

There has never been a more critical time for students to understand the record of Earth's climate history, as well as the relevance of that history to understanding Earth's present and likely future climate. There also has never been a more critical time for students, as well as the public-at-large, to understand **how we know**, as much as **what we know**, in science. This book addresses these needs by placing you, the student, at the center of learning. In this book, you will actively use inquiry-based explorations of authentic scientific data to develop skills that are essential in all disciplines: making observations, developing and testing hypotheses, reaching conclusions based on the available data, recognizing and acknowledging uncertainty in scientific data and scientific conclusions, and communicating your results to others.

The context for understanding global climate change today lies in the records of Earth's past, as preserved in archives such as sediments and sedimentary rocks on land and on the seafloor, as well as glacial ice, corals, speleothems, and tree rings. These archives have been studied for decades by geoscientists and paleoclimatologists. Much like detectives, these researchers work to reconstruct what happened in the past, as well as when and how it happened, based on the often-incomplete and indirect records of those events preserved in these archives. This book uses guided-inquiry to build your knowledge of foundational concepts needed to interpret such archives. Foundational concepts include: interpreting the environmental meaning of sediment composition, determining ages of geologic materials and events (supported by a new section on radiometric dating), and understanding the role of CO₂ in Earth's climate system, among others. Next, this book provides the opportunity for you to apply your foundational knowledge to a collection of paleoclimate case studies. The case studies consider: long-term climate trends, climate cycles, major and/or abrupt episodes of global climate change, and polar paleoclimates. New sections on sea level change in the past and future, climate change and life, and climate change and civilization expand the book's examination of the causes and effects of Earth's climate history.

In using this book, we hope you gain new knowledge, new skills, and greater confidence in making sense of the causes and consequences of climate change. Our goal is that science becomes more accessible to you. Enjoy the challenge and the reward of working with scientific data and results!

Reconstructing Earth's Climate History, Second Edition, is an essential purchase for geoscience students at a variety of levels studying paleoclimatology, paleoceanography, oceanography, historical geology, global change, Quaternary science and Earth-system science.

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Cover Design: Jess Lambert and Kate Pound

Cover Image: core image: NASA

Dry area: NASA images by Jesse Allen and Robert Simmon

Ice shelf: NASA Earth Observatory images by Lauren Dauphin

www.wiley.com/wiley-blackwell

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Also available
as an e-book

ISBN 978-1-119-54411-1



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viii The Authors

x Foreword from First Edition

xi Acknowledgments

xii Book Introduction to the Second Edition for Students and Instructors

xvii About the Companion Website

1 Chapter 1. Introduction to Paleoclimate Records

3 Part 1.1. Archives and Proxies

13 Part 1.2. Obtaining Cores from Terrestrial and Marine Paleoclimate Archives

27 Part 1.3. Owens Lake – An Introductory Case Study of Paleoclimate Reconstruction

31 Chapter 2. Seafloor Sediments

33 Part 2.1. Sediment Predictions

34 Part 2.2. Core Observation and Description

41 Part 2.3. Sediment Composition

52 Part 2.4. Seafloor Sediment Synthesis

57 Chapter 3. Geologic Time and Geochronology

59 Part 3.1. The Geologic Timescale

62 Part 3.2. Principles of Stratigraphy and Determining Relative Ages

64 Part 3.3. Radiometric Age Dating Fundamentals

69 Part 3.4. Using $^{40}\text{K} - ^{40}\text{Ar}$ Dating to Determine the Numerical Ages of Layered Volcanic Rocks

76 Part 3.5. Using Uranium Series Dating to Determine Changes in Growth Rate of Speleothems

89 Chapter 4. Paleomagnetism and Magnetostratigraphy

91 Part 4.1. Earth's Magnetic Field Today and the Paleomagnetic Record of Deep-Sea Sediments

100 Part 4.2. History of Discovery: Paleomagnetism in Ocean Crust and Marine Sediments

108 Part 4.3. Using Paleomagnetism to Test the Seafloor Spreading Hypothesis

114 Part 4.4. The Geomagnetic Polarity Timescale

119 Chapter 5. Microfossils and Biostratigraphy

121 Part 5.1. What Are Microfossils? Why Are They Important in Climate Change Science?

130 Part 5.2. Microfossils in Deep-Sea Sediments

137 Part 5.3. Application of Microfossil First and Last Occurrences

144 Part 5.4. Using Microfossil Datums to Calculate Sedimentation Rates

149 Part 5.5. How Reliable Are Microfossil Datums?

156 Part 5.6. Organic-Walled Microfossils: Marine Dinoflagellates and Terrestrial Pollen and Spores

165 Chapter 6. CO₂ as a Climate Regulator During the Phanerozoic and Today

167 Part 6.1. The Short-Term Global Carbon Cycle

169 Part 6.2. CO₂ and Temperature

179 Part 6.3. Recent Changes in CO₂

183 Part 6.4. The Long-Term Global Carbon Cycle, CO₂, and Phanerozoic Climate History

191 Part 6.5. Carbon Isotopes as a Tool for Tracking Changes in the Carbon Cycle

200 Chapter 7. Oxygen Isotopes as Proxies of Climate Change

202 Part 7.1. Introduction to Oxygen Isotope Records from Ice and Ocean Sediments

205 Part 7.2. The Hydrologic Cycle and Isotopic Fractionation

209 Part 7.3. $\delta^{18}\text{O}$ in Meteoric Water and Glacial Ice

218 Part 7.4. $\delta^{18}\text{O}$ in Marine Sediments

226 Chapter 8. Climate Cycles

228 Part 8.1. Patterns and Periodicities

245 Part 8.2. Orbital Metronome

250 Part 8.3. Glacial-Interglacial Periods and Modern Climate Change

255 Chapter 9. The Paleocene-Eocene Thermal Maximum (PETM) Event

257 Part 9.1. An Important Discovery

260 Part 9.2. Global Consequences of the PETM

296 Part 9.3. Two Hypotheses for the Cause of the PETM

299 Part 9.4. Rates of Onset and Duration of Event

306 Part 9.5. Global Warming Today and Lessons from the PETM

314 Chapter 10. Glaciation of Antarctica: The Oi1 Event

316 Part 10.1. Initial Evidence

321 Part 10.2. Evidence for Global Change

342 Part 10.3. Mountain Building, Weathering, CO₂ and Climate

349 Part 10.4. Legacy of the Oi1 Event: The Development of the Psychrosphere

355 Chapter 11. Antarctic Climate Variability in the Neogene

358 Part 11.1. What Do We Think We Know About the History of Antarctic Climate?

362 Part 11.2. What is Antarctica's Geographic and Geologic Context?

375 Part 11.3. Selecting Drillsites to Best Answer our Questions

379 Part 11.4. What Sediment Facies are Common on the Antarctic Margin?

390 Part 11.5. The BIG Picture of ANDRILL 1-B

398 Chapter 12. Pliocene Warmth as an Analog for Our Future

400 Part 12.1. The Last 5 Million Years

407 Part 12.2. Pliocene Latitudinal Temperature Gradient

414 Part 12.3. Estimates of Pliocene CO₂

416 Part 12.4. Sea Level Past, Present, and Future

430 Chapter 13. Climate, Climate Change, and Life

432 Part 13.1. Initial Ideas

433 Part 13.2. The Long View: “Precambrian” and Phanerozoic Life and Climate

441 Part 13.3. Examples of Cenozoic Terrestrial Evolution and Climate Connections

458 Part 13.4. Examples of Cenozoic Marine Biotic Evolution and Climate Connections

469 Part 13.5. Humanity, Climate, and Life

481 Part 13.6. Humanity and Future Climate: At a Tipping Point

487 Chapter 14. Climate Change and Civilization

489 Part 14.1. Climate Change Here and Now

497 Part 14.2. Evidence of Climatic Stress on Ancient Maya Civilization

513 Part 14.3. The Precipitation Record of the North American Southwest: The Physical Record and Human Response

536 Index