Marine Pollution Solutions

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Vessel-Source Marine Pollution McGraw-Hill Companies
This book, written by a multidisciplinary team of authors comprising scientists, artists and communicators, explores one of the most pressing issues of our time – the menace plastics pose to marine environments and organisms. It takes readers on a journey that begins on the beaches of Galicia, where the beach litter formed the starting point for an exhibition that combines art and science to alert the audience to the urgent need for action. The journey culminates with a short "plastic story", which reveals a disturbing vision of the future significance of plastics for humans, and an example of how comics can deliver information to a younger audience. Along the way there is plenty of fascinating science, such as insights into the impacts of plastics and microplastics; the new marine ecosystem, known as the "plastisphere"; and the current status of the oceans, from the Arctic to the Mediterranean. The book also explores the historical developments; sustainable solutions, including the use of circular economy methodologies; and protective measures, like those being tried in China and the Far East. Lastly, it describes the role played by rivers as transport vectors for plastic, with special reference to the Danube, and to complete the picture, since most of the plastic is of terrestrial origin, it investigates problems related to microplastics in soils.

Proceedings of the 3rd International Conference on Microplastic Pollution in the Mediterranean Sea CRC Press
An estimated 8 million metric tons (MMT) of plastic waste enters the world's ocean each year - the equivalent of dumping a garbage truck of plastic waste into the ocean every minute. Plastic waste is now found in almost every marine habitat, from the ocean surface to deep sea sediments to the ocean's vast mid-water region, as well as the Great Lakes. This report responds to a request in the bipartisan Save Our Seas 2.0 Act for a scientific synthesis of the role of the United States both in contributing to and responding to global ocean plastic waste. The United States is a major producer of plastics and in 2016, generated more plastic waste by weight and per capita than any other nation. Although the U.S. solid waste management system is advanced, it is not sufficient to deter leakage into the environment. Reckoning with the U.S. Role in Global Ocean Plastic Waste calls for a national strategy by the end of 2022 to reduce the nation's contribution to global ocean plastic waste at every step - from production to its entry into the environment - including by substantially reducing U.S. solid waste generation. This report also recommends a nationally-coordinated and expanded monitoring system to track plastic pollution in order to understand the scales and sources of U.S. plastic waste, set reduction and management priorities, and measure progress.

Marine Pollution Springer
This book addresses a broad range of issues concerning microplastic pollution, including microplastic pollution in various environments (freshwater, marine, air and soil); the sources, fate and effects of microplastics; detection systems for microplastic pollution monitoring; green approaches for the synthesis of environmentally friendly polymers; recovery and recycling of marine plastics; wastewater treatment plants as a microplastic entrance route; nanoplastics as emerging pollutants; degradation of plastics in the marine environment; impacts of microplastics on marine life; microplastics: from marine pollution to the human food chain; mitigation of microplastic impacts and innovative solutions; sampling, extraction, purification and identification approaches for microplastics; adsorption and transport of pollutants on and in microplastics; and lastly, the socio-economic and environmental impacts: assessment and risk analysis. In addition to presenting cutting-edge information and highlighting current trends and issues, the book proposes concrete solutions to help face this significant environmental threat. It is chiefly intended for researchers and industry decision-makers; international, national and local institutions; and NGOs, providing them with comprehensive information on the origin of the problem; its effects on marine environments, with a particular focus on the Mediterranean Sea and coasts; and recent and ongoing research activities and projects aimed at finding technical solutions to mitigate the phenomenon.

Pollution in the Black Sea Springer Science & Business Media
Research Paper (postgraduate) from the year 2010 in the subject Environmental Sciences, grade: A, Central European University Budapest (-), course: -, language: English, abstract: Rapid population growth and enormous urban and coastal developments have increased the anthropogenic pollution into the oceans. Human activities may responsible for the decline in biodiversity and productivity of marine ecosystems, resulting in the depletion of human marine food resources (Jenssen, 2003). Furthermore, the marine environment is an important resource for human welfare and health and fortunately in recent years awareness of its intrinsic value has increased (Derraik, 2002). One particular type of threat to marine ecosystems is the pollution from plastics. These particles are a serious treat to the marine biota and human life and entail significant economic and social costs. Further, they reduce the aesthetic and perhaps intrinsic value of the marine environment (Jenssen, 2003). The aim of this paper is to examine the threats from plastic pollution and introduce an interesting case study from the North Pacific Ocean. The paper will describe the current policies and propose market based instruments which can provide solution to the issue.

Plastic Pollution Springer Science & Business Media
Much of what you've heard about plastic pollution may be wrong. Instead of a great island of trash, the infamous Great Pacific Garbage Patch is made up of manmade debris spread over hundreds of miles of sea--more like a soup than a floating garbage dump. Less than nine percent of the plastic we create is reused, and microplastic fragments are found almost everywhere, even in our bodies. In Thicker Than Water: The Quest for Solutions to the Plastic Crisis, journalist Erica Cirino brings readers on a globe-hopping journey to meet the scientists and activists telling the real story of the plastic crisis. New technologies and awareness bring some hope, but Cirino shows that we can only fix the problem if we begin to repair our throwaway culture. Thicker

Than Water is an eloquent call to reexamine the systems churning out waves of plastic waste.

Global Marine Plastic Pollution Taylor & Francis

This book discusses in a concise manner the key aspects that are important for the understanding of regulations and managerial framework governing marine pollution. It identifies the practical context in which marine pollution comes into play and addresses the international legal regime governing the numerous sources of marine pollution, as well as the ways in which these regulations affect the conduct of day-to-day shipping operations. With illustrations, case studies, emphasis boxes, references to case law and to national jurisdictions and other tools facilitating understanding and knowledge, readers will find helpful guidance on: the sources of marine pollution (including ship-source pollution and pollution from the offshore oil and gas sector); the forms of cooperation needed in order to tackle the prevention, management and response to marine pollution; overview of MARPOL Convention, other key IMO conventions, and selected regional regimes; legal ramifications, including P & I Clubs and limitation of liability; involvement of the flag State, coastal State and port State; industry best practice; the human element Marine Pollution Control will be a useful guidance tool for shipping Industry professionals, (P & I) Clubs, Legal practitioners, maritime administrators, as well as academics and students of marine pollution.

Thicker Than Water Springer Nature

Modern Treatment Strategies for Marine Pollution provides an overview of assessment tools that identify contaminants in marine water, also discussing the latest technologies for removing these contaminants. Through templated and consistently structured chapters, the author explores the importance of seawater to our marine ecosystems and the devastating effects pollutants are causing. Sections cover the emission of toxic pollutants from industries, wastewater discharge, oil spills from boarding ships, ballast water emission, abnormal growth of algal blooms, and more. Techniques explored include huge diameter pipelines erected for removing floating debris from seawater, which is denoted as a primary idea for cleaning contaminants. The book includes numerous case studies that demonstrate how these tools can be successfully used. It is an essential read for marine ecologists and oceanographers at the graduate level and above, but is also ideal for those looking to incorporate these techniques into their own work. Presents and discusses advanced technologies used in the treatment of marine water Includes case studies to show what techniques have been successful Provides new information on contamination assessment and analytical protocols for identifying pollutants, which is essential for readers to use in their own work

Innovative Solutions to Plastic Pollution Frontiers Media SA

This student research paper presents the Great Pacific Garbage Patch, a floating plastic accumulation in the middle of the Pacific Ocean between Hawaii and California, as a case study for examining the threats from plastic pollution.

Acute Plastic Pollution: causes, problems and solutions Springer Nature

This open access book reflects aims of the Blue Circular Economy (BCE) project, which focused on small and medium-sized enterprises (SMEs) aiming to create value using circular economy concepts related to products and services within fishing gear recycling in the Northern Periphery and Arctic (NPA) area. Cluster establishment and operation were carried out in collaboration with academia, industry and government agencies following a triple-helix approach. Discarded fishing gear constitutes a large part of marine plastics. Preventing future discharge of fishing gear into the ocean is a vital step in combating plastic pollution. Circular economy is one of the tools in the European Green deal, targeting waste minimisation. Closing the loop for waste fishing nets by transferring them to a resource could be a solution for preventing discharge at sea: exploring this opportunity is at the core of this book.

Marine Pollution GRIN Verlag

This book addresses pertinent issues relating to microplastic pollution including its sources and sink of the microplastics and their environmental fate. It focuses on the impacts of microplastic pollution on marine life and human health. Available conventional methods and future solutions for the prevention and control of the marine microplastic pollution, such as bacterial and marine fungus biodegradation, membrane technology, and bioengineered microbes are included along with limitations and future challenges. Features: Provides detailed insight into the marine microplastics pollution, fate, health impacts, and removal technology Reviews ecological risks and environmental fate of microplastic pollution to the marine ecosystem Describes control and prevention methods of the microplastics pollution Covers global legislature for the mitigation of microplastic to the marine environment Discusses the role of community participation for the reduction of microplastic emissions This book is aimed at researchers and professionals in environmental engineering, science, and chemistry, marine pollution, marine and aquatic science.

Plastics in the Environment: Understanding Impacts and Identifying Solutions Springer Nature

Available online: https://pub.norden.org/temanord2023-524/ Release of small plastic items, known as Acute Plastic Pollution (APP) in the environment. What is it and what can it cause? For understanding, the Nordic Council of Ministers commissioned an assessment which is described in this report including the problems, causes and solutions to address APP at multiple levels. It is a serious problem for which there are no legal frameworks nor coordinated response. Research on the magnitude and locations of APP emphasizing pellet loss is needed. Recommendations include adoption of an internationally accepted definition, reclassification of pellets as hazardous goods, inclusion in legislation, awareness-raising and incorporation of APP in a legal framework with actions for preparedness and a standardized disaster response protocol. Prevention is key, hence, technical and legal measures should be applied to achieve this.

Oceanic Pollution: a Survey and Some Suggestions for Control Nordic Council of Ministers

This book provides information on the causes, consequences, and possible solutions to modern environmental problems associated with ocean pollution with a particular focus on the Back Sea. The oceans are a vast but fragile complex. In recent decades, it has become especially manifest when ocean pollution has reached an unparalleled situation. Meanwhile, not only the well-being of ecosystems depends on the state of ocean waters, but human civilization largely depends on the oceans as a consequence of environmental dependence. This book examines the consequences of pollutants such as oil and hydrocarbon products (including plastics and microplastics), water acidification, sewage, wastewaters discharge into the ocean, thermal pollution, nuclear pollution, and biological pollution. Beyond the types of pollutants and their consequences, this book outlines the state of the art of the legal situation internationally regarding ocean pollution. The authors also show the current pollution of the inland seas, taking as an example of the Black Sea (anthropogenic and natural sources of pollution, its shelf, and shallow waters as well as international legislation). A part of the book analyzes the main types of environmental monitoring of the oceans and their role in solving ocean pollution problems with a particular interest in the Black Sea. The book is of interest to specialists in ocean pollution, ecologists, oceanologists, students, and graduate students studying oceanography, marine ecology, current methods of environmental monitoring, and legal problems related to the oceans and seas pollution, as well as to anyone interested in modern problems of the oceans.

Modern Treatment Strategies for Marine Pollution Springer Nature

The book explains the harm caused by plastics on oceans, lakes, streams, humans and animals. The book proposes solutions to plastic pollution, including legislation in the United States and an international treaty.

Ocean Solutions, Earth Solutions Springer

The need for harmonized monitoring protocols for marine microplastic has been discussed for many years, but how to reach this goal has not been agreed upon. Important questions addressed when microplastics are monitored are: how to carry out field sampling, how to eliminate other particulate matter from a sample without harming the microplastics, and how to accurately identify

the particles, while also preventing and assessing potential sample contamination at each step from sampling to analyses. In the project HARMIC, Nordic scientist with long term experience in microplastic research, applied and evaluated different methods for sampling and sample preparation relevant for the establishment of common guidelines. The outcomes of the studies are discussed from a monitoring perspective, including aspects of quality assurance and quality control.

Emerging Challenges and Solutions for Plastic Pollution Frontiers Media SA

This book describes how man-made litter, primarily plastic, has spread into the remotest parts of the oceans and covers all aspects of this pollution problem from the impacts on wildlife and human health to socio-economic and political issues. Marine litter is a prime threat to marine wildlife, habitats and food webs worldwide. The book illustrates how advanced technologies from deep-sea research, microbiology and mathematic modelling as well as classic beach litter counts by volunteers contributed to the broad awareness of marine litter as a problem of global significance. The authors summarise more than five decades of marine litter research, which receives growing attention after the recent discovery of great oceanic garbage patches and the ubiquity of microscopic plastic particles in marine organisms and habitats. In 16 chapters, authors from all over the world have created a universal view on the diverse field of marine litter pollution, the biological impacts, dedicated research activities, and the various national and international legislative efforts to combat this environmental problem. They recommend future research directions necessary for a comprehensive understanding of this environmental issue and the development of efficient management strategies. This book addresses scientists, and it provides a solid knowledge base for policy makers, NGOs, and the broader public.

Preventive Methods for Coastal Protection CRC Press

This book focuses on different aspects of microplastic pollution, offering authors and readers the opportunity to share their knowledge, identify issues and propose solutions and actions to face this environmental threat. Although plastic pollution is a well-known global problem, the recent discovery of microplastics and nanoplastics in seas and oceans represents a very alarming new environmental challenge. The book offers comprehensive insights into the origins of the problem, its impact on marine environments, particularly the Mediterranean Sea and coasts, and the current research trends aimed at finding technical solutions to mitigate the phenomenon. It is primarily intended for scientists and decision makers from industry, international, national and local institutions and NGOs

Marine Debris ESRI Press

Marine debris is a global pollution problem affecting marine life, maritime commerce and environmental quality. Scientists, policymakers and the public must be knowledgeable about the source, impact and control efforts if effective solutions are to be developed. Marine Debris addresses the origin of persistent solid waste in the ocean, from urban and rural discharges to waste from ships and the recreational use of oceans. The book identifies key issues from biological, technological, economic and legal perspectives, and gives a framework for controlling each of the main sources of marine debris.

The impacts of plastic pollution in the North Pacific Ocean and possible solutions Nordic Council of Ministers

"Innovative Solutions to Plastic Pollution" is a comprehensive book that delves into the urgent issue of plastic pollution and provides valuable insights into understanding the impact of plastics on the environment. With a focus on identifying practical solutions, this book explores various aspects of plastic usage, its environmental challenges, and presents alternative approaches to tackle this global problem. The book begins by providing an overview of plastics, their ubiquity, and the environmental consequences they pose. It traces the evolution of plastics, highlighting their widespread adoption in various sectors, including agriculture, healthcare, and sanitation. The intricate relationship between children and plastics is explored, along with the debate on whether plastics save trees or exacerbate deforestation. Additionally, the book examines the effects of plastics on food, emphasizing the need for sustainable packaging solutions. A significant portion of the book is dedicated to elucidating the impact of plastic pollution on the marine ecosystem and wildlife. It highlights the detrimental consequences on marine life, including the alarming rise in plastic debris in oceans. The correlation between plastics and adverse health effects is also discussed, shedding light on the potential risks posed by exposure to certain types of plastics. The book introduces readers to the five R's - Refuse, Reduce, Reuse, Repair, and Recycle - as a framework for tackling plastic pollution. It explores the roles of individuals and institutions in adopting these principles and emphasizes the importance of responsible waste management. The debate surrounding pro-plastic researchers and their viewpoints is examined, promoting critical thinking and informed decision-making. Furthermore, the book explores a range of solutions to plastic pollution. It discusses strategies such as refusing single-use plastics, reducing plastic consumption, reusing and repurposing plastic items, and promoting effective recycling practices. The significance of marking and labeling plastics for proper disposal is highlighted, along with the responsibilities of waste generators in managing plastic waste. The book also delves into the realm of plastic alternatives and materials of the future. It explores biodegradable and eco-friendly solutions, shedding light on the latest advancements in bioplastics, compostable packaging, and innovative materials derived from renewable sources. The importance of adhering to governmental regulations, including the Plastic Waste Management Rules 2016, is emphasized. Lastly, the book examines international efforts and initiatives to combat plastic pollution, showcasing examples of successful interventions from around the world. It concludes by discussing government orders and the prohibition of plastics, underscoring the role of policy frameworks in driving change. With its comprehensive analysis of plastics, environmental challenges, and innovative solutions, "Innovative Solutions to Plastic Pollution" serves as a valuable resource for researchers, policymakers, educators, and individuals concerned about the global plastic pollution crisis. It inspires readers to adopt sustainable practices, promotes awareness, and encourages collective action to create a cleaner and healthier future.

International Control of Marine Pollution SAI BHASKAR REDDY NAKKA

This open access book examines global plastic pollution, an issue that has become a critical societal challenge with implications for environmental and public health. This volume provides a comprehensive, holistic analysis on the plastic cycle and its subsequent effects on biota, food security, and human exposure. Importantly, global environmental change and its associated, systems-level processes, including atmospheric deposition, ecosystem complexity, UV exposure, wind patterns, water stratification, ocean circulation, etc., are all important direct and indirect factors governing the fate, transport and biotic and abiotic processing of plastic particles across ecosystem types. Furthermore, the distribution of plastic in the ocean is not independent of terrestrial ecosystem dynamics, since much of the plastic in marine ecosystems originates from land and should therefore be evaluated in the context of the larger plastic cycle. Changes in species size, distribution, habitat, and food web complexity, due to global environmental change, will likely alter trophic transfer dynamics and the ecological effects of nano- and microplastics. The fate and transport dynamics of plastic particles are influenced by their size, form, shape, polymer type, additives, and overall ecosystem conditions. In addition to the risks that plastics pose to the total environment, the potential impacts on human health and exposure routes, including seafood consumption, and air and drinking water need to be assessed in a comprehensive and quantitative manner. Here I present a holistic and interdisciplinary book volume designed to advance the understanding of plastic cycling in the environment with an emphasis on sources, fate and transport, ecotoxicology, climate change effects, food security, microbiology, sustainability, human exposure and public policy.

Marine Pollution Problems and Remedies Springer Nature

The aim of the book is to present for non-specialist researchers as well as for experts a comprehensive overview of the background, key ideas, basic

methods, implementation details and a selection of solutions offered by a novel technology for the optimisation of the location of dangerous offshore activities in terms of environmental criteria, as developed in the course of the BalticWay project. The book consists of two parts. The first part introduces the basic principles of ocean modeling and depicts the long way from the generic principles to the practical modeling of oil spills and of the propagation of other adverse impacts. The second part focuses on the techniques for solving the inverse problem of the quantification of offshore areas with respect to their potential to serve as a source of environmental danger to vulnerable regions (such as spawning, nursing or also tourist areas). The chapters are written in a tutorial style; they are mostly self-contained and understandable for non-specialist researchers and students. They are carefully peer-reviewed by international experts. The goal was to produce a book that highlights all key steps, methods, models and data sets it is necessary to combine in order to produce a practically usable technology and/or decision support system for a particular sea region. Thus the book is useful not only as a description and a manual of this particular technology but also as a roadmap highlighting the complicated technical issues of ocean modeling for practical purposes. It describes the approaches taken by the authors in an understandable way and thus is useful for educational purposes, such as a course in industrially and environmentally relevant applications of ocean modeling. ?