Where Geography Can Take You:

An Interactive CD-ROM

A project supported by a grant from the Oklahoma Geography Education Fund.
What is Geography?

Geography deals with similarities and differences in people and the environment from place to place. Examples of questions a geographer might ask include:

- Why are prearranged marriages common in many parts of the world?
- Why are the interiors of continents subject to extreme climates?

Explaining these kinds of spatial variations is central to geography.
Geographers are interested in:

- political and economic systems
- cultures
- maps and map projections
- human impacts on the environment
- landform development

Tom Wikle
Alyson Greiner
Peter H. Dana
Index to Geography and Career Opportunities

Training in geography opens doors to careers in these areas:

**Physical Geography**
- Biogeography
- Geomorphology
- Hydrology
- Weather & Climate
- Natural Hazards

**Human Geography**
- Regional Geography
- Cultural Geography
- Historical Geography
- Urban Geography
- Economic Geography

**Resource Management**
- Environmental Geography
- Outdoor Recreation Management

**Geotechniques**
- Cartography
- Geographic Information Systems (GIS)
- Global Positioning System (GPS)
- Remote Sensing

**Geographic Education**
- Geographic Research
- Resources for Educators
Physical Geography
PHYSICAL GEOGRAPHY

🌟 Examines the distribution of Earth’s surface features such as mountain ranges and rivers.

🌟 Analyzes the processes that create and shape landforms.
Subdivisions of physical geography include:

- Biogeography
- Geomorphology
- Hydrology
- Weather & Climate
- Natural Hazards
Career options in physical geography include:

- habitat researcher
- soil scientist
- wildlife ecologist
- plant specialist
- pharmaceutical researcher
- university professor
- weather forecaster
- atmospheric data technician
- meteorologist
- hydrologist
- climatologist
- coastal zone manager
- crisis response coordinator

Which of these topics interest you?

- landforms
- natural hazards
- climates
- vegetation
- water
- weather
- wildlife

Physical Geography
Biogeographers are interested in plant or animal distributions and their habitats.

A biogeographer might study the effect of environmental change on an ecosystem such as the Florida Everglades, shown here.

Careers suited to biogeographers include:
- habitat researcher
- plant specialist
- wildlife ecologist
- pharmaceutical researcher
Geographers at work . . .

. . . as habitat researchers

Biogeographers combine information about an environment with detailed knowledge of its flora and fauna to understand habitat requirements of endangered species.
Geomorphologists work to explain the origin and development of landforms.

Careers suited to geomorphologists include:
• coastal zone manager
• soil scientist
• university professor

Erosion and fracturing are two of the processes that have shaped this giant granite boulder.
Geomorphologists knowledgeable about beach erosion manage the development and protection of coastal zones such as this section of beach near La Jolla, California.
A Geographer’s Testimonial . . .

Richard Marston
B.A., M.S., Ph.D. Geography
Professor and Sun Chair, School of Geology
Oklahoma State University

“Geography plays an important part in my day-to-day work because scientists and policy makers have come to realize that most environmental problems require training, experience, and expertise that deal with both humans . . . and natural systems, and how they interact with each other.”
Hydrologists monitor water sources and movement on and below the surface of the earth.

Hydrologists doing field work measure stream flow in Washington State near Mount St. Helens.
Biogeography, Geomorphology, Hydrology

Related Web Links

• NASA Destination: Earth
• NASA: Hydrological Sciences Branch
• Canada National Water Research Institute
• Landscape Ecology & Biogeography
Careers suited to physical geographers interested in weather and climate include:

- meteorologist
- climatologist
- weather forecaster
- atmospheric data technician

Training in geography provides good preparation for work related to the global patterns of weather and climate.
Weather & Climate
Related Web Links

• National Oceanic and Atmospheric Administration
• National Weather Service
• National Aeronautic and Space Administration
• The National Center for Atmospheric Research
NATURAL HAZARDS

Some physical geographers study natural disasters in order to understand why and where they occur.

Careers suited to specialists in natural hazards include:
  • emergency route planner
  • crisis response coordinator
  • risk assessor
  • severe storm analyst

Natural hazards include:

**Earthquakes**
- Damage to Highway 247 in southern California caused by the Landers earthquake on June 28, 1992.

**Volcanic Eruptions**
- The eruption of Mount St. Helens in 1980.

**Hurricanes**
- Hurricane Bret moves into the coastal bend of Texas on August 22, 1999.

**Droughts and Fires**
- Fire in Queensland, Australia, 1999.
Insurance companies employ risk assessors to determine if properties are within floodplains or are likely to sustain damage in the event of severe weather.
Natural Hazards
Related Web Links

• NOAA: Hurricanes - The Greatest Storms On Earth
• National Disaster Reference Database
• United States Geological Survey
Resource Management
RESOURCE MANAGEMENT

 BLL Involves monitoring direct and indirect impacts of people on the environment.

 BLL Includes developing and implementing plans and programs to conserve or protect natural resources.
Subdivisions of resource management include:

- Environmental Geography
- Outdoor Recreation Management

Kamaoa Wind Farm, South Point, Hawaii.

Great Smoky Mountains National Park.
Career options in resource management include:

- pollution control consultant
- water quality manager
- forester
- park ranger
- environmental lawyer
- recycling coordinator
- outdoor interpretive guide
- soil conservation specialist
- solid waste management planner
- ecotourism planner
- state and national parks

Which of these topics interest you?

- ecotourism
- resource conservation

Index  Back  Forward  Quit
Environmental geographers monitor problems caused by the impact of human activities. They also develop solutions to these problems.

Careers suited to environmental geographers include:

- pollution control consultant
- water quality manager
- recycling coordinator
- environmental lawyer
- solid waste management planner

Heavy pollution in northern Spain.
Environmental Lawyers:
- settle disputes concerning the use of natural resources
- interpret laws such as the Endangered Species Act
- need training in both geography and legal affairs

County courthouse, Shelbyville, Tennessee.
Environmental Agencies

Related Web Links

- **Environmental Protection Agency (EPA)**
- **The Nature Conservancy**
- **Environmental Defense Fund**
- **Worldwatch Institute**
- **World Resources Institute**
OUTDOOR RECREATION MANAGEMENT

Managing outdoor recreation areas involves knowing the environmental history and human use of an area.

Today outdoor recreation management often incorporates principles of ecotourism, such as minimizing the ecological impact of tourists.

Careers suited to outdoor recreation managers include:
- park ranger
- forester
- soil conservation specialist
- outdoor interpretive guide
- ecotourism planner

Located in southwestern Montana, Big Hole National Battlefield serves as a memorial to those who lost their lives during the Nez Perce War of 1877.
Ron Parker
B.S. Geography
Chief of Resource Management
Chickasaw National Recreation Area

“The big picture that geography painted in my undergraduate education . . . laid a foundation that steered me to my graduate education in parks and outdoor recreation.”
Resource Management
Related Web Links

- The National Park Service
- United Nations Industrial Development Organization
- The International Institute for Sustainable Development
- Ecotourism Explorer
Human Geography
HUMAN GEOGRAPHY

✱ Seeks to understand and explain the distribution of human activities around the world.

✱ Examines the relationships between people and their environment.
Subdivisions of human geography include:

- Regional/Cultural Geography
- Historical Geography
- Urban Geography
- Economic Geography

Top: Austin, Texas. (photo by Alyson Greiner)
Bottom Right: Skyline of Manhattan.
Bottom Left: Telephone booths in Great Britain.
Career options in human geography include:

- international business representative
- transportation coordinator
- diplomat
- city/regional planner
- medical geographer
- travel consultant
- map librarian
- location analyst
- area specialist
- market researcher
- historic preservationist
- sales representative
- zoning official
- cultural resource manager
- museum director

Which of these topics interest you?

- health and health care
- cities
- politics
- people
- economies
- history
- places
REGIONAL/CULTURAL GEOGRAPHY

What environmental characteristics and cultural practices give personality or identity to different places?

An aerial view of the pattern of settlement in East Tennessee.

In parts of Thailand and Myanmar (Burma) women wear neck rings as a sign of status or wealth.

Careers suited to regional/cultural geographers include:

- area specialist
- international business representative
- medical geographer
- travel consultant

Index Subdivisions of human geography Back Forward Career options in human geography Quit
Geographers at work . . .

. . . as area specialists

Area specialists have a thorough understanding of the ethnic composition, political system, and economy of a country or region.

The floating market in Bangkok, Thailand.

Taos Pueblo in northern New Mexico.
A Geographer’s Testimonial . . .

David Peters
Former Peace Corps Volunteer to Sierra Leone
Senior Library Technical Assistant

“The social sciences help an individual learn skills needed to deal with people, to problem solve and to work in groups . . .”
Geographers at work . . .

. . . as international business representatives

• Corporations employ regional and cultural geographers to provide specialized information about countries where they conduct business.

• International exchange and study abroad programs provide an excellent way to learn about a foreign country in preparation for a career in international business.

A student from South Africa (right) schedules her geography classes.
What causes differences in people’s health from one country to another?

If you live in a small town or rural area, how might your access to a hospital or clinic differ from someone who lives in a city?

Medical geographers answer these types of questions, and are typically interested in medicine, biology, lab work, and field work.

The geographical study of disease includes identifying where a disease originates as well as how and where it spreads. This information can be used in the search for cures. The pictures above show different aspects of research on malaria.
Regional/Cultural Geography
Related Web Links

- UN World Health Organization
- Centers for Disease Control and Prevention
- U.S. State Department
- The World Bank
- The Red Cross
- The Peace Corps
**HISTORICAL GEOGRAPHY**

- How do places change over time?
- What forces shape the evolution of landscapes?

Careers suited to historical geographers include:

- historic preservationist
- political analyst/diplomat
- cultural resource manager
- museum exhibit consultant

Granary Burial Ground in Boston, Massachusetts.

An old threshing machine; the precursor to the modern combine.
Geographers at work . . .

. . . as diplomats

International diplomacy makes use of the expertise of historical geographers who can explain ethnic and political conflicts, and can help negotiate treaties.

Diplomats require strong skills in geography, history, and political science. It is not unusual for diplomats to learn a foreign language as well.
A Geographer’s Testimonial . . .

Jim Gabbert
B.S. Geography
Architectural Historian
Oklahoma Historical Society

“Be interdisciplinary in your studies . . . [for example] applied geographers need a background in cultural geography and vice versa. It brings a different thought process to your work and to your studies.”
How do cities organize their space?
Where do shopping areas and neighborhoods develop?
What services should cities provide surrounding areas?

Careers suited to urban geographers include:
• city planner
• zoning official
• transportation coordinator
• chamber of commerce director

The city of Brisbane in Queensland, Australia.

Chicago’s “spaghetti bowl” intersection.
Geographers at work . . .

. . . as planners

Designing our surroundings to suit human needs and preferences lies at the core of planning.

City and regional planners determine locations of transportation routes, businesses, residences, parks, and even rest areas like this one on Interstate 81 near the Virginia-Tennessee border.
"[Geography] was instrumental in opening the field of planning as a possibility. By taking courses which were directly tied to urban planning I was able to . . . land my first planning job."
Urban & Regional Planning
Related Web Links

• Cities and Urban Geography at MiningCo
• Department of Housing and Urban Development
• Arcosanti - A New Sustainable Community in Arizona
• CUBE - Center for Understanding the Built Environment
ECONOMIC GEOGRAPHY

What is the best location for an oil refinery, restaurant, or shopping center?

What networks and facilities enable the distribution of goods from place to place?
ECONOMIC GEOGRAPHY

Careers suited to economic geographers include:

• location analyst
• international business consultant
• real estate agent or appraiser
• market researcher/regional sales representative

Because no two places are the same, realtors need a keen understanding of the local geography and market in which they work.

The Mexico-U.S. border between Ciudad Juarez and El Paso.
Location, location, location . . . the three most important words to a business.

Geographers are trained to think spatially, giving them an edge in understanding factors that make a location advantageous.
A Geographer’s Testimonial...

Tom Daxon
B.S. Geography
Secretary of Finance & Revenue
State of Oklahoma

“It’s difficult to find a field where geography does not play a role... almost any field that someone is going to go into will have a locational aspect to it.”
Geographers at work . . .

. . . as market researchers or regional sales representatives

The same product may not sell very well in different places or markets. This is why businesses need to know the local geography.

Third Street Promenade in Los Angeles, California.

Signs in Korean and Chinese reveal the presence of different ethnic groups in Annandale, Virginia.
“In my day-to-day work, statistics are important, the relationship of statistics to spatial data is essential . . . much of the classwork I had in geography was very influential in that respect . . . ”

David Goughner
B.S. and M.S. Geography
Sales Representative
SST Development Group, Inc.
Geotechniques
GEOTECHNIQUES

Applies geographic tools and methods to improve our understanding of the earth.

Involves the use of maps, aerial photographs, satellite images, the global positioning system (GPS), and sophisticated computer software.
Subdivisions of geotechniques include:

• Cartography

• Geographic Information Systems (GIS)

• Global Positioning System (GPS)

• Remote Sensing

A GPS receiver uses data from satellites to establish location.
Career options in geotechniques include:

- GIS manager
- cartographer
- field surveyor
- GIS software developer
- aerial photo analyst
- spatial data analyst
- aerial photo analyst
- map interpreter
- GIS analyst
- satellite images
- graphic design
- aerial photos
- spatial data collection

Which of these topics interest you?
Cartographers are trained in the art, science, and technology of creating maps. They need to understand the rules for making maps as well as how maps communicate information.

Careers suited to cartographers include:
- map curator
- cartographic designer
- computer mapping technician
- map projection specialist

The history of cartography tracks changes in our knowledge of geography. Compare this map of Southeast Asia to a present day map of the same area.
Geographers at work . . .

. . . as cartographers

Cartographers create maps with a variety of tools including computers and mapping software.

Top: A cartographer at his computer.
Center: Working at a light table.
Bottom: Digitizing a map.

Photos by Jennifer Spencer
Cartography
Related Web Links

• USGS National Mapping Information Service
• The WWWVL Cartography Resources
• Society of Cartographers
• Map Projection Home Page
• Library of Congress Geography and Map Division
GEOGRAPHIC INFORMATION SYSTEMS

A geographic information system can be thought of as an intelligent mapping system that allows overlay and analysis of different kinds of geographic features such as roads, rivers, soil types, and political boundaries. A GIS is useful for uncovering previously unknown relationships between these data layers.

Careers suited to GIS specialists include:
• city GIS manager
• spatial data analyst
• GIS software developer
• natural resource GIS specialist

A GIS technician works with a map of ecoregions.
A Geographer’s Testimonial . . .

Julie Adams
B.S. Geography
GIS Analyst
Natural Resource Conservation Service

“Geography applies to many areas of our daily lives which gives the subject a scientific yet human appeal.”
GIS is helping to make agricultural production more efficient. Farmers can use satellite and field data to determine when, where, and in what quantities to apply insecticides, herbicides, and fertilizers.

Farm machinery can be equipped with GPS receivers and GIS maps that allow specific control of the application of fertilizers.
Geographic Information Systems

Related Web Links

• GIS and the Geographer’s Craft
• USGS Geographic Information Systems
• Precision Agriculture Initiative
GLOBAL POSITIONING SYSTEM

GPS receivers determine locations using radio signals transmitted by Earth-orbiting satellites.

Field researchers use GPS receivers to record the location of study sites, and later to navigate back to these sites.

A geographer uses a GPS unit to establish the location of a research site.
Geographers at work . . .

. . . using the Global Positioning System

Geographers use GPS receivers to map Earth phenomena such as wildlife habitats and highway routes.

For example, a biogeographer can use GPS to track animals equipped with radio collars to follow location and movement.

The GPS constellation of 24 Earth-orbiting satellites.
Remote sensing focuses on the collection and analysis of information about the earth using satellites or aircraft-mounted sensors or cameras. Examples of remote sensing applications include:

- analyzing land use changes in an urban area
- measuring differences in sea surface temperatures caused by El Niño
- identifying areas threatened by pine beetle infestation
REMOTE SENSING

A natural color image of the Marple Fire in California in 1996.

A thermal image of the same area created by sensors measuring energy radiated from objects on the earth’s surface.
Geographers at work . . .

. . . as remote sensing analysts

Geographers specializing in remote sensing may work in private industry or for a government agency such as NASA or the U.S. Forest Service.

An analyst uses a stereoscope to view surface features shown on aerial photographs in three dimensions.
Remote Sensing
Related Web Links

• NASA: Commercial Remote Sensing Program
• Aerial Photography and Remote Sensing
• American Society for Photogrammetry & Remote Sensing
GEOGRAPHIC EDUCATION

🌟 Geography comes alive in the classroom when instructors provide first-hand knowledge about a place, region, or cultural group they have studied intensively.

🌟 Educators trained in geography can teach at the elementary, secondary, or college level.
"The favorite part of my job is sparking the interest in the student, [whether it is] in the classroom or outside the classroom."
Sport geographers study regional patterns related to participation in athletic activities.

Questions a sport geographer might ask include:

- Why does the Deep South outrank other areas in the production of National Football League players?

- Why is field hockey more prevalent in the Northeast?

- How has soccer become popular in places as distant as Brazil, Italy, Nigeria, and China?
• Geographers who study music are interested in the origins and diffusion of music styles.

• Music geographers also seek to understand how music is tied to place.

What places do you associate with these types of music?

zydeco, reggae, jazz, bluegrass, grunge
Religion has many geographic dimensions including:

- how religions spread or remain confined to a particular area
- sacred places
- patterns of pilgrimage
- how different religions influence diet, architecture, and burial practices
The National Geographic Society’s Geography Education Program supports the Geographic Alliance Network.

Each state now has a Geographic Alliance with the goal of improving geography education.

The Alliances provide teacher training workshops as well as materials for curriculum development.
"As a major, geography provides many possibilities that extend beyond just knowing names and places. Geography is a spatial science allowing one to incorporate it into just about any interest."
Resources for Educators
Related Web Links

• National Geographic Society Geography Education
• Association of American Geographers
• National Council for Geographic Education
• Priority Academic Student Skills
For additional copies of this CD-ROM please contact:

CD-ROM Careers Project
Department of Geography
Oklahoma State University
225 Scott Hall
Stillwater, OK 74078

Phone: (405) 744-6250
FAX: (405) 744-5620
Email: osugeog@okstate.edu
Credits

Design: Jennifer Spencer and Dr. Alyson Greiner
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