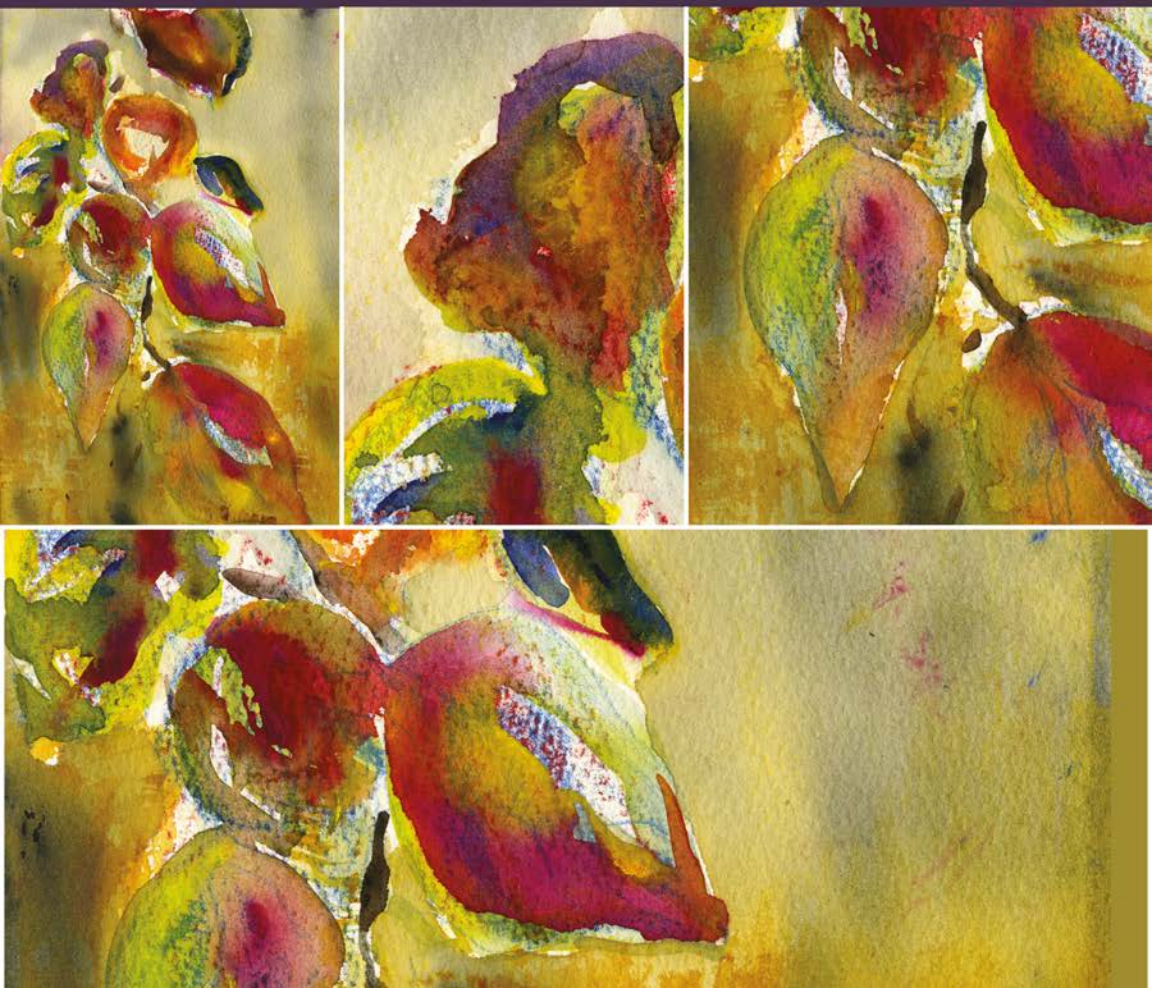


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# Methodological Challenges in Nature-Culture and Environmental History Research

Edited by Jocelyn Thorpe, Stephanie Rutherford and L. Anders Sandberg



# Methodological Challenges in Nature-Culture and Environmental History Research

This book examines the challenges and possibilities of conducting cultural environmental history research today. Disciplinary commitments certainly influence the questions scholars ask and the ways they seek out answers, but some methodological challenges go beyond the boundaries of any one discipline. The book examines: how to account for the fact that humans are not the only actors in history yet dominate archival records; how to attend to the non-visual senses when traditional sources offer only a two-dimensional, non-sensory version of the past; how to decolonize research in and beyond the archives; and how best to use sources and means of communication made available in the digital age.

This book will be a valuable resource for those interested in environmental history and politics, sustainable development and historical geography.

**Jocelyn Thorpe** is Associate Professor of the Women's and Gender Studies Program at the University of Manitoba, Canada. Her interdisciplinary research focuses on the history and legacies of, as well as challenges to, colonialism in the Canadian context, examining how past discourses and relationships of power influence the present.

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**L. Anders Sandberg** is Professor of Environmental Studies at York University, Canada. His two most recent books are the co-edited *Urban Forests, Trees, and Greenspace: A Political Ecology Perspective* (Routledge 2014) and *Post-Industrial Urban Greenspace: An Environmental Justice Perspective* (Routledge 2015).

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Edited by Jocelyn Thorpe, Stephanie  
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“The book opens up a world of possibilities. Contributors invite us to rethink established modes of academic production, to decolonize our methodological inheritances, to find ways to understand and trace nonhuman actors as well as engage with the full palette of human sensory perception. Doing research requires us to take chances and to put ourselves out there – this collection does that and more.” — **Steven High, Concordia University, Canada**

“Thorpe, Rutherford and Sandberg have brought together a team of brave and gifted interdisciplinary scholars, who assiduously and judiciously scrutinize the generative intersections amongst place, body, mind and spirit. The contributors provide effective commentaries on the methodological challenges faced by scholars looking for voices beyond conventional texts and archives, and give me hope that navigating such methodological challenges will yield fresh, elegant and generative results.” — **Joy Parr, University of Western Ontario, Canada**



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**Bawaka Country**, including **Laklak Burarrwanga, Ritjili Ganambarr, Merrkiyawuy Ganambarr-Stubbs, Banbapuy Ganambarr, Djawundil Maymuru, Sarah Wright, Sandie Suchet-Pearson, Kate Lloyd and Jill Sweeney**, are an Indigenous and non-Indigenous research collective. They are four sisters, elders and caretakers for Bawaka Country in northeast Arnhem Land, and their daughter, Djawundil. They are also three non-Indigenous academics, Sarah, Sandie and Kate from Newcastle and Macquarie universities, who have been adopted into the family as granddaughter, sister and daughter. Non-Indigenous academic Jill is a human geographer who has supported the collaboration's work, contributing valuable insights into the theoretical literature. Bawaka Country refers to the diverse land, water, human and nonhuman animals (including the human authors of this paper), plants, rocks, thoughts and songs that make up their Indigenous homeland of Bawaka. Theirs is a story of lives entwined and of new places of being and belonging. It is also a collaborative narrative of unexpected transformations, embedded families and the spirituality and agency of nonhuman elements in and of the landscape. The group members have worked together as a research collective since 2006, and have written two books and several academic and popular articles together.

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interdisciplinary journals such as *Soundings* and in environmental journals such as *Worldviews* and the *Journal for the Study of Religion, Nature, and Culture*. Her work also appears in prominent guides to the field such as *The Blackwell Companion to Science and Christianity* and the *Oxford Handbook of Religion and Ecology*. Sideris serves as Associate Editor of the *Journal for the Study of Religion, Nature, and Culture*. Her current research interests include the emergence of Anthropocene narratives, and the role of wonder in environmental discourse and scientific discourse.

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**Martha Stiegman** is a scholar and documentary filmmaker currently based in Toronto, where she is an Assistant Professor at York University's Faculty of Environmental Studies. Her work has screened in festivals around the world from Tunisia and New Zealand to Brazil. Her first two documentaries, *In Defense of our Treaties* (2007) and *The End of the Line* (2007) explore alliances between Mi'kmaq and non-Native fishing communities in her home province of Nova Scotia. *Honour Your Word* (2013) is an intimate, behind the blockades portrait of the Algonquins of Barriere Lake and their decades-long fight to defend their territory. *Seeking Netukulimk* (2013) is a lyrical exploration of the traditional laws that govern fishing for Mi'kmaq people. Underlying Stiegman's filmmaking and scholarship is a commitment to collaboration and social justice. Indigenous self-determination struggles and settler solidarities have been the focus of Martha's film work, community-arts practice and academic research for more than ten years.

**Jesse Thistle** is Métis-Cree from Saskatchewan and a master's student in history at the University of Waterloo. His work centres on trauma and memory within populations of Métis and Cree in Northern Saskatchewan, and the Algonquin of Timiskaming, Ontario. Specifically, he looks at how history can be applied to understand the effects of intergenerational trauma in contemporary Indigenous populations. His work is directed towards community healing and cultural reclamation as well as retrieval of oral history archives –

termed as *truth-telling* as defined by the Truth and Reconciliation Commission – challenging orthodox settler histories in the narrative of Turtle Island. Jesse is also interested in how the arts – film, writing, dance, painting and illustration – can be used as a mode of resistance, cultural revitalization, and land reclamation among Indigenous peoples.

**Jocelyn Thorpe** is Associate Professor of Women's and Gender Studies at the University of Manitoba in Winnipeg, Canada. Her interdisciplinary research focuses on the history and legacies of, as well as challenges to, colonialism in the Canadian context, examining how past discourses and relationships of power influence the present. With Innu artist Joanna Barker, she is currently working on a five-year project about the history of relationships among Indigenous and non-Indigenous Newfoundlanders and the territory they have come to share. She is the author of *Temagami's Tangled Wild: Race, Gender, and the Making of Canadian Nature* (UBC Press, 2012).

**Marsha Weisiger** is the Julie and Rocky Dixon Chair of U.S. Western History and Associate Professor of History and Environmental Studies at the University of Oregon. She is the author of *Dreaming of Sheep in Navajo Country* (University of Washington Press, 2009) and *Land of Plenty: Oklahomans in the Cotton Fields of Arizona, 1933–1942* (University of Oklahoma Press, 1995) and the principal author of *Buildings of Wisconsin* (University of Virginia Press, forthcoming 2016). Her work has won the Carol and Norris Hundley Award and the Hal Rothman Book Award, among others, as well as fellowships from the National Endowment for the Humanities and the American Council of Learned Societies. She is currently working on three book projects, *The River Runs Wild*, *Danger River*, and *Ecotopia Rising*, the third of which explores the significance of the counterculture, including artists, to the environmental movement.

**Nina Wormbs** has an MSc in Engineering Physics, a PhD in History of Technology, and is Associate Professor of History of Science and Technology in the Division of History of Science, Technology and Environment, KTH Royal Institute of Technology, Stockholm. From 2010 to 2016, she served as chair of said Division. Nina has written mainly on the media and technological change during the 20th century with a focus on infrastructure and politics. She takes special interest in ideas about what technology can achieve, not the least digital technology. Recent publications include the co-edited volume *Media and the Politics of Arctic Climate Change: When the Ice Breaks* (Palgrave 2013). Together with Sabine Höhler, she is running a research project named "Views from a distance", which investigates how remote sensing and digital data construct the environment.

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# 1 Introduction

## Methodological challenges

*Stephanie Rutherford, Jocelyn Thorpe and  
L. Anders Sandberg*

This collection of essays started life as a round table on research methods at the World Congress of Environmental History in Guimarães, Portugal, in the summer of 2014. We, the editors of this volume, asked round-table participants to reflect on their research methods that take them outside of archives, as well as on how they communicate that research beyond scholarly books and articles. While archives can be valuable sources of information about the past, there is also a lot they do not tell us, particularly if we are trying to understand the past of other-than-human beings and/or of human beings whose perspectives are difficult to find in stored files. Like the archives, scholarly ways of communicating can obfuscate as well as illuminate, for example by using words such as obfuscate instead of perfectly acceptable alternatives such as confuse.

Much to our surprise, given the warm weather and stunning beauty of our mountainous surroundings, conference attendees packed the room for the round table, making possible and contributing to a rich discussion about the challenges and possibilities of conducting and communicating research on the history of relationships between humans and the rest of the world. Scholars from a diversity of disciplines and inter-disciplines attended the conference, some of them hailing from history and geography departments and conducting their research under the respective banners of environmental history and historical geography. Others work in anthropology, English, and interdisciplinary departments and programmes such as Indigenous studies, cultural studies, environmental studies, gender studies, and science and technology studies. The level of interest in the round table led us to consider the importance of making space and time at conferences to share ideas about the common elements of our work—the *how* of research and teaching—as well about our more individual research interests and projects. It also motivated us to continue and expand the conversation in book form.

Despite their varied intellectual traditions, researchers who seek to comprehend the histories of relationships between humans and the more-than-human world take as a starting point that key to understanding the past is paying attention to how humans shaped and were shaped by the world in which they lived. Disciplinary commitments certainly influence the questions scholars ask and the ways they seek out answers, but some methodological challenges go beyond the

boundaries of any one discipline. In this collection, we grapple with such methodological challenges by bringing to bear the insights of a number of scholars working in different geographical and disciplinary areas on questions related to nature, culture and history.

The methodological challenges that authors in this collection explore are inspired by the conversations we had at the round table, and do not have easy solutions. Our aim in collecting these stories is to continue the conversation that began for us at the round table in Portugal, but that we know also takes place in supervisors' offices, on walks, and online as we grapple to figure out how to answer the questions we pose in our research and how best to communicate what we find out. While we know that this book represents just one part of this broader conversation and that it does not fully reflect the geographical diversity of our shared world, we hope that it offers a promising continuation of the conversation about the 'how' of our research and communication. We would like to see this conversation continue over the variety of media available to us today, including in scholarly books such as this one.

This book is about the challenges and the possibilities of conducting nature-culture-history research today. The methodological challenges that authors in the collection examine include: how to account for the fact that humans are not the only actors in history, yet they dominate in archival records; how to decolonize research when archival sources and their embedded narratives are both colonial and colonizing; how to attend to the non-visual senses, to materiality and to affect when traditional sources offer only a two-dimensional, non-sensory version of the past; and how effectively to use sources and means of communication made available in the digital age. The book is divided into sections (or 'parts') according to these main challenges, and the chapters within each section consider pieces of the larger methodological challenges addressed within each section. The themes of the sections emerged both from the round table and from abstract proposals submitted by contributors, not all of whom participated in the round table. By emphasizing the research process rather than product, we aim to challenge ourselves and our readers to think creatively and to make use of research tools we might not have considered previously. While the focus on process rather than product sets this collection apart, it is exciting also to think about how different research processes might also lead to innovative research findings and communication strategies. Below, we explain the sections and chapters in further detail.

## **Part I: Nonhuman actors**

In the past 20 years, the 'question of the animal' and discussions about the agency of the more-than-human world have gained currency. Environmental historians, animal geographers, scholars of posthumanism, anthropologists, sociologists, and literary theorists have produced a range of studies that consider the nonhuman not simply as fodder in the human story of change over time, but as agents that shape the course of history (see, for example, Coleman 2004; Fudge 2006;

Haraway 2007; Wolfe 2003). This kind of research can offer particularly nuanced ways of apprehending the world. As geographers Stephen Hinchliffe and Nick Bingham note, 'All kinds of things become more interesting once we stop assuming that "we" are the only place to begin and end our analysis' (2008: 1541). Including the nonhuman in conversations about historical and landscape change offers the opportunity not only to understand the past in a more holistic way, but also to begin to encounter with fresh eyes the variety of environmental problems we now face.

This kind of research, however, remains fraught with methodological dilemmas. The most central among them is how to understand and trace the histories and contemporary realities of beings whose patterns of communication, movements, and life-worlds are often outside of human comprehension. How do we come to know animals, trees and glaciers as agents in historical change if the only record we use to understand them is that made by humans? The chapters in this section engage with these questions, and, in so doing, offer students and practitioners concerned with the roles in history played by nonhuman actors tools with which to conduct research.

The first two contributions in this section consider landscapes—often imagined as passive terrains to be written upon—as agents that shape relationships in the more-than-human world. This section opens with a chapter by Sverker Sörlin that considers glaciers as protagonists in global environmental change. Working against the grain of scientific knowledge, Sörlin suggests that we pay attention to the ways that glaciers act as local 'truth-spots': sites where climate change is made manifest. Drawing together cultural representations of glaciers, Sörlin contends that glaciers give us a visual and conceptual language to apprehend our changing environment. In the next chapter, Martha Weisiger takes the reader on a journey to another iconic landscape: the American West. Accessing methodological questions through the lens of art, Weisiger offers an analysis of what we can learn about environmental history by walking the land, including through landscapes shaped by Earth art. The following two chapters consider how animals might be written into environmental histories and nature-culture research, and what methodological challenges and opportunities this might pose. Stephanie Rutherford attends to how sound might be an entry point into histories of the animal, exploring how the howl of the wolf has been recognized (and misrecognized) through time in Canada. Rutherford suggests that paying attention to sound offers a way to understand the affective registers wolves have induced, especially in settler Canadians, while offering new insights into human-nonhuman relationality. Moving from Canada to China, Michael Hathaway contends that changing conceptions of agency can open up data (gained through interviews, participant observation, and oral histories) to new interpretations, and queries the uses and limits of using conventionally generated scientific information to enrich our writings about animal histories. The final chapter in this section considers neither landscapes nor animals, but weather. Roger Owen's contribution traces the history of a dance-theatre work that illuminated a political act of Welsh nationalism set within the context of, and indeed affected by, a



heavy and prolonged snowfall in the UK. In his description of the event, Owen asserts that theatre practice may effectively combine and collide human and nonhuman actors within a single assembly of action, spectatorship, and objects in space.

## **Part II: Decolonizing research**

The idea that historical documents provide a clear window into the past has long given way, at least in many circles, to the scholarly notion that objectivity is an illusion and truth is an effect of power (Brown and Vibert, 2003, p. xiv; see also Mills, 1997; Smith, 2012). Indeed, anthropologist and historian Ann Laura Stoler (2002) has encouraged students of colonialism to think of archives not simply as sources of information, but as sites of knowledge production that require their users to take seriously the implication of archives in colonial power relations (see also Burton 2005). The relationship between archives and colonialism comes as no surprise to Indigenous scholars, activists, and community members who have consistently critiqued written historical documents for their failure to include Indigenous perspectives (see, for example, Cardinal et al. 2005). The recent Truth and Reconciliation Commission on Indian Residential Schools in Canada makes powerfully clear the disconnect between the written historical record and the experiences lived by people in their communities and in residential schools. It is only through the persistence and courage of residential school Survivors that their stories of a system designed to eradicate their cultures by removing children from communities are becoming part of the mainstream historical record (Truth and Reconciliation Commission of Canada 2012). It is impossible to go to the archives and access an unmediated and unbiased past.

Yet scholars examining historical relationships between ‘nature’ and ‘culture,’ like others interested in understanding and illuminating parts of the past, often find themselves conducting research in colonial archives. Certainly archives can help researchers reveal important (though not apolitical) insights about the past, even as work such as Julie Cruikshank’s (2005) demonstrates the need to conduct research beyond a colonial archival record. In *Do Glaciers Listen?*, she shows how Indigenous oral traditions can offer quite different, though no less true, readings of the past than the written colonial record, and makes clear how colonial power relationships can reappear through the telling of historical stories as though European perspectives are the only ones. Decolonizing nature-culture-history research, then, requires conducting research differently, both at the archives and beyond.

This section opens with a chapter co-written by Bawaka Country, which includes Indigenous and non-Indigenous women from Bawaka, an Indigenous homeland in the north of Australia. Together, the chapter’s authors examine how their research team has grappled with the concept of time in their research, and show how understanding time within Yolŋu ontologies of co-becoming presents unique challenges and possibilities for decolonizing nature-culture-history

research. Next, Lianne C. Leddy examines the possibilities of *dibaajimowinan* (stories) as a method for conducting environmental history research on *Anishinaabe* territory, demonstrating that while oral history research might be 'new' within environmental history, it is anything but new within Indigenous communities. Its centrality to Indigenous ways of knowing, however, does not mean that there exist no challenges to balancing oral histories and archival material as sources of knowledge about the past, and Leddy addresses these challenges as well. In her chapter, Aimée Craft reflects upon the process of coming to learn about *Anishinaabe* water law, describing the research as a practice of learning and growing together. She shows that ceremony and research depend on each other, much as humans depend on and indeed are made of water. In an interview with co-editor Jocelyn Thorpe, Fred Metallic reflects upon decolonizing academic work through language, describing how he conducted his PhD work in Mi'gmaw, including the defence of his dissertation. He also argues that how one does research is at least as important as the outcome of the research. Jocelyn Thorpe's chapter concludes this section with an analysis of what she has learned so far, often from Indigenous scholars and knowledge holders, on her journey toward decolonizing research.

### Part III: Senses and affect

In recent years, an exploration of 'sensory histories,' through attention to sound, smell, taste, touch, vision and movement, has enlarged the possibility of using different sources to piece together an understanding of the past (see, for example, Harvey 2003; Fitzgerald and Petrick 2008; Jay 2011; Parr 2006; Picker 2003). Simultaneous to this embrace of the senses has been what's named 'the affective turn' (Ticento, Clough and Halley 2007). Studies rooted in affect recognize that precognitive, unstructured intensities shape how humans encounter the world on a physiological level. To return to the senses, one might suggest that a foot that unconsciously taps to the beat of a song offers one expression of affective attunement to sound. Scholars of affect suggest that these intensities give feelings strength and resonance. As such, the emphasis on materiality and sensory understandings of the past offer new research horizons in the social sciences and humanities. This attention to senses is a particularly important endeavour when one's study focuses on historical engagements with nature, where so much of what we know is felt rather than seen.

The chapters in this section employ eclectic strategies to access the senses and to consider affect, demonstrating the myriad approaches scholars in nature-culture and environmental history can use to understand human/nonhuman relations through time. Owain Jones and Katherine Jones start off this section emphasizing the affective dimensions of narrative. Drawing on their relationship with tidal landscapes as places, spectacles, experiences, and as manifestations of a living, mobile planet and biosphere, they offer vignettes that attempt to mirror the ebb and flow of the tides themselves to tell the story of environmental change. Ian Mosby offers an examination of the palate, thinking with taste as a

novel access point into environmental history. Mosby explores eating practices through time, using the changing experiences of food's smell, taste and presentation to offer an innovative set of tools for examining the past. From the delight of a tasty meal, we move on to the smell of garbage in Marco Armiero and Salvatore Paolo Da Rosa's exploration of environmental injustice in Naples, Italy. Armiero and Da Rosa use waste, and the smells it produces, as a source of environmental history, exploring the way that perception can lead to new kinds of alliances between activists and scientists in the matter of what gets thrown away. Sonja Boon's chapter turns to movement and embodiment as ways of knowing. Using the minuet, an eighteenth-century dance form, Boon argues that our understanding of the nonhuman environment is shaped by the way that we physically and physiologically move through space, and that such movement is fundamentally gendered and classed. Moving from the scale of the body to the cosmic, Lisa Sideris's chapter takes on Big History, investigating stories such as the 'Epic of Evolution' as the basis for a new metanarrative that inspires wonder and affective connection to Earth. She contends that these stories reveal a phenomenology of human-as-species, offering an intriguing, if problematic, means to craft an environmental cosmopolitanism. This section is rounded out with a chapter by Stephen Bocking on cycling as a novel method in environmental history scholarship. Bocking asserts that the unique vantage point of a bike provides access to sensory histories, enabling one, at least in part, to recapture how people sensed and experienced past environments.

#### **Part IV: Digital research**

The Internet has certainly changed the way people do research, and indeed many forms of work. Digital history has emerged as a sub-discipline ('Interchange' 2008), and the journal *Environmental History* (2014) recently appointed a digital content editor who edits a web-only 'field notes' section that provides insights into the practice of environmental history scholarship. (Its editor is also one of the contributors to this book.) There is a growing number of archival sources that are available on the Internet rather than in the reading rooms of remote archives. The open-access *Programming Historian* (2014) is an online, open-access, peer-reviewed suite of tutorials that assist humanists to learn a wide range of digital tools, techniques, and workflows to facilitate their research and help organize and present their data. Many digital historians are public historians, seeking to reach a wide audience with open-access publications, websites, podcasts, blogs, and tweets. They often use innovative ways to present research material through augmented reality technology, repeat photography, composite imaging, and GIS mapping (Bonnell and Fortin 2014). Yet, in the digital age, researchers are often faced with the dilemma of how to learn technological skills and how to sort through, make sense of, and present the welter of digitized sources and material made available through the click of a button. How do the demands of the digital help and hinder, reveal and obscure, and connect and disconnect the researcher to research matters (Barringer and Wallace 2014)?

Contributors to this section explore specifically the effects of new technologies on research that seeks to understand nature-culture-history relations. Sean Kheraj and Jan Oosthoek trace the history of digital communication and connection for the environmental history community. By looking at email listservs, audio and video podcasts, as well as blogging and micro-blogging, Kheraj and Oosthoek contend that digital technology opens the possibility for truly collaborative research ventures that reach audiences beyond academic ones. Dolly Jørgensen's contribution explores the role blogging can play not only in attracting non-academic audiences to academic work, but also in shaping the research process itself. Crafting her chapter as five pseudo-blog posts, Jørgensen suggests that 'doing historical research in public' has made her a better writer, one more willing to take risks on 'side' stories that have led to robust academic work. Kimberly Coulter and Wilko Graf von Hardenberg pay attention to the building of communities in the digital realm. They argue that the dynamism of environmental history makes it particularly well-suited to digital collaboration and explore examples they contend work to demonstrate a 'spirit of the commons' in digital environmental history. Sabine Höhler and Nina Wormbs look at environmental change from a distance, considering how remote sensing crafts particular kinds of environments through visualization techniques. Their chapter dwells on both the opportunities and challenges of this way of understanding environmental change, grappling with the question of what happens to environmental history if sensory data become the source and digital data management becomes the practice of making sense of the earthly environment. Like Stephen Bocking in the previous section, Finn Arne Jørgensen is concerned with understanding history through mobility. But for Jørgensen, this mobility is accompanied by the digital technology of GPS, allowing him to reflect on the ways technology shapes our encounter of the natural world. The final chapter in this volume also considers movement. L. Anders Sandberg, Martha Stiegman and Jesse Thistle recount the development and expansion of their alternative campus tour at York University in Toronto, Canada, and the way the information generated through this practice has been disseminated online. Sandberg, Stiegman and Thistle suggest that the different elements of this project—walking, telling stories, video-recording, and providing a digital record—disrupt the dominant narrative of Canada as settler nation, highlighting instead the presence and actions of Indigenous peoples.

As a whole, the collection shows that how we do our work matters fundamentally for what kind of work we do. Discussing research practices and processes as well as research products makes possible different ways of doing research, ways that might help us answer the pressing questions of today. We hope that readers' engagement with this book will allow for the continuation of conversations about how to conduct excellent and engaged nature-culture-history research.

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Part I

**Nonhuman actors**





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## 2 Do glaciers speak?

### The political aesthetics of vo/ice

*Sverker Sörlin*

Climate change is a reality, but one that is hard for most of us to sense on an everyday basis. On the timescales of meteorology it may be fast enough; the global average temperature has risen almost one degree Celsius over the last century, which is a drastic leap compared to ordinary Holocene variations. Only a few generations ago, even scientists had a hard time knowing for sure what direction global climate would take. Temperatures were not systematically measured in many places and systematic monitoring and collecting of data didn't exist. Even more importantly, the very concept of climate wasn't a global concept; it was precisely the prevailing atmospheric conditions, including average temperature, that characterized a local place.

That said, ice is a dynamic material and it was obvious to people in many parts of the world that multiyear ice demonstrated changes. When these changes were studied more systematically in the nineteenth century it became clear that glaciers, in most regions from which there were any kinds of records, were retreating. This observation gave impetus to the emerging Ice Age theory that was first proposed in the 1840s by Charpentier and Agassiz. In the coming decades glacial data were registered at an increasing pace all over the world, which corroborated the idea that there was some kind of warming trend affecting the atmosphere. Thus, glaciers came to be regarded as living markers, or signals, of changes that were otherwise extremely hard to anchor in data. Strangely perhaps, the theory of global warming based on increased levels of carbon dioxide in the atmosphere was known before there was any commonly acknowledged record of rising temperatures.

Glaciers thus played an important role in nineteenth-century climatology, as a marker of climate change. Through their specific properties of slow melting—with a negative mass balance—during low precipitation and warm years, and slow growth—with a positive mass balance—during cold years, glaciers had what we might call 'voice'. They spoke, albeit in a soft voice and with a language that required patience in the listener. It also required a presence in the field to hear that signal. Glaciers, even small ones, are massive formations. They move slowly, too slowly for any of our senses to capture. They melt very slowly vertically but at their end down a slope or in a valley they can lose meters or dozens of meters in one year. Still, in order to secure a trend you need many years of observation. The voice of glaciers is special.

The fact that anthropogenic climate change is now well-established must not permit us to forget that for a long time that was a claim that was controversial, or, before the 1950s, hardly even taken seriously. That glacial retreat was documented in the nineteenth century and was the object of systematic, comparative study around the world in the first half of the twentieth, of course says nothing about the causes for their retreat. But for anyone who wished to create an argument about climate change, regardless of its cause, the performance of glaciers became of critical importance. They acquired a role as indicators of climate change. By their numbers, size and sheer mass and, perhaps most importantly, their climate response on the directly observable timescale, this role was different from other indicators such as tree rings or layered clay. Here was an element, with local presence in mountains and Alps across the northern hemisphere and in certain locations in the southern hemisphere as well, that served as a global demonstration of a change that was otherwise not visible, not even with the most sophisticated instruments, until far later, when sediments or wooden data could be analyzed.

Yet another step was taken when *anthropogenic* climate change became more widely acknowledged in the final decades of the twentieth century. Then the retreating glaciers, and perhaps especially the melting Greenland ice cap, became sites to go to for tangible evidence of climate change. Almost like holy sites of the tragedy of human-nature relationships, glaciers now performed a role as ‘truth-spots’ (Gieryn 2002 & 2006), shedding any possibly remaining doubt on whether climate change is real. Thus glaciers have come to serve the role of major protagonists in stories about the human predicament, serving increasingly important political purposes.

### Narratives, iconographies—and sites

What can a historian make of this slow performativity of a medium whose properties and behavior have, after all, mostly attracted scientists? More than you might think. Once you get a little deeper into the history of glaciers and glaciology in the wider science politics of climate change, you are made aware that this performativity—this slow, soft voice of glaciers—is always at the core of the attention. The distinctness of their retreat (or growth) is attractive and calls for measurement and long-term monitoring. But at the same time, what does the melting at the glacial ends really tell about the loss of mass? The relationship between changes in climate and the behavior of glaciers is diffuse and precision therefore hard to attain. These are obsessions in the history of glaciology: the quest for precision (how much exactly does the glacier shrink or grow?) and the quest for explanation (why does it shrink/grow?). The glacier itself is never the same object. It always moves: it grows and shrinks seasonally, it has good years and bad years. It was at an early stage described as an ‘economy’ with a ‘budget’. The ‘budgetary balance’ of glaciers was a way of talking about ice as if it was a matter of money in an account. Some years were spending years, and others were saving years.