

Chapter 1: Introduction to Human Geography (from Fouberg/Murphy/de Blij, *Human Geography: People, Place, and Culture*, 11th ed.)

Field Note: Awakening to World Hunger

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 that nearly all of the agricultural fields I could see were planted with coffee or tea. 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?” Trying to answer such a question sheds light on the complexities of globalization. In a globalized world, connections are many and simple answers are few.

On its face, such a huge problem might 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-seventh 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.

Food consumption is currently distributed unevenly. Wealthier countries also are the best fed and Sub-Saharan Africa (the part of Africa south of the Sahara Desert) is currently in the worst position, with numerous countries in the highest categories of hunger and malnourishment.

The major causes of malnourishment are poverty (inability to pay for food), the failure of food distribution systems, and cultural and political practices that favor some groups over others. Where food does reach the needy, its price may be unaffordable. Two billion people subsist on the equivalent of two dollars a day, and many in the vast shantytowns encircling some of the world’s largest 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. Despite this disparity, Norway is wealthy and well fed, whereas Bangladesh is poor and malnourished. Norway overcomes its inadequate food production by importing food. Bangladesh depends on rice as its staple crop, and the monsoon rains that flood two-thirds of the country each year during monsoon season are good for rice production, but they make survival a daily challenge for some.

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 others. For example, only 8 percent of Kenya’s land is arable, but areas in the western highlands are 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 it produces, who owns the land, and how Kenya is tied into the global economy.

Kenya’s most productive lands, 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.

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 an increasingly globalized 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 poverty and malnutrition in the country. In addition to these structural concerns, Kenyan agro-pastoralists, especially in the northeast, have suffered higher rates of famine since a drought began in the region in 2006. Agro-pastoralists raise crops and have livestock; therefore, they struggle against drought as well as livestock diseases and political conflict.

To solve one of the structural problems in Kenya 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?

Answering each of these questions requires geographic inquiry because the answers are rooted in the characteristics of places and the connections those places have to other places. Moreover, geographic **fieldwork** can provide tremendous insights into such questions. Geographers have a long tradition of fieldwork. They go out in the field and see what people are doing, they observe how people's actions and reactions vary across space, and they develop maps and other visualizations that help them situate and analyze what they see. We, the authors, have countless field experiences, and we share many with you understand the diversity of Earth's surface and show how global processes have unique outcomes in different places.

Solving major global problems such as hunger or HIV-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, enable you to recognize the patterns of human geographic phenomena that shape the world, give you an appreciation for the uniqueness of place, and teach you to ask and answer your own geographic questions about this world we call home.

Key Question 1: 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, people can cross the globe in a matter of days, with easy access to automobiles, high-speed railroads, airplanes, and ships.

Economic globalization and the rapid diffusion of elements of popular culture, including fashion and architecture, are making many people and places look more alike. Despite the push toward homogeneity, 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 a wide variety of settlement types, ranging 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.

Places all over the world are fundamentally affected by globalization. **Globalization** is a set of processes that are increasing interactions, deepening relationships, and accelerating interdependence across national borders. Globalization 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 the global, seen as a blanket covering the world, and the local, seen as a continuation of the traditional despite the blanket of globalization. Geographers are well placed to recognize globalization as something significantly more complex. Geographers employ the concept of “scale” to understand individual, local, regional, national, and global interrelationships. 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 influence the global. Reducing the world to “local” and “global” risks losing sight of the complexity that characterizes modern life. In this book, we study globalization, and as geographers we are sensitive to the fact that the same globalized process has different impacts in different places because no two places are the same. Moreover, whenever we look at something at one scale, we always try to think about how processes that exist at other scales may affect what we are looking at, and vice versa.

Globalizing processes occur at the world scale; these processes bypass country borders and include global financial markets and 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 the impacts of globalization are exaggerated, but as geographers Ron Johnston, Peter Taylor, and Michael Watts (2002) 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, processes that are not confined to local places or national borders, are clearly changing the human geography of the planet. At the same time, as we travel the world and continue to engage in fieldwork and research, we are constantly reminded of how different places and people are from one another – 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 social 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.

Key Question 2: What are geographic questions?

Geographers study human phenomena, including language, religion, and identity, as well as physical phenomena, including landforms, climate, and environmental change. Geographers also examine the interactions between humans and environment. Human geography is the study of the spatial and material characteristics of physical environment. Human and physical geographers adopt a similar perspective but focus on different phenomena.

Geographer Marvin Mikesell once gave a shorthand definition of geography 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? How do the characteristics of particular places shape what happens? To what extent do things in one place influence those in other places? To these questions, we add “so what?” Why do differences across geographic space matter? What role does a place play in its region and in the world, and what does that mean for people there and

elsewhere? Questions like 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 bring to their studies: a spatial perspective. Whether they are human geographers or physical geographers, virtually all geographers are interested in the **spatial** arrangements of places and phenomena, how they are laid out, organized, and arranged on Earth, and how they appear on the landscape.

Mapping the **spatial distribution** of a phenomenon can be 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 distributions of **patterns**, and what relationships exist among 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 an ancient disease associated with diarrhea and dehydration. It 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**, that is, worldwide outbreaks of the disease. This initial wave abated by 1823, but by then 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. Approximately 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 it. The result was dramatic: Almost immediately the number of reported new cases fell to nearly zero, confirming Snow's theory about the role of water in the spread of cholera.

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 might be affected, and in any case many people simply did not have the ability to boil water or wash hands with soap.

Cholera has not been defeated completely, and in some ways the risks have been rising in recent years rather than falling. People contract cholera by eating food or water contaminated with cholera bacteria. Cholera bacteria diffuse to broader areas because once one person has cholera it can be spread via his or her feces. In an impoverished area with no sanitary sewer system, the person's feces can easily contaminate the water supply, flood the sanitary sewer system.

We expect to find cholera in places that lack sanitary sewer systems and in places that are flood prone. In many of the teeming shantytowns of the growing cities of the developing world, and in some of 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. In 2006, a cholera outbreak in Angola, in southern Africa,

spread quickly throughout the country. When heavy rains came to West Africa in 2010, an outbreak of cholera killed 1500 people in Nigeria alone.

A cholera outbreak in the slums of Lima, Peru, in January 1991 became a fast-spreading **epidemic** (regional outbreak of a disease) that touched every country in the Americas, infected more than 1 million people, and killed over 10,000 in the region. The outbreak in Peru began when ocean waters warmed off the coast. Cholera bacteria live on plankton in the ocean, and the warming of the ocean allowed both the plankton and cholera to multiply. Fish ate the plankton, and people ate raw fish, thus bringing cholera to Peru.

In the slums of Peru, the disease diffused quickly. The slums are densely populated and lack a sanitary sewer system large enough to handle the waste of the population. An estimated 14 million Peruvians were infected with cholera, 350,000 were hospitalized, and 3500 Peruvians died during the outbreak in the 1990s. Peruvians who accessed health care received clean water, salts, and antibiotics, which combat the disease.

In January 2010, an earthquake that registered 7.0 on the Richter scale hit Haiti, near the capital of Port au Prince. Months later there was a cholera outbreak in the Artibonite region of Haiti. Health officials are not certain exactly how cholera reached Haiti, but the disease diffused quickly through refugee camps and by October 2010 reached the capital city of Port au Prince. Scientists worry that the cholera outbreak in Haiti will be long lasting because the bacteria have contaminated the Artibonite River, which is the water supply for a large region. Although purifying the water through boiling and thoroughly washing hands prevents the spread of cholera, water contaminated with cholera and a lack of access to soap abound in many neighborhoods of world cities. A vaccine exists, but its effectiveness is limited, 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 lifesaving in Snow's case, and the example illustrates the general advantage that comes from looking at the geographic context of events and circumstances. Geographers want to understand how and why places are similar or different, why people do different things and the physical world varies across space.

The Spatial Perspective

Geographic literacy involves much more than memorizing places on a map. Place locations are to geography what dates are to history. History is not merely about 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 across space is equally important to understanding change over time. 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 these perspectives rather than being confined to a subject matter.

Human geographers employ 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 formed the Geography Educational National Implementation Project in the 1980s. The National Geographic Society published their findings in 1986, introducing the **five themes** of geography: location, human-environment interactions, region, place, and movement. The five themes are derived from geography's spatial concerns.

The Five Themes

The first theme, **location**, highlights how the geographical position of people and things on 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 practice: Why are villages, towns and cities spaced the way they are? A geographer versed in location theory might assess whether a SuperTarget should be built downtown or in a suburb, given the characteristics of existing neighborhoods and new developments, the median income of 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, land use, and road networks.

A spatial perspective invites consideration of the relationship among phenomena in individual places – including the relationship between humans and the physical world. 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 it 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? Asking locational questions often means looking at the reciprocal relationship between humans and environments.

The third theme of geography is the **region**. Phenomena are not evenly distributed on Earth's surface. Instead, features tend to be concentrated in particular areas, which we call regions. Geographers use fieldwork and both 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 place-based information as well.

The fourth theme is represented by the seemingly simple word **place**. All places on the surface of 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** where 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. What we know shapes our perceptions of places.

The fifth theme, **movement**, refers to the mobility of people, goods, and ideas. 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 human geography.

Cultural Landscape

In addition to the five themes – location, human-environment interaction, region, place, and movement – **landscape** is a core element of geography. Geographers use the term *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 Sauer's words, 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. 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 building, roads, memorials, churches, fields, and homes that human activities over time have stamped on the landscape.

Cultural landscapes have layers of impressions from compounded years of human activity. As each group of people arrives and occupies a place, they carry their own technological and cultural traditions and transform the landscape accordingly. Imprints made by a sequence of occupants, whose impacts are layered one on top of the other, were described as a cultural landscape of **sequent occupance** in 1929 by Derwent Whittlesey. 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 (now Mumbai) India. 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 on the cultural landscape.

A 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." Like Whittlesey, Lewis recommended looking for layers of history and cultural practice in cultural landscapes, adding that most major changes in the cultural landscape occur after a major event, such as a war, an invention, or an economic depression.

Key Question 3: Why do geographers use maps, and what do maps tell us?

Maps are incredibly powerful tools in geography, and **cartography**, which is the art and science of making maps, is as old as geography itself. Maps are used for countless purposes, including waging war, promoting political positions, solving medical problems, locating shopping centers, bringing relief to refugees, and warning 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 accurately show the **absolute locations** of places, using a coordinate system that allows for the precise plotting of 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 simple. The coordinate system most frequently used on maps is based on 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 lines.

Establishment of the satellite-based **global positioning system** (GPS) allows us to locate features on Earth with extraordinary accuracy. Researchers collect data quickly and easily in the field, and low-priced units encourage fishers, hunters, runners, and hikers to use GPS in their activities. New cars are equipped with GPS units, and dashboard map displays help commuters navigate traffic and travelers find their way. **Geocaching** is a popular 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. Smartphones are equipped with GPS units, helping spread the use of GPS even further.

Relative location describes the location of 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 major roads lead to Chicago. Within this region, people define much of their lives relative to Chicago because of the tight interconnectedness between Chicago and the region. Northwest Indiana is so connected to Chicago that it has 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 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. During the Civil War, several bloody battles took place in Fredericksburg as the North and South fought 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 region (North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas) in your mind. Even if your mental map is not accurate, you still use it to process information about the Great Plains. 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 affected by it.

Our mental maps of the places within our **activity spaces**, the places we travel to routinely in our rounds of daily activity, are more accurate and detailed than our mental maps of places where we have never been. If your friend calls and asks you to meet her at the movie theater you go to frequently, 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 mental maps. The earliest humans, who were nomadic, had incredibly accurate mental

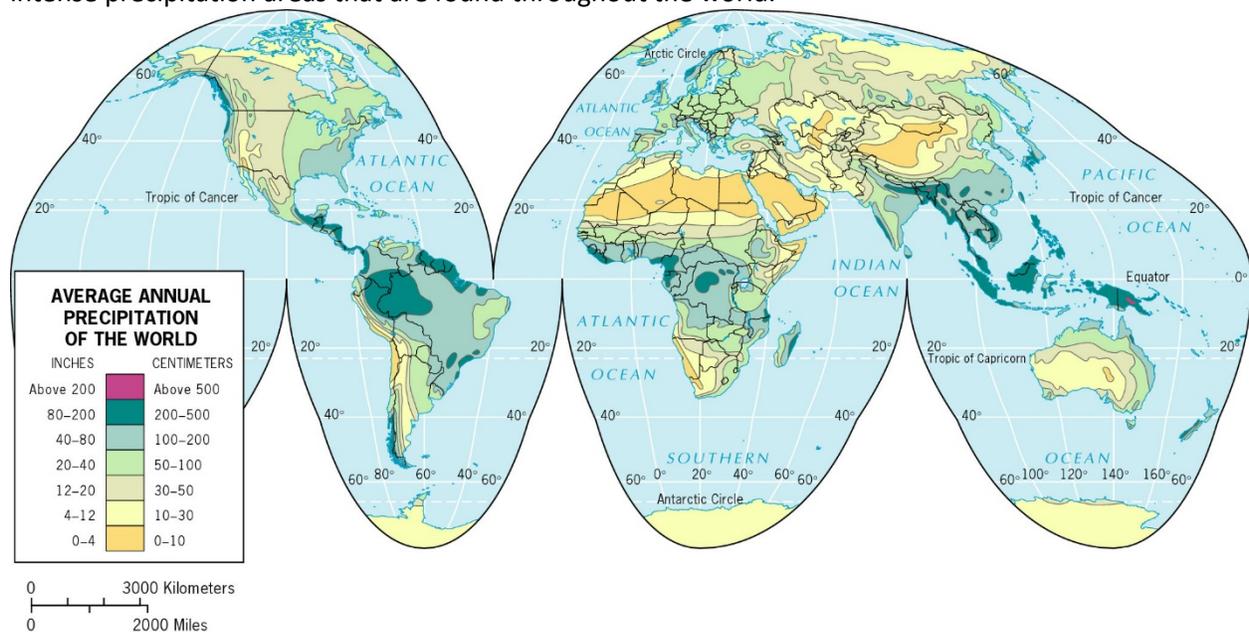
maps of where to find food and seek shelter. Today, people need mental maps to find their way through the concrete jungles of cities and suburbs.

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 attend, your map on paper may 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, including 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 the precise path of every hurricane for the last 50 years. 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 a phenomenon is present, and symbols show where specific phenomena are located.

Generalized maps help us see general trends, but we cannot see all cases of a given phenomenon. The map of world precipitation is a generalized map of mean annual precipitation received around the world. The areas shaded in 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 year brings precipitation to the equatorial region. At the scale of the world, we can see the microscale climates of intense precipitation areas that are found throughout the world.



Remote Sensing and GIS

Geographic studies include both long- and short-term environmental change. Geographers monitor Earth from a distance, using **remote sensing** technology. Remotely sensed data are collected by satellites and aircraft and are often almost instantaneously available.

After a major weather or hazard event, such as the 2011 floods in the Mississippi River Valley, the unprecedented hurricane season in the Gulf of Mexico in 2005 (which included Hurricane Katrina), or the 2010 earthquakes in Haiti and Chile, remotely sensed data show us the major areas of impact. A remotely sensed image surveys the damage of the earthquake, and photos taken on the ground show the impact and destruction.

In states that restrict foreign access or that do not reliably allow foreign aid to enter the country, remote sensing can help geographers understand the physical and human geography of the place. ArcGIS Online is a free, web-based user-friendly GIS. You can create a map in ArcGIS Online and set the background to world imagery, which is composed of satellite and aerial images from a variety of sources. The images are accurate to .3 meters in the continental United States and western Europe and to 1 meter in the rest of the world.

Remotely sensed images can be incorporated in a map, and absolute locations can be studied by plotting change in remotely sensed imagery 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 analysis based on **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, 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 insights into geographic patterns and relationships.

Geographers use GIS in both human and physical geographic research. For example, political geographers use GIS to map layers showing voters, party registration, race and ethnicity, likelihood of voting, and 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 how many voters are inside the region, determining the racial composition of the district, and show how many of the current political representatives live within the new district's boundaries.

Geographers trained in GIS employ the technology in countless undertakings. Students who earn undergraduate degrees in geography are employed by software companies, government agencies, and businesses to use GIS to survey wildlife, map soils, analyze natural disasters, track diseases, assist first responders, plan cities, plot transportation improvements, and follow weather systems. For example, a group of geographers working for one GIS company tailors the GIS software to serve the branches 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 that can be undertaken on a computer platform, and the ease of analysis that is possible using GIS software applications allow geographers to answer complicated questions. For example, geographer Korine Kolivras analyzed the probability of dengue fever outbreaks in Hawaii using GIS. 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 GISci. Geographic information science (GISci) is a 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 GISci that draws across disciplines, bringing together computer scientists who write the programs, engineers who create sensors that gather data about Earth, and geographers who combine layers of data and interpret them to make sense of our world.

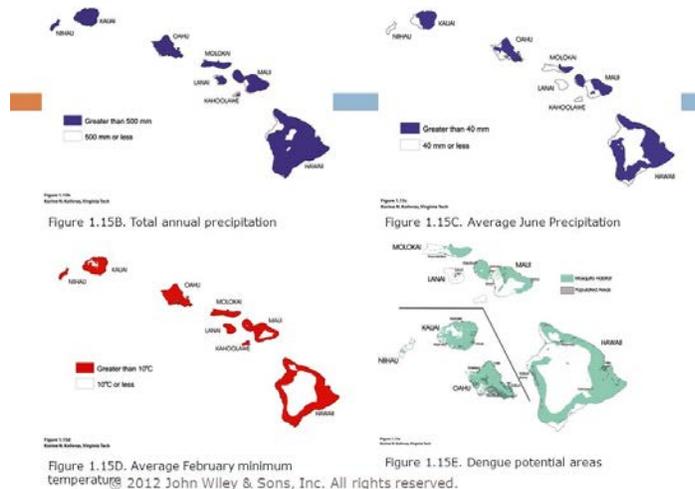
Guest Field Note: Korine N Kolivras, Virginia Tech

The diffusion of diseases carried by vectors, such as 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 diversity of 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 in which the mosquitos likely bred during the 2001-2002 dengue outbreak. I talked to public health officials who worked so hard to control the dengue outbreak so that I better understood the local environmental factors contributing to the disease. I visited a family that 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, but also seasonal variations in precipitation and temperature, 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.

The GIS model I created can now be altered by public officials in Hawaii to reflect the 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.



Key Question 4: Why are geographers concerned with scale and connectedness?

Geographers study places and patterns across 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 Earth, and the second is the spatial extent of something. When we refer to scale we are using the second of these definitions. Geographers' interest in this type of scale derives from the fact that phenomena found at one scale are usually influenced by what is happening at other scales. Explaining a geographic pattern or process requires looking across scales. Moreover, 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 the global scale affects localities and how what is happening at a local scale affects the globe. Or we can study a phenomenon at a particular scale and then ask how processes at other scales affect what we are studying.

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 material wealth at the scale of the globe, we see that the countries in western Europe, Canada, the United States, Japan, and Australia are the wealthiest, and the countries of Sub-Saharan 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, 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, supplemented by oil revenues shared among the residents.

By shifting scales again to just one city, for example, metropolitan Washington, D.C., you observe the suburbs west, northwest, and southwest of the city are the wealthiest and that suburbs to the 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, D.C., 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 from single men or how immigrants with visas cope differently from paperless immigrants, but no two individual cases are exactly the same.

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 study how processes operating at different scales influence 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. 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 – all influenced Rwanda and help to explain the context of the conflict.

Geographers are also interested in how people use scale politically. Locally based political movements, 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 local scale to the national scale through 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 relatively few local political movements achieve.

Geographer Victoria Lawson uses the term *jumping scale* to describe such rescaling activities. She compares the ways in which Western countries, multinational corporations, and the World Trade Organization take products and ideas created in Western places and by Western corporations and globalize all rights to profits from them through intellectual property law. Efforts to push Western views of intellectual property challenge 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 can serve to legitimate that view and negate other regional and local views.

Regions

A region constitutes an area that shares similar characteristics and as a whole is distinct from other regions. Geographers define regions as formal, functional, or perceptual.

A **formal region** has a shared trait, either physical or cultural. A formal physical region is based on a shared physical geographic criterion, such as the karst region of China. In a formal 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. Whether physical or cultural, when the scale of analysis shifts, the formal region changes. If we shift scales to the world, the karst region expands to lands that were previously underwater and are now covered in limestone, and the French-speaking formal region expands beyond France into former French colonies of Africa and into the overseas departments that are still under French jurisdiction.

A **functional region** is defined by a particular set of activities or interactions that occur within it. Places (also called nodes) 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 office parks in suburbs. That entire urban area, defined by people moving toward and within it, is a functional region. A functional region is a spatial connection among nodes, and the extent of the connections defines the boundaries of the region. 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 is itself part of hundreds of functional regions – from the State of Illinois to the seventh Federal Reserve district.

Regions may be perceptual, intellectual constructs that help people order their knowledge and understanding of the world. Each person carries **perceptual regions** in their mind based on accumulated knowledge of regions and cultures. Perceptual regions can include people and their cultural traits (dress, food, language, and religion), places and their physical traits (mountains, plains, or coasts), and built environments (windmills, barns, skyscrapers, or beach houses).

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, most Americans thought the Middle East 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, regional perceptions of the Middle East changed; for many, the region now stretched to encompass Afghanistan and Pakistan. Scholars who specialize in this part of the globe had long studied the relationship between parts of Southwest Asia and the traditional “Middle East,” but the connections between Afghanistan and Pakistan and the rest of the Middle East had been almost invisible to the American population.

Perceptual Regions in the United States

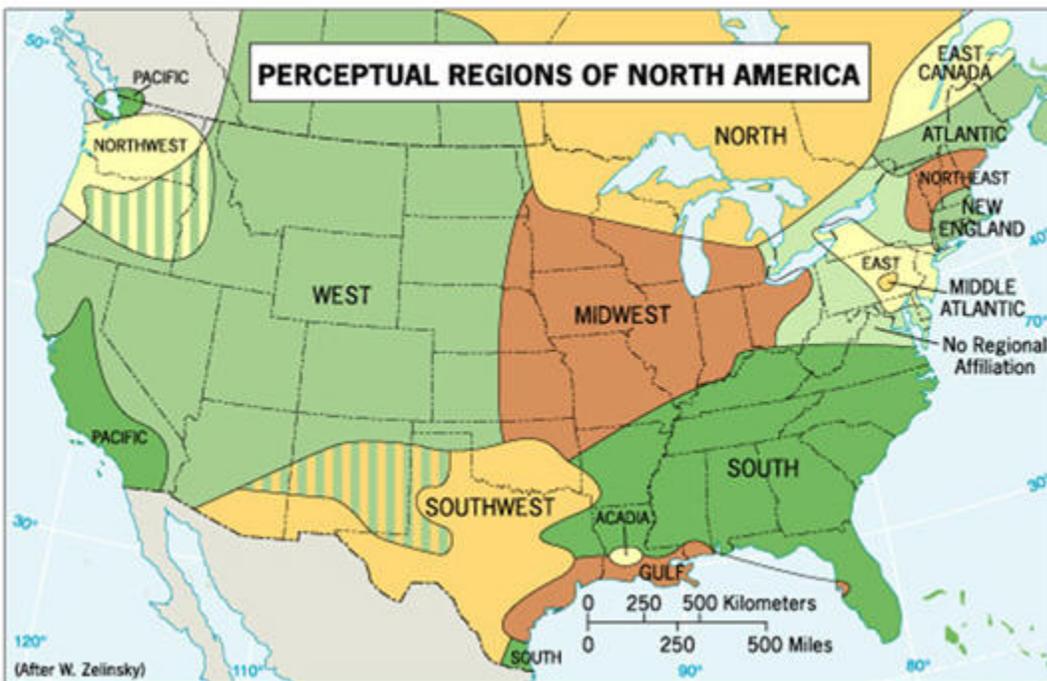
Cultural geographer Wilbur Zelinsky tackled the complex task of defining and delimiting the perceptual regions of the United States and southern Canada. In an article titled “North America’s Vernacular Regions,” he identified 12 major perceptual regions on a series of maps. When you examine the map, 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.

To make his regional map of the United States, Zelinsky 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 Company” or “Western Printing”) in their listings. The resulting maps show a close similarity between these perceptual regions and culture regions identified by geographers.

The perceptual region of the South has changed markedly since the civil rights movement of the 1960s. A “New South” has emerged, forged by Hispanic immigration, urbanization, movement of people from other parts of the United States to the South, and other processes. At the same time, the South continues to carry imprints of a culture with deep historical roots through 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.

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



Culture

Culture refers not only to the music, literature, and arts of a society but 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 of 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. Culture lies at the heart of human geography.

Academics, from human geographers to anthropologists, have sought to define culture. 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. 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, wearing a turban is a culture trait in certain societies. Many men in the semiarid and desert areas of North Africa, Southwest Asia, and South Asia wore turbans before the birth of Islam. The turbans protected the wearers from sunlight and also helped distinguish tribes. Not all Muslims wear turbans, but in some Muslim countries, including Afghanistan, wearing turbans is popular because either religious or political leaders prescribe it for men. Today, turbans often distinguish a man's status in society or are worn as a sign of faithfulness to God. In some Muslim countries, including Egypt and Turkey, men rarely wear turbans. When men in other Muslim countries do wear turbans, the appearance of the turban varies a great deal. For instance, in Yemen men who cover their heads typically wear kalansuwa, which are caps wrapped in fabric. In Palestine, Jordan, and Saudi Arabia, men who cover their heads typically wear kaffiyeh, which are rectangular pieces of cloth draped and secured on the head.

Wearing turbans is not a cultural trait limited to Muslims. In the United States, most men who cover their heads with a turban are Sikhs, which is a different religion from Islam. In the Sikh religion, men are required to keep their hair uncut. The common practice is to twist the hair and knot it on top of one's head and then cover it with a turban. The Sikh religion began in the 1500s, and in the late 1600s, the tenth guru of the religion taught that wearing a turban was a way to demonstrate one's faithfulness to God.

As the turban example exhibits, a culture trait is not always confined to a single culture. More than one culture may exhibit a particular culture trait, like turbans. A distinct combination of culture traits is a **culture complex**. Herding of cattle is a cultural trait shared by many cultures. Across cultures, cattle are regarded and used in different ways. 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 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 cultural traits diffuse. Culture traits, for example the religion of Islam, can be traced to a single place and time. Muhammad founded Islam in the 600s C.E. (common 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. When such a trait develops in more than one hearth without being influenced by its development elsewhere, each hearth operates as a case of **independent invention**.

Connectedness Through Diffusion

Historians believe the innovation of agriculture began independently in hearths in Europe, Africa, and Asia. Drawing from archaeological evidence, geographer Carl Sauer established that Mesoamerica was also a hearth for agriculture, another case of independent invention. From these hearths of agriculture, the ideas of purposefully planting and caring for seeds and feeding and raising livestock spread throughout the world in a process called diffusion.

In 1970, Swedish geographer Torsten Hagerstrand published pioneering research on the role of time in diffusion. Hagerstrand's research revealed how time, as well as distance, affects individual human behavior and the dissemination of people and ideas. Sauer and Hagerstrand's fascinating research attracted many geographers to the study of **diffusion**. Geographers are still using principles of diffusion to create models of movement in GIS.

Whether a cultural trait diffuses to a place depends, in part, on the time and distance from the hearth. The farther a place is from the hearth, the less likely an innovation will 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.

Not all cultural traits or innovations diffuse. Prevailing attitudes or cultural taboos can mean that certain innovations, ideas, or practices are not acceptable or adoptable in particular cultures. Religious teachings may prohibit certain practices or ideas, such as divorce, abortion, or contraceptive use, on the grounds of theology or morality. Some cultures or religions prohibit consumption of alcoholic beverages, and others prohibit consuming certain kinds of meat and other foods. Prescriptions cultures make about behavior act as **cultural barriers** and can pose powerful obstacles to the spread of ideas or innovations.

Expansion Diffusion

When a culture trait, such as a religion, spreads, it does so from a hearth. Islam's hearth was on the Arabian Peninsula, and from there, Islam diffused to Egypt and North Africa, through Southwest Asia, and into West Africa. This is a case of expansion diffusion, when an innovation or idea develops in a hearth and remains strong there while also spreading outward. Geographers classify diffusion 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.

When a trend or innovation diffuses quickly, it seems to come out of nowhere and then can "explode" and be seen virtually everywhere you look. In 1996, Kevin Plank, a recent graduate of the University of Maryland who played football as a walk-on for the Terrapins, invented a heat gear shirt that would wick sweat away and be a cooling layer under football gear. Plank called his new body-hugging gear Under Armour. He gave samples of polyester heat gear Under Armour shirts to his friends at the University of Maryland and to friends at other football teams in the East Coast Conference. The first "knowers" of the new Under Armour brand were football players connected to Kevin Plank or to college teams on the east coast.

The spread of Under Armour heat gear 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 are already adopting) what is being diffused. Under Armour diffused from college and professional football players who were

trying to stay cool and keep their clothing light while practicing in the hot sun twice a day, to lacrosse players and other athletes who were friends of the football players, then to young athletes who were friends of the football players, then to young athletes around the United States who, as fans, took note of the Under Armour logo on their favorite players' sportswear and wanted to wear what their idols were wearing, and finally to those who saw people they knew wearing Under Armour clothing and bought the gear as a fashion trend. The hierarchy of football players, other athletes, and then the **contagious diffusion** among school-age children that followed helps explain the rapid growth of the Under Armour brand, which had revenues of \$200 million in 2004 and \$2 billion in 2013.

Plank started giving away Under Armour heat gear, sold the shirts out of the trunk of his car from a base at his grandmother's home in Washington, D.C., and then set up headquarters from the company in Baltimore, Maryland. As is the case in expansion diffusion, the hearth of Under Armour has remained strong. The University of Maryland has close ties to Under Armour, which designed an innovative (some thought it was cool and some thought it was garish) new football uniform in 2011. In 2014, the University of Maryland signed a ten-year sponsorship agreement with Under Armour, one of 19 sponsorships Under Armour has with universities.

College and professional athletes whose teams had contracts with Nike or Adidas wanted to wear heat gear clothing, and some wore Under Armour beneath their Nike and Adidas uniforms. This prompted Nike, Adidas, and other athletic companies to offer their own performance gear, including compression shirts, compression shorts, and sports bras bearing their logo. Under Armour acted as a stimulus to Nike's Pro Performance line and Adidas's Clima Ultimate line. Under Armour's performance line prompted **stimulus diffusion** or local experimentation and change in the Nike and Adidas brands. The performance apparel market alone was expected to reach \$7.6 billion by 2014, and Forbes estimates the entire global sports apparel market will reach \$178 billion by 2019. According to Forbes, 70 percent of Under Armour's stock revenue in 2014 was generated by sales of performance apparel, and Under Armour captured 14.7 percent of the global sports apparel market, second to Nike with 27 percent of the market.

Culture traits, rather than economics, can prohibit contagious diffusion and encourage stimulus diffusion as well. 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 ideas can still have an impact. They may indirectly promote local experimentation and eventual changes in ways of doing things. For example, the diffusion of fast, mass-produced food in the late twentieth century led to the introduction of the hamburger to India. Yet the Hindu religion in India prohibits consumption of beef, which is a major cultural obstacle to adoption of the hamburger. Instead, retailers began selling burgers made of vegetable products. The diffusion of the hamburger took on a new form in the cultural context of India. With expansion diffusion, whether contagious or hierarchical, the people stay in place and the innovation, idea, trait, or disease does the moving.

Relocation Diffusion

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. **Relocation diffusion** 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. 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.

Key Question 5: What are geographic concepts, and how are they used in answering geographic questions?

To think geographically, start by asking a geographic question, one with a spatial or landscape component. Then choose the scale(s) of analysis for your research and apply one or more geographic concepts to answer the question. **Geographic concepts** give us insight and help us understand people, place, space, location, and landscape.

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 and incorporates a broad range of geographic concepts.

Rejection of Environmental Determinism

To understand what geographers do and how they do it, it is easiest to start by defining what geography is not. The ancient Greeks noticed that some of the peoples subjugated by their expanding empire were relatively docile while others were rebellious; they 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 the inhabitants of modern-day Turkey) as “intelligent and inventive...[but] always in a state of subjection and slavery.” Aristotle attributed peoples’ response to being taken over by an outside power to the respective climates of the regions. In his mind, the cold northern European environment encouraged people to rebel and the warmer climate of Southwest Asia forced people to become enslaved.

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.

Huntington and Cushing claim 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 Mediterranean 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. Each of these theories can be classified as **environmental determinism**, which holds that human behavior, individually and collectively, is strongly affected by, even controlled or determined by, the physical environment.

Environmentally deterministic 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 not in Europe. The hearths of the agricultural and urban revolutions and the hearths of all of the world’s major religions were in North Africa, Southwest Asia, Southeast Asia, and East Asia, not Europe.

Chipping away at deterministic explanations helped move the geographic study of the relationships between human society and the environment in different directions. 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, motivated primarily by cultural traits, economics, and politics, shape environments, constantly altering the landscape and impacting environmental systems.

Possibilism

In response to environmental determinism, geographers 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 called this doctrine **possibilism**.

Even possibilism, however, has its limitations, partly because it encourages a line of inquiry that starts with the physical environment and asks what it allows. Human cultures, however, frequently push the boundaries of what is “environmentally possible” through their own ideas and ingenuity, and advances in technology. In the interconnected, technologically dependent world, it is possible to transcend many of the limitations imposed by the natural environment.

Today, much research in human geography focuses on how and why humans have altered their environment, and on the sustainability of their practices. In the process, the interest in **cultural ecology**, an area of inquiry concerned with culture as a system of adaptation to and alteration of environment, has been supplanted by interest in **political ecology**, an area of inquiry fundamentally concerned with the environmental consequences of dominant political-economic arrangements and understandings. 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 today seeks to make sense of the spatial organization of humanity and human institutions on Earth, the character of the places and regions created by people, and the relationships between humans and the physical environment. Human geography encompasses many sub-disciplines, including political geography, economic geography, population geography, and urban geography. Human geography also encompasses cultural geography, which incorporates a concern with culture 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 varying titles: 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, and environmental consultant. All of these careers and more are open to geographers because each of these fields is grounded in the understanding of places and is advanced through spatial analysis.