

INTRODUCTION

Framing environmental history today and for the future

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Environmental history is both an established and continuously innovative field, shaped and reshaped within global networks of researchers, teachers, and practitioners. It emerged as a self-defined and conscious field in the United States in response to the environmental movement of the 1970s. Nevertheless, broader intellectual and socio-political trajectories from more diverse origins and spatial and temporal scales have also influenced its methods, approaches, and guiding questions. These trajectories include, among others, the earlier work of scholars in the French *Annales* school in the 1930s concerned with the *longue durée* of interlinked human and geographical history, and contemporaneous questions of land ownership in former settler colonies within history, historical geography, and other disciplines (see McNeill 2003; Griffiths 2003; O’Gorman and Morgan 2021; Sutter 2013; Winiwarter et al. 2004). Transnational trajectories, such as the United Nations Conference on the Human Environment in 1972, the struggle over decolonisation, conservation, and self-determination to manage natural resources in the post-colonial world, movements opposing development projects during the Cold War, and the rise of sustainable development in the 1980s have also informed the global rise of environmental history beyond the specific scales and scopes of the field in the United States.

Globally, environmental history emerged as a distinct field in the discipline of history; however, it did so in close dialogue with the natural sciences and geography. Environmental history continues these connections while also integrating closely with other fields such as animal studies, political ecology, ecocriticism, anthropology, environmental studies, ethics, and science and technology studies (STS) (Sutter 2013; O’Gorman and Morgan 2021). The field’s blurring of human and non-human worlds, of nature and culture, as well as its analysis of various agencies and species interactions has much to offer other environmental researchers working broadly in coupled natural-human systems, sustainability sciences, and climate adaptation that are more recently seeking the kind of depth and nuance inherent to environmental history scholarship.

Today, the field of environmental history encompasses a wide range of issues around the globe, from planetary questions of climate change and entangled social and ecological impacts of colonisation, to questions of ethical and sustainable management of natural

resources and non-human historical agencies. In all of these areas, environmental historians examine not just how various people and societies have influenced the non-human world across time and space, but also how environments – from pastures and farms to glaciers and whale pods – are products of a long and dynamic interplay between human and non-human forces. This interchange of forces means that ideas, discourse, and politics are as important to our studies as the material effects of climate, toxins, and species population changes. Environmental historians are thus equipped with a valuable interdisciplinary set of skills to examine some of the most pressing socio-ecological issues of our time, such as climate change, species extinction, sustainable development, and the governance of environmental commons.

This *Handbook* seeks to provide novel and important contributions to environmental history while stimulating and inspiring new types of scholarship in the history of human-environment dynamics. As a handbook, rather than, say, an edited volume of essays, it seeks to be more widely accessible and comprehensive in coverage and approaches, although no volume could ever be fully comprehensive. It is intentionally organised thematically – rather than geographically or regionally – in order to bring the histories of different regions into conversation with each other and, more importantly, to underscore new approaches and trends in the field rather than specific places and time periods. That said, the work in this *Handbook* is grounded in time and space, with many of the chapters highlighting specific issues or places. Our goal is thus to broaden the approaches and make them accessible to scholars working in all subfields, places, and time periods while providing concrete examples. To be more wide-ranging and globally accessible in terms of topics and approaches, this *Handbook* is also global in nature. Firstly, it features approximately 72 authors from 27 countries. It also covers a wide array of world regions and countries, with the objective that authors working in distinct places find it easy to use, relatable, and relevant to their own work. Additionally, the *Handbook* works to advance new and innovative methodological approaches, such as through new sources and evidentiary bases, through co-authorship, or through different approaches such as oral history, Geographic Information Systems (GIS), and more ethics-based approaches.

This introductory chapter frames and explains the suite of essays in this *Handbook*. Really, it is intended as a kind of prolegomenon as it offers an overview and contextualisation that both introduces and interprets that which follows. Overall, the *Handbook* strives both to capture some of the most groundbreaking, interesting, and stimulating recent trends in the field and to open new paths forward for environmental history research globally. The chapters exemplify environmental history’s disciplinary responses to shifting scholarly, political, socio-economic, and environmental landscapes. Indeed, over the last decade, the field has changed significantly as it has responded to new opportunities, such as those presented by engagements with new academic fields like the environmental humanities, as well as global challenges, including climate change, biodiversity loss, health and socio-economic inequalities, and the growth of nationalisms. This expansion offers a wonderful – and crucial – time to take stock of where the field is now and, much more importantly, chart some new directions that showcase where the field can go. We explore what exactly environmental history brings to related fields, to other disciplines, to current policymaking, and to the fundamental and urgent need to address environmental injustices and inequalities. As environmental historians know very well, the framing of these societal and environmental problems often lacks context and historical understandings, which shape not just what these “wicked problems” have come to be, but also what can be done about them and who gets to decide. As such,

the audience for this *Handbook* is well-established environmental historians as well as undergraduates and graduate students trying to make their way into environmental research and practitioners beyond academia. Of course, as scholars in the environmental humanities, political ecology, environmental studies, natural resources management, environmental planning, and other cognate fields wrestle with similar topics, the volume strives to reach them as well, engaging in the important ways environmental historians contribute to these pressing issues.

A cross-cutting concern among many *Handbook* authors is with past and ongoing legacies of imperialism and colonisation over the last 400 years. Chapters largely focus on the period since 1600. Yet they engage with multiple temporalities, including a consideration of Deep Time and the longer timescales implicated in the Anthropocene. Key concerns that cut across the volume are the current planetary crises of biodiversity and habitat loss coupled to the collapse of ecosystems, the loss or liminalisation of local environmental knowledge, accelerating pollution and toxicity, and climate change. A core theme with which several authors engage is novel ways of grappling with “agency”. This volume explicitly aims to push (and push at) the boundaries of the field. It engages with emerging approaches as well as suggesting future pathways that build on, dialogue with, and depart from more traditional practices in environmental history.

The *Handbook* also purposefully engages with intellectual inquiries and research outside of the academic circles in the north Atlantic and the Global North. In short, it seeks not just global coverage and international topics, but more global intellectual inquiries—with questions, approaches, and academic contexts that expand beyond and sometimes differ from those posed in North America and Western Europe. It encourages conversations about global (in)justices and power disparities that integrate underrepresented agents (e.g., Indigenous peoples and knowledges, sexual and gender minorities, and grassroots movements, among others), non-humans (e.g., animals, plants, technologies, and landscape elements), future generations (intergenerational justice), and mobile entities (e.g., chemical forms, knowledge and cultural systems, waste, and governance architectures) into a broader understanding of socio-ecological change across scales. We also actively sought to feature a range of authors coming from diverse backgrounds, institutional affiliations, positions, and places, such as authors from the Global South and Global North as well as both early career and senior scholars.

Another innovative feature of this volume stands out immediately even with just a quick glance at the Table of Contents: every chapter and every piece of the *Handbook* is co-authored and co-edited. The *Handbook* was built through collaboration and partnership, through sharing and helping, through countless conversations and compromises that we believe improve the scholarship and its contributions. Sole authorship remains the norm in environmental history (and, indeed, in history more generally) but there is a great deal to be gained from co-authorship and collaboration, especially in a volume such as this that benefits from including a range of perspectives and geographical diversity. A recent call for greater collaboration in our field further explains that:

collaboration is especially important in Environmental History because answering complex questions about past environmental conditions, biophysical changes in the environment, and human-environment relations requires eclectic theories and methods that no one scholar can ever hope to master.

(Alagona, Carey, and Howkins 2023)

Co-authorship offers many benefits. It can expand geographical and temporal coverage while also building international relationships, networks, and communities. Some author teams help increase demographic diversity (gender, race, age, region, career stage, type of institution, and so on) when they choose co-authors from different backgrounds or contexts. In some cases, co-authorship creates mentoring opportunities when early-career scholars collaborate with more experienced researchers. Given that each author brings their own networks to an author team, the research partnership can also help scholars reach new and larger audiences for their work, particularly when they collaborate with researchers outside their discipline. In this way, co-authorship can stimulate methodological innovation within and beyond environmental history. Finally, collaborative writing enriches learning and deepens analysis by requiring co-authors to decide how to write, organise, represent, compare, and share material. We believe something more profound happens when researchers co-author a chapter rather than just sharing a draft for comment. This was the case for co-editing this *Handbook*: we all learned from each other, and thus improved the volume, by working together, despite the challenges of collaborating across time zones in Australia, South Africa, and, in the United States, Massachusetts and Oregon.

We have thus actively encouraged co-authorship of chapters by scholars at different career stages and from different parts of the world, with attention to diversity of gender, professional affiliation, and cultural background. We believe addressing co-authorship with an intentional focus on diversity and inclusion can help address the unequal nature of academic labour and the disparities impacting early career scholars and practitioners, especially in low-income and post-colonial nations and in institutions affected by severe budgetary cuts after the Covid-19 pandemic. We also do so as we understand that the lack of diversity and global representation in the production of environmental knowledge creates epistemological gaps that compromise our understanding of complex socio-ecological issues (San Martín 2021). We moved from the premise that women, Black, Indigenous, and People of Colour (BIPOC) scholars and those from the Global South are under-cited (Ahmed 2017; Collyer 2018). So we took scholarly identity seriously to move toward a more just and less insular academic practice (Dworkin, Zurn, and Bassett 2020). We consciously tried to subvert existing inequities in global knowledge economies by developing new networks of citation through new collaborations.

Chapter authors have responded with enthusiasm, forming productive co-authorship teams that in many cases did not exist previously. The afterword of the volume – “Future directions” – has been written by a team of early-career environmental historians who have distilled where they see, and where they would *hope* to see, the field heading. This radical approach is a response to calls to increase diversity in academic institutions and research, to address issues of representation in environmental scholarship and activism, and to provide concrete platforms that overcome traditional structures and practices (Ferdinand 2021; García Peña 2022; Liboiron 2016; McKittrick 2021; Soto Laveaga 2020). Co-authorship provides one avenue to help address these issues because it inherently expands the ideas, scopes, and methods in a scholarly piece. Yet, as noted earlier, among environmental historians, this kind of collaboration is still relatively rare – although we believe it will be part of the future of the field. This volume, with its co-authored chapters, thus tries to take one small step toward implementing and practising these goals. Most collaborations in the *Handbook* are historians teaming with historians. But we hope this co-authorship model and its benefits will inspire historians to build teams beyond our field, to do more joint scholarship with biologists and ecologists, geologists and hydrologists, political scientists and philosophers,

which many of the *Handbook's* editors and authors already do. In short, we believe the co-authorship format helps deliver new content, diversify the discipline, and inspire new methodological approaches to environmental history.

The *Handbook* is structured in five parts, each of which centres on a key concern within environmental history: (1) new methods and innovative approaches; (2) non-human agencies; (3) engaging with the planetary and the Anthropocene; (4) power, flows, and knowledges; and (5) practices and actions for current socio-ecological crises. The remainder of this chapter outlines each of these themes within the field and introduces the chapters that address them.

New methods, innovative approaches

Environmental historians have always engaged with and combined a variety of different methods in their approaches to particular questions and topics. This has ranged from research of documentary archives to donning a pair of good boots for site visits (Worster 1989: 289), doing ethnographic fieldwork, and engaging with ecological or natural science studies, to understand aspects of the changing relationships among people, animals, plants, and geophysical forces. Analysis has long encompassed both qualitative and quantitative approaches, reflecting the interdisciplinary nature of the field. However, qualitative approaches have tended to predominate, perhaps due to the ongoing influence of the humanities. For similar reasons, research of documentary archives and text-based sources arguably has been the most common method used by environmental historians since the emergence of the field in the 1970s, as it has predominated in other sub-disciplines within the discipline of history. However, the questions, methodologies, and approaches environmental historians bring to researching and examining archives have changed over time, contoured by shifting global and local concerns, as well as by intellectual and technological breakthroughs within the field. A cross-cutting theme in the chapters throughout this *Handbook* is the importance of the researchers' positionality in examining archives. This reflects enduring and recent considerations within the field and more widely about the way a researcher's background (including cultural, gender, socio-economic, and so on) and/or emerging scholarly stances influence how they examine archives and other documentary sources. The chapters often foreground questions of asymmetrical power relationships and diverse agencies in their examination of archives and documents. For example, Chapter 10 examines how international agreements might be analysed in terms of non-human agencies, while Chapter 17 shows that archives related to the toxins produced by gold mining in Zimbabwe contain powerful evidence of race and class oppression.

Part I of the *Handbook* focuses on inventive approaches and new methods in the field beyond archival research and more traditional academic practices. Chapter 1 provides an overarching discussion of the role and importance of positionality, ethics, and justice in approaches to environmental history. It specifically considers the role of positionality in differing perspectives on justice, pondering on whose voices are amplified and muted in environmental histories, and how analyses of environmental justice have been shaped by competing views within and among different groups. These points are illustrated through three case studies, two from India and one from Australia.

Environmental history has all too frequently lacked critical reflection on the methodologies of oral history, or the challenges of working with memory as a historical source, as Williams and Riley (2020) have noted. The tendency has been to weave interview material

into an environmental analysis without critical reflection on the nature of the source, the significance of memory or, indeed, the methodologies used to collect such material. Combining approaches in environmental history, environmental humanities, and anthropology, Chapter 2 shows the potential uses of oral history as an explicit, reflexive methodology that helps decolonise research methodologies with Indigenous and marginalised communities, and that re-centres a more-than-human world.

Other sources beyond archives and oral histories also offer environmental historians rich material through which to examine the past. Chapter 3 examines emerging approaches to sound in environmental history research and analysis. It considers how we can think with sound in academic worlds dominated by the visual and reclaim soundscapes that no longer exist. It argues that examining the work of acoustic ecologists, experimental sound art, and the possibilities opened up by recording technology, audio software, and the digital, *sounding* environments – as both adjective and verb – can provide novel approaches to studying sound and silence, blurring the conventional categories of biophony and anthropophony in a context of crises and environmental inequalities.

Environmental historians have also turned to methods like GIS to serve as critical tools for examining the changing relationships between society and the environment graphically and spatially over time. Chapter 4 departs from the general assumption that GIS is only a tool to represent or examine spatial data. The authors instead demonstrate that GIS can provide a more complex analysis that integrates a spatial dimension along with other areas more broadly used by historians, such as social, cultural, economic, and political dimensions. This is demonstrated through two case studies: urban river basins in Brazil and toponymy in the Guarani Jesuit Missions.

Non-human agencies

Environmental historians are increasingly engaging with questions of non-human agency. These engagements have emerged in dialogue with work in animal history and studies (Aderinto 2022; Ritvo 2022; Tortorici and Few 2013), and more recently in interdisciplinary more-than-human and multispecies studies (O’Gorman and Gaynor 2020). In general terms, a concern with non-human agency aims to decentre purely human perspectives and instead centre particular non-humans or sets of more-than-human relationships in order to emphasise a more distributed historical agency (Doro and Swart 2022). These sorts of approaches have developed in response to mounting critiques of dominant ideas of human separation from and superiority over “nature” that have significantly contributed to past and current socio-ecological crises (Horsthemke 2015; Plumwood 2002) and have erased other ways of multi-species coexistence. Importantly, these perspectives emphasise diversity of both humans and non-humans, the connections between the real and represented species, the nuances of change in complex multi-species assemblages and asymmetrical power relationships in their analyses.

Part II provides a set of perspectives on emerging considerations of non-human agency within environmental history. An underlying theme environmental historians grapple with is the scales at which we can examine changing and enduring non-human agencies, from particular places and specific periods, to landscapes as a concept that emphasise more-than-human relationality, and all the way up to the scale of global migrations of some species. Environmental historians can use the lens of domestication, as Chapter 5 does, to understand and analyse many of the different and shifting human-animal relationships that

have emerged over time. The authors consider a series of relationships, such as the extermination and then re-introduction of wolves into Yellowstone National Park in the United States, or recent attempts to resurrect mammoths using biotechnology.

Environmental historians have been changing and expanding the ways in which they approach and present animal agency. Chapter 6 focuses on a discernible “animal (agency) turn” within the field that has increasingly centred animals. In particular, the chapter shows three emerging research areas that exemplify this growing tendency within the field to engage with both animal cultures and the influence of animals on more-than-human cultural systems and assemblages: animal resignification of human-influenced environments, the roles of wild predators and their symbolism, and human-animal co-production of waterscapes.

How zoonotic diseases shaped history and how historians have captured the shifting bodies of knowledge about such diseases is another key area of research on non-human agency, explored in Chapter 7. It explains how the Covid-19 pandemic ignited fresh debate (from Twitter conspiracy theories to academic arguments) over the genesis and spread of diseases in a globalised world. These are obviously contested but increasingly popular processes and debates. The chapter shows how a term such as “One Health” makes a powerful argument about how human plans to alter the environment to avoid or eradicate disease have themselves led to the (re-)emergence of devastating diseases. In so doing, environmental historians can show the links between understandings of disease, environmental actions, and risks of future outbreaks.

Chapter 8 examines non-human agency and enrolments in agriculture from the perspective of environmental history. Focusing on the period since the nineteenth century, it argues that animals, plants, and soils involved in agricultural projects supported the global mobilisation of technologies. This is demonstrated through an analysis of efforts to increase production and modernise agriculture in particular places. This chapter exposes the uneven power relationships that have shaped the multiple scales of human and non-human relationships over time.

Landscape mobility and changes have shaped human and non-human histories in profound ways. Chapter 9 considers sand dunes as historical actors. Focusing on Mozambique in the twentieth and twenty-first centuries, it examines the role of sand dunes in shaping international and transnational human movements across time and space. Taking a transdisciplinary approach, it shows how a focus on these sand dunes can reveal new connections between local and international events and trends.

Chapter 10 argues that Actor-Network Theory (ANT) can be a critical tool for the study of international treaties specifically and more-than-human agency broadly. Treaties, conventions, and agreements involve not just mobilising humans and their institutions but also non-human organisms and technologies. The chapter grounds its analysis in two major transnational treaties for wildlife protection: the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the African-Eurasian Migratory Waterbirds Agreement (AEWA).

Events and disasters have shaped histories in sometimes dramatic ways. Chapter 11 explores a range of catastrophes – from earthquakes and volcanoes to extreme weather and insect plagues – while also examining a range of temporalities, from Deep History to the present. The chapter contends strongly that environmental history is useful in understanding disasters by explaining both failed and successful responses, and suggesting the general and contextually idiosyncratic factors that contour the outcomes.

Engaging with the planetary and the Anthropocene

The Anthropocene – a new framing of our current geological age, conceptualising from *anthropo*, for “human,” and *cene*, for “new”, as the epoch during which human activity has become the prevailing influence on climate and the environment – has become an important, yet controversial, concept in the humanities as well as the sciences. It usefully captures the unparalleled global scale of change. Yet since it was first coined as a term in 2000 (Crutzen and Stoermer 2000; Zottola and de Majo 2022), it has been contested because it implies a sweeping generalisation of all “humanity’s” complicity in this, which masks how geographically, politically, generationally, and culturally situated such causes and impacts have always been. Nevertheless, in this very debate, it also prompts a useful interrogation of the politics, ethics, and economics of global change, as well as a range of explanations for historical causes and hence for future solutions. Environmental historians and others have debated and utilised this concept in relation to past socio-ecological transformations, including the role and experiences of Indigenous people (Bashford 2013; Whyte 2018), and developed alternative propositions such as the “noösphere” (Vernadsky, cited in Rispoli 2022), “chthulucene” (Haraway 2015), “plantationocene” (Moore et al. 2019), “pyrocene” (Pyne 2021), “capitalocene” (Moore 2016), and “wastecene” (Armiero 2021). Indeed, environmental historians have become some of the leading humanities researchers and thought-leaders in this area (Warde, Robin, and Sörlin 2017).

Arguments over the concept of the Anthropocene (and many other-cenes) expose deep inter- and even intra-disciplinary fissures between the natural and social sciences/humanities. In fact, many chapters in this volume continue a trend among scholars in environmental history, history of science, and in the interdisciplinary environmental humanities and social sciences of critiquing Earth system science and the grip it has had on our understanding of planetary configurations of space, time, and people. These homogenous and sweeping depictions of global processes erase social difference, power imbalances, colonialism, and the uneven effects of natural resource extraction, among many other social and environmental problems. Environmental historians challenge these simplistic framings of the Anthropocene, global climate change, and many other planetary depictions that have gripped the public and policymakers. Challenges to Earth system science have long shown how modelling global processes or depicting places from satellites – the supposed “view from nowhere” – erases societal variation and the uneven effects of climate change (e.g., Borie et al. 2021; Hulme 2010; Shapin 1998). Environmental historians also expose how climate records, such as from ice cores, also vastly oversimplify and homogenize global time as well as space, including Earth time, human time, and future time – temporalities born in scientific studies that have also had far-reaching public effects on (mis)understandings of history (Antonello and Carey 2017).

Yet the debates about the Anthropocene and discussions about scientific representations of Earth’s processes and timescales also promise potential for fresh and unusual collaborations across disciplines. After all, and as John McNeill has explained, the evidence for understanding climatic changes and other planetary shifts is no longer coming just from government documents and other archival sources (texts) that historians are accustomed to using. Instead, the data come from ocean and ice cores, tree rings, marine corals, and speleothems. Environmental history is “undergoing a renaissance,” suggests McNeill, as the natural sciences create a “volcano-like eruption of new historical data” that are inspiring an ever-increasing number of cross-disciplinary collaborations (McNeill 2016: 19, 20). At the

same time, and relatedly, growing concern over the deterioration of a variety of interlinked planetary processes – from biodiversity to climate systems – has brought environmental historians into a more acute awareness of past and ongoing global issues and wicked problems such as species extinction.

Part III centres on some of the key considerations environmental historians are grappling with in engaging with the planetary and the Anthropocene. Conceptualisations of the Anthropocene, global climate change, and other planetary framings have in many ways erased humanity and ethics. Chapter 12 examines how such configurations of the planetary have drawn heavily from Earth system science. The authors show how this effort to provide a view from nowhere essentially helps perpetuate a trajectory of modern science that proclaims to capture some objective reality. The chapter argues for “provincialising the Anthropocene” through a “view from somewhere”. Moreover, they draw on the work of First Nations and Global South scholars to humanise the Anthropocene, to ground the global in time and place, and to challenge single and simplistic narratives that are so often embedded in framings of climate change and the Anthropocene.

Chapter 13 explores how environmental historians have engaged with extinction to try to help understand not only how, when, and why extinction happens, but to go further and grapple with multifaceted issues like the difficulties of actually classifying a being as “extinct” and the complexities of extinction versus extermination. Taking a historical lens to this category shows that extinction is not a teleological binary of “dead or alive”, but rather a deeply contested process that is historically contextualised.

Examining the emergence and changes in post-war Earth system science and climatology is important for understanding these contemporary debates. Chapter 14 argues that the emergence of climate knowledge during this period was also crucial to understanding and managing time. Climate archives, such as ice- and deep-sea cores and computer models, served as time-making technologies to document and predict human-induced changes. This chapter demonstrates that looking at notions of time and practices of time-making in environmental sciences can better inform the planetary turn in environmental history and the humanities.

The reliance of many people and economies on fossil fuels continues to be an ongoing issue in addressing climate change. Chapter 15 examines how path-dependency on fossil fuels emerged. It traces this through the dynamic of extraction and emission, focusing on perspectives from the Global South. Importantly, this approach highlights the planetary and interconnected nature of this issue and centrality of empire making and coloniality in its history.

Power, flows, and knowledges

Environmental historians have always been concerned with the changing ways that diverse social groups have known and experienced environments. Increasingly, these are being brought into dialogue with questions of justice and power, and with human and non-human movements across time and space. Historians interested in the environment have been concerned with environmental justice and environmental racism, some stemming from outrage after hazardous pollutants and toxic waste were abandoned near African American communities in the 1980s, making it starkly clear how environmental issues connect with socio-political injustice. A separate seam of research developed from concerns by historians over how marginalised people suffer from coercive extraction, being forced from their land,

forced into exploitative labour regimes, and compelled to live with mining’s toxic by-products. Another seam of research has focused specifically on those removed from their land under duress (and thus severed from both culture and livelihoods) – because of colonisation, for commercial agriculture and resource extraction (Guha and Martínez-Alier 1998), or because of “fortress conservation” in game reserves and so-called “pristine” wilderness areas, which dispossessed Indigenous peoples in creating national parks like Yellowstone and Kruger National Park (Dlamini 2020; Wakild 2013). There is also increasing concern among those investigating environmental justice over how environmental burdens and the effects of anthropogenic climate change have been increasingly carried by the Global South.

Part IV on power, flows, and knowledges tackles these and related issues over time and space. The chapters ask who controls the flows of water, food, energy, and goods – and with what consequences for diverse social groups, particularly in the Global South. Focusing on places like Latin America, Africa, and Asia, they examine local places where people experience these injustices and global processes, from mines and oil wells to urban infrastructure and riverbanks. While environmental histories of colonialism and capitalism have long concentrated on resource extraction and the harsh, often deadly, impacts on workers and neighbouring populations, the chapters in Part IV incorporate new approaches, themes, and topics as well. Many focus on systems of scientific knowledge, unmasking the globalising efforts that not only deny the geography of science in practice. Moreover, they also reveal the ways in which scientific framings and processes, such as through Environmental Impact Assessments (EIAs) or the Anthropocene, remove humanity, erase the local, and feed state and corporate power. To rectify that framing, these chapters turn to micro-histories or place-based analyses. They scrutinise “expert power”, whether to enact quotas on fishing or to approve a mine through EIAs. While focusing on the local, they also trace a variety of flows and intertwined linkages that run from the global to the local (and vice versa), from the North to the South, from hinterlands into cities, from labour to corporate profits. While exposing environmental narratives and storylines that empower some at the expense of others, the chapters in Part IV also analyse material environments, showing also the physical flows, as with energy, toxins like cyanide, water in cities, and fish into families and local economies. Grappling with all these issues leads many chapters to address directly, or have implications for, issues of care, trust, and ethics, thereby making this section important for the ways in which environmental historians engage with environmental justice.

Chapter 16 examines relationships between environment, labour, and energy, particularly in Asia and Africa, with broader implications for anyone investigating histories of colonialism and capitalism. The authors challenge universalist claims or assumptions that scholars can make about concepts (such as justice, labour, environment) and processes (such as labour exploitation). Instead, through their close historiographical analysis of labour and environment in Asia and Africa as well as their case study focusing on Nigeria, the authors make a case for putting the study of labour and environment into distinct temporal and spatial contexts, rather than importing notions from existing literatures produced in North America or Europe.

Questions of power, flows, and knowledges further draw attention to questions of chemical use in production techniques and historical environmental injustices. Chapter 17 examines the history of gold mining in Zimbabwe (then Southern Rhodesia) in terms of its effects on subaltern bodies. It specifically examines the impacts of colonial mining company’s use of cyanide in their processes from 1900, which significantly affected the health of workers. Environmental history is an important means for analysing these sorts of past and ongoing

environmental injustices, and this chapter draws the field into closer dialogue with multidisciplinary research and concepts. It also shows just how crucial it is to centre not only investigations of power, contamination, and the human body, but also the intersectionality of race, capitalism, colonialism, and labour.

Chapter 18 is a bold call for environmental history to stop the Manichean division of “ways of knowing” between “science” and vernacular or local empirical knowledge. It uses the case study of artisanal fishing techniques in two very different ecological and socio-political settings, the Danube Delta in Eastern Europe and Lake Guiers in West Africa. By putting these two case studies in conversation with each other, the authors illustrate the struggle between state-sponsored models and the tacit, vernacular, or traditional ways of “knowing and being” of the fishers. Notwithstanding enduring conflict between local and scientific approaches, both groups understand the ecological assemblages – especially the fish – in ways that are neither entirely different nor disconnected.

Changing environmental management processes have further been implicated in concerns over power, flows, and knowledges. Chapter 19 analyses the rise and fall of EIAs since the 1960s, with a case study examining Chile that has broader implications for understanding the international expansion and failure of these assessments. Importantly, the chapter does not simply condemn EIAs for being neoliberal tools pushing destructive, science-led, technocratic, and anti-democratic policies—though the chapter does show these results over time. Yet the authors argue that with care, trust, and legitimacy built into EIA processes, the assessments could, in fact, become tools that recognise the needs of social groups and multiple life forms.

The shifting metabolic flows and far-reaching impacts of cities have further been a key consideration of environmental historians. Chapter 20 provides an overview of how environmental historians have engaged with cities. It develops the concept of “bubbles” as a means for understanding and examining the far-flung environmental and economic flows between cities and the places on which they depend. This analysis is grounded in examples from India, China, and the United States.

Chapter 21 examines South Asian urban environmental governance, offering methodological and topical innovations by linking urban environmental history with political ecology. The chapter contends that researchers can uncover new historical processes and narratives of urban environmental governance when they combine historical archival research with political ethnography. The result is what they call Historical Urban Political Ecology. This approach helps deeply illuminate the place of religion, caste, class, ethnicity, institutions, and bodies in the colonial and postcolonial projects governing urban environments in South Asia, with larger implications for broader debates about power relationships between the North and South.

Practices and actions for current socio-ecological crises

The many, and mounting, current socio-ecological crises – from climate change to water scarcity – have led environmental historians to reconsider how they undertake their existing practices to better address these. Already in a field that grapples with questions of environmental change, many environmental historians have further reoriented their academic research and writing to engage with these issues more directly. But environmental historians have also rethought other aspects of their practices or developed new avenues for actions to address urgent issues, some embracing the approach of “applied history” to help understand

present-day environmental conditions by investigating historical patterns and analogues (Guldi and Armitage 2014). This kind of engaged history writing is inspired by a current crisis and then tries to understand it by using the past as a source of explanation to offer deeper understanding. This helps us suggest probable further consequences and encourages imaginative solutions – and even propose possible policy interventions.

Part V focuses on some of the key ways that environmental historians are reorienting their practices and actions for pressing times. It explores how we are moving *beyond* conventional research and more traditional forms of scholarly writing such as journal articles and books published by academic presses. Chapter 22 grapples with university teaching, arguing for the importance of inspiring students to be hopeful and imaginative rather than only despairing. Teachers can thereby empower students to experiment with new ways of engaging with history and the world. More specifically, the chapter focuses on the possibilities that stem from centring multispecies approaches, imaginative learning, and process-driven pedagogies.

Environmental historians have also engaged in various forms of activism within and beyond their academic work. Exploring this theme, Chapter 23 focuses on several new ways to engage with current crises, including social media, blogs, and filmmaking. However, opportunities for activism by academics are shaped by inequities, access to skills and technologies, and opportunities to work across disciplines and in teams. Activism in the field is also difficult to define and, in many instances, almost impossible to fully separate from scholarly practices, and therefore to identify as such. There may be possibilities for activism, however, if environmental historians remain open to them.

Relatedly, environmental historians have sought to reach audiences beyond the academy. Chapter 24 focuses on the imperative for environmental historians to communicate their research to diverse audiences. It grapples with the promises and limitations of online platforms as a means for doing so, giving practical recommendations and guidance. Environmental history’s long-standing engagement with online listservs and other online communication platforms means it is well placed in this regard now and in the future.

Environmental history has also been important in other spheres and organisations that are seeking to address contemporary crises. Chapter 25 focuses on how museums and galleries are using environmental history to engage with the past and promote dialogue amongst audiences about current and future challenges. It grounds its analysis in examples from Australia, Estonia, and Germany, arguing that environmental history offers museums and galleries an important channel for engaging with the Anthropocene.

Finally, Chapter 26 centres on the relationships between environmental history and policy. Examining how environmental historians have engaged with policy in the past and more recently, it offers useful examples, frameworks, and concepts that can assist these efforts into the future. While engaging with policymaking can be difficult and time-consuming, if approached with patience and determination, it can make important differences.

Future directions in environmental history

Six early career scholars and practitioners met for two months across time zones to assess the past and present of environmental history and reimagine its future paths at a time of ecological crises, job market constraints, and long-lasting neocolonial research practices. As a result of an open call, this co-authorship team brought together researchers with global expertise from Australia, South Asia, Latin America, southern Africa, and Southeast Asia.

Their work goes beyond academia and profoundly engages with local organisations, Indigenous communities, educational institutions, museums, and public scholarship. Building on their areas of expertise, shared views, and differing visions, this afterword calls to accept the coloniality of environmental history knowledge and research practices and unveil the role of Western epistemologies in the field. The authors do so not only to provide a thoughtful diagnosis of the challenges of the environmental history field and the profession but also to provide a series of paths to heal and reconcile the work we do with more-than-human worlds, the communities with whom we work, and historical trajectories that cannot be reducible to the harms of colonialism, hetero-patriarchy, and the colonial archive. The afterword is a grounded call to action and a hopeful plea to amplify the everyday small and affirming relations that can help us build a better future for the environmental history field and the communities we care about within and beyond academia.

As co-editors and scholars, we believe that during this critical moment of global crisis, our generation has the urgent job of negotiating new ways to be in the world. We need an understanding of how we got here, if not to reverse, then at least to navigate and ameliorate perhaps the most extreme challenges humanity has ever confronted. The viability of our future depends on an understanding and a reckoning with our past, building towards a more ethical and more sustainable world than the one we live in now.

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