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Natural Hazards and Public Choice National Academies Press
This book addresses different aspects of natural hazards and vulnerabilities, with a focus on prevention and protection. It consists of nine chapters, five on flood events addressing vulnerabilities, risk assessments, impacts, sensitivity analyses, and mitigation measures, two on climate change and reconstruction of natural hazard events such as avalanches and rockslides, and two on tsunamis and volcanoes. All chapters provide relevant information and useful elements for readers interested and concerned about the lack of action or its ineffectiveness in containing the vulnerabilities and risks of possible natural hazards worldwide.

Extreme Value Theory with Applications to Natural Hazards Springer
The term 'natural disaster' is often used to refer to natural events such as earthquakes, hurricanes or floods. However, the phrase 'natural disaster' suggests an uncritical acceptance of a deeply engrained ideological and cultural myth. At Risk questions this myth and argues that extreme natural events are not disasters until a vulnerable group of people is exposed. The updated new edition confronts a further ten years of ever more expensive and deadly disasters and discusses disaster not as an aberration, but as a signal failure of mainstream 'development'. Two analytical models are provided as tools for understanding vulnerability. One links remote and distant 'root causes' to 'unsafe conditions' in a 'progression of vulnerability'. The other uses the concepts of 'access' and 'livelihood' to understand why some households are more vulnerable than others. Examining key natural events and incorporating strategies to create a safer world, this revised edition is an important resource for those involved in the fields of environment and development studies.

Natural Hazards University of Pennsylvania Press
This textbook provides a thorough introduction to natural disaster risk management. Many aspects of disaster risk management, such as those involved in earthquakes, volcanic eruptions, floods, avalanches and mudslides call for similar prevention and preparedness instruments, management concepts, and countermeasures. This textbook assumes the viewpoint of a regional disaster risk manager who is responsible for a certain area, and for making the lives of the people who live there safer, regardless of the type of natural disaster that may occur. The same holds true for boosting preparedness and awareness in the population at risk. The book includes numerous examples of hazard mitigation concepts and techniques, as well as ways of intensively involving the local population in prevention schemes at an early stage. Furthermore, it provides an in-depth examination of the function of risk communication, both as an instrument for disseminating official information and as a function of public media. In closing, a chapter on risk splitting offers insights into insurance-based models for risk financing. This comprehensive book is a must-read for all students, researchers and practitioners dealing with natural disaster risk management.

An Introduction to Natural Hazard Analysis and Design Criteria Guilford Press
An earthquake shatters Haiti and a hurricane slices through Texas. We hear that nature runs rampant, seeking to destroy us through these 'natural disasters'. Science recounts a different story, however: disasters are not the consequence of natural causes; they are the consequence of human choices and decisions. we put ourselves in harm's way; we fail to take measures which we know would prevent disasters, no matter what the environment does. This can be both hard to accept, and hard to unravel. A complex of factors shape disasters. They arise from the political processes dictating where and what we build, and from social circumstances which create and perpetuate poverty and discrimination. They develop from the social preference to blame nature for the damage wrought, when in fact events such as earthquakes and storms are entirely commonplace environmental processes We feel the need to fight natural forces, to reclaim what we assume is ours, and to protect ourselves from what we perceive to be wrath from outside our communities. This attitude distracts us from the real causes of disasters: humanity's decisions, as societies and as individuals. It stops us accepting the real solutions to disasters: making better decisions. This book explores stories of some of our worst disasters to show how we can and should act to stop people dying when nature unleashes its energies. The disaster is not the tornado, the volcanic eruption, or climate change, but the deaths and injuries, the loss of irreplaceable property, and the lack and even denial of support to affected people, so that a short-term interruption becomes a long-term recovery nightmare. But we can combat this, as Kelman shows, describing inspiring examples of effective human action that limits damage, such as managing flooding in Toronto and villages in Bangladesh, or wildfire in Colorado. Throughout, his message is clear: there is no such thing as a natural disaster. The disaster lies in our inability to deal with the environment and with ourselves.

Encyclopedia of Natural Hazards Springer Science & Business Media
The impacts of natural and man-made disasters have increased exponentially over the past few decades. Moreover, with our global interconnectedness and the growing scale of disasters, today's catastrophic disasters can have regional, national, and even global economic consequences. Following in the tradition of the successful first edition, Hazards Analysis: Reducing the Impact of Disasters, Second Edition provides a structure and process for understanding the nature of natural and human-caused disasters. Stressing the role of hazard risk management for public, private, and nonprofit organizations, the author and expert contributors cover problem solving, risk analysis, and risk communications to ensure readers are in a position to identify key problems associated with hazards and the risks that they present. The book details a systematic process of hazards identification, vulnerability determination, and consequence assessment for the natural, built, and human environment. Using a cross-disciplinary approach, this book effectively demonstrates how to use the results of vulnerability assessment, spatial analysis, and community planning to reduce adverse disaster outcomes and foster social, economic, and environmental sustainability. Throughout, the book stresses that hazards analysis is not an isolated process but one that must engage the local community. Complete with clearly set objectives, key terms, discussion questions, satellite images and maps, and ancillary websites for further study, this authoritative guide covers every element of the hazard analysis process in a step-by-step format. Hazards Analysis presents time-proven strategies for building sustainable communities, identifying and prioritizing risks, and establishing successful disaster prevention and relief strategies prior to a disaster.
Natural Hazard Risk Assessment and Public Policy CRC Press
This book presents a unique, interdisciplinary approach to disaster risk research, combining cutting-edge natural science and social science methodologies. Bringing together leading scientists, policy makers and practitioners from around the world, it presents the risks of global hazards such as volcanoes, seismic events, landslides, hurricanes, precipitation floods and space weather, and provides real-world hazard case studies from Latin America, the Caribbean, Africa, the Middle East, Asia and the Pacific region. Avoiding complex mathematics, the authors provide insight into topics such as the vulnerability of society, disaster risk reduction policy, relations between disaster policy and climate change, adaptation to hazards, and (re)insurance approaches to extreme events. This is a key resource for academic researchers and graduate students in a wide range of disciplines linked to hazard and risk studies, including geophysics, volcanology, hydrology, atmospheric science, geomorphology, oceanography and remote sensing, and for professionals and policy makers working in disaster prevention and mitigation.
At Risk John Wiley & Sons
Assessment of risk and uncertainty is crucial for natural hazard risk management, facilitating risk communication and informing strategies to successfully mitigate our society's vulnerability to natural disasters. Written by some of the world's leading experts, this book provides a state-of-the-art overview of risk and uncertainty assessment in natural hazards. It presents the core statistical concepts using clearly defined terminology applicable across all types of natural hazards and addresses the full range of sources of uncertainty, the role of expert judgement and the practice of uncertainty elicitation. The core of the book provides detailed coverage of all the main hazard types and concluding chapters address the wider societal context of risk management. This is an invaluable compendium for academic researchers and professionals working in the fields of natural hazards science, risk assessment and management and environmental science and will be of interest to anyone involved in natural hazards policy.
Natural Hazards, UnNatural Disasters CRC Press
Mathematically, natural disasters of all types are characterized by heavy tailed distributions. The analysis of such distributions with common methods, such as averages and dispersions, can therefore lead to erroneous conclusions. The statistical methods described in this book avoid such pitfalls. Seismic disasters are studied, primarily thanks to the availability of an ample statistical database. New approaches are presented to seismic risk estimation and forecasting the damage caused by earthquakes, ranging from typical, moderate events to very rare, extreme disasters. Analysis of these latter events is based on the limit theorems of probability and the duality of the generalized Pareto distribution and generalized extreme value distribution. It is shown that the parameter most widely used to estimate seismic risk – Mmax, the maximum possible earthquake value – is potentially non-robust. Robust analogues of this parameter are suggested and calculated for some seismic catalogues. Trends in the costs inferred by damage from natural disasters as related to changing social and economic situations are examined for different regions. The results obtained argue for sustainable development, whereas entirely different, incorrect conclusions can be drawn if the specific properties of the heavy-tailed distribution and change in completeness of data on natural hazards are neglected. This pioneering work is directed at risk assessment specialists in general, seismologists, administrators and all those interested in natural disasters and their impact on society.
At Risk Routledge
This book provides insight on how disaster risk management can increase the resilience of society to various natural hazards. The multi-dimensionality of resilience and the various different perspectives in regards to disaster risk reduction are taken explicitly into account by providing studies and approaches on different scales and ranging from natural science based methods to social science frameworks. For all chapters, special emphasis is placed on implementation aspects and specifically in regards to the targets and priorities for action laid out in the Sendai Framework for Disaster Risk Reduction. The chapters provide also a starting point for interested readers on specific issues of resilience and therefore include extensive reference material and important future directions for research.
Environmental Health and Hazard Risk Assessment Geological Society of London
This book presents comprehensive hazard analysis methods for seismic soil liquefaction, providing an update on soil liquefaction by systematically reviewing the phenomenon ’ s occurrence since the beginning of this century. It also puts forward a range of advanced research methods including in-situ tests, laboratory studies, physical model tests, numerical simulation, and performance-based assessment. Recent seismic liquefaction-related damage to soils and foundations demonstrate the increasing need for the comprehensive hazard analysis of seismic soil liquefaction in order to mitigate this damage and protect human lives. As such the book addresses the comprehensive hazard analysis of seismic soil liquefaction, including factors such as macroscopic characteristics, evaluating the liquefaction potential, dynamic characteristics and deformation processes, providing reliable evaluation results for liquefaction potential and deformation in the context of risk assessment. “ p>
A Safer Future Springer Nature
Few subjects have caught the attention of the entire world as much as those dealing with natural hazards. The first decade of this new millennium provides a litany of tragic examples of various hazards that turned into disasters affecting millions of individuals around the globe. The human losses (some 225,000 people) associated with the 2004 Indian Ocean earthquake and tsunami, the economic costs (approximately 200 billion USD) of the 2011 Tohoku Japan earthquake, tsunami and reactor event, and the collective social impacts of human tragedies experienced during Hurricane Katrina in 2005 all provide repetitive reminders that we humans are temporary guests occupying a very active and angry planet. Any examples may

have been cited here to stress the point that natural events on Earth may, and often do, lead to disasters and catastrophes when humans place themselves into situations of high risk. Few subjects share the true interdisciplinary dependency that characterizes the field of natural hazards. From geology and geophysics to engineering and emergency response to social psychology and economics, the study of natural hazards draws input from an impressive suite of unique and previously independent specializations. Natural hazards provide a common platform to reduce disciplinary boundaries and facilitate a beneficial synergy in the provision of timely and useful information and action on this critical subject matter. As social norms change regarding the concept of acceptable risk and human migration leads to an explosion in the number of megacities, coastal over-crowding and unmanaged habitation in precarious environments such as mountainous slopes, the vulnerability of people and their susceptibility to natural hazards increases dramatically. Coupled with the concerns of changing climates, escalating recovery costs, a growing divergence between more developed and less developed countries, the subject of natural hazards remains on the forefront of issues that affect all people, nations, and environments all the time. This treatise provides a compendium of critical, timely and very detailed information and essential facts regarding the basic attributes of natural hazards and concomitant disasters. The Encyclopedia of Natural Hazards effectively captures and integrates contributions from an international portfolio of almost 300 specialists whose range of expertise addresses over 330 topics pertinent to the field of natural hazards. Disciplinary barriers are overcome in this comprehensive treatment of the subject matter. Clear illustrations and numerous color images enhance the primary aim to communicate and educate. The inclusion of a series of unique " classic case study " events interspersed throughout the volume provides tangible examples linking concepts, issues, outcomes and solutions. These case studies illustrate different but notable recent, historic and prehistoric events that have shaped the world as we now know it. They provide excellent focal points linking the remaining terms in the volume to the primary field of study. This Encyclopedia of Natural Hazards will remain a standard reference of choice for many years.

Disaster by Choice Springer Science & Business Media

This series is dedicated to serving the growing community of scholars and practitioners concerned with the principles and applications of environmental management. Each volume is a thorough treatment of a specific topic of importance for proper management practices. A fundamental objective of these books is to help the reader discern and implement man's stewardship of our environment and the world's renewable resources. For we must strive to understand the relationship between man and nature, act to bring harmony to it, and nurture an environment that is both stable and productive. These objectives have often eluded us because the pursuit of other individual and societal goals has diverted us from a course of living in balance with the environment. At times, therefore, the environmental manager may have to exert restrictive control, which is usually best applied to man, not nature. Attempts to alter or harness nature have often failed or backfired, as exemplified by the results of imprudent use of herbicides, fertilizers, water, and other agents. Each book in this series will shed light on the fundamental and applied aspects of environmental management. It is hoped that each will help solve a practical and serious environmental problem.

Quantitative Risk Assessment (QRA) for Natural Hazards Springer

Examines the significance of the human factor which is as much of a cause of disasters as the natural environment. Practical and policy conclusions are drawn with a view to disaster reduction and the promotion of safer environments.

Plate Boundaries and Natural Hazards Springer

Adopting an integrated approach to natural hazards that incorporates facets of both the physical and social sciences, this text examines how different societies have responded to such extremes of nature. The authors bring together the behavioural, political, psychological and economic approaches, leading to increased comprehension of a range of natural hazards, rather than a detailed analysis of particular events or hazard categories.

Mitigation of Natural Hazards and Disasters Springer Nature

The study of disaster statistics and disaster occurrence is a complicated interdisciplinary field involving the interplay of new theoretical findings from several scientific fields like mathematics, physics, and computer science. Statistical studies on the mode of occurrence of natural disasters largely rely on fundamental findings in the statistics of rare events, which were derived in the 20th century. With regard to natural disasters, it is not so much the fact that the importance of this problem for mankind was recognized during the last third of the 20th century - the myths one encounters in ancient civilizations show that the problem of disasters has always been recognized - rather, it is the fact that mankind now possesses the necessary theoretical and practical tools to effectively study natural disasters, which in turn supports effective, major practical measures to minimize their impact. All the above factors have resulted in considerable progress in natural disaster research. Substantial accrued material on natural disasters and the use of advanced recording techniques have opened new doors for empirical analysis. However, despite the considerable progress made, the situation is still far from ideal. Sufficiently complete catalogs of events are still not available for many types of disasters, and the methodological and even terminological bases of research need to be further developed and standardized. The present monograph summarizes recent advances in the field of disaster statistics, primarily focusing on the occurrence of disasters that can be described by distributions with heavy tails. These disasters typically occur on a very broad range of scales, the rare greatest events being capable of causing losses comparable to the total losses of all smaller disasters of the same type. Audience: This SpringerBrief will be a valuable resource for those working in the fields of natural disaster research, risk assessment and loss mitigation at regional and federal governing bodies and in the insurance business, as well as for a broad range of readers interested in problems concerning natural disasters and their effects on human life.

Natural Hazards World Bank Publications

Named one of Planetizen's Top 10 Books of 2006 Hurricane Katrina not only devastated a large area of the nation's Gulf coast, it also raised fundamental questions about ways the nation can, and should, deal with the inevitable problems of economic risk and social responsibility. This volume gathers leading experts to examine lessons that Hurricane Katrina teaches us about better assessing, perceiving, and managing risks from future disasters. In the years ahead we will inevitably face more problems like those caused by Katrina, from fire, earthquake, or even a flu pandemic. America remains in the cross hairs of terrorists, while policy makers continue to grapple with important environmental and health risks. Each of these scenarios might, in itself, be relatively unlikely to occur. But it is statistically certain that we will confront such catastrophes, or perhaps one we have never imagined, and the nation and its citizenry must be prepared to act. That is the fundamental lesson of Katrina. The 20 contributors to this volume address questions of public and private roles in assessing, managing, and dealing with risk in American society and suggest strategies for moving ahead in rebuilding the Gulf coast. Contributors: Matthew Adler, Vicki Bier, Baruch Fischhoff, Kenneth R. Foster, Robert Giegengack, Peter Gosselin, Scott E. Harrington, Carolyn Kousky, Robert Meyer, Harvey G. Ryland, Brian L. Strom, Kathleen Tierney, Michael J. Trebilcock, Detlof von Winterfeldt, Jonathan Walters, Richard J. Zeckhauser.

Heavy-Tailed Distributions in Disaster Analysis Cambridge University Press

Natural Hazards and Public Choice: The State and Local Politics of Hazard Mitigation presents a research project that emerged from a concern for estimating the balance of support

versus opposition to prospective social policies that aim to reduce the risks of damage or injuries from major natural hazard events via the regulation of land use and establishment of building and occupancy standards in high-risk areas. The volume begins with an overview of the research project and the main findings. Separate chapters describe the study design; assess the views of politically influential people regarding the seriousness of natural hazards; measure the support for federal disaster policies; and consider public opinion on hazards-mitigation issues in California. Subsequent chapters cover the National Flood Insurance Program (NFIP); patterns of activity, influence, and power among key positions and groups in local communities with respect to issues involving disasters; and hazard mitigation activities at the state level.

At Risk National Academies Press

Uncertainties are pervasive in natural hazards, and it is crucial to develop robust and meaningful approaches to characterize and communicate uncertainties to inform modeling efforts. In this monograph we provide a broad, cross-disciplinary overview of issues relating to uncertainties faced in natural hazard and risk assessment. We introduce some basic tenets of uncertainty analysis, discuss issues related to communication and decision support, and offer numerous examples of analyses and modeling approaches that vary by context and scope. Contributors include scientists from across the full breath of the natural hazard scientific community, from those in real-time analysis of natural hazards to those in the research community from academia and government. Key themes and highlights include: Substantial breadth and depth of analysis in terms of the types of natural hazards addressed, the disciplinary perspectives represented, and the number of studies included Targeted, application-centered analyses with a focus on development and use of modeling techniques to address various sources of uncertainty Emphasis on the impacts of climate change on natural hazard processes and outcomes Recommendations for cross-disciplinary and science transfer across natural hazard sciences This volume will be an excellent resource for those interested in the current work on uncertainty classification/quantification and will document common and emergent research themes to allow all to learn from each other and build a more connected but still diverse and ever growing community of scientists. Read an interview with the editors to find out more: https://eos.org/editors-vox/reducing-uncertainty-in-hazard-prediction

Statistical Analysis of Natural Disasters and Related Losses Springer Science & Business Media

Measuring Vulnerability to Natural Hazards presents a broad range of current approaches to measuring vulnerability. It provides a comprehensive overview of different concepts at the global, regional, national, and local levels, and explores various schools of thought. More than 40 distinguished academics and practitioners analyse quantitative and qualitative approaches, and examine their strengths and limitations. This book contains concrete experiences and examples from Africa, Asia, the Americas and Europe to illustrate the theoretical analyses.The authors provide answers to some of the key questions on how to measure vulnerability and they draw attention to issues with insufficient coverage, such as the environmental and institutional dimensions of vulnerability and methods to combine different methodologies.This book is a unique compilation of state-of-the-art vulnerability assessment and is essential reading for academics, students, policy makers, practitioners, and anybody else interested in understanding the fundamentals of measuring vulnerability. It is a critical review that provides important conclusions which can serve as an orientation for future research towards more disaster resilient communities.

Natural Hazards GIS-Based Spatial Modeling Using Data Mining Techniques Guilford Press

This richly illustrated book describes statistical extreme value theory for the quantification of natural hazards, such as strong winds, floods and rainfall, and discusses an interdisciplinary approach to allow the theoretical methods to be applied. The approach consists of a number of steps: data selection and correction, non-stationary theory (to account for trends due to climate change), and selecting appropriate estimation techniques based on both decision-theoretic features (e.g., Bayesian theory), empirical robustness and a valid treatment of uncertainties. It also examines and critically reviews alternative approaches based on stochastic and dynamic numerical models, as well as recently emerging data analysis issues and presents large-scale, multidisciplinary, state-of-the-art case studies. Intended for all those with a basic knowledge of statistical methods interested in the quantification of natural hazards, the book is also a valuable resource for engineers conducting risk analyses in collaboration with scientists from other fields (such as hydrologists, meteorologists, climatologists).