

PHILOSOPHY AND CLIMATE SCIENCE

There continues to be a vigorous public debate in our society about the status of climate science. Much of the skepticism voiced in this debate suffers from a lack of understanding of how the science works – in particular the complex interdisciplinary scientific modeling activities such as those which are at the heart of climate science. In this book Eric Winsberg shows clearly and accessibly how philosophy of science can contribute to our understanding of climate science, and how it can also shape climate policy debates and provide a starting point for research. Covering a wide range of topics including the nature of scientific data, modeling, and simulation, his book provides a detailed guide for those willing to look beyond ideological proclamations, and enriches our understanding of how climate science relates to important concepts such as chaos, unpredictability, and the extent of what we know.

ERIC WINSBERG is Professor of Philosophy at the University of South Florida. He is the author of *Science in the Age of Computer Simulation* (2010) and has published in a number of philosophy journals including *Philosophy of Science*, *The Journal of Philosophy*, *The British Journal for the Philosophy of Science*, *Studies in History and Philosophy of Modern Physics*, and *Synthese*.

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We are now faced with the fact that tomorrow is today. We are confronted with the fierce urgency of now. In this unfolding conundrum of life and history there is such a thing as being too late. Procrastination is still the thief of time. Life often leaves us standing bare, naked and dejected with a lost opportunity. The “tide in the affairs of men” does not remain at the flood; it ebbs. We may cry out desperately for time to pause in her passage, but time is deaf to every plea and rushes on. Over the bleached bones and jumbled residue of numerous civilizations are written the pathetic words: “Too late.”

Martin Luther King, Jr. – Speech delivered April 4, 1967

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Preface

The philosophy of climate science is a sub-field of the philosophy of science that is growing very fast. Just a few years ago, there were only a few people who had published on this topic, but now there are dozens. There are also a growing number of aspiring philosophers in graduate school who are turning their attention to climate science as an area of science that is both extremely socially relevant and ripe for philosophical investigation. A few well-known climate scientists, including Reto Knutti, Gavin Schmidt, Leonard Smith and Jonathan Rougier, have even written papers that are explicitly intended as contributions to the philosophical literature.

The goal of this book is both to provide an introduction to this growing literature to those interested in what philosophy of science can contribute to our understanding of climate science and its role in shaping climate policy debates, as well as to advance the debate on many of its topics. The first four chapters of the book are more or less introductory, and should be accessible to anyone regardless of their background in either climate science or philosophy. The remainder of the book builds on this background. After reading the first four chapters, each of the following sections is more or less self-contained: Chapter 5 (plus the appendix), Chapters 6–9, Chapters 10–12, and Chapter 13.

I'm in debt to a number of people and institutions for helping me make this book possible. I'll try to mention a few of them here. Much of the book was written while on a fellowship at the MECS at Leuphana University, Lüneburg, funded by the Deutsche Forschungsgemeinschaft (DFG) in the spring of 2016 and while on sabbatical at the University of South Florida in the fall of 2016. I want to thank Roger Ariew, my department chair, for always making it easy to get time to work on the book – especially during those two semesters. Thanks to Martin Warnke and Claus Pias not only for inviting me to the MECS but for making the whole thing happen in the first place. And thanks to Jantje Sieling for all her tireless work in helping me, Jessica, and Chora have such an easy time visiting Lüneburg.

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I want to thank Hilary Gaskin at Cambridge for her early encouragement and for her skillful shepherding of the book from its earliest stages up into production and Colette Forder for her patient and careful copyediting. Lots of people have read parts or all of this manuscript and have given me valuable feedback. I especially need to thank Mathias Frisch and Elisabeth Lloyd for this, but also Wendy Parker, Doug Jesseph, Dasha Pruss, and Jonah Schupbach. But nobody has looked at the manuscript quite as carefully as Lukas Nabergall and Alejandro Navas – the two best students anyone could ever hope to have. Discussions with them were especially helpful, as any reader will be able to see, in understanding exactly what the relationship is between chaos, non-linearity, and structural stability. They also caught literally hundreds of errors, ranging from minor typos to mathematical mistakes. Thanks also to both of them, as well as to Wendy Parker, for letting me borrow freely from joint work in writing the appendix, and Chapter 9, respectively.

Thanks most of all to Jessica Williams, who pushed me to write this book in the first place, who read every draft of not only every chapter, but of the proposal, the emails to important people, and everything in between. And thanks to her, all the more, for her love and support all through the whole process of making the book come into being. Finally, though she never cared a whit about books, or philosophy, or climate science, or really anything other than chasing balls, sticks, rabbits, and squirrels, I need to thank Chora for always getting me out of my head when I needed a break from the project.