



## Reconstructing Earth's Climate History: Inquiry-based Exercises for Lab and Class

By Kristen St. John, R. Mark Leckie, Kate Pound, Megan Jones, Lawrence Krissek

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The context for understanding global climate change today lies in the records of Earth's past. This is demonstrated by decades of paleoclimate research by scientists in organizations such as the Integrated Ocean Drilling Program (IODP), the Antarctic Geological Drilling Program (ANDRILL), and many others.

The purpose of this full colour textbook is to put key data and published case studies of past climate change at your fingertips, so that you can experience the nature of paleoclimate reconstruction.

Using foundational geologic concepts, students explore a wide variety of topics, including: marine sediments, age determination, stable isotope paleoclimate proxies, Cenozoic climate change, climate cycles, polar climates, and abrupt warming and cooling events, students are invited to evaluate published scientific data, practice developing and testing hypotheses, and infer the broader implications of scientific results.

It is our philosophy that addressing *how we know* is as important as addressing *what we know* about past climate change. Making climate change science accessible is the goal of this book.

This book is intended for earth science students at a variety of levels studying paleoclimatology, oceanography, Quaternary science, or earth-system science.

**Additional resources for this book can be found at:**  
<http://www.wiley.com/go/stjohn/climatehistory>.

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### Editorial Review

#### Review

"In developing *Reconstructing Earth's Climate History*, St John et al. say that they were driven by the philosophy that "addressing how we know is as important as addressing what we know about past climate". They have, without question, lived up to the billing. The book is composed of exercises based on authentic data, with well-constructed, full-color graphs, photos, tables, and diagrams. In fact, the graphic elements are the central features of this book, and the text, which is mostly organized by series of questions, tasks, and boxes, is supplementary - an entirely refreshing and inviting format that is designed to enhance inquiry-based learning by working directly with real paleoclimate data and their underlying geological concepts...St John et al. have provided a tremendous educational gift to the paleoclimate community. If you are in the field and want a textbook that will be sure to stimulate student interest in this important topic, look no further." (*Eos*, April 2013)

"This publication has added value for and warmly recommend to support not only courses in palaeoclimatology, but also courses in a wider array of interdisciplinary environmental sciences." (*Int. J. Environment and Pollution*, 1 May 2013)

#### From the Back Cover

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*Readership:* earth science students at a variety of levels studying paleoclimatology, oceanography, Quaternary science, or earth-system science.

#### About the Author

**Dr. Kristen St. John** is a Professor of Geology at James Madison University in Harrisonburg, VA. St. John is a marine sedimentologist, specializing in high latitude paleoclimate records and reconstructing ice-rafting histories. She has participated in four scientific ocean drilling expeditions with the ODP/IODP. Her teaching responsibilities include: Earth Systems and Climate Change, Oceanography for Teachers, Earth Science for Teachers, Geowriting and Communication, Paleoclimatology, and Physical Geology.

**Dr. R. Mark Leckie** is a Professor of Geology at the University of Massachusetts-Amherst. Leckie is a marine micropaleontologist and specializes in paleoceanography, particularly reconstructing ocean-climate history of the past 120 million years. He has participated in six DSDP/ODP scientific expeditions, and served

as Co-Chief Scientist of ODP Leg 165. His teaching responsibilities include: Introductory Oceanography; History of the Earth; Introductory Field Methods; Paleooceanography; and Marine Micropaleontology.

**Dr. Kate Pound** is a Professor of Geology, and a member of the Science Education Group at St. Cloud State University. Pound leads hands-on education and outreach programs for teachers in Minnesota, and was a science educator in the ANDRILL program in Antarctica. Her research focuses on provenance studies and regional tectonics. Her teaching responsibilities include: Physical Geology, Glacial Geology, Field Geology, Rocks & Minerals, Sedimentology, General Education Geology courses, and Science for Elementary Teachers.

**Dr. Megan Jones** is a Professor of Geology at North Hennepin Community College, a diverse, open-access institution. Jones' broad background and experience in marine micropaleontology/paleoceanography, sed/strat and field geology offers her students options to pursue field experiences and undergraduate research. Her research interest focuses on the connections between student motivation and success in introductory science courses. Her teaching responsibilities include: Physical and Historical Geology, Oceanography, and Minnesota Field Geology.

**Dr. Lawrence Krissek** is a Professor in the School of Earth Sciences, Ohio State University. His primary scientific research is the study of the evolution of climates and ocean environments on the earth during the past 65 million years. He has conducted field research in the Antarctic, and has sailed on numerous DSDP, ODP, and IODP cruises. He teaches Oceanography, Oceanography for Educators, Field Geology for Educators, Natural Hazards, Physical Geology, Historical Geology, and Stratigraphy and Sedimentation.

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