

# Remote Sensing Of Mangrove Forest Structure And Dynamics

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**Drivers of Mangrove Forest Change and its Effects on Biodiversity and Ecosystem Services** - Jennifer Howard 2022-08-25

**World Atlas of Mangroves** - Mark Spalding 2010-09-23

Published with ISME, ITTO and project partners FAO, UNESCO-MAB, UNEP-WCMC and UNU-INWEH This atlas provides the first truly global assessment of the state of the world's mangroves. Written by a leading expert on mangroves with support from the top international researchers and conservation organizations, this full colour atlas contains 60 full-page maps, hundreds of photographs and illustrations and a comprehensive country-by-country assessment of mangroves. Mangroves are considered both ecologically and from a human perspective. Initial chapters provide a global view, with information on distribution, biogeography, productivity and wider ecology, as well as on human uses, economic values, threats, and approaches for mangrove management. These themes are revisited throughout the regional chapters, where the maps provide a spatial context or starting point for further exploration. The book also presents a wealth of statistics on biodiversity, habitat area, loss and economic value which provide a unique record of mangroves against which future threats and changes can be evaluated. Case-studies, written by regional experts provide insights into regional mangrove issues, including primary and potential productivity, biodiversity, and information on present and traditional uses and values and sustainable management.

**Remote Sensing Handbook - Three Volume Set** - Prasad Thenkabail 2018-10-03

A volume in the three-volume Remote Sensing Handbook series, Remote Sensing of Water Resources, Disasters, and Urban Studies documents the scientific and methodological advances that have taken place during the last 50 years. The other two volumes in the series are Remotely Sensed Data Characterization, Classification, and Accuracies, and Land Reso

**Remote Sensing of Above Ground Biomass** - Lalit Kumar 2019-08-20

Above ground biomass has been listed by the Intergovernmental Panel on Climate Change as one of the five most prominent, visible, and dynamic terrestrial carbon pools. The increased awareness of the impacts of climate change has seen a burgeoning need to consistently assess carbon stocks to combat carbon sequestration. An accurate estimation of carbon stocks and an understanding of the carbon sources and sinks can aid the improvement and accuracy of carbon flux models, an important pre-requisite of climate change impact projections. Based on 15 research topics, this book demonstrates the role of remote sensing in quantifying above ground biomass (forest, grass, woodlands) across varying spatial and temporal scales. The innovative application areas of the book include algorithm development and implementation, accuracy assessment, scaling issues (local-regional-global biomass mapping), and the integration of microwaves (i.e. LiDAR), along with optical sensors, forest biomass mapping, rangeland productivity and abundance (grass biomass, density, cover), bush encroachment biomass, and seasonal and long-term biomass monitoring.

**Advances in Remote Sensing for Forest Monitoring** - Prem C. Pandey 2022-10-11

Advances in Remote Sensing for Forest Monitoring An expert overview of remote sensing as applied to forests and other vegetation In Advances in Remote Sensing for Forest Monitoring, a team of distinguished researchers delivers an expansive and insightful discussion of the latest research on remote sensing technologies as they relate to the monitoring of forests, plantations, and other vegetation. The authors also

explore the use of unmanned aerial vehicles and drones, as well as multisource and multi-sensor data – such as optical, SAR, LIDAR, and hyperspectral data. The book draws on the latest data and research to show how remote sensing solutions are being used in real-world settings. It offers contributions from researchers and practitioners from a wide variety of backgrounds and geographical regions to provide a diverse and global set of perspectives on the subject. Readers will also find: A thorough introduction to forest monitoring using remote sensing including recent advances in remote sensing technology Comprehensive explorations of sustainable forest management to enhance ecosystem services and livelihood security using a geospatial approach Case studies of monitoring the biochemical and biophysical parameters of forests, including carotene and xanthophyll content Practical advice on how to apply machine learning tools to remote sensing data Perfect for postgraduates, lecturers, and researchers in the fields of environmental science, forestry, and natural resource management, Advances in Remote Sensing for Forest Monitoring will also earn a place in the libraries of professionals and researchers working with remote sensing technology.

**Land Surface Remote Sensing in Urban and Coastal Areas** - Nicolas Baghdadi 2016-09-19

For a long time, the dynamics of urban and coastal areas have been the focus of administrators and decision makers in charge of public policy in order to better take into account anthropogenic pressure and the impact of climate change. This volume presents applications of remote sensing in urban environments and coastal zones, including the use of remote sensing in city planning (urban expansion, light pollution, air quality, etc.), observation of the properties of ocean color, the study of coastal dynamics (identifying coastlines and estimating sediment balances, etc.) and analysis of the dynamics of mangroves. This book, part of a set of six volumes, has been produced by scientists who are internationally renowned in their fields. It is addressed to students (engineers, Masters, PhD), engineers and scientists, specialists in remote sensing applied to the coastal environment and urban areas. Through this pedagogical work, the authors contribute to breaking down the barriers that hinder the use of Earth observation data. Clear-and-concise descriptions of modern methods of remote sensing for a variety of applications Explores the most current remote sensing techniques, with physical aspects of their measurement (theory) Presents physical principles, measurement, and data processing chapters that are provided for each technique described

**Mangroves: Structure, Functions, Ecology and Biodiversity** - Dr. Hiren B. Soni

Marine ecosystems are diverse habitats, endowed with physical, chemical, and geographical variations in the ecosystems, where the gradation from highly productive organisms to highly specialized organisms exists. India has almost 7,517 km long coast, of which 5,423 km belongs to the peninsular India, and around 2,094 km to the Andaman, Nicobar and Lakshadweep Islands. The mainland coast of India consists of 43% sandy beaches; 11% rocky coast including cliffs; and 46% mudflats or marshy coast. This massive coastline of India supports the human population tremendously through marine resources. Nearly 250 million people live within the fringe of 50 km from the coastline of India. Hence, a vital role in India's economic growth is played by the ecological services that the marine and coastal ecosystems provide. The MPAN (Marine Protected Area Network) in India regulates the natural marine resources to conserve the depleting biodiversity for the betterment of people that are dependent on these coastal resources. Moreover, Gujarat State is bestowed with one of the longest coastline of India (1,650 km). The Gulf of Kachchh (Gujarat) is

India's first Marine National Park (MNP) contributing to the ecological importance of the state's coastal ecosystem; exhibiting the most vulnerable biological diversity in intertidal mudflats, gulfs, bays wetlands, mangroves, salt marshes, coral reefs, beaches, dunes, and estuaries. The book *Mangroves: Structure, Functions, Ecology and Biodiversity* focuses on environmental and ecological studies of Gulf of Kachchh, Western Gujarat, India, in relation to eutrophication, biotic components, structure and functions of mangroves, and biomonitoring of metals. The book covers an in-depth study of surface water and bottom sediment quality, diversity, density, abundance, commonness, rarity of shells, ecological structure and functions of mangrove environment including composition, population dynamics, community structure of floral and faunal species, phytochemical constituents of selected mangrove tree species, and biomonitoring of nutrients in *Avicennia marina*. The book would unquestionably be the need of an hour for mangroves managers, marine conservationists, and policy makers or decision authorities to prevent the unrestrained exploitation of marine biodiversity, destruction of potential mangrove habitats, and uncontrolled interactions of man and technology with mangrove ecosystems around the world.

*Advanced Image Processing Techniques for Remotely Sensed Hyperspectral Data* - Pramod K. Varshney 2004-08-12

The first of its kind, this book reviews image processing tools and techniques including Independent Component Analysis, Mutual Information, Markov Random Field Models and Support Vector Machines. The book also explores a number of experimental examples based on a variety of remote sensors. The book will be useful to people involved in hyperspectral imaging research, as well as by remote-sensing data like geologists, hydrologists, environmental scientists, civil engineers and computer scientists.

*Mangrove Community Boundary Interpretation and Detection of Areal Changes on Marco Island, Florida* - Samuel Goodman Patterson 1986

*Re-envisioning Remote Sensing Applications* - Ripudaman Singh 2021-03-04

*Re-envisioning Remote Sensing Applications: Perspectives from Developing Countries* aims at discussing varied applications of remote sensing, with respect to upcoming technologies with diverse themes. Organized into four sections of overlapping areas of research, the book covers chapters with themes related to agriculture, soil and land degradation studies; hydrology, microclimates and climate change impacts; land use/land cover analysis applications; resource analysis and bibliometric studies, culminating with future research agenda. All the topics are supported via case studies and spatial data analysis. Features: Provides the applications of remote sensing in all fields through varied case studies and spatial data analysis Includes soil and land degradation, microclimates, and climate change impacts Covers remote sensing applications in broad areas of agriculture, hydrology, land use/land cover change and resource analysis Discusses usage of GPS-enabled smartphones and digital gadgets used for mapping and spatial analysis Explores future research agenda for applications of remote sensing in post-COVID scenario This book is of interest to researchers and graduate students in environmental sciences, remote sensing, GIS, agricultural scientists and managers, forestry scientists and managers, and water resources scientists and managers.

**Remote Sensing of Biomass** - Lola Fatoyinbo 2012-03-28

The accurate measurement of ecosystem biomass is of great importance in scientific, resource management and energy sectors. In particular, biomass is a direct measurement of carbon storage within an ecosystem and of great importance for carbon cycle science and carbon emission mitigation. Remote Sensing is the most accurate tool for global biomass measurements because of the ability to measure large areas. Current biomass estimates are derived primarily from ground-based samples, as compiled and reported in inventories and ecosystem samples. By using remote sensing technologies, we are able to scale up the sample values and supply wall to wall mapping of biomass. Three separate remote sensing technologies are available today to measure ecosystem biomass: passive optical, radar, and lidar. There are many measurement methodologies that range from the application driven to the most technologically cutting-edge. The goal of this book is to address the newest developments in biomass measurements, sensor development, field measurements and modeling. The chapters in this book are separated into five main sections.

**Restoration of Mangrove Ecosystems** - Colin Field 1996

**Mangrove Ecology, Silviculture and Conservation** - Peter Saenger 2013-06-29

Mangroves are a fascinating group of plants that occur on tropical and subtropical shorelines of all continents, where they are exposed to saltwater inundation, low oxygen levels around their roots, high light and temperature conditions, and periodic tropical storms. Despite these harsh conditions, mangroves may form luxuriant forests which are of significant economic and environmental value throughout the world - they provide coastal protection and underpin fisheries and forestry operations, as well as a range of other human activities. This book provides an up-to-date account of mangrove plants from around the world, together with silvicultural and restoration techniques, and the management requirements of these communities to ensure their sustainability and conservation. All aspects of mangroves and their conservation are critically re-examined. Those activities which threaten their ongoing survival are identified and suggestions are offered to minimise their effects on these significant plant communities.

*Sundarbans Mangrove Systems* - Anirban Mukhopadhyay 2021-08-15

Sundarbans, a UNESCO heritage site, is the world's largest single chunk of mangroves distributed on the Indian and Bangladesh coasts. The mangroves and associated ecosystems are one of the most fertile ecosystems of the earth. *Sundarbans Mangrove Systems: A Geo-Informatics Approach* portrays different perspectives of studying Sundarbans and mangroves using geospatial analysis. This book highlights the major issues with the Sundarbans mangrove forest, its future conservation strategies and its ecological importance using geo-informatics technology. It explains the usage of remote sensing data for providing information about the present state of mangroves and their tropic status, including assessment in terms of extent, density of community, condition, diversity, identifying potential habitats and heterogeneity.

Furthermore, it discusses the use of hyperspectral remote sensing data for species level classification of mangroves, community zonation for biodiversity assessment and for preparing management plans for conservation. **KEY FEATURES** Exclusively covers the ecological state of Sundarbans (mangrove systems) through geo-informatic studies Describes the application of a combination of geomorphological, biogeochemical and remote sensing methods to the analysis of temporal changes Includes environmental factors affecting the health and decline of mangroves Covers biodiversity and ecological controls in mangroves ecosystems Discusses a remote sensing approach for tropical forested island and mangroves mapping This book is aimed at graduate students and researchers in environmental sciences, ecology, marine sciences, biology, geosciences and GIS/remote sensing areas.

*Mangrove Ecosystems of Asia* - I. Faridah-Hanum 2013-11-01

The book provides an up-to-date account of mangrove forests from Asia, together with restoration techniques, and the management requirements of these ecosystems to ensure their sustainability and conservation. All aspects of mangroves and their conservation are critically re-examined. The book is divided into three sections presenting the distribution and status of mangrove ecosystems in Asia, the challenges they are facing, their issues and opportunities, and the management strategies for their conservation.

**Emerging Technologies and Techniques for Remote Sensing of Coastal and Inland Waters** - Wesley Moses 2022-11-08

**Seafloor Mapping along Continental Shelves** - Charles W. Finkl 2016-03-24

This university-level reference work covers a range of remote sensing techniques that are useful for mapping and visualizing benthic environments on continental shelves. Chapters focus on overviews of the history and future of seafloor mapping techniques, cartographical visualisation and communication of seafloor mapping, and practical applications of new technologies. Seabed mapping is referenced by high-resolution seismic methods, sidescan sonar, multibeam bathymetry, satellite imagery, LiDAR, acoustic backscatter techniques, and soundscape ecology monitoring, use of autonomous underwater vehicles, among other methods. The wide breadth of subjects in this volume provides diversified coverage of seafloor imaging. This collection of modern seafloor mapping techniques summarizes the state of the art methods for mapping continental shelves.

The Management of Natural Coastal Carbon Sinks - Dan Laffoley 2009

*Remote Sensing of Plant Biodiversity* - Jeannine Cavender-Bares 2020-01-01

This Open Access volume aims to methodologically improve our understanding of biodiversity by linking disciplines that incorporate remote sensing, and uniting data and perspectives in the fields of biology, landscape ecology, and geography. The book provides a framework for how biodiversity can be detected and evaluated—focusing particularly on plants—using proximal and remotely sensed hyperspectral data and other tools such as LiDAR. The volume, whose chapters bring together a large cross-section of the biodiversity community engaged in these methods, attempts to establish a common language across disciplines for understanding and implementing remote sensing of biodiversity across scales. The first part of the book offers a potential basis for remote detection of biodiversity. An overview of the nature of biodiversity is described, along with ways for determining traits of plant biodiversity through spectral analyses across spatial scales and linking spectral data to the tree of life. The second part details what can be detected spectrally and remotely. Specific instrumentation and technologies are described, as well as the technical challenges of detection and data synthesis, collection and processing. The third part discusses spatial resolution and integration across scales and ends with a vision for developing a global biodiversity monitoring system. Topics include spectral and functional variation across habitats and biomes, biodiversity variables for global scale assessment, and the prospects and pitfalls in remote sensing of biodiversity at the global scale.

**Remote Sensing of Coastal Environments** - Yeqiao Wang 2009-12-09

As coastal environments around the world face unprecedented natural and anthropogenic threats, advancements in the technologies that support geospatial data acquisition, imaging, and computing have profoundly enhanced monitoring capabilities in coastal studies. Providing systematic treatment of the key developments, *Remote Sensing of Coastal Environments* brings together renowned scholars to supply a clear presentation of the state-of-the-art in this technically complex arena. Edited by a recipient of the prestigious PECASE award, this book provides unrivaled coverage of the issues unique to coastal environments. It presents the best available data for measuring and monitoring coastal zones and explains how decision makers and resource managers can use this data to address contemporary issues in coastal zone management. The text illustrates the latest developments in active remote sensing, hyperspectral remote sensing, high spatial resolution remote sensing, the integration of remote sensing and in situ data, and covers the effects of land-cover and land-use change on coastal environments. Complete with representative case studies, this authoritative resource provides a timely snapshot of the wide range of remote sensing applications in coastal issues to enhance the understanding of how increasing disturbances to our coastal regions are affecting the ecological dynamics, biological diversity, and ecosystem health of our coastal environments.

Tropical Peatland Ecosystems - Mitsuru Osaki 2015-12-07

This book is an excellent resource for scientists, political decision makers, and students interested in the impact of peatlands on climate change and ecosystem function, containing a plethora of recent research results such as monitoring-sensing-modeling for carbon-water flux/storage, biodiversity and peatland management in tropical regions. It is estimated that more than 23 million hectares (62 %) of the total global tropical peatland area are located in Southeast Asia, in lowland or coastal areas of East Sumatra, Kalimantan, West Papua, Papua New Guinea, Brunei, Peninsular Malaysia, Sabah, Sarawak and Southeast Thailand. Tropical peatland has a vital carbon-water storage function and is host to a huge diversity of plant and animal species. Peatland ecosystems are extremely vulnerable to climate change and the impacts of human activities such as logging, drainage and conversion to agricultural land. In Southeast Asia, severe episodic droughts associated with the El Niño-Southern Oscillation, in combination with over-drainage, forest degradation, and land-use changes, have caused widespread peatland fires and microbial peat oxidation. Indonesia's 20 Mha peatland area is estimated to include about 45–55 GtC of carbon stocks. As a result of land use and development, Indonesia is the third largest emitter of greenhouse gases (2–3 Gtons carbon dioxide equivalent per year), 80 % of which is due to deforestation and peatland loss. Thus, tropical peatlands are key ecosystems in terms of the carbon-water cycle and climate change.

**Mangroves: Ecology, Biodiversity and Management** - Rajesh P. Rastogi 2021-10-01

Mangroves are one of the most productive and biologically important blue-carbon ecosystems across the coastal intertidal zone of earth. In the current scenario of serious environmental changes like global warming, climate change, extreme natural disasters, mangrove forests play a vital role in mitigating greenhouse gas emissions and maintaining ecosystem balance. Mangroves are unique ecosystems with rich biological diversity of different taxonomic groups exhibiting great ecological and commercial importance. The book consolidates existing and emerging information on ecology of mangroves, with a special reference to their biodiversity and management. It emphasizes on the role of mangroves in providing various ecological services. The book is a comprehensive compilation covering all aspects of mangrove ecology. It is useful for students and researchers in ecology, plants sciences and environmental sciences.

*Mangrove Ecosystems: A Global Biogeographic Perspective* - Victor H. Rivera-Monroy 2017-11-03

This book presents a comprehensive overview and analysis of mangrove ecological processes, structure, and function at the local, biogeographic, and global scales and how these properties interact to provide key ecosystem services to society. The analysis is based on an international collaborative effort that focuses on regions and countries holding the largest mangrove resources and encompasses the major biogeographic and socio-economic settings of mangrove distribution. Given the economic and ecological importance of mangrove wetlands at the global scale, the chapters aim to integrate ecological and socio-economic perspectives on mangrove function and management using a system-level hierarchical analysis framework. The book explores the nexus between mangrove ecology and the capacity for ecosystem services, with an emphasis on thresholds, multiple stressors, and local conditions that determine this capacity. The interdisciplinary approach and illustrative study cases included in the book will provide valuable resources in data, information, and knowledge about the current status of one of the most productive coastal ecosystem in the world.

**Advances in Mapping from Remote Sensor Imagery** - Xiaojun Yang 2012-12-12

*Advances in Mapping from Remote Sensor Imagery: Techniques and Applications* reviews some of the latest developments in remote sensing and information extraction techniques applicable to topographic and thematic mapping. Providing an interdisciplinary perspective, leading experts from around the world have contributed chapters examining state-of-the-art techniques as well as widely used methods. The book covers a broad range of topics including photogrammetric mapping and LiDAR remote sensing for generating high quality topographic products, global digital elevation models, current methods for shoreline mapping, and the identification and classification of residential buildings. Contributors also showcase cutting-edge developments for environmental and ecological mapping, including assessment of urbanization patterns, mapping vegetation cover, monitoring invasive species, and mapping marine oil spills—crucial for monitoring this significant environmental hazard. The authors exemplify the information presented in this text with case studies from around the world. Examples include: Envisat/ERS-2 images used to generate digital elevation models over northern Alaska In situ radiometric observations and MERIS images employed to retrieve chlorophyll a concentration in inland waters in Australia ERS-1/2 SAR images utilized to map spatiotemporal deformation in the southwestern United States Aerospace sensors and related information extraction techniques that support various mapping applications have recently garnered more attention due to the advances in remote sensing theories and technologies. This book brings together top researchers in the field, providing a state-of-the-art review of some of the latest advancements in remote sensing and mapping technologies.

*Hyperspectral Remote Sensing of Tropical and Sub-Tropical Forests* - Margaret Kalacska 2008-02-26

While frequently used in temperate environments, hyperspectral sensors and data are still a novelty in the tropics. Exploring the potential of hyperspectral remote sensing for assessing ecosystem characteristics, *Hyperspectral Remote Sensing of Tropical and Sub-Tropical Forests* focuses on the complex and unique set of challenges involved in using t

Remote Sensing of Wetlands - Ralph W. Tiner 2015-03-23

Effectively Manage Wetland Resources Using the Best Available Remote Sensing Techniques Utilizing top scientists in the wetland classification and mapping field, *Remote Sensing of Wetlands: Applications and Advances* covers the rapidly changing landscape of wetlands and describes the latest advances in remote

sensing that have taken place over the past few decades. The *Handbook of Himalayan Ecosystems and Sustainability, Volume 1* - Bikash Ranjan Parida 2022-11-22 Volume 1: Spatio-Temporal Monitoring of Forests and Climate is aimed to describe the recent progress and developments of geospatial technologies (remote sensing and GIS) for assessing, monitoring and managing fragile Himalayan ecosystems and their sustainability under climate change. It is a collective research contribution from renowned researchers and academicians working in the Hindu Kush Himalayan (HKH) mountain range. The Himalayas ecosystems have been facing substantial transformation due to severe environmental conditions, land transformation, forest degradation and fragmentation. The authors utilized satellite datasets and algorithms to discuss the intricacy of land use/land cover change, forest and agricultural ecosystems, canopy height estimation, above-ground biomass, wildfires, carbon sequestration, and landscape restoration. Furthermore, the potential impacts of climate change on ecosystems, biodiversity and future food and nutritional security are also addressed including the impact on the livelihood of people of the Himalayas. This comprehensive Handbook explains the advanced geospatial technologies for mapping and management of natural resources of the Himalayas. Key Features Explains multiple aspects of geospatial technologies for studying fragile Himalayan ecosystems and sustainability Focuses on the utility of interferometric synthetic aperture radar (SAR) modeling for canopy height Explain how remote sensing techniques are useful for deriving the above-ground biomass, gross primary productivity (GPP), and carbon fluxes Addresses how geospatial technologies are valuable for understanding vegetation dynamics, composition and landscape restoration due to shifts in timberline and forest fires Includes contributions from global professionals working in the HKH mountain range Readership The Handbook serves as a valuable reference for students, researchers, scientists, ecologists, agricultural scientists, meteorologists, decision makers and all others who wish to advance their knowledge on vegetation remote sensing considering climate change in the HKH region.

**Advances in Remote Sensing for Forest Monitoring** - Paul Arellano 2022-10-07

Advances in Remote Sensing for Forest Monitoring An expert overview of remote sensing as applied to forests and other vegetation In *Advances in Remote Sensing for Forest Monitoring*, a team of distinguished researchers delivers an expansive and insightful discussion of the latest research on remote sensing technologies as they relate to the monitoring of forests, plantations, and other vegetation. The authors also explore the use of unmanned aerial vehicles and drones, as well as multisource and multi-sensor data - such as optical, SAR, LIDAR, and hyperspectral data. The book draws on the latest data and research to show how remote sensing solutions are being used in real-world settings. It offers contributions from researchers and practitioners from a wide variety of backgrounds and geographical regions to provide a diverse and global set of perspectives on the subject. Readers will also find: A thorough introduction to forest monitoring using remote sensing including recent advances in remote sensing technology Comprehensive explorations of sustainable forest management to enhance ecosystem services and livelihood security using a geospatial approach Case studies of monitoring the biochemical and biophysical parameters of forests, including carotene and xanthophyll content Practical advice on how to apply machine learning tools to remote sensing data Perfect for postgraduates, lecturers, and researchers in the fields of environmental science, forestry, and natural resource management, *Advances in Remote Sensing for Forest Monitoring* will also earn a place in the libraries of professionals and researchers working with remote sensing technology.

**Operationalization of Remote Sensing Solutions for Sustainable Forest Management** - Gintautas Mozgeris 2021-06-02

The great potential of remote sensing technologies for operational use in sustainable forest management is addressed in this book, which is the reprint of papers published in the *Remote Sensing Special Issue "Operationalization of Remote Sensing Solutions for Sustainable Forest Management"*. The studies come from three continents and cover multiple remote sensing systems (including terrestrial mobile laser scanning, unmanned aerial vehicles, airborne laser scanning, and satellite data acquisition) and a diversity of data processing algorithms, with a focus on machine learning approaches. The focus of the studies ranges from identification and characterization of individual trees to deriving national- or even continental-level forest attributes and maps. There are studies carefully describing exercises on the case study level,

and there are also studies introducing new methodologies for transdisciplinary remote sensing applications. Even though most of the authors look forward to continuing their research, nearly all studies introduced are ready for operational use or have already been implemented in practical forestry.

*Mangrove Forest Management Guidelines* - Food and Agriculture Organization of the United Nations. Forest Resources Development Branch 1994

**Remote Sensing and Geospatial Technologies for Coastal Ecosystem Assessment and Management** - Xiaojun Yang 2008-12-11

In this landmark publication, leading experts detail how remote sensing and related geospatial technologies can be used for coastal ecosystem assessment and management. This book is divided into three major parts. In the first part several conceptual and technical issues of applying remote sensing and geospatial technologies in the coastal environment are examined. The second part showcases some of the latest developments in the use of remote sensing and geospatial technologies when characterizing coastal waters, submerged aquatic vegetation, benthic habitats, shorelines, coastal wetlands and watersheds. Finally, the last part demonstrates a watershed-wide synthetic approach that links upstream stressors with downstream responses for integrated coastal ecosystem assessment and management.

**Threats to Mangrove Forests** - Christopher Makowski 2018-04-20

This book focuses on the worldwide threats to mangrove forests and the management solutions currently being used to counteract those hazards. Designed for the professional or specialist in marine science, coastal zone management, biology, and related disciplines, this work will appeal to those not only working to protect mangrove forests, but also the surrounding coastal areas of all types. Examples are drawn from many different geographic areas, including North and South America, India, and Southeast Asia. Subject areas covered include both human-induced and natural impacts to mangroves, intended or otherwise, as well as the efforts being made by coastal researchers to promote restoration of these coastal fringing forests.

*Remote Sensing of the Terrestrial Water Cycle* - Venkataraman Lakshmi 2014-10-31

*Remote Sensing of the Terrestrial Water Cycle* is an outcome of the AGU Chapman Conference held in February 2012. This is a comprehensive volume that examines the use of available remote sensing satellite data as well as data from future missions that can be used to expand our knowledge in quantifying the spatial and temporal variations in the terrestrial water cycle. Volume highlights include: - An in-depth discussion of the global water cycle - Approaches to various problems in climate, weather, hydrology, and agriculture - Applications of satellite remote sensing in measuring precipitation, surface water, snow, soil moisture, groundwater, modeling, and data assimilation - A description of the use of satellite data for accurately estimating and monitoring the components of the hydrological cycle - Discussion of the measurement of multiple geophysical variables and properties over different landscapes on a temporal and a regional scale *Remote Sensing of the Terrestrial Water Cycle* is a valuable resource for students and research professionals in the hydrology, ecology, atmospheric sciences, geography, and geological sciences communities.

**Remote Sensing in Mangroves** - Chandra Giri 2021-07-05

The book highlights recent advancements in the mapping and monitoring of mangrove forests using earth observation satellite data. New and historical satellite data and aerial photographs have been used to map the extent, change and bio-physical parameters, such as phenology and biomass. Research was conducted in different parts of the world. Knowledge and understanding gained from this book can be used for the sustainable management of mangrove forests of the world

**Applications of Remote Sensing Data in Mapping of Forest Growing Stock and Biomass** - José Aranha 2021-09-01

This Special Issue (SI), entitled "Applications of Remote Sensing Data in Mapping of Forest Growing Stock and Biomass", resulted from 13 peer-reviewed papers dedicated to Forestry and Biomass mapping, characterization and accounting. The papers' authors presented improvements in Remote Sensing processing techniques on satellite images, drone-acquired images and LiDAR images, both aerial and terrestrial. Regarding the images' classification models, all authors presented supervised methods, such as

Random Forest, complemented by GIS routines and biophysical variables measured on the field, which were properly georeferenced. The achieved results enable the statement that remote imagery could be successfully used as a data source for regression analysis and formulation and, in this way, used in forestry actions such as canopy structure analysis and mapping, or to estimate biomass. This collection of papers, presented in the form of a book, brings together 13 articles covering various forest issues and issues in forest biomass calculation, constituting an important work manual for those who use mixed GIS and RS techniques.

### **3D Remote Sensing Applications in Forest Ecology** - Hooman Latifi 2019-11-19

Dear Colleagues, The composition, structure and function of forest ecosystems are the key features characterizing their ecological properties, and can thus be crucially shaped and changed by various biotic and abiotic factors on multiple spatial scales. The magnitude and extent of these changes in recent decades calls for enhanced mitigation and adaptation measures. Remote sensing data and methods are the main complementary sources of up-to-date synoptic and objective information of forest ecology. Due to the inherent 3D nature of forest ecosystems, the analysis of 3D sources of remote sensing data is considered to be most appropriate for recreating the forest's compositional, structural and functional dynamics. In this Special Issue of Forests, we published a set of state-of-the-art scientific works including experimental studies, methodological developments and model validations, all dealing with the general topic of 3D remote sensing-assisted applications in forest ecology. We showed applications in forest ecology from a broad collection of method and sensor combinations, including fusion schemes. All in all, the studies and their focuses are as broad as a forest's ecology or the field of remote sensing and, thus, reflect the very diverse usages and directions toward which future research and practice will be directed.

### **Mangrove Dynamics and Management in North Brazil** - Ulrich Saint-Paul 2010-09-30

Mangrove ecosystems are being increasingly threatened by human activities. Their biotic productivity supplies food and other resources to the human populations that inhabit or make use of them. This volume highlights the results of a ten-year German / Brazilian research project, called MADAM, in one of the largest continuous mangrove areas of the world, located in northern Brazil. Based on the analysis of the ecosystem dynamics, management strategies for the conservation and sustainable use of mangroves are presented and discussed. Beyond the scientific results, this book also provides guidelines for the development of international cooperation projects.

### Advanced Remote Sensing - Shunlin Liang 2012-08-17

Advanced Remote Sensing is an application-based reference that provides a single source of mathematical concepts necessary for remote sensing data gathering and assimilation. It presents state-of-the-art techniques for estimating land surface variables from a variety of data types, including optical sensors such

as RADAR and LIDAR. Scientists in a number of different fields including geography, geology, atmospheric science, environmental science, planetary science and ecology will have access to critically-important data extraction techniques and their virtually unlimited applications. While rigorous enough for the most experienced of scientists, the techniques are well designed and integrated, making the book's content intuitive, clearly presented, and practical in its implementation. Comprehensive overview of various practical methods and algorithms Detailed description of the principles and procedures of the state-of-the-art algorithms Real-world case studies open several chapters More than 500 full-color figures and tables Edited by top remote sensing experts with contributions from authors across the geosciences

### **Biomass** - Maggy Ndombo Benteke Momba 2010-08-12

Due to demands placed on natural resources globally and subsequent deterioration of the environment, there is a need to source and develop appropriate technology to satisfy this requirement. For decades mankind has largely depended on natural resources such as fossil fuels to meet the ever increasing energy demands. Realizing the finite nature of these resources, emphasis is now shifting to investigating alternate energy source governed by environmentally friendly principles. The abundance of biomass and associated favorable techno-economics has recently changed global perceptions of harnessing biomass as a valuable resource rather than a waste. To this end this book aims to make a contribution to exploring further this area of biomass research and development in the form of a compilation of chapters and covering areas of ecological status of different types of biomass and the roles they play in ecosystems, current status of biomass utilization and deriving energy and other value added products from biomass. In this context biomass can be defined as large plants and trees and different groups of microorganisms. This book will serve as an invaluable resource for scientists and environmental managers in planning solutions for sustainable development.

### Blue Carbon Dynamics of the Indian Ocean - Abhra Chanda 2022

This book gives an overview of various aspects of blue carbon dynamics from each country bordering the Indian Ocean. Given the importance of the topic of blue carbon, it can be assumed that in near future, more and more researchers from the Indian Ocean countries will pursue environmental research in this domain. This book is a ready reference to all those who are interested to have a holistic understanding about the ground scenario of blue carbon in the Indian Ocean. There are many research institutes situated in the periphery of the Indian Ocean that are devoted to nurturing the new avenues of marine carbon research. Researchers and scholars interested in this domain will find this book provides a good overview, wherein all the necessary information on the status and functioning of these blue carbon ecosystems are detailed in a concise way. The book is also helpful to postgraduate students of marine science or those who have a specialization in marine biogeochemistry or chemical oceanography to develop a basic understanding about the very concept of blue carbon from the perspective of the Indian Ocean.