

NATURAL HAZARDS

Natural hazards afflict all corners of the Earth; often unexpected, seemingly unavoidable and frequently catastrophic in their impact.

This revised edition is a comprehensive, inter-disciplinary treatment of the full range of natural hazards. Accessible, readable and well supported by over 150 maps, diagrams and photographs, it is a standard text for students and an invaluable guide for professionals in the field.

Clearly and concisely, the author describes and explains how hazards occur, examines prediction methods, considers recent and historical hazard events and explores the social impact of such disasters. This revised edition makes good use of the wealth of recent research into climate change and its effects.

Edward Bryant is Associate Dean of Science at Wollongong University in Australia. Among his other publications is *Tsunami: The Underrated Hazard* (Cambridge University Press, 2001). He has particular interest in climatic change and coastal evolution.

Praise for the First Edition:

‘Professor Bryant’s heroic compilation is an excellent guide.’

Scientific American

NATURAL

SECOND EDITION

HAZARDS

EDWARD BRYANT



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To Dianne, Kate and Mark



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Preface

I have reread the preface to the first edition many times: extreme events, dire warnings about Greenhouse warming, El Niño–Southern Oscillation prediction . . . Little has changed in the fifteen years since I wrote about them. I am still perplexed because extreme events continue to happen and global warming is no closer to occurring. As Sydney in February 2004 experienced a heat wave of a magnitude unprecedented since at least 1939, I was chasing my favourite research topic – cosmogenically induced mega-tsunami – on Stewart Island, New Zealand some two thousand kilometres away where an unprecedented cold snap was occurring. One event witnessed by four million people got all the publicity; the other played out in a remote cabin in front of half of dozen trekkers got none. Yet both climatic extremes were produced by the same pattern of atmospheric circulation controlled by the same sequence of mobile polar highs. Sydney lay on the equatorial ‘greenhouse’ side of the highs and Stewart Island lay on the poleward ‘Ice Age’ side. This book covers two of the phenomena I experienced in my February of extremes – mobile polar highs and tsunamis. As with the first edition, the book does not cover the third phenomena, Greenhouse warming. This book is about everyday climatic and geological hazards that can be explained, predicted, and alleviated. Global warming is mentioned and is covered by the concept of changing hazard regimes. However, heat waves – and cold snaps – are

about everyday hazards that we have lived with, will continue to experience, and hopefully can survive. These concepts are what this second edition is about.

In order to convey this point of view clearly in the book, adherence to academic referencing has been kept to a minimum. Usually each section begins by listing the major papers or books on a topic that have influenced my thinking and writing. Full reference to these publications can be found at the end of each chapter. I apologize to anyone who feels that their crucial work has been ignored; but the breadth of coverage in this textbook precluded a complete review of the literature on many topics including some of my own.

Manuscript preparation is quite different now from what it was in the late 1980s when the first edition was being published. For one thing, the software programs for scanning, image enhancement, graphics, and word processing are far more comprehensive and efficient at doing tasks. The diagrams in the first edition were hand-drawn, a technique that is rarely used today. Readers will find that many of those diagrams remain in this version. However, many have been revamped using graphics software. New computer-prepared diagrams have also been added. Word processing packages now allow spelling and grammar to be checked uniformly without the assistance of a copy-editor. Minor changes have been made to text retained from the first edition using this capability. The Internet was in its infancy when the first edition was

prepared. It is now very easy to capture all the arguments or theories related to a hazard topic via this medium. Where the Internet was used to prepare the current edition, the web sites have been referenced in the text and their full addresses appended to individual chapters. The reader should be aware that some of

these addresses may not be available to them because they have changed, or because of the lack of an archival tradition on the Internet.

Ted Bryant
9 August 2004

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