

Extreme Events and Natural Hazards: The Complexity Perspective

A. Surjalal Sharma
Armin Bunde
Vijay P. Dimri
Daniel N. Baker
Editors

 American Geophysical Union
Washington, DC

CONTENTS

Preface

A. Surjalal Sharma, Armin Bunde, Vijay P. Dimri, and Daniel N. Baker.....vii

Complexity and Extreme Events in Geosciences: An Overview

A. Surjalal Sharma, Daniel N. Baker, Archana Bhattacharyya, Armin Bunde, Vijay P. Dimri, Harsh K. Gupta, Vijay K. Gupta, Shaun Lovejoy, Ian G. Main, Daniel Schertzer, Hans von Storch, and Nicholas W. Watkins1

Section I: Solid Earth

Earthquakes: Complexity and Extreme Events

M. R. Yoder, D. L. Turcotte, and J. B. Rundle.....17

Patterns of Seismicity Found in the Generalized Vicinity of a Strong Earthquake: Agreement With Common Scenarios of Instability Development

M. V. Rodkin27

Characterizing Large Events and Scaling in Earthquake Models With Inhomogeneous Damage

Rachele Dominguez, Kristy Tiampo, C. A. Serino, and W. Klein.....41

Fractal Dimension and b Value Mapping Before and After the 2004 Megathrust Earthquake in the Andaman-Sumatra Subduction Zone

Sohini Roy, Uma Ghosh, Sugata Hazra, and J. R. Kayal.....55

Stress Pulse Migration by Viscoelastic Process for Long-Distance Delayed Triggering of Shocks in Gujarat, India, After the 2001 M_w 7.7 Bhuj Earthquake

B. K. Rastogi, Pallabee Choudhury, Rakesh Dumka, K. M. Sreejith, and T. J. Majumdar.....63

Extreme Seismic Events in Models of Lithospheric Block-and-Fault Dynamics

A. T. Ismail-Zadeh, J.-L. Le Mouél, and A. A. Soloviev.....75

Section II: Oceans

Investigation of Past and Future Polar Low Frequency in the North Atlantic

Matthias Zahn and Hans von Storch.....99

Variability of North Atlantic Hurricanes: Seasonal Versus Individual-Event Features

Álvaro Corral and Antonio Turiel111

Large-Scale Patterns in Hurricane-Driven Shoreline Change

Eli D. Lazarus, Andrew D. Ashton, and A. Brad Murray.....127

Section III: Atmosphere

Precipitation and River Flow: Long-Term Memory and Predictability of Extreme Events

Armin Bunde, Mikhail I. Bogachev, and Sabine Lennartz139

Extreme Events and Trends in the Indian Summer Monsoon

V. Krishnamurthy.....153

Empirical Orthogonal Function Spectra of Extreme Temperature Variability Decoded From Tree Rings of the Western Himalayas <i>R. K. Tiwari, R. R. Yadav, and K. P. C. Kaladhar Rao</i>	169
On the Estimation of Natural and Anthropogenic Trends in Climate Records <i>S. Lennartz and A. Bunde</i>	177
Climate Subsystems: Pacemakers of Decadal Climate Variability <i>Anastasios A. Tsonis</i>	191
Dynamical System Exploration of the Hurst Phenomenon in Simple Climate Models <i>O. J. Mesa, V. K. Gupta, and P. E. O'Connell</i>	209
Low-Frequency Weather and the Emergence of the Climate <i>S. Lovejoy and D. Schertzer</i>	231
Section IV: Geospace	
Extreme Space Weather: Forecasting Behavior of a Nonlinear Dynamical System <i>D. N. Baker</i>	255
Supermagnetic Storms: Hazard to Society <i>G. S. Lakhina, S. Alex, B. T. Tsurutani, and W. D. Gonzalez</i>	267
Development of Intermediate-Scale Structure in the Nighttime Equatorial Ionosphere <i>A. Bhattacharyya</i>	279
Complex Analysis of Polar Auroras for 1996 <i>James Wanliss and Joshua Peterson</i>	293
On Self-Similar and Multifractal Models for the Scaling of Extreme Bursty Fluctuations in Space Plasmas <i>N. W. Watkins, B. Hnat, and S. C. Chapman</i>	299
Section V: General	
Extreme Value and Record Statistics in Heavy-Tailed Processes With Long-Range Memory <i>Aicko Y. Schumann, Nicholas R. Moloney, and Jörn Davidsen</i>	315
Extreme Event Recurrence Time Distributions and Long Memory <i>M. S. Santhanam</i>	335
Dealing With Complexity and Extreme Events Using a Bottom-Up, Resource-Based Vulnerability Perspective <i>Roger A. Pielke Sr., Rob Wilby, Dev Niyogi, Faisal Hossain, Koji Dairuku, Jimmy Adegoke, George Kallos, Timothy Seastedt, and Katharine Suding</i>	345
AGU Category Index	361
Index	363