



Introduction to

GEOGRAPHY

N i n t h E d i t i o n

Arthur Getis
Judith Getis
Jerome D. Fellmann

Introduction to

GEOGRAPHY

Ninth Edition

Arthur Getis

San Diego State University

Judith Getis

Jerome D. Fellmann

*University of Illinois,
Urbana-Champaign*



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INTRODUCTION TO GEOGRAPHY, NINTH EDITION

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PREFACE

“If you build it, they will come” was the message that inspired the character played by Kevin Costner in the movie *Field of Dreams* to create a baseball field in his Iowa cornfield. A similar hope encouraged us when we first began to think about writing *Introduction to Geography* in 1975. At that time, very few departments of geography in the United States and Canada offered a general introductory course for students—that is, one that sought to acquaint students with the breadth of the entire field. Instead, most departments offered separate courses in physical and human or cultural geography.

Recognizing that most students will have only a single college course and textbook in geography, we wanted to develop a book that covers all of the systematic topics that geographers study. Our hope, of course, was that the book would so persuasively identify and satisfy a disciplinary instructional need that more departments would begin to offer a general introductory course to the discipline, a dream that has been realized.

APPROACH

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

The content is structured around the major research traditions of the discipline. Chapter 1 introduces students to the four organizing traditions that have emerged through the long history of geographic thought and writing: earth science, culture-environment, locational, and area analysis. Each of the four parts of this book centers on one of these

geographic perspectives. Within each of the first three parts are chapters devoted to the subfields of geography, each placed with the tradition to which we think it belongs. Thus, the study of weather and climate is part of the earth science tradition; population geography is considered under the culture-environment tradition; and urban geography is included with the locational perspective. The tradition of area analysis—of regional geography—is presented in a single final chapter, which draws on the preceding traditions and themes and is integrated with them by cross-references. A fuller discussion of the book’s organization is offered in Chapter 1, pp. 17 to 19.

Of course, our assignment of a topic may not seem appropriate to all users, since each tradition contains many emphases and themes. Some subfields could logically be attached to more than one of the recognized traditions. The rationale for our clustering of chapters is given in the brief introduction to each part of the text.

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

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

NEW TO THIS EDITION

Although the text’s established framework of presentation has been retained in this ninth edition, we have added and deleted materials to reflect new research findings in the

different topical areas of geography and the spatial consequences of continuing changes in established economic, political, social, and environmental structures and relationships. In addition to the necessary chapter revisions and updating of facts, analyses, and viewpoints mandated by current events, we have made every effort to incorporate in this revision many of the helpful suggestions offered by users. Nearly every chapter contains at least brief text additions or modifications, and three have been altered significantly.

- Extensive text changes in Chapter 6, Population Geography, include an expanded discussion of HIV/AIDS and other disease and mortality matters; revision and expansion of "A Divided World Converging"; inclusion of a new "agricultural density" segment; and extensive revision and updating of most boxed discussions. All population data and projections have been updated, all world maps revised, and a new table added.
- The title and focus of Chapter 8 have been changed from Spatial Behavior to Spatial Interaction. In place of the content that has been deleted are a new chapter-opening vignette; a new box, "DOSCapital"; and a lengthy new section on globalization, including as subtopics economic, political, and cultural integration.

FEATURES

Every effort has been made to gain and retain student attention, the essential first step in the learning process.

- An outline at the beginning of each chapter clarifies the organization of the chapter.
- Chapter-opening vignettes capture the reader's interest in preparation for the subject matter that follows.
- Figures: The text contains more than 450 full-color maps, charts, and photographs, with information and explanations that serve as extensions of the text, not just identification or documentation of the figure.

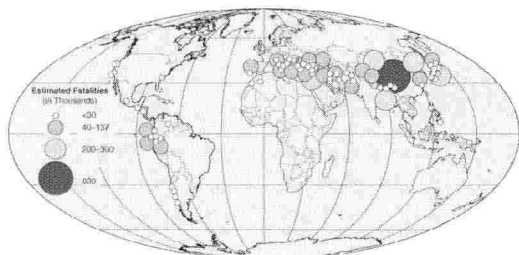
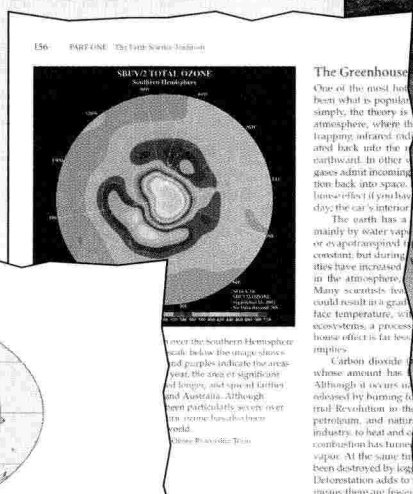
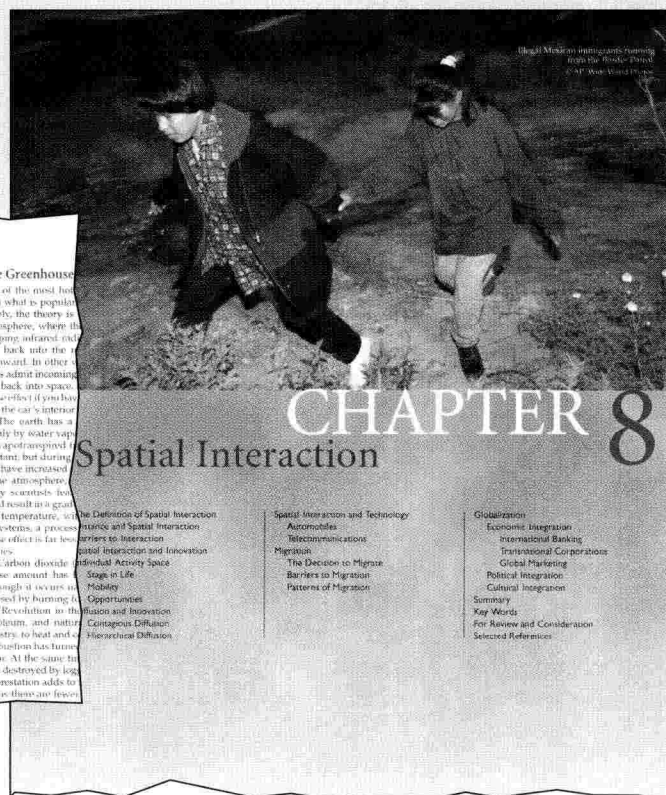


Figure 2.18 Deaths from earthquakes from 5:00 May 1994 through February 1995. On this map, the area of the circle is proportional to the estimated number of fatalities. The circles were placed over the approximate locations of cities, countries, or physiographic regions experiencing earthquake deaths. The scale to the left of the map helps the reader to interpret the map.



- Chapter 9, Political Geography, has seen the deletion of material on geopolitics. In its place are a substantially revised and expanded discussion of boundaries as sources of conflict, a new section on supranationalism, and the box "The Day the World Stopped Turning." Briefer text additions have been made to discussions of the evolution of the modern state, religion as a centrifugal force, regional economic alliances, and redistricting.
- Every table and figure has been reviewed for accuracy and currency and has been replaced, updated, or otherwise revised where necessary. This ninth edition contains more than 60 new pieces of line art (maps, graphs, and diagrams), 30 new photographs or satellite images, and several new tables. In addition, about 50 figures have been revised and redrawn. Two new maps inside the front cover of the book, "World Political Map" and "Topographic Regions of the World," replace earlier versions.
- Because of the frequency with which World Wide Web addresses change and the continual addition and deletion of individual websites, the On-Line boxes that were a feature of each chapter of the eighth edition have been removed. They now appear in the text's Online Learning Center, which can be accessed at www.mhhe.com/getis9e/.



Boxed inserts, three to five per chapter, further develop ideas and are written so as to enhance student interest in the material. Except where noted, the authors have written all of the boxes. One box in most chapters explores gender-related issues. See, for example, "100 Million Women Are Missing" in Chapter 6 and "Legislative Women" in Chapter 9.

A special "Geography and Public Policy" box that appears in every chapter but the first and last highlights an important or controversial issue. The boxes are intended to encourage students to think about the relevance of geography to real-world concerns. Critical-thinking questions at the end of the box, designed to have students reflect on and form an opinion about the issue, can serve as catalysts for class discussion.

GEOGRAPHY and PUBLIC POLICY

PUBLIC LAND, PRIVATE PROFIT

When President Ulysses S. Grant signed the Mining Act of 1872, the presidential and congressional goal was to encourage Western settlement and development by allowing any "hard-rock" miners (including prospectors for silver, gold, copper, and other metals) to mine federally owned land without royalty payment. It further permitted mining companies to gain clear title to publicly owned land and all subsurface minerals for no more than \$12 a hectare (\$5 an acre). Under those liberal provisions, mining firms have bought 1.3 million hectares (3.2 million acres) of federal land since 1872 and each year remove some \$1.2 billion worth of minerals from government property. In contrast to the royalty-free extraction privileges granted to metal miners, oil, gas, and coal companies pay royalties of as much as 12.5% of their gross revenues for exploiting federal lands.

Whatever the merits of the 1872 law in encouraging economic development of lands otherwise unattractive to homesteaders, modern-day mining companies throughout the Western states have secured enormous actual and potential profits from the law's generous provisions. In Montana, a company claim to 810 hectares (2000 acres) of land would cost it less than \$10,000 for an estimated \$4 billion worth of platinum and palladium; in California, a gold mining company in 1994 sought title to 93 hectares (230 acres) of federal land containing a potential of \$320 million of gold for less than \$1200. Foreign as well as domestic firms may be beneficiaries of the 1872 law. In 1994, a South African firm arranged to buy 411 hectares (1016 acres) of Nevada land at a prospective \$1.1 bil-

lion in gold from the government for \$5100. And a Canadian firm in 1994 received title to 800 hectares (nearly 2000 acres) near Elko, Nevada, that cover a likely \$10 billion worth of gold—a transfer that Interior Secretary Bruce Babbitt dubbed "the biggest gold heist since the days of Butch Cassidy." And in 1995, Mr. Babbitt conveyed about \$1 billion worth of trawertine (a mineral used in whitening paper) under 45 hectares (110 acres) of Idaho to a Danish-owned company for \$275.

The "gold heist" characterization summarized a growing administration and congressional feeling that what was good in 1872 and today for metal mining companies was not necessarily beneficial to the American public that owns the land. In part, that feeling results from the fact that mining companies commit environmental sins that require public funding to repair or public tolerance to accept. The mining firms may destroy whole mountains to gain access to low-grade ores and leave toxic mine tailings, surface water contamination, and open-pit scarring of the landscape as they move on or disappear. Projected public costs of cleaning up more than 50,000 abandoned mine sites, thousands of miles of damaged or dead streams, and several billion tons of contaminated waste are estimated at a minimum of \$35 billion.

A congressional proposal introduced, but defeated, in 1993 would require mining companies to pay royalties of 8% on gross revenues for all hard-rock ores extracted and prohibit them from outright purchase of federal land. The royalty provision alone would have yielded nearly \$100 million annually at 1994 levels of company income. Mining

The reverse flow carried manufactured goods processed in the industrialized states back to the developing countries. That two-way trade presumably benefited the developed states by providing access to a continuing supply of industrial raw materials and technologies not available domestically and gave less developed countries needed capital to invest in their own development or the export on the importation of manufactured goods, food supplies, or commodities—such as petroleum—they did not themselves produce.

By the start of the 21st century, however, world trade flows and export patterns of the emerging economies had radically changed. Raw materials greatly decreased and

manufactured goods correspondingly increased in the export flows from developing states as a group. In 1980, manufactured (unprocessed) goods accounted for 60% of their exports; by 2000 that share had been cut in half; and, in a reversal, manufactured goods made up 61% of the export flows from the developing to the industrialized world. Even with that overall decline in raw material exports, however, trade in unprocessed goods remains dominant in the economic well-being of many of the world's poorer economies. Increasingly, the terms of the traditional trade flows they depend on have been criticized as unequal and damaging to commodity-exporting countries.

End-of-Chapter Material. Chapter summaries bring together and reinforce the major ideas of the chapter. A **Key Words** list contains page references to important terms introduced in the chapter, making it easy for students to verify their understanding of each term. **For Review and Consideration** questions enable readers to check their grasp of chapter material. A limited **Selected References** listing cites important recent or classic considerations of the subject matter of each chapter. We have included both widely available recent books and articles and a few more specialized titles useful to students who want to delve more deeply into particular subfields of geography.

On Becoming Mussel-Bound

Zebra mussels appear to be harmless, even attractive creatures. But ecologists view their recent entry into North America as nothing but a disaster. Native to the Caspian and Black Seas, zebra mussels (*Dreissena polymorpha*) were first detected in North America in 1988. They are believed to have been stowaways on an East European freighter that dumped ballast water into Lake St. Clair near Detroit.

In just a few years, the mussels had spread to the rest of the Great Lakes. The floods of 1993 carried the mussel larvae into the Mississippi River system, extending their range as far south as New Orleans.

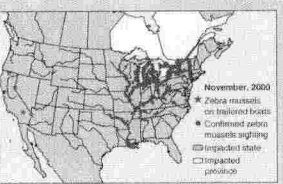
The rapid advance of the mussels is due both to a scarcity of natural predators, such as diving ducks and crawfish, and to the mussels' prodigious reproductive

capacity. Adult females produce from 30,000 to 40,000 eggs a year, and males contribute a like amount of sperm. The mussels have an unfortunate tendency to attach themselves to anything hard, including water intake pipes. Colonies of mussels now clog the underwater intake pipes of power plants, water treatment plants, and industrial plants in the Great Lakes. A square meter (about 10 sq ft) of wall at one utility plant was found to contain over 700,000 mussels, and a single intake pipe at an Ontario water plant was clogged by 30 tons of the shellfish.

The zebra mussels also endanger the Great Lakes fisheries, the largest freshwater fisheries in the world. Because they devour phytoplankton, the microscopic plants at the base of the aquatic food chain, the mussels compete with algae-eating fish for both food and oxygen. Accidentally introduced into the region, the zebra mussel might significantly alter the ecosystem of the entire Great Lakes.



Severed section of freshwater intake pipe clogged with zebra mussels.
© Peter Vukobratovic



cross in small colonies of these plants are affected throughout the islands, and there is a massive eradication program underway in an attempt to curb its spread. The fear is that mimosa might do to Hawaii what it has done in Tahiti, where it has displaced 70% of the native rain forest and is threatening 25% of the island's native wildlife species.

As this discussion indicates, introduced plants, as well as animals, can alter vegetative patterns. Some 300 species of invasive plants now threaten native ecosystems in the mainland United States and Canada. At least half were deliberately imported, including purple loosestrife, the melaleuca tree, Norway maple, and water hyacinth. These

and other imports have arrived without their natural enemies and spread uncontrollably, driving out native species.

The Asian chestnut blight has destroyed most of the native American chestnut trees in the United States, trees with significant commercial as well as aesthetic value. The cause was the importation of some chestnut trees from China to the United States. They carried a fungus that was fatal to the American chestnut tree but not to the Asiatic variety, which is largely immune to it.

An aquatic weed, hydrilla, imported into Florida from Sri Lanka for use in aquariums, was dumped near a canal in Tampa in 1951. Also known as water thyme, it has over-

Summary

Birth, death, fertility, and growth rates are important in understanding the numbers, composition, distribution, and spatial trends of population. Recent "explosive" increases in human numbers and the prospects of continuing population expansion may be traced to sharp reductions in death rates, increases in longevity, and the impact of demographic momentum on a youthful population largely concentrated in the developing world. Control of population numbers historically was accomplished through a demographic transition first experienced in European societies that adjusted their fertility rates downward as death rates fell and life expectancies increased. The introduction of advanced technologies of preventive and curative medicine, pesticides, and famine relief have reduced mortality rates in developing countries without, until recently, always a compensating reduction in birth rates. Recent fertility declines in many developing regions suggest the demographic transition no longer limited to the advanced industrial countries and promise world population stability earlier and at lower numbers than envisioned just a few years ago.

Even with the advent of more widespread fertility decline, the global population being present at the end of the 20th century will still likely grow to about 11 billion by the middle of the 21st century. That growth will largely reflect increases unavoidable because of the size and youth of populations in developing countries. Eventually, a new balance between population numbers and carrying capacity of the world will be reached, as it has already been following past periods of rapid population increase.

People are unevenly distributed over the earth. The ecumene, or permanently inhabited portion of the globe, is discontinuous and marked by pronounced differences in population concentrations and numbers. East Asia, South Asia, Europe, and northeastern United States/southeastern Canada represent the world's greatest population clusters, though smaller areas and regions and continue and population densities in regions outside the new patterns of population taking form.

A respected goal in the point of not geography is the essential of the human population and population units, through statistical adjustment by the abstract but widely experienced, which collectively called diverse that we see.

Key Words

agricultural density 214
arithmetic density 212
carrying capacity 214
cohort 188
crude birth rate (CBR) 189
crude death rate (CDR) 193
crude density 212
demographic equation 188
demographic (population) momentum 222
demographic transition 203
demography 186
dependency ratio 197
doubling time 200
ecumene 211
homesteadic plateau 220
J-curve 205
Matthius 221

For Review and Consideration

1. How do the crude birth rate and the fertility rate differ? Which measure is the more accurate statement of the amount of reproduction occurring in a population?
2. How is the crude death rate calculated? What factors account for the worldwide decline in death rates since 1945?
3. How is a population pyramid constructed? What shape of "pyramid" reflects the structure of a rapidly growing country? Of a population with a slow rate of growth? What can you infer?

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Selected References

Websites

The World Wide Web has a tremendous variety of sites pertaining to geography. Websites relevant to the subject matter of this chapter appear in the "Web Links" section of the Online Learning Center associated with this book. Access it at www.mhhe.com/getis9e/.

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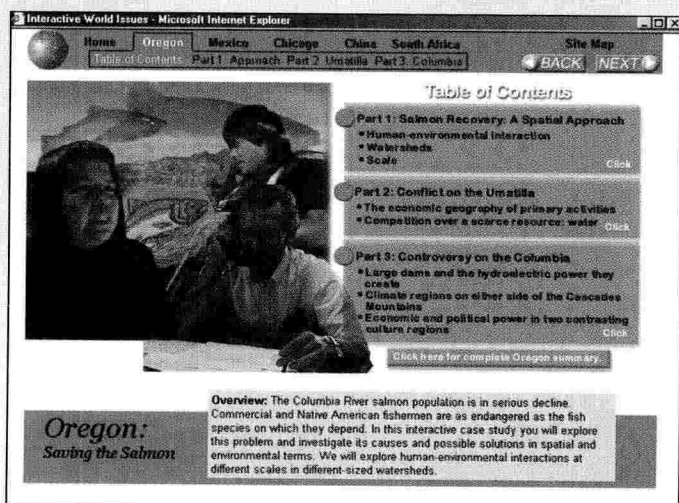
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SUPPLEMENTS

The ninth edition provides a complete geography program for the student and teacher.

Online Learning Center with PowerWeb: Geography at
www.mhhe.com/getis9e

This site gives you the opportunity to further explore topics presented in the book using the Internet. The site contains interactive quizzing with immediate feedback, base maps, animations, flashcards, and critical thinking questions. We've integrated *PowerWeb: Geography's* informative and timely world news, web links, and much more into the site to make these valuable resources easily accessible to students.



APPENDIX

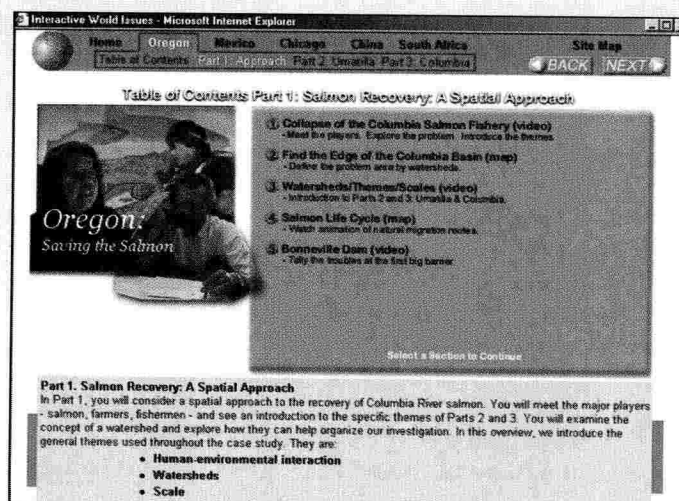
2002 World Population Data

		Population Mid-2012 (millions)	Births per 1,000 Pop.	Rate of Natural Increase (%)	Population Age Chg. 2012-2035 (%)	Physician / population for 2012 (per 100,000)	Physician / population for 2035 (per 100,000)	Total Fertility Rate	Percent of Population of Age 45 & over	Life Expectancy at Birth (years) 2012	Life Expectancy at Birth (years) 2035	Percent Urban	Percent of Pop. 15+ Age HIV/AIDS in 2011	% with Access to Improved Water Source	Dr. Capital GNI 2012 (US\$)	
WORLD		6,215	21	9	16	7,859	9,104	54	22.8	30/75	67	75	12	81	1.1	
MORE DEVELOPED		1,097	11	0	1	1,349	1,231	1.7	1.6	10/18	78	82	—	—	—	
LESS DEVELOPED		5,018	24	1.3	47	6,610	7,673	60	31	35/65	67	74	1.8	78	—	
(Excl. China)		3,575	27	9	19	7	3,156	6,479	64	3.5	36/4	61	4.1	1.9	—	
AFRICA		840	38	2.4	120	1,281	1,445	86	82	43/3	53	33	6.6	—	—	
SUBSAHARAN AFRICA		693	40	3.5	121	1,089	1,095	91	56	44/3	49	30	9.0	54	48	
NORTHERN AFRICA		146	27	7	3.0	189	342	55	3.8	36/4	66	45	0.5	—	—	
Algeria		31.4	23	5	1.8	83	83.0	21.3	5.4	35/4	70	49	0.1	84	1,500	
Egypt		71.2	22	7	2.0	62	96.1	185.4	44	3.8	36/4	66	43	3	93	1,400
Libya		5.4	28	1	2.4	101	8.3	10.8	30	37	36/3	75	56	0.2	72	—
Morocco		29.2	26	6	1.9	62	40.5	50.1	3.1	32/4	65	53	0.3	83	1,100	
Sudan		72.6	36	12	8.4	95	49.6	63.5	82	4.9	40/3	26	2.7	26	—	—
Tunisia		9.8	17	6	1.2	24	11.6	12.2	26	3.1	30/6	67	0.5	—	3,080	
Western Sahara		0.3	46	17	2.9	123	0.4	0.5	140	6.8	—	95	—	—	—	
WESTERN AFRICA		247	42	15	2.7	145	403	605	87	5.8	45/3	51	3.8	50	—	—
Benin		6.6	41	12	2.7	173	12.0	18.1	85	5.6	46/3	54	3.9	2.6	63	58
Burkina Faso		1.6	47	13	3.0	125	6.5	34.7	66	49.1	43	37	3.0	83	—	—
Cape Verde		0.5	37	7	0.0	81	0.2	0.8	3.1	4.0	43/2	49	53	—	24	1,330
Chad of French		10.8	36	20	11.2	23.6	35.7	95	42	47/7	45	46	97	7.7	66	—
Guinea		1.5	42	13	2.8	186	2.7	4.2	52	5.8	44/3	33	37	1.6	62	33
Ghana		20.2	32	10	2.5	26.5	33.0	22.6	42	43/3	56	37	3.0	83	—	—
Guinea		8.4	46	18	2.7	347	14.1	20.9	11.5	45/3	38	26	1.5	48	35	—
Guinea-Bissau		1.3	43	20	2.5	201	2.2	3.3	136	60	44/4	45	22	2.8	39	16
Liberia		4.7	47	21	2.6	6.0	10.0	16.6	43/3	44	45	2.8	3.0	83	—	—
Mali		11.3	49	20	3.0	241	22.6	26.4	13	47	43	37	0.5	65	—	—

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Interactive World Issues CD-ROM

Your instructor may require the *Interactive World Issues* CD-ROM. This CD allows you to have hands-on exercises and to see videos of different case studies. The five case studies include Chicago, Oregon, Mexico, China, and South Africa. Since most of us are unable to visit different world regions, this is a good way to understand the issues facing different parts of the world.



For the Instructor

Online Learning Center with PowerWeb: Geography at
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Take advantage of the classroom activities, PowerPoint slides, and access to PageOut—McGraw-Hill's course management tool. *PowerWeb Geography* is also available and will provide you with current news updates and articles that are great tools for stimulating class discussion.

Online Instructor's Manual

Included in this password-protected section of the Online Learning Center are chapter overviews, key terms, and discussion topics.

Digital Content Manager CD-ROM

This CD-ROM contains most of the figures and photographs from the text. The software makes customizing your multimedia presentation easy. You can organize figures in any order you want; add labels, lines, and your own artwork; integrate materials from other sources; edit and annotate lecture notes; and then have the option of placing your multimedia lecture into another presentation program, such as PowerPoint.

Overhead Transparencies

Included are 100 illustrations from the text, all enlarged for excellent visibility in the classroom.

Slide Set

One hundred slides include illustrations and some photographs from the text.

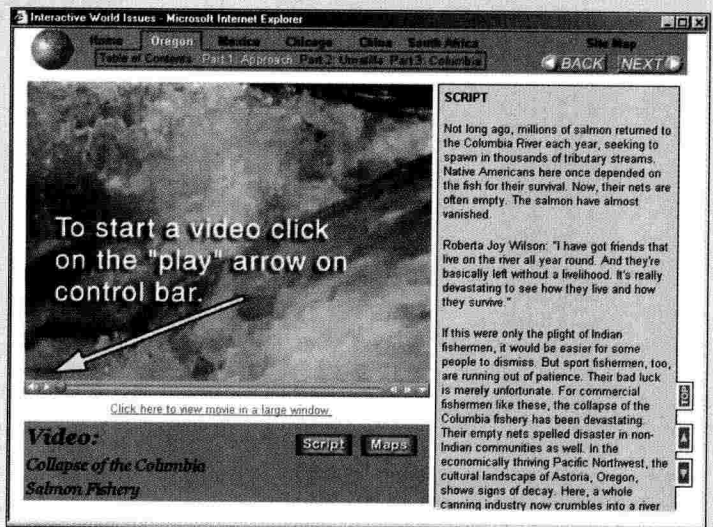
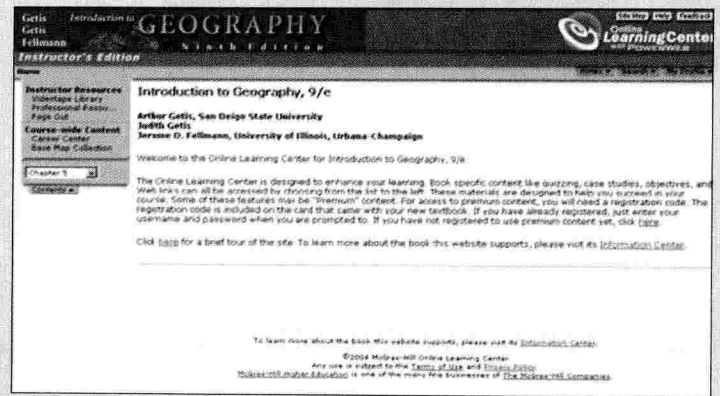
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This cross-platform CD-ROM provides a wealth of resources for the instructor. Supplements featured on this CD-ROM include a computerized test bank utilizing Brownstone Diploma® testing software to quickly create customized exams. This user-friendly program allows instructors to search for questions by topic, format, or difficulty level; edit existing questions or add new ones; and scramble questions and answer keys for multiple versions of the same test.

Other assets on the Instructor's Testing and Resource CD-ROM are grouped within easy-to-use folders. The Instructor's Manual and Test Item File are available in both Word and PDF formats. Word files of the test bank are included for those instructors who prefer to work outside of the test-generator software.

Videotape Library

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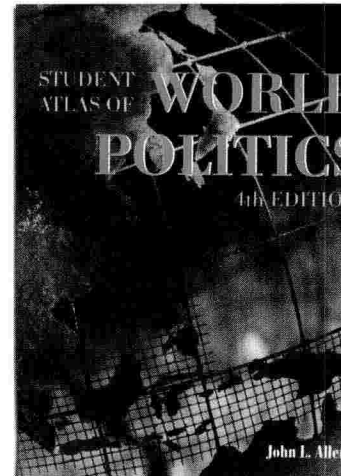
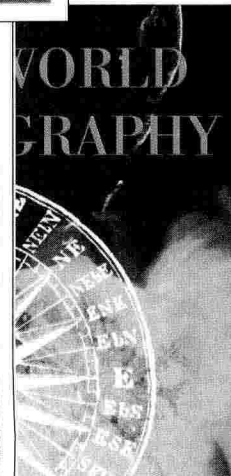
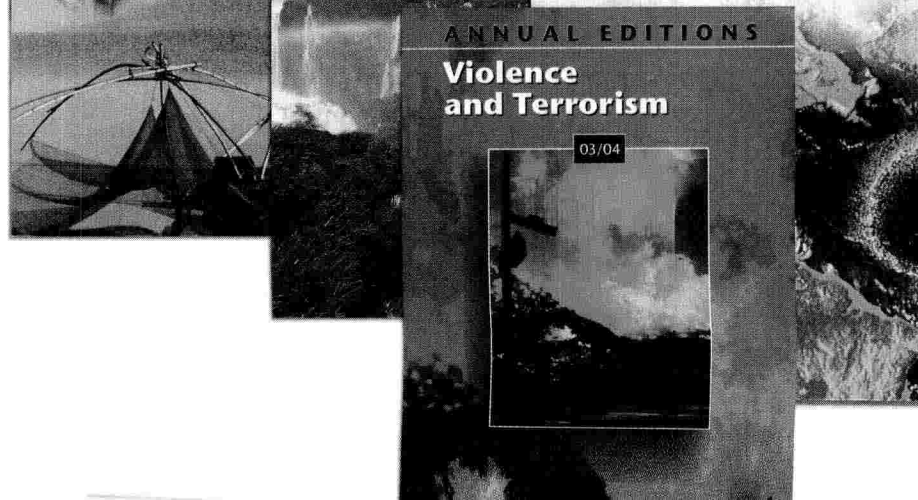
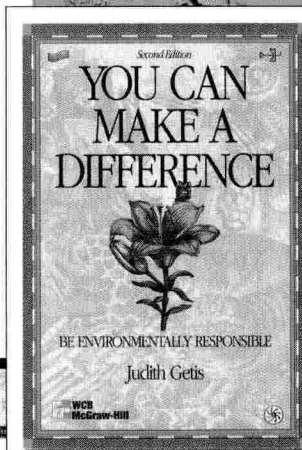
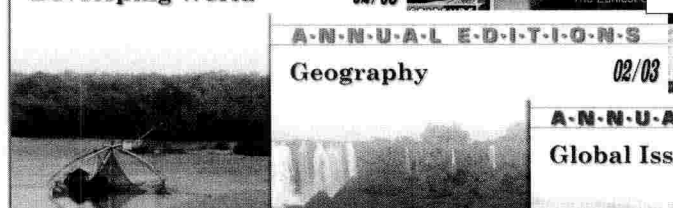
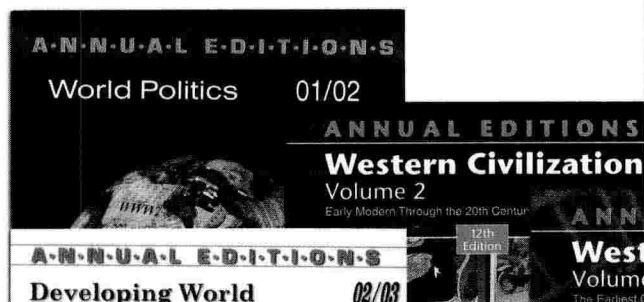
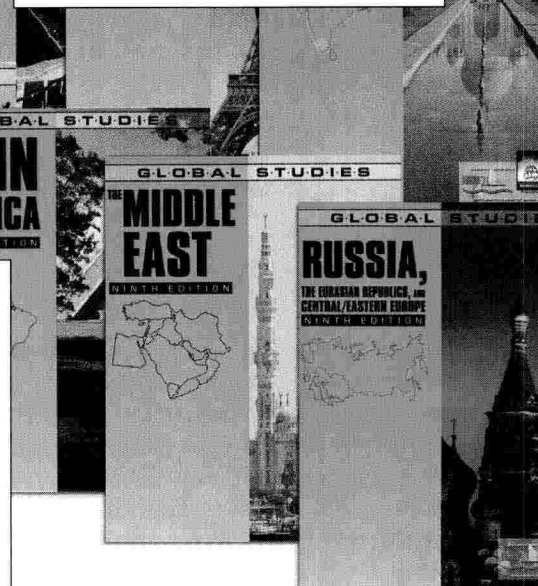
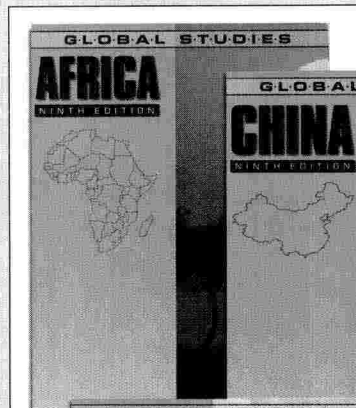
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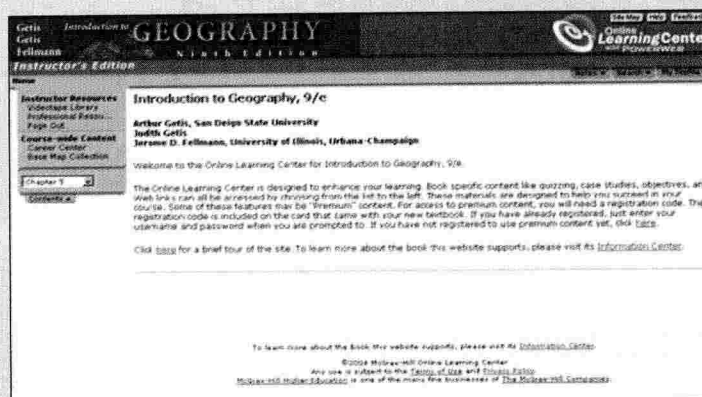
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University of North Carolina–Pembroke

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Longwood College

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Indiana State University–Terre Haute

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California State University–Sacramento

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Clemson University

Rachel C. Larson
Bob Jones University–Greenville

Karl Lillquist
Central Washington University–Ellensburg

Jose Javier Lopez
Minnesota State University–Mankato

Donald W. Lovejoy
Palm Beach Atlantic College

Peter H. Meserve
Columbia College–Columbia

Jo Beth Mullens
Keene State College

Mark A. Ouimette
Hardin-Simmons University

Nick Polizzi
Cypress College

William Porter
Elizabeth City State University

Neil Reid
University of Toledo

Sherman E. Silverman
Prince George's Community College

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Arthur Getis
Judith Getis
Jerome D. Fellmann

MEET THE AUTHORS

Arthur Getis

Arthur Getis received his B.S. and M.S. degrees from The Pennsylvania State University and his Ph.D. from the University of Washington. He is the co-author of several geography textbooks as well as two books dealing with map pattern analysis. He has also published widely in the areas of urban geography, spatial analysis, and geographical information systems. He is co-editor of *Journal of Geographical Systems* and for many years served on the editorial boards of *Geographical Analysis* and *Papers in Regional Science*. He has held administrative appointments at Rutgers University, the University of Illinois, and San Diego State University (SDSU) and currently holds the Birch Chair of Geographical Studies at SDSU. In 2002 he received the Association of American Geographers Distinguished Scholarship Award. Professor Getis is a member of many professional organizations and has served as an officer in, among others, the Western Regional Science Association and the University Consortium for Geographic Information Science.

Judith Getis

Judith Getis earned her B.A. and a teaching credential from the University of Michigan and her M.A. from Michigan State University. She has co-authored several geography textbooks and wrote the environmental handbook *You Can Make a Difference*. In addition to numerous articles in the fields of urban geography and geography education, she has written technical reports on topics such as solar power

and coal gasification. She and her husband, Arthur Getis, were among the original unit authors of the High School Geography Project, sponsored by the National Science Foundation and the Association of American Geographers. In addition, Mrs. Getis was employed by the Urban Studies Center at Rutgers University; taught at Rutgers; was a social science examiner at Educational Testing Service, Princeton, NJ; developed educational materials for Edcom Systems, Princeton, NJ; and was a professional associate in the Office of Energy Research, University of Illinois.

Jerome D. Fellmann

Jerome Fellmann received his B.S., M.S., and Ph.D. degrees from the University of Chicago. Except for visiting professorships at Wayne State University, the University of British Columbia, and California State University/Northridge, his professional career has been spent at the University of Illinois at Urbana-Champaign. His teaching and research interests have been concentrated in the areas of human geography in general, and urban and economic geography in particular, in geographic bibliography, the geography of Russia and the CIS, and geographic education. His varied interests have been reflected in articles published in the *Annals* of the Association of American Geographers, *Professional Geographer*, *Journal of Geography*, the *Geographical Review*, and elsewhere. He is the co-author of McGraw-Hill's *Human Geography: Landscapes of Human Activity*. In addition to teaching and research, he has held administrative appointments at the University of Illinois and has served as a consultant to private corporations on matters of economic and community development.

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