- The National Renewable Energy Laboratory (NREL), a national laboratory of the U.S. Department of Energy, is a leading developer of renewable energy and energy efficiency technologies and practices to further the goal of creating an economically and environmentally sustainable future for the country. Ask groups of students to investigate major research and development areas of the NREL, such as wind, solar and hydrogen and fuel cell technologies. Each group should generate reports that summarize the basics of its alternative energy source, describe the extent to which this solution has been implemented and offer predictions as to the future of the resource. More information about the NREL may be found at the following web site: **www.nrel.gov/**
- In the first part of the 20th century, seven oil companies known as the "Seven Sisters" controlled the world oil market. In 1960, in response to what they perceived as unfair trade practices by the "Seven Sisters," five nations formed The Organization of Petroleum Exporting Countries (OPEC). Ask students to research and develop a map showing the 11 modern countries that make up OPEC and create charts that show the percentage of the world's known oil reserves that OPEC countries control. Students should also develop country profiles of OPEC members, leaders and oil-exporting policies. As a follow-up, ask students to research and analyze theories regarding the concept of peak oil and the future of world oil supplies. Students may learn more about the history of OPEC and the concept of peak oil at the following web sites: **www.opec.org/opecna/Speeches/2005/CosmoVie.htm**, **www.energybulletin.net/4733.html**.
- Experts point out that the unequal distribution of resources around the world often leads to conflict because no one country has all the natural resources it needs in order to prosper. This concept is especially applicable if the resources have incredible human value — like diamonds. Ask students to research and define the term "conflict diamonds" and list wars that have been fueled by the illicit transaction of these valuable minerals. Students may also research U.N. reports on "conflict diamonds" and develop mock U.N. commissions that provide recommendations to governments, NGOs, diamond traders and financial institutions to help prevent further confrontations. Links to a variety of U.N. reports on "conflict diamonds" may be found at the following web site: **www.globalpolicy.org/security/issues/diamond/**.

TEACHER'S GUIDE

Suggested Internet Resources

Periodically, Internet Resources are updated on our web site at www.LibraryVideo.com

- **www.cet.edu/earthinfo/camerica/panama/PCtopic2.html**
  Wheeling Jesuit University's Center for Educational Technologies has an extensive history of the construction of and modern issues related to the Panama Canal.
- **www.fws.gov/endangered/wildlife.html#Species**
  The U.S. Fish & Wildlife Service provides a current list of threatened and endangered animals and plants.
- **cwch.uoregon.edu/**
  The University of Oregon's Institute for a Sustainable Environment offers research, education and technical assistance on balancing economic development with environmental needs.
- **www.who.int/mediacentre/news/releases/2005/pr38/en/**
  In 2005, twenty years after the Chernobyl disaster, the World Health Organization issued a report on the true scale of the accident, providing definitive answers and ways to repair lives.

Suggested Print Resources

- Bryan, Nichol. *Chernobyl: Nuclear Disaster*. World Almanac Library, Milwaukee, WI; 2004.
- Ingram, Scott. *Panama Canal*. Blackbirch Press, San Diego, CA; 2004.
- Smith, Trevor. *Renewable Energy Resources*. Weigl Publishers, Mankato, MN; 2004.

TEACHER'S GUIDE

Jeffrey W. Litzke, M.Ed.
Curriculum Specialist, Schlessinger Media

TITLES IN THIS SERIES

- **ENVIRONMENT & SOCIETY**
- **GEOGRAPHIC PERSPECTIVES: THE UNITED STATES OF AMERICA**
- **HUMAN SYSTEMS**
- **PHYSICAL SYSTEMS**
- **PLACES & REGIONS**
- **THE WORLD IN SPATIAL TERMS**

Teacher's Guides Included and Available Online at:

800-843-3620

P.O. Box 580, Wynnewood, PA 19096 • 800-843-3620
Executive Producer: Andrew Schlessinger
Programs produced and directed by JWM Productions, LLC.

T0151
V6291

TEACHER'S GUIDE

Geography for Students

ENVIRONMENT & SOCIETY

Grades 5–9

The study of geography brings together various dimensions of Earth, so that we can increase our knowledge of both the physical and human processes that shape the planet. Enhancing geographic literacy with an in-depth analysis of the spatial aspects of human existence provides students with insight into some of the most challenging questions facing Earth. As world population surges past the six billion mark, as globalization intensifies social and economic interconnections and as the physical environment becomes more and more threatened, *Geography for Students* offers students a unique opportunity to grasp their increasingly complex world and gain a better understanding of their place in it.

Program Summary

Many of the most significant social, economic and political issues facing the world today are connected to the impact that people are having on the physical environment. There are positive and negative implications of the human alteration of the balance of nature, as increased prosperity and improved living conditions are often counteracted by environmental dilemmas and crises related to pollution and the by products of economic growth. In addition, misuse of natural resources, conflicts associated with their unequal distribution and the destruction of natural habitats threaten the long-term stability of the global environment and endanger the planet. The ultimate goal of a sustainable environment is to allow all of the inhabitants of Earth to live in equilibrium with the natural environment through such strategies as leaving a smaller human footprint on Earth and better balancing the current and future use of natural resources.

Vocabulary

The Johnstown Flood — A catastrophic flood that killed over 2,200 people in Johnstown, PA on May 31, 1889.

renewable resources — Materials that can be replenished and are readily available for use, such as sunlight, water, air, soil, plants and animals.

nonrenewable resources — Materials that are in limited supply or take a very long time to form, such as fossil fuels like coal, oil or natural gas.

fossil fuels — Nonrenewable energy resources produced over millions of years by decaying plant and animal remains. Some examples of fossil fuels are coal, oil and natural gas.

flow resources — A resource that is simultaneously used and replaced, such as running water and wind which can be harnessed to create energy.

The Gulf War — A 1991 conflict in the Middle East in which the United States led a group of nations in an effort to expel Saddam Hussein's Iraqi troops from Kuwait.

sustainable environment — The type of development and use of natural resources that balances current and future needs.

Panama Canal — An over 50-mile-long canal built by the United States in the early 20th century that cuts through the isthmus of Panama and connects the Atlantic and Pacific Oceans.

atmosphere — A layer of gases — mainly nitrogen and oxygen — that surrounds and protects life on Earth by absorbing ultraviolet solar radiation.

biosphere — The parts of the Earth, such as air, land and water, where all life occurs.

lithosphere — The outermost shell of Earth which includes the crust and the top layer of the mantle.

hydrosphere — The collective mass of water on Earth, consisting of all the lakes, rivers and oceans on the planet.

(Continued)

urban heat island — A metropolitan area that can be up to ten degrees warmer than the rural areas surrounding it.

desertification — The conversion of vast areas of land into desert, caused by overgrazing and cultivation of marginal lands, combined with water scarcity.

Sahel — The boundary zone that lies between the Sahara desert and the more fertile areas of southern Africa.

dead zone — A large area of a body of water, such as in the Gulf of Mexico, which is seasonally deprived of oxygen, causing the death of most of its aquatic species.

Butterfly Effect — The environmental concept that suggests that everything is connected to the extent that a butterfly's wings might have enough impact to affect weather patterns all over the world.

Chernobyl — A town in Ukraine and the site of a major nuclear accident in 1986, from which radioactive contamination continues to plague the region.

Richter Scale — The scale developed by Dr. Charles Richter in 1935 to measure the relative size of earthquakes. The weakest earthquake is rated a 1 on the scale; the strongest is a 10.

tsunami — A giant wave caused by an earthquake on the ocean floor.

Pre-viewing Discussion

- What are renewable and nonrenewable resources? Provide examples of each.
- In what ways have people used technology to obtain and use Earth's natural resources?
- Describe several different environmental issues that are affecting Earth and speculate about their causes.

Focus Questions

1. What is a flow resource? What unique challenges are involved in harnessing this type of energy?
2. Why does the unequal distribution of resources often lead to conflict?
3. What are the characteristics of a sustainable environment?
4. Why was the Panama Canal built? What effect did its construction have on international trade?
5. How was the Imperial Valley in Southern California transformed into one of the richest agricultural regions in the world?
6. What is an urban heat island? What are its causes and effects?
7. What is desertification? Provide an example of a place that is being affected by desertification.

(Continued)

8. Why is Earth's hydrosphere considered to be in trouble?
9. What is a dead zone? What factors contribute to the existence of dead zones?
10. What is the "Butterfly Effect"?
11. Why did the Chernobyl nuclear disaster have global implications?
12. What was the major cause of destruction related to the 1906 San Francisco Earthquake?
13. What is a tsunami?
14. How did the 2004 tsunami impact society and the environment in affected areas?

Follow-up Discussion

- Worldwide concern for the Amazon rain forest continues. Why is this region so important? Summarize the major causes and possible effects of the disappearing rain forest.
- Why did Japan invade the Chinese province of Manchuria in 1931? Provide several historical examples of imperial powers attempting to control the interests of other countries.
- What do scientists and environmentalists mean by a "sustainable environment"? Describe some characteristics of an effective sustainable environment and recommend different strategies to try to achieve this goal.

Follow-up Activities

- When constructed in the 1850s, the earthen South Fork Dam in Johnstown, Pennsylvania was the largest of its type in the world. On the 100th anniversary of the Johnstown Flood, an article in *Civil Engineering* magazine concluded, "If South Fork Dam had been rebuilt to the original specifications and construction, the disaster of May 31, 1889, never would have happened." Debate continues as to whether the dam's collapse was caused by the neglect of wealthy members of the South Fork Fishing and Hunting Club, or whether it should be attributed solely to a torrential storm that dropped eight inches of rain on the area. Contemporary lawsuits vindicated the club's members, including Andrew Carnegie and Andrew Mellon, but public opinion remained firmly against them. Ask groups of students to research the 1889 catastrophe and conduct mock congressional hearings on the matter, offering their own findings and conclusions as to whether the flood was more a manmade or a natural disaster. Excerpts from the 1988 *Civil Engineering* article and other research material may be found at the following web sites: **www.nps.gov/jofl/home.htm**, **smoter.com/flooddam/johnstow.htm**.

(Continued)