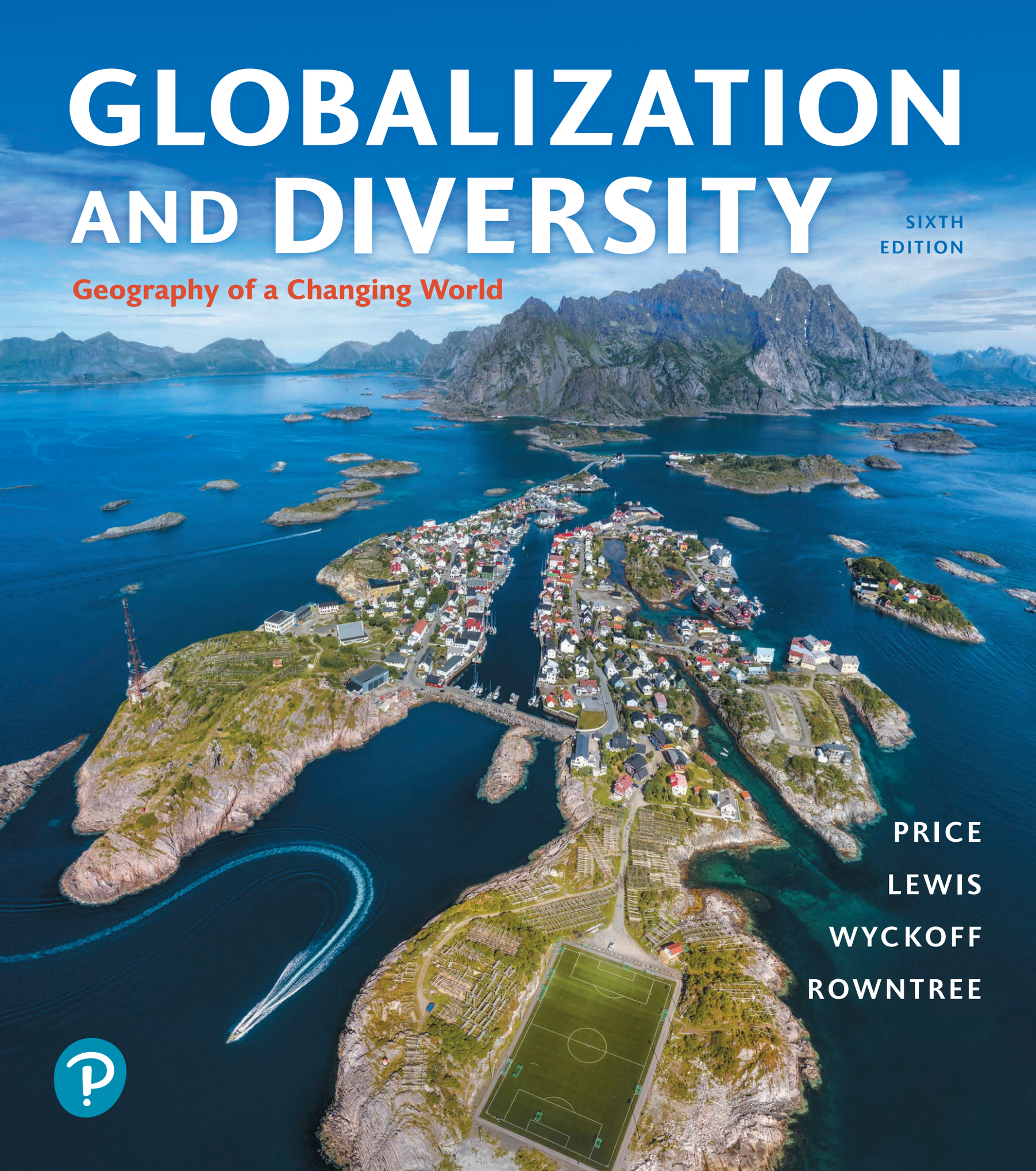
GLOBALIZATION AND DIVERSITY

SIXTH EDITION

Geography of a Changing World



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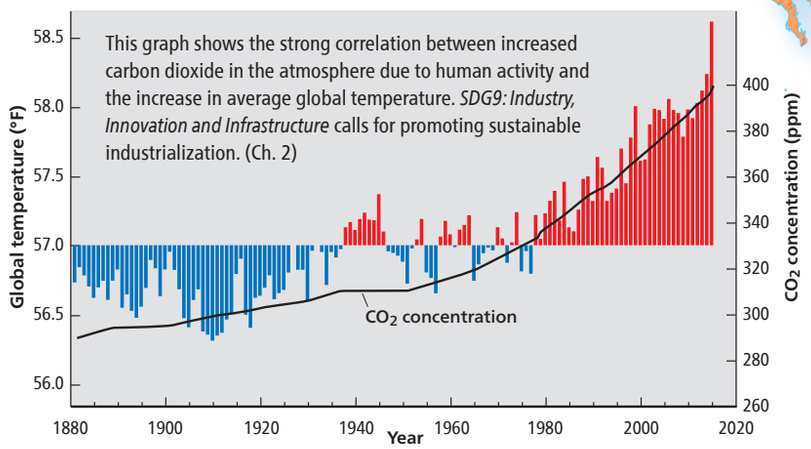
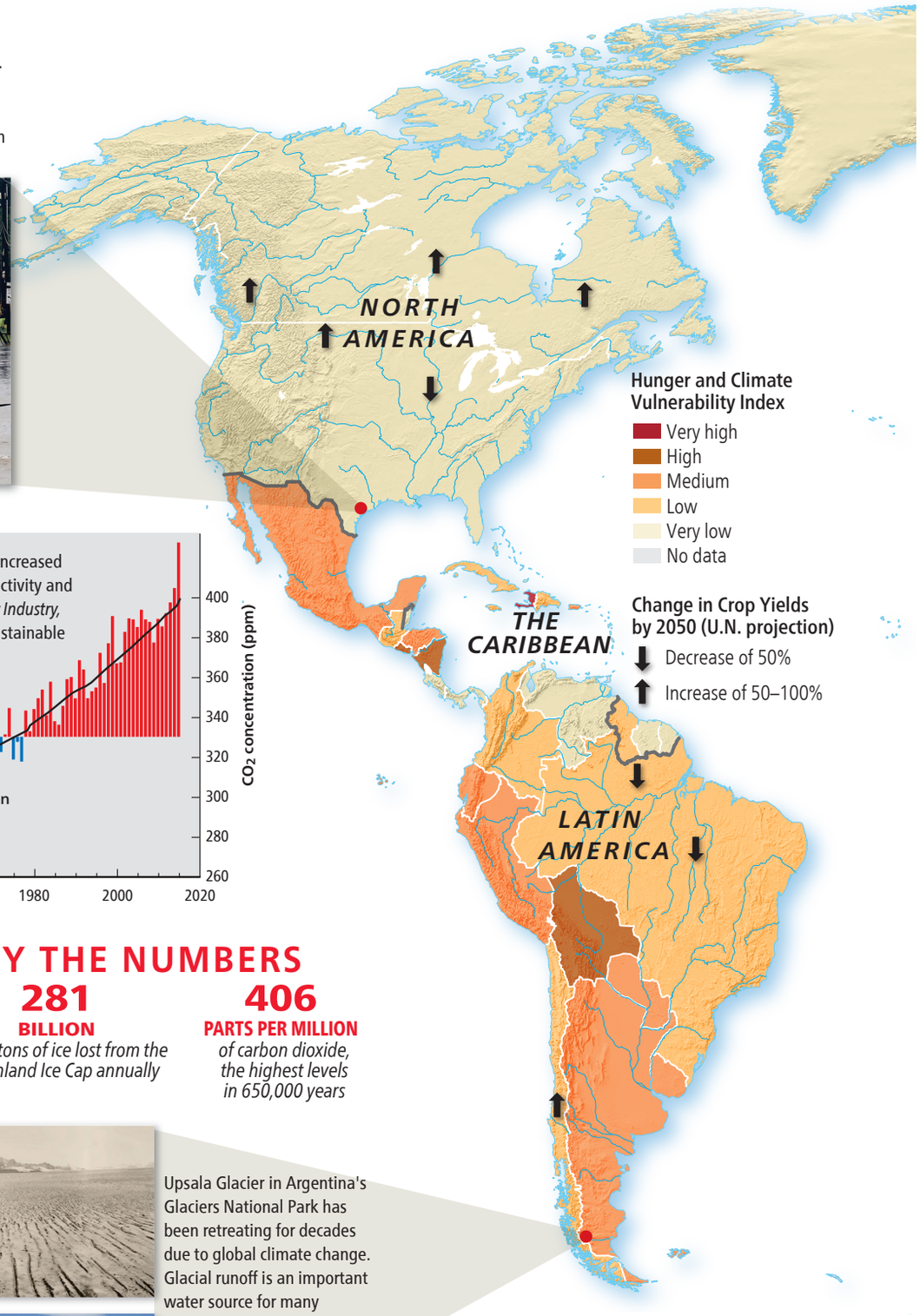
GLOBAL CLIMATE CHANGE, FOOD SECURITY, AND SUSTAINABLE DEVELOPMENT GOALS

Earth's temperature continues to rise due primarily to greenhouse gases (GHG) emitted by human activity. Corresponding environmental changes impact food production as farmlands are damaged or diminished. Food insecurity can lead to poverty, conflict, and mass migration as people look for better living conditions elsewhere.

In 2016, the United Nations adopted Sustainable Development Goals (SDGs) to tackle global issues like climate change and food security through 17 interconnected missions. SDGs challenge every country to promote better living conditions for all while protecting the planet.

Torrential rains from Hurricane Harvey flooded Houston in 2017. Global climate change may lead to more intense storms, threatening rural and urban places alike. *SDG11: Sustainable Cities and Communities* calls for more resilient, sustainable urban practices. (Ch. 3)





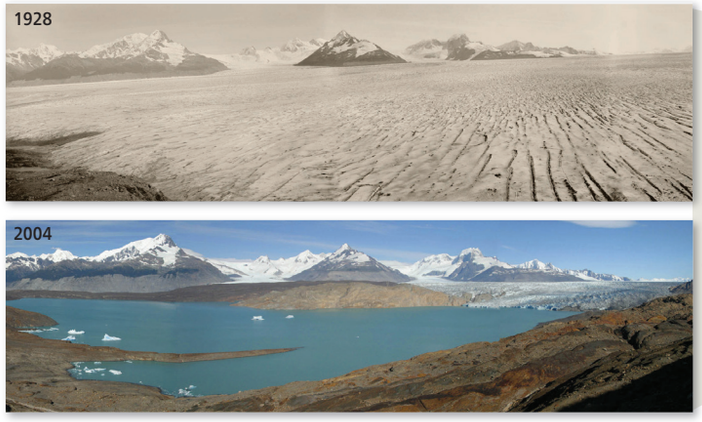
CLIMATE CHANGE BY THE NUMBERS

13.3
PERCENT
decrease per decade of Arctic ice since 1980

7
INCHES
of sea-level rise in the past 100 years

281
BILLION
metric tons of ice lost from the Greenland Ice Cap annually

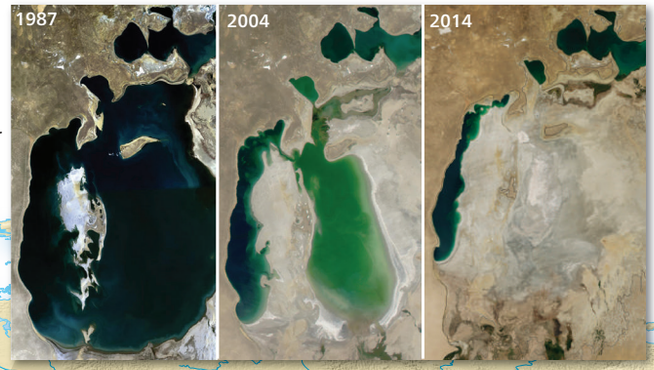
406
PARTS PER MILLION
of carbon dioxide, the highest levels in 650,000 years



Upsala Glacier in Argentina's Glaciers National Park has been retreating for decades due to global climate change. Glacial runoff is an important water source for many regions. *SDG6: Clean Water and Sanitation* calls for better management of freshwater ecosystems. (Ch. 4)

Map labels indicate Earth's 12 world regions, as defined by *Globalization and Diversity*

Sources: World Food Programme, United Nations FAO, World Health Organization, NASA, NOAA



The Aral Sea has been shrinking due to water diversion, devastating fisheries and farmlands. *SDG2: Zero Hunger* calls for sustainable agricultural practices. (Ch. 10)

EURASIA

EUROPE

CENTRAL ASIA

EAST ASIA

NORTH AFRICA/ SOUTHWEST ASIA

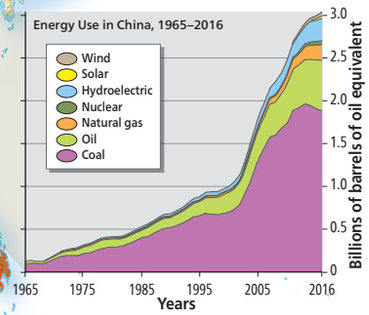
SOUTH ASIA

SOUTHEAST ASIA

SUB-SAHARAN AFRICA

OCEANIA

Most of China's energy demand is still met by burning coal and oil, although use of renewables is steadily increasing. *SDG7: Affordable and Clean Energy* calls for greater integration of renewable energy sources. (Ch. 11)

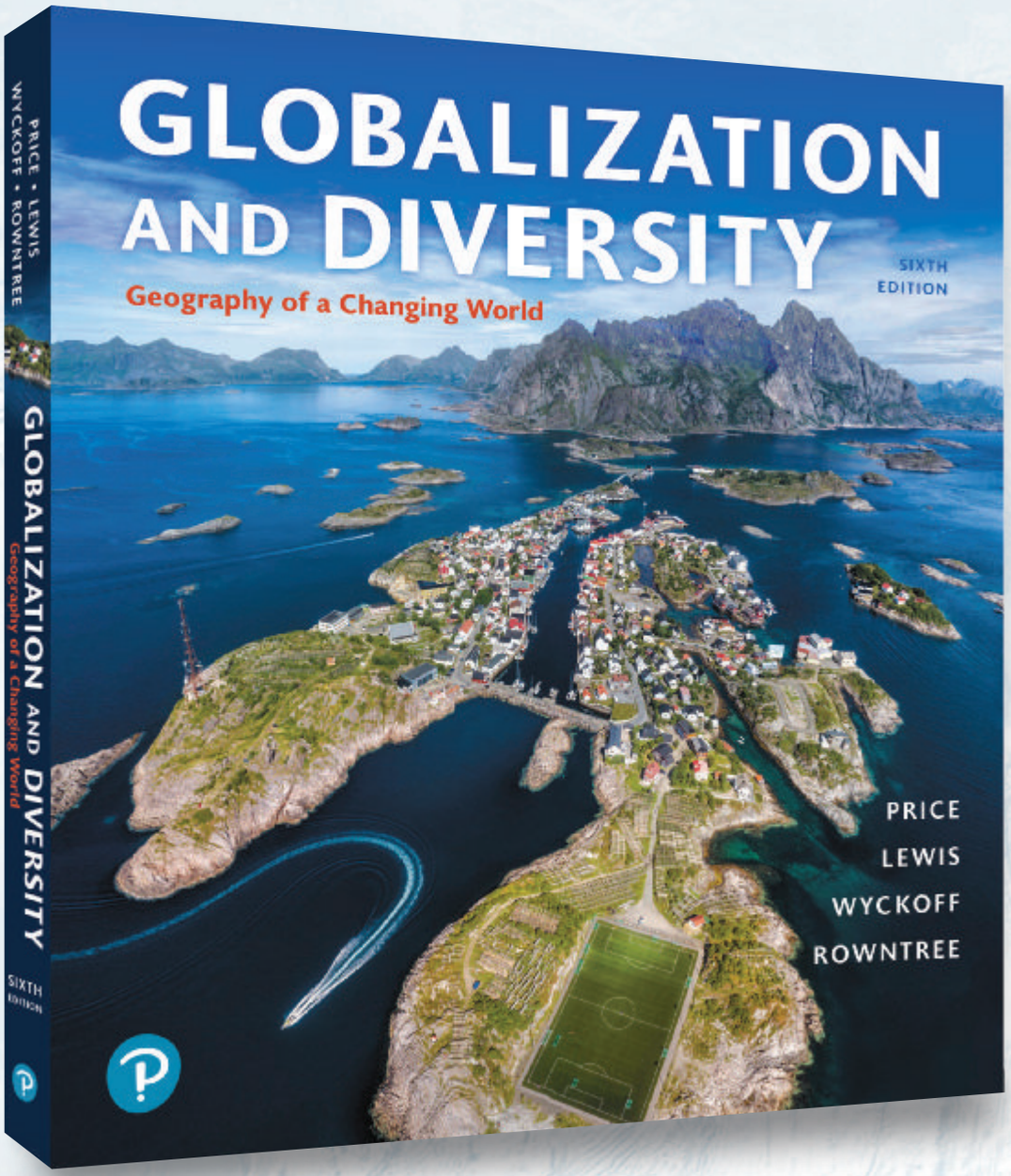


Low-lying parts of Bangladesh suffer repeated flooding due to more intense storms and sea-level rise, threatening the livelihood of millions. *SDG1: Ending Poverty* calls for supporting disaster-prone countries and regions at economic risk. (Ch. 12)

A Senegalese pastoralist moves his herd toward grass and water. Overgrazing combined with drought threatens food supplies in the Sahel. *SDG15: Life on Land* calls for halting and reversing land degredation. (Ch. 6)

Pacific Climate Warriors representing the island states of Oceania march in Bonn, Germany, to protest the loss of land due to sea-level rise. *SDG13: Climate Action* calls for all countries to support coordinated international responses. (Ch. 14)

Empowering Students to Address Global Issues



***Globalization and Diversity,* Sixth Edition**

The sixth edition has a deep emphasis on humanitarian geography and sustainability, and encourages students to explore the sights, sounds, and tastes of world regions with embedded links to online digital resources.

Pearson

How Geographers Help Make the World a Better Place

HUMANITARIAN GEOGRAPHY

Unmasking the Tragedy in Flint, Michigan

▲ Figure 3.1.1 Rick Sadler

Rick Sadler, a geographer and GIS expert at Michigan State University, helped to uncover the roots of the water crisis that has recently plagued Flint, Michigan (Figure 3.1.1). In an effort to save money, the state directed the cash-strapped city to switch its water supply to the local Flint River in 2014. Tragically, the naturally more turbid water was not treated properly. Flint's new water supply corroded lead from delivery and home service lines, resulting in lead poisoning for thousands of residents, including many children. But initially no one knew the source of the problem. A local pediatrician suspected that the elevated lead levels in Flint children were linked to Flint River water, and called on Sadler to examine the data.

Remapping the Data Sadler quickly realized that the data that state officials used were based on Flint ZIP codes, larger units that did not match city boundaries or represent the residents drinking the tainted water. "One-third of the addresses with a Flint ZIP code weren't in the city," Sadler recalls, and used a different water source. Remapping the data by the actual street addresses of children with elevated lead levels revealed a strong correlation with use of Flint River water. These older homes often house lead pipes that proved vulnerable to corrosion and leaching. Sadler's evidence confirmed the cause of the poisoning.

A Flint native, Sadler has been interested in mapping "as long as I can remember" and enrolled in GIS courses as an undergraduate. After returning to Flint, he became known as "the map guy" while working with different community groups. Sadler says his heart is in issues relevant to the city: "The more I learned about issues that drove Flint's decline...the more I felt compelled to not just understand them, but to uncover some of the spatial patterns—to use the tools that I had learned."

Based on Sadler's findings and intense public outcry surrounding the crisis, Flint returned to a safer water supply. Yet the crisis continues: less than 25 percent of the 20,000 affected lead-rich pipes had been upgraded by 2017, and contaminated water and its associated effects remain a daily challenge for thousands (Figure 3.1.2). Meanwhile, the spatial tools and geographic analysis that Sadler employed to confirm the source of the Flint tragedy have aided legal and criminal proceedings to address liability and seek environmental justice for affected residents.

Sadler notes that GIS is applicable to many public health issues, and that a geographer's multidisciplinary approach can be invaluable: "It's like being a goalie as opposed to being a forward. It's a special position that not everyone does, but it's absolutely essential."

1. Why do you think ZIP code zones are often used to map U.S. public health issues?

2. Find a map of local ZIP codes and argue why they may or may not be useful in studying environmental or social problems. What might be a better unit of analysis?

▲ Figure 3.1.2 Flint Residents Receive Bottled Water Volunteers from Full Gospel Churches in Michigan deliver bottled water to residents of Flint.

GOOGLE EARTH Virtual Tour Video

NEW! Humanitarian Geography features demonstrate how geographic tools and approaches improve the human condition when confronted with current challenges such as natural disasters, disease outbreaks, crisis and humanitarian mapping, and Sustainable Development Goals (SDGs).

UPDATED! Working Toward Sustainability features explore how the theme of sustainability plays out across world regions, looking at initiatives and positive outcomes of environmental and cultural sustainability. All features are integrated with Quick Response (QR) links to Google Earth® Virtual Tour Videos.

WORKING TOWARD SUSTAINABILITY

Saving the Great Barrier Reef

Scientists call it the world's single largest expression of a living organism. Stretching through the azure- and turquoise-tinted waters of the Coral Sea for more than 1400 miles (2300 km) off the coast of Queensland, the Great Barrier Reef (GBR) includes more than 900 small islands and a myriad of underwater coral reefs (Figure 14.1.1). This remarkable ecosystem is home to 1500 species of fish, 400 species of coral, whales, dolphins, sea turtles, sea eagles, terns, and plant species found nowhere else on Earth (Figure 14.1.2). Taking more than 10,000 years to form, the reef has been a UN World Heritage Site since 1981, and much of the area is protected by Australia's Great Barrier Reef Marine Park.

Fighting for Survival Today, however, the GBR is in the fight of its life. Thanks to global climate change, the reef has lost more than half its coral cover since 1985, much of it damaged by warmer ocean temperatures that have accelerated rates of seawater acidification and coral bleaching. Bleaching occurs when the organism experiences increased stress from changing temperature, light, or nutrient conditions. The stressed corals expel helpful algae, causing them to turn white. Bleached corals may survive but are more susceptible to disease and death.

Coastal development also has added to its watery woes: More intensive agriculture in Queensland has produced ocean-bound sediment and increased runoff of toxic agricultural chemicals. Recent plans for expanding coal-loading depots at Abbot Point include potentially dumping waste rock onto the reef, a practice sure to disrupt the purity of local waters. On a hopeful note, the reef contributes to a huge tourist industry in Queensland, amounting to more than $4.8 billion annually. That translates into powerful economic interests that are actually committed to preserving the reef's environmental health.

Adapting to Change Recently, the Australian government pledged over $100 million toward improving reef water quality and toward innovations designed to slow future bleaching episodes. Farmers in nearby Queensland will be paid subsidies to limit runoff of harmful sediments and agricultural chemicals. Another area of investment is the development of a floating, sunscreen-like film that could protect especially vulnerable reefs by limiting the harmful rays of direct sunlight (which hasten the bleaching process). Additional money has been allocated toward targeting the crown of thorns starfish which has widely invaded delicate reef systems, making them even more vulnerable to bleaching and death. Scientists are also working to develop new genetic strains of coral that may be more resistant to global climate change and could be used to repopulate damaged settings.

Still, the long-term story for the GBR will probably hinge upon responsible choices for development along the Queensland coast as well as the further global-scale impacts of ocean warming and acidification that will no doubt affect the region in coming decades. In addition, better aerial surveillance (such as more satellite reconnaissance and use of high-tech drones) of the Marine Park may monitor rogue fishing vessels more effectively in the future. For now, the reef's survival hangs in the balance, a giant poster child for a long list of damaging human impacts that threaten the environmental health of the entire South Pacific.

1. How might economic development in Queensland proceed while at the same time preserving the environmental health of the GBR?

2. Cite a fragile and protected environmental area in your region and briefly outline future prospects for its survival.

▲ Figure 14.1.1 Australia's Great Barrier Reef Off the eastern coast of Australia, the Great Barrier Reef stretches for more than 1400 miles (2300 km) through the Coral Sea.

▲ Figure 14.1.2 Great Barrier Reef's Diverse Ecosystem This undersea view of the Great Barrier Reef features yellow sea-fan corals, acroporas (hard and white corals), and purple anthias (fish).

GOOGLE EARTH Virtual Tour Video

Connecting the Global to the Local

GLOBALIZATION IN OUR LIVES

Putin May Want to Be Your Friend

Russian operatives, Internet trolls, and hackers conducted a sustained campaign to influence the U.S. presidential election in 2016, according to the CIA, FBI, and the National Security Agency. These efforts included running anti-Clinton propaganda on Russian media outlets, hacking Democratic Party emails, and releasing these materials via WikiLeaks, and posting pro-Trump and politically divisive ads on a variety of social media that many of us use every day.

The abuse of social media platforms included Twitter, Facebook, Google, and Instagram, and was a reminder of the vulnerability of these virtual communities. More than 2700 fake Twitter accounts and 36,000 bots churned out pro-Trump tweets and political posts. Russian operatives purchased 80,000 Facebook ads that reached over 125 million users. The Russian-backed "Internet Research Agency" was the source of many of these bogus ads, but a lack of regulations and oversight at the time prevented many people from questioning their veracity or sources. Finally, Facebook CEO Mark Zuckerberg, aware that the Russians had outfoxed him, put in place more security measures designed to catch future abuses (Figure 9.4.1).

Russia's global reach into national elections is nothing new, but the pace of cyber-interference in the world of social media and computer hacking has accelerated since 2014. Russia has also used its superiority in the cyberworld to attempt to influence elections in the United Kingdom, Germany, France, and elsewhere. Has it worked? No one knows, but the next time you jump on your favorite social media site, you may be closer to your Russian comrades than you know.

1. **What geopolitical advantages might Russians hope to gain by interfering with elections in western Europe and the United States?**
2. **Are you vulnerable to being influenced by unethical ads or posts on your social media sites? Why or why not?**

▲ Figure 9.4.1 **Mark Zuckerberg, Facebook CEO** Following the 2016 U.S. Presidential election, Zuckerberg and Facebook were criticized after it was revealed that Russian operatives had misused American social media during the campaign.

NEW! Globalization in Our Lives features explore common familiar commodities, cultural norms, activities, or popular culture that could be in a college student's experience or social network, showing how globalization connects their behavior or consumption across world regions.

UPDATED! Exploring Global Connections features describe unexpected and often surprising connections across world regions, leveraging recent events and coverage of cultural and environmental topics. All features are integrated with QR links to Google Earth Virtual Tour Videos.

EXPLORING GLOBAL CONNECTIONS

South America's Lithium Triangle

High in a remote corner of the Andes, where Bolivia, Argentina, and Chile meet, is the largest known reserve of lithium in the world. This soft, silver-white metal is an essential element in lightweight batteries, like those that power cell phones and laptops. It is also a key metal for electric vehicle batteries and photovoltaic cells. Companies such as Tesla, Samsung, and Apple are keenly aware of the cost and scarcity of lithium, which could greatly benefit these developing economies. Yet possessing more than half of the world's lithium is only step one—being able to extract it for global markets has been the challenge.

Lithium is found under salt flats in South America's Altiplano region, at elevations of up to 13,000 ft (Figure 4.4.1). Miners must extract the lithium-bearing brine from wells sunk deep below the salt crust and then deposit the liquid into evaporation ponds to let the sun do its work. Once sun-baked, the concentrate is taken for processing into lithium carbonate. South America's lithium boom thus far has been hindered by a lack of technology and capital, as well as national laws that designate lithium a strategic metal and therefore limit investment from foreign companies. Bolivia and Argentina have the largest known reserves, but Australia is the leading producer, followed by Chile. China rounds out the top five lithium source countries.

For decades, Chile has been the region's export leader, sending lithium carbonate primarily to manufacturers in South Korea, China, and Japan. The Atacama salt flats have the highest quality reserves, and ports such as Antofagasta are relatively close (Figure 4.4.2). Moreover, Chile's neoliberal policies have been more open to foreign investment in mining. Argentina is trying to catch up through increased foreign investment in lithium extraction around Jujuy province. In 2016, it produced about half as much lithium as Chile. Bolivia, which may have the largest reserves under the Salar de Uyuni salt flat, has yet to become a significant producer. This is partly due to the state's tight control of the resource and the wariness of foreign investors to engage in this country, which is noted for nationalizing key resources such as natural gas. As far as Bolivians are concerned, they need only look to the nearby mountain of Potosí, whose silver financed Spain's colonization of the Americas, to understand that owning a resource does not mean profiting from it.

1. **What are the factors that make Chile the leading South American exporter of lithium?**
2. **What are the products that you use that need lithium to function?**

▲ Figure 4.4.1 **Lithium Mining in South America** The largest lithium deposits in the world are found where Bolivia, Chile, and Argentina converge. Lithium is a critical metal for lightweight batteries used in cell phones and laptops.

▲ Figure 4.4.2 **Lithium Processing in San Pedro de Atacama, Chile** In the high Atacama desert, lithium-laden brine is pumped out of the ground and into evaporation ponds. Once dried, the powdery substance is shipped and processed into lithium.

GOOGLE EARTH
Virtual Tour Video

A Structured Learning Path to Support Today's Students

Physical Geography and Environmental Issues

China has long experienced severe deforestation and soil erosion, and its current economic boom is generating some of the world's worst pollution problems. Japan, South Korea, and Taiwan, however, have extensive forests and relatively clean environments.

Population and Settlement

Low birth rates and aging populations are found throughout East Asia. China is currently undergoing a major transformation as tens of millions of peasants move from impoverished villages in the interior to booming coastal cities.

Cultural Coherence and Diversity

Despite several unifying cultural features, East Asia in general and China in particular are divided along striking cultural lines. Historically, however, the entire region was linked by Mahayana Buddhism, Confucianism, and the Chinese writing system.

Geopolitical Framework

China's growing power is generating tension with other East Asian countries, while Korea remains a divided nation. As China's global influence grows, Japan, South Korea, and Taiwan are responding by strengthening ties with the United States.

Economic and Social Development

East Asia has been a core area of the world economy for several decades, with China undergoing one of the world's most rapid economic expansions. North Korea, however, remains desperately poor, plagued by widespread malnutrition.

UPDATED! Critical Themes of Geography
Following two unique introductory chapters, each regional chapter is organized into five thematic sections, making navigation and cross-regional comparisons easy for students and instructors. Themes include Physical Geography and Environmental Issues, Population and Settlement, Cultural Coherence and Diversity, Geopolitical Framework, and Economic and Social Development.

UPDATED! Region-specific Learning Outcomes in each chapter's opening pages outline the knowledge and skills that students should gain from each chapter.

LEARNING OBJECTIVES

After reading this chapter you should be able to:

- **11.1** Contrast the physical geographies of the islands of East Asia (Japan and Taiwan) and the mainland.
- **11.2** Describe the main environmental problems China faces today and compare them with environmental challenges faced by Japan, South Korea, and Taiwan.
- **11.3** Explain why China's population is so unevenly distributed, with some areas densely settled and others almost uninhabited.
- **11.4** Summarize the distribution of major urban areas on the map of East Asia and explain why the region's largest cities are continuing to grow.
- **11.5** Describe how religion and other systems of belief both unify and divide East Asia.
- **11.6** Explain the distinction between, and geographical distribution of, the Han Chinese and the other ethnic groups of China, paying particular attention to language.
- **11.7** Outline the geopolitical division of East Asia during the Cold War era and explain how that division still influences East Asian geopolitics.
- **11.8** Identify factors behind East Asia's rapid economic growth in recent decades and discuss possible limitations to continued expansion at such a rate.
- **11.9** Summarize the geographical differences in economic and social development found in China and across East Asia as a whole.

UPDATED! Two Review Questions at the end of each section help students check their comprehension as they read, and are followed by a listing of the key terms from each section, reinforcing the key concepts from each chapter section.

REVIEW

- **11.3** Why does East Asia import so much of its food and natural resources from other parts of the world?
- **11.4** Describe how the urban landscape of China is currently changing.

KEY TERMS anthropogenic landscape, hukou, urban primacy, megalopolis

REVIEW

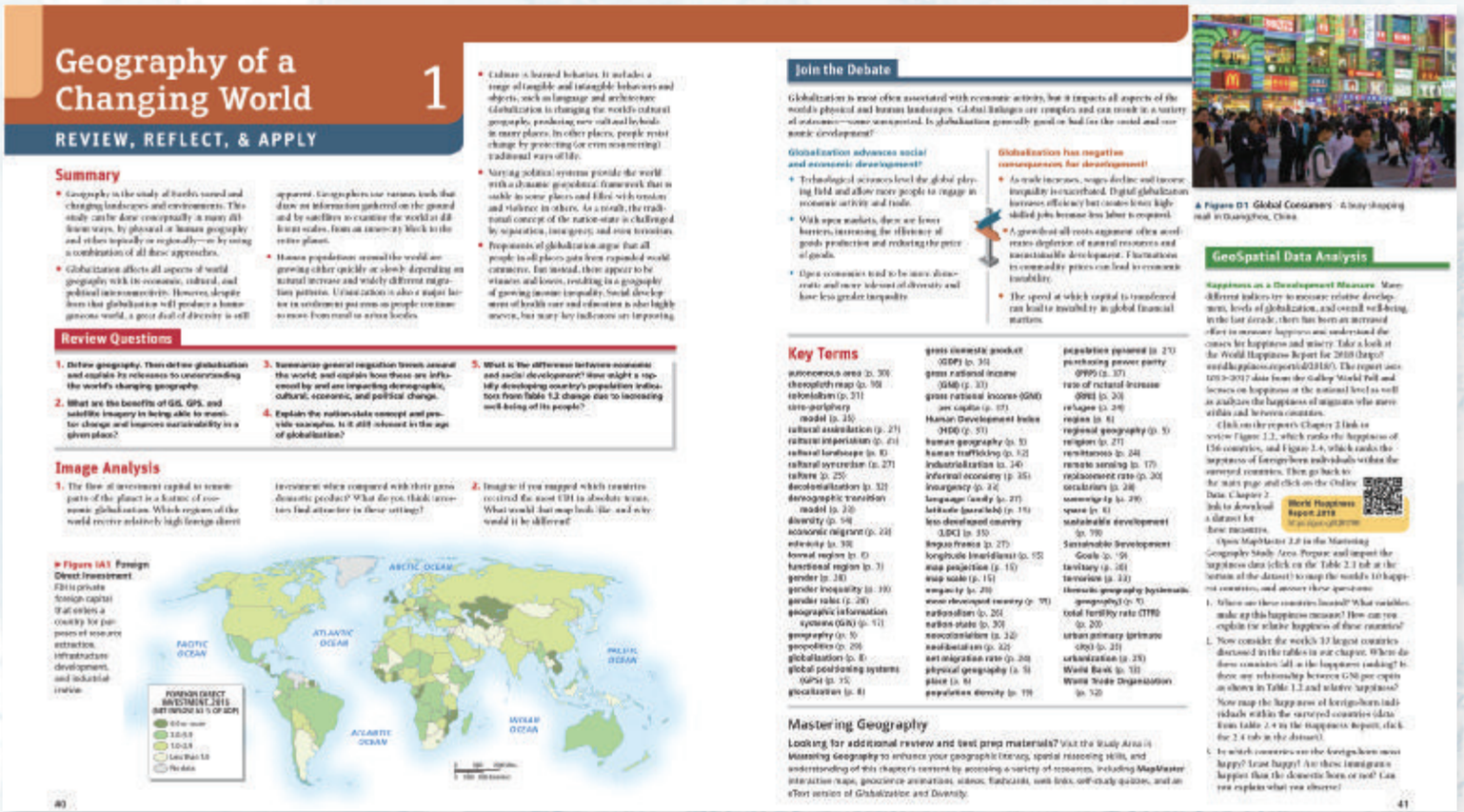
- **11.9** How has the process of economic development been similar in Japan, South Korea, Taiwan, and China since the end of World War II, and how has it differed in each country?
- **11.10** Why do levels of social and economic development vary so extensively from the coastal region of China to its interior provinces?

KEY TERMS chaebol, laissez-faire, Special Economic Zone (SEZ), World Trade Organization (WTO), One Belt, One Road, social and regional differentiation, rust belt

Develop 21st Century Skills

NEW! 2-page Review, Reflect, & Apply Sections at the end of each chapter provide a robust interactive review experience, including a concise chapter summary, *Review Questions* that bridge multiple chapter themes, *Image Analysis* questions, new *Join the Debate* activities, new *Geospatial Data Analysis* activities, as well as QR links to *Geographers at Work* profiles.

NEW! Join the Debate presents two sides of a complex topic to engage students in active debate around the most critical topics of geography today. *Join the Debate* can be used for homework, group work, and discussions.



Geography of a Changing World 1

REVIEW, REFLECT, & APPLY

Summary

Review Questions

Image Analysis

Join the Debate

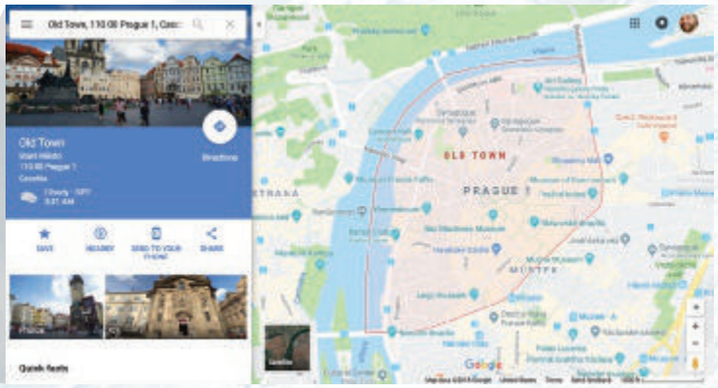
Key Terms

Mastering Geography

GeoSpatial Data Analysis

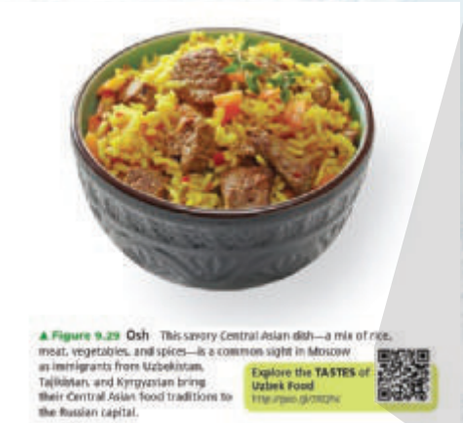
NEW! GeoSpatial Data Analysis activities send students to online data sources to collect, prepare, and analyze spatial data using MapMaster 2.0.

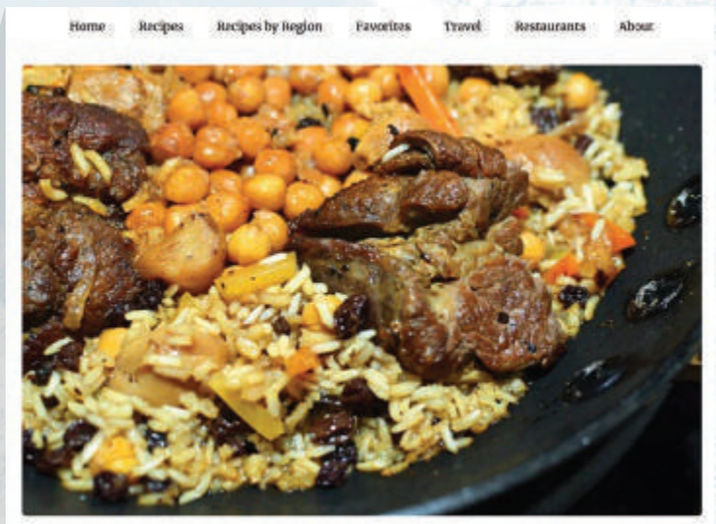
The Sights, Sounds, & Tastes of World Regions



NEW! Sights of the Region features link photos and maps to dynamic online Google Maps that include community contributed photos, empowering students to explore the places and spaces that make up world regions.

NEW! Sounds of the Region features give students access to audio of regional music, language, and nature.





NEW! Tastes of the Region features help students explore the geography and politics of food in each region, and include links to regional dishes and recipes.

MapMaster 2.0: Geospatial Tools in Your Hands

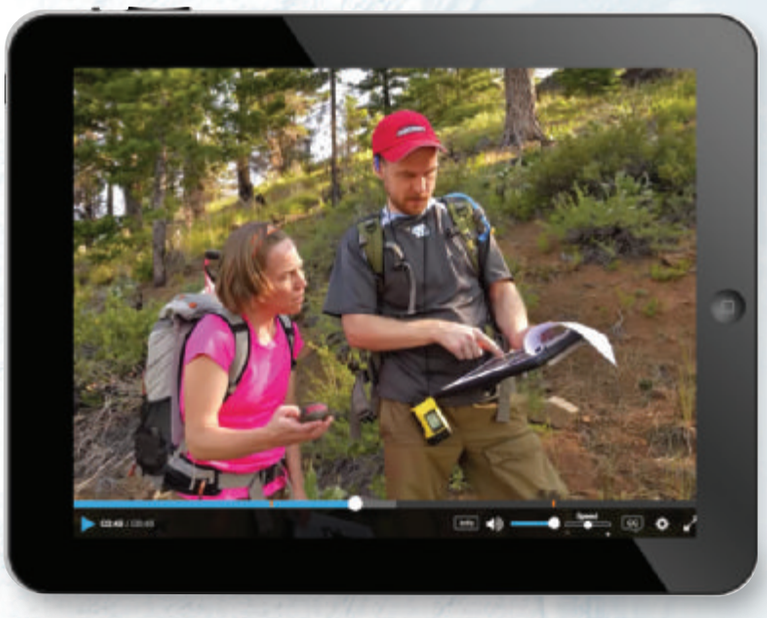
UPDATED! Mastering Geography is the teaching and learning platform that empowers you to reach *every* student. By combining trusted author content with digital tools developed to engage students and emulate the office-hour experience, Mastering personalizes learning and improves results for each student.

NEW! MapMaster 2.0 Interactive Map Activities Inspired by GIS, MapMaster 2.0 allows students to layer various thematic maps to analyze spatial patterns and data at regional and global scales. Now fully mobile, with enhanced analysis tools, MapMaster 2.0 allows students to upload their own data and geolocate themselves within the data. This tool includes zoom and annotation functionality, with hundreds of map layers leveraging recent data from sources such as the PRB, the World Bank, NOAA, NASA, USGS, United Nations, the CIA, and more. Available with assessment in Mastering Geography.

Transport Your Students to World Regions

NEW! Video Activities from sources such as the BBC, Financial Times, and Television for the Environment's *Life* and *Earth Report* series are included in Mastering Geography. These videos provide students with applied real-world examples of geography in action, a sense of place, and allow students to explore a range of locations and topics.

NEW! Google Earth Virtual Tour videos give students brief narrated spatial explorations of places and people around the world, covering critical themes such as globalization and sustainability.



NEW! Mobile Field Trips videos for geography from Michael Collier give students another avenue for exploring U.S. landscapes and the major themes of physical geoscience concepts. These are embedded in the eText and available to assign in Mastering Geography.

Pearson eText:
An Integrated Learning Experience

NEW! Pearson eText is a simple-to-use, mobile-optimized, personalized reading experience available within Mastering. It allows students to easily highlight, take notes, and review key vocabulary all in one place—even when offline. Seamlessly integrated videos and other rich media engage students and give them access to the help they need, when they need it. Pearson eText is available within Mastering when packaged with a new book; students can also purchase Mastering with Pearson eText online.

UPDATED! Customizable for a Changing World
As an instructor you can add your own notes, embed videos and links, share highlights and notes with students, and rearrange chapters and sections to ensure the Pearson eText fits your unique course.

Resources for Instructors & Students

Instructor Resources are now found in Mastering Geography for your convenience. These resources provide everything you need to prep for your course and deliver a dynamic lecture, in one convenient place. Resources include:

Measuring Student Learning Outcomes

All of the Mastering Geography assignable content is tagged to Learning Outcomes from the book, the National Geography Standards, and Bloom's Taxonomy. You also have the ability to add your own learning outcomes, helping you track student performance against your course goals. You can view class performance against the specified learning outcomes and share those results quickly and easily by exporting to a spreadsheet.

PowerPoint & Lecture Assets for Each Chapter

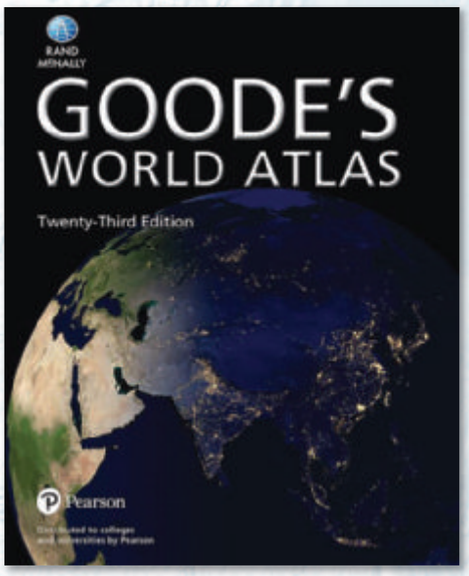
- PowerPoint Lecture Outlines
- PowerPoint Clicker Questions
- All illustrations, tables, and photos from the text in PowerPoint and JPEG formats

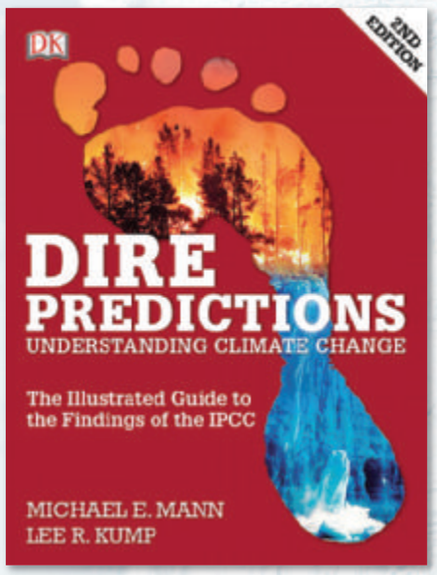
TEST BANK

- The *Test Bank* in Microsoft Word formats
- TestGen Computerized *Test Bank*, which includes all the questions from the *Test Bank* in a format that allows you to easily and intuitively build exams and quizzes

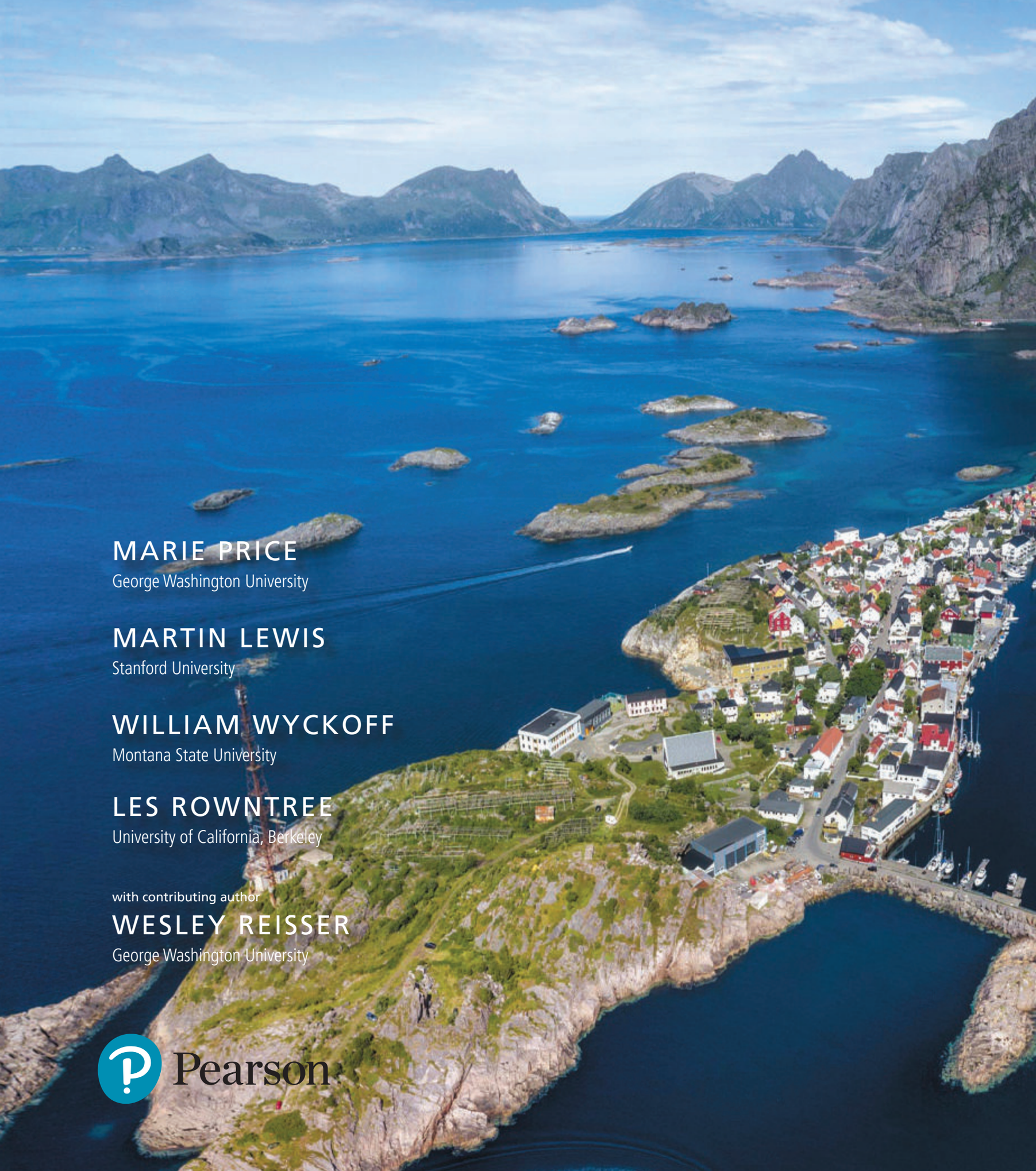
ADDITIONAL RESOURCES

- *Instructor Resource Manual* in Microsoft Word and PDF formats
- Goode's *World Atlas*, 23rd Edition
- *Dire Predictions: Understanding Climate Change*, 2nd Edition by Mann and Kump





GLOBALIZATION AND DIVERSITY



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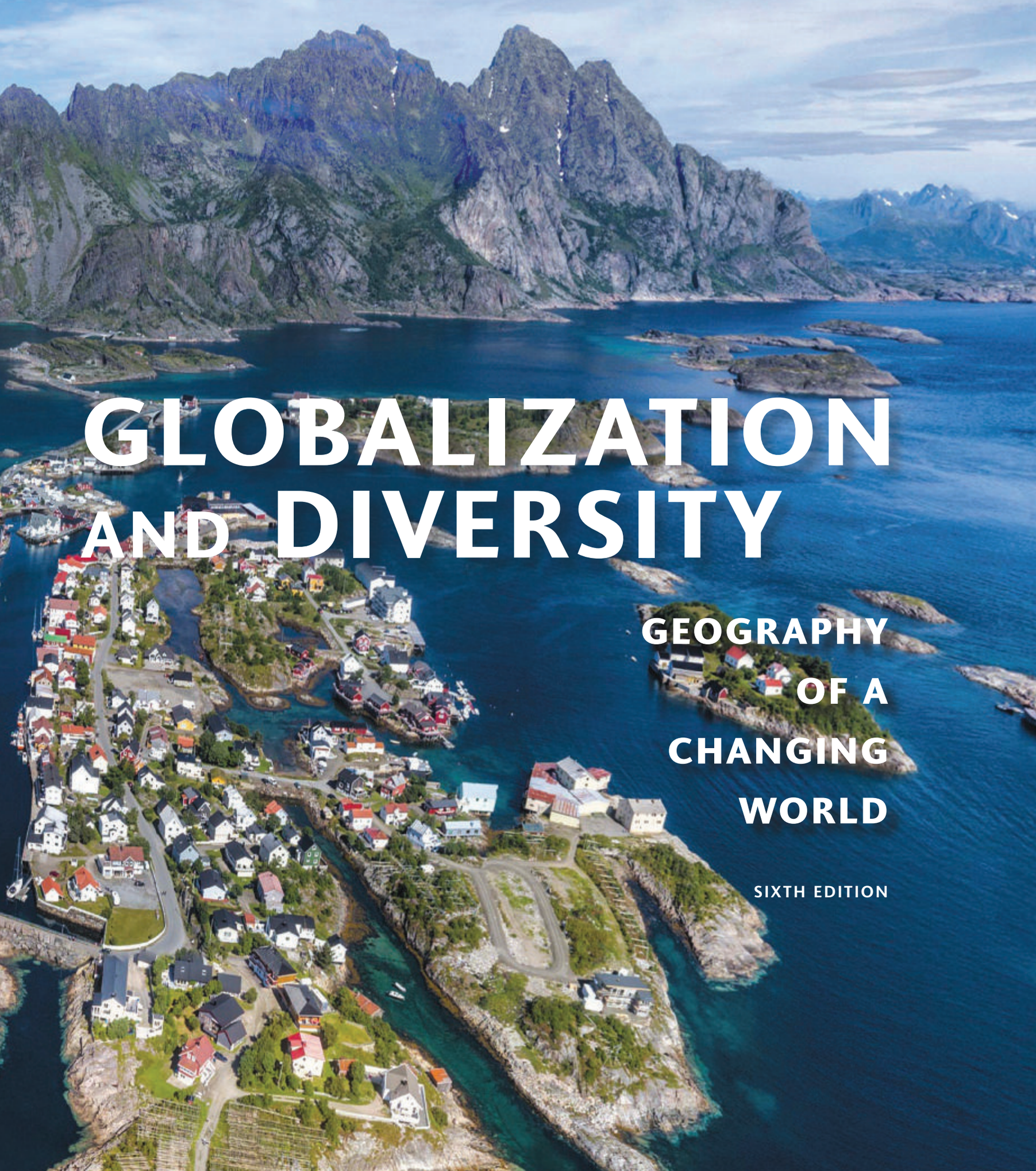

GLOBALIZATION AND DIVERSITY

GEOGRAPHY OF A CHANGING WORLD

SIXTH EDITION

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Preface

Globalization and Diversity: Geography of a Changing World, sixth edition, is an issues-oriented textbook for college and university world regional geography classes that explicitly recognizes the vast geographic changes taking place because of globalization. With this focus we join the many scholars who consider globalization to be the most fundamental reorganization of the world's socioeconomic, cultural, and geopolitical structure since the Industrial Revolution. That provides the point of departure and thematic structure for our book.

As geographers, we think it essential for our readers to understand and critique two interactive themes: the consequences of converging environmental, cultural, political, and economic systems inherent to globalization, and the persistence—and even expansion—of geographic diversity and differences in the face of globalization. These two opposing forces, homogenization and diversification, are reflected in our book's title, *Globalization and Diversity*.

NEW & UPDATED IN THE SIXTH EDITION

- In this edition we welcome Dr. Wesley Reisser as a NEW contributing author. Dr. Reisser is a scholar and diplomat. He earned his PhD from the University of California, Los Angeles (UCLA) and teaches political geography and energy resources as an adjunct professor at the George Washington University. For over 15 years he has worked at the U.S. Department of State, most recently in the Bureau of Democracy, Human Rights, and Labor. Dr. Reisser brings to *Globalization and Diversity* a strong interest in political geography and human rights, extensive experience in Europe and Southwest Asia, and scholarly work on the social, political, and environmental implications of energy production and consumption.
- NEW ***Humanitarian Geography*** sidebars examine how geospatial tools and geographic analysis contribute to addressing humanitarian issues and natural disasters in each world region. Topics include finding and relocating refugee populations, teaching mapping skills to volunteers to respond to natural disasters or to build legal cases for human rights abuses, or uncovering and addressing environmental challenges. Some of the *Humanitarian Geography* examples feature individual geographers in the field, describing their work and their thoughts on geography's role in humanitarian efforts.
- NEW ***Sights of the Region*** features provide mobile-ready Quick Response (QR) links from photos to online Google Maps, enabling students to browse web maps and community-contributed photos of the diverse geographies featured in the print book. Students use mobile devices to scan Quick Response (QR) codes to get immediate online access and connect print images with dynamic online web maps and photos.
- NEW ***Sounds of the Region*** features provide QR links to sound clips that help give students a sense of culture and natural environments around the world, highlighting language, music, and the soundscapes of both natural and urban environments.
- NEW ***Tastes of the Region*** features in each regional chapter explore culinary traditions and innovations associated with different parts of the world. These QR links to websites or videos provide recipes and other pertinent information on food production and consumption, as well as material on cultural aspects of regional cuisines.
- The NEW end-of-the-chapter format—***Review, Reflect, & Apply***—asks students to answer broad-based questions spanning concepts and regions. Two of the three components of this feature, ***Image Analysis*** and the NEW ***GeoSpatial Data Analysis***, provide concrete exercises based on the analysis of graphic images and demographic or socioeconomic data. *GeoSpatial Data Analysis* features invite students to prepare and visualize data using NEW MapMaster 2.0 in Mastering Geography. The NEW ***Join the Debate*** feature frames two opposing viewpoints on controversial issues and asks students to assess their claims and weigh in on their own. The end of chapter also features NEW QR links to online *Geographers at Work* profiles of geographers who specialize in that world region. Most describe their fieldwork as well as their insights on the discipline.
- NEW ***Mobile Field Trip Videos*** have students accompany renowned geoscience photographer Michael Collier in the air and on the ground to explore iconic landscapes that have shaped North America and beyond. Students scan QR codes in the print book to get instant access to these media, which are also available for assignment with quizzes in Mastering Geography.
- Many NEW ***Key Concepts*** and terms introduced in the first two chapters are revisited in at least two regional chapters. The overall number of terms have been reduced and major concepts that are critical to understanding globalization and diversity in a changing world are emphasized throughout the book.
- NEW chapter opener vignettes and photos highlight recent events and global linkages, with accompanying maps that pinpoint vignette locations. This edition also features more focused and consistent introductions in Chapters 3–14, placed under the heading "Defining the Region."
- UPDATED ***Globalization in Our Lives*** sidebars (previously known as *Everyday Globalization*) explore the daily items we use, from the cell phones that never seem to leave our sides, to the foods we eat, the clothing we wear, the music we listen to, and the technology that connects us to each other and the world.
- UPDATED & REVISED Tables in each chapter present *Population Indicators* and *Development Indicators* for the world's 10 most populous countries (Chapter 1) and for each country in the various world regions (Chapters 3–14). New indicators measuring development include Secondary School Enrollment Rates for males and females and an overall Freedom Rating developed by Freedom House, an independent watchdog organization.

New & Updated Features in Chapter 1: Geography of a Changing World

- This chapter has been retitled and the introduction is focused more sharply on geography in order to better integrate globalization processes and the discipline. In the section *Geography Matters*, the discussion of areal differentiation and connectivity has been revised. A *Mobile Field Trip* QR link, "Introduction to Geography," has been added.
- *Converging Currents of Globalization* section is retitled *Globalization and New Geographies* with new examples and figures, including a new International Migration diagram and new Global Arms Sales maps. The "Thinking Critically about Globalization" discussion has been revised and shortened.
- The thematic sections of this introductory chapter have also been updated, revised, and enhanced with new examples and photos. The *Geopolitical Framework* section introduces the Freedom Rating (included in all chapter data tables) with a new *Freedom in the World* map, while the *Economic and Social Development* section updates the discussion of poverty measures (with a new map of Morocco) and introduces secondary school enrollment (now included in all chapter data tables).
- Several key terms have been added, including *economic migrant, refugee*, and *sustainable development*. Existing sidebars have been revised, and a new *Humanitarian Geography* sidebar titled "Tools for Service" has been added.

New and Updated Features in Chapter 2: Physical Geography and the Environment

- The discussion of plate tectonics in the *Geology* section has been revised and shortened, with new examples and photos. NEW *Mobile Field Trip* QRs link to concise videos on climate change, volcanic activity, and cloud dynamics.
- The ***Global Climates*** section has been revised, with enhanced discussions of both climate change itself and international mitigation efforts. The 2015 Paris Agreement goals are introduced, as are various national climate plans.
- New key terms include *ecosystem*, *geothermal*, *Paris Agreement*, and *watershed*. New sidebars highlight climate change on the Greenland Ice Sheet; Saudi Arabian plans to acquire water rights abroad; developed and developing countries aiming for carbon neutrality, and the problem of plastics pollution.

ORGANIZATION

Globalization and Diversity: Geography of a Changing World is organized around the conventional world regions of Sub-Saharan Africa, Europe, Latin America, East Asia, South Asia, and so on. We have, however, added two distinctive regions that are often excluded from the standard world regional scheme: Central Asia and the Caribbean. Also in this edition Chapter 9 has been renamed Eurasia and Chapter 14, Oceania. Our 12 regional chapters further depart from the treatment found in traditional world regional textbooks by employing a thematic framework that avoids extensive descriptions of each individual country.

Globalization and Diversity opens with two substantive introductory chapters that provide the geographic fundamentals of both human and physical geography. ***Chapter 1: Geography of a Changing World*** begins by introducing the discipline of geography and its major concepts, followed by a section on the geographic dimensions of globalization, including discussion of the costs and benefits of globalization according to proponents and opponents. Next is a section called "The Geographer's Toolbox," where students are introduced to map-reading, cartography, aerial photos, remote sensing, and GIS. This initial chapter concludes with a discussion of the concepts and tabular data that are used throughout the regional chapters.

Chapter 2: Physical Geography and the Environment builds an understanding of physical geography and environmental issues with discussions of geology and environmental hazards; weather, climate, and global climate change; global bioregions and biodiversity; hydrology and water stress; and energy issues. Both introductory chapters introduce key concepts that are revisited in the regional chapters.

Each regional chapter is structured around five geographic themes:

- **Physical Geography and Environmental Issues**, in which we not only describe the physical geography of each region, but also environmental issues, including climate change and energy.
- **Population and Settlement**, where we examine the region's demography, migration patterns, land use, and settlement, including cities.
- **Cultural Coherence and Diversity** covers the traditional topics of language and religion, but also examines the ethnic and cultural tensions resulting from globalization. New to this edition is a focus on regional foodways. Gender issues and popular culture topics such as sports and music (with *Sounds of the Region* QR links) are also included in this section.
- **Geopolitical Framework** examines the political geography of the region, taking on such issues as postcolonial tensions, ethnic conflicts, separatism, micro-regionalism, and global terrorism.
- **Economic and Social Development** explores each region's economic framework at both local and global scales and examines such social issues as health, education, and gender inequalities.

CHAPTER FEATURES

- **Structured learning path.** Every chapter begins with an explicit set of *learning objectives* to provide students with the larger context of each chapter. *Review questions* after each section allow students to test their learning. Each chapter ends with an innovative ***Review, Reflect, & Apply*** section, where students are asked to apply what they have learned from the chapter using an active-learning framework: broad questions integrating material across sections and chapters, image analysis and debate, and mapping real-world data.
- **Comparable regional maps.** Of the many maps in each regional chapter, many are constructed on the same themes and with similar data so that readers can easily draw comparisons between regions. Most regional chapters have maps of physical geography, climate, environmental issues, population density, migration, language, religion, and geopolitical issues.
- **Other chapter maps pertinent to each region.** The regional chapters also contain many additional maps illustrating important geographic topics such as global economic issues, social development, and ethnic tensions.

- **Regional data sets integrated with MapMaster 2.0.** Two thematic tables in each regional chapter provide insights into the characteristics of each region and facilitate comparisons between regions. The first table provides population data on a number of issues, including fertility rates and proportions of the population under 15 and over 65 years of age, as well as net migration rates for each country within the region. The second table presents economic and social development data for each country, including gross national income per capita, gross domestic product growth, percentage of the population living on less than $3.10 per day, child mortality rates, secondary school enrollment, the international gender inequality index and the Freedom Rating. Each table now includes a QR link to MapMaster 2.0 in Mastering Geography, so that students gain experience mapping data and analyzing the map to answer questions about the region.
- **Sidebar features.** Each chapter has four sidebars that expand on geographic themes:
  - New ***Humanitarian Geography*** explores the geospatial tools and geographic analysis employed to address pressing issues such as responses to natural disasters, assistance to refugees, monitoring human rights abuses, and tracking environmental issues.
  - ***Globalization in Our Lives*** (previously known as *Everyday Globalization)* shows examples of how globalization influences our daily lives from the clothing we wear, the foods we consume, the technology we rely upon, and the activities we enjoy.
  - ***Working Toward Sustainability*** feature case studies of sustainability projects throughout the world, emphasizing positive environmental and social initiatives and their results. Each includes a QR link to an online Google Earth Virtual Tour Video.
  - ***Exploring Global Connections*** investigate the many ways in which activities in different parts of the world are linked so that students understand that in globalized world regions are neither isolated nor discrete. Each includes a QR link to an online Google Earth Virtual Tour Video.

ACKNOWLEDGEMENTS

We have many people to thank for the conceptualization, writing, rewriting, and production of *Globalization and Diversity*, sixth edition. First, we'd like to thank the thousands of students in our world regional geography classes who have inspired us with their energy, engagement, and curiosity; challenged us with their critical insights; and demanded a textbook that better meets their need to understand the contemporary geography of their dynamic and complex world.

This is also the first edition of *Globalization and Diversity* in which Dr. Les Rowntree has not contributed new materials and revisions. Dr. Rowntree led this textbook team since its inception in the mid-1990s. After a long and productive career as professor, scholar, and author, he has retired. Dr. Rowntree assembled the author team for this book, and collectively the authors have enjoyed over two decades of fruitful collaboration, scholarship, and friendship.

Finally, we are deeply indebted to many professional geographers and educators for their assistance, advice, inspiration, encouragement, and constructive criticism as we labored through the different stages of this book. Among the many who provided invaluable comments on various drafts and editions of *Globalization and Diversity* or who worked on supporting print or digital material are: Gilian Acheson (S. Illinois Univ., Edwardsville), Joy Adams (Humboldt State Univ.), Victoria Alapo (Metropolitan Comm. College), Dan Arreola (Arizona State Univ.), Bernard BakamaNume (Texas A&M Univ.), Brad Baltensperger (Michigan Tech. Univ.), Max Beavers (Samford Univ.), Laurence Becker (Oregon State Univ.), Dan Bedford (Weber State Univ.), James Bell (Univ. of Colorado), Katie Berchak (Univ. of Louisiana, Lafayette), William H. Berentsen (Univ. of Connecticut), Kevin Blake (Kansas State Univ.), Mikhail Blinnikov (St. Cloud State Univ.), Sarah Blue (Texas State Univ., San Marcos), Michelle Brym (Univ. of Central Oklahoma), Karl Byrand (Univ. of Wisconsin, Sheboygan County), Michelle Calvarese (California State Univ., Fresno), Craig Campbell (Youngstown State Univ.), G. Scott Campbell (College of DuPage), Elizabeth Chacko (George Washington Univ.), Philip Chaney (Auburn Univ.), Xuwei Chen (N. Illinois Univ.), David B. Cole (Univ. of Northern Colorado), Amanda Coleman (N. State Univ.), Malcolm Comeaux (Arizona State Univ.), Jonathan C. Comer (Oklahoma State Univ.), Deborah Corcoran (Missouri State Univ.), Jeremy Crampton (George Mason Univ.), Kevin Curtin (Univ. of Texas at Dallas), James Curtis (California State Univ., Long Beach), Dydia DeLyser (California State Univ., Fullerton), Francis H. Dillon (George Mason Univ.), Jason Dittmer (Georgia Southern Univ.), Jerome Dobson (Univ. of Kansas), Caroline Doherty (N. Arizona Univ.), Vernon Domingo (Bridgewater State College), Roy Doyon (Ball State Univ.), Dawn Drake (Missouri W. State Univ.), Jane Ehemann (Shippensburg Univ.), Steven Ericson (Univ. of Alabama, Tuscaloosa), Chuck Fahrer (Georgia College and State Univ.), Dean Fairbanks (California State Univ., Chico), Emily Fekete (Univ. of Kansas), Caitie Finlayson (Florida State Univ.), Colton Flynn (Univ. of Arkansas, Fort Smith), Doug Fuller (Univ. of Miami), Douglas Gamble (Univ. of North Carolina, Wilmington), Sherry Goddicksen (California State Univ., Fullerton), Sarah Goggin (Cypress College), Mark Guizlo (Lakeland Community College), Reuel Hanks (Oklahoma State Univ.), Megan Hoberg (Orange Coast College & Golden West College), Steven Hoelscher (Univ. of Texas, Austin), Erick Howenstine (N. Illinois University), Tyler Huffman (E. Kentucky Univ.), Peter J. Hugil (Texas A&M Univ.), Eva Humbeck (Arizona State Univ.), Shireen Hyrapiet (Oregon State Univ.), Drew Kapp (Univ. of Hawaii, Hilo), Ryan S. Kelly (Univ. of Kentucky), Richard H. Kesel (Louisiana State Univ.), Cadey Korson (Kent State Univ.), Rob Kremer (Front Range Community College), Robert C. Larson (Indiana S. Univ.), Chi Kin Leung (California State Univ., Fresno), Alan A. Lew (N. Arizona Univ.), Elizabeth Lobb (Mt. San Antonio College), Catherine Lockwood (Chadron State College), Max Lu (Kansas State Univ.), Luke Marzen (Auburn Univ.), Daniel McGowin (Auburn Univ.), James Miller (Clemson Univ.), Bob Mings (Arizona State Univ.), Wendy Mitteager (SUNY, Oneonta), Sherry D. Morea-Oakes (Univ. of Colorado, Denver), Anne E. Mosher (Syracuse Univ.), Julie Mura (Florida State Univ.), Tim Oakes (Univ. of Colorado), Nancy Obermeyer (Indiana State Univ.), Karl Offen (Univ. of Oklahoma), Daniel Olsen (Brigham Young Univ.), Thomas Orf (Las Positas College), Kefa Otiso (Bowling Green State Univ.), Joseph Palis (Univ. of North Carolina),

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Martin Lewis is a Senior Lecturer in History at Stanford University, where he teaches courses on global geography. He has conducted extensive research on environmental geography in the Philippines and on the intellectual history of world geography. His publications include *Wagering the Land: Ritual, Capital, and Environmental Degradation in the Cordillera of Northern Luzon, 1900–1986* (1992), and, with Karen Wigen, *The Myth of Continents: A Critique of Metageography* (1997). Dr. Lewis has traveled extensively in East, South, and Southeastern Asia. His most recent book, co-written with Asya Pereltsvaig, is *The Indo-European Controversy: Facts and Fallacies in Historical Linguistics* (2015). In April 2009, Dr. Lewis was recognized by *Time* magazine as one of America's most favorite lecturers.

William Wyckoff is a geographer in the Department of Earth Sciences at Montana State University specializing in the cultural and historical geography of North America. He has written and co-edited several books on North American settlement geography, including *The Developer's Frontier: The Making of the Western New York Landscape* (1988), *The Mountainous West: Explorations in Historical Geography* (1995) (with Lary M. Dilsaver), *Creating Colorado: The Making of a Western American Landscape 1860–1940* (1999), and *On the Road Again: Montana's Changing Landscape* (2006). His most recent book, entitled *How to Read the American West: A Field Guide*, appeared in the Weyerhaeuser Environmental Books series and was published in 2014 by the University of Washington Press. A World Regional Geography instructor for 26 years, Dr. Wyckoff emphasizes in the classroom the connections between the everyday lives of his students and the larger global geographies that surround them and increasingly shape their future.

Les Rowntree is currently a Research Associate at the University of California, Berkeley, where he writes about global and local environmental issues. This career change comes after 35 years teaching both Geography and Environmental Studies at San Jose State University. As an environmental geographer, Dr. Rowntree's interests focus on international environmental issues, biodiversity conservation, and climatic change. He sees world regional geography as way to engage and inform students by providing them with the conceptual tools to critically and constructively assess the contemporary world. His current writing projects include a natural history book and website about California's Coast Ranges, and several essays on different European environmental topics. Along with these writings he maintains an assortment of web-based blogs and websites.

Wesley Reisser is an adjunct professor of Geography at the George Washington University specializing in political geography and energy. Since 2003, Dr. Reisser has served at the U.S. Department of State in a variety of positions working on human rights, the United Nations, the Israeli-Palestinian conflict, and responding to crisis situations abroad. Dr. Reisser received the United Nations Association Tex Harris Award for Human Rights and Diplomacy in 2015. Dr. Reisser's first book, *The Black Book: Woodrow Wilson's Secret Plan for Peace* (2013), is the only comprehensive analysis of the maps and plans used by the United States at the end of World War I. His second book, written with his brother Colin, is *Energy Resources: From Science to Society* (2018), the first interdisciplinary textbook on global energy issues. Dr. Reisser is a Councilor of the American Geographical Society, the founding Artistic Director of Washington, DC's central and eastern European Carpathia Folk Dance Ensemble, and is the 2007 World Geography Bowl MVP.

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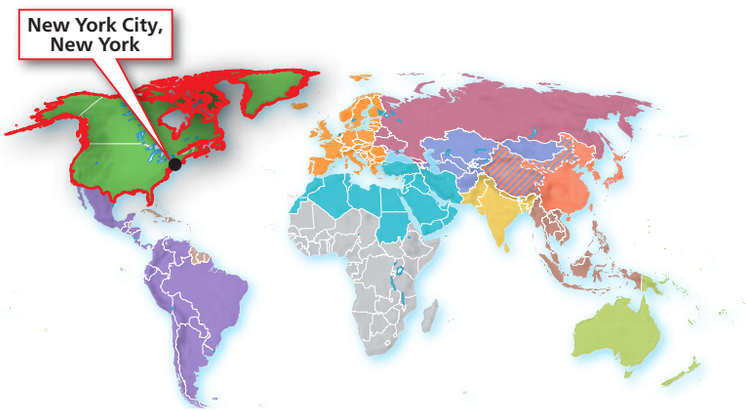
***Dire Predictions: Understanding Climate Change*, 2nd edition, by Michael Mann and Lee R. Kump** (0133909778).
Periodic reports from the Intergovernmental Panel on Climate Change (IPCC) evaluate the risk of climate change brought on by humans. But the sheer volume of scientific data remains inscrutable to the general public, particularly to those who may still question the validity of climate change. In just over 200 pages, this practical text presents and expands upon the essential findings of the IPCC's Fifth Assessment Report in a visually stunning and undeniably powerful way to the lay reader. Scientific findings that provide validity to the implications of climate change are presented in clear-cut graphic elements, striking images, and understandable analogies. The second edition covers the latest climate change data and scientific consensus from the IPCC Fifth Assessment Report and integrates links to online media. The text is also available in various eText formats, including an eText upgrade option from Mastering Geography courses.

Practicing Geography: Careers for Enhancing Society and the Environment (0321811151).
This book examines career opportunities for geographers and geospatial professionals in business, government, nonprofit, and educational sectors. A diverse group of academic and industry professionals share insights on career planning, networking, transitioning between employment sectors, and balancing work and home life. The book illustrates the value of geographic expertise and technologies through engaging profiles and case studies of geographers at work.

Television for the Environment *Earth Report* Geography Videos on DVD (0321662989).
This three-DVD set is designed to help students visualize how human decisions and behavior have affected the environment and how individuals are taking steps toward recovery. With topics ranging from the poor land management promoting the devastation of river systems in Central America to the struggles for electricity in China and Africa, these 13 videos from Television for the Environment's global *Earth Report* series recognize the efforts of individuals around the world to unite and protect the planet.

Geography of a Changing World

1

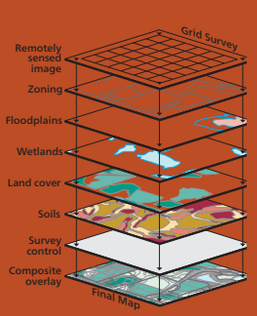


▲ People stroll along New York City's High Line, an elevated park of a former railway, taking in the view of this dynamic urban space. The High Line has become a symbol of repurposing old infrastructure for public uses and gentrification in New York City. It has spurred other cities to consider similar elevated parks. The quintessential global metropolis, New York City encapsulates the processes of globalization and diversity examined in this book.

Geography Matters

Globalization and New Geographies

The Geographer's Toolbox



Population and Settlement

Cultural Coherence and Diversity

Geopolitical Framework

Economic and Social Development

Manhattan, the hub of New York City, has experienced a demographic and economic rebirth in the past two decades. A prominent symbol of the creative redesign of the city is the High Line, an elevated linear park on a former abandoned railroad line, which first opened to the public in 2009. With spectacular views of the skyline, the High Line meanders through neighborhoods such as Chelsea and the Garment District, revitalizing interest in these parts of the city. The park has become a highly desirable place to walk, enjoy green space, observe art installations, or just sit and watch the world go by. Its success has inspired other cities to create "elevated" parks by repurposing outdated or abandoned infrastructure. The High Line has also driven a real estate gold rush, with developers competing to construct luxury properties in neighborhoods that used to be known for gritty tenement buildings.

New York City is the quintessential global city; a center of global finance, marketing, and entertainment, it is also a long-standing immigrant gateway with people from every country of the world. In the city that never sleeps, nearly 40 percent of the population is foreign-born, with the Dominican Republic, China, Mexico, Jamaica, Guyana, and Ecuador being the top sending countries. While its industrial output has declined, New York City has made up for it through financial services and creative industries such as fashion, design, art, advertising, and education. It's a city of 8.5 million, in a metropolitan area of 20 million that attracts 60 million tourists a year. Many businesses and institutions in New York City are leaders in the economic, cultural, and political aspects of globalization. At the same time, globalization has transformed New York City's economy, which has attracted a diverse range of people with varying skills who call this place home.

Through the lens of *geography*, a discipline that examines Earth's physical and human dimensions, *Globalization and Diversity* investigates these global interactions and patterns. The analysis is by world regions, which invites consideration of long-term cultural and environmental practices that characterize and shape these distinct areas. Yet we contend that *globalization*—the increasing interconnectedness of people and places through converging economic, political, and cultural activities—is one of the most important forces reshaping the world today. Pundits say globalization is like the weather: It's everywhere, all the time. It is a ubiquitous part of our lives and landscapes that is both beneficial and negative, depending on our needs and point of view.

While some people in some places embrace the changes brought by globalization, others resist and push back, seeking refuge in traditional habits and places. Thus, globalization's impact is highly uneven across space, which invites the need for a geographic (or spatial) understanding. As you will see in the pages that follow, geographers, who study places and phenomena around the globe and seek to explain the similarities and differences among places, are uniquely suited to analyze the impacts of globalization in different cities, countries, or world regions. In our opening New York City example, consider how millions of migrants over decades have transformed this city by bringing with them different languages, foods, musical traditions, and ways of organizing their environments. Collectively, this diverse yet highly unequal city has been a driving force for cultural, political, and economic change.

Globalization's impact is highly uneven across space, which invites the need for a geographic understanding.

As a counterpoint to globalization, *diversity* refers to the state of having different forms, types, practices or ideas, as well as the inclusion of distinct peoples, in a particular society. We live on a diverse planet with a mix of languages, cultures, environments, political ideologies, and religions that influence how people in particular localities view the world. At the same time, the intensification of communication, trade, travel, and migration that result from global forces have created many more settings in which people from vastly different backgrounds live, work, and interact. For example, in metropolitan Toronto, Canada's largest city, over half of the area's 5.5 million residents were born in another country. Increasingly, modern diversifying societies must find ways to build social cohesion among distinct peoples. Confronting diversity can challenge a society's tolerance, trust, and sense of shared belonging. Yet, diverse societies also stimulate creative exchanges and new understandings that are beneficial, building greater inclusion. The regional chapters that follow provide examples of the challenges and opportunities that diverse societies in an interconnected world experience today. We begin by introducing the discipline of geography and then examine this ongoing diversity in the context of globalization from a geographer's perspective.

LEARNING OBJECTIVES

After reading this chapter you should be able to:

1.1 Describe the conceptual framework of world regional geography.

1.2 Identify the different components of globalization, including controversial aspects, and list several ways in which globalization is changing world geographies.

1.3 Summarize the major tools used by geographers to study Earth's surface.

1.4 Explain the concepts and metrics used to document changes in global population and settlement patterns.

1.5 Describe the themes and concepts used to study the interaction between globalization and the world's cultural geographies.

1.6 Explain how different aspects of globalization have interacted with global geopolitics from the colonial period to the present day.

1.7 Identify the concepts and data important to documenting changes in the economic and social development of more and less developed countries.

Geography Matters: Environments, Regions, Landscapes

Geography is a foundational discipline, inspired and informed by the long-standing human curiosity about our surroundings and how we are connected to the world. The term *geography* has its roots in the Greek word for "describing the Earth," and this discipline is central to all cultures and civilizations as humans explore their world, seeking natural resources, commercial trade, military advantage, and scientific knowledge about diverse environments. In some ways, geography can be compared to history: Historians describe and explain what has happened over time, whereas geographers describe and explain the world's spatial dimensions—how it differs from place to place.

▲ **Figure 1.1 Rio Itaya Settlement in the Amazon Basin** A woman and child peer out the doorway of their newly built waterfront home near Iquitos, Peru. Settlers in the Amazon Basin have relied upon the vast forests and rivers of this region for their food, livelihood, and transport.

Given the broad scope of geography, it is no surprise that geographers have different conceptual approaches to investigating the world. At the most basic level, geography can be broken into two complementary pursuits: *physical* and *human geography*. **Physical geography** examines climate, landforms, soils, vegetation, and hydrology. **Human geography** concentrates on the spatial analysis of economic, social, and cultural systems.

Mobile Field Trip: Introduction to Geography
https://goo.gl/VYnVqW

A physical geographer, for example, studying the Amazon Basin of Brazil, might be interested primarily in the ecological diversity of the tropical rainforest or the ways in which the destruction of that environment changes the local climate and hydrology. A human geographer, in contrast, would focus on the social and economic factors explaining the migration of settlers into the rainforest or the tensions and conflicts over resources between new migrants and indigenous peoples. Both human and physical geographers share an interest in human–environment dynamics, asking how humans transform the physical environment and how the physical environment influences human behaviors and practices. Thus, they learn that Amazon residents may depend on fish from the river and plants from the forest for food (Figure 1.1) but raise crops for export and grow products such as black pepper or soy, rather than wheat, because wheat does poorly in humid tropical lowlands.

Another basic division in geography is the focus on a specific topic or theme as opposed to analysis of a specific place or a region. The theme approach is termed **thematic** or **systematic geography**, while the regional approach is called **regional geography**. These two perspectives are complementary and by no means mutually exclusive. This textbook, for example, utilizes a regional scheme for its overall organization, dividing Earth into 12 separate world regions. It then presents each chapter thematically, examining the topics of environment, population and settlement, cultural differentiation, geopolitics, and socioeconomic development in a systematic way. In doing so, each chapter combines four kinds of geography: physical, human, thematic, and regional geography.

Areal Differences and Connections

As a spatial science, geography is charged with the study of Earth's surface. A central theme of that responsibility is describing and explaining

▶ **Figure 1.2 Areal Differences** The oasis village of Tinghir on the southern slope of Morocco's Atlas Mountains illustrates dramatic landscape change over short distances. Agricultural fields and date palms in the foreground are irrigated by a river that flows from the high mountains. Irrigated land in an arid environment is precious, so the village settlements are nearby in the dry areas. In the background, the desert and mountains loom.

what distinguishes one piece of the world from another. These differences can be about the physical Earth, or about cultural features such as building designs, transportation systems, or language groups. Why is one part of Earth humid and lush, while another, just a few hundred kilometers away, is arid (Figure 1.2)? Or, why are people in one setting more affluent, while those in an adjoining area are poor?

Geographers are not only interested in place differences, but also in how these distinct localities are interconnected within and among each other. This concern for understanding *integration* and *connectivity* is fundamental to geographic analysis. For example, a geographer might ask how and why the economies of Singapore and the United States are closely intertwined, even though the two countries are situated in entirely different physical, cultural, and political environments. Questions of linkages over space are becoming increasingly important because of the new global connections inherent in globalization.

▲ **Figure 1.3 The Cultural Landscape** Despite globalization, the world's landscapes still have great diversity, as seen in Prague, Czechia (Czech Republic). Red tile roofs, three-to-four-story buildings, organic street patterns, and open squares distinguish this historic capital city. Geographers use the cultural landscape concept to better understand how people interact with their environment.

Explore the SIGHTS of Historic Prague
https://goo.gl/1J9dbJ

Scale: Global to Local All systematic inquiry considers *scale*, whatever the discipline. In biology, some scientists study the very small units such as cells, genes, or molecules, while others take a larger view, analyzing plants, animals, or whole ecosystems. Geographers also work at different scales. While one may concentrate on analyzing a local landscape—perhaps a single village in the Philippines—another might focus on the broader regional picture, examining patterns of trade throughout Southeast Asia. Other geographers do research on a still larger global scale, perhaps studying emerging trade networks between southern India's center of information technology in Bengaluru and North America's Silicon Valley, or investigating how the Indian monsoon might be connected to and affected by the Pacific Ocean's El Niño phenomenon. But even though geographers may work at different scales, they never lose sight of the interactivity and connectivity among local, regional, and global scales. They will note the ways that the village in the Philippines might be linked to world trade patterns, or how the late arrival of the monsoon could affect agriculture and food supplies in Bangladesh.

The Cultural Landscape: Space into Place

Humans transform space into distinct places that are unique and heavily loaded with significance and symbolism. **Place**, as a geographic concept, is not just the characteristics of a location; it also encompasses the meaning that people give to such areas, as in the sense of place. This diverse fabric of *placefulness* is of great interest to geographers because it tells us much about the human condition throughout the world. Places can tell us how humans interact with nature and how they interact among themselves; where there are tensions, and where there is peace.

A common tool for the analysis of place is the concept of the **cultural landscape**, which is the tangible, material expression of human settlement, past and present. Thus, the cultural landscape visually reflects the most basic human needs—shelter, food, and work. Additionally, the cultural landscape acts to bring people together (or keep them apart) because it is a marker of cultural values, attitudes, history, and symbols. As cultures vary greatly around the world, so do cultural landscapes (Figure 1.3).

Geographers are also interested in spatial analysis and the concept of space. **Space** represents a more abstract, quantitative, and model-driven approach to understanding how objects and practices are connected to and impact each other. For example, a geographer interested in economic development may measure income inequality and examine how it differs from one location to another to better understand how poverty might be addressed. Similarly, a geographer interested in the impacts of climate change might model the effects of sea-level change on coastal settlements based on different warming scenarios. An appreciation for space and place is critical in understanding geographic change.

Regions: Formal and Functional

The human intellect seems driven to make sense of the universe by lumping phenomena together into categories that emphasize similarities. Biology has its taxa of living organisms, while history marks off eras and periods of time. Geography, too, organizes information about the world into units of spatial similarity called **regions**—each a contiguous bounded territory that shares one or many common characteristics.

Sometimes, the unifying threads of a region are physical, such as climate and vegetation, resulting in a regional designation like the *Sahara Desert* or *Siberia*. Other times, the threads are more complex, combining economic and social traits, as in the use of the term *Rust Belt* for parts of the northeastern United States that have lost industry and population. Think of a region as spatial shorthand that provides an area with some signature characteristic that sets it apart from surrounding areas. In addition to delimiting an area, generalizations about society or culture are often embedded in these regional labels.

Geographers designate two types of regions: formal and functional. A **formal region** is defined by some long-term aspect of physical form, such as a climate type or mountain range. The Rocky Mountains or the Amazon Basin are two examples of formal regions. Cultural features, such as the dominance of a particular language or religion, can also be used to define formal regions. Belgium can be divided into Flemish-speaking Flanders and French-speaking Wallonia. Many of the maps in this book denote formal regions. In contrast, a

▶ Figure 1.4 U.S. Rust Belt The Rust Belt is an example of a functional region. It is delimited to show an area that has lost manufacturing jobs and population over the last four decades. By constructing this region, a set of functional relationships is highlighted. **Q: In what formal and functional regions do you live?**

functional region is one where a certain activity (or cluster of activities) takes place. The earlier example of North America's Rust Belt is such a region because it encompasses a triangle from Milwaukee to Cincinnati to Syracuse, where manufacturing dominated through the 1960s and then experienced steady decline as factories shut down and people left (Figure 1.4). Geographers designate functional regions to show changing regional associations, such as the spatial extent of a sports team's fan base or the commuter shed of a major metropolitan area like Los Angeles. Delimiting such regions can be valuable for marketing, planning transportation, or thinking about the ways that people identify with an area.

Regions can be defined at various scales. In this book, we divide the world into 12 *world regions* based on formal characteristics such as physical features, language groups, and religious affiliations, but also relying on functional characteristics such as trade groups and regional associations (Figure 1.5). In Chapter 3, we will begin with a region familiar to most of our readers—North America—and then move on to Latin America, the Caribbean, Sub-Saharan Africa, North Africa and Southwest Asia, Europe, Eurasia, and the different regions of Asia, before concluding with Oceania. Each regional chapter employs the same five-part thematic structure—physical geography and environmental issues, population and settlement, cultural coherence and diversity, geopolitical framework, and economic and social development.

Some of these regional terms are in common use, such as Europe or East Asia. Understandings and characteristics of these regions have often evolved over centuries. Yet the boundaries of these regions do shift. For example, during the Cold War, it made sense to divide Europe into east and west, with eastern Europe closely linked to the former Soviet Union. With the 1991 collapse of the Soviet Union and the expansion of the European Union in the 2000s, that divide became less meaningful. In this edition, the regions of Europe (Chapter 8) and Eurasia (Chapter 9, which includes Russia) reflect

▼ Figure 1.5 World Regions The boundaries shown here are the basis for the 12 regional chapters in this book. Countries or areas within countries that are treated in more than one chapter are designated on the map with a striped pattern. For example, western China is discussed in both Chapter 10, on Central Asia, and Chapter 11, on East Asia. Also, three countries on the South American continent are discussed as part of the Caribbean region because of their close cultural similarities to the island region.

this long-standing west–east divide. Working at the world regional scale invariably creates regions that are not homogeneous, with some states fitting better into regional stereotypes than others. Yet understanding world regional formations is an important way to explore the impact of globalization on environments, cultures, political systems, and development.

REVIEW

1.1 **Explain the difference between place and space in geographic understanding and analysis.**

1.2 **How is the concept of the cultural landscape related to place?**

1.3 **How do functional regions differ from formal regions?**

KEY TERMS geography, physical geography, human geography, thematic geography (systematic geography), regional geography, place, cultural landscape, space, region, formal region, functional region

Globalization and New Geographies

One of the most important features of the 21st century is **globalization**—the increasing interconnectedness of people and places. Once-distant regions and cultures are now increasingly linked through commerce, communications, and travel. Although earlier forms of globalization existed, especially during Europe's colonial period, the current degree of planetary integration is stronger than ever. In fact, many observers argue that contemporary globalization is the most fundamental reorganization of the world's socioeconomic structure since the Industrial Revolution (see *Exploring Global Connections: A Closer Look at Globalization*).

Economic activities may be the major force behind globalization, but the consequences of globalization affect all aspects of land and life: Human settlement patterns, cultural attributes, political arrangements, and social development are all undergoing profound change. Because natural resources are viewed as global commodities, the planet's physical environment is also affected by globalization. Financial decisions made thousands of miles away now affect local ecosystems and habitats, often with far-reaching consequences for Earth's health and sustainability. For example, gold mining in the Peruvian Amazon is profitable for the corporations involved and even for individual miners, but it may ruin biologically diverse ecosystems and threaten indigenous communities.

The Environment and Globalization

The expansion of a globalized economy is creating and intensifying environmental problems throughout the world. Transnational firms conducting business through international subsidiaries disrupt ecosystems around the globe with their incessant search for natural resources and manufacturing sites. Landscapes and resources previously used by only small groups of local peoples are now considered global commodities to be exploited and traded in the world marketplace.

On a larger scale, globalization is aggravating worldwide environmental problems such as climate change, air pollution, water pollution, and deforestation. Consequently, it is only through global cooperation, such as the United Nations treaties on biodiversity protection or greenhouse gas reductions, that these problems can be addressed. Environmental degradation and efforts to address it are discussed further in Chapter 2.

Globalization and Changing Human Geographies

Globalization changes cultural practices. The spread of a global consumer culture, for example, often accompanies globalization and frequently hurts local economies. It sometimes creates deep and serious social tensions between traditional cultures and new, external global culture. Television shows and movies available via satellite, along with online videos and social media such as Facebook and Twitter, often implicitly promote Western values and culture that are then imitated by millions throughout the world (Figure 1.6).

Fast-food franchises are changing—some would say corrupting—traditional diets, with explosive growth in most of the world's cities. Although these foods may seem harmless to North Americans because of their familiarity, they are an expression of deep cultural changes for many societies and are also generally unhealthy and environmentally destructive. Yet some observers contend that even multinational corporations have learned to pay attention to local contexts. **Glocalization** (which combines globalization with locale) is the process of modifying an introduced product or service to accommodate local tastes or cultural practices. For example, a McDonald's in Japan may serve shrimp burgers along with Big Macs.

Although the media give much attention to the rapid spread of Western consumer culture, nonmaterial culture is also dispersed and homogenized through globalization. Language is an obvious example—American tourists in far-flung places are often startled to hear locals speaking an English made up primarily of movie or TV clichés. However, far more than speech is involved, as social values also are dispersed globally. Changing expectations about human rights, the role of women in society, and the intervention of nongovernmental organizations are also expressions of globalization that may have far-reaching effects on cultural change.

▼ Figure 1.6 Global Communications The effects of globalization are everywhere, even in remote villages in developing countries. This rural family in a small village in southwestern India earns a few dollars a week by renting out viewing time on its globally linked television set.

EXPLORING GLOBAL CONNECTIONS

A Closer Look at Globalization

Globalization comes in many shapes and forms as it connects far-flung people and places. Many of these interactions are common knowledge, such as the global reach of multinational corporations like H&M and Zara transforming how young people dress. Others may be rather surprising. Who would expect to find Bosnians transforming a St. Louis neighborhood, or Filipino contract workers employed in nearly every world region? Would you predict that Saudi investors are leasing large tracts of land in the arid U.S. Southwest for hay exports to the Arabian Peninsula?

Indeed, global connections are ubiquitous and often complex—so much so that understanding the many different shapes, forms, and scales of these interactions is a key component of the study of world geography. To complement that study, each chapter of this book contains an *Exploring Global Connections* sidebar that presents a globalization case study.

The Chapter 4 sidebar, for example, explains how and why a remote area of the South American Andes has become a focus for foreign capital investment to extract lithium. This lightweight medal is essential for the small batteries that run laptops and cell phones, and this is the region of the world where the largest reserves of lithium are concentrated (Figure 1.1.1). Other examples include Dubai Airport as a global travel hub (Chapter 7); India's expanding video game industry (Chapter 12); and the spread and influence of the Armenian diaspora (Chapter 9). A Google Earth virtual tour video supplements each sidebar.

▲ **Figure 1.1.1 Lithium Triangle** The world's largest lithium deposits lie where the three countries of Bolivia, Chile, and Argentina converge. Lithium is a critical metal for lightweight batteries used in cell phones and laptops.

1. **Consider complex global connections based on your own experiences. For example, what food from another part of the world did you buy today, and how did it get to your store?**
2. **Now choose a foreign place in a completely different part of the world, either a city or a rural village, then suggest how globalization affects the lives of people in that place.**

GOOGLE EARTH
Virtual Tour Video
http://goo.gl/Uorj2U

In return, cultural products and ideas from around the world greatly impact U.S. culture. The large and diverse immigrant population in the United States has contributed to heightened cultural diversity and exchange. The internationalization of American food and music, and the multiple languages spoken in American cities, are all expressions of globalization (Figure 1.7).

Globalization also clearly influences population movements. International migration is not new, but increasing numbers of people from all parts of the world are now crossing national boundaries, legally and illegally, temporarily and permanently. The United Nations (UN) estimates that there are over 250 million immigrants in the world (people who live in a country other than their country of birth). Figure 1.8 shows the major migration flows from regions of origin designated as Africa, Asia, Europe, Latin America and the Caribbean, North America, and Oceania. One of the most striking aspects of the figure is that many of the largest international flows are

◀ Figure 1.7 Ethiopian Culture in Washington, DC While many view globalization as the one-way spread of North American and European socioeconomic traits into the developing world, one needs only to look around his or her own neighborhood to find expressions of global culture within the United States. For example, the largest concentration of Ethiopians in the United States is in Metropolitan Washington, DC, where Ethiopian cuisine and music are a visible presence in the nation's capital.

Explore the SOUNDS of Ethiopian Pop Music
https://goo.gl/5brFt9

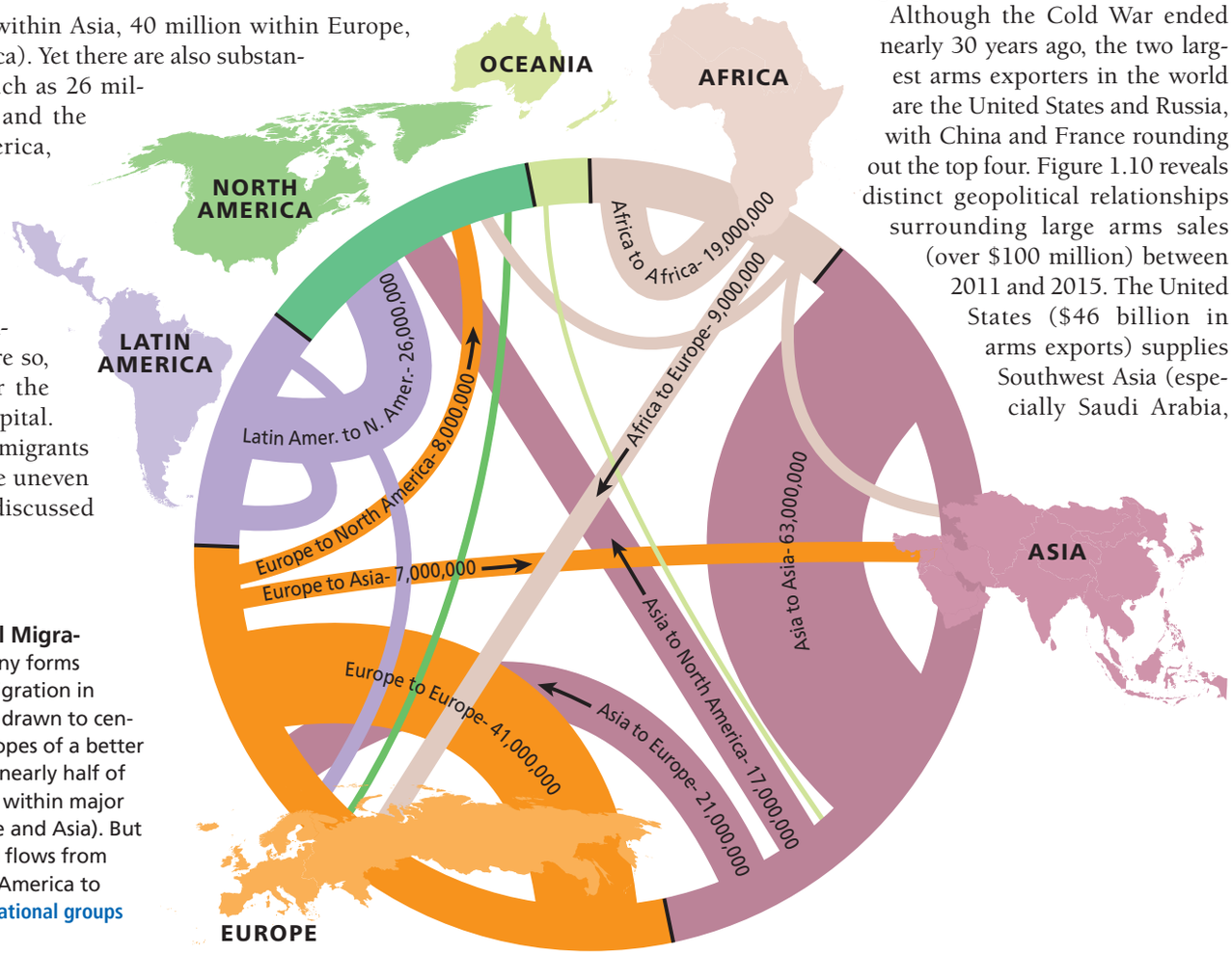
in more detail later in the chapter) and demographic changes in parts of the world with aging populations and shortages of labor.

Geopolitics and Globalization

Globalization also has important geopolitical components. To many, an essential dimension of globalization is that it is not restricted by territorial or national boundaries. For example, the creation of the United Nations (UN) following World War II was a step toward creating an international governmental structure in which all nations could find representation (Figure 1.9). The simultaneous emergence of the Soviet Union as a military and political superpower led to a rigid division into Cold War blocs that slowed further geopolitical integration. However, with the peaceful end of the Cold War in the early 1990s, the former communist countries of eastern Europe and the Soviet Union were opened almost immediately to global trade and cultural exchange, changing those countries immensely.

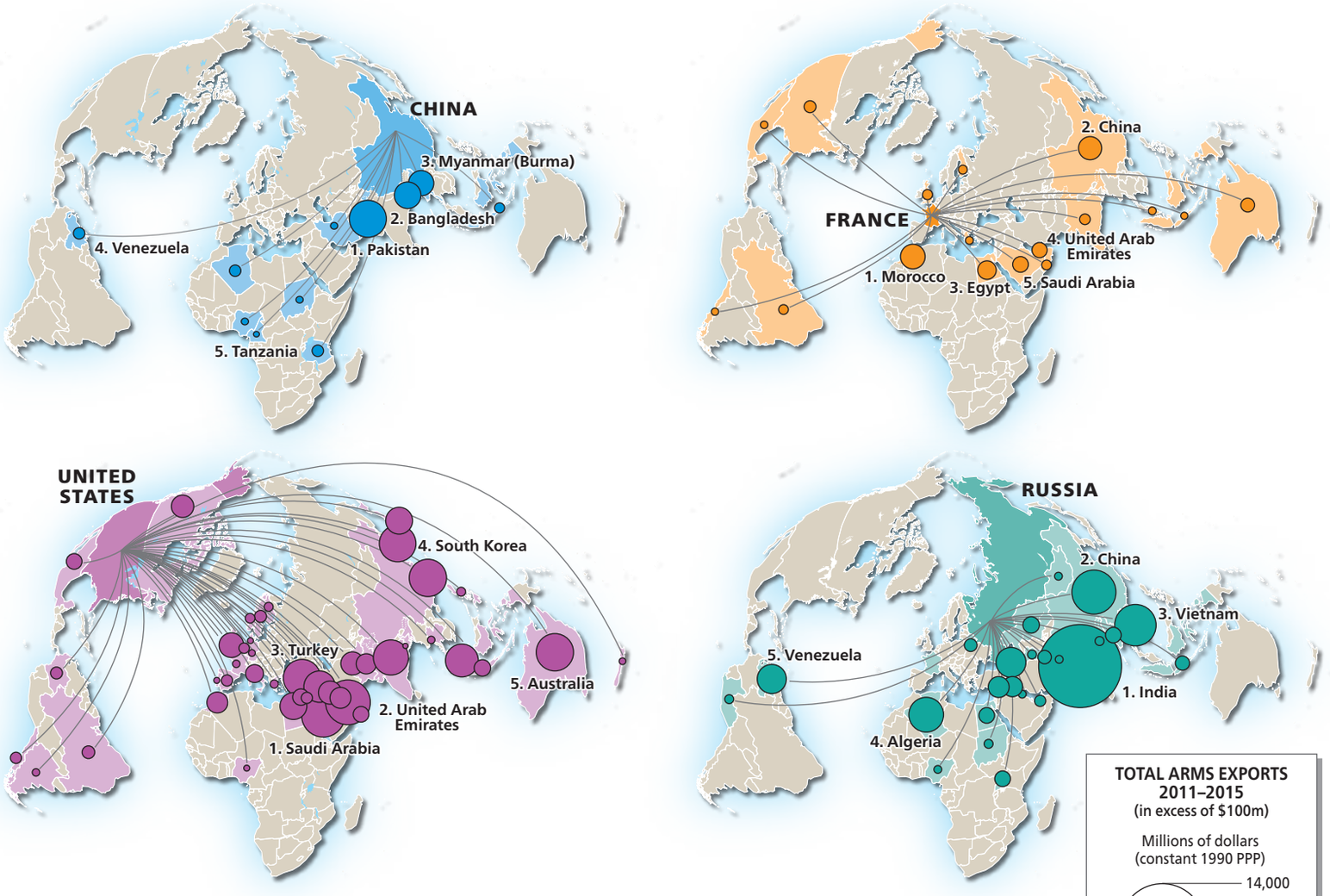
Although the Cold War ended nearly 30 years ago, the two largest arms exporters in the world are the United States and Russia, with China and France rounding out the top four. Figure 1.10 reveals distinct geopolitical relationships surrounding large arms sales (over $100 million) between 2011 and 2015. The United States ($46 billion in arms exports) supplies Southwest Asia (especially Saudi Arabia,

intraregional (60 million within Asia, 40 million within Europe, and 18 million within Africa). Yet there are also substantial *interregional* flows, such as 26 million from Latin America and the Caribbean to North America, 20 million from Asia to Europe, and 17 million from Asia to North America. Attempts to control the movement of people are evident throughout the world—much more so, in fact, than control over the movement of goods or capital. Yet this growing flow of immigrants is propelled, in part, by the uneven economic development (discussed



▶ Figure 1.8 International Migration Globalization in its many forms is connected to the largest migration in human history, as people are drawn to centers of economic activity in hopes of a better life. This diagram shows that nearly half of the world's immigrants move within major world regions (such as Europe and Asia). But there are major interregional flows from Asia to Europe or from Latin America to North America. **Q: What international groups are found in your city?**

◀ Figure 1.9 UN Peacekeepers in Africa A convoy rolls past displaced people walking towards a UN camp outside of Malakal, South Sudan. Conflict in South Sudan has displaced tens of thousands. The town of Malakal was destroyed by fighting; its former residents sought shelter in a UN camp.



▲ Figure 1.10 Global Arms Exports The four largest exporters of arms in the world are the United States, followed by Russia, France, and China. This export economy has major economic and geopolitical implications. U.S. arms go to many world regions, but especially Southwest Asia. Russia exports arms to India, whereas Pakistan and Bangladesh are major buyers of arms from China.

the United Arab Emirates, and Turkey); Russia ($35 billion) exports to India, China, and Vietnam; France largely exports arms to Morocco and China; and China is the top supplier of armaments to Pakistan and Bangladesh in South Asia. These maps suggest evolving geopolitical relations that may differ from more formal geopolitical or economic ties.

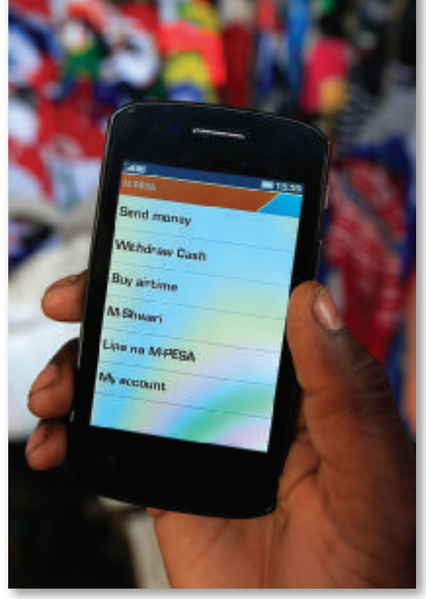
At the same time, there are globalized criminal networks that trade in weapons, drugs, prostitution, pornography, wildlife, money laundering, and forced labor. These illegal networks can incorporate often impoverished and remote places such as Afghanistan, Myanmar (Burma), or Zimbabwe into thoroughly integrated circuits of global exchange. **Human trafficking** is the illegal trade of humans for the purpose of forced labor, sexual slavery, or commercial sexual exploitation that is often integrated into these illegal networks. The International Labor Organization (ILO) estimated that in 2014, trafficking of people was a $150 billion industry.

Ironically, many observers argue that globalization—almost by definition—has weakened the political power of individual states by strengthening regional economic and political organizations, such as the European Union (EU) and the **World Trade Organization** (WTO), an institution that deals with the global rules of trade among nations. In some world regions, a weakening of traditional state power has led to stronger local and separatist movements, as illustrated by the turmoil on Russia's southern border. Yet even established regional blocs such as the EU may be contested, as witnessed by the surprising result of the 2016 referendum in the United Kingdom to leave the European Union. Similarly, many view the election of U.S. President Donald J. Trump in 2016 as a vote against open trade and open borders, as he campaigned aggressively against such policies.

Economic Globalization and Uneven Development Outcomes

Most scholars agree that the major component of globalization is the economic reorganization of the world. Although different forms of a world economy have existed for centuries, a well-integrated and truly global economy is primarily the product of the past several decades. Attributes of this system, while familiar, bear repeating:

- Global communication systems and the digital flow of information that links all regions and most people instantaneously (Figure 1.11)
- Transportation systems that can quickly and inexpensively move goods by air, sea, and land
- Transnational business strategies that have created global corporations more powerful than many sovereign nations
- New and more flexible forms of capital accumulation and international financial institutions that make 24-hour trading possible
- Global and regional trade agreements that promote more free trade
- Market economies and private enterprises that have replaced state-controlled economies and services
- An emphasis on producing more goods, services, and data at lower costs to fulfill consumer demand for products and information (Figure 1.12)
- Growing income inequality between rich and poor, both within and between countries



◀ Figure 1.11 Global Use of Cell Phones Mobile technologies have revolutionized the way people communicate, acquire information, and interact in a globalized world. In Nairobi, Kenya, the majority of the city's adult population now uses M-Pesa, a cell-phone-based money transfer service, to pay for everything from street food to rides on the city's privately owned minibuses.

This global reorganization has resulted in unprecedented economic growth in some areas of the world in recent years; China is a good example, with an average annual growth rate of 8.2 percent from 2009 to 2015. But not everyone profits from economic globalization, as continuing wage gaps within China indicate, nor have all world regions shared equally in the benefits. During the same time period (2009–2015), Latin America and the Caribbean averaged only 2.7 percent annual growth, while the financial troubles in Greece resulted in an annual average of −4.5 percent.

Thinking Critically About Globalization

Globalization, particularly its economic aspects, is one of today's most contentious issues. Supporters believe that globalization creates greater economic efficiency that will eventually result in rising prosperity for the entire world. In contrast, critics claim that globalization largely benefits those who are already prosperous, leaving most of the world poorer than before as the rich and powerful exploit the less fortunate. Increasingly, scholars discuss the pros and cons of digital globalization, which is less about the movement of capital, goods, and people but

▼ Figure 1.12 Chinese Factories Workers sew denim jeans in the city of Shenzhen, China. Typically from rural parts of China where wages are lower, these workers live in factory-owned dorms and work six days a week. The products they sew are shipped around the world.

instead describes the accelerated movement of data to facilitate daily demands for information, searches, financial transactions, communication, and video.

Pro-globalization Arguments Economic globalization is generally applauded by corporate leaders and economists, and underlies pro-market reforms and fiscal discipline as exemplified by policies put forward by the World Bank, International Monetary Fund (IMF), and the World Trade Organization. The primary function of the **World Bank** is to make loans to poor countries so that they can invest in infrastructure and build more modern economic foundations. The IMF makes short-term loans to countries in financial difficulty—those having trouble, for example, making interest payments on loans that they had previously taken. The WTO, a much smaller organization than the other two, works to reduce trade barriers between countries to enhance economic globalization. The WTO also tries to mediate between countries and trading blocs engaged in trade disputes.

Beyond North America, moderate and conservative politicians in most countries generally support free trade and other aspects of economic globalization. Advocates argue that globalization is a logical and inevitable expression of contemporary international capitalism that benefits all nations and all peoples. Economic globalization can work wonders, they contend, by enhancing competition, increasing the flow of capital and employment opportunities to poor areas, and encouraging the spread of beneficial new technologies and ideas. To support their claims, pro-globalizers argue that countries that have embraced the global economy generally enjoy more economic success than those that have sought economic self-sufficiency. The world's most isolated country, North Korea, is an economic disaster with little growth and rampant poverty, whereas those that have opened themselves to global forces during the same period, such as Vietnam and Thailand, have seen rapid growth and substantial reductions in poverty.

Critics of Globalization Opponents of globalization, such as labor and environmental groups, as well as many social justice movements, often argue that globalization is not a "natural" process. Instead, it is the product of an explicit economic policy promoted by free-trade advocates, capitalist countries (mainly the United States, but also Japan and the countries of Europe), financial interests, international investors, and multinational firms that maximize profits by moving capital and seeking low-wage labor. Further, because the globalization of the world economy is creating greater inequity between rich and poor, the trickle-down model of developmental benefits for all people in all regions has yet to be validated. On a global scale, the richest 20 percent of the world's people consume 86 percent of the world's resources, whereas the poorest 80 percent use only 14 percent. Critics also worry that a globalized economic system—with its instantaneous transfers of vast sums of money over nearly the entire world on a daily basis—is inherently unstable. The worldwide recession of 2008–2010 demonstrated that global interconnectivity can also increase economic vulnerability, as illustrated by the collapse of financial institutions in Iceland or the decline of remittances from Mexicans working in the United States to their families in Mexico.

There are growing concerns that an emphasis on export-oriented economies at the expense of localized ones has led to overexploitation of resources. World forests, for example, are increasingly cut for export timber rather than serving local needs. As part of their economic structural adjustment package, the World Bank and the IMF often encourage developing countries to expand their resource exports to earn more hard currency to pay off their foreign debts. When commodity prices are high, this strategy can stimulate growth, but as commodity prices decline, as they did in 2014–2016, growth rates in developing countries slow. Moreover, the IMF often requires countries that receive loans to adopt programs of fiscal austerity that substantially reduce public spending for education, health, and food subsidies. Adopting such policies, critics warn, will further impoverish a country's people (Figure 1.13).

A Middle Position Advocates of a middle-ground position argue that economic globalization is indeed unavoidable and that, despite its promises and pitfalls, globalization can be managed at both the national and the international levels to reduce economic inequalities and protect the natural environment. These experts stress the need for strong yet efficient national governments, supported by international institutions (such as the UN, World Bank, and IMF) and globalized networks of nongovernmental environmental, labor, and human rights groups. Moreover, the global movement of goods has flattened in the last few years, whereas the digital flow of information has soared, creating new opportunities and pitfalls that require further study.

Unquestionably, globalization is one of the most important issues of the day—and certainly one of the most complicated. While this book does not pretend to resolve the controversy, nor does it take a position, it does encourage readers to reflect on these critical points as they apply to each world region.

Diversity in a Globalizing World

As globalization progresses, many observers foresee a world far more uniform and homogeneous than today's. The optimists among them imagine a universal global culture uniting all humankind into a single community untroubled by war, ethnic strife, or resource shortages—a global utopia of sorts.

A more common view is that the world is becoming blandly homogeneous as different places, peoples, and environments lose their

▼ Figure 1.13 Protesting Greeks Cuts to pensions and health care prompted Athens residents to march in Athens in 2018. Greece's financial bailout from the IMF and EU in 2010 led to mandatory austerity measures, and workers and pensioners have experienced dramatic declines in income and services.

distinctive character and become indistinguishable from their neighbors. Yet even as globalization generates a certain degree of homogenization, the world is still a highly diverse place (Figure 1.14). We can still find marked differences in culture (language, religion, architecture, foods, and other attributes of daily life), economies, and politics—as well as in the physical environment—from place to place. Such **diversity** is so vast that it cannot readily be extinguished, even by the most powerful forces of globalization. Diversity may be difficult for a society to live with, but it also may be dangerous to live without. Nationality, ethnicity, cultural distinctiveness—all are defining expressions of humanity that are nurtured in specific places.

In fact, globalization often provokes a strong reaction on the part of local people, making them all the more determined to maintain what is unique about their way of life. Thus, globalization is understandable only if we also examine the diversity that continues to characterize the world and, perhaps most important, the tension between these two forces: the homogenizing power of globalization and the reaction against it, often through demands for protecting cultural distinctiveness.

The politics of diversity demand increasing attention as we try to understand such concepts as global terrorism, ethnic identity, religious practices, and political independence. Groups of people throughout the world seek self-rule of territory they can call their own. Today most wars are fought *within* countries, not *between* them. As a result, our interest in geographic diversity takes many forms and goes far beyond simply celebrating traditional cultures and unique places. People have many ways of making a living throughout the world, and it is important to recognize this fact as the globalized economy becomes increasingly focused on mass-produced consumer goods. Furthermore, a stark reality of today's economic landscape is uneven outcomes: While some people and places prosper, others suffer from unrelenting poverty (Figure 1.15). To analyze these patterns of unevenness and change, the next section considers the tools used by geographers to better know the world.

▼ **Figure 1.14 Shopping in Isfahan** Young women shop in the grand bazaar in Isfahan, Iran, in preparation for Eid al-Fitr, the celebration at the end of Ramadan. While few places are beyond the reach of globalization, it is also true that distinct cultures, traditions, and landscapes exist in the world's various regions.

▲ **Figure 1.15 Landscape of Economic Inequality** The gap between rich and poor is painfully obvious in many of the world's large cities. In Rio de Janeiro, Brazil, the wealthy reside in highrises that offer security, modernity, and ocean views, whereas the city's poor live in *favelas*—sprawling self-built shantytowns where crime, violence, and poverty are all too common. Brazil, the world's fifth largest country, suffers from extreme economic inequality.

REVIEW

1.4 **Provide examples of how globalization impacts the culture of a place or region.**

1.5 **Describe and explain five components of economic globalization.**

1.6 **Summarize three elements of the controversy about globalization.**

KEY TERMS globalization, glocalization, human trafficking, World Trade Organization (WTO), World Bank, diversity

The Geographer's Toolbox: Location, Maps, Remote Sensing, and GIS

Geographers use many different tools to represent the world in a convenient form for examination and analysis. Different kinds of images and data are needed to study vegetation change in Brazil or mining activity in Mongolia; population density in Tokyo or language regions in India; religions practiced in Southwest Asia or rainfall distribution in southwestern Australia. Knowing how to display and interpret information in map form is part of a geographer's skill set. In addition to traditional maps, today's modern satellite and communications systems provide an array of tools not imagined 50 years ago.

Latitude and Longitude

To navigate their way through daily tasks, people generally use a mental map of *relative locations* to locate specific places in terms of their

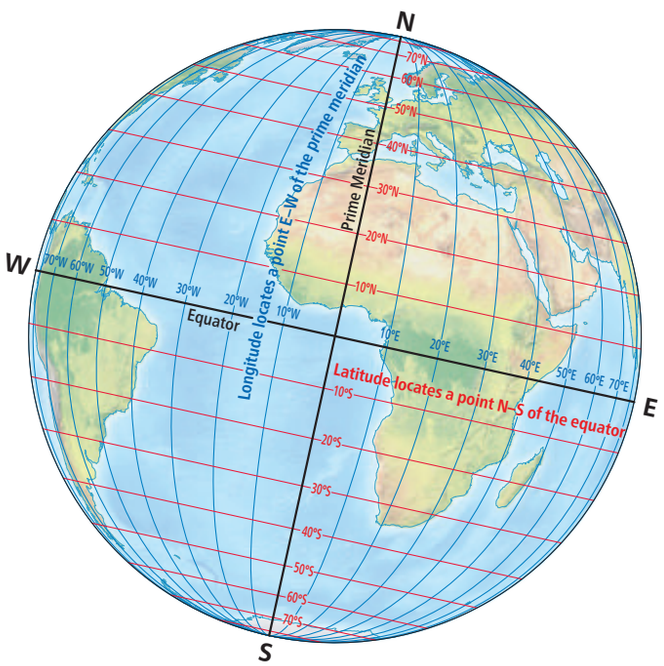
relationship to other landscape features. The shopping mall is near the highway, for example, or the college campus is near the river. In contrast, map makers use *absolute location*, often called a mathematical location, which draws on a universally accepted coordinate system that gives every place on Earth a specific numerical address based on latitude and longitude. The absolute location for the Geography Department at the University of Oregon, for example, has the mathematical address of 44 degrees, 02 minutes, and 42.95 seconds north and 123 degrees, 04 minutes, and 41.29 seconds west. This is written 44° 02′ 42.95″ N and 123° 04′ 41.29″ W.

Lines of **latitude**, often called **parallels**, run east–west around the globe and are used to locate places north and south of the equator (0 degrees latitude). In contrast, lines of **longitude** (or **meridians**), run from the North Pole (90 degrees north latitude) to the South Pole (90 degrees south latitude). Longitude values locate places east or west of the *prime meridian*, located at 0 degrees longitude at the Royal Naval Observatory in Greenwich, England (just east of London) (Figure 1.16). The equator divides the globe into northern and southern hemispheres, whereas the prime meridian divides the world into eastern and western hemispheres; these latter two hemispheres meet at 180 degrees longitude in the western Pacific Ocean. The International Date Line, where each new solar day begins, lies along much of 180 degrees longitude, deviating where necessary to ensure that small Pacific island nations remain on the same calendar day.

Each degree of latitude measures 60 nautical miles or 69 land miles (111 km) and is made up of 60 minutes, each of which is 1 nautical mile (1.15 land miles). Each minute has 60 seconds of distance, each approximately 100 feet (30.5 meters).

From the equator, parallels of latitude are used to mathematically define the tropics: The Tropic of Cancer at 23.5 degrees north and the Tropic of Capricorn at 23.5 degrees south. These latitude lines denote where the Sun is directly overhead at noon on the solar solstices in June and December. The Arctic and Antarctic circles, at 66.5 degrees north and south latitude respectively, mathematically define the polar regions.

▼ Figure 1.16 Latitude and Longitude Latitude locates a point between the equator and the poles and is designated in degrees north or south. Longitude locates a point east or west of the prime meridian, located just east of London, England. **Q: What are the latitude and longitude of your school?**



Global Positioning Systems (GPS) Historically, precise measurements of latitude and longitude were determined by a complicated method of celestial navigation, based on one's location relative to the Sun, Moon, planets, and stars. Today absolute location on Earth (or in airplanes above Earth's surface) is determined through satellite-based **global positioning systems (GPS)**. These systems use time signals sent from your location to a satellite and back to your GPS receiver (which can be a smartphone) to calculate precise coordinates of latitude and longitude. GPS was first used by the U.S. military in the 1960s and then made available to the public in the later decades of the 20th century. Today GPS guides airplanes across the skies, ships across oceans, private autos on the roads, and hikers through wilderness areas. In the future, such systems will guide driverless cars. While most smartphones use locational systems based on triangulation from cell-phone towers, some smartphones are capable of true satellite-based GPS accurate to 3 feet (or 1 meter).

Map Projections

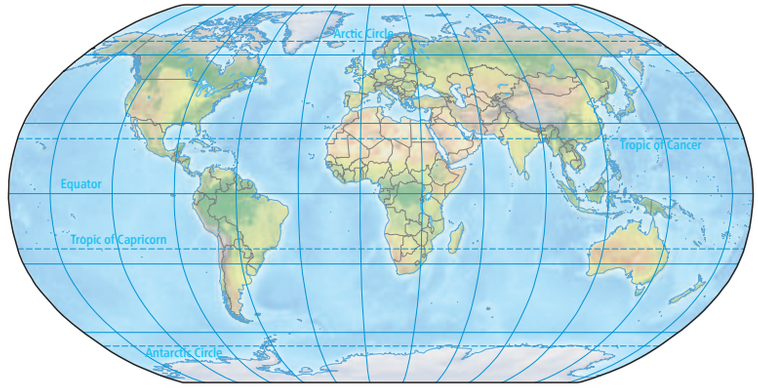
Because the world is a sphere, mapping the globe on a flat piece of paper creates inherent distortions in the latitudinal, or north–south, depiction of Earth's land and water areas. Cartographers (those who make maps) have tried to limit these distortions by using various **map projections**, defined as the different ways to project a spherical image onto a flat surface. Historically, the Mercator projection was the projection of choice for maps used for oceanic exploration. However, a glance at the inflated Greenlandic and Russian landmasses shows its weakness in accurately depicting high-latitude areas (Figure 1.17). Over time, cartographers have created literally hundreds of different map projections in their attempts to find the best ways to map the world while limiting distortions.

For the last several decades, cartographers have generally used the Robinson projection for maps and atlases. In fact, several professional cartographic societies tried unsuccessfully in 1989 to ban the Mercator projection for world maps because of its spatial distortions. Like many other professional publications, maps in this book utilize the Robinson projection.

Map Scale

All maps must reduce the area being mapped to a smaller piece of paper. This reduction involves the use of **map scale**, or the mathematical ratio between the map and the surface area being mapped. Many maps note their scale as a ratio or fraction between a unit on the map and the same unit in the area being mapped, such as 1:63,360 or 1/63,360. This means that 1 inch on the map represents 63,360 inches on the land surface; thus, the scale is 1 inch equals 1 mile. Although 1:63,360 is a convenient mapping scale to understand, the amount of surface area that can be mapped and fitted on a letter-sized sheet of paper is limited to about 20 square miles. At this scale, mapping 100 square miles would produce a bulky map 8 feet square. Therefore, the ratio must be changed to a larger number, such as 1:316,800. This means that 1 inch on the map now represents 5 miles (8 km) of distance on land.

(a) Mercator projection



(b) Robinson projection

◄▲ **Figure 1.17 Map Projections** Cartographers have long struggled with how best to accurately map the world given the distortions inherent in transferring features on a round globe to a flat piece of paper. Early mapmakers commonly used the Mercator projection (a), which distorts features in the high latitudes but worked fairly well for seagoing explorers. (b) This map is the Robinson projection, developed in the 1960s and now the industry standard because it minimizes cartographic distortion.

Animation: Map Projections
https://goo.gl/Y3z9rY

Based on the *representative fraction*, the ratio between the map and the area being mapped, maps are categorized as having either large or small scales (Figure 1.18). It may be easy to remember that large-scale maps make landscape features like rivers, roads, and cities *larger*, but because the features are larger, the maps must cover *smaller* areas. Conversely, small-scale maps cover *larger* areas, but must then make landscape features *smaller.*

Map scale is probably the easiest to interpret when it is a *graphic* or *linear scale*, which visually depicts distance units such as feet, meters, miles, or kilometers on a horizontal bar. Most of the maps in this book are small-scale maps of large areas; thus, the graphic scale is in miles and kilometers.

Map Patterns and Map Legends

Maps depict everything from the most basic representation of topographic and landscape features to complicated patterns of population, migration, economic conditions, and more. A map can be a simple *reference map* showing the location of certain features, or a *thematic map* displaying data such as religious affiliations or popular tourist attractions in a city. Most of the maps in this text are thematic maps illustrating complicated spatial phenomena. Every map has a *legend* that provides information on the categories used in the map, their values (when relevant), and other symbols that may need explanation.

One type of thematic map used often in this book is the **choropleth map** in which color shades represent different data values, with darker shades generally showing larger average values. Per capita income and population density are often represented by these maps, with data divided into categories and then mapped by spatial units such as countries, provinces, counties, or neighborhoods. The category breaks and

▼ **Figure 1.18 Small- and Large-Scale Maps** A portion of Australia's east coast north of Sydney is mapped at two scales: (a) one at a small scale and (b) the other at a large scale. Note the differences in distance depicted on the linear scales of the two maps. There is more closeup detail in the large-scale map, but it covers only a small portion of the area mapped at a small scale.

(a) Small-scale map of Sydney

(b) Large-scale map of Sydney

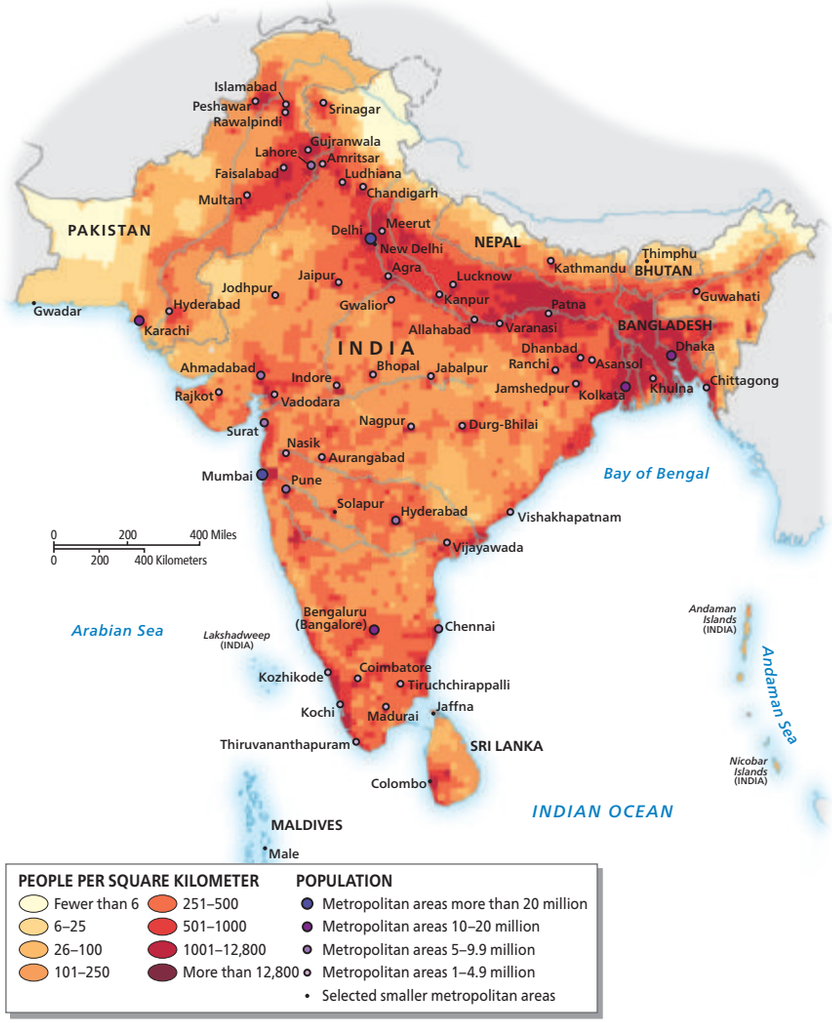
spatial units selected can have a dramatic impact on the patterns shown in a choropleth map (Figure 1.19).

Aerial Photos and Remote Sensing

Although maps are a primary tool of geography, much can be learned about Earth's surface by deciphering patterns on aerial photographs taken from airplanes, balloons, or satellites. Originally available only in black and white, today these images are digital and can exploit visible light (like a photograph) or other light wavelengths such as infrared that are not visible to the human eye.

Even more information about Earth comes from electromagnetic images taken from aircraft or satellites, termed **remote sensing** (Figure 1.20). Unlike aerial photography, remote sensing gathers electromagnetic data that must be processed and interpreted by computer software to produce images of Earth's surface. This technology has many applications, including monitoring the loss of rainforests, tracking the biological health of crops and woodlands, and even measuring the growth of cities. Remote sensing is also central to national defense, such as monitoring the movements of troops or the building of missile sites in hostile countries.

▼ Figure 1.19 Choropleth Map The population density of South Asia is mapped using different categories, from sparsely populated to very high densities, depicted with increasing intensity of colors so that you see immediately the gradients from low to high population density. This is an example of a choropleth map, which is commonly used to show variations across space of a particular phenomenon.



▲ Figure 1.20 Remote Sensing of Dubai This NASA satellite image of Dubai shows the extraordinary changes that have taken place along the arid gulf coast of the United Arab Emirates. Sprawling urbanization, construction of port facilities, new water features, and expensive island real estate (one shaped like a palm and the other shaped like the continents) are evident. Areas in red are irrigated green spaces for parks and golf courses.

Explore the SIGHTS of Palm Jumeirah
http://goo.gl/4akxhs

The Landsat satellite program launched by the United States in 1972 is a good example of both the technology and the uses of remote sensing. These satellites collect data simultaneously in four broad bands of electromagnetic energy, from visible through near-infrared wavelengths, that is reflected or emitted from Earth. Once these data are processed by computers, they display a range of images, as illustrated in Figure 1.20. The resolution on Earth's surface ranges from areas 260 feet (80 meters) square down to 98 feet (30 meters) square.

Commercial satellite companies such as DigitalGlobe now provide high-resolution satellite imagery down to 1.5 feet (or 0.5 meters) square. This means that a car, small structure, or group of people would be easily seen, but an individual person would not. Of course, cloud cover often compromises the continuous coverage of many parts of the world.

Geographic Information Systems (GIS)

Vast amounts of computerized data from sources such as maps, aerial photos, remote sensing, and census data are brought together in **geographic information systems (GIS)**. The resulting

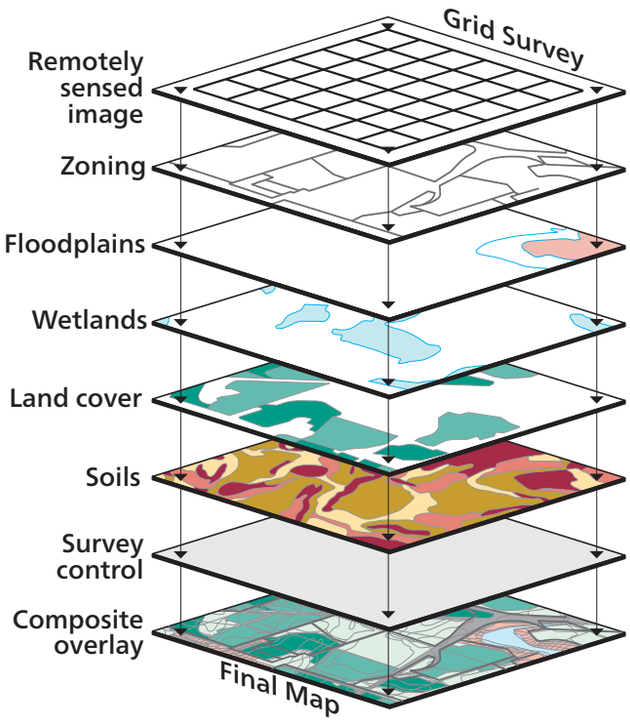
spatial databases are used to analyze a wide range of issues. Conceptually, GIS can be considered a computer system for producing a series of overlay maps showing spatial patterns and relationships (Figure 1.21). A GIS map, for example, might combine a conventional map with data on toxic waste sites, local geology, groundwater flow, and surface hydrology to determine the source of pollutants appearing in household water systems.

Although GIS dates back to the 1960s, it is only in the last several decades—with the advent of desktop computer systems and remote sensing data—that GIS has become absolutely central to geographic problem solving. It plays a central role in city planning, environmental science, public health, and real-estate development, to name a few of the many activities using these systems. GIS and other spatial tools and techniques are also critical in uncovering the patterns that allow geographers to address the themes discussed in the rest of this chapter and in the rest of the book.

Physical Geography and Environmental Issues: The Changing Global Environment

Chapter 2 provides background on world physical and environmental geography, outlining the global environmental elements fundamental to human settlement—landforms, climate, vegetation, hydrology, and energy. In the regional chapters, the physical geography sections explain the environmental issues relevant to each world region, covering such topics as climate change, sea-level rise, acid rain, energy and resource issues, deforestation, and wildlife conservation. Each regional chapter addresses specific environmental problems, but also discusses policies and plans to resolve those issues (see *Working Toward Sustainability: Meeting the Needs of Future Generations*).

▼ Figure 1.21 GIS Layers Geographic information systems (GIS) maps usually consist of many layers of information that can be viewed and analyzed separately or as a composite overlay. This is a typical environmental planning map where different physical features (such as wetlands and soils) are combined with zoning regulations.



REVIEW

1.7 **Explain the difference between latitude and longitude, and describe how they are used to locate a place.**

1.8 **What does a map's scale tell us?**

1.9 **What is a choropleth map, and what might it depict?**

1.10 **What are geographic information systems (GIS), and how are they used today to address societal needs?**

KEY TERMS latitude (parallels), longitude (meridians), global positioning systems (GPS), map projection, map scale, choropleth map, remote sensing, geographic information systems (GIS), sustainable development, Sustainable Development Goals (SDGs)

Population and Settlement: People on the Land

Currently, Earth has more than 7.5 billion people, with demographers (those who study human populations and population change) forecasting an increase to 9.8 billion by 2050 (Figure 1.22). Most of this increase will take place in Sub-Saharan Africa, North Africa and Southwest Asia, and South Asia. In contrast, the regions of Europe, Eurasia, and East Asia will likely experience no demographic growth between now and 2050. Population concerns vary, with some countries, such as Bangladesh trying to slow population growth, while others, like Ukraine, worry about population decline.

Population is a complex topic, but several points may help to focus the issues:

- The current rate of population growth is now half the peak rate experienced in the early 1960s, when the world population was around 3 billion. At that time, talk of a "population bomb" and "population explosion" was common, as scholars and activists voiced concern about what might happen if such high growth rates continued. Still, even with today's slower growth, demographers predict that over 2 billion more people will be added by 2050, with much of this growth taking place in the world's poorest countries.
- Population planning takes many forms, from the fairly rigid two-child policy of China to slow population growth to the family-friendly policies of no-growth countries, like South Korea, that would like to increase their natural birth rates. Over half of the world's married women use modern contraceptive methods, which has contributed to slower growth (Figure 1.23).
- Not all attention should be focused on natural growth because migration is increasingly a significant source of growth in some countries. International migration is often driven by a desire for a better life in a new country. Although much international migration is to developed countries in Europe, North America, and Oceania, there are comparable flows of migrants moving between developing countries, such as flows from South Asia to Southwest Asia or immigration within Latin America and Sub-Saharan

WORKING TOWARD SUSTAINABILITY

Meeting the Needs of Future Generations

The word *sustainable* seems to be everywhere, as we hear about sustainable cities, agriculture, forestry, business—even sustainable lifestyles. With so many different uses of the word, it is appropriate to revisit its original definition.

Sustainable has two meanings: The first is to endure or to maintain something at a certain level so that it lasts. The second means something that can be upheld or defended, such as a *sustainable idea* or *action.* Resource management has long used terms such as *sustained-yield forestry* to refer to timber practices in which tree harvesting is attuned to the natural rate of forest growth so that the resource is not exhausted, but can renew itself over time.

Moral and ethical dimensions were added to this traditional usage in 1987 when the UN World Commission on Environment and Development addressed the complicated relationship between economic development and environmental deterioration. The commission stated that "**sustainable development** is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This cautionary message expands the notion of sustainability from a narrow focus on resource management to include the whole range of human "needs," both now and in the future. In 2016, the United Nations Development Program launched the **Sustainable Development Goals** (SDGs), 17 universal goals aimed at ending poverty, protecting the planet, and promoting peace, in effect until 2030. These goals are priority areas in which governments should invest their resources, including poverty reduction, health, education, gender equality, clean water, clean energy, climate action, infrastructure, sustainable cities, responsible consumption/production, biodiversity, and strong institutions.

Sidebars in the following chapters explore the different ways that people around the world are working toward sustainability and sustainable development. Examples include offshore wind power in Denmark (Chapter 8); China's efforts at flood control (Chapter 11) (Figure 1.2.1); and preserving gibbon habitat in Cambodia (Chapter 13). Each sidebar links to a Google Earth virtual tour video.

1. **How might the concept of sustainability differ for a city or town in India or China compared to a U.S. city?**
2. **Does your college or community have a sustainability plan? If so, what are the key elements?**

▲ **Figure 1.2.1 Urban Wetlands** This opera house near Harbin, China, was built on a large semi-urban wetland. China is designing model "sponge cities" to absorb and store runoff in wetland environments in order to reduce the risk of urban flooding.

GOOGLE EARTH
Virtual Tour Video
http://goo.gl/oGTPq9

Africa. In addition, the UN estimates that over 60 million people were displaced as a result of civil strife, political persecution, and environmental disasters in 2016, the largest number ever recorded. This includes both internally displaced people and refugees who have left their country of origin.

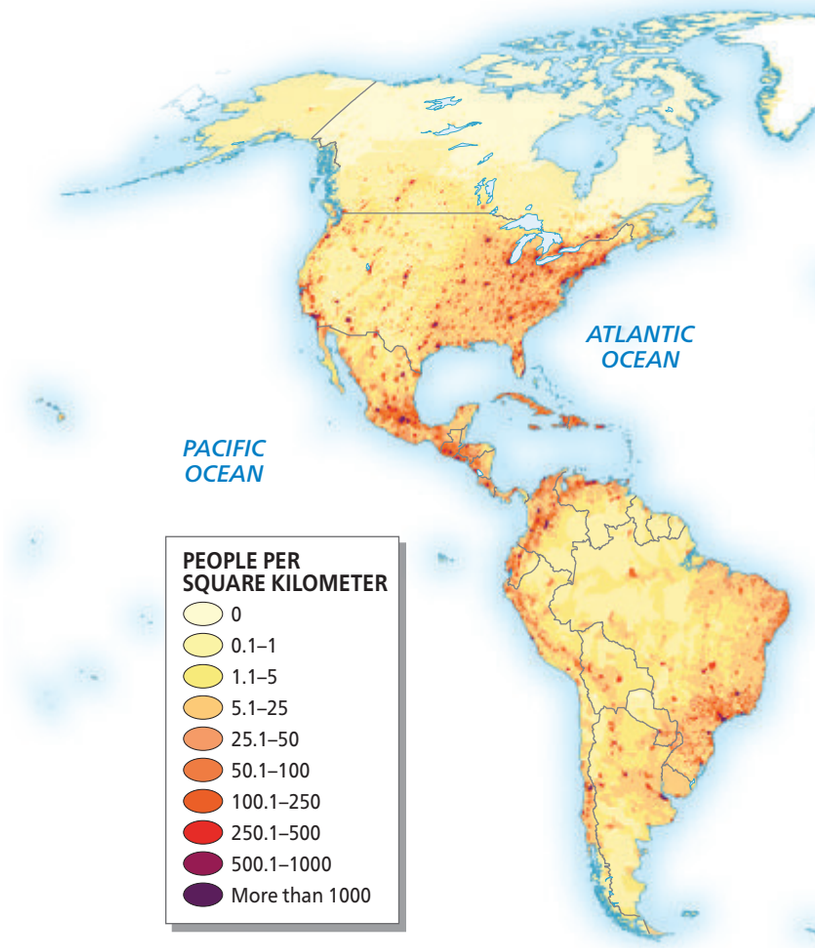
- The greatest migration in human history is going on now as millions of people move from rural to urban places. In 2009, a landmark was reached when demographers estimated that for the first time, more than half the world's population lived in towns and cities.

Population Growth and Change

Geographers make use of a variety of ways to define the population characteristics of a region. The most common measures and models are described here. Because of the central importance of demography in shaping localities, each regional chapter has a table of population indicators for the countries of that region. Table 1.1 includes key population indicators for the world's 10 largest countries by total population size in 2018. Keep in mind that one-third of the world's 7.5 billion people live in two countries—China and India. The next largest countries are the United States, followed by Indonesia and Brazil. Combined, the 10 largest countries account for over 60 percent of the world's population.

Population size alone tells only part of the story. **Population density**, for the purposes of this text, is the average number of people per square kilometer. Thus, China is the world's largest country demographically, but the population density of India, the second largest country, is three times that of China. Bangladesh's population density is far greater still at over 1200 people per square kilometer.

Population densities differ considerably across a large country and between rural and urban areas, making the gross national figure a bit misleading. Many of the world's largest cities, for example, have



▶ **Figure 1.22 World Population** This map emphasizes the world's different population densities. East and South Asia stand out as the most populated regions, with high densities in Japan, eastern China, northern India, and Bangladesh. In arid North Africa and Southwest Asia, settlements are often linked to the availability of water for irrigated agriculture, as is apparent with the population cluster along the Nile River. Higher population densities in Europe, North America, and other countries are usually associated with major metropolitan areas.

densities of more than 30,000 people per square mile (10,300 per square kilometer), with the central areas of São Paulo, Brazil, and Shanghai, China, easily twice as dense because of the prevalence of high-rise apartment buildings. In contrast, most North American cities have densities of fewer than 10,000 people per square mile (3800 per square kilometer), due largely to a cultural preference for single-family dwellings on individual urban lots.

The statistics in Table 1.1 might seem daunting, but this information is crucial to understanding general population trends, overall growth rates, age structure, patterns of settlement, and rates of migration among the countries that make up various world regions.

Natural Population Increase A common starting point for measuring demographic change is the **rate of natural increase (RNI)**, which provides the annual growth rate for a country or region as a percentage. This statistic is produced by subtracting the number of deaths from the number of births in a given year. Important to remember is that population gains or losses through migration are not considered in the RNI.

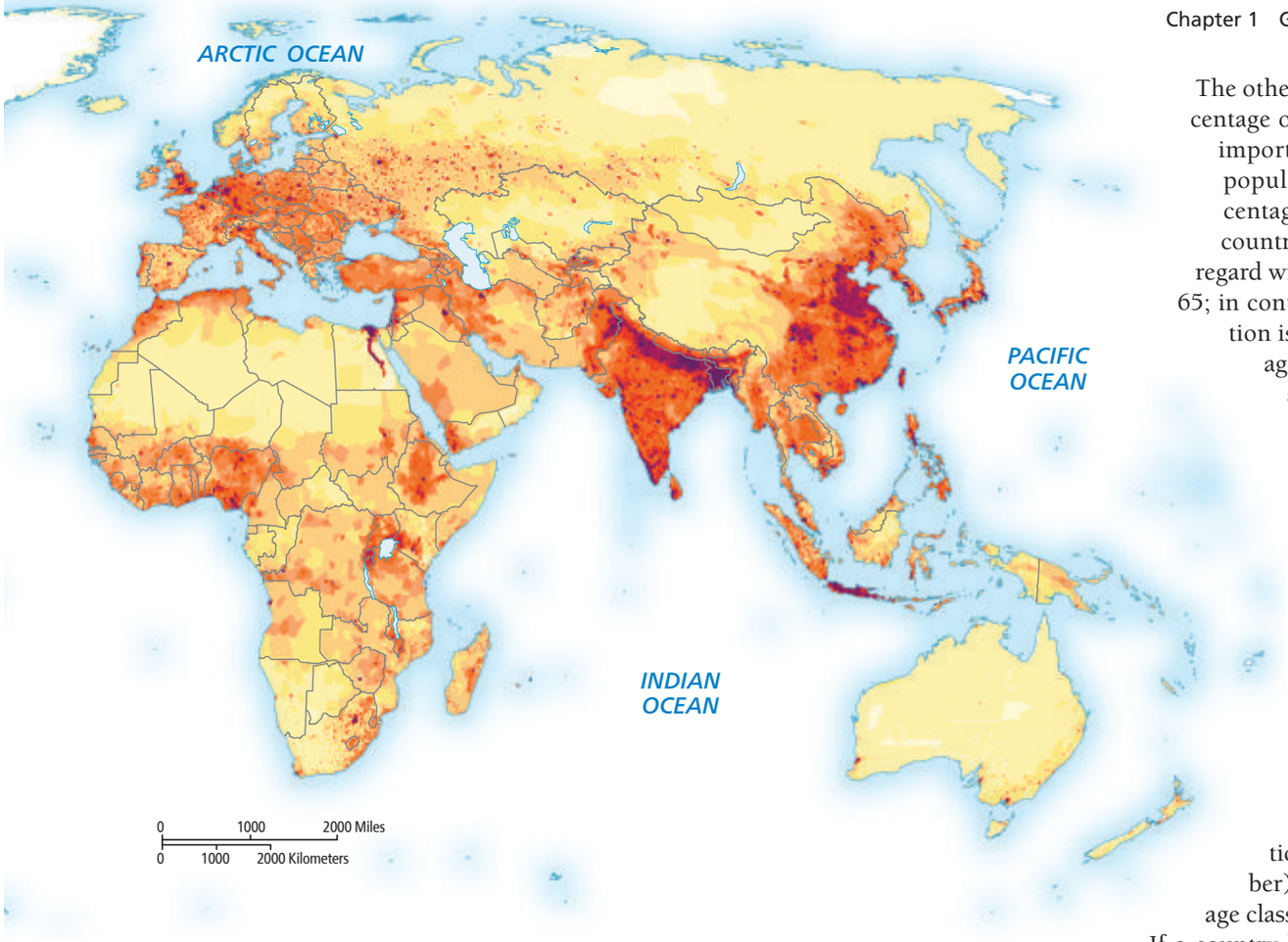
The RNI is a small number with major consequences. It can be positive as in the case of Nigeria, or stable as in the United States; some countries have negative rates, which means they are losing population. China's RNI is 0.5, whereas India's is 1.4. Yet if those rates are maintained, China's population will double in 140 years, whereas India's will double in 50 years. This is why demographers are confident that India will surpass China as the largest country in the next decade or so. The country with the highest RNI on Table 1.1 is Nigeria at 2.6. If Nigeria maintains that rate, it will double its size in 27 years. In fact, demographers forecast that in 2050 Nigeria will be the third largest country in the world, after India and China. Countries with a rate close to zero are demographically stable, but countries with persistent negative rates will experience slow declines in population unless immigration occurs.

▼ **Figure 1.23 Family Planning in Cambodia** Women in a reproductive health clinic in Kampong Cham, Cambodia learn about modern birth control options. The availability of modern contraception has brought total fertility rates down throughout the world.

For many years Japan was one of the demographic top 10, but due to negative RNI, the country has lost population and in 2015 was replaced by Mexico (Figure 1.24).

Total Fertility Rate Population change is impacted by the **total fertility rate (TFR)**, which is the average number of live births a woman has in her lifetime. The TFR is a good indicator of a country's potential for growth. A TFR of 2.1 is considered the **replacement rate** and suggests that it takes two children per woman, with a fraction more to compensate for infant and child mortality, to maintain a stable population. Where infant mortality is high, a country's actual replacement rate could be higher—say, 3.0. Clearly, women do not have 1.6 or 5.6 children; rather, women in some countries on average have 1 to 2 children versus 5 to 6 children, which means the potential for population growth is very different. In 1970, the global TFR was 4.7, but by 2017 that rate was nearly cut in half to 2.5. Around the world, fertility rates have been coming down for the last four decades as women move to cities, become better educated, work outside the home, control their fertility with modern contraception, and receive better medical care for themselves and their infants.

Four of the countries listed in Table 1.1 have a below-replacement TFR, meaning that over time their natural growth will slow as fewer children are born; and in some cases, population will decline if immigration does not occur. Even India's current TFR is 2.3, a dramatic change from 5.5 in 1970. India will still grow for many decades to come, but the potential for growth has been reduced as Indian women have smaller families. The countries with the highest total fertility rates are in Sub-Saharan Africa, where the average is about 5. Nigeria's TFR is slightly higher at 5.5.



Population Age Structure Another important indicator of a population's relative youthfulness, and its potential for growth, is the percentage of the population under age 15. Currently, 26 percent of the world's population is younger than age 15. However, in fast-growing Sub-Saharan Africa, that figure is 43 percent. This is another indicator of the population growth that will continue in this region for at least another generation. In contrast, only 16 percent of the populations of East Asia and Europe are under 15, suggesting slower growth and shrinking family sizes.

The other end of the age spectrum—the percentage of a population over age 65—is also important. Just 9 percent of the world's population is over age 65, yet the percentage is twice that in many developed countries. Japan distinguishes itself in this regard with 28 percent of its population over 65; in contrast, only 12 percent of its population is under 15, indicating that the average age of the population is increasing as well. An aging population is significant when calculating a country's need to provide social services for its senior citizens and pensioners. It also has implications for the size of the overall workforce that supports retired and elderly individuals.

Population Pyramids The best graphic indicator of a population's age and gender structure is the **population pyramid**, which depicts the percentage of a population (or, in some cases, the raw number) that is male or female in different age classes, from young to old (Figure 1.25). If a country has many more young people than old, the graph has a broad base and a narrow tip, thus taking on a pyramidal shape that commonly forecasts rapid population growth. In contrast, slow-growth or no-growth populations are top-heavy, with a larger number of seniors than younger age classes.

Not only are population pyramids useful for comparing different population structures around the world at a given point in time; they also capture the structural changes of a population as it transitions from fast to slow growth. In addition, population pyramids display gender differences within a population, showing whether or not there is a disparity in the numbers of males and females. In the mid-20th century,

TABLE 1.1 Population Indicators **Explore these data in MapMaster 2.0** https://goo.gl/Ab8mdY

Country	Population (millions) 2018	Population Density (per square kilometer)[1]	Rate of Natural Increase (RNI)	Total Fertility Rate	Life Expectancy		Percent Urban	Percent <15	Percent >65	Net Migration (rate per 1000)
					Male	Female				
China	1393.8	148	0.5	1.8	75	78	59	17	11	0
India	1371.3	450	1.4	2.3	67	70	34	28	6	0
United States	328.0	36	0.3	1.8	76	81	82	19	15	3
Indonesia	265.2	146	1.2	2.4	67	71	54	28	5	−1
Brazil	209.4	25	0.8	1.7	72	79	86	22	8	0
Pakistan	200.6	256	1.9	3.1	66	68	37	33	4	−4
Nigeria	195.9	210	2.6	5.5	53	54	50	44	3	0
Bangladesh	166.4	1265	1.4	2.1	70	73	37	29	5	−3
Russia	147.3	9	–0.1	1.6	68	78	74	18	14	2
Mexico	130.8	66	1.3	2.2	75	80	73	27	7	−1

Sources: Population Reference Bureau, *World Population Data Sheet, 2018.*
[1] World Bank Open Data 2018.

Log in to Mastering Geography & access MapMaster to explore these data!
1) Compare the maps for the overall Population and the RNI for each county in this table. How might the top 10 rankings change in the next 20 years?
2) What is the value of the replacement rate? Which countries are currently below the replacement rate of 2.1? What does that mean for their long-term growth?

▲ **Figure 1.24 Smaller Families, Declining Population** Japan has seen its family size shrink to one or two children. Consequently, the total population of the country has declined as well.

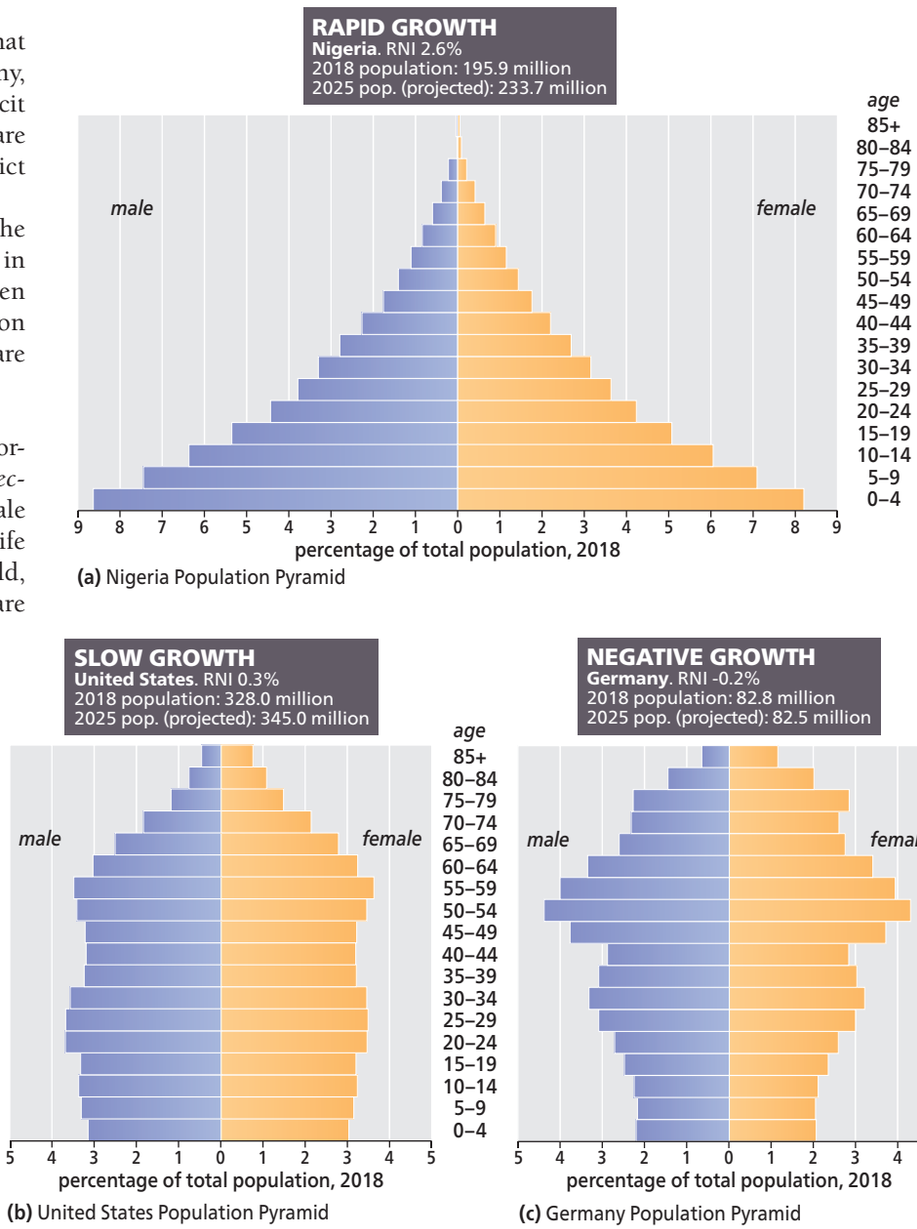
for example, population pyramids for those countries that fought in World War II (such as the United States, Germany, the former Soviet Union, and Japan) showed a distinct deficit of males, indicating those lost to warfare. Similar patterns are found today in countries experiencing widespread conflict and civil unrest.

Cultural preferences for one sex or another, such as the preference for male infants in China and India, show up in population pyramids when there are more male children than female. Because of their utility in displaying population structures graphically, comparative population pyramids are found in many of the regional chapters of this book.

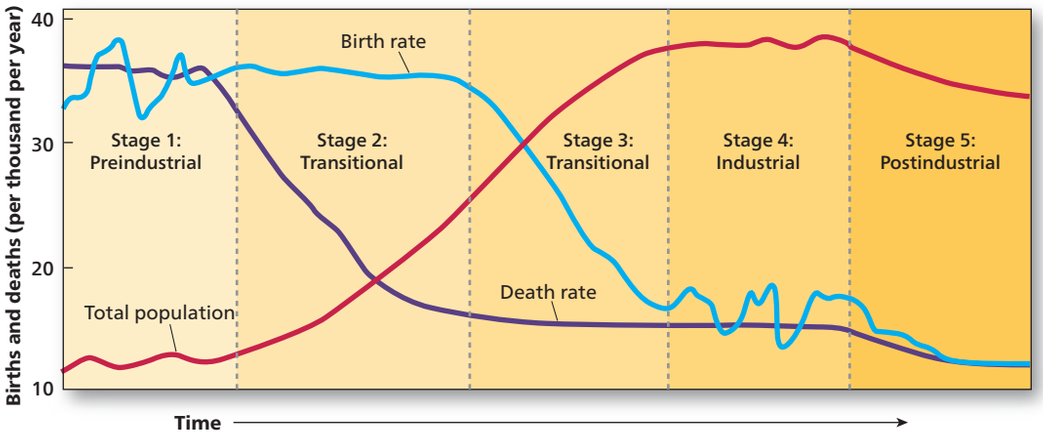
Life Expectancy A demographic indicator containing information about health and well-being in a society is *life expectancy*, which is the average number of years a typical male or female in a specific country can be expected to live. Life expectancy generally has been increasing around the world, indicating that conditions supporting life and longevity are improving. To illustrate, in 1970 the average life expectancy figure for the world was 58 years, whereas today it is 70 for men and 74 for women—female life expectancy is nearly always higher than male by a few years. Some countries, such as Bangladesh, Iran, and Nepal, have seen average life expectancies increase by 20 years or more since 1970. Table 1.1 shows that women in China, the United States, Brazil, and Mexico all have life expectancies of 78–81 years; men's life expectancies are a few years less. Of the top 10 countries, Nigeria's life expectancy is the lowest. Russia has the widest gap between male and female life expectancy—10 years. The life expectancy of men in Russia is similar to that of men in India and Pakistan, although Russia has higher levels of economic development.

Because a large number of social factors—such as health services, nutrition, and sanitation—influence life expectancy, many researchers use life expectancy as a surrogate measure for development. When this figure is improving, it indicates that other aspects of development are occurring. Each regional chapter reports on male and female life expectancy.

The Demographic Transition The historical record suggests that population growth rates have slowed over time. More specifically, in



▶ **Figure 1.25 Population Pyramids** The term *population pyramid* comes from the shape of the graph representing a rapidly growing country such as (a) Nigeria, when data for age and sex are plotted as percentages of the total population. The broad base illustrates the high percentage of young people in the country's population, indicating that rapid growth will likely continue for at least another generation. Contrast the pyramidal shape with the narrow bases of slow- and negative-growth countries, such as (b) the United States and (c) Germany, which have fewer children and people in the childbearing years and a larger proportion of the population over age 65. **Q: Think of two example countries that fit into each of these three categories: rapid growth, slow growth, and negative growth.**



◀ Figure 1.26 Demographic Transition As a country industrializes, its population moves through the five stages in this diagram, known as the *demographic transition model*. In Stage 1, population growth is low because high birth rates are offset by high death rates. Rapid growth takes place in Stage 2, as death rates decline. Stage 3 is characterized by a decline in birth rates. The transition was initially thought to end with low growth once again in Stage 4, resulting from a relative balance between low birth rates and low death rates. But with many developed countries now showing no natural growth, demographers have added a fifth stage to the traditional model to show no growth or even negative natural growth.

Europe and North America, population growth slowed as countries became increasingly industrialized and urbanized. From these historical data, demographers generated the **demographic transition model**, a conceptualization that tracks the changes in birth rates and death rates over time. Birth rates are the annual number of births per 1000 people in a country, and death rates are the annual number of deaths per 1000 people. When birth rates exceed death rates, natural increase occurs (Figure 1.26).

Stage 1 of the demographic transition model is characterized by both high birth rates and high death rates, resulting in a very low RNI. Historically, this stage is associated with Europe's preindustrial period, a time that predated common public health measures such as water and sewage treatment, an understanding of disease transmission, and the most fundamental aspects of modern medicine. Not surprisingly, death rates were high and life expectancy was short. Currently there are no Stage 1 countries in the world.

In Stage 2, death rates fall dramatically while birth rates remain high, thus producing a rapid rise in the RNI. In both historical and contemporary times, this decrease in death rates is commonly associated with the development of public health measures and modern medicine. Additionally, one of the assumptions of the demographic transition model is that these health services become increasingly available only after some degree of economic development and urbanization takes place.

However, even as death rates fall and populations increase, it takes time for people to respond with lower birth rates. This happens in Stage 3, the transitional stage in which people become aware of the advantages of smaller families in an urban and industrial setting, contrasted with the earlier need for large families in rural, agricultural settings or where children worked at industrial jobs (both legally and illegally).

Then in Stage 4, a low RNI results from a combination of low birth rates and low death rates. Until recently, this stage was assumed to be the static end point of change for developing and urbanizing populations. However, this does not seem to be the case. In many highly urbanized developed countries, such as those in Europe as well as Japan, the death rate now exceeds the birth rate, and the RNI falls below the replacement level, expressed as a negative number. This negative growth state can be considered a fifth stage of the traditional demographic transition model.

Remember, though, that the RNI is just that—the rate of *natural* increase—and does not capture a country's growth from immigration. For example, even if RNI is negative, a country may demographically grow or stabilize due to immigration from other countries.

Global Migration and Settlement

Never before have so many people been on the move, either from rural areas to cities or across international borders. Today more than 250 million people live outside the country of their birth and thus are officially designated as immigrants by the UN and other international agencies. Much of this international migration is directly linked to the new globalized economy because the majority of these migrants live either in the developed world or in developing countries with vibrant industrial, mining, or petroleum extraction economies. In the oil-rich countries of the United Arab Emirates, Qatar, and Saudi Arabia, the labor force is composed primarily of foreign migrants, especially from South Asia (Figure 1.27), who are considered **economic migrants** (immigrants who arrive for employment opportunities). The top six destination countries, which account for 40 percent of the world's immigrants, are major industrial or mining economies: United States, Russia, Germany, Saudi Arabia, United Kingdom, and

▲ Figure 1.27 Global Workforce South Asia laborers working on a construction site in Doha, Qatar. Many Persian Gulf countries rely on vast numbers of contract laborers, mostly from South Asia, to provide the labor necessary to build these modern cities and serve the populations living there.

United Arab Emirates. Within these countries, and for most other destinations, migrants are drawn to the opportunities found in major metropolitan areas. They are also responsible for billions of dollars in **remittances**, monies sent by individuals working abroad to families in the origin country. Many view remittances as a critical livelihood resource that is a catalyst for continued migration.

Not all migrants move for economic reasons. War, persecution, famine, and environmental destruction cause people to flee to safe havens elsewhere. Accurate data on **refugees** (migrants fleeing a well-founded fear of persecution) are often difficult to obtain for several reasons. Often these individuals are illegally crossing international boundaries, or countries deliberately obscure the number of people fleeing for political reasons. The UN estimates that there are currently 60 million refugees or internally displaced persons; more than half of these people are in Africa and Southwest Asia. The conflict in Syria has displaced over half of that country's population. Over half of the 11.6 million displaced people are scattered within Syria, but nearly 5 million live outside the territory—mostly in Turkey, Lebanon, Jordan, and Iraq (see *Humanitarian Geography: Tools for Service*).

Net Migration Rates The amount of immigration (people entering a country) and emigration (those leaving a country) is measured by the **net migration rate**. A positive figure means that a country's population is growing because of migration, whereas a negative number means more people are leaving. As with other demographic indicators, the net migration rate is expressed as the numbers of migrants per 1000 of base population. Returning to Table 1.1, only the United States and Russia have positive net migration rates. Indonesia, Pakistan, Bangladesh, and Mexico have negative rates, while China, India, Brazil, and Nigeria have rates at zero, meaning the number of people entering and leaving in a particular year cancel each other out. This does not mean that these countries do not produce immigrants—both India and China have large populations overseas—but for that particular year, incoming and outgoing flows were equivalent.

Countries with some of the highest net migration rates—such as Qatar, Bahrain, and the United Arab Emirates—depend heavily on migrants for their labor force. Countries with the highest negative migration rates include those in conflict—such as Syria and Somalia, and Pacific island nations with relatively small populations and weak economies, such as Samoa and Micronesia.

HUMANITARIAN GEOGRAPHY

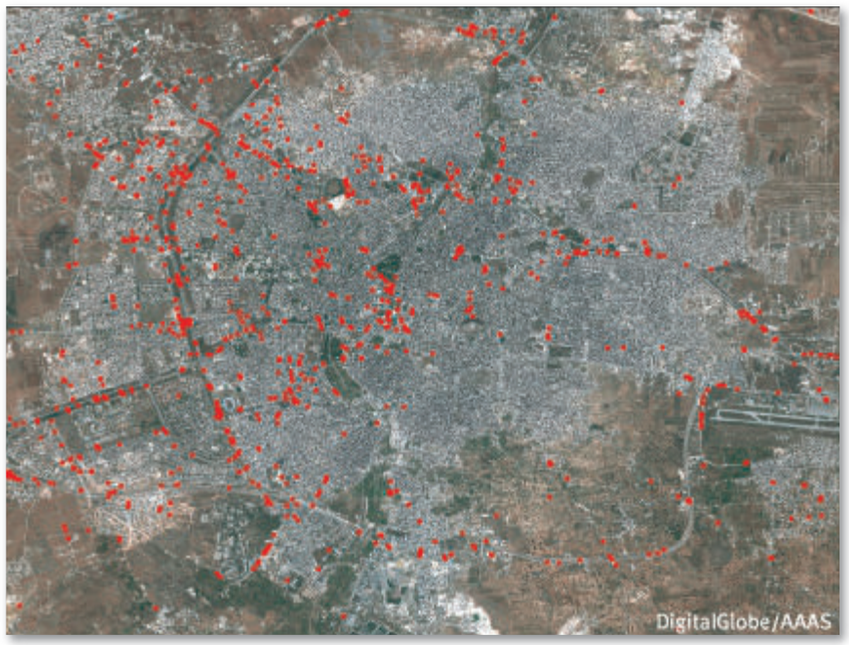
Tools for Service

▲ **Figure 1.3.1**
Susan Wolfinbarger

Geographers regularly use satellite imagery, GIS, drones, and crowd-sourced data to address humanitarian crises and to seek justice. From mapping the extent of a landslide or flood, to identifying the source of a pollutant, to tracking a wildfire moving across the landscape, accurate real-time information on maps can save lives, plan a response, or document crimes. Each chapter in this book highlights an example of humanitarian geography.

For example, Susan Wolfinbarger, a geographer at the U.S. State Department, has utilized satellite imagery for years, documenting human rights abuses in conflict zones (Figure 1.3.1). When she worked at the American Association for the Advancement of Science, her team used high-resolution satellite imagery to analyze the increase in roadblocks in the Syrian city of Aleppo in 2013. Roadblocks demonstrate a decline in the circulation of people and goods in this densely settled city (Figure 1.3.2).

Examples of geospatial tools and analysis contributing to humanitarian efforts include mapping environmental hazards in Indonesia (Chapter 13); teaching map skills to defectors to pinpoint human rights crimes in North Korea (Chapter 11); monitoring the exclusion zone around the Chernobyl nuclear site (Chapter 9), and rescuing migrants in the Mediterranean Sea (Chapter 8).



▲ **Figure 1.3.2 Monitoring Aleppo** This image shows the Syrian city in May 2013, where over 1000 roadblocks were detected. Roadblocks are an indicator of ongoing conflict and potential humanitarian concerns because they restrict the movement of people and goods throughout the city.

1. **Explain how mapping skills would be useful during a natural disaster. How might mapping be helpful in documenting crime?**
2. **How have maps benefited you or your community?**

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