Class Xii Chapter 13 Organisms And Populations Biology

Life **The Biology of Death** *Plant Galls* **Population Ecology Ecology Population Biology** Population Genomics: Marine Organisms From Populations to Ecosystems *Minimum Animal Populations* **Population Ecology of Individuals** Population Biology of Plants **Introductory Ecology Population Biology Ecology of Populations Populations in a Seasonal Environment** Parasitoid Population Biology **Modeling Populations of Adaptive Individuals** *Concepts of Biology AP Biology For Dummies* **Ecology of Populations** *Surveying Natural Populations* **Mathematical Biology Mathematical Ecology of Populations and Ecosystems Ecological Modeling in Risk Assessment Structure and Dynamics of Fungal Populations** Population Ecology in Practice Modeling Dynamic Biological Systems **Entangled Life Ecological Dynamics** Evolution and the Genetics of Populations, Volume 1 **The Big Book Of Biology For NEET Volume 2** *Stability in Model Populations* Environmental Stress, Adaptation, and Evolution *Genes, Organisms, Populations* **Analytical Theory of Biological Populations Complex Population Dynamics** Biodiversity Dynamics **Mechanisms of Evolution Population Ecology** *Diseases and Plant Population Biology*

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The Biology of Death Oct 04 2022 "Everyone dies, and so, we naturally associate death with the end of an individual life. However, life is much more complicated, and death is actually interwoven into biology at many levels. Normal development and life could not exist without carefully regulated death of certain cells and as one defense against disease. Other cells wear out and die and must be replaced regularly. On a larger scale, death has influenced the direction of entire species. In fact, death has shaped all life through the cycle of life and death, throughout time, and in normal development. It affects our cells, our development, and our life"--

Population Ecology of Individuals Jan 27 2022 A common tendency in the field of population ecology has been to overlook individual differences by treating populations as homogeneous units; conversely, in behavioral ecology the tendency has been to concentrate on how individual behavior is shaped by evolutionary forces, but not on how this behavior affects population dynamics. Adam Lomnicki and others aim to remedy this one-sidedness by showing that the overall dynamical behavior of populations must ultimately be understood in terms of the behavior of individuals. Professor Lomnicki's wide-ranging presentation of this approach includes simple mathematical models aimed at describing both the origin and consequences of individual variation among plants and animals. The author contends that further progress in population ecology will require taking into account individual differences other than sex, age, and taxonomic affiliation--unequal access to resources, for instance. Population ecologists who adopt this viewpoint may discover new answers to classical questions of population ecology. Partly because it uses a variety of examples from many taxonomic groups, this work will appeal not only to population ecologists but to ecologists in general.

Populations in a Seasonal Environment Aug 22 2021 Most organisms live in a seasonal environment. During their life cycles, some species face seasons of cold and heat, aridity and abundant rainfall, migration and stable residence, breeding and nonbreeding. Populations grow and decline as supplies of materials essential to their survival wax and wane. Such qualitative truths as these flow obviously from field observations. In this original monograph, Stephen Fretwell analyzes the highly complex interaction between a population and a regularly varying environment in an attempt to define and measure seasonality as a critical parameter in the general theory of population regulation. Concerned primarily with the size and the habitat distribution of populations, Professor Fretwell develops simple models that, when applied to specific populations, usually of birds, demonstrate the effect of seasonal variations on the regulation of populations. He maintains that seasonality, as a concept, is essential to a full understanding of environmental interaction. During the course of his exposition, the author offers several new hypotheses, including theories affecting the breeding, numbers, distribution, and diversity of wintering birds, and a theory affecting the body size of sparrows.

Population Ecology Jul 29 2019 Populations are more than simple collections of individuals.

From Populations to Ecosystems Mar 29 2022 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 most recent 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.

Surveying Natural Populations Feb 13 2021 "Reads almost like a novel in comparison to normal statistical books." Ecoscience --

Biodiversity Dynamics Sep 30 2019 How will patterns of human interaction with the earth's ecosystem impact biodiversity loss over the long term - not in the next ten or even fifty years, but on the vast temporal scale dealt with by earth scientists? The contributors to Biodiversity Dynamics bring together the cutting-edge findings of a number of different fields that have traditionally had little crossover: data from population biology, community ecology, comparative biology, and paleontology are all presented. Where paleontologists and ecologists have long had divergent perspectives, Biodiversity Dynamics seeks a middle ground, finding ways for both scientific communities to work together to comprehend the great biodiversity of the earth and how to preserve it for future generations.

Structure and Dynamics of Fungal Populations Oct 12 2020 This book is a comprehensive treatment of the population biology of fungi. Intended for mycologists as well as biologists without mycological background, it includes detailed coverage of all major taxonomic groups for which information is available and key topics in depth, including species concepts, somatic incompatibility, gene flow, role of sexual vs. asexual reproduction, mycoviruses, demography and fitness. Kinds and patterns of intraspecific variation are considered, including quantitative and especially molecular characteristics. Throughout, an attempt is made to relate aspects of fungal population biology to biology as a whole.

Population Ecology in Practice Sep 10 2020 A synthesis of contemporary analytical and modeling approaches in population ecology The book provides an overview of the key analytical approaches that are currently used in demographic, genetic, and spatial analyses in population ecology. The chapters present current problems, introduce advances in analytical methods and models, and demonstrate the applications of quantitative methods to ecological data. The book covers new tools for designing robust field studies; estimation of abundance and demographic rates; matrix population models and analyses of population dynamics; and current approaches for genetic and spatial analysis. Each chapter is illustrated by empirical examples based on real datasets, with a companion website that offers online exercises and examples of computer code in the R statistical software platform. Fills a niche for a book that emphasizes applied aspects of population analysis Covers many of the current methods being used to analyse population dynamics and structure Illustrates the application of specific analytical methods through worked examples based on real datasets Offers readers the opportunity to work through examples or adapt the routines to their own datasets using computer code in the R statistical platform Population Ecology in Practice is an excellent book for upper-level undergraduate and graduate students taking courses in population ecology or ecological statistics, as well as established researchers needing a desktop reference for contemporary methods used to develop robust population assessments.

Stability in Model Populations Mar 05 2020 Reviewing the general theory of population stability, this text critically analyzes techniques for inferring whether a given population is in balance or not. It goes on to show how rigorous empirical research can reveal both the proximal causes of stability and its most evolutionary cases.

Introductory Ecology Nov 24 2021 In this age of increasing human domination of the Earth's biological and physical resources, a basic understanding of ecology is more important than ever. Students need a textbook that introduces them to the basic principles of ecological science, one that is relevant to today's world, and one that does not overwhelm them with detail and jargon. Peter Cotgreave and Irwin Forseth have designed this book to meet the needs of these students, by providing a basic synthesis of how individual organisms interact with their physical environment, and with each other, to generate the complex ecosystems we see around us. The unifying theme of the book is biodiversity-its patterns, causes, and the growing worldwide threats to it. Basic ecological principles are illustrated using clearly described examples from the current ecological literature. This approach makes the book valuable to all students studying ecology. Examples have been chosen carefully to represent as wide a range of ecosystems (terrestrial and aquatic, northern and southern hemisphere) and life forms (animal, plant and microbe) as possible. Particular attention is paid to consequences of global change on organisms, populations, ecological communities and ecosystems. The end result is a text that presents a readable and persuasive picture of how the Earth's natural systems function, and how that functioning may change over the coming century. Features include: · strong coverage of applied and evolutionary ecology · applications of ecology to the real world · a question-orientated approach · the only comprehensive treatment of ecology written for the introductory student · an emphasis on definitions of key words and phrases · an integration of experimental, observational and theoretical material · examples drawn from all over the world and a wide variety of organisms · a logical structure, building from the response of individual organisms to physical factors, through population growth and population interactions, to community structure and ecosystem function · suggested further reading lists for each chapter · boxes to explain key concepts in more depth · dedicated textsite featuring additional information and teaching aids www.blackwellpublishing.com/cotgreave Peter Cotgreave is an animal ecologist who has worked for the University of Oxford and the Zoological Society of London. His research interests centre on abundance and rarity within animal communities. Irwin Forseth is a plant physiological ecologist who has taught introductory ecology and plant ecology at the University of Maryland since 1982. His research focuses on plant responses to the environment. The authors have studied organisms as diverse as green plants, insects and mammals in habitats from deserts to tropical rainforests. They have worked in ecological research and education in Africa, Asia, North and South America, Europe and the Caribbean.

Parasitoid Population Biology Jul 21 2021 Extraordinary in the diversity of their lifestyles, insect parasitoids have become extremely important study organisms in the field of population biology,

and they are the most frequently used agents in the biological control of insect pests. This book presents the ideas of seventeen international specialists, providing the reader not only with an overview but also with lively discussions of the most salient questions pertaining to the field today and prescriptions for avenues of future research. After a general introduction, the book divides into three main sections: population dynamics, population diversity, and population applications. The first section covers gaps in our knowledge in parasitoid behavior, parasitoid persistence, and how space and landscape affect dynamics. The contributions on population diversity consider how evolution has molded parasitoid populations and communities. The final section calls for novel approaches toward resolving the enigma of success in biological control and questions why parasitoids have been largely neglected in conservation biology. Parasitoid Population Biology will likely be an important influence on research well into the twenty-first century and will provoke discussion amongst parasitoid biologists and population biologists. In addition to the editors, the contributors are Carlos Bernstein, Jacques Brodeur, Jerome Casas, H.C.J. Godfray, Susan Harrison, Alan Hastings, Bradford A. Hawkins, George E. Heimpel, Marcel Holyoak, Nick Mills, Bernard D. Roitberg, Jens Roland, Michael R. Strand, Teja Tscharntke, and Minus van Baalen.

Mechanisms of Evolution Aug 29 2019 Three of the four major mechanisms of evolution, natural selection, genetic drift, and gene flow are examined. There are 5 tenets of natural selection that influence individual organisms: Individuals within populations are variable, that variation is heritable, organisms differ in their ability to survive and reproduce, more individuals are produced in a generation than can survive, and survival & reproduction of those variable individuals are non-random. Organisms respond evolutionarily to changes in their environment and other selection pressures, including global climate change. The importance of spatial structure of a population in relation to how it affects the strength of gene flow and/or genetic drift, as well as the genetic variation and evolution of populations, is shown. Gene flow tends to reduce variation between populations and increase it within populations, whereas genetic drift tends to reduce genetic variation, especially in small, isolated populations. The mechanisms of evolution can lead to speciation, which requires both time and genetic isolation of populations, in addition to natural selection or genetic drift.

Ecology Jul 01 2022

Population Biology May 31 2022

Analytical Theory of Biological Populations Dec 02 2019 In the 50 years that have passed since Alfred Latka's death in 1949 his position as the father of mathematical demography has been secure. With his first demographic papers in 1907 and 1911 (the latter co authored with F. R. Sharpe) he laid the foundations for stable population theory, and over the next decades both largely completed it and found convenient mathematical approximations that gave it practical applica tions. Since his time, the field has moved in several directions he did not foresee, but in the main it is still his. Despite Latka's stature, however, the reader still needs to hunt through the old journals to locate his principal works. As yet no exten sive collections of his papers are in print, and for his part he never as sembled his contributions into a single volume in English. He did so in French, in the two part Theorie Analytique des Associations Biologiques (1934, 1939). Drawing on his Elements of Physical Biology (1925) and most of his mathematical papers, Latka offered French readers insights into his biological thought and a concise and mathematically accessible summary of what he called recent contributions in demographic analy sis. We would be accurate in also calling it Latka's contributions in demographic analysis.

Modeling Dynamic Biological Systems Aug 10 2020 Many biologists and ecologists have developed models that find widespread use in theoretical investigations and in applications to organism behavior, disease control, population and metapopulation theory, ecosystem dynamics, and environmental management. This book captures and extends the process of model development by concentrating on the dynamic aspects of these processes and by providing the tools such that virtually anyone with basic knowledge in the Life Sciences can develop meaningful dynamic models. Examples of the systems modeled in the book range from models of cell development, the beating heart, the growth and spread of insects, spatial competition and extinction, to the spread and control of epidemics, including the conditions for the development of chaos. Key features: - easy-to-learn and easy-to-use software - examples from many subdisciplines of biology, covering models of cells, organisms, populations, and metapopulations - no prior computer or programming experience required Key benefits: - learn how to develop modeling skills and system thinking on your own rather than use models developed by others - be able to easily run models under alternative assumptions and investigate the implications of these assumptions for the dynamics of the biological system being modeled - develop skills to assess the dynamics of biological systems

Minimum Animal Populations Feb 25 2022 H. REMMERT Small populations are very often discussed, but there seems to be no general overview touching all the self-evident but norma,lly simply neglected problems connected with small populations. First, there are many very different types of organisms, and as every biologist should know, the problems of small populations are very different in different types of organisms. 1. In vascular plants the problems are different from the situation in birds and mammals; in marine benthic animals or in parasites such as tapeworms the problems are different again, and in seasonal planktonic animals or insects they are different from those in biotopes under constant conditions. In tapeworms or in vascular plants, an adult organism seems to be comparable to a population of mammals or birds because its offspring can be so diverse and plentiful. 2. There are small populations which explode and break down to a small population again, and then explode and break down again.

Environmental Stress, Adaptation, and Evolution Feb 02 2020 Most organisms and populations have to cope with hostile environments, threatening their existence. Their ability to respond phenotypically and genetically to these challenges and to evolve adaptive mechanisms is, therefore, crucial. The contributions to this book aim at understanding, from a evolutionary perspective, the impact of stress on biological systems. Scientists, applying different approaches spanning from the molecular and the protein level to individuals, populations and ecosystems, explore how organisms adapt to extreme environments, how stress changes genetic structure and affects life histories, how organisms cope with thermal stress through acclimation, and how environmental and genetic stress induce fluctuating asymmetry, shape selection pressure and cause extinction of populations. Finally, it discusses the role of stress in evolutionary change, from stress induced mutations and selection to speciation and evolution at the geological time scale. The book contains reviews and novel scientific results on the subject. It will be of interest to both researchers and

graduate students and may serve as a text for graduate courses.

The Big Book Of Biology For NEET Volume 2 Apr 05 2020 1. The Big Book of Biology Volume 2 - New Self Study Guide 2. The book is designed on Chapterwise Premises 3. Entire syllabus is divided into 16 Chapters 4. 7000 Topically divided objective questions along with detailed explanations 5. more than 13000 MCQs given from all possible typologies There was never a better time to emphasize the Fact that How important doctors are. Its probably the most fulfilling and dream career opportunity for any aspirants. NEETis the gateway to millions of dreamers to open the door for admission in top MBBS Colleges in India and Biology plays half the role. Looking at the need of the hour and based on Changing and Latest Pattern of examination Arihant brings you the “The Big Book of Biology”. The New Self Study Guide has been designed on Chapterwise Premises. The all-new series of “Big Book of Biology for NEET – Volume 2” has been designed to fulfil the important needs of all NEET aspirants. The syllabus in this volume has been divided into 16 chapters as per latest pattern, serving as an in-depth question bank of Biology subject. This book has; 7000 Topically divided objective questions are given for along with the Detailed explanations, collection of more than 13000 MCQs given from all possible typologies arranged in Chapterwise and Topicwise as per NEET 2020 Syllabus for practice, to the point amicable explanations in each chapter, vast coverage given to objection questions asked in various Medical Entrances from 2000 till date. TOC Reproduction in Organisms, Sexual Reproduction in the flowering plants, Human Reproduction, Reproductive Health, Principles of Inheritance and Variation, Molecular basis of Inheritance, Evolution, Human Health and Diseases, Strategies of enhancement in food production, Microbes in Human Welfare, Biotechnology: Principle and Processes, Biotechnology and its Applications, Organisms and Populations, Ecosystem, Biodiversity and its Conservation, Environmental Issues.

Modeling Populations of Adaptive Individuals Jun 19 2021 "This book offers a new theory for modeling how organisms make tradeoff decisions and how these decisions affect both individuals and populations. Tradeoff decisions (or behaviors) are those that are optimize survival and include behaviors like foraging and reproduction. Existing theories have not painted a complete picture of tradeoff decisions because they only observe how the decisions of an individual affect them rather than how individuals impact, and are impacted by, the behavior of their communities. The authors' theory-which they call state and prediction based theory-uses individual-based models since these models show the complex ways that organisms relate to their environment. The authors' broader approach, one that integrates behavior and population dynamics, allows ecologists to see how individuals make adaptive tradeoff decisions. In simpler terms, this theory does not assume, as the previous models do, that future conditions are fixed, known, and unaffected by the behavior of others. Instead, the authors assume individuals make decisions like people do, which is by forecasting future conditions, using approximation to make good decisions, and updating their choices as conditions change"--

Mathematical Biology Jan 15 2021 This text presents mathematical biology as a field with a unity of its own, rather than only the intrusion of one science into another. The book focuses on problems of contemporary interest, such as cancer, genetics, and the rapidly growing field of genomics.

Plant Galls Sep 03 2022 Plant galls may be produced by a wide variety of organisms, from fungi to parasitic insects, on an equally wide variety of hosts. Their taxonomy is highly complex, as are the life cycles of the organisms associated with them. Yet, common as they are, plant galls are often poorly understood. This book brings together information from the diverse disciplines involved in the study of plant galls: ecology, evolution, molecular biology, physiology, and developmental biology. The work considers the latest issues, covering questions of classification, coevolution, ecology, physiology, and plant genetic engineering. As an up-to-date resource in an area of immense interest and debate, the book will enhance the quality of discussion surrounding these phenomena, across all disciplinary perspectives.

Complex Population Dynamics Oct 31 2019 Why do organisms become extremely abundant one year and then seem to disappear a few years later? Why do population outbreaks in particular species happen more or less regularly in certain locations, but only irregularly (or never at all) in other locations? Complex population dynamics have fascinated biologists for decades. By bringing together mathematical models, statistical analyses, and field experiments, this book offers a comprehensive new synthesis of the theory of population oscillations. Peter Turchin first reviews the conceptual tools that ecologists use to investigate population oscillations, introducing population modeling and the statistical analysis of time series data. He then provides an in-depth discussion of several case studies--including the larch budmoth, southern pine beetle, red grouse, voles and lemmings, snowshoe hare, and ungulates--to develop a new analysis of the mechanisms that drive population oscillations in nature. Through such work, the author argues, ecologists can develop general laws of population dynamics that will help turn ecology into a truly quantitative and predictive science. Complex Population Dynamics integrates theoretical and empirical studies into a major new synthesis of current knowledge about population dynamics. It is also a pioneering work that sets the course for ecology's future as a predictive science.

Ecology of Populations Mar 17 2021 The theme of this book is the distribution of the abundance of organisms in space and time. Its core lies in how local births and deaths are tied to emigration and immigration processes, and how environmental variability at different scales affects population dynamics with stochastic processes and spatial structure. The book shows how elementary analytical tools can be used to understand population fluctuations, synchrony, processes underlying range distributions and community structure and species coexistence, as well as how spatial population dynamics models can be used to understand life history evolution and aspects of evolutionary game theory.

Life Nov 05 2022

Population Biology Oct 24 2021 Population biology has been investigated quantitatively for many decades, resulting in a rich body of scientific literature. Ecologists often avoid this literature, put off by its apparently formidable mathematics. This textbook provides an introduction to the biology and ecology of populations by emphasizing the roles of simple mathematical models in explaining the growth and behavior of populations. The author only assumes acquaintance with elementary calculus, and provides tutorial explanations where needed to develop mathematical concepts. Examples, problems, extensive marginal notes and numerous graphs enhance the book's value to students in classes ranging from population biology and population ecology to mathematical biology and mathematical ecology. The book will also be useful as a supplement to introductory courses in ecology.

Genes, Organisms, Populations Jan 03 2020 This anthology collects some of the most important papers on what is believed to be the major force in evolution, natural selection. An issue of great consequence in the philosophy of biology concerns the levels at which, and the units upon which selection acts. In recent years, biologists and philosophers have published a large number of papers bearing on this subject. The papers selected for inclusion in this book are divided into three main sections covering the history of the subject, explaining its conceptual foundations, and focusing on kin and group selection and higher levels of selection. One of the book's interesting features is that it draws together material from the biological and philosophical literatures. The philosophical literature, having thoroughly absorbed the biological material, now offers conceptual tools suitable for the reworking of the biological arguments. Although a full symbiosis has yet to develop, this anthology offers a unique resource for students in both biology and philosophy. Robert N. Brandon is Professor in the Philosophy Department, Duke University. Richard M. Burian is Professor of Philosophy and Department Chairman, Virginia Polytechnic Institute and State University. A Bradford Book.

Evolution and the Genetics of Populations, Volume 1 May 07 2020 These volumes discuss evolutionary biology through the lense of population genetics.

Diseases and Plant Population Biology Jun 27 2019

AP Biology For Dummies Apr 17 2021 Relax. The fact that you're even considering taking the AP Biology exam means you're smart, hard-working and ambitious. All you need is to get up to speed on the exam's topics and themes and take a couple of practice tests to get comfortable with its question formats and time limits. That's where AP Biology For Dummies comes in. This user-friendly and completely reliable guide helps you get the most out of any AP biology class and reviews all of the topics emphasized on the test. It also provides two full-length practice exams, complete with detailed answer explanations and scoring guides. This powerful prep guide helps you practice and perfect all of the skills you need to get your best possible score. And, as a special bonus, you'll also get a handy primer to help you prepare for the test-taking experience. Discover how to: Figure out what the questions are actually asking Get a firm grip on all exam topics, from molecules and cells to ecology and genetics Boost your knowledge of organisms and populations Become equally comfortable with large concepts and nitty-gritty details Maximize your score on multiple choice questions Craft clever responses to free-essay questions Identify your strengths and weaknesses Use practice tests to adjust you exam-taking strategy Supplemented with handy lists of test-taking tips, must-know terminology, and more, AP Biology For Dummies helps you make exam day a very good day, indeed.

Ecological Dynamics Jun 07 2020 Ecological Dynamics is unique in that it can serve both as an introductory text in numerous ecology courses and as a resource for more advanced work. It provides a flexible introduction to ecological dynamics that is accessible to students with limited previous mathematical and computational experience, yet also offers glimpses into the state of the art in the field. The book is divided into three parts: Part I, Methodologies and Techniques, defines the authors' modeling philosophy, focusing on models rather than ecology, and introduces essential concepts for describing and analyzing dynamical systems. Part II, Individuals to Ecosystems, the core of the book, describes the formulation and analysis of models of individual organisms, populations, and ecosystems. Part III, Focus on Structure, introduces more advanced readers to models of 'structured' and spatially extended populations. Approximately 25% of the book is devoted to case studies drawn from the authors' research. Readers are guided through the many judgment calls involved in model formulation, shown the key steps in model analysis, and offered the authors' interpretation of the results. All chapters end with exercises and projects. While the book is designed to be independent of any particular computing environment, a well-tested software package (SOLVER), including programs for solution of differential and difference equations, is available via the World Wide Web at http: //www.stams.strath.ac.uk/external/solver. Ideal for courses in modeling ecological and environmental change, Ecological Dynamics can also be used in other courses such as theoretical ecology, population ecology, mathematical biology and ecology, and quantitative ecology.

Population Biology of Plants Dec 26 2021 Population Biology of Plants defines a science of population biology for plants and other fixed organisms. The author describes the processes that determine the number of plants (and the number of plant parts), examines the separate stages in a general model of population behavior, the ways in which individual plants interfere with each others growth and risk of death and aspects of the behavior of animals that influence or determine the size of plant populations.

Population Genomics: Marine Organisms Apr 29 2022 Population genomics has provided unprecedented opportunities to unravel the mysteries of marine organisms in the oceans' depths. The world's oceans, which make up 70% of our planet, encompass diverse habitats and host numerous unexplored populations and species. Population genomics studies of marine organisms are rapidly emerging and have the potential to transform our understanding of marine populations, species, and ecosystems, providing insights into how these organisms are evolving and how they respond to different stimuli and environments. This knowledge is critical for understanding the fundamental aspects of marine life, how marine organisms will respond to environmental changes, and how we can better protect and preserve marine biodiversity and resources. This book brings together leading experts in the field to address critical aspects of fundamental and applied research in marine species and share their research and insights crucial for understanding marine ecosystem diversity and function. It also discusses the challenges, opportunities and future perspectives of marine population genomics.

Ecology of Populations Sep 22 2021 Studies the effects of nutrition, climate, and soil on the growth, reproduction, and evolution of living organisms

Concepts of Biology May 19 2021 Concepts of Biology is designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such, this course represents an important opportunity for students to develop the necessary knowledge, tools, and skills to make informed decisions as they continue with their lives. Rather than being mired down with facts and vocabulary, the typical non-science major student needs information presented in a way that is easy to read and understand. Even more importantly, the content should be meaningful. Students do much better when they understand why biology is relevant to their everyday lives. For these reasons, Concepts of Biology is grounded on an evolutionary basis and includes exciting features that highlight careers in the biological sciences and everyday applications of the concepts at hand.We also strive to show the interconnectedness of topics within this extremely broad discipline. In order to meet the needs of today's instructors and students, we maintain the overall organization and coverage found in most

syllabi for this course. A strength of Concepts of Biology is that instructors can customize the book, adapting it to the approach that works best in their classroom. Concepts of Biology also includes an innovative art program that incorporates critical thinking and clicker questions to help students understand--and apply--key concepts.

Ecological Modeling in Risk Assessment Nov 12 2020 Toxic chemicals can exert effects on all levels of the biological hierarchy, from cells to organs to organisms to populations to entire ecosystems. However, most risk assessment models express their results in terms of effects on individual organisms, without corresponding information on how populations, groups of species, or whole ecosystems may respond to chemical stressors. Ecological Modeling in Risk Assessment: Chemical Effects on Populations, Ecosystems, and Landscapes takes a new approach by compiling and evaluating models that can be used in assessing risk at the population, ecosystem, and landscape levels. The authors give an overview of the current process of ecological risk assessment for toxic chemicals and of how modeling of populations, ecosystems, and landscapes could improve the status quo. They present a classification of ecological models and explain the differences between population, ecosystem, landscape, and toxicity-extrapolation models. The authors describe the model evaluation process and define evaluation criteria. Finally, the results of the model evaluations are presented in a concise format with recommendations on modeling approaches to use now and develop further. The authors present and evaluate various models on the basis of their realism and complexity, prediction of relevant assessment endpoints, treatment of uncertainty, regulatory acceptance, resource efficiency, and other criteria. They provide models that will improve the ecological relevance of risk assessments and make data collection more cost-effective. Ecological Modeling in Risk Assessment serves as a reference for selecting and applying the best models when performing a risk assessment.

Entangled Life Jul 09 2020 This volume explores the interactions between organisms and their environments and how this “entanglement” is a fundamental aspect of all life. It brings together the work and ideas of historians, philosophers, biologists, and social scientists, uniting a range of new perspectives, methods, and frameworks for examining and understanding the ways that organisms and environments interact. The volume is organized into three main sections: historical perspectives, contested models, and emerging frameworks. The first section explores the origins of the modern idea of organism-environment interaction in the mid-nineteenth century and its development by later psychologists and anthropologists. In the second section, a variety of controversial models—from mathematical representations of evolution to model organisms in medical research—are discussed and reframed in light of recent questions about the interplay between organisms and environment. The third section investigates several new ideas that have the potential to reshape key aspects of the biological and social sciences. Populations of organisms evolve in response to changing environments; bodies and minds depend on a wide array of circumstances for their development; cultures create complex relationships with the natural world even as they alter it irrevocably. The chapters in this volume share a commitment to unraveling the mysteries of this entangled life.

Mathematical Ecology of Populations and Ecosystems Dec 14 2020 Population ecologists study how births and deaths affect the dynamics of populations and communities, while ecosystem ecologists study how species control the flux of energy and materials through food webs and ecosystems. Although all these processes occur simultaneously in nature, the mathematical frameworks bridging the two disciplines have developed independently. Consequently, this independent development of theory has impeded the cross-fertilization of population and ecosystem ecology. Using recent developments from dynamical systems theory, this advanced undergraduate/graduate level textbook shows how to bridge the two disciplines seamlessly. The book shows how bifurcations between the solutions of models can help understand regime shifts in natural populations and ecosystems once thresholds in rates of births, deaths, consumption, competition, nutrient inputs, and decay are crossed. Mathematical Ecology is essential reading for students of ecology who have had a first course in calculus and linear algebra or students in mathematics wishing to learn how dynamical systems theory can be applied to ecological problems.

Population Ecology Aug 02 2022 Worldwide, Population Ecology is the leading textbook on this titled subject. Written primarily for students, it describes the present state of population ecology in terms that can be readily understood by undergraduates with little or no background in the subject. Carefully chosen experimental examples illustrate each topic, and studies of plants and animals are combined to show how fundamental principles can be derived that apply to both species. Use of complex mathematics ia avoided throughout the book, and what math is necessary is dealt with by examination of real experimental data rather than dull theory. The latest edition of this leading textbook. Adopted as an Open University set text.