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 CO_2 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.

About the Authors

Dr Kristen St. John is a Professor of Geology at James Madison University.

Dr R. Mark Leckie is a Professor of Geology at the University of Massachusetts-Amherst.

Dr Kate Pound is a Professor of Geology and a member of the Science Education Group at St. Cloud State University.

Dr Megan Jones is a Professor of Geology at North Hennepin Community College.

Dr Lawrence Krissek is a Professor Emeritus in the School of Earth Sciences, Ohio State University.

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