



Kyu Oh/Getty Images

This view of Mt. Hood in Oregon reflects many geographical processes discussed in this text, including the character of the atmosphere, how water is stored and flows within the hydrosphere, the role of climate and its impact on vegetation, and the way landscapes evolve over time.

Introduction to Physical Geography

I want to welcome you to this introductory textbook about physical geography, an exciting scientific discipline that examines the Earth and how it functions. Physical geographers study a wide variety of interesting things, ranging from climate and weather to soils, glaciers, and beaches, to name just a few. Their purpose is to understand the location and character of certain features on the landscape, such as mountain ranges and river valleys, and to explain why they came to be and how they differ from a geographical perspective. This text seeks to encapsulate the essence of physical geography in a way that is appropriate for a beginning student of the discipline such as yourself. As you read through it, your first goal should be to investigate the various physical processes on Earth and how they operate and combine to form distinctive geographical features and patterns. At a secondary level, you will be asked to examine how aspects of physical geography affect human lives and, in turn, how people impact them. This opening chapter outlines the topics discussed in this book and places them in the context of the overall discipline of geography. Then we discuss the various components and features of the book and how they will assist with your learning.

CHAPTER PREVIEW

The Scope of Geography

Defining Physical Geography

Organization of This Book

Stream Meandering

LEARNING OBJECTIVES

1. Comprehend the character and scope of geography as a scientific discipline.
2. Discuss the concept of spatial analysis and how it relates to geography.
3. Define the subdisciplines of physical geography.
4. Explain the concept of a natural system.
5. Define the four Earth spheres.
6. Describe how the scientific method is used in physical geography.
7. Discuss why physical geography is relevant to many human/environment issues.

The Scope of Geography

When most people are asked to describe the nature of geography, a common response is that the discipline focuses primarily on the locations of countries, capital cities, rivers, and oceans. They also assume that most of the work geographers do involves maps in some way. Although such an understanding of the discipline is accurate to some degree, the field actually encompasses *far* more than the average person realizes. In fact, geography is a discipline that is highly relevant to everyday life in myriad ways, ranging from analysis of traffic patterns to importation of economic goods, migration of ethnic groups, cost of gasoline, and earthquake hazards, to name a very few. In addition to maps, geographers use a fascinating array of techniques and technologies to conduct their work, such as computer models, field reconnaissance, personal interviews, satellite imagery, global positioning systems, and even shovels.

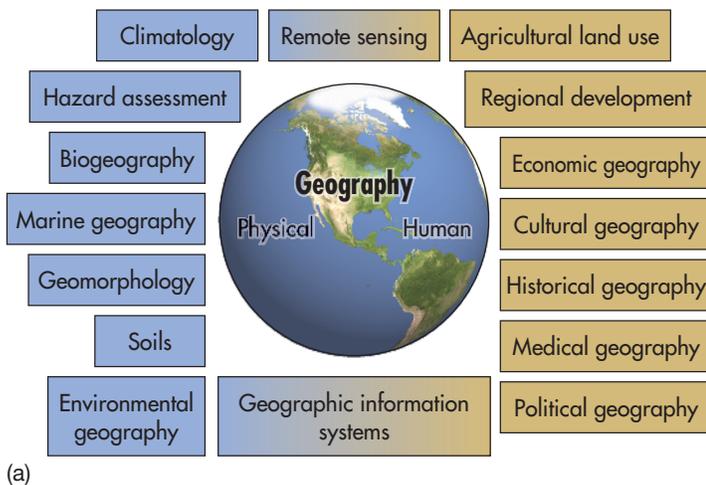
Geography, a word derived from the Greek words for “Earth description,” is an ancient discipline that examines the spatial attributes of the Earth’s surface and how they differ from one place to another. The concept of geography has likely been important to the human experience for tens of thousands of years. It is easy to imagine, for example, that prehistoric hunters and gatherers were intimately aware of their surroundings, including the location and character of forests, streams, lakes, berry patches, migrating animal herds, and competing groups of people. In short, this *geographical awareness* would have been absolutely essential for people to sustain themselves and their communities. It would also have been critically important to pass this awareness on to future generations so that they, in turn, could successfully compete for resources.

So, for thousands of years at least, geography was a descriptive discipline that focused on the generalized location and character of places and features on the landscape.

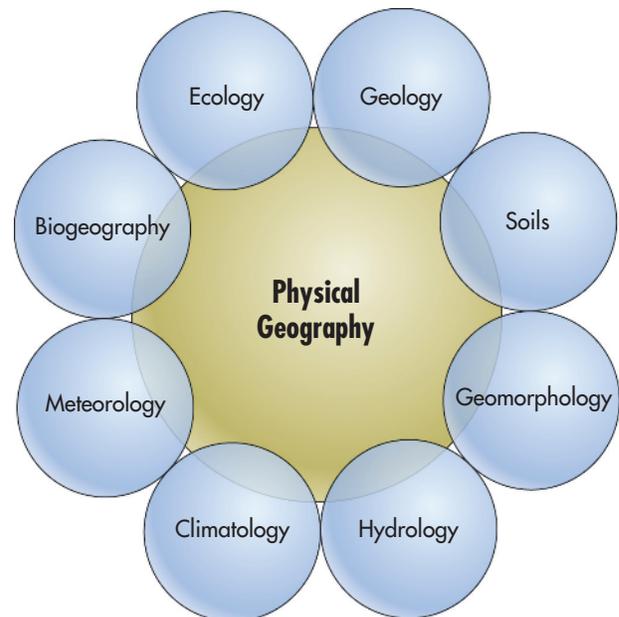
As civilization evolved, however, geography slowly became an academic discipline with numerous specialized subfields. Scientists became experts in areas such as geology, meteorology, ecology, and human cultural differences. Interest in geography grew especially between the 15th and 19th centuries when explorers such as Christopher Columbus, Ferdinand Magellan, James Cook, Charles Darwin, and Lewis and Clark began to investigate parts of the world that were previously unknown to people of European descent (including Americans). These explorers, as well as many others, brought detailed descriptions of exotic places and animals to a keenly interested public. The new knowledge and perspectives gained from this time provided a major driving force for the development of the modern world.

The trend toward increased specialization in geography has continued to the present time. Most geographers generally consider themselves primarily either physical or human specialists. Within these two broad fields are a range of geographical subdisciplines, as shown in **Figure 1.1a**. Although each of these subfields has a unique focus, such as soils or agricultural land use, geographers draw from many of these subfields when they analyze any particular spatial pattern. For example, to fully understand human settlement patterns in Africa, it is important to consider the interaction of subfields such as climatology, soils, and vegetation. In turn, to understand the nature of soils in any given place, you must consider the effects of climatology, vegetation, geomorphology (**Figure 1.1b**), and perhaps even regional cultural practices.

Although this book focuses on physical geography, it is useful to know that all subfields of geography are based on the same five themes of location, movement, place, human/



(a)



(b)

FIGURE 1.1 Subdisciplines of geography. (a) The field of geography can be broadly subdivided into physical and human geography. Many subfields occur within these two broad categories, with many that overlap. (b) Physical geography itself overlaps with several other areas of science. Many of these areas require a good understanding of chemistry and physics as well.

environment interactions, and region. Location refers to the exact position where something is found on Earth. As the name implies, movement is related to the way that geographical variables flow from one locality to another. The concept of place is an important theme in geography because it reflects the characteristics that make a certain location distinct. Human/environment interactions acknowledge the complex bond between people and nature. Finally, a region is a large area that shares one or more common characteristics.

In the context of these five themes, all geographers share a common methodology that makes them part of the overall discipline. Geographers use a method known as **spatial analysis**, which attempts to explain patterns or distributions of specific variables across physical space. At a fundamental level, most geographers want to know the answer to a pair of important questions about any geographical variable: *where* and *why*. In other words, geographers want to know where a specific environmental or cultural variable is located and why it happens to be there.

To see how these questions are important and work in tandem, let's briefly consider an example involving cultural diversity in the Middle East. As you may know, this region has many different religious sects, dialects, and tribal identities. Although this diversity has produced a rich heritage, it has also resulted in a great deal of conflict between and among various cultural groups. A cultural geographer can examine the spatial distribution of the many groups in the area (in other words, *where are they?*), as well as study why people in one place differ

in, say, their political or religious views, from people someplace else. The geographer might look for similarities (such as language or religion) among groups across physical space, which might explain why certain people align themselves politically with others. In the course of this study, the geographer would have integrated several variables into one picture, including language, religion, history, and climate. Such a study might contribute to an understanding of why people differ across this region and why sources of conflict remain.

Defining Physical Geography

Now that the general character of geography has been defined, let's focus on a more detailed definition of physical geography. You probably already have an interest in this part of the discipline, whether you know it or not. For example, do you like big storms and wonder why they happen? You may know that tornadoes frequently occur in the central United States, especially in the springtime (**Figure 1.2a**). Do you know why? Maybe you wonder why large mountains are found in Washington but not in Texas (**Figure 1.2b**). Perhaps you have heard about the Sahara Desert and wonder why it is so dry there and why much of it is covered with sand dunes (**Figure 1.2c**). Like many people, you might enjoy the seashore and wonder why nice beaches form in some places (**Figure 1.2d**) but not in others. If you have asked

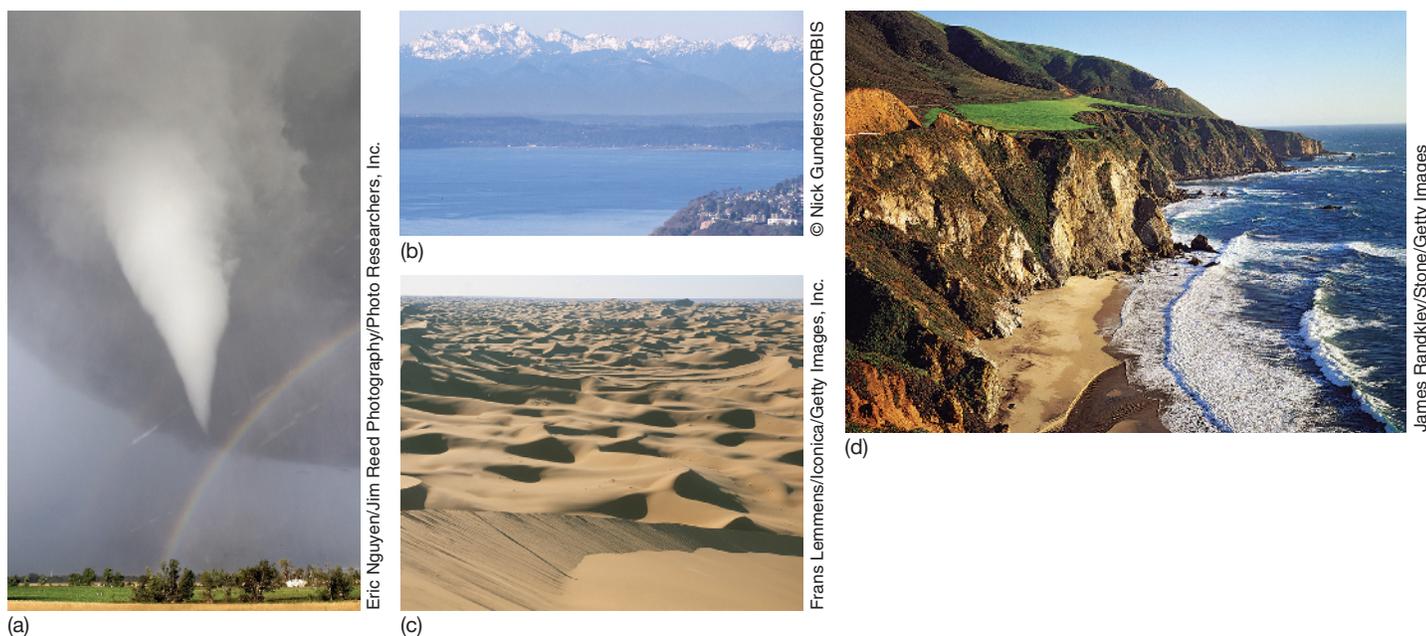


FIGURE 1.2 Some elements of physical geography. (a) A tornado in the central United States (see Chapter 8). (b) The Olympic Mountains overlooking Puget Sound in Washington (see Chapter 13). (c) Sand dunes in the Sahara Desert (see Chapters 9 and 18). (d) Coastline at Big Sur in northern California (see Chapter 19).

Spatial analysis A method of analyzing data that specifically includes information about the location of places and their defining characteristics.



Roger Harris/Photo Researchers, Inc.



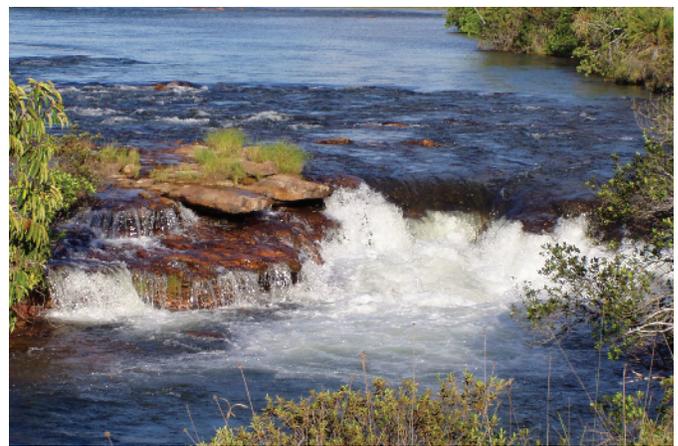
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(a)

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Science Source



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FIGURE 1.3 Examples of energy flows on Earth. (a) Earth receives its energy from the Sun in the form of solar radiation (see Chapters 3 and 4). (b) The atmosphere circulates energy around Earth, as can be seen in this stream of clouds (see Chapter 7). (c) Some energy is transferred when water flows from the atmosphere to Earth as rain (see Chapter 5). (d) Some of the energy on the surface of Earth is transferred by flowing water (see Chapter 16).

yourself questions like these, then you are probably interested in physical geography at some level. The fact is that most people have such interests; they just do not realize it.

Simply stated, **physical geography** involves the spatial analysis of the various physical components and natural processes of the Earth. Some examples of Earth's physical components are air, water, rocks, vegetation, and soil. The term **process** broadly refers to a series of actions that can be measured and that produce a predictable end result. In physical geography, these processes are often products of the energy that flows from the Sun to Earth in the form of solar radiation. Once this energy reaches Earth, it then flows from one place to another on the planet in various forms. Some examples of

natural processes directly related to the flow of solar radiation (**Figure 1.3**) are the circulation of the atmosphere (Chapter 7), the distribution of vegetation (Chapter 10), the formation of soils (Chapter 11), and the movement of water in the air and streams, and collection in lakes (Chapters 5 and 16).

As you will see throughout this book, many processes behave in an interconnected way within *natural systems* where one environmental variable has a direct impact on another. Given these relationships, physical geographers often invoke **systems theory** in their studies because it is a holistic framework through which they can analyze and/or describe a group of variables that work together to produce some definable result. Another way to look at natural systems is to recognize that they

Physical geography Spatial analysis of the physical components and natural processes that combine to form the environment.

Process A naturally occurring series of events or reactions that can be measured and that result in predictable outcomes.

Systems theory The examination of interactions involving energy inputs and outputs that result in predictable outcomes.

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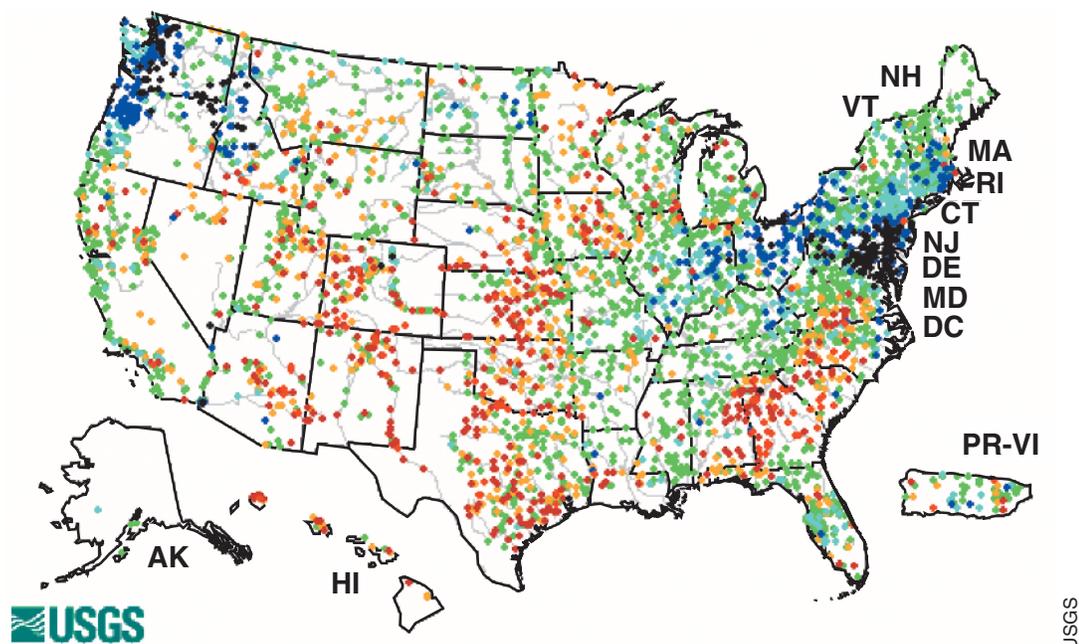


FIGURE 1.4 Location of stream-gaging stations in the United States. The dense concentration of stations in the eastern half of the country reflects the fact that many more streams occur in the eastern United States than in the interior western states. The map is color-coded to illustrate the amount of water in any given stream on October 29, 2012, relative to its average flow on that day calculated over time. For example, red dots reflect very low water levels, whereas dark blue/purple dots mean that stream flow was relatively high on that day. Black dots represent localities on streams that have very high flow and may be close to flooding. The concentration of black dots along the central Atlantic coast reflects prodigious rains dropped by Hurricane Sandy on this day.

are greater than the sum of their parts. Such systems depend on a set of energy inputs that flow in some way to various kinds of predictable outputs. Physical geographers understand that natural systems are complex and that processes within them do not occur in isolation from one another. Instead, they are interconnected in often complicated ways that may at first appear chaotic. Despite this apparent complexity, natural systems are, in fact, self-organizing entities that internally adjust toward an equilibrium condition. These adjustments can be readily explained by understanding how dynamic feedbacks, oscillations, and delays in reaction time influence outcomes.

To see an example of how environmental variables relate to one another and can be viewed holistically within a natural system, imagine you want to explain the spatial distribution of rivers in the United States. One way to see the geographical concentration of rivers in the country is with a map showing the location of gaging stations, which are places where the U.S. Geological Survey continuously monitors the flow of water in the streams (Figure 1.4). Observe that the eastern part of the country contains many more gaging stations than the interior west in places such as Nevada and Utah. This pattern reflects the fact that far more streams are found in the eastern part of the United States than in the interior west.

The question a geographer would ask about this pattern is: *Why* do more rivers occur in the eastern United States than in the western part of the country? This question would naturally lead you to holistically examine streams as natural systems that reflect the input of water from some kind of source to the output of water actually flowing in rivers and creeks. Understanding these relationships, in turn, helps explain the geographical patterns observed in Figure 1.4. The simple reason for the geographical distribution of streams in the United States is that far more precipitation falls in the eastern part of the United States than in the western states. You will later study why this geographical variability occurs, but for now it is sufficient to say it exists because the atmosphere over the eastern United States typically contains more water than in the interior parts of the western states. Thus, more water flows from the atmosphere to the ground as precipitation in the eastern United States than in the western states. Some of this water flows directly across the Earth's surface as input into streams. A great deal of it slowly absorbs into the ground, where it is steadily released into streams. As a result of these interconnected processes, the eastern United States contains more streams than the western part of the country.

Center photo: Hal Pierce, Laboratory for Atmospheres, NASA Goddard Space Flight Center.
Surrounding photos: Alan Arbogast

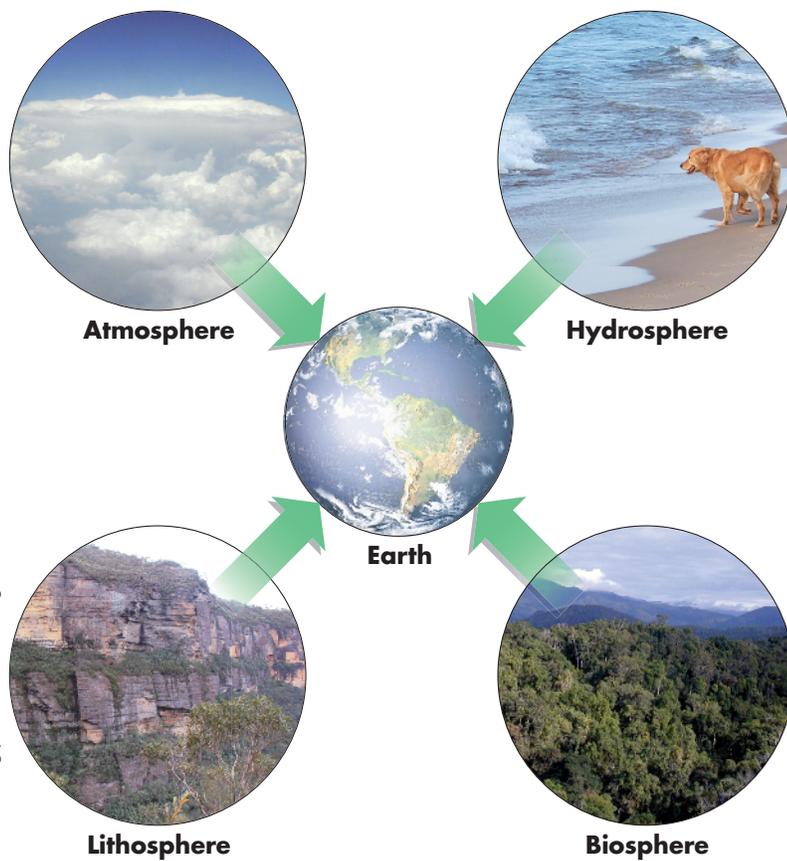


FIGURE 1.5 The four Earth spheres. Each sphere encompasses a major component of the Earth's natural environment.

The Earth's Four Spheres

As you can imagine, a huge number of component/process combinations exist for geographical study in a holistic way. In physical geography, these various combinations can be grouped into the four “spheres” on Earth (**Figure 1.5**):

- 1. Atmosphere**—The atmosphere is the gaseous shell that surrounds Earth. This sphere is composed of many critical components essential to life, such as oxygen, carbon, water, and nitrogen, that flow around Earth.
- 2. Lithosphere**—The lithosphere is the solid part of Earth, including soil and minerals. A good example of a natural system in this sphere is the way in which water, minerals, and organic matter flow in the outermost layer of the Earth to form soil. This sphere provides the habitat and nutrients for many life-forms.
- 3. Hydrosphere**—The hydrosphere is the part of Earth where water, in all its forms (solid ice, liquid water, and gaseous water vapor), flows and is stored. This sphere is absolutely critical to life and is one with which humans regularly interact—for example, through irrigation and navigation.

- 4. Biosphere**—The biosphere is the living portion of Earth and includes all the plants and animals (including humans) on the planet. Various components of this sphere regularly flow from one place to another, both on a seasonal basis and through human intervention. Humans interact with this sphere in a wide variety of ways, with agriculture being an obvious example.

These four spheres overlap to form the natural environment that makes Earth a unique place within our solar system. Physical geography examines the spatial variation within these spheres, how natural systems work within them, the observable outcomes in each, and the manner in which components flow from one sphere to another.

Physical geography can be a descriptive discipline that simply characterizes the nature of the Earth's spheres in specific regions. A simple example of such a descriptive focus would be to acknowledge that the western part of the United States is mountainous, whereas the central part of the country consists mostly of relatively level plains. Physical geography is also a science because research is conducted within the framework of the scientific method, which is the systematic pursuit of knowledge through the recognition of a problem,

Atmosphere The gaseous shell that surrounds Earth.

Lithosphere A layer of solid, brittle rock that comprises the outer 70 km (44 mi) of Earth.

Hydrosphere The part of Earth where water, in all its forms, flows and is stored.

Biosphere The portion of Earth and its atmosphere that supports life.



NASA Media Services

(a)



Alan Arbogast

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FIGURE 1.6 Examples of collecting scientific data about Earth. (a) Certain satellites are designed to obtain measurements about the atmosphere, oceans, and the distribution and character of plants, among many other things. (b) To learn about the behavior of streams in the past, scientists study the type of sediment deposited by the stream through time. This picture is from one of my class field trips in the Great Plains. (c) One way to learn about past climate changes on Earth is to obtain samples of ancient ice on the Greenland and Antarctic ice caps. (d) Digital technology enables spatial scientists to easily obtain accurate measurements about elevation and location.

the formulation of hypotheses, and the testing of hypotheses through the collection of data by measurement, observation, and experiment. The conclusions derived from the systematic application of the scientific method contribute to the formulation of scientific theories and laws that explain how Earth functions.

A simple example of using the scientific method in physical geography would be to test the hypothesis that water in streams within a certain region is acidic. This hypothesis would best be tested by collecting water samples from a number of streams and

conducting chemical analyses on them to determine their acid levels. If high acid levels were indeed obtained, then an effort would be made to explain why that pattern occurred. In addition to the understanding produced in these kinds of analyses, physical geographers also test hypotheses about all sorts of natural phenomena by collecting information from the atmosphere, rocks, soils, ice cores, satellite images, the Earth's magnetic field, and even other planets (Figure 1.6). For these investigations to occur, it is essential that scientists understand physical laws and have the ability to mathematically analyze and compare them.

Organization of This Book

The chapters in this book are organized to provide you with a good understanding of the fundamental concepts associated with physical geography. They contain information that ranges in scale from global to local, which will allow you to better grasp your place both in the world and even in your neighborhood. Chapter 2 focuses on the various kinds of tools that geographers use in their work, such as maps, remote sensing, and geographical information systems. Chapters 3 through 5 examine our relationship with the Sun (Chapter 3), the way we receive solar radiation (Chapter 4), and how those interactions relate to temperature (Chapter 5). The processes discussed in these chapters will prepare you for the topics that will be covered in the rest of the book. Chapters 6 through 9 revolve around the atmosphere, including the way that air circulates within it (Chapter 6), precipitation processes (Chapter 7), weather systems (Chapter 8), and global climate patterns (Chapter 9). The text then examines the influence of the atmosphere and how it interacts with Earth's other spheres by focusing on plant geography in Chapter 10 and soils in Chapter 11.

Chapters 12 through 19 deal mainly with the lithosphere and hydrosphere. Chapter 12 describes the Earth's internal structure, rock cycle, and geologic time. This discussion leads directly into Chapter 13, which focuses on the lithosphere and tectonic landforms. From there, we turn your attention in Chapter 14 to the way that rocks weather and how sediment moves through mass wasting processes. Chapters 15 and 16 discuss the way that water moves on Earth and how it is stored within it. Chapter 15 focuses specifically on groundwater processes and the formation of landforms such as caves. In Chapter 16 we look at how water flows across the surface in stream systems and the landforms that result. Chapters 17 through 19 are devoted to specific geomorphic processes and the resulting landforms, including glaciers (Chapter 17), eolian (wind) processes and arid landscapes (Chapter 18), and coastal regions (Chapter 19).

Exploring Cause-and-Effect Relationships Holistically

As you work through these chapters, you will constantly see how the four Earth spheres interact with each other to produce definable geographical patterns. To understand how such interactions work, let's briefly examine the searing drought in the central United States in the summer of 2012. With this issue in mind, consider the following question, one that encompasses elements of the atmosphere and the hydrosphere: How was the quantity of water in rivers in this part of the country affected by the drought? A testable hypothesis would be that the quantity of water in rivers decreased. You could test this hypothesis by collecting data from gaging stations about the amount of water in the streams during the drought and comparing those values to normal water levels. In all probability, the amount of water dropped significantly during the drought,

which, in fact, is reflected in Figure 1.4. The reason for this decreased water level is that a significant drought would result in less water flowing from the atmosphere (as precipitation) to Earth. As a result, less water would then be available as an input to streams across the Earth's surface. In addition, the quantity of water stored in the ground likely decreased, which would also have reduced river levels because a great deal of water in streams is derived from the ground. Potential further impacts of this drought could have been that some forms of vegetation became less common or that the likelihood of fire increased.

This book systematically explores these kinds of cause-and-effect relationships in a variety of ways. One way is through the traditional use of text accompanied by photographs, diagrams, and tables. Each chapter contains detailed discussions that connect important concepts to events that you may have experienced.

Emphasis on Human Interactions with the Environment

Many of the scientific analyses associated with physical geography are driven by the growing impact that human activities have within and among the Earth spheres. Given the nature of human impact on the natural environment, physical geography is at the forefront of research on many environmental issues that face the world today. Among just a very few of these issues are the following.

- **Global climate change**—Human industrial activities are increasing the levels of carbon dioxide in the atmosphere. Abundant scientific evidence suggests that this relationship is contributing significantly to global climate change.
- **Deforestation**—The clearing of the tropical rainforests is occurring at a very rapid rate, leading to soil erosion, loss of wildlife habitat, and species extinctions.
- **Farmland loss**—Due to increasing global population, farmland is being converted to zones of economic development and residential housing. This loss of farmland is resulting in more intensive farming of agricultural soils still in use, which increases the risk of soil erosion and pollution due to the extensive application of fertilizers and pesticides.
- **Natural hazards**—Hazards occur when extreme events result in danger to humans. Examples of natural hazards include hurricanes, tornadoes, flooding, earthquakes, and volcanoes. Natural hazards are a particularly important area of geographical study because as the global population grows, increasing numbers of people are moving into areas that are susceptible to extreme natural events.

A recent natural disaster in the United States vividly illustrates the integrated nature of physical geography and the critical role that geographers play with respect to solving real-world problems. As you probably know, Hurricane Sandy

devastated the East Coast in the fall of 2012, causing many deaths and billions of dollars of damage, much of it occurring when the New Jersey shore was extensively flooded. Before the storm reached land, geographers were at the forefront of the effort to monitor the storm's path and predict where the most significant damage would occur. Once the storm passed, geographers began conducting research on the impact that the hurricane had on a variety of issues, including the shape of the coastline, the distribution of wetlands, and the regional economy. These studies have profound implications for future environmental decisions, politics, and economic development in the region. Most chapters of this book contain sections specifically devoted to such human–environment interactions, including a discussion of solar energy production in Chapter 4, wind energy in Chapter 5, and petroleum in Chapter 12. The final chapter (Chapter 20) is devoted entirely to these kinds of issues and demonstrates how physical geography is highly relevant to human–environmental interactions.

Geo Media Library: An Interactive Tool

These holistic discussions in the text are accompanied by graphics and photographs, as well as a more dynamic tool—the Geo Media Library. This online resource contains a variety of animations and simulations that allow you to visualize and manipulate many of the factors associated with geographical processes and to see the results over time and space. The animations and simulations will enhance your learning as you participate more closely with geographical processes and will reinforce the interactive nature of the discipline by showing related variables in motion. The presentation of the media is integrated within the chapter text as distinct sections that explain what you should expect to learn when you access them in the online resource.

Here is a good example of how the Geo Media Library will enhance your learning. Let's again use flowing water in rivers as an example because it is easy to visualize. This concept is described in great detail in Chapter 16, where it is accompanied by a variety of diagrams that illustrate how water flows, using flow lines and arrows embedded within them. It is also supplemented by several animations that are accessed through the Geo Media Library or on the text's accompanying website. One of the animations in that chapter shows how streams snake across the river valley in a process called *meandering*. Through this process, the geographical position of streams actually moves through time. The Geo Media Library shows this process in animated form, which will enable you to comprehend it better. Have a look now to see what these animations are like.

Focus on Geographical Literacy

In addition to improving your overall understanding of physical geography and how it relates to human/environmental issues, another goal of this book is to enhance your geographical literacy. It is common knowledge that the overall

geographical literacy of most Americans is very poor. How many Americans can identify, for example, the countries of the Middle East, where so much of our national focus is presently centered? Do they know the location and character of Afghanistan, which is where we continue to engage in the longest war in our history? In a similar vein, how many people understand the science associated with the issue of ongoing climate change, or why hurricanes may raise the cost of gasoline at the pump?

Geographical literacy also involves knowing the location of distinct physical regions on Earth, such as the Sahara Desert or the Himalaya Mountains, and why they exist. In this context, you will see that discussions include maps of the places described. I also hope that your *visual* geographical literacy will improve by using this text. In other words, this book is designed to sharpen *your eye* so that when *you* see things in the landscape, which you may have previously ignored, you might better appreciate them and why they occur. Two features that are found on the book companion site—*Discover* and *Visual Concept Check*—are specifically designed to help you improve this aspect of your geographical literacy. The *Discover* feature allows you to see certain parts of the physical landscape and what they mean about environmental conditions at the time or place they formed. The *Visual Concept Check* features are placed after key topic discussions in the text so that you can test your understanding of those topics immediately after encountering them.

Physical Geography Is Interesting, Exciting, and Very Relevant to Your Life

As with any new endeavor, you can expect that improving your understanding of physical geography may be difficult at times. Many students initially avoid this subject because they feel that geography is boring, or they are intimidated by science, or they see no relevance of geography to their lives. If you genuinely give this subject a chance, however, you will see that physical geography is indeed relevant to *your* everyday life and, most of all, is interesting and even exciting. How else can you explain the popularity of weather and nature programs, national and state parks, the travel industry, mountains, or beautiful coastlines? Why do people go on exotic vacations if not, in part, to enjoy the uniqueness of the physical landscape in new places? With a greater understanding of physical geography, you will appreciate those trips more. You may even appreciate the immediate world around you more.

In addition, an understanding of physical geography will help you make *informed* decisions when you are confronted with important environmental issues in your lifetime. Thus, you will become a better citizen, one who is capable of better protecting the best interests of your family and community. For instance, at some point in the future you may be confronted with a choice of where to place a landfill in your city or town. In order to make the most informed decision, one that perhaps ensures the safety of your drinking water, it will be important to understand the geology of the site, the character of soils, and the way water moves through the ground and is stored within it.

It is also possible that after using this text you may even decide that you want to become a physical geographer, as many people have. A number of excellent, well-paying jobs can be obtained with a specialization in physical geography, including environmental analysts, cultural resource managers, conservation agents, teachers, meteorologists, and landscape architects. If you decide to pursue such a career,

you will find that collecting, analyzing, and reporting about geographical data are very rewarding activities. I do that kind of work myself and find it incredibly rewarding. Earth is a beautiful and complex place, and it is fun to understand how it works. Regardless of whether or not you are a geographer, you will understand your home planet better after using this text. Enjoy the ride!

Geo Media

Stream Meandering

An excellent way to get a feel for the interactive media in this book is by examining a simple animation showing how streams move across the landscape. To do so, view the animation [Stream Meandering](#) in the [Geo Media Library](#). This animation allows you to visualize the way that streams migrate horizontally through the process of meandering. Throughout the book, you will frequently

encounter modules like this one that will give you a better idea of how geographical processes function. Some of the modules are simple and require only that you carefully watch them. Others are simulations that allow you to manipulate variables to see how outcomes change. Regardless of the type of media, each module will contain a series of questions that can be used to test your understanding of the concepts after you watch the animation or simulation.

Check Your Understanding

1. Describe the character of geography as a scientific discipline.
2. Explain the concept of spatial analysis and how it is used in geography.
3. What is the nature of physical geography, and why is it a subdiscipline of geography?
4. What is a natural system, and why can it be viewed holistically with distinct inputs and predictable outputs? Provide an example.
5. What is the scientific method, and how is it applied to research problems in physical geography?
6. Compare and contrast the four spheres of Earth, and provide an example of how two of them interact with each other.
7. Why can physical geography be used to understand the relationship of humans with the environment?