

Digital Terrain Modelling Development And Applications In A Policy Support Environment Lecture Notes In Geoinformation And Cartography

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UNDOC, Current Index - 1993

GeoSpatial Visual Analytics - Raffaele de Amicis 2009-07-11

Access, distribution and processing of Geographic Information (GI) are basic preconditions to support strategic environmental decision-making. The heterogeneity of information on the environment today available is driving a wide number of initiatives, on both sides of the Atlantic, all advocating both the strategic role of proper management and processing of environme- related data as well as the importance of harmonized IT infrastructures designed to better monitor and manage the environment. The extremely wide range of often multidimensional environmental information made available at the global scale poses a great challenge to technologists and scientists to find extremely sophisticated yet effective ways to provide access to relevant data patterns within such a vast and highly dynamic information flow. In the past years the domain of 3D scientific visualization has developed several solutions designed for operators requiring to access results of a simulation through the use of 3D visualization that could support the understanding of an evolving phenomenon. However 3D data visualization alone does not provide model and hypothesis-making neither it provide tools to validate results. In order overcome this shortcoming, in recent years scientists have developed a discipline that combines the benefits of data mining and information visualization, which is often referred to as Visual Analytics (VA).

Open Source GIS: A GRASS GIS Approach - Markus Neteler 2004-09-21

Since the first edition of Open Source GIS: A GRASS GIS Approach was published in 2002, GRASS has undergone major improvements. This second edition includes numerous updates related to the new development; its text is based on the GRASS 5.3 version from December 2003. Besides changes related to GRASS 5.3 enhancements, the introductory chapters have been re-organized, providing more extensive information on import of external data. Most of the improvements in technical accuracy and clarity were based on valuable feedback from readers. Open Source GIS: A GRASS GIS Approach, Second Edition, provides updated information about the use of GRASS, including geospatial modeling with raster, vector, and site data, image processing, visualization, and coupling with other open source tools for geostatistical analysis and web applications. A brief introduction to programming within GRASS encourages new development. The sample data set used throughout the book has been updated and is available on the GRASS web site. This book also includes links to sites where the GRASS software and on-line reference manuals can be downloaded and additional applications can be viewed.

Digital Terrain Analysis in Soil Science and Geology - Igor Florinsky 2016-07-11

Digital Terrain Analysis in Soil Science and Geology, Second Edition, synthesizes the knowledge on methods and applications of digital terrain analysis and geomorphometry in the context of multi-scale problems in soil science and geology. Divided into three parts, the book first examines main concepts, principles, and methods of digital terrain modeling. It then looks at methods for analysis, modeling, and mapping of spatial distribution of soil properties using digital terrain analysis, before finally considering

techniques for recognition, analysis, and interpretation of topographically manifested geological features. Digital Terrain Analysis in Soil Science and Geology, Second Edition, is an updated and revised edition, providing both a theoretical and methodological basis for understanding and applying geographical modeling techniques. Presents an integrated and unified view of digital terrain analysis in both soil science and geology Features research on new advances in the field, including DEM analytical approximation, analytical calculation of local morphometric variables, morphometric globes, and two-dimensional generalized spectral analytical methods Includes a rigorous description of the mathematical principles of digital terrain analysis Provides both a theoretical and methodological basis for understanding and applying geographical modeling

Digital Elevation Model Technologies and Applications - David Francis Maune 2001

Soil Erosion in Europe - John Boardman 2007-01-11

Provides a unique and comprehensive assessment of soil erosion throughout Europe, an important aspect to control and manage if landscapes are to be sustained for the future. Written in two parts, Soil Erosion in Europe primarily focuses on current issues, area specific soil erosion rates, on and off-site impacts, government responses, soil conservation measures, and soil erosion risk maps. The first part overviews the erosion processes and the problems encountered within each European country, whilst the second section takes a cross-cutting theme approach. Based on an EU-funded project that has been running for four years with erosion scientists from 19 countries Reviews contemporary erosion processes and rates on arable and rangeland in Europe Looks at current issues, such as socio-economic drivers, controlling factors specific to the country and changes in land use

Mathematical Modelling in Geographical Information System, Global Positioning System and Digital Cartography - Hari Shanker Sharma 2006

"Papers presented at the Training Programme on Mathematical Modelling in GIS/GPS and Digital Cartography, held at Jaipur during 1st February to 2nd March 2005".--[Source inconnue].

Digital Terrain Modelling - Robert Joseph Peckham 2007-07-30

This publication is the first book on the development and application of digital terrain modeling for regional planning and policy support. It is a compilation of research results by international research groups at the European Commission's Joint Research Centre, providing scientific support to the development and implementation of EU environmental policy. This practice-oriented book is recommended reading for practising environmental modelers and GIS experts working on regional planning and policy support applications.

Digital Soil Mapping with Limited Data - Alfred E. Hartemink 2008-07-11

Signi?cant technological advances have been few and far between in the past approximately one hundred years of soil survey activities. Perhaps one of the most innovative techniques in the history of soil survey was the introduction of aerial photographs as base maps for ?eld mapping, which replaced the conventional

base map laboriously prepared by planetable and alidade. Such a relatively simple idea by today's standards revolutionized soil surveys by vastly increasing the accuracy and efficiency. Yet, even this innovative approach did not gain universal acceptance immediately and was hampered by a lack of aerial coverage of the world, funds to cover the costs, and in some cases a reluctance by some soil mappers and cartographers to change. Digital Soil Mapping (DSM), which is already being used and tested by groups of dedicated and innovative pedologists, is perhaps the next great advancement in delivering soil survey information. However, like many new technologies, it too has yet to gain universal acceptance and is hampered by ignorance on the part of some pedologists and other scientists. DSM is a spatial soil information system created by numerical models that - count for the spatial and temporal variations of soil properties based on soil - formation and related environmental variables (Lagacheric and McBratney, 2007).

Geoinformation Technologies for Geo-Cultural Landscapes: European Perspectives - Andreas Vassilopoulos 2008-12-04

The focal main objective of the book is to constitute a meaningful linkage among research problems, geoinformation methods and corresponding applications. The research goals, related both to theoretical and practical issues, derive from multidisciplinary fields such as archaeology, history, geography, landscape planning, environment, geoinformation

General Technical Report PNW-GTR - 2005

Digital Terrain Analysis in Soil Science and Geology - Igor Florinsky 2011-08-26

Digital Terrain Analysis in Soil Science and Geology provides soil scientists and geologists with an integrated view of the principles and methods of digital terrain analysis. Its attention to first principles and focus on error analysis makes it a useful resource for scientists to uncover the method applications particular to their needs. Digital Terrain Analysis in Soil Science and Geology covers a wide range of applications in the context of multi-scale problems of soil science and geology. Presents a mathematical approach from a single author who is actively researching in the field and has published a number of fundamental papers Outlines principles and methods and then follows with examples in a simple setup that builds on content Provides an integrated view of the principles and methods of digital terrain analysis

Geospatial Analyses of Earth Observation (EO) Data - Antonio Pepe 2019-11-27

Recent Trends in Environmental Hydraulics - Monika B. Kalinowska 2020-02-18

This book presents an overview of current research problems and advances in theoretical and applied aspects of environmental hydraulics. The rapid development of this branch of water studies in recent years has contributed to our fundamental understanding of processes in natural aquatic systems and helped provide solutions for civil engineering and water resources management. The book features comprehensively reviewed versions of invited lectures and regular presentations given at the 38th International School of Hydraulics, held May 21-24, 2019, in Łąck, Poland. With papers by leading international experts as well as young researchers from around the globe, it covers recent findings from laboratory and field studies, numerical modeling related to sediment and pollutant transport processes in rivers, fluvial morphodynamics, flow in vegetated channels and hydraulic structures in rivers and estuaries.

Geospatial Technologies in Land Resources Mapping, Monitoring and Management - G. P. Obi Reddy 2018-09-11

This book offers an overview of geospatial technologies in land resources mapping, monitoring and management. It consists of four main sections: geospatial technologies - principles and applications; geospatial technologies in land resources mapping; geospatial technologies in land resources monitoring; and geospatial technologies in land resources management. Each part is divided into detailed chapters that include illustrations and tables. The authors, from leading institutes, such as the ICAR-NBSS&LUP, IIT-B, NRSC, ICRISAT, share their experiences and offer case studies to provide advanced insights into the field. It is a valuable resource for the scientific and the teaching community, extension scientists at research institutes and agricultural universities/colleges as well as those involved in planning and managing land resources for sustainable agriculture and livelihood security.

Digital Terrain Modeling - Zhilin Li 2004-11-29

Written by experts, Digital Terrain Modeling: Principles and Methodology provides comprehensive coverage of recent developments in the field. The topics include terrain analysis, sampling strategy, acquisition methodology, surface modeling principles, triangulation algorithms, interpolation techniques, on-line and off-line quality control in data a

Digital Terrain Modeling - Zhilin Li 2004-11-29

Written by experts, Digital Terrain Modeling: Principles and Methodology provides comprehensive coverage of recent developments in the field. The topics include terrain analysis, sampling strategy, acquisition methodology, surface modeling principles, triangulation algorithms, interpolation techniques, on-line and off-line quality control in data acquisition, DTM accuracy assessment and mathematical models for DTM accuracy prediction, multi-scale representation, data management, contouring, visual analysis (or visualization), the derivation of various types of terrain parameters, and future development and applications.

Environmental Applications of Digital Terrain Modeling - John P. Wilson 2018-02-15

A digital elevation model (DEM) is a digital representation of ground surface topography or terrain. It is also widely known as a digital terrain model (DTM). A DEM can be represented as a raster (a grid of squares) or as a vector based triangular irregular network (TIN). DEMs are commonly built using remote sensing techniques, but they may also be built from land surveying. DEMs are used often in geographic information systems, and are the most common basis for digitally-produced relief maps. The terrain surface can be described as comprising of two different elements; random and systematic. The random (stochastic) elements are the continuous surfaces with continuously varying relief. It would take an endless number of points to describe exactly the random terrain shapes, but these can be described in practice with a network of point. It is usual to use a network that creates sloping triangles or regular quadrants. This book examines how the methods and data sources used to generate DEMs and calculate land surface parameters have changed over the past 25 years. The primary goal is to describe the state-of-the-art for a typical digital terrain modeling workflow that starts with data capture, continues with data preprocessing and DEM generation, and concludes with the calculation of one or more primary and secondary land surface parameters. Taken as a whole, this book covers the basic theory behind the methods, the instrumentation, analysis and interpretation that are embedded in the modern digital terrain modeling workflow, the strengths and weaknesses of the various methods that the terrain analyst must choose among, typical applications of the results emanating from these terrain modeling workflows, and future directions. This book is intended for researchers and practitioners who wish to use DEMs, land surface parameters, land surface objects and landforms in environmental projects. The book will also be valuable as a reference text for environmental scientists who are specialists in related fields and wish to integrate these kinds of digital terrain workflows and outputs into their own specialized work environments.

Proceedings of the Meeting on Planning and Implementing Forest Operations to Achieve Sustainable Forests - Council on Forest Engineering. Meeting 1996

Environmental Applications of Digital Terrain Modeling - John P. Wilson 2018-04-23

A digital elevation model (DEM) is a digital representation of ground surface topography or terrain. It is also widely known as a digital terrain model (DTM). A DEM can be represented as a raster (a grid of squares) or as a vector based triangular irregular network (TIN). DEMs are commonly built using remote sensing techniques, but they may also be built from land surveying. DEMs are used often in geographic information systems, and are the most common basis for digitally-produced relief maps. The terrain surface can be described as comprising of two different elements; random and systematic. The random (stochastic) elements are the continuous surfaces with continuously varying relief. It would take an endless number of points to describe exactly the random terrain shapes, but these can be described in practice with a network of point. It is usual to use a network that creates sloping triangles or regular quadrants. This book examines how the methods and data sources used to generate DEMs and calculate land surface parameters have changed over the past 25 years. The primary goal is to describe the state-of-the-art for a typical digital terrain modeling workflow that starts with data capture, continues with data preprocessing

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United Nations Documents Checklist - 1998

Advances in Digital Terrain Analysis - Qiming Zhou 2008-02-21

Terrain analysis has attracted research studies from geographers, surveyors, engineers and computer scientists. The contributions in this book represent the state-of-the-art of terrain analysis methods and techniques in areas of digital representation, morphological and hydrological models, uncertainty and applications of terrain analysis. The book will appeal to postgraduate and senior undergraduate students who take advanced courses in GIS and geographical analysis.

Upper Rio Grande Basin Water Operations Review - 2007

General Technical Report NC. - 1981

Representing, Modeling, and Visualizing the Natural Environment - Nick Mount 2008-12-22

The explosion of public interest in the natural environment can, to a large extent, be attributed to greater public awareness of the impacts of global warming and climate change. This has led to increased research interest and funding directed at studies of issues affecting sensitive, natural environments. Not surprisingly, much of this work has required the innovative application of GIS and has led to a crucial research question: How should the environment be represented, modeled, analyzed, and visualized within a GIS? With contributions from recognized international experts, *Representing, Modeling, and Visualizing the Natural Environment* explores the interplay between data representation, modeling, and visualization in environmental studies. It reviews state-of-the-art GIS applications for the natural environment and presents them in the context of a range of recent studies. This focus identifies analytical challenges and illustrates broader opportunities for applying GIS within other areas of the sciences and social sciences. The integrated approach reflects the need for a single volume covering all aspects. While many texts cover aspects of GIS application within an environmental context, few of these books focus specifically on the natural environment nor do they integrate the questions that encompass the full process of enquiry associated with GIS application in studies of the environment. The thirteenth volume in the widely recognized *Innovations of GIS* series, this book investigates each of these questions in turn, explicitly addressing all aspects of GIS application in the natural environment.

ICT Innovations 2013 - Vladimir Trajkovik 2013-07-20

Information communication technologies have become the necessity in everyday life enabling increased level of communication, processing and information exchange to extent that one could not imagine only a decade ago. Innovations in these technologies open new fields in areas such as: language processing, biology, medicine, robotics, security, urban planning, networking, governance and many others. The applications of these innovations are used to define services that not only ease, but also increase the quality of life. Good education is essential for establishing solid basis of individual development and performance. ICT is integrated part of education at every level and type. Therefore, the special focus should be given to possible deployment of the novel technologies in order to achieve educational paradigms adapted to possible educational consumer specific and individual needs. This book offers a collection of papers presented at the Fifth International Conference on ICT Innovations held in September 2013, in Ohrid, Macedonia. The conference gathered academics, professionals and practitioners in developing solutions and systems in the industrial and business arena especially innovative commercial implementations, novel

applications of technology, and experience in applying recent ICT research advances to practical solutions.
GIS and Remote Sensing in Hydrology, Water Resources and Environment - Yangbo Chen 2004

Terrain Analysis - John P. Wilson 2000-08-03

The only reference on the use of GIS and related technologies in terrain analysis. In this landmark publication, reflecting the collaborative effort of thirteen research groups based in four countries, leading experts detail how GIS and related technologies, such as GPS and remote sensing, are now being used, with the aid of computer modeling, in terrain analysis. Continuing the innovative work of Professor Ian Moore, a visionary who saw terrain analysis as a robust method for modeling the large areas and complex spatial patterns of environmental systems, *Terrain Analysis* puts into action TAPES, or Terrain Analysis Programs for Environmental Sciences, Dr. Moore's innovative tool for terrain analysis. The book's contributors describe how TAPES are applied to specific geomorphologic problems, explain the algorithms used in current terrain analysis software, and examine the interpretation and use of terrain attributes in predictive models. With expert coverage of terrain analysis in the digital age, *Terrain Analysis* will be welcomed by ecologists, environmental engineers, geographers, and hydrologists who increasingly depend on GIS, GPS, and remote sensing.

Spatial Modeling in GIS and R for Earth and Environmental Sciences - Hamid Reza Pourghasemi 2019-01-18

Spatial Modeling in GIS and R for Earth and Environmental Sciences offers an integrated approach to spatial modelling using both GIS and R. Given the importance of Geographical Information Systems and geostatistics across a variety of applications in Earth and Environmental Science, a clear link between GIS and open source software is essential for the study of spatial objects or phenomena that occur in the real world and facilitate problem-solving. Organized into clear sections on applications and using case studies, the book helps researchers to more quickly understand GIS data and formulate more complex conclusions. The book is the first reference to provide methods and applications for combining the use of R and GIS in modeling spatial processes. It is an essential tool for students and researchers in earth and environmental science, especially those looking to better utilize GIS and spatial modeling. Offers a clear, interdisciplinary guide to serve researchers in a variety of fields, including hazards, land surveying, remote sensing, cartography, geophysics, geology, natural resources, environment and geography. Provides an overview, methods and case studies for each application. Expresses concepts and methods at an appropriate level for both students and new users to learn by example.

Digital Soil Mapping - 2006-12-18

The book compiles the main ideas and methodologies that have been proposed and tested within these last fifteen years in the field of Digital Soil Mapping (DSM). Beginning with current experiences of soil information system developments in various regions of the world, this volume presents states of the art of different topics covered by DSM: Conception and handling of soil databases, sampling methods, new soil spatial covariates, Quantitative spatial modelling, Quality assessment and representation of DSM outputs. This book provides a solid support to students, researchers and engineers interested in modernising soil survey approaches with numerical techniques. It is also of great interest for potential soil data users. * A new concept to meet the worldwide demand for spatial soil data * The first compilation of ideas and methodologies of Digital Soil Mapping * Offers a variety of specialities: soil surveying, geostatistics, data mining, fuzzy logic, remote sensing techniques, Geographical Information Science,...* Written by 82 researchers from 13 different countries

Earth Resources - 1983

Innovations In GIS - Zarine Kemp 2003-09-02

Derived from presentations made at the fourth annual UK National Conference on GIS Research, this work consists of contributions by leading experts in: geography, mathematics, computing science, surveying, archaeology, planning and medicine.

GIS Applications for Water, Wastewater, and Stormwater Systems - U.M. Shamsi 2005-01-27

Professionals involved in the planning, design, operation, and construction of water, wastewater, and

stormwater systems need to understand the productivity-enhancing applications of GIS. Inspired by an ASCE-sponsored continuing education course taught by the author, *GIS Applications for Water, Wastewater, and Stormwater Systems* focuses on the practical aspects of software and data tools that enable GIS applications. The book documents and analyzes effective use of GIS, demonstrating how you can apply the technology to make tasks easier to perform, saving time and money for your organization. The book first describes GIS, detailing its importance and explaining how to avoid potential pitfalls via a needs analysis study. It then describes GIS-related technologies that are crucial in applications development: remote sensing; DEM data; GPS; Internet applications; and mobile GIS. The final ten chapters focus on the "Four Ms" of the water industry—Mapping, Monitoring, Modeling, and Maintenance—applications that define the most important activities for efficient management of water, wastewater, and stormwater systems. Promoting a performance- (or outcome-) based style of learning, each chapter first states learning objectives and later concludes with a chapter summary and questions. The text encourages more effective and natural inductive study by first presenting case studies, then explaining procedures. This volume supplements the text with numerous maps, tables, and illustrations.

Appropriate Technologies for Environmental Protection in the Developing World - Ernest K. Yanful 2009-02-19

This book is the first edited compilation of selected, refereed papers submitted to ERTEP 2007. The selected papers either dealt with technologies or scientific work and policy findings that address specific environmental problems affecting humanity in general, but more specifically, people and ecosystems in developing countries. It was not necessary for the work to have been done in a developing country, but the findings and results must be appropriate or applicable to a developing country setting. It is acknowledged that environmental research, technology applications and policy implementation have been demonstrated to improve environmental sustainability and protection in several developed economies. The main argument of the book is that similar gains can be achieved in developing economies and economies in transition. The book is organized into six chapters along some of the key themes discussed at the conference: Environmental Health Management, Sustainable Energy and Fuel, Water Treatment, Purification and Protection, Mining and Environment, Soil Stabilization, and Environmental Monitoring. It is hoped that the contents of the book will provide an insight into some of the environmental and health management challenges confronting the developing world and the steps being taken to address them.

Digital Terrain Modelling - Robert Joseph Peckham 2007-10-12

This publication is the first book on the development and application of digital terrain modeling for regional planning and policy support. It is a compilation of research results by international research groups at the European Commission's Joint Research Centre, providing scientific support to the development and implementation of EU environmental policy. This practice-oriented book is recommended reading for practising environmental modelers and GIS experts working on regional planning and policy support applications.

Handbook of Research on Developing Smart Cities Based on Digital Twins - Del Giudice, Matteo 2021-01-15
The advent of connected, smart technologies for the built environment may promise a significant value that has to be reached to develop digital city models. At the international level, the role of digital twin is strictly related to massive amounts of data that need to be processed, which proposes several challenges in terms of digital technologies capability, computing, interoperability, simulation, calibration, and representation. In these terms, the development of 3D parametric models as digital twins to evaluate energy assessment of private and public buildings is considered one of the main challenges of the last years. The ability to gather, manage, and communicate contents related to energy saving in buildings for the development of smart cities must be considered a specificity in the age of connection to increase citizen awareness of these fields. The *Handbook of Research on Developing Smart Cities Based on Digital Twins* contains in-depth research focused on the description of methods, processes, and tools that can be adopted to achieve smart city goals. The book presents a valid medium for disseminating innovative data management methods related to smart city topics. While highlighting topics such as data visualization, a web-based ICT platform, and data-sharing methods, this book is ideally intended for researchers in the building industry, energy, and computer science fields; public administrators; building managers; and energy professionals along with practitioners,

stakeholders, researchers, academicians, and students interested in the implementation of smart technologies for the built environment.

Scientific and Technical Aerospace Reports - 1994

Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database.

Handbook on Advances in Remote Sensing and Geographic Information Systems - Margarita N. Favorskaya 2017-02-24

This book presents the latest advances in remote-sensing and geographic information systems and applications. It is divided into four parts, focusing on Airborne Light Detection and Ranging (LiDAR) and Optical Measurements of Forests; Individual Tree Modelling; Landscape Scene Modelling; and Forest Ecosystem Modelling. Given the scope of its coverage, the book offers a valuable resource for students, researchers, practitioners, and educators interested in remote sensing and geographic information systems and applications.

Laser Scanning for the Environmental Sciences - George Heritage 2009-05-06

3D surface representation has long been a source of information describing surface character and facilitating an understanding of system dynamics from micro-scale (e.g. sand transport) to macro-scale (e.g. drainage channel network evolution). Data collection has been achieved through field mapping techniques and the use of remotely sensed data. Advances in this latter field have been considerable in recent years with new rapid-acquisition methods being developed centered around laser based technology. The advent of airborne and field based laser scanning instruments has allowed researchers to collect high density accurate data sets and these are revealing a wealth of new information and generating important new ideas concerning terrain characterisation and landform dynamics. The proposed book collates a series of invited peer reviewed papers presented at the a conference on geoinformatics and LIDAR to be held at the National Centre for Geocomputation based in the National University of Ireland, Maynooth. Current constraints in field survey and DEM construction are reviewed together with technical and applied issues around the new technology. The utility of the data in process modelling is also covered. The book will be of great value to researchers in the field of geomorphology, geostatistics, remote sensing and GIS and will prove extremely useful to students and practitioners concerned with terrain analysis. The proposed work will: Highlight major technological breakthrough in 3D data collection. Feature examples of application across a wide range of environmental areas. Critically evaluate the role of laser based techniques in the environment. Detail theory and application of laser techniques in the natural environment.

GIS Methodologies for Developing Conservation Strategies - Basil G. Savitsky 1998-04-28

Tropical habitats may contain more than a third of the world's plant and animal species; Costa Rica alone is home to one of the highest levels of biodiversity per unit area in the world, and stands at center stage in worldwide conservation efforts. Within such regions, the use of state-of-the-art digital mapping technologies—sophisticated techniques that are relatively inexpensive and accessible—represents the future of conservation planning and policy. These methods, which employ satellites to obtain visual data on landscapes, allow environmental scientists to monitor encroachment on indigenous territories, trace park boundaries through unmarked wilderness, and identify wildlife habitats in regions where humans have limited access. Focusing on the rich biodiversity of Costa Rica, the contributors demonstrate the use of geographic information systems (GIS) to enhance conservation efforts. They give an overview of the spatial nature of conservation and management and the current status of digital mapping in Costa Rica; a review of the basic principles behind digital mapping technologies; a series of case studies using these technologies at a variety of scales and for a range of conservation and management activities; and the results of the Costa Rican gap analysis project. *GIS Methodologies for Developing Conservation Strategies* provides powerful tools for those involved in decision-making about the natural environment, particularly in developing nations like Costa Rica where such technologies have not yet been widely adopted. For specialists in such areas as geography, conservation biology, and wildlife and natural resource management, the combination of conceptual background and case examples make the book a crucial addition to the literature.

