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*Immeasurable Weather* is the story of “how settler colonialism, white supremacy, and heteropatriarchal power informed, upheld, and bolstered meteorological science and data collection in the United States from the early nineteenth century to the present day.” It is a rejection of the “collectivized forgetting” of the violent legacies of the relationship between meteorological science and settler colonialism (p. 176). The result is an unflinching account, rich with original research. *Immeasurable Weather* gives the reader nowhere to hide from Sara J. Grossman’s sharp interrogation of the role that settler colonial knowledge and ideologies have played in the collection, curation, and use of weather data.

Each chapter “illuminates the power that everyday communities have in shaping data,” from the early nineteenth-century weather observers to the way we consume and understand satellite imagery in the present day (p. 13). *Immeasurable Weather* traces meteorological data’s emergence as part of a settler colonial project of nation-building, resulting in the marginalization and erasure of indigenous people and knowledge, a failure to create a relationship of care and reciprocity with our environment, and a “settler sense of place” that deeply affects our understanding of biospheric systems (p. 19).

Chapter 1 traces the early stages of meteorological observation in the eastern part of North America, focused on the actions of a network of observers and the efforts of white male officials to create a national scientific project. Reliant on settler occupation of land, a vast number of meteorological observations created an “environmental imagination of a state ... literally bounded by weather” (p. 45). Grossman shows how the “instrumentalizing” of settler bodies, the language of data, and emerging practices of tabulation and graphical observations served to create an imagined settler community (the nation-state), connected by weather and visualized in maps. This
chapter also shows how meteorological science began to be institutionalized in this period through the Smithsonian Meteorological Project, the focus of chapter 2.

Chapter 2 offers a “nineteenth-century example of women, data labor, and gender discrimination” (p. 58). Grossman explores white women’s participation in the emerging field of meteorology in the nineteenth century. Met with “resistance and erasure,” women were nonetheless “constel‐

latory stars” in the field of meteorological science, as observers, computers, and clerks (p. 59). Grossman explores how the Smithsonian Meteorological Project idealized male bodies and sensory experiences, despite the efforts of women contributing to the project. Women struggled to access information and resources for observation; even when formally employed to reduce data, their work was marginalized. Grossman also argues in this chapter that women participated in and advanced settler colonial logics, but this element of the chapter is arguably underdeveloped, with the focus being on the misogyny of meteorology. However, Grossman acknowledges that she has only begun to explore “what is likely a much longer path” (p. 86).

Where early/mid-century science was defined by a network of observers collecting numerical data from the ground by hand, the later part of the century sees the introduction of airborne and automated optical observations. In chapter 3 we thus take to the air with the emergence of kites as a meteorological tool. Grossman charts how this “boyish pastime” went from a toy to an instrument to “quantify the air” (p. 89). The evolution of the kite from tool to technology occurs alongside the growth of print culture and the deepening military-meteorology relationship in the United States. Through kites and the optical science they facilitated, Grossman argues that settlers could “imagine a vast nation bounded by a sky of data and kites” (p. 105). This period cemented the role of airborne, optical, automated data collection for both meteorological and military purposes.

We enter the twentieth century in chapter 4 with an investigation of the transformation of meteorological science at the turn of the century and the implications of the 1930s Dust Bowl crisis. Grossman first explores how standardization and automation of data collection hinged on a narrative of “clean versus dirty” data, a narrative that led to the estrangement of data collectors/users from their environment. Thus, she argues, the Dust Bowl was a “data crisis” as much as an environmental one, a “fundamental disjuncture between historic forms of colonial scientific capture and complex Earth systems” (p. 132). A “data landscape” built around the geography of frontier forts and homesteading, rooted in standardization and a settler colonial “way of relating,” was unable to capture the literal, categorical, and environmental messiness of dust. Through this work, Grossman illuminates why the solution to environmental crises is not “more data,” in 1930 or 2023.

In the final chapter of Immeasurable Weather, Grossman takes us into the “age of satellites,” beginning with the launch of Television InfraRed Observation Satellite (TIROS), the world’s first meteorological satellite, and traveling through the NIMBUS, Landsat, and GOES satellites to the modern day. Grossman explores the “historic interdependence” of meteorological science and US military, a relationship that intensified in the twentieth century.

The “satellite age” finishes the story Grossman began in the early nineteenth century, through which she shows the settler state becoming increasingly disconnected from the reality of environmental/weather crises and the responsibility it bears. The turn toward global data in the 1950s, the positioning of vision as objective, and the visualization of weather through satellite images rendered weather a disembodied, abstract thing, with critical implications for narratives of contem-
porary climate crisis. For example, Grossman argues that satellite visualizations of weather events like Hurricane Sandy obscure “the lived scale of weather crises and the ways ongoing settler colonialism and dispossession are central to lived crises” (p. 159). The representation of satellite images as sublime and aesthetic also obscures how “nation-state technologies for reconnaissance, resource extraction, geophysical domination, and meteorological data collection have become eternal bedfellows” (p. 146).

Overall, *Immeasurable Weather* will be valuable to those interested in environmental humanities, history of science, data, and technology, North American settler colonialism, and geographies of knowledge. Grossman has drawn together a wide body of scholarship and a rich archive of historical data in a timely account of our relationship with weather and our environment, as it is mediated through data.

The weaknesses of this book are inherent in its major strength: when covering two centuries of history in a rich narrative dense with original research, it is inevitable that some aspects are underdeveloped. In chapter 4, for example, the final section on the impact of the world wars on meteorological science and the emergence of the satellite age feels rushed and incomplete, a footnote between the Dust Bowl and the 1960s launch of TIROS. Moreover, despite Grossman’s frequent references to the injustices facilitated by settler colonial environmental knowledge/consciousness, there are few places in the book where she brings out what this means in practice. In chapter 6, for example, there is a brief reference to the material consequences of satellite imagery for indigenous communities regarding the use of images to plan oil pipelines, but it is brief. However, *Immeasurable Weather* covers an immense amount of material in a short space, and gaps are inevitable. Grossman provides the evidence of meteorology’s deeply rooted relationship with settler colonialism; it is up to the reader to take this knowledge forward and understand the practical implications in our contemporary climate crisis.

A future in which “the violence of settler colonialism no longer structures everyday life,” Grossman argues, requires knowledge of settler history, accountability on the part of settlers, and work toward restorative, transformative justice (p. 167). Grossman contributes to that effort with her unflinching and detailed history of meteorology’s relationship with settler colonialism in the US. *Immeasurable Weather* is a must-read for those seeking to understand the history and present of our relationship with weather.
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