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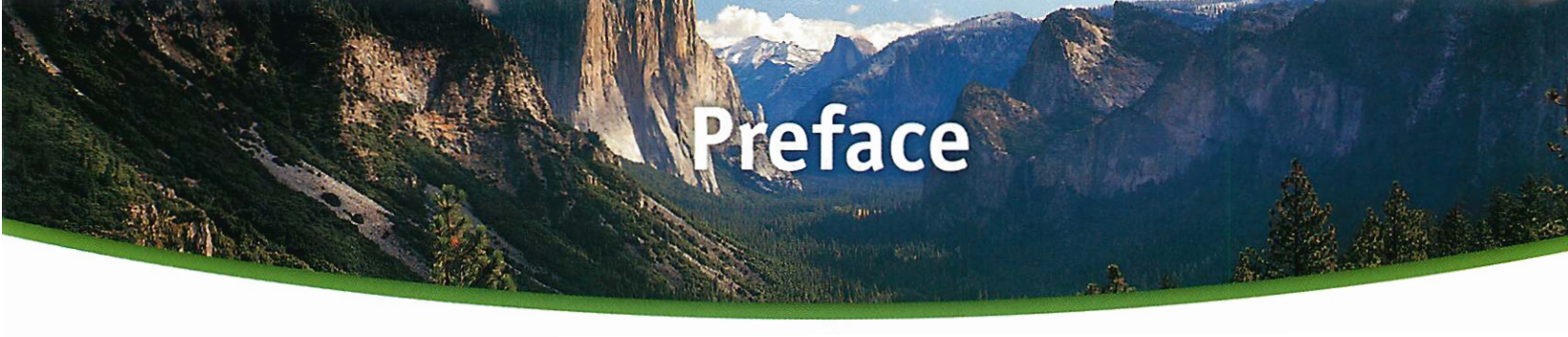
List of Case Studies



Preface

Renewed Passion for Environmental Science

A new energy is invigorating the environmental movement. Analysts once said that environmentalism is dead, but now a diverse, savvy, and passionate movement is taking shape. The need for environmental science education has never been greater as the mounting evidence of environmental threats has become impossible to ignore. Meanwhile, scientists are finding better ways to interpret and explain research results, activists are discovering new approaches for shaping public policy, and the general public is awaking to the importance of clean water and clear air. In the United States, hundreds of colleges, communities, and local governments are working to reduce carbon emissions and to use energy efficiently. More than 400 bills have been passed in 40 states to require renewable energy or to otherwise combat climate change.

Environmental science is truly a global concern. Even people in developing countries are demanding better protection of environmental quality. The Chinese government, for example, responding to thousands of citizen protests, has promised new policies that will promote renewable energy, clean surface waters, and improve air quality. It remains to be seen how well these ambitions will be met, but the dramatic changes in rhetoric, technology, and creativity are remarkable. Most importantly, environmental concern is not just a fringe movement involving efforts to protect and improve our common environment: it is business leaders finding ways to reduce costs by reducing waste, insurance companies concerned about rising sea levels, and inner-city communities trying to lower asthma rates in children. Major changes are occurring across the globe in the quest to save the critical resources that provide life and health to the environment. It's a wonderful time to be studying these issues and to prepare to play a role either as a practitioner or an informed citizen.

What Sets This Book Apart?

A Positive, Balanced Viewpoint

If students are to take the ideas of environmental science to heart, they need positive messages about ways all of us can contribute to a more sustainable world. This book presents the positive developments through introductory **case studies** at the beginning of each chapter, illustrating an important current issue to demonstrate how it relates to practical environmental concerns. Most of these case studies present optimistic examples in which people are working to find solutions to environmental problems. These stories also help to demystify scientific investigation and help students understand how scientists study complex issues. In addition to these introductory stories, case studies and examples of how scientists investigate our environment appear periodically throughout the book to reiterate the practical importance of these issues.

Integrated Approach Emphasizing Sustainability

Environmental problems and their solutions occur at the intersection of natural systems and the human systems that manipulate the natural world. In this book we present an **integrated approach** to physical sciences—biology, ecology, geology, air and water resources—and to human systems that affect nature—food and agriculture, population growth, urbanization, environmental health, resource economics, and policy. Although it is tempting to emphasize purely natural systems, we feel that students can never understand why coral reefs are threatened or why tropical forests are being cut down if they don't know something about the cultural, economic, and political forces that shape our decisions.

Current and Accurate Data

Throughout this book, we present up-to-date tables and graphs with the most current available data. We hope this data will give students an appreciation of the kinds of information available in environmental science. Among the sources we have called upon here are geographic information systems (GIS) data and maps, current census and population data, international news and data sources, and federal data collection agencies. Every chapter in this book has numerous updates that reflect recent events in energy, food, climate, population trends, and other important issues.

Active Learning and Critical Thinking

Learning how scientists approach problems can help students develop habits of independent, orderly, and objective thought. But it takes active involvement to master these skills. *Principles of Environmental Science* integrates numerous learning aids that will encourage students to think for themselves. Data and interpreta-