

Marine Pollution Solutions

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Blueprint to End Ocean Pollution Greenwood

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.

The impacts of plastic pollution in the North Pacific Ocean and possible solutions McGraw-Hill Companies

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.

Monitoring of microplastics in the marine environment: Changing directions towards quality controlled tailored solutions Springer Nature

Microplastic pollution is a global problem, and its severity only threatens to get worse. This book presents all of the most up-to-date research on microplastic pollution, identifies issues and proposes actions to be taken and solutions to be implemented in facing down this environmental threat. The book details a host of aspects related to microplastic pollution, including: causes and effects; the impact on different environments; the emerging threat of nanoplastics; detection systems for monitoring areas subject to pollution; the ramifications in regard to other types of pollutants; green approaches for the synthesis of environmentally-friendly polymers; and socio-economic and environmental impact assessment and risk analysis, including in regard to effects on the human food chain. The primary audience for the book are scientists and decision-makers from industries, international, national and local institutions, and NGOs. It offers comprehensive information on the origin of the problem, its impact on marine environments, with particular attention to the Mediterranean Sea and Coasts, and the current research activities and ongoing projects aimed at finding technical solutions to mitigate the phenomenon.

Modern Treatment Strategies for Marine Pollution Springer Science & Business Media

Management of Marine Plastic Debris gives a thorough and detailed presentation of the global problem of marine plastics debris, covering every aspect of its management from tracking, collecting, treating and commercial exploitation for handing this anthropogenic waste. The book is a unique, essential source of information on current and future technologies aimed at reducing the impact of plastics waste in the oceans. This is a practical book designed to enable engineers to tackle this problem—both in stopping plastics from getting into the ocean in the first place, as well as providing viable options for the reuse and recycling of plastics debris once it has been recovered. The book is essential reading not only for materials scientists and engineers, but also other scientists involved in this area seeking to know more about the impact of marine plastics debris on the environment, the mechanisms by which plastics degrade in water and potential solutions. While much research has been undertaken into the different approaches to the increasing problem of plastics marine debris, this is the first book to present, evaluate and compare all of the available techniques and practices, and then make suggestions for future developments. The book also includes a detailed discussion of the regulatory environment, including international conventions and standards and national policies. Reviews all available processes and techniques for recovering, cleaning and recycling marine plastic debris Presents and evaluates viable options for engineers to tackle this growing problem, including the use of alternative polymers Investigates a wide range of possible applications of marine plastics debris and opportunities for businesses to make a positive environmental impact Includes a detailed discussion of the regulatory environment, including international conventions and standards and national policies

The Ocean Plastics Reduction Guide Springer

The objective of this guide is to raise awareness about the oceans' crucial importance to us and to the planet, and the growing threats posed by plastics discharged into and accumulating in the oceans. The

guide outlines the key problems and challenges and how these can be addressed. The guide is promoting circular solutions to the ocean plastic pollution, and intends to inspire impactful action and change.

Proceedings of the 2nd International Conference on Microplastic Pollution in the Mediterranean Sea Nordic Council of Ministers

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.

Microplastics in Marine Ecosystem John Wiley & Sons

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.

Reckoning with the U.S. Role in Global Ocean Plastic Waste GRIN Verlag
Analysing the regulation of vessel-source pollution from the perspective of the political interests of key players in the ship transportation industry, this 2005 book by Alan Khee-Jin Tan offers a comprehensive and convincing account of how pollution of the marine environment by ships may be better regulated and reduced. In this timely study, he traces the history of regulation at the International Maritime Organization (IMO) and investigates the political, economic and social forces influencing the IMO treaties. Also examined are the efforts of maritime states, ship-owners, cargo owners, oil companies and environmental groups to influence IMO laws and treaties. This is an important book, which uncovers the politics behind the law and offers solutions for overcoming the deficiencies in the regulatory system. It will be of great interest to professionals in the shipping industry as well as practitioners and students.

The Impacts of Plastic Pollution in the North Pacific Ocean and Possible Solutions Springer
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
Management of Marine Plastic Debris Springer Nature

Plastics have transformed every aspect of our lives. Yet the very properties that make them attractive—they are cheap to make, light, and durable—spell disaster when trash makes its way into the environment. Plastic Soup: An Atlas of Ocean Pollution is a beautifully-illustrated survey of the plastics clogging our seas, their impacts on wildlife and people around the world, and inspirational initiatives designed to tackle the problem. With striking photography and graphics, Plastic Soup brings plastic pollution to brilliant life for readers. According to some estimates, if we continue on our current path, the oceans will contain more plastic than fish by the year 2050. Created to inform and inspire readers, Plastic Soup is a critical tool in the fight to reverse this trend.

Marine Debris Springer

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.

Proceedings of the International Conference on Microplastic Pollution in the Mediterranean Sea Frontiers Media SA

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.

Marine Pollution Control Springer Science & Business Media

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.

Acute Plastic Pollution: causes, problems and solutions CRC Press

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.

Vessel-Source Marine Pollution 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.

Plastic Soup 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. ?

The International Politics of Marine Pollution Control Springer Nature

This book showcases the latest and best oceanography research using spatial analyses and geographic information systems. This is the leading, most up-to-date book on the subject.

Marine Pollution Problems and Remedies CRC Press

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.

Marine Pollution and Its Control Elsevier

Plastics show up in every area of our lives. They are durable, cheap and light, properties that make them attractive but also problematic for the environment. The focus of this book is not just to highlight the problem of plastics, its definition, and how plastic pollution is impacting human health and environment but also to look at some best practices in both nature based solutions and in the field of law and policies. The first section of the book focuses on plastic pollution – it’s origin, relationship to climate change, linear/circular economy, followed by sustainable plastics, scientific solutions, and how policies can address plastic pollution. This includes looking at better designs, more sustainable feedstocks, and partnerships between various stakeholders worldwide including USA, China, Canada, South Korea, Thailand. This book will interest those who are associated with the production industry, packaging industry, and waste management industry as well as, academicians, students and policymakers.

Pollution in the Black Sea Taylor & Francis

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.