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Environment 00/01



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ENVIRONMENT

00/01

Nineteenth Edition



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University of Connecticut

John L. Allen is professor of geography at the University of Connecticut. He received his bachelor's degree in 1963 and his M.A. in 1964 from the University of Wyoming, and in 1969 he received his Ph.D. from Clark University. His special area of interest is the impact of contemporary human societies on environmental systems.

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Members of the Advisory Board are instrumental in the final selection of articles for each edition of ANNUAL EDITIONS. Their review of articles for content, level, currentness, and appropriateness provides critical direction to the editor and staff. We think that you will find their careful consideration well reflected in this volume.

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In publishing ANNUAL EDITIONS we recognize the enormous role played by the magazines, newspapers, and journals of the public press in providing current, first-rate educational information in a broad spectrum of interest areas. Many of these articles are appropriate for students, researchers, and professionals seeking accurate, current material to help bridge the gap between principles and theories and the real world. These articles, however, become more useful for study when those of lasting value are carefully collected, organized, indexed, and reproduced in a low-cost format, which provides easy and permanent access when the material is needed. That is the role played by ANNUAL EDITIONS.

New to ANNUAL EDITIONS is the inclusion of related World Wide Web sites. These sites have been selected by our editorial staff to represent some of the best resources found on the World Wide Web today. Through our carefully developed topic guide, we have linked these Web resources to the articles covered in this ANNUAL EDITIONS reader. We think that you will find this volume useful, and we hope that you will take a moment to visit us on the Web at <http://www.dushkin.com> to tell us what you think.

As a new millennium begins, environmental dilemmas long foreseen by natural and social scientists have begun to emerge in a number of guises: population/food imbalances, problems of energy scarcity, acid rain, toxic and hazardous wastes, ozone depletion, water shortages, massive soil erosion, global atmospheric pollution and possible climate change, forest dieback and tropical deforestation, and the highest rates of plant and animal extinction the world has known in 65 million years.

These and other problems have worsened in spite of an increasing amount of national and international attention to environmental issues and increased environmental awareness and legislation. The problems have resulted from centuries of exploitation and unwise use of resources, accelerated recently by the short-sighted public policies that have favored the short-term, expedient approach to problem solving over longer-term economic and ecological good sense. In Africa, for example, the drive to produce enough food to support a growing population has caused the use of increasingly fragile and marginal resources, resulting in the dryland deterioration that brings famine to that troubled continent. Similar social and economic problems have contributed to massive deforestation in Middle and South America and Southeast Asia.

The economic problems generated by resource scarcity have caused the relaxation of environmental quality standards or have contributed to the refusal to enact environmentally sound protective measures that are viewed as too costly. The lack of adequate environmental policy has been particularly apparent in those countries that are striving to become economically developed. But even in the more highly developed nations, economic concerns tend to favor slackening environmental controls. In the interests of maintaining jobs for the timber industry, for example, many of the last areas of old-growth forests in the United States are imperiled, and in the interests of maintaining agricultural productivity at all costs, destructive and toxic chemicals continue to be used on the nation's farmlands. In addition, concerns over energy availability have created the need for foreign policy and military action to protect the developed nations' access to cheap oil and have prompted increasing reliance on technological quick fixes.

There is some reason to hope that, globally, a new environmental consciousness is awakening at the dawning of a new millennium. The dissolution of the Soviet Union lifted the Iron Curtain, and the environmental horror stories that have

emerged from Eastern Europe and the newly independent states that made up the former USSR have given new incentives to international cooperation. International conferences have been held on global warming and other environmental issues, and there is some evidence of an increased international desire to do something about environmental quality before it is too late.

The articles contained in *Annual Editions: Environment 00/01* have been selected for the light they shed on these and other problems and issues. The selection process was aimed at including material that will be readily assimilated by the general reader. Additionally, every effort has been made to choose articles that encourage an understanding of the nature of the environmental problems that beset us and how, with wisdom and knowledge and the proper perspective, they can be solved or at least mitigated. Accordingly, the selections in this book have been chosen more for their intellectual content than for their emotional tone. They have been arranged into an order of topics—the global environment, population and food, energy, the biosphere, resources, and pollution—that lends itself to a progressive understanding of the causes and effects of human modifications of Earth's environmental systems. We will not be protected against the ecological consequences of human actions by remaining ignorant of them. Although the knowledge gained through the use of this book may not allow any of us to escape the environmental predicament, it should ensure that we do not continue to act and react in ways that will make that predicament worse.

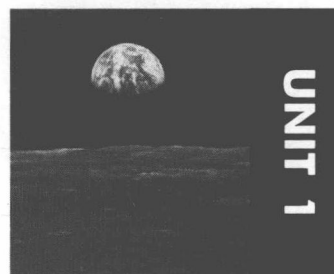
The World Wide Web sites in this edition can be used to further explore the topics. These sites will be cross-referenced by number in the topic guide. In addition, this edition contains both a newly refreshed *Environmental Information Retrieval* guide and glossary.

Readers can have input into the next edition of *Annual Editions: Environment* by completing and returning the postpaid article rating form at the back of the book.



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Editor

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Selected World Wide Web Sites	4
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1. The Global Challenge , Michael H. Glantz, <i>The World & I</i> , April 1997.	8
The world's atmosphere and oceans are truly global commons , shared by all nations and peoples. Because the two interlocked systems circulate freely around the globe, impacts on air and water quality produced by human action are also shared. The capacity of the global atmospheric and oceanic systems to withstand human modifications is being tested by increasing human demands.	
2. The Nemesis Effect , Chris Bright, <i>World Watch</i> , May/June 1999.	12
The complexity of environmental systems and human interactions with them suggests that environmental pressures produced by human activities will begin to converge in ways that will produce a number of unexpected environmental crises . The only way to avoid the "nemesis" of unpredicted environmental crisis is to do a better job of managing the human-environmental systems.	
3. Windows on the Future: Global Scenarios & Sustainability , Gilberto C. Gallopín and Paul Raskin, <i>Environment</i> , April 1998.	22
The construction of scenarios or glimpses of future alternative worlds provides a unique way to evaluate the impact of continued population growth on the global environment. Of all possible future worlds, only one scenario allows for transcending the industrial culture of the present without descending into chaos. That scenario requires the development of sustainability as the guiding principle behind the world's technological systems.	
4. Crossing the Threshold: Early Signs of an Environmental Awakening , Lester R. Brown, <i>World Watch</i> , March/April 1999.	32
An environmental threshold is a critical parameter beyond which significant environmental change becomes inevitable. Globally, we are approaching some important environmental thresholds (the number of endangered species, for example). But we may also be approaching some key breakthroughs in social concepts and organization that will enable us to restructure the global economy before environmental deterioration can lead to irreversible economic decline.	



The Global Environment: An Emerging World View

Four selections provide information on the current state of Earth and the changes we will face.



The World's Population: People and Hunger

Four selections examine the problems the world will have in feeding its ever-increasing population.

Overview

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| Overview | 42 |
| 5. The Population Surprise , Max Singer, <i>The Atlantic Monthly</i> , August 1999. | 44 |
| For years, population experts have been predicting that the world's population will continue to grow well into the twenty-first century before stabilizing sometime after 2050. Most of these predictions have been based on the demographic transition , a pattern of population growth experienced in the industrialized nations in which population growth eventually approaches zero. Recent evidence suggests that rather than leveling off, the world's population will actually enter a period of decline. | |
| 6. The Emperor's New Crops , Brian Halweil, <i>World Watch</i> , July/August 1999. | 46 |
| The problem of feeding the world's 6 billion people on finite and nearly exhausted farmlands has given rise to speculation about the future of agricultural biotechnology in which genetically engineered crops will produce abundance from salty, dry, low-nutrient soils. While genetic engineering does contain some potential for agriculture, the direction of the industry at present suggests that engineered plants may produce more problems than solutions. | |
| 7. The Technology of Hope: Tools to Empower the World's Poorest Peoples , Rashmi Mayur and Bennett Daviss, <i>The Futurist</i> , October 1998. | 55 |
| The traditional pattern of economic development has been for the small percentages of the world's population who live in industrialized countries to consume large percentages of the world's resources, obtained from nonindustrialized countries. The global environment cannot sustain this pattern of economic growth for the three-fourths of the world's population who live in developing countries . Environmentally compatible techniques will have to be found to create a postindustrial path to prosperity. | |
| 8. Food Scarcity: An Environmental Wakeup Call , Lester Brown, <i>The Futurist</i> , January/February 1998. | 61 |
| The environmental deterioration that the world has undergone during the last few decades cannot continue without having serious consequences for the global economy . The most likely sector through which environmental decline becomes economic decline is the system of food production or agriculture . Future food security depends upon creating an environmentally sustainable agriculture. | |

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9. **King Coal's Weakening Grip on Power**, Seth Dunn, *World Watch*, September/October 1999.

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Although the fuel of choice today is petroleum, for most of the last thousand years coal has been the **fossil fuel** most in demand for uses ranging from the village blacksmith to the modern electrical generation power plant. The use of coal has left a legacy of human and **environmental costs** that we have only now begun to assess. Initiatives to replace coal as a primary fuel in all societies suggest that the reign of this destructive **energy source** is nearing an end.

10. **The End of Cheap Oil**, Colin J. Campbell and Jean H. Laherrère, *Scientific American*, March 1998.

75

In the 1970s, sudden price increases for crude oil awoke the world to the dependence on this **energy resource**. Since global production of **conventional oil** will begin to decline significantly by 2010, the world's economy is in for another oil crunch. The world's industrial nations must face the end of abundant and cheap oil upon which their economic systems depend by investing more in **energy research**.

11. **Sunlight Brightens Our Energy Future**, Randy Quinn, *The World & I*, March 1997.

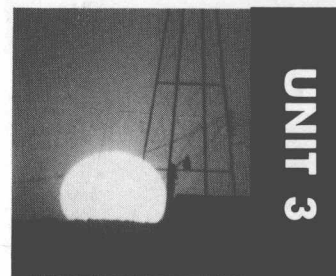
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Solar energy has been the ultimate goal of those in search of the perfect energy source, largely because of its potentially inexpensive utilization and its nonpolluting character. New technologies are being developed that could make solar power a **conventional energy source** within the next 5 to 10 years. The most promising technology is that based upon converting sunlight directly into electricity through **photovoltaics**.

12. **Bull Market in Wind Energy**, Christopher Flavin, *World Watch*, March/April 1999.

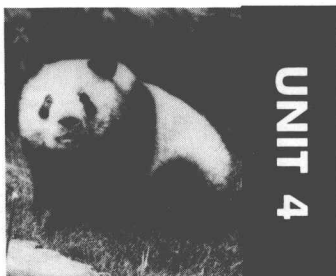
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Wind power is one of the world's most rapidly expanding industries and both industrialized and developing countries are discovering that **electrical energy** from wind-driven turbines is not only cheap and environmentally protective but also technologically accessible. In some rapidly developing countries like China, the potential of wind energy exceeds the current demand for electricity.



Energy: Present and Future Problems

Four articles consider the problems of meeting present and future energy needs. Alternative energy sources are also examined.



Biosphere: Endangered Species

Six articles examine the problems in the world's biosphere. Not only are plants and animals endangered, but many human groups are also disastrously affected by deforestation and primitive agricultural policies.

Overview

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13. **Planet of Weeds**, David Quammen, *Harper's*, October 1998. 90

Earth has undergone periods of major **biological extinction** requiring millions of years of recovery time. Biologists believe that we are entering another such period; a significant reduction in **biodiversity** brought about not by natural forces but by human action. Over the next century huge percentages of Earth's plants and animals will disappear, leaving behind impoverished ecosystems dominated by "weeds," the hardiest, most adaptable plants and animals, including the consummate weed: ***Homo sapiens***.

A. PLANTS

14. **Old Growth for Sale**, Douglas Gantenbein, *Audubon*, May/June 1998. 98

In 1993, with great fanfare, a "timber summit" attended by President Clinton produced the **Northwest Forest Plan** that was intended to slash logging on federal lands by 85 percent and manage forests for wildlife, fish, and recreation. Five years later, thousands of trees in the Northwest's **old growth forests**, some of them as old as four centuries, continue to be cut.

15. **Alien Invasion**, Steve Mirsky, *Audubon*, May/June 1999. 101

Invasive species of plants are those that are alien to an area and tend to be destructive because of their impact on native plant life. In the United States, alien plants threaten almost two-thirds of all **endangered species** that are native to the continent. Many of the most dangerous invaders were brought to the United States intentionally as ornamental plants, erosion control plants, or food plants. Without natural enemies, these aliens reduce biodiversity, destroy wetlands, and decrease forage.

16. **The Organic Revolution**, Joel Bourne, *Audubon*, March/April 1999. 108

Pesticides and other **agricultural chemicals** have been poisoning soil and water in North America and other parts of the world for more than half a century. There is some growing evidence that the trend toward increasingly toxic farming methods is reversing in favor of methods of **organic farming** that avoid chemicals, rely on natural systems, increase biodiversity, and—most important—maintain agricultural production at high levels.

B. ANIMALS

17. **Not in My Backyard**, Anthony Brandt, *Audubon*, 114
September/October 1997.

Wildlife populations are rapidly encroaching on America's suburbs—and vice versa. Problems have ranged from damage to ornamental shrubs to the spread of diseases such as **Lyme disease**. No one is certain how to deal with the problems. Most of the big environmental battles have been fought over remote wilderness rather than suburban backyards and policymakers are ill-equipped to deal with problems much closer to home.

18. **The Ultimate Survivor**, Mike Finkel, *Audubon*, May/ 119
June 1999.

For nearly a century, **government agencies** and private concerns in the United States have waged war against the coyote, an indigenous wild canine smaller than a wolf. In spite of the fact that more than 400,000 of these animals are killed every year, there are now more coyotes in more places than ever before. The continued survival of this animal teaches good lessons in the ability of some **animal populations** to regulate their own growth in response to external pressures.

Overview 124

19. **The Tragedy of the Commons: 30 Years Later**, 126
Joanna Burger and Michael Gochfeld, *Environment*,
December 1998.

In 1968, the pioneering human ecologist Garrett Hardin argued in an article entitled "**The Tragedy of the Commons**" that increasing human **population** would create such pressure on finite resources at both local and global levels that the inevitable consequence would be overexploitation and **environmental crisis**. Hardin's work spawned new approaches to **resource management**, but, 30 years later, the problem of the commons still exists.

A. LAND

20. **Lessons from the Land Institute**, Scott Russell Sanders, 134
Audubon, March/April 1999.

Perhaps the ultimate in **sustainable agriculture** would be the field that ran only on water and sunlight, never needed plowing, and was perennial, with crops intermingled and supporting one another. On an **experimental farm** based on the natural ecosystem of the tall-grass prairie, a MacArthur Fellow with a Ph.D. in genetics is attempting to develop such an agricultural system in time to help feed the world's swelling population.

21. **Winning the War for the West**, Perri Knize, 138
The Atlantic Monthly, July 1999.

For several generations conservationists and livestock raisers in the American West have battled one another over the best use of most of the nation's **public lands**. Recent evidence has begun to suggest that, contrary to long-held conservationist opinion, not all grazing is environmentally destructive. Ranchers and environmentalists are even beginning to agree on certain ways that **livestock grazing** can actually benefit the environment.



Resources: Land, Water, and Air

Seven selections discuss the environmental problems affecting our land, water, and air resources.

B. WATER

22. **When the World's Wells Run Dry**, Sandra Postel, **145**
World Watch, September/October 1999.

Most of the water used in **irrigation agriculture** is **groundwater** rather than water drawn from surface reservoirs. And because groundwater is being extracted or withdrawn at rates far in excess of its renewal or recharge, the world is quickly running short of one of its most precious resources. The only solution is to develop plans to reduce overconsumption of groundwater and to ensure sustainable groundwater use.

23. **The Deep Green Sea**, Edward Carr, *The Economist*, **153**
May 23, 1998.

For millennia, the ocean has seemed boundless in its resources and infinite in its capacity to withstand human interference. Now, the sea is suffering from **overfishing** and **pollution**. Scientific ignorance and the sea's lack of natural boundaries frustrate efforts to design institutions to manage the world's **marine environments**, which would all respond favorably to policies that would stop subsidizing marine destruction and would limit human access to marine resources.

C. AIR

24. **The Great Climate Flip-Flop**, William H. Calvin, *The Atlantic Monthly*, January 1998. **167**

The popular understanding of **climate change** is an enhanced **greenhouse effect** that, predictions say, could cause coastal flooding and severe weather. But paradoxically, the **global warming** brought on by an accelerated greenhouse effect could also lead to abrupt cooling. A change in ocean currents in the North Atlantic that would accompany a drastic cooling trend would pose massive problems for Europe.

25. **Last Tango in Buenos Aires**, Christopher Flavin, *World Watch*, November/December 1998. **175**

The signing of the **Kyoto Protocol** to limit carbon dioxide emissions raised hopes that international consensus was finally in place to get the global climate problem resolved by reducing human-produced **greenhouse gases**. Unfortunately, continued progress on the finer points of the international agreement has stalled and, meanwhile, the apparent consequences of **global warming** are beginning to be felt in new and unexpected ways.

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26. Making Things Last: Reinventing Our Material Culture

184

Gary Gardner and Payal Sampat, *The Futurist*, May 1999.

Consumption of industrial products in countries like the United States have increased nearly twentyfold in this century and manufacturing has converted unprecedented amounts of **raw materials** to usable products that then end up as **solid waste**. The waste that characterizes the industrialized countries of the world has produced enormous damage to both human and **environmental health**.

27. Crawling Out of the Pipe

189

Chris Bright, *World Watch*, January/February 1999.
One of the most serious forms of **pollution** in today's world is organic: easily transportable, often microscopic organisms that invade established ecosystems and wreak tremendous environmental damage or—even more frightening—pose enormous problems for **public health**. In global terms **biotic spills**, or unintentional releases of these organisms, are much more dangerous than the more widely publicized oil spills.

28. Recycling Human Waste: Fertile Ground or Toxic Legacy?

200

Gary Gardner, *World Watch*, January/February 1998.
Recycling of **human waste** is not anything new. For thousands of years farmers in the Orient have used "night soil" on their fields to maintain fertility. Unfortunately, modern farming methods and sewage treatment systems have greatly complicated the risks of using our most obvious **fertilizer**, since human waste often mixes freely with heavy metals, pesticides, dioxins, petroleum products, and other **toxic wastes**, making it unusable even after treatment.

29. Lessons from Lake Apopka

207

Ted Williams, *Audubon*, July/August 1999.
The draining and filling of natural wetlands has reduced habitat vital to shorebirds and has made flooded agricultural lands increasingly valuable for **wildlife populations** as feeding and nesting areas. Unfortunately, many—if not most—of these flooded agricultural lands carry high quantities of **agricultural chemicals** (pesticides, herbicides, fertilizers) that create a rich toxic soup capable of decimating any bird or fish population with which they come in contact.

30. Earth's Last Gasp?

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Daniel A. Lashof, *USA Today Magazine* (Society for the Advancement of Education), May 1997.
Scientists have been observing the buildup of **greenhouse gases** in the atmosphere for decades and have become increasingly concerned over the potential for **global warming** that such an increase portends. If **atmospheric pollution** is not controlled, the average rate of warming over the next century will probably be greater than during any period in the last 10,000 years.

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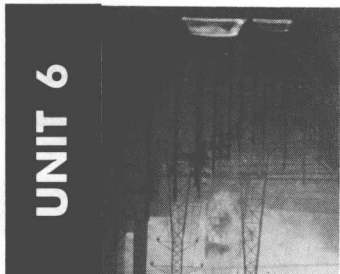
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UNIT 6

Pollution: The Hazards of Growth

Five selections weigh the environmental impacts of the growth of human population.



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UNIT 6

Topic Guide

This topic guide suggests how the selections and World Wide Web sites found in the next section of this book relate to topics of traditional concern to students and professionals in the field of environmental studies. It is useful for locating interrelated articles and Web sites for reading and research. The guide is arranged alphabetically according to topic.

The relevant Web sites, which are numbered and annotated on pages 4 and 5, are easily identified by the Web icon () under the topic articles. By linking the articles and the Web sites by topic, this ANNUAL EDITIONS reader becomes a powerful learning and research tool.

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Energy Cost	9. King's Coal's Weakening Grip on Power • 15, 16, 17, 18, 19	Greenhouse Gases	25. Last Tango in Buenos Aires 30. Earth's Last Gasp? • 24

TOPIC AREA	TREATED IN	TOPIC AREA	TREATED IN
Groundwater	22. When the World's Wells Run Dry ⊙ 27, 28	Postindustrial Technology	7. Technology of Hope ⊙ 6, 8, 15, 16, 17, 29
Human Waste	28. Recycling Human Waste ⊙ 7, 9, 10	Public Health	27. Crawling Out of the Pipe ⊙ 30, 32
Invasive Species	15. Alien Invasion ⊙ 2, 3, 7	Public Lands	21. Winning the War for the West ⊙ 2, 5, 7
Irrigation Agriculture	22. When the World's Wells Run Dry ⊙ 25	Raw Materials	26. Making Things Last: Reinventing Our Material Culture ⊙ 1, 4
Kyoto Protocol	25. Last Tango in Buenos Aires ⊙ 24	Recycling	28. Recycling Human Waste ⊙ 7, 9, 10
Livestock Grazing	21. Winning the War for the West ⊙ 20, 21, 23	Resource Management	19. Tragedy of the Commons: 30 Years Later ⊙ 9, 10, 12, 14
Lyme Disease	17. Not in My Backyard ⊙ 23, 32	Scenarios	3. Windows on the Future ⊙ 2, 6, 8
Marine Environment	23. Deep Green Sea ⊙ 25	Solar Energy	11. Sunlight Brightens Our Energy Future ⊙ 24, 28
Northwest Forest Plan	14. Old Growth for Sale ⊙ 2, 6, 7, 22	Solid Waste	26. Making Things Last: Reinventing Our Material Culture ⊙ 1, 4
Old Growth Forests	14. Old Growth for Sale ⊙ 2, 6, 7, 22	Sustainability	3. Windows on the Future ⊙ 2, 6, 8
Organic Farming	16. Organic Revolution ⊙ 1, 3, 7, 21	Sustainable Agriculture	20. Lessons from the Land Institute ⊙ 1, 3, 7, 21
Overfishing	23. Deep Green Sea ⊙ 25	Toxic Wastes	28. Recycling Human Waste ⊙ 7, 9, 10, 27, 28, 30, 32
Photovoltaics	11. Sunlight Brightens Our Energy Future ⊙ 15, 16, 17, 18, 19	Tragedy of the Commons	19. Tragedy of the Commons: 30 Years Later ⊙ 9, 10, 12, 14
Pollution	23. Deep Green Sea 27. Crawling Out of the Pipe ⊙ 25, 32	Wildlife	17. Not in My Backyard 29. Lessons from Lake Apopka ⊙ 20, 23, 32
Population	19. Tragedy of the Commons: 30 Years Later ⊙ 9, 10, 12, 14	Wind Power	12. Bull Market in Wind Energy ⊙ 24, 25, 28
Population Growth	3. Windows on the Future 5. Population Surprise ⊙ 9, 10, 12, 14		

● AE: Environment

The following World Wide Web sites have been carefully researched and selected to support the articles found in this reader. If you are interested in learning more about specific topics found in this book, these Web sites are a good place to start. The sites are cross-referenced by number and appear in the topic guide on the previous two pages. Also, you can link to these Web sites through our DUSHKIN ONLINE support site at <http://www.dushkin.com/online/>.

The following sites were available at the time of publication. Visit our Web site—we update DUSHKIN ONLINE regularly to reflect any changes.

General Sources

1. Britannica's Internet Guide

<http://www.britannica.com>

This site presents extensive links to material on world geography and culture, encompassing material on wildlife, human lifestyles, and the environment.

2. EnviroLink

<http://www.envirolink.org>

One of the world's largest environmental information clearing houses, EnviroLink is a grassroots nonprofit organization that unites organizations and volunteers around the world and provides up-to-date information and resources.

3. Library of Congress

<http://www.loc.gov>

Examine this extensive Web site to learn about resource tools, library services/resources, exhibitions, and databases in many different subfields of environmental studies.

4. SocioSite: Sociological Subject Areas

<http://www.pscw.uva.nl/sociosite/TOPICS/>

This huge sociological site from the University of Amsterdam provides many discussions and references of interest to students of the environment, such as the links to information on ecology and consumerism.

5. U.S. Geological Survey

<http://www.usgs.gov>

This site and its many links are replete with information and resources in environmental studies, from explanations of El Niño to discussion of concerns about water resources.

The Global Environment: An Emerging World View

6. Earth Science Enterprise

<http://www.earth.nasa.gov>

This site will direct you to information about NASA's Mission to Planet Earth program and its Science of the Earth System. Surf here to learn about satellites, El Niño, and even "strategic visions" of interest to environmentalists.

7. National Geographic Society

<http://www.nationalgeographic.com>

This site provides links to National Geographic's huge archive of maps, articles, and other documents. There is a great deal of material related to the atmosphere, the oceans, and other environmental topics.

8. Santa Fe Institute

<http://acoma.santafe.edu>

This home page of the Santa Fe Institute—a nonprofit, multidisciplinary research and education center—will lead to many interesting links related to its primary goal: to create a new kind of scientific research community, pursuing emerging science. A variety of topics related to the environment are addressed.

9. United Nations

<http://www.unsystem.org>

Visit this official Web site locator for the United Nations System of Organizations to get a sense of the scope of international environmental inquiry today. Various UN organizations concern themselves with everything from maritime law to habitat protection to agriculture.

10. United Nations Environment Programme

<http://www.unep.ch>

Consult this home page of UNEP for links to critical topics of concern to environmentalists, including desertification, migratory species, and the impact of trade on the environment. The site will direct you to useful databases and global resource information.

The World's Population: People and Hunger

11. The Hunger Project

<http://www.thp.org>

Browse through this nonprofit organization's site to explore the ways in which it attempts to achieve its goal: the sustainable end to global hunger through leadership at all levels of society. The Hunger Project contends that the persistence of hunger is at the heart of the major security issues that threaten our planet.

12. Penn Library Resources

<http://www.library.upenn.edu/resources/websitestest.html>

This vast site is rich in links to information about virtually every subject you can think of in environmental studies. Its extensive population and demography resources address such concerns as migration, family planning, and health and nutrition in various world regions.

13. World Health Organization

<http://www.who.int>

This home page of the World Health Organization will provide links to a wealth of statistical and analytical information about health and the environment in the developing world.

14. WWW Virtual Library: Demography & Population Studies

<http://demography.anu.edu.au/VirtualLibrary/>

This is a definitive guide to demography and population studies. A multitude of important links to information about global poverty and hunger can be found here.

Energy: Present and Future Problems

15. Alternative Energy Institute, Inc.

<http://www.altenergy.org>

On this site created by a nonprofit organization, you can learn about the impacts of the use of conventional fuels on the environment. Learn, too, about research work on new forms of energy.

16. Communications for a Sustainable Future

gopher://csf.colorado.edu

This site will lead to information on topics in international environmental sustainability. It pays particular at-

tention to the political economics of protecting the environment.

17. Energy and the Environment: Resources for a Networked World

<http://zebu.uoregon.edu/energy.html>

This University of Oregon site points you to an extensive array of materials having to do with energy sources—both renewable and nonrenewable—as well as other topics of interest to students of the environment.

18. Institute for Global Communication/EcoNet

<http://www.igc.org/igc/issues/energy/>

This environmentally friendly site provides links to dozens of governmental, organizational, and commercial sites having to do with energy sources. Resources address energy efficiency, renewable generating sources, global warming, and more.

19. U.S. Department of Energy

<http://www.doe.gov>

Scrolling through the links provided by this Department of Energy home page will lead you to information about fossil fuels and a variety of sustainable/renewable energy sources.

Biosphere: Endangered Species

20. Friends of the Earth

<http://www.foe.co.uk/index.html>

Friends of the Earth, a nonprofit organization based in the United Kingdom, pursues a number of campaigns to protect the Earth and its living creatures. This site has links to many important environmental sites, covering such broad topics as ozone depletion, soil erosion, and biodiversity.

21. Smithsonian Institution Web Site

<http://www.si.edu>

Looking through this site, which will provide access to many of the enormous resources of the Smithsonian, offers a sense of the biological diversity that is threatened by humans' unsound environmental policies and practices.

22. Tennessee Green

<http://kornet.org/tngreen/>

Visit this site to find a wealth of information related to sustainability and ways that we can "lighten our load on the environment." It provides links to other environmental sites and guidance to articles and books.

23. World Wildlife Federation

<http://www.wwf.org>

This home page of the WWF leads to an extensive array of links to information about endangered species, wildlife management and preservation, and more. It provides many suggestions for how to take an active part in protecting the biosphere.

Resources: Land, Water, and Air

24. Global Climate Change

<http://www.puc.state.oh.us/consumer/gcc/index.html>

PUCO (Public Utilities Commission of Ohio) aims for this site to serve as a clearinghouse of information related to global climate change. Its extensive links provide for explanation of the science and chronology of global climate change, acronyms, definitions, and more.

25. National Oceanic and Atmospheric Administration

<http://www.noaa.gov>

Through this home page of NOAA, part of the U.S. Department of Commerce, find information about coastal issues,

fisheries, climate, and more. The site provides many links to research materials and other Web resources.

26. National Operational Hydrologic Remote Sensing Center

<http://www.nohrsc.nws.gov>

Flood images are available at this site of the NOHRSC, which works with the U.S. National Weather Service to track weather-related information.

27. Virtual Seminar in Global Political Economy/Global Cities & Social Movements

<http://csf.colorado.edu/gpe/gpe95b/resources.html>

This site of Internet resources is rich in links to subjects of interest in regional environmental studies, covering topics such as sustainable cities, megacities, and urban planning. Links to many international nongovernmental organizations are included.

28. Websurfers Biweekly Earth Science Review

<http://shell.rmi.net/~michaelg/index.html>

This is a biweekly compilation of Internet sites devoted to the terrestrial and planetary sciences. It includes a list of hyperlinks to related earth science sites and news items. A great deal of information about climate and the atmosphere can be found here.

Pollution: The Hazards of Growth

29. IISDnet

<http://iisd1.iisd.ca>

This site of the International Institute for Sustainable Development, a Canadian organization, presents information through links on business and sustainable development, developing ideas, and Hot Topics. Linkages is its multimedia resource for environment and development policymakers.

30. School of Labor and Industrial Relations: Hot Links

<http://www.lir.msu.edu/hotlinks/>

This Michigan State University SLIR page goes to sites regarding industrial relations throughout the world. It has links to U.S. government statistics, newspapers and libraries, international intergovernmental organizations, and more. With this level of access, it should be possible to research virtually every labor and industrial relations topic of relevance in environmental studies.

31. Space Research Institute

<http://arc.iki.rssi.ru/Welcome.html>

For a change of pace, browse through this home page of Russia's Space Research Institute for information on its Environment Monitoring Information Systems, the IKI Satellite Situation Center, and its Data Archive.

32. Worldwatch Institute

<http://www.worldwatch.org>

The Worldwatch Institute is dedicated to fostering the evolution of an environmentally sustainable society in which human needs are met without threatening the health of the natural environment. This site provides access to *World Watch Magazine* and *State of the World 2000*. Click on Alerts and Press Briefings for discussions of current problems.

We highly recommend that you review our Web site for expanded information and our other product lines. We are continually updating and adding links to our Web site in order to offer you the most usable and useful information that will support and expand the value of your Annual Editions. You can reach us at:
<http://www.dushkin.com/annualeditions/>.