



# Earth's Dynamic Systems (10th Edition)

*By W. Kenneth Hamblin, Eric H. Christiansen*

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For Introductory courses in Physical or Introductory Geology found in departments of Geology, Earth Science, or Physical Science. Significantly revised to be an optimum learning tool, the Tenth Edition of Earth's Dynamic Systems maintains its solid coverage of the two major energy systems of Earth: the plate tectonic system and the hydrologic cycle. Boasting a new, highly accessible four-part organization, this renowned text fulfills the needs of professors with current content and a striking illustration package, while exposing students to the global view of Earth and teaching them to look at the world as geologists do.

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## **Editorial Review**

From the Publisher

Highly acclaimed and praised as the best teaching text available, *Earth's Dynamic Systems* is the only introductory text that fully integrates the two major energy systems of Earth: the plate tectonic system and the hydrological system. Using these systems to explore fundamental geological processes, the seventh edition of this leader continues to offer Hamblin's trademark "question- statement-discussion-example" format and unrivaled art program.

From the Back Cover

There are two major pathways for the flow of energy and matter on Earth: (1) the hydrologic system—the circulation of water over Earth's surface and through its atmosphere powered by energy from the Sun, and (2) the tectonic system—the movement of material powered by heat from Earth's interior. These two unifying themes form the backbone of *Earth's Dynamic Systems*, providing a logical, well-crafted, spectacularly illustrated introduction to physical geology.

### **NEW TO THIS EDITION:**

**GeoLogic**—Geologists have a unique way of "reading" the landscape and rocks. These essays illustrate in words and images how modern geologists interpret the world around us.

**Updated and Enhanced Student CD-ROM:** Includes dozens of high-quality animations, photographs, and videos.

- **Guided Tours:** These animated tours of Earth's major landforms illustrate key concepts in a way the printed word and still pictures cannot.
- **Slideshows:** Written and photographed by the authors, the slideshows expand on the text with additional photographs and explanations.
- **Videos and animations:** Gathered from geologists around the world, these illustrate both fundamental concepts and how modern geologists study Earth

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Planet Earth was first photographed from space more than 30 years ago by the astronauts of the *Apollo* mission. Since then a variety of satellites have given us supernatural eyes in space. With sophisticated sensors we can "see" through clouds, observe the surface features on the ocean floor, and selectively image temperature, water vapor, ocean currents, and even patterns of ancient river systems now buried beneath the sand of the Sahara Desert. New technology has permitted us to penetrate deep into the interior of our planet and X ray its internal structure. We can now "see" hot material in the interior moving in huge convection cells, creating ocean basins, volcanic islands, and mountain systems.

With this era of enlightenment comes an increased awareness of how our planet is continually changing and a fresh awareness of how fragile it is. Earth is a finite sphere with limited resources, so it is impossible for the population to grow indefinitely. We may find more oil, gas, and coal by improved detection methods, yet nature requires more than a million years to concentrate the oil now consumed in only one year. We have

created nuclear waste, yet are unsure how to dispose of it safely. What can we do about the fact that rivers today transport more agricultural and industrial waste than natural sediment? Is greenhouse heating real? The answers to these questions can be found only if we understand Earth's dynamic systems with their many interdependent and interconnected components.

There are two major pathways for the flow of energy and matter on the planet: (1) the hydrologic system—the circulation of water over Earth's surface and through its atmosphere powered by energy from the Sun, and (2) the tectonic system—the movement of material powered by heat from Earth's interior. Everything discussed in this book is related to these unifying themes.

The tenth edition of *Earth's Dynamic Systems* introduces these systems and will help students to understand and participate in the solutions to some of these problems. It is written for students taking their first college course in physical geology at both two- and four-year schools.

## **This Edition**

This book was significantly revised to make it a more effective learning tool.

1. We have reinforced the themes of the book by dividing it into four parts. In Part I, we discuss Earth's materials and how they are created by geologic systems. In Part II, we discuss the hydrologic system by examining subsystems chapter by chapter. Plate tectonics is the theme of Part IV, with separate chapters on divergent, transform, and convergent boundaries, as well as mantle plumes—the subsystems of the tectonic system. In Part IV, we look back and apply the principles learned to see how Earth's resources formed and just how different our home in space is when compared with other planets. The focus on the hydrologic and tectonic systems is captured in the cover illustrations, which symbolize the energy sources—heat from the Sun and heat from Earth's interior—that drive our dynamic planet.
2. Our major new thrust is the introduction of a series of essays that illustrate the scientific method. We call these summary messages Geologic, as we attempt to show the logic behind using simple observations to come to important conclusions about the way Earth works. We have designed new illustrations to take students from "seeing" to "understanding."
3. The State of the Art sections have been retained. We attempt to distill the important techniques used in modern geology into a few words and couple them with some of the most spectacular and informative images available today. In these short essays, we show how geologists come to understand the world around us, emphasizing not just "what we know" but "how we know" it as well.
4. We strive to present a new perspective in visualizing geology by using panoramic photographs of the landscape. Panoramic photographs begin each chapter and provide the student with a visual summary of the theme of the chapter.
5. All chapters were updated and checked for accuracy. Special attention was focused on improving the illustrations so that the student can more fully experience the excitement and satisfaction of visualizing and understanding geology. We have traveled over much of North America and many other parts of the world—including Brazil, Antarctica, Iceland, Mexico, China, Tibet, Oman—to take photographs specifically for this book. Photographs not otherwise credited were taken by W Kenneth Hamblin.
6. An important element in this edition is the use of new digital topographic maps. The recent release of new data on seafloor and continental topography by defense and other governmental agencies has opened a new window through which we can see the continents and seafloor in a more accurate and detailed fashion than ever before. These colored, shaded relief maps are a visual and intellectual feast for those who carefully study them.
7. The instructor support package has been upgraded since the last edition. In addition to the slides and transparencies to support your lectures, you'll also have electronic access to all the illustrations, most of the photographs from the text, and dozens of additional photographs and video clips via an Instructors

## To the Student

### How to Use This Book

One of the most difficult problems you face in beginning a course in a new subject is to identify fundamental facts and concepts and separate them from supportive material. This problem is often expressed by the question, *What do I need to learn?* We have attempted to overcome this problem by presenting the material in each chapter in a manner that will help you recognize immediately the essential concepts.

**Outline of Major Concepts.** To help you focus on the key points, we have identified them at the beginning of each chapter under the title of "Major Concepts."

**Thesis Statements.** A brief statement of the main idea of each section is in a colored box.

**Guiding Questions.** Experience has shown that the most successful students are those who read with a specific purpose—those who read to answer a question. Consequently, we have developed guiding questions that are presented in the margins next to the appropriate text material. The questions are intended to guide you in your study, stimulate your curiosity, and help focus attention on important concepts.

**Illustrations.** You will find that careful study of the figures and captions is one of the most useful methods of reviewing the content of the chapter.

**Key Terms.** Important terms are printed in bold type. In the Key Terms section at the end of each chapter, the terms are listed alphabetically, with the number of the page on which each appears. These terms are also defined in the glossary at the end of the book.

**Review Questions.** These discussion questions are intended to reinforce the main concepts and stimulate further investigation by pointing out some of the intriguing questions on which scientists are working.

**Illustrated Glossary.** At the end of the book there is an illustrated glossary defining approximately 800 important geologic terms. Many of the terms are accompanied by an illustration that will help in visualizing the definition and meaning of the term. This glossary, if properly used, can be a convenient and significant aid in learning the basic vocabulary of geology.

**World Wide Web/CD-ROM Tools.** Prentice Hall has published two unique electronic items to support your studies: the *Earth's Dynamic Systems* Companion Web Site ([www.prenhall.com/hamblin](http://www.prenhall.com/hamblin)) and a CD-ROM (packaged with the book). These resources are designed to help you organize, prioritize, and apply what you learn from the text and in class. The Web site hosts a variety of review materials, including multiple choice questions; interpretation of maps, images, and photographs; and critical thinking questions linked to external sources of geologic data and images. The quizzes can be automatically graded to help you gauge your progress. To help focus your efforts further, refined feedback is supplied for right and wrong answers. It also provides you with a host of topic-specific Internet addresses and search terms to help you utilize this vast new source of information. On the CD you will find dozens of images, videos, and animations. Together with Eclectic Multimedia and Chalk Butte, Inc., we have developed *Exploring Earth*, an interactive map of the world that let's you "fly" across the globe, zooming in and out to see details or the regional context. We have also developed a series of narrated *Guided Tours* to illustrate how geologic systems have shaped every aspect of the planet.

## **Users Review**

### **From reader reviews:**

#### **David Pimentel:**

The book Earth's Dynamic Systems (10th Edition) make you feel enjoy for your spare time. You can use to make your capable much more increase. Book can being your best friend when you getting tension or having big problem with the subject. If you can make reading a book Earth's Dynamic Systems (10th Edition) to become your habit, you can get considerably more advantages, like add your capable, increase your knowledge about a few or all subjects. You may know everything if you like start and read a e-book Earth's Dynamic Systems (10th Edition). Kinds of book are a lot of. It means that, science guide or encyclopedia or other folks. So , how do you think about this book?

#### **Ruth McMillian:**

Here thing why this Earth's Dynamic Systems (10th Edition) are different and trustworthy to be yours. First of all reading through a book is good however it depends in the content from it which is the content is as delicious as food or not. Earth's Dynamic Systems (10th Edition) giving you information deeper and different ways, you can find any book out there but there is no book that similar with Earth's Dynamic Systems (10th Edition). It gives you thrill examining journey, its open up your personal eyes about the thing in which happened in the world which is probably can be happened around you. You can actually bring everywhere like in recreation area, café, or even in your way home by train. When you are having difficulties in bringing the branded book maybe the form of Earth's Dynamic Systems (10th Edition) in e-book can be your alternate.

#### **Theresa Adams:**

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#### **Irma Tijerina:**

People live in this new day time of lifestyle always try and and must have the spare time or they will get large amount of stress from both everyday life and work. So , when we ask do people have time, we will say absolutely of course. People is human not really a huge robot. Then we request again, what kind of activity do you have when the spare time coming to anyone of course your answer can unlimited right. Then ever try this one, reading guides. It can be your alternative throughout spending your spare time, typically the book you have read is actually Earth's Dynamic Systems (10th Edition).

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