

## 17 Beyond science

### Climate change in a ‘wicked world’

*Mike Hulme*



Mike Hulme (1960–)

#### **Introduction**

For over 40 years I have sought to understand climate change – initially as a physical phenomenon, but in the last 20 years as also an idea that has a certain life of its own in society. In my career, I’ve operationalised the perspectives of both a physical and human geographer, starting with heavily quantitative research into climate dynamics, later studying how people think and talk about climate. Climate and its changes is not something that geographers can ignore. And nor have they. For geographers pursuing their task of ‘writing and drawing the Earth’, the geographical and historical variations in the world’s

weather offer a tableau – a vivid, lively scene – which can inform our understanding of many other physical and cultural facets of planetary and human life.

Seeking an understanding of climate has been integral to a geographer's mission, from the earliest shaping of Geography as an academic discipline in the late nineteenth century. But how exactly should geographers conceive of climate? Is climate a self-evident property of the physical world, “a largely taken for granted setting” (Stehr, 1997: 167) for human life, much like soil, vegetation and rivers? This was how the influential Scottish and Oxford geographer Andrew Herbertson (1865–1915) regarded climate, as one of the four “fundamental distributions” that defined his reading of the Earth in terms of ‘natural regions’. Herbertson's natural regions were really climatic in basis, and “climate ... lay at the root of his thinking about the natural world. The vaults of the Oxford School of Geography are packed with the library of climatological literature that he accumulated” (Hare, 1966: 99).

Or should climate rather be understood as an *idea* of the human imagination, an idea which co-constitutes people and places in a multitude of different ways (Wright & Tofa, 2021) and which is bound up with the collective symbolism of human cultural life, belonging and memory? In this reading, it is climate's “near infinite plasticity” (Hulme, 2009: 28) that gives climate such imaginative power and consequently makes it such a rich object of geographic study. The idea of climate is also used to stand in for the more general notion of ‘environment’, a description of the unity and inter-dependency of all things which offers the pre-condition for all emplaced life. This is how the German naturalist Alexander von Humboldt imagined climate two hundred years ago, climate as a description of the “unity of landscape” emerging from a confluence of nature and mind.

And then what of the slippery difference between weather and climate? The aphorism ‘climate is what you expect, weather is what you get’ is too trite, but it does seem to capture something important. It distinguishes between the embodied human experience of ‘weather in place’, on the one hand, and the mediating role of ‘climate in the mind’, on the other (Simonetti, 2019). Amidst the ceaseless volatility of the atmosphere's physical behaviour, the idea of climate – as distinct from weather – seems to offer the human body-mind something important: both the prospect of semi-predictable patterns and regularities in physical phenomena *and* some means of psychological orientation in a lively world of constant change and variability.

However one approaches the idea of climate, it's clearly something that is bound up with the ways in which people live, think and act in the world. It's an intimate idea, almost (but not quite) intuitive at one level, but also an idea difficult to fully grasp in formal terms. Climate is everywhere: wherever one is in the world one lives ‘in a climate’. But it's also nowhere: it escapes rigid boundaries or fixed manifestations. Making sense of climate and its change is therefore a task warranting the serious efforts of geographers, a task that has occupied my entire professional life. This autobiographical essay reflects on how I have conducted this inquiry, sometimes outside the discipline of Geography but always with the training and instincts of a geographer. My journey from undertaking quantitative research about climate trends and dynamics to research and thought leadership in how societies think about climate change has been a relatively unusual, but highly rewarding one.

### Climate as ‘climatology’

Geography degree courses have traditionally offered compulsory or elective courses in ‘climatology’, literally the study of climate. Recognising spatial and temporal variations in climate, climatology divides into distinct sub-fields depending on analytical method or theme. For example, English geographer A. Austin Miller's classic textbook *Climatology*

went through nine editions over the 34 years of its publishing life (1931–1965): it offered students “a systematic geographical treatment of the subject in which the climatic type is adopted as the unit, while the important regional peculiarities are dealt with separately. Particular attention is paid to the climatic control of vegetation” (Miller, 1931: title page). These sub-fields of climatology, familiar to many past geographers, later expanded to include, among others, statistical, synoptic, mountain, urban, tropical, agricultural and applied climatologies, each spawning distinct literatures of their own.

It was therefore as ‘climatology’ that I first encountered the formal study of climate as an undergraduate geographer in 1979 at the University of Durham. This was in an optional second-year course taught by climatologists Ray Harris and Joan Kenworthy. Their synopsis stated that the course would “examine the ways in which we observe the atmosphere and the models developed to explain the behaviour of climate”, including some “regional and local climates”. The course concluded with “an examination of the changes in our climate which have occurred and which continue to occur”. My climatological lectures 45 years ago consisted of topics such as ‘climatological methods’, ‘climatic classification’, ‘synoptic climatology’, ‘urban, monsoon and mountain climates’, ‘climate modification’ and ‘climatic change’.

As Julie Winkler observes in her entry ‘Climatology’ in *The International Encyclopedia of Geography* (Richardson et al., 2017), interest in climatology “has increased dramatically, partly in response to concerns about natural and anthropogenic climate change. The terminology ‘climate science’ has grown in popularity, and appears to be replacing ‘climatology’ as the umbrella term for the study of climate” (Winkler, 2017). But even in 1979, geographer climatologists such as Harris and Kenworthy could alert their 19-year-old students to “the flood of literature relating to current anxieties about climatic change” and would preface the introduction to their course by stating that “In recent years, our climate has been brought to the attention of many scientists”.

Having taken this second-year course, and with my own interest in the subject matter probably piqued by an especially cold British winter in 1978/1979, I titled my undergraduate dissertation ‘A Synoptic Study of Recent Winters in the British Isles’. This got me working with historical instrumental meteorological data to construct and analyse statistical indexes of winter weather and to place this analysis in the context of longer-term trends or cycles in British climate. I was somewhat astonished to find later that what became known as the “Hulme winter severity index” had been promoted by geographer John Thornes at the University of Birmingham and used by a number of local authorities in the development and application of salting regimes for motorway winter maintenance (Gustavsson, 1996). It demonstrated to me very early in my career how statistical representations of climatic variability could find direct practical applications.

But even as my Geography peers and I were being introduced to the sub-discipline of ‘climatology’ around 1980, a new science of climate was already emerging internationally. This brought together a range of disciplines – for example, meteorology, geochemistry, oceanography, Quaternary science, glaciology – which, by the mid-1980s, had crystallised as a new inter-discipline called Earth System science (NRC, 1986). Since the International Geophysical Year of 1957/1958, new global infrastructure of planetary-scale monitoring and computerised calculation, sustained by huge public investment in a Cold War world, had facilitated the emergence of this more exclusively scientific notion of a global climate system (Heymann & Dalmedico, 2019). The goal of Earth System science (ESS) was to make climate amenable to integrated scientific enquiry, to advanced numerical simulation, visualisation and prediction, and hence, presumptively, amenable to control.

Geographers of the later twentieth century were not central to this development of ESS, nor even for the most part peripheral. The new climate science developed with little regard to geographers' earlier understanding of climate as rooted in places and connected to distinctive local environments and cultures. It was this latter framing that had guided my own PhD studies in the period between 1981 and 1985. My PhD followed a fairly traditional (geographical) path of statistical climatology combined with infusions of thinking about human–environment interactions, inspired by Hewitt and Hare's (1973) conceptual framework for environmental geography. My PhD thesis on semi-arid Sudanese rainfall variations barely acknowledged the global climatic context of these changes, and was completely uninformed by the rapidly developing science of climate modelling (Hulme, 2022).

Towards the end of my PhD studies, I gained my first academic job at the University of Salford in 1984, as lecturer in physical geography. As well as teaching some introductory physical geography courses, and geographical statistics, I designed my own specialist third-year course which I titled, 'Contemporary climatic change'. The aims of this course were to introduce students to:

- The sensitivity of the atmospheric system to 'man-made' and natural changes in the environment;
- The techniques and methods of studying climate changes and variations which result from the above sensitivity;
- The impacts of an unstable climate on human society and the natural environment.

I taught this course for three years between 1985 and 1988, but my approach remained quite distinctively climatological and geographical, rather than embracing the new computation and systems approach to climate science. I delivered lectures on the historical context of present-day climate, on long-term trends in global climate, on the causes of drought in North Africa and on climate research programmes; the four recommended core books were: Ausubel and Biswas (1980), Houghton (1984), Lamb (1982) and Tickell (1977).

### **Climate as Earth System science**

By the later 1980s, public concerns about anthropogenic climate change – in particular the 'enhanced greenhouse effect' – had surged on the rising tide of the new climate science and modelling. It was not geographers or Geography journals that the media and policy advisers looked to. It was to the new breed of globally oriented climate scientists and their connections to powerful and well-funded national and international science programmes emerging under the auspices of the International Union for the Conservation of Nature (IUCN) and the UN. I was acutely aware of this at the time. If I wanted my enthusiasm for researching climate and its changes to gain public funding and visibility, and if I wanted to make my own contribution to this rising public policy issue, then maybe I'd be better off leaving the discipline of Geography.

The Climatic Research Unit (CRU) is located in the School of Environmental Sciences at the University of East Anglia (UEA) and by the late 1980s had been aligning itself with these new international climate science networks for at least a decade. It was founded in 1971 by the geographer-meteorologist Hubert Lamb, but since 1978 had been led by the Australian physicist Tom Wigley. Wigley was well tuned to the 'epistemic

**UNIVERSITY OF EAST  
ANGLIA, NORWICH**  
Climatic Research Unit

**A SENIOR  
RESEARCH  
ASSOCIATE**

is required to work with Professor T. M. L. Wigley and Dr P. D. Jones in the Climatic Research Unit on a Department of Environment sponsored project to study observed and modelled precipitation changes, with a view to improving our understanding of the greenhouse effect. The project, which involves collaboration with the Meteorological Office, will run from July 1988 for two years. Applicants should have a higher degree in meteorology, climatology, oceanography, mathematics, statistics or physics. Appointment will be on the 1A scale with a starting salary in the range of £9865-£12 150 pa.

Applications, containing full cv and the names, addresses and telephone numbers of three referees, should be sent by 20 May, 1988 to Dr J. P. Darch, Research Administrator, Climatic Research Unit, University of East Anglia, Norwich NR4 7TJ. (0603 592994). Further particulars are available from Dr Darch. Specific enquiries about details of the project should be made to Professor T. M. L. Wigley: 0603 592721.

Figure 17.1 Advertisement for a research position in the Climatic Research Unit, for which I applied and was successful.

From *New Scientist* magazine, 12 May 1988. Copyright University of East Anglia, with permission.

power' and public and political kudos of the new generation of climate models and had astute awareness of sources of public funding for work in this area, often from the USA.

When a fixed-term research position was advertised at CRU in May 1988 to work on a project validating global climate models, funded by the UK Department of Environment, it seemed the perfect exit route for me out of Geography (see Figure 17.1). Working within this internationally recognised Unit, connected to most of the world's leading climate research and modelling centres, I would have a much bigger platform from which to pursue my research into climatic change. I therefore relinquished my lectureship in physical geography at Salford and in September 1988 embarked on what became a series of fixed-term post-doctoral positions at UEA. At the time I gave little thought to the significance of embracing this new paradigm of climate science. To an enterprising 28-year-old there seemed little alternative.

Not only did I leave the discipline of Geography behind, I also left teaching behind. CRU was a research-oriented unit, with neither undergraduate nor (until rather later) Master's level teaching. I pursued various lines of investigation, working with quantitative data and models, creating and promoting what I later called "global kinds of knowledge" (Hulme, 2010a). These were the forms of knowledge that the newly established Intergovernmental Panel on Climate Change (IPCC) was called on to assess and package for policy audiences. Not only was this knowledge 'global', it was exclusively numerical and often quite detached from the social-cultural world (ironically the world that was both responsible for anthropogenic warming and being impacted by it). Geographers and their semi-quantitative, eclectic and somewhat disjointed forms of climatological knowledge, appeared to me a backwater for climate research.

Around this time, c.1990, quite a lot of the more environmentally oriented geographers – at least a lot of those that I knew in the UK – seemed to agree. The international networks, and the governmental and inter-governmental funding bodies that kept them well oiled, began to absorb a fair number of geographers, among them Ann Henderson-Sellers, Martin Parry, Tim Carter, Jean Palutikof, Diana Liverman, Nigel Arnell and Paula Harrison. Climatology courses began to disappear from undergraduate Geography programmes and at some stage during the 1990s, the joint specialist study group on climate – the Association of British Climatologists -- run jointly by the Institute of British Geographers (IBG) and Royal Meteorological Society, disbanded. When the IBG and the Royal Geographical Society merged in 1995, I let my 11-year long membership of the IBG lapse, a symbolic severing from my intellectual roots. Working in a School of Environmental Sciences, where there was no Geography taught, I was now a long way from my Geography homeland.

### **The limits of Earth System science**

By the late 1990s, my work was deeply embedded within the international networks of global climate science. I was committed to making 'global kinds of knowledge' and to assessing this knowledge and communicating it through various roles I had within the IPCC, notably in the Third Assessment Report (1996–2001). I was regarded as 'a climate scientist' both within my epistemic community, but also by myself. In my passport and on visa application forms I entered my occupation as 'climate scientist'. I had very little connection with the academic discipline of Geography.

In 1998, as an outcome from New Labour's first spending review under Chancellor Gordon Brown, several major new investments in UK science were announced. One of these was the calling of an open competition to establish a national climate change centre, a new inter-university research network to be based at a British university and with a vision to design and deliver integrated research for sustainable solutions to climate change. Very substantial funding of £10m (c. £22m in today's value) was available for the successful bid.

The University of East Anglia saw itself at the time as probably the leading university in the country for climate change research. Discussions between my colleagues and I in CRU, and with senior management, quickly confirmed the institution's desire to lead one of the bids for this centre. A number of circumstances led to my name being put forward to lead the bid development and, if successful, to become the founding executive director. Not least of these reasons, I now believe, was my background as a geographer. This was as someone who could be perceived by researchers affiliated to the new centre, and by the

three relevant funding research councils, as holding credibility across different disciplinary traditions: natural science, social sciences, economics, ecology and engineering. My Geography background, unexpectedly, had now become a trump card within the academic communities that we sought to bring together around the £10m honeypot. Following success in the competition process, the newly named Tyndall Centre for Climate Change Research was formally launched in November 2000, boldly promising a range of stakeholders – public, private, governmental, non-governmental – solution-oriented integrated science, one of the first bespoke research centres worldwide to do this with regard to climate change.

Although the Centre attracted stakeholders and secured research impact, my experience of running the Centre started to trouble me. I had direct high-level exposure to the worlds of government, business, NGOs, media and academia, and I saw at much closer quarters how the framing, communication and search for solutions of the growing public policy issue of climate change was heavily shaped by the knowledge emerging from research. I began to question the knowledge framework/epistemic paradigm that we had adopted in the Centre. I was clear that Earth System models were a limited technology/methodology for studying the dynamics and politics of climate change. That much we were clear about in our original bid and proposed research programme. But I now saw that our favoured paradigm of integrated assessment models (IAMs), to which the Tyndall Centre would make a pioneering contribution jointly with the Potsdam Institute for Climate Impact Research (PIK) through the mediation of my research director John Schellnuber, was also deficient. IAMs were one way of trying to integrate the human world with the physical world to provide decision support tools for policy advisers and decision makers. But IAMs provided a very impoverished representation of human agency, of how people individually or collectively form beliefs, make decisions and act in the world.

There was something else that troubled me. Working closely with up to 100 researchers from different disciplines spread across nine institutions seeking jointly to design and deliver an integrated programme of research, I increasingly observed that Tyndall Centre researchers were not all working from the same starting assumptions. We might all be studying climate change – and making our careers out of doing so. But when it came to choices about practical interventions, or proposed policy measures to research, and how to evaluate such measures, we were guided by different worldviews, values and preferences. Examples of such measures at the time included the idea of domestic tradeable carbon quotas, the role of nuclear energy, preferences for carbon taxes or carbon trading, how to capture non-market valuations, and whether the energy transition was hampered more by inadequate innovation or by weak-willed implementation.

And yet we rarely made these value differences explicit in our work. I observed that we seemed to hold the implicit belief that integrated interdisciplinary knowledge within a (predominantly) scientific and computational paradigm would inevitably yield the universal insights and tools that decision makers were wanting. Between the years 2003 and 2006, this observation formed the seeds from which my later book, *Why We Disagree About Climate Change*, emerged.

At the same time, I began to realise that generating more ‘integrated scientific knowledge’ may be as much a part of the problem of climate change as it was part of a solution. The Tyndall Centre straddled the ESS and IAM paradigms, making some limited space for critical social science, with the ambition for this knowledge to be useful for public policy. But reflecting on this ambition, I found myself re-visiting a dormant element of

my earlier geographical education. This concerned the philosophy of knowledge or what, as a Durham undergraduate geographer, we had encountered in our courses on ‘Principles of Geography’. From around 2004 onwards I began to read literature from science and technology studies, including Jerry Ravetz’s and Silvio Funtowicz’s idea of “post-normal science” (Funtowicz & Ravetz, 1993) and the notion of “wicked problems” introduced by Horst Rittel and Melvin Webber (Rittel & Webber, 1973). More generally, I was reading the work of people such as Thomas Kuhn, David Bloor, Dan Sarewitz, Sheila Jasanoff and Steve Rayner. Not much of this literature was written by geographers. But these writings afforded me new windows into how knowledge is made and how it gains its social status, connecting me with half-forgotten questions we had discussed as undergraduate geographers about positivism, humanism, models and phenomenology through reading the work of geographers such as Derek Gregory, Ron Johnston, David Harvey and Yi-Fu Tuan.

These two emerging lines of discontent now crystallised in my thinking: the masking or suppression of the plural values that underlie our approach to framing and solving climate change; and the ignorance or naivety of how researchers think science gains and retains trust in (different) society(ies) (see Figure 17.2). These concerns were pressing in on me. They appeared far more important, and exciting, subjects of research than the questions that had motivated my earlier research, such as ‘What were the observed trends

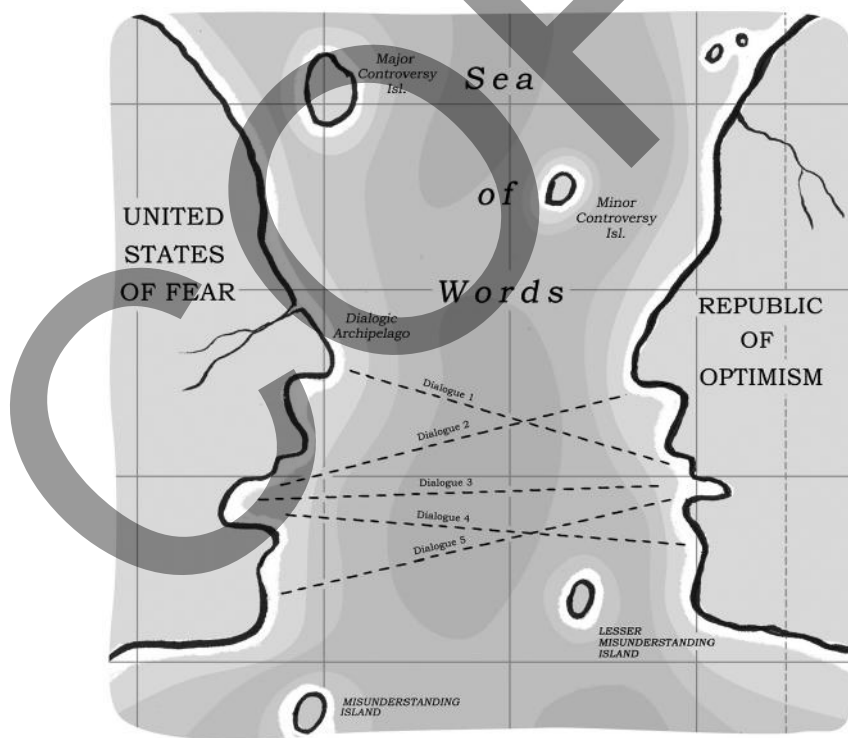


Figure 17.2 Cartoon depicting the need for dialogue and discussion between those holding different viewpoints on climate change.

Source: Hulme (2013) *Exploring Climate Change Through Science and in Society* (Routledge).

in precipitation?', 'Were climate models getting better?' or 'How can future climate scenarios be designed?'

Put simply, climate change was not an environmental problem (that had been scientised), but best seen as a conundrum of the human condition (linking culture, society, knowledge and politics). The relationship between facts and values, and how that relationship was perceived differently within and among different societies and politics, now seemed to me of central importance. Climate change was indeed a wicked problem. These were not questions that we were openly pursuing within the Tyndall Centre. Nor were they the primary concerns of the wider international research networks of IGBP, WCRP, IPCC or even the IHDP, within which my work and professional life had previously been embedded.

During the years 2005 and 2006 I therefore experienced a major intellectual crisis (together with a minor personal one, which I won't elaborate here). My need to escape the suffocating way in which climate change was being framed, studied and acted on became overwhelming. Initially, I did this by re-entering the classroom, enrolling in an evening class on memoir writing and registering for a postgraduate diploma in history, both undertaken at the UEA. A vastly different reading agenda also formed part of my escape route, with Julie Cruikshank's *Do Glaciers Listen?* (2005), Thomas Dunlap's *Faith in Nature: Environmentalism as Religious Quest* (2004) and David Livingstone's *Putting Science in its Place* (2003) just three examples of books that offered signature moments of mind-shaping enlightenment. I also found myself connecting my thinking about climate change more explicitly with my own religious faith, traditional evangelical Christianity, which is quite comfortable with discussions about faith, truth and myth in the search for the grounds for just and moral action in the world.

It was the limits to science, the embeddedness of climate in culture and the sheer diversity of ways that peoples around the world made sense of their climatic environments and its vicissitudes that now excited me. I began to re-discover what had animated my interest in climate in the first place as an undergraduate student and then a PhD student in Sudan. It was an excitement that demanded my re-connection with Geography.

### 'Geographical work at the boundaries of climate change'

Much of my thinking around this time became expressed in a shortish essay I published in *Transactions of the Institute of British Geographers* as one of their series of commissioned essays called 'boundary crossings' (Hulme, 2008). This became one of the journal's top-ten cited articles of the last 15 years. My choice of this journal to publish in was deliberate. It signalled the growing importance of Geography (again) in my thinking about climate change – a discipline I had left behind 20 years earlier. I wanted to pose my recent (re-)thinking about climate change as a challenge specifically to geographers: "We need new ways of thinking about and understanding the hybrid phenomenon of climate change. Geographers have a unique role to play in this task" (p.6). I articulated this role in terms of "repairing the damage done" – not the damage done to the physical functioning of the climate system through our actions, but *damage done to our way of thinking about climate* in narrowly scientific and reductionist terms.

Geographers ... understand that meaning is lost once the physical and the cultural are cleaved. By purifying climate [of cultural meaning] we de-stabilise the idea of climate, allowing it to be appropriated in support of one-eyed agendas. We cannot allow this to happen ... By stripping climate of its flowing cultural and psychological symbolism,

by ignoring the multiple meanings of climate, we are in danger of letting the idea of climate change get out of control. And why does any of this matter for geography and geographers? For too long geographers have forgotten that climate is an idea that emerges from the heart of the discipline – or rather that Geography lies at the heart of the idea of climate.

(p. 10) – see also Hulme (2015b)

I went on to argue that the naïve climate determinists of the first half of the twentieth century had inadvertently prompted geographers to distance themselves from the idea of climate as something that brought the physical and social worlds together. Geographers had “become increasingly happy to leave climate well alone. Distancing themselves from the idea, climate was left first to the physical geographers, who in turn handed it over to the meteorologists who most recently have been usurped by the Earth system scientists. This distancing has not been helpful” (p. 10).

At the same time, I was writing what was to be published as my first monograph, *Why We Disagree About Climate Change* [WWDACC] (Hulme, 2009). This was both the culmination of the factors that had shaped my (re-)thinking about how to study climate change which had surfaced during the years I had been running the Tyndall Centre and my attempt to make sense of climate change’s ‘human dimensions’. These factors were a growing conviction about the limits and reductionism of science; frustration with the inadequacy of how scientific knowledge connected to people’s lives; an intellectual fatigue and staleness; and a personal mid-life soul-searching: did I really want to spend the next 15–20 years doing the same thing?

Among the various reviews of WWDACC, I noticed how often readers attached significance to me being a climate “scientist”. Thus Silke Beck in the journal *Futures*, “Drawing upon 25 years of professional work as an international climate change scientist and public commentator”; Chris Caseldine in *The Geographical Journal*, “Essentially this is a book about ideas, written by a scientist who not only recognises the importance of his science but also ... wants to understand what it is about that science that needs to be communicated widely and how best to achieve that objective”; Rupert Read in *Green World*, “It’s great virtue is that it is a book by a climate scientist that, unlike many previous pronouncements by climate scientists, does not seek to pretend that being a climate scientist gives one any special political, ethical or philosophical privilege”; and David Demeritt in *Progress in Human Geography*, “Steeped in this tradition of predictive environmental science, Hulme offers a powerful critique of its limitations and of the problems caused by ‘disconnecting climate from its cultural forms [and] framing climate as overtly physical and global’ (p. 28). Hulme began his career as a climate scientist and continues ... to make important contributions to precipitation climatology and climate scenario analysis.” People received the book, and gauged its significance, partly on the grounds it was written by ‘a scientist’ as opposed to ‘a geographer’.

The wider reception to WWDACC was astonishing. As I wrote a few years later in an essay in the journal *Dialogues in Human Geography* (Hulme, 2015a: 323–324):

The subsequent reaction to the book surprised me. Unknowingly, I had written a climate change text which seemed of not much interest to climate scientists and geoscientists, but which was of considerable interest to disciplines beyond environmental science. The book offered a framework for scholars, analysts and other professionals to engage with climate change on their own terms, rather than on the terms being

offered by global climate science or the IPCC. The central argument of the book was that it is necessary to reveal our (many) reasons for disagreement – our underlying beliefs and motivations – before we can act effectively in the world. The intellectual bandwidth which Geography occupies, and from which it launches its engagement with those outside geography, now offered a natural home for me. After writing *Why We Disagree...*, an eventual return to a geography department was perhaps inevitable.

With my conviction strengthened by the success of *WWDACC*, I now widened the range of academic journals in which I published. Thus in one of the earliest issues of the new climate change journal from the Nature-Springer stable, *Nature Climate Change*, I published an essay titled ‘Meet the humanities’ (Hulme, 2011a). Here, I argued that, “To shed new light on the multiple meanings of climate change in diverse cultures, and to create new entry points for policy innovation, the interpretative social sciences, arts and humanities need new spaces for meeting as equals with the positivist sciences” (p.179). In the same year, in the American history of science journal *Osiris*, I published a warning about reducing the future to climate (Hulme, 2011b). Geographers’ older dalliance with environmental determinism (see Chapter 3) was worryingly being resurrected under the guise of what I called “climate reductionism”. This essay has been the most highly cited in the journal’s 85-year history. And then in 2016, writing a chapter entry for the *Routledge Handbook of Religion and Ecology*, I argued that climate change would not be understood in today’s world without engaging with the thought and practice of the world’s major religions. “Different regions and diverse groups of stakeholders understand the threat of climate change according to particular and often distinct religious frames of reference. These religious narratives and rituals shape the nature and credibility of different knowledge claims about climate – what is happening to it and why – as well as shaping individual and communal ethical and social behaviors” (Hulme, 2016: 243).

These moves were all part of a deliberate expansion of my analytical purchase on the idea of climate change, beyond the quantitative paradigm of natural science or the study of social and institutional behaviours in the social sciences. I gained inspiration from the challenge laid down in Jerome Kagan’s book *The Three Cultures* (2009): “... every society needs a cohort of intellectuals to check the dominance of a single perspective when its ideological hand becomes too heavy” (pp. 266–267). I was arguing that to fully understand the mutating idea of climate change in contemporary life, the imaginative disciplines of the humanities were essential for exploring and establishing meaning and purpose, and for reaching people in new ways, whether this be through literature, art, poetry or religion (see Figure 17.3).

Whether or not “a return to a Geography department” (cf. above) was inevitable, after writing *WWDACC* I did indeed return to academic Geography to continue studying climate change on my own terms. By 2013, I was finding myself increasingly isolated in a School of Environmental Sciences which, ironically, in 1988 I had been very happy to leave Geography in order to join. A catalysing example of how this came about concerned a new MA in Environmental Science and Humanities that I had designed, along with some colleagues in the Faculty of Humanities at UEA, and that included environmental history, philosophy and literature. Establishing this taught programme was a struggle, largely because the School of Environmental Sciences had no vision for what I was seeking to do. Very little financial or institutional support was forthcoming. The MA admitted its first students for academic year 2012/2013, but by then I was already looking for opportunities to move back into Geography and in 2013 an opportunity arose at King’s College London (KCL).

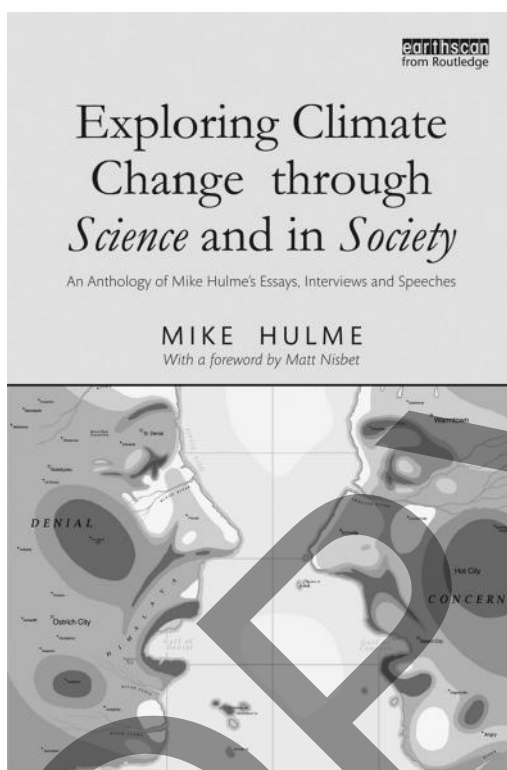


Figure 17.3 Cover from my book, *Exploring Climate Change Through Science and in Society* (Routledge, 2013), which captures a range of my writings about climate change over the previous 25 years.

After 25 years outside the discipline of Geography, I was now back. Two years after arriving at KCL, I delivered my inaugural lecture which I titled ‘Studying Climate and its Changes: In Places, With Numbers, Through Myths’. This laid out my new manifesto for how climate change should be studied through science, social sciences and humanities, and a department of Geography seemed the perfect home for such a programme of work. In 2015, with the full support of senior management in the Faculty of Social Science at KCL, a contrast to the lukewarm support I had received at UEA, I launched a new MA in Climate Change: History, Culture, Science. The advertising blurb was now explicit about how I believed climate change should be studied. Students, it said, would “Explore the ways that science, policy, beliefs, values and the imagination shape human responses to climate change”. The MA was suitable for students “with either a science or humanities background who wish to develop their understanding of how climate change is historically and culturally situated”. This was a more expansive taught programme on climate change than existed elsewhere at the time. And Geography provided a welcoming intellectual home.

### **Making Geography matter for climate change**

Having read the foregoing pages, I can imagine my readers asking whether ‘the project’ narrated here is really about Geography rather than being one that has been conducted

by someone who self-identifies as a geographer. My project certainly isn't the way in which all practising academic geographers today would approach the study of climate change; it also far from exhausts what geographers have to offer to our understanding of climate change. On the other hand, this project has given me the vantage point to contribute a recent book-length version of my framing of climate change in the Routledge 'Key Ideas in Geography' series (Hulme, 2021). This was my attempt to show why Geography matters for climate change.

Moving between and across these different cultures of knowing – sciences, social sciences and humanities – has not always been smooth or painless. I have been criticised in my later work for not giving sufficient weight to scientific claims about climate change, been charged with being a climate 'delayer' if not a 'denier', and been accused of not doing enough to galvanise climate activism. At other times I have found myself on the wrong side of the peer review process. Peer reviewers 'police' what should or should not be published and at times my work hasn't fitted the standard scientised narrative of climate change, or else as a 'mere' geographer or as 'a scientist' my work appears to violate the theories and tacit epistemic commitments of a particular sub-discipline. For example, when publishing my 2010 article in the journal *Science as Culture* (Hulme, 2010b), one of the reviewers sniffily pronounced that,

Having said all that, I can now see why I am undecided. This has all the hallmarks of an essay by a highly intelligent and committed scientist, *who (in my opinion) shares the limitation of many scientists, in believing that writing on broader issues does not require the same intellectual discipline as doing real research.* This lack of awareness of the 'tacit knowledge' (to quote Polanyi) of social studies of science may not be too damaging in the case of a reflective piece for a newspaper. But since this piece is intended for a scholarly journal, its deficiencies obtrude. The editors ... should try a second opinion.

[emphasis added]

Moving into different epistemic territories is not always welcome by the incumbent dwellers.

But if Geography is what is done by geographers, then my 'project' of pursuing climate change beyond science, described here, has achieved certain things for Geography by drawing upon sensibilities I first cultivated as a Geography undergraduate in the 1970s. It has opened new approaches for how a new, younger generation of geographers might engage with the idea of climate change. For example, it has helped inspire the 'cultural turn' in climate change studies of the last 15 years, as signalled by the work in the early 2010s of the cultural geographer Hilary Geoghagen (Geoghagen & Leyshon, 2012). An element of this turn has been to attach new emphasis to religious myth, symbolism and practice for understanding climate change sense-making, as is well illustrated in the work of the young geographer Hannah Fair (Fair, 2018). My project of representing climate as much more than a physical phenomenon has also been picked up and developed in significant new ways by more experienced geographers, notably Harriet Bulkeley as captured in her 2019 essay 'Navigating climate's human geographies: Exploring the whereabouts of climate politics' (Bulkeley, 2019). Bulkeley's signature work was recognised in her receiving the Chair for the 2023 RGS-IBG Annual Conference in London, on her own theme, 'Climate changed geographies'.

And this is why making Geography matter for climate change matters. Geography provides the intellectual space to explore the world in its holistic integrity, without the necessity of narrow disciplinary or reductionist thinking. In 1953, the philosopher Isaiah Berlin published a short book called *The Hedgehog and the Fox* (Berlin, 1953). Berlin used this metaphor to divide thinkers into two categories. Hedgehogs view the world and write about it through the lens of a single defining idea. They dig deep along a single line of sight, but are closed off to seeing things differently. Foxes, on the other hand, scavenge widely. They draw on a wide variety of experiences to make sense of the world they encounter in all its diversity. Both hedgehogs and foxes are survivors, but their survival strategies are different. My instincts when it comes to studying and understanding climate change are those of a fox: as per my KCL inaugural lecture, ‘Studying Climate and its Changes: In Places, With Numbers, Through Myths’.

But they are also the instincts of a geographer. When I took on the task in 2008 of designing, and then executing for 15 years as Editor-in-Chief, the interdisciplinary review journal *WIREs Climate Change*, I had a definite vision in mind. It was that of a geographer. As I wrote in one of my *WIREs* editorials (Hulme, 2018):

You will know that I make no apologies for my belief in the primacy of “geography” as a disciplinary space in which the many dimensions of climate change as a socio-natural phenomenon can best be studied and taught. Geography, at least in the UK, knows no intellectual boundaries and this is reflected in my approach to curating the content of *WIREs Climate Change*. The scope of climate change reviews published here very deliberately covers humanities disciplines and interpretative social sciences, as well as the social sciences more broadly, and environmental geography, the natural sciences and economics.

(p. 1)

### Study task

This task can be set as a term paper or an exam question:

*On a BBC radio programme in April 2019, Greta Thunberg was asked ‘What do you want people to do, what do you want governments to do?’. Thunberg replied ‘... listen to the science, listen to the scientists ...’ Drawing upon Mike Hulme’s work, explain why Thunberg’s reply is inadequate?*

Alternative:

*Drawing upon Mike Hulme’s work, why are “global kinds of climate change knowledge” (Hulme, 2010a) unlikely to bring about necessary change?*

### Starter reading list

- Hulme, M. (2020) One Earth, many futures, no destination. *One Earth* 2(4): 309–311.
- Hulme, M. (2018) “Gaps” in climate change knowledge: Do they exist? Can they be filled? *Environmental Humanities* 10(1), 330–337.
- Hulme, M. (2015a) (Still) Disagreeing about climate change: Which way forward?. *Zygon: A Journal of Religion and Science* 50(4), 893–905.

- Hulme, M. (2015b) Climate and its changes: A cultural appraisal. *GEO: Geography and Environment* 2(1), 1–11.
- Hulme, M. (2011a) Meet the humanities. *Nature Climate Change* 1(4), 177–179.
- Hulme, M. (2011b) Reducing the future to climate: A story of climate determinism and reductionism. *Osiris* 26(1), 245–266.
- Hulme, M. (2010) Problems with making and governing global kinds of knowledge. *Global Environmental Change* 20(4), 558–564.

## References

- Ausubel, J. and Biswas, A.K. (eds) (1980) *Climatic Constraints and Human Activities*. Oxford: Pergamon Press. 205 pp.
- Berlin, I. (1953) *The Hedgehog and the Fox: On Tolstoy's View of History*. London: Weidenfeld & Nicolson.
- Bulkeley, H. (2019) Navigating climate's human geographies: Exploring the whereabouts of climate politics. *Dialogues in Human Geography* 9(1): 3–17.
- Cruikshank, J. (2005) *Do Glaciers Listen? Local Knowledge, Colonial Encounters and Social Imagination*. Vancouver: UBC Press. 312 pp.
- Dunlap, T.R. (2004) *Faith in Nature: Environmentalism as Religious Quest*. Seattle: University of Washington Press. 206 pp.
- Fair, H. (2018) Three stories of Noah: Navigating religious climate change narratives in the Pacific Island region. *Geo: Geography and Environment* 5(2): e00068.
- Funtowicz, S.O. and Ravetz, J.R. (1993) Science for the post-normal age. *Futures* 25: 739–755.
- Geoghegan, H. and Leyson, C. (2012) On climate change and cultural geography: Farming on the Lizard Peninsula, Cornwall, UK. *Climatic Change* 113(1): 55–66.
- Gustavsson, T. (1996) Test of indices for classification of winter climate. *Meteorological Applications* 3: 215–222.
- Hare, F.K. (1966) The concept of climate. *Geography* 51: 99–110.
- Hewitt, K. and Hare, F. K. (1973) *Man and Environment: Conceptual Frameworks*. Washington, DC: Association of American Geographers.
- Heymann, M. and Dahan Dalmedico, A. (2019) Epistemology and politics in Earth system modeling: Historical perspectives. *Journal of Advances in Modeling Earth Systems* 11(5): 1139–1152.
- Houghton, J.T. (ed.) (1984) *The Global Climate*. Cambridge: Cambridge University Press.
- Hulme, M. (2008) Geographical work at the boundaries of climate change. *Transactions of the Institute of British Geographers* 33(1): 5–11.
- Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding Controversy, Inaction and Opportunity*. Cambridge: Cambridge University Press. 393 pp.
- Hulme, M. (2010a) Problems with making and governing global kinds of knowledge. *Global Environmental Change* 20(4): 558–564.
- Hulme, M. (2010b) Claiming and adjudicating on Kilimanjaro's shrinking glaciers: Guy Callendar, Al Gore and extended peer communities. *Science as Culture* 19(3): 303–326.
- Hulme, M. (2011a) Meet the humanities. *Nature Climate Change* 1(4): 177–179.
- Hulme, M. (2011b) Reducing the future to climate: A story of climate determinism and reductionism. *Osiris* 26(1): 245–266.
- Hulme, M. (2013) *Exploring Climate Change Through Science and in Society: An Anthology of Mike Hulme's Essays*. Abingdon, UK: Interviews and Speeches Routledge, 330 p.
- Hulme, M. (2015a) Changing what exactly, and from where? A response to Castree. *Dialogues in Human Geography* 5(3): 322–326.
- Hulme, M. (2015b) Climate and its changes: A cultural appraisal. *GEO: Geography and Environment* 2(1): 1–11.
- Hulme, M. (2016) Climate change: Varieties of religious engagement. Chapter 25 (pp. 239–248) in: *Routledge Handbook on Religion and Ecology*. (eds) Jenkins, W., Tucker, M.E. and Grim, J. Abingdon: Routledge. 448 pp.
- Hulme, M. (2018) WIREs Climate Change 2018: an editorial essay. *WIREs Climate Change*. 9(1): e503, 6 pp.

- Hulme, M. (2021) *Climate Change: Key Ideas in Geography*. Abingdon: Routledge. 288 pp.
- Hulme, M. (2022) Reflections on the afterlives of a geography PhD thesis. *Area* 54(2): 280–289.
- Kagan, J. (2009) *The Three Cultures: Natural Sciences, Social Sciences and the Humanities in the 21st Century*. Cambridge: Cambridge University Press. 310 pp.
- Lamb, H.H. (1982) *Climate, History and the Modern World*. London: Methuen.
- Livingstone, D.N. (2003) *Putting Science in its Place: Geographies of Scientific Knowledge*. Chicago: University of Chicago Press. 234 pp.
- Miller, A.A. (1931) *Climatology* (1st ed.) London: Methuen & Co. Ltd.
- NRC (1986) *Earth System Science. Overview: A Program for Global Change*. Washington, DC: National Academies Press.
- Richardson, D., Castree, N., Goodchild, M.F., Kobayashi, A.L., Liu, W. and Marston, R. (eds.) (2017) *The International Encyclopedia of Geography: People, the Earth, Environment, and Technology*. Malden, Oxford: John Wiley & Sons, 9,120 p.
- Rittel, H.W.J. and Webber, M.M. (1973) Dilemmas in a general theory of planning. *Policy Sciences* 4: 155–169.
- Simonetti, C. (2019) Weathering climate: Telescoping change. *Journal of the Royal Anthropological Institute* 25: 241–264.
- Stehr, N. (1997) Trust and climate. *Climate Research* 8: 163–169.
- Tickell, C. (1977) *Climate Change and World Affairs*. Cambridge, MA: Harvard University Press.
- Winkler, J. (2017) Climatology. Entry in: *The International Encyclopedia of Geography: People, the Earth, Environment, and Technology*. (eds) Richardson, D., Castree, N., Goodchild, M.F., Kobayashi, A.L., Liu, W. and Marston, R.. Malden, Oxford: John Wiley & Sons, 9, 120 pp.
- Wright, S. and Tofa, M. (2021) Weather geographies: Talking about the weather, considering diverse sovereignties. *Progress in Human Geography* 5(5): 1126–1146.