The Biology Of Coral Reefs Biology Of Habitats

The iconic and beautiful Great Barrier Reef Marine Park is home to one of the most diverse ecosystems in the world. With contributions from international experts, this timely and fully updated second edition of The Great Barrier Reef describes the animals, plants and other organisms of the reef, as well as the biological, chemical and physical processes that influence them. It contains new chapters on shelf slopes and fisheries and addresses pressing issues such as climate change, ocean acidification, coral bleaching and disease, and invasive species. The Great Barrier Reef is a must-read for the interested reef tourist, student, researcher and environmental manager. While it has an Australian focus, it can equally be used as a reference text for most Indo-Pacific coral reefs.

This volume is a complete review and reference work for scientists, engineers, and students concerned with coral reefs in the Red Sea. It provides an up-to-date review on the geology, ecology, and physiology of coral reef ecosystems in the Red Sea, including data from most recent molecular studies. The Red Sea harbours a set of unique ecological characteristics, such as high temperature, high alkalinity, and high salinity, in a quasi-isolated environment. This makes it a perfect laboratory to study and understand adaptation in regard to the impact of climate change on marine ecosystems. This book can be used as a general reference, guide, or textbook.

Coral Reefs of the Gulf: Adaptation to Climatic Extremes is a complete review and reference for scientists, engineers and students concerned with the geology, biology or engineering aspects of coral reefs in the Middle East. It provides for the first time a complete review of both the geology and biology of all extant coral areas in the Gulf, the water body between Iran and the Arabian Peninsula. In summer, this area is the hottest sea with abundant coral growth on earth and already today exhibits a temperature that is predicted to occur across the topical ocean in 2100. Thus, by studying the Gulf today, much can be learned about tomorrow’s world and the capability of coral reefs to adapt to climatic extremes. This volume provides the most authoritative and up-to-date review of the coral reefs in the Gulf. It can be used as a volume of general reference or as a textbook treating recent coral reefs. Written by local and international experts, the text is richly illustrated and will remain a standard reference for the region for decades to come. Contributions stretch from climatology through geology, biology, ecological modelling and fisheries science to practical conservation aspects. The book is useful for the technical expert and casual reader alike.

Highly illustrated synthesis of research on cold-water corals worldwide.

Coral Reefs

Over in the Ocean

Biology, Environment and Management
CORAL REEFS
Coral Bleaching
The Ecology of Fishes on Coral Reefs

Reefs provide a wealth of opportunity for learning about biological and ecosystem processes, and reef biology courses are among the most popular in marine biology and zoology departments the world over. Walter M. Goldberg has taught one such course for years, and he marshals that experience in the pages of The Biology of Reefs and Reef Organisms. Goldberg examines the nature not only of coral reefs–the best known among types of reefs–but also of sponge reefs, worm reefs, and oyster reefs, explaining the factors that influence their growth, distribution, and structure. A central focus of the book is reef construction, and Goldberg details the plants and animals that form the scaffold of the reef system and allow for the attachment and growth of other organisms, including those that function as bafflers, binders, and cementing agents. He also tours readers through reef ecology, paleontology, and biogeography, all of which serve as background for the problems reefs face today and the challenge of their conservation. Visually impressive, profusely illustrated, and easy to read, The Biology of Reefs and Reef Organisms offers a fascinating introduction to reef science and will appeal to students and instructors of marine biology, comparative zoology, and oceanography.

Coral reef communities are among the most complex, mature and productive ecosystems on earth. Their activity resulted in the creation of vast lime constructions. Being extremely productive and having the function of a powerful biofilter, coral reefs play an important role in global biogeochemical processes and in the reproduction of food resources in tropical marine regions. All aspects of coral reef science are covered systematically and on the basis of a holistic ecosystem approach. The geological history of coral reefs, their geomorphology as well as biology including community structure of reef biota, their functional characteristics, physiological aspects, biogeochemical metabolism, energy balance, environmental problems and management of resources are treated in detail.

The local diversity and global richness of coral reef fishes, along with the diversity manifested in their morphology, behaviour and ecology, provides fascinating and diverse opportunities for study. Reflecting the very latest research in a broad and ever-growing field, this comprehensive guide is a must-read for anyone interested in the ecology of fishes on coral reefs. Featuring contributions from leaders in the field, the 36 chapters cover the full spectrum of current research. They are presented in five parts, considering coral reef fishes in the context of ecology, patterns and processes, human intervention and impacts, conservation, and past and current debates. Beautifully illustrated in full-colour, this book is designed to summarise and help build upon current knowledge and to facilitate further research. It is an ideal resource for those new to the field as well as for experienced researchers.

This volume investigates the effects of human activities on coral reefs, which provide important life-supporting systems to surrounding natural and human communities. It examines the self-reinforcing ecological, economic and technological mechanisms

that degrade coral reef ecosystems around the world. Topics include reefs and limestones in Earth history; the interactions between corals and their symbiotic algae; diseases of coral reef organisms; the complex triangle between reef fishes, seaweeds and corals; coral disturbance and recovery in a changing world. In addition, the authors take key recent advances in DNA studies into account which provides new insights into the population biology, patterns of species distributions, recent evolution and vulnerabilities to environmental stresses. These DNA analyses also provide new understandings of the limitations of coral responses and scales of management necessary to sustain coral reefs in their present states. Coral reefs have been essential sources of food, income and resources to humans for millennia. This book details the delicate balance that exists within these ecosystems at all scales, from geologic time to cellular interactions and explores how recent global and local changes influence this relationship. It will serve as an indispensable resource for all those interested in learning how human activities have affected this vital ecosystem around the world.

Biology 2

Coming to Terms with Nature on the Coral Reef

The Enchanted Braid

Coral Reefs: A Very Short Introduction

The Biology of Coral Reefs

Biology and Geology of Coral Reefs

This book provides a unique perspective on the destruction - both natural and human-caused - of coral reef ecosystems. Reconstructing the ecological history of coral reefs, the authors evaluate whether recent dramatic changes are novel events or part of a long-term trend or cycle. The text combines principles of geophysics, paleontology, and marine sciences with real-time observation, examining the interacting causes of change: hurricane damage, predators, disease, rising sea-level, nutrient loading, global warming and ocean acidification. Predictions about the future of coral reefs inspire strategies for restoration and management of ecosystems. Useful for students and professionals in ecology and marine biology, including environmental managers.

Biology and Geology of Coral Reefs, Volume IV: Geology 2 covers the major advances made in the geological aspects of coral reef problems. This book is composed of 10 chapters that summarize the types, economics, radiometric dating, and geological features of coral reefs. The introductory chapters present the types and distribution of coral reefs, such as fringing, barrier, and Atoll reefs. A chapter discusses the findings of the 1973 Royal Society and Queensland Universities Expedition to the northern part of the Great Barrier Reefs on the specialized Low Wooded Islands. Another chapter deals with the interrelation of ecology and sedimentation in coral reef complexes and the Coral Sea Plateau. The next part of the book discusses the techniques and results of radiometric dating of coral reefs and the coral reefs of the Solomon Islands. The remaining chapters deal with the Great Barrier Reef Province and discuss the geology of the basement upon

which the reefs rest is included. The reefs are described from geological, geophysical, and hydrological viewpoints, providing a complete bibliography on the reefs. This volume will acquaint readers with some of the exciting developments in coral reef geology and will provide information that will enable them to assess the status of research in different fields.

Authored by world-class scientists and scholars, The Handbook of Natural Resources, Second Edition, is an excellent reference for understanding the consequences of changing natural resources to the degradation of ecological integrity and the sustainability of life. Based on the content of the bestselling and CHOICE-awarded Encyclopedia of Natural Resources, this new edition demonstrates the major challenges that the society is facing for the sustainability of all well-being on the planet Earth. The experience, evidence, methods, and models used in studying natural resources are presented in six stand-alone volumes, arranged along the main systems of land, water, and air. It reviews state-of-the-art knowledge, highlights advances made in different areas, and provides guidance for the appropriate use of remote sensing and geospatial data with field-based measurements in the study of natural resources. Volume 5, Coastal and Marine Environments, discusses marine and coastal ecosystems, their biodiversity, conservation, and integrated marine management plans. It provides fundamental information on coastal and estuarine systems and includes discussions on coastal erosion and shoreline change, natural disasters, evaporation and energy balance, fisheries and marine resource management, and more. New in this edition are discussions on sea level rise, renewable energy, coral reef restoration, fishery resource economics, and coastal remote sensing. This volume demonstrates the key processes, methods, and models used through many case studies from around the world. Written in an easy-to-reference manner, The Handbook of Natural Resources, Second Edition, as individual volumes or as a complete set, is an essential reading for anyone looking for a deeper understanding of the science and management of natural resources. Public and private libraries, educational and research institutions, scientists, scholars, and resource managers will benefit enormously from this set. Individual volumes and chapters can also be used in a wide variety of both graduate and undergraduate courses in environmental science and natural science at different levels and disciplines, such as biology, geography, earth system science, and ecology.

This book covers in one volume materials scattered in hundreds of research articles, in most cases focusing on specialized aspects of coral biology. In addition to the latest developments in coral evolution and physiology, it presents chapters devoted to novel frontiers in coral reef research. These include the molecular biology of corals and their symbiotic algae, remote sensing of reef systems, ecology of coral disease spread, effects of various scenarios of global climate change, ocean acidification effects of increasing CO2 levels on coral calcification, and damaged coral reef remediation. Beyond extensive coverage of the above aspects, key issues regarding the coral organism and the reef ecosystem such as calcification, reproduction, modeling, algae, reef invertebrates, competition and fish are re-evaluated

in the light of new research and emerging insights. In all chapters novel theories as well as challenges to established paradigms are introduced, evaluated and discussed. This volume is indispensible for all those involved in coral reef management and conservation.

Coral Reefs: An Ecosystem in Transition

Cities of the Ocean

Biology and Geology of Coral Reefs V2

Science and Management

Biology 1

Coral Reef Ecology

Demonstrating the relevance and need of science in planning the future of the Great Barrier Reef and coral reefs worldwide, Oceanographic Processes of Coral Reefs: Physical and Biological Links in the Great Barrier Reef emphasizes multi-disciplinary processes - physical and biological links - that have emerged as the dominant forces shaping and controlling the ecosystem. The book draws heavily on data from coral reefs in Australia, Indonesia, Thailand, and the Philippines. Oceanographic Processes of Coral Reefs: Physical and Biological Links in the Great Barrier Reef covers: Climate and global change Coastal oceanography Wetlands ecology Estuaries Marine biology Land use management in the tropics Fisheries management Coral Reef ecological modeling Biodiversity and the human impact Explore how the ecosystem responds to both physical and biological stimuli, and how they interact Understand processes imperative to create sustainable design strategies Comprehend the connectivity of biotopes - land, mangroves, seagrass, and corals Discover the relationship between managing marine resources and managing adjoining land use Learn how fish behavior and migration patterns control fisheries

A multi-disciplinary account of the current status, problems, and solutions to the coral reef crisis, first published in 2006.

Every volume of Science Comics offers a complete introduction to a particular topic--dinosaurs, coral reefs, the solar system, volcanoes, bats, flying machines, and more. These gorgeously illustrated graphic novels offer wildly entertaining views of their subjects. Whether you're a fourth grader doing a natural science unit at school or a thirty-year-old with a secret passion for airplanes, these books are for you! This volume: in Coral Reefs, we learn all about these tiny, adorable sea animals! This absorbing look at ocean science covers the biology of coral reefs as well as their ecological importance. Nonfiction comics genius Maris Wicks brings to bear her signature combination of hardcore cuteness and in-depth science.

This book documents and examines the state of health of coral reefs in the eastern tropical Pacific region. It touches on the occurrence of coral reefs in the waters of surrounding countries, and it explores their biogeography, biodiversity and condition relative to the El Niño southern oscillation and human impacts. Additionally contained within is a field that presents information on many of the species presented in the preceding chapters.

A Natural History of an Endangered Habitat

Explore and Protect the Natural Wonders of the Sea

The Biology and Geology of Deep-Sea Coral Habitats

Coral Reefs of the Red Sea

Cold-Water Corals

Biology and Geology of Coral Reefs V4

One of the most serious consequences of global climate change for coral reefs is the increased frequency and severity of mass coral bleaching events and, since the first edition of this volume was published in 2009, there have been additional mass coral bleaching events. This book provides comprehensive information on the causes and consequences of coral bleaching for coral reef ecosystems, from the genes and microbes involved in the bleaching response, to individual coral colonies and whole reef systems. It presents detailed analyses of how coral bleaching can be detected and quantified and reviews future scenarios based on modeling efforts and the potential mechanisms of acclimatisation and adaptation. It also briefly discusses emerging research areas that focus on the development of innovative interventions aiming to increase coral climate resilience and restore reefs.

Like many coral specialists fifteen years ago, Veron thought Australia's Great Barrier Reef was impervious to climate change. Then he saw for himself the devastation that elevated sea temperatures can inflict on corals.

Biology and Geology of Coral Reefs V1 ...

This book provides a comprehensive and up-to-date review of the ecology of coral reef fishes presented by top researchers from North America and Australia. Immense strides have been made over the past twenty years in our understanding of ecological systems in general and of reef fish ecology in particular. Many of the methodologies that reef fish ecologists use in their studies will be useful to a wider audience of ecologists for the design of their ecological studies. Significant among the impacts of the research on reef fish ecology are the development of nonequilibrium models of community organization, more emphasis on the role of recruitment variability in structuring local assemblages, the development and testing of evolutionary models of social organization and reproductive biology, and new insights into predator-prey and plant-herbivore interactions.

Science Comics: Coral Reefs

The World of Coral Reefs

Biology and Field Guide

Geological Approaches to Coral Reef Ecology
Geology 2
A Reef in Time

"The influence of fishing, nutrients, bacteria, viruses, and climate change on nature's most wondrous constructs"--Cover.

Learning becomes fun with this book about the animals of the ocean! In Over in the Ocean: In a Coral Reef, amazing artwork will inspire kids in classrooms and at home to appreciate the beauty and biology of coral reefs and world around us! Brilliant artwork is the star of this oceanic counting book, based on the classic children's song "Over in the Meadow". Kids will sing, clap, and count their way among pufferfish that "puff," gruntfish that "grunt" and seahorses that "flutter," and begin to appreciate the animals in the ocean. And the clay art will inspire many a project. Parents, teachers, giftgivers, and many others will find: captivating illustrations of sculptures fashioned from polymer clay. backmatter that includes further information about the coral reef and the animals of the ocean. music and song lyrics to "Over in the Ocean" sung to the tune "Over in the Meadow"! a book for young readers learning to count!

Coral reefs represent the most spectacular and diverse marine ecosystem on the planet as well as a critical source of income for millions of people. However, the combined effects of human activity have led to a rapid decline in the health of reefs worldwide, with many now facing complete destruction. This timely book provides an integrated overview of the function, physiology, ecology, and behaviour of coral reef organisms. Each chapter is enriched with a selection of 'boxes' on specific aspects written by internationally recognised experts. As with other books in the Biology of Habitats Series, the emphasis in this book is on the organisms that dominate this marine environment although pollution, conservation, climate change, and experimental aspects are also included. Indeed, particular emphasis is placed on conservation and management due to the habitat's critically endangered status. A global range of examples is employed which gives the book international relevance. This accessible text is intended for students, naturalists and professionals and assumes no previous knowledge of coral reef biology. It is particularly suitable for both senior undergraduate and graduate students (in departments of biology, geography, and environmental science) taking courses in coral reef ecology, marine biology, oceanography and conservation biology, as well as the many professional ecologists and conservation biologists requiring a concise overview of the topic. It will also be of relevance and use to reef managers, recreational divers, and amateur naturalists.

Very Short Introductions: Brilliant, Sharp, Inspiring Coral reefs are among the most beautiful, and most diverse, of ecosystems. Early seafarers were wary of them, naturalists were confused by them, yet many coastal people benefited greatly from these mysterious rocky structures that grew up to the surface of the sea. They have been rich in their supply of food, and they provided a breakwater from storms and high waves to countless coastal communities that developed from their protection. Their scale is enormous and their value high. Found in countless locations around the world, from the Indo-Pacific coral reef province to the Caribbean and Australia, they support both marine and human life. But today coral reefs are in trouble, with many dying or

suffering from over-exploitation, pollution, and the warming and acidification of the oceans. Understanding reefs, their conservation and management, is vital, and so is conveying this to authority if we are to preserve these remarkable ecosystems. In this Very Short Introduction Charles Sheppard describes the complex structure and interdependencies of a reef, how reefs have evolved, the diversity of marine life that they support, and their importance to the human population who live beside them. This new edition describes the latest research on the complex symbioses of coral animals with microorganisms. It also highlights the scale of the challenge facing our reefs today, following recent ocean heatwaves - part of wider climate disruption - that killed half the world's reefs, and considers what can be done to preserve these essential and vibrant ecosystems. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Strategy for Ecosystem Symbiosis and Coexistence with Humans under Multiple Stresses

Reef Corals of the World

Coral Reefs of the Eastern Tropical Pacific

Coral Reef Conservation

Physical and Biological Links in the Great Barrier Reef

Persistence and Loss in a Dynamic Environment

Biology and Geology of Coral Reefs, Volume III: Biology 2 covers the major advances made in the biological aspects of coral reef problems. This book discusses the ecology, animal associates, and toxicity of coral reefs. Composed of 11 chapters, the book initially describes the diversity of animals permanently or temporarily associated with living corals despite the formidable nematocyst batteries possessed by corals. The text goes on discussing some specializations of some shrimps and prawns permanently associated with living corals, thus, augmenting the number of biological niches available for colonization. The subsequent chapters deal with the appearance and distribution of coral reefs echinoderms and their biogeography; the role of fishes in the energetic of the coral reef system; the high incidence of toxic fishes in coral reef waters; and the origin, transmission, detection, pharmacology, and chemistry of ciguatoxin. The book also discusses natural and man-induced destruction of coral reef communities and the rate, manner, and extent of recovery of such destruction. It also describes the types of vegetation that grow on the limestone substratum provided by coral islands. Another chapter provides distributional data on the birds of the Great Barrier Reef region and the behavior and evolution of island populations of sea birds. The concluding chapters present the general biology of sea turtles and the factors that influence the number and types of organisms found on coral islands. This book will acquaint readers with some of the exciting developments in coral reef biology

and will provide information that will enable them to assess the status of research in different fields.

Coral reefs represent the most spectacular and diverse marine ecosystem on the planet as well as a critical source of income for millions of people. However, the combined effects of human activity have led to a rapid decline in the health of reefs worldwide, with many now facing complete destruction. Their world-wide deterioration and over-exploitation has continued and even accelerated in many areas since the publication of the first edition in 2009. At the same time, there has been a near doubling in the number of scientific papers that have been written in this short time about coral reef biology and the ability to acclimate to ocean warming and acidification. This new edition has been thoroughly revised and updated, incorporating the significant increase in knowledge gained over the last decade whilst retaining the book's focus as a concise and affordable overview of the field. The Biology of Coral Reefs provides an integrated overview of the function, physiology, ecology, and behaviour of coral reef organisms. Each chapter is enriched with a selection of 'boxes' on specific aspects written by internationally recognised experts. As with other books in the Biology of Habitats Series, the emphasis in this book is on the organisms that dominate this marine environment although pollution, conservation, climate change, and experimental aspects are also included. Indeed, particular emphasis is placed on conservation and management due to the habitat's critically endangered status. A global range of examples is employed which gives the book international relevance.

The Biology of Coral ReefsOxford University Press

Published by the American Geophysical Union as part of the Coastal and Estuarine Studies, Volume 61.

The effects of increased atmospheric carbon dioxide and related climate change on shallow coral reefs are gaining considerable attention for scientific and economic reasons worldwide. Although increased scientific research has improved our understanding of the response of coral reefs to climate change, we still lack key information that can help guide reef management. Research and monitoring of coral reef ecosystems over the past few decades have documented two major threats related to increasing concentrations of atmospheric CO2: (1) increased sea surface temperatures and (2) increased seawater acidity (lower pH). Higher atmospheric CO2 levels have resulted in rising sea surface temperatures and proven to be an acute threat to corals and other reef-dwelling organisms. Short periods (days) of elevated sea surface temperatures by as little as 1–2°C above the normal maximum temperature has led to more frequent and more widespread episodes of coral bleaching-the expulsion of symbiotic algae. A more chronic consequence of increasing atmospheric CO2 is the lowering of pH of surface waters, which affects the rate at which corals and other reef organisms secrete and build their calcium carbonate skeletons. Average pH of the surface ocean has already decreased by an estimated 0.1 unit since preindustrial times, and will continue to decline in concert with rising atmospheric CO2. These climate-

related Stressors combined with other direct anthropogenic assaults, such as overfishing and pollution, weaken reef organisms and increase their susceptibility to disease.

Encyclopedia of Modern Coral Reefs

Coral Reefs of the USA

Coral Reefs of the Gulf

In a Coral Reef

Structure, Form and Process

Biology of Coral Reefs

This book aims to illuminate coral reefs which comprise a symbiotic system coexisting among ecosystems, landforms, and humans at various levels and to provide a scientific basis for its reconstruction. The authors conducted an interdisciplinary project called “Coral Reef Science” from 2008 to 2012 and obtained novel results and clues to unite different disciplines for a coral reef as a key ecosystem.

Coral reefs are ancient and extremely complex communities functioning as a single unit. They are the 'rain forests of the sea,' containing the richest biodiversity of all marine ecosystems. This book examines the biological aspects of coral reefs and the importance of their existence. Environmental threats to coral reefs are reviewed (i.e., global warming, overfishing), and ways in which the coral reef ecosystem can be restored are also discussed. Marine ornamental fish play an extremely important role today in the international fish trade. The data on breeding and rearing protocols for some of these high value marine ornamental species are reviewed. Phototrophic dinoflagellates called zooxanthellae and their possible role in coral reef management are also described. Furthermore, the causes of reef damage such as destructive fishing methods are examined. Other examples of adverse human impacts on coral reef sustainability, such as over-fishing, are also reviewed. It is suggested that coral calcification is closely coupled with carbon dioxide in seawater. This book describes the impact of anthropogenic surface ocean acidification with increasing atmospheric carbon dioxide on coral calcification. In addition, changes of caspases in the brains of hypoxic fish are examined by comparing a coral reef with a freshwater teleost. This book also provides a basic knowledge of tsunami effects on coral reefs to aid in the future evaluations of coral damage by tsunamis.

Coral Reefs of the USA provides a complete overview of the present status of knowledge regarding all coral reef areas within the USA and its territories. It is written by the most experienced authorities in their fields and geographic areas. Stretching from the Caribbean to the western Pacific, the coral reefs of the USA span extensive geographic and biotic diversity, occur in a wide variety of geomorphological settings, and provide a representative cross-section of Holocene reef-building. This book will therefore be of broad general interest. For the first time, complete scholarly reviews are given for the geology, geomorphology and the biology of reefs encompassing a vast area stretching from the Mariana Islands in the west, Samoa in the south, Hawaii in the north and the Virgin Islands in the east. This book is not a status report, but will provide up-to-date information about stressors and the biotic responses of the reefs, as well as the geological explanations why these reefs exist in the first place. It will be an invaluable baseline-reference for all those who are engaged in research or management of these coral reefs or to those who simply enjoy being well-informed about one of the most iconic ecosystems of the USA.

Coral reefs are the largest landforms built by plants and animals. Their study therefore incorporates a wide range of disciplines. This encyclopedia approaches coral reefs from an earth science perspective, concentrating especially on modern reefs. Currently coral reefs are under high stress, most prominently from climate change with changes to water temperature, sea level and ocean acidification particularly damaging. Modern reefs have evolved through the massive environmental changes of the Quaternary with long periods of exposure during glacially lowered sea level periods and short periods of interglacial growth. The entries in this encyclopedia condense the large amount of work carried out since Charles Darwin first attempted to understand reef evolution. Leading authorities from many countries have contributed to the entries covering areas of geology, geography and ecology, providing comprehensive access to the most up-to-date research on the structure, form and processes operating on Quaternary coral reefs.
Ecology of Fishes on Coral Reefs

Biology, Threats and Restoration
Coastal and Marine Environments
Patterns, Processes, Causes and Consequences
Adaptation to Climatic Extremes

Explores the natural history of coral reefs, from microscopic zooplankton to the majestic Great Barrier Reef

Coral reefs have been long regarded with awe by the millions of people who have encountered them over the centuries. Early seafarers were wary of them, naturalists were confused by them, yet many coastal people benefited greatly from these mysterious rocky structures that grew up to the surface of the sea. They have been rich in their supply of food, and they provided a breakwater from storms and high waves to countless coastal communities that developed from their protection. Their scale is enormous and their value high. Found in countless locations around the world, from the Indo-Pacific coral reef province to the Caribbean and Australia, they support both marine and human life. In this Very Short Introduction, Charles Sheppard provides an account of what coral reefs are, how they are formed, how they have evolved, and the biological lessons we can learn from them. Today, the vibrancy and diversity of these fascinating ecosystems are under threat from over exploitation and could face future extinction, unless our conservation efforts are stepped up in order to save them. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

"In this illustrated book for ages 7 to 10, marine ecologist Erin Spencer provides fascinating, scientific information about coral reef and conservation work that scientists are undertaking, and

solution-oriented ways kids and families can help in the effort"--

Biology and Geology of Coral Reefs, Volume II: Biology 1 discusses the major advances made in the biological aspects of coral reef problems. This book is organized into 12 chapters that cover the microbial aspects of coral reefs, the nutrition in corals, and diversity in coral reefs. The opening chapters describe the distribution and role of coral reef microorganisms, as well as the significance of bacterioplankton as a food source for the marine fauna of coral reefs. The following chapter discusses the occurrence of algae in coral reef, their competition with corals for space, and their role in reef construction. Other chapters deal with food and feeding mechanisms of corals, the role of marine antibiotics in coral reef ecology, and some chemical compounds isolated from coral reef organisms, providing evidence for marine pharmacologic activity in coral reef areas. The book also discusses some basic problems relating to the distribution and abundance of hermatypic corals on reefs. It then examines species diversity on coral reefs, variety of reef structure, and the important role of toxic materials produced by holothurians on the general ecology and physiology of coral reefs. The last chapters describe the development, feeding, and behavior of the larval stages of several coral reef asteroids. Particular emphasis is given to the larval and post-larval stages of the crown-of-thorns starfish, Acanthaster planci. The starfish population explosions, the devastating effects on the hard coral cover of coral reefs, and causes and control of population explosions are also covered. This volume will acquaint readers with some of the exciting developments in coral reef biology and will provide information that will enable them to assess the status of research in different fields.

The Great Barrier Reef

Coral Reefs in the Anthropocene

Coral Reef Science

Coral Reefs in the Microbial Seas

The Great Barrier Reef from Beginning to End

Coral Reefs and Climate Change