Remote Sensing Crop Yield Estimation And Agricultural | 0ad6725991d83db1c44dd29f2a70df92

The SAGE Handbook of Remote Sensing
Harnessing Dividends from Drylands
Remote Sensing and Crop Yield Estimation
Application of Machine Learning Methods and Airborne Hyperspectral Remote Sensing for Crop Yield Estimation
The Effect of Meteorological Factors on Crop Yields and Methods of Forecasting the Yield
Remote Sensing of Drought
Crop Acreage and Yield Estimation Studies in Chilli Using Remote Sensing
Use of Remote Sensing to Estimate Paddy Area and Production
Radar Remote Sensing for Crop Biophysical Parameter Estimation
Precipitation agriculture ‘19
Advances in Land Remote Sensing
Hyperspectral Remote Sensing of Vegetation
Re-envisioning Remote Sensing Applications
Precision Agriculture ‘21
The Future Rice Strategy for India
Satellite Remote Sensing-Based Estimation of Evapotranspiration
Crop Growth and Yield
Applications of Remote Sensing in Agriculture
A Crop Condition and Crop Yield Estimation Method Based on NOAA/AVHRR Satellite Data
Advances in Citrus Nutrition
Integrating Remote Sensing, Geographic Information System and Modeling for Estimating Crop Yield
Agricultural Survey Methods
Remote Sensing and Crop Yield Estimation
Advances in Estimating Crop Yield Through Combined Remote Sensing and Growth Modeling
Optimization Concepts and Applications in Engineering
Polarimetric Synthetic Aperture Radar
Environmental Control of Plant Growth
Precision Agriculture Basics
Geospatial Technologies for Crops and Soils
Google Earth Engine Applications
Crop Modeling and Decision Support
A National Ecological Framework for Canada
Advances in Wheat Genetics: From Genome to Field
Regional Wheat Yield Estimation by Crop Simulation Model Using Remote Sensing Inputs and Geographic Information System
Advanced Applications in Remote Sensing of Agricultural Crops and Natural Vegetation
Remote Sensing Time Series
Remote Sensing Applications for Agriculture and Crop Modelling
Methods for Measuring Greenhouse Gas Balances and Evaluating Mitigation Options in Smallholder Agriculture
Quantitative Remote Sensing of Land Surfaces
Re-envisioning Remote Sensing Applications
Agricultural Crop Modelling and Remote Sensing for Yield Estimation

The SAGE Handbook of Remote Sensing
[An] expanded attribute database [that] includes attribute data for the ecoprovince level of generalization.

Harnessing Dividends from Drylands

Precision agriculture is a reality in agriculture and is playing a key role as the industry comes to terms with the environment, market forces, quality requirements, traceability, vehicle guidance and crop management. Research continues to be necessary, and needs to be reported and disseminated to a wide audience. These proceedings contain reviewed papers presented at the 12th European Conference on Precision Agriculture, held at Montpellier SupAgro, France. The papers reflect the wide range of disciplines that impinge on precision agriculture - technology, crop science, soil science, agronomy, information technology, decision support, remote sensing and others. The broad range of research topics reported will be a valuable resource for researchers, advisors, teachers and professionals in agriculture long after the conference has finished.

Remote Sensing and Crop Yield Estimation

Due to the widespread use of surveys in agricultural resources estimation there is a broad and recognizable interest in methods and techniques to collect and process agricultural data. This book brings together the knowledge of academics and experts to increase the dissemination of the latest developments in agricultural statistics. Conducting a census, setting up frames and registers and using administrative data for statistical purposes are covered and issues arising from sample design and estimation, use of remote sensing, management of data quality and dissemination and analysis of survey data are explored. Key features:
Brings together high quality research on agricultural statistics from experts in this field. Provides a thorough and much needed overview of developments within agricultural statistics. Contains summaries for each chapter, providing a valuable reference framework for those new to the field. Based upon a selection of key methodological papers presented at the ICAS conference series, updated and expanded to address current issues. Covers traditional statistical methodologies including sampling and weighting. This book provides a much needed guide to conducting surveys of land use and to the latest developments in agricultural statistics. Statisticians interested in agricultural statistics, agricultural statisticians in national statistics offices and statisticians and researchers using survey methodology will benefit from this book.

Application of Machine Learning Methods and Airborne Hyperspectral Remote Sensing for Crop Yield Estimation

In a rapidly changing world, there is an ever-increasing need to monitor the Earth’s resources and manage it sustainably for future generations. Earth observation
from satellites is critical to provide information required for informed and timely decision making in this regard. Satellite-based earth observation has advanced rapidly over the last 50 years, and there is a plethora of satellite sensors imaging the Earth at finer spatial and spectral resolutions as well as high temporal resolutions. The amount of data available for any single location on the Earth is now at the petabyte-scale. An ever-increasing capacity and computing power is needed to handle such large datasets. The Google Earth Engine (GEE) is a cloud-based computing platform that was established by Google to support such data processing. This facility allows for the storage, processing and analysis of spatial data using centralized high-power computing resources, allowing scientists, researchers, hobbyists and anyone else interested in such fields to mine this data and understand the changes occurring on the Earth’s surface. This book presents research that applies the Google Earth Engine in mining, storing, retrieving and processing spatial data for a variety of applications that include vegetation monitoring, cropland mapping, ecosystem assessment, and gross primary productivity, among others. Datasets used range from coarse spatial resolution data, such as MODIS, to medium resolution datasets (WorldView -2), and the studies cover the entire globe at varying spatial and temporal scales.

The Effect of Meteorological Factors on Crop Yields and Methods ofForecasting the Yield

Hyperspectral narrow-band (or imaging spectroscopy) spectral data are fast emerging as practical solutions in modeling and mapping vegetation. Recent research has demonstrated the advances in and merit of hyperspectral data in a range of applications including quantifying agricultural crops, modeling forest canopy biochemical properties, detecting crop stress and disease, mapping leaf chlorophyll content as it influences crop production, identifying plants affected by contaminants such as arsenic, demonstrating sensitivity to plant nitrogen content, classifying vegetation species and type, characterizing wetlands, and mapping invasive species. The need for significant improvements in quantifying, modeling, and mapping plant chemical, physical, and water properties is more critical than ever before to reduce uncertainties in our understanding of the Earth and to better sustain it. There is also a need for a synthesis of the vast knowledge spread throughout the literature from more than 40 years of research. Hyperspectral Remote Sensing of Vegetation integrates this knowledge, guiding readers to harness the capabilities of the most recent advances in applying hyperspectral remote sensing technology to the study of terrestrial vegetation. Taking a practical approach to a complex subject, the book demonstrates the experience, utility, methods and models used in studying vegetation using hyperspectral data. Written by leading experts, including pioneers in the field, each chapter presents specific applications, reviews existing state-of-the-art knowledge, highlights the advances made, and provides guidance for the appropriate use of hyperspectral data in the study of vegetation as well as its numerous applications, such as crop yield modeling, crop vegetation biophysical and biochemical property characterization, and crop moisture assessment. This comprehensive book brings together the best global expertise on hyperspectral remote sensing of agriculture, crop water use, plant species detection, vegetation classification, biophysical and biochemical modeling, crop productivity and water productivity mapping, and modeling. It provides the pertinent facts, synthesizing findings so that readers can get the correct picture on issues such as the best wavebands for their practical applications, methods of analysis using whole spectra, hyperspectral vegetation indices targeted to study specific biophysical and biochemical quantities, and methods for detecting parameters such as crop moisture variability, chlorophyll content, and stress levels. A collective “knowledge bank,” it guides professionals to adopt the best practices for their own work.

Remote Sensing of Drought

This open access book focuses on the practical application of electromagnetic polarimetry principles in Earth remote sensing with an educational purpose. In the last decade, the operations from fully polarimetric synthetic aperture radar such as the Japanese ALOS/PalSAR, the Canadian Radarsat-2 and the German TerraSAR-X and their easy data access for scientific use have developed further the research and data applications at L,C and X band. As a consequence, the wider distribution of polarimetric data sets across the remote sensing community boosted activity and development in polarimetric SAR applications, also in view of future missions. Numerous experiments with real data from spaceborne platforms are shown, with the aim of giving an up-to-date and complete treatment of the unique benefits of fully polarimetric synthetic aperture radar data in five different domains: forest, agriculture, cryosphere, urban and oceans.

Crop Acreage and Yield Estimation Studies in Chilli Using Remote Sensing

This book provides standards and guidelines for quantifying greenhouse gas emissions and removals in smallholder agricultural systems and comparing options for climate change mitigation based on emission reductions and livelihood trade-offs. Globally, agriculture is directly responsible for about 11% of annual greenhouse gas (GHG) emissions and induces an additional 17% through land use change, mostly in developing countries. Farms in the developing countries of sub-Saharan Africa and Asia are predominately managed by smallholders, with 80% of land holdings smaller than ten hectares. However, little to no information exists on greenhouse gas emissions and mitigation potentials in smallholder agriculture. Greenhouse gas measurements in agriculture are expensive, time consuming, and error prone, challenges only exacerbated by the heterogeneity of smallholder systems and landscapes. Concerns over methodological rigor, measurement costs, and the diversity of approaches, coupled with the demand for robust information suggest it is germane for the scientific community to establish standards of measurements for quantifying GHG emissions from smallholder agriculture. Standard guidelines for use by scientists, development organizations, and policymakers will help generate reliable data on emissions baselines and allow rigorous comparisons of mitigation options. The guidelines described in this book, developed by the CGIAR Research
Program on Climate Change, Agriculture, and Food Security (CCAFS) and partners, are intended to inform anyone conducting field measurements of agricultural greenhouse gas sources and sinks, especially to develop IPCC Tier 2 emission factors or to compare mitigation options in smallholder systems.

**Use of Remote Sensing to Estimate Paddy Area and Production**

Remote Sensing of Drought: Innovative Monitoring Approaches presents emerging remote sensing-based tools and techniques that can be applied to operational drought monitoring and early warning around the world. The first book to focus on remote sensing and drought monitoring, it brings together a wealth of information that has been scattered throughout the literature and across many disciplines. Featuring contributions by leading scientists, it assembles a cross-section of globally applicable techniques that are currently operational or have potential to be operational in the near future. The book explores a range of applications for monitoring four critical components of the hydrological cycle related to drought: vegetation health, evapotranspiration, soil moisture and groundwater, and precipitation. These applications use remotely sensed optical, thermal, microwave, radar, and gravity data from instruments such as AMSR-E, GOES, GRACE, MERIS, MODIS, and Landsat and implement several advanced modeling and data assimilation techniques. Examples show how to integrate this information into routine drought products. The book also examines the role of satellite remote sensing within traditional drought monitoring, as well as current challenges and future prospects. Improving drought monitoring is becoming increasingly important in addressing a wide range of societal issues, from food security and water scarcity to human health, ecosystem services, and energy production. This unique book surveys innovative remote sensing approaches to provide you with new perspectives on large-area drought monitoring and early warning.

**Radar Remote Sensing for Crop Biophysical Parameter Estimation**

**Precision agriculture '19**

Precision agriculture is a reality in agriculture and is playing a key role as the industry comes to terms with the environment, market forces, quality requirements, traceability, vehicle guidance and crop management. Research continues to be necessary, and needs to be reported and disseminated to a wide audience."These edited proceedings contain peer reviewed papers presented at the 13th European Conference on Precision Agriculture, held in Budapest, Hungary. The papers reflect the wide range of disciplines that impinge on precision agriculture - technology, crop science, soil science, agronomy, information technology, decision support, remote sensing and others."The broad range of research topics reported will be a valuable resource for researchers, advisors, teachers and professionals in agriculture long after the conference has finished.

**Advances in Land Remote Sensing**

"This study investigated the potential of developing in-season crop yield forecasting and mapping systems based on interpretation of airborne hyperspectral remote sensing imagery by machine learning algorithms. The data used for this study was obtained over a corn (Zea mays L.) field in eastern Canada." --

**Hyperspectral Remote Sensing of Vegetation**

A substantial portion of the world's rice is produced and consumed in the Asia and Pacific region. As much of the region's population depends on rice farming for consumption and livelihood, the demand for good quality statistics remains essential for effective policy formulation. Recent advances in remote sensing serve as a viable alternative to traditional methods of compiling agricultural statistics by responding to the emerging data requirements and overall needs of modern agriculture, especially for staple commodities such as rice. This publication outlines the procedures, methods and tools developed for generating statistics on paddy rice area and production using remote sensing and GIS techniques. It is intended to encourage and assist national statistical systems in piloting and adopting satellite-based techniques as an alternative to existing data collection methods, while enabling other interested readers to comprehend whether the adoption of these methodologies can improve the quality and timeliness of agricultural statistics. The handbook also serves as a complement to a massive online open course developed by ADB for crop area estimation.

**Re-envisioning Remote Sensing Applications**

This book presents a timely investigation of radar remote sensing observations for agricultural crop monitoring and advancements of research techniques and their applicability for crop biophysical parameter estimation. It introduces theoretical background of radar scattering from vegetation volume and semi-empirical
modelling approaches that are the foundation for biophysical parameter inversion. The contents will help readers explore the state-of-the-art crop monitoring and biophysical parameter estimation using approaches radar remote sensing. It is useful guide for academicians, practitioners and policymakers.

**Precision Agriculture ‘21**

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.

**The Future Rice Strategy for India**

'A magnificent achievement. A who's who of contemporary remote sensing have produced an engaging, wide-ranging and scholarly review of the field in just one volume' - Professor Paul Curran, Vice-Chancellor, Bournemouth University Remote Sensing acquires and interprets small or large-scale data about the Earth from a distance. Using a wide range of spatial, spectral, temporal, and radiometric scales Remote Sensing is a large and diverse field for which this Handbook will be the key research reference. Organized in four key sections: • Interactions of Electromagnetic Radiation with the Terrestrial Environment: chapters on Visible, Near-IR and Shortwave IR; Middle IR (3-5 micrometers); Thermal IR ; Microwave • Digital sensors and Image Characteristics: chapters on Sensor Technology; Coarse Spatial Resolution Optical Sensors ; Medium Spatial Resolution Optical Sensors; Fine Spatial Resolution Optical Sensors; Video Imaging and Multispectral Digital Photography; Hyperspectral Sensors; Radar and Passive Microwave Sensors; Lidar • Remote Sensing Analysis - Design and Implementation: chapters on Image Pre-Processing; Ground Data Collection; Integration with GIS; Quantitative Models in Remote Sensing; Validation and accuracy assessment; • Remote Sensing Analysis - Applications: LITHOSPHERIC SCIENCES: chapters on Topography; Geology; Soils; PLANT SCIENCES: Vegetation; Agriculture; HYDROSPHERIC and CRYOSPHERIC SCIENCES: Hydrosphere: Fresh and Ocean Water; Cryosphere; GLOBAL CHANGE AND HUMAN ENVIRONMENTS: Earth Systems; Human Environments & Links to the Social Sciences; Real Time Monitoring Systems and Disaster Management; Land Cover Change Illustrated throughout, an essential resource for the analysis of remotely sensed data, the SAGE Handbook of Remote Sensing provides researchers with a definitive statement of the core concepts and methodologies in the discipline.

**Satellite Remote Sensing-Based Estimation of Evapotranspiration, Crop Growth and Yield**

Applications of Remote Sensing in Agriculture

It collects the review papers of the 9th International Symposium on Physical Measurements and Signatures in Remote Sensing (ISPMSRS). It systematically summarizes the past achievements and identifies the frontier issues as the research agenda for the near future. It covers all aspects of land remote sensing, from sensor systems, physical modeling, inversion algorithms, to various applications.

**A Crop Condition and Crop Yield Estimation Method Based on NOAA/AVHRR Satellite Data**

In this revised and enhanced second edition of Optimization Concepts and Applications in Engineering, the already robust pedagogy has been enhanced with more detailed explanations, an increased number of solved examples and end-of-chapter problems. The source codes are now available free on multiple platforms. It is vitally important to meet or exceed previous quality and reliability standards while at the same time reducing resource consumption. This textbook addresses this critical imperative integrating theory, modeling, the development of numerical methods, and problem solving, thus preparing the student to apply optimization to real-world problems. This text covers a broad variety of optimization problems using: unconstrained, constrained, gradient, and non-gradient techniques; duality concepts; multiobjective optimization; linear, integer, geometric, and dynamic programming with applications; and finite element-based optimization. It is ideal for advanced undergraduate or graduate courses and for practising engineers in all engineering disciplines, as well as in applied mathematics.
Advances in Citrus Nutrition

Integrating Remote Sensing, Geographic Information System and Modeling for Estimating Crop Yield

Agricultural Survey Methods

Remote Sensing and Crop Yield Estimation

Environmental Control of Plant Growth consists of the proceedings of a symposium held at Canberra, Australia, in August 1962. The symposium aims to consider the natural microenvironments of plants and the associations between natural and controlled environments. It also considers the physiological and genetic bases of responses by plants to environmental conditions. The book contains 24 chapters and discusses the physics of plant environment, as well as the physical quantities within plant-air layers. It also elucidates the energy and water balance, light relations, gas exchange, and energy relations in plant communities. The book also looks into the respiration of various organs and of whole plants. Lastly, the effects of the environment, including “climatic factors, on the metabolism of plant cells are addressed.

Advances in Estimating Crop Yield Through Combined Remote Sensing and Growth Modeling

The livelihoods of millions of people in developing countries, which depend on dryland agriculture to ensure their food security and their well-being, could be improved measurably by gains in agricultural crop yields. This book describes lessons learnt from an innovative scheme in India that improved crop yields in drylands. It shows how the scheme can be scaled up for other dryland regions of the world. The scheme uses localized soil nutrient analyses to create an integrated, climate smart fertilizer and planting plan that maximises yields for farmers. This book describes how a partnership between a global scientific organization (such as International Crops Research Institute for the Semi-Arid Tropics, ICRISAT) and state and non-state actors can provide a route to equitable growth, specifically for small and marginal farmers, and how this approach can be replicated worldwide to enhance rural livelihoods. This strategic collaboration and its conceptual and functional design is fully outlined, as well as the scheme's implementation and the effective monitoring and learning process that has been created.

Optimization Concepts and Applications in Engineering

Crop models and remote sensing techniques have been combined and applied in agriculture and crop estimation on local and regional scales, or worldwide, based on the simultaneous development of crop models and remote sensing. The literature shows that many new remote sensing sensors and valuable methods have been developed for the retrieval of canopy state variables and soil properties from remote sensing data for assimilating the retrieved variables into crop models. At the same time, remote sensing has been used in a staggering number of applications for agriculture. This book sets the context for remote sensing and modelling for agricultural systems as a mean to minimize the environmental impact, while increasing production and productivity. The eighteen papers published in this Special Issue, although not representative of all the work carried out in the field of Remote Sensing for agriculture and crop modeling, provide insight into the diversity and the complexity of developments of RS applications in agriculture. Five thematic focuses have emerged from the published papers: yield estimation, land cover mapping, soil nutrient balance, time-specific management zone delineation and the use of UAV as agricultural aerial sprayers. All contributions exploited the use of remote sensing data from different platforms (UAV, Sentinel, Landsat, QuickBird, CBERS, MODIS, WorldView), their assimilation into crop models (DSSAT, AQUACROP, EPIC, DELPHI) or on the synergy of Remote Sensing and modeling, applied to cardamom, wheat, tomato, sorghum, rice, sugarcane and olive. The intended audience is researchers and postgraduate students, as well as those outside academia in policy and practice.

Polarimetric Synthetic Aperture Radar

Processing the vast amounts of data on the Earth's land surface environment generated by NASA's and other international satellite programs is a significant challenge. Filling a gap between the theoretical, physically-based modelling and specific applications, this in-depth study presents practical quantitative algorithms for estimating various land surface variables from remotely sensed observations. A concise review of the basic principles of optical remote sensing as well as practical algorithms for estimating land surface variables quantitatively from remotely sensed observations. Emphasizes both the basic principles of optical remote sensing and practical algorithms for estimating land surface variables quantitatively from remotely sensed observations Presents the current physical
Environmental Control of Plant Growth

Evapotranspiration (ET) is the largest consumer of global fresh water resources and monitoring of actual ET (ETa) in heterogeneous soil-water conditions and land surface characteristics is a challenge. Since crop productivity is closely associated with transpiration thus ETa. Therefore, estimating crop growth and yields at large scales in non-homogenous land surface conditions is also challenging. This dissertation presented a solution for that problem. METRIC, a remote sensing model that estimates ETa from satellite images was evaluated in eastern Washington, representative of a vast dryland region of the US Inland Pacific Northwest (IPNW). The results of the ET a when compared against eddy covariance (EC) flux tower measurements in highly contrasting annual precipitation zones with different crops, revealed that METRIC can accurately estimate ETa in water-limited conditions. METRIC ETa provided the basis to develop a new methodology called RS-SCM (remote sensing based simple crop model). Where the remotely sensed LAI (leaf area index) and METRIC ETa was used to estimate crop growth and yields in eastern Washington. The RS-SCM was tested in dryland agricultural systems of the IPNW against the in-situ AGB (above ground biomass) measurements at different times from crop growth till harvest, and EC above ground net primary production (ANPP) calculations. The results showed that RS-SCM AGB agreed well with all in-situ measurements of AGB at various crop growth stages for all crops on the ground. The total biomass and harvested yields estimated by RS-SCM were also satisfactory when compared against the actual yields per hectare. The results of the analysis for three growing seasons from 2013 onward are presented. The analyses cover the following topics: a review of current methodologies to determine ETa, an overview of the methods used to estimate crop yields from remote sensing information, evaluation of METRIC for ETa estimation in IPNW typical dryland agricultural settings, the development and implementation of RS-SCM a simple model to estimate crop growth and yields from transpiration use efficiency and comparison of estimated crop growth and yields with in-situ measurements and EC tower flux calculations.

Precision Agriculture Basics

With the growing popularity and availability of precision equipment, farmers and producers have access to more data than ever before. With proper implementation, precision agriculture management can improve profitability and sustainability of production. Precision Agriculture Basics is geared at students, crop consultants, farmers, extension workers, and practitioners that are interested in practical applications of site-specific agricultural management. Using a multidisciplinary approach, readers are taught to make data-driven on-farm decisions using the most current knowledge and tools in crop science, agricultural engineering, and geostatistics. Precision Agriculture Basics also features a stunning video glossary including interviews with agronomists on the job and in the field.

Geospatial Technologies for Crops and Soils

Applications of Remote Sensing in Agriculture contains the proceedings of the 48th Easter School in Agricultural Science, held at the University of Nottingham on April 3-7, 1989. The meeting invites 146 delegates from over 22 countries and contributions to this book come from nine countries. This book generally presents a review of the achievements of remote sensing in agriculture, establishes the state of the art, and gives pointers to developments. This text is organized into seven parts, wherein Parts I-III cover the principles of remote sensing, climate, soil, land classification, and crop inventories. Productivity; stress; techniques for agricultural applications; and opportunities, progress, and prospects in the field of remote sensing in agriculture are also discussed.

Google Earth Engine Applications

This is a solitary attempt to streamline all the possible information related to citrus nutrition, with emphasis on diagnosis and management of nutrient constraints, employing a variety of state-of-art techniques evolved globally over the years . While doing so care has been taken to include peripheral disciplines so that the discussion becomes more lively and authoritative. An entire array of exclusive subjects has been nicely portrayed with the help of latest data and photographs.

Crop Modeling and Decision Support

A National Ecological Framework for Canada
This volume comprises an outstanding variety of chapters on Earth Observation based time series analyses, undertaken to reveal past and current land surface dynamics for large areas. What exactly are time series of Earth Observation data? Which sensors are available to generate real time series? How can they be processed to reveal their valuable hidden information? Which challenges are encountered on the way and which pre-processing is needed? And last but not least: which processes can be observed? How are large regions of our planet changing over time and which dynamics and trends are visible? These and many other questions are answered within this book “Remotely Sensed Time Series Analyses – Revealing Land Surface Dynamics”. Internationally renowned experts from Europe, the USA and China present their exciting findings based on the exploitation of satellite data archives from well-known sensors such as AVHRR, MODIS, Landsat, ENVISAT, ERS and METOP amongst others. Selected review and methods chapters provide a good overview over time series processing and the recent advances in the optical and radar domain. A fine selection of application chapters addresses multi-class land cover and land use change at national to continental scale, the derivation of patterns of vegetation phenology, biomass assessments, investigations on snow cover duration and recent dynamics, as well as urban sprawl observed over time.

Advances in Wheat Genetics: From Genome to Field

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.

Regional Wheat Yield Estimation by Crop Simulation Model Using Remote Sensing Inputs and Geographic Information System

The Future Rice Strategy for India presents forward-looking insights toward achieving sustainable development of the rice sector, ensuring future food and nutritional security. As a staple food for many in India, including the economically disadvantaged, there are many concerns that affect the development of rice sector. Facing issues from environmental demands to economic stagnation, access to food, food inflation, and the Food Security Act (demand - supply - distribution of rice) achieving sustainability in production and exports is an important and urgent challenge. Using case studies to illustrate existing and potential issues, challenges and solutions, The Future Rice Strategy for India presents key strategic options while considering the implicit consequences. In addition, the findings enrich the strategy and policy formulation considerations for the role of rice in the country. This multidisciplinary approach features the expertise of rice scientists covering different aspects of rice sector; from breeding to consumer preferences and markets and trade. Uses analysis based on agro ecological zones (AEZ) patterns providing understanding of future growth patterns based on rice ecologies. Includes case studies with proposed solutions taking into consideration pros and cons of each, allowing readers facing similar concerns and issues to identify an appropriate solution more efficiently and effectively.

Advanced Applications in Remote Sensing of Agricultural Crops and Natural Vegetation

Written by leading global experts, including pioneers in the field, the four-volume set on Hyperspectral Remote Sensing of Vegetation, Second Edition, reviews existing state-of-the-art knowledge, highlights advances made in different areas, and provides guidance for the appropriate use of hyperspectral data in the study and management of agricultural crops and natural vegetation. Volume IV, Advanced Applications in Remote Sensing of Agricultural Crops and Natural Vegetation discusses the use of hyperspectral or imaging spectroscopy data in numerous specific and advanced applications, such as forest management, precision farming, managing invasive species, and local to global land cover change detection. It emphasizes the importance of hyperspectral remote sensing tools for studying vegetation processes and functions as well as the appropriate use of hyperspectral data for vegetation management practices. The concluding chapter provides readers with useful guidance on the highlights and essence of Volume IV through the editors’ perspective. Key Features of Volume IV: Guides readers to harness the capabilities of the most recent advances in applying hyperspectral remote sensing technology to the study of terrestrial vegetation. Includes specific applications on agriculture, crop management practices, study of crop stress and diseases, crop characteristics based on inputs (e.g., nitrogen, irrigation), study of vegetation impacted by heavy metals, gross and net primary productivity studies, light use efficiency studies, crop water use and actual evapotranspiration studies, phenology monitoring, land use and land cover studies, global change studies, plant species detection, wetland and forest characterization and mapping, crop productivity and crop water productivity mapping, and modeling. Encompasses hyperspectral or imaging spectroscopy data in narrow wavebands used across visible, red-edge, near-infrared, far-infrared, shortwave infrared, and thermal portions of the spectrum. Explains the implementation of hyperspectral remote sensing data processing.
mechanisms in a standard, fast, and efficient manner for their applications. Discusses cloud computing to overcome hyperspectral remote sensing massive big data challenges. Provides hyperspectral analysis of rocky surfaces on the earth and other planetary systems.

Remote Sensing Time Series

This proceedings is a collection of 46 selected papers that were presented at the 12th International Wheat Genetics Symposium (IWGS). Since the launch of the wheat genome sequencing project in 2005, the arrival of draft genome sequences has marked a new era in wheat genetics and genomics, catalyzing rapid advancement in the field. This book provides a comprehensive review of the forefront of wheat research, across various important topics such as germplasm and genetic diversity, cytogenetics and allopolyplid evolution, genome sequencing, structural and functional genomics, gene function and molecular biology, biotic stress, abiotic stress, grain quality, and classical and molecular breeding. Following an introduction, 9 parts of the book are dedicated to each of these topics. A final, 11th part entitled “Toward Sustainable Wheat Production” contains 7 excellent papers that were presented in the 12th IWGS Special Session supported by the OECD. With rapid population growth and radical climate changes, the world faces a global food crisis and is in need of another Green Revolution to boost yields of wheat and other widely grown staple crops. Although this book focuses on wheat, many of the newly developed techniques and results presented here can be applied to other plant species with large and complex genomes. As such, this volume is highly recommended for all students and researchers in wheat sciences and related plant sciences and for those who are interested in stable food production and food security.

Remote Sensing Applications for Agriculture and Crop Modelling

Methods for Measuring Greenhouse Gas Balances and Evaluating Mitigation Options in Smallholder Agriculture

Quantitative Remote Sensing of Land Surfaces

The sustainable development of the agriculture sector is the only option to meet the demands of increased and economically viable production in a changing climate. This means there is a need to introduce the latest technologies to enhance production, and also help policymakers make decisions for the future. Geospatial technologies & tools, such as remote sensing, geographical information systems (GIS), global positioning systems (GPS), and mobile & web applications, provide unique capabilities to analyze multi-scale, multi-temporal datasets, and support decision-making in sustainable agriculture development and natural resources management. Further, the availability of reliable and timely geospatial information on natural resources and environmental conditions is essential for sustainable agricultural development and food security. Since remote sensing solutions are fast, non-destructive and have large spatial coverage, they can play a significant role in the identification, inventory, and mapping of land resources. Over the past four decades, remote sensing has proved to be a cost-effective and powerful tool to assess crop and soil properties in varying spatial and temporal scales using both visual and digital techniques. Satellite remote sensing coupled with GIS & mobile-app based positional information has emerged as an efficient tool for optimizing input resources, and minimizing cost of production and risk of biotic/abiotic factors nature to promote sustainable agriculture. This book comprehensively documents the applications of space-based technologies for crop and soil assessments for the sustainable development of agriculture.

Re-envisioning Remote Sensing Applications

"Crop Modeling and Decision Support" presents 36 papers selected from the International Symposium on Crop Modeling and Decision Support (ISCMDS-2008), held at Nanjing of China from 19th to 22nd in April, 2008. Many of these papers show the recent advances in modeling crop and soil processes, crop productivity, plant architecture and climate change; the rests describe the developments in model-based decision support systems (DSS), model applications, and integration of crop models with other information technologies. The book is intended for researchers, teachers, engineers, and graduate students on crop modeling and decision support. Dr. Weixing Cao is a professor at Nanjing Agricultural University, China.

Agricultural Crop Modelling and Remote Sensing for Yield Estimation