

Marine Biology Castro Huber 9th Edition Uksom

Marine Biology covers the basics of marine biology with a global approach, using examples from numerous regions and ecosystems worldwide. This introductory, one-semester text is designed for non-majors. Authors Castro and Huber have made a special effort to include solid basic science content needed in a general education course, including the fundamental principles of biology, the physical sciences, and the scientific method. This science coverage is integrated with a stimulating, up-to-date overview of marine biology.

The biological sciences cover a broad array of literature types, from younger fields like molecular biology with its reliance on recent journal articles, genomic databases, and protocol manuals to classic fields such as taxonomy with its scattered literature found in monographs and journals from the past three centuries. Using the Biological Literature: A Practical Guide, Fourth Edition is an annotated guide to selected resources in the biological sciences, presenting a wide-ranging list of important sources. This completely revised edition contains numerous new resources and descriptions of all entries including textbooks. The guide emphasizes current materials in the English language and includes retrospective references for historical perspective and to provide access to the taxonomic literature. It covers both print and electronic resources including monographs, journals, databases, indexes and abstracting tools, websites, and associations—providing users with listings of authoritative informational resources of both classical and recently published works. With chapters devoted to each of the main fields in the basic biological sciences, this book offers a guide to the best and most up-to-date resources in biology. It is appropriate for anyone interested in searching the biological literature, from undergraduate students to faculty, researchers, and librarians. The guide includes a supplementary website dedicated to keeping URLs of electronic and web-based resources up to date, a popular feature continued from the third edition.

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A fascinating guide to a career in marine biology written by bestselling journalist Virginia Morell and based on the real-life experiences of an expert in the field—essential reading for someone considering a path to this profession. For the last two decades, Dr. Robin Baird has spent two months out of each year aboard a twenty-four-foot Zodiac boat in the waters off the big island of Hawai'i, researching the twenty-five species of whales and dolphins that live in the Pacific Ocean. His life may seem an impossible dream—but his career path from being the first person in his family to graduate college to becoming the leading expert on some of Hawai'i's marine mammals was full of twists and turns. Join Baird aboard his Zodiac for a candid look at the realities of life as a research scientist, from the ever-present struggles to secure grants and publish new data, to the joys of helping to protect the ocean and its inhabitants. You'll also learn pro tips, like the unexpected upsides to not majoring in marine biology and the usefulness of hobbies like sailing, birdwatching, photography, and archery. (You'll need good aim to tag animals with the tiny recording devices that track their movements.) *Becoming a Marine Biologist* is an essential guide for anyone looking to turn a passion for the natural world into a career. This is the most valuable informational interview you'll have—required reading for anyone considering this challenging yet rewarding path.

Man's understanding of how this planet is put together and how it evolved has changed radically during the last 30 years. This great revolution in geology - now usually subsumed under the concept of Plate Tectonics - brought the realization that convection within the Earth

is responsible for the origin of today's ocean basins and continents, and that the grand features of the Earth's surface are the product of ongoing large-scale horizontal motions. Some of these notions were put forward earlier in this century (by A. Wegener, in 1912, and by A. Holmes, in 1929), but most of the new ideas were an outgrowth of the study of the ocean floor after World War II. In its impact on the earth sciences, the plate tectonics revolution is comparable to the upheaval wrought by the ideas of Charles Darwin (1809-1882), which started the intense discussion on the evolution of the biosphere that has recently heated up again. Darwin drew his inspiration from observations on island life made during the voyage of the Beagle (1831-1836), and his work gave strong impetus to the first global oceanographic expedition, the voyage of HMS Challenger (1872- 1876). Ever since, oceanographic research has been intimately associated with fundamental advances in the knowledge of Earth. This should come as no surprise. After all, our planet's surface is mostly ocean.

This volume presents a broad panorama of the current status of research of invertebrate animals considered belonging to the phylum Cnidaria, such as hydra, jellyfish, sea anemone, and coral. In this book the Cnidarians are traced from the Earth's primordial oceans, to their response to the warming and acidifying oceans. Due to the role of corals in the carbon and calcium cycles, various aspects of cnidarian calcification are discussed. The relation of the Cnidaria with Mankind is approached, in accordance with the Editors' philosophy of bridging the artificial schism between science, arts and Humanities. Cnidarians' encounters with humans result in a broad spectrum of medical emergencies that are reviewed. The final section of the volume is devoted to the role of Hydra and Medusa in mythology and art.

A compilation of 3M voices, memories, facts and experiences from the company's first 100 years.

Jellyfish are one of the most conspicuous animals in our oceans and are renowned for their propensity to form spectacular blooms. The unique features of the biology and ecology of jellyfish that enable them to bloom also make them successful invasive species and, in a few places around the world, jellyfish have become problematic. As man increasingly populates the world's coastlines, interactions between humans and jellyfish are rising, often to the detriment of coastal-based industries such as tourism, fishing and power generation. However we must not lose sight of the fact that jellyfish have been forming blooms in the oceans for at least 500 million years, and are an essential component of normal, healthy ocean ecosystems. Here many of the world's leading jellyfish experts explore the science behind jellyfish blooms. We examine the unique features of jellyfish biology and ecology that cause populations to 'bloom and bust', and, using case studies, we show why jellyfish are important to coastal and ocean ecosystem function. We outline strategies coastal managers can use to mitigate the effects of blooms on coastal industries thereby enabling humans to coexist with these fascinating creatures. Finally we highlight how jellyfish benefit society; providing us with food and one of the most biomedically-important compounds discovered in the 20th century. ?

Focusing on comparative cognition in cephalopods, this book illuminates the wide range of mental function in this often overlooked group.

This book argues for the essential use of drawing as a tool for science teaching and learning. The authors are working in schools, universities, and continual science learning (CSL) settings around the world. They have written of their experiences using a variety of prompts to encourage people to take pen to paper and draw their thinking – sometimes direct observation and in other instances, their memories. The result is a collection of research and essays that offer theory, techniques, outcomes, and models

for the reader. Young children have provided evidence of the perceptions that they have accumulated from families and the media before they reach classrooms. Secondary students describe their ideas of chemistry and physics. Teacher educators use drawings to consider the progress of their undergraduates' understanding of science teaching and even their moral/ethical responses to teaching about climate change. Museum visitors have drawn their understanding of the physics of how exhibit sounds are transmitted. A physician explains how the history of drawing has been a critical tool to medical education and doctor-patient communications. Each chapter contains samples, insights, and where applicable, analysis techniques. The chapters in this book should be helpful to researchers and teachers alike, across the teaching and learning continuum. The sections are divided by the kinds of activities for which drawing has historically been used in science education: An instance of observation (Audubon, Linnaeus); A process (how plants grow over time, what happens when chemicals combine); Conceptions of what science is and who does it; Images of identity development in science teaching and learning.

Molluscs comprise the second largest phylum of animals (after arthropods), occurring in virtually all habitats. Some are commercially important, a few are pests and some carry diseases, while many non-marine molluscs are threatened by human impacts which have resulted in more extinctions than all tetrapod vertebrates combined. This book and its companion volume provide the first comprehensive account of the Mollusca in decades. Illustrated with hundreds of colour figures, it reviews molluscan biology, genomics, anatomy, physiology, fossil history, phylogeny and classification. This volume includes general chapters drawn from extensive and diverse literature on the anatomy and physiology of their structure, movement, reproduction, feeding, digestion, excretion, respiration, nervous system and sense organs. Other chapters review the natural history (including ecology) of molluscs, their interactions with humans, and assess research on the group. Key features of both volumes: up to date treatment with an extensive bibliography; thoroughly examines the current understanding of molluscan anatomy, physiology and development; reviews fossil history and phylogenetics; overviews ecology and economic values; and summarises research activity and suggests future directions for investigation. Winston F Ponder was a Principal Research Scientist at The Australian Museum in Sydney where he is currently a Research Fellow. He has published extensively over the last 55 years on the systematics, evolution, biology and conservation of marine and freshwater molluscs, as well as supervised post graduate students and run university courses. David R. Lindberg is former Chair of the Department of Integrative Biology, Director of the Museum of Paleontology, and Chair of the Berkeley Natural History Museums, all at the University of California. He has conducted research on the evolutionary history of marine organisms and their habitats on the rocky shores of the Pacific Rim for more than 40 years. The numerous elegant and interpretive illustrations were produced by Juliet Ponder.

How might Hercules, the most famous of the Greek heroes, have used mathematics to complete his astonishing Twelve Labors? From conquering the Nemean Lion and cleaning out the Augean Stables, to capturing the Erymanthean Boar and entering the Underworld to defeat the three-headed dog Cerberus, Hercules and his legend are the inspiration for this book of fun and original math puzzles. While Hercules relied on superhuman strength to accomplish the Twelve Labors, Mythematics shows how math

could have helped during his quest. How does Hercules defeat the Lernean Hydra and stop its heads from multiplying? Can Hercules clean the Augean Stables in a day? What is the probability that the Cretan Bull will attack the citizens of Marathon? How does Hercules deal with the terrifying Kraken? Michael Huber's inventive math problems are accompanied by short descriptions of the Twelve Labors, taken from the writings of Apollodorus, who chronicled the life of Hercules two thousand years ago. Tasks are approached from a mathematical modeling viewpoint, requiring varying levels of knowledge, from basic logic and geometry to differential and integral calculus. Mythematics provides helpful hints and complete solutions, and the appendixes include a brief history of the Hercules tale, a review of mathematics and equations, and a guide to the various disciplines of math used throughout the book. An engaging combination of ancient mythology and modern mathematics, Mythematics will enlighten and delight mathematics and classics enthusiasts alike.

Summarizes the science of climate change and impacts on the United States, for the public and policymakers.

The rapid conversion of land to urban and suburban areas has profoundly altered how water flows during and following storm events, putting higher volumes of water and more pollutants into the nation's rivers, lakes, and estuaries. These changes have degraded water quality and habitat in virtually every urban stream system. The Clean Water Act regulatory framework for addressing sewage and industrial wastes is not well suited to the more difficult problem of stormwater discharges. This book calls for an entirely new permitting structure that would put authority and accountability for stormwater discharges at the municipal level. A number of additional actions, such as conserving natural areas, reducing hard surface cover (e.g., roads and parking lots), and retrofitting urban areas with features that hold and treat stormwater, are recommended.

This book is devoted to the dangerous fishes found offshore the eastern and southern Arabian Peninsula. It covers information about the main groups of dangerous fish species i.e., biting and predator fish group, venomous stinging fish, electric shock fish, harmful stinging fish, and poisonous fish. In the latter group, the book gives details about fishes that cause several types of toxicities to human. The purpose of this book is to thoroughly introduce life, nature and methods of dangerous fishes in order to form awareness about their danger and to take the proper preventive steps. It will appeal to researchers, scholars, divers, the sea coast visitors and students of marine biology as it is highly informative and carefully presented. This book is the first of its kind for the Arabian region in particular and the Middle East in general. Our current knowledge of marine organisms and the factors affecting their ecology, distribution and evolution has been revolutionised by the use, in the last 20 years, of molecular population genetics tools. This book is the result of a meeting of world-leading experts, in Rio de Janeiro, where the state of the art of this field was reviewed. Topics covered include the molecular analysis of bio-invasions, the recent developments in marine biotechnology, the factors affecting levels of genetic variation and population structure in marine organisms and their application to conservation biology, fisheries and aquaculture. This is the first book dedicated to the genetic study of marine organisms. It will be very useful to biology

students, scientists and anyone working or simply interested in areas such as marine biology, zoology, ecology, and population and molecular genetics.

Widely regarded as the most captivating, accessible and comprehensive text for undergraduate marine biology courses, Marine Biology examines the subject from a unique global and evolutionary perspective. Written in clear, conversational style, this highly acclaimed volume emphasizes the principles and processes that underlie - and unify - vastly different marine communities.

Recognizing the importance of good nutrition for physical and mental status, the Department of Defense asked the Institute of Medicine to guide the design of the nutritional composition of a ration for soldiers on short-term, high-stress missions. Nutrient Composition of Rations for Short-Term, High-Intensity Combat Operations considers military performance, health concerns, food intake, energy expenditure, physical exercise, and food technology issues. The success of military operations depends to a large extent on the physical and mental status of the individuals involved. Appropriate nutrition during assault missions is a continuous challenge mainly due to diminished appetites of individuals under stress. Many less controllable and unpredictable factors, such as individual preferences and climate, come into play to reduce appetite. In fact, soldiers usually consume about half of the calories needed, leaving them in a state called "negative energy balance." The consequences of being in negative energy balance while under these circumstances range from weight loss to fatigue to mental impairments. An individual's physiological and nutritional status can markedly affect one's ability to maximize performance during missions and may compromise effectiveness. With the number of these missions increasing, the optimization of rations has become a high priority.

The Routledge Handbook of Research Methods for Social-Ecological Systems provides a synthetic guide to the range of methods that can be employed in social-ecological systems (SES) research. The book is primarily targeted at graduate students, lecturers and researchers working on SES, and has been written in a style that is accessible to readers entering the field from a variety of different disciplinary backgrounds. Each chapter discusses the types of SES questions to which the particular methods are suited and the potential resources and skills required for their implementation, and provides practical examples of the application of the methods. In addition, the book contains a conceptual and practical introduction to SES research, a discussion of key gaps and frontiers in SES research methods, and a glossary of key terms in SES research. Contributions from 97 different authors, situated at SES research hubs in 16 countries around the world, including South Africa, Sweden, Germany and Australia, bring a wealth of expertise and experience to this book. The first book to provide a guide and introduction specifically focused on methods for studying SES, this book will be of great interest to students and scholars of sustainability science, environmental management, global environmental

change studies and environmental governance. The book will also be of interest to upper-level undergraduates and professionals working at the science–policy interface in the environmental arena.

During the recent decades, social, political and academic endeavours have been made to improve environmental quality and reduce pollution. In particular, the ocean, sea and coastal areas show varying degrees of impact from the multiple human activities carried out in the terrestrial as well as in the aquatic environment. Ecology is a science which studies the relationship between organisms and the surrounding environment and in the modern era, the marine world is getting increasing attention. For centuries it has been the final reservoir of human garbage; later it became an oil farm with a concomitant increase of coastal population growth and unplanned growth of the fishing industry and the increasing use of sea routes for cargo transport and recreational uses (cruises). All this led to rising contamination with negative effects on biota and even human health. It is then imperative to know the current situation of the world's oceans: that is the main purpose of this book, to document at a glance the latest research in the field of ocean pollution.

The research paper "Extinction Risk from Climate Change" published in the journal *Nature* in January 2004 created front-page headlines around the world. The notion that climate change could drive more than a million species to extinction captured both the popular imagination and the attention of policy-makers, and provoked an unprecedented round of scientific critique. *Saving a Million Species* reconsiders the central question of that paper: How many species may perish as a result of climate change and associated threats? Leaders from a range of disciplines synthesize the literature, refine the original estimates, and elaborate the conservation and policy implications. The book: examines the initial extinction risk estimates of the original paper, subsequent critiques, and the media and policy impact of this unique study presents evidence of extinctions from climate change from different time frames in the past explores extinctions documented in the contemporary record sets forth new risk estimates for future climate change considers the conservation and policy implications of the estimates. *Saving a Million Species* offers a clear explanation of the science behind the headline-grabbing estimates for conservationists, researchers, teachers, students, and policy-makers. It is a critical resource for helping those working to conserve biodiversity take on the rapidly advancing and evolving global stressor of climate change—the most important issue in conservation biology today, and the one for which we are least prepared.

Teacher digital resource package includes 2 CD-ROMs and 1 user guide. Includes Teacher curriculum guide, PowerPoint chapter presentations, an image gallery of photographs, illustrations, customizable presentations and student materials, Exam Assessment Suite, PuzzleView for creating word puzzles, and LessonView for dynamic lesson planning. Laboratory and activity disc includes the manual in both student and teacher editions and a lab materials list.

The *Laboratory Rat, Volume I: Biology and Diseases* focuses on the use of rats in specific areas of research, ranging from dental research to toxicology. The first part of this book retraces the biomedical history of early events and personalities involved in the establishment of rats as

a leading laboratory animal. The taxonomy, genetics and inbred strains of rats are also elaborated. The next chapters illustrate the hematology, clinical biochemistry, and anatomical and physiological features of the laboratory rat. This text concludes with a description of infectious diseases that may be contracted from laboratory and/or wild rats. This volume is a good source for commercial and institutional organizations involved in producing rats for research use, specialists in laboratory animal, animal care and research technicians, as well as students in graduate and professional curricula.

The new series "Microbiology Monographs" begins with two volumes on intracellular components in prokaryotes. In this first volume, "Inclusions in Prokaryotes", the components, labeled inclusions, are defined as discrete bodies resulting from synthesis of a metabolic product. Research on the biosynthesis and reutilization of the accumulated materials is still in progress, and interest in the inclusions is growing. This comprehensive volume provides historical background and comprehensive reviews of eight well-known prokaryotic inclusions. Dive into this uniquely elegant visual exploration of the sea An informative and utterly beautiful introduction to marine life and the ocean environment, *Oceanology* brings the riches of the underwater world onto the printed page. Astounding photography reveals an abundance of life, from microscopic plankton to great whales, seaweed to starfish. Published in association with the Smithsonian Institution, the book explores every corner of the oceans, from coral reefs and mangrove swamps to deep ocean trenches. Along the way, and with the help of clear, simple illustrations, it explains how life has adapted to the marine environment, revealing for example how a stonefish delivers its lethal venom and how a sponge sustains itself by sifting food from passing currents. It also examines the physical forces and processes that shape the oceans, from global circulation systems and tides to undersea volcanoes and tsunamis. To most of us, the marine world is out of reach. But with the help of photography and the latest technology, *Oceanology* brings us up close to animals, plants, and other living things that inhabit a fantastic and almost incomprehensibly beautiful other dimension.

Meet the world's most fascinating sea creatures—see the lives and curiosities of colorful fish and coral reefs—this spectacular volume has more than 300 color photos and extraordinary text from a leading marine biologist and underwater photographer, and the international expert on seahorses. In this richly informative volume, brimming with new discoveries and more than three hundred colorful images of jaw-dropping fish and coral reefs, you'll swim in the Atlantic, Pacific, and Indian Oceans; you'll be dazzled in the Coral Triangle and amazed in Triton Bay. Up close you'll meet the Cenderawasih fairy wrasse, with its florescent yellow streak; the polka-dot longnose filefish; and the multicolored seadragon. There are scarlet-colored corals, baby-blue sponges, daffodil crinoids, and all sorts of mystifying creatures that change color at the drop of a hat. The whale shark is almost larger than life and the author's beloved pygmy seahorse, unless photographed, is almost too tiny to see. The wondrous creatures inside are charmers and tricksters and excel in the arts of seduction and deception, and you'll have the rare chance to see and delight in their antics. You'll also learn what they eat, how they play, and how they care for one another, live on one another, and mimic others when they're afraid. There is also compelling insight into the naming process, which sea creatures are facing extinction, and how we can help them before it's too late.

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The collection of systems represented in this volume is a unique effort to reflect the diversity and utility of models used in biomedicine. That utility is based on the consideration that observations made in particular organisms will provide insight into the workings of other, more complex systems. This volume is therefore a comprehensive and extensive collection of these important medical parallels.

The oceans are our planet's most distinctive and imposing natural habitat. They cover 71 percent of its surface; support a remarkably diverse

and exquisitely adapted array of life forms, from microscopic viruses, bacteria, and plankton to the largest existing animals; and possess many of Earth's most significant, intriguing, and inaccessible ecosystems. In an era in which humans are significantly altering the global environment, the oceans are undergoing rapid and profound changes. The study of marine biology is thus taking on added importance and urgency as people struggle to understand and manage these changes to protect our marine ecosystems. Healthy oceans produce half of the oxygen we breathe; stabilize our climate; create ecosystems that protect our coasts from storms; provide us with abundant food; and host diverse organisms that provide us with natural products for medicine and biotechnology. In this Very Short Introduction, marine biologist Philip Mladenov provides an accessible and up-to-date overview of marine biology, offering a tour of marine life and marine processes that ranges from the unimaginably abundant microscopic organisms that drive the oceans' food web to the apex predators that we exploit for food; from polar ocean ecosystems to tropical coral reefs; and from the luxurious kelp beds of the coastal ocean to deep-ocean hydrothermal vents where life exists without the energy of the sun. Throughout the book he considers the human impacts on marine life including overfishing, plastic and nutrient pollution, the spread of exotic species, and ocean warming and acidification. He discusses the threats these pose to our welfare, and the actions required to put us on a path to a more sustainable relationship with our oceans so that they can be restored and protected for future generations. Mladenov concludes with a new chapter offering an inspiring vision for the future of our oceans in 2050 that can be realised if we are wise enough to accelerate actions already underway and be bold with implementing new approaches. The next decade will decide the state of the oceans that we leave behind for future generations. 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.

Biology is a critical application area for engineering analysis and design, and students in engineering programs must be well-versed in the fundamentals of biology as they relate to their field. Biology for Engineers is an introductory text that minimizes unnecessary memorization of connections and classifications and instead emphasizes concepts, technology, and the utilization of living things. Whether students are headed toward a bio-related engineering degree or one of the more traditional majors, biology is so important that all engineering students should know how living things work and act. Classroom-tested at the University of Maryland, this comprehensive text introduces concepts and terminology needed to understand more advanced biology literature. Filled with practical detailed examples, the book presents: Scientific principles relevant to biology that all engineers must know A discussion of biological responses from the perspective of a broad range of fields such as psychology, human factors, genetics, plant and animal physiology, imaging, control systems, actuary, and medicine A thorough examination of the scaling of biological responses and attributes A classification of different types of applications related to biological systems Tables of useful information that are nearly impossible to find elsewhere A series of questions at the end of each chapter to test comprehension Emphasizing the ever-present interactions between a biological unit and its physical, chemical, and biological environments, the book provides ample instruction on the basics of physics, chemistry, mathematics, and engineering. It brings together all of the concepts one needs to understand the role of biology in modern technology.

A collection of short poems, mainly on themes suggested by the natural world.

This volume presents the four sub-themes of the 38th European Marine Biology Symposium. These are patterns and processes, assessment, threats and management and conservation. Understanding the functioning of marine ecosystems is the first step towards measuring and

predicting the influence of Man, and to finding solutions for the enormous array of problems we face today. The papers in this book represent current research and concerns about Marine Biodiversity in Europe.

The situation in the South China Sea with regard to territorial disputes remains unsettled despite The Hagues Permanent Court of Arbitration unanimous ruling in favor of the Philippines and against Chinas historic rights to the South China Sea. This collection of academic essays examines many interpretations of international law on the legal status of the contested islands and rocks. Whats clear to all is that the failure to uphold international law and norms harms all claimants interests in the contested sea.

Humans have changed ecosystems more rapidly and extensively in the last 50 years than in any comparable period of human history. We have done this to meet the growing demands for food, fresh water, timber, fiber, and fuel. While changes to ecosystems have enhanced the well-being of billions of people, they have also caused a substantial and largely irreversible loss in diversity of life on Earth, and have strained the capacity of ecosystems to continue providing critical services. Among the findings: Approximately 60% of the services that support life on Earth are being degraded or used unsustainably. The harmful consequences of this degradation could grow significantly worse in the next 50 years. Only four ecosystem services have been enhanced in the last 50 years: crops, livestock, aquaculture, and the sequestration of carbon. The capacity of ecosystems to neutralize pollutants, protect us from natural disasters, and control the outbreaks of pests and diseases is declining significantly. Terrestrial and freshwater systems are reaching the limits of their ability to absorb nitrogen. Harvesting of fish and other resources from coastal and marine systems is compromising their ability to deliver food in the future. Richly illustrated with maps and graphs, Current State and Trends presents an assessment of Earth's ability to provide twenty-four distinct services essential to human well-being. These include food, fiber, and other materials; the regulation of the climate and fresh water systems; underlying support systems such as nutrient cycling; and the fulfillment of cultural, spiritual, and aesthetic values. The volume pays particular attention to the current health of key ecosystems, including inland waters, forests, oceans, croplands, and dryland systems, among others. It will be an indispensable reference for scientists, environmentalists, agency professionals, and students.

Whether the result of an oil well blowout, vessel collision or grounding, leaking pipeline, or other incident at sea, each marine oil spill will present unique circumstances and challenges. The oil type and properties, location, time of year, duration of spill, water depth, environmental conditions, affected biomes, potential human community impact, and available resources may vary significantly. Also, each spill may be governed by policy guidelines, such as those set forth in the National Response Plan, Regional Response Plans, or Area Contingency Plans. To respond effectively to the specific conditions presented during an oil spill, spill responders have used a variety of response options—including mechanical recovery of oil using skimmers and booms, in situ burning of oil, monitored natural attenuation of oil, and dispersion of oil by chemical dispersants. Because each response method has advantages and disadvantages, it is important to understand specific scenarios where a net benefit may be achieved by using a particular tool or combination of tools. This report builds on two previous National Research Council reports on dispersant use to provide a current understanding of the state of science and to inform future marine oil spill response operations. The response to the 2010 Deepwater Horizon spill included an unprecedented use of dispersants via both surface application and subsea injection. The magnitude of the spill stimulated interest and funding for research on oil spill response, and dispersant use in particular. This study assesses the effects and efficacy of dispersants as an oil spill response tool and evaluates trade-offs associated with dispersant use.