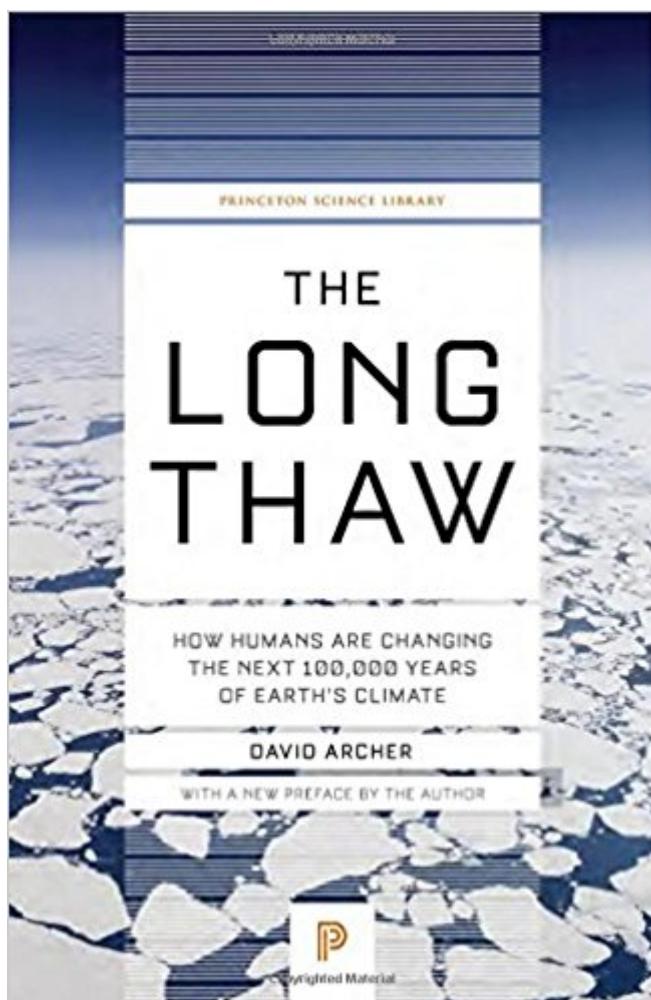


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# The Long Thaw: How Humans Are Changing The Next 100,000 Years Of Earth's Climate (Princeton Science Library)



## Synopsis

The human impact on Earth's climate is often treated as a hundred-year issue lasting as far into the future as 2100, the year in which most climate projections cease. In *The Long Thaw*, David Archer, one of the world's leading climatologists, reveals the hard truth that these changes in climate will be "locked in," essentially forever. If you think that global warming means slightly hotter weather and a modest rise in sea levels that will persist only so long as fossil fuels hold out (or until we decide to stop burning them), think again. In *The Long Thaw*, David Archer predicts that if we continue to emit carbon dioxide we may eventually cancel the next ice age and raise the oceans by 50 meters. A human-driven, planet-wide thaw has already begun, and will continue to impact Earth's climate and sea level for hundreds of thousands of years. The great ice sheets in Antarctica and Greenland may take more than a century to melt, and the overall change in sea level will be one hundred times what is forecast for 2100. By comparing the global warming projection for the next century to natural climate changes of the distant past, and then looking into the future far beyond the usual scientific and political horizon of the year 2100, Archer reveals the hard truths of the long-term climate forecast. Archer shows how just a few centuries of fossil-fuel use will cause not only a climate storm that will last a few hundred years, but dramatic climate changes that will last thousands. Carbon dioxide emitted today will be a problem for millennia. For the first time, humans have become major players in shaping the long-term climate. In fact, a planetwide thaw driven by humans has already begun. But despite the seriousness of the situation, Archer argues that it is still not too late to avert dangerous climate change--if humans can find a way to cooperate as never before. Revealing why carbon dioxide may be an even worse gamble in the long run than in the short, this compelling and critically important book brings the best long-term climate science to a general audience for the first time. With a new preface that discusses recent advances in climate science, and the impact on global warming and climate change, *The Long Thaw* shows that it is still not too late to avert dangerous climate change--if we can find a way to cooperate as never before.

## Book Information

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## Customer Reviews

With so much dust and noise thrown up by those economic forces opposed to reducing carbon emissions, average readers may be hard-pressed to understand what all the fuss is about. Univ. of Chicago geophysicist Archer has perfectly pitched answers to the most basic questions about global warming while providing a sound basis for understanding the complex issues frequently misrepresented by global warming skeptics. Revisiting his technical treatment of the same subject (2006's *Global Warming: Understanding the Forecast*), Archer presents detailed science in layman's language. With a breezy, conversational style, he breaks complex concepts into everyday analogies, comparing for example the oxidation and reduction of carbon dioxide in seawater with an upset stomach. Divided into three parts—the Present, the Past and the Future—Archer provides a complete picture of climate change now, in the past, and what we can expect in years and centuries to come. His models, though conservative, imply that humans won't survive the environmental consequences of severe warming over the next thousand years. While Archer is neither grim nor pessimistic, he is forthright about what's at stake, and what must be done to avert catastrophe. Copyright © Reed Business Information, a division of Reed Elsevier Inc. All rights reserved. --This text refers to an out of print or unavailable edition of this title.

Winner of the 2009 Walter P. Kistler Award, The Foundation For the FutureOne of The Australian's Best Books of 2009Selected to appear on ClimateUnited's Booklist of Top Books on Climate Change"worried about warming but confused about carbon? Try [The Long Thaw], which tells you nearly everything you need to know with down-to-earth clarity and brevity."--Evan Hadingham, PBS's NOVA blog"Archer . . . presents the dire and long-lasting consequences of our fossil-fuel dependency but concludes that it's not too late for us to go a different, better way."--Avital Binshtock, Sierra Club Blog"Archer has perfectly pitched answers to the most basic questions about global warming while providing a sound basis for understanding the complex issues frequently

misrepresented by global warming skeptics. With a breezy, conversational style, he breaks complex concepts into everyday analogies. Divided into three parts--the Present, the Past and the Future--Archer provides a complete picture of climate change now, in the past, and what we can expect in years and centuries to come. His models, though conservative, imply that humans won't survive the environmental consequences of severe warming over the next thousand years. While Archer is neither grim nor pessimistic, he is forthright about what's at stake, and what must do to avert catastrophe."--Publishers Weekly" It is comprehensive, well written and includes numerous useful vignettes from climate history. Archer leads the reader to a simple yet accurate picture of climate changes, ranging from geological time scales to current warming, ice ages and prospects for the future."--Susan Solomon, *Nature*" The Long Thaw is written for anyone who wishes to know what cutting-edge science tells us about the modern issue of global warming and its effects on the pathways of atmospheric chemistry, as well as global and regional temperatures, rainfall, sea level, Arctic sea-ice coverage, melting of the continental ice sheets, cyclonic storm frequency and intensity and ocean acidification. This book will also appeal to scientists who want a clear and unbiased picture of the global-warming problem and how it may progress in the future. It encapsulates Archer's own efforts in the field of climate research, which I found invaluable."--Fred T. Mackenzie, *Nature Geoscience*" The power of Archer's book is to show that such [climate] changes, which we can bring about through just a few centuries of partying on carbon, can only be matched by the earth itself over vastly longer periods. . . . It's the kind of perspective we need in order to realize how insane we're being."--Chris Mooney, *American Prospect*" Global climate change is the subject of thousands of books; this short volume is distinctive in multiple ways. Archer is a geophysicist (and a look-alike--except for stubble--for late British actor David Niven), whose scientific background lets him place climate change in the context of its variations in geological history. He points out that the Earth's orbital cycles had poised it to enter a new ice age when human influences began to override natural forces."--F.T. Manheim, *Choice*" If you think global warming is going to stop in its tracks as soon as our fossil fuel fix runs its course, think again. Intensifying hurricanes, mega-droughts, and the mass extinction of species are just the beginning, says leading climatologist David Archer, renowned in part for his work with the respected blog *RealClimate*. Though we still have time to avert the worst of climate change, he says, the ramifications of our carbon spewing (think a ten-foot rise in ocean levels) will last well beyond even our grandchildren's years. A good storyteller, Archer walks us through the history of climate change, starting in the 1800s, when the term 'greenhouse effect' first made its way into scientific parlance. Tempering techie speak with accessible analogies, Archer manages in the James Hansen-approved volume to speak to scientists and laymen

alike."--Plenty"Notice to climate change deniers: I don't want to hear another word about the Little Ice Age, cosmic rays of the Palaeocene Eocene thermal maximum event 55 million years ago until you've read David Archer's little book. He's a geophysical scientist at the University of Chicago and he knows his stuff. He sets out the latest scientific understanding of climate change through geological time, human time, and beyond. It's the clearest introduction I've seen yet to the complexity of the planet's climate system and how a certain bipedal species may know it gally wonk."--Leigh Dayton, *The Australian*"The great appeal of this short book lies in Archer's ability to find easily comprehensible analogies and his no-nonsense prose. . . . This is a true rarity. A book about climate change written by an expert everyone can understand."--*Sydney Morning Herald*, "Pick of the Week""David Archer has written a highly engaging and accessible review of the scientific bases for anthropogenic global warming and the dilemmas of what, as a global community, we should do next. The text is written for a general audience, reflecting the aims of the Science Essentials series of which it is a part, namely, to bring the findings of cutting-edge scientific research to the public."--Tim Denham, *Journal of Archaeological Science*"If you have time in your busy schedule to read only one book on climate change and climate science basics, this would be a good choice. Archer, an oceanographer and University of Chicago geosciences professor, has written a conversational, engaging, and short (remember, you are busy) book that covers the last 500 million years or so of the Earth's climate."--*Disaster Prevention and Management*"David Archer's *The Long Thaw* . . . tells you nearly everything you need to know with down-to-earth clarity and brevity. . . . [R]ead *The Long Thaw* is sobering and enlightening rather than depressing. It's packed with informative, accessible background on past climate cycles and why they are relevant to assessing today's warming."--Evan Hadingham, *Inside NOVA*"[T]he ideas expounded in the book are of great importance to the debate on climate change and deserve to be more widely appreciated. Let us hope that Archer's message becomes widely understood and acted upon before we find that we have already committed ourselves to damaging (and potentially irreversible) climate change."--John King, *Journal of Polar Record*"A beautifully written primer on why climate change matters hugely for our future--on all time scales."--*New Scientist*"If you have time in your busy schedule to read only one book on climate change and climate science basics, this would be a good choice. Archer, an oceanographer and University of Chicago geosciences professor, has written a conversational, engaging, and short (remember, you're busy) book."--*Natural Hazards Observer*

This is a very well written book from an Oceanographer's perspective. Archer does an excellent job of keeping political and alternative energy solutions out of his argument and instead

focuses on the science of the climate change issue. I wouldn't recommend this to someone who is trying to get into the specific details about climate change, but this is a great piece for someone who is interested in knowing more than it's getting hotter outside so there must be global warming. Archer divides the book into 3 categories, present, past and future. The present conversation gives you a snapshot at the current situation. Archer again keeps his arguments on point and is able to give information that is relevant and most sought after in the climate change argument. The past portion of the book is also well done by giving a historical picture of the how the Earth goes through various cooling and warming cycles. Most of this portion gives the reader an understanding as to why climate change is such a difficult topic and how it is not a yes or no question. The future portion of the book is also very telling in that there are so many different possibilities of what could happen. But from

Archer's perspective the ocean will be able to dictate how climate will change either warming or cooling. Overall I thought this was a well-written book. Because of the nature of climate change, it is already close to being obsolete but it is interesting to see how the climate change debate has changed in a few short years. I would have liked to see more of the science behind the findings because that can help the reader fully understand the argument. There were a few other errors made that have been pointed out by other reviewers, but overall a well-written book that would be a great addition to any climate change library.

The first thing you will notice upon receiving this book is how small it is. It is almost a pamphlet. However, in spite of that, it is packed full of interesting observations. By now, I have read stacks of books on global warming, and in many ways, this one follows the same general plot line as most of them. The author of this book is an expert on oceanography and as such, the best parts of the book are the ones that draw from that field of study. The author divides the book up into different sections that look at the past history of the planet as well as the prospects for the future and while he does bring a lot of his own expertise in, he also draws on research from other disciplines. In many ways, this book fits the vein of recent books on the topic of global warming in that it acknowledges both that contributions to warming are proceeding apace and that predictions for things like sea level rise have probably been underestimated. In other words, he shares in some of the resignation that other experts have begun to allow to creep into their books. The only knock I have against the book is that here and there, he plays a bit loose with terminology or characterizations of things like evolution and these could be seized upon by science deniers to claim the author isn't very good. However, when talking about actual climate issues, he seems to be on top of the latest research and makes

excellent observations. As can be seen from the title, the overriding theme of the book is how current practices are putting into place effects that will probably last many thousands of years. While other books have pointed out the idea that current man-made global warming may be putting off the next ice age, few authors have explored the idea in as much depth and clarity as this one. He does an excellent job of putting the current situation into the context of both long-term trends and the normal factors that cause climate variation to show what the current situation is likely to lead to. This in and of itself is almost worth the price of the book. In relatively few pages, the author is able to put to lie the cottage industry of climate denial that often focuses on wrongheaded claims about natural causes for climate variation. If you are interested in the topic of global warming and would like an interesting and easy-to-read book by someone who is an expert in a discipline related to climatology, this is an excellent choice.

This is an excellent book for anyone who needs an introduction to global warming. If you have been reading newspapers and online articles then, chances are, you know little about the effect we are having on the environment. If you are using the Kindle edition, the graphs are too small to make out, even when using the zoom option; thus, 4 stars instead of 5, as I can easily relate to graphs. For those who like graphs, get a hard copy version. What stood out was the following: the co2 effect has been known and studied through empirical analysis for over 100 years; the co2 record goes back hundreds of thousands of years; co2 chemistry (land, sea and air) is pretty well defined; the sun has been dimming since 1970 (remember the new ice age predictions from the 70's?); what we release into the atmosphere lasts tens of thousands of years; carbon sequestration has the potential to reduce the peak. What punctuated it all at the very end was the long-term effect of burning just one gallon of gas. It just takes your breath away.

At first blush, this is another in a long line of books written to introduce people to the concepts of global climate change. It covers many of the basics and includes information such as how models work, how scientists discover past climate information and what will happen on Earth as the climate warms. The twist with this book is that it goes out for thousands of years and explains why we have to worry about climate change for thousands of years. The vast majority of books take us through this century, and maybe slightly into the next century, but very few look hundreds of centuries into the future. This is generally well written, although a little repetitive at times and presents a different look at climate change.

Outstanding, complete, and concise review of all aspects of global warming and the future consequences of not controlling carbon dioxide into our atmosphere,

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