Key Concepts in Geomorphology – Edition 2 of a community-based textbook

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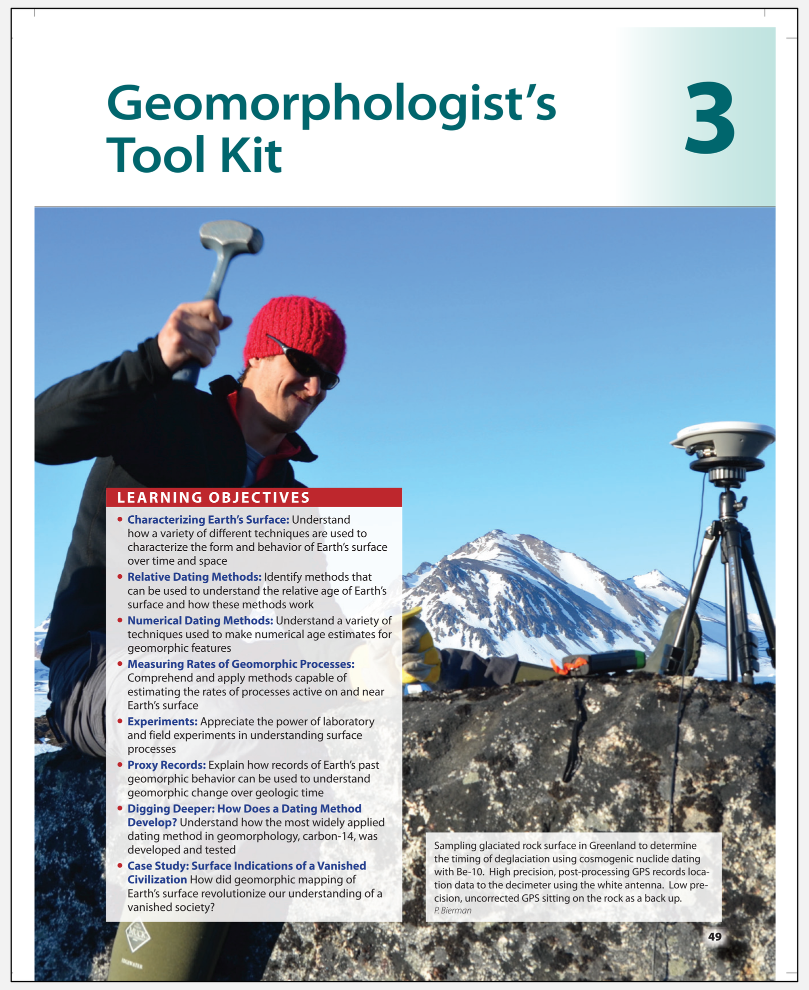
Abstract

It's time for a new edition! In 2019, we extensively revised Key Concepts in Geomorphology, the 2013 Geomorphology textbook supported by the US National Science Foundation to serve as a model for extensive community involvement and vetting at all stages from initial outlining through chapter development and revision to final review. Our revision was based in large part of nearly 60 pages of comments submitted to our public revision blog by students and faculty around the world. Comments from the community identified organizational improvements, recent advances that should be included, and images and figures that could be clarified, added, or omitted.

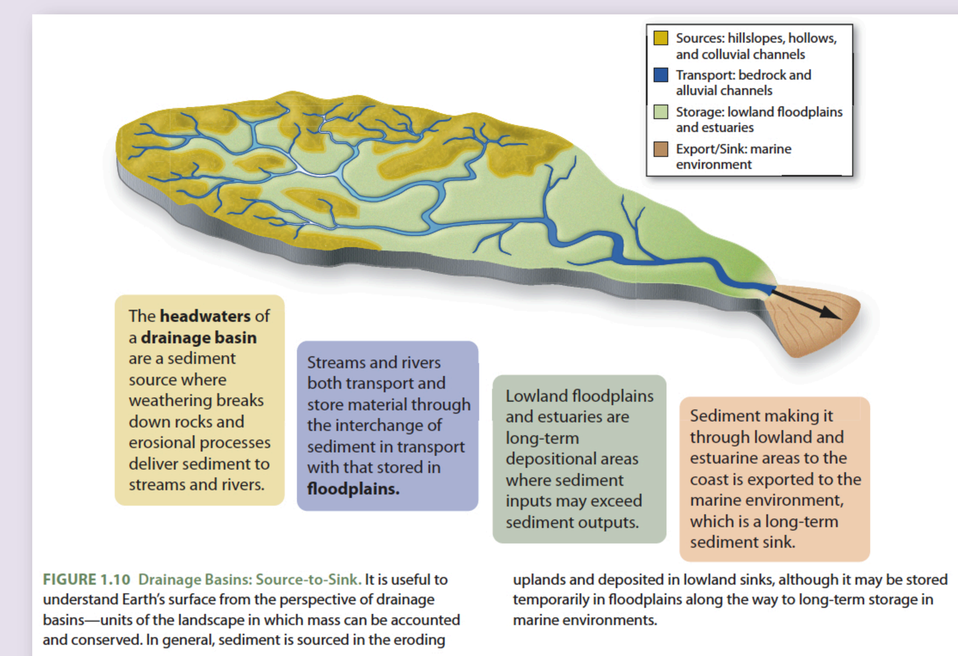
The new, second edition differs from the initial edition in several important ways. The textbook now has 16 chapters organized into four sections. Each chapter still includes 8 to 16 revised full-color figures designed specifically for novice learners. The previous section on the history of geomorphology has been expanded into a stand-alone chapter, and the previous chapter on soils and weathering has been expanded and split into a chapter on each. We have swapped out many of the 20 to 30 color photographs that illustrate each of the chapters and added more callouts to guide novice readers. We have added a Case Study to each chapter which applies geomorphology skills and techniques to a current-day problem important to society. At the start of each chapter, we articulate Learning Objectives and have organized the end-of-chapter questions in the order in which material is presented and in line with the Learning Objectives. The text is updated with new, important changes to the field of Geomorphology including such revolutionary data collection techniques as LiDAR. At the end of each chapter, revised Digging Deeper sections continue to present an in-depth look at the development of scientific thought on a problem relevant to the chapter. Come by the poster and have a look at proofs of the new edition.

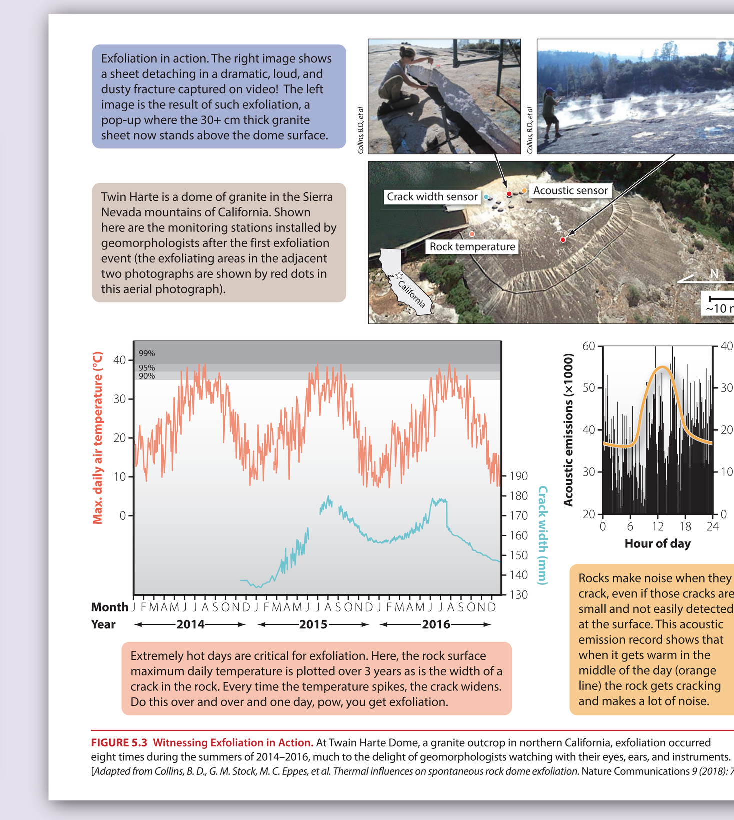
Key Concepts in Geomorphology is designed to serve undergraduate students in their first course about Earth Surface Processes, Geomorphology, Physical Geography, and Quaternary Geology. It is also designed to be useful for students in related fields such as forestry, agriculture, and civil engineering.

16 Chapters each begin with Learning Objectives.



Full color art, 10 to 14 figures per chapter, uses explanatory text boxes and images to make learning new concepts easier for students.

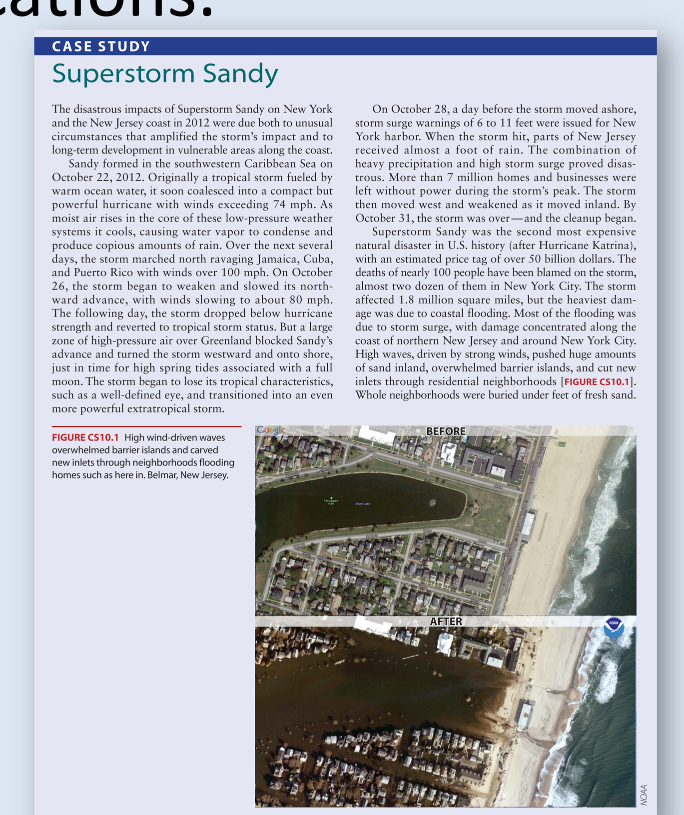




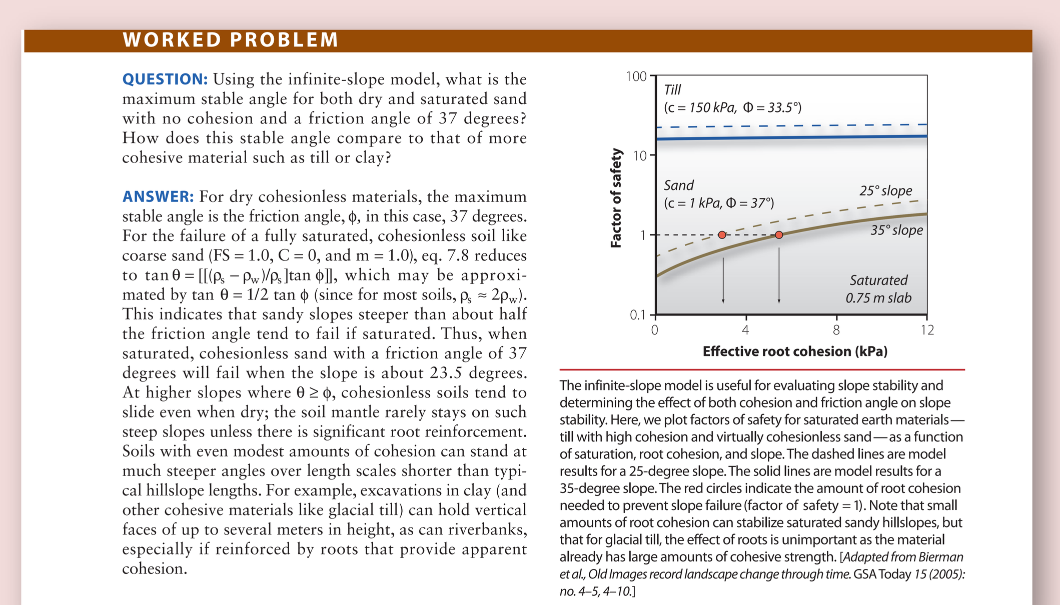
Community involvement and extensive peer review determined content and ensured accuracy. 60 pages of public blog comments guided our revision

We thank Editorial experts Ari Matmon, Arjun Heimsath, Beverley Wemple, Cam Wobus, Chuck Nittrouer, David Dethier, Derek Booth, Dorothy Merritts, Doug Clark, Ellen Wohl, Eric Leonard, Eric Steig, Frank Magilligan, Frank Pazzaglia, Gordon Grant, Grant Meyer, Kathy Cashman, Leslie McFadden, Lisa Ely, Milan Pavich, Missy Eppes, Nick Lancaster, Paul Bishop, Ray Torres, Sara Mitchell, Scott Burns, and Scott Linneman.

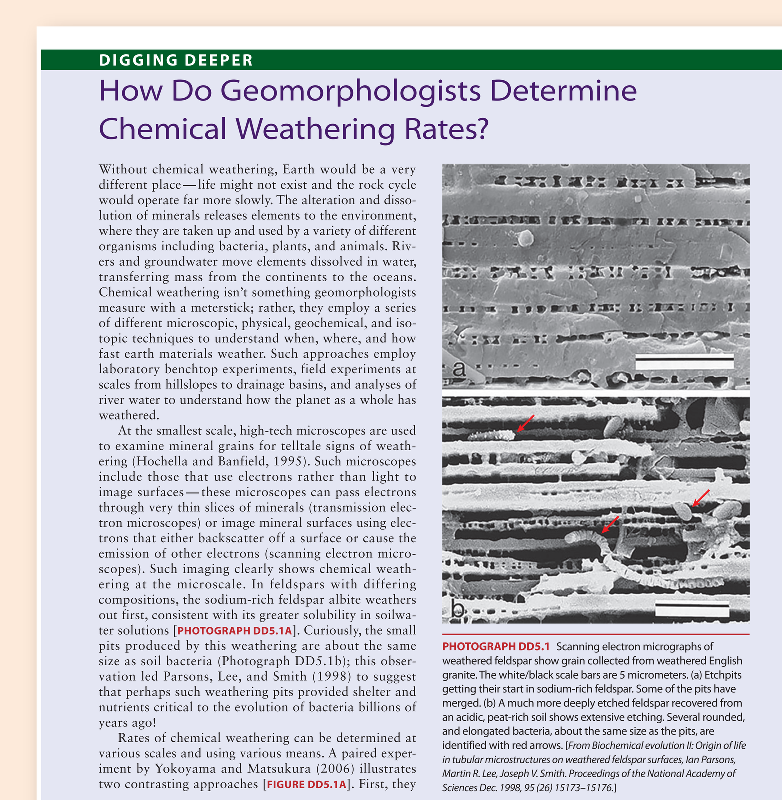
Case Studies at the end of each chapter provide contemporary, real-life Geomorphic applications.



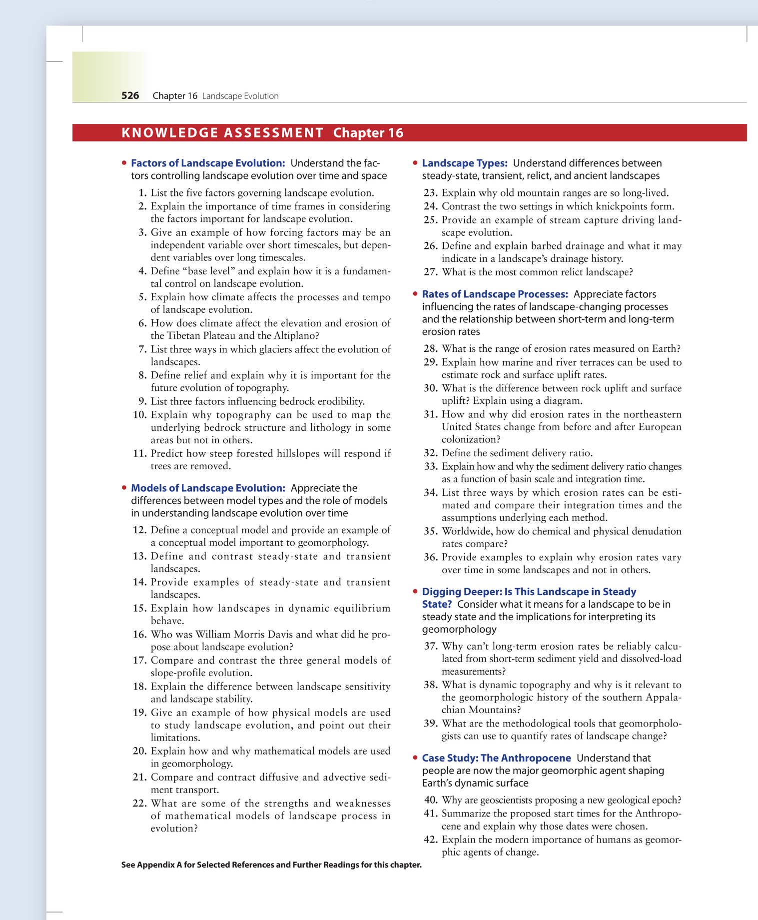
Worked problems at the end of each chapter provide written and numeric examples to aid student learning - some are quantitative, some qualitative.



Digging Deeper sections end each chapter and provide an in-depth, referenced narrative detailing the development of thinking on important geomorphic problems.



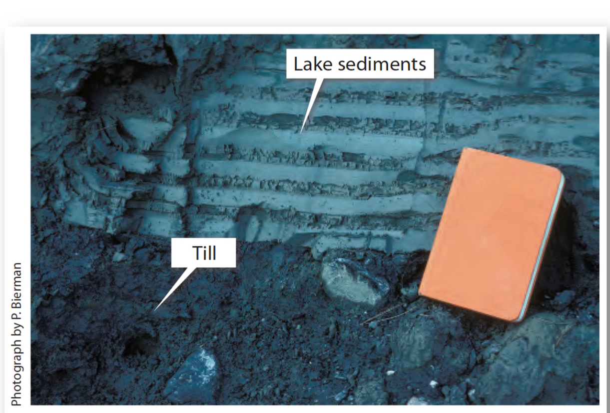
Knowledge assessments provide study guides for students and reflect the important content of each chapter organized by Learning Objectives.



New high quality color photographs, illustrate key concepts, techniques, and landforms. Many are taken by geoscientists. Annotations aid recognition of landforms.

Photograph by P. Bierman

PHOTOGRAPH 2.16 Tracking Sediment Movement. Placing painted pebbles at General Patton's former Camp Iron Mountain in the Mojave Desert to trace sediment movement over time.



Photograph by P. Bierman

PHOTOGRAPH 2.1 Glacial Lake Sediment and Till. When a glacial lake formed next to a retreating ice margin in eastern New York State, rhythmically bedded fine-grain couplets of sand and silt were deposited over till. The underlying till is older than the overlying lake sediments. The fieldbook is about 20 cm long.

Photograph by J. Stone

PHOTOGRAPH 3.5 Felsenmeer. Felsenmeer, frost-shattered rock, and sheeted tors of bedrock on the summit of Mount Darling, Marie Byrd Land, Antarctica. The geologist in the image is between two much less weathered glacial erratics deposited on the surface by glacial ice frozen to its weathered bed.

The University of Vermont