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978-1-107-01016-1 - Natural Disasters and Adaptation to Climate Change

Edited by Sarah Boulter, Jean Palutikof, David John Karoly and Daniela Guitart

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## NATURAL DISASTERS AND ADAPTATION TO CLIMATE CHANGE

Every year extreme events occur that are costly in terms of human life and damage to infrastructure. The extent of this damage is a measure of the extent to which adaptation, whether planned or autonomous, has been successfully undertaken. Extreme events, their impacts, and the measures undertaken to protect ecosystems, human activities, and human welfare contain instructive lessons for adaptation to the effects of climate change.

This volume presents eighteen case studies of natural disasters from Australia, Europe, North America, and developing countries. By comparing the impacts, it seeks to identify what moves people to adapt, which adaptive activities succeed and which fail, the underlying reasons for success or failure, and the factors that determine when adaptation is required and when simply bearing the impact may be the more appropriate response. Much has been written about the theory of adaptation and high-level, especially international, policy responses to climate change. This book aims to inform actual adaptation practice – what works, what does not, and why. It explores some of the lessons we can learn from past disasters and the adaptation that takes place after the event in preparation for the next. How successful are these actions, how do communities respond and behave, what makes an action fail, and how do these actions fare in the long term? As a modern society, we have no past experience of adapting to climate change, so managing and responding to historical extremes provides the only empirical evidence, however imperfect, of how successfully we may adapt to climate change now and in the future.

This volume will be especially useful for researchers and decision makers in policy and government concerned with climate change adaptation, emergency management, disaster risk reduction, and environmental policy and planning.

SARAH BOULTER is a Research Fellow with the National Climate Change Adaptation Research Facility (NCCARF), Griffith University, Gold Coast, Australia, where she works on synthesis and communication of adaptation research. She has been involved in the development of policy guidance development programs for adaptation, research programs on historical case studies, assessment of forest vulnerability in Australasia, and as the convenor of Australia's Climate Adaptation conferences. She is a contributing author to the Australia chapter of the Intergovernmental Panel on Climate Change Fifth Assessment Report. Her research background includes studies of biodiversity and reproductive ecology of forested systems and the impacts of climate change.

JEAN PALUTIKOF is the Director of the NCCARF, Griffith University, Gold Coast, Australia. At NCCARF, she has built a national program of adaptation research, communication, and partnerships. Her work at NCCARF has convinced her of the need for case studies of good practice in adaptation action, to build adaptive capacity and knowledge among decision makers. Prior to joining NCCARF, Professor Palutikof managed the production of the Intergovernmental Panel on Climate Change Fourth Assessment Report for Working Group II (Impacts, Adaptation and Vulnerability), while based at the UK Met Office. Prior to joining the Met Office, she was a Professor in the School of Environmental Sciences and Director of the Climatic Research Unit at the University of East Anglia, United Kingdom. Her research interests focus on climate change impacts and adaptation and the application of climatic data to economic and planning issues.

DAVID JOHN KAROLY is a Professor of Climate Science in the School of Earth Sciences at the University of Melbourne. He is an internationally recognized expert in climate change and climate variability, including greenhouse climate change, stratospheric ozone depletion, and interannual climate variations stemming from the El Niño–Southern Oscillation. He was heavily involved in preparation of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. He joined the University of Melbourne in 2007 as an ARC Federation Fellow funded by the Australian government. He is a member of the new Climate Change Authority in Australia, the Science Advisory Panel to the Australian Climate Commission, and the Wentworth Group of Concerned Scientists.

DANIELA GUITART is an environmental scientist working at the NCCARF, Griffith University, Gold Coast, Australia. At NCCARF she coordinates the Adaptation Research Network activities and manages the production of information tools that communicate climate change adaptation research. Prior to joining NCCARF, she conducted research on community-based urban agriculture and its contribution to food security and the conservation of agricultural biodiversity.

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*Edited by*

SARAH BOULTER

*National Climate Change Adaptation Research Facility, Griffith University*

JEAN PALUTIKOF

*National Climate Change Adaptation Research Facility, Griffith University*

DAVID JOHN KAROLY

*University of Melbourne*

DANIELA GUITART

*National Climate Change Adaptation Research Facility, Griffith University*



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## Contributors

**W. Neil Adger**, College of Life and Environmental Sciences, University of Exeter

**Jeroen Aerts**, Institute for Environmental Studies, VU University Amsterdam

**Armando Apan**, Australian Centre for Sustainable Catchments, University of Southern Queensland

**Jessica Ayers**, International Institute for Environment and Development

**Jon Barnett**, Department of Resource Management and Geography, University of Melbourne

**Juan F. Barrera**, El Colegio de la Frontera Sur, Tapachula, Chiapas

**Simon P. J. Batterbury**, Department of Resource Management and Geography, University of Melbourne

**Linda C. Botterill**, Faculty of Business, Government and Law, University of Canberra

**Sarah Boulter**, National Climate Change Adaptation Research Facility, Griffith University

**Edwin Castellanos**, Centro de Estudios Ambientales y de Biodiversidad, Universidad del Valle de Guatemala

**Declan Conway**, School of International Development, University of East Anglia

**Gustavo Cruz-Bello**, Centro de Investigación en Geografía y Geomática ‘Ing. Jorge L. Tamayo’

**W. Priyan S. Dias**, Department of Civil Engineering, University of Moratuwa

**Markus G. Donat**, Climate Change Research Centre, University of New South Wales

**Stephen Dovers**, Australian National University

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*Contributors*

**Thomas E. Downing**, Global Climate Adaptation Partnership

**Hallie Eakin**, School of Sustainability, Arizona State University

**C. J. Fotheringham**, US Geological Survey, Western Ecological Research Center

**Andrew W. Garcia (Deceased)**, Coastal and Hydraulics Laboratory Engineer  
Research and Development Center, US Army Corps of Engineers

**Marisa C. Goulden**, Tyndall Centre for Climate Change Research, University of  
East Anglia

**Daniela Guitart**, National Climate Change Adaptation Research Facility, Griffith  
University

**John Handmer**, Centre for Risk and Community Safety, RMIT University

**Katharine Haynes**, Risk Frontiers, Macquarie University

**Sam S. L. Hettiarachchi**, Department of Civil Engineering, University of Moratuwa

**Saleemul Huq**, International Institute for Environment and Development

**Jiang Tong**, China Meteorological Administration

**David John Karoly**, School of Earth Sciences, University of Melbourne

**Jon E. Keeley**, US Geological Survey, Western Ecological Research Center; Depart-  
ment of Ecology and Evolutionary Biology, University of California

**Diane Keogh**, Australian Centre for Sustainable Catchments, University of Southern  
Queensland

**David King**, Centre for Disaster Studies, James Cook University

**Zbigniew W. Kundzewicz**, Institute for Agricultural and Forest Environment, Polish  
Academy of Sciences, Poland; Potsdam Institute for Climate Impact Research

**Timothy M. Kusky**, Three Gorges Research Center for Geohazards, China University  
of Geosciences

**Karine Laaidi**, Institut de Veille Sanitaire – French National Institute for Public  
Health Surveillance

**Alain Le Tertre**, Institut de Veille Sanitaire – French National Institute for Public  
Health Surveillance

**Gregor C. Leckebusch**, School of Geography, Earth and Environmental Sciences,  
University of Birmingham

**Matthew Mason**, Risk Frontiers, Macquarie University

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**David M. Mills**, Stratus Consulting Inc.

**Helda Morales**, El Colegio de la Frontera Sur, San Cristóbal de las Casas, Chiapas

**Michael J. Mortimore**, Drylands Research

**Colette Mortreux**, Department of Resource Management and Geography, University of Melbourne

**Karen O'Brien**, Department of Sociology and Human Geography, University of Oslo

**Jean Palutikof**, National Climate Change Adaptation Research Facility, Griffith University

**Mathilde Pascal**, Institut de Veille Sanitaire – French National Institute for Public Health Surveillance

**Bimal K. Paul**, Department of Geography, Kansas State University

**Munshi K. Rahman**, Kent State University

**William D. Snook**, City of Kansas City, Missouri, Health Department

**Su Buda**, China Meteorological Administration

**Alexandra D. Sypard**, Conservation Biology Institute

**Melanie Thomas**, Centre for Disaster Studies, James Cook University

**Madeleine C. Thomson**, International Research Institute for Climate and Society, and Mailman School of Public Health, Columbia University

**Uwe Ulbrich**, Institute of Meteorology, Freie Universität Berlin

**Pier Vellinga**, Earth System Science Department, Wageningen University; Research, Alterra, Wageningen

**George Walker**, Risk Frontiers, Macquarie University, Australia; Engineering and Physical Sciences, James Cook University; Aon Benfield Analytics

**Joshua Whittaker**, Centre for Risk and Community Safety, RMIT University

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## Preface

As we prepare this book for publication, communities here in Australia are emerging once again from a summer of disasters – widespread flooding, bushfires, and record heatwaves. Communities that have just recovered from the last summer of extremes (see Chapter 25) find their newly repaired roads, bridges, buildings, and homes once again destroyed or damaged. The question on the minds of many is whether this is the shape of things to come – is this the reality of climate change? But, this book is not about attribution of extreme events. It does not seek to tease out the signal of climate change from the background noise of day-to-day variability. Rather, its goal is to use the empirical evidence from extreme events to better understand our ability to respond effectively to climate change.

Many of us will experience climate change most clearly through a change in the frequency and severity of extremes. Although some acclimatisation will occur, how effectively we coped with extremes in the past can be indicative of how well we will adapt to climate change in the future. This book sets out to explore some of the lessons we can learn from past disasters and the adaptation that takes place after the event in preparation for the next. How successful are these actions, how do communities respond and behave, what makes an action fail, and how do these actions fare in the long term? These are some of the questions we wanted to address in this book in order to better understand how we might in the future adapt to climate change. As a modern society, we have no past experience of adapting to climate change, so that managing and responding to historical extremes provides the only empirical evidence, however imperfect, of how successfully we will adapt to climate change now and in the future.

The core of this book is a set of case studies of extremes in Australia, prepared for the National Climate Change Adaptation Research Facility, or NCCARF. These were some of the first products to come out of NCCARF, and we have found them to have resonance with communities and decision makers working in adaptation, giving them a focus for their own thinking about responding to climate change. From this core

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of Australian events we have built a set of case studies that seek to demonstrate how other countries, whether developed or developing, have approached the challenge.

Three of the editors – Sarah Boulter, Jean Palutikof, and Daniela Guitart – work in NCCARF, which is hosted by Griffith University in Queensland. The fourth editor is David John Karoly from the University of Melbourne. The original concept for the book arose from discussions between Jean and David, who worked together, respectively, as Head of Technical Support Unit and Coordinating Lead Author for Chapter 1 of the IPCC's Working Group II Fourth Assessment. The concept was then nurtured and fostered under the guidance of Sarah, and later Daniela helped to ensure that the idea became reality.

Sarah Boulter, NCCARF, Griffith University, Queensland  
Jean Palutikof, NCCARF, Griffith University, Queensland  
David John Karoly, University of Melbourne, Melbourne  
Daniela Guitart, NCCARF, Griffith University, Queensland