PREFACE xix

Connect Geology

McGraw-Hill Connect Geology is a web-based assignment and assessment platform that gives students the means to better connect with their coursework, with their instructors, and with the important concepts that they will need to know for success now and in the future. With Connect Geology, instructors can deliver assignments, quizzes, and tests easily online. Students can practice important skills at their own pace and on their own schedule.

Companion Website

www.mhhe.com/plummer13e

The companion website contains the following resources for instructors:

- **Presentation Tools** Everything you need for outstanding presentations in one place! This easy-to-use table of assets includes
 - Animation PowerPoints—Numerous full-color animations illustrating important processes are also provided. Harness the visual impact of concepts in motion by importing these files into class-room presentations or online course materials.
 - · Lecture PowerPoints—with animations fully embedded
 - Labeled and unlabeled JPEG images—Full-color digital files of all illustrations that can be readily incorporated into presentations, exams, or custom-made classroom materials.
 - Tables—Tables from the text are available in electronic format.
- Presentation Center—In addition to the images from your book, this
 online digital library contains photos, artwork, animations, quizzes,
 and other media from an array of McGraw-Hill textbooks that can be
 used to create customized lectures, visually enhanced tests and quizzes, compelling course websites, or attractive printed support materials. All assets are copyrighted by McGraw-Hill Higher Education,
 but can be used by instructors for classroom purposes.
- Instructor's Manual—The instructor's manual contains chapter outlines, lecture enrichment ideas, and critical thinking questions.
- Computerized Test Bank—A comprehensive bank of test questions is provided within a computerized test bank powered by McGraw-Hill's flexible electronic testing program EZ Test Online. EZ Test Online allows you to create paper and online tests or quizzes in this easy to use program! Imagine being able to create and access your test or quiz anywhere, at any time, without installing the testing software. Now, with EZ Test Online, instructors can select questions from multiple McGraw-Hill test banks or author their own, and then either print the test for paper distribution or give it online.



Test Creation

- Author/edit questions online using the 14 different question type templates
- Create question pools to offer multiple versions online—great for practice
- Export your tests for use in WebCT[®], Blackboard, PageOut, and Apple's iQuiz
- Sharing tests with colleagues, adjuncts, TAs is easy

Online Test Management

- Set availability dates and time limits for your quiz or test
- Assign points by question or question type with dropdown menu
- Provide immediate feedback to students or delay feedback until all finish the test
- · Create practice tests online to enable student mastery
- Your roster can be uploaded to enable student self-registration

Online Scoring and Reporting

- Automated scoring for most of EZ Test's numerous question types
- Allows manual scoring for essay and other open-response questions
- Manual rescoring and feedback are also available
- EZ Test's grade book is designed to easily export to your grade book
- View basic statistical reports

Support and Help

- Flash tutorials for getting started on the support site
- Support Website: www.mhhe.com/eztest
- Product specialist available at 1-800-331-5094
- Online Training: http://auth.mhhe.com/mpss/workshops

Student Response System

Wireless technology brings interactivity into the classroom or lecture hall. Instructors and students receive immediate feedback through wireless response pads that are easy to use and engage students. This system can be used by instructors to take attendance, administer quizzes and tests, create a lecture with intermittent questions, manage lectures and student comprehension through the use of the grade book, and integrate interactivity into their PowerPoint presentations.

For Students

Companion Website

www.mhhe.com/plummer13e

The Plummer: Physical Geology companion website is an electronic study system that offers students a digital portal of knowledge. Students can readily access a variety of digital learning objects that include:

- Chapter-level quizzing
- Bio Tutorial animations with quizzing
- Virtual Labs

Electronic Book

If you or your students are ready for an alternative version of the traditional textbook, McGraw-Hill has partnered with CourseSmart and Vital-Source to bring you innovative and inexpensive electronic textbooks. Students can save up to 50% off the cost of a print book, reduce their impact on the environment, and gain access to powerful web tools for learning including full text search, notes and highlighting, and email tools for sharing notes between classmates. eBooks from McGraw-Hill are smart, interactive, searchable and portable.

To review comp copies or to purchase an eBook, go to either www.CourseSmart.com or www.VitalSource.com.

Packaging Opportunities

McGraw-Hill offers packaging opportunities that not only provide students with valuable course-related material, but also a substantial cost savings. Ask your McGraw-Hill sales representative for information on discounts and special ISBNs for ordering a package that contains one of the following laboratory manuals:

- Physical Geology Laboratory Manual, Fourteenth Edition, by Zumberge et al. ISBN 9180073051499 (MHID 0073051497)
- Laboratory Manual for Physical Geology, Seventh Edition, by Jones/Jones ISBN 9780073369396 (MHID 007336939X)

Custom Publishing

Did you know that you can design your own text or laboratory manual using any McGraw-Hill text and your personal materials to create a custom product that correlates specifically to your syllabus and course goals? Contact your McGraw-Hill sales representative to learn more about this option.

LearnSmart

Built around metacognition learning theory, LearnSmart provides your students with a GPS (Guided Path to Success) for your Geology course. Using artificial intelligence, LearnSmart intelligently assesses a student's knowledge of course content through a series of adaptive questions. It pinpoints concepts the student does not understand and maps out a personalized study plan for success.

Available as an integrated feature of McGraw-Hill's Connect Geology, you can incorporate LearnSmart into your course in a number of ways to

- Gauge student knowledge before a lecture
- · Reinforce learning after lecture
- Prepare students for assignments and exams

Discover for yourself how the LearnSmart diagnostic ensures students will **connect** with the content, **learn** more effectively, and **succeed** in your course.

Mc Graw Cegrity compus

Tegrity Campus is a service that makes class time available all the time by automatically capturing every lecture in a searchable format for students to review when they study and complete assignments. With a simple one-click start and stop process, you capture all computer screens and corresponding audio. Students replay any part of any class with easy-to-use browser-based viewing on a PC or Mac.

Educators know that the more students can see, hear, and experience class resources, the better they learn. With Tegrity Campus, students quickly recall key moments by using Tegrity Campus's unique search feature. This search helps students efficiently find what they need, when they need it across an entire semester of class recordings. Help turn all your students' study time into learning moments immediately supported by your lecture.

To learn more about Tegrity watch a 2 minute Flash demo at http://tegritycampus.mhhe.com.

Acknowledgments

We have tried to write a book that will be useful to both students and instructors. We would be grateful for any comments by users, especially regarding mistakes within the text or sources of good geological photographs.

Although he is no longer listed as an author, this edition bears a lot of the writing, style, and geologic philosophy of the late David McGeary. He was coauthor of the original edition, published in 1979. His authorship continued through the seventh edition, after which he retired and turned over revision of his half of the book to Diane Carlson. We greatly appreciate his role in making this book successful way beyond what he or his original coauthor could ever dream of.

Tom Arny wrote the planetary geology chapter for the 10th edition. This chapter was revised and updated by Steve Kadel for the 11th and 12th editions and by Jim Jensen for this edition. We greatly appreciate the publisher's "book team," whose names appear on the copyright page. Their guidance, support, and interest in the book were vital for the completion of this edition.

Thank you also to Cindy Shaw for her contribution to the superior art program of the 11th and 12th editions. Mary Jo Colletti helped revise the soil section and box in chapter 5 and also helped write the boxes on the effects of Hurricane Katrina in chapters 10 and 14. She also helped with the research and revision of the 13th edition. Dr. Nancy Buening researched and wrote the box on Racetrack Playa in chapter 14.

Diane Carlson would like to thank her husband Reid Buell for his tireless support and for his technical assistance with engineering geology and hydrogeology material in several chapters. Charles Plummer thanks his wife, Beth Strasser, for assistance with photography in the field and for her perspective as a paleontologist and anthropologist. We thank Susan Slaymaker for writing the planetary geology material originally in early editions.

We are also very grateful to the following reviewers for their careful evaluation and useful suggestions for improvement.

Joseph C. Hill Bloomsburg University of Pennsylvania

Ellen A. Cowan Appalachian State University

Lindsey C. Henry University of Wisconsin-Milwaukee

Adil Wadia University of Akron Wayne College

Glenn B. Stracher East Georgia College

Chris Dewey Mississippi State University

David R. Berry California State Polytechnic University, Ponoma

Samantha Reif Lincoln Land Community College

Barbara Savage College of the Mainland

Hayden Chasteen Tarrant County College

Harold C. Connolly Jr. Kingsborough Community College

Pamela Nelson Glendale Community College

Sadredin Moosavi Tulane University

Dave Berner Normandale Community College