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Creating safer communities

New resource will help reduce the impact of natural hazards in Australia

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'No state or territory in Australia is immune to the impact of natural disasters. As well as having an enormous economic cost, natural disasters inflict a massive social cost on the community. Although disaster response, recovery and mitigation are reasonably developed in Australia, risk analysis, which provides the foundation for risk reduction, has received less attention.' (Middelmann 2007, page xi)

Every Australian has experienced the effect of natural hazards. For some, the effect might be as small as the increased cost of bananas following tropical cyclone Larry. Those less fortunate have felt the direct impact of a natural disaster on their home and community. These effects may be tangible (such as loss of a car or business opportunity) or intangible (for example, loss of personal memorabilia, personal injury or increased stress levels). Intangible loss is much more difficult to measure, and its impacts may last long after tangible effects have ceased to be significant.

The recently published *Natural hazards in Australia: Identifying risk analysis requirements* (Middelmann 2007) contains something of interest to everyone. The report details rapid-onset natural hazards, including tropical cyclones, floods, severe storms, bushfires, landslides, earthquakes and tsunami, and illustrates and describes the impact that natural hazards have on Australia. It also includes details and images of significant natural disaster impacts in Australia, including Cyclone Tracy (1974), the southeast Queensland floods (1974), the Sydney hailstorm (1999), the Ash Wednesday bushfires (1983) and the Thredbo landslide (1997).

Although much has been done to reduce risk to Australian communities, some recent events declared as natural disasters, such as the floods in Queensland in January 2008, serve as a reminder of the continuing impact on the community. This is why analysing the risk is so important.

'Accurately modelling the likely impacts of natural hazards on communities provides decision makers with the tools to make more informed decisions aimed at reducing the impact of natural hazards.' (Middelmann 2007, page 4)

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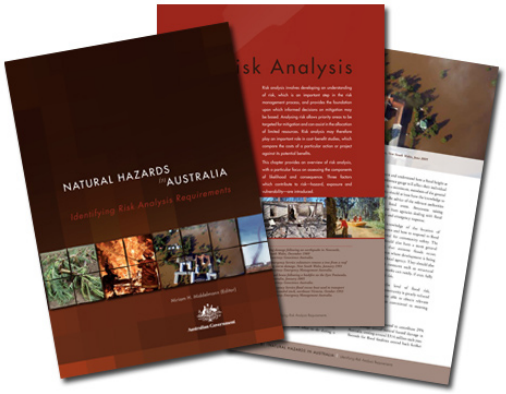

Natural disaster impact and risk analysis

The early chapters of *Natural hazards in Australia* highlight the impact that natural disasters have had on Australia and introduce the concept of risk. Together, these chapters illustrate the need for analysing risk and provide the background for subsequent hazard-specific chapters.

A good understanding of the risk from natural hazards is vital to minimise their potential impacts. 'Risk analysis' (the systematic process used to understand and assess the level of risk) provides essential input to planning an emergency response and prioritising resources for sound mitigation practice. Risk analysis is an important step in the risk management process.

'Risk is analysed by considering the combined effects of likelihood and consequence that produce disasters. Assessing likelihood involves assessing the frequency or probability of natural hazard events. Consequences are examined by collecting the information on the elements likely to be exposed to the impact of the hazard phenomenon, such as buildings, infrastructure and people, and gathering information on their vulnerability to a particular hazard.' (Middelmann 2007, pages xii–xiii)

Natural hazards in Australia also examines the economic and social impact of natural disasters, the distribution of natural hazards in Australia, and the role that human activities play in creating and mitigating disasters.

'As Australia's population and density of living continue to grow, so does the potential impact of a natural disaster on the Australian community. Increasing numbers of people, buildings and infrastructure assets are being exposed to natural hazards as the pressures for urban development extend into areas of higher risk.' (Middelmann 2007, page xi)

Among the questions answered are 'What was the most expensive natural hazard in Australian history?' and 'Which hazard caused the most fatalities?'. The report also illustrates how a single major event can change the perceived wisdom about hazards. For example, the historical cost of earthquakes is attributed largely to one event—the 1989 Newcastle earthquake. Therefore, we also need to gather evidence on prehistoric impacts of natural hazards.

The distribution of natural hazard impacts may be more random for some hazards than for others. For example, the threat to Australian communities from bushfires and thunderstorms increases during the summer. During that period, tropical cyclones (including severe winds, storm tides and flooding) also become more prevalent and pose a threat to the northern half of Australia. Climate change might also affect the future distribution of some natural hazards.

Government policy on natural disasters plays a vital role in mitigating their impacts. Governments are involved in minimising risk, particularly in such areas as land-use planning, construction standards and emergency management.

Two events with particularly high impacts, both on the communities affected and in changing government policy, occurred in 1974: the floods in the Brisbane region in January and Cyclone Tracy in Darwin in December (figure 1). The Natural Disasters Organisation (now Emergency Management Australia) was formed following the Brisbane floods, and Cyclone Tracy reinforced the necessity of disaster mitigation (Walker 1999). *Natural hazards in Australia* also emphasises the need for close links between policy makers, researchers, practitioners and the community in reducing the impact of natural hazards.

Figure 1. Destruction caused by tropical cyclone Tracy in Darwin, Northern Territory, December 1974. Photo courtesy of Bureau of Meteorology.

Finding out about natural hazards

The report examines some key questions in chapters covering each of the major hazards. These include:

- What is a landslide, tsunami or severe storm?
- How are they caused and where do they occur?
- What is the potential influence of climate change on meteorological hazards such as tropical cyclones, floods and bushfires?
- How is the risk analysed for each hazard? What issues are involved and what data are needed?

The report also outlines some of the information gaps that reduce our ability to analyse the risk for each hazard more rigorously. Common themes that emerge include the need for more research into the vulnerability of buildings and infrastructure to natural hazards, and the potential impact of climate change. The need for good data to inform the risk analysis process is emphasised throughout the report.

Data collection is a long-term investment which requires the ongoing support of all levels of government, the private sector and the community. Where the data are inadequate, the ability to analyse and effectively reduce the impact of natural hazards is severely limited. (Middelmann 2007, page xiii)

Many government and non-government agencies, groups and individuals are involved in the management of natural hazards (figure 2). An overview of the roles and responsibilities at all levels of government, as well as industry, coordinating groups, professional bodies and research institutions, is included for each hazard. The role of the courts and legal institutions, property developers, the media, and the general community is also explained where relevant.

Figure 2. A firefighter fighting a blaze from the Great Alpine Road, near Bruthen, Victoria, January 2007. Photo courtesy of Country Fire Authority Public Affairs / Martin Anderson.

Background

Natural hazards in Australia was developed in response to a Council of Australian Governments report, *Natural disasters in Australia—Reforming mitigation, relief and recovery arrangements* (COAG 2004), which identified a need to develop systematic and rigorous risk assessments and establish a nationally consistent system of data collection, research and analysis. It also relates and contributes to the National Risk Assessment Framework (NRAAG 2007) prepared by all levels of government, which identified the need to produce consistent information on risk, so that risks can be compared for different locations and for different hazards.

The entire report and individual chapters can be downloaded from Geoscience Australia's website. A hardcopy version of the report can be obtained from the Geoscience Australia Sales Centre.

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Related websites

Natural Hazards in Australia: Identifying Risk Analysis Requirements
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Natural disasters in Australia, Council of Australian Governments (COAG)
www.infrastructure.gov.au/disasters/index.aspx

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