Vegetation Dynamics And Global Change

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The objective was implemented by our initiation of a mathematical model of global vegetation, including agriculture, as defined by the forces which control and change vegetation. The model was to illustrate the geographical consequences to vegetation structure and functioning of changing climate and land use, based on plant responses to environmental variables.

Vegetation Dynamics & Global Change | SpringerLink
Vegetation Dynamics and Global Change will introduce both students and professionals to the sophisticated mathematical and computational tools used to predict the rate of change in the world's forests. It emphasizes the importance of scale in global studies.

Vegetation Dynamics And Global Change | Allen M. Solomon ...
As a palaeoecologist and biogeographer I am delighted to have become a Subject Editor for Plant Ecology & Diversity (PE&D). In my new role for the journal I hope to handle a broad range of articles within my area “Global Change & Vegetation Dynamics: Past, Present & Future”.As Subject Editor, as well as organizing general submissions, I would also like to promote a range of articles ...

Plant Ecology & Diversity: Global Change & Vegetation Dynamics
Vegetation dynamics strongly corresponded to climate change: A significantly increasing trend in vegetation growth was observed in the eastern part of Central Asia, whereas a significantly decreasing trend was found in the western part of Central Asia.

Vegetation dynamics and responses to climate change and ...
Vegetation Dynamics and Global Change . By A.M. Solomon and H.H. Shugart. Abstract. In the greenhouse debate, one of the most critical questions is how the world's forests will respond to a changing climate. This book introduces ecologists, environmentalists, foresters and earth scientists to the models which describe the forests and their rate ...

Vegetation Dynamics and Global Change - CORE
The vegetation dynamics model is the Lund–Potsdam–Jena (LPJ) dynamic global vegetation model. The land model is the National Center for Atmospheric Research (NCAR) Land Surface Model (LSM). Vegetation is defined in terms of plant functional types.

A dynamic global vegetation model for use with climate ...
The circumpolar vegetation dynamics product comprises four layers, i.e., start (SOS), end (EOS), length of growing season (LOS), and growing season integrated annual normalized difference vegetation index (NDVI) (Table 1, Table 2). As an example application for global change studies, we also present the responses of the circumpolar vegetation dynamics to long-term trend and interannual variability of dominant global change indicators in the region.

Circumpolar vegetation dynamics product for global change ...
A Dynamic Global Vegetation Model (DGVM) is a computer program that simulates shifts in potential vegetation and its associated biogeochemical and hydrological cycles as a response to shifts in climate. DGVMs use time series of climate data and, given constraints of latitude, topography, and soil characteristics, simulate monthly or daily dynamics of ecosystem processes.

Dynamic global vegetation model - Wikipedia
Global Vegetation Dynamics: Concepts and Applications in MC1 model will be a valuable resource for students and researchers in the fields of climate change science, conservation science, biogeochemistry and ecology, as well as for land managers looking for a better understanding of the projections of climate change impacts and of the tools that have been developed to produce them.

Global Vegetation Dynamics | Geophysical Monograph Series
A modelling approach to simulating vegetation dynamics is described, incorporating critical processes of carbon sequestration, growth, mortality and distribution. The model has been developed to investigate the responses of vegetation to environmental change, at time scales from days to centuries and from the local to the global scale.

Vegetation dynamics--simulating responses to climatic change.
Vegetation has been altered by anthropogenic global change drivers including land-use change, altered disturbance regimes, invasive species, and climate change, for decades to centuries, or in some cases millennia. Vegetation responses to land use and disturbance can be more immediate than to climate change and can be long lasting.

Global change and terrestrial plant community dynamics | PNAS
Land?use change in the Andes between 2001 and 2014 resulted in the loss of ~500,000 ha and a gain of ~1,000,000 ha of woody vegetation cover, emphasizing the importance of land?cover redistribution as a process at least as important as the overall net change (Aide et al., 2013; Nanni & Grau, 2014). In the foothills of the Andes (1,000–1,500 m), the overall pattern was forest loss mainly caused by an increase in pastures and croplands.

Woody vegetation dynamics in the tropical and subtropical ...
Vegetation Dynamics And Global Change by Allen M. Solomon and a great selection of related books, art and collectibles available now at AbeBooks.com. 0412036819 - Vegetation Dynamics and Global Change - AbeBooks

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Knowledge of the current changes and dynamics of different types of vegetation in relation to climatic changes and anthropogenic activities is critical for developing adaptation strategies to address the challenges posed by climate change and human activities for ecosystems.

Vegetation dynamics and responses to climate change and ...
The ecosystems in this system are intensely sensitive to global climate change [Chen et al., 2009], and the rising temperatures and increased evaporation are accelerating the soil water consumption. This, coupled with a significant decline in water storage and shallow groundwater levels, is causing the shallow roots of desert plants to die.

Potential impacts of climate change on vegetation dynamics ...
Get this from a library! Vegetation dynamics & global change. [Allen M Solomon; Herman H Shugart;] -- "The response of forests to global climate change is one of the most hotly contested issues in the greenhouse effect debate. This volume introduces ecologists, environmental scientists, foresters and ...

Vegetation dynamics & global change (Book, 1993) [WorldCat ...
A modelling approach to simulating vegetation dynamics is described, incorporating critical processes of carbon sequestration, growth, mortality and distribution. The model has been developed to investigate the responses of vegetation to environmental change, at time scales from days to centuries and from the local to the global scale.

Vegetation dynamics – simulating responses to climatic ...
As a priority for Phase 2, dynamic global vegetation modelling (DGVM) suited to Australia is noted for the longer term research direction. This workshop considered and prioritised longer term research needs to better understand basic biological/ecological processes driving vegetation dynamics.

Vegetation Dynamics and Climate Change Workshop
Vegetation Dynamics and Global Change will introduce both students and professionals to the sophisticated mathematical and computational tools used to predict the rate of change in the world's forests. It emphasizes the importance of scale in global studies. Leaders in the field of vegetation modeling cover physiological phenomena typically ...

During the summer of 1987, a series of discussions I was held at the International Institute for Applied Systems Analysis (nASA) in Laxenburg, Austria, to plan a study of global vegetation change. The work was aimed at promoting the Interna tional Geosphere-Biosphere Programme (IGBP), sponsored by the International Council of Scientific Unions (ICSU), of which nASA is a member. Our study was designed to provide initial guidance in the choice of approaches, data sets and objectives for constructing global models of the terrestrial biosphere. We hoped to provide substantive and concrete assistance in formulating the working plans of IGBP by involving program planners in the development and application of models which were assembled from available data sets and modeling ap proaches. Recent acceptance of the "nASA model" as the starting point for endeavors of the Global Change and Terrestrial Ecosystems Core Project of the IGBP suggests we were successful in that aim. The objective was implemented by our initiation of a mathematical model of global vegetation, including agriculture, as defined by the forces which control and change vegetation. The model was to illustrate the geographical consequences to vegetation structure and functioning of changing climate and land use, based on plant responses to environmental variables. The completed model was also expected to be useful for examining international environmental policy responses to global change, as well as for studying the validity of IIASA's experimental approaches to environmental policy development.

Understanding ecosystem structure and function requires familiarity with the techniques, knowledge and concepts of the three disciplines of plant physiology, remote sensing and modelling. This is the first textbook to provide the fundamentals of these three domains in a single volume. It then applies cross-disciplinary insights to multiple case studies in vegetation and landscape science. A key feature of these case studies is an examination of relationships among climate, vegetation structure and vegetation function, to address fundamental research questions. This book is for advanced students and researchers who need to understand and apply knowledge from the disciplines of plant physiology, remote sensing and modelling. It allows readers to integrate and synthesise knowledge to produce a holistic understanding of the structure, function and behaviour of forests, woodlands and grasslands.

This book celebrates the relaunch of the African Pollen Database, presents state-of-the-art of modern and ancient pollen data from sub-Saharan Africa, and promotes Open Access science. Pollen grains are powerful tools for the study of past vegetation dynamics because they preserve well within sedimentary deposits and have a huge diversity in ornamentation that allows different taxa to be determined. The reconstruction of past vegetation from the examination of ancient pollen records thus can be used to characterize the nature of past landscapes (e.g. abundance of forests vs. grasslands), provide insights into changes in biodiversity, and gain empirical evidence of vegetation response to climatic change and human activity. In this, the 35th Volume of "Palaeoecology of Africa", we bring together new data and extensive synthetic reviews to provide novel insights into the relationships between human evolution, human activity, climate change and vegetation dynamics during the Quaternary, the last 2.6 million years. Current and ongoing climate and land-use change is exerting pressure on modern vegetation formations and threatening the livelihoods and wellbeing of many peoples in Africa. In this book the focus is on the Quaternary because it is during this geological period that the modern vegetation formations developed into their current configurations against a backdrop of high magnitude global climate change (glacial-interglacial cycles), human evolution, and a growing human land-use footprint. In this book the latest information is presented and collated from around the African continent to parameterize past vegetation states, identify the drivers of vegetation change, and assess the vegetation resilience to change. To achieve this research from two broad themes are covered: (i) the present is the key to the past (i.e. studies which improve our understanding of modern environments so that we can better interpret evidence from the past), and (ii) the past is the key to the future (i.e. studies which unlock information on how and why vegetation changed in the past so one can better anticipate trajectories of future change). This Open Access book will provide a strong foundation for future research exploring past ecological, environmental and climatic change within Africa and the surrounding islands. The book is organized regionally (covering western, eastern, central, and southern Africa) and it contains specialized articles focused on particular topics (such as modern pollen-vegetation relationships and fire as a driver of vegetation change), as well as regional and pan-African syntheses drawing together decades of research to assess key scientific questions (including the role of climate in driving vegetation change and the role of vegetation change in human evolution). These articles will be useful to students and teachers from high school to the highest level of university who are interested in the origins and dynamics of vegetation in Africa. Furthermore, it is also meant to provide societally relevant information that can act as an inspiration for the development of sustainable management practices for the future.

This book provides information essential for anyone interested in climate and environmental change of the Himalayan region, including land and resource managers, environmental planners, conservationists, environmentalists, geographers, climatologists, ecologists, and students. The book is unique in its coverage of the current understanding of the science of climate change in the Himalayan mountain system and of the major impacts on physical systems and ecosystems. The book gives an overview of the physical science basis of climate change and explains drivers and processes of glacier and vegetation dynamics. The book covers relevant aspects of accelerated climate change observed in the Himalayan mountain system, and highlights the regional differentiation of climatic changes and associated environmental modifications. The focus is on climate variability and change, and how physical systems and ecosystems respond to climate change impacts. Consequences include impacts on physical systems such as glacier shrinkage, glacial lake outburst floods, altered hydrological characteristics, permafrost warming and thawing, and mass movements on slopes. Climate change is also a powerful stressor on ecosystems and induces range shifts of plant and animal species and alterations in terms of phenology, biomass, plant cover, plant group dominance and species composition. Thus, ecosystem structure and functioning will be strongly affected. The book has an introductory chapter followed by a section on climate change, a section on impacts on glaciers and hydrology, and a section on vegetation dynamics. Each section has several chapters presenting key concepts, major drivers and key processes of environmental change in the Himalayan region from different perspectives. Climate change impacts in the Himalaya have not been studied in much detail, and respective findings were not presented so far in a comprehensive overview. This book summarizes the current knowledge of interactions between climate change and the dynamics of glaciers, hydrology, and vegetation.

Brings together plant ecophysiology, remote sensing and modelling of vegetation and landscape function for advanced students and researchers.

MC1 is a widely used dynamic global vegetation model (DGVM) that has been used to simulate potential vegetation shifts in National Parks (NPs) such as Wind Cave NP and Yosemite NP, across various states such as California and Alaska, over the entire continent of North America, and even over the entire globe, under a variety of climate change scenarios. Global Vegetation Dynamics: Concepts and Applications in the MC1 model describes the creation in the mid-1990s, architecture, uses, and limitations of the MC1 DGVM that is being used by an increasing number of research groups around the world. The scientific foundation of most models is often poorly documented and difficult to access, and a centralized source of information for MC1, including the complete list of over eighty papers and reports with MC1 results will be useful to scientists and users who want to better understand the model and the output it generates. The topics in this volume include general descriptions of the original model design, including the fire model, which was the first of its kind among dynamic global vegetation models; a brief history of the model creation; summaries of model results at the continental (North America), regional (Pacific Northwest), and local (Wind Cave NP and Sierra Nevada) scales; a description of its use to transform a state and transition model into its climate-smart version to help managers prepare for climate change challenges; and the description of an on-line tool (databasin.org) that provides snapshots as well as animated time series of its results. Finally, a complete bibliography (as of spring 2015) lists over 80 publications that include MC1 results. Global Vegetation Dynamics: Concepts and Applications in the MC1 model will be a valuable resource for students and researchers in the fields of climate change science, conservation science, and biogeochemistry and ecology, as well as for land managers looking for a better understanding of the projections of climate change impacts and of the tools that have been developed to produce them.

The natural environment of drylands is highly vulnerable and fra¬gile, variations of climate conditions here are the highest among all terrestrial ecosystems and that is why they are expected to be strongly influenced by the current climate change. Remote sensing and GIS play an important role in a better understanding about the nature of climate impacts on the drylands as a whole system and on the vegetation cover as the most important component of this ecosystem at all scales from global to regional and local. This book is one of the first to examine the dynamics of drylands in Kazakhstan using time series of remote sensing derived data and climate records over the last 20 years. The author investigated the problem from different views and combined analyses at multiple time and spatial scales. The entire spectrum of the interrelationship between climate and vegetation cover - spatial and temporal, on the regional, subregional and local scale, interannual and within the growing season -, has been analysed, described and discussed. A new monitoring approach was presented which enables discrimination between climatic and anthropogenic forces in the complex of dryland dynamics. The text improves the understanding of the nature and mechanisms of the ecosystem dynamics in the internal Eurasia and provides the basis for predicting changes in vegetation productivity that accompany changes in climate and human activities. Taken as a whole, the results of this study present indispensable information for ecological and socio-economic research and may be used by scientists, landscape managers, and decision makers interested in this region.

Additional resources for this book can be found at: ahref="http://www.wiley.com/go/vandermaarelfranklin/vegetationecology"www.wiley.com/go/vandermaarelfranklin/vegetationecology/a. Vegetation Ecology, 2nd Edition is a comprehensive,integrated account of plant communities and their environments.Written by leading experts in their field from four continents, thesecond edition of this book: covers the composition, structure, ecology, dynamics,diversity, biotic interactions and distribution of plantcommunities, with an emphasis on functional adaptations; reviews modern developments in vegetation ecology in ahistorical perspective; presents a coherent view on vegetation ecology whileintegrating population ecology, dispersal biology, soilbiology, ecosystem ecology and global change studies; tackles applied aspects of vegetation ecology, includingmanagement of communities and invasive species; includes new chapters addressing the classification and mappingof vegetation, and the significance of plant functional types Vegetation Ecology, 2nd Edition is aimed at advancedundergraduates, graduates and researchers and teachers in plantecology, geography, forestry and nature conservation. VegetationEcology takes an integrated, multidisciplinary approach and will bewelcomed as an essential reference for plant ecologists the worldover.