Not surprisingly, much of this work has required the innovative application of GIS and has led to a crucial research question: How can the natural environment be, 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.

Representing, Modeling, and Visualizing the Natural Environment-Nick Mount 2008-12-22 The explosion of public interest in the Earth’s climate, climate-system simulation models are necessary. When and how do we trust climate model predictions? The book offers a framework for answering this question. It provides readers with a basic primer on climate and climate change, and offers more technical explanations for how climate models are constructed, why they are uncertain, and what level of confidence we should place in them. It presents current results and the key uncertainties concerning them. Uncertainty is not a weakness but understanding uncertainty in a strength and a key part of using any model, including climate models. Case studies of how climate model output has been used and how it might be used in the future are provided. The ultimate goal of this book is to present a better understanding of the structure and uncertainties of climate models among users, including scientists, engineers and policymakers.

Flood Forecasting: From Observation to Prediction-Philip LeBlond 2009-04-06 Flood Forecasting: A Global Perspective describes flood forecast systems and operations as they currently exist at national and regional centers around the globe, focusing on the technical aspects of flood forecast systems. This book includes the details of data flow, what data is used, quality control, the hydrologic and hydraulic models used, and the unique problems of each country or system, such as glacial melt down, levee breaks, lateral dam breaks, and ephemeral streams and rivers. Each chapter describes the system, including details about its strengths and weaknesses, and lessons learned. This helpful resource facilitates sharing knowledge that will lead to improvements of existing systems and provides a valuable reference to those seeking to develop new flood systems by drawing on best practices. Current global systems allowing users to see a worldwide perspective with different approaches used by existing flood forecast systems Provides technical coverage allowing readers to understand why forecast systems have developed as they have and to see how specific systems have dealt with common problems Encourages a vision of what appears to be the future of hydrologic forecasting and the decision making potential of hydrologic forecasting Provides a helpful resource to facilitate improvements to existing systems based on a best practices approach Modeling Environmental Dynamics-Martin 2008-07-10 Modeling environmental dynamics is critical to understanding and predicting the evolution of the environment in response to the large number of influences including urbanization, climate change and deforestation. Simulation and modeling provide support for decision making in environmental management. The first chapter introduces terminology, and provides an overview of methodological modeling approaches which may be applied to environmental and complex dynamics. Based on this introduction the book illustrates various models applied to a large variety of themes; deforestation in tropical regions, fire risk, natural resource degradation in European mountains, agriculture, biodiversity, urbanism, climate change and land management for decision support, etc. These case studies, provided by a large international spectrum of researchers and presented in a uniform structure, focus particularly on methods and model validation so that this book is not only aimed at researchers and graduates but also professionals.

Environmental Modelling and Prediction