

The background of the cover is a photograph of a forest. The top half is a semi-transparent grey overlay where the title and subtitle are placed. The bottom half shows a dense forest of tall, thin trees, likely redwoods or sequoias, with a person visible in the distance on the left side. The lighting is soft, suggesting a misty or overcast day.

# Environmental and Natural Resources Economics

Theory, Policy, and the Sustainable Society

FOURTH EDITION

Steven C. Hackett

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Theory, Policy, and the Sustainable Society

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Foreword by Michael C. Moore



Steven C. Hackett

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## Foreword to the Fourth Edition

This new edition of Professor Hackett's *Environmental and Natural Resources Economics* textbook illustrates the enduring power of economic principles to adapt—and be adapted—to changing information, institutions, and most of all, to an emerging understanding of the importance of the environment and its response to human activity. Here, Professor Hackett has elucidated for us the synthesis of economic and environmental principles, as well as the modeling tools essential to shaping public policies capable of promoting long-term sustainable outcomes. The importance of this role cannot be overstated; it is the fundamental need to adjust, respond, and continuously improve the intellectual products we offer society.

The world of economics, especially the branch that deals with environmental and market regulation, reflects a world of tension, conflict, and incomplete resolution, striving for equilibrium or balance, if only briefly. Normally, students arrive at this point in their education having confronted a formal introduction to microeconomic theory and some grounding in macroeconomics and fiscal policy. At every step along the way, they are exposed to the word “policy,” but they rarely get to see the implications of the use, misuse, misunderstanding, manipulation, and challenges of that word in the context of real markets, real environmental or social market failure—in sum, real decision making.

Policy-driven markets (such as for pollution allowances in the context of cap and trade) have become increasingly complex, in part due to the institutional frameworks that guide them. Simultaneously, the trade-offs involved in decision making, especially in the collision of environmental systems and economic development, have become less clear, and the consequences of failure or delay in enacting policies or defining relative values have become more costly. In this arena time matters, but in the end it won't matter at all if we experience institutional and regulatory failure while trying to avoid addressing these emerging problems.

The centerpiece of understanding these issues remains the concepts of benefit/cost analysis, discounting, and the role of regulation, seen not only from the development point of view, but in the responsibility of effective, transparent policymaking. Here, it is no secret that the time frame utilized for decision making has been growing shorter and shorter since the later part of the twentieth century. Elected officials and policymakers have begun to see issues, problems, and the solutions to them in light of brief terms of office or worse, as something that will not be harmed or

weakened if pushed off to some future time. The phrase “Let the next administration deal with this” has become more than a dismissive jocular reference.

This passion play has all the ingredients of future catastrophic upsets. Identifying and preserving future options is a fundamental human characteristic. Preserving or reserving options is not free, however, and as Professor Hackett points out, we often run the risk of loss by failing to understand the embedded cost of waiting, of loss of initiative.

This edition improves our understanding of the interaction of regulation, environmental accounting, and the notion of options, pricing, and the influence of externalities, giving the student an opportunity to see more of the connection between the microeconomics, planning, and regulatory oversight—in other words, the everyday trade-offs of applied policy development.

This is a new and exciting way to meld economics and environmental science and policy. From Arthur Pigou to William Baumol and David W. Pearce, economists have painstakingly built the edifice of policy from the bricks of market-based regulatory instruments. Now it is clear that we desperately need the most refined and reliable of those tools simply to make it through to the next century. Professor Hackett takes us on a journey to understand the subtleties of translating the theories of these control instruments into active programs where tradable pollution allowances and environmental taxes and subsidies play key roles in shaping public policy. More important, he demonstrates with simple clarity how to measure, appreciate, and apportion the costs, with an understanding of who should and who ultimately does bear those costs in relation to the benefits they generate.

For instance, as Professor Hackett points out, in the context of regulating pollution we have created new and radically different types of allowance markets. In these markets, allowed emissions are scarce and therefore valuable. In essence, the act of regulation has created a fungible and tradable good. This in turn leads us to new markets, not only for core goods, but for their attributes as well. In this way, the author develops the idea of environmental science and economics beginning the transition to more imaginative, flexible, and long-lasting policy development.

This book brings rigorous description and analysis for the reader of some of the most intractable issues of our age, revealing a systematic and consistent approach to understanding conflicts, not only in fundamental decision making but regarding the reliability of data and information underlying public policy actions as well. More than anything, however, the fourth edition of *Environmental and Natural Resources Economics* is about listening, honing skills, and developing new techniques, especially in the areas of effective public policy. The central tenet, however, is the need to apply classic economic tools to the process of adaptation. This edition offers clear and practical insight into the evolution of economics in the face of uncertainty.

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PhD (Cantab.)  
June 2010  
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# Preface

The core principle guiding the fourth edition of *Environmental and Natural Resources Economics* is the balance of accessibility, breadth, and rigor. The goal is to provide a valuable learning experience for students in academic programs that include economics as well as environmental science, environmental studies, natural resource planning, and natural resources management. This latest edition of the textbook reflects more than 15 years of classroom testing and input from students and fellow instructors alike. Instructors can package different combinations of chapters for use in both undergraduate and interdisciplinary graduate courses.

The textbook is designed to be adaptable to a variety of curricula and pedagogies. The first three chapters provide an introduction to economics, values, and markets, and are suitable preparation for students having no prior study of microeconomic principles. Chapters 1–11 can be used for a traditional one-semester undergraduate environmental and natural resources economics course that may include economics majors but may also include students with no prior experience with economics. Those who are teaching a more introductory course can skip the mathematical models on dynamic efficiency in Chapter 5 and the bioeconomics of a marine capture fishery in Chapter 6, and instead focus on concepts. A nontraditional undergraduate general education course on the economics of a sustainable society can be built around Chapters 12–16, along with additional outside readings. In a graduate course I usually supplement this textbook with original readings from the scholarly literature, and I frequently assign spreadsheet simulation problems that can be used to reveal the moving parts and sensitivity of the models developed in this textbook.

There are a number of ways that this textbook differs from others on the same topic. One is that this book makes extensive use of citations to the scholarly literature, so that students can identify primary material for outside reading and for developing research papers. In addition, the narrative is written to provide an intellectually appealing level of depth while maintaining accessibility. Chapter 2 of this edition provides a broader coverage of value systems, ethics, and their relationship with economics and public policy. Still other distinguishing features include the extensive coverage of sustainability issues in Chapters 12–16, and the links to Internet resources in each chapter.

Each chapter has undergone comprehensive updating and revision for this fourth edition. Some chapters, such as those on benefit/cost analysis (Chapter 7), incen-

tive regulation (Chapter 10), and climate change (Chapter 11), have been nearly completely rewritten and updated. Additional explanatory material on consumer choice theory and market demand was also added (Chapter 3). Much of the more complex material regarding externalities (Chapter 4) and dynamic efficiency (Chapter 5) was reworked to enhance clarity and accessibility. The presentation on natural resources and common-pool resources (Chapter 5) has also been enhanced. The material on fisheries economics and policy (Chapter 6) and on promoting compliance with environmental law (Chapter 9) has been substantially revised and updated. Likewise, the content addressing interdependencies (Chapter 13) has been updated, and the presentation on weak sustainability (Chapter 14), renewable energy (Chapter 15), and local economic development (Chapter 16) has been revised to enhance clarity.

Other changes implemented in the fourth edition affect the entire textbook. Those who used earlier editions will notice a larger, more “textbook-like” format that should improve its look and feel for students. There are substantially more tables and figures than in previous editions, and the figures are now in color. Those who are new to environmental and natural resources economics must develop a large new technical vocabulary, and the fourth edition’s glossary has been substantially expanded and streamlined for this purpose. We have also added a new feature to this edition—definitions from the glossary are now included in the margins of each chapter where the concepts are first introduced. Readers new to the subject will likely find that these marginal definitions enhance accessibility. In addition, each chapter of the fourth edition includes a new *You Decide* feature designed to foster classroom conversation and debate on important or controversial issues relating to the subject matter. Course instructors can also access PowerPoint slides for each chapter at <http://www.mesharpe-instructor.com>.

In writing each edition of this textbook over the years, I have benefited from considerable feedback and many good ideas from students who have read the book and from colleagues who have used the book in their courses. For the fourth edition I would like to thank the students in my Environmental and Natural Resources Economics class, and my Economics of a Sustainable Society class. After more than two decades of teaching, I still draw my best inspiration from my students, and I continue to learn from them as well. I would like to thank student research assistants Carmen King, Tai-Aqua Morgan-Marbet, Jing Cao, and Keith Rice, and colleagues Arne Jacobson, Dan Ihara, and Jim Roumasset. Special thanks to my friend and colleague Michal Moore for writing the moving and inspirational Foreword to this textbook. I am particularly grateful for the vision and support of my editor, Lynn Taylor, and for the thoughtful suggestions of copyeditor Barbara Bigelow, and production editor Stacey Victor. As always I am most thankful for the gift of time and support from my family, and particularly from my wife, Mary.

Steve Hackett  
Arcata, California

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