



Introduction to

# GEOGRAPHY

Fourteenth Edition

Arthur Getis  
Mark Bjelland  
Victoria Getis

FOURTEENTH EDITION

# Introduction to Geography

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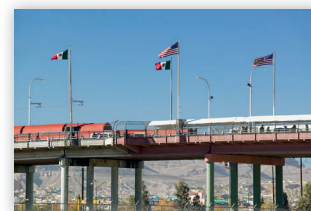


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# PREFACE

“If you build it, they will come” was the message that inspired the character played by Kevin Costner in the movie *Field of Dreams* to create a baseball field in his Iowa cornfield. A similar hope encouraged us when we first began to think about writing *Introduction to Geography* in 1975. At that time, very few departments of geography in the United States and Canada offered a general introductory course for students—that is, one that sought to acquaint students with the breadth of the entire field. Instead, most departments offered separate courses in physical and human or cultural geography. Recognizing that most students will have only a single college course and textbook in geography, we wanted to develop a book that covers all of the systematic topics that geographers study. Our hope, of course, was that the book would so persuasively identify and satisfy a disciplinary instructional need that more departments would begin to offer a general introductory course to the discipline, a dream that has been realized.

## Approach

Our purpose is to convey concisely and clearly the nature of the field of geography, its intellectual challenges, and the logical interconnections of its parts. Even if students take no further work in geography, we are satisfied that they will have come into contact with the richness and breadth of our discipline and have at their command new insights and understandings for their present and future roles as informed adults. Other students may have the opportunity and interest to pursue further work in geography. For them, we believe, this text will make apparent the content and scope of the subfields of geography, emphasize its unifying themes, and provide the foundation for further work in their areas of interest.

A useful textbook must be flexible enough in its organization to permit an instructor to adapt it to the time and subject matter constraints of a particular course. Although designed with a one-quarter or one-semester course in mind, this text may be used in a full-year introduction to geography when employed as a point of departure for special topics and amplifications introduced by the instructor or when supplemented by additional readings and class projects.

Moreover, the chapters are reasonably self-contained and need not be assigned in the sequence presented here. The chapters may be rearranged to suit the emphases and sequences preferred by the instructor or found to be of greatest interest to the students. The format of the course should properly reflect the joint contribution of instructor and book, rather than be dictated by the book alone.

## New to this Edition

Although we have retained the framework of presentation introduced in the previous edition of this book, we have revised, added, and deleted material for a variety of reasons.

- The material on economic geography has been split into two chapters, allowing greater coverage of agriculture (Chapter 9), manufacturing (Chapter 10), the emerging international division of labor, and the services industry.

- The chapter on natural resources has been moved and grouped with the chapter on human impacts on the environment (Chapter 12).
- Current events always mandate an updating of facts and analyses and may suggest discussion of additional topics. Examples include a new chapter opening vignette on Hurricane Sandy and the growth of hydraulic fracturing in the United States as a source of oil and natural gas.
- In every new edition, both changes in spatially variable patterns of population growth and decline and changes in the populations of major urban areas require updating. Maps and tables depicting the U.S. population were updated based on data from the 2010 census.
- Every table and figure in the book has been reviewed for accuracy and currency and has been replaced, updated, or otherwise revised where necessary.
- As always, we rely on reviewers of the previous edition to offer suggestions and to call our attention to new emphases or research findings in the different topical areas of geography. Our effort to incorporate their ideas is reflected not only in the brief text modifications or additions that occur in nearly every chapter but also in more significant alterations.
- The urban chapter (Chapter 11) incorporates recent scholarship on postindustrial cities and on world cities. It also focuses on changing patterns of urbanization and suburbanization in the United States, reflecting recent trends of a return to central cities and smaller growth in the suburbs. There are new data on homelessness. There is new information on the postcommunist city as economies change in Eastern Europe. And there is a new section on slums in cities in the developing world, emphasizing governments' efforts to upgrade slums.
- The political geography chapter reflects changes in current events. Chapter 8 includes a discussion of the oil pipeline dispute in the new country of South Sudan, updated information on women's participation in legislative bodies worldwide, and references to the euro crisis.
- Chapter 7 has been renamed Human Interaction rather than its original title Spatial Interaction. This in no way diminishes the importance of the spatial point of view, but puts into a more balanced perspective the influence of Internet types of communications such as e-mail, Facebook, and Twitter. These as well as other forms of human interaction are spatially nuanced, but by their very nature are considered to be more generally unconstrained by the friction of distance. The chapter reflects this more up-to-date point of view.
- At the beginning of each chapter the learning outcomes are listed.

## New Figures and Tables

To reflect the most recent data, many figures have been revised or newly drawn for the 14th edition of *Introduction to Geography*. They include:

- New map illustrating the concepts of site and situation using the example of New Orleans (Chapter 1)
- New pair of maps to illustrate the concepts of spatial pattern and spatial association. The maps depict predominant religions and dry counties in Texas (Chapter 1)
- New map of vernacular regions of the United States based on Wilbur Zelinsky's work (Chapter 1)
- New pair of historic and contemporary photographs depicting landscape change, using the example of Dubai (Chapter 1)
- A new diagram illustrating the basic systematic structure of the discipline of geography (Chapter 1)
- A new series of maps representing the distortion of different map projections; the face used for the illustration now a woman rather than a man (Chapter 2)
- Maps representing population distribution in California and electoral results from the 2012 presidential election (Chapter 2)
- New photos illustrating the effects of the Japanese tsunami of 2011 and Hurricane Sandy of 2012 (Chapters 3 and 4, respectively)
- Figures providing new information on climate change and demonstrating more succinctly the altitude and form of different types of clouds (Chapter 4)
- All maps, graphs, charts, and tables related to population that required updating (Chapter 5)
- New set of population pyramids depicting a variety of U.S. communities including a retirement community, university town, Texas-Mexico border town, and Indian reservation (Chapter 5)
- Improved map of major world migrations since 1500 (Chapter 5)
- New map and graph of the distribution of the world's population by latitude using 2010 data (Chapter 5)
- Improved map of the U.S. regions that use the term *pop*, *soda*, or *coke* for a soft drink (Chapter 6)
- New map of Internet users around the world (Chapter 6)
- New map showing the diffusion of dialects across the United States (Chapter 6)
- Maps reflecting the latest data on flows of refugees, migration in the United States, and migration fields of California and Florida (Chapter 7)
- Figures listing new countries admitted to the UN, South Sudanese proposed oil pipelines, and geographic shifts in congressional apportionment. (Chapter 8)
- Improved map of accessibility and ocean shipping flows (Chapter 9)
- New table illustrating the importance of the informal economy in developing regions (Chapter 9)
- New figure illustrating the locational interdependence model (Chapter 10)
- Improved map of the major international financial centers and stock exchanges (Chapter 10)
- Figures and tables now reflecting 2010 census data and new UN Population Division data and projections (Chapter 11)
- Figures reflecting new research or data regarding world cities and their global networks; population density changes in Atlanta and Detroit; Megalopolis on the East Coast of the United States; racial/ethnic residential changes in Los Angeles; and the percentage of urban residents living in slums worldwide (Chapter 11)
- All maps, graphs, charts, and tables related to natural resource use that required updating (Chapter 12)
- New figure depicting the relationship between standard of living and the scale of environmental impacts (Chapter 13)
- New Appendix 3 using 2012 population data; a new data field showing the percentage of each country's population with access to improved drinking water sources in line with the United Nation's Millennium Development Goals

## New/Revised Boxes

The boxed elements in the book have been updated if necessary or replaced with new discussion texts.

- Box on terrorism revised to reflect new country of South Sudan (Chapter 8)
- Updated information in the environmental justice box (Chapter 8)
- New box "Eating Locally on the College Campus" (Chapter 9)
- New box "Where Do Your Clothes Come From?" discussing the changing geographic patterns of the garment industry and ethical questions about working conditions (Chapter 10)
- Substantial revision to "Birds of a Feather" box, reflecting changes in technology and marketing (Chapter 11)
- Revised Geography & Public Policy box, "Fuel Economy and CAFE Standards" (Chapter 12)

## New/Revised Topical Discussions

- New opening vignette about Hurricane Sandy in 2012
- New discussion of the 2010 Deepwater Horizon oil spill in the Gulf of Mexico
- New discussion of the 2011 Fukushima nuclear accident in Japan
- All resource-use data updated to reflect the most recent production, consumption, and reserve figures
- Population data and projections updated to reflect the latest available world, regional, and country information from UN population agencies, the Population Reference Bureau, and the U.S. Census Bureau
- New discussion of ethnourbs
- Updated discussion of offshoring and a comparison of wages around the world
- Updated discussion of the growing Chinese economy, high-tech innovation, and transnational corporations
- New discussion of international commodity chains for consumer electronics such as the iPhone
- New discussion of the United Nation's Millennium Development Goals for addressing gender inequality

- New discussion of sustainable agriculture
- New presentation of the locational interdependence theory for services
- New discussion of tourism and gambling
- Revised system for dividing economic activity into three sectors: primary, secondary, and tertiary. This three-part scheme follows standard practice and matches the format of major international economic databases. Within the tertiary or service sector, consumer services distinguished from business services
- New discussion of hydraulic fracturing and its significance for energy production from the Bakken Formation and Marcellus Shale
- New discussion of sustainable cities and green technologies to reduce greenhouse gas emissions
- New discussion of transboundary river basins
- New discussion of Not In My Backyard protests
- The discussion on climate change updated to be in line with current scientific thinking on the subject

---

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A number of reviewers have greatly improved the content of this and earlier editions of *Introduction to Geography* by their critical comments and suggestions. Although we could not act upon every helpful suggestion, or adopt every useful observation, all were carefully and gratefully considered. In addition to those acknowledgments of assistance detailed in previous editions, we note the thoughtful advice provided by the following individuals.

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**Mark D. Bjelland**  
**Victoria Getis**

Pedagogical content in Introduction to Geography has been created to gain and retain student attention, the essential first step in the learning process.

## CHAPTER 6

# Cultural Geography



Hindu pilgrims worship at dawn in the sacred Ganga (Ganges) River at Varanasi, India. © Porterfield/Chickering/Photo Researchers

**CHAPTER OUTLINE**

<p><b>6.1 Components of Culture</b>  <b>6.2 Subsystems of Culture</b>                      The Technological Subsystem                      The Sociological Subsystem                      The Ideological Subsystem</p> <p><b>6.3 Interaction of People and Environment</b>                      Environments as Controls                      Human Impacts</p> <p><b>6.4 Culture Change</b>                      Innovation                      Diffusion                      Acculturation</p> <p><b>6.5 Cultural Diversity</b></p> <p><b>6.6 Language</b>                      Language Spread and Change                      Standard and Variant Languages                      Language and Culture</p>	<p><b>6.7 Religion</b>                      Classification and Distribution of Religions                      The Principal Religions  <i>Judaism</i>  <i>Christianity</i>  <i>Islam</i>  <i>Hinduism</i>  <i>Buddhism</i>  <i>East Asian Ethnic Religions</i></p> <p><b>6.8 Ethnicity</b></p> <p><b>6.9 Gender and Culture</b></p> <p><b>6.10 Other Aspects of Diversity</b></p> <p><b>SUMMARY OF KEY CONCEPTS</b>  <b>KEY WORDS</b>  <b>THINKING GEOGRAPHICALLY</b></p>
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Each chapter opens with **Learning Objectives** students can use to guide their study and help them focus on critical concepts. These objectives specify what students are expected to know, understand, and be able to do after studying the chapter.

**Vignettes** are used to begin each chapter with a brief real-life story intended to capture student interest and prepare them for the subject matter to follow.

Numbered **Chapter Outlines** are included on the opening page of each chapter to clarify the organization of the chapter and to make it easy to locate specific topics of discussion.

46 Chapter 3

### LEARNING OBJECTIVES

**After studying this chapter you should be able to:**

- 3.1 Characterize the three classes of rock.
- 3.2 Define folding, joint, and faulting.
- 3.3 Illustrate how plate tectonics relate to earthquakes.
- 3.4 Explain how a tsunami originates.
- 3.5 Compare the effect of mechanical and chemical weathering on landforms.
- 3.6 Compare the effect of groundwater erosion with that of surface water erosion.
- 3.7 Relate how glaciers form and how their erosion creates landscapes.
- 3.8 Define landform features such as deltas, alluvial fans, natural levees, and moraines.
- 3.9 Understand the landform changes due to waves, currents, and wind.

**3.1 Earth Materials**

The rocks of the earth's crust vary according to mineral composition. Rocks are composed of particles that contain various combinations of such common elements as oxygen, silicon, aluminum, iron, and calcium, together with less-abundant elements. A particular chemical combination that has a hardness, density, and definite crystal structure of its own is called a **mineral**. Some well-known minerals are quartz, feldspar, and mica. Depending on the nature of the minerals that form them, rocks are hard or soft, more or less dense, one color or another, or chemically stable or not. While some rocks resist decomposition, others are very easily broken down. Among the more common varieties of rock are granites, basalts, limestones, sandstones, and slates.

Although one can classify rocks according to their physical properties, the more common approach is to classify them by the way they formed. The three main groups of rock are igneous, sedimentary, and metamorphic.

**Igneous Rocks**

**Igneous rocks** are formed by the cooling and solidification of molten rock. Openings in the crust give molten rock an opportunity to find its way into or onto the crust. When the molten rock cools, it solidifies and becomes igneous rock. The name for underground molten rock is *magma*; aboveground, it is *lava*. *Intrusive* igneous rocks are formed below ground level by the solidification of magma, whereas *extrusive* igneous rocks are created above ground level by the solidification of lava (Figure 3.1).

The composition of magma and lava and, to a limited extent, the rate of cooling determine the minerals that form. The rate of cooling is mainly responsible for the size of the crystals. Large crystals of quartz—a hard mineral—form slowly beneath the surface of the earth. When combined with other minerals, quartz forms the intrusive igneous rock called *granite*.

The lava that oozes out onto the earth's surface and makes up a large part of the ocean basin becomes the extrusive igneous rock called *basalt*, the most common rock on the earth's surface. If, instead of oozing, the lava erupts from a volcano crater, it may cool very rapidly. Some of the igneous rocks formed in this manner

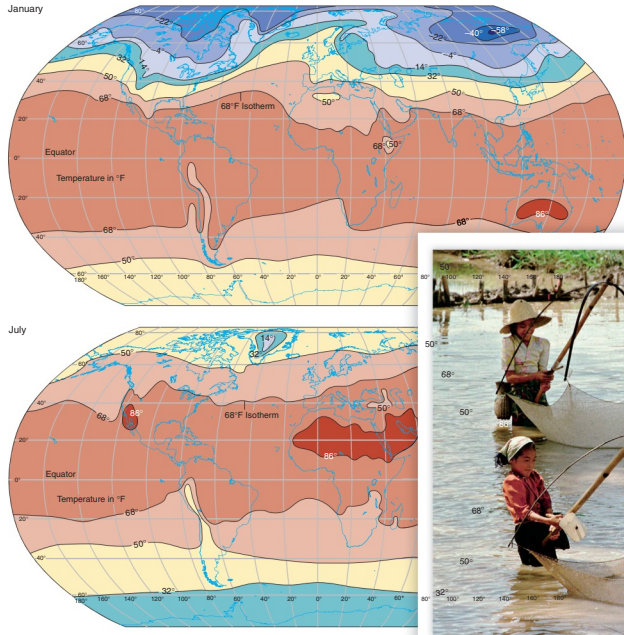


Figure 4.9 Temperatures of the Earth. At a given latitude, water areas are warmer than land areas in winter and cooler in summer. Isotherms are lines of equal temperatures.



Figure 9.21 Fish farming in China. Fish farming is one of the fastest-growing sectors in world food production with Asian countries supplying the vast majority of the total fish farming harvest. As shown here, fish farming can be done in flooded rice paddies. Fish wastes enhance soil fertility and the fish eat insects that damage rice crops. © AP Photo/Greg Baker.

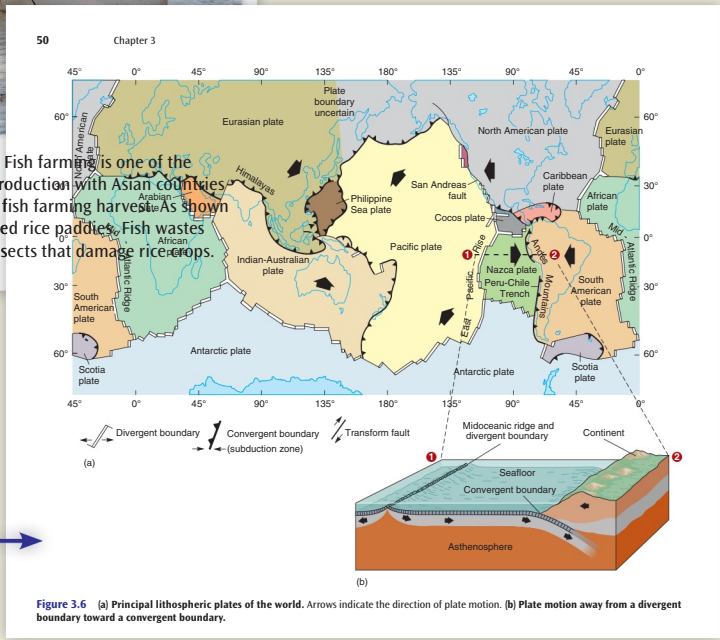


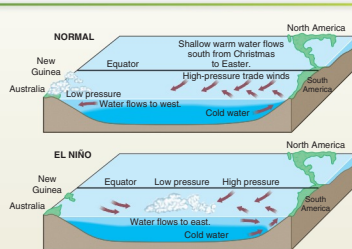
Figure 3.6 (a) Principal lithospheric plates of the world. Arrows indicate the direction of plate motion. (b) Plate motion away from a divergent boundary toward a convergent boundary.

More than 450 full-color maps, charts, and photographs, along with information and explanations, serve as an extension of the text. World maps have been created using the Robinson projection and colors have been chosen to accommodate most color-blind students. The Fold-out world map at the back of the text can be easily referenced for any chapter in the text.

EL NIÑO

El Niño is a term coined years ago by fishermen who noticed that the normally cool waters off the coasts of Ecuador and Peru were considerably warmer every 3 or 4 years around Christmas-time, hence the name El Niño, Spanish for "the child," referring to the infant Jesus. The fish catch was significantly reduced during these periods. If fishermen had been able to identify the scientific associations that present-day oceanographers and climatologists make, they would have recognized a host of other effects that follow from El Niño.

During the winter of 1997-1998, an unusually severe El Niño caused enormous damage and hundreds of deaths. The West Coast of the United States, especially California, was inundated with rainfall amounts double, triple, and even quadruple the normal. For the November to March winter period, San Francisco received 102.24 centimeters (40.25 in.) of rain—the normal is 41.63 centimeters (16.39 in.). The 38 centimeters (15 in.) in February 1998 was the most for that month in the 150 years of record keeping in San Francisco. The resort city of Acapulco, Mexico, was badly battered by torrential rains and high, wind-blown tides. Parts of South America, especially Ecuador, Peru, and Chile, were ravaged by floods and mud slides, while droughts and fires scorched eastern South America, Australia, and parts of Asia, especially Indonesia. A stronger than usual southern branch of the jet stream generated by El Niño spawned dozens of tornadoes, which killed more than 100 people in Alabama, Georgia, and Florida.



The top diagram shows normal circumstances in the southern Pacific Ocean. Trade winds blow warm surface water westward and allow cold water to come to the surface along the South American coast. The bottom diagram shows that, during El Niño, winds from near Australia blow warm water eastward to the coast of South America.

Boxed inserts are written to further develop ideas and enhance student interest in the course material. Chapters generally include three to five boxes and most chapters include a box on gender-related issues.

**Geography & Public Policy** boxes highlight important or controversial issues, encouraging students to think about the relevance of geography to real-world concerns. Critical thinking questions at the end of each box prompt students to reflect upon and form an opinion about specific issues and serve as a catalyst for class discussion.

## GEOGRAPHY & PUBLIC POLICY

### International Population Policies

After a sometimes rancorous 9-day meeting in Cairo in September 1994, the United Nations International Conference on Population and Development endorsed a strategy for stabilizing the world's population at 7.27 billion by no later than 2015. The 20-year program of action accepted by 179 signatory countries sought to avoid the environmental consequences of excessive population growth. Its proposals were therefore linked to discussions and decisions of the UN Conference on Environment and Development held in Rio de Janeiro in June 1992.

The Cairo plan abandoned several decades of top-down government programs that promoted *population control* (a phrase avoided by the conference) based on targets and quotas and, instead, for the first time embraced policies giving women greater control over their lives, greater economic equality and opportunity, and a greater voice in reproduction decisions. It recognized that limiting population growth depends on programs that lead women to want fewer children and make them partners in economic development. In that recognition, the conference accepted the documented link between increased educational access and economic opportunity for women and falling birth rates and smaller families. Earlier population conferences—1974 in Bucharest and 1984 in Mexico City—did not fully address these issues of equality, opportunity, education, and political rights; their adopted goals had failed to achieve hoped-for changes in birth rates, in large part because women in many traditional societies had no power to enforce contraception and feared their other alternative, sterilization.

The earlier conferences had carefully avoided or specifically excluded abortion as an acceptable family planning method. It was the more open discussion of abortion in Cairo that elicited much of the spirited debate that registered religious objections by the Vatican and many Muslim and Latin American states to the inclusion of legal abortion as part of health care, and to language suggesting approval of sexual relations outside marriage. Although the final text of the conference declaration did not promote any universal right to abortion and excluded it as a means of family planning, some delegations still registered reservations to its wording on both sex and abortion. At the conference's close, however, the Vatican endorsed the declaration's underlying principles, including the family as "the basic unit of society" and the need to "stimulate economic growth and to promote gender equality, equity, and the empowerment of women."

A special United Nations "Cairo+5" session in 1999 recommended some adjustments to the earlier agreements. It urged an emphasis on measures ensuring safe and accessible abortion in countries where it is legal, called for schoolchildren at all levels to be instructed in sexual and reproductive health issues, and told governments to provide special family planning and health services for sexually active adolescents, with particular stress on reducing their vulnerability to AIDS.

In 2004, the UN reported progress toward reaching Cairo and Cairo+5 goals. The consensus was that much remained to be done to broaden programs for the poorest population groups, to invest in rural development and urban planning, to strengthen laws ending discrimination against women, and to encourage donor countries to fully meet

their agreed-upon contributions to the program. Nevertheless, positive Cairo plan results were also seen in declining fertility rates in many of the world's most-populous developing countries. Some demographers and many women's health organizations pointedly claim that those declines had little to do with government planning policies. Rather, they assert, current lower and falling fertility rates were the expected result of women's assuming greater control over their economic and reproductive lives. The director of the UN Population Division noted: "A woman in a village making a decision to have one or two or at most three children is a small decision in itself. But . . . compounded by millions and millions . . . of women in India and Brazil and Egypt, it has global consequences."

That women are making those decisions, population specialists have observed, reflects important cultural factors emerging since Cairo. Satellite television takes contraceptive information even to remote villages and shows programs of small, apparently happy families that viewers think of emulating. Increasing urbanization reduces some traditional family controls on women and makes contraceptives easier to find, and declining infant mortality makes mothers more confident their babies will survive. Perhaps most important, population experts assert, is the dramatic increase in most developing states in female school attendance, with corresponding reductions in the illiteracy rates of girls and young women, who will themselves soon be making fertility decisions.

#### Considering the Issues

1. Do you think it is appropriate or useful for international bodies to promote policies affecting such purely personal or national concerns as reproduction and family planning? Why or why not?
2. Do you think that current international concerns over population growth, development, and the environment are sufficiently valid and pressing to risk the loss of long-enduring cultural norms and religious practices in many of the world's traditional societies? Why or why not?
3. The Cairo plan called for sizable monetary pledges from developed countries to support enhanced population planning in the developing world. For the most part, those pledges have not been honored. Do you think the financial obligations assigned to donor countries are justified in light of the many other international needs and domestic concerns faced by their governments? Why or why not?
4. Many environmentalists see the world as a finite system unable to support ever-increasing populations; to exceed its limits would cause frightful environmental damage and global misery. Many economists counter that free markets will keep supplies of needed commodities in line with growing demand and that science will, as necessary, supply technological fixes in the form of substitutes or expansion of production. In light of such diametrically opposed views of population growth consequences, is it appropriate or wise to base international programs solely on one of them? Why or why not?

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44 Chapter 2

### Summary of Key Concepts

- Maps are as indispensable to the geographer as are words, photographs, and quantitative techniques of analysis. Also relying on maps are people involved in the analysis and solution of many of the critical issues of our time, such as climate change, pollution, national security, and public health—all issues that call for the accurate representation of elements on the earth's surface.
- The geographic grid of longitude and latitude is used to locate points on the earth's surface. Latitude is the measure of distance north and south of the equator, while longitude is the angular distance east or west of the prime meridian.
- All systems of representing the curved earth on a flat map distort one or more earth features. Any given projection will distort area, shape, distance, and/or direction.
- Among the most accurate and most useful large-scale maps are the topographic quadrangles produced by a country's chief mapping agency. They contain a wealth of information about both the physical and the cultural landscape and are used for a variety of purposes.
- Remote sensing from aircraft and satellites employing a variety of sensors is an important source of spatial data. The need to store, process, and retrieve the vast amounts of data generated by remote sensing has spurred the development of geographic information systems, which provide a way to search for spatial patterns and processes.

As you read the remainder of this book, note the many different uses of maps. For example, notice in Chapter 3 how important maps are to your understanding of the theory of continental drift; in Chapter 6, how maps aid geographers in identifying cultural regions; and in Chapter 7, how behavioral geographers use maps to record people's perceptions of space.

### Key Words

area cartogram (value-by-area map) 31  
azimuthal projection 26  
cartography 20  
choropleth map 30  
conformal projection 26  
contour interval 30

contour line 28  
equal-area (equivalent) projection 23  
flow-line map 32  
geographic database 41  
geographic grid 21

geographic information latitude 21  
map projection 23  
prime meridian 22  
remote sensing 34  
scale 27  
topographic map 27

### Thinking Geographically

1. What important map and globe reference purpose does the *prime meridian* serve? Is the prime, or any other, meridian determined in nature or devised by humans? How is the prime meridian designated or recognized?
2. What happens to the length of a degree of longitude as one nears the North and South Poles? What happens to a degree of latitude between the equator and the poles?
3. From a world atlas, determine, in degrees and minutes, the locations of New York City, Moscow, Russia; Sydney, Australia; and your hometown.
4. List at least five properties of a globe.
5. Briefly make clear the differences in properties and purposes of *conformal*, *equivalent*, and *equidistant* projections. Give one or two examples of the kinds of map information that would best be presented on each type of projection.
6. Give one or two examples of how maps can be misused.
7. In what different ways can *map scale* be presented? Convert the following map scales into their verbal equivalents.  
1:1,000,000    1:63,360    1:12,000
8. What is the purpose of a *contour line*? What is a *contour interval*? What landscape feature is implied by closely spaced contours?
9. What kinds of data acquisition are suggested by the term *remote sensing*? To what uses are remotely sensed images put?
10. What are the basic components of a *geographic information system*? What are some of the applications of a GIS?

Chapters **Summaries of Key Concepts** appear at the end of each chapter as a way to reinforce the major ideas of the chapter and guide student understanding of key concepts.

**Thinking Geographically** questions are easily assignable and provide students an opportunity to check their grasp of chapter material.

A **Key Words** list with page references makes it easy for students to verify their understanding of the most important terms in the chapter.

**Appendix 1: Map Projections** include a discussion of methods of projection, globe properties and map distortion, and classes of projection.

**Appendix 2: Climates, Soils, and Vegetation** supplements Chapter 4 *Physical Geography: Weather and Climate* by providing information about soil formation, soil profiles and horizons, soil taxonomy, and natural vegetation regions.

**Appendix 3: 2012 World Population Data Sheet for the Population Reference Bureau** (a modified version) includes basic demographic data and projections for countries, regions, and continents, as well as selected economic and social statistics helpful in national and regional comparisons. The comparative information in the appendix data is useful for student projects, regional and topical analyses, and the study of world patterns.



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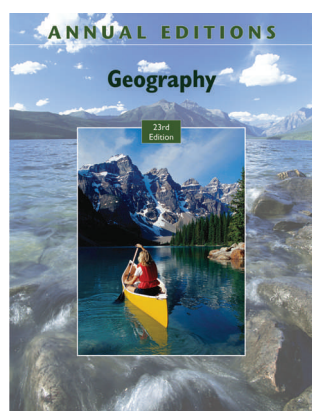


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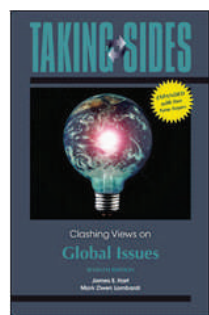
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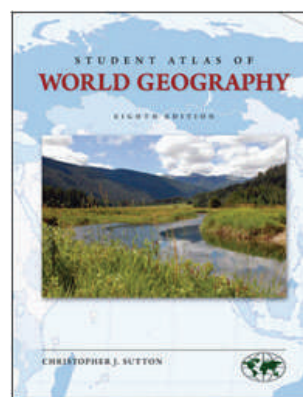
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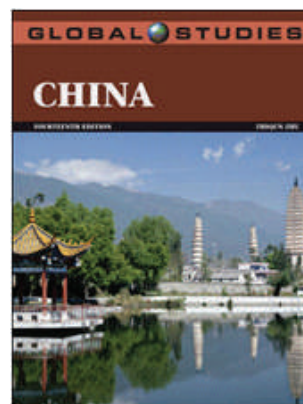


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# Introduction



This Italian valley village with its fields forms a cultural landscape in sharp contrast to the natural landscape of the background Dolomite Alps. © Creatas/Jupiter Images RF.

## CHAPTER OUTLINE

### 1.1 What Is Geography?

### 1.2 Evolution of the Discipline

Subfields of Geography

Why Geography Matters

### 1.3 Some Core Geographic Concepts

Location, Direction, and Distance

*Location*

*Direction*

*Distance*

Size and Scale

Physical and Cultural Attributes

Attributes of Place Are Always Changing

Interrelations between Places

Place Similarity and Regions

*Spatial Distributions*

*Types of Regions*

### 1.4 Geography's Themes and Standards

### 1.5 Organization of This Book

## LEARNING OBJECTIVES

After studying this chapter you should be able to:

- 1.1 Understand what geographers mean when they say that “location matters.”
- 1.2 Describe what is meant by physical and cultural landscapes.
- 1.3 Discuss how geography aids in understanding national and international problems.
- 1.4 Explain how the word *spatial* is used in the discipline of geography.
- 1.5 Appreciate which concepts are used to understand the processes of human interaction.
- 1.6 Summarize the kinds of understanding encompassed in the National Standards.

**O**n the days just before Halloween, 2012, citizens and authorities in the eastern United States were preparing for Hurricane Sandy, whose eye was heading for Atlantic City, New Jersey, just 100 miles from New York City to the north, 60 miles from Philadelphia to the northwest, and 120 miles from Baltimore to the southwest. It had already been determined that the hurricane would be the largest in terms of area to ever strike the mainland of the United States. Although winds were strong, the great fear was that the surge of water into the harbors and along the beaches

would cause considerable damage to coastal buildings and roads. In addition, a particularly high tide was forecast for the same time that Hurricane Sandy would arrive. Even more disconcerting were meteorologists’ warnings that a storm arriving from the U.S. Midwest would combine with the hurricane to create a superstorm. All of these fears were realized. Preparations, although extensive, could not cope with the devastating effects of the storm. On October 29, Hurricane Sandy came ashore as predicted (see **Figure 1.1**). Having already left portions of several Caribbean islands in shambles, the storm caused 253 deaths overall along the hurricane’s seven-country path, and was responsible for \$65 billion in damage, mainly in New York City and New Jersey, two of the most populous places in the United States. The only hurricane more costly was Katrina in 2005 which wiped out huge portions of the city of New Orleans. The storm surge flooded streets, subway tunnels, and the auto tunnels leading into and out of New York. Downed power lines forced New York, the world’s leading financial center, to come to a standstill. Stock market trading was abandoned concomitantly with the closing of a transportation system that normally carries about 3 million people a day. At the time that you are reading this, many areas on the East Coast are still attempting to recover from Hurricane Sandy.

In contrast to Hurricane Sandy, two years earlier a magnitude 7.0 earthquake devastated Haiti, a poverty-stricken country in the Caribbean. The Haiti earthquake caused the loss of an estimated 250,000 lives. News reports often refer to catastrophes such as these as “natural disasters,” but the devastating human consequences of the earthquake that struck Haiti, Hurricane Sandy, or innumerable others were not due to nature alone. Past decisions about

where to build and where not to build, availability or lack of availability of economic resources, and government enforcement of building codes and land-use regulations played a major role in determining the outcomes of such disasters. The devastation left by these disasters is a tragic reminder that human actions take place within the context of the environment. They are also a reminder that, just as maps and satellite images were essential tools in the storm prediction, emergency management, and recovery processes, many of the world’s pressing problems require a geographic understanding that takes in earth systems, the locational aspects of human activities, and the relationships between human societies and their environment—all important themes in the discipline of geography.



**Figure 1.1** Destruction from Hurricane Sandy in Great Kills Harbor, New York. The October 2013 hurricane caused more than \$65 billion in damages and temporarily brought New York City, the world’s leading financial center, to a standstill. Natural disasters are tragic reminders of the close relationships between human societies and the natural environment. *Courtesy U.S. Coast Guard photo by Petty Officer 2nd Class Stephen Lehmann.*

## 1.1 What Is Geography?

Many people associate the word *geography* simply with knowing *where* things are: whether they be countries, such as Myanmar and Uruguay; cities, such as Timbuktu or Almaty; or deposits of natural resources, such as petroleum or iron ore. Some people pride themselves on knowing which rivers are the longest, which mountains are the tallest, and which deserts are the largest. Such factual knowledge about the world has value, permitting us to place current events in their proper spatial setting. When we hear of an earthquake in Turkey or an assault in Chechnya, we at least can visualize where they occurred. Knowing *why* they occurred in those places, however, is considerably more important.

Geography is much more than place names and locations. It is the study of spatial variation, of how and why things differ from place to place on the surface of the earth. It is, further, the study of how observable spatial patterns evolved through time. Just as knowing the names and locations of organs in the human body does not equip one to perform open-heart surgery, knowing where things are located is only the first step toward understanding why things are where they are, and what events and processes determine or change their distribution. Why are earthquakes common in Turkey but not in Russia, and why is Chechnya but not Tasmania wracked by insurgency? Why are the mountains in the eastern United States rounded and those in the western states taller and more rugged? Why do you find a concentration of French speakers in Quebec but not in other parts of Canada?

In answering questions such as these, geographers focus on the interaction of people and social groups with their environment—planet Earth—and with one another; they seek to understand how and why physical and cultural spatial patterns evolved through time and continue to change. Because geographers study both the physical environment and human use of that environment, they are sensitive to the variety of forces affecting a place and the interactions among them. To explain why Brazilians burn a significant portion of the tropical rain forest each year, for example, they draw on their knowledge of the climate and soils of the Amazon Basin; population pressures, landlessness, and the need for greater agricultural area in rural Brazil; the country's foreign debt status; midlatitude markets for lumber, beef, and soybeans; and Brazil's economic development objectives. Understanding the environmental consequences of the burning requires knowledge of, among other things, the oxygen and carbon balance of the earth; the contribution of the fires to the greenhouse effect, acid rain, and depletion of the ozone layer; and the relationships among deforestation, soil erosion, and floods.

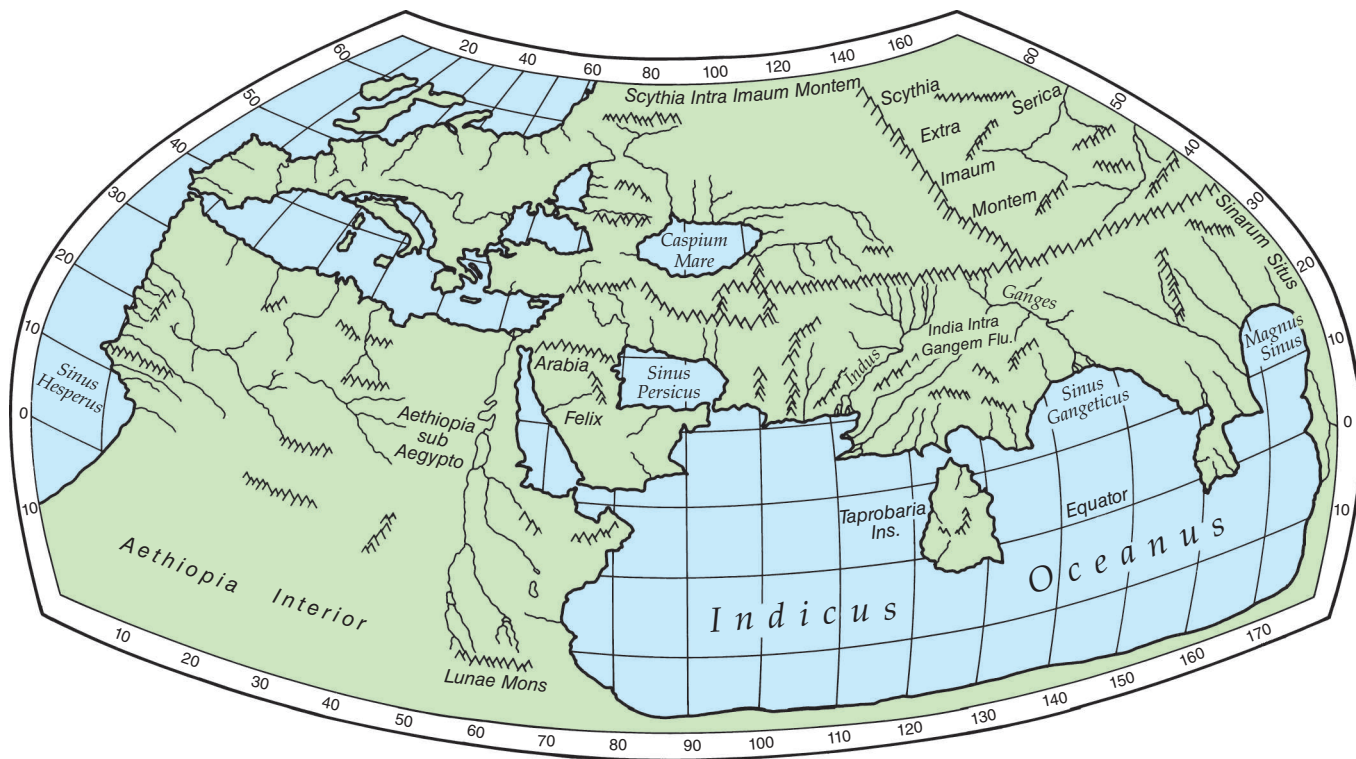
Geography, therefore, is about earth space and the content of that space. We think of and respond to places from the standpoint of not only where they are but, what is more important, what they contain or what we think they contain. Reference to a place or an area usually calls up images about its physical nature or what people do there, and this often suggests to us, without our consciously thinking about it, how those physical things and activities are related. Examples include “Bangladesh,” “farming,” and “flooding” as well as “Colorado,” “mountains,” and “skiing.” That is, the content of an area has both physical and cultural aspects, and geography is always concerned with understanding both (**Figure 1.2**).



**Figure 1.2** Aspen, Colorado, demonstrates changing interactions between physical environment and human activity. Mineral resources, mountainous terrain, and abundant snowfall have made different specialized human uses attractive and possible. The brick buildings in the foreground are the legacy of its original settlement as a silver mining town, peaking with over 5000 residents in 1890 but declining to about 700 by 1930. The groomed ski slopes in the background represent the town's current identity as a premier ski resort, year-round tourist destination and home to celebrities. © Punchstock RF.

## 1.2 Evolution of the Discipline

Geography's combination of interests was apparent even in the work of the early Greek geographers who first gave structure to the discipline. Geography's name was reputedly coined by the Greek scientist Eratosthenes over 2200 years ago from the words *geo*, “the earth,” and *graphein*, “to write.” From the beginning, that writing focused both on the physical structure of the earth and on the nature and activities of the people who inhabited the various lands of the known world. To Strabo (c. 64 B.C.–A.D. 20), the task of geography was to “describe the several parts of the inhabited world, . . . to write the



**Figure 1.3** World map of the 2d-century A.D. Greco-Egyptian geographer-astronomer Ptolemy. Ptolemy (Claudius Ptolemaeus) adopted a previously developed map grid of latitude and longitude based on the division of the circle into 360°, permitting a precise mathematical location for every recorded place. Unfortunately, errors of assumption and measurement rendered both the map and its accompanying six-volume gazetteer inaccurate. Ptolemy’s map, accepted in Europe as authoritative for nearly 1500 years, was published in many variants in the 15th and 16th centuries. The version shown here summarizes the extent and content of the original. Its underestimation of the earth’s size convinced Columbus a short westward voyage would carry him to Asia.

assessment of the countries of the world [and] to treat the differences between countries.” Even earlier, Herodotus (c. 484–425 B.C.) had found it necessary to devote much of his writing to the lands, peoples, economies, and customs of the various parts of the Persian Empire as necessary background to an understanding of the causes and course of the Persian wars.

Greek (and, later, Roman) geographers measured the earth, devised the global grid of parallels and meridians (marking latitudes and longitudes; see p. 7), and drew upon that grid surprisingly sophisticated maps of their known world (**Figure 1.3**). They explored the apparent latitudinal variations in climate and described in numerous works the familiar Mediterranean Basin and the more remote, partly rumored lands of northern Europe, Asia, and equatorial Africa. Employing nearly modern concepts, they described river systems, explored cycles of erosion and patterns of deposition, cited the dangers of deforestation, described variations in the natural landscape, and noted the consequences of environmental abuse. Against that physical backdrop, they focused their attention on what humans did in home and distant areas—how they lived; what their distinctive similarities and differences were in language, religion, and custom; and how they used, altered, and perhaps destroyed the lands they inhabited. Strabo, indeed, cautioned against the assumption that the nature and actions of humans

were determined by the physical environment they inhabited. He observed that humans were the active elements in a human-environmental partnership.

The interests guiding the early Greek and Roman geographers were and are enduring and universal. The ancient Chinese, for example, were as involved in geography as an explanatory viewpoint as were westerners, though there was no exchange between them. Further, as Christian Europe entered its Middle Ages between A.D. 800 and 1400 and lost its knowledge of Greek and Roman geographic work, Muslim scholars—who retained that knowledge—undertook to describe and analyze their known world in its physical, cultural, and regional variation.

In the 15th and 16th centuries, European voyages of exploration and discovery put geography at the forefront of the scientific revival. Modern geography had its origins in the surge of scholarly inquiry that, beginning in the 17th century, gave rise to many of the traditional academic disciplines we know today. In its European rebirth, geography from the outset was recognized—as it always had been—as a broadly based integrative study. Patterns and processes of the physical landscape were early interests, as was concern with humans as part of the earth’s variation from place to place. The rapid development of geology, botany, zoology, climatology, and other natural sciences by the end of the 18th century strengthened regional geographic investigation and

increased scholarly and popular awareness of the intricate interconnections of things in space and between places. By that time, accurate determination of latitude and longitude and scientific mapping of the earth had made assignment of place information more reliable and comprehensive. A key figure during this period of geographic research was Alexander von Humboldt. Humboldt, for whom Humboldt University in Berlin, Germany, is named, led ambitious scientific expeditions to distant places and synthesized vast amounts of geographic data in his famous writings.

## Subfields of Geography

During the 19th century, national censuses, trade statistics, and ethnographic studies gave firmer foundation to human geographic investigation. By the end of the 19th century, geography had become a distinctive and respected discipline in universities throughout Europe and in other regions of the world where European academic examples were followed. The proliferation of professional geographers and geography programs resulted in the development of a whole series of increasingly specialized disciplinary subdivisions, many represented by separate chapters of this book. Political geography, urban geography, and economic geography are examples of some of these subdivisions.

Geography's specialized subfields are not isolated from one another; rather, they are closely interrelated. Geography in all its subdivisions is characterized by three dominating interests. The first is in the spatial variation of physical and human phenomena on the surface of the earth; geography examines relationships between human societies and the natural environments that they occupy and modify. The second is a focus on the systems that link physical phenomena and human activities in one area of the earth with other areas. Together, these interests lead to a third enduring theme, that of regional analysis: geography studies human-environmental (or "ecological") relationships and spatial systems in specific locational settings. This areal orientation pursued by some geographers is called *regional geography*.

Other geographers choose to identify particular classes of things, rather than segments of the earth's surface, for specialized study. These *systematic geographers* may focus their attention on one or a few related aspects of the physical environment or of human populations and societies. In each case, the topic selected for study is examined in its interrelationships with other spatial systems and areal patterns. *Physical geography* directs its attention to the natural environmental side of the human-environmental structure. Its concerns are with landforms and their distribution, with atmospheric conditions and climatic patterns, with soils or vegetation associations, and the like. The other systematic branch of geography is *human geography*. Its emphasis is on people: where they are, what they are like, how they interact over space, and what kinds of landscapes of human use they erect on the natural landscapes they occupy.

## Why Geography Matters

There are three good reasons people study geography. First, it is the only discipline concerned with understanding why and how both physical and cultural phenomena differ from place to place on the surface of the earth. Each chapter in this book is designed

to give you a basic knowledge of the many processes that shape our world. Chapter 3, for example, introduces you to the tectonic forces that warp, fold, and fault landforms; create volcanoes; and cause earthquakes and tsunamis. The discussion of cultural geography in Chapter 6 will give you a framework for understanding the technological, sociological, and ideological components of culture and an awareness of the forces that bring about changes in a culture over time.

Second, a grasp of the broad concerns and topics of geography is vital to an understanding of the national and international problems that dominate daily news reports. Global climate change, the diffusion of AIDS and other diseases, international trade imbalances, inadequate food supply and population growth in developing countries, turmoil in Africa and the Middle East—all of these problems have geographic dimensions, and geography helps explain them. To be geographically illiterate is to deny oneself not only the ability to comprehend local and world problems but also the opportunity to contribute meaningfully to the development of policies for dealing with them.

Third, because geography is such a broad field of study, a great diversity of job opportunities await those who pursue college training in the discipline. Geographic training opens the way to careers in a wide array of fields (see "Careers in Geography"). Geographical techniques of analysis are used for interpreting remotely sensed images, determining the optimum location for new businesses, monitoring the spread of infectious diseases, delineating voting districts, and a host of other tasks. A good book to read is *Why Geography Matters* (Oxford University Press, 2005) by Harm J. de Blij.

## 1.3 Some Core Geographic Concepts

The topics included within the broad field of geography are diverse. That very diversity, however, emphasizes the reality that all geographers—whatever their particular topical or regional interests—are united by the similar questions they ask and the common set of basic concepts they employ to consider their answers. Of either a physical or cultural phenomenon, they will inquire: What is it? Where is it? How did it come to be what and where it is? Where is it in relation to other physical or cultural realities that affect it or are affected by it? How is it part of a functioning whole? How does its location affect people's lives and the content of the area in which it is found?

These and similar questions are rooted in geography's concern with earth space and are derived from enduring central themes in geography. In answering them, geographers draw upon a common store of concepts, terms, and methods of study that together form the basic structure and vocabulary of geography. Geographers believe that recognizing spatial patterns is the essential starting point for understanding how people live on and shape the earth's surface.

Geographers use the word *spatial* as an essential modifier in framing their questions and forming their concepts. Geography, they say, is a *spatial science*. It is concerned with the *spatial distribution* of phenomena, with the *spatial extent* of regions, the *spatial behavior* of people, the *spatial relationships* between places on the earth's surface, and the *spatial processes* that underlie those behaviors and relationships. Geographers use *spatial data* to



## CAREERS IN GEOGRAPHY

Geography admirably serves the objectives of a liberal education. It can make us better-informed citizens, more able to understand the important issues facing our communities, our country, and our world and better prepared to contribute solutions.

Can it, as well, be a pathway to employment for those who wish to specialize in the discipline? The answer is yes, in a number of different types of jobs. One broad cluster is concerned with supporting the field itself through teaching and research. Teaching opportunities exist at all levels, from elementary to university post-graduate. Teachers with some training in geography are in increasing demand in elementary and high schools in the United States, reflecting geography's inclusion as a core subject in the federally adopted *No Child Left Behind Act* and the national determination to create a geographically literate society (see "The National Standards," p. 16). At the college level, specialized teaching and research in all branches of geography have long been established, and geographically trained scholars are prominently associated with urban, community, and environmental studies; regional science; locational economics; and other interdisciplinary programs.

Because of the breadth and diversity of the field, training in geography involves the acquisition of techniques and approaches applicable to a wide variety of jobs outside the academic world. Modern geography is both a physical and social science and fosters a wealth of technical skills. The employment possibilities it presents are as many and varied as are the public and private agencies and enterprises dealing with the natural environment, with human economic and social activities, and with the acquisition and analysis of spatial data.

Many professional geographers work in government at the federal, state, and local levels and in a variety of international organizations. Indeed, geographers have made careers in essentially all of the many bureaus and offices of the executive departments of

the U.S. national government—Agriculture, Commerce, Education, Health and Human Services, Homeland Security, Housing and Urban Development Interior, and others—and in their counterparts at the state level. Such major independent federal agencies as the Central Intelligence Agency (CIA), National Aeronautics and Space Administration (NASA), Federal Trade Commission, National Geospatial-Intelligence Agency (NGA), Federal Aviation Agency, and many others have steady need for geographically trained workers.

Although many positions do not carry a geography title, physical geographers serve as water and other natural resource analysts, weather and climate experts, soil scientists, and the like. Areas of recent high demand include environmental managers and technicians and geographic information specialists. Geographers who have specialized in environmental studies find jobs in both public and private agencies. Their work may include assessing the environmental impact of proposed development projects on such things as air and water quality and endangered species, as well as preparing the environmental impact statements required before construction can begin.

Human geographers work in many different roles in the public sector. Jobs include data acquisition and analysis in health care, transportation, population studies, economic development, and international economics. Many geography graduates find positions as planners in local and state government agencies concerned with housing and community development, park and recreation planning, and urban and regional planning. They map and analyze land use plans and transportation systems, monitor urban land development, make informed recommendations about the location of public facilities, and engage in basic social science research.

Most of the same specializations are found in the private sector. Geographic training is ideal for such tasks as business planning and market analysis; factory, store, and shopping center site

identify *spatial patterns* and to analyze *spatial systems*, *spatial interaction*, *spatial diffusion*, and *spatial variation* from place to place.

The word *spatial* comes, of course, from *space*, and to geographers it always carries the idea of the way things are distributed, the way movements occur, and the way processes operate over the whole or a part of the surface of the earth. The geographer's space, then, is earth space, the surface area occupied or available to be occupied by humans. Spatial phenomena have locations on that surface, and spatial interactions occur among places, things, and people within the earth area available to them. The need to understand those relationships, interactions, and processes helps frame the questions that geographers ask.

Those questions have their starting point in basic observations about the location and nature of places and about how places are similar to or different from one another. Such observations, though simply stated, are profoundly important to our comprehension of the world we occupy.

- Places have location, direction, and distance with respect to other places.

- A place has size; it is large, medium, or small. Scale is important.
- A place has both physical structure and cultural content.
- The attributes, or characteristics, of places develop and change over time.
- The content of places is structured and explainable.
- The elements of places interrelate with other places.
- Places may be generalized into regions of similarities and differences.

These basic notions are the means by which geographers express fundamental observations about the earth spaces they examine and put those observations into a common framework of reference. Each of the concepts is worth further discussion, for they are not quite as simple as they seem.

### Location, Direction, and Distance

*Location*, *direction*, and *distance* are everyday ways of assessing the space around us and identifying our position in relation to other things and places of interest. They are also essential

selection; and community and economic development programs for banks, public utilities, and railroads. Publishers of maps, atlases, news and travel magazines, and the like employ geographers as writers, editors, and mapmakers.

The combination of a traditional, broad-based liberal arts perspective with the technical skills required in geographic research and analysis gives geography graduates a competitive edge in the labor market. These field-based skills include familiarity with geographic information systems (GIS, explained in Chapter 2), cartography and computer mapping, remote sensing and photogrammetry, and competence in data analysis and problem solving.

In particular, students with expertise in GIS, who are knowledgeable about data sources, hardware, and software, are finding they have ready access to employment opportunities. The following table, based on the booklet “Careers in Geography,”<sup>a</sup> summarizes some of the professional opportunities open to students who have specialized in one (or more) of the various subfields of geography. Also, be sure to read the discussion of geography careers accessed on the homepage of the Association of American Geographers at [www.aag.org](http://www.aag.org). Additional links on the topic of geography careers can be found in the Online Learning Center for this text. The link can be found in the Preface.

Geographic Field of Concentration	Employment Opportunities
Cartography and geographic information systems	Cartographer for federal government (agencies such as Defense Mapping Agency, U.S. Geological Survey, or Environmental Protection Agency) or private sector (e.g., Environmental Systems Research Institute, ERDAS, Intergraph, or Bentley); map librarian; GIS specialist for planners, land developers, real estate agencies, utility companies, local government; remote-sensing analyst; surveyor
Physical geography	Weather forecaster; outdoor guide; coastal zone manager; hydrologist; soil conservation/agricultural extension agent
Environmental studies	Environmental manager; forestry technician; park ranger; hazardous waste planner
Cultural geography	Community developer; Peace Corps volunteer; health care analyst
Economic geography	Site selection analyst for business and industry; market researcher; traffic/route delivery manager; real estate agent/broker/appraiser; economic development researcher
Urban and regional planning	Urban and community planner; transportation planner; housing, park, and recreation planner; health services planner
Regional geography	Area specialist for federal government; international business representative; travel agent; travel writer
Geographic education	Elementary/secondary school teacher; general geography college professor; overseas teacher

<sup>a</sup>“Careers in Geography,” by Richard G. Boehm. Washington, D.C.: National Geographic Society, 1996. Previously published by Peterson’s Guides, Inc.

in understanding the processes of spatial interaction that figure so importantly in the study of both physical and human geography.

## Location

The location of places and things is the starting point of all geographic study as well as of our personal movements and spatial actions in everyday life. We think of and refer to location in at least two different senses, *absolute* and *relative*.

**Absolute location** is the identification of place by a precise and accepted system of coordinates; therefore, sometimes it is called *mathematical location*. We have several such accepted systems of pinpointing positions. One of them is the global grid of parallels and meridians—that is, latitude and longitude (discussed in Chapter 2, pp. 21–23). With it, the absolute location of any point on the earth can be accurately described by reference to its degrees, minutes, and seconds of *latitude* and *longitude*.

Other coordinate systems are also in use. Survey systems such as the township, range, and section description of property in much

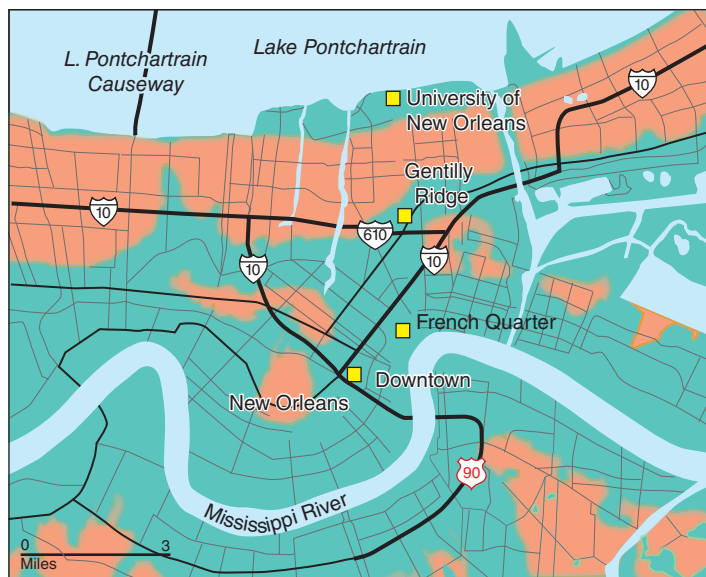
of the United States give mathematical locations on a regional level, and street address precisely defines a building according to the reference system of an individual town. Absolute location is unique to each described place, is independent of any other characteristic or observation about that place, and has obvious value in the legal description of places, in measuring the distance separating places, or in finding directions between places on the earth’s surface.

When geographers—or real estate agents—remark that “location matters,” however, their reference is usually not to absolute but to **relative location**—the position of a place or thing in relation to that of other places or things (Figure 1.4). Relative location expresses spatial interconnection and interdependence and may carry social (neighborhood character) and economic (assessed valuations of vacant land) implications. On an immediate and personal level, we think of the location of the school library not in terms of its street address or room number but where it is relative to our classrooms, the cafeteria, or another reference point. On the larger scene, relative location tells us that people, things, and places exist not in a spatial vacuum but in a world of physical and cultural characteristics that differ from place to place.



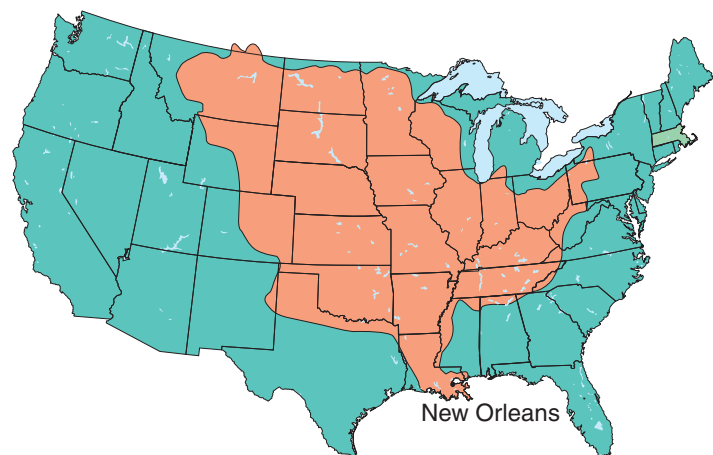
**Figure 1.4** The reality of *relative location* on the globe may be strikingly different from the impressions we form from flat maps. The position of Russia with respect to North America when observed from a polar perspective emphasizes that relative location properly viewed is important to our understanding of spatial relationships and interactions between the two world areas.

New York City, for example, may be described in absolute terms as located at (approximately) latitude  $40^{\circ}43'N$  (read as 40 degrees, 43 minutes north) and longitude  $73^{\circ}58'W$ . We have a better understanding of the meaning of its location, however, when



Areas below sea level

(a)



Mississippi River Basin

(b)

**Figure 1.5** **Site and Situation** (a) The *site* of New Orleans is hardly ideal for building a city. The French occupied the most suitable high ground they could find near the mouth of the Mississippi River. The site extends from the “high ground” on the natural levee next to the Mississippi River to former wetlands near Lake Pontchartrain. Much of the city and its suburbs are below sea level on sinking soils composed of soft sediments deposited by past river floods. (b) The *situation* of New Orleans is ideal for building a city. New Orleans is connected to 9000 miles of navigable waterways through the Mississippi River which drains a basin that stretches from the Rocky Mountains to the Appalachian Mountains.

reference is made to its spatial relationships: to the continental interior through the Hudson-Mohawk lowland corridor or to its position on the eastern seaboard of the United States. Within the city, we gain understanding of the locational significance of Central Park or the Lower East Side not solely by reference to the street addresses or city blocks they occupy but also by their spatial and functional relationships to the total land use, activity, and population patterns of New York City.

In view of these different ways of looking at location, geographers make a distinction between the *site* and the *situation* of a place (**Figure 1.5**). **Site**, an absolute location concept, refers to the physical and cultural characteristics and attributes of the place itself. It is more than mathematical location, for it tells us something about the specific features of that place. **Situation**, on the other hand, refers to the relations between a place and other places. It is an expression of relative location with particular reference to items of significance to the place in question. Site and situation in the city context are further examined in Chapter 11.

## Direction

Direction is the second universal spatial concept. Like location, it has more than one meaning and can be expressed in absolute or relative terms. **Absolute direction** is based on the cardinal points of north, south, east, and west. These appear in all cultures, derived from the obvious “givens” of nature: the rising and setting of the sun for east and west, the sky location of the noontime sun and of certain fixed stars for north and south.

We also commonly use **relative**, or *relational*, **directions**. In the United States, we go “out West,” “back East,” or “down South”; we worry about conflict in the “Near East” or economic competition from the “Far Eastern countries.” Despite their reference to cardinal compass points, these directional references are culturally based and locationally variable. The Near East and

the Far East locate parts of Asia from the European perspective; they are retained in the Americas by custom and usage, even though one would normally travel westward across the Pacific, for example, to reach the “Far East” from California, British Columbia, or Chile. For many Americans, “back East” and “out West” are reflections of the migration paths of earlier generations for whom home was in the eastern part of the country, to which they might look back. “Up North” and “down South” reflect our accepted custom of putting north at the top and south at the bottom of our maps.

## Distance

*Distance* joins *location* and *direction* as a commonly understood term that has dual meanings for geographers. Like its two companion spatial concepts, distance may be viewed in both an absolute and a relative sense.

**Absolute distance** refers to the spatial separation between two points on the earth’s surface, measured by an accepted standard unit—such as miles or kilometers for widely separated locales, feet or meters for more closely spaced points. **Relative distance** transforms those linear measurements into other units more meaningful to human experience or decision making.

To know that two competing malls are about equidistant in miles from your residence is perhaps less important in planning your shopping trip than is knowing that, because of street conditions or traffic congestion, one is 5 minutes and the other 15 minutes away (Figure 1.6). Most people, in fact, think of time distance rather than linear distance in their daily activities; downtown is 20 minutes by bus, the library is a 5-minute walk. In some instances, money rather than time is the distance transformation. An urban destination might be estimated to be a \$10 cab ride away, information that may affect either the decision to make the trip at all or the choice of travel mode to get there. As a college student, you already know that rooms and apartments are less expensive at a greater distance from campus.

A *psychological* transformation of linear distance is also frequent. A solitary late-night walk back to the car through an unfamiliar or dangerous neighborhood seems far longer than a daytime stroll of the same distance through familiar and friendly territory. A first-time trip to a new destination frequently seems much longer than the return trip over the same path. Nonlinear distance and spatial interaction are further considered in Chapter 7.

## Size and Scale

When we say that a place may be large, middle size, or small, we speak both of the nature of the place itself and of the generalizations that can be made about it. Geographers are concerned with **scale**, though we may use that term in different ways. We can, for example, study a problem such as population or landforms at the local scale or on a global scale. Here, the reference is purely to the size of unit studied. More technically, scale tells us the relationship between the size of an area on a map and the actual size of the mapped area on the surface of the earth. In this sense, as Chapter 2 makes clear, scale is a feature of every map and is essential to recognizing what is shown on that map.



**Figure 1.6** Travel times from downtown San Diego, 2002, in minutes. Lines of equal travel time (*isochrones*: from Greek *isos*, equal, and *chronos*, time) mark off the different linear distances accessible within given spans of time from a starting point. The fingerlike outlines of isochrone boundaries reflect variations in road conditions, terrain, traffic congestion, and other aids or impediments to movement. Note the effect of freeways on travel time.

In both senses of the word, *scale* implies the degree of generalization represented (Figure 1.7). Geographic inquiry may be broad or narrow; it occurs at many different size-scales. Climate may be an object of study, but research and generalization focused on climates of the world will differ in degree and kind from study of the microclimates of a city. Awareness of scale is very important. In geographic work, concepts, relationships, and understandings that have meaning at one scale may not be applicable at another.

For example, the study of world agricultural patterns may refer to global climate patterns, cultural food preferences, levels of economic development, and patterns of world trade. These large-scale relationships are of little concern in the study of crop patterns within single counties of the United States, where topography, soil and drainage conditions, farm size, ownership, and capitalization, or even personal management preferences, may be of greater explanatory significance.

## Physical and Cultural Attributes

All places have individual physical and cultural attributes distinguishing them from other places and giving them character, potential, and meaning. Geographers are concerned with identifying and analyzing the details of those attributes and, particularly,