CHAPTER 1

Introduction to Human Geography

Field Note Awakening to World Hunger





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Figure 1.1
Kericho, Kenya. Tea plantations established by British colonists in western Kenya. © H. J. de Blij.

Dragging myself out of bed for a 9:00 A.M. lecture, I decide I need to make a stop at Starbucks. "Grande coffee of the day, please, and leave room for cream." I rub my eyes and look at the sign to see where my coffee was grown. Kenya. Ironically, I am about to lecture on Kenya's coffee plantations. Just the wake up call I need.

When I visited Kenya in eastern Africa, I drove from Masai Mara to Kericho and I noticed nearly all of the agricultural fields I could see were planted with coffee or tea (Fig. 1.1). I also saw the poor of Kenya, clearly hungry, living in substandard housing. I questioned, "Why do farmers in Kenya grow coffee and tea when they could grow food to feed the hungry?" Through the process of answering this question, I learned a lot about the complexities of globalization. In a globalized world, connections are many and simple answers are few.

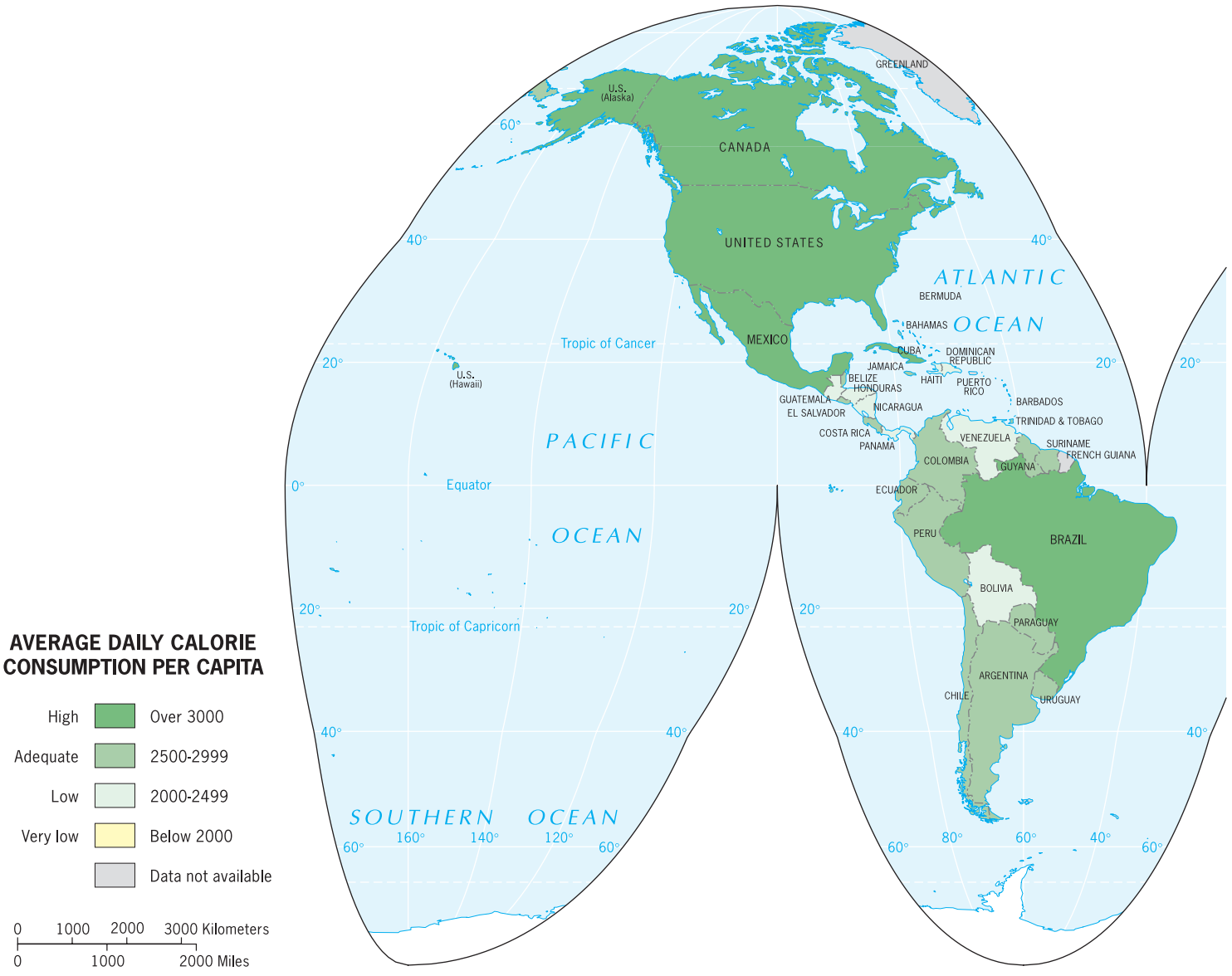


Figure 1.2

Average Daily Calorie Consumption Per Capita, 2004. *Data from*: United Nations Food and Agriculture Organization Food Balance Sheets 2004. Note that this map (see Appendix A) is interrupted in the oceans, allowing for maximum clarity of detail on the landmasses.

Major problems in the world, like hunger, may seem easy to solve. Take the total annual food production in the world, divide it by the world's population, and we have plenty of food for everyone. Yet, one-sixth of the world's population is seriously malnourished. The vast majority of the 1 billion malnourished people on Earth are women and children, who have little money and even less power.

[1]Figure 1.2 reveals the wide range of caloric intake throughout the world. Various agencies monitor this index, but their categories differ, and, in recent years, the urgency of their reporting has diminished. As the map indicates, countries are usually grouped into four ranks, ranging from high intake (usually over 3000 calories daily) to very low, or under 2000, but there is no agreement about adequacy. The World Bank regards 2500 calories as adequate, whereas the United Nations uses 2360 as its boundary between adequate and low intake. Such discrepancies (there are others when additional sources are consulted) should raise a caution when you consult Figure 1.2, which is based on data from 2004. The map may effectively portray the global situation by country in general terms. What the map does not reflect is also important: there are nutritional disparities within countries that cannot be shown at this level of scale. For example, diets in western India are

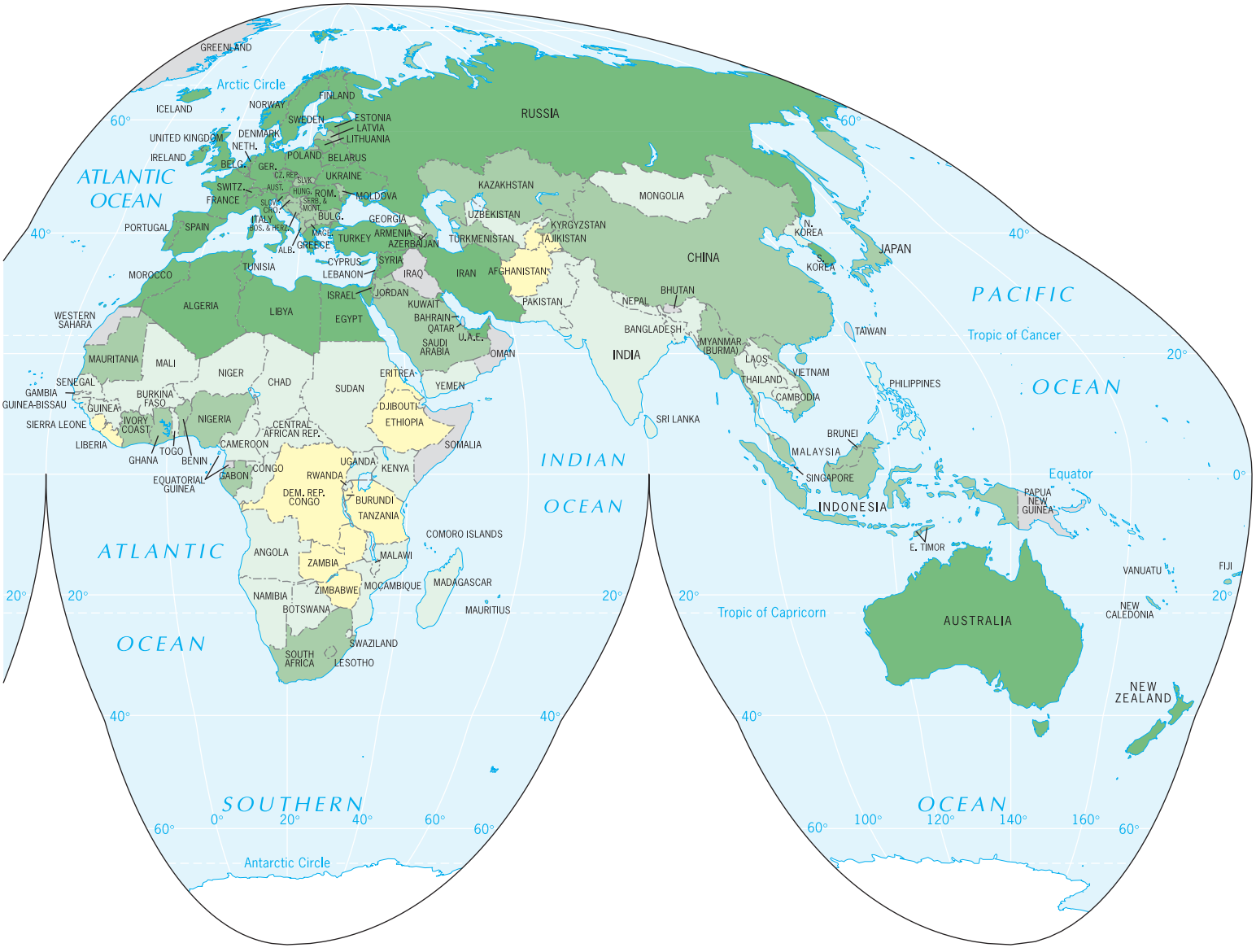


Figure 1.2 shows how food consumption is currently distributed—unevenly.[1] Comparing Figure 1.2 with Figure 1.3 shows that the wealthier countries also are the bestfed and that Subsaharan Africa (the part of Africa south of the Sahara Desert) is currently in the worst position, with numerous countries in the lowest categories.

superior to those in eastern India; the intake in northern parts of Sudan is substantially higher than that in its war-ridden south and west. Another factor not shown in Figure 1.2 is dietary balance. With few exceptions, the countries where caloric intake is low are also those where protein is in short supply. Recent studies have indicated that the first six months of life are critical in this respect: inadequate protein intake can damage brain and body for life. Moreover, the food sources that are richest in proteins—meat, fish, and dairy products—are in short supply where they are most needed. It takes food to raise the animals that produce meat, and that food cannot be spared to feed animals when it is needed to sustain the people themselves. And while fish may be obtainable in coastal areas, it becomes less available (and more expensive) in interior Africa and Asia. Thus, even people whose caloric intake is marginally adequate may still be malnourished, and what is often called hidden hunger occurs even in areas mapped as having "adequate calories."

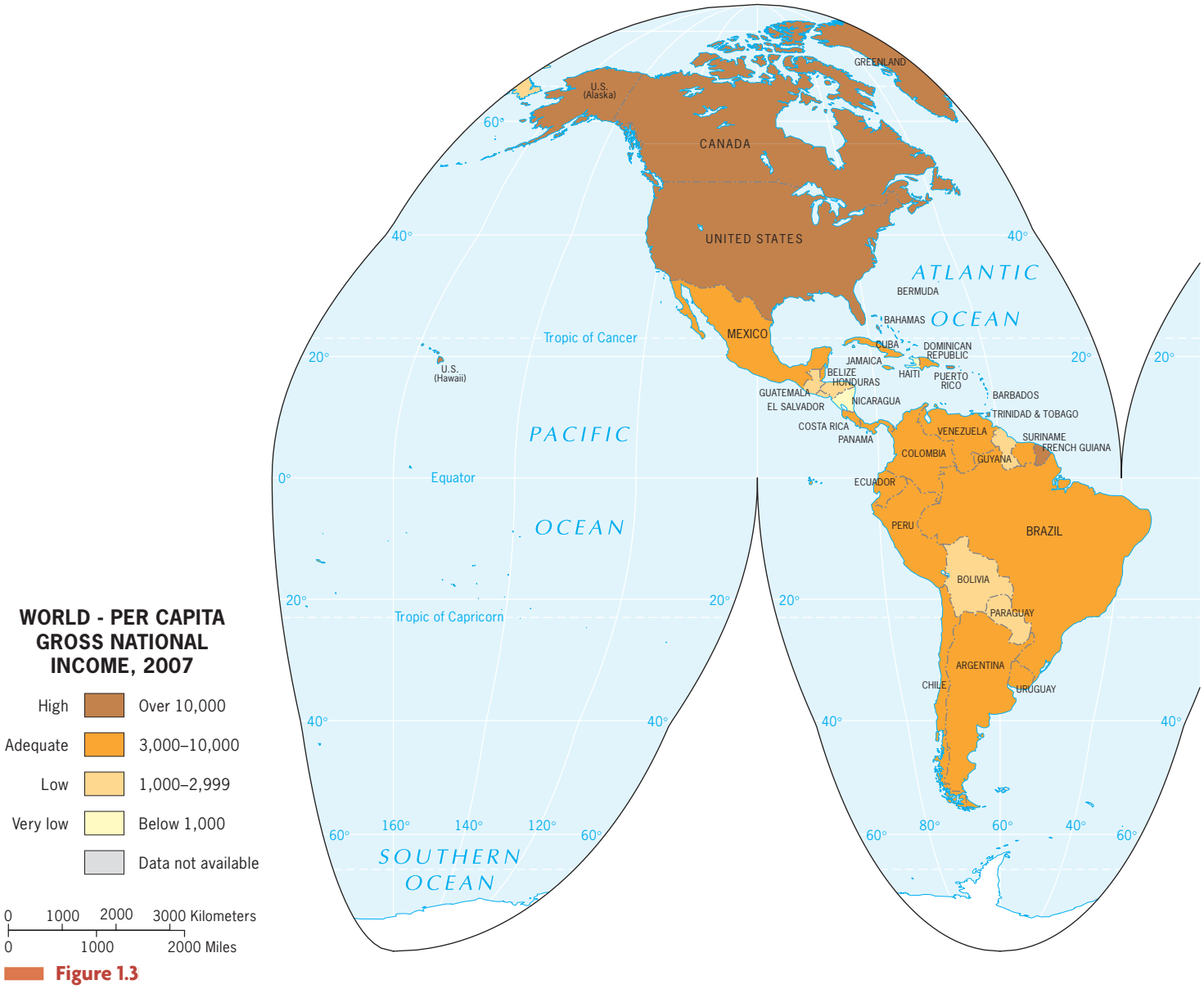
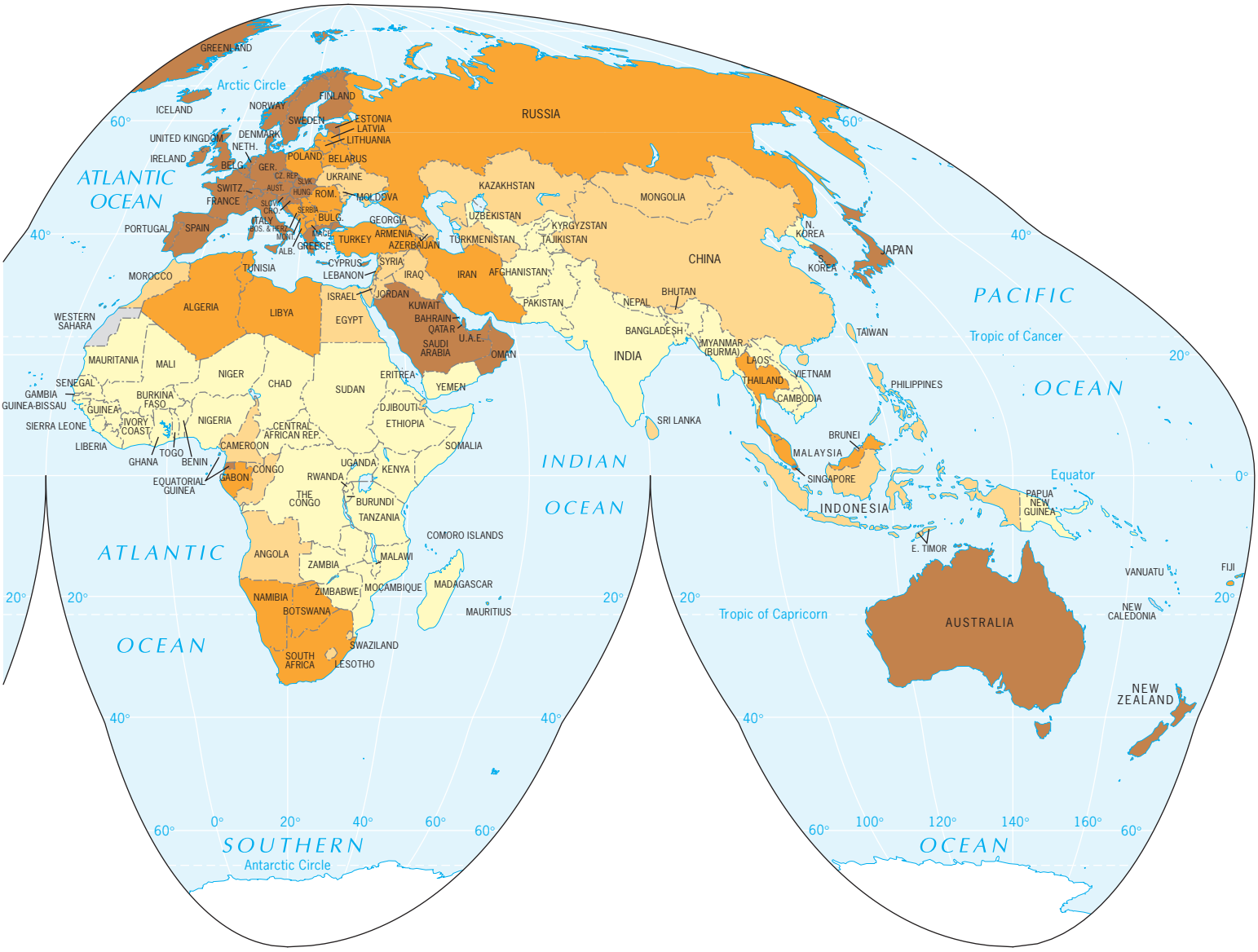


Figure 1.3

Per Capita Gross National Income (in U.S dollars) (GNI), 2007. *Data from:* World Bank, World Development Indicators, 2008.

The major causes of malnourishment are poverty (inability to pay for food), the failure of food distribution systems, and cultural practices that favor men over women and children. Where food does reach the needy, its price may be unaffordable. Hundreds of millions of people subsist on the equivalent of one dollar a day, and many in the vast shantytowns encircling the world's cities must pay rent to landlords who own the plots on which their shacks are built. Too little is left for food, and it is the children who suffer most.

Is solving hunger as simple as each country growing enough food to feed its people? Do the best-fed countries have the most arable (farmable) land? Only 4 percent of Norway is arable land, and more than 70 percent of Bangladesh is arable land (Fig. 1.4). Despite this disparity, Norway is wealthy and well fed, whereas Bangladesh is poor and malnourished. Fortunately for the Norwegians, they are able to overcome their inadequate food production by importing food. Unfortunately for the Bangladeshis, two-thirds of their country is flooded each year during monsoon season, making survival a daily question.



If a poor country has a small proportion of arable land, does that destine its population to a lifetime of malnourishment? It depends on the place. Of all the land classified as arable, some is much more productive than other. For example, only 8 percent of Kenya's land is arable, but the land in the western highlands is some of the most productive agricultural land in the world. Do the Kenyans simply not produce enough food on their lands? Is that what accounts for their malnutrition rate of over 30 percent? No, hunger in Kenya depends much more on what they produce, who owns the land, and how Kenya is tied into the global economy.

The most productive lands of Kenya, those in the western highlands, are owned by foreign coffee and tea corporations. Driving through the open, luxury-crop covered slopes, I saw mostly Kenyan women working the plantations. The lowland plains are dotted by small farms, many of which have been subdivided to the point of making the land unviable. Here, an even higher proportion of the people working the lands are women, but the lands are registered to their husbands or sons because, by law, they cannot own them.

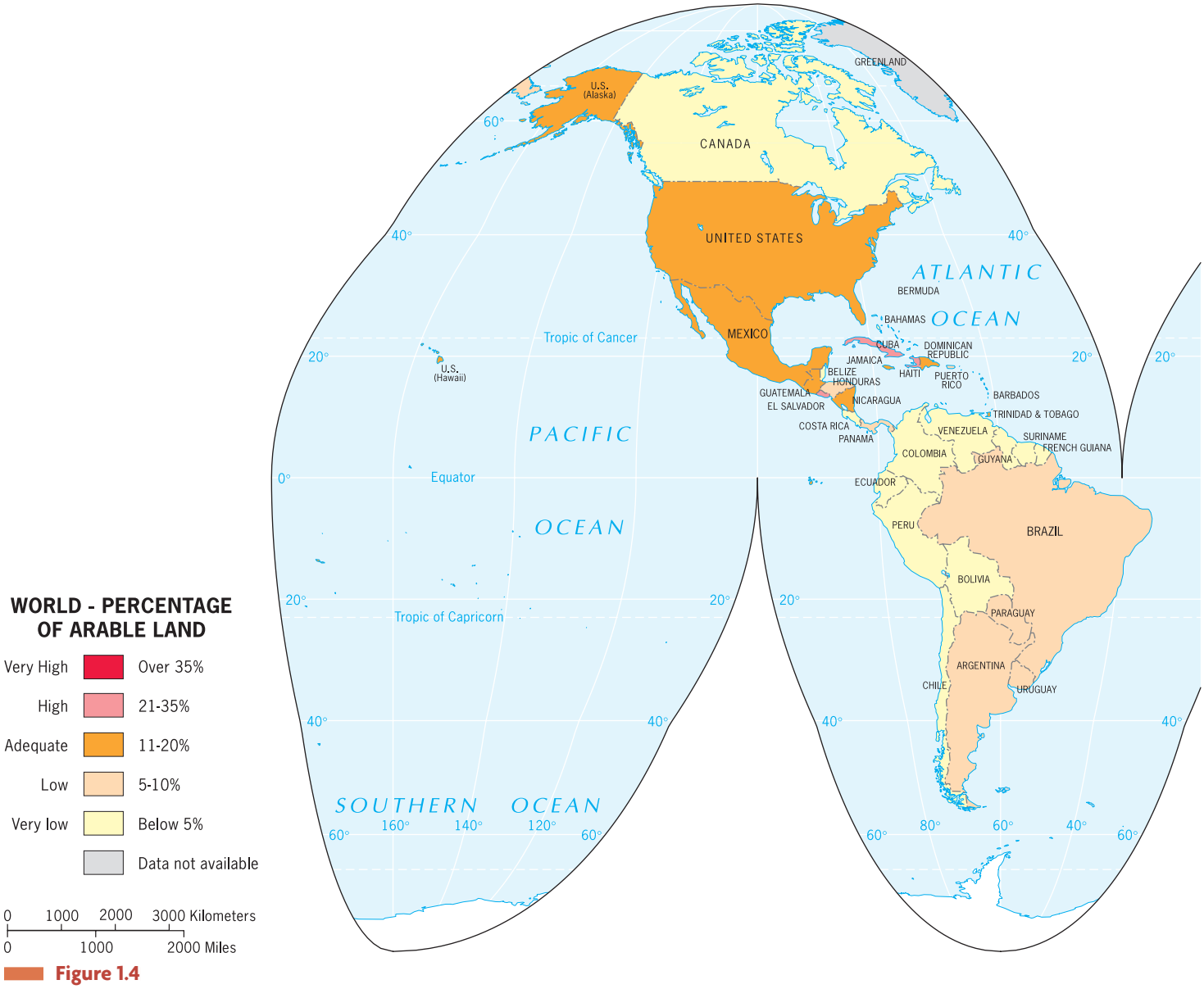


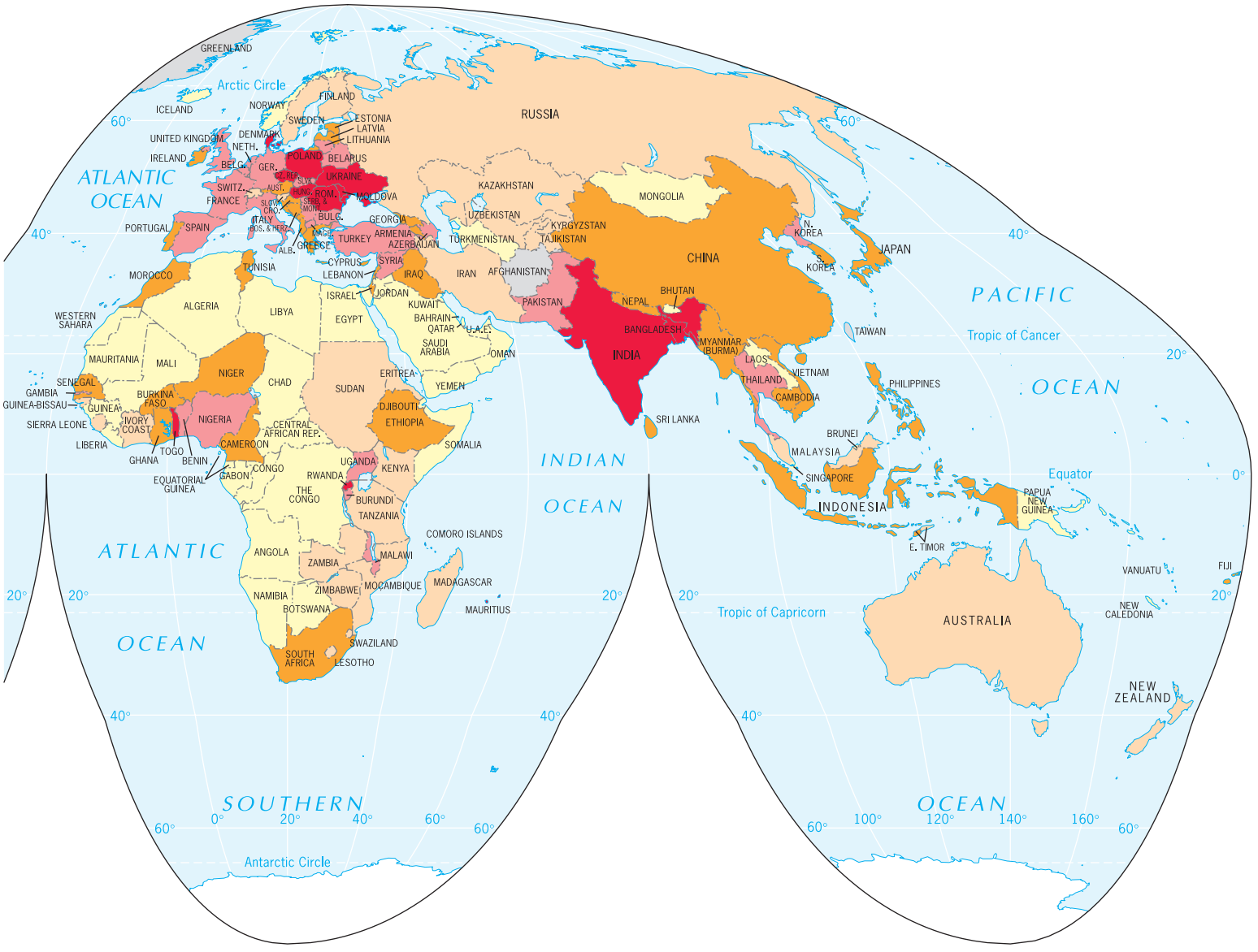
Figure 1.4

Percent of Land that is Arable (Farmable), 2005. *Data from*: United Nations Food and Agriculture Organization, 2005.

As I drove through the contrasting landscapes, I continued to question whether it would be better for the fertile highlands to carry food crops that could be consumed by the people in Kenya. I drove to the tea processing center and talked to the manager, a member of the Kikuyu ethnic group, and asked him my question. He said that his country needed foreign income and that apart from tourism, exporting coffee and tea was the main opportunity for foreign income.

As part of the global world-economy, Kenya suffers from the complexities of globalization. With foreign corporations owning Kenya's best lands, a globalized economy that thrives on foreign income, tiny farms that are unproductive, and a gendered legal system that disenfranchises the agricultural labor force and disempowers the caregivers of the country's children, Kenya has multiple factors contributing to the poverty and malnutrition in the country.

To solve one of these problems raises another. If Kenyans converted the richest lands to cash crop production, how would the poor people be able to afford the crops? What would happen to the rest of Kenya's economy and the



government itself if it lost the export revenue from tea and coffee? If Kenya lost its export revenue, how could the country pay loans it owes to global financial and development institutions?

Each of these questions requires its own path of geographic inquiry to answer. Geographers have a long tradition of **fieldwork**: they go out in the field and see what people are doing, and they observe how peoples' actions and reactions vary across space. We, the authors, have countless field experiences, and we will share these with you in order to illustrate that global processes have unique outcomes in different places.

Solving major global problems such as hunger or AIDS is complicated in our interconnected world. Each solution has its own ramifications not only in one place, but also across regions, nations, and the world. Our goals in this book are to help you see the multitude of interconnections in our world, to help you recognize the patterns of human geographic phenomena, to help you understand the uniqueness of place, and to teach you to ask and answer your own geographic questions about this world we call home.

Key Questions For Chapter 1

1. What is human geography?
2. What are geographic questions?
3. Why do geographers use maps, and what do maps tell us?
4. Why are geographers concerned with scale and connectedness?
5. What are geographic concepts, and how are they used in answering geographic questions?

WHAT IS HUMAN GEOGRAPHY?

Human geographers study people and places. The field of **human geography** focuses on how people make places, how we organize space and society, how we interact with each other in places and across space, and how we make sense of others and ourselves in our localities, regions, and the world.

Advances in communication and transportation technologies are making places and people more interconnected. Only 100 years ago, the fastest modes of transportation were the steamship, the railroad, and the horse and buggy. Today, we can cross the globe in record time, with easy access to automobiles, airplanes, and ships.

Aspects of popular culture, such as fashion and architecture, are making many people and places look more alike. Despite all these changes encouraging us to be more alike, our world still encompasses a multitude of ways in which people identify themselves and others. The world consists of nearly 200 countries, a diversity of religions, thousands of languages, and any number of settlement types from small villages to enormous global cities. All of these attributes come together in different ways around the globe to create a world of endlessly diverse places and people. Understanding and explaining this diversity is the mission of human geography.

The word "globalization" is all around us. To make sense of this phenomenon, we first need to define it. **Globalization** is a set of processes that are increasing interactions, deepening relationships, and heightening interdependence without regard to country borders. It is also a set of outcomes that are felt from these global processes—outcomes that are unevenly distributed and differently manifested across the world.

All too often, discussions of globalization focus on the pull between global—seen as a blanket covering the world—and local—seen as a continuation of the traditional despite the blanket of globalization. Geographers are in a place to understand globalization as much more than this. When geographers look at the outcomes of globalization as being distributed unevenly, they are not only talking about the local. Geographers use scale to understand the interrelationships among individual, local, regional, national, and global. What happens at the global scale affects the local, but it also affects the individual, regional and national, and similarly the processes at these scales impact the global. To reduce the world to local and global is to miss much. In this book, we study globalization, and we use scale to understand the effects of globalization and the things that shape globalization (see the discussion of scale later in this chapter).

Globalizing processes occur at the world scale; these processes bypass country borders and include global financial markets or even global environmental change. However, the processes of globalization do not magically appear at the global scale: *what happens at other scales (individual, local, regional, national) helps create the processes of globalization and shape the outcomes of globalization*.

Some argue that understanding globalization is critical to understanding the world today, whereas others maintain that globalization is overhyped. As geographers Ron Johnston, Peter Taylor, and Michael Watts explain, "Whatever your opinion may be, any intellectual engagement with social change in the twenty first century has to address this concept seriously, and assess its capacity to explain the world we currently inhabit." We integrate the concept of globalization into this textbook because processes at the global scale and processes that disregard country borders are clearly changing human geography. At the same time, as we travel the world and continue to engage in fieldwork and research, we are constantly reminded how different places and people are—processes at the individual, local, regional, and national scales continue to change human geography and shape globalization.

No place on Earth is untouched by people. As people explore, travel, migrate, interact, play, live, and work, they make places. People organize themselves into communities, nations, and broader societal networks, establishing political, economic, religious, linguistic, and cultural systems that enable them to function in space. People adapt to, alter, manipulate, and cope with their physical geographic environment. No environment stands apart from human action. Each place we see is affected by and created by people, and each place reflects the culture of the people in that place over time.

thinking geographically

Imagine and describe the most remote place on Earth you can think of 100 years ago. Now, describe how globalization has changed this place and how the people there continue to shape it—to make it the place it is today.

WHAT ARE GEOGRAPHIC QUESTIONS?

Geographers study human phenomena such as language, religion, and identity, and they also study physical phenomena, such as landforms, climate, and environmental change. Geographers also examine the interactions between humans and environment. Human geography is the study of human phenomena on Earth, and **physical geography** is the study of physical phenomena on Earth. Geographers are trained in studying both the human and physical worlds, but most focus on one more than the other. We ask similar questions but focus on different phenomena.

Geographer Marvin Mikesell defined geography in shorthand as the "why of where." Why and how do things come together in certain places to produce particular outcomes? Why are some things found in certain places but not in others? To what extent do things in one place influence those in other places? To these questions, we add "so what?" Why does it matter that things are different across space? What role does a place play in its region and in the world, and what does that mean for people there and elsewhere? Questions such as these are at the core of geographic inquiry—whether human or physical—and they are of critical importance in any effort to make sense of our world.

If geography deals with so many aspects of our world, ranging from people and places to coastlines and climates, what do the various facets of this wide-ranging discipline have in common? The answer lies in a perspective that both human and physical geographers use: **spatial**. Whether they are human geographers or physical geographers, virtually all geographers are interested in the spatial arrangement of places and phenomena, how they are laid out, organized, and arranged on the Earth, and how they appear on the landscape.

Mapping the **spatial distribution** of a phenomenon is typically the first step to understanding it. By looking at a map of how something is distributed across space, a geographer can raise questions about how the arrangement came about, what processes create and sustain the particular **pattern** of the distribution, and what relationships exist between different places and things.

Maps in the Time of Cholera Pandemics

In **medical geography**, mapping the distribution of a disease is the first step to finding its cause. In 1854, Dr. John Snow, a noted anesthesiologist in London, mapped cases of cholera in London's Soho District. Cholera is a term used to denote a set of diseases in which diarrhea and dehydration are the chief symptoms.

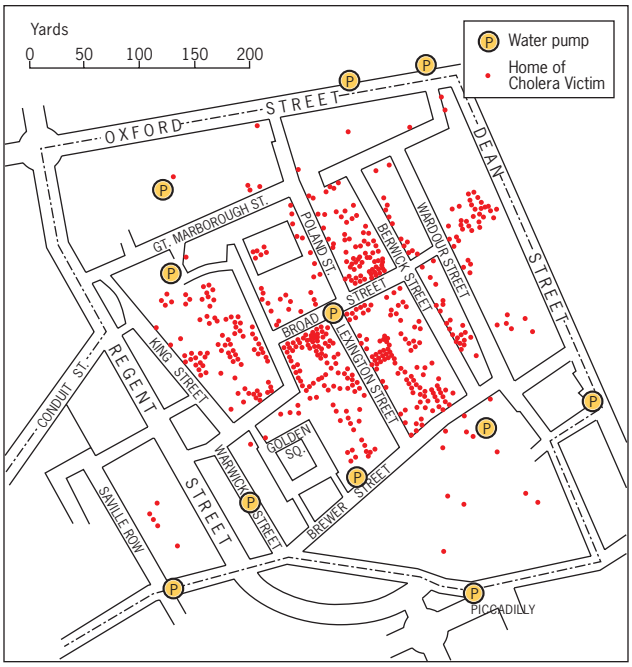
Cholera is an ancient disease and was confined to India until the beginning of the nineteenth century. In 1816 it spread to China, Japan, East Africa, and Mediterranean Europe in the first of several **pandemics**, a worldwide outbreak of the disease. This initial wave abated by 1823, but by then the very name cholera was feared throughout the world, for it had killed people everywhere by the hundreds, even thousands. Death was horribly convulsive and would come in a matter of days, perhaps a week, and no one knew what caused the disease or how to avoid it.

Soon a second cholera pandemic struck. It lasted from 1826 to 1837, when cholera crossed the Atlantic and attacked North America. During the third pandemic, from 1842 to 1862, England was severely hit, and cholera again spread into North America.

When the pandemic that began in 1842 reached England in the 1850s, cholera swept through the Soho District of London. Dr. Snow mapped the Soho District, marking all the area's water pumps—from which people got their water supply for home use—with a P and marking the residence of each person who died from cholera with a dot (Fig. 1.5). Approximately

Figure 1.5

Cases of Cholera in the Soho District of London, England, 1854. *Adapted with permission from:* L. D. Stamp, *The Geography of Life and Death,* Cornell University Press, 1964.



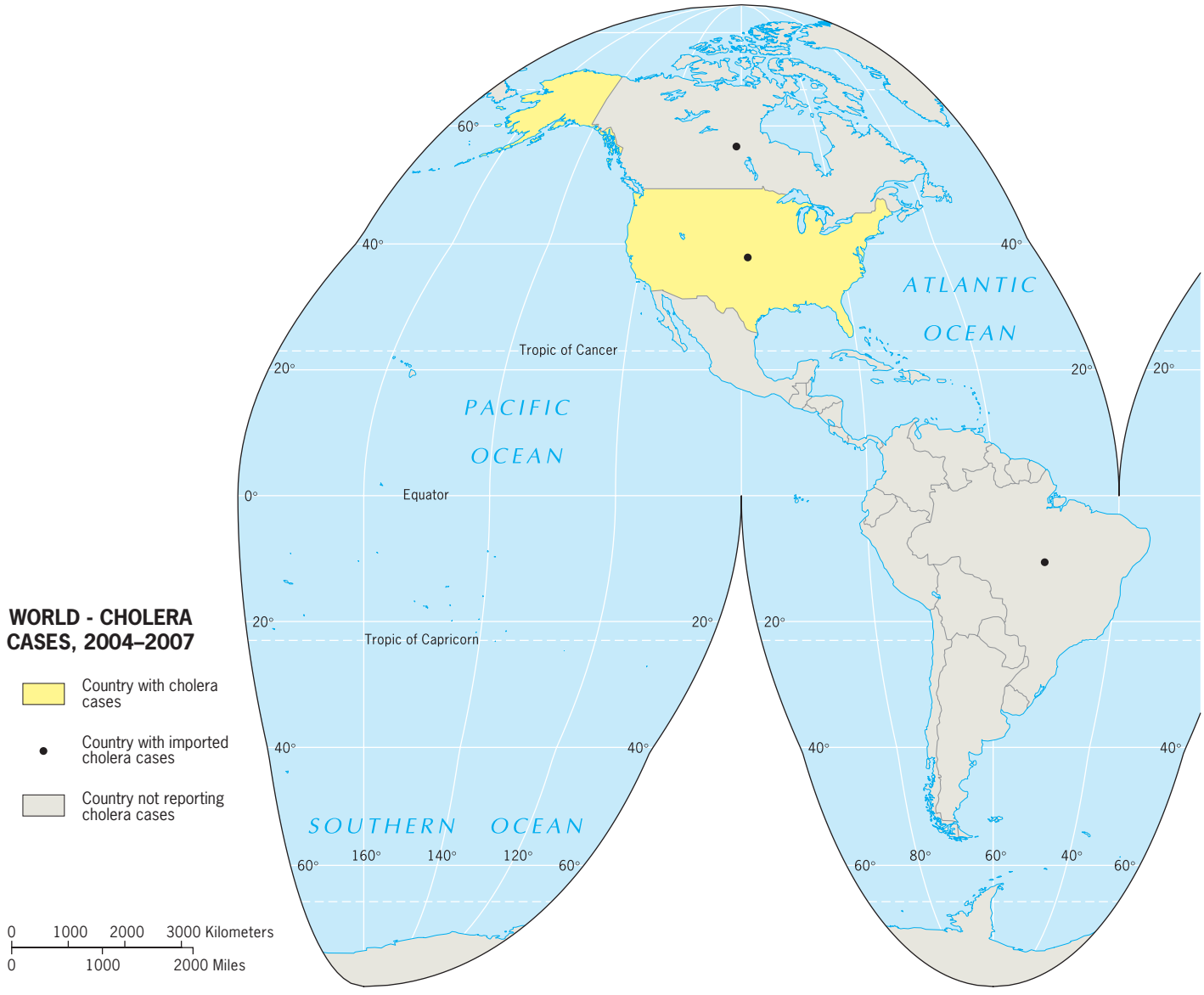
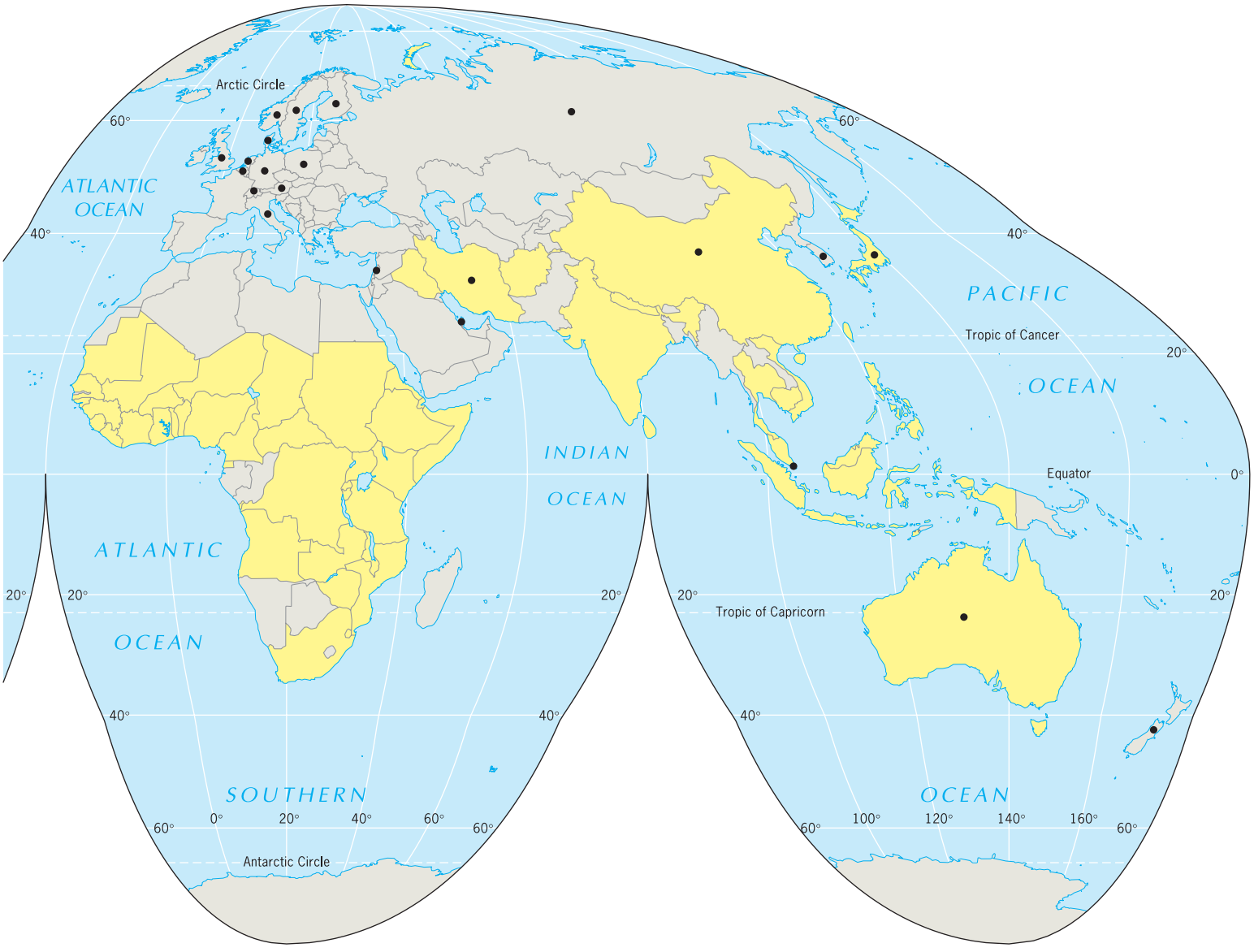


Figure 1.6
Cases of Cholera and Imported Cholera, 2004–2007. *Reprinted by permission of:* United Nations World Health Organization, 2007.

500 deaths occurred in Soho, and as the map took shape, Snow noticed that an especially large number of those deaths clustered around the water pump on Broad Street. At the doctor's request, city authorities removed the handle from the Broad Street pump, making it impossible to get water from that pump. The result was dramatic: almost immediately the number of reported new cases fell to nearly zero. Snow's theory about the role of water in the spread of cholera was confirmed.

Dr. Snow and his colleagues advised people to boil their water, but it would be a long time before his advice reached all those who needed to know, and in any case many people simply did not have the ability to do so.

Cholera has not been defeated completely, however, and in some ways the risks have been rising in recent years rather than falling (Fig. 1.6). In the teeming shantytowns of the growing cities of the developing world, and in the refugee camps of Africa and Asia, cholera remains a threat. Until the 1990s, major outbreaks remained few and limited (after remaining cholera-free for a half century, Europe had its first reappearance of cholera in Naples in 1972), and Africa reported most cases. But an outbreak in the slums of Lima, Peru, in December 1990 became a fast-spreading **epidemic** (regional outbreak of a disease) that, though confined to the Americas, touched every country in the hemisphere, infected more than 1 million people, and killed over 10,000. In 2006, a cholera outbreak in



Angola spread quickly throughout the country. When the cholera outbreak occurred in 2006, Angola's civil war had ended, which allowed people to move around the country easier and helped spread cholera quickly.

Hygiene prevents cholera, but contaminated water abounds in much of the tropical world's cities. A cholera vaccine exists, but it remains effective for only six months, and it is costly. Dr. Snow achieved a victory through the application of geographical reasoning, but the war against cholera is not yet won.

The fruits of geographical inquiry were life-saving in this case, but the work of geographers typically goes further in life-understanding. Geographers want to understand why people do different things in different places and how the relationship between people and the physical world varies across space.

The Spatial Perspective

Geography, and being geographically literate, involves much more than memorizing places on a map. In this sense, the disciplines of geography and history have much in common. History is not merely memorizing dates. To understand history is to appreciate how events, circumstances, and ideas came together at particular times to produce certain outcomes. Knowledge of how events have developed over time is thought to

be critical to understanding who we are and where we are going.

Understanding change over time is critically important, and understanding change across space is equally as important. The great German philosopher Immanuel Kant argued that we need disciplines focused not only on particular phenomena (such as economics and sociology), but also on the perspectives of time (history) and space (geography). The disciplines of history and geography have intellectual cores defined by perspective rather than by subject matter.

Human geographers use a **spatial perspective** as they study a multitude of phenomena ranging from political elections and urban shantytowns to gay neighborhoods and folk music. To bring together the many subfields of human geography and to explain to nongeographers what geographers do, four major geographical organizations in the United States came together in the 1980s and formed the Geography Educational National Implementation Project. The National Geographic Society published their findings in 1986, introducing the **five themes** of geography. The five themes are derived from the spatial perspective of geography.

The Five Themes

The first theme, **location**, highlights how the geographical position of people and things on the Earth's surface affects what happens and why. A concern with location underlies almost all geographical work, for location helps to establish the context within which events and processes are situated.

Some geographers develop elaborate (often quantitative) models describing the locational properties of particular phenomena—even predicting where things are likely to occur. Such undertakings have fostered an interest in **location theory**, an element of contemporary human geography that seeks answers to a wide range of questions—some of them theoretical, others highly practical: Why are villages, towns, and cities spaced the way they are? A geographer versed in location theory might conclude where a SuperTarget should be built (downtown or in a suburb), given the current neighborhoods and new developments, the median income of the people, the locations of other shopping areas, and the existing and future road system. Similarly, a geographer could determine the best location for a wildlife refuge, given existing wildlife habitats and migration patterns, human settlement patterns, and road networks.

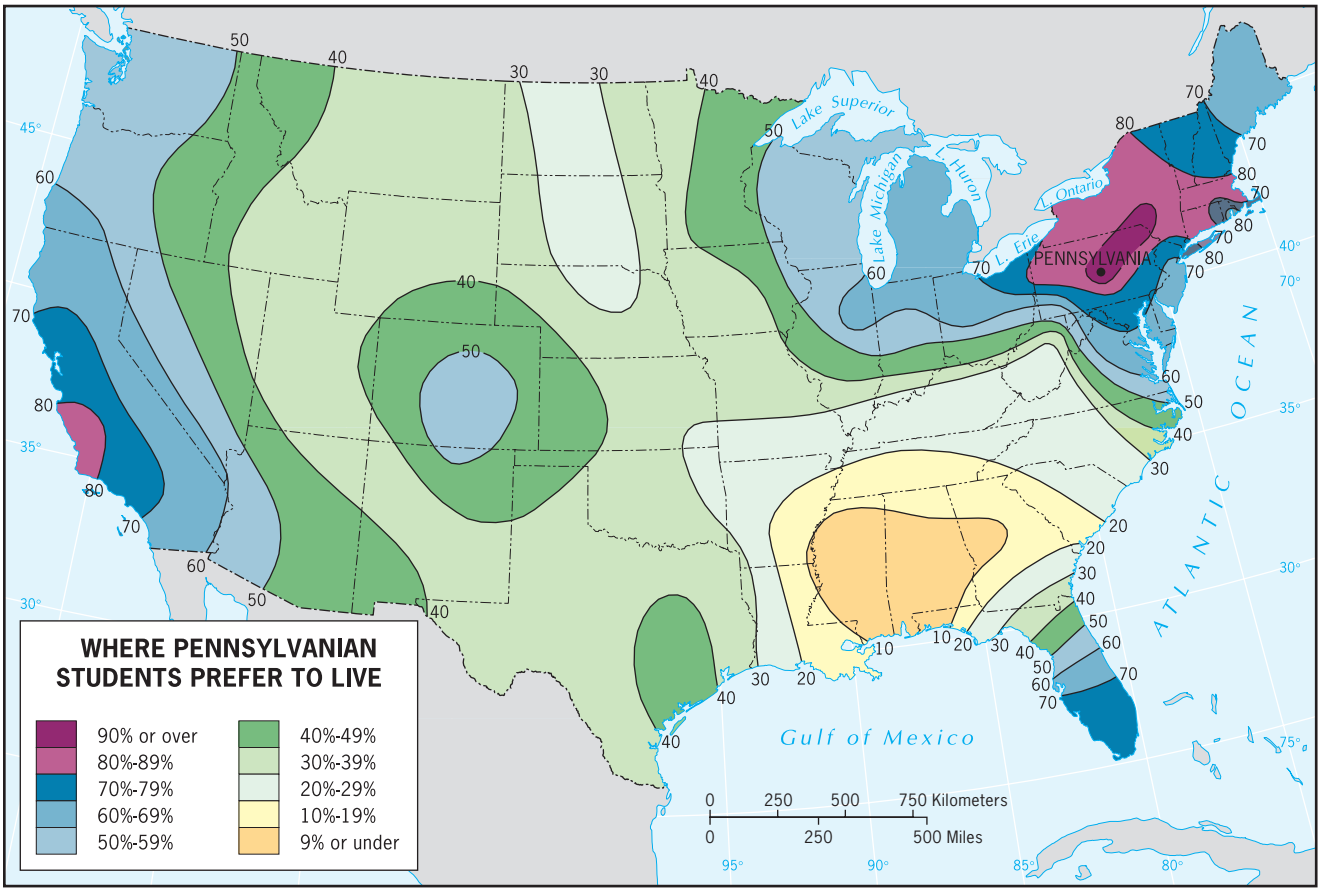


Figure 1.7

Desirable Places to Live. Where Pennsylvanian college students would prefer to live, based on questionnaires completed by college students. *Reprinted by permission of:* P. R. Gould and R. White, *Mental Maps*. Harmondsworth: Penguin Books, 1986, pp. 55 and 58.

A spatial perspective invites consideration of the relationship among phenomena in individual places—including the relationship between humans and the physical world. Thus, the second of the five themes concerns **human–environment** interactions. Why did the Army Corps of Engineers alter Florida's physical environment so drastically when they drained part of the Everglades? Have the changes in Florida's environment created an easier path of destruction for hurricanes? Why is the Army Corps of Engineers again changing the course of the Kissimmee River, and what does that mean for farmers around the river and residential developments in the south of Florida? Geographers study the reciprocal relationship between humans and environments.

The third theme of geography is the **region**. Phenomena are not evenly distributed on the surface of the Earth. Instead, features tend to be concentrated in particular areas, which we call regions. Geographers use fieldwork, quantitative, and qualitative methods to develop insightful descriptions of different regions of the world. Novelist James Michener once wrote that whenever he started writing a new book, he first prepared himself by turning to books written by regional geographers about the area where the action was to occur. Understanding the regional geography of a place allows us to make sense of much of the information we have about places and digest new information about places as well.

The fourth theme is represented by the seemingly simple word **place**. All places on the surface of the Earth have unique human and physical characteristics, and one of the purposes of geography is to study the special character and meaning of places. People develop a **sense of place** by infusing a place with meaning and emotion, by remembering important events that occurred in a place, or by labeling a place with a certain character. Because we experience and give meaning to places, we can have a feeling of "home," when we are in a certain place.

We also develop **perceptions of places** we have never been through books, movies, stories, and pictures. Geographers Peter Gould and Rodney White asked college students in California and Pennsylvania: "If you could move to any place of your choice, without any of the usual financial and other obstacles, where would you like to live?" Their responses showed a strong bias for their home region and revealed that students from both regions had negative perceptions of the South, Appalachia, the Great Plains, and Utah (Fig. 1.7).

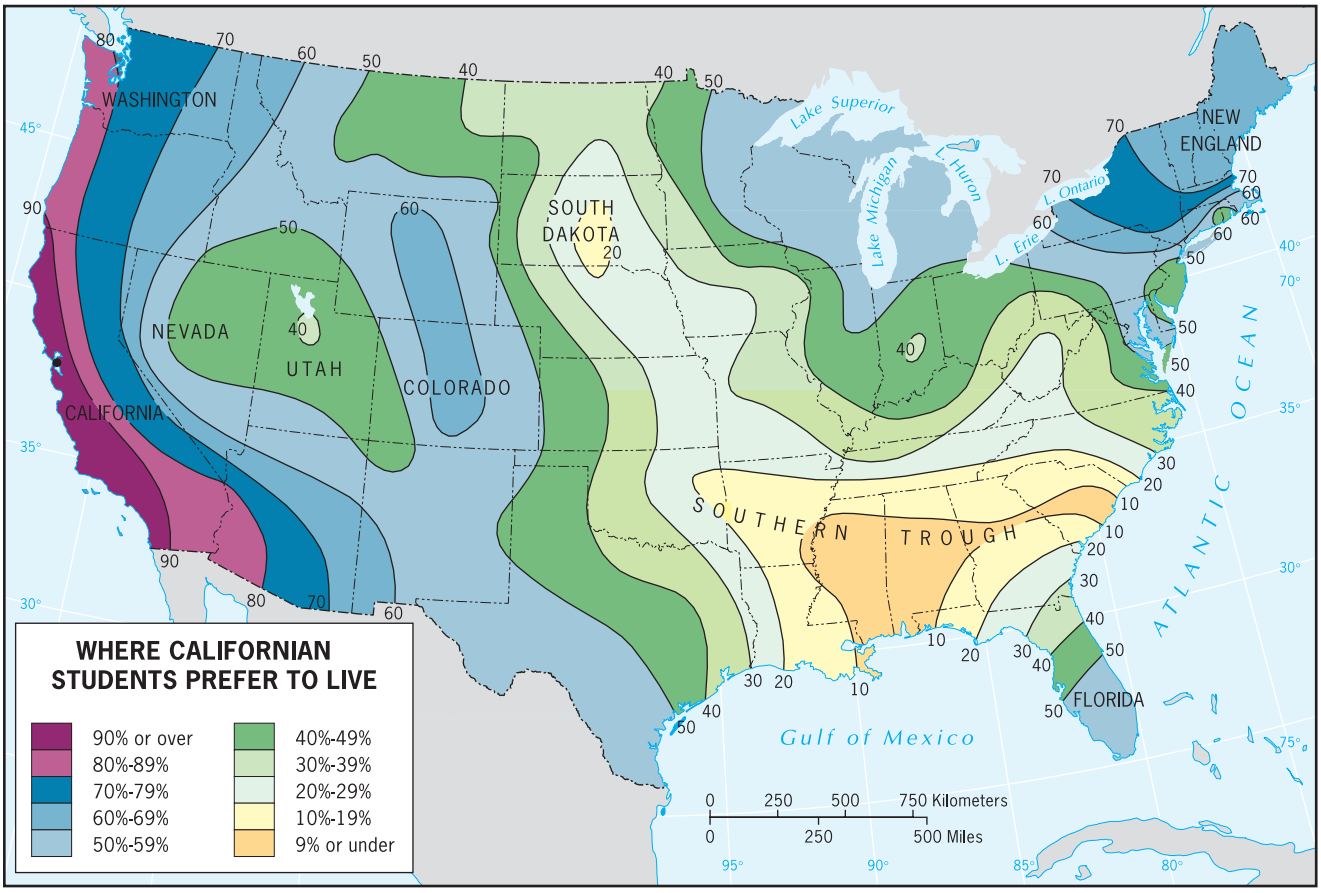


Figure 1.7 (continued)

The fifth theme, **movement**, refers to the mobility of people, goods, and ideas across the surface of the planet. Movement is an expression of the interconnectedness of places. **Spatial interaction** between places depends on the **distances** (the measured physical space between two places) among places, the **accessibility** (the ease of reaching one location from another) of places, and the transportation and communication **connectivity** (the degree of linkage between locations in a network) among places. Interactions of many kinds shape the human geography of the world, and understanding these interactions is an important aspect of the global spatial order.

Cultural Landscape

In addition to the five themes—location, human–environment, region, place, and movement—**landscape** is a core element of geography. Geographers use the term

Field Note

"Hiking to the famed Grinnell Glacier in Glacier National Park brings one close to nature, but even in this remote part of the United States the work of humans is inscribed in the landscape. The parking lot at the start of the six-mile trail, the trail itself, and the small signs en route are only part of the human story. When I arrived at the foot of the glacier, I found myself looking at a sheet of ice and snow that was less than a third the size of what it had been in 1850. The likely reason for the shrinkage is human-induced climate change. If the melt continues at present rates, scientists predict that the glacier will be gone by 2030."



Figure 1.8
Glacier National Park, United States. © Alexander B. Murphy.

landscape to refer to the material character of a place, the complex of natural features, human structures, and other tangible objects that give a place a particular form. Human geographers are particularly concerned with the **cultural landscape**, the visible imprint of human activity on the landscape. The geographer whose name is most closely identified with this concept is former University of California at Berkeley professor Carl Sauer. In 1927, Sauer wrote an article entitled "Recent Developments in Cultural Geography," in which he argued that cultural landscapes are comprised of the "forms superimposed on the physical landscape" by human activity.

No place on Earth is in a "pristine" condition—humans have made an imprint on every place on the planet (Fig. 1.8). The cultural landscape is the visible imprint of human activity and culture on the landscape. We can see the cultural landscape in the layers of buildings, roads, memorials, churches, fields, and homes that human activities over time have imprinted on the landscape.

Any cultural landscape has layers of imprints from years of human activity. As each group of people arrived and occupied a place, they brought their own technological and cultural traditions and transformed the landscape accordingly. Each new group of residents can also be influenced by what they find when they arrive—and leave some of it in place. In 1929, Derwent Whittlesey proposed the term **sequent occupance** to refer to these sequential imprints of occupants, whose impacts are layered one on top of the other.

The Tanzanian city of Dar es Salaam provides an interesting urban example of sequent occupance. Arabs from Zanzibar first chose the African site in 1866 as a summer retreat. Next, German colonizers imprinted a new layout and architectural style (wood-beamed Teutonic) when they chose the city as the center of their East African colonies in 1891. After World War I, when the Germans were ousted, a British administration took over the city and began yet another period of transformation. The British encouraged immigration from their colony in India to Tanzania. The new migrant Asian population created a zone of three- and four-story apartment houses, which look as if they were transplanted from Bombay, India (Fig. 1.9 left and right). Then, in the early 1960s, Dar es Salaam became the capital of newly independent Tanzania. Thus, the city experienced four stages of cultural dominance in less than one century, and each stage of the sequence remains imprinted in the cultural landscape.

The cultural landscape can be seen as a kind of book offering clues into each chapter of the cultural practices, values, and priorities of its various occupiers. As geographer Peirce Lewis explained in *Axioms for Reading the Landscape* (1979), "Our human landscape is our unwitting autobiography, reflecting our tastes, our values, our aspirations, and even our fears, in tangible, visible form."



Figures 1.9, left and right

Mumbai, India (left) and Dar-es-Salaam, Tanzania (right). Apartment buildings throughout Mumbai (formerly Bombay), India are typically four stories with balconies. In Dar-es-Salaam, Tanzania, this four-story walkup with its laundry and other household items festooned on balconies and in doorways (right) stands where single-family African dwellings once stood, reflecting the sequential occupance of the city. © Jessica, Poser, University of Illinois at Chicago (left) and Mark Carlson (right).

Like Whittlesey, Lewis recommended looking for layers of history in cultural landscapes, adding that most major changes in the cultural landscape occur after a major event—a war, an invention, an economic depression.

thinking geographically

Geographers who practice fieldwork keep their eyes open to the world around them and through practice become adept at reading cultural landscapes. Take a walk around your campus or town and try reading the cultural landscape. Choose one thing in the landscape and ask yourself, "What is that and why is it there?" Take the time to find out the answers!

WHY DO GEOGRAPHERS USE MAPS, AND WHAT DO MAPS TELL US?

Maps are an incredibly powerful geographic tool, and **cartography**, the art and science of making maps, is as old as geography itself. (For details on cartography, see Appendix A at the end of this book.) Maps are used for countless purposes—to wage war, make political propaganda, solve medical problems, locate shopping centers, bring relief to refugees, and warn of natural hazards. **Reference maps** show locations of places and geographic features. **Thematic maps** tell stories, typically showing the degree of some attribute or the movement of a geographic phenomenon.

Reference maps focus on accuracy in showing the **absolute locations** of places, using a coordinate system that allows you to plot precisely where on Earth something is. Imagine taking an orange, drawing a dot on it with a marker, and then trying to describe the exact location of that dot to someone who is holding another orange so she can mark the same spot on her orange. If you draw and number the same coordinate system on both oranges, the task of drawing the absolute location on each orange is not only doable but is simple. Plotting absolute locations to make a reference map is simple with the use of a coordinate system, and the system most frequently used is latitude and longitude. For example, the absolute location of Chicago is 41 degrees, 53 minutes North Latitude and 87 degrees, 38 minutes West Longitude. Using these coordinates, you can plot Chicago on any globe or map that is marked with latitude and longitude.

The establishment of satellite-based **global positioning system (GPS)** allows us to locate things on the surface of the Earth with extraordinary accuracy. Researchers collect data quickly and easily in the field, and low-priced units are encouraging fishers, hunters, and hikers to use GPS in their hobbies. New cars are equipped with GPS units, and dashboard map displays help commuters navigate traffic and travelers find their way. **Geocaching** is a new hobby based on the use of GPS. Geocachers use their GPS units to play a treasure hunt game all over the world. People leave the treasures ("caches") somewhere, mark the coordinates on their GPS, and post clues on the Internet. If you find the cache, you take the treasure and leave a new one.

Relative location describes a place in relation to other human and physical features. Descriptors such as "Chicago is on Lake Michigan, south of Milwaukee" or "Chicago is located where the cross-country railroads met in the 1800s" or "Chicago is the hub of the corn and soybean markets in the Midwest" are all descriptors of Chicago relative to other features. In the southern Wisconsin, northern Illinois, and western Indiana region, all roads lead to Chicago (Fig. 1.10). Within this region, people define much of their lives relative to Chicago because of the tight interconnectedness between Chicago and the region. Northwestern Indiana is so connected to Chicago that they have a time zone separate from the rest of Indiana—allowing people in northwestern Indiana to stay in the same time zone as Chicago.

Absolute locations do not change, but relative locations are constantly modified and change over time. Fredericksburg, Virginia is located halfway between Washington, D.C. and Richmond, Virginia. Today, it is a suburb of Washington, D.C., with commuter trains, van pools, buses, and cars moving commuters between their homes in Fredericksburg and their workplaces in metropolitan Washington, D.C. During the Civil War, several bloody battles took place in Fredericksburg as the North and South fought over the land halfway between their wartime capitals. The absolute location of Fredericksburg has not changed, but its place in the world around it, its relative location, certainly has.

Mental Maps

We all carry maps in our minds of places we have been and places we have merely heard of; these are called **mental maps**. Even if you have never been to the Great Plains of the United States, you may have studied wall maps and atlases or come across the region in books, magazines, and newspapers frequently enough to envision the states of the region (North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas) in your mind. Even if you have not visited the Great Plains, you will use your mental map of the region. If you hear on the news that a tornado destroyed a town in Oklahoma, you use your mental map of the Great Plains region and Oklahoma to make sense of where the tornado occurred and who was impacted.

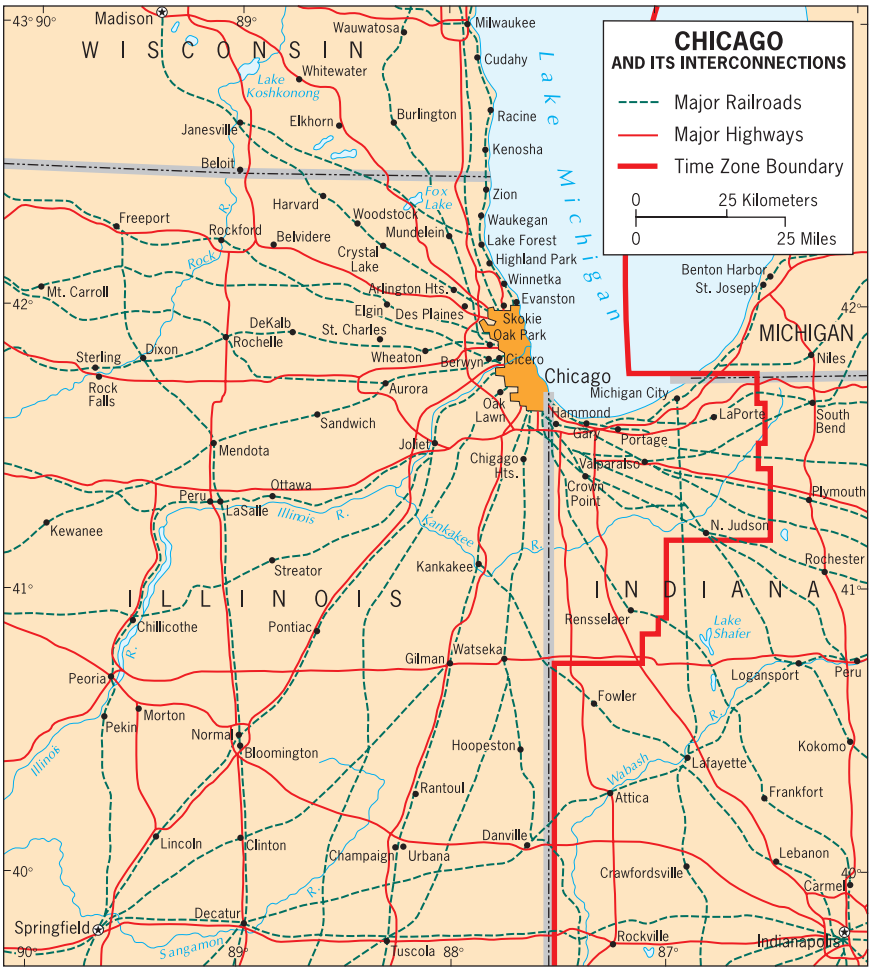


Figure 1.10
All Roads Lead to Chicago. Network of Midwestern roads that lead to Chicago, reflecting the dominance of Chicago in the region. © E. H. Fouberg, A. B. Murphy, H. J. de Blij, and John Wiley & Sons, Inc.

Our mental maps of the places within our **activity spaces**, those places we travel to routinely in our rounds of daily activity, are more accurate and detailed than places we have never been. If your friend calls and asks you to meet her at the movie theater you go to all the time, your mental map will engage automatically. You will envision the hallway, the front door, the walk to your car, the lane to choose in order to be prepared for the left turn you must make, where you will park your car, and your path into the theater and up to the popcorn stand.

Geographers who study human–environment behavior have made extensive studies of how people develop their mental maps. The earliest humans, who were nomadic, had incredibly accurate mental maps of where to find food and seek shelter. Today, people need mental maps to find their way through the concrete jungles of cities and suburbs.

Geographers have studied the mental map formation of children, the blind, new residents to cities, men, and women, all of whom exhibit differences in the formation of mental maps. To learn new places, women, for example, tend to use landmarks, whereas men tend to use paths. Activity spaces vary by age, and the extent of peoples' mental maps depends in part on their ages. Mental maps include *terra incognita*, unknown lands that are off-limits. If your path to the movie theater includes driving past a school that you do not go to, your map on paper will likely label the school, but no details will be shown regarding the place. However, if you have access to the school and you are instead drawing a mental map of how to get to the school's cafeteria, your mental map of the school will be quite detailed. Thus, mental maps reflect a person's activity space, what is accessible to the person in his or her rounds of daily activity and what is not.

Generalization in Maps

All maps simplify the world. A reference map of the world cannot show every place in the world, and a thematic map of hurricane tracks in the Atlantic Ocean cannot pinpoint every hurricane and its precise path for the last 50 years.

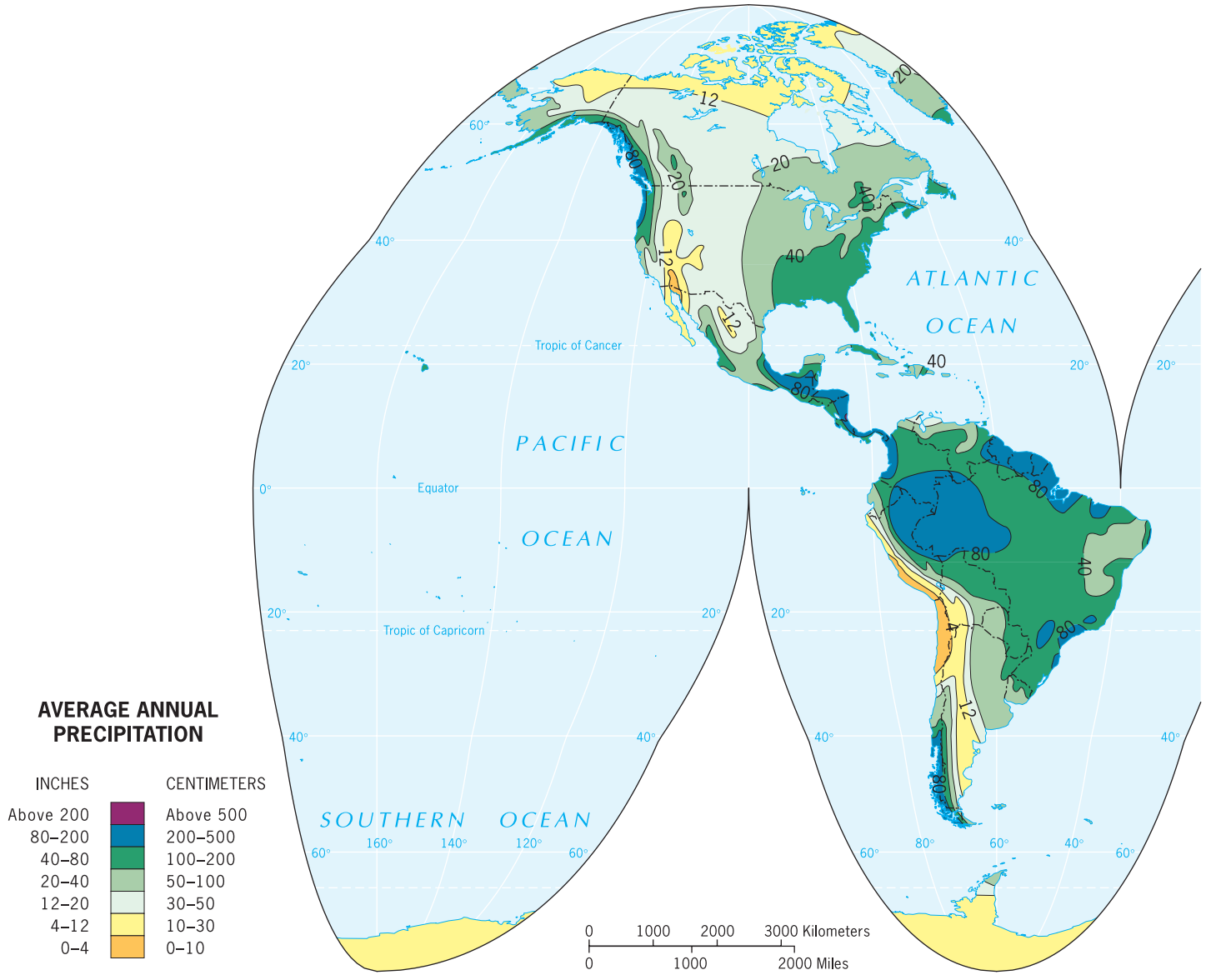
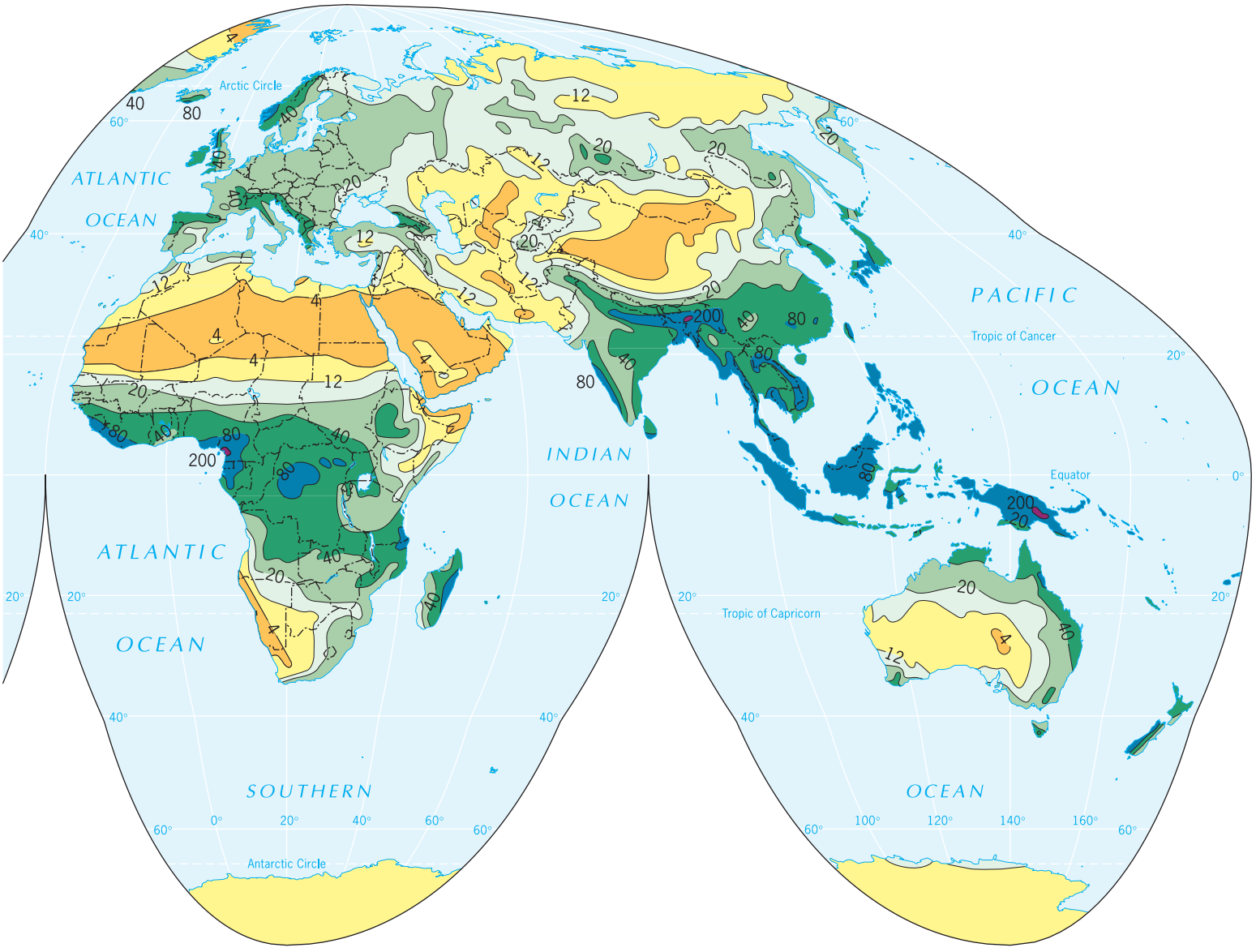


Figure 1.11

Average Annual Precipitation of the World. A generalized map of the mean annual precipitation received around the world. © H. J. de Blij, P. O. Muller, and John Wiley & Sons, Inc.

When mapping data, whether human or physical, cartographers, the geographers who make maps, *generalize* the information they present on maps. Many of the maps in this book are thematic maps of the world. Shadings show how much or how little of some phenomena can be found on a part of the Earth's surface.

Generalized maps help us see general trends, but we cannot see all cases of a given phenomenon. The map of world precipitation (Fig. 1.11) is a **generalized map** of mean annual precipitation received around the world. The areas shaded burgundy, dark blue, and vibrant green are places that receive the most rain, and those shaded in orange receive the least rain on average. Take a pen and trace along the equator on the map. Notice how many of the high-precipitation areas on the map are along the equator. The consistent heating of the equator over the course of the entire year brings consistent precipitation to the equatorial region. At the scale of the world, we can see general trends in precipitation, such as this, but it is difficult to see the microscale climates of intense precipitation areas everywhere in the world.



Remote Sensing and GIS

Geographic studies include both long- and short-term environmental change. Geographers monitor the Earth from a distance, using **remote sensing**, using technology that is a distance away from the place being studied. Remotely sensed data are collected by satellites and aircraft (airplanes, balloons) and are almost instantaneously available. After a major weather event, such as the 2008 floods in the Mississippi River Valley or the unprecedented hurricane season in the Gulf of Mexico in 2005, remotely sensed data show us the major areas of impact (Fig. 1.12). A remotely sensed image highlights the eye of a hurricane, and photos taken on the ground show the impact and destruction (Fig. 1.13).

In a government that is harming its citizens or that will not reliably allow foreign aid to help its citizens, remote sensing helps geographers understand the physical and human geography of the place. Google Earth is a free, web-based user-friendly set of remotely sensed images from around the world woven together and accessible to anyone with Internet access. You can think of Google Earth as a quilt of remotely sensed images, taken

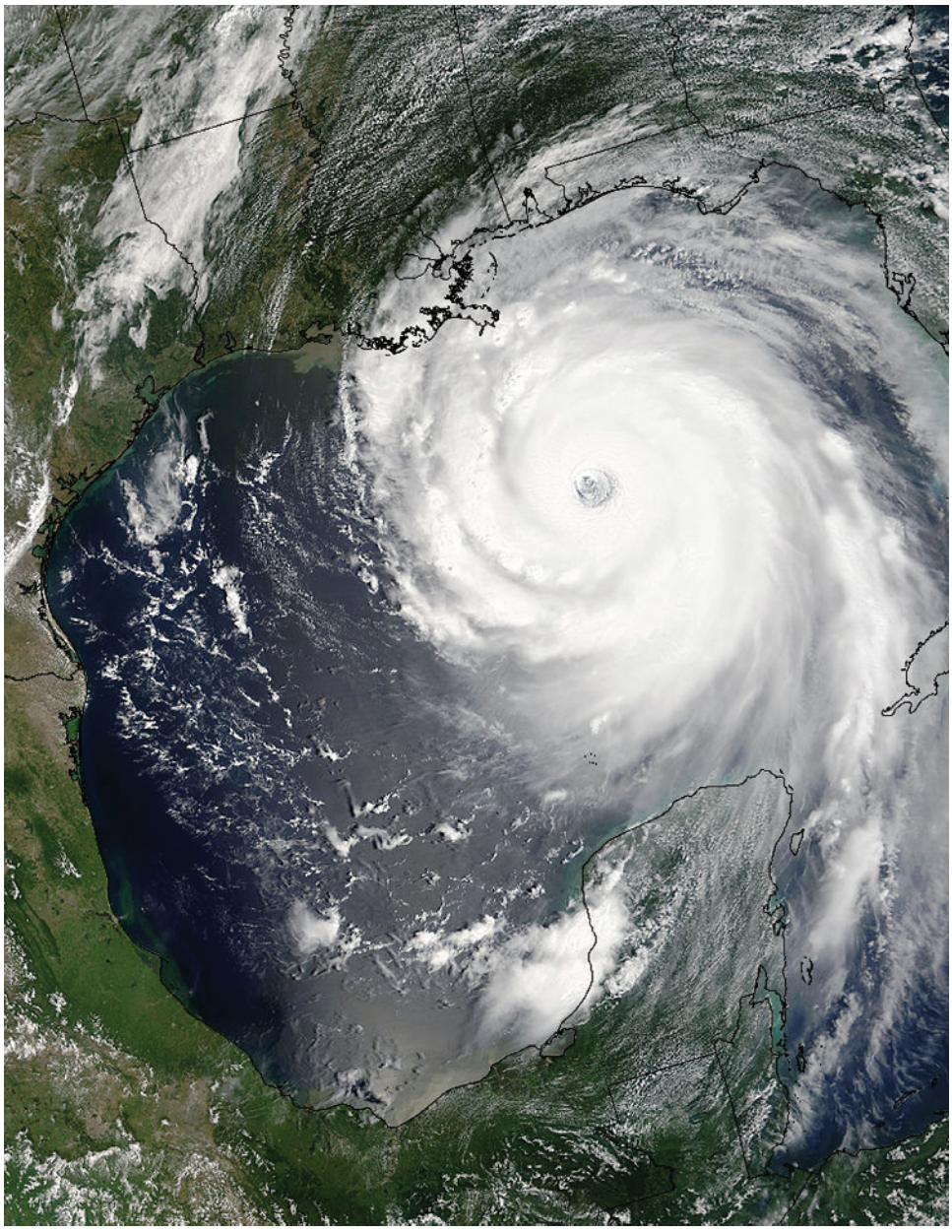


Figure 1.12
Satellite image of Hurricane Katrina. NASA collected this image on the morning of Monday, August 29, 2005, shortly before the hurricane made landfall.
© AP/Wide World Photos.

all over the world, coming from several sources, and sewn together—like a patchwork quilt. As a result, the resolution (the measure of the smallest object that can be resolved by the sensor, the degree of detail) of the images (each piece of the quilt) differs.

Remotely sensed images can be incorporated in a map, and absolute locations can be studied over time by plotting change in remotely sensed images for one place over time. Advances in computer technology and data storage, increasing accessibility to locationally based data and GPS technology, and software corporations that tailor products to specific uses have all driven incredible advances in **geographic information systems** (GIS) over the last two decades. Geographers use GIS to compare a variety of spatial data by creating digitized representations of the environment (Fig. 1.14), combining layers of spatial data, and creating maps in which patterns and processes are superimposed. Geographers also use GIS to analyze data, which can give us new insight into geographic patterns and relationships.

Geographers use GIS for applications in both human and physical geographic research. For example, political geographers use GIS to map layers showing voters, their party registration, their race, their likelihood of voting, and their income in order to determine how to draw voting districts in congressional and state legislative elections. In this case, a geographer can draw a line around a group of people and ask the computer program to tally



Figure 1.13
New Orleans, Louisiana. Floodwaters from Hurricane Katrina covered over 80 percent of New Orleans, Louisiana on Tuesday, August 30, 2005.
© AP/Wide World Photos.

how many voters are inside the region, determine what the racial composition is of the district, and show how many of the current political representatives live within the new district's boundaries.

Geographers trained in GIS apply the software technologies in countless fields today. Students who earn undergraduate degrees in geography are employed by software companies, government agencies, and businesses to use GIS in surveying wildlife, mapping soils, analyzing natural disasters, following diseases, assisting first responders, planning cities, plotting transportation improvements, and tracking weather systems. For example, a group of geographers working for one GIS company tailors the GIS software to serve the branches

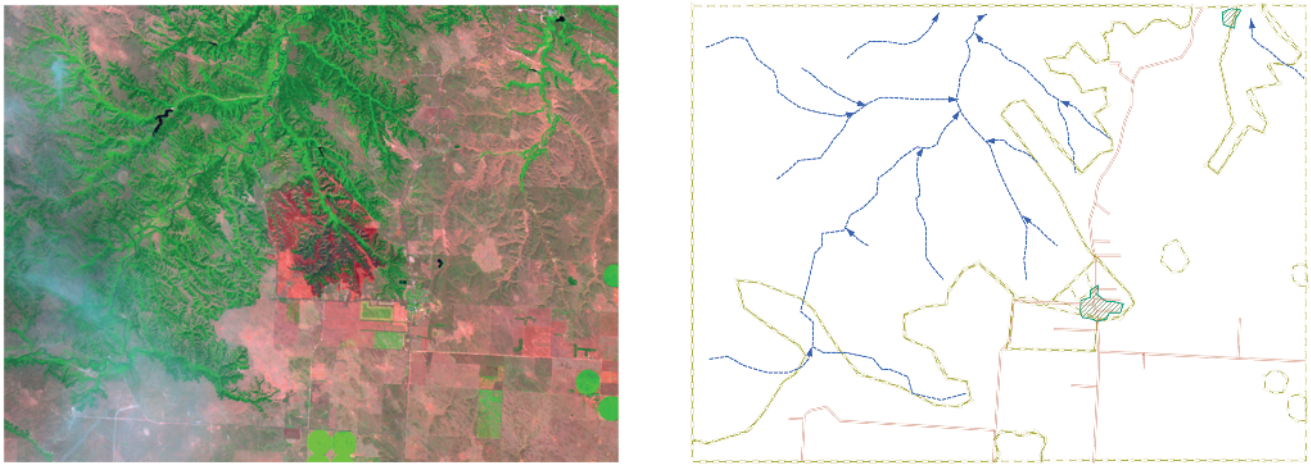


Figure 1.14
Two Representations of St. Francis, South Dakota. A) panchromatic raster satellite image collected in 2002 at 10 m resolution during a grassland wildfire; B) vector data—rivers, roads, cities, and land use/land cover digitalized from the image. Courtesy Joseph J. Kerski using ArcGIS software from Environmental Systems Research Institute, Inc.

of the military and the defense intelligence community. The vast amounts of intelligence data gathered by the various intelligence agencies can be integrated into a GIS and then analyzed spatially. Geographers working in the defense intelligence community can use GIS to query a vast amount of intelligence, interpret spatial data, and make recommendations on issues of security and defense.

The amount of data digestible in a GIS, the power of the location analysis possible with computer hardware, and the ease of analysis with GIS software applications allow geographers to answer complicated questions using GIS. For example, geographer Korine Kolivras analyzed the probability of dengue fever outbreaks in Hawaii using GIS (Fig. 1.15). The maps Kolivras produced may look as simple and straightforward as the cholera maps produced by Dr. John Snow in the 1800s, but the amount of data that went into Kolivras's analysis is staggering in comparison. Dengue fever is carried by a particular kind of mosquito called the Aedes mosquito. Kolivras analyzed the breeding conditions needed for the Aedes mosquito, including precipitation, topography, and several other variables, to predict what places in Hawaii are most likely to experience an outbreak of dengue fever.

A new term of art used in geography is GISc. Geographic information science (GISc) is an emerging research field concerned with studying the development and use of geospatial concepts and techniques to examine geographic patterns and processes. Your school may have a program in GISc that draws across disciplines, bringing together the computer scientists who write the programs, the engineers who create sensors that gather data about the Earth, and the geographers who combine layers of data and interpret them to make sense of our world.



Use Google Earth to find a place where a humanitarian crisis is occurring today (such as Myanmar or Darfur) and study the physical and human geography overlaid on Google Earth in this place. How does studying this place on Google Earth change your mental map of the place and/or your understanding of the crisis?

WHY ARE GEOGRAPHERS CONCERNED WITH SCALE AND CONNECTEDNESS?

Geographers study places and patterns at a variety of scales, including local, regional, national, and global. Scale has two meanings in geography: the first is the distance on a map compared to the distance on the Earth, and the second is the territorial extent of something. Throughout the book, when we refer to scale we are using the second of these definitions. As geographers, the scale of our research or analysis matters because we can make different observations at different scales. We can study a single phenomenon across different scales in order to see how what is happening at the global scale affects localities and how what is happening at a local scale affects the globe. Geographers recognize that phenomena, whether human or physical, happen in a context and that the context looks different at different scales.

The scale at which we study a geographic phenomenon tells us what level of detail we can expect to see. We also see different patterns at different scales. For example, when we study the distribution of wealth at the scale of the globe (see Fig. 1.3), we see the countries in western Europe, Canada, the United States, Japan, and Australia are the wealthiest, and the countries of Subsaharan Africa and Southeast Asia are the poorest. Does that mean everyone in the United States is wealthy and everyone in Indonesia is poor? Certainly not, but on a global-scale map of states, that is how the data appear.

When you shift scales to North America and examine the data for States of the United States and the provinces of Canada (Fig. 1.16), you see that the wealthiest areas are on the coasts and the poorest are in the interior and in the extreme northeast and south. The State of Alaska and the province of the Northwest Territories have high gross per capita incomes that stem largely from oil revenues that are shared among the residents.

Shifting scales again to just one city, for example, metropolitan Washington, D.C. (Fig. 1.17), you observe that suburbs west, northwest, and southwest of the city show the greatest wealth and that suburbs east and southeast have lower income levels. In the city itself, a clear dichotomy of wealth divides the northwest neighborhoods from the rest of the city. Shifting scales again to the individual, if we conducted fieldwork in Washington, DC and interviewed people who live below the poverty line, we would quickly find that each person's experience of poverty and reasons for being in poverty vary—making it difficult to generalize. We would find some trends, such as how women in poverty who have children cope differently than single men or how illegal immigrants cope differently from legal immigrants.

Because the level of detail and the patterns observed change as the scale changes, geographers must be sensitive to their scale of analysis and also be wary of researchers who make generalizations about a people or a place at a particular scale without considering other scales of analysis.

Geographers' concern with scale goes beyond an interest in the scale of individual phenomena to a concern with how processes operating at different scales influence

Guest Field Note



Figure 1.15 A
Maui, Hawaii. *Aedes* mosquitoes breed in artificial and natural water containers, such as the standing puddles left behind when streams dry up during a drought as shown in this photograph along the northeast coast of Maui.

The diffusion of diseases carried by vectors, like the *Aedes* mosquito that transmits dengue, is not solely a result of the environmental factors in a place. I use disease ecology to understand the ways in which environmental, social, and cultural factors interact to produce disease in a place. Through a combination of fieldwork and geographic information systems (GIS) modeling, I studied the environmental habitat of the *Aedes* mosquito in Hawaii and the social and cultural factors that stimulated the outbreak of dengue in Hawaii.

When I went into the field in Hawaii, I observed the variety in the physical geography of Hawaii, from deserts to rainforests. I saw the specific local environments of the dengue outbreak area, and I examined the puddles in streams (Fig. 1.15A) in which the mosquitoes likely bred during the 2001–2002 dengue outbreak. I talked to public health officials who worked so hard to control the dengue outbreak, and I better understood the local environmental factors contributing to the disease. I visited a family who had been heavily affected by dengue, and I saw their home, which, by their choice, lacked walls or screens on all sides. In talking with the family, I came to understand the social and cultural factors that affected the outbreak of dengue in Hawaii.

I created a GIS model of mosquito habitat that considered not only total precipitation in Hawaii (Fig. 1.15B), but also seasonal variations in precipitation (Fig. 1.15C) and temperature (Fig. 1.15D), to help explain where the *Aedes* mosquito is able to breed and survive on the islands. I also studied seasonal fluctuations in streams and population distributions in creating my model of dengue potential areas (Fig. 1.15E).

The GIS model I created can now be altered by public officials in Hawaii to reflect precipitation and temperature variations each year or to incorporate new layers of environmental, social, and cultural data. Officials will be able to better predict locations of dengue outbreaks so they can focus their efforts to combat the spread of the disease.

Credit: Korine N. Kolivras, Virginia Tech

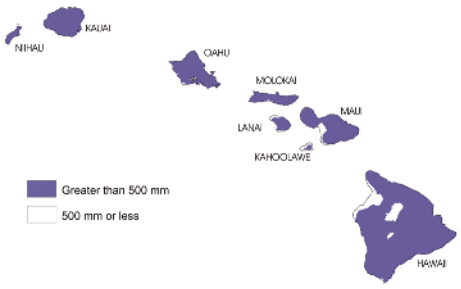


Figure 1.15 B
Total annual precipitation.

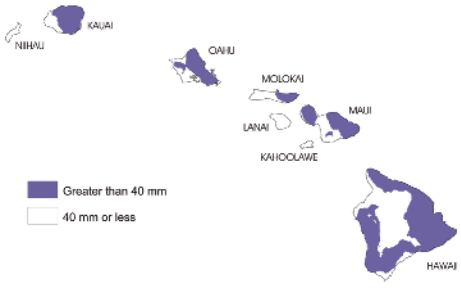


Figure 1.15 C
Average June precipitation.

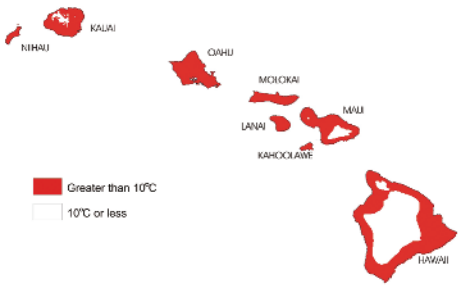


Figure 1.15 D
Average February minimum temperature.

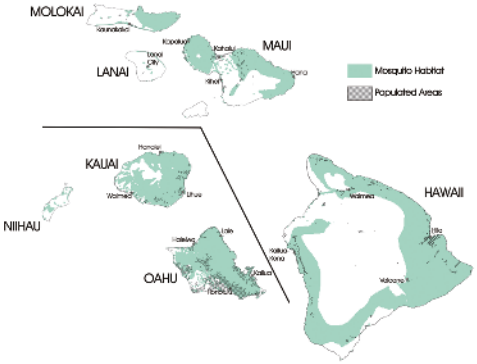


Figure 1.15 E
Dengue potential areas.

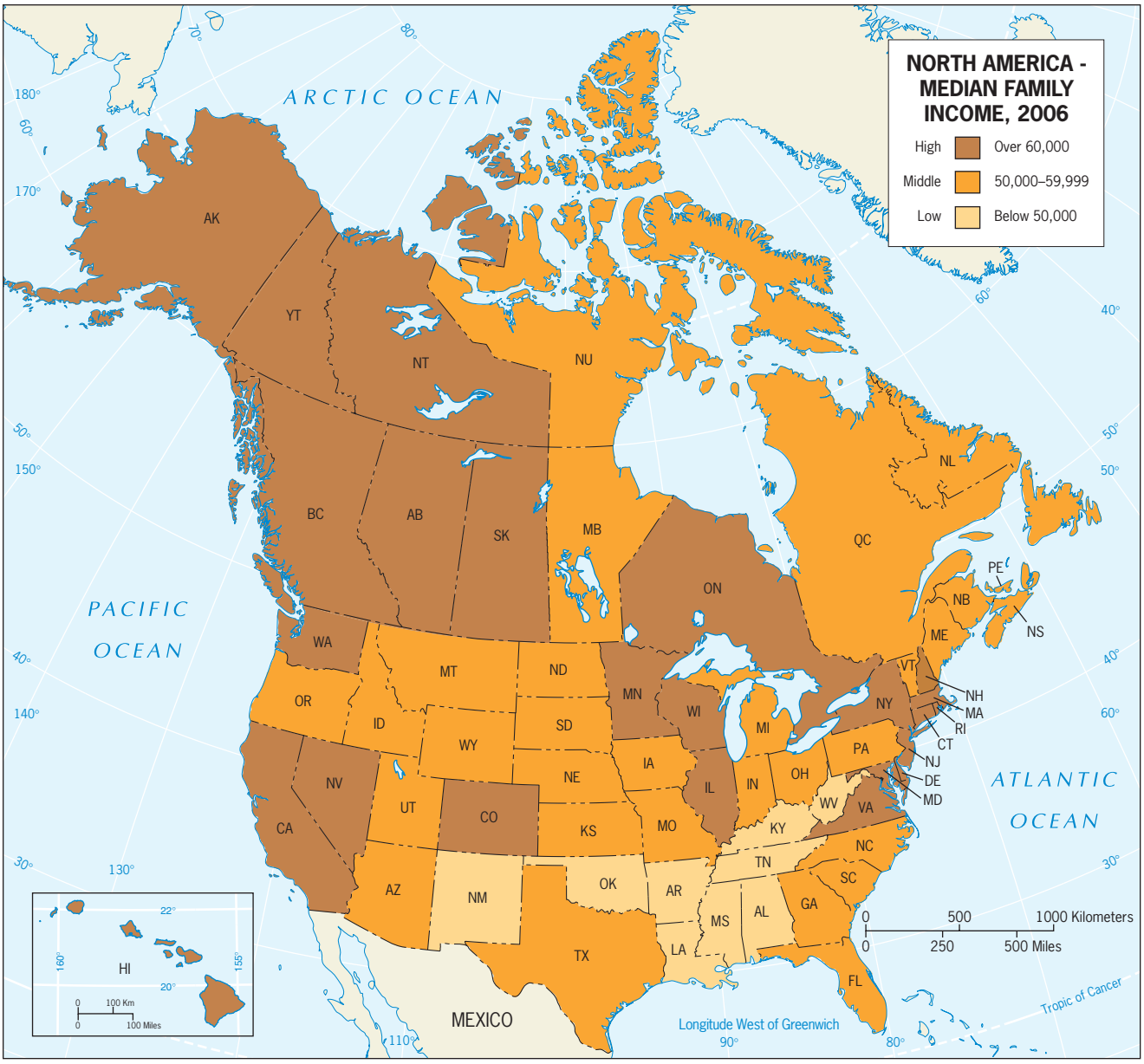


Figure 1.16
Median Family Income (in U.S. dollars), 2006. *Data from:* United States Census Bureau and Census Canada.

one another. If you want to understand the conflict between the Tutsi and the Hutu people in Rwanda, for example, you cannot look solely at this African country. The Rwandan conflict is influenced by developments at a variety of different scales, including patterns of migration and interaction in Central Africa, the economic and political relations between Rwanda and parts of Europe, and the variable impacts of globalization—economic, political, and cultural.

Geographers are also interested in how people use scale politically. Local political movements, such as like the Zapatistas in southern Mexico, have learned to **rescale** their actions—to involve players at other scales and create a global outcry of support for their position. By taking their political campaign from the individual and local scale to the national scale through their protests against the North American Free Trade Agreement (NAFTA), and then effectively using the Internet to wage a global campaign, the Zapatistas gained attention from the world media, a feat few local political movements achieve.

Geographer Victoria Lawson uses the term *jumping scale* to describe rescaling. She compares the ways in which Western countries, multinational corporations, and the World Trade Organization all take products and ideas

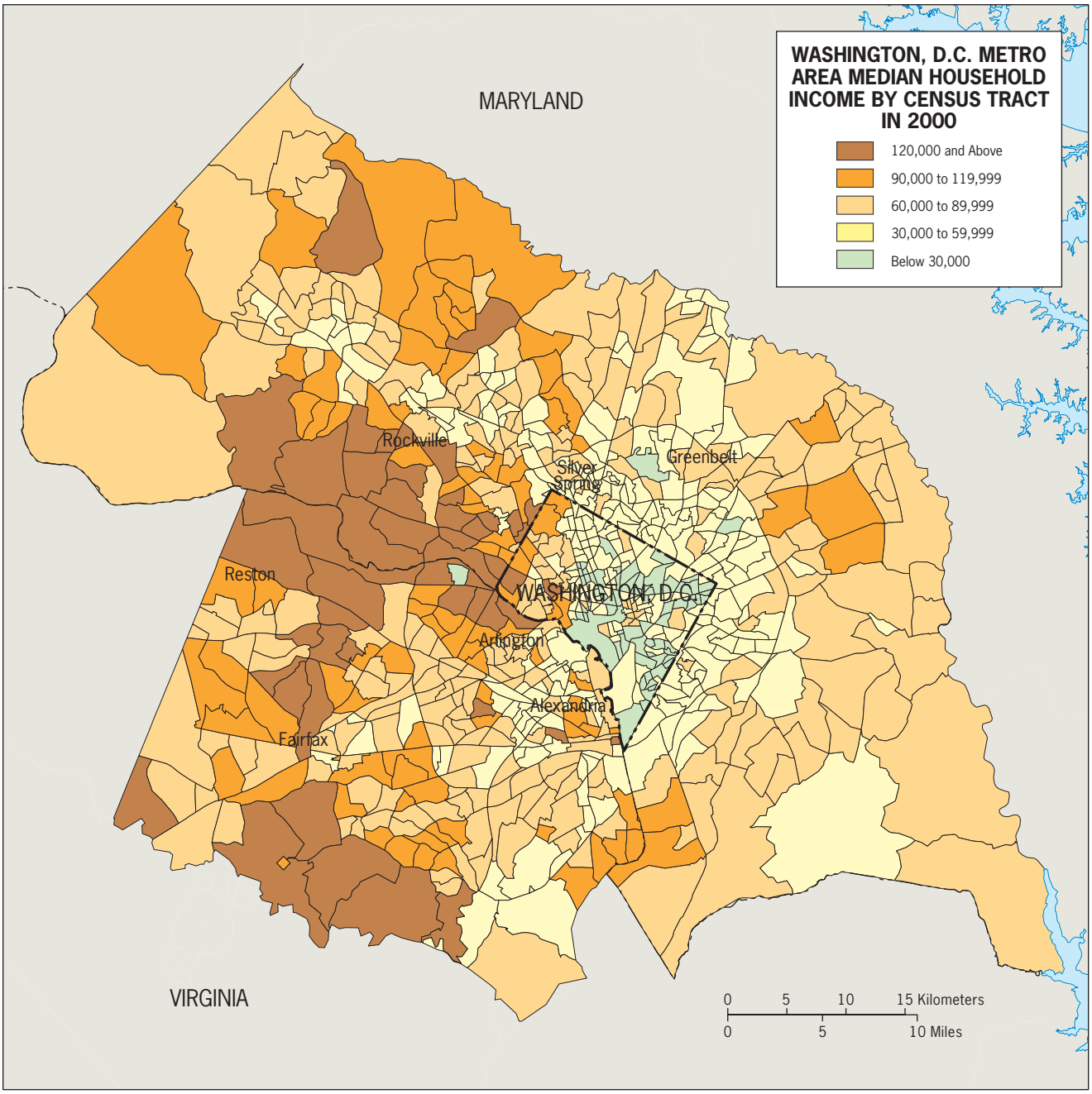


Figure 1.17
Median Family Income (in U.S. dollars), 2000. *Data from:* United States Census Bureau, 2000.

created in Western places and by Western corporations and globalize all rights to profits from them through intellectual property law. Efforts to push European and American views of intellectual property on the globe negate other local and regional views of products and ideas. To the West, rice is a product that can be owned, privatized, and bought and sold. To East Asians, rice is integral to culture, and new rice strains and new ideas about growing rice can help build community, not just profit. Lawson explains that taking a single regional view and jumping scale to globalize it legitimates that view and negates other regional and local views.

Regions

Geographers often divide the world into regions for analysis. Many colleges offer a course in world regional geography that compares and contrasts major regions of the world. In this book, we use examples from every region of

the world, but our focus throughout is on human geography. Nongeographers use some form of the regional idea all the time, even in everyday conversation. When you plan or dream of a vacation in the Rockies, or a hiking trip in New England, or a cruise in the Caribbean, you are using regional notions to convey what you have in mind. Used this way, regions serve as informal frames of reference.

In geography, a region constitutes an area that shares similar characteristics. To identify and delimit regions, we must establish criteria for them. The criteria we choose to define a region can be physical, cultural, functional, or perceptual.

When geographers choose one or more physical or cultural criteria to define a region, we are looking for formal regions. A formal region is marked by homogeneity in one or more criteria or phenomena. A formal physical region is based on a shared physical geographic criterion, such as the karst region of China (Fig. 1.18).

A **formal region** has a shared trait—it can be a shared cultural trait or a physical trait. In a formal cultural region, people share one or more cultural traits. For example, the region of Europe where French is spoken by a majority of the people can be thought of as a French-speaking region. When the scale of analysis shifts, the formal region changes. If we shift scales to the world, the French-speaking formal region expands beyond France into former French colonies of Africa and into the overseas departments that are still associated politically with France.

A **functional region** is defined by a particular set of activities or interactions that occur within it. Places that are part of the same functional region interact to create connections. Functional regions have a shared political, social, or economic purpose. For example, a city has a surrounding region within which workers commute, either to the downtown area or to subsidiary centers such as office parks and shopping malls. That entire urban area, defined by people moving toward and within it, is a functional region. Thus a functional region is a spatial system; its boundaries are defined by the limits of that system. Functional regions are not necessarily culturally homogeneous; instead, the people within the region function together politically, socially, or economically. The city of Chicago is a functional region, and the city itself is part of hundreds of functional regions—from the State of Illinois to the seventh federal reserve district.

Finally, regions may be primarily in the minds of people. **Perceptual regions** are intellectual constructs designed to help us understand the nature and distribution of phenomena in human geography. Geographers do not agree entirely on their properties, but we do concur that we all have impressions and images of various regions and cultures. These perceptions are based on our accumulated knowledge about such regions and cultures. Perceptual



Figure 1.18
Guilin, China. The South China Karst region, bisected here by the Li River outside Guilin, is an UNESCO World Heritage Site. © Alexander B. Murphy.



Figure 1.19
Mid-Atlantic Cultural Region. One delimitation of the Mid-Atlantic culture region. *Adapted with permission from:* H. Glassie, *Pattern in the Material Folk Culture of the Eastern United States.* Philadelphia: University of Pennsylvania Press, 1968, p. 39.

regions are not just curiosities. How people think about regions has influenced everything from daily activity patterns to large-scale international conflict. A perceptual region can include people, their cultural traits, such as dress, food, and religion; places and their physical traits, such as mountains, plains, or coasts; and built environments, such as windmills, barns, skyscrapers, or beach houses.

But where is this Mid-Atlantic region? If Maryland and Delaware are part of it, then eastern Pennsylvania is, too. But where across Pennsylvania lies the boundary of this partly cultural, partly physical region, and on what basis can it be drawn? There is no single best answer (Fig. 1.19).

Major news events help us create our perceptual regions by defining certain countries or areas of countries as part of a region. Before September 11, 2001, we all had perceptions of the Middle East region. For most of us, that region included Iraq and Iran but stretched no farther east. As the hunt for Osama bin Laden began and the media focused attention on the harsh rule of the Taliban in Afghanistan, our perceptual region of the Middle East stretched farther east to incorporate Afghanistan and Pakistan. Scholars who specialize in the region had long studied the relationship between these places and areas to the west, but the similarities between Afghanistan and Pakistan and the rest of the Middle East were almost invisible to the general population.

Perceptual Regions in the United States

Cultural geographer Wilbur Zelinsky tackled the enormous, complex task of defining and delimiting the perceptual regions of the United States and southern Canada. In an article titled "North America's Vernacular Regions," he identified 12 major perceptual regions on a series of maps (summarized in Fig. 1.20). When you examine the map, you will notice some of the regions overlap in certain places. For example, the more general term *the West* actually incorporates more specific regions, such as the Pacific Region and part of the Northwest.

The problem of defining and delimiting perceptual regions can be approached in several ways. One is to conduct interviews in which people residing within as well as outside a region are asked to respond to questions about their home and cultural environment. Zelinsky used a different technique; he analyzed the telephone directories of 276 metropolitan areas in the United States and Canada, noting the frequency with which businesses and other enterprises use regional or locational terms (such as "Southern Printing

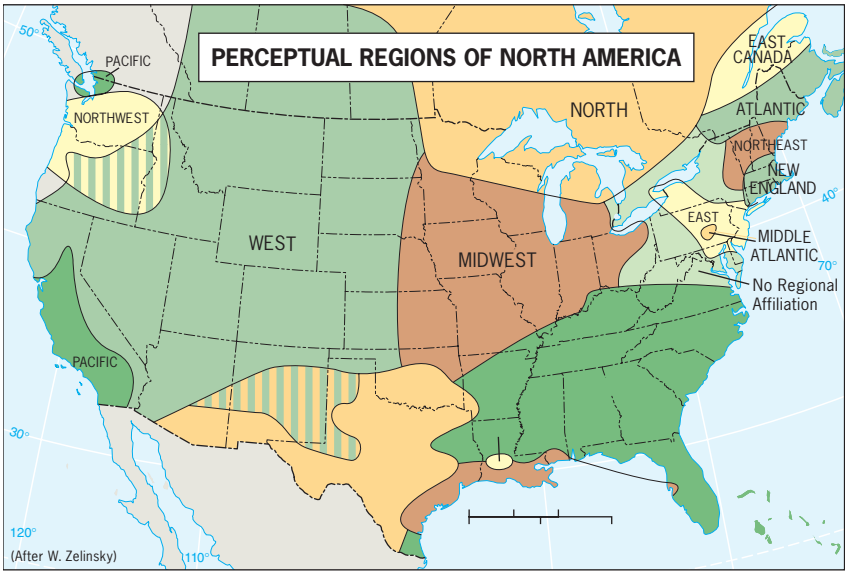


Figure 1.20
Perceptual Regions of North America. *Adapted with permission from:* W. Zelinsky, "North America's Vernacular Regions," *Annals of the Association of American Geographers*, 1980, p. 14.

Company" or "Western Printing") in their listings. The resulting maps show a close similarity between these perceptual regions and culture regions identified by geographers.

Among the perceptual regions shown in Figure 1.20, one, the South, is unlike any of the others. Even today, five generations after the Civil War, the Confederate flag still evokes strong sentiments from both those who revere the flag and those who revile it.

A "New South" has emerged over the past several decades, forged by Hispanic immigration, urbanization, movement of people from other parts of the United States to the South, and other processes. But the South—especially the rural South—continues to carry imprints of a culture with deep historical roots. Its legacy is preserved in language, religion, music, food preferences, and other traditions and customs.

If you drive southward from, say, Pittsburgh or Detroit, you will not pass a specific place where you enter this perceptual region. You will note features in the cultural landscape that you perceive to be associated with the South (such as Waffle House restaurants), and at some stage of the trip these features will begin to dominate the area to such a degree that you will say, "I am really in the South now." This may result from a combination of features in the culture: the style of houses and their porches, items on a roadside restaurant menu (grits, for example), a local radio station's music, the sound of accents that you perceive to be Southern, a succession of Baptist churches in a town along the way. These combined impressions become part of your overall perception of the South as a region.

Such cultural attributes give a certain social atmosphere to the region, an atmosphere that is appreciated by many of its residents and is sometimes advertised as an attraction for potential visitors. "Experience the South's warmth, courtesy, and pace of life," said one such commercial, which portrayed a sun-drenched seaside landscape, a bowing host, and a couple strolling along a palm-lined path.

The South has its vigorous supporters and defenders, and occasionally a politician uses its embattled history to arouse racial antagonism. But today the South is so multifaceted, diverse, vigorous, and interconnected with the rest of the United States that its regional identity is much more complicated than traditional images suggest (Fig. 1.21). This serves as an important reminder that perceptual regions are not static. Images of the South are rapidly changing, and perceptions of the South as a region will change over time.

Guest Field Note

Montgomery, Alabama



Figure 1.21

Located in a predominately African American neighborhood in Montgomery, Alabama, the street intersection of Jeff Davis and Rosa Parks is symbolic of the debates and disputes in the American South over how the past is to be commemorated on the region's landscape. The Civil War and civil rights movement are the two most important events in the history of the region. The street names commemorate Montgomery's central role in both eras, and they do so in the same public space. Montgomery was the site of the first capital of the Confederacy in 1861 while Jefferson Davis was president. The Alabama capital was also the site of the 1955–1956 Montgomery bus boycott that launched the civil rights movement. The boycott was sparked by Rosa Parks's arrest after she refused to give up her seat on a city bus when ordered to do so by a white person. Most of my research examines the politics of how the region's white and African Americans portray these separate heroic eras within the region's public spaces, ranging from support for and against flying the Confederate flag to disputes over placing statues and murals honoring the Civil War and the civil rights movement on the South's landscape.

Credit: Jonathan Leib, Old Dominion University

Regions—whether formal, functional, or perceptual—are ways of organizing humans geographically. They are a form of spatial classification, a means of handling large amounts of information so we can make sense of it.

Culture

At the heart of human geography lies the concept of **culture**. Location decisions, patterns, and landscapes are fundamentally influenced by cultural attitudes and practices. Culture refers not only to the music, literature, and arts of a society but also to all the other features of its way of life: prevailing modes of dress; routine living habits; food preferences; the architecture of houses and public buildings; the layout o f fields and farms; and systems of education, government, and law. Culture is an all-encompassing term that identifies not only the whole tangible lifestyle of peoples, but also their prevailing values and beliefs.

The concept of culture is closely identified with the discipline of anthropology, and over the course of more than a century anthropologists have defined it in many different ways. Some have stressed the contributions of humans to the environment, whereas others have emphasized learned behaviors and ways of thinking. Several decades ago the noted anthropologist E. Adamson Hoebel defined culture as

> *[the] integrated system of learned behavior patterns which are characteristic of the members of a society and which are not the result of biological inheritance… culture is not genetically predetermined; it is noninstinctive… [culture] is wholly the result of social invention and is transmitted and maintained solely through communication and learning.*

Hoebel's emphasis on communication and learning anticipated the current view of culture as a system of meaning, not just a set of acts, customs, or material products. Clifford Geertz advanced this view in his classic work, *The Interpretation of Cultures* (1973), which has influenced much recent work in human geography. Hence, human geographers are interested not just in the different patterns and landscapes associated with different culture groups, but in the ways in which cultural understandings affect both the creation and significance of those patterns and landscapes.

Cultural geographers identify a single attribute of a culture as a **culture trait**. For example, the wearing of a turban can be a culture trait of certain Muslim societies; for centuries, it was obligatory for Muslim men to wear this headgear. Although it is no longer required everywhere, the turban continues to be a distinctive trait of many Muslim societies.

Culture traits are not necessarily confined to a single culture. More than one culture may exhibit a particular culture trait, but each will consist of a discrete combination of traits. Such a combination is referred to as a **culture complex**. In many cultures, the herding of cattle is a trait. However, cattle are regarded and used in different ways by different cultures. The Maasai of East Africa, for example, follow their herds along seasonal migration paths, consuming blood and milk as important ingredients of a unique diet. Cattle occupy a central place in Maasai existence; they are the essence of survival, security, and prestige. Although the Maasai culture complex is only one of many cattle-keeping complexes, no other culture complex exhibits exactly the same combination of traits. In Europe, cattle are milked, and dairy products, such as butter, yogurt, and cheese, are consumed as part of a diet very different from that of the Maasai.

A **cultural hearth** is an area where cultural traits develop and from which the cultural traits diffuse. Often a cultural trait, for example, the religion of Islam, can be traced to a single place and time. Muhammad founded Islam in the 500s C.E. (current era) in and around the cities of Mecca and Medina on the Arabian Peninsula. Other culture traits, such as agriculture, can be traced to several hearths thousands of years apart. The term for a trait with many hearths that developed independent of each other is **independent invention**.

Connectedness through Diffusion

Diffusion occurs through the movement of people, goods, or ideas across space. The process of dissemination, the spread of an idea or innovation from its hearth (source area) to other places, is known as **cultural diffusion**. Carl Sauer focused attention on this process in *Agricultural Origins and Dispersals* in which he defined the ancient hearths of agriculture and traced the diffusion of agricultural practices from the hearths. In 1970, Swedish geographer Torsten Hägerstrand published pioneering research on the role of time in the diffusion process. Hägerstrand's research revealed how time, as well as distance, affects individual human behavior and the diffusion of people and ideas. Sauer and Hägerstrand's fascinating research attracted many geographers to the study of diffusion processes. Geographers are still using principles of diffusion to model movement and diffusion through GIS and other geographic techniques.

Whether diffusion of a cultural trait occurs depends, in part, on time and distance from the hearth. The farther a place is from the hearth, the less likely an innovation is to be adopted. Similarly, the acceptance of an innovation becomes less likely the longer it takes to reach its potential

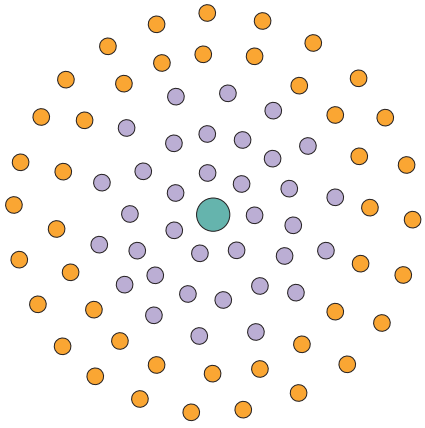
adopters. In combination, time and distance cause **time-distance decay** in the diffusion process.

Cultural barriers can also work against diffusion. Certain innovations, ideas, or practices are not acceptable or adoptable in particular cultures because of prevailing attitudes or even taboos. Prohibitions against alcoholic beverages, as well as certain forms of meat, fish, and other foods, restrict their consumption in certain areas. Cultural barriers against other practices, such as the use of contraceptives, also have inhibited diffusion processes. Cultural barriers can pose powerful obstacles to the spread of ideas as well as artifacts.

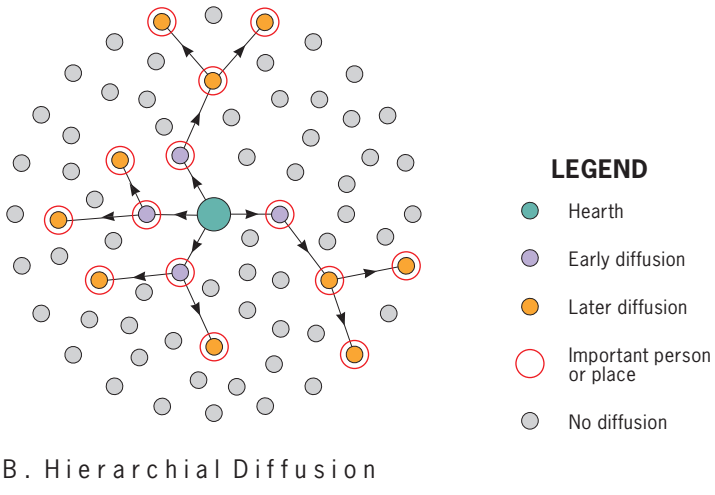
Expansion Diffusion

Geographers classify diffusion processes into two broad categories: expansion diffusion and relocation diffusion. In the case of **expansion diffusion**, an innovation or idea develops in a hearth and remains strong there while also spreading outward (Fig. 1.22). Later, for example, we will study the spread of Islam from its hearth on the Arabian Peninsula to Egypt and North Africa, through Southwest Asia, and into West Africa. This is a case of expansion diffusion. If we were to draw a series of maps of followers of Islam (Muslims) at 50-year intervals beginning in 620 C.E., the area of adoption of Islam would be larger in each successive period.

Expansion diffusion takes several forms. The spread of Islam is an example of **contagious diffusion**, a form of expansion diffusion in which nearly all adjacent individuals and places are affected. A disease can spread in this way, infecting almost everyone in a population (although not everyone may show symptoms of the disease). However, an idea such as a new fashion or new genre of music may not always spread throughout a contiguous population. For example, the spread of Crocs



A. Contagious Diffusion



B. Hierarchial Diffusion

Figure 1.22
Contagious and Hierarchical Diffusion. © E. H. Fouberg, A. B. Murphy, H. J. de Blij, and John Wiley & Sons, Inc.

footwear is a case of **hierarchical diffusion**, a pattern in which the main channel of diffusion is some segment of those who are susceptible to (or adopting) what is being diffused. In the case of Crocs, founder Scott Seamans found a clog manufactured by a Canadian company that was created out of the unique croc resin material. Seamans, an avid sailor, put a strap on the back and holes for drainage. He and two co-founders of the crocs company based the company in Boulder, Colorado, had the shoes manufactured, and sold them at boat shows in 2002 and 2003. Crocs footware diffused from boating enthusiasts to gardeners, to the American public—becoming especially popular among children, who adorned their crocs with Jibbitz, or charms designed for crocs. The hierarchy of boaters, gardeners, and then the contagious diffusion that followed helps explain the rapid growth of the crocs brand, which had revenues of over $800 million in 2007.

A third form of expansion diffusion is **stimulus diffusion**. Not all ideas can be readily and directly adopted by a receiving population; some are simply too vague, too unattainable, too different, or too impractical for immediate adoption. Yet, these ideals can still have an impact. They may indirectly promote local experimentation and eventual changes in ways of doing things. For example, the diffusion of mass-produced food items in the late twentieth century—pushed by multinational retailers—led to the introduction of the hamburger to India. Yet the Hindu religion in India prohibits consumption of beef. This was a major cultural obstacle to the adoption of the hamburger (Fig. 1.23). Instead, retailers began selling burgers made of vegetable products—an adaptation that was stimulated by the diffusion of the hamburger but that took on a new form in the cultural context of India.

Relocation Diffusion

Expansion diffusion spreads across space without people physically moving to become "knowers" of the trait or innovation. With expansion diffusion, the people stay put and the innovation, idea, trait, or disease does the moving. **Relocation diffusion**, in contrast, involves the actual movement of individuals who have already adopted the idea or innovation, and who carry it to a new, perhaps distant, locale, where they proceed to disseminate it (Fig. 1.22).

Relocation diffusion occurs most frequently through migration. When migrants move from their homeland, they take their cultural traits with them. Developing an ethnic neighborhood in a new country helps immigrants maintain their culture in the midst of an unfamiliar one. If the homeland of the immigrants loses enough of its population, the cultural customs may fade in the hearth while gaining strength in the ethnic neighborhoods abroad.





Figure 1.23 left and right

New Delhi, India (left) and Vrindavan, India (right). Hindus believe cows are holy, and in India, evidence of that can be seen everywhere from cows roaming the streets to the menu at McDonald's. In 1996, the first McDonald's restaurant opened in New Delhi, India (left), serving Maharaja Macs and Vegetable Burgers with Cheese. In Indian towns, such as Vrindavan (right), cows are protected and share the streets with pedestrians, bicyclists, and motorists. © Douglas E. Gurran/AFP/Getty Images (left) and AP/Wide World Photos (right).



Once you think about different types of diffusion, you will be tempted to figure out what kind of diffusion is taking place for all sorts of goods, ideas, or diseases. Please remember that any good, idea, or disease can diffuse in more than one way. Choose a good, idea, or disease as an example and describe how it diffused from its hearth across the globe, referring to at least three different types of diffusion.

WHAT ARE GEOGRAPHIC CONCEPTS, AND HOW ARE THEY USED IN ANSWERING GEOGRAPHIC QUESTIONS?

Geographic concepts include most of the boldfaced words in this chapter, such as relative location, mental map, perceptual region, diffusion, and cultural landscape. In doing geographic research, a geographer thinks of a geographic question, one that has a spatial or landscape component, chooses the scale(s) of analysis, and then applies one or more geographic concepts to conduct research and answer the question. Geographers use fieldwork, remote sensing, GIS, GPS, and qualitative and quantitative techniques to explore linkages among people and places and to explain differences across people, places, scales, and times.

Research in human geography today stems from a variety of theories and philosophies. To understand what geographers do and how they do it, it is easiest to start by defining what geography is not. Today's geography is not environmental determinism.

Rejection of Environmental Determinism

The ancient Greeks, finding that some of the peoples subjugated by their expanding empire were relatively docile while others were rebellious, attributed such differences to variations in climate. Over 2000 years ago, Aristotle described northern European people as "full of spirit … but incapable of ruling others," and he characterized Asian people (by which he meant modern-day Turkey) as "intelligent and inventive … [but] always in a state of subjection and slavery." Aristotle attributed these traits to the respective climates of the regions—the cold north versus the more tropical Mediterranean.

Aristotle's views on this topic were long-lasting. As recently as the first half of the twentieth century, similar notions still had strong support. In 1940, in the *Principles of Human Geography*, Ellsworth Huntington and C.W. Cushing wrote:

> *The well-known contrast between the energetic people of the most progressive parts of the temperate zone and the inert inhabitants of the tropics and even of intermediate regions, such as Persia, is largely due to climate … the people of the cyclonic regions rank so far above those of the other parts of the world that they are the natural leaders.*

The doctrine expressed by these statements is referred to as **environmental determinism**. It holds that human behavior, individually and collectively, is strongly affected by—even controlled or determined by—the physical environment. It suggests that climate is the critical factor in how humans behave. Yet what constitutes an "ideal" climate lies in the eyes of the beholder. For Aristotle, it was the climate of Greece. Through the eyes of more recent commentators from Western Europe and North America, the climates most suited to progress and productiveness in culture, politics, and technology are (you guessed it) those of Western Europe and the northeastern United States.

For a time, some geographers attempted to explain the location of major cultural hearths as solely a function of environment. Quite soon, however, certain geographers doubted whether these sweeping generalizations were valid. They recognized exceptions to the environmental determinists' theories (for example, the Maya civilization in the Americas arose in a tropical climate that most assumed was incapable of complex cultures) and argued that humanity was capable of much more than merely adapting to the natural environment. The many environmentally determinist theories that explain Europe as "superior" to the rest of the world because of the climate and location of the region ignore the fact that for thousands of years, the most technologically advanced civilizations were found outside of Europe in North Africa, Southwest Asia, Southeast Asia, and East Asia.

Chipping away at environmentally determinist theories helped move the geographic study of the relationships between human society and the environment in different directions, but for several decades some geographers still held to environmental determinist positions. In *Climate and the Energy of Nations* (1947), Sidney Markham thought that by tracing the migration of the center of power in the Mediterranean (from Egypt to

Greece to Rome), he could detect the changing climates of that part of Europe during several thousand years of glacial retreat. Markham saw the northward movement of **isotherms**—lines connecting points of equal temperature values—as a key factor in the shifting centers of power in the Ancient World. Basically, he argued that as new places "thawed" after the Ice Age, they became the center of power.

Geographers grew increasingly cautious about such speculative notions, however, and they began asking new questions about human–environment relationships. If generalizations were to be made, they felt they ought to arise from detailed, carefully designed research. Everyone agrees that the natural environment affects human activity in some ways, but people are the decision makers and the modifiers—not just the slaves of environmental forces. People and their cultures shape environments, constantly altering the landscape and affecting environmental systems.

Possibilism

Reactions to environmental determinism produced counterarguments. An approach known as **possibilism** emerged—espoused by geographers who argued that the natural environment merely serves to limit the range of choices available to a culture. The choices that a society makes depend on what its members need and on what technology is available to them. Geographers increasingly accepted the doctrine of possibilism, and geographers increasingly discredited environmental determinism. For those who have thought less carefully about the human–environment dynamic, environmental determinism continues to hold an allure, leading to some highly questionable generalizations about the impact of the environment on humans and a multitude of popular books that use environment as the dominant force in explaining complex histories.

Even possibilism has its limitations because it encourages a line of inquiry that starts with the physical environment and asks what it allows. Human cultures frequently push the boundaries of what is "environmentally possible" through advances in technology—their own ideas and ingenuity. In the interconnected, technologically dependent world we live in today, it is possible to do many things that are at odds with the local environment.

Research today tends to focus on how and why humans have altered environment, and on the sustainability of their practices. In the process, the perspectives of **cultural ecology** (an area of inquiry concerned with culture as a system of adaptation to and alteration of environment) have been supplemented by those of **political ecology**—an area of inquiry fundamentally concerned with the environmental consequences of dominant political-economic arrangements and understandings (see Chapter 13). The fundamental point is that human societies are diverse and the human will is too powerful to be determined by environment.

Today's Human Geography

Human geography encompasses many subdisciplines, including political geography, economic geography, population geography, and urban geography. Human geography also incorporates cultural geography, including cultural traits such as religion, language, and ethnicity.

Cultural geography is both part of human geography and also its own approach to all aspects of human geography. Cultural geography looks at the ways culture is implicated in the full spectrum of topics addressed in human geography. As such, cultural geography can be seen as a perspective on human geography as much as a component of it.

To appreciate more fully the vast topics researched by human geographers, we can examine the multitude of careers human geographers pursue. Human geographers have titles such as location analyst, urban planner, diplomat, remote sensing analyst, geographic information scientist, area specialist, travel consultant, political analyst, intelligence officer, cartographer, educator, soil scientist, transportation planner, park ranger, or environmental consultant. All of these careers and more are open to geographers because each of these fields is grounded in place and is advanced through spatial analysis.



Choose a geographic concept introduced in this chapter. Think about something that is of personal interest to you (music, literature, politics, science, sports), and think about how you could use a geographic concept to study this interest. Think about space and location, your geographic concept, and your interest. Write a geographic question that could be the foundation of a geographic study.

Summary

Our study of human geography will analyze people and places and explain how they interact across space and time to create our world. Chapters 2 and 3 lay the basis for our study of human geography by looking at where people live. Chapters 4–7 focus on aspects of culture and how people use culture and identity to make sense of themselves in their world. The remaining chapters examine how people have created a world in which they function economically, politically, and socially, and how their activities in those realms re-create themselves and their world.

Geographic Concepts

fieldwork
human geography
globalization
physical geography
spatial
spatial distribution
pattern
medical geography
pandemic
epidemic
spatial perspective
five themes
location
location theory
human–environment
region
place
sense of place
perception of place
movement
spatial interaction
distance
accessibility
connectivity
landscape
cultural landscape
sequent occupance
cartography
reference maps
thematic maps
absolute location
global positioning system
geocaching
relative location
mental map
activity space
generalized map
remote sensing
geographic information systems
rescale
formal region
functional region
perceptual region
culture
culture trait
culture complex
cultural hearth
independent invention
cultural diffusion
time-distance decay
cultural barrier
expansion diffusion
contagious diffusion
hierarchical diffusion
stimulus diffusion
relocation diffusion
geographic concept
environmental determinism
isotherm
possibilism
cultural ecology
political ecology

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click on Video On Demand for “One Earth, Many Scales”