

Contemporary Environmental Issues

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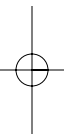
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For my son, Liam
Isn't this a marvelous planet?



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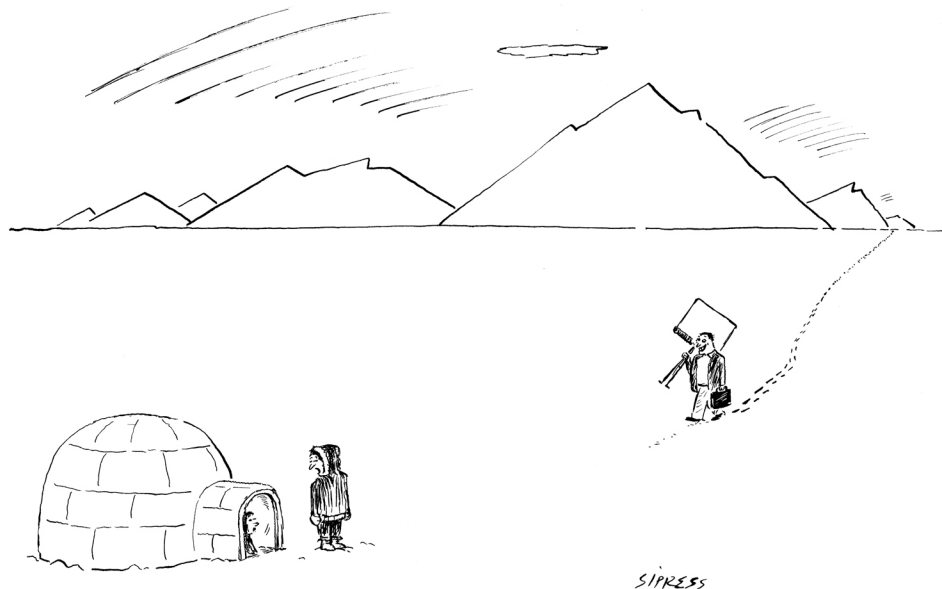
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Preface

Our relationship with the Earth is changing at an unprecedented rate. The pace of change is accelerating not only from our advancing technology, but from world population growth, economic growth, and increasingly frequent collisions between expanding human demands and the limits of the Earth's natural systems. Scientists now say we are in a new stage of the Earth's history, the Anthropocene Epoch, when we humans have become the globe's principal agent of change. We frequently hear that current global consumption levels could result in a large-scale ecosystem collapse by the middle of the century, and that environmental catastrophe looms ahead unless major changes are made in a short period of time.

Whether or not current human pressure on the Earth's ecosystems threatens our future as a species, one thing seems certain: we cannot continue to consume at northern levels indefinitely. To begin to shift towards a "sustainable society" scenario requires significant action now on a range of issues. Fortunately, people are capable of changing their



"It's Al Gore."

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x Preface

behaviors and values. Often these changes stem from exposure to new information or experiences. I have seen this first-hand in Costa Rica, where I take students from my university on a three-week trip each spring. Here, they get to see widespread environmental degradation (deforestation, soil erosion, and overgrazed landscapes) juxtaposed against pristine rainforests teeming with wildlife. Many begin to grasp, for the first time, the extent of our impact on the Earth's ecosystems, as well as the challenges we face in trying to strike a balance between development and conservation.

I believe everyone should be exposed to such information and experiences, because it develops a level of environmental literacy that is necessary for dealing with the challenges of the 21st century. The sad truth, however, is that environmental literacy is almost nonexistent in formal education. At most universities, undergraduates are required to take a set of common courses—chemistry, physics, calculus, English, etc.—that make up a “core” of the degree plan. Hardly anywhere do you see a required course in global environmental issues, although issues related to the environment affect each of us in our daily lives. I believe every citizen should become fluent in the principles of environmental science, demonstrating a working knowledge of the basic grammar and underlying concepts of environmental wisdom. This book has been written with this goal in mind.

Why am I writing yet another environmental book when so many exist on the market? In short, I believe this book is different. Most of the traditional introductory texts are too broad, attempt to do too much, and have, in my opinion, become “environmental encyclopedias” that are laden with too many facts about the environment. I have tried several textbooks in my introductory course over the past decade, and during this time, I have become increasingly frustrated with students having to spend in excess of \$100 for these books when we only cover half of the material in a typical 15-week semester course. A lot of the time, the best value students get out of a book is the money they receive when they sell it back to the bookstore! What I really wanted to create was a book that presents a candid analysis of the top environmental issues the world currently faces: one that was inexpensive, informative, and made students *think* about how the environment affects their lives and how their actions affect the environment. I always half-jokingly said I wanted a book that students could read in the bathtub. More importantly, I wanted a book that they would *want* to keep after the course is over!

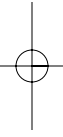
This book covers ten issues that I believe are the most pressing environmental issues today: population growth, energy, atmospheric pollution, ozone depletion, global warming, deforestation, biodiversity loss, soil degradation, water quantity and quality, and our ecological footprint. I chose them after surveying the environmental studies faculty at my university, asking them a simple question: What environmental issues do we want our students—all our students, and not just environmental science majors—to be conversant in? Interestingly, there was almost unanimous agreement among the faculty on the issues, with one or two personal interest topics emerging. It is not an exhaustive list, nor is it meant to be. Rather, my approach to writing the book was to cover these key issues and cover them well, providing the current state of scientific knowledge, yet written at a level that is digestible by the non-science major. However, adequate solutions to environmental problems also require well-informed ethical, aesthetic, political, and cultural perspectives, in addition to basic science and economics, and I have attempted to weave these perspectives throughout the text. The following questions, in particular, are ones that I would like you to think about as you read the material:

1. What (if any) are the ethical responsibilities of humans relating to the natural environment?
2. What is the role of science in the environmental debate?
3. Is scientific research value-neutral?
4. Does nature have intrinsic value?
5. Are there ethical principles that constrain how we use resources and modify our environment?
6. How do we achieve a balance between human values and interests and our obligations and responsibilities to nature?

In summary, it is my hope that upon completion of this book, you will: (1) understand the complexity of the delicately-balanced processes that shape the natural world; (2) understand the need to make informed and responsible decisions with regard to the development of the Earth; and (3) appreciate the notion of humans as the dominant species and the consequences of human-induced changes to the environment.

A NOTE ABOUT THE DIAGRAMS

As you flip through the pages of this book, you will no doubt notice that there are very few photographs of soon-to-be extinct species or pollution pouring into our atmosphere or waterways. You can find any number of those online or in the numerous glossy color texts that are on the market or in libraries. Instead, the majority of the diagrams in this book are conceptual figures and data-rich graphs from the scientific literature that have been simplified and redrawn to *tell the story*. The illustrations convey important ideas—such as the relationship between carbon dioxide concentration and global warming projections, or between the amount of land required to feed humanity, population growth, and rates of soil loss. Some illustrations may seem light-hearted, but they have all been chosen specifically to either inform or simply inspire. For ones that don't reproduce well and black and white, we will keep an updated collection on our institute's homepage; please go to <http://www.ensc.tcu.edu> for the link.



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