

NATURAL HAZARDS *in* AUSTRALIA

Identifying Risk Analysis Requirements



Miriam H. Middelmann (Editor)



Australian Government

Department of Industry, Tourism & Resources
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Parliamentary Secretary: The Hon. Bob Baldwin, MP
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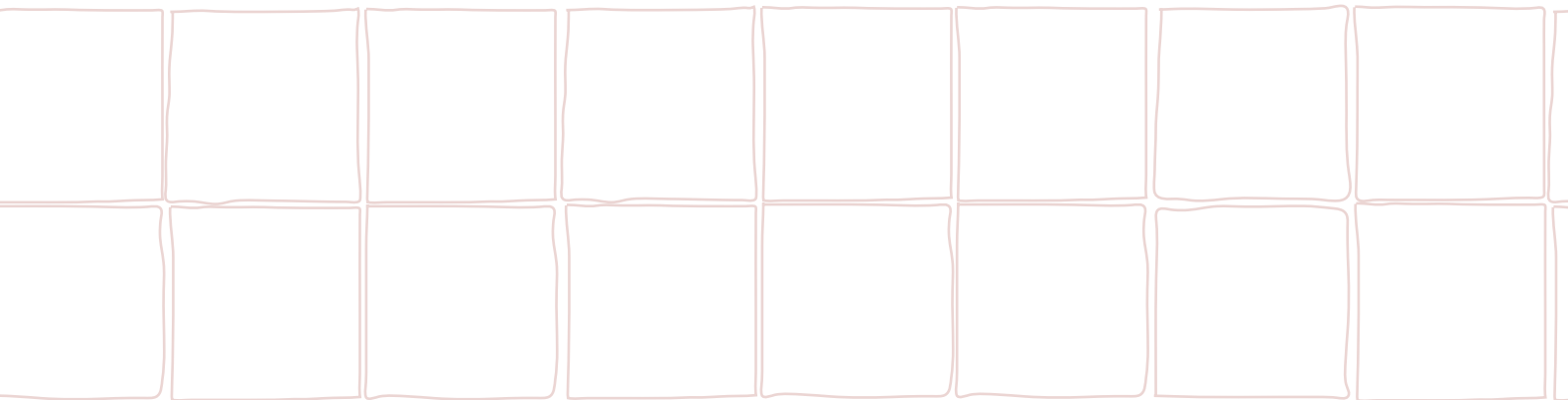
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ISBN 0 978-1-921236-60-0 (Hardcopy)

ISBN 0 978-1-921236-61-7 (Web)

GeoCat # 65444

Bibliographic reference: Middelmann, M. H. (Editor) (2007) *Natural Hazards in Australia: Identifying Risk Analysis Requirements*. Geoscience Australia, Canberra.



Photos on front cover (left to right)

Crop damage from Cyclone Larry, Queensland, 2006
Photo courtesy: Bureau of Meteorology/J. Davidson.
Fire near Bruthen, Victoria, 2007
Photo courtesy: CFA Public Affairs/M. Anderson.
Flood in Lismore, New South Wales, 2005
Photo courtesy: NSW SES/P. Campbell.
Tornado in Port Hedland, Western Australia, December 1975
Photo courtesy: Bureau of Meteorology/P. Mudra.

Photos on back cover (left to right)

Flood damage in Brisbane, Queensland, 1893
Photo courtesy: John Oxley Library/123308/P. Poulsen.
Debris flow on Bulli Pass, New South Wales, 1998
Photo courtesy: NSW SES.
Earthquake damage in Newcastle, New South Wales, 1989
Photo courtesy: Emergency Management Australia.
Lightning near Alstonville, New South Wales, 2003
Photo courtesy: NSW Storms/D. Ellem.



Natural Hazards in Australia

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Australian Government

Geoscience Australia

**Department of Transport and
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Bureau of Meteorology

CSIRO



Foreword

Whether it's from bushfire, flood, severe storm, earthquakes, or even tsunami, Australia has suffered loss of life and extreme damage to infrastructure from natural hazards. And as our communities grow, so does the potential for greater losses in these areas.

My electorate of Paterson, New South Wales, has experienced firsthand the effects of natural hazards on a community. In 1989 the most damaging earthquake in Australia's history rocked the city of Newcastle, and more recently floods in the upper Hunter Valley caused major damage.

Following a Council of Australian Government (COAG) natural hazard review into reforming mitigation, relief and recovery arrangements, the Australian Government identified a new approach was needed for the management of natural disasters in Australia and tabled a number of recommendations.

The first two reform commitments relate to this report:

- 1) Develop and implement a five-year national programme of systematic and rigorous disaster risk assessments
- 2) Establish a nationally consistent system of data collection, research and analysis to ensure a sound knowledge base on natural disasters and disaster mitigation.

In response to the COAG review, Geoscience Australia and its partner, the Department of Transport and Regional Services, committed to provide risk assessment methods, models and data to be used as benchmarks for risk assessment projects.

The purpose of this Report is to provide a knowledge base of how to conduct a risk analysis for natural hazards in Australia. The Report considers the suite of natural hazards identified by COAG and addresses a range of issues including impacts, gaps, data requirements and risk analyses. The report highlights the gains in a long-term data collection system and how integral it is to the risk analysis process.

Geoscience Australia has been a leader in hazard risk research in Australia for over a decade, and this collaborative report is an example of how mitigation research can provide emergency response managers at ground level with the information they need to combat the conditions at hand.



Natural hazards are a constant threat that every Australian has to live with, and as such we have developed some of the best emergency management response techniques in the world.

To limit the impact on our communities, we as a nation must continue to further our understanding and research of natural hazards, and this report is a great platform from which to learn.

A handwritten signature in blue ink, which appears to read 'Bob Baldwin'. The signature is fluid and cursive, written over a white background.

The Hon Bob Baldwin, MP
Parliamentary Secretary to the Minister for Industry, Tourism and Resources
5 October 2007

Foreword

Every year, many Australian communities are confronted with the devastation caused by natural disasters. These disasters often cause considerable disruption to the community and significant damage to property, infrastructure, industry and economy. Natural disasters pose a unique challenge that government, private enterprise and communities must work together to prepare for and manage.

Reliable information to identify the risk and degree of damage that can be caused by a natural hazard is very important. Risk analysis is an important step in a comprehensive risk management approach to minimise the potentially devastating impact of bushfires, floods, tropical cyclones and other natural hazards on communities.

Australia's Climate Change Policy (July 2007) identifies climate change as a serious challenge in the future and predicts impacts to include rising sea levels and a greater number of severe storms. A range of research suggests that the number and severity of natural hazards is set to rise across Australia, exposing a greater number of Australians to the risks they present, with potential flow on effects to the nation and the economy more generally.

The Australian Government plays an important role in mitigating the effects of natural disasters. This is done through:

- fostering strong relationships with communities, the private sector, state government and local authorities
- developing an understanding of common and individual goals before, during and after a natural disaster event
- developing a consistent national approach to the assessment of risks associated with different types of natural disasters
- improving mitigation measures to reduce the impact of natural disasters
- a more comprehensive approach to assisting communities to recover from an event
- identifying best practice initiatives to better manage events before, during and after they occur.

I have developed an appreciation of a range of issues relating to natural disasters through my current role as Secretary of the Australian Government Department of Transport and Regional Services (DOTARS) and in a previous role as Secretary of the Victorian Government Department of Natural Resources and Environment.

DOTARS oversees a number of future-oriented initiatives that aim to reduce the social and economic impact of natural disasters. While protection of the community and property is the responsibility of state and territory governments, DOTARS plays a vital role at the Australian Government level by providing policy advice and administering a number of funding programmes that enhance communities' ability to prepare for and recover from natural disasters.



This publication brings together current understanding of natural disasters across Australia. It provides a new, central source of information on the process involved in analysing risk, which is a vital step in reducing the loss and suffering caused by natural disasters in Australia.

A handwritten signature in black ink that reads "Michael Taylor". The signature is written in a cursive, flowing style.

Michael Taylor
Secretary, Department of Transport and Regional Services
5 October 2007



Photo courtesy: NAA: A1200, L85800.

Acknowledgements

This report is the result of input from many individuals and agencies. Appreciation and thanks are extended to all who contributed.

The contribution made by the Australian Emergency Management Committee in nominating representatives from each state and territory government to comment on the report is gratefully acknowledged. The feedback subsequently received from the state and territory governments, particularly during the report's scoping phase, is much appreciated.

Appreciation is also extended to the members of the National Risk Assessment Advisory Group and the Technical Risk Assessment Advisory Group who provided input.

A special thank you is extended to Ken Granger from the Institute for International Development, who reviewed the entire report.

Many agencies and individuals have given permission to use information from previous publications and reports, and to reproduce images. While this is acknowledged at the appropriate locations in the text, appreciation of each contribution is also extended here.

In the following sections, specific contributions made by individuals are acknowledged. Although an attempt has been made to thank everyone who directly contributed, an apology is extended to any individual whose contribution has been missed.

Chapter 1 - Introduction

The introduction was written by Miriam Middelmann from Geoscience Australia.

Appreciation is extended to the many people who commented on various drafts from the beginning. Review comments provided on the final draft by Dale Thurling (Department of Transport and Regional Services) and David Burbidge, Trevor Dhu and Monica Osuchowski (Geoscience Australia) are also greatly appreciated.

Chapter 2 - Impact of Natural Disasters

The 'Impact of Natural Disasters' chapter was written by Miriam Middelmann from Geoscience Australia.

Many thanks are extended to Mike Allen (Department of Planning and Infrastructure, Western Australia), Anita Dwyer (formerly Geoscience Australia), Michael Edwards (Department of Sustainability and Environment, Victoria), Paul Gabriel (Office of the Emergency

Services Commissioner, Victoria), Kathleen McInnes (CSIRO Marine and Atmospheric Research) and Karl Sullivan (Insurance Council of Australia) for their input on an early draft.

Appreciation is also extended to Peter Lawler and Dale Thurling (Department of Transport and Regional Services), Colin Mazengarb (Mineral Resources Tasmania), George Walker (Aon Re) and Craig Arthur, David Burbidge, Bob Cechet, Dan Clark, Trevor Dhu, Monica Osuchowski, Amy Prendergast and Chris Thompson (Geoscience Australia) for their review comments and/or expert input on hazards.

Chapter 3 - Risk Analysis

The 'Risk Analysis' chapter was written by Miriam Middelman from Geoscience Australia.

Review comments on the chapter, received from Linda Anderson-Berry (Bureau of Meteorology), Michael Edwards (Department of Sustainability and Environment, Victoria), John Handmer (RMIT University), and Trevor Dhu, Monica Osuchowski and John Schneider (Geoscience Australia), are much appreciated.

Chapter 4 - Tropical Cyclone

The 'Tropical Cyclone' chapter authors were Alan Sharp (Bureau of Meteorology) and Craig Arthur, Bob Cechet and Mark Edwards (Geoscience Australia). Input on climate change was provided by Deborah Abbs and Kathleen McInnes (CSIRO Marine and Atmospheric Research).

The review comments provided by Mike Allen (Department of Planning and Infrastructure, Western Australia), Andrew Burton (Bureau of Meteorology), Michael Edwards (Department of Sustainability and Environment, Victoria), Paul Gabriel (Office of the Emergency Services Commissioner, Victoria), Bruce Harper (Systems Engineering Australia), Steve Hudson (Australian Building Codes Board) and George Walker (Aon Re) are also appreciated.

Chapter 5 - Flood

The 'Flood' chapter was written by Miriam Middelman from Geoscience Australia. Input on climate change was provided by Kathleen McInnes and Deborah Abbs from CSIRO Marine and Atmospheric Research.

The flood chapter was reviewed by representatives from the National Flood Risk Advisory Group (NFRAG). In particular, appreciation is extended to the following for their input: Richard Bretnall (Department



Photo courtesy: NAA: A1200, L60753.



Photo courtesy: Emergency Management Australia.

of Water, Western Australia), Michael Edwards (Department of Sustainability and Environment, Victoria), Jim Elliott (Bureau of Meteorology), John Handmer (RMIT University), Hori Howard (NFRAG Chair), Steve Hudson (Australian Building Codes Board), Fraser MacLeod (Department of Water, Land and Biodiversity Conservation, South Australia) and Duncan McLuckie (Department of Environment and Climate Change, New South Wales).

The valuable input provided by non-NFRAG members, in particular Jim Barratt (Department of Water, Land and Biodiversity Conservation, South Australia), Nick Ronan (Department of Sustainability and Environment, Victoria) and Soori Sooriyakumaran (Bureau of Meteorology), is also greatly appreciated. The review of individual sections by Craig Arthur and Ken Dale from Geoscience Australia is also gratefully acknowledged.

Chapter 6 - Severe Storm

The 'Severe Storm' chapter was written by Terry Hart and Bruce Gunn (Bureau of Meteorology), Craig Arthur and Mark Edwards (Geoscience Australia), and Kathleen McInnes (CSIRO Marine and Atmospheric Research).

Review comments provided by Bob Cechet (Geoscience Australia), Michael Edwards (Department of Sustainability and Environment, Victoria), Bruce Harper (Systems Engineering Australia) and George Walker (Aon Re) are much appreciated.

Chapter 7 - Bushfire

The 'Bushfire' chapter was written by Robin Hicks (Bureau of Meteorology), Justin Leonard (CSIRO Sustainable Ecosystems) and Craig Arthur and Ken Dale (Geoscience Australia). Input on climate change was provided by Kevin Hennessy (CSIRO Marine and Atmospheric Research).

Many thanks are extended to the chapter's reviewers, including Gerry Byrne, Steven Pearce and Ken Thompson (New South Wales Fire Brigades) and Mike Allen and Richard Kay (Department of Planning and Infrastructure, Western Australia). Review comments received from Gary Morgan (Australasian Fire Authorities Council) and Russell Taylor (New South Wales Rural Fire Service) are also appreciated.

Chapter 8 - Landslide

The 'Landslide' chapter authors were Monica Osuchowski (Geoscience Australia) and Colin Mazengarb (Mineral Resources Tasmania).

Phil Flentje (University of Wollongong), Marion Leiba (ML Consulting), Andrew Leventhal (GHD Geotechnics) and Anthony Miner (A.S. Miner Geotechnical) are gratefully acknowledged for their reviews and their significant contributions to the chapter.

Contributions provided by Matthew Hayne (Geoscience Australia), Kim Marriott (Yarra Ranges Shire), Anthony Meyers (Rocktest Consulting), Jennifer Selkirk-Bell (Mineral Resources Tasmania), Peter Tobin (Wollongong City Council) and Graham Whitt (Graham Whitt Planning Services) are also appreciated.

Chapter 9 - Earthquake

The 'Earthquake' chapter authors were Clive Collins, Trevor Dhu, Mark Edwards, Mark Leonard and Ken Dale from Geoscience Australia.

Many thanks are extended to Gary Gibson (Seismology Research Centre, Environmental Systems and Services) and George Walker (Aon Re), who reviewed the chapter. Input received from Michael Edwards (Department of Sustainability and Environment, Victoria), is also appreciated.

Chapter 10 - Tsunami

The 'Tsunami' chapter was written by David Burbidge from Geoscience Australia. Input on tsunami hazard was provided by Phil Cummins from Geoscience Australia.

Many thanks are extended to Diana Greenslade from the Bureau of Meteorology for her review and comments on the chapter. Ken Dale, Kriton Glenn, Dan Jaksa, Ole Nielsen and Jane Sexton from Geoscience Australia also provided useful reviews and input to the chapter. Comments made by Greg Nettleton from the Fire and Rescue Service, Northern Territory, are also appreciated.

Graphics, Design, and Production

Appreciation is extended to Silvio Mezzomo and Lindy Gratton for their management of the graphics, design and production process. Angie Jaensch, Chris Evenden and David Arnold from Geoscience Australia ensured the professional quality of the figures and Jim Mason and Jeremy Russell's assistance in the production process are all appreciated.

Finally, many thanks are extended to Maria Bentley for her expertise and dedication in the design and layout of the finish product.



Photo courtesy: Geoscience Australia.