voices; and, finally, the introduction of the notion of ‘cryocide’ to describe the risks faced by peoples across the globe who depend on ice-based landscapes for their existence. Although the contributions to come reflect a very wide range of issues and perspectives, they all reveal a commitment to examining abstractly understood climatological and geopolitical processes through the lens of local experiences and understandings.

## On Decentring ‘the Human’ in Environmental Understanding

To capture some of the intellectual threads that might connect such a collection, in this introduction we propose a thought experiment: like so many, we start with Chakrabarty’s (2009) assertion that a recognition of the Anthropocene as an idea that tells us something about human action as a determinant factor in geologic process invites – perhaps even requires – new ways of thinking. To approach this we want – as a beginning – to bring together three recent authors, all of whom are involved in what Ghosh (2016: 71) calls ‘projects of imagination’ that cross conventional disciplinary boundaries and, as such, may offer readers a way into the intellectual tenor of the volume overall: Amitav Ghosh’s (2016) *The Great Derangement: Climate Change and the Unthinkable*; Elizabeth Povinelli’s (2016) *Geonotologies: A Requiem to Late Liberalism*; and Kath Weston’s (2017) reconsideration of ‘the intimate’ in her collection of essays, *Animate Planet: Making Visceral Sense of Living in a High-Tech Ecologically Damaged World*. In an important sense, all three might be considered post-humanist to the extent that none assumes that

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their focus can be restricted to human experience, human understanding, or human action – even though all of these are brought into their respective analyses. Thus, even through the conceptual lens of the Anthropocene, it is not the presence of ‘the human’ that is key here but rather the question of what happens to our thinking if we move away from humano-centric assumptions about past, present and future eventful processes. All three authors, then, recognize human activity as entangled in forceful ways in all sorts of non-human relations even as they propose ways of moving human actors from centre stage in their respective analytical frames. All three authors recognize that their shift in focus brings core contradictions into view. Weston (2017:10) frames her work as an attempt ‘to describe a range of ecological intimacies through which people have co-constituted a world in which their finest technological achievements are implicated in habitat destruction’. Elizabeth Povinelli asserts, ‘We must de-dramatize human life [even] as we squarely take responsibility for what we are doing. This ... may allow for opening new questions’ (2016: 27). Such a statement is, of course, more easily asserted than realized. Ontological questions of conceptual framing, epistemological questions of evidence and knowledge, and ethical questions of the moral ‘so what’ in terms of responsible action are, we assume, in a constant state of mutual transformation. When we approach the subject of climate change from an actor’s rather than a system’s point of view, the analytical challenges multiply; not only is climate change, in Hulme’s words, a ‘wicked problem’ (2009: 34), something he defines as ‘essentially unique, with no definitive formulation, and [potentially...] symptomatic of yet other problems’, but it is also (and most certainly in the Arctic) a ‘threat multiplier’ that has the potential to ‘deepen already existing divisions and lead to the intensification of a range of conflicts’ (Ghosh 2016: 143). Nowhere are these challenges more evident than in the Circumpolar North – where climatological processes take shape with ever increasing rapidity; geo-political desires bring nation states as well as local communities into intense confrontation; and struggles over whose voices count are the subject of constant negotiation. In our original call for papers, we explicitly invited our contributors to bring these factors into view. The results, we feel, meet Povinelli’s exhortation to reframe our terms of reference as we open out new questions.

First, however, we would like to draw our readers’ attention to the problem of time-as-signifier. As we shall see, one of Povinelli’s quarrels with ‘animism’ as a concept is the degree to which its deployment effectively fossilizes not only indigenous knowledge, but

relegates the people who inhabit animated worlds to some ‘pre-modern’ state of being and defines ‘traditional knowledge’ as a means to invoke that pre-modern past.<sup>2</sup> Despite Fabian’s (1983) classic exhortations to anthropologists that they need to recognize their interlocutors as co-eval, the ‘savage slot’ continues to be invoked in many contexts. It should come as no surprise then to hear, even now, that Circumpolar peoples are often tagged as ‘recently emerged from the stone age’ (in Bodenhorn 1994: 7). At the same time, the Arctic is often characterized as the canary in the mine – the harbinger of the rest of the world’s future. Whether as fossil or harbinger (or conceivably as a simultaneous both), the result of reaching for these sorts of images is – more often than not – to reduce the living inhabitants of these regions to signs: where ‘we’ (whoever that is) come from; where ‘we’ may end up. Thus we (the editors) want to establish two foundational points right at the start:

1. The accounts contained here reflect twenty-first-century struggles by people living in the Circumpolar North; they emerge from historical processes that are complexly contemporary (in the literal sense of sharing time with everyone else living in the twenty-first century). What Michael Bravo identified as ‘constellations of risk’ are being met with all the tools at our interlocutors’ disposal: traditional, modern, scientific, practical, political and cultural. That conjunction of interests, knowledges and strategies is one of the core themes of the volume.
2. Nonetheless, what happens in the Arctic is also relevant for people not living in the Arctic – for thinking about resilience and creativity as well as for watching climatological processes as they unfold in real time.

For the rest of the introduction, we explore the provocations we feel Povinelli, Weston and Ghosh have to offer and then shift focus to consider the legacies of some classical models of risk. We conclude this part of our introductory remarks with an overview of the chapters themselves. In Chapter 1, we turn to the Arctic specifically and consider it as an eco-zone which acts as a planetary driver; we look at it as a politico/economic ‘hot spot’ that attracts multiples of competing interests and subsequently consider the implications of thinking about the Circumpolar North as a complex of cosmo-geopolitics. Finally, we introduce the notion of ‘cryocide’ to characterize the processes we feel have engulfed the worlds inhabited by ice-dependent peoples.

## On Animism/Vitalism

Our food consists entirely of souls.

—Inuit shaman; in Barbara Bodenhorn, ‘Whales, Souls, Children and Other Things that are Good to Share’, 1988

These things (baskets) is living. ... now who can tell me what I mean, ‘is living’?

—Mabel McKay, in Greg Sarris, ‘What I’m Talking about When I Talk about My Baskets’, 1992

This is not your great great grandmother’s animism.

—Kath Weston, *Animate Planet*, 2017

It is certainly possible to write powerfully about global climate change without recognizing that the globe’s inhabitants have varying cosmological views about their surroundings and the processes which affect them.<sup>3</sup> Even Chakrabarty, with whom we began, assumes a unified ‘anthro’ in his vision of the anthropogenic climate change which drives the emergence of the Anthropocene as a geological era. But – as we shall explore in detail in Chapter 1 – one really cannot pay serious attention to the voices of Arctic peoples without acknowledging the importance of world views which are founded on ideas of human-non-human vital connectivity. Since recognizing the power of animated worlds continues to be controversial in much of academia, we want to begin our discussion by engaging with recent work that revisits the notion of animacy – and with it, its connection to intimacy.

Towards the end of her introduction to *Animate Planet*, Weston (2017: 26) muses that in current scholarship, ‘everyone wants to rethink animacy but no one wants to be an animist’. She and Povinelli explore the debates around this conceptual complex in quite different ways. We feel the material in the present volume pushes both. While – as we shall explore below – we see how both authors rethink notions of animacy in creative and productive ways, we shall argue that it is quite important not to throw any vital babies out with the bathwater.

In *Geontologies*, Elizabeth Povinelli (2016) opens our frames of analysis by drawing a distinction between life/death and life(bio)/non-life (geo) as organizing principals. Western philosophy, she suggests, leans heavily towards the bio.<sup>4</sup> Geontopower, she argues, emerges from (and shapes) the ways in which this bio/geo nexus is organized conceptually to order human life politically and economically (and, by extension, the relations involving the rest of the planet). She proposes

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three figures – the Desert, Animism, the Virus – for understanding this dynamic. The desert (for which carbon is the major signifier) stands simultaneously for potential life – that vitality which can be created through the extraction of past lives contained in fossil fuels – life past and future, and an apocalyptic future when all life has become impossible.

Povinelli's attention to animism comes largely in the form of critique of the model (into which she slots, amongst others, the fossilized indigen, new vitalisms, and Gaia theorists) – which assumes that everything is life-filled. Such a starting point, she argues, closes down the possibilities offered by an awareness of non-life (2016: 18f). But her critique is actually considerably more nuanced than that.

To consider how Povinelli uses what she calls Karrabing analytics in order to push beyond conventional meanings of animism, it is worth exploring the figure of Tjipel – a presence/existent (Povinelli's term) on the Karrabing landscape where Povinelli has worked for decades.<sup>5</sup> At some point in her existence Tjipel was a young girl, murdered by an older man as she lay – face down – on the ground. Gradually her shape began to meld into the landscape, meandering, at times entwining with the vegetation on her edges, sometimes nibbling away at the random sand bank, at other times more rigidly confined by rock formations, occasionally disappearing altogether. At some points, her waters run clear and host many fish; at others, weighed down by tailings emptied into her waters by mining initiatives, she is sluggish and inhospitable. By listening to Karrabing talk about Tjipel, Povinelli suggests, an opening out process occurs. Karrabing, she asserts, are not interested in origin stories (Tjipel takes on this present form due to the murder, but she has other forms elsewhere); nor are they interested in the order in which things appear (who knows if rock fish precede or follow her appearance). Rather, they ask about directionality (where is she going?), orientation and relationality to other features in the landscape, including but not restricted to humans. A question of endless interest is why the creek offers fish to one person and not another. What is important for Povinelli is that Tjipel exists in multiple forms in multiple times – turning to and away from caring relations depending on circumstance. She is vital in her multiplicities but she is not an animated object/subject – not an entity with a soul. Her presence takes on many forms of being, blithely ignoring artificial boundaries between life/non-life and certainly not giving one precedence over another: vitality without singularity; existence without essence; existents which may turn toward each other in care – or may turn away

(ibid.: 28). This recognition of relational energy that can be understood as story, event, co-constituting process and being without ever being fixed is, we feel, a productive move away from an understanding of ‘anima’ which fixes vitality to singular materialities.

Like Povinelli, Weston turns her attention to recent critiques of animism which – as a term – has been associated with the sort of evolutionist anthropology that assigns cosmological types to evolutionist hierarchies. To use the term is often to be tarred with a Tylorian brush (something both editors have experienced) (2017: 25ff). After noting what she considers the humanist character of the alternative model labelled ‘perspectivalism’, Weston turns her attention to forms of animation that she defines as co-constitutive rather than relational. Even as the term animism falls into disrepute, the sense that the world is replete with animating process comes to articulation across an increasingly broad intellectual landscape – but, in Weston’s selection, not in ways that necessarily imply some form of social morality. Weston speaks of plants ‘calling out’ in warning to other plants, or in pleas for ‘help’ from insects – communications conducted via the release of pheromones; elsewhere Suzanne Simard (2021) traces the ways in which ‘mother trees’ send nutrients to ‘their’ young via root systems.<sup>6</sup> Mochizuki (2011) speaks of ‘a generation of Japanese people becoming nuclear fuel rods’ in the wake of the Fukushima meltdown;<sup>7</sup> Weston herself (2017) explores the intimacies animated by the unwanted penetration of radioactivity in that same meltdown. This conjunction of what Weston calls ‘animacies and intimacies’ points away from assumptions about animation as in any way self-defined, or, indeed, necessarily social. In Weston’s words: ‘These twenty-first century eco-intimacies are not about separate-but-equal. Neither are they the products of relations between entities. ... Rather, these eco-intimacies are compositional; ... creatures co-constitute other creatures, infiltrating one’s very substance’ (ibid.: 33).

In some ways, Ghosh forms a bridge between Povinelli and Weston, focused squarely on questions of how humans engage with climate processes, by linking notions of coming-into-animation, intimacy, and the uncanny.

The environmental uncanny is not the same as the uncanniness of the supernatural: it is different precisely because it pertains to nonhuman forces and beings ... Animals like the Sundarbans tiger and freakish weather events like the Delhi tornado, have no human referents at all.

There is an additional element of the uncanny in events triggered by climate change, one that did not figure in my experience of the Delhi tornado. That is that the freakish weather events of today, despite their radically nonhuman nature, are nonetheless animated by cumulative human actions. In that sense, the events set in motion by global warming have a more intimate connection with humans than did the climatic phenomena of the past ... They are the mysterious work of our own hands returning to haunt us in unthinkable shapes and forms. ... [T]hey are instances ... of the uncanny intimacy of our relationship with the nonhuman. (2016: 32)

Note, his distinction is between human/non-human agencies, not life/non-life, or spirit/matter. Like Weston, his understanding of intimate and animating process is one of co-constitution and not necessarily of intersubjectivity. Like Povinelli, he provides a way of recognizing the impacts of human action without relying on a human-centric world view. The recognition of 'the uncanny' as an important aspect of people's experiences resonates strongly with a number of our contributors, perhaps most dramatically in the accounts of Siberian reindeer herders for whom weather, topography and animals 'should' be known quantities but are today being experienced in unpredictable and unsettling ways.

So we come to the question of how to 'read' what is going on. In chapter three of *Geonotologies*, Povinelli notes that Karrabing aware that this vitality/energy/power does not just exist in the world, but becomes manifest in it. In a way that resonates with several of our authors, the key is that humans must learn to how recognize what is manifesting in any particular instance in order to decide what to do:

The fundamental task of human thought – and thus the fundamental task of training humans how to think – was to learn how to discern a manifestation from an appearance; how to assess what these manifestations were indicating about the current arrangement of existence; and how to act properly given the sudden understanding that what is, is not what you thought it was. (Ghosh 2016: 58)

Mabel McKay (in Sarris 1989), a Kashaya Pomo basket maker and elder who has worked with Gregg Sarris for many years, has some provocative things to say that link the question of animacy with the question of learning. Sarris, himself brought up by Kashaya Pomo grandparents and currently in the Stanford English Department, had invited Mabel McKay to speak with his students about her skill as a basket maker. She said she would demonstrate rather than talk.<sup>8</sup> Luckily for us, she also spoke, showing herself to be a master



teacher: ‘it all starts from the beginning with roots. How the basket makes itself. Like two people meeting’ (23); ‘these things are living ... now who can tell me what I mean, is living?’ (24). When asked, ‘does it breathe?’, she laughs. When asked, ‘does it talk?’ She responds, ‘yeah, it talk all right. ... But how would YOU know? (ibid.)’. This is already pretty complicated stuff. On the surface it might seem like straightforward ‘animism-as-social-relation’ – basket and basket maker are both living; they can communicate; the basket maker at least is in some senses committed to acting properly towards the basket. But it all starts with the roots; and the basket tells Mabel how to make it. So whatever ‘it’ is, it exists before its material form. In Weston’s sense, roots and basket maker are co-constituting the living that is the basket. In a Povinelli sense, the question of ‘how would YOU know?’ is entirely about manifestation. It’s not just that roots and basket maker are in the same place, but that each is sensitive to the other. You have to learn how to recognize when you are being given instructions. And you need to know how to follow them. It seems that Mabel McKay is a bit more forthcoming about the learning process than Povinelli – although neither is providing a bullet point curriculum. ‘What I’m talking about when I’m talking about my baskets’, McKay says, ‘is my life, the stories, the rules, how this thing is living, what they do to you’ (25). It is not – as one member of the audience assumed – that McKay uses her baskets to tell the story of her life but rather that the stories, the rules and her life experiences provide her with a fund for understanding when, to echo Povinelli, roots are manifesting a basket with the vitality which affords them the agency to ‘do something to you’, or whether they are simply an appearance. In this volume, the problem comes when the frames of reference become unreliable: why in Siberia, for instance, bears ‘go rogue’ (Ulturgasheva, Chapter 2), what happens when open modes of thought become closed down (Edwardson, Chapter 3), or, if one assumes that ‘the universe listens to everything’, how to think about what it hears (see Rasmus, Chapter 4). In all of these instances, the felt urgency to respond to contemporary processes is made more complicated not only because of multiple sorts of overlapping risks but because it has become harder to figure out what is manifesting itself.

This brings us back to our concern with babies and bathwater. It is stimulating to think about animated intimacy which emerges from co-constitution which may have nothing at all to do with sociality or intentionality. It is helpful to think about multiplicities of Tjipel and the extent to which animacy can elude being fixed in a single

thing or in a unique relationship. However, there are several ‘yes, buts’ here. Bodenhorn was introduced to the Iñupiaq concept of ‘sila’ (today translated as weather) in the 1980s. This, she was told, was an impersonal, implacable, unapproachable force. This was not an entity you could bribe with gifts, sacrifices or songs. You had to learn how to watch, be careful and stay alert.<sup>9</sup> But the world was also filled with ‘iñua’ – generally glossed by Iñupiat as soul or spirit, and literally translated as ‘its person’. And when North Slopers have talked to Bodenhorn about whales and whaling over the years, it has been, more often than not, in terms of a moral, social, personal relationship. When Patrick Attungana (1988), a whaler and Episcopal Minister from Point Hope, addressed the Alaskan Eskimo Whaling Commission in the mid-1980s, he said a number of things: that whales see humans’ actions and hear their interaction and decide ‘to go camping’ (i.e. to offer themselves up to a particular crew) based on whether or not they feel a welcoming campsite has been offered; if their bodies ‘are treated tenderly’, then the whale ‘soul or spirit’ will return to other whales to tell them that this was either a good place to go camping and that they will return the following year, or that a lack of generosity will drive them elsewhere. The whale gives itself to the entire community and expects to be shared by the entire community. This will continue ‘if we hunt in harmony; this is what keeps us together’.<sup>10</sup> This is a powerful narrative that assumes intersubjectivity and moral sociality across (at least some) species boundaries. Although it of course cannot be taken as a mode of understanding that shapes all Iñupiaq behaviour, its footprint, so to speak, is present in contemporary discussions of how to proceed in social life. As Rachel Edwardson argues in this volume, this is a form of morality that continues intergenerationally through the circulation of whale and human DNA, mixed and melded with commensality. And it is a form of sentience explored by Rasmus at the level of the universe. Much as we welcome the conceptual openings out of our colleagues, we caution against a refusal to recognize the continuing strength of this form of animated relationality.

The notion of animism without its anthropological evolutionary baggage – without the question of whether or not ultimately this turns on the centrality of materiality – allows us to hear, see, feel, taste multiplicities of vital energies. That can include plants ‘calling for help’; baskets that speak, but only if you know how to listen; creeks ‘turning away’; and microbes upon microbes passing through and constituting the being-in-the-container they inhabit for moments, or for the entire span of their existence.<sup>11</sup> In virtually all of

the chapters to come, it also helps us to understand moral relationality that extends beyond a humano-centric world and – crucially – reminds its practitioners that ‘value’ is not only that which can be calculated in market terms.

We give the final word in the section to Robin Wall Kimmerer. At the start of *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Things Plants Have to Teach Us* (2013), Kimmerer, a Potawatomi elder and lecturer in Botany at SUNY, Buffalo, begins with an account of Skywoman’s fall to earth; it is a journey she survives because geese gather to break her fall, and like any good guest she brings gifts: grasses, flowers and seeds which will become the basis of sustenance for humans and other living beings. ‘Images of Skywoman’, Kimmerer asserts, ‘speak not just of where we came from, but how we might go forward’ (2013: 5). On discovering that her ecology students framed human/nature relations only in negative terms (those of toxicity, pollution and over-exploitation), Kimmerer suggests that they had not grown up on the story of Skywoman (ibid.: 6). ‘How can we begin to move toward cultural and ecological sustainability if we cannot imagine what the path feels like?’ she asks, ‘If we cannot imagine the generosity of geese?’ (ibid.). Throughout her exploration of human-non-human interactions in northern New York, she repeatedly returns to her mantra: that we humans need to experience the world around us as something that requires our gratefulness. That contrast, between the need to be grateful and the assumed need to conquer, reflects one of the core tensions that trouble not only the contributors to the present volume, but many others who are also trying to reach a broader understanding of what we mean by ‘climate change’, its accompanying dangers, and our responsibilities to respond.

### **Recognizing ‘Risk’: On the Intersections of Hazards, Risks, Knowledge, Voice and Responsibilities**

Since the mid-1990s when Iñupiat began to worry out loud about their ice, a steady stream of risk-related literature has appeared, much of it related to environmental unpredictability (see, for example, Gaul 2017; Richardson et al. 2011), threats to national security (e.g. Klare 2019), the perception of risk (Slovic 2010) and ‘modes of uncertainty’ (Samimian-Darash and Rabinow 2015). Of particular note is the work of Oreskes and Conway (2010) who set out in *Merchants of Doubt* a history of the concerted campaign to sow

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doubt in the reliability of scientific assessments concerning the risks presented by tobacco, acid rain and, most recently, climate change. Whereas, the authors argue, the campaign regarding tobacco was to challenge the interpretation of research results, the most recent interventions have been to demonize scientific expertise altogether. Thus, while we recognize ways in which scientific narratives can be used politically to diminish alternative forms of knowledge, we also see how scientific/indigenous collaborations can be the subject of a kind of double-barrelled dismissal. Our intention for the remainder of this section, however, is to pay close attention to some of the classical discussions that were developing at the same time as ice melt was starting to be of concern in the Circumpolar North. The literature we are considering thus reflects the ethnographic as well as the theoretical context of that time. Even more importantly, we feel that the ground they covered continues to provide fertile discussion in the present.

At the time that Bodenhorn was beginning to explore ‘risky decisions’ made by Iñupiaq whalers (see Chapter 7, this volume), the dominant model within government and scientific communities – what both Lupton (1999) and Fox (1999) called the ‘techno-scientific/realist’ approach to ‘risk’ – assumed that ‘it’ is out there. According to the British Medical Association (1987: 13), for instance, a hazard is something ‘with the potential to cause harm’; the risk is the likelihood that it will do so. Thus the task of ‘risk management’ was to map causes in order to calculate, predict and limit effects; it was – and often continues to be – therefore presented as a technical procedure.<sup>12</sup> The British Medical Association (1987: vii) acknowledged that complete agreement in terms of what constitutes ‘acceptable risk’ was virtually impossible, and suggested that ‘if people can agree upon the ways risks are measured and on the relevance of the levels of risk thus represented to the choices we must all make, then the scope for disagreement and dissent is thereby limited’. In the intervening decades, as we have noted, explosive global processes such as climate change, the increasing frequency of global pandemics, mass migration or the unintended consequences of technological developments have all generated a surge of risk analyses that these developments are thought to pose. The paradigm above, which posits the risk/hazard relation as one of cause and effect that is open to objective analysis, which in turn can produce effective management techniques, continues to exert a powerful presence on the landscape of environmental risk assessment (see both Gaul 2017, and Richardson et al. 2011, already mentioned).

With that context in mind, we turn to three bodies of social science work that gained attention in the 1980s and 1990s and strongly challenged the techno/science approach to risk which continues to hold sway in many quarters even in the twenty-first century. Although a great deal of thinking about risk has taken place since then, their footprints thus remain visible and their arguments provocative.

In *Risk and Culture*, Mary Douglas and Aaron Wildavsky (1982: 2) argue that ‘fear of risk coupled with the confidence to face it has something to do with knowledge and something to do with the kind of people we are’. Different people worry about different things. ‘[T]o organise [in the face of perceived risk] means to organise some things in and other things out’ (1982: 8). The nature of the perception of risk(s) and strategies for dealing with them, they argue, depend on organizational aspects of the social groups in question: whether groups are in core or peripheral positions and whether they are generally egalitarian or hierarchical in their social organization. Core groups tend to be present-oriented whereas peripheral ones tend to look to the future or to the past. These groups ‘will never agree, because they are arguing from different premises’ (1982: 175). The process – of identifying risk, assessing it and creating strategies with relation to its perceived implications – of considering ‘goods’ and ‘bads’ is thus moral and consequently always both cultural and political. Although Douglas and Wildavsky assert that the concern with ‘risk’ in the United States (their ethnographic field) has intensified radically since the 1960s, it is not ‘about’ modernity (1982: 14).<sup>13</sup>

Sociologists such as Ulrich Beck (1992, et al. 1994, 1996) and Anthony Giddens (1990, 1994) argue that this is not only about ‘modernity’, but about ‘late modernity’. According to Beck (1996: 27), ‘risk society’ emerges as ‘a phase of modernity in which the social, political, ecological and individual risks created by the momentum of innovation increasingly elude the control and protective institutions of industrial society’. Insurance companies, Beck argues, show us that the limits of this way of being have been reached. With new technological developments, the risk of a ‘bad’ outcome may be low, but the consequences of even a single failure may be limitless. As a result, insurance companies refuse coverage for most major research companies or limit it to almost meaningless amounts (1996: 33). In stage one, these consequences are systematically produced, but they are not subject to debate. In stage two, the hazards of industrial society dominate public and private debate. This debate he calls ‘reflexive’ (1996: 28ff), but clarifies that this is first in the sense of reflex and only subsequently in terms of critical reflection. Following on from

Simmel, Durkheim and Weber, Beck understands the process of modernization to be one of increasing individualization in which people are turned into the bearers of rights and duties, but only as individuals. His model, as well as Giddens', is very much one based on rational choice theory. What he calls (1996: 30) 'risky freedoms' are imposed on individuals without the latter being in a position – because of the great complexity of modern society – to make decisions in a knowledgeable and responsible way with regard to consequences.

Wynne (1996) challenges this position with a close and critical examination of the expert/lay knowledge model that assumes the former is objective and trusted by the latter. In part, his critique stems from the almost purely institutional emphasis in Beck's and Giddens' work. Drawing on case studies of sheep farmers in Cumbria and Andean potato growers, Wynne shows how scientists may often generate inaccurate predictions because they do not elicit local environmental knowledge (with serious consequences when those predictions form the basis of government or development policy). He shows how local knowledge may at times drive research, and become eclipsed when the researchers 'discover' what locals have been saying. And he emphasizes the extent to which silence should not be taken as evidence of 'trust' in expert opinion.

And there are those (e.g. Castel 1991; Lupton 1999; Fox 1999; Crook 1999) who tend to concentrate on Foucauldian governmentality: that 'complex form of power, which has ... as its essential technical means apparatuses of security' (Foucault 1991: 102/3). The presentation of risk, Lupton (1999: 5) suggests, is a strategy of governmentality, one aspect of which is to suggest that it is ultimately controllable by following 'expert' opinion. Thus, Fox (1999: 19) explains, what for him was 'just a milk truck' was for his driving instructor a hazard – as was everything else on the road. Any analysis of the process of perceiving and acting on risk, then, must begin with a cultural analysis of why hazards are defined as hazards.

But we are also seeing some shifts in the conceptual make-up of this landscape. It remains commonplace in many settings that risk assessment is assumed to be a question of rational, objective judgement which is somehow disengaged from cultural factors. Because non-specialists are assumed to respond individually and subjectively to events around them, their opinions are generally considered to be 'biased' or 'anecdotal' in comparison to expert scientific assessment.<sup>14</sup> The tensions between natural and social scientists as holders of expert knowledge have often been played out on these grounds. Socio-cultural processes have historically not been considered,

except insofar as these were considered with reference to the rational generation and implementation of management strategies by experts. Beck (1996) and Wynne (1996) noted, for instance, that major governmental institutions such as the National Science Foundation in the US and the European Union generally incorporated social scientists into their information gathering processes in the expectation that social scientists would be able to follow a ‘hard science’ paradigm in documenting, analysing and predicting outcomes of human responses to environmental policy shifts.<sup>15</sup> As we explore further in Chapter 1, the provocations of anthropocenic thinking have expanded both the scale and the boundaries of environmental modelling even though tensions behind the recognition of ‘expertise’ and ‘evidence’ remain subjects of lively debate when predicting the risk of undesirable environmental outcomes to human action (see, e.g., Sneath 2013). At the same time, however, in the demonizing of expertise that has characterized much public discourse in the US during the past decade, the deriding of expert knowledge as it pertains to risk, whether concerning climate change, gang violence or COVID, has frequently been heard in the Houses of Congress.

Still, perhaps one of the encouraging developments of the first decades of the twenty-first century has been a more genuine opening out – at least in some instances – of collaborative interactions between knowledge holders of different orders.<sup>16</sup> Several of the chapters in this volume reveal active sharing of knowledge between different sorts of experts: Evenly reindeer herders and permafrost scientists; public health experts and Yup’ik elders; and whale biologists and whalers.

Regardless of our recognition of collaboration, questions of voice remain. An awareness of the political consequences of eclipsing perspective, of refusing to listen to alternative voices is a theme that has fed through the present volume – from the elimination of the Arctic and its residents from news coverage of COP21 detailed by Callison, to the criminalization of any challengers to pipeline construction proposed by President Trump in 2019 and passed by the Senate in 2020.<sup>17</sup> This was aimed directly at Lakota defending their rights to clean water at Standing Rock. Lest we make too easy assumptions about these forms of silencing as either limited to the scientific/lay divide, or anti-colonial struggles between indigenous/modern knowledge holders, we need to recognize that the struggle over authoritative voice is one of power in the crudest sense. The demonization of science concerning environmentalism in general, climate change more specifically (including the US military’s assessments of the risks to national security posed by it) and, more recently,

COVID, has been actively deployed in the service of industry and of politics for some time (see, for instance, Oreskes and Conway 2010; the subsequent *Merchants of Doubt* documentary, 2014; Klare 2019). Over the past several years, in the face of an active muzzling of the Federal agencies as a source of environmental and climate research results, perhaps ironically Native American news media such as *Indian Country Today* in the US or *The Narwhal* in Canada became important sources of cutting-edge reporting. Because so many Native American communities were – and continue to be – at the forefront of the toxic impacts of environmental degradation, it has been deemed crucial that they had access to all of the current information they could get.<sup>18</sup>

There is no need to reduce our anthropological understanding to a single line of analysis. This is not a contest for last theory standing. But in a world where – as Ghosh, Weston and Povinelli eloquently describe – having to bear the brunt of the consequences of human actions is unevenly distributed across humanity, as is the ability for voices to carry that are trying to make sense of those actions, and where – now more than ever – a dominant discourse of man (sic) over (sic) nature (sic) and the political economy it underpins continues in its ascendancy even as it is contested on multiple fronts, we hope that the thoughtful discussions contained in this volume have the power to animate further explorations into the implications of risky Arctic Futures for Circumpolar residents as well as for others who take climate change seriously.

## The Order of Chapters

As already mentioned, we have chosen to zoom in on specific issues that we feel inform the volume as a whole rather than undertaking a comprehensive literature overview. This has included a detailed discussion of animacy/intimacy as a key idea complex for taking indigenous voices into account; a conversation about the politics of environmental knowledge and voice; and finally, a discussion of risk as multi-faceted. These encompass two broad issues: a) the importance of recognizing the presence as well as the potential of non-human-centric cosmological models; and b) how ‘precarity’ is experienced, communicated and acted upon. Both threads have been the subject of considerable discussion. We hope that the observations and insights in the chapters to come can open these discussions still further.



In Chapter 1, our attention is turned specifically to the Arctic, challenging the (still prevalent) fallacy that the Arctic – like the Antarctic – is barren, empty space and bringing our attention to the lived [lives= as= lived] of the peoples who have been occupying the Circumpolar region for millennia. In particular, we bring the geo-political and the cosmological into mutual view; we revisit the notion of the Anthropocene that has the capacity not only to revolutionize disciplinary boundary thinking, but also to homogenize ‘anthro’ to the detriment of non-mainstream peoples the world over. Finally, we suggest ‘cryocide’ as a term to describe the processes currently being experienced by peoples who inhabit ice-dependent landscapes.

Chapters 2, 3 and 4 provide ethnographic descriptions of those lived lives. In every account, unfolding events produce spiritual, cognitive and pragmatic disruptions. The sense of precarity that emerges from these multiple processes is equally complex and intertwined. By offering these narratives, we are not engaging in an exercise in homogenization. Eveny reindeer herders, Iñupiaq whalers and young Yupiit are not experiencing exactly the same unpredictability; nor are the resources and responsibilities which shape their responses the same. Nonetheless, we urge readers to recognize the importance of hearing non humano-centric world views across these chapters and to be aware that those senses of being in the world contribute to people’s experiences of their homelands as zones of precarity that is as social and political as it is climatological.

In Chapter 2, Ulturgasheva provides a detailed account of recent Eveny reindeer herders’ experiences with the violent and unpredictable ways in which extreme events are now a constant in their environment. The consequences of these include the appearance of ‘rogue bears’ fleeing forest fires from elsewhere who, it seems, do not understand the social contract between bears and humans; and it includes the unpredictable behaviour of the land/ice/riverscapes themselves. She explores some of the ways in which these reindeer herders understand such events and details the modes through which Eveny develop responsive strategies to them. This includes collaborative relations with Russian permafrost scientists who admitted to Ulturgasheva that they would have been unable to carry out their research without Eveny help. This first ethnographic chapter, then, reveals the importance of recognizing multiple modes of knowing that are neither centred on humans, nor pit ‘science’ and ‘non-science’ against each other. The politics of climate change in this instance emerge largely in the absence of a state that has retreated since the collapse of the Soviet Union, leaving Eveny for the most part on their

own. Eveny do not assume that there is a single source of expertise and, in the face of precarious uncertainty, draw on all the sources at their disposal: their own observational skills, shamanic ritual practices, the mobilization of collective responsibility and a readiness to consult with scientists. The ‘constellations of risk’ put forward by Michael Bravo are met with constellations of responses. This is a story of adaptation and resilience, but it is not a story with a happy ending. None of the chapters in the volume are. The precarity is keenly felt; the uncertainty produces profound anxiety. But that leads neither to paralysis, dependency or inaction.

If Chapter 2 gives readers a view of collective action in the face of challenge, Chapter 3 brings internal political discord onto centre stage. Here Edwardson (an Inupiaq oral historian) explores in evocative detail how she has come to learn what it means to be in the world as an Inupiaq woman. In doing so, she provides a powerful, historicized account of tensions between what she identifies as the short-term and siloed thinking that Iñupiat have been subject to since the earliest arrival of commercial whalers and the more long-term, holistic world view that valorizes the moral imperative to protect the habitat of the whales on whom Iñupiaq communities depend. Like Eveny reindeer herders, Iñupiaq whalers are confronting uncertain and precarious changes in their marine environment which have profound implications for the moral, social relations Inupiat maintain with bowhead whales and other animals. At the same time, however, the North Slope of Alaska is oil rich and Iñupiat have struggled for decades to balance a determination to protect their habitat and to participate in the oil driven economy. In this instance, to echo Douglas and Wildavsky, what gets factored in and factored out is a matter of moral struggle by Iñupiat themselves. This has only been exacerbated by the increasingly intense complications that climate change introduces.

By the end of Chapter 3, then, we have already confronted a number of challenges to conventional depictions of Arctic socialities: that it is ‘empty space’; that unbridgeable gulfs characterize ‘traditional/scientific’ divides; and that it is possible to talk about a unified indigenous view. The complexity of competing interests and the tensions it introduces into young people’s lives – as well as the difficulties these youth find in bringing their experiences to articulation – is the subject of Stacy Rasmus’s account in Chapter 4. Working in Yup’ik villages in southwestern Alaska, Rasmus has heard for years about the need to be able ‘to weather the storms’ – of unpredictable weather, intractable government authorities, and confusing social and economic messaging – particularly as these contribute to the risk of suicide amongst

Yup'ik young people. The Yup'ik universe, suggests Rasmus, is contracting and expanding at the same time. Here the gap is less about differences in opinion about future goals and more between generations who are hearing different things. In the face of less than effective One Health initiatives (which propose inclusion but are, in fact, imposed), one Elder told Rasmus, 'the weather is changing with the people'; the tides are no longer predictable and you need to be willing to wait them out – just as you need to wait out the emotional storms that have engulfed so many young people's minds – you need to wait until they are willing 'to open up their minds'. If one of our through lines has been about voice, this chapter importantly is about listening.

How people articulate what they know and how they negotiate discussions of response are issues that thread their way through these first chapters, but in Chapter 5 Candis Callison place 'voice' in the centre of the frame. In her chapter, Callison (a member of the Tłá'tán people of British Columbia and media scholar) provides a forensic analysis of erasure as she offers a telling critique of media coverage of COP21. Here she details a growing absence of the Arctic as a space, or of Arctic residents who have expert knowledge of their places in the public media accounts covering the event. There were many indigenous participants at the Paris COP21 meetings (see, e.g., Fraser, forthcoming). Nevertheless, as Callison illustrates in great detail, the slight presence of 'the Arctic' and its residents that appeared at the outset of the conference simply slowly but steadily disappeared. It is not that Circumpolar peoples were prevented from attending the conference, but that their presence simply became a non-event. Their very considerable knowledge of a region that is one of the most rapidly changing in the world due to environmental shifts was not thought to be part of the overall conversation.

In Chapter 6, Hildegard Diemberger and Astrid Hovden return to the question of connections rather than the suppression or inclusion of voice. As with the first three ethnographic examples, the Tibetan nomads with whom Diemberger and Hovden work inhabit an animated landscape which residents engage with spiritually and practically. Like their Arctic counterparts they are ice-dependent – in this case on that of glaciers. As with Iñupiat and Eveny, they are keen observers of the world around them and interpret what they see according to a world view that does not place them at the centre of it. With these similarities in mind Diemberger and Hovden propose an inclusive view of new spaces and new connections. Here they champion the idea that reformulating our categories from 'the Arctic' to 'the cryosphere' allows us to think together the challenges faced by peoples

living at high latitudes alongside those living in high altitudes. That, in fact, forms one basis to our question in Chapter 1 about whether we are now being confronted with what can only be termed ‘cryocide’.

Finally, in Chapter 7, through her examination of strategic decisions made in the face of uncertain whaling conditions Bodenhorn returns to the idea that ‘risk’ in the Arctic is a highly complex set of phenomena which include physical, social, cosmological, political and economic elements. Thus, she brings the discussion back to Bravo’s characterization of the volume as a depiction of constellations of risks.

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## Notes

1. The title of the workshop was ‘Northern Futures? Climate, Geopolitics and Local Realities’. We had originally proposed ‘Arctic Futures?’ as the title to the present volume and indeed it remains a central focus to the work as a whole. However, during the time it has taken to finalize this book, a number of other publications have appeared with almost identical titles, hence our shift to the notion of ‘Risky Futures’.
2. Povinelli notes, for instance, that in Australia, ‘traditional knowledge’ can be put forward as evidence for continual historical presence in land claims

Risky Futures

Climate, Geopolitics and Local Realities in the Uncertain Circumpolar North

Edited by Olga Ulturgasheva and Barbara Bodenhorn

<https://www.berghahnbooks.com/title/UlturgashevaRisky>

Not for Resale.

- cases, but is not accepted in court as an explanation/analysis of current geopolitical/physical processes (2016: 103ff).
3. This list could be vast, but see, for instance, Jamail (2019); Klare (2019); or Rush's first-person accounts of environmentally extreme events that affect coastal erosion (2018).
  4. Bodenhorn, however, is minded of conversations with Robert Suydam, an Arctic ecologist working in Utqiagvik who is explicit that it is the non-biological (soil, topography, weather, latitude) that determines what forms the biological can take (personal communication, July 2006).
  5. This discussion is primarily a compression of chapter four, 'The Normativity of Creeks' (2016).
  6. We recommend the PBS (2013) documentary, 'What Plants Talk About', for an exploration of communication in the absence of any sort of central organizing nervous system.
  7. 24 October 2011, Mochizuki's blog Fukushima Diary, <http://fukushima-diary.com>. Accessed by Weston on 3 May 2016.
  8. McKay was in fact recognized as an accomplished public speaker.
  9. We are not staking claims to a unified cosmology here; Bodenhorn also read in Brower's late nineteenth century diaries that he had paid shamans to arrange the right kind of weather for him to go out on the ocean.
  10. See also Hess 1999.
  11. This might seem self-evident to any biochemist aware of the constant swirling of microbes and other things that make up a human being, but it goes counter to basic anthropological assumptions of bodies as discrete entities. Helmreich (2009), Latour (1993) and Weston (2017), all from Science and Technology Studies, have (amongst others) explored such issues for some time.
  12. See, e.g., Johnstone-Brydan 1995, Fox 1999, for analysis.
  13. See also Douglas 1985, 1992.
  14. The literature is substantial, but see, e.g., Hertz and Thomas 1983; Frankenfeld 1992; Johnstone-Brydan 1995; Wells 1996; see also Douglas 1985, which critically reviews some of the earlier scientific literature. See Wynne 1994, Wynne 1996: 77 and Gieryn 1999 for analyses of the 'expert'/'lay' divide.
  15. Indeed, an NSF organized 'Human impact of global warming in the Arctic' conference held in Fairbanks in 1997 allowed a small number of social scientists to participate after considerable local academic protest that to hold such a conference without the inclusion of people who worked with people would be foolish. To be fair, the NSF has supported qualitative and descriptive anthropological research as well as quantitative and predictive work. As a first-time participant in what was predominantly a hard science conference, Bodenhorn was surprised by the degree to which the daily summing up sessions invariably presented the day's workshops in terms of agreed upon results. In classic Latourian fashion, dissent and uncertainty – much in evidence during the discussions – seemed to be almost entirely eclipsed.
  16. Utqiagvingmiut (people of Utqiagvik, or Barrow) have a long history of working with scientists (see Brewster 2004); in 'Meeting Minds, Encountering Worlds (Bodenhorn 2013), I review three multi-year research projects in

- Barrow, two of which had been initiated by Inupiat and a third which was actively supported by UIC, the village corporation. See also Konrad 2013, amongst others.
17. Senate bill 2299, passed 6 August 2020. <https://www.congress.gov/bill/116th-congress/senate-bill/2299>; see also Brown 2020 for a fuller discussion of the background of this bill.
  18. This was the subject of considerable discussion at a conference on Indigenous environmental knowledge held in Princeton in December 2018, organized by Candis Callison.

## References

- Attungana, Patrick. 1988. 'Address to the Alaskan Eskimo Whaling Commission', *The Open Lead* (1)2: 16ff, trans. James Nageak.
- Beck, Ulrich. 1992. *Risk Society*, London: Sage.
- . 1996. 'Risk Society and the Provident State', in S. Lash, B. Szerszynski and B. Wynne (eds), *Risk, Environment and Modernity: Towards a New Ecology*. London: Sage.
- Beck, Ulrich, Anthony Giddens and Scott Lash (eds). 1994. *Reflexive Modernization*. Cambridge: Polity.
- Bodenhorn, Barbara. 1988. 'Whales, Souls, Children and Other Things That Are Good to Share: Core Metaphors in a Contemporary Hunting Society', *Cambridge Anthropology* 13(1): 1–19.
- . 1994. 'Las ballenas y los Inuit', *El Mar* (volume theme). *SacBé* 1(1): 7–11.
- . 2003. 'Strategic Decision Making on the North Slope of Alaska', in A.P. McCartney (ed.), *Indigenous Ways to the Present: Native Whaling in the Western Arctic*. Edmonton: Canadian Circumpolar Institute Press; Salt Lake City: University of Utah.
- . 2013. 'Meeting Minds; Encountering Worlds: Science and Other Expertises on the North Slope of Alaska', in Monica Konrad (ed.), *Collaborators Collaborating*. Oxford: Berghahn.
- Brewster, Karen. 2004. *The Whales, They Give Themselves: Conversations with Harry Brower, Sr.* Fairbanks: University of Alaska Press.
- British Medical Association. 1987. *Living with Risk*. Chichester: John Wiley.
- Brower, Charles, Sr. Diaries. multiyear diaries extended from the mid 1880s through to the early nineteenth century. Archived at the Rasmussen Library, University of Alaska, Fairbanks.
- Brown, Alleen. 2020. 'Trump Administration Asks Congress to Make Disrupting Pipeline Construction a Crime Punishable by 20 Years in Prison', *The Intercept*. Retrieved April 2021 from <https://theintercept.com/2019/06/05/pipeline-protests-proposed-legislation-phmsa-alec/>.
- Burchell, Graham, Colin Gordon and Peter Miller (eds). 1991. *The Foucault Effect: Studies in Governmentality*. Chicago: University of Chicago Press.
- Castel, Robert. 1991. 'From Dangerous to Risk', in G. Burchell, C. Gordon and P. Miller (eds), *The Foucault Effect: Studies in Governmentality*. Chicago: University of Chicago Press, pp. 281–98.

- Chakrabarty, Dipesh. 2009. 'The Climate of History: Four Theses', *Critical Inquiry* 35: 197–222.
- Crook, Stephen. 1999. 'Ordering Risks', in D. Lupton (ed.), *Risk and Sociocultural Theory*, Cambridge: Cambridge University Press, pp. 160–85.
- Douglas, Mary. 1985. *Risk Acceptability According to the Social Sciences*. New York: Russell Sage Foundation.
- . 1992. *Risk and Blame: Essays in Cultural Theory*. London: Routledge.
- Douglas, Mary and Aaron Wildavsky. 1982. *Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers*. Berkeley: University of California Press.
- Fabian, Johannes. 1983. *Time and the Other: How Anthropology Makes its Object*. New York: Columbia University Press.
- Foucault, Michel. 1991. 'Governmentality', in Graham Burchell, Collin Gordon and Peter Millers (eds), *The Foucault Effect: Studies in Governmentality with Two Lectures by and an Interview with Michel Foucault*. Chicago: University of Chicago Press.
- Fox, Nick. 1999. 'Postmodern Reflections on "Risk", "Hazards" and Life Choices', in D. Lupton (ed.), *Risk and Sociocultural Theory*. Cambridge: Cambridge University Press, pp. 12–33.
- Frankenfeld, Philip. 1992. 'Technological Citizenship: A Normative Framework for Risk Studies', *Science, Technology and Human Values* 17: 459–84.
- Fraser, Richard. (forthcoming). 'After Paris: An Ethnographic Eye on COP21 and Beyond', in B. Bodenhorn (ed.), *In the Name of Climate Change: On the Politics and Pragmatics of Environmental Knowledge*. Oxford: Berghahn.
- Gaul, Gilbert. 2017. *The Geography of Risk: Epic Storms, Rising Seas, and the Cost of America's Coasts*. New York: Macmillan.
- Ghosh, Amitav. 2016. *The Great Derangement: Climate change and the Unthinkable*. Chicago: Chicago University Press.
- Gieryn, Thomas. 1999. *Cultural Boundaries of Science: Credibility on the Line*. Chicago: University of Chicago Press.
- Giddens, Anthony. 1990. *The Consequences of Modernity*. Cambridge: Polity Press.
- . 1994. 'Living in a Post-Traditional Society', in U. Beck, A. Giddens and S. Lash (eds), *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order*. Cambridge: Polity Press, pp. 56–109.
- Helmreich, Stefan. 2009. *Alien Ocean: Anthropological Voyages in Microbial Seas*. Berkeley: University of California Press.
- Hertz, David and Howard Thomas. 1983. *Risk Analysis and its Applications*. Chichester: Wiley.
- Hess, Bill. 1999. *Gift of the Whale: The Inupiat Bowhead Hunt, a Sacred Tradition*. Seattle, Washington: Sasquatch Books.
- Hulme, Mike. 2009. *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*. Cambridge: Cambridge University Press.
- Jamail, Dahr. 2019. *End of Ice: Bearing Witness and Finding Meaning in the Path of Climate Disruption*. New York: The New Press.
- Johnstone-Brydan, Ian. 1995. *Managing Risk*. Aldershot: Avebury.

- Kimmerer, Robin Wall. 2013. *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Things Plants Have to Teach Us*. Minneapolis: Milkweed Press.
- Klare, Michael. 2019. *All Hell Breaking Loose: The Pentagon's Perspective on Climate Change*. New York: Metropolitan Books, Henry Holt and Company.
- Lash, Scott, Bronislaw Szerszynski and Brian Wynne (eds). 1996. *Risk, Environment and Modernity: Towards a New Ecology*. London: Sage Publications.
- Latour, Bruno. 1993. *We Have Never Been Modern*. Translated by C. Porter. Cambridge, MA: Harvard University Press.
- Lupton, Deborah (ed.). 1999. *Risk and Sociocultural Theory: New Directions and Perspectives*. Cambridge: Cambridge University Press.
- Merchants of Doubt*. 2014. A documentary directed by Robert Kenner and produced by Participant. Release date 14 December 2014.
- Mochizuki, Iori. 2011. *Blog. Fukushima diary*, <http://fukushima-diary.com>. Accessed by Weston 3 May 2016.
- Oreskes, Naomi and Erik Conway. 2010. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth from Tobacco Smoke to Global Warming*. London: Bloomsbury Press.
- Povinelli, Elizabeth. 2016. *Geontologies: A Requiem to Late Liberalism*. Durham and London: Duke University Press.
- Richardson, Katherine, Will Steffen and Diana Liverman. 2011. *Climate Change: Global Risks, Challenges and Decisions*. Cambridge: Cambridge University Press.
- Rush, Elizabeth. 2018. *Rising: Dispatches from the New American Shore*. Minneapolis: Milkweed Editions.
- Samimian-Darash, Limor and Paul Rabinow. 2015. *Modes of Uncertainty: Anthropological Cases*. Chicago: University of Chicago Press.
- Sarris, Greg. 1992. "What I'm Talking about When I Talk about My Baskets": A Conversation with Mabel McKay', in S. Smith and J. Watson (eds), *De/colonizing the Subject: The Power of Gender in Women's Autobiography*. Minneapolis: University of Minnesota Press, pp. 20–33.
- Simmard, Suzanne. 2021. *Finding the Mother Tree: Discovering the Wisdom of the Forest*. New York: Penguin/Random House.
- Slovic, Paul (ed.). 2010. *The Feeling of Risk: New Perspectives on Risk Perception*. New York: Earthscan Books.
- Sneath, David (ed.). 2013. 'Seeing Environmental Process in Time: Questions of Evidence and Agency', *Cambridge Anthropology*, Special Issue, 31(1).
- Trahant, Mark. 2021. *Indian Country Today*. Retrieved April 2021 from Digital Native American news journal, <https://indiancountrytoday.com/>
- Valkenburg, Govert. 2012. 'Sustainable Technological Citizenship', *European Journal of Social Theory* 15(4): 471–87.
- Wells, Geoff. 1996. *Hazard Identification and Risk Assessment*. Rugby: Institute of Chemical Engineers.
- Weston, Kath. 2017. *Animate Planet: Making Visceral Sense of Living in a High-Tech Ecologically Damaged World*. Durham and London: Duke University Press.



- Wynne, Brian 1992 Misunderstood Misunderstanding. Social Identities and Public Uptake of Science. In. Public Understanding of Science 1 (3) <https://doi.org/10.1088/0963-6625/1/3/004>.
- . 1996. 'May the Sheep Safely Graze? A Reflexive View of the Expert-Lay Knowledge Divide', in S. Lash, B. Szerszynski and B. Wynne (eds), *Risk, Environment and Modernity: Towards a New Ecology*. London: Sage Publications, pp. 44–83.