

## Soils: *Genesis and Geomorphology*

*Soils: Genesis and Geomorphology* is a comprehensive and accessible textbook on all aspects of soils.

The book's introductory chapters on soil morphology, physics, mineralogy and organisms prepare the reader for the more advanced and thorough treatment that follows. Unlike other books on soils, the authors devote considerable space to discussions of soil parent materials and soil mixing (pedoturbation), along with dating and paleoenvironmental reconstruction techniques. Theory and processes of soil genesis and geomorphology form the backbone of the book, rather than the emphasis on soil classification that permeates other soils textbooks. This refreshingly readable text takes a truly global perspective, with many examples from around the world sprinkled throughout.

Replete with hundreds of high-quality figures and a large glossary, this book will be invaluable for anyone studying soils, landforms and landscape change. *Soils: Genesis and Geomorphology* is an ideal textbook for mid- to upper-level undergraduate and graduate level courses in soils, pedology and geomorphology. It will also be an invaluable reference text for researchers.

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# Soils

## Genesis and Geomorphology

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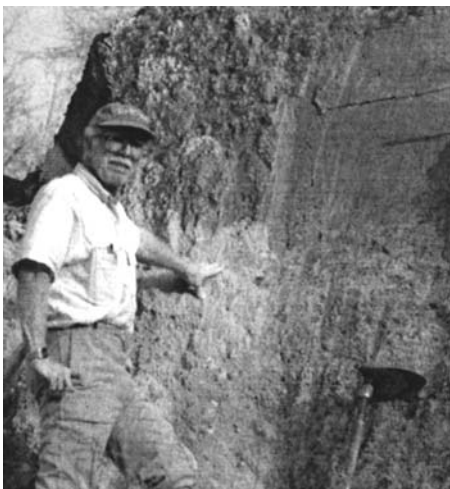
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*We dedicate this volume to those who have inspired us to write it . . . through their lifelong scholarship, insatiable curiosity about the world around them, and their willingness to share it with all who have an interest . . . innovative thinkers who have made many, including us, stop and think about the world through different intellectual “filters” . . .*

Francis Doan Hole (1913–2002)  
and  
Donald Lee Johnson (1934–)



Francis D. Hole in 1978. Image courtesy of the University of Wisconsin, Photo Media Center.



Donald L. Johnson in 1999. Image by RJS.

Soil is the hidden, secret friend . . . the root domain of lively darkness and silence.

Francis D. Hole

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## Preface

This book is about soil geography, which we think is a difficult and challenging area of study. Our purpose in writing this book is to assert that only through a study of the spatial interactions of soils on *landscapes* can soil and landscape evolution be truly resolved.

This book can be used in courses on soil geography, soil genesis, pedology and soil geomorphology. Our assumption is that the readers have had some background in the natural sciences, and are eager to learn more about soils. We do not assume, nor does the reader need, a substantial background in soils to read and comprehend this book. Difficult as the task may seem, our goal was to write a soils text that could serve both as an initial soils text and as a cutting-edge resource book of research grade. Only time will tell if we met that goal.

Our emphasis, beyond that of soil geography, is deliberately intended to be broad. Other books of similar ilk (Daniels and Hammer 1992, Birkeland 1999) focus on geomorphology and the initial geologic setting as a guiding framework for the understanding of soil landscape evolution. We emphasize these issues in later chapters. Buol *et al.* (1997) and Fanning and Fanning (1989) focus on soil genesis while at the same time emphasizing classification.

Our book relies heavily on concepts and imagery to convey ideas. We have compiled a suite of figures, images and graphics that, in and of themselves, convey messages that cannot be put into words. Throughout the text we include brief “outtakes” on soil landscapes from around the world. We call these excursions “Landscapes,” and believe that they convey, with pictures and graphics, what would otherwise take many hundreds of words to tell.

We believe in the necessity of soil taxonomy and soil classification; we use its terminology in the book but do not focus on it. Taxonomy exists to serve those who study and communicate

about soils; it is not an end in and of itself. Because we feel that one of the best ways to “learn” and use taxonomy is to examine it in the context of landscapes, we include taxonomic descriptions within many “Landscapes.”

We are proud of the extensive literature listing that our book makes use of. We hope that we have cited all the major works, both the classic ones and the recent cutting-edge papers. If we have missed something, we urge our readers to call it to our attention; we will be receptive. Where possible, we have tried to cite mainly papers and studies that are readily accessible in most academic libraries. That is, we have steered clear of papers that are difficult to find or in the gray literature, as well as theses and dissertations, unless we felt that they were essential reading. The end result is a book that relies heavily on work published in national and international scholarly journals and books. If you wish to have a digital copy of our References Section entries, just email us and ask.

The glossary is rich in terms, many of which are only marginally touched upon in the text. Our philosophy with regard to the glossary was simple: if the reader needed to know a term to understand the book, include it in the glossary and define it clearly. The glossary adds length to the book but makes it more “readable.”

We intend to continue to work at updating this book, without necessarily making it longer. We encourage you, the reader, to help us. For example, if you wish any topics added to the glossary or the body of the book, contact us with your request. More importantly, alert us to your papers, send reprints and citations, email or write to inform us of new findings or breakthroughs; we will include them as best we can. Contact us with your perceptions of the book, positive or otherwise. Help us make this book better and we promise to continue to work hard toward this goal.



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- Curt Sorenson, who taught me (RJS) to simply love soils and instilled within me a passion to excel.
- Leon Follmer, who taught me (RJS) to look closely at soils, and made me realize that soils and paleosols are truly remarkable things.
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- Matt Mitroka, Ellen White, Beth Weisenborn, Peter Dimitriou and Beth Kaupa assisted Paul

Delamater in the production of the figures, arguably the strength of the book. Paul was the consummate QA/QC person for graphics. His diligence and high standards permeate the book, and for that reason this is as much *his* book as it is ours. Thank you Paul!

- Ron Amundson, Dave Cremeens, Chris Evans, John Hunter, Don Johnson, Warren Lynn, Fritz Nelson, Jenny Olson, Paul Reich, John Tandarich, Charles Tarnocai, Pat Webber, Beth Weisenborn and Antoinette WinklerPrins provided images, graphs, charts and figures of soils and landscapes that have been reproduced within the book. Without these images, the book would have been much weaker.
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Last and most important, we acknowledge that we have approached this book from the perspective of St. John Vianney, the Curé of Ars, when he said, “I have been privileged to give great gifts from my empty hands.”