

Foundations Of Ecology Classic Papers With Commentaries

Macroecology is an approach to science that emphasizes the description and explanation of patterns and processes at large spatial and temporal scales. Some scientists liken it to seeing the forest through the trees, giving the proverbial phrase an ecological twist. The term itself was first introduced to the modern literature by James H. Brown and Brian A. Maurer in a classic 1995 study, Macroecology, that is credited with inspiring the broad-scale subfield of ecology. But as with all subfields, many modern-day elements of macroecology are implicit in earlier works dating back decades, even centuries. Foundations of Macroecology charts the evolutionary trajectory of these concepts—from the species-area relationship and the link between richness to the relationship between body size and metabolic rate—through forty-six landmark papers originally published between 1920 and 1998. Divided into two parts—“Macroecology before Macroecology” and “Dimensions of Macroecology”—the collection also takes the long view, with each paper accompanied by an original commentary from a contemporary ecologist who provides a broader context and explains its foundational role. Providing a solid, coherent assessment of the history, current state, and potential future of the field, Foundations of Macroecology will be an essential text for students and teachers of ecology alike.

The first history of population ecology traces two generations of science and scientists from the opening of the twentieth century through 1970. Kingsland chronicles the careers of key figures and the field’s theoretical, empirical, and institutional development, with special attention to tensions between the descriptive studies of field biologists and later mathematical models. The book includes a new afterword that brings the book up to date, with special attention to the rise of “the new natural history” and debates about ecology’s future as a large-scale scientific enterprise.

Approximately 99% of all life that has ever existed is extinct. Fortunately, these long dead species have left traces of their lives and interactions with other species in the rock record that paleoecologists use to understand how species and ecosystems have changed over time. This record of past life allows us to study the dynamic nature of the Earth and gives context to the challenges. This book brings together forty-four classic papers published between 1924 and 1999 that trace the origins and development of paleoecology. The articles cross taxonomic groups, habitat types, geographic areas, and time and have made substantial contributions to our knowledge of the evolution of life. Encompassing the full breadth of paleoecology, it covers community and ecosystem dynamics, community reconstruction, diversity dynamics, paleoenvironmental reconstruction, species interaction, and taphonomy. Each paper is also introduced by a contemporary expert who gives context and explains its importance to ongoing paleoecological research. A comprehensive introduction to the field, Foundations of Paleoeology is an essential reference for new students and established paleoecologists alike.

Beginning with Darwin’s work in the 1870s, Foundations of Animal Behavior selects the most important works from the discipline’s first hundred years—forty-four classic papers—and presents them in facsimile, tracing the development of the field. These papers are classics because they either founded a line of investigation, established a basic method, or provided a new conceptual orientation, and communication; and the evolution of behavior. This outstanding collection will serve as the basis for undergraduate and graduate seminars and as a reference for researchers in animal behavior, whether they focus on ethology, behavioral ecology, comparative psychology, or anthropology. Published in association with the Animal Behavior Society

Spinning the Semantic Web
Foundations of Macroecology
Ecology for Conservationists
Relentless Evolution
And Sketches Here and There
Bryozoan Evolution
“Society for Ecological Restoration”---Cover.

Freshwater Ecology, Second Edition, is a broad, up-to-date treatment of everything from the basic chemical and physical properties of water to advanced unifying concepts of the community ecology and ecosystem relationships as found in continental waters. With 40% new and expanded coverage, this text covers applied and basic aspects of limnology, now with more emphasis on wetlands and reservoirs than in the previous edition. It features 80 new and updated figures, including a section of color plates, and 500 new and updated references. The authors take a synthetic approach to ecological problems, teaching students how to handle the challenges faced by contemporary aquatic scientists. This text is designed for undergraduate students taking courses in Freshwater Ecology and Limnology and introductory graduate students taking courses in Freshwater Ecology and Limnology. Expanded revision of Dodds' successful text. New boxed sections provide more advanced material within the introductory, modular format of the first edition. Basic scientific concepts and environmental applications featured throughout. Added coverage of climate change, ecosystem function, hypertrophic habitats and secondary production. Expanded coverage of physical limnology, groundwater and wetland habitats. Expanded coverage of the toxic effects of pharmaceuticals and endocrine disruptors as freshwater pollutants More on aquatic invertebrates, with more images and pictures of a broader range of organisms Expanded coverage of the functional roles of filterer feeding, scraping, and shredding organisms, and a new section on omnivores. Expanded appendix on standard statistical techniques. Supporting website with figures and tables -
http://www.elsevierdirect.com/companion.jsp?ISBN=9780123747242

Why do species live where they live? What determines the abundance and diversity of species in a given area? What role do species play in the functioning of entire ecosystems? All of these questions share a single core concept—the ecological niche. Although the niche concept has fallen into disfavor among ecologists in recent years, Jonathan M. Chase and Mathew A. Leibold argue that the niche is an ideal tool with which to unify disparate research and theoretical approaches in contemporary ecology. Chase and Leibold define the niche as including both what an organism needs from its environment and how that organism’s activities shape its environment. Drawing on the theory of consumer–resource interactions, as well as its graphical analysis, they develop a framework for understanding niches that is flexible enough to include a variety of small- and large-scale processes, from resource competition, predation, and stress to community structure, biodiversity, and ecosystem function. Chase and Leibold’s synthetic approach will interest ecologists from a wide range of subdisciplines.

When we want advice from others, we often casually speak of “getting some feedback.” But how many of us give a thought to what this phrase means? The idea of feedback actually dates to World War II, when the term was developed to describe the dynamics of self-regulating systems, which correct their actions by feeding their effects back into themselves. By the early 1970s, feedback had become the governing trope for a counterculture that was reoriented and reinvigorated by ecological thinking. The Culture of Feedback digs deep into a dazzling variety of left-of-center experiences and attitudes from this misunderstood period, bringing us a new look at the wild side of the 1970s. Belgrad shows us how ideas from systems theory were taken up by the counterculture and the environmental movement, eventually influencing a wide range of beliefs and behaviors, particularly related to the question of what is and is not intelligence. He tells the story of a generation of Americans who were struck by a newfound interest in—and respect for—plants, animals, indigenous populations, and the very sounds around them, threading his tapestry with cogent insights on environmentalism, feminism, systems theory, and psychedelics. The Culture of Feedback repaints the familiar image of the ’70s as a time of Me Generation malaise to reveal an era of revolutionary and hopeful social currents, driven by desires to radically improve—and feed back into—the systems that had come before.

Classic Papers with Commentaries
Species Diversity in Space and Time
Nature, Culture, and Literature in America

Foundations of Ecology
Foundations of Tropical Forest Biology
Metacommunity Ecology

Invasion ecology is the study of the causes and consequences of the introduction of organisms to areas outside their native range. Interest in this field has exploded in the past few decades. Explaining why and how organisms are moved around the world, how and why some become established and invade, and how best to manage invasive species in the face of global change are all crucial issues that interest biogeographers, ecologists and environmental managers in all parts of the world. This book brings together the insights of more than 50 authors to examine the origins, foundations, current dimensions and potential trajectories of invasion ecology. It revisits key tenets of the foundations of invasion ecology, including contributions of pioneering naturalists of the 19th century, including Charles Darwin and British ecologist Charles Elton, whose 1958 monograph on invasive species is widely acknowledged as having focussed scientific attention on biological invasions.

Five books have had a greater impact than A Sand County Almanac, which many credit with launching a revolution in land management. Written as a series of sketches based principally upon the flora and fauna in a rural part of Wisconsin, the book, originally published by Oxford in 1949, gathers informal pieces written by Leopold over a forty-year period as he traveled through the woodlands of Wisconsin, Iowa, Arizona, Sonora, Oregon, Manitoba, and elsewhere; a final section addresses the philosophical issues involved in wildlife conservation. Beloved for its description and evocation of the natural world, Leopold’s book, which has sold well over 2 million copies, remains a foundational text in environmental science and a national treasure.

How to learn population biology. Population genetics. Ecology. Biogeography: species equilibrium theory.

An exploration of why we play video games despite the fact that we are almost certain to feel unhappy when we fail at them. We may think of video games as being “fun,” but in The Art of Failure, Jesper Juul claims that this is almost entirely mistaken. When we play video games, our facial expressions are rarely those of happiness or bliss. Instead, we frown, grimace, and shout in frustration as we lose, or die, or fail to advance to the next level. Humans may have a fundamental desire to succeed and feel competent, but game players choose to engage in an activity in which they are nearly certain to fail and feel incompetent. So why do we play video games even though they make us unhappy? Juul examines this paradox. In video games, as in tragic works of art, literature, theater, and cinema, it seems that we want to experience unpleasantness even if we also dislike it. Reader or audience reaction to tragedy is often explained as catharsis, as a purging of negative emotions. But, Juul points out, this doesn’t seem to be the case for video game players. Games do not purge us of unpleasant emotions; they produce them in the first place. What, then, does failure in video game playing do? Juul argues that failure in a game is unique in that when you fail in a game, you (not a character) are in some way inadequate. Yet games also motivate us to play more, in order to escape that inadequacy, and the feeling of escaping failure (not by improving skills) is a central enjoyment of games. Games, writes Juul, are the art of failure: the singular art form that sets us up for failure and allows us to experience it and experiment with it. The Art of Failure is essential reading for anyone interested in video games, whether as entertainment, art, or education.

Invasion Ecology
Ecological Niches
Chance and Change
Foundations of Ecological Resilience
Foundations of Biogeography

Ecological Statistics
This flexible laboratory manual contains nearly 60 exercises involving small-scale ecological systems that can be conducted within a weekly lab period right on campus, regardless of the weather or resources available. Each chapter describes an ecological concept, and provides a choice of exercises involving outdoor observation and measurement, hands-on modeling, small-scale laboratory systems, biological collections, problem sets or computer-based analyses. In order to help build quantitative and critical thinking skills, record sheets, graphs, and calculation pages are provided as needed for in-class data analysis. Question sets are provided in each chapter, and computer step-by-step instructions walk through standard mathematical models and commonly used statistical methods. Suggestions for further investigation present each topic as an open-ended subject of inquiry.”-- book cover.

Ecological resilience provides a theoretical foundation for understanding how complex systems adapt to and recover from localized disturbances like hurricanes, fires, pest outbreaks, and floods, as well as large-scale perturbations such as climate change. Ecologists have developed resilience theory over the past three decades in an effort to explain surprising and nonlinear dynamics of complex adaptive systems. Resilience theory is especially important to environmental scientists for its role in underpinning adaptive management approaches to ecosystem and resource management. Foundations of Ecological Resilience is a collection of the most important articles on the subject of ecological resilience—those writings that have defined and developed basic concepts in the field and help explain its importance and meaning for scientists and researchers. The book’s three sections cover articles that have shaped or defined the concepts and theories of resilience, including key papers that broke new conceptual ground and contributed novel ideas to the field; examples that demonstrate ecological resilience in a range of ecosystems; and articles that present practical methods for Resilience. This book will be suitable for students, academics and scholars of law, philosophy, politics, international relations and economics.

The application and interpretation of statistics are central to ecological study and practice. Ecologists are now asking more sophisticated questions than in the past. These new questions, together with the continued growth of computing power and the availability of new software, have created a new generation of statistical techniques. These have resulted in major recent developments in both our understanding and practice of ecological statistics. This novel book synthesizes a number of these changes, addressing key approaches and issues that tend to be overlooked in other books such as missing/censored data, correlation structure of data, heterogeneous data, and complex causal relationships. These issues characterize a large proportion of ecological data, but most ecologists’ training in traditional statistics simply does not provide them with adequate preparation to handle the associated challenges. Uniquely, Ecological Statistics highlights the underlying links among many statistical approaches that attempt to tackle these issues. In particular, it gives readers an introduction to approaches to inference, likelihoods, generalized linear (mixed) models, spatially or phylogenetically-structured data, and data synthesis, with a strong emphasis on conceptual understanding and subsequent application to data analysis. Written by a team of practicing ecologists, mathematical explanations have been kept to the minimum necessary. This user-friendly textbook will be suitable for graduate students, researchers, and practitioners in the fields of ecology, evolution, environmental statistics, and computational biology, who are interested in updating their statistical tool kits. A companion web site provides example data sets and commented code in the R language.

The Ecology of Human Development
Concepts and Environmental Applications of Limnology
Landscape Ecology in Theory and Practice

The Culture of Feedback
A Critique for Ecology

Presents a critical yet optimistic view of contemporary ecology.
Foundations of EcologyClassic Papers with CommentariesUniversity of Chicago Press

Habitat. Ecological succession. IV. Vegetation and the control of land animal communities / V.E. Shelford -- Nature and structure of the forest / G. Stewart and S.S. Hutchings -- The cover map in wildlife management / P.D. Dalke -- The individualistic concept of the plant association / H.A. Gleason -- Habitat selection / S.C. Wecker -- The comparison of usage and availability measurements for evaluating resource preference / D.H. Johnson. Human dimensions. Perceptions of animals in American society / S.R. Kellert -- Guidelines for authorship of scientific articles / J.G. Dickson, et al. -- Biodiversity studies: science and policy / R.R. Ehrlich and E.O. Wilson -- Human dimensions of living with wildlife: a management challenge for the 21st century / D.J. Decker and L.C. Chase -- Public attitudes toward a suburban deer herd / D.J. Decker and T.A. Gavin.

The end of a lifeboat and in the classroom, Chance and Change challenges many of the tenets of establishment ecology. Charging that many of the environmental movement has ignored or rejected the changes in thinking that have infiltrated ecological theory since the mid 70s, William Drury presents a convincing case that disorder is what makes the natural world work, and that clinging to romantic notions of nature’s grand design only saps the strength of the conservation movement. Drury’s training in botany, ecology, and zoology as well as his life-long devotion to work in the field gave him a depth and range of knowledge that few ecologists possess. This book opens our eyes to a new way of looking at the environment and our role in it. Chance and Change is intended for the serious amateur naturalist or professional conservationist. Drury argues that chance and change are the rule, that the future is as unpredictable to other organisms as it is to us, and that natural disturbance is too frequent for equilibrium models to be useful. He stresses the centrality of natural selection in explaining the meaning of biology and insists the book and the laboratory must be checked at all times against the real world. Written in an easy, personal style, Drury’s narrative comes alive with the landscape—the salt marshes, dunes, seashores, and forests—that he believed served as the best classroom. His novel approach of correlating landscape evolution with ecological principles offers a welcome corrective to discordance between what we observe in nature and what theory tells us we should see.

The Legacy of Charles Elton
Ecology
Hierarchy

Foundations of Environmental Sustainability
Bringing the World Wide Web to Its Full Potential
The Covolution of Science and Policy

A wide-ranging appraisal of environmental thought. It explores such topics as the history of ecology, radical science studies and ecology, the need for greater theoretical sophistication in ecocriticism, the dubious legacy of Thoreau, and the contradictions of contemporary nature writing.

This book presents a timely collection of pioneering work in the study of these diverse and fascinating ecosystems. It consists of facsimiles of papers chosen by world experts in tropical biology as the ‘classics’ in the field.

The authors argue that the growth pattern and form of the colony in many bryozoans is an adaptive strategy rather than a stable genetic character. “Bryozoan Evolution is profusely illustrated and has a bibliography of over 400 titles. It will find an appreciative audience of paleontologists, invertebrate zoologists, and ecologists thanks to its innovative and detailed evaluations of the roles of ecology, adaptive and functional morphology, life histories, biomechanics, developmental constraints, and chance on the evolution of the marine taxa of this speciose group.”—Russel L. Zimmer, Science “This book is an excellent source of information on the functional morphology and variety of colonial architecture in bryozoans, very well illustrated, and worth reading at least twice.”—Robert L. Anstey, Paleobiology “Even as one of the converted, I found the book a stimulating combination of paleobiology and ecology. In many ways it is a ‘teaser’—the authors suggest a number of interesting hypotheses, and can test only some of them. Perhaps most important, McKinney and Jackson provide a plethora of fascinating ideas and examples that demonstrate the potential of this group of animals, and that should stimulate more work.”—Michael S. Keough, TREE “This stimulating book is sure to promote further interest in bryozoans. It will appeal to biologists and paleontologists alike.”—Paul Taylor, Times Higher Education Supplement

An ideal text for students taking a course in landscape ecology. The book has been written by very well-known practitioners and pioneers in the new field of ecological analysis. Landscape ecology has emerged during the past two decades as a new and exciting effort of ecological study. Environmental problems such as global climate change, land use change, habitat fragmentation and loss of biodiversity have required ecologists to expand their traditional spatial and temporal scales and the widespread availability of remote imagery, geographic information systems, and desk top computing has permitted the development of spatially explicit analyses. In this new text book this new field of landscape ecology is given the first fully integrated treatment suitable for the student. Throughout, the theoretical developments, modeling approaches and results, and empirical data are merged together, so as not to introduce barriers to the synthesis of the various approaches that constitute an effective ecological synthesis. The book also emphasizes selected topic areas in which landscape ecology has made the most contributions to our understanding of ecological processes, as well as identifying areas where its contributions have been limited. Each chapter features questions for discussion as well as recommended reading.

An Essay on the Pain of Playing Video Games
Philosophical Foundations of Human Rights
The Art of Failure

Ecology on Campus
Foundations of Paleoeology
Freshwater Ecology

Foundations of Biogeography provides facsimile reprints of seventy-two works that have proven fundamental to the development of the field. From classics by Georges-Louis LeClerc Compte de Buffon, Alexander von Humboldt, and Charles Darwin to equally seminal contributions by Ernst Mayr, Robert MacArthur, and E. O. Wilson, these papers and book excerpts not only reveal biogeography’s historical roots but also trace its theoretical and empirical development. Selected and introduced by leading biogeographers, the articles cover a wide variety of taxonomic groups, habitat types, and geographic regions. Foundations of Biogeography will be an ideal introduction to the field for beginning students and an essential reference for established scholars of biogeography, ecology, and evolution. List of Contributors John C. Briggs, James H. Brown, Vicki A. Funk, Paul S. Giller, Nicholas J. Gotelli, Lawrence R. Heaney, Robert Hengeveld, Christopher J. Humphries, Mark V. Lomolino, Alan A. Myers, Brett R. Riddle, Dov F. Sax, Geerat J. Vermeij, Robert J. Whittaker

Biodiversity.
A guide to the Semantic Web, which will transform the Web into a structured network of resources organized by meaning and relationships.

This new edition of Invasion Ecology provides a comprehensive and updated introduction to all aspects of biological invasion by non-native species. Highlighting important research findings associated with each stage of invasion, the book provides an overview of the invasion process from transportation patterns and causes of establishment success to ecological impacts, invader management, and post-invasion evolution. The authors have produced new chapters on predicting and preventing invasion, managing and eradicating invasive species, and invasion dynamics in a changing climate. Modern global trade and travel have led to unprecedented movement of non-native species by humans with unforeseen, interesting, and occasionally devastating consequences. Increasing recognition of the problems associated with invasion has led to a rapid growth in research into the dynamics of non-native species and their adverse effects on native biota and human economies. This book provides a synthesis of this fast growing field of research and is an essential text for undergraduate and graduate students in ecology and conservation management. Additional resources are available at www.wiley.com/go/invasionecology

Essential Readings in Wildlife Management and Conservation
Foundations of Restoration Ecology

Ecological Thinking in Invertebrates America
Foundations of Ecology II
Primer Of Population Biology

Community Ecology
In Macroecology, James H. Brown proposes a radical new research agenda designed to broaden the scope of ecology to encompass vast geographical areas and very long time spans. While much ecological research is narrowly focused and experimental, providing detailed information that cannot be used to generalize from one ecological community or time period to another, macroecology draws on data from many disciplines to create a less detailed but much broader picture with greater potential for generalization. Integrating data from ecology, systematics, evolutionary biology, paleobiology, and biogeography to investigate problems that could only be addressed on a much smaller scale by traditional approaches, macroecology provides a richer, more complete understanding of how patterns of life have moved across the earth over time. Brown also demonstrates the advantages of macroecology for conservation, showing how it allows scientists to look beyond endangered species and ecological communities to consider the long history and large geographic scale of human impacts. An important reassessment of the direction of ecology by one of the most influential thinkers in the field, this work will shape future research in ecology and other disciplines. “This approach may well mark a major new turn in the road in the history of ecology, and I find it extremely exciting. The scope of Macroecology is tremendous and the book makes use of its author’s exceptionally broad experience and knowledge. An excellent and important book.”—Lawrence R. Heaney, Center for Environmental and Evolutionary Biology, the Field Museum
Community ecology has undergone a transformation in recent years, from a discipline largely focused on processes occurring within a local area to a discipline encompassing a much richer domain of study, including the linkages between communities separated in space (metacommunity dynamics), niche and neutral theory, the interplay between ecology and evolution (eco-evolutionary dynamics), and the influence of high-level processes in shaping patterns of biodiversity. To fully understand these new developments, however, students continue to need a strong foundation in the study of species interactions and how these interactions are assembled into food webs and other ecological networks. This new edition fulfills the book’s original aims, both as a much-needed up-to-date and accessible introduction to modern community ecology, and in identifying the important questions that are yet to be answered. This research-driven textbook introduces state-of-the-art community ecology to a new generation of students, adopting reasoned and balanced perspectives on as-yet-unresolved issues. Community Ecology is suitable for advanced undergraduates, graduate students, and researchers seeking a broad, up-to-date coverage of ecological concepts at the community level.

Metacommunity ecology links smaller-scale processes that have been the provenance of population and community ecology—such as birth-death processes, species interactions, selection, and stochasticity—with larger-scale issues such as dispersal and habitat heterogeneity. Until now, the field has focused on evaluating the relative importance of distinct processes, with niche-based environmental sorting on one side and neutral-based ecological drift and dispersal limitation on the other. This book moves beyond these artificial categorizations, showing how environmental sorting, dispersal, ecological drift, and other processes influence metacommunity structure simultaneously. Mathew Leibold and Jonathan Chase argue that the relative importance of these processes depends on the characteristics of the organisms, the strengths and types of their interactions, the degree of habitat heterogeneity, the rates of dispersal, and the scale at which the system is observed. Using this synthetic perspective, they explore metacommunity patterns in time and space, including patterns of coexistence, distribution, and diversity. Leibold and Chase demonstrate how these processes and patterns are altered by micro- and macroevolution, traits and phylogenetic relationships, and food web interactions. They then use this scale-explicit perspective to illustrate how metacommunity processes are essential for understanding macroecological and biogeographical patterns as well as ecosystem-level processes. Moving seamlessly across scales and subdisciplines, Metacommunity Ecology is an invaluable reference, one that offers a more integrated approach to ecological patterns and processes.

Foundations of Tropical Forest Biology presents a timely collection of pioneering work in the study of these diverse and fascinating ecosystems. Modeled on the highly successful Foundations of Ecology, this book consists of facsimiles of papers chosen by world experts in tropical biology as the “classics” in the field. The papers are organized into sections on related topics, each introduced with a discussion of their role in triggering subsequent research. Topics covered include ecological and evolutionary perspectives on the origins of tropical diversity; plant-animal interactions; patterns of species diversity and distribution of arthropods, vertebrates, and plants; forest dynamics and ecosystem ecology; conservation biology; and tropical forest management. Foundations of Tropical Forest Biology makes essential works in the development of tropical biology available in a convenient form to both senior scholars interested in the roots of their discipline and to students encountering the field for the first time, as well as to everyone concerned with tropical conservation.

Foundations of Animal Behavior
Macroecology
Contemporary Theory and Application

A Sand County Almanac
The Truth of Ecology
Pattern and Process

The classic papers that laid the foundations of modern ecology alongside commentaries by noted ecologists. The period of 1970 to 1995 was a time of tremendous change in all areas of ecology—from an increased rigor for experimental design and analysis to the reevaluation of paradigms, new models for understanding, and theoretical advances. Edited by ecologists Thomas E. Miller and Joseph Travis, Foundations of Ecology II includes facsimiles of forty-six papers from this period alongside expert commentaries that discuss a total of fifty-three key studies, addressing topics of diversity, predation, complexity, competition, coexistence, extinction, productivity, resources, distribution, abundance, and conservation. The result is more than a catalog of historic facts; this book offers diverse perspectives on the foundational papers that led to today’s ecological work. Like this book’s 1991 predecessor, Foundations of Ecology edited by Leslie A. Real and James H. Brown, Foundations of Ecology II promises to be the essential primer for graduate students and practicing ecologists for decades to come.

This book reviews and analyzes the period (roughly from the 1950s to the present) when the “environment” became an issue as important as economic growth, or war and peace, to address the current situation, and begin planning for the challenges that lie ahead. Most people are aware of both the environmental destruction taking place around the world and of the specter of climate change. The devastation of New Orleans by hurricane Katrina illustrates the potential for disaster when climate change is combined with the mismanaged environmental policy. How did we get to this point? What has been done and what can be done to avoid future environmental disasters? Thirty-two contributing chapter authors (among them, one of the principal drafters of the National Environmental Policy Act, Chief of the African Environment Division and the World Bank, Vice President of the Center for Conservation Innovation at the World Wildlife Fund, President of the Zoological Society of London, former President of the Ecological Society of America) use their unique, authoritative perspective to review the evolution of environmental science and policy in the past half century. Each author describes the evolution of environmental science and policy in the past half century and consider the challenges of the future. Although the authors of this book come from various fields, they have followed paths that have generally converged on the concept of sustainability. This book attempts to define what sustainability is, how we can achieve it, and what the prospects for sustainability in the future are.

Although complexity surrounds us, its inherent uncertainty, ambiguity, and contradiction can at first make complex systems appear inscrutable. Ecosystems, for instance, are nonlinear, self-organizing, seemingly chaotic structures in which individuals interact both with each other and with the myriad biotic and abiotic components of their surroundings across geographies as well as spatial and temporal scales. In the face of such complexity, ecologists have long sought tools to streamline and aggregate information. Among them, in the 1980s, T. F. H. Allen and Thomas B. Starr implemented a burgeoning concept from business administration: hierarchy theory. Cutting-edge when Hierarchy was first published, their approach to unraveling complexity is now integrated into mainstream ecological thought. This thoroughly revised and expanded second edition of Hierarchy reflects the assimilation of hierarchy theory into ecological research, its successful application to the understanding of complex systems, and the many developments in thought since. Because hierarchies and levels are habitual parts of human thinking, hierarchy theory has proven to be the most intuitive and tractable vehicle for addressing complexity. By allowing researchers to look explicitly at only the entities and interconnections that are relevant to a specific research question, hierarchically informed data analysis has enabled a revolution in ecological understanding. With this new edition of Hierarchy, that revolution continues.

At a glance, most species seem adapted to the environment in which they live. Yet species relentlessly evolve, and populations within species evolve in different ways. Evolution, as it turns out, is much more dynamic than biologists realized just a few decades ago. In Relentless Evolution, John N. Thompson explores why adaptive evolution never ceases and why natural selection acts on species in so many different ways. Thompson presents a view of life in which ongoing evolution is essential and inevitable. Each chapter focuses on one of the major problems in adaptive evolution: How fast is evolution? How strong is natural selection? How do species co-opt the genomes of other species as they adapt? Why does adaptive evolution sometimes lead to more, rather than less, genetic variation within populations? How does the process of adaptation drive the evolution of new species? How does coevolution among species continually reshape the web of life? And, more generally, how are our views of adaptive evolution changing? Relentless Evolution draws on studies of all the major forms of life—from microbes that evolve in microcosms within a few weeks to plants and animals that sometimes evolve in detectable ways within a few decades. It shows evolution not as a slow and stately process, but rather as a continual and sometimes frenetic process that favors yet more evolutionary change.

Linking Classical and Contemporary Approaches
The Evolution of Life Histories

Modeling Nature
Perspectives for Ecological Complexity
Fifty Years of Invasion Ecology

Assembled here for the first time in one volume are forty classic papers that have laid the foundations of modern ecology. Whether by posing new problems, demonstrating important effects, or stimulating new research, these papers have made substantial contributions to an understanding of ecological processes, and they continue to influence the field today. The papers span nearly nine decades of ecological research, from 1887 on, and are organized in six sections: foundational papers, theoretical advances, synthetic statements, methodological developments, field studies, and ecological experiments. Selections range from Connell’s elegant account of experiments with barnacles to Watt’s encyclopedic natural history, from a visionary exposition by Grinnell of the concept of niche to a seminal essay by Hutchinson on diversity. Six original essays by contemporary ecologists and a historian of ecology place the selections in context and discuss their continued relevance to current research. This combination of classic papers and fresh commentaries makes Foundations of Ecology both a convenient reference to papers often cited today and an essential guide to the intellectual and conceptual roots of the field. Published with the Ecological Society of America.