Essentials of WORLD REGIONAL GEOGRAPHY

White Dymond Chacko Scheidt Bradshaw

Third Edition

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World Regional
GEOGRAPHY

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third edition

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About the Authors

George W. White

George W. White grew up in Oakland, California. He pursued graduate work in Eugene, Oregon, completing a Ph.D. at the University of Oregon. He then moved to Frostburg, Maryland, where he met his wife. George served as a faculty member for 15 years at Frostburg State University, attaining the rank of full professor and serving for a time as department chair. He then moved to South Dakota State University, where he now serves as head of the Department of Geography. Political geography and Europe are two of his primary interests. He authored a book titled *Nationalism and Territory: Constructing Group Identity in Southeastern Europe* (2000) and a second titled *Nation, State, and Territory. Vol. 1. Origins, Evolutions, and Developments* (2004).

After meeting Michael Bradshaw, George was impressed by Michael's long and distinguished career of teaching, research, and publication. He accepted the opportunity to join Michael in his plans to write a new world regional geography text. He initially took lead authorship of the chapters on Europe and Russia and Neighboring Countries, later adding Northern Africa and Southwestern Asia.

George became a geographer because he believes that the field of geography is alive and dynamic, attuned to our ever-changing world and its great diversity. The world regional approach represents the breadth of the field of geography, and world regional geography texts are the epitome of the geographer's art. George White chose to collaborate with Michael Bradshaw on this project because the text combines local practices with global processes, and explains interactions between the two as they shape each other.

Joe Dymond

Joe Dymond earned a master of science degree from The Pennsylvania State University in 1994 and a master of natural sciences degree from Louisiana State University in 1999. He taught world regional geography courses for the Louisiana State University Department of Geography and Anthropology from 1995 through 2000. During Joe's six years at LSU, he instructed thousands of students and was recognized in the spring of 1997, fall of 1999, and fall of 2000 for superior instruction to freshman students by the Louisiana State University Freshman Honor Society, Alpha Lambda Delta. Joe currently lives in suburban Washington, D.C., with his wife and children, and is an assistant professor and lead undergraduate major advisor in the Department of Geography at The George Washington University (GWU). In the fall of 2006, Joe was honored by GWU as a recipient of a Morton A. Bender Teaching Award. The George Washington University recognized him again in 2010 with a GWU Service Excellence: Student Choice Award. In the spring of 2012, Joe was celebrated by GWU as the recipient of the 2011–2012 GWU Writing in the Disciplines Distinguished Teaching Award.

Joe is the secondary author for Chapter 1 and is the lead author for the regional chapters on Australia, Oceania, Antarctica, and Latin America. Joe is interested in providing students with the geographic tools that will help them to better understand the human and environmental patterns present in their world. His greatest concern for geography students is that they obtain a comprehensive and fair perspective when learning about the people and places comprising the regions of the world. The style of this text attempts to tell the regional geographic story from many perspectives. This structure permits students to better analyze geographic characteristics, connections, and relationships around the world and to think critically about important global issues. *Essentials of World Regional Geography* **teaches** rather than **lectures**.

Elizabeth Chacko

Elizabeth Chacko was born and raised in Kolkata, India. She received her undergraduate degree in geography (with honors) from the University of Calcutta. Moving to the United States for further study, she earned a master's degree in geography from Miami University, Ohio. She also obtained a graduate degree in public health and a Ph.D. in geography from the University of California, Los Angeles (UCLA). Elizabeth taught geography at the college level at various institutions, including Loreto College, Kolkata; UCLA, and The George Washington University, where she is Chair and Associate Professor of Geography and International Affairs.

Elizabeth was selected as Professor of the Year from the District of Columbia in 2006 by the Carnegie Foundation for the Advancement of Teaching and the Council for the Advancement and Support of Education (CASE). She teaches courses on South Asia, globalization, medical and population geography, and development. Elizabeth's research interests include women's health and the role of culture in health and health care. She is currently engaged in research on transnationalism, the African immigrant community in the United States, and the return migration of Asian Indian professionals to India. Elizabeth is on the editorial board of the *Journal of Cultural Geography* and the *Professional Geographer*, and she is a member of the Board of Trustees of the Population Reference Bureau.

In this edition, Elizabeth is the lead author for the chapters on South Asia and East Asia. She is delighted to be part of an author team of committed geographers. She enjoys helping students understand the dynamic interactions between humans and the earth's surface and comprehend the interplay of economic, sociocultural, and political forces that impact globalization and the spatial variations that result at local, regional, and global scales. She hopes that this book will raise students' appreciation of the relevance and significance of geography in their lives.

Justin Scheidt

Justin Scheidt is an assistant professor of geography and geology at Georgia Southern University. Previously he served as a faculty member at Delta College and Ferris State University. He is currently working on his dissertation in geography, examining the regional development and planning of passenger high-speed rail systems in North America, and he completed coursework toward the Ph.D. degree at Florida State University from 2010 to 2011. He has a master of science degree in geological sciences from the University of South Carolina (2005), and a highest honors B.A. in geography from the University of Florida (2000), with minors in geology and environmental science. Justin brings experience to this textbook project in the fields of North America and Sub-Saharan Africa.

Justin has worked extensively on research and planning for passenger high-speed rail efforts in the United States, co-authoring publications on this topic with Dr. Joseph Schwieterman of DePaul University in the *Journal of Regional Planning* (2007, 2008). He was a guest speaker at the North American High Speed Rail Summit in Ottawa, Ontario, in November 2009, and he has given similar presentations at the Association of American Geographers National Conventions (2010, 2011). He currently lives in Canadian Lakes, Michigan, and is originally from Tampa, Florida.

Michael Bradshaw

Michael Bradshaw lives in Canterbury, England, and has two sons and three grandchildren. Michael taught for 25 years at the College of St. Mark and St. John, Plymouth, as Geography Department chair and dean of the humanities course. He has written texts for British high schools and colleges since the 1960s. In 1985, he was awarded a Ph.D. from Leicester University for his study on the impacts of federal grant-aid in Appalachia. His book *The Appalachian Regional Commission: Twenty-Five Years of Government Policy* was published in 1992. Since 1991, he has written for U.S. students and has been responsible for two physical geography texts and the successful world regional geography text, *The New Global Order*. Michael believes that we should all be better equipped to live in the modern, increasingly global world. Understanding of geographic differences should make us more able to assess crucial issues and value other people who bring varied resources and who face pressures that we find difficult to imagine.

Preface

As the authors of *Contemporary World Regional Geography*, we are pleased to bring you the third edition of *Essentials of World Regional Geography.* We created this text because many instructors teach under circumstances that make a shorter, streamlined text more desirable than the standard world regional text. It has its own unique features. In preparing this text, we adopted a fresh approach that combines fundamental geographical elements, internal regional diversity, and contemporary issues. These allow serious discussion of cultural and environmental issues along with political and economic changes, for example, in Russia and China. The shorter length and distinctive approach were received enthusiastically by nearly all our reviewers.

The main innovations are in the ordering of the text. Each of the 11 regional chapters opens with a full-page (or larger) map of the region, short accounts of people or events to provide a personal flavor of the region, an outline of the chapter contents, and a short section placing the region in its wider global context. Each chapter has three further sections. The first summarizes the distinctive physical and human geographies of the region; the second explores the internal diversity of the region at subregional, selected country, and local scales. These take forward our commitment to the comparative nature of world regional geography. The third section focuses on a selection of contemporary issues that are important to the people of each region and frequently have implications for the rest of the world. Many of these issues are highly contested, with opposing factions having dramatically differing viewpoints. We have outlined these views in debate formats to help students understand them. Reviewing instructors were enthusiastic about the teaching value of this overall approach.

The opening chapter contains a discussion of the basis and value of world regional geography and overviews of the main relevant aspects of physical and human geography. Students are introduced to the maps and diagrams that are features of each chapter to encourage comparative study and familiarization with the set of illustrations chosen. Maps take a prominent role, and photos throughout the text provide windows on the elements of the regional geographies. We know that students are interested in how geography can be used in the workplace, and so each chapter ends with a personal example of work in progress.

Chapter Highlights

Chapter 1, Essentials of World Regional Geography, defines geography and regional geography and introduces the concept of globalization-localization tensions. This is followed by an overview of physical geography with a focus on Earth's interior forces, climate, ecosystems, and human impact on the physical environment. The human geography overview is led by a consideration of how culture influences regional character, followed by major aspects of population geography, political geography, and economic geography. These aspects are connected in a summary of approaches to human development and human rights. At the end of the chapter, the world regions are defined with a summary of their main distinctive characteristics.

Chapter 2, Europe, begins a world region tour where many modern global processes and innovations began, often building upon previous African, Asian, and Arab achievements. The contemporary issues include the development and future of the European Union and an exploration of the growing multicultural nature of European society.

We next move eastward in **Chapter 3, Russia and Neighboring Countries**. This is a study of the geographical impacts of European-origin communist principles adopted by governments for most of the 1900s, followed by massive changes as the Soviet Union broke up in the early 1990s. The Russian "Empire" remains a political and economic reality in the region. Contemporary issues include questions of human rights and environmental problems, together with the region's wealth derived from oil and natural gas.

In **Chapter 4, East Asia**, we enter a region of cultural contrast to Europe, but one that contains the world's most significant emerging countries: Japan, China, South Korea, and Taiwan. These contrast with North Korea and Mongolia. Contemporary issues include the emergence of China as a world power and its distinctive population policy, human rights, local multinational corporations, and globally connected cities.

Chapter 5, Southeast Asia, deals with a region at a global crossroads where the impacts of commerce, cultural exchanges, conquest, and globalization are evident. Most countries in the region have coastal access and a history of population movements between the mainland and islands. A geographic transition zone between East and South Asia, Southeast Asia has incorporated demographic and cultural elements from both these regions. Among the contemporary issues examined in this chapter are regional cooperation through ASEAN (Association of Southeast Asian Nations), conflicts over ocean space and piracy, and the rise of Singapore as a significant financial and trading hub in the region.

Moving westward, we reach **Chapter 6, South Asia**, with its distinctive cultural background, including the origins of Hinduism and Buddhism, and colonial experiences. After gaining independence from the British Raj in 1947, the new countries attempted self-sufficiency, avoiding close relations with other regions and leading a group of nonaligned countries. This policy was partly successful, but switched in the 1990s to a more global outlook. The contemporary issues include ethnic conflicts and environmental problems, alongside considerations of population and urban growth.

Further westward we enter **Chapter 7, Northern Africa and Southwestern Asia**, at the junction of Asia, Europe, and Africa. Although a mainly arid region, its people initiated, influenced, and passed on many cultural and technical innovations to the surrounding regions. Today it is the world's center of the Islamic religion and has the world's largest oil resources. However, its fragmented and conflicting peoples tend toward political instability. The contemporary issues include the Israeli-Palestinian conflict, the Iraq situation, and aspects of human rights.

Southward is the subject of **Chapter 8, Sub-Saharan Africa**, the world's poorest region despite its leading role at the outset of human history. After major migrations of African peoples, Muslim and European influences took control of much of the region. Most countries gained independence, mainly in the 1960s, but struggled through internal political conflict and poverty. The contemporary issues include the role of HIV/AIDS, the culture shocks of global elements, exploding city populations, and the question of this century's challenge to Africans.

The tour then reaches **Chapter 9, Australia, Oceania, and Antarctica**. Though distant from many of the other world regions, countries in this world region were first brought into the global system through European colonization and territorial claims. Continued globalization is increasingly connecting this world region to other world regions.

Crossing the South Pacific Ocean to **Chapter 10, Latin America**, we find a world region where many indigenous peoples remain but enjoy little political or economic power in contrast to the descendants of European colonists and those of mixed ethnic groups. Contemporary issues include the deforestation of Amazon rain forest, the international drug trade based in the northern Andes, and the growth of huge cities in Mexico and Brazil.

Finally, we reach **Chapter 11, North America**, with the world's most affluent societies in the United States and Canada. The United States in particular sets the conditions of globalization, although not all the impacts offer better livelihoods to all Americans. Contemporary issues include the impacts of immigration, the North American Free Trade Agreement, and the role of French-speaking Québec in Canada.

What's New to This Edition

- **New information.** The world in which we live is constantly changing. This edition features new information on population changes, migration, the global economy, gender (in)equality, conflict, and the environment. Globalization is causing some societies to become increasingly connected as they share products, styles, and ideas. At the same time, others remain disconnected, and often by choice. In either case, the world's connections are continually changing.
- **New and improved physical features maps.** Each new chapter opener is now a redrawn and enlarged full-page physical features map, or a two-page map in the case of Chapter 3: Russia and Neighboring Countries and Chapter 7: Northern Africa and Southwestern Asia. The new maps show major physical features, country boundaries, capital cities, and other major cities that students can easily reference while reading the chapter. Every map has been evaluated for size, labeling, and color consistency.
- **New climate maps.** Regional climate maps have been rendered and placed in each chapter, where they are more easily accessed by students and instructors.
- **Learning objectives** have been added to each chapter to help guide both the instructor and students through the key content of the chapter.
- **Updated data tables.** Throughout the text, tables have been updated to reflect the most current data.
- **Global economic crisis.** This text incorporates coverage of the 2008–2009 global economic crisis. Details are provided in most regional chapters about the local, regional, and global effects of the crisis. Further coverage incorporates documentation and analysis of the post-crisis recovery for many areas.
- **Natural disasters and human-environment issues.** Unfolding crises are seamlessly integrated into the regional discussions of the human dimension of physical geography and environmental issues. Disaster coverage is also integrated into relevant political and economic discussion. The scale of impacts from local to global is analyzed to help students to appreciate how events in one part of the world can affect everyday life in others. Examples include earthquakes in Haiti and New Zealand, an oil spill in the Gulf of Mexico, and an earthquake, tsunami, and nuclear disaster in Japan.
- **Economic crisis in Europe.** The recent world recession hit Europe particularly hard, and it has changed the relationships between the members of the European Union.
- **Russia as a world power.** The changing global economy has changed Russia's ability to act as a world power. Discussions include Russia's invasion of South Ossetia.
- Chapter 1 includes an expanded section on "**deglobalization**," which takes into account the rising costs of fuel and transportation and the rise of new technologies that use new materials.
- Chapter 2 discusses actions taken in Europe to address **climate change**, which includes new information on investments in **green energy** and new developments in Europe's auto industry. It also offers new information on the continued development of **Russia's economy**, especially its agricultural sector.
- Chapter 4 offers new discussions on the **globally connected cities of East Asia** (Hong Kong, Beijing, Tokyo,

Seoul) and an expanded section on **environmental problems in China**.
- Chapter 5 contains a more current discussion of **ASEAN** and **APEC** as well as a section on the tensions surrounding the **South China Sea**, and the impacts of human rights violations and economic sanctions on **Myanmar**.
- Chapter 6 highlights the **changing urban landscape** of South Asia and the growing urban population of India. It also touches on manufacturing and infrastructure in India.
- Chapter 7 contains a new section on the **Arab Spring** as well as new information on resources such as oil and water, and on **human rights**, especially concerning women in society.
- Chapter 8 includes significant updates, including current information on **South Sudan** and new maps and tables with up-to-date data.
- Chapter 9 offers updated discussions on recent geologic events, Aboriginal communities of Australia, current and projected **water issues in Australia**, the impact of regional resources on local, regional, and global trace/economies of Australia and New Zealand.
- Chapter 10 highlights include more detailed discussions on **Mexico City**—the expansion of the metropolitan area as well as squatter settlements, impoverished neighborhoods, and crime. It also includes a section on the **Andes Mountains**; the significant components of the economy, crime and drug trafficking and efforts to combat it, urban geography, and societal and cultural developments like the "mall/shopping culture" and the "bicycle culture."
- Chapter 11 contains a new section on **water issues and potential solutions** in the 21st century, with a focus on the process of desalination and its applications in North America. It also has a new agricultural regions map, which highlights the wide spatial diversity of land use across North America.

A Text for Students

Students are encouraged to think about what it means to be part of a global community and to develop their geographical understandings of world events. This text features:

- **Accessibility.** Reviewers commented on the clarity of writing, clear definition of terms, and up-to-date illustrations.
- **Consistent structure.** The clear and consistent structure within each chapter encourages readers to compare world regions.
- **Superior illustrations.** Straightforward maps and diagrams with styles that are repeated in each chapter allow students to easily compare regions.
- **An efficient and economic option.** A book of fewer pages encourages student participation.

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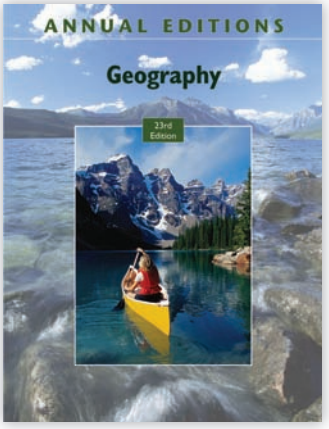

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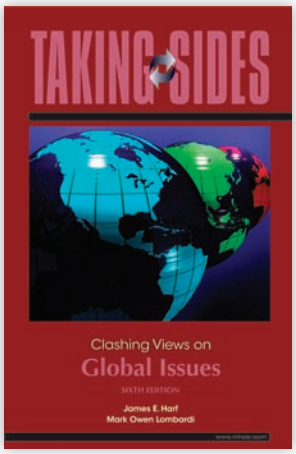

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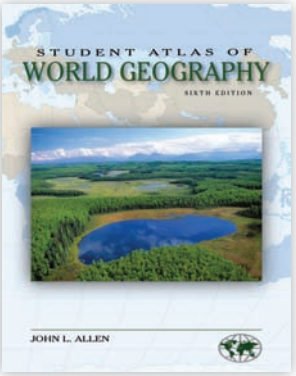

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Coastal Carolina University, Daniel A. Selwa
College of DuPage, Keith Yearman
Collin County Community College, Irina Vakulenko
Columbus State University, Amanda Rees
Community College of Denver, Peg Clover-Stipek
Concordia University–Nebraska, Jack Kinworthy
Craven Community College, Robert Scull
Defiance College, Don Buerk
Delta State University, Mark Bonta
Duquesne University, Charles Wilf
Eastern Kentucky University, Bruce E. Davis
Eastern Kentucky University, Elizabeth J. Leppman
Eastern Iowa Community College District, John Lindberg
Edinboro University, Wook Lee
Edison State Community College, Katherine Clifton
Elmhurst College, Ralph Feese
Endicott College, Michael Kilburn
Florida International University, Patricia L. Price
Fort Hays State University, Paul E. Phillips
Front Range Community College, Colorado, Uwe R. Kackstaetter
Gadsden State Community College, George W. Terrell, Jr.
George Mason University, Patricia Boudinot
George Mason University, Sinclair A. Sheers
Georgia College, Amy R. Sumpter
Georgia College & State University, Chuck Fahrer
Georgia Southern University, Jason Dittmer
Grand Valley State University, Jim Penn
Greenville Technical College, Nick Hill
Hannibal-LaGrange University, Mark S. Quintanilla
Hardin-Simmons University, Tiffany M. Fink
Heartland Community College, Mark McBride
Hutchinson Community College, Femi Ferreira
Indiana State University, Cyril Oluyomi Wilson
Indiana University–South Bend, Gabriel Popescu
Iowa Lakes Community College, Sharon Hackenmiller
Ivy Tech Community College, Milan Andrejevich
Jackson Community College, Glenn M. Fox
Jacksonville College, Patricia Richey
Kansas State University, L. Scott Deaner
Kansas State University, Matthew J. Gerike
Kansas State University, Chris Laingen
Kansas State University, Max Lu
Kansas State University, Sumanth G. Reddy
Kansas State University, Jeffrey S. Smith
Kansas State University, Jacob Sowers
Kennesaw State University, Ulrike Ingram
Kennesaw State University, Lynn M. Patterson
Kennesaw State University, Harold R. (Harry) Trendell
Kent State University, Weronika Kusek
Kent State University, Amy Rock
Kirkwood Community College, Jeremy J. Brigham
Lake Erie College, Darlene Hall
Las Positas College, Thomas Orf
Long Beach City College, Ebenezer Kofi Peprah
Long Beach City College, Ray Sumner
Louisiana State University, Kent Mathewson
Marshall University, Joshua Hagen
Marshall University, James M. Leonard
Martin Luther College, Earl Heidtke
Marygrove College, Tal Levy
Metropolitan State College of Denver, Kenneth W. Engelbrecht
Michigan Technological University, Bradley H. Baltensperger
Middle Tennessee State University, Denis A. Bekaert
Middle Tennessee State University, Douglas Heffington
Middle Tennessee State University, Paul J. O'Farrell
Mississippi State University, Dalton W. Miller, Jr.
Missouri State University, Deborah Corcoran
Missouri State University, Ju Luo
Missouri State University, Paul Rollinson
Missouri State University–West Plains, John H. Fohn II
Montclair State University, Danlin Yu
Moorpark College, Andrea Ehrgott
Morehead State University, Royal Berglee
Morris College, Patricia Ali
Mt. San Antonio College, Elizabeth Lobb
Muskingum University, Stephen Van Horn
National-Louis University, Frank Scruggs
New England College, Wayne Lesperance
North Country Community College, William F. Price
Northern Illinois University, Sarah A. Blue
Northern Illinois University, Xuwei Chen
North Hennepin Community College, Karen Johnson
Northwestern State University, Dean Sinclair
Northwest-Shoals Community College, Selina Pearson
Ohio Mid-Western College, Bill Dykes
Oregon State University, Cub Kahn
Ozarks Technical Community College, Susan Siemens
Palm Beach Community College, Shari L. MacLachlan
Pittsburg State University, Tim Bailey
Red Rocks Community College, Laura A. Zeeman
Rochester College, Mark Manry
Rowan University, New Jersey, Denyse Lemaire
Salt Lake Community College, Robert Adam Dastrup
Samford University, Jennifer Rahn
San Jacinto College–Central Campus, Michael Modica
Santa Fe College, Heidi L. J. Lannon
Shawnee State University, Anthony Dzik
Sitting Bull College Library, Mark Holman
South Dakota State University, James Peterson

Southern Arkansas University, Natalia G. Murphy
Southern Utah University, Paul R. Larson
Southwestern Illinois College, Jeff Arnold
Tarleton State University, Greg Arkinson
Tarleton State University, Robert Atkinson
Tennessee State University, Gashaw Bekele
Texarkana College, Janet G. Brantley
Texas A&M University, Erik Prout
Texas Tech University, Cynthia L. Sorrensen
Three Rivers Community College, Peter Patsouris
Towson University, R. D. K. Herman
Trinity International University, Linda Fratt
United States Military Academy, Francis A. Galgano, Jr.
United States Military Academy, Steven Oluic
University of Akron, Robert Barrett
University of Central Oklahoma, Robert M. Kerr
University of Colorado–Colorado Springs, Emily Skop
University of Delaware, Yda Schreuder
University of Kansas, Joshua Long
University of Kentucky, Stanley D. Brunn
University of Louisiana–Lafayette, Dennis Ehrhardt
University of Louisville, Carol L. Hanchette
University of Nebraska–Kearney, Brett R. Chloupek
University of North Carolina–Wilmington, W. Frank Ainsley
University of North Carolina–Wilmington, Robert Argenbright
University of Northern Colorado, Phil Klein
University of North Texas, Donald I. Lyons
University of Regina, Ben Cecil
University of South Carolina–Aiken, Linda Q. Wang
University of Vermont, Cheryl Morse Dunkley
University of Wisconsin–Green Bay, Marcelo Cruz
University of Wisconsin–Manitowoc, Melvin Johnson
University of Wisconsin–Milwaukee, Linda McCarthy
University of Wisconsin–Stevens Point, Jia Lu
University of Wisconsin–Stevens Point, Ismaila Odogba
University of Wisconsin–Whitewater, Margo Kleinfeld
Utah State University, Cliff B. Craig
Western Illinois University, Yongxin Deng
Western Kentucky University, John All
Western Kentucky University, Amy T. Nemon
Western State Colorado University, Phil Crossley
Westfield State College, Julie Urbanik
West Virginia University, Brent McCusker
Youngstown State University, Craig S. Campbell

Market in Moshi, Tanzania. *This town is situated 30 km (18 mi.) from Mt. Kilimanjaro. Fertile volcanic soils combined with orographically enhanced rainfall make the region south of Kilimanjaro, including Moshi, one of the most agriculturally productive in Tanzania.* Photo: Joseph P. Dymond.

CHAPTER 1

Essentials of World Regional Geography

LEARNING OBJECTIVES

After reading this chapter, you should be able to:

- Describe the study of world regional geography, and its importance to a changing world.
- Define globalization and localization.
- Understand the concept of region, and describe how regions change over time.
- Describe the broad physical geographic concepts of atmosphere and water interactions, lithosphere movement and relief, ecosystems and biomes, and natural hazards and resources. Explain how these phenomena contribute to defining world regions.
- Identify human impacts on natural environments, both historic and modern.
- Define cultural geography and explain how culture defines regions. Provide examples of divisions based on language, religion, ethnicity, class, and gender.
- Understand population change in terms of birth and death rates, fertility rates, and migration.
- Interpret a population pyramid, consumer goods chart, and income distribution chart. Explain how each of these highlights differences among and within world regions.
- Define nationalism, and explain how the concept of the nation-state contributes to the modern world map. List different types of governance, and describe the scale at which these operate.
- Explain how economic development is measured, and connect wealth, economic development, and type of economic system to differences among and within world regions.
- Discuss what is meant by the global economy, and identify important elements that make up the global economy.
- Explain what is meant by human development, and recognize the difference between the HDI and the GDP. Describe modern theories of development.
- Trace the evolution of the concept of human rights, and explain how recognition of these rights can vary from region to region.
- Identify the 10 major world regions and locate these on a world map. Compare and contrast the geographic characteristics that define these regions.


A 160° B 140° C 120° D 100° E 80° F 60° G 40° H 20° J 0°
A R C T I C
Queen Elizabeth Is.
Sverdrup Is.
Ellesmere I.
Parry Is.
Beaufort Sea
Point Barrow
Devon I.
Victoria I.
Baffin Bay
Baffin I.
Greenland
Gunnbjørn Fjeld 1,214 ft 3,700 m
Norwegian Sea
Arctic Circle
Denmark Str.
Davis Str.
Nuuk
Reykjavik
Iceland
Cape Farewell
Mt. McKinley 20,321 ft 6,194 m
Alaska
Alaska Range
Anchorage
Gulf of Alaska
Kodiak I.
Aleutian Is.
Yukon
Mackenzie
Yellowknife
Coast Mts.
Rocky Mountains
Hudson Bay
Canadian Shield
Labrador
Labrador Sea
Labrador Current
Edmonton
Vancouver
Seattle
Winnipeg
Great Plains
NORTH AMERICA
Missouri
Mississippi
Montréal
Toronto
Chicago
Boston
New York
Appalachian Mts.
Newfoundland
Cape Race
North Atlantic Drift
British Is.
North Sea
Oslo
London
Land's End
Paris
15,771 ft 4,807 m
C. Finisterre
Madrid
Lisbon
Algiers
Tunis
San Francisco
Sa. Nevada
14,495 ft 4,418 m
Mt. Whitney
Denver
St. Louis
Mt. Mitchell 6,683 ft 2,037 m
Washington, D.C.
Gulf Stream
Cape Hatteras
Los Angeles
Dallas
Atlanta
Florida
Bermuda Is.
Azores
Madeira
Casablanca
Atlas
Tubqal 13,665 ft 4,165 m
Canary Is.
Canary Current
North Pacific Current
20,879 ft 6,364 m
Hawaiian Is.
Tropic of Cancer
Honolulu
13,796 ft 4,205 m
Hawaii
19,373 ft 5,905 m
Sa. Madre Occ.
Monterrey
New Orleans
Gulf of Mexico
Havana
Cuba
Bahama Is.
Hispaniola
ATLANTIC
22,949 ft 6,995 m
3,632 ft 1,107 m
Al-Hajjār
Sahara
C. San Lucas
Mexico City
Pico de Orizaba 18,405 ft 5,610 m
Greater Antilles
Lesser Antilles
North Equatorial Current
C. Nawadhibu
Cape Verde Is.
Dakar
C. Verde
Niger
Niamey
Bamako
North Equatorial Current
Guatemala City
Caribbean Sea
Punta Gallinas
PACIFIC
Equatorial Counter Current
18,947 ft 5,775 m
Caracas
Llanos
9,219 ft 2,810 m
Guiana Highlands
23,924 ft 7,292 m
Conakry
Lagos
Abidjan
Accra
13,435 ft 4,095 m
Guinea Current
Gulf of Guinea
C. Lopez
Line Islands
17,549 ft 5,349 m
Kiritimati
Jarvis I.
Equator
South Equatorial Current
Galápagos Is.
Bogotá
Quito
9,888 ft 3,014 m
Chimborazo
20,577 ft 6,272 m
Manaus
Amazon
Belém
South Equatorial Current
São Paulo
Fernando de Noronha
C. de São Roque
19,199 ft 5,852 m
Punta Negra
Selvas
Recife
Ascension
Benguela Current
Marquesas Is.
Huascarán 22,204 ft 6,768 m
Lima
Campos
SOUTH AMERICA
Salvador
Andes
Cook Islands
Society Is.
Tuamotu Is.
Polynesia
La Paz 21,463 ft 6,542 m
Brasília
Brazilian Highlands
9,482 ft 2,890 m
Brazil Current
St. Helena
OCEAN
8,399 ft 2,560 m
Humboldt Current
Pico da Bandeira
Rio de Janeiro
São Paulo
20,075 ft 6,119 m
Tubuai Is.
Pitcairn Is.
Tropic of Capricorn
Desventurados Is.
Asunción
Easter I.
Sala-y-Gómez
Porto Alegre
Pampas
22,841 ft 6,962 m
Juan Fernández Is.
Santiago
Montevideo
Buenos Aires
Río de la Plata
Tristan da Cunha
Gough I.
OCEAN
Patagonia
Falkland Current
Antarctic Circumpolar Current
13,313 ft 4,058 m
20,380 ft 6,212 m
Falkland Is.
South Georgia
Tierra del Fuego
Bouvet
Str. of Magellan
Cape Horn
Scotia Sea
27,113 ft 8,264 m
South Sandwich Is.
Drake Passage
17,355 ft 5,290 m
South Shetland Is.
South Orkney Is.
Antarctic Circle
Antarctic Pen.
Bellingshausen Sea
Peter I I.
Mt. Jackson 10,446 ft 3,184 m
Alexander I.
Weddell Sea
Queen
Amundsen Sea
Ellsworth Land
Berkner I.
A N T A R
Elevation
13,124 ft 4,000 m
6,562 ft 2,000 m
3,281 ft 1,000 m
1,640 ft 500 m
656 ft 200 m
0 ft 0 m
Depression
656 ft 200 m
6,562 ft 2,000 m
13,124 ft 4,000 m
19,686 ft 6,000 m
26,248 ft 8,000 m
Inland ice, glaciers
Ice shelf
Pack ice
Cold current
Warm current
Limit of drift ice
A 160° B 140° C 120° D 100° E 80° F 60° G 40° H 20° J 0°

Figure 1.1 World: physical features, country boundaries, and capital cities.

1.1 Contemporary Geography

What Is Geography?

Geography is a discipline that studies spatial patterns in the human and physical world. Geographers examine where and how the human and natural features of Earth's surface are distributed, how they relate to each other, and how they change over time. The distribution of language, religion, human and natural resources, and vegetation are among the many spatial phenomena examined by geographers. They attempt to explain such patterns, how they are changing, and what they might become. Many jobs require a geographic understanding. For example, urban planners need to be aware that cities contain people with varied preferences, traditions, fears, and desires; they are constantly moving around, interacting with one another, and having impacts on their urban environment. Disciplines such as history, sociology, economics, political science, and environmental science increasingly view spatial differences as crucial to understanding the Earth's human and physical conditions. They give significance to the research carried out by geographers.

Geography is a unique discipline encompassing both the physical and social sciences. **Physical geography** includes natural environmental processes across Earth's surface that result in the distribution of climate zones, plant ecologies, soil types, mountain formation, and fresh water distribution, among other patterns. In addition, physical geography increasingly examines the impacts of human actions on Earth's natural environments. **Human geography** is the study of the distribution of people (Figure 1.1) and their activities (economies, cultures, politics, and urban changes). World regional geography is an integrative analysis of the relationship between the human and the physical.

Geographers study places on Earth's surface as the environments or spaces where people live and through which they make life meaningful. Geography thus provides a place- or space-related **spatial view** of the human experience.

Place matters. Consider what it would be like if you grew up in a different country. How might that affect the language you speak, your family's religious preference, the food you eat, the music you listen to, or the schools you attend? How might the weather and other environmental conditions affect you? What might be different about you? Might your views of world issues and possible solutions differ from what they are now? What might be the same? These are the sorts of questions geographers ask about people and the places where they live. Geographic literacy is increasingly essential because people are connected and interacting on unprecedented and still increasing levels.

Maps and Geographic Information Systems

In their approach to understanding and solving human problems, geographers use maps to present information about location, distance, direction, flows, and other characteristics of places. **Maps** are relatively small representations of much larger areas of Earth's surface. On maps, a scale implies a mathematical relationship between features on a map and on the ground area it represents. Map scales vary with the purpose of the map (Figure 1.2). Small-scale maps show areas at frac-

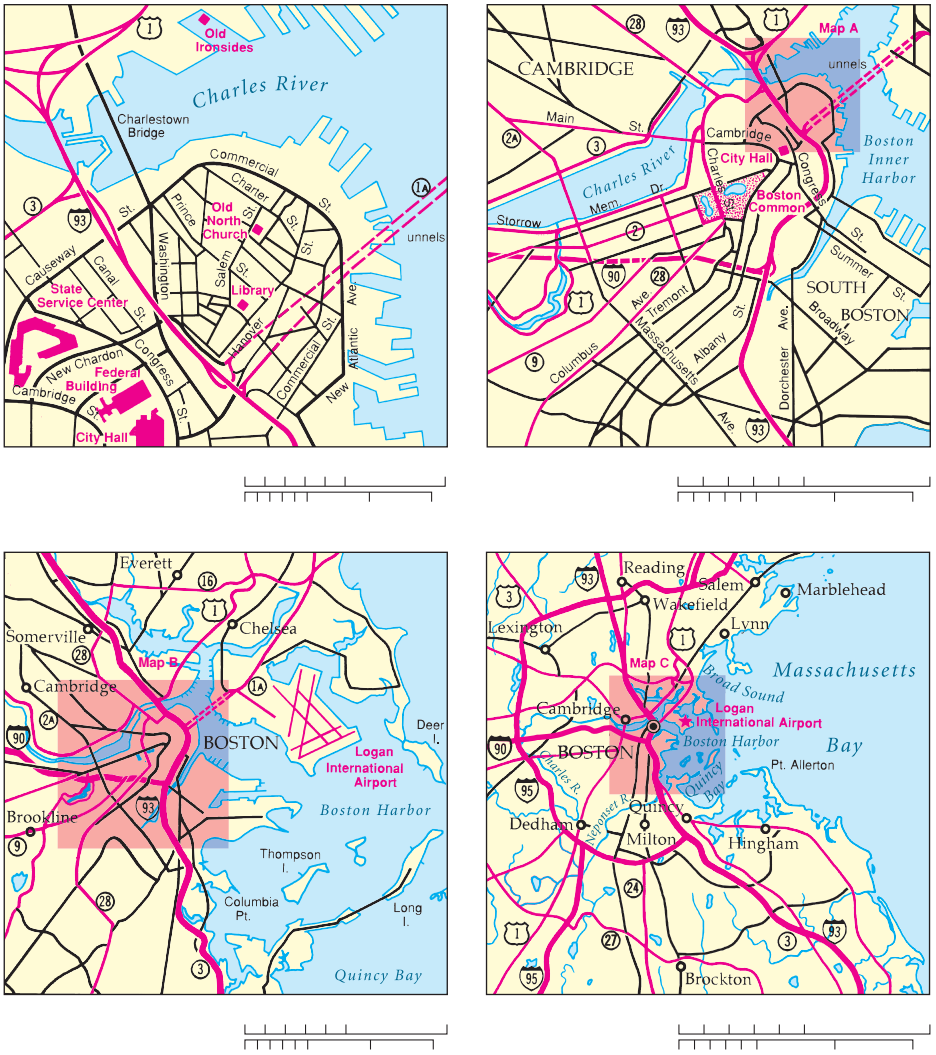


Figure 1.2 **Map scale and detail.** Maps of Boston from large scale (1:25,000) to small scale (1:1,000,000). The larger scale maps show more detail (streets, buildings) than the small scale maps (only major roads) for the same size of map.

tions of 1:250,000 or smaller (e.g., 1/1 million or a ratio of 1:1 million). Large-scale maps have map-to-ground ratios ranging from 1:10,000 to 1:250,000 (e.g., 1:50,000). The world maps used in this text (see, for example, Figure 1.5b) are examples of small-scale maps, in which the scale along the equator is approximately 1:120 million. Large-scale maps cover smaller areas, as in town maps, but can include more details. Not everything can be drawn to scale on maps, or else features would be too small to be seen: for example, roads, rivers, and buildings are denoted by symbols.

Geographic information systems (GIS) combine maps and aerial and satellite images with data relevant to the area (Figure 1.3). Such systems bring together a range of information that can form the basis for finding answers to complex questions. GIS became a significant tool in geography in the 1970s. The technology, utility, and application of GIS has increased substantially from its early use in the discipline, and today the majority of published large-scale maps now relate to satellite images.

Latitude and Longitude

Absolute location is the precise position of places on Earth's surface. The most universally accepted means of determining absolute location is by calculating latitude and longitude.

Latitude and longitude form the framework of an internationally accepted, location-based reference system that pinpoints absolute location (Figure 1.4). **Latitude** describes how far north or south of the equator a place is, measured in degrees. The north pole is at 90°N and the south pole at 90°S. Although the equator is an imaginary line, its position has a direct physical relationship between Earth and the sun as the line along which the most direct radiation from the sun reaches Earth. The equator encircles the globe midway between the north and south poles and is the 0° (zero degree) line of latitude. The almost spherical Earth's circumference is around 40,000 km (25,000 mi.) at the equator. A circle that joins places of the same latitude on Earth's surface is called a **parallel of latitude**. The ground distance from one degree

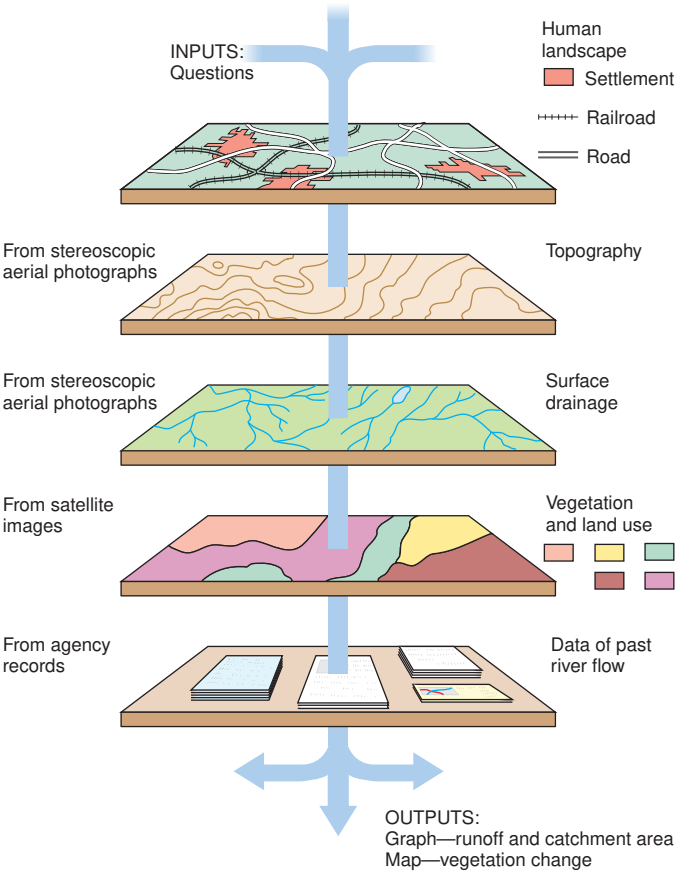


Figure 1.3 **Geographic information system.** The layers of information in this example are used to monitor a river system feeding a reservoir. Outputs from the system could include graphs of seasonal streamflow per unit of drainage basin area, or maps of dominant vegetation types or changing land use.

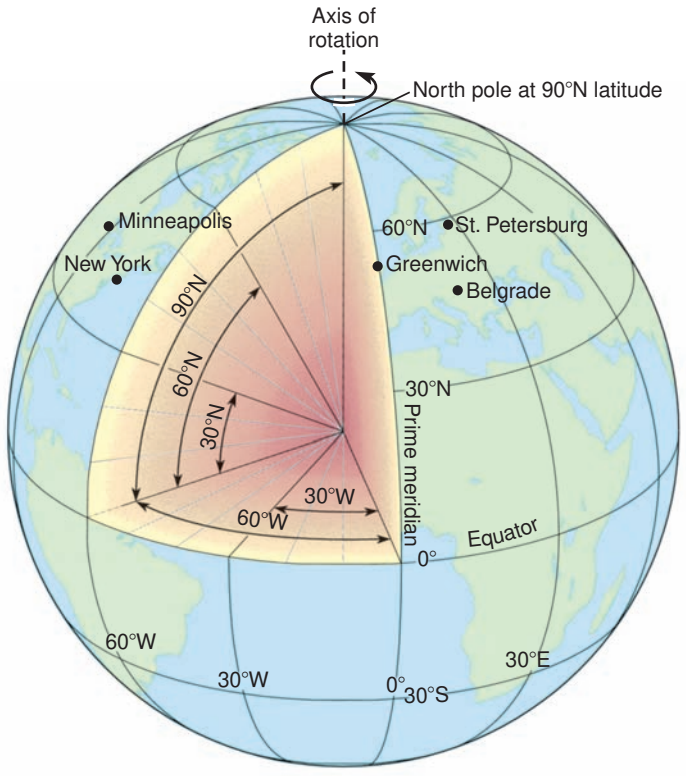


Figure 1.4 **Location: latitude and longitude.** Locating places on Earth's surface is made possible by the coordinate system of latitude and longitude. The degrees of latitude and longitude are formed by angles focused at Earth's center. Define the differences between 60°N and 30°N and between the 0° meridian and 60°W in terms of angles at Earth's center. Give the latitude and longitude of the cities marked on the globe.

of latitude to the next is approximately 110 km (69 mi.) on Earth's surface. For a long time, latitude was found by measuring the angle of the sun above the horizon at noon.

Longitude measures position east or west of an imaginary line drawn from the north pole to the south pole—a half circle—that passes through the former Royal Observatory at Greenwich, London, United Kingdom. Lines joining places of the same longitude are called **meridians of longitude**. The position of the prime meridian passing through Greenwich (0°) was chosen by an international conference in 1884, when London was the world's most powerful decision-making city. Methods of determining longitude, especially when charting the position of a ship, were more complex and took longer to evolve than latitude measurements. Longitude lines are not parallel like their latitude counterparts, and thus they do not provide equal measurements of ground distance. Longitude lines are farther apart at the equator and closer together at the poles. Instead of measuring sun angle at noon, people had to create tables of planetary positions, and they needed accurate clocks (chronometers first made in the late 1700s). In the late 1900s, radio beacons and satellites provided standard reference points by emitting radio pulses that could be timed and interpreted rapidly in computerized navigation systems to give accurate position fixes in global positioning system devices. Air travel, ocean transport, and increasingly, automobile use all rely on latitude and longitude through global positioning systems (GPS). Engineers on construction sites, real estate developers, and city planners also depend on GPS technology.

Distance and Direction

Physical **distance** between places is usually measured in kilometers or miles. However, the **relative distance**, or the time it takes to get from one place to another, may be much more significant to commuters, commercial shipping interests, and travelers. The relative measures of time-distance and cost-distance are often substituted for measured distance in geographic studies. The increasing cost and time to cover distance between places gives rise to the idea of the **friction of distance**. As costs increase with distance, interactions decrease. However, improving technology decreases the friction of distance. For example, the friction of distance between New York and Chicago was reduced in the 1800s, when time for the journey was cut from weeks to days by building the Erie Canal and railroads. Air travel between these places today takes a couple of hours. The increasing availability of rapid transportation facilities and the "global information highway" (the Internet) bring people into easier contact with each other, making them relatively—but not absolutely—closer. Friction of distance is still affected by other factors that slow or increase contacts among people. These factors include natural obstacles such as mountains and oceans, political factors such as country boundaries or conflict, and cultural factors such as language differences.

Geographers give directions by the cardinal points: north, east, south, west. Direction and distance help to define the locations of places relative to each other.

The Regional Approach to Geography

Our world of closer connections among peoples and places and increasingly rapid changes focuses attention on regional geography. A **region** is an area of Earth's surface with physical and human characteristics that distinguish it from other places. Regions vary in geographic scale from major divisions of the world (world regions) to single countries and parts of countries; metropolitan regions, for example, are areas that focus on large cities and their suburbs. **Regional geography** evaluates differences and similarities within and between defined areas, or regions, of Earth's surface.

Regional studies combine consideration of the systematic physical (rocks and landforms, climates, natural vegetation, soils) and human (culture, population, politics, economy) features that give a region geographic character. Regional linkages and boundaries change over time, or they may be perceived and defined differently by their inhabitants or different geographers. The range of regional scales between the global and local includes world regions, subregions, countries, and smaller regions within countries.

This text adopts the regional geography approach. Regions form and change as different systematic aspects interact and influence one another in specific areas of the world.

- People create regions over time by interacting with natural environments and other regions. People in some regions may view people in other regions as friendly or as different, and perhaps even as hostile. Perceptions of the region's identity are often helped by propaganda.
- Regional character and identity influence the actions of people living there. There is thus a two-way interaction of people creating their region and of the region's character influencing the people.
- Regional character may change over time at varied rates as a result of introducing new people, products, cultural features, or political control. Individuals and small groups may be as responsible for change as governments. For example, powerful leaders, inner government groups, or local pressure groups may dominate the outcome of issues leading to changed or unchanged geographies.
- Regions are not isolated from one another. Ties among them became more intense over the last 200 years, causing more far-reaching and frequent changes of internal geographies and flows between regions.

1.2 Globalization and Localization

Two geographic trends help us understand what makes regions unique as a result of the increasing flows among them: globalization and localization.

Globalization

Globalization, in its simplest form, is the increasing level of interconnection among people and places throughout the world. Economic globalization involves the integration and exchange of capital, technology, and information across country borders. It also affects society, culture, politics, and the natural environment. It could be argued that globalization began with the European discoveries in the late 1400s or even earlier, but the speed and intensity of globalization, especially in terms of world trade and the flow of financial investments, increased markedly beginning in the 1990s. Few people used the term "globalization" before 1990, but it is now mentioned daily in the media. It is an essentially geographic phenomenon.

Global connections include the spread of ideas, technologies, crimes, and diseases; flows of goods and services; long-term migrations of people for work, seekers of political asylum, and family consolidation; short-term flows of people for business purposes or tourism; impacts of dominant ideologies, both religious and political; and the spread of images and messages through the media of film, TV, the Internet, and print. Today a few languages, notably English, Chinese, French, Spanish, and Arabic, act as a basis for global communication. Although many worldwide flows continue to be controlled by country-based legislation and policing, others, such as the trafficking of arms, drugs, or slaves, are difficult for individual countries to control.

Localization

Localization stems from established local identities that existed prior to the intrusion of globalizing forces. Such identities respond to globalization as an increasing or a strengthening of local traditions in resistance to the global diffusion of human practices. The "local" scale is any place less than global in size, including countries, regions within countries, and wider regions that include groups of countries.

The rapid and widespread acceptance of the "globalization" theme by politicians, members of the media, special interest groups, and academia, among many others, created substantial confusion over precise meanings. Some people assume pervasive globalization is already overriding country and smaller community boundaries and interests. They consider globalization as either a great opportunity for a more cohesive world or a danger to cultures, economies, politics, and environments. Others think the term is overused and unjustified when country governments remain the dominant political entities and when cultural awareness and identities remain strong.

1.3 Regions and Natural Environments

Physical geography is the study of natural environments and their world distributions. In world regional geography, the interactions between people and natural environments are important. Major physical features, such as oceans, seas, mountain ranges, and rivers, have directed patterns of human movement. For many centuries, human activities relied on natural resources. The length of the growing season, the amount of water available, soil types, and mineral-bearing rocks influenced the locations of people. Natural environments played important parts in the locations of early culture hearths and concentrations of people. From the 1800s, physical geography also played important roles in the locations of new human-engineered urban environments. Today, in a reversal of the idea that physical geography determines human affairs, human beings increasingly influence many of the ways in which natural processes function. For example, natural vegetation has been removed to make way for agriculture, rivers are straightened or diverted, slopes are graded, and mountains are tunneled. We now believe that human actions are increasingly altering weather and climate.

Powerful Natural Systems

The Earth contains four major natural environments, which are powered by energy from Earth's interior and the sun. They work together to produce a dynamic and interacting system. The **solid earth environment** (lithosphere) receives its energy from the Earth's interior, which causes huge sections of the crust to collide with one another, slide past one another, or move apart. These interactions create earthquakes, volcanoes, mountain chains, and continental movements. **Earth-surface environments** come about from the interactions of the atmosphere and hydrosphere with the lithosphere. These interactions produce rain, glacier ice, wind, and ocean waves and shape landforms such as hills, valleys, cliffs, and beaches. The **atmosphere-ocean environment** receives incoming solar energy, which controls the circulations of the atmospheric gases and oceanic waters (atmosphere and hydrosphere). This solar energy produces weather, climate, and longer-term climate changes. In the **ecosystem environments** (biosphere), plants convert solar energy into food for animals. Living organisms (plants, animals, and humans) respond to and modify local climates, landforms, and soils. It is important to examine these environments in greater detail.

Solid Earth Environments

Earth is a multilayered planet with a hot molten core surrounded by the solid mantle and a relatively thin outer crust. Earth's interior provides the energy that forces large blocks of surface rock, known as **tectonic plates**, to crash into one another, slide past one another, or move apart. Earth's surface is comprised of about a dozen major and several minor plates (Figure 1.5), each up to thousands of kilometers across and around 100 km (65 mi.) thick. Most earthquakes and volcanic eruptions of molten rock from beneath Earth's surface occur along plate boundaries. The volcanic "ring of fire" and earthquake zone around the Pacific Ocean was created by plates clashing there.

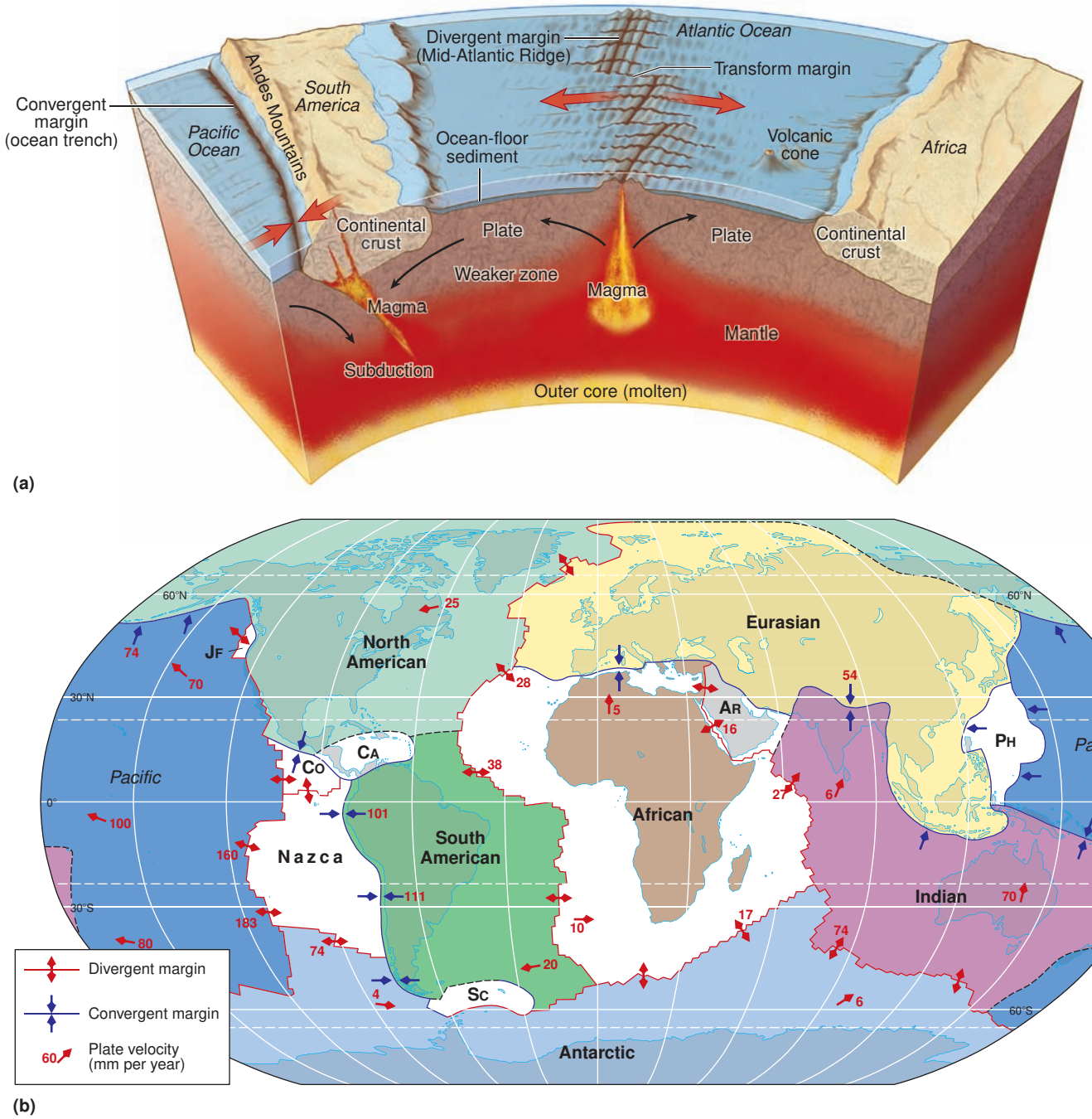


Figure 1.5 **Plate tectonics, ocean basins, and mountain ranges.** (a) A diagram that simplifies the plate tectonics relationships of the South Atlantic Ocean area. The large red arrows depict the plate movements: diverging from the Mid-Atlantic Ridge where molten rock (magma) rises and solidifies as new plate; converging where the Pacific Ocean and Andes Mountains meet, where plate material is destroyed and rises as molten magma to form volcanoes. A mid-ocean ridge is associated with diverging plates, and an ocean trench and high fold mountains with convergence. Where a plate is broken horizontally, a transform margin forms. All plate margins are associated with earthquakes and volcanic activity. (b) World map of major and the main minor plates. The minor plates include Nazca, Cocos (Co), Caribbean (CA), Juan de Fuca (JF), Arabian (AR), Philippine (PH), and Scotia (Sc). *Source: (b) Data from NASA.*

The plate movements cause the opening and closing of ocean basins and the raising of mountain systems. Where plates move apart, or diverge, fissures open and rock erupts as molten lava, adding to the edge of a plate where it solidifies. Such **divergent plate boundaries** include the Mid-Atlantic Ridge, where the eruption of molten lava builds Iceland.

Collisions occur along **convergent plate boundaries** and often force one plate upward to form mountain systems such as the Andes Mountains of South America. A plate that is forced beneath another plate is said to be **subducted**. The subducted solid rock melts under high temperatures generated by burial and friction. The molten rock produced rises toward the surface

under pressure and erupts to create volcanic mountains and huge lava fields such as those forming the Columbia Plateau in the northwestern United States. Japan also lies along a number of convergent boundaries that result in subduction (Figure 1.6a).

Along transform plate boundaries, plates move horizontally against each other. They create earthquakes but usually without volcanic eruptions, such as those that occur along the San Andreas Fault in California (Figure 1.6b).

Earth Surface Environments

Earth's surface is 71 percent covered by oceans and only 29 percent occupied by the continents and islands on which people live. Weather and the action of the sea interact with Earth's internal continent-building forces to produce differences in the height and shape of the land, or its **relief**, in features such as mountains, valleys, and plains.

Once land emerges above sea level, atmospheric processes and ocean waves etch the details of surface relief. The temperature and chemical composition of the atmosphere, together with water from rain and snowmelt, react with the rocks exposed at the surface and dissolve them or break them into fragments. Such changes are called **weathering**. The broken and dissolved rock material forms the mineral basis for soil. On steep slopes, weathered material moves downhill under the influence of gravity. Such movement may be rapid in slides, flows of mud, or avalanches, or slow in local heaving and downslope creep of the surface. The mobile fraction of this broken rock material often enters rivers or glaciers and is moved toward the ocean.

The concentrated flows of water or ice and rock particles in rivers and glaciers gouge valleys in the rocks—a process called **erosion**. Glaciers formed of ice move slowly, helped by meltwater lubrication in the summer. When the flows reach a lowland, lake, or ocean, the rock particles drop to the valley, lake, or ocean floor in the process of **deposition**. Wind blows fine (dust-size) rock particles long distances, while sand-sized particles are moved around deserts or across beaches to form dunes. Along the coast, sea waves and tides erode cliffs and deposit beach materials, often moving the rock particles supplied by rivers, glaciers, or wind (Figure 1.7). The combination of these internal and external forces shapes the land surface features of regions. These features also are determined by the presence of plate margins, the nature of the rocks, the climate, and how long natural forces operated without catastrophic changes. Human activities also explain the character of surface land features.

(a)

(b)

Figure 1.6 **Internal and external earth forces mold the landscape.** (a) Workers inspect a caved-in section of a prefectural road in Satte, Saitama Prefecture. On March 11, 2011, it was damaged by one of the largest earthquakes ever recorded (9.0 magnitude by some measures) in Japan. (b) The gash across the Carrizo Plain in southern California is caused by the transform San Andreas Fault splitting a section of Earth's crustal rocks. Two plates move against each other with the western side moving northward. Rain and rivers etched out the line of weakness along the fault. Continuing movement along the fault offsets the lines of stream valleys on either side. *Photos: (a) © AP Photo/Saitama Shimbun via kyodo News; (b) © BrandX/Punchstock RF.*

Figure 1.7 **Eroding the land.** Ocean waves attack the cliffs and form beaches in Oregon. Inland, valleys are formed by a combination of river action and slope processes. *Photo: © Corbis RF.*

Soils form as broken rock matter interacts with weather, plants, and animals. Rock materials supply or withhold nutrients. Rainwater and snowmelt make any nutrients present available to plants. Decaying plant and animal matter release the nutrients back to the soil in mineral form. Soil fertility is based on rock structure, nutrient content, heat, and moisture.

Atmosphere-Ocean Environments

The **climate** of a place is based on long-term averages of the weather conditions (mainly temperature and precipitation). Differences in climatic conditions result from the transfers of heat and moisture through the atmosphere and oceans, and how they interact with the surface conditions. The transfers are powered by energy from the sun.

Heating the Atmosphere-Ocean System

Mostly visible light rays from the sun reach Earth's surface. Earth's atmosphere filters out other elements of solar-ray energy that harm living organisms, including ultraviolet rays, x-rays, and gamma rays. Absorption of the light rays at Earth's surface causes rock, soil, and ocean water to be heated and to radiate heat upward. This heat is then absorbed in the lower atmosphere by water vapor and carbon gases, raising the temperature of the air. This natural process in Earth's atmosphere is known as the **greenhouse effect**. An approximate balance between the incoming solar radiation and radiation from Earth to space reduces temperature fluctuations over time in Earth's atmosphere.

Important geographic differences in solar heating cause climatic differences from place to place. Earth rotates on its axis every 24 hours, creating day and night. It revolves in orbit around the sun once a year, producing seasonal changes. The seasonal progression of the overhead sun north and south of the equator brings summers of warmer weather and long days to each hemisphere, while the winter hemisphere with low sun angles has cooler weather and longer nights. Earth's axial tilt causes the sun to be directly overhead at noon at the Tropic of Cancer (Northern Hemisphere summer) between June 19 and June 23 and at the Tropic of Capricorn (Southern Hemisphere summer) between December 19 and December 23.

Because the sun is more directly overhead for most of the year in tropical regions, it produces higher temperatures there (Figure 1.8). Tropical areas have an excess of incoming energy over that which is radiated back to space. The polar regions, however, have a deficit of energy: in winter, they have several months of almost complete darkness, losing energy to space without any coming in. Flows of air and ocean water transfer the heat from the tropics toward the polar regions. Tropical oceans are huge reservoirs of heat, which ocean currents move poleward to heat the atmosphere of temperate and high latitudes. The air and waters cool by releasing heat in higher latitudes and then return as cool flows to the tropics, where they are reheated. This system makes human habitation possible outside the areas of greatest solar radiation.

Air and Water Circulating in the Atmosphere-Ocean System

Oceans are the major sources of water that evaporates into the atmosphere, condenses into clouds, and produces precipitation as rain, hail, or snow. The areas of the world with the highest rainfalls are near the equator (Figure 1.9), where warm, humid airstreams collide, force the air to rise, and produce frequent rainstorms. High precipitation totals also occur where moisture-laden winds from the ocean meet tropical islands or the coasts of temperate continents. **Orographic lifting** ("mountain-related") occurs when moisture-laden winds are forced upward over mountains (as in Canada and southern Chile). As the air lifts, it is forced to cool and loses its ability to hold moisture. Clouds form and rain occurs. As the air descends down the other side of mountains, it warms and releases little if any of its remaining moisture. The leeward sides of mountains often are dry.

Earth's rotation affects winds and ocean currents across the surface. The effect of rotation increases away from the equator toward the poles, bending winds to form circulating weather systems, including cyclones (counterclockwise wind circulation in the Northern Hemisphere, clockwise in the Southern Hemisphere) and anticyclones (clockwise circulation in the Northern Hemisphere, counterclockwise in the Southern Hemisphere).

World Climate Regions

The transfers of energy and moisture and the circulation within the atmosphere produce distinctive seasonal changes and weather systems that distinguish climate regions (Figure 1.10). **Tropical climates** experience high temperatures (around 30°C

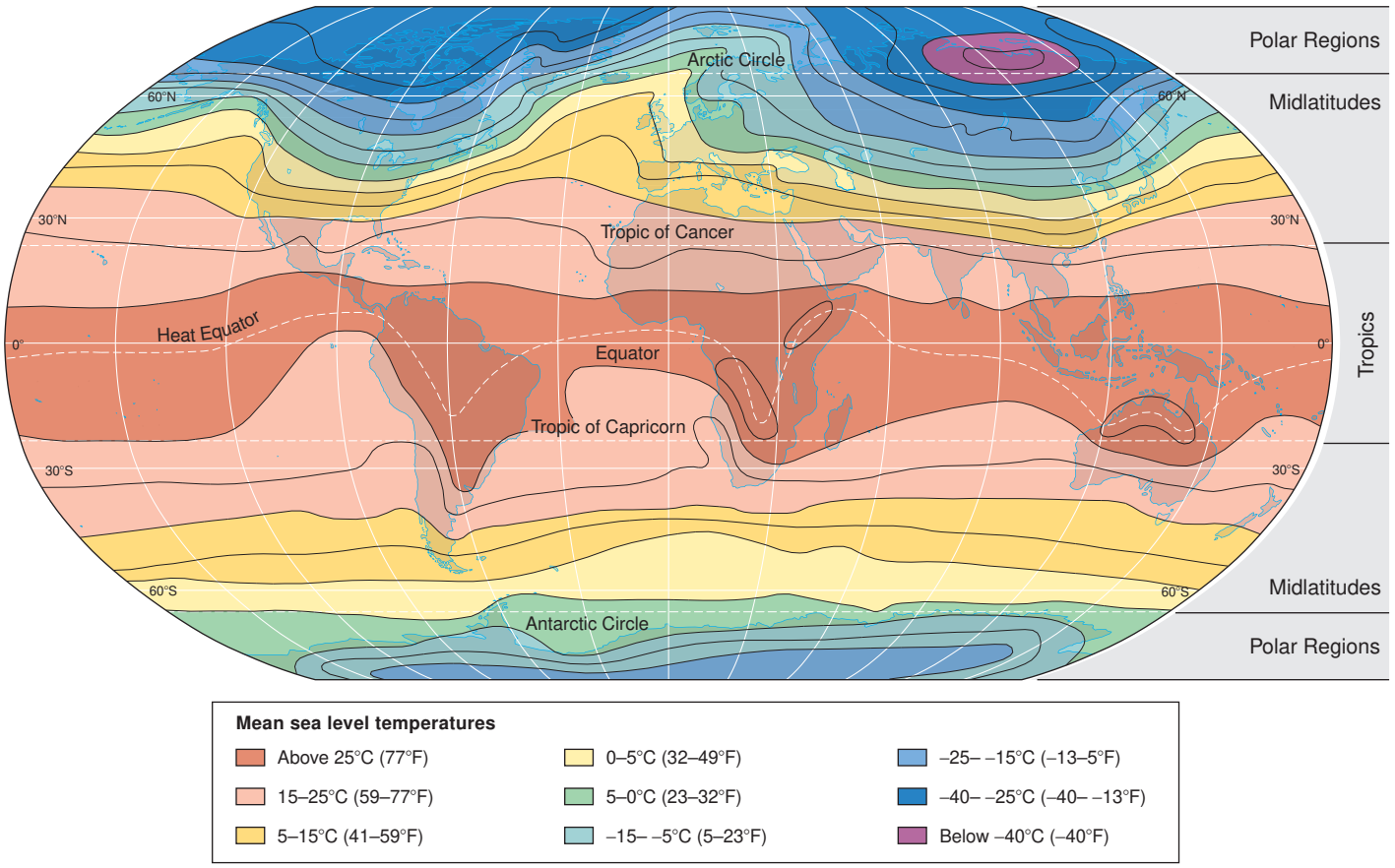


Figure 1.8 **Temperatures at ground level: January.** Isotherms (lines joining places of equal temperature) during the Northern Hemisphere winter. The heat equator connects points of highest temperature at each meridian of longitude. Compare the Northern and Southern Hemispheres for the extent of very cold temperatures and the position of the warmest band of temperatures. What effect do the oceans and continents have on the air temperatures above them?

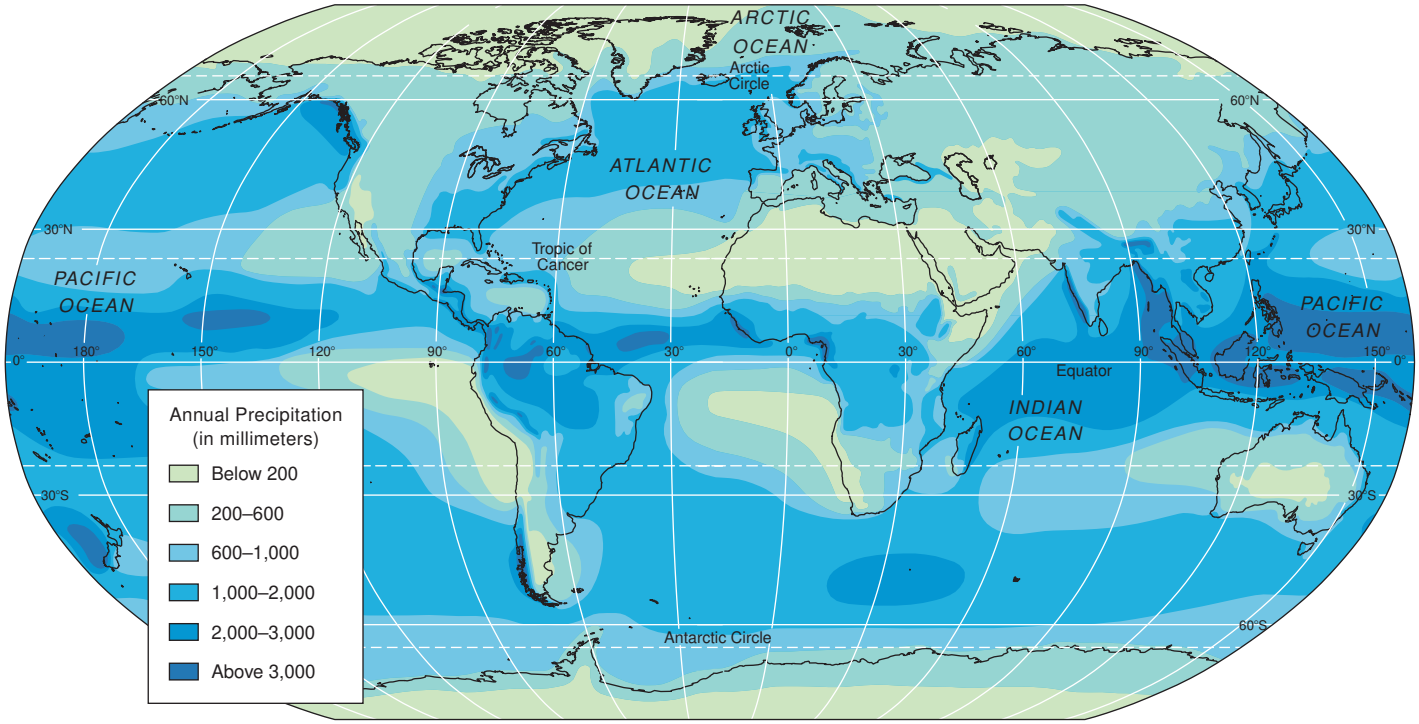


Figure 1.9 **World precipitation (rain, hail, snow).** Locate the main areas of low and high precipitation. Areas with less than 200 mm of precipitation in a year are classed as arid; those with more than 2,000 mm are nearly all in the tropical ocean areas. Warm air (which can hold more moisture than cold air) from the northern and southern tropics converges at the equator, rises, and forms clouds that precipitate rain.

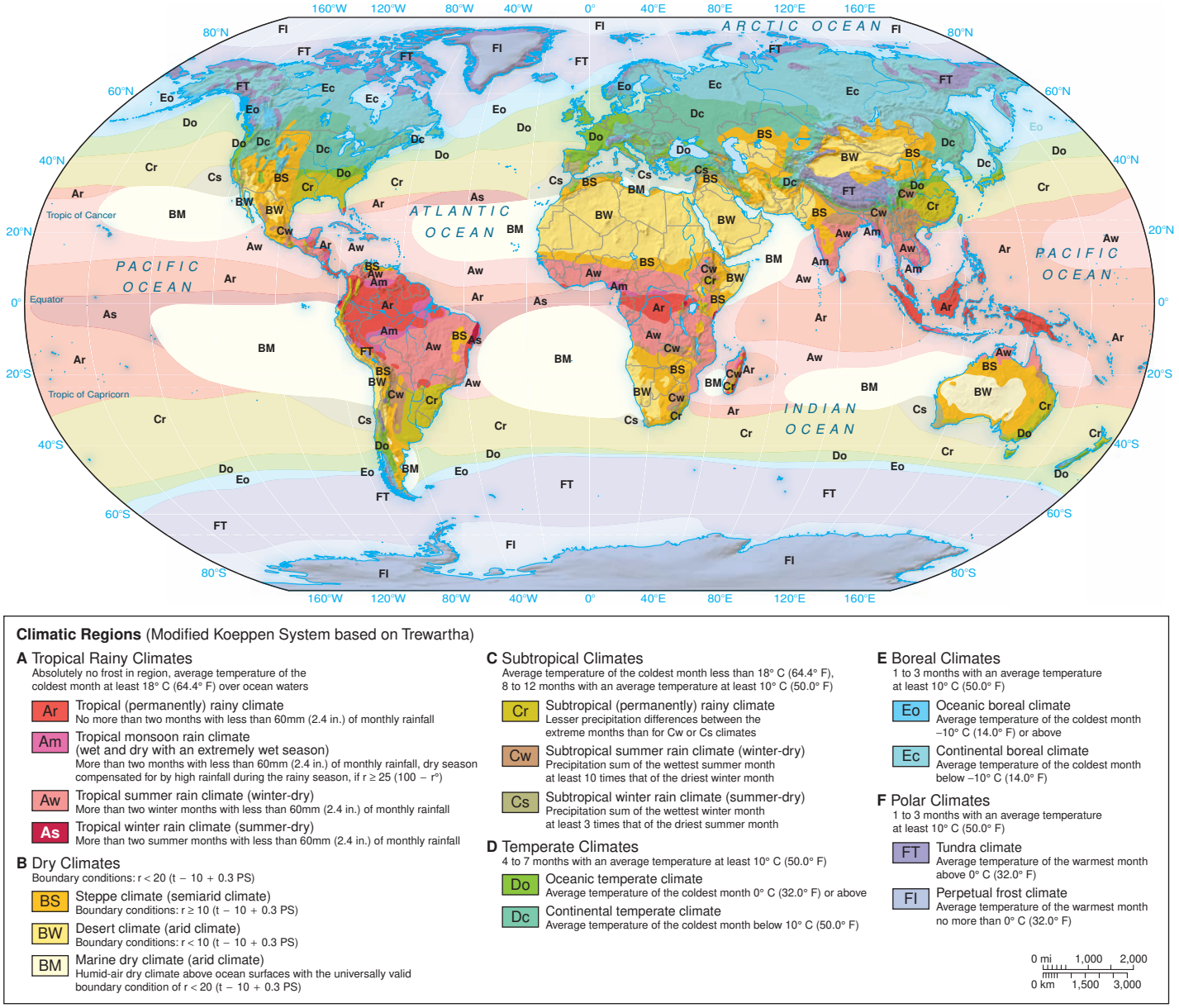


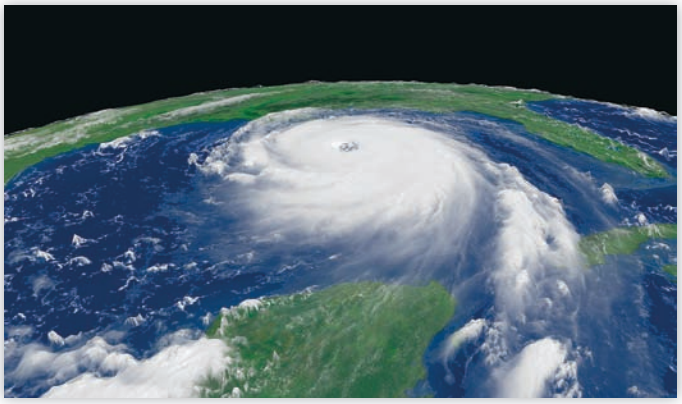
Figure 1.10 **World climate types.** Included are letters referring to the Köppen classification based on the climate characteristics of natural vegetation zones.

or 80–90˚F) through the year. The main tropical climates have a north-south distribution, from the equatorial climate with rain at all seasons (Ar), through wet-dry seasonal climates (Aw), to very arid (BW) climates with almost no appreciable rainfall. Seasonal wet-dry differences are greatest in the monsoon climates of South Asia (Am). Distinctive tropical weather systems include the frequent and widespread development of clusters of thunderstorms near the equator (Figure 1.11a). Intense tropical cyclones (also called hurricanes and typhoons) tend to originate in the tropical waters north and south of 10 degrees of latitude (Figure 1.11b).

Temperate climates in middle latitudes respond to the sun's changing overhead seasonal position. They have marked seasonal temperature differences between summer and winter. Summer temperatures may be warm to hot, while temperate winters include freezing temperatures as latitude increases north and south of the equator. The greatest temperature range from average winter to average summer temperatures exists in the continental interiors of North America and in northern and central Asia (Ec, Dc). Territories receiving persistent air flow from large bodies of water, such as Western Europe's prevailing winds from the Atlantic Ocean, have modified oceanic climates which reduce the range from coldest to warmest average temperatures (Eo, Do). Most precipitation falls on coastal hills and windward, west-facing sides of mountain ranges. Precipitation amounts decline inland. Temperate climates have a west-east

distribution, with mild and moist west coasts (Do, Eo, Cs), drier continental interiors with significant ranges in winter-summer temperatures (BS, Dc, Ec), and east coasts with moderate contrasts in summer-winter temperature and rainfall amounts (Cr, Do, Eo).

(a)



(b)

Figure 1.11 **Tropical thunderstorms and hurricanes.** (a) Thunderstorms over Africa, seen from a space shuttle. Several cloud tops amalgamate in fibrous masses of ice that spread outward and downwind. (b) Hurricane Katrina over the Gulf of Mexico, August 28, 2005. The hurricane passed over Florida (on the right) and narrowly missed Cuba and Mexico (foreground) before turning north toward the Mississippi River delta and New Orleans. Several hundred kilometers across, this hurricane shows the cloud-free eye of descending air in the center, surrounded by swirling clouds affected by strong winds. Once over the Gulf of Mexico, it picked up energy from the warm surface waters, intensifying the winds and surge of ocean water. *Photos: (a) NASA; (b) NOAA.*

Frontal cyclone systems with low atmospheric pressures bring rain and high winds across vast areas in the temperate latitudes. Temperate west coasts lacking persistent year-round westerly winds have transitional climates characterized by long, warm, dry summers and mild, wet, windy winters. They are typical of lands around the Mediterranean Sea, the south-central Californian coastlands, the south-central Chilean coastlands, and the southwestern-facing coasts of South Africa and Australia. On eastern coasts, air drawn in from the ocean produces summer rains, while cold winter winds from the interior bring frost and snow.

Polar climates are extremely cold through the year, seldom rising above freezing temperatures. Winter conditions dominate the Arctic climates (FT, FI), although short summer spells may melt some of the snow and ice. Truly polar climates are frozen all year. Temperate cyclones occasionally invade polar regions, bringing high winds and precipitation.

Global Climate Change

Changes in the path of Earth's solar orbit and the planet's axis angle alter the intensity of solar radiation and are significant, naturally occurring factors in long-term climate change cycles. Evidence exists for cyclic patterns of warming and cooling phases.

An example of a long-term cooling phase was the intensive freeze that was the latest part of the Pleistocene Ice Age. It lasted for most of the last 100,000 years, ending around 10,000 years ago with a period of warming and ice melt that led to a sea surface rise of around 100 m (300 ft.) to its present level. During the freeze, huge ice sheets dominated the northern parts of North America and Europe, and sea levels were lowered around the world.

After the ice cover retreated, smaller fluctuations of climate brought the warmest conditions around 5,000 years ago. The "Little Ice Age," from approximately AD 1430 to 1850, caused upland glaciers to advance several kilometers down valleys and cultivation to retreat from higher areas in temperate countries. Climatic warming since the early 1800s resulted in a reversal of those trends, with glacier melt and higher temperatures. This phase coincided with the Industrial Revolution, which spread from Europe and North America.

Human reliance on fossil fuels (carbon-based fuels such as oil, natural gas, and coal) for both energy production, such as electricity generation, and energy consumption, such as fueling our cars or heating our homes, produces greenhouse gases (GHGs). The anthropogenic GHGs are emitted into the lower atmosphere surrounding Earth. Earth has a natural greenhouse effect, whereby GHGs in the lower atmosphere prevent some of the heat energy created when the sun warms Earth's surface from escaping into the outer atmosphere. The naturally occurring GHGs thus help to produce temperatures warm enough for habitation. The human-generated GHGs in

the lower atmosphere are producing an enhanced greenhouse effect. In other words, the steadily increasing levels of carbon-based gases in the lower atmosphere make the atmosphere trap more radiation, or heat energy, and thus keep warmer temperatures present at Earth's surface. One of the many responses to increasing surface temperatures is the melting of mountain glaciers and ice in Antarctica and the Arctic.

Ecosystem Environments

Plants and animals live in communities in which they share the physical characteristics of heat, light, water availability, and nutrients. Most plants produce the food that animals require by capturing and storing the sun's energy in chemical form. An **ecosystem** is the total environment of such a community and its physical conditions. Ecosystems exist at all geographic scales, but for the purposes of this text they are discussed in relation to the largest scale, or **biome**. The five main types of biomes are forest, grassland (Figure 1.12), desert, polar, and ocean.

Hazards and Resources

Natural hazards and resources are distributed unevenly on Earth and contribute to the differences between world regions. The study of them involves both physical geography and the part of human geography that considers the cultural perceptions of what is useful or harmful to human populations.

Figure 1.12 World biome types: savanna grassland in the Ngorongoro Conservation Area, Tanzania. Tropical savanna grassland is common in Eastern Africa. The grasses grow in areas which receive moderate, seasonal amounts of average annual rainfall. Tropical savanna regions are characterized by grasses, bushes, and scattered trees. The grasses support large numbers of grazing animals, such as zebras, which then become a food source for lions and other carnivores at the top of the food chain. The abundance of vegetation varies in tropical savanna areas depending on the season and on surface features such as streams and creeks. *Photo: © Joseph P. Dymond.*

Natural resources are Earth's materials that human societies use to maintain their living systems and built environments. They include fertile soils, water, and minerals in the rocks. However, resources valuable to one society or technology are not always rated highly by other groups. For example, Stone Age peoples used flint and other hard rocks that flaked with sharp edges to make tools and weapons, but such rocks have few uses today. The clay mineral bauxite was ignored until it was found that refining it produced the strong, lightweight metal aluminum. Among energy resources, emphasis shifted over time from wood to wind, running water, coal, oil, natural gas, and nuclear fuels.

Renewable resources replenish naturally. The best example is solar energy, which provides a constant stream of light and heat to Earth. Water is a renewable resource that is recycled from ocean to atmosphere and back to the ground and oceans. All renewable resources are, however, ultimately finite in quantity and quality or limited by human ability to exploit them. For example, the limits of water supply affect irrigation-based development in arid countries. In fact, as the world's population increases, water is becoming increasingly scarce.

Nonrenewable resources are not replenished after they are extracted and used. They include the fossil fuels (e.g., oil, natural gas, and coal) and metallic minerals available in rocks. Though these are exhaustable, technological advances or new and increased demands drive our continued efforts to find new sources, to extract sources that were once thought to be uneconomical, and to recycle. Such technologies extend the lifetime usefulness of nonrenewable resources.

Natural hazards such as volcanic eruptions, earthquakes, hurricanes and other storms, mudslides, river and coastal floods, and coastal erosion pose difficulties and challenges for humans. They interrupt human activities but seldom deter humans from settling or developing a region if its resources are attractive. For example, people are drawn to living in California or the major cities of Japan despite earthquakes. Similarly, people continue to live and work in areas prone to hurricane damage or river flooding. In areas such as the Mississippi River valley in the United States and the lower Rhine River valley in the Netherlands, protective walls are designed to cope with all but the worst river floods. Extreme weather events may produce levels of flooding that overflow these walls, as in 1995 along the lower Rhine and in 2005 in New Orleans.

Hazards cause loss of life and destruction of property, but the costs of protection against hazards are also high. Most protection is provided in economically wealthier countries and succeeds in preventing high death tolls, though property and broader economic damage tend to be very high. In contrast, economically poorer countries have few resources available to construct protective structures against natural hazards. Consequently, they often suffer major losses of life after floods, hurricanes, or earthquakes. For example, Hurricane Katrina struck Louisiania in 2005 and an earthquake set off a tsunami that hit Japan in 2011. Because of Katrina, just over 1,800 people died and around US$100 billion in property damage resulted with increases to as much as US$250 billion in total economic damage

when lost businesses and disrupted supply chains are included. Similary, the Japanese earthquake and tsunami in 2011 killed 28,000 people and likewise caused US$100 to $250 billion of property and broader economic damage. In contrast, the Indonesian tsunami in 2004 resulted in at least 230,000 deaths and US$10 to 15 billion in economic damage. Similarly, the earthquake in Haiti in 2010 caused 200,000 to 250,000 deaths and about US$8 to 9 billion in economic damage.

Human Impacts on Natural Environments

Natural environments operate largely outside human controls, being powered by energy from the sun or Earth's interior. However, specific human activities have altered the functioning of natural systems as they change rates of erosion, remove natural vegetation cover, or emit pollutants into the atmosphere and hydrosphere. Even early humans changed natural environments, for example, by burning vegetation around forest edges to expand grasslands. This in turn increased populations of grazing animals such as bison in North America that provided meat and hides for Native Americans. As humans have developed technologies from farming and mining to industry, human activities have had increasing impacts on natural systems.

Farming, Forestry, and Fishing

The first farmers settled the lighter soils where there was not much vegetation to clear. From around 1000 BC, new iron implements made it possible to fell trees on a larger scale and extend farmland into heavy clay soil areas. Phases of woodland clearance increased soil erosion in uplands, deposition in lowlands, and changed the species composition of animals and plants. Drainage of marshes and protection of coastal lands also altered ecosystems. In recent times, the widespread use of fertilizers and the accumulation of mining and nuclear wastes as well as other toxic emissions have contaminated soil and water, which in turn have made land unusable and uninhabitable for many years.

Another environmental alteration is **desertification**, which is the destruction of the productive capacity of an area of land. It can occur naturally with climate change, but human stripping of vegetation cover or soils has been a major cause. For example, deserts, such as the Sahara, are expanding in area (Figure 1.13). The southern margin of the Sahara has experienced desertification since the 1970s after commercial agriculture extended into less humid areas and then years of drought followed (see Chapter 8). It resulted in the deaths of cattle and vegetation and forced many communities to move away from their traditional lands.

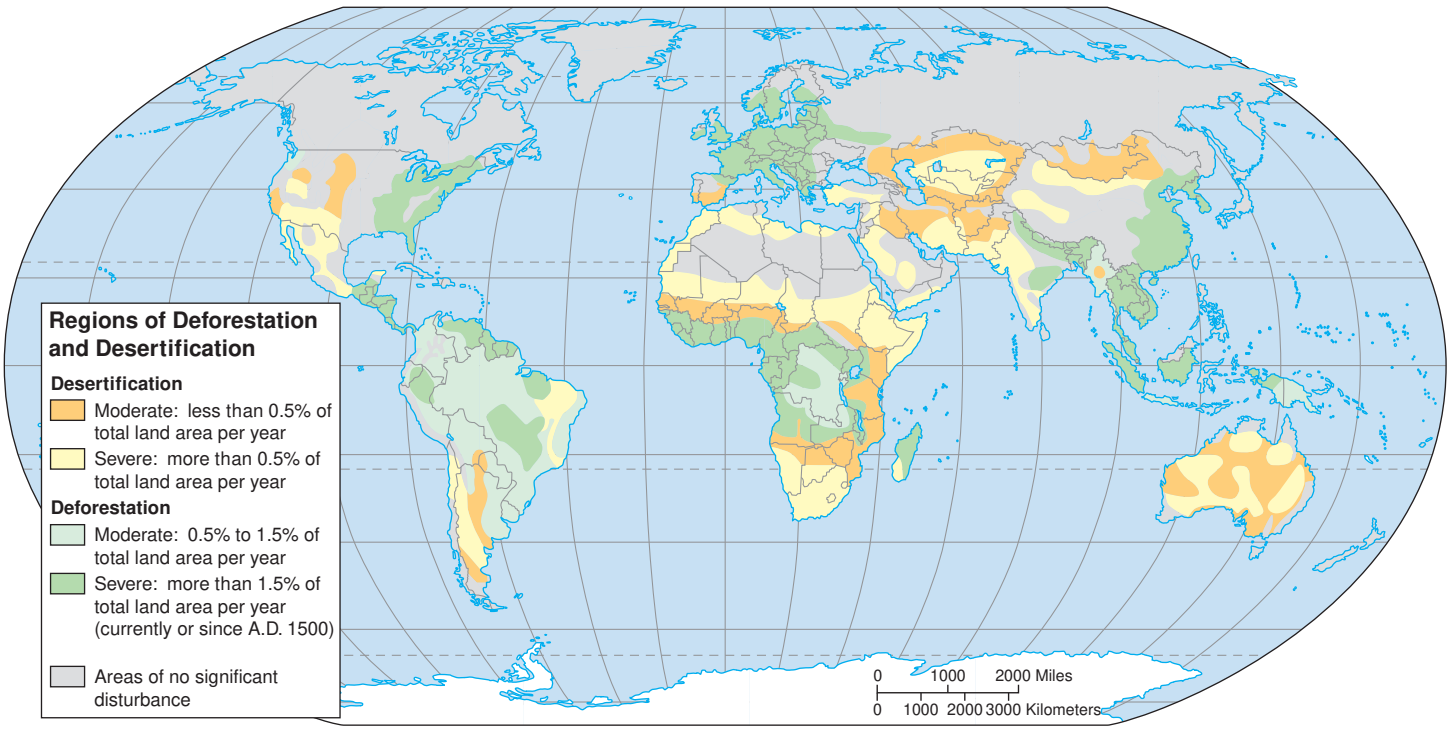
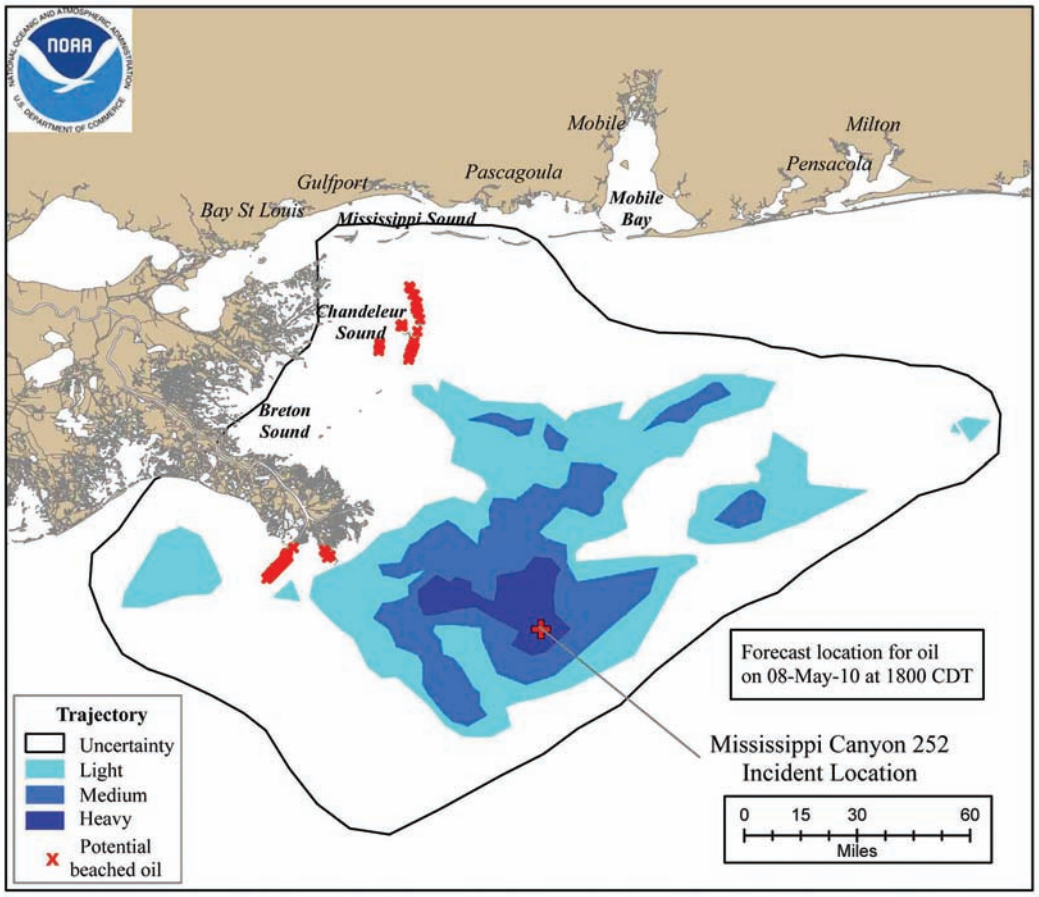


Figure 1.13 **Desertification and deforestation.** Climate change and human activities lower the productive capacity of the land in many areas.

As farming has expanded and the demand has grown for wood products, the world's forests have been cut (see Figure 1.13). Today, about half of the Earth's forests are gone, with only about 22 percent of its original, old growth forests remaining. Until about 100 years ago, most forest removal occurred in Europe, North America, and North Africa and Southwest Africa. Deforestation has reversed in the last 100 years as tree planting has led to the increase of second growth forests. About half of the world's forests are now in tropical areas such as Brazil, central Africa, and Southeast Asia. In the 1990s, approximately 16 million hectares of forest were cut every year, but this declined to 13 million hectares per year in the 2000s. Aggressive tree planting programs in countries such as the United States, China, India, and Vietnam reduced the net loss of forests from 8.3 million hectares per year in the 1990s to 5.2 million hectares per year in the 2000s.



(a)

The demand for ocean fish has been met in the last several decades with the introduction of new technologies. However, increased fishing is now removing more than 70 percent of the world's fish stocks faster than they can be replenished. For example, a number of northern cod fisheries collapsed in the 1990s, leaving less than 1 percent of their previous populations. Many haddock, salmon, Pacific halibut, Alaska pollock, Atlantic redfish, Atlantic mackerel, shrimp, and king crab fisheries are overfished. Bluefin tuna are so depleted that they may go extinct in the next few years. The Atlantic bluefin tuna is particularly vulnerable because its spawning grounds are in the Gulf of Mexico where the British Petroleum oil spill occurred in 2010 (Figure 1.14).

(b)

Figure 1.14 **British Petroleum (BP) oil spill.** On April 20, 2010, an explosion occurred on the Deepwater Horizon drilling rig about 40 miles southeast of Louisiana's coast. The explosion killed 11 workers and led to an oil spill which continued until the oil well finally was capped on September 20, 2010. It was the largest oil spill in U.S. history. (a) The extent of the oil spill on May 8, 2010. (b) Oily water in the Gulf of Mexico. The Gulf of Mexico is a critical spawning area for bluefin tuna and important to yellowfin as well. With an abnormally large number of dead baby dolphins washing ashore starting in February 2011, the impact on marine life was only in the early stages. *Map: NOAA. Photo: U.S. Coast Guard, photo by Jaclyn Young.*

Industry and the Global Atmosphere

Though humans have been modifying Earth's natural systems for centuries, the industrial revolutions that began in the 1750s marked the beginning of new technological developments that have allowed humans to modify natural environments on unprecedented scales (Figure 1.15). With the building of modern factories, wastes have been poured into the atmosphere and rivers. Consequently, environmental stresses have built up rapidly over large areas of the Earth's world regions.

The carbon gases emitted by the burning of fossil fuels such as coal, oil, and natural gas may very well exceed the amounts that natural systems can absorb. Certainly, carbon dioxide and other gases in the atmosphere have been rising for the last 200 years. These gases trap solar energy in the lower atmosphere, enhance the greenhouse effect, and likely contribute to **global warming**. Today emissions from the burning of fossil fuels are increasing rapidly in newly industrializing countries such as India and China (Figure 1.16).

Rising temperatures melt ice sheet margins, and the meltwater pours into the oceans. The level of the oceans is forecast to rise a meter or so within the next 50 years. The low-lying coasts of coral islands, wetlands, port areas, and hundreds of millions of people will be at risk. This is by far the most important global environmental issue today and will increasingly affect people's lives around the world.

The ozone layer, which is comprised of large concentrations of ozone gas (O_3), forms a protective shield in the atmosphere and blocks incoming ultraviolet rays from the sun. In the 1980s, it became clear that chlorine gases, including the human-made chlorofluorocarbons used in refrigeration systems, gradually permeate upward and destroy ozone by chemical reactions, and they have created an "ozone hole" over Antarctica. The reactions are most intense during the cold polar winters over Antarctica, which makes the hole largest at this time of year. The loss of the protective ozone shield increases people's risk of skin cancer. Governments agreed to end the use of ozone-depleting gases, and the policy is reducing ozone destruction. However, the potential dangers will last for several decades. Indeed, ozone depletion is now a concern in the Arctic, where it was once thought that it did not become cold enough to allow the chemical reactions that destroy ozone. However, with increased greenhouse gases being trapped in and then warming Earth's lower atmosphere, the upper atmosphere is no longer heating to its previous levels. The atmosphere above the Arctic is now notably colder. During the winter of 2011–2012, the first ozone hole above the Arctic was discovered.

While global warming and ozone depletion may have worldwide effects, acid deposition affects areas up to several hundred kilometers downwind of major urban-industrial areas. It is mainly caused by sulfur and nitrogen gases from power stations and vehicle exhaust, which react with sunlight in the atmosphere and return to the ground as acids. Soils and lakes that are close to the pollution sources and are already somewhat low in plant nutrients suffer first. The phenomenon is a growing menace downwind of new industrial areas in developing countries.

Figure 1.15 **Human modification of the earth.** When it was built in the 1930s, Hoover Dam was the largest dam in the world. It created Lake Mead, which extends for 112 miles (180 km) behind it, and it has changed the ecosystems of the Colorado River. By providing drinking water and electricity, it also made it possible for millions of people to inhabit the dry Southwest, which includes cities such as Las Vegas, Phoenix, Los Angeles, and San Diego. *Photo: U.S. Bureau of Reclamation, photo by Andy Pernick.*

Rio and Kyoto

International conferences have been called to address and limit the amount of human-generated emissions that affect global and regional natural systems. Notable conferences took place in Rio

de Janeiro, Brazil, in 1992 and in Kyoto, Japan, in 1997. The United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, in 1992, is now commonly known as the "Rio Earth Summit." The Rio conference produced a number of conventions, namely the UN Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (CBD), and the United Nations Convention to Combat Desertification (UNCCD). The UNFCCC established an overall policy framework for addressing climate change and laid the foundation for combating global warming. It went into effect in March 1994 after 50 countries ratified it.

The **Kyoto Protocol** to the UNFCCC was adopted on December 11, 1997, and addressed specific targets for reducing the six primary greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6). Industrialized countries, primarily in Europe but also including the United States, Canada, Japan, Australia, and New Zealand, were known as Annex I countries. According to the Kyoto Protocol, these countries needed to reduce their greenhouse gas emissions so that their average yearly emissions for the years 2008 to 2012 were 5 percent less than their emissions in 1990. The protocol finally was ratified by enough countries by the end of 2004 so that it went into effect on February 16, 2005. The United States did not ratify the protocol though it was by far the world's largest emitter of carbon dioxide (CO_2) at the time (36.1 percent of total world emissions). In the meantime, many developing countries have increased their emissions with continued industrialization. As China surpassed the United States to become the biggest emitter of greenhouse gases sometime in 2007 or 2008 (see Figure 1.16), it has become clear that developing countries need to assume new responsibilities in collective global actions.

Other international meetings have been convened to develop new initiatives to follow after the Kyoto Protocol's 2012 end date. Examples include conferences held in Bali, Indonesia, in 2007, and in Copenhagen, Denmark, in 2009. The most recent conference was in Rio de Janeiro, Brazil, in 2012 and was called Rio 2012 or Rio+20. The conference focused on seven critical issues that ultimately affect the natural environment: jobs, energy, cities, food, water, oceans, and disasters. Despite much discussion, these conferences made little progress in building on the Kyoto Protocol's ambitious goals.

Multiple methods for reducing greenhouse gases exist, and most of them will be employed. Examples include biofuels such as ethanol based on corn, sugarcane, or switchgrass. Some automobiles run on compressed natural gas, while further research is being conducted on hydrogen fuel cells and better batteries for electric cars. More generally, investments in solar and wind energy have increased dramatically. Some countries are turning to nuclear power, though it creates other environmental problems. Some are imposing carbon taxes on their industries. Others use cap-and-trade systems that place limits on emissions but allow companies to sell their unused allotments to other companies. This system supposedly encourages companies to see a profit in emitting less.

Figure 1.16 **Air pollution: Beijing.** As China's economy rapidly expands, so do its industrial emissions. *Photo: © AFP/Getty Images.*

1.4 Regions and Human Geography

Human geography (see p. 4) is concerned with the spatial variations of humans and their characteristics. Specific examples include cultural, political, economic, population, and urban geographies. **Cultural geography** is concerned with such phenomena as material traits, social structures, and belief systems. Specific examples include language use, religious beliefs and affiliations, dress, food, recreation, building practices and styles, and social organization. Culture explains how peoples create and re-create the distinctiveness of their regions, which in turn shapes the lives of regions' inhabitants and their descendants. People often behave according to their culture's norms and find comfort and security through identification with a group that shares common cultural characteristics.

The most important thing to understand about culture is that it is learned behavior. A combination of traditions and behavior practices is transmitted from generation to generation along with adaptations, variations, and new ideas or innovations more recently acquired or accepted by various groups of people. Cultural identification is not mutually exclusive. One may be part of many different culture groups at the same

time. Biology and genetics do not determine any element of culture, but some cultures focus on gender and racial characteristics when deciding who does and does not belong to their group.

Language

A **language**, which includes speech, writing, and signing, is a means of communication among people. It is an important factor in geographic diversity. Languages grow out of historic experiences and traditions and often provide a shared identity for a cultural group. Some groups make a point of using their language to enhance their identity and separate themselves from others. For example, the French-speaking Québecois people in Québec, Canada, emphasized their language when they wanted to achieve greater political recognition.

Some six thousand languages are spoken around the world, many by small groups of people in isolated environments such as South America's Amazon River basin. Related languages can be grouped in families (Figure 1.17). For example, the Indo-European family includes most of the languages of South Asia (e.g., Hindi) and many of the languages of Europe and Russia and its neighboring countries. Some of these languages, especially Spanish, Portuguese, English, French, and Dutch, spread with European colonization after around AD 1450. They dominated the Americas and the South Pacific and become important in many parts of Africa and Asia.

Many of these languages became **world languages** (lingua francas), which are spoken by people who otherwise do not share a mother tongue. They are among the world's 12 most widely spoken languages, each having over 100 million speakers. Six of these (English, French, Spanish, Russian, Arabic, and Mandarin Chinese) are official languages of the United Nations, mostly (with the exception of Arabic) chosen from the victorious allies at the end of World War II. Other significant world languages are Hindi/Urdu, Portuguese, German, Persian, and Swahili. The dominance of these languages has been brought about by globalization. As borders have been opened, some forcibly, economic competition has allowed some languages to flourish and expand at the expense of others.

Religion

Religions also generate geographic variations in culture through strong group loyalties and exclusive attitudes. Each **religion** is an organized set of practices that professes to explain our existence and purpose on Earth. Many also have value systems and faith in and worship of a divine being or beings. Religious belief often influences social and legal practices, shapes views of the natural environment, and reflects itself in the cultural landscape, such as in building designs (Figure 1.18). Religions play a significant role in transferring cultural values and practices from one generation to the next.

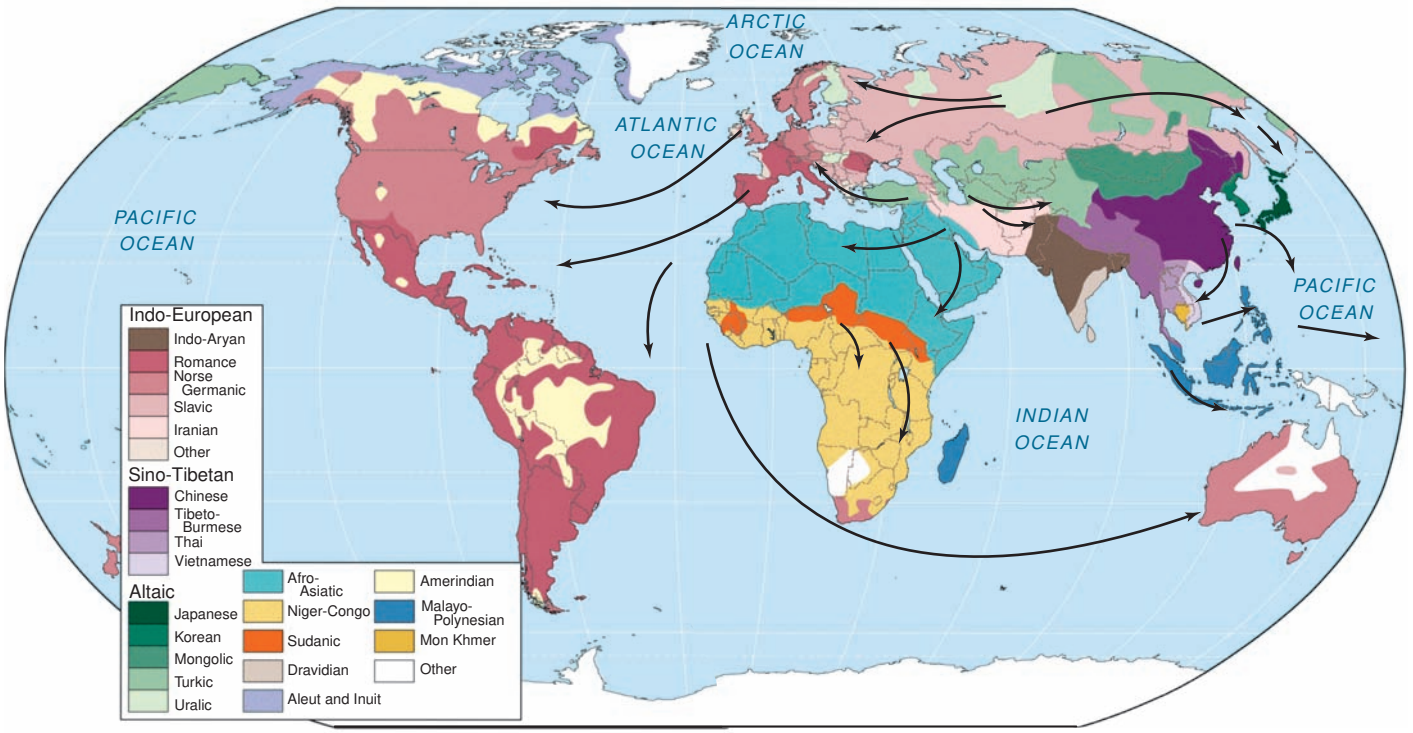
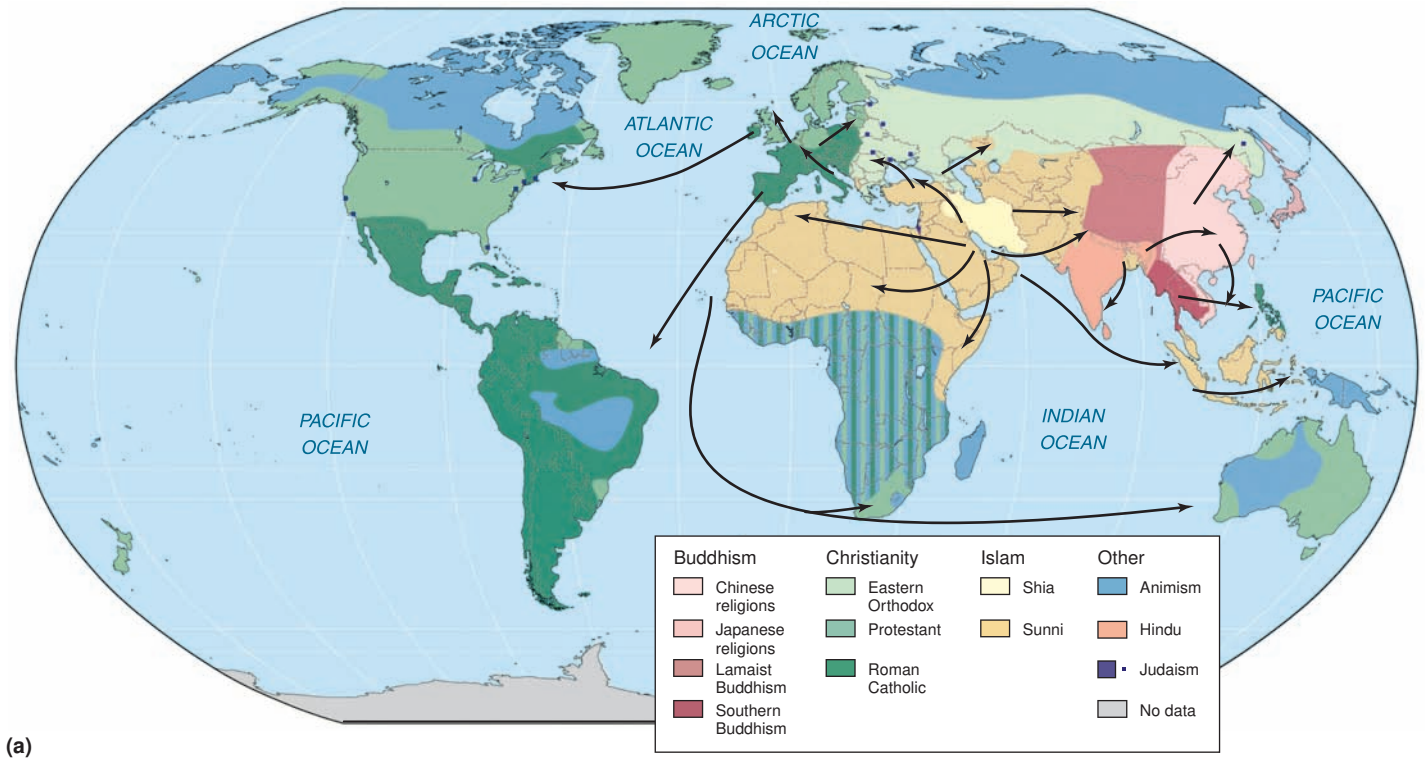


Figure 1.17 **Cultural geography: world language families.** The arrows show some diffusion routes. The map records the majority languages; there are often many different languages, including those of minority groups, in each area.



(a)

(b)

(c)

Figure 1.18 **Cultural geography: world religions.** (a) The map shows the geographical dominance of Christianity in its various forms, Islam, Hinduism, and Buddhism. These also have the highest numbers of adherents. The Jewish religion is spread around the world, mainly in cities. Older and local religious practices remain in localized areas. Many places have mixtures of allegiances to different religions—sometimes working together, other times in conflict. Religious landscapes: (b) Angkor Wat, Cambodia, originally Hindu, now Buddhist; (c) Islamic Center of America, mosque in Dearborn, Michigan. *Photos: (b) © Ronald Wixman; (c) © George White.*

Major World Religions

The religions claiming the largest numbers of adherents are Christianity (2 billion), Islam (1.4 billion), Hinduism (900 million), and Buddhism (500 million). Judaism has a smaller number of adherents (14 to 15 million) but an important place among world religions. Christianity, Islam, and Buddhism are religions that can be joined by anyone in any country, and they actively seek to expand their memberships: this makes them **universalizing**, or global, **religions**. Hinduism and Judaism are considered to be mainly a matter of birth by adherents, closely tied to family and region: they are **ethnic religions**. People practicing ethnic religions do not actively seek converts because they see their religions as only appropriate for their own ethnic groups.

These major religions also can be categorized into western and eastern groupings. The western religions, namely Judaism, Christianity, and Islam, all originated in Southwestern Asia (see Chapter 7). Christianity and Islam were created from the already existing structure of Judaism. All three believe in the same God and share many religious texts and figures. Because they all consider Abraham to be the earliest patriarch of their faiths, they often are called the "Abrahamic religions." They do not share texts or religious figures with Hinduism and Buddhism, which are considered eastern religions. These religions both originated in South Asia (see Chapter 6) and are connected because Buddhism grew out of Hinduism. As Buddhism spread into East Asia, it encountered and interacted with other religions such as Daoism in China and Shintoism in Japan.

Religion and Society

Religious adherence often motivates believers to advocate certain social, economic, and political policies because religions have very specific views on such issues as abortion, sexuality, family life, gender roles, education, the natural environment, crime, punishment, and the propriety of certain activities and professions. For example, many Roman Catholic and Muslim leaders officially oppose birth control, although individual families increasingly make their own choices. Some religious views argue that humans are either part of or stewards of the natural environment and, therefore, should conserve it. Their views conflict with those that argue that Earth was created for human use.

Most Jews, Christians, Muslims, Hindus, Buddhists, and peoples of other faiths live together peacefully. However, religious differences between peoples may result in conflicts, especially when one group's actions violate or offend another group's beliefs. Those in or seeking political power sometimes deliberately stereotype and emphasize differences to fan ignorance and exacerbate conflict for their own political gain. These actions encourage violence and religious extremism. Since the end of the Cold War in 1991, the growth of Christian, Hindu, Jewish, Islamic, and Buddhist extremism in some countries is one sign that religious ideologies have replaced the political ideologies of the Cold War period.

Cultural Status: Race, Class, and Gender

The concept of meritocracy, which grants status based on achievement, only is practiced to certain limits around the world. Inherited monetary wealth, political allegiance, media prominence, or sporting performance can be more important in defining a person's status. In many cultures, however, one's position in society is more profoundly determined by one's ethnicity, race, class, and gender. Because these concepts have such an influence on everyone's lives and geographic diversity, it is important to discuss what they mean.

Ethnicity and Race

An **ethnic group** is a cultural group whose members are defined by such characteristics as common origin (real or imaginary), religion, language, customs, or physical features. The term is often used synonymously for tribe, clan, or segregated minority though they are not the same.

Individuals become so accustomed to behaviors and standards of their own ethnic groups that they judge others as "wrong" or "backwards" when they do not behave and act the same. For example, in some cultures, people eat hamburgers, French fries, and pizza with a knife and fork rather than with their hands. Others drive on the left side of the road instead of the right side. These reflect preferences that have become standards for groups and are not caused by a lack of morality or development. Nevertheless, the term **ethnocentrism** refers to those who judge other ethnic groups harshly because they do things differently.

The concept of **race** is assumed by many to be based on essential biological differences, but characteristics such as skin color, eye shape, or hair type vary as much within so-called "races" as between them. Although race and racism are often at the center of human conflicts, the most basic human biological features, DNA and blood type, demonstrate little variation across the human species, which is a single reproducing group. However, racial characteristics frequently are chosen to divide people into groups of "us" and "them."

Examples of cultural racism include South Africa, where the minority white population operated a supremacist apartheid ("apartness") policy until 1994, separating whites, blacks, and other "colored" peoples into segregated neighborhoods. The country is now reversing this policy (see Chapter 8). In the United States, many African-Americans still struggle against discrimination from people of "whiter" European origin. Even in Brazil, where Native American, European, African, and Asian peoples mix freely, the upper socioeconomic classes are of European origin and lower socioeconomic classes consist of people of African or Native American origin.

In many countries, ethnicity decides the membership of opposing political groups and may lead to armed conflict. The promotion of ethnic groups as "superior nations" and the demotion of others as "inferior" had much to do with the Holocaust associated with World War II and other ethnic cleansings in Europe and Asia. Before that, colonial powers often highlighted and exploited ethnic and tribal differences by playing one group against another. After the former colonial countries in Africa, Asia, and Latin America achieved independence, many new rulers established one-party rule and often emphasized the perceived differences among ethnic groups by rewarding those in their own ethnic group and penalizing others. For example, Saddam Hussein in Iraq favored the Sunni Muslims over the more numerous Shia Muslims. Such favoritism created a hostility and distrust that continues today.

Class Distinctions

Class hierarchies within societies are created by an emphasis on such criteria as ethnicity, race, religion, material wealth, education, perceived birthright, and other social characteristics. In the United Kingdom, the royal family is on the top of a hierarchy of hereditary dukes, earls, and knights with commoners at the bottom. In India, the caste system and, increasingly,

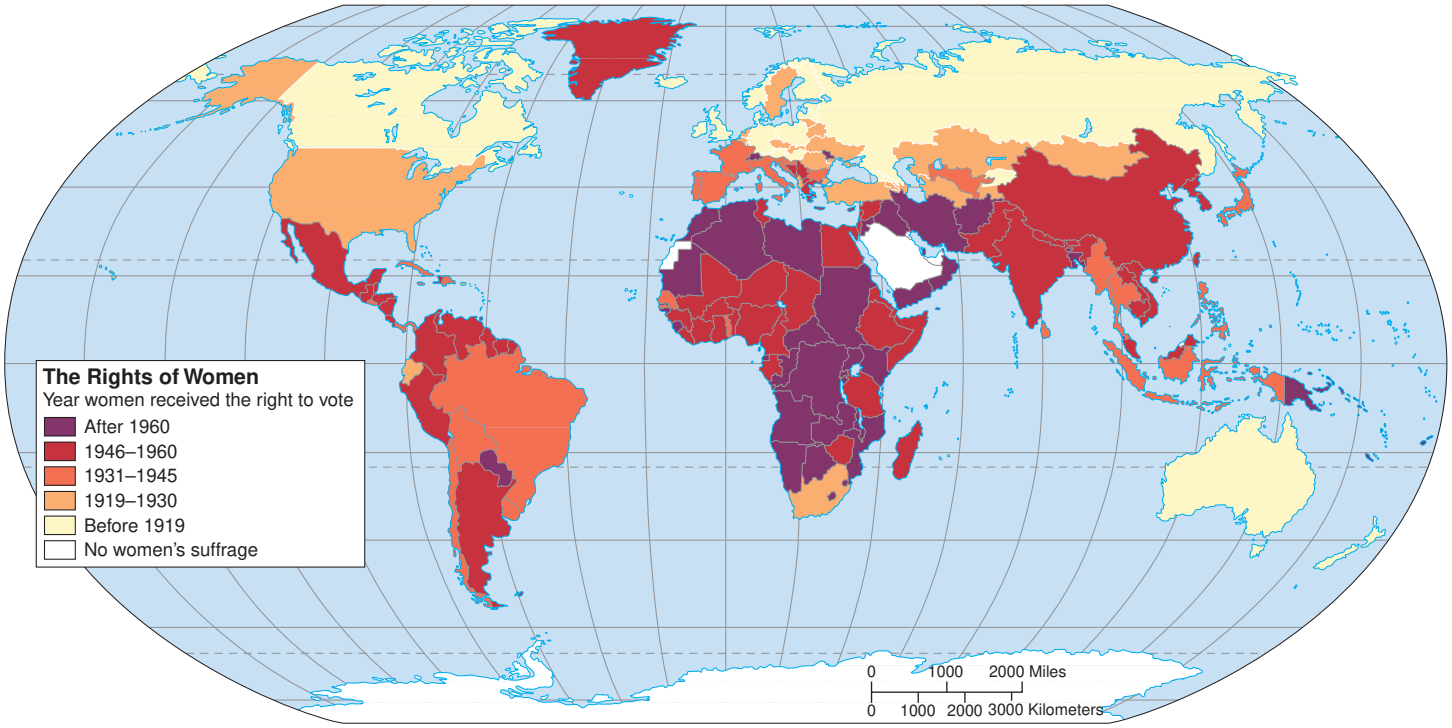


Figure 1.19 **Women: the right to vote.** This map illustrates that women only recently have gained the right to vote in many countries. Are there any geographical patterns to when this right was obtained?

education define position in society. In Communist countries, the expectation of a classless society is contradicted by the status and privileges given to members of the Communist Party. Most Americans identify general class differences by material possessions and appearances largely based on income: a lower-middle class of factory and shop workers, an upper-middle class of managers and professionals, and a group of exceptionally wealthy financiers, property owners, and sports and media stars.

Gender Inequalities

Gender—the cultural implications of one's sex—also highlights differences and inequalities of opportunity within and among societies. Males dominate most societies and have a history of denying full rights to women. Although major changes occurred in the 1900s, particularly in extending voting franchises to women (Figure 1.19), some countries still deny women the human rights defined by the United Nations. Many cultures prefer and favor males. Consequently, abuse, aborted female fetuses, and denial of adequate food, shelter, and access to health care has taken its toll on women in what is called "gendercide." As many as 100 million fewer women are alive today simply because of the poorer treatment they receive for being women.

In Afghanistan, girls and women risk having their noses and ears cut off or acid thrown in their faces for trying to go to school. In Africa, female genital mutilation, or "cutting," continues in some societies. In Iran and northern Nigeria, women—but not men—can be stoned to death for adultery. Illiteracy among women is still much higher than among men in most of Africa and Asia. Few European countries allowed women to vote in elections until the 1900s, with Switzerland delaying it until 1971 and one of its cantons until 1990.

Women, even in the world's wealthier countries, commonly receive lower wages than men for the same jobs and constitute a minority of doctors, engineers, corporate executives, and elected politicians. Some jobs such as nursing, secretarial work, elementary school teaching, and sales clerking have been widely regarded as "women's work" and often have lower status. Further, women commonly take a major role in running the household and child care, which often affects their career opportunities.

Some aspects of women's inequality are gradually being tackled. The high rates of female illiteracy in poorer countries affect population growth rates and resource consumption. Better education gives women confidence, enables them to take jobs, improves their self-esteem, and increases their roles in decision making. Women, especially educated ones, commonly want fewer children than men. However, male dominance exercised through cultural traditions often still prevents women from controlling how many children they have.

Women hold as many as half of the jobs in countries like the United States. In the United States, they also possess roughly half of the master's degrees but are only 2 percent of CEOs of Fortune 500 companies and comprise less than 13 percent of board members in American companies. Overall, women's salaries are on average 83 percent of those of their male counterparts. Though sex discrimination is not allowed in many countries, most workplaces are male-structured, providing few

childcare facilities, flex-time or part-time work schedules, or extended leaves to take care of family matters. Where these shortcomings exist, women still find it difficult to advance.

To measure gender inequalities in and among countries, the United Nations developed the Gender Inequality Index (GII) for its Human Development Report 2010. The GII is "a measure that captures the loss in achievements due to gender disparities in the dimensions of reproductive health, empowerment and labour force participation. Values range from 0 (perfect equality) to 1 (total inequality)." Actual values for countries range from 0.049 to 0.769. In the most recent 2011 report, Sweden ranked as the most gender-equal country and was followed by the Netherlands, Denmark, Switzerland, and Finland. The lowest-ranked country was Yemen. It was closely followed by Chad, Niger, Mali, and Democratic Republic of Congo. The rankings indicate that gender inequality is linked to economic prosperity and political stability.

According to the Human Development Report 2011, gender inequality also impacts the natural environment. For example, in countries where inequality is high, women have less control over their reproduction and less access to family planning. It means that women have more children than they personally desire. "Meeting unmet need for family planning by 2050 would lower the world's carbon emissions an estimated 17 percent below what they are today." Also, the Gender Inequality Index indicates a causal link between gender inequality and deforestation in more than 100 countries between 1990 and 2000. Less deforestation occurs in democracies, but democracy requires more gender equality.

Though gender inequalities exist, they were much greater 50 years ago. The gender gap has closed dramatically over the last few decades for two reasons: the contraceptive pill and higher education. The contraceptive pill has allowed women to choose when to have children. Many have chosen to put off having children to pursue a higher education, which in turn has increased their incomes. At the same time, women have changed their career paths. For example in 1966, 40 percent of American women who received bachelor degrees majored in education and 2 percent majored in business. By 2010, 12 percent majored in education while 50 percent majored in business. There are also 3 million more women than men pursuing university degrees.

Women are also better able to compete in the modern global economy as manufacturing jobs have declined and knowledge-based service sector jobs have increased. More men lost jobs in the world recession from 2007 to 2009. In the European Union, women obtained 6 million of the 8 million new jobs created from 2000 to 2010. In the United States, the Bureau of Labor Statistics estimates that women hold two-thirds of the jobs in 10 of the 15 job categories that are growing the fastest. Increasing female employment compared to that of males will tremendously boost the GDPs of countries. According to a study by Goldman Sachs cited in the *Economist*, growing female employment will increase Italy's GDP by 21 percent, Spain's by 16 percent, Japan's by 9 percent, and those of the United States, France, the United Kingdom, and Germany each by 8 percent.

1.5 Regions and Population

From the time that humans first walked the Earth, it took until 1804 for the world's population to reach one billion people. Just over 200 years later, in 2011, the world's population passed the seven billion mark (Figure 1.20). This tremendous change in population has altered resource use, environmental impacts, economic systems, political relations, and some of the differences among world regions. To appreciate these changes and their impacts, it is important to understand population dynamics such as growth, settlement patterns, and migration.

Population Distribution and Dynamics

Where People Are

With countries and other political units varying in land area, meaningful comparisons between places are commonly measured by looking at **population density**—the numbers of people per given area (e.g., square kilometer or square mile). Population densities vary greatly around the world (Figure 1.21) and can be used to map out **population distribution**. The

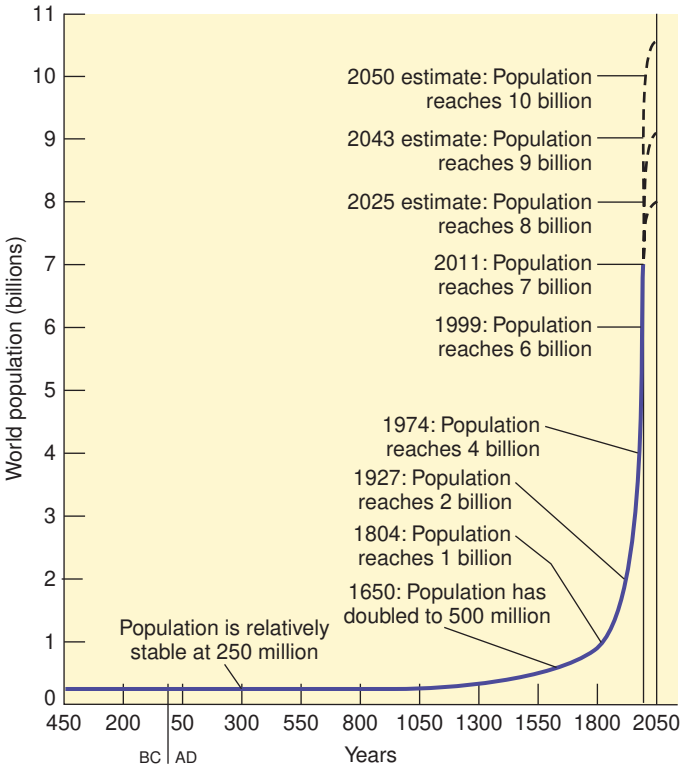


Figure 1.20 **World population growth.** For most of the human occupation of Earth, population growth was slow compared to the last 300 years. The population took 1,300 years to double from 250 to 500 million, then doubled again in 254 years to reach 1 billion. The next doubling took 123 years to reach 2 billion, followed by a doubling time of just 47 years to reach 4 billion. It is estimated the world's population will reach 8 billion in 2025, which would make the doubling time 51 years. *Source: United Nations.*

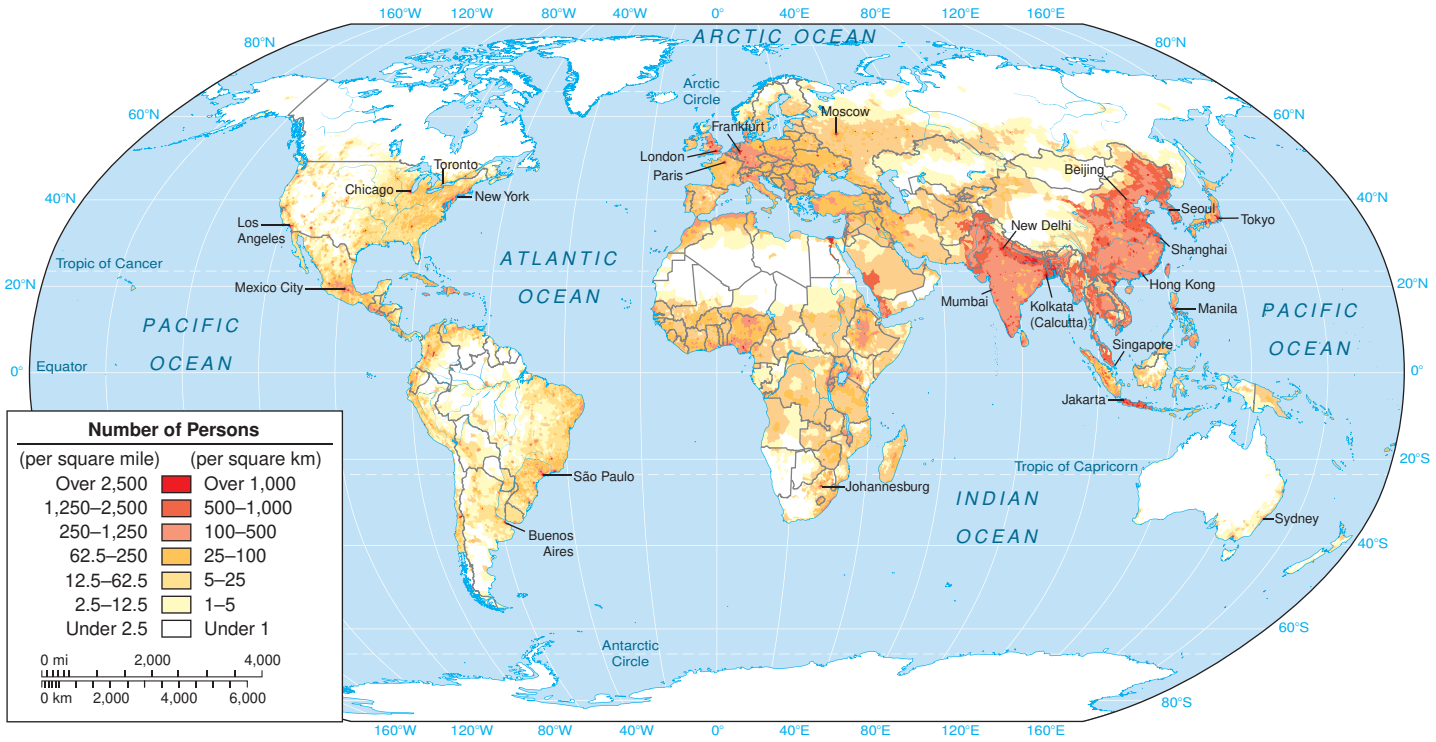


Figure 1.21 **World population distribution.** Which world regions have the highest and lowest densities of population? As you read through this chapter, try to explain the differences.

highest densities developed in fertile lowlands and the lowest densities in physically challenging regions such as deserts and mountains. Now, many urban areas are expanding over good farmland and along coastal areas.

Urban Growth

One of the most basic geographic differences is between **urban** and **rural areas**. At present, half the world's people are concentrated with very high densities in expanding urban areas. In addition to high population densities, urban areas are marked by such characteristics as large proportions of offices, housing, and factories, a concentration of economic activities, and political boundaries of legally incorporated places.

Industrialization dramatically increased urbanization in world regions such as Europe and North America in the 1800s and early 1900s. In 1950, New York was the world's largest city with just over 12 million people; it was closely followed by Tokyo. Since 1950, urbanization has been more rapid in much of the rest of the world (Figure 1.22). The number of cities with populations over 10 million inhabitants, called **megacities**, increased from two in 1950 to 23 in 2011. Tokyo is now the world's largest urban area with almost 37 million people. It is followed by Delhi (India), Mexico City, New York–Newark (20 million), São Paulo (Brazil), Shanghai (China), Mumbai (Bombay, India), Beijing (China), Dhaka (Bangladesh), and Kolkata (Calcutta, India). Listings of major city populations and their projected growths are in each regional chapter. Where a country has a single very large city, often several times the population of its other cities, it is known as a **primate city**.

Population Ups and Downs

Demography is the study of population numbers, densities, growth and decline, migration, and their relationships. The following terms illustrate how they are measured.

- The **crude birth rate (CBR)** refers to the number of live births per 1,000 inhabitants per year in a given population. It is related closely to the **total fertility rate (TFR)**—the average number of births per woman in her lifetime. Total fertility rates of 6 to 7 are typical of many developing countries, while industrialized countries have rates of 2 or below.
- The **crude death rate (CDR)** is the number of deaths per 1,000 inhabitants per year in a given population. It is often broken down into age groups. **Infant mortality** (deaths per 1,000 live births in the first year of life) and child mortality (deaths per 1,000 live births in the first five years of life) are examples. Infant mortality rates below 10 (i.e., 10 infant deaths per 1,000 live births) in industrialized countries compare with those above 100 in many developing countries. The crude birth and death rates are labeled "crude" because they do not account for the age and gender structure of a population.
- The crude birth rate minus the crude death rate equals the rate of natural population increase or decrease.

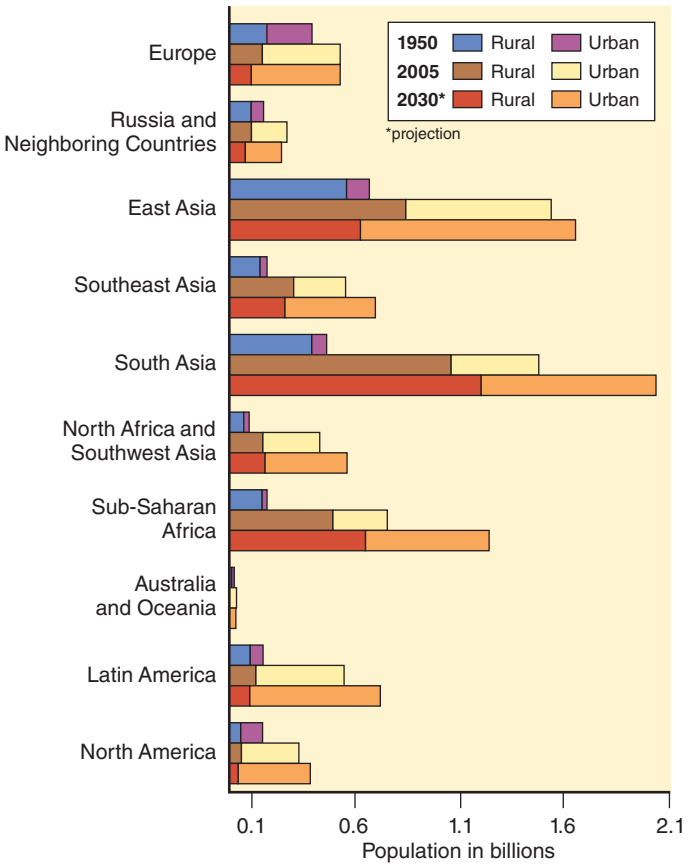


Figure 1.22 **Growth in population and urbanization.** Identify those world regions that have grown the most in total population and urbanized the most since 1950.

The Migration Factor

Migration is the long-term movement of people into or out of places. Immigration ("into") and emigration ("out of") can dramatically change the population of a country despite natural increase. For example, immigration is a major cause of population growth in the United States, Canada, Australia, and some European countries, as natural increase is slow. In general, major migration flows are tied to globalization.

By 2010, 215 million people lived outside their country of birth, making up 3.1 percent of the world population. However, migrants are not evenly distributed. More than 20 percent of the populations of Australia and Switzerland are foreign born. Canada, Germany, the United States, Sweden, Ireland, the United Kingdom, and France have foreign-born populations of more than 10 percent.

With travel costs high and entry difficult, about 78 million migrants have not journeyed to wealthy countries but instead only were able to trek to neighboring countries. This has been particularly true for refugees fleeing war-torn countries such as Iraq, Somalia, and Afghanistan. About 70 percent of migrants from Sub-Saharan Africa stay in their region. Some migrants seek more moderate-income countries like Argentina, India, Russia, and South Africa.

Immigrants play significant roles in their host and home countries and the global economy. For example, migrants from South and Southeast Asia have moved to the Persian Gulf oil countries and Europe where their labor is needed. Also, educated men and women move to major economic urban centers for better-paying jobs. On the one hand, these migrants represent a "brain drain" from their home countries. On the other hand, along with many of the world migrants, they send their paychecks home as remittances. These money transfers provide a high proportion of national income in some poorer countries. For example, remittances from abroad make up over half the national income of Haiti, and 40 percent of Zimbabwean households receive money from abroad.

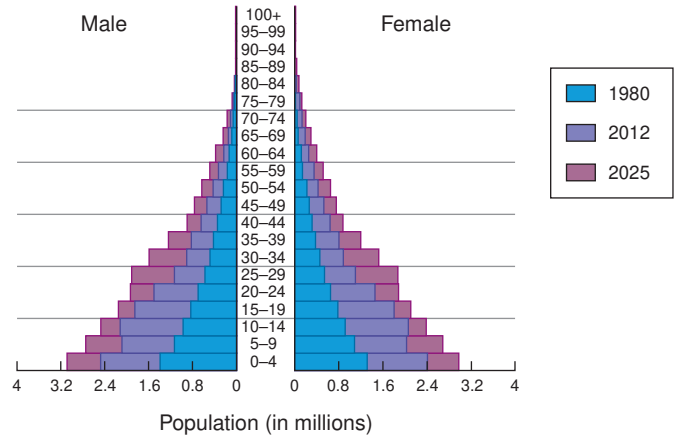
Overall Population Change

A change of 1 or 2 percent in a country's annual population growth rate will have a dramatic effect over time. This effect is illustrated by **population doubling time**, the time in years taken to double the number of people in a place. A population increase of 1 percent growth leads to a population doubling time of 70 years. An increase of 2 percent means a doubling in 35 years; 3 percent growth means a doubling in 23 years. Developed countries today commonly have below 0.5 percent population increase, while developing countries have rates of 2 to 3 percent. Countries with high emigration, low birth rates, or high death rates may experience population losses.

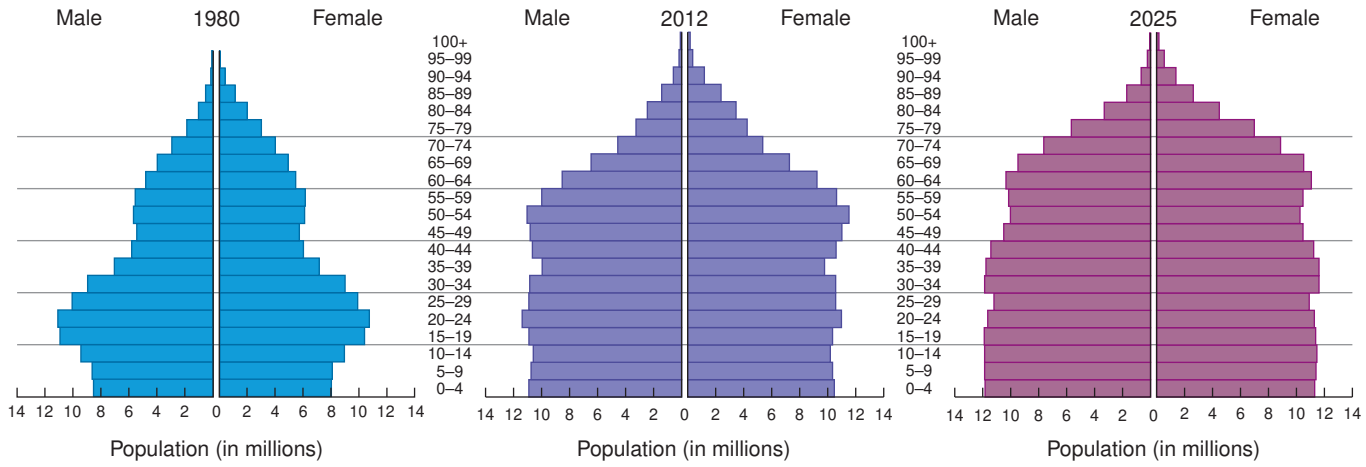
The composition and recent history of a country's population characteristics are often summarized in an age-sex diagram, also termed a "population pyramid" (Figure 1.23). Migrations into the country or baby booms show up as expansions in particular age and gender groups; deaths in major wars may be reflected in a narrowing of specific cohorts. Long life spans result in larger groups of older people, which are illustrated at the tops of the pyramids.

Is the World's Population Growth Sustainable?

Population growth puts greater demands on Earth's resources. In 1798 the English economist Thomas Malthus argued that without moral restraint in choosing the number of children that we have, world population growth would exceed the growth of food production, creating overpopulation. This would lead to widespread famine, disease, and war. Overpopulation and its consequences have occurred locally, but new technologies have prevented it from happening globally. Technology has expanded resource production through the development of genetically modified foods, fertilizers, additives, plastics, synthetics, and alternative fuels. However, the mathematics of population increase make it questionable whether technology alone will provide the solutions. Some argue for conservation and the slowing, stopping, or reversing of population growth. Certainly, our lifestyle choices concerning transportation, food, and clothing, among many others, will impact future patterns of human and physical geography.



(a) Afghanistan



(b) United States of America

Figure 1.23 Age-sex diagrams (population pyramids). Diagrams for three years are overlaid or set side-by-side to show changes. In each case, the bars represent a five-year age group (male and female). Total numbers of people in each group are preferred here to percentages of the total population to allow comparisons of places. (a) Afghanistan, a materially poor country with large numbers of young people and fewer old; middle-age groups will increase by 2025. The progressive increases allow the three years to be superimposed. (b) The United States, a typical materially wealthier country with a more even spread of numbers in each age group. The baby boom of 1950–1965 is seen to move upward over time. The three years are separated for clarity. Age-sex diagrams can be found in Chapters 2 through 10. *Source: U.S. Census International Database: http://www.census.gov/population/international/data/idb/region.php.*

1.6 Regions and Politics

Political geography is the study of how governments and political movements (e.g., nongovernmental organizations, labor unions, political parties) influence the human and physical geography of the world and its regions. Cultural phenomena (e.g., language and religion) and physical features (e.g., the distribution of fresh water) influence governments, political movements, and their relationships.

The world is primarily divided up into **countries** (also called states), which are bordered territories with governments that have political control, or sovereignty, over the internal and external affairs of the territory's contents and inhabitants. The number of self-governing countries increased from 62 in 1914 to 74 in 1946 and 195 today. The world's newest country, South Sudan, came into being in July 2011. Each country ideally is recognized by other countries, but such is not always the case. For example, Taiwan is not recognized by the People's Republic of China, which claims Taiwan as its territory. Taiwan once had the recognition of more than 100 countries, but the list has declined to just 23. One of the newer countries, Kosovo, had only received the recognition of 91 countries by mid-2012.

Country governments promote and protect their peoples in world affairs and may join other country governments in mutual trading or defense agreements. Countries tax their citizens to provide public services, including military defense, and encourage economic and social welfare. Countries often have systems of regional, state, or local government that carry out some of the governmental responsibilities at different geographic levels. In world regional geography, countries provide the main subunits of study within the world regions.

Nations and Nationalism

Countries often are called nations, but these two terms do not have the same meaning. A **nation** is a group of people who share a common identity, a sense of unity, and a desire for self-governance. Each nation defines its common identity in its own way and is thus called an "imagined community." Typical imaginations of commonality are shared language, religion, history, ideology, ethnicity, and race. An ethnic group also is defined by a set of shared characteristics, but many ethnic groups have no sense of unity and do not wish to govern themselves. When a group sharing one or more of the aforementioned characteristics becomes politicized, it becomes a nation. Thus, some nations are comprised of a single ethnic group, such as the English, Serbs, and Japanese. However, other nations are multiethnic, such as Americans. Many Americans emphasize their different ethnic backgrounds by combining their ethnic and nation identities with a hyphen (e.g., Irish-American, Japanese-American, and African-American).

Nationalism is pride in one's national identity and the belief that one's national interests are more important than all other interests. To protect and advance each nation's interests, nationalists believe that each nation must be able to govern itself, which is best ensured with a separate state (or country). Thus, nation and state are linked together into the concept of the nation-state. However, not all nations have their own states, though they may wish to. For example, Basques, Kurds, and Palestinians are all stateless nations and live as minorities in other groups' nation-states. Consequently, the nationalists in many such groups try to create their own nation-states, but such attempts often result in violence and oppression. Not all violence is begun by the minorities; often it begins with the dominant national groups who see the minorities as threats.

Indigenous peoples are the first inhabitants of any given area. Today indigenous groups often remain as minority populations within individual countries, subject to some denial of human rights and development opportunities. The numbers of indigenous peoples often dramatically declined during the colonial period and world wars, and some groups were exterminated. Other groups evolved their own cultural and political aspirations as minority "nations." For example, Native Americans initially fought back against the taking of their lands by European colonists. Since then, they have gained rights and varying degrees of autonomy in the United States. In Canada, they recently won major rights as "First Nations."

Governments

Government functions are concentrated in **capital cities**, where the heads of state live and administrative and government offices are situated. Many capital cities are the largest cities in the country, like London (United Kingdom), Tokyo (Japan), and Nairobi (Kenya). In some countries, new capital cities were built as a gesture to replace colonial choices, to expand economic development of the interior, or to provide a more central location. Washington, D.C., Brasília (Brazil), Abuja (Nigeria), and Canberra (Australia) are examples.

Global Governance

No global government exists with the same powers as country governments. Any vision of a worldwide government remains a long way off. However, the term **governance** is increasingly being applied to entities other than country governments. These entities are categorized as either **intergovernmental organizations (IGOs)** or **nongovernmental organizations (NGOs)**. In various ways, they seek to legislate and regulate human activities and set new governing standards, often based on universal principles. Together with their networks that function across country borders, often with minimal government consultation, they are increasingly challenging and eroding the sovereignty of countries.

Intergovernmental Organizations (IGOs)

The United Nations (UN), which includes almost all of the world's countries, is the largest IGO. Founded in 1945 at the end of World War II, its goal has been to prevent and stop wars between countries by serving as a forum for dialogue and by promoting cooperation in international law and security, social progress, human rights, environmental protection, and economic development. Member countries pay dues, and these are used to fund various programs and specialized agencies. Examples of programs are UNICEF (UN Children's Fund) and WFP (World Food Program). Examples of specialized agencies are the International Monetary Fund (IMF), the World Bank, and the WHO (World Health Organization).

The UN has few specific programs in the security field apart from the Security Council and the groups of military peacekeepers that are drawn from member countries. Although the UN has had difficulty in preventing all civil wars, nuclear testing, or drug, weapons, and slave trafficking, its role in world affairs continues to grow. For example, it has completed almost 50 missions and is currently undertaking 16 others. A criticism and challenge for the UN is that its wealthier donor countries like the United States try to use the organization to advance their own foreign policies. At the same time, poorer countries like Bangladesh, Pakistan, and India obtain much-needed funds at the expense of having their soldiers serve on dangerous UN missions.

Not all IGOs are global in intent like the UN. Some are associations of countries with cultural and historical connections. The Commonwealth of Nations (formerly the British Commonwealth) is comprised of countries that were once part of the British Empire, while Islam unites members of the Organization of the Islamic Conference. Other IGOs are closely connected to specific world regions such as the European Union (EU), the African Union (AU), and the Organization of American States (OAS).

Country Groupings for Trade or Defense

Countries make agreements with other countries to foster security through common trading and defense interests. Governments influence world trade patterns whenever they encourage their people to export goods and whenever they control certain imports by charging taxes, or tariffs, on them. The General Agreement on Tariffs and Trade (GATT) was established in 1948 to increase world trade by encouraging countries to lower their tariffs. In 1995, the World Trade Organization (WTO) took over GATT's role of trying to prevent discrimination among trading partners, but many believe that its rules favor the wealthier countries at the expense of the weaker ones.

Most progress on liberalizing trade has been made at the world regional level in free-trade areas, the members of which impose common tariff rates on imports. The largest trading group at present is the European Union (EU). Other examples are the North American Free Trade Agreement (NAFTA) for Canada, the United States, and Mexico, and the Asia-Pacific Economic Cooperation Forum (APEC). Such groupings of regional interests are considered in each chapter of this text.

The Cold War period that began after World War II generated defense agreements on both sides. The North Atlantic Treaty Organization (NATO) linked North America and

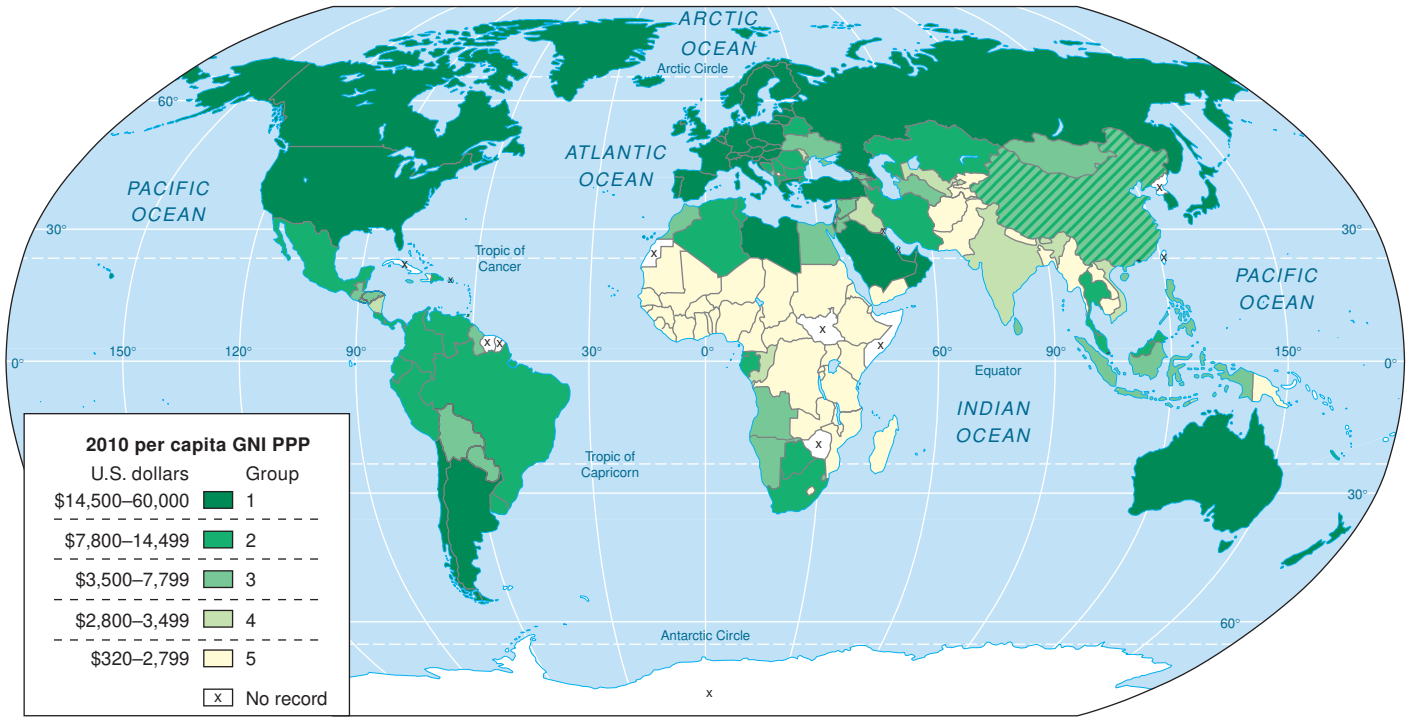


Figure 1.24 **Major income groups of countries.** A World Bank division based on GNI PPP per capita for each country. How do the five categories relate to the major world regions? *Source: Data (for 2010) from* World Development Indicators, *World Bank.*

western Europe in a common response to a perceived military threat from the Soviet Union and still exists today despite the disintegration of the Soviet Union.

The Association of South East Asian Nations (ASEAN) began with political objectives during the Cold War, opposing Communist countries such as Vietnam, but later shifted to increasingly economic objectives and admitted Vietnam as a member.

Nongovernmental Organizations

Increasingly, nongovernment organizations (NGOs) such as aid bodies have been assuming responsibilities for government-like activities. They include any group engaging in collective action of a noncommercial, nonviolent manner that is not on behalf of a government. Some NGOs are locally based, others are associated with particular countries, and the largest engage in international activities. Examples of the last group include the International Red Cross, Green Crescent, Oxfam, Save the Children, Amnesty International, Greenpeace, and Médécins Sans Frontières (Doctors Without Borders). Some are better known than many smaller countries. Each has a particular concern, such as human rights or the environment. Many international NGOs are contracted by governments and international agencies to supply aid irrespective of country borders. The number of NGOs working or consulting with the United Nations rose from under 500 in 1970 to over 2,000 today.

1.7 Regions and Economics: Wealth and Poverty

Economic geography is concerned with the spatial patterns of material wealth and poverty, natural resource use, goods' production, distribution, and consumption, and labor and capital flows. The spatial distribution of material wealth depicted on the World Bank map demonstrates the pattern of economic inequality (Figure 1.24). According to the World Wealth Report, the number of dollar millionaires (or HNWI: High Net Worth Individuals) in the world in 2011 was 10 million (up from 5.2 million in 1997). For the first time since the world recession, the collective value of their material wealth declined. At US$42 trillion, it was a decrease of almost 1.7 percent from the previous year. Although comprising only 0.14 percent of the world's population, they control one-third of the world's wealth. Significantly, the geographic distribution of the world's extremely wealthy also is shifting. In 2010, the number of dollar millionaires in Asia surpassed those in Europe, and then in 2011 overtook those in North America for the first time. China, Japan, South Korea, Thailand, Malaysia, and Indonesia are largely responsible for Asia's growth in millionaires. Their growth offset 20 percent decreases in the number of millionaires in India and Hong Kong. Nevertheless, the North American HNWI wealth at US$11.4 trillion still remained greater than Asian HNWI of US$10.7 trillion.

Measuring Wealth and Poverty

To give more precise meanings to material wealth and poverty, specific indicators have been chosen to compare and understand the differences between countries and regions. The ownership of consumer goods and access to piped water and energy resources are vivid indicators of differences in material wealth among countries (Figure 1.25). Poor people's luxuries such as better drinking water, food, clothing, and shelter are often wealthier people's normal expectations.

The economic development of countries is commonly measured by two statistics of income. **Gross domestic product** (GDP) is the total value of goods and services produced within a country in a year. Gross national product (GNP), now called **gross national income** (GNI), adds the role of foreign transactions to GDP. Per capita figures of a country's total annual income are averages of GDP or GNI per person in the population. They do not indicate personal incomes. The divisions shown on the World Bank map (see Figure 1.24) are based on GNI per capita, with countries divided into five income groups: high, upper middle, middle, lower middle, and low.

GDP and GNI are informative, but they may not reflect the costs of living in a country. The **purchasing power parity** (PPP) estimates of GNI and GDP are more meaningful comparisons of living costs among countries and are used extensively in this text. Because prices in India, for example, are much lower for equivalent items you might buy in the United States, US$440 will buy as much in India as US$2,230 does in the United States. To illustrate this idea, *The Economist* devised a "Big Mac index" based on exchange rates against the U.S. dollar. In January 2012, the burgers that sold for an average of $4.20 in the United States would cost $6.81 in Switzerland, $5.86 in Brazil, $2.70 in Mexico, $2.55 in Russia, $2.44 in China, and $1.62 in India. Countries with high incomes and high living costs have a lower PPP estimate of income than the GDP or GNI based on exchange rates; poorer countries often have higher estimates. For example, in 2007 Switzerland had a GNI per capita income of US$60,820 but a GNI PPP per capita estimate of US$44,410; Mexico had comparable values of US$9,400 and US$13,910.

Figure 1.26 shows that the distribution of wealth is geographically uneven: in 2010 approximately 61 percent of world income was accrued by countries having 20 percent of the world's population, while 21 percent of world income was accrued by countries having 60 percent of the population.

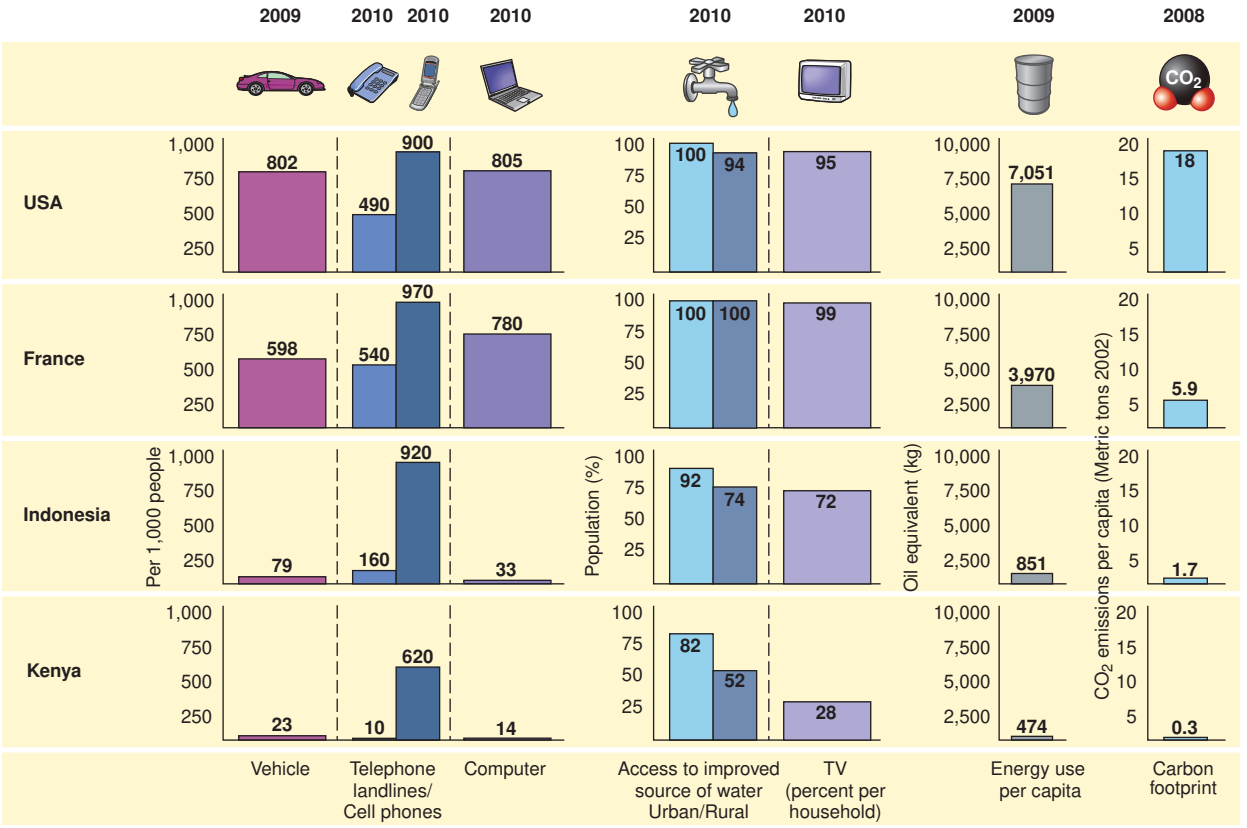


Figure 1.25 **Consumer goods, water access, and energy use.** The ownership of consumer goods is shown as the number of goods per thousand people (e.g., 802 people per thousand have a vehicle in the United States). Access to clean water is given as a percentage of the urban and rural populations. TV ownership is given as a percentage of homes. Energy use is annual kilograms of oil equivalent per capita. Carbon dioxide emissions are in annual metric tons per capita. How do these items demonstrate differences in affluence among the United States, other materially wealthy countries (France), middle-income countries (Indonesia), and materially poor countries (Kenya)? This type of diagram occurs in each of the regional chapters 2 through 11, enabling comparisons. *Source: Data for 2008–2010 from* 2012 World Development Indicators, *World Bank.*

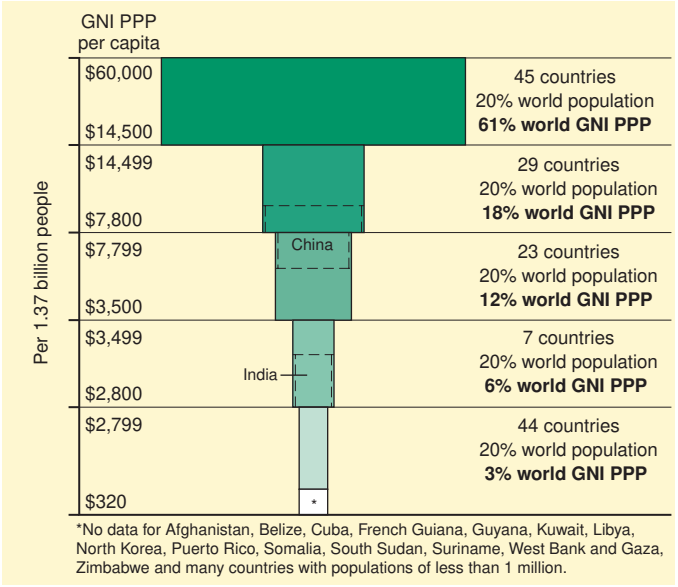


Figure 1.26 **Distribution of world incomes.** The 2010 world population was divided into five groups of 1.4 billion people each. Gross national income purchasing power parity (GNI PPP) forms the basis of comparison of these groups. Each country's position is shown in the regional chapters, 2 through 11. The United States is in the top group and has 4.5 percent of world population and 20 percent of GNI PPP. *Source: Data (for 2010) from* 2012 World Development Indicators*, World Bank.*

Creating Material Wealth

Material wealth and poverty in countries stems from a number of factors. Two important ones concern the development of a country's economic sectors and a government's structuring of its country's economy. Economic sectors refers to the differing stages at which goods and services are produced and provided within a country. The decision of governments to pursue either free-market capitalism or central planning affects the development and success of particular economic sectors.

Economic Sectors

A country's economy can be divided into four major groups of production: primary, secondary, tertiary, and quaternary. Little wealth is produced in the lowest sector, the primary sector, but wealth generation generally increases with greater emphasis on the other sectors. Exceptions exist, but countries with economies focusing mainly on primary production tend to have less wealth and higher levels of poverty than those that have developed the other sectors of their economies.

The **primary sector** produces raw materials from natural sources including minerals, oil, gas, timber, and fish. Farm products come from domesticated plants and animals, subject to local soil and climate conditions. Many materially poor countries are poor because their economies, and thus the livelihoods of most of their citizens, focus heavily on this low-wage sector.

The **secondary sector** focuses on manufacturing and construction. Extra value and profit come from using raw materials generated by the primary sector to produce clothes, furniture, food and drink products, pharmaceuticals, railroads, engines, trucks, cars, airplanes, consumer electrical goods, and many other products. The cost of raw materials is a relatively small part of total product costs, which include the costs of building factories and equipping them with machinery, the wages of factory workers, and the cost of getting the products to those who want to buy them. The value of the final goods brings greater profits than primary products.

The **tertiary sector** centers on the service industries, which grew on the backs of the manufacturing companies and from government decisions to provide health services, education, and a wide range of other services such as legal, financial, and media. This sector also includes retail and wholesale trade, and is mainly present in urban areas. Since the second half of the 1900s, all service industries have been experiencing huge employment growth.

As the tertiary sector grew and expanded, a new **quaternary sector** has developed. It focuses on information-based services such as legal, financial, and media, and their increasing use of the Internet and information technology (IT). As a specialized and highly sophisticated branch of the services sector, it first concentrated in the cities of materially wealthy countries. However, as these services have become more complex, the headquarters of many large corporations have sent many aspects of work to low-cost countries, encouraged and enabled by information technology, falling telecommunications costs, and low wages. The growth of the call center industry is one of the major outgrowths of this trend, but higher-level business services from logging insurance claims to making payments are also moving to these global centers. At present, this overseas movement of activity is particularly important in India.

Marketplace Economy

Since the 1990s, following the end of the Cold War and the collapse of the Soviet Union's Communist political–economic system, the **free-market**, or **capitalist, system** has dominated the world. It is based on accumulating capital through profits and investing it to accumulate more. Customers choose what they want from a range of products and services. Businesses compete with one another for customers by offering the lowest prices possible while still making profits.

Capitalism has been operating in Western countries for over 200 years and involves the private and corporate organization of investment, production, and marketing. Western countries frequently buy low-priced raw materials from the materially poorer countries to produce and market sophisticated goods at high prices.

Free-market capitalists face the challenge that affects all economic systems. Fallible humans invest, run companies, and generally perform roles to the best of their ability. Sometimes the investments produce profits, but not always. Sometimes managers take advantage of weaknesses in the system by fixing prices with their competitors or by dishonest accounting. Even in countries with well-regulated economies, major corporations may crash in scandal and create personal catastrophes for employees, suppliers, and customers.

In theory, governments and entities like the World Trade Organization intervene in free-market economies mainly to regulate the terms of trade and ensure fairness among producers. In practice, they decide on what trade should happen and what is fair, but their decisions are not necessarily carried out in the public interest. Politics means that some groups are favored when policies and laws are made. Consequently, some imported products are taxed, and some domestic goods are subsidized despite the goal of free trade. Furthermore, governments of many wealthier countries provide social services and build infrastructure (roads, airports, harbors, water supplies, waste disposal) that give businesses and people in those countries many cost advantages compared to the poorer countries. As a result of increased government intervention, capitalist countries are becoming less "free" market.

Central Planning Economy

Communists detested the free-market system because they believed that it allowed the rich to become richer and the poor to become poorer. To prevent this from happening, they designed centrally planned systems that were adopted by the former Soviet Union, its satellite countries, the People's Republic of China, and linked countries such as Cuba. This system places planning and decision-making responsibilities in the central government on the grounds that the whole country's interests come first and the central ministries know what is best for the people. They plan the production of goods considered essential—whatever the cost and whether or not the goods meet consumer demands. Central governments provide desired medical care and education and develop strong military defenses.

Those in command of centralized policymaking, however, often made large-scale mistakes, handicapped even more than in the free markets by a lack of information or by personal bias or interest. Many leaders were afraid to change policies, even if inefficient or oppressive, while regional bureaucrats often obeyed central commands despite knowing the policies would fail. Overproduction of some goods and underproduction of others led to these countries failing to produce the consumer goods available in most Western free-market countries. Incomes for most families remained modest, while members of the Communist Party hierarchy became relatively wealthy or privileged elites.

In the 1980s, dissatisfaction grew in the Soviet Union as the economic situation worsened for most. In 1991 the Soviet Union broke up and caused the collapse of economic relationships with the former countries of the Soviet bloc in East Central Europe and in other allied countries worldwide. These countries then entered the global free-market capitalist economic system, but it has been a traumatic change for most of them. The People's Republic of China avoided this when it began adopting enough capitalist practices as early as 1978 to bring about economic growth.

The Global Economy

The United States, European Union countries, and East Asia (Japan and China) represent the pillars of the global economy (Figure 1.27). Growing communications, greater free trade, and the movement of jobs and workers has resulted in greater "globalization," a process that is leading to the increasing economic interconnectedness of countries. Globalization has been encouraged and facilitated by multinational corporations, global financial institutions, trade organizations, and the rise of global city-regions. Intervals of recession and rising fuel costs create the opposite trend of "deglobalization" or localization as local goods and services become cheaper and countries engage in **protectionism** when jobs are being lost.

Multinational Corporations

Multinational corporations (MNCs) make goods or provide services for profit in several countries but direct operations from a headquarters in one country. The term *transnational corporation* (TNC) is often used instead to refer to corporations that are no longer rooted in a single country. The greater ease of travel and telecommunications contacts, together with the Internet transfer of information, encouraged MNCs to expand in numbers and operations. For example, in the early 1990s, an estimated 37,000 TNCs had 170,000 foreign affiliates. In 2008, the number had grown to 82,053 with 807,363 foreign affiliates. About 60 percent of all international trade is actually trade within MNCs, making MNCs a major force in globalization trends.

Multinational corporations place production facilities in countries outside their homelands to take advantage of cheaper labor, land, energy, and to avoid tariffs, stringent worker safety standards, and environmental laws in their home countries

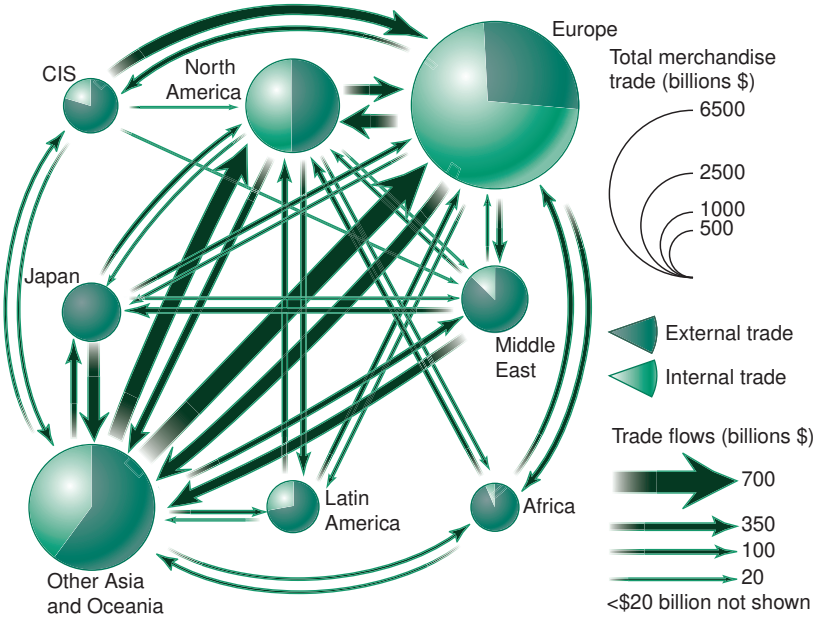


Figure 1.27 **The network of world trade, 2008.** *Source:* Global Shift *by Peter Dicken. Copyright 2007 by Guilford Publications, Inc. Reproduced with permission of Guilford Publications, Inc.*

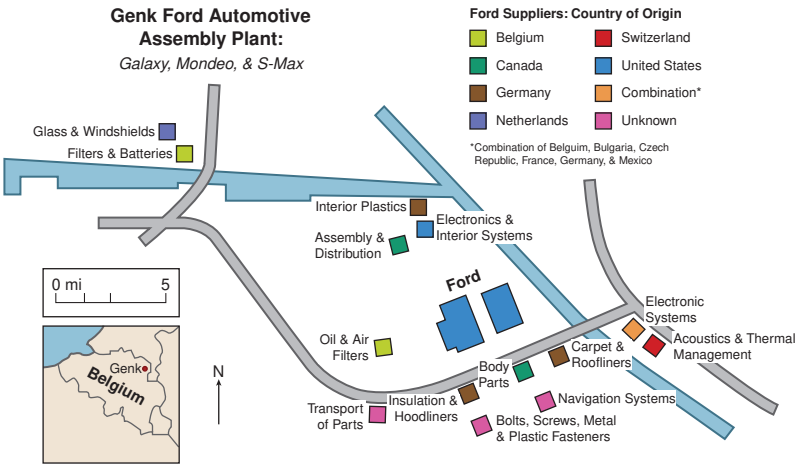


Figure 1.28 **Multinational corporation's international linkages.** In the automotive industry, for example, automobiles are assembled from parts manufactured in many different places around the world. In the United States, General Motors (GM), Ford, and Chrysler receive about one-third of their parts from foreign companies, one-third from foreign companies in the United States, and one-third from American companies. Canada, Japan, and Mexico are the largest suppliers. Parts manufacturers are increasingly opening factories near automobile assembly plants as illustrated by this map of a Ford assembly plant and its foreign-parts suppliers in Genk, Belgium. The close geographical proximity of these factories not only illustrates "just in time" delivery but also shows how international an industrial park of just a few square miles can be.
Source: Adam P. Lewis and Ashley Wolfe.

(Figure 1.28). For example, auto manufacturers spread the manufacture of components across several countries to ensure supplies during labor strikes and to react to local needs. Of the top Fortune 100 companies in 2012, 71 were from five countries: the United States (29), Japan (12), Germany (11), France (9), and China (9), with the number in China quickly increasing. The five largest MNCs in order were Royal Dutch Shell (the Netherlands), Exxon Mobil (U.S.), Wal-Mart Stores (U.S.), BP (British Petroleum) (UK), and Sinopec (China).

MNCs wield considerable power in the countries where they operate. Some MNCs are perceived as uncaring monolithic institutions without concern for the best interests of the people they employ in either home or adopted countries. However, other MNCs transfer wealth and technology to poorer countries, provide jobs where none existed in rural areas, and pay better wages and provide better employee benefits and prospects than local companies.

Outsourcing, Offshoring, and Offshore Financial Centers

As globalization is breaking down barriers, corporations are cutting operating costs and lowering their tax obligations by engaging in outsourcing and offshoring and using offshore financial centers. **Outsourcing** occurs when a business or government agency contracts with a company to produce a good or perform a service that it once produced or performed for itself. It occurs both inside and outside of countries. **Offshoring** refers to the shifting of a job to another country, often overseas. A single job can be outsourced and offshored at the same time. However, many companies simply move jobs to branch offices overseas, meaning that such jobs are offshored but not outsourced. In 1983, for example, American Airlines established Caribbean Data Services in Bridgetown, Barbados, to process the paperwork related to its tickets and boarding passes. It became the largest single employer in Barbados. U.S. insurance companies process claims in Ireland. India, with its large population of English speakers, is growing as one of the world's major call centers for multinational corporations. Some Indian companies even train their staff to respond in American accents.

One of the fears of globalization is that more and more jobs will be lost overseas. However, outsourcing hit a peak in 2004 and has generally declined since. Low wages are attractive, but local workers' knowledge of a local market is still important to maximizing profits, in turn minimizing the number of jobs that American companies are exporting. At the same time, foreign companies are employing American workers to produce and sell their products in the United States because American workers better understand American consumer choices and demands. Moreover, low wages is not the only goal of outsourcing. For example, as demand for environmentally friendly front-loading washing machines increased in the United States, Whirlpool found it more cost effective to pay $32 per hour to German workers than $23 to American workers to make these machines because German factories were already tooled for such machines and German workers already had the knowledge to build them. It shows that knowledge, experience, and infrastructure are as important as low wages in minimizing costs.

Individuals and businesses also save money by moving their financial assets to **offshore financial centers (OFC)**. The term comes from the fact that many of these places are small islands in the Caribbean and the South Pacific, although some of them are mainland countries like Switzerland, Luxembourg, Costa Rica, and Kuwait (Figure 1.29). OFCs attract individuals and businesses with low tax rates, few regulations, and secrecy. The United States loses about US$40 billion a year in taxes from monies moved to OFCs. Apple Inc. recently became best known for its "Double Irish with a Dutch Sandwich," whereby it logs large amounts of its profits at its two subsidiaries (Apple Operations International and Apple Sales International) in low-tax Ireland. From its Irish subsidiaries, other profits are moved tax-free to the Netherlands and the British Virgin Islands. Apple also has a subsidiary (iTunes S.à.r.l.) in low-tax Luxembourg where a little more than a dozen employees record more than one billion U.S. dollars in sales annually. These practices have lowered Apple's tax rates to less than 10 percent, which stands in sharp contrast to the 24 percent that Walmart pays in taxes.

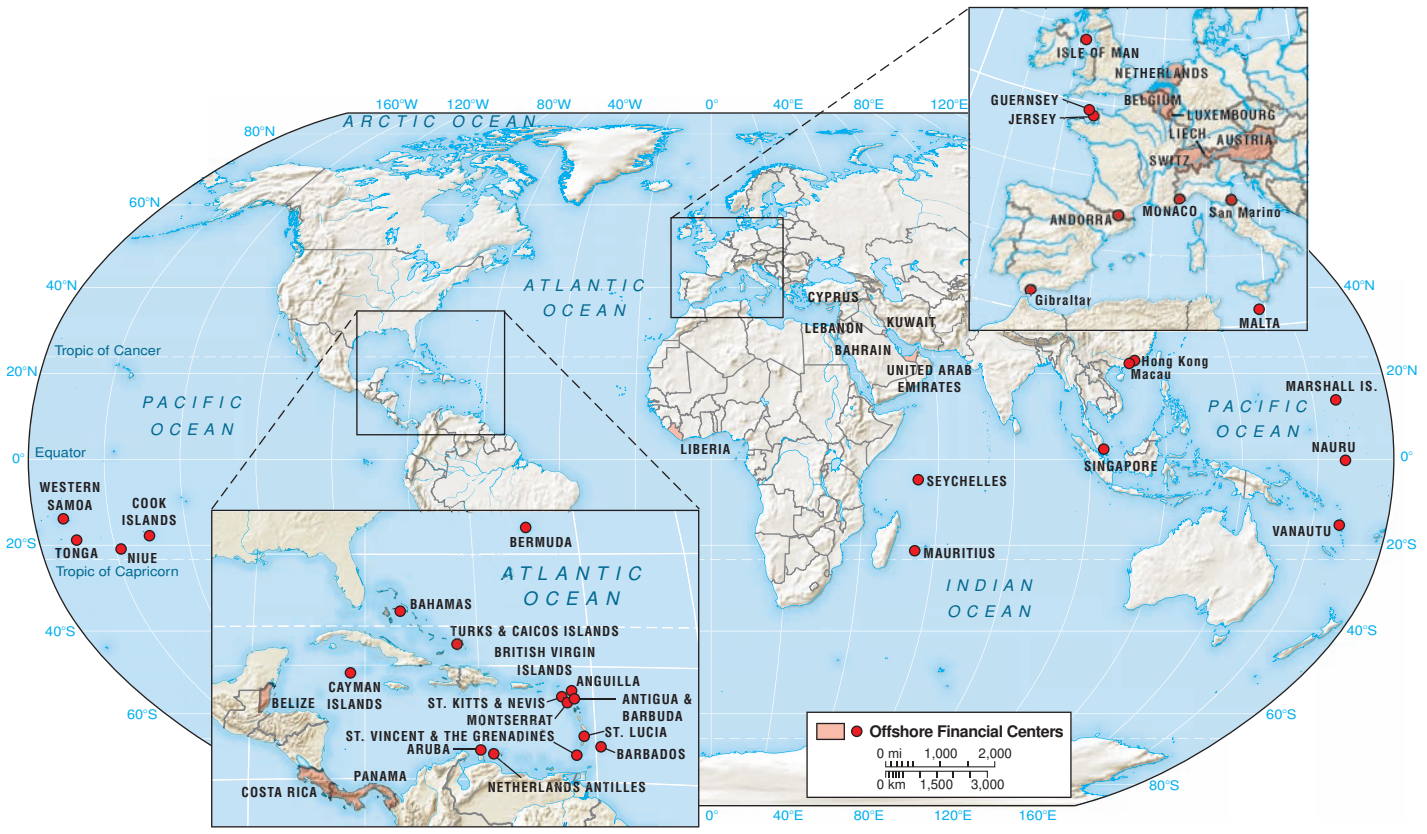


Figure 1.29 **Offshore financial centers (OFCs).** By offering low tax rates, few regulations, and secrecy, OFCs attract assets from individuals and businesses.

While many companies open up subsidiaries in OFCs, some subsidiaries have less than their nameplate in the lobby of another business. For example, fewer than 3 percent of companies in the Virgin Islands have any presence there. The loss of taxes and opportunities for criminals and terrorists to hide their monies has prompted the Organization for Economic Cooperation and Development (OECD) in 2009 to compile a blacklist of OFCs for the Group of 20, the world's largest economies. This has helped these countries collect almost US$19 billion in additional taxes. Similarly, after the government on the island of Vanuatu required banks to have a permanent office with at least one full-time employee, 30 out of 37 offshore banks there ceased to exist.

"Deglobalization" and the New Industrial Revolution

The world economy does not always become more globalized every day. For example, when prices of commodities such as oil rise, they dramatically increase transportation costs and erase the savings of low wages found far away. When oil prices hit record highs in spring 2008, it became cheaper for Americans to produce steel at home rather than buy it from China. Although Chinese wages were a fraction of U.S. wages, steel is heavy and expensive to transport. Subsequently, the U.S. steel industry prospered after years of decline. Such phenomena can be called "deglobalization" or localization. Deglobalization also often occurs during recessions, when countries place tariffs on foreign goods and services in an attempt to stimulate businesses at home.

Deglobalization is occurring with a new industrial revolution. The old industrial revolution emphasized the mass production of identical objects created by large numbers of workers doing simple, repetitive tasks. Profits depended greatly on locating factories where cheap labor could be found. Thanks to manufacturing becoming digital, the development of new materials like carbon-fibre composites and processes like 3D printing, robots, and online collaborative services, goods can be made cheaply in small quantities. Rather than being characterized by large, sprawling factories, the new industrial landscape is transforming into a multitude of small production facilities located near markets where customers can communicate with the production facility and receive their products quickly.

1.8 Geography, Development, and Human Rights

Geographers consider how some places experience greater material and personal well-being than others, and how improvements,

or **development**, of poorer regions may occur. For each place or region they build a knowledge of:

- the complex interactions of people with the natural environment,
- the historic growth of population numbers and cultural expressions,
- the evolution of political systems and their present operation,
- the growth of economic output, and
- the effect that different views of human rights have on those living in different parts of the world.

In this chapter we highlighted geographically related analyses of natural environmental concerns, resources, cultural features, population, political governance, wealth and poverty, and the global economy. They affect human development and human rights in different ways in different parts of the world.

Human Development

Despite the homogenizing effects of globalization, the world remains full of differences and inequalities. The material wealth of many Americans sharply differs from the poverty of other Americans and the extreme material poverty of millions in Africa and Asia. Such differences have led to studies of how some regions and countries move ahead and others fall behind in terms of their levels of development. The process of enhancing human capabilities and improving quality of life by providing access to better incomes, education, health care, piped water, and energy supplies is known as **human development**. Concern is given to the possibilities of helping materially poor, "less developed" or "underdeveloped" countries and regions to catch up with the wealthier countries.

The United Nations' **human development index (HDI)** is a measure of human well-being, incorporating statistics calculated from life expectancy, education attainment, and health, as well as income. Materially poorer countries investing heavily in education and health care, such as Costa Rica and Sri Lanka, provide a better quality of life for their people and have a higher HDI than GDP (merely based on a country's income) rank. By contrast, many of the oil-rich Persian Gulf countries have high income rankings based on oil exports but lower HDI rankings because of poor improvements in schooling, especially for girls, and health care—although both are improving.

Sustainable human development involves economic growth that does not deplete renewable resources for the future. It thus links to both human and natural resources, drawing together studies of human and physical geography.

The United Nations Human Development Program and recent World Bank publications focus on the need to eradicate material poverty. The last 50 years saw major reductions of income poverty in large parts of the world, improvements in human development indicators—particularly in health and education—and the wider spread of law and fair administration of justice. However, the fact that so many people in the world remain materially poor is a challenge. In 2000, the United Nations and other global organizations formulated the Millennium Development Goals, to be achieved by 2010–2015 (Table 1.1). A 2012 report revealed that Goal 1 was likely achieved in 2010, but it will be a challenge to meet all goals by 2015.

An Unequal World

Beginning in the 1950s, the economically more developed countries encouraged the economically less developed countries to improve their levels of human development through modernization: the transformation of a country's economy from relying on traditional agriculture (the primary sector) to one based on industrial production and mass consumption (the secondary sector), eventually leading to the development of services (the tertiary and quaternary sectors). This was how Western Europe and North America developed and prospered.

Modernization, however, did not proceed as imagined. Though Europe began decolonizing in the late 1940s, the colonial economic system that had been in place since at least the 1800s did not fundamentally change. European colonial powers traded low-value raw materials with their own high-value manufactured goods. As colonizers and colonies were simply replaced by materially wealthier **core countries** and dependent **peripheral countries**, a similar economic relationship continued. It was difficult for the materially poorer peripheral countries to follow the same path as the wealthier core countries. By the 1950s it became clear that although most materially wealthier places got wealthier, few poorer places experienced improvements.

In the 1960s and 1970s, those living in materially poorer countries were concerned about the lag in economic development, and they also resented previous colonial domination. Many materially poorer countries strove to be self-sufficient, and they disengaged from involvement in the West-dominated world economy when they achieved political independence. They developed home-based manufacturing (**import substitution**) and created local trade barriers, placed restrictions on

Table 1.1 Millennium Development Goals

In 2000, many target dates were set for between 2010 and 2020, but lack of progress by 2006 suggested that these goals will take much longer to achieve.

Goal 1: Eradicate extreme poverty and hunger.
Goal 2: Achieve universal primary education.
Goal 3: Promote gender equality and empower women.
Goal 4: Reduce by two-thirds the under-five mortality rate.
Goal 5: Improve maternal health.
Goal 6: Combat HIV/AIDS, malaria, and other diseases.
Goal 7: Ensure environmental sustainability.
Goal 8: Develop a global partnership for development.