

Reorienting World Environmental History: Pedagogy and Scholarship on Cold Places (REVISED)

Pey-Yi Chu and Andrew Stuhl

The crackle of the fire was not simply a backdrop. When the temperatures dropped to single digits, and we arrived at the heart of Jack London's 'To Build a Fire', we also found ourselves at a uniquely teachable moment. Huddled around dancing flames, a dozen advanced undergraduates from various majors considered how the cold has shaped human experiences. We talked of hubris, of exploration, and of technology while feeling the delicate threshold separating comfort from frostbite.¹ It was a Saturday night in the winter of 2014, and our classroom was the snowy bank of Buffalo Creek, a few miles from Bucknell University in central Pennsylvania. This moment of deconstructing London's essay was a microcosm of the semester itself. That is, to understand life in the cold is to gain a new, lasting respect for the interaction of human and more-than-human processes.

Two years earlier, and more than two thousand miles to the west, students at Pomona College explored the cold in a patch of converted inland California desert. As a capstone experience for an interdisciplinary first-year writing seminar, students performed Pecha Kuchas—timed presentations featuring 20 slides displayed for 20 seconds each. Their analyses drew on essays they had written and revised, thus reflecting the scholarship they had encountered over the semester. A project about the Athabasca oil sands in Alberta, Canada, and the controversy surrounding the Keystone XL pipeline touched upon modes of framing climate change discussed in Mike Hulme's *Why We Disagree About Climate Change*.² Another on Inuit foodways drew upon the importance of indigenous knowledge documented in Julie Cruikshank's *Do Glaciers Listen?*³ A study of death rituals among the Chukchi of northeastern Siberia highlighted patterns in perceptions of cultural others described in Yuri Slezkine's *Arctic Mirrors*.⁴ While experimenting with an alternative talk format, students revealed the complexity of human experiences with the cold around the world.

The course we taught on the east and west coasts of the United States, called 'Cold Places', engaged students not only because of its evocative title but also because of its particular

¹ Jack London, 'To Build a Fire', *The Century Magazine* 76 (August 1908): 525-534.

² Mike Hulme, *Why We Disagree about Climate Change: Understanding Controversy, Inaction, and Opportunity* (Cambridge: Cambridge University Press, 2009). The Athabasca oil sands refer to deposits of bitumen along the Athabasca River in western Canada that are among the largest proven oil reserves in the world. Extracting the highly viscous petroleum has generated opposition because of its impacts on the environment, including deforestation and chemical pollution. Proposed by energy company TransCanada, the Keystone XL pipeline was intended to increase the delivery of oil extracted in Canada, including at Athabasca, to the United States. Proponents of the project touted employment opportunities and independence from Middle East oil as benefits, but climate change activists argued that its construction would exacerbate global warming. US president Barack Obama refused approval of the project in November 2015.

³ Julie Cruikshank, *Do Glaciers Listen? Local Knowledge, Colonial Encounters, and Social Imagination* (Vancouver: UBC Press, 2005).

⁴ Yuri Slezkine, *Arctic Mirrors: Russia and the Small Peoples of the North* (Ithaca: Cornell University Press, 1994).

approach to world environmental history. Taking the phenomenon of the cold as a starting point, we sought to situate it in time and space in order to challenge assumptions about its universality and timelessness. Our perspective resonates with what Sverker Sörlin calls ‘cryo-history’: the project of bringing the cold into human history and historical inquiry.⁵ We wanted students to understand corners of the world that have long escaped the narratives of historians yet regularly appear in the popular press. Moments of public awareness often presented serendipitous learning opportunities. The release of the documentary, *Chasing Ice*, during the first iteration of the course occasioned a class trip to the local movie theater. Ensuing discussions linked the film to Mark Carey's descriptions of glaciers as an endangered species.⁶ The more we dug into cold places in this fashion, the more we saw them as a fresh lens on world environmental affairs, past and present. In 2013, Nick Paumgarten's piece, ‘The Manic Mountain’ in *The New Yorker*, which chronicled a clash between European mountaineers and Sherpas at Mount Everest, became fodder for a first-day-of-class conversation about the commercialization of nature and whether tourism had become, à la Lenin, the ‘highest stage of imperialism’.⁷ The range of class activities we organized—camping in winter, viewing films, discussing scholarship, supporting independent research, and connecting all of this to current events—reoriented the cold within a trajectory of global environmental change over time.

Our goal in this article is to make a case for existing courses in world environmental history to include modules on cold places. In pursuing this pedagogical end, we draw from previous reflections that outlined the opportunities of folding understudied places into survey courses of the subfield. As James Feldman and Lynne Heasley have shown for the Great Lakes in North American history, or Nancy Langston has done for the boreal forests in world history, there is value in taking stock of what places we incorporate into the grand stories of the environmental past, and which have been left out.⁸ We do not expect teaching faculty to suddenly take up the active study of cold landscapes or develop entirely new classes in response

⁵ Sverker Sörlin, ‘Cryo-History: Narratives of Ice and the Emerging Arctic Humanities’, in *The New Arctic* (Cham: Springer, 2015), 327-340. Scholarly initiatives in the vein of cryo-history have included a series of conferences organized by the Rachel Carson Center for Environment and Society and the German Historical Institute Moscow: ‘Exploring Ice and Snow in the Cold War’ (2011), ‘Frost, Ice, Snow: Cold Climate in Russian History’ (2012), and ‘The Soviet Arctic: Exploration, Investigation, Representation’ (2014). In addition, a three-year research project at Aarhus University in Denmark was dedicated to ‘Exploring Greenland: Science and Technology in Cold War Settings’.

⁶ *Chasing Ice*, DVD, directed by Jeff Orlowski (New York: Docuramafilms, 2013); Mark Carey, ‘The History of Ice: How Glaciers Became an Endangered Species’, *Environmental History* 12, no. 3 (July 2007): 497–527.

⁷ Nick Paumgarten, ‘The Manic Mountain: Ueli Steck and the Clash on Everest’, *The New Yorker*, June 3, 2013, <http://www.newyorker.com/magazine/2013/06/03/the-manic-mountain>. In 2014-2015, news features about Shell Oil's ill-fated pursuit of offshore drilling in the Arctic and sinkholes opening up in the Yamal Peninsula of northwestern Siberia could also have served as launching points for discussion. See McKenzie Funk, ‘The Wreck of the Kulluk’, *The New York Times*, December 30, 2014, <http://www.nytimes.com/2015/01/04/magazine/the-wreck-of-the-kulluk.html>; Andrew Revkin, *On Siberian Holes, Top Permafrost Expert Separates Fact & Fiction*, 2014, <https://www.youtube.com/watch?v=E5fK3TT2GAQ>.

⁸ James Feldman and Lynne Heasley, ‘Recentring North American Environmental History: Pedagogy and Scholarship in the Great Lakes Region’, *Environmental History* 12, no. 4 (October 2007): 951-58; Nancy Langston, ‘On Teaching World Forest History’, *Environmental History* 10, no. 1 (2005): 20-29.

to the ideas we propose here. Rather, we hope the experiences we share can smooth that bumpy road between a fleeting impulse to revise one's syllabus and the realization of that revision, providing a fresh injection of teaching material in the middle of the term.

It is fair to make clear that we designed *Cold Places* as an entry-level course at private liberal arts colleges in the United States. Because of the emphasis and resources given to teaching at our institutions, the latitude we enjoy in course design is in some ways unique. Despite differences in settings among readers, however, we hope that commonalities among our students make the below recommendations transferrable and even critical. When students entered our classrooms, they had little familiarity with the particular locations of the world we planned to study. Yet they had qualitatively more knowledge about world history and even more understanding of current environmental issues. These kinds of divergences in the classroom, we wager, describe many of our student audiences regardless of where we teach. In addition, the gaps between cold places, history, and environmental knowledge make visible a core contribution of the environmental humanities: to contextualize environmental change by fostering interpretative, analytical, and humanistic orientations to the world. Indeed, our shared goal with *Cold Places*—one that likely appears on many World Environmental History syllabi—was to engender in our students a more critical view of themselves and the world they inhabit.

Below, we detail two themes of a possible *Cold Places* module. Section one examines the idea of cold places as sites of colonial encounter. Showing their connectedness to global developments is one approach to historicizing these seemingly peripheral spaces. Section two investigates cold places as windows on histories of science and technology and as a possible bridge among histories of capitalism, empire, and the environment. In both sections, we take a 'nuts and bolts' approach by offering specific readings while highlighting some of the ways students evaluated the course's ability to forge connections among history, nature, and culture. Ultimately, we hope that a direct discussion of the materials we use to teach doubles as a map of the historiographical areas of interest, charting the intersection between cold places and global environmental history. In assembling lectures, discussions, and texts, we are not simply teaching about the cold, but teaching about the world from another perspective. We close with a note on the promises and pitfalls of the course and the ways *Cold Places* helps advance broader project of the environmental humanities.

Not Empty Spaces: Colonialism, Industrialization, and Cultural Paradigms

When confronted with the subject of cold places, students initially fit them into preloaded categories. The high-altitude and high-latitude environments that came to mind—the Arctic, Antarctica, the Himalayas, Siberia—appeared as exotic as they were remote, and even more inhospitable. Learning about cold places, however, required repositioning them as sites of rich relationships between humans and the rest of nature. Our courses therefore highlighted ties between cold places and key historical developments: colonialism, industrialization, and the evolution of cultural paradigms such as wilderness and the frontier. By approaching cold places in these ways, we revealed their enduring connections to human history as well as imagination.

Although colonialism can be a challenging theme to explore, it serves to historicize cold places, anchoring them in time and space rather than perpetuating perceptions of them as primordial and unchanging. A range of sources help to focus attention on colonial encounters, providing entry points for conversations about perceptions of cultural ‘others’ as well as interactions between different knowledge traditions and ways of life. In one iteration of the course, students read chapters from *Arctic Mirrors* by historian Yuri Slezkine in conjunction with viewing Akira Kurosawa's film, *Dersu Uzala*.⁹ Slezkine's monograph analyzes changing conceptions of the northern peoples of Eurasia among Russian elites as well as the Russian state from the seventeenth to twentieth centuries. Kurosawa's film, based on the memoir of Russian explorer V.K. Arsen'ev, depicts the relationship between Arsen'ev and a Nanai hunter named Dersu as they mapped the Ussuri region of the Russian Far East in the early twentieth century. Slezkine's scholarly monograph provided context, as well as a lens, for interrogating the events portrayed in *Dersu*. In another iteration of the course, students read accounts by polar explorers and mountaineers against the grain of historical scholarship on societal ambitions and anxieties at the *fin de siècle*. Putting together in one analysis the experiences of itinerants in the Northwest Passage, the South Pole, and the ‘Third Pole’ of Mount Everest helped students see how a rhetoric of emptiness galvanized knowledge production and stories of adventure while rationalizing continued intervention in occupied lands.¹⁰

Students explored colonial relationships in cold places by engaging the sources through discussion and analytical writing. For instance, how did Arsen'ev and Dersu compare in their approaches and adaptations to the Siberian environment? How did the environment shape interactions and expressions of power differences between the characters? What kinds of visible and invisible structures underlay their friendship? In-class conversations laid the foundations for an assignment that asked students to compose papers for an imaginary conference, ‘Colonial Encounters in Northern Environments’, to be held in Thule. The essays were to analyze the colonial encounter portrayed in Kurosawa's film in relation to Slezkine's historical study. Students could use insights from Slezkine's monograph to inform their analysis of Kurosawa's film, or they could use their analysis of Kurosawa's film to challenge Slezkine's viewpoints. Some students found that Slezkine's historical perspective enabled them to read between the lines

⁹ Slezkine, *Arctic Mirrors; Dersu Uzala*, DVD, directed by Akira Kurosawa (New York: Kino International Corp. and Image Entertainment, 2000).

¹⁰ The literature on Polar exploration is immense and could be used in a variety of ways in a Cold Places course. Good primers on Polar exploration as colonial encounter can be found in Ed Larson, *An Empire of Ice: Scott, Shackleton, and the Heroic Age of Antarctic Science* (New Haven: Yale University Press, 2011) and Michael Robinson, *Coldest Crucible: Arctic Exploration and American Culture* (Chicago: University of Chicago Press, 2006). Particularly illuminating primary sources that may be paired with the above monographs include Vilhjalmur Stefansson, ‘Why the Erroneous Ideas Persist’, in *Northward Course of Empire* (New York: Harcourt, Brace, and Company, 1922), 249-270 and Apsley Cherry-Gerrard, ‘Preface’, and ‘Never Again’, in *The Worst Journey in the World* (London: Constable and Co., Ltd., 1922), 6-7 and 251-270. Scholars have also started to bring mountains into discussions about polar exploration, especially as it pertains to science and colonialism. See Denis Cosgrove and Veronica della Dora, ‘Introduction’ in Denis Cosgrove and Veronica della Dora, eds, *High Places: Cultural Geographies of Mountains, Ice, and Science* (London: I.B. Tauris, 2009), 1-16.

of Kurosawa's film and more clearly perceive inequalities between colonizer and colonized. Others argued that the taiga or boreal forest biome portrayed in the film subverted power relationships and provided a setting where the knowledge and experience of indigenous peoples were invaluable. Not only did examining the two works together highlight the relevance of colonialism to cold places, but it also trained students to approach sources not simply as repositories of facts but as texts with arguments.

Another potentially fruitful pairing for exploring colonialism in cold places is Peter Høeg's novel, *Smilla's Sense of Snow*, and Julie Cruikshank's anthropological study, *Do Glaciers Listen?*¹¹ Høeg's novel is a murder mystery set in Denmark and Greenland in the 1990s. The heroine, Smilla Jaspersen, is the daughter of a Danish father and Greenlandic Inuit mother who spent her childhood in the Arctic before migrating to the metropole. Through the character of Smilla, Høeg not only explores tensions in colonial identities—Smilla bitterly calls herself a 'fake Greenlander'—but also the commensurability, or lack thereof, of indigenous and Western knowledge. Smilla's 'sense of snow', that is, her awareness of the diversity of snow and ice and her intuitive understanding of their behavior, contends with her love of formal mathematics as well as her contempt for what she perceives to be the calculating nature of Western science. Cruikshank's anthropology centers on the North American subarctic and the encounter between Euro-Americans and the Tlingit peoples beginning in the eighteenth century. Like *Smilla's Sense of Snow*, *Do Glaciers Listen?* examines Western and indigenous ways of knowing. Although Cruikshank does not deny differences between traditions and power inequalities, she raises the possibility of mutual adaptation and asserts the relevance of Tlingit ideas about nature to the contemporary world. Reading Høeg and Cruikshank together invited students to consider the cultural and intellectual dimensions of colonialism, as well as modernity and loss in human understandings of the environment. What is the viability of hybrid forms of knowledge? How might it be possible to recover the agency of indigenous peoples under colonialism?

All of these sources make visible the lives of indigenous peoples in cold places and the ways in which they became marginalized by Euro-American cultures. Colonized people such as the Tlingit, Inuit, and the Nanai experienced both material exploitation and cultural domination. But these texts also reveal that, at certain historical moments, American, French, Danish, and Russian writers and explorers romanticized the natives that they encountered. Moreover, in their own ways, the course materials argue that non-European knowledge was essential to the development of global understandings about cold places. Traces of indigenous participation in the making of science were not completely erased. On the contrary, fieldworkers relied heavily on native residents for provisions basic to survival, including shelter, nutrition, and clothing and

¹¹ Cruikshank, *Do Glaciers Listen?*; Peter Høeg, *Smilla's Sense of Snow*, trans. Tina Nunnally (New York: Farrar, Straus, and Giroux, 1993). For analysis of the theme of postcolonialism in Høeg's novel, see Prem Poddar and Cheralyn Meador, 'Danish Imperial Fantasies: Peter Høeg's Miss Smilla's Feeling for Snow' in *Translating Nations* (Aarhus: Aarhus University Press, 2000), 161–202, and Kirsten Thisted, 'The Power to Represent: Intertextuality and Discourse in Smilla's Sense of Snow', in *Narrating the Arctic: A Cultural History of Nordic Scientific Practices* (Canton: Science History Publications, 2002), 311–42.

also oriented scientists to the subjects they sought but could not readily locate, such as migratory animals, mineral deposits, or cultural heritage sites. Especially as many indigenous communities are now sovereign owners of northern lands, reading indigenous and archaeological accounts of the pre-European history of cold places disrupts uncritical understandings of world history.¹² In the classroom setting, this disruption manifests as hesitance among students to confirm scientific and economic developments as ‘progress’ or ‘advancements’ after appreciating the human and ecological costs of these activities. Similarly, students wondered what separated science and industrial society from peoples and knowledges long considered primitive or based in myth. Examining colonialism, in other words, highlights modernity as being made up of moments of interconnectedness and encounter rather than being defined as the opposite of backwardness. It also places people at the center of the story of cold places.

Besides developing awareness of the presence of indigenous cultures, investigating colonialism draws attention to resource extraction and the circulation of commodities. These phenomena emphasize that, although cold places may seem distant, they are not simply ‘ends of the earth’. They are also ends of the spokes of industrial economies. For some students, the histories of colonialism and industrial capitalism may initially seem disconnected, especially given Eurocentric narratives that locate industrialization primarily in the West. Works by Kenneth Pomeranz, Mike Davis, and Timothy Mitchell can provide perspectives for contextualizing discussions about industrialization's global dimensions.¹³ Although they do not focus on cold places, these authors emphasize the relationship between European imperialism in particular and global economic and technological transformations in the nineteenth and twentieth centuries. Environmental factors play a prominent role in each of their studies. Demonstrating that colonial possessions and natural resources were key to Europe's leap forward helps to connect empire to industrialization and the marginalization of rural populations.

¹² There are many indigenous peoples in cold places, and thus many possible indigenous accounts of history. The cultural resource centers of native governments often provide useful historical summaries, but these are not always well circulated in print. Some materials now live online. See Inuvialuit Cultural Resource Center, ‘Inuvialuit Pitqusiit Inuuniarutait: Inuvialuit Living History’, <http://www.inuvialuitlivinghistory.ca/>, accessed 4 August 2015. Cruikshank's *Do Glaciers Listen?* presents several lightly-edited interviews with native peoples of Mount St. Elias region as a contrast to the narratives of explorer-scientists like John Muir. Archaeological accounts of the circumpolar north are equally rich. A useful and stimulating set of essays comes from Robert McGhee, ‘After the Ice Age’, and ‘A Hunter's World’, in *The Last Imaginary Place: A Human History of the Arctic World* (Chicago: University of Chicago Press, 2005), 11-19, 34-55.

¹³ Kenneth Pomeranz, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2000); Mike Davis, *Late Victorian Holocausts: El Niño Famines and the Making of the Third World* (London: Verso, 2001); Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002). Pomeranz tells the story of how coal and colonies combined to enable the ‘great divergence’ between industrialized and non-industrialized countries in the late nineteenth century. Davis shows that decisions made by the British colonial administration combined with drought-inducing climate phenomena to produce devastating famines in India, in effect creating the ‘Third World’. Although the environment, specifically El Niño Southern Oscillation, plays a crucial role, *Late Victorian Holocausts* indicts British imperialism for its commitment to ‘laissez-faire’ capitalism in the face of humanitarian disaster. Finally, Mitchell highlights how the imperative of producing cotton and sugar for export transformed the physical and social landscape in Egypt.

By establishing connections between empire and the environment, the work of Pomeranz, Davis, and Mitchell help to frame similar studies of cold places, such as Kathryn Morse's history of the Klondike gold rush.¹⁴ In *The Nature of Gold*, Morse takes the interior of the Yukon Territory (Canada) as a prime example of the ways industrial resource extraction both abstracted nature from the human experience and required intimate, exploitative interactions between people and the environment. Morse investigates the place of gold in the American economy in the late 1800s, demonstrating that its position as a standard for currency was as much a product of Euro-American politics as the mineral's so-called inherent value. From here, Morse takes readers to the north via the famed Chilkoot Pass route, explaining how both the journey to the Klondike and the work at gold mines embedded humans in physical ecosystems of soil, rock, water, moose, and forests. To survive the hike across the mountains, or find a pay streak, miners traveled by horse and dogsled, diverted water through flumes and sluices, stripped vegetation from the surface of the earth, and dug through the frozen subsurface. But Morse presses further, connecting gold mining to both the dispossession of native northerners and the rise of corporate culture in North America over the second half of the nineteenth century. Just as miners and governmental leaders displaced Yukon Indians within northern exchange relations, centralized management and a hierarchy of labor in the corporate model meant that prospectors rarely found financial success, even if they found gold. By the end of Morse's narrative, when the author brings the reader to bustling Seattle—the beneficiary of the Klondike's boom—students can see how legacies of northern history remain alive from Dawson City to urban infrastructure in the Pacific Northwest. For students, the deceptively simple task of finding gold agitates a beehive of interactions among power, labor, technology, nature, and systems of value.

Morse's *The Nature of Gold* succeeds as a course text because it allows for a meditation on multiple human and environmental processes in one cold place. The author's careful treatment of cultural paradigms such as the wilderness and frontier provides a final avenue through which to engage students in world environmental history. These paradigms have been foundational to the subfield and can be found across the existing terrain of scholarship on global environmental history. Morse's analysis engages with the Turnerian model of the frontier. She adds to work by historians of the Conservation Movement by emphasizing how industrial laborers pursued the 'strenuous life', which was advocated by U.S. president Theodore Roosevelt and marshaled as a justification for programs such as national parks. Morse's work therefore presents a capsule summary of an important thread in U.S. environmental historiography. In the context of a module on cold places, however, Morse's work allows for comparison of wilderness and frontier traditions across Canada, Europe, Asia, and South America.¹⁵ In our experiences, one means of making these connections was to examine the rise of mountaineering clubs in continental Europe and North America, which coincided with the

¹⁴ Kathryn Morse, *The Nature of Gold: An Environmental History of the Klondike Gold Rush* (Seattle: University of Washington Press, 2003).

¹⁵ On how a historical account of the Klondike could differ if examined from a Canadian perspective, see Graeme Wynn, 'Review of *Nature of Gold: An Environmental History of the Klondike Gold Rush*', *Agricultural History* 79, no. 2 (Spring 2005): 243-246.

search for gold in the Yukon Basin but differed considerably along lines of class, race, and gender.¹⁶ Another set of comparisons emerges through the juxtaposition of the subarctic with Antarctica, which served as a canvas for European and American projections of nationhood and modernity.¹⁷ Like other place-based studies of cold environments, Morse's book works because it reveals the many layers of natural and human history laid down even in locations that show up as blank spaces on our students' mental maps.¹⁸

From Non-Western Science to Climategate: The Social and Cultural Dimensions of Knowledge

Revealing cold places as sites of manifold relationships between peoples and nature complements another aspect of environmental history: the social and cultural dimensions of knowledge. As many scholars have asserted, environmental history encompasses not only the history of environmental change, but also how we know what we know about environments. Environmental history therefore intersects with the history of science.¹⁹ In the annals of human exploration and discovery, cold places have loomed large, and they remain ripe for further investigation. From cartographic and natural history expeditions to geological surveys and programs to manage biological resources to infrastructure projects and climatology, cold places have been key destinations and targets in diverse fields of scientific endeavor. The physical realities of fieldwork in cold places fostered a range of engagements with technologies, whether European or indigenous. Doing science at altitude or latitude required careful accounting for navigational equipment, food preservation methods, materials for clothing and shelter, and transportation. The emergence of laboratories solved only some of these issues, and their stories are only beginning to be told.²⁰ Cold places also remain scenes of heated debate about what

¹⁶ See Karen Morin, 'Peak Practices: Englishwomen's "Heroic" Adventures in the Nineteenth-Century American West', *Annals of the Association of American Geographers* 89, no. 3 (1999), 489-514; Joseph E. Taylor III, *Pilgrims of the Vertical: Yosemite Rock Climbers and Nature at Risk* (Harvard University Press, 2010).

¹⁷ For a journalistic account of Antarctic imaginaries, see Sara Wheeler, 'The Big White', and 'Landscapes of the Mind', in *Terra Incognita: Travels in Antarctica* (New York: Random House, 1996), 3-26 and 44-60. For a more nuanced academic study of this theme from the European perspective, see Peder Roberts, *The European Antarctic: Science and Strategy in Scandinavia and the British Empire* (New York: Palgrave Macmillan, 2011).

¹⁸ Another wonderfully deep, broad, and provocative place-based study of a cold place is Lyle Dick, *Muskox Land: Ellesmere Island in the Age of Contact* (Calgary: University of Calgary Press, 2001).

¹⁹ William Cronon, 'The Uses of Environmental History', *Environmental History Review* 17, no. 3 (Fall 1993): 1-22; Douglas R. Weiner, 'A Death-Defying Attempt to Articulate a Coherent Definition of Environmental History', *Environmental History* 10, no. 3 (July 2005): 404-20; Stephen Bocking, 'Science and Spaces in the Northern Environment', *Environmental History* 12, no. 4 (October 2007): 867-94; Diana K. Davis, *Resurrecting the Granary of Rome: Environmental History and French Colonial Expansion in North Africa* (Athens: Ohio University Press, 2007); Stephen Bocking, 'Nature's Stories? Pursuing Science in Environmental History', in *Method and Meaning in Canadian Environmental History* (Toronto: Nelson Education, 2008), 294-310; Ronald Doel, 'What's the Place of the Physical Environmental Sciences in Environmental History?', *Revue D'histoire Moderne et Contemporaine* 56, no. 4 (2009): 137-64; Dolly Jørgensen, Finn Arne Jørgensen, and Sara Pritchard, *New Natures: Joining Environmental History with Science and Technology Studies* (Pittsburgh: University of Pittsburgh Press, 2013).

²⁰ Liza Piper, *The Industrial Transformation of Subarctic Canada* (Vancouver: UBC Press, 2009); John McCannon, *A History of the Arctic: Nature, Exploration and Exploitation* (London: Reaktion Books, 2012); Michael Bravo and

constitutes credible environmental knowledge. Within the domain of natural resource management, ‘Western’ science can conflict with knowledge deemed more ‘traditional’, opening challenges about who is authorized as an expert and how. Within the domain of climate science, environmental changes across the cold regions of the planet are often cast by denialists as ‘natural’ phenomena, forcing scientists to defend and articulate carefully their conclusions about change over time. In both cases, the production of knowledge about nature becomes a sticking point in issues of governance, identity, economic development, and environmental protection.

As suggested earlier, discussing colonialism in cold places naturally raises questions about the politics of science and technology. In the history of European expansion, for example, not only greed, but also curiosity motivated voyages around the world; exploration and empires went hand in hand. Historians of science and empire have demonstrated that encounters with non-Europeans in colonial settings advanced European sciences, such as cartography and botany, which also became tools of imperialism.²¹ On the one hand, industrial technologies such as steamships helped Europeans establish political and economic control in the nineteenth century. On the other hand, technoscientific knowledge itself was a product of projects undertaken to maintain that control. In the context of cold places, Cruikshank's *Do Glaciers Listen?* shows that Euro-American domination had not only material but also cultural consequences, as non-European ways of knowing became devalued and marginalized. At the same time, she aims to recover the agency of the Tlingit and reveal common ground between locals and outsiders whose traditions were different but mutually influencing, with ongoing relevance for understanding environments today. In the other direction, a range of literature examines the failures, limits, and assumptions of scientific knowledge in cold places, not only in the age of exploration but in colonial engagements beyond it. A particularly arresting voice in this regard is Barry Lopez, whose *Arctic Dreams* enthralled students.²² But there are plenty of similar treatises from native residents themselves. Focusing on the roles of cold places in colonialism is therefore one way to open up inquiries into the social and cultural dimensions of knowledge.

While Antarctica is the only continent without a native human population, its history of science and colonialism is just as rich as that of other cold places. The ‘continent of science’ serves as a foil for analyses of empire, exploration, and environment across the twentieth century. In the early 1900s, scientific communities identified Antarctica as home to unique organisms that, because of their isolation from other planetary ecosystems, might unlock the

Sverker Sorlin, eds., *Narrating the Arctic: A Cultural History of Nordic Scientific Practices* (Canton: Science History Publications, 2002); Janet Martin-Nielsen, *Eismitte in the Scientific Imagination: Knowledge and Politics at the Center of Greenland* (New York: Palgrave Macmillan, 2013); Dolly Jørgensen and Sverker Sorlin, eds., *Northscapes: History, Technology, and the Making of Northern Environments* (Vancouver: UBC Press, 2013); Paul Josephson, *The Conquest of the Russian Arctic* (Cambridge: Harvard University Press, 2014); Paul Simpson-Housely, ‘Problems of Antarctic Navigation and Perception: The Compass, Longitude, and Mirages’, in *Antarctica: Exploration, Perception, and Metaphor* (New York: Routledge, 1992), 38-50.

²¹ Lucile Brockway, *Science and Colonial Expansion: The Role of the British Royal Botanic Garden* (New Haven: Yale University Press, 2002); Kapil Raj, *Relocating Modern Science: Circulation and the Construction of Knowledge in South Asia and Europe, 1650-1900* (New York: Palgrave Macmillan, 2007).

²² Barry Lopez, *Arctic Dreams: Imagination and Desire in a Northern Landscape* (Westminster: Bantam Books, 1987).

mysteries of nature—particularly evolution. A memorable discussion with students followed a pairing of historical scholarship on early twentieth century natural history in Antarctica—from Ed Larson, Paul Simpson-Housely, and Stephen Pyne—with the 2005 National Geographic Society film *March of the Penguins*. Students could dismiss neither the ‘heroic age’ of polar science nor Social Darwinism as antiquated because, in both the past and present, scientists pitted Antarctica as the key to understanding both nature and human nature.²³ Later, as we examined the elaboration of the Antarctic Treaty System of 1959, the South Pole became a touchpoint for the politics of science at a moment of worldwide decolonization. As historians and political scientists have pointed out, nations with interests in Antarctica—which includes the United States and Britain, but also countries in Africa and South America—believed they could administer the region in a postcolonial fashion precisely because the only activities taking place there were scientific. But this was not possible, as ensuing international relations and physical infrastructure cast into sharp relief. That science itself is a political process is made clear through scholarship by Elena Glasberg and Christopher Joyner, as well as Werner Herzog’s 2007 film *Encounters at the End of the World*.²⁴ Collectively, they document how colonial relations were reproduced and reanimated over the second half of the 1900s through the presence of military contractors, the maintenance of discrete research stations for the various Treaty signatories, and the casual disregard for prohibitions on natural resource extraction. These case studies in Antarctica help students grasp the political ramifications of scientific research and the politics of managing scientists in a distant, unfamiliar environment.

The themes of imperialism and industrialization also set up a major topic in the history of science and world environmental history: global warming. Cold places have been crucial to understanding the ways human activity drives climate change today because changes in the cryosphere are plainly visible to the naked eye. Filmmaker-scientist James Balog built from this principle in *Chasing Ice*, which documented the calving of glaciers the size of Manhattan from Greenlandic fjords. Al Gore also famously deployed an animation of a polar bear frantically treading water in his 2006 documentary *An Inconvenient Truth* to expose the links between fossil-fuel burning, carbon dioxide emissions, and increasing atmospheric temperatures.²⁵ Scientific media abounds in today’s cultural moment combining broad skepticism of scientific expertise, resistance to critiques of industrial capitalism, and easy availability of viral videos and

²³ See Paul Simpson-Housely, ‘Problems of Antarctic Navigation and Perception: The Compass, Longitude, and Mirages’, in *Antarctica: Exploration, Perception, and Metaphor* (Routledge: New York, 1992), 38-50; Ed Larson, ‘March to the Penguins’, from *An Empire of Ice: Scott, Shackleton, and the Heroic Age of Antarctic Science*, (New Haven: Yale University Press, 2011), 173-210; Stephen Pyne, *The Ice: A Journey to Antarctica* (Iowa City: University of Iowa Press, 1986); *March of the Penguins*, DVD, directed by Luc Jacquet (Burbank: Warner Home Video, 2005). Author Andrew Stuhl thanks geographer Duane Griffin for recommending Apsley Cherry-Gerrard’s writing to pair with *March of the Penguins*.

²⁴ See Stephen Pyne, ‘The Cold Peace: The Geopolitics of Antarctica’, in *The Ice*, 323-378; Elena Glasberg, ‘Who Goes There? Science, Fiction, and Belonging in Antarctica’, *Journal of Historical Geography* 34, no. 4 (2008) 639-657; Christopher Joyner, ‘United States Foreign Policy Interests in the Antarctic’, *The Polar Journal* 1, no. 1 (2011): 17-35; *Encounters at the End of the World*, DVD, directed by Werner Herzog (Chatsworth: Image Entertainment, 2008).

²⁵ *An Inconvenient Truth*, DVD, directed by Davis Guggenheim (Hollywood: Paramount, 2006).

infographics. The visuality of global warming in cold places thus exposes students to the thread tying histories of resource exploitation to modern global change. It also invites contemplation about how we access information in the Internet age. Consider re-photography projects on the retreat of mountain glaciers or spatial representations of the shrinking Arctic sea ice pack over time, which can proliferate just as easily as misinformation campaigns or controversies like ‘climategate’. Recent scholarly attention to scientific communication by cultural geographer Mike Hulme and climate scientists Richard Alley and Michael Mann provides grist for talking with students about how we talk about science and nature.²⁶

To be fair, environmental historians regularly incorporate strategies of scientific communication in their teaching, whether to discuss environmentalism and ecology or track the politics of the global atmosphere over the second half of the twentieth century. In a survey or module on cold places, however, scholars can situate climate change differently. Given that students will have already come to know how science shaped colonial encounters and industrial expansion, the investigation of climate change can reach beyond the post-World War II period, treating cold regions of the planet as *places*, not merely baselines or backdrops. Mark Carey’s *In the Shadow of Melting Glaciers* models this approach, offering students a view of contemporary discourse about climate adaptation and engineering steeped in the values, conflicts, and environments of Andean society.²⁷ We authors also conduct similar place-based historical scholarship of science, environment, and global change in the North American Arctic and Siberia, and have used our own work at this stage of the course. In this way, a study of cold places unites some of the most dominant processes in world environmental history. Colonialism provides an entryway to industrialization, which, in turn, establishes context for understanding global warming. Taken together, the topics of colonial encounter, industrial capitalism, and climate change make up a sequence that could effectively structure a unit on cold places within an environmental history course.

Facing the Cold, Engaging the Environmental Humanities

What did students think of the course? Despite their shortcomings, end-of-term evaluations provide insights into student learning, especially written comments. In the context of this essay, student reflections allow us to measure how well Cold Places met its goal of helping students develop critical and more comprehensive views of the world. In turn, student reflections underline the promises and pitfalls of a Cold Places module in a world environmental history course and in engaging the environmental humanities more broadly.

One of the clear successes of the course was developing an awareness of locations once regarded as empty. By the end of the term, students talked about cold places with an entirely

²⁶ Richard B. Alley, *The Two-Mile Time Machine: Ice Cores, Abrupt Climate Change, and Our Future* (Princeton: Princeton University Press, 2001); Michael E. Mann, *The Hockey Stick and the Climate Wars* (New York: Columbia University Press, 2013); Hulme, *Why We Disagree about Climate Change*.

²⁷ Mark Carey, *In the Shadow of Melting Glaciers: Climate Change and Andean Society* (New York: Oxford University Press, 2010).

different vocabulary than when they started the course. These landscapes were filled with plant, animal, and human life, and they were instrumental to global developments over the past two hundred years. One student concluded that ‘Arctic exploration can tell us much more about the human condition than one would think on a first glance at the topic’. Another expressed a sense of place by describing a ‘connection to the land.’ In terms of a module in a global environmental history course, such attachments foster understanding of environmental change over time and space. Our students could explain the patterns of planetary-scale processes, such as climate change and colonialism, as well as the ways individual choices in one location ramify across the globe. Importantly, students could also link historical developments in a chain from past to present. One student explained various cold places as shaped by four general processes: discovery, exploration, exploitation, and preservation. This statement sparked a discussion on the last day of class about whether these processes were nonlinear, localized, or unique to high altitude and high latitude zones. Such reflections on place and history offer a compelling story about how we come to know nature that resonates with the findings of historians and other scholars.²⁸

Students also expressed sophisticated orientations toward environmental knowledge, its politics, and its complicated histories. In evaluations, students commented that the course allowed them to interrogate ‘scientific’ or ‘technical’ documents instead of simply imbibing them. They felt a new critical distance from academic scholarship and gained confidence in identifying trade-offs between quantitative and qualitative views of nature. Students concluded that the natural and social sciences, though necessary for understanding human and ecological transformations, were unlikely to reach the ethical dimensions of environmental connection, a domain at which humanistic inquiry strikes. One appreciated the attention to ‘climate change *discourse*, because this helped me develop the ability to “read” and interpret the climate change conversation that I will continue to encounter’. Documentaries, literature, and history produced by indigenes and non-indigenes alike helped students enroll the data of atmospheric scientists and political scientists in larger questions of justice and morality. Investigating such combinations and collisions of different ways of knowing sits at the heart of the environmental humanities.

Our students noted the variety of materials—by historians, anthropologists, geographers, archaeologists, political scientists, economists, climate scientists, nature writers, literary scholars, philosophers, and artists—stating that it not only prevented monotony but also allowed them to see nature and society in new ways. At the same time, we must acknowledge that incorporating multiple approaches and disciplines certainly presented challenges. One risk was having disparate topics and course materials seem disconnected, brought together by nothing more than a common preoccupation with the cold. Building coherence and identifying clear threads to pull

²⁸ The scholarly literature on place is immense, but a good introduction to the concept’s use within environmental history remains Dan Flores, ‘Place: An Argument for Bioregional History’, *Environmental History Review* 18, no. 4 (Winter 1994): 1-18. Ursula Heise’s work on place and the environmental humanities also stands as a landmark. See Ursula Heise, *Sense of Place and Sense of Planet: The Environmental Imagination of the Global* (Oxford: Oxford University Press, 2008).

throughout the semester entailed trial and error, and not all readings worked equally well. The themes that we selected—cold places as sites of cultural encounter and the social dimensions of knowledge production—also generated controversy in the classroom. Some students defended the integrity and objectivity of Western science, while others pointed to its connection to the history of colonialism and imperialism to adopt denialist or skeptical positions. Some students found certain genres and disciplines, such as creative writing and science writing, more comfortable to inhabit than others, such as history and anthropology. Finding ways to integrate diverse approaches, rather than simply showcasing them alongside each other, demands continued experimentation. Yet it is this imperative that demonstrates how a course on cold places can make tangible both the challenges and contributions of environmental humanities.

At many institutions around the world, class sizes may be much larger than those found at small teaching-oriented colleges, and curricula may not accommodate an entire course devoted to cold places. In such cases, however, we believe that the ideas and experiences we have shared could be adapted by a creative instructor. Each of the sections highlighted above—colonial encounters and the history of science—could become one of several modules in a broader World Environmental History course. The themes we identified could be explored more briefly in a pair of lectures or a pair of weeks. Books and monographs on cold places could be excerpted to complement readings focused on other parts of the world, and films could be utilized to diversify course materials. Given that the themes we identified have global relevance, including cold places as a means to approach them could generate discussion about comparisons with other environments.

Finally, we feel compelled to note that our conversations with students did not close with simple solutions for world environments. The richer awareness of global interconnectedness achieved through Cold Places brought hope and despair in equal measure. Such cognitive dissonance could be found in sentiments like ‘What we do here impacts cold places’. The subtext here, as in many other end-of-the-semester reflections, was *for better and worse*. Like many of our colleagues in environmental history, we struggled with a lack of decisiveness that lurked behind such declarations of complexity—and we still do.²⁹ As with pointing to the limits of science and the humanities, we resolved that competing impulses between optimism and pessimism are themselves a heuristic in an age of planetary vulnerability. As the product of historical perspective on global environments, disharmony helps students feel more responsible for the future, even as they are less certain about how it will look. Such a curious discord seemed a fitting note to end the semester’s project of aligning the stories of cold places with the polyphonic narratives of world environmental history.

²⁹ William Cronon, ‘The Uses of Environmental History’, *Environmental History Review* 17, no. 3 (Fall 1993), 1-22. Jim Clifford, ‘Pessimism and Hope when Teaching Global Environmental History’, 2014, <http://activehistory.ca/2014/06/global-environmental-history/>.