Eventually, you will very discovery a additional experience and ability by spending more cash. nevertheless when? pull off you undertake that you require to acquire those all needs subsequently having significantly cash? Why dont you attempt to acquire something basic in the beginning? Thats something that will guide you to comprehend even more roughly the globe, experience, some places, when history, amusement, and a lot more?

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Ecological Stoichiometry - Robert W. Sterner - 2017-02-15

All life is chemical. That fact underpins the developing field of ecological stoichiometry, the study of the balance of chemical elements in ecological interactions. This long-awaited book brings this field into its own as a unifying force in ecology and evolution. Synthesizing a wide range of knowledge, Robert Sterner and Jim Elser show how an understanding of the biochemical deployment of elements in organisms from microbes to metazoa provides the key to making sense of both aquatic and terrestrial ecosystems. After summarizing the chemistry of elements and their relative abundance in Earth’s environment, the authors proceed along a line of increasing complexity and scale from molecules to cells, individuals, populations, communities, and ecosystems. The book examines fundamental chemical constraints on ecological phenomena such as competition, herbivory, symbiosis, energy flow in food webs, and organic matter sequestration. In accessible prose and with clear mathematical models, the authors show how ecological stoichiometry can illuminate diverse fields of study, from metabolism to global change. Set to be a classic in the field, Ecological Stoichiometry is an indispensable resource for researchers, instructors, and students of ecology, evolution, physiology, and biogeochemistry. From the foreword by Peter Vitousek: “This book represents a significant milestone in the history of ecology. . . . Love it or argue with it—and I do both—most ecologists will be influenced by the framework developed in this book. . . . There are points to question here, and many more to test. . . . And if we are both lucky and good, this questioning and testing will advance our field beyond the level achieved in this book. I can’t wait to get on with it.”

Progress in Ecological Stoichiometry - Dedmer B. Van de Waal - 2002-10-01

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ecological-stoichiometry-the-biology-of-elements-from-molecules-to-the-biosphere
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Plant Ecology - Zubaaida Yousaf - 2017-09-06
This book is aimed to cover the phylogenetic and functional ecology with special reference to ecological shifts. I hope this book may benefit the students, fellow professors, and resource managers studying plant sciences. Since the topics stated in this book are not new but the issues and technologies mentioned were new to me, I expect that they will be new and equally advanced for the readers too. I encourage the readers to get out into the field to identify plants and to dig out the anthropogenic and social activities affecting plants to come along with the development of plant ecology; to rise and serve the topic of the enormous number of plants facing extinction; and to relish themselves and make some effort to contribute something to the world.

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Emerging Frontiers in Ecological Stoichiometry - Michelle Evans-White - 2020-01-16
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Ecosystem Homeostasis - P. Trojan - 1984-03-31
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Eco-Evolutionary Dynamics - 2014-08-12
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Phosphorus - Jim Elser - 2020-12-11
Phosphorus is essential to the production of our food, and it also triggers algal blooms in lakes, rivers, and oceans when it slips through our hands. An understanding of this essential resource and how we have used and misused it over the years is crucial to the sustainability of our well-being on our planet. In this book, world authorities on phosphorus sustainability Jim Elser and Phil Haygarth explain this element’s involvement in biology, human health and nutrition, food production, ecosystem function, and environmental sustainability. Phosphorus chronicles the sustainability challenges phosphorus both poses and solves in various contexts. The book begins with its discovery over 350 years ago, moving to its basic chemistry and the essential role it plays in all living things on Earth. Chapters go on to explain the rise in the usage of phosphorus in agriculture and how the increase in the mining of rock phosphate in the mid-20th century was essential for the Green Revolution. However, phosphorus emissions from human wastes and detergents triggered widespread algal blooms in the 1960s and 1970s. While such emissions have been brought under better control with wastewater treatment, diffuse emissions from farming continue to cause water quality degradation. The authors explain how these diffuse phosphorus emissions may worsen with climate change. In ten concise chapters, Elser and Haygarth offer engaging explanations of our historical use and abuse of phosphorus, including the phosphorus sustainability movement and new efforts to sustain food benefits of limited rock reserves following the phosphate rock price shock in 2007-2008. Highlighting new approaches for phosphorus, the two “Systems Innovators” turn toward the emerging set of sustainable phosphorus solutions necessary to achieve a sustainable “phosphoheaven” and avoid “phosphogeddon.” The book provides an insider’s take on this essential resource and why all of us need to wrestle with the wicked problems this element will cause, illuminate, or eliminate in years to come.

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Saproxylic Insects - Michael D. Ulyshen - 2018-05-21
This volume offers extensive information on insect life in dying and dead wood. Written and reviewed by leading experts from around the world, the twenty-five chapters included here provide the most global coverage possible and specifically address less-studied taxa and topics. An overarching goal of this work is to unite literature that has become fragmented along taxonomic and geographic lines. A particular effort was made to recognize the dominant roles that social insects (e.g., termites, ants and passalid beetles) play in saproxylic assemblages in many parts of the world without overlooking the non-social members of these communities. The book is divided into four parts: Part I “Diversity” includes chapters addressing the major orders of saproxylic insects (Coleoptera, Diptera, Hymenoptera, Hemiptera, Lepidoptera and Blattodea), broadly organized in decreasing order of estimated global saproxylic diversity. In addition to order-level treatments, some chapters in this part discuss groups of particular interest, including pollinators, hymenopteran parasitoids, ants, stag and passalid beetles, and wood-feeding termites. Part II “Ecology” discusses insect-fungal and insect-insect interactions.
complementarity, food webs, stability and complexity, material cycling, and metacommunities. Loreau describes
importance of primary forests for saproxylic insects, offers recommendations for conserving these organisms in
managed forests, discusses the relationships between saproxylic insects and fire, and addresses the value of tree
hollows and highly-decomposed wood for saproxylic insects. Utilization of non-native wood by saproxylic insects
and the suitability of urban environments for these organisms are also covered. Lastly, Part IV “Methodological
Advancements” highlights molecular tools for assessing saproxylic diversity. The book offers an accessible and
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From Populations to Ecosystems - Michel Loreau - 2010-07-01

The major subdisciplines of ecology—population ecology, community ecology, ecosystem ecology, and evolutionary
ecology—have diverged increasingly in recent decades. What is critically needed today is an integrated, real-world
approach to ecology that reflects the interdependency of biodiversity and ecosystem functioning. From Populations
to Ecosystems proposes an innovative theoretical synthesis that will enable us to advance our
fundamental understanding of ecological systems and help us to respond to today’s emerging global ecological
crisis. Michel Loreau begins by explaining how the principles of population dynamics and ecosystem functioning
can be merged. He then addresses key issues in the study of biodiversity and ecosystems, such as functional
complementarity, food webs, stability and complexity, material cycling, and metacommunities. Loreau describes
the major theoretical advances that link the properties of individual populations to the aggregate properties of
communities, and the properties of functional groups or trophic levels to the functioning of whole ecosystems,
placing special emphasis on the relationship between biodiversity and ecosystem functioning. Finally, he turns his
attention to the controversial issue of the evolution of entire ecosystems and their properties, laying the
theoretical foundations for a genuine evolutionary ecosystem ecology. From Populations to Ecosystems points the
way to a much-needed synthesis in ecology, one that offers a fuller understanding of ecosystem processes in the
natural world.

Encyclopedia of Aquatic Ecotoxicology - Jean-Francois Pérard - 2013-06-14

With its 104 chapters, this Encyclopedia of aquatic ecotoxicology reveals the diversity of issues, problems and
challenges that have faced, and are facing today, receiving environments. It also indicates ways by which tools,
techniques and future investigations can contribute to correct, minimize, solve and prevent water quality
degradation. Structured homogeneously, the chapters convey salient information on historical background,
features, characteristics, uses and/or applications of treated topics, often complemented by illustrations and case
studies, as well as by conclusions and prospects. This work is most suitable for teaching purposes. Academics, for
example, could literally deliver comprehensive lectures to students simply based on chapter outlines and contents.
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Handbook of Graphs and Networks - Stefan Bornholdt - 2006-03-06

Complex interacting networks are observed in systems from such diverse areas as physics, biology, economics,
ecology, and computer science. For example, economic or social interactions often organize themselves in
complex network structures. Similar phenomena are observed in traffic flow and in communication networks as
the internet. In current problems of the Biosciences, prominent examples are protein networks in the living cell,
as well as molecular networks in the genome. On larger scales one finds networks of cells as in neural networks,
up to the scale of organisms in ecological food webs. This book defines the field of complex interacting networks
in its infancy and presents the dynamics of networks and their structure as a key concept across disciplines. The
contributions present common underlying principles of network dynamics and their theoretical description and
are of interest to specialists as well as to the non-specialized reader looking for an introduction to this new
exciting field. Theoretical concepts include modeling networks as dynamical systems with numerical methods and
new graph theoretical methods, but also focus on networks that change their topology as in morphogenesis and
self-organization. The authors offer concepts to model network structures and dynamics, focussing on approaches
applicable across disciplines.

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ecological stoichiometry: the biology of elements from molecules to the biosphere 3/10
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Resolving Ecosystem Complexity (MPB-47) - Oswald J. Schmitz - 2010-07-01

An ecosystem’s complexity develops from the vast numbers of species interacting in ecological communities. The nature of these interactions, in turn, depends on environmental context. How do these components together influence an ecosystem’s behavior as a whole? Can ecologists resolve an ecosystem’s complexity in order to predict its response to disturbances? Resolving Ecosystem Complexity develops a framework for anticipating the ways environmental context determines the functioning of ecosystems. Oswald Schmitz addresses the critical questions contemporary ecologists ask: How should an ecosystem be conceptualized to blend its biotic and biophysical components? How should evolutionary ecological principles be used to derive an operational understanding of complex, adaptive ecosystems? How should the relationship between the functional biotic diversity of ecosystems and their properties be understood? Schmitz begins with the universal concept that ecosystems are comprised of species that consume resources and which are then resources for other consumers. From this, he deduces a fundamental rule or evolutionary ecological mechanism for explaining context dependency: individuals within a species trade off foraging gains against the risk of being consumed by predators. Through empirical examples, Schmitz illustrates how species use evolutionary ecological strategies to negotiate a predator-eat-predator world, and he suggests that the implications of species trade-offs are critical to making ecology a predictive science. Bridging the traditional divides between individuals, populations, and communities in ecology, Resolving Ecosystem Complexity builds a systematic foundation for thinking about natural systems.

Ecological Biochemistry - Gerd-Joachim Krauss - 2015-01-12

The first stand-alone textbook for at least ten years on this increasingly hot topic in times of global climate change and sustainability in ecosystems. Ecological biochemistry refers to the interaction of organisms with their abiotic environment and other organisms by chemical means. Biotic and abiotic factors determine the biochemical flexibility of organisms, which otherwise easily adapt to environmental changes by altering their metabolism. Sessile plants, in particular, have evolved intricate biochemical response mechanisms to fit into a changing environment. This book covers the chemistry behind these interactions, bottom up from the atomic to the system’s level. An introductory part explains the physico-chemical basis and biochemical roots of living cells, leading to secondary metabolites as crucial bridges between organisms and the respective ecosystem. The focus then shifts to the biochemical interactions of plants, fungi and bacteria within terrestrial and aquatic ecosystems with the aim of linking biochemical insights to ecological research, also in human-influenced habitats. A section is devoted to methodology, which allows network-based analyses of molecular processes underlying systems phenomena. A companion website offering an extended version of the introductory chapter on Basic Biochemical Roots is available at http://www.wiley.com/go/Krauss/Nies/EcologicalBiochemistry

Scaling in Ecology with a Model System - Aaron M. Ellison - 2021-08-03

“Scale - the understanding of ecological phenomena through levels of biological organization across time and space - is one of most important concepts in ecology. It is often challenging for ecologists to find systems that lend themselves to study across scales; however, Sarracenia, a pitcher plant indigenous to the eastern United States, is unique because it can be studied at a hierarchy of scales: individuals, communities, and whole ecosystems. Ecologists Aaron Ellison and Nicolas Gotelli have studied Sarracenia for decades and, in this book, they synthesize their research and show how this system can inform the broad and challenging question of scaling in ecology. The authors’ goal is to deepen the current understanding of major ecological processes, and how they operate across scales”--

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The Phytochemical Landscape - Mark D. Hunter - 2016-08-09

The dazzling variation in plant chemistry is a primary mediator of trophic interactions, including herbivory, predation, parasitism, and disease. At the same time, such interactions feed back to influence spatial and temporal variation in the chemistry of plants. In this book, Mark Hunter provides a novel approach to linking the trophic interactions of organisms with the cycling of nutrients in ecosystems. Hunter introduces the concept of the “phytochemical landscape”—the shifting spatial and temporal mosaic of plant chemistry that serves as the nexus between trophic interactions and nutrient dynamics. He shows how plant chemistry is both a cause and consequence of trophic interactions, and how it also mediates ecosystem processes such as nutrient cycling. Nutrients and organic molecules in plant tissues affect decomposition rates and the fluxes of elements such as carbon, nitrogen, and phosphorus. The availability of these same nutrients influences the chemistry of cells and tissues that plants produce. In combination, these feedback routes generate pathways by which trophic interactions influence nutrient dynamics and vice versa, mediated through plant chemistry. Hunter provides evidence from terrestrial and aquatic ecosystems for each of these pathways, and describes how a focus on the phytochemical landscape enables us to better understand and manage the ecosystems in which we live. Essential reading for students and researchers alike, this book offers an integrated approach to population-, community-, and ecosystem-level ecological processes.

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Emissions provides a state of the art overview of recent findings and future research challenges regarding predation, parasitism, and disease. At the same time, such interactions feed back to influence spatial and temporal variability in the abundance of species. In this book, Mark Hunter provides a novel approach to linking the trophic interactions of organisms with the cycling of nutrients in ecosystems. Hunter introduces the concept of the "phytochemical landscape"—the shifting spatial and temporal mosaic of plant chemistry that serves as the nexus between trophic interactions and nutrient dynamics. He shows how plant chemistry is both a cause and consequence of trophic interactions, and how it also mediates ecosystem processes such as nutrient cycling.

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Meta-Ecosystem Dynamics - Frederic Guichard - Islands - Peter Vitousek - 2013-03-08
Oceanic islands represent a set of systems in which biological diversity varies as a consequence of remoteness or size, not environment; they are also generally simpler than continental ecosystems. Islands therefore provide an opportunity to determine the direct effects of biological diversity on ecosystem function. The volume addresses the components of biological diversity on islands and their patterns of variation; the modern threats to the maintenance of biological diversity on islands; the consequences of island biology and its modification by humanity regarding aspects of ecosystem function; the global implications of islands for conservation; and how islands can help one to understand the processes inducing changes throughout the world.

Soil Management and Climate Change - Maria Angeles Munoz - 2017-10-27
Soil Management and Climate Change: Effects on Organic Carbon, Nitrogen Dynamics, and Greenhouse Gas Emissions provides a state of the art overview of recent findings and future research challenges regarding physical, chemical and biological processes controlling soil carbon, nitrogen dynamic and greenhouse gas emissions from soils. This book is for students and academics in soil science and environmental science, land managers, public administrators and legislators, and will increase understanding of organic matter preservation in soil and mitigation of greenhouse gas emissions. Given the central role soil plays on the global carbon (C) and nitrogen (N) cycles and its impact on greenhouse gas emissions, there is an urgent need to increase our common understanding about sources, mechanisms and processes that regulate organic matter mineralization and stabilization, and to identify those management practices and processes which mitigate greenhouse gas emissions, helping increase organic matter stabilization with suitable supplies of available N. Provides the latest findings about soil organic matter stabilization and greenhouse gas emissions Covers the effect of practices and management on soil organic matter stabilization Includes information for readers to select the most suitable management practices to increase soil organic matter stabilization

Ecosystem Ecology and Geochemistry of Cuatro Cienegas - Felipe Garcia-Oliva - 2018-10-12
Carbon (C), Nitrogen (N) and Phosphorus (P) are three of the most important elements used to build living beings, and their uptake from the environment is consequently essential for all organisms. Photosynthesis is the process in which plants absorb atmospheric C as they grow and convert it to biomass. However, plants acquire N and P only when these are available in the soil solution, which makes these elements the most limiting nutrients in plant growth and productivity in most ecosystems. When plant residues and roots decompose, the C, N and P they contain is transformed primarily into soil organic matter (SOM) or C and N can release to the atmosphere. Recent interest on the global C, N and P cycles has focused attention on the different proportion of terrestrial, C, N and P stored in different ecosystem pools. Cuatro Cienegas represents an exceptional place, since the plants are not the base of the food web, they are the microbial community, that recycle the elements essential for life. In this book we describe how this is an analog of early Earth.

Freshwater Ecology - Walter Dodds - 2019-11-03
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 ecologists. 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 disrupters 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=9780123747724
This is the third volume of Advances in Microbial Ecology to be produced by the current editorial board. I would, therefore, like to take this opportunity to thank my co-editors for all their efforts, particularly in maintaining a balance of subject matter and geographical distribution of the contributions. Volume 15 is no exception in that we have a balance between the prokaryotic and eukaryotic organisms and a range of subject matter from applied ecology through process ecology to ecological theory. The response from our readers has been encouraging in the sense that the breadth of coverage is much appreciated by teachers and postdoctoral researchers. However, we still strive to improve our coverage and particularly to move wider than the North America/Europe axis for contributions. Similarly, we would like to see coverage of the more unusual microbes, perhaps a chapter devoted to the ecology of a particular species or genus. There must exist many ecological notes on “rarer” organisms that have not found their way into the standard textbooks or taxonomic volumes; properly compiled these could provide valuable information for the field ecologist.

Eco-evolutionary Dynamics - Andrew P. Hendry - 2020-06-09

In recent years, scientists have realized that evolution can occur on timescales much shorter than the ‘long lapse of ages’ emphasized by Darwin - in fact, evolutionary change is occurring all around us all the time. This work provides an authoritative and accessible introduction to eco-evolutionary dynamics, a cutting-edge new field that seeks to unify evolution and ecology into a common conceptual framework focusing on rapid and dynamic environmental and evolutionary change.

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Advances in Microbial Ecology - J.G. Jones - 2013-06-29

This is the third volume of Advances in Microbial Ecology to be produced by the current editorial board. I would, therefore, like to take this opportunity to thank my co-editors for all their efforts, particularly in maintaining a balance of subject matter and geographical distribution of the contributions. Volume 15 is no exception in that we have a balance between the prokaryotic and eukaryotic organisms and a range of subject matter from applied ecology through process ecology to ecological theory. The response from our readers has been encouraging in the sense that the breadth of coverage is much appreciated by teachers and postdoctoral researchers. However, we still strive to improve our coverage and particularly to move wider than the North America/Europe axis for contributions. Similarly, we would like to see coverage of the more unusual microbes, perhaps a chapter devoted to the ecology of a particular species or genus. There must exist many ecological notes on “rarer” organisms that have not found their way into the standard textbooks or taxonomic volumes; properly compiled these could provide valuable information for the field ecologist. Ecological theory has, until recently, been the domain of the “macroecologist.” Recent advances in molecular techniques will ensure that the microbial ecologist will play a more significant role in the development of the subject. We shall not, therefore, change our policy of encouraging our contributors to speciate, permitting them sufficient space to develop their ideas.

Genetic Aspects of Plant Mineral Nutrition - W.H. Gabelman - 2012-12-06

This volume presents the proceedings of the Second International Sym posium on Genetic Aspects of Plant Mineral Nutrition, held in Madison, Wisconsin in 1985. The mechanisms by which plants acquire, transport and utilize essential mineral nutrients are highly complex. The means by which plants either exclude or tolerate ions of metals toxic to plants are equally complex. The first symposium attempted to convene research scientists concerned with mineral nutrition for the purpose of exploring the kinds of mineral nutrition phenomena identified as being under genetic control. The first symposium also placed much emphasis on research to which genetic intervention might be applied. At the second symposium more papers were presented on genetic and breeding research, a long-term objective of the first symposium. The second symposium also included biotic interactions under genetic con trol that either enhanced or impeded ion uptake, e.g. mycorrhizae and nitrogen fixing bacteria. This continuing dialogue is essential for a research area the complexity of which is due to its interdisciplinary nature.

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Ocean Ecology - J. Emmett Duffy - 2021-08-10

A comprehensive introduction to ocean ecology and a new way of thinking about ocean life Marine ecology is more interdisciplinary, broader in scope, and more intimately linked to human activities than ever before. Ocean Ecology provides advanced undergraduates, graduate students, and practitioners with an integrated approach to marine ecology that reflects these new scientific realities, and prepares students for the challenges of studying and managing the ocean as a complex adaptive system. This authoritative and accessible textbook advances a framework based on interactions among four major features of marine ecosystems-geography, morphology, the abiotic environment, biodiversity, and biochemistry—and shows how life is a driver of environmental conditions and dynamics. Ocean Ecology explains the ecological processes that link organismal to ecosystem scales and that shape the major types of ocean ecosystems, historically and in today's Anthropocene world. Provides an integrated new approach to understanding and managing the ocean Shows how biological diversity is the heart of functioning ecosystems Spans genes to earth systems, surface to seafloor, and estuary to ocean gyre Links species
Experts in biogeochemical cycling in atmospheric, land, freshwater, and marine environments offering chapters on problems of the years ahead, the book remains, in its essence, an exposition of the science of ecology. This new edition incorporates the results from more than a thousand recent studies into a fully up-to-date text. Written for students of ecology, researchers and practitioners, the fifth edition of Ecology: From Individuals to Ecosystems is a seminal reference to all aspects of ecology and addresses environmental problems of the future.

Foundational and Applied Statistics for Biologists Using R - Ken A. Aho - 2016-03-09

Full of biological applications, exercises, and interactive graphical examples, Foundational and Applied Statistics for Biologists Using R presents comprehensive coverage of both modern analytical methods and statistical foundations. The author harnesses the inherent properties of the R environment to enable students to examine the code of complica.


The circulation and interactions of major elements such as carbon, nitrogen, phosphorus, sulphur, oxygen, and hydrogen are critical for the maintenance of the earth’s ecosystems. Human activities including agriculture, industry, and urbanization alter element interactions and contribute to major environmental problems ranging from climate change and depletion of the ozone layer to acidification of soils to the destruction of coral reefs. Interactions of the Major Biogeochemical Cycles is a new scientific assessment of element interactions in the biosphere. It provides an up-to-date review of biogeochemistry and its effects on earth’s systems, with leading experts in biogeochemical cycling in atmospheric, land, freshwater, and marine environments offering chapters that summarize and synthesize information in each discipline. The book opens with chapters on cross-cutting issues that have significance in understanding global change effects and their potential management. These chapters address trends in element interactions in response to global change, the effects of natural disturbances, and managing the ocean to address major environmental issues.

Ecology - Michael Begon - 2020-11-17

A definitive guide to the depth and breadth of the ecological sciences, revised and updated The revised and updated fifth edition of Ecology: From Individuals to Ecosystems – now in full colour – offers students and practitioners a review of the ecological sciences. The previous editions of this book earned the authors the prestigious ‘Exceptional Life-time Achievement Award’ of the British Ecological Society - the aim for the fifth edition is not only to maintain standards but indeed to enhance its coverage of Ecology. In the first edition, 34 years ago, it seemed acceptable for ecologists to hold a comfortable, objective, not to say aloof position, from which we simply monitored for what we could evidence. Now, we must accept the immediacy of the many environmental problems that threaten us and the responsibility of ecologists to play their full part in addressing these problems. This fifth edition addresses this challenge, with several chapters devoted entirely to applied topics, and examples of how ecological principles have been applied to problems facing us highlighted throughout the remaining nineteen chapters. Nonetheless, the authors remain wedded to the belief that environmental action can only ever be as sound as the ecological principles on which it is based. Hence, while trying harder than ever to help improve preparedness for addressing the environmental problems of the years ahead, the book remains, in its essence, an exposition of the science of ecology. This new edition incorporates the results from more than a thousand recent studies into a fully up-to-date text. Written for students of ecology, researchers and practitioners, the fifth edition of Ecology: From Individuals to Ecosystems is a seminal reference to all aspects of ecology and addresses environmental problems of the future.


Despite often violent fluctuations in nature, species extinction is rare. California red scale, a potentially devastating pest of citrus, has been suppressed for fifty years in California to extremely low yet stable densities by its controlling parasitoid. Some larid budmoth populations undergo extreme cycles; others never cycle. In Consumer-resource Dynamics, William Murdoch, Cherrie Briggs, and Roger Harcourt provide a framework for understanding the interplay between consumer-resource interactions. Throughout, the focus is on how the properties of real organisms affect population dynamics. The core of the book synthesizes and extends the authors’ own models involving insect parasitoids and their hosts, and explores in depth how consumer species compete for a dynamic resource. The emerging general consumer-resource theory accounts for how consumers respond to differences among

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Ecological Stoichiometry of Freshwater Benthic Ecosystems - Wyatt F. Cross - 2005

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Ecological Niches - Jonathan M. Chase - 2009-08-11

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 disciplines.

Encyclopedia of Theoretical Ecology is a compendium of clear and concise essays by the intellectual leaders across this vast breadth of knowledge. --Harold Mooney, Stanford University "A remarkable and indispensable reference work that also is flexible enough to provide essential readings for a wide variety of courses. A masterful collection of authoritative papers that convey the rich and fundamental nature of modern theoretical ecology."

Simon A. Levin, Princeton University "Theoretical ecologists exercise their imaginations to make sense of the astounding complexity of both real and possible ecosystems. Imagining a real or possible topic left out of the Encyclopedia of Theoretical Ecology has proven just as challenging. This comprehensive compendium demonstrates a mature theoretical ecology, an endeavor that will become a mature science, and the volume will serve as a long-term foundation for future creativity in this area."

Fred Adler, University of Utah "The editors have assembled an outstanding group of contributors who are a great match for their topics. Sometimes the author is a key, authoritative figure in a field; and at other times, the author has enough distance to convey all sides of a subject. The next time you need to introduce ecology students to a theoretical topic, you'll be glad to have this encyclopedia on your bookshelf."

Stephen Eliner, Cornell University "Everything you wanted to know about theoretical ecology, and much more but will now! Alan Hastings and Louis Gross have done us a great service by bringing together in very accessible form a huge amount of information about a broad, complicated, and expanding field."

Daniel Simberloff, University of Tennessee, Knoxville

The Structure and Function of Aquatic Microbial Communities - Christon J. Hurst - 2015-05-13

This book discusses how aquatic microbial communities develop interactive metabolic coordination both within and between species to optimize their energetics. It explains that microbial community structuration often includes functional stratification among a multitude of organisms that variously exist either suspended in the water, lodged in sediments, or bound to one another as biofilms on solid surfaces. The authors describe techniques that can be used for preparing and distributing microbiologically safe drinking water, which presents the challenge of successfully removing the pathogenic members of the aquatic microbial community and then safely delivering that water to consumers. Drinking water distribution systems have their own microbial ecology, which we must both understand and control in order to maintain the safety of the water supply. Since studying aquatic microorganisms often entails identifying them, the book also discusses techniques for successfully isolating and cultivating bacteria. As such, it appeals to microbiologists, microbial ecologists and water quality scientists.

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The Structure and Function of Aquatic Microbial Communities - Christon J. Hurst - 2015-05-13
A History of Biology - Michel Morange - 2021-06-01

A comprehensive history of the biological sciences from antiquity to the modern era This book presents a global history of the biological sciences from ancient times to today, providing needed perspective on the development of biological thought while shedding light on the field's upheavals and key breakthroughs through the ages. Michel Morange brings to life the dynamic interplay of science, society, and biology's many subdisciplines, enabling readers to better appreciate the interdisciplinary exchanges that have shaped the field over the centuries. Each chapter of this incisive book focuses on a specific period in the history of biology, describing the major transformations that occurred, the enduring scientific concerns behind these changes, and the implications of yesterday's science for today's. Morange covers everything from the first cell theory to the origins of the concept of ecosystems, and offers perspectives on areas that are often neglected by historians of biology, such as ecology, ethology, and plant biology. Along the way, he highlights the contributions of technology, the important role of hypothesis and experimentation, and the cultural contexts in which some of the most breathtaking discoveries in biology were made. Unrivalled in scope and written by a world-renowned historian of science, A History of Biology is an ideal introduction for students and experts alike, and essential reading for anyone seeking to understand the present state of biological knowledge.

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The Natural Selection of the Chemical Elements - Robert Joseph Paton Williams - 1996

This beautifully written book is a study of the physical relationship between the inanimate environment and living organisms. It describes how the evolution of both has been interactive and interdependent; the authors show that this can be explained in terms of the properties of the chemical elements and their compounds. The book discusses the physical and chemical balances between the animate and inanimate worlds, with kinetic and thermodynamic principles given to support this analysis. These principles are applied to both organic and inorganic chemical systems to provide a basis for understanding the evolution of life in terms of the interaction of both types of chemistry within ever more complex organizations. The book concludes with an examination of an intriguing problem: the long-term consequences of our manufacture and exploitation of chemicals. This intervention may be altering the symbiotic relationship between life and the environment, an issue of great concern to ecologists and biologists as well as those who study chemistry.

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The Microbial Regulation of Global Biogeochemical Cycles - Johannes Rosuk - 2014-10-17

Global biogeochemical cycles of carbon and nutrients are increasingly affected by human activities. So far, modeling has been central for our understanding of how this will affect ecosystem functioning and the biogeochemical cycling of carbon and nutrients. These models have been forced to adopt a reductive approach built on the flow of carbon and nutrients between pools that are difficult or even impossible to verify with empirical evidence. Furthermore, while some of these models include the contribution of primary producers and biogeography of primary consumers to environmental change, the microbial part of the ecosystem is generally poorly represented or lacking altogether. The principal pool of carbon and nutrients in soil is the organic matter.
conditions into biogeochemical cycling of carbon and nutrients. The dependency of this conversion activity on individual environmental conditions such as pH, moisture and temperature has been frequently studied. On the contrary, only rarely have the microorganisms involved in carrying out the processes been identified, and one of the biggest challenges for advancing our understanding of biogeochemical processes is to identify the microorganisms carrying out a specific set of metabolic processes and how they partition their carbon and nutrient use. We also need to identify the factors governing these activities and if they result in feedback mechanisms that alter the growth, activity and interaction between primary producers and microorganisms. By determining how different groups of microorganisms respond to individual environmental conditions by allocating carbon and nutrients to production of biomass, CO2 and other products, a mechanistic as well as quantitative understanding of formation and decomposition of organic matter, and the production and consumption of greenhouse gases, can be achieved. In this Research Topic, supported by the Swedish research councils’ programme “Biodiversity and Ecosystem Services in a Changing Landscape” (BECC), we intend to promote this alternative framework to address how cycling of carbon and nutrients will be altered in a changing environment from the first-principle mechanisms that drive them – namely the ecology, physiology and biogeography of microorganisms – and on up to emerging global biogeochemical patterns. This novel and unconventional approach has the potential to generate fresh insights that can open up new horizons and stimulate rapid conceptual development in our basic understanding of the regulating factors for global biogeochemical cycles. The vision for the research topic is to facilitate such progress by bringing together leading scientists as proponents of several disciplines. By bridging Microbial Ecology and Biogeochemistry, connecting microbial activities at the micro-scale to carbon fluxes at the ecosystem-scale, and linking above- and belowground ecosystem functioning, we can leap forward from the current understanding of the global biogeochemical cycles.

The Microbial Regulation of Global Biogeochemical Cycles - Johannes Rousk - 2014-10-17

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