



Disposal of debris following urban earthquakes: guiding the development comprehensive pre-event plans

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Introduction

At the time of natural disasters the immediate concern is for the safety and wellbeing of the affected population. However, once the immediate threats to people have passed, or are being managed, it is necessary to remove debris as quickly as possible to allow communities to rebuild. Disaster events can generate large quantities of debris and the management of this debris can present a major challenge. Recent overseas earthquakes have highlighted range of debris management issues within a post-earthquake recovery environment. Having guidelines and procedures in place for the management of disaster debris assists in the timely and efficient removal of debris, followed by appropriate recycling and/or disposal to appropriate locations. An inefficient or poorly planned response can impose additional social, economic and environmental burden on an already impacted community.

In 1995 the United States Environmental Protection Agency (EPA) published a discussion document "Planning for Disaster Debris". The report highlights a range of issues and illustrates these around cases studies from recent events (Hurricane Andrew 1992, Northridge earthquake 1994; Hurricane Iniki 1992 and Hurricane Hugo 1989). The report concludes that *"any community likely to be faced with significant debris from a natural disaster should develop a debris management plan... The development of a disaster debris management plan usually requires input from neighbouring communities, state officials, local contractors and a variety of local agencies"*.

New Zealand's last large scale urban earthquake was in the Hawke's Bay in 1931. The approach to debris disposal following that event was different to the way society would respond today. The environment was only first identified as a focus for policy in 1953, with the enactment of the Town and Country Planning Act, 22 years after the 1931 earthquake. Hence with no planning regulations, earthquake debris was used to reclaim land around the coast. There was no consideration of Maori concerns, contaminated material, environmental effects of disposal on the surrounding environment, or implications for coastal processes. Today with the Resource Management Act 1991, such disposal could not be so easily achieved, particularly within the coastal marine area or major waterway.

In recent years many New Zealand councils have had experience with flooding events and have developed experience managing debris removal. The issue of disaster debris removal has also been raised in recovery planning of most CDEM groups. Research by Becker et al. (2006) has explored the role of pre-event recovery planning and established a framework for councils to address many common recovery issues before events occur.

A new project has been initiated to explore the key issues of post earthquake debris disposal within the context of a Wellington and Christchurch earthquake scenario. Our research will address (1) the type and volume of earthquake debris; (2) strategies for debris collection; (3) temporary storage and staging area, (4) recycling and disposal optimisation; (5) identification of and/or issues for development of suitable disposal sites; (6) hazardous waste identification and handling; (7) effective project management in a post-disaster environment, linked to CDEM recovery plans; (8) mutual aid arrangements; (9) coordination and dissemination of public information; and (10) land-use planning issues and instruments in Regional and District Plans.

Outputs from this research are due in early 2009.

References

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Author's Biography



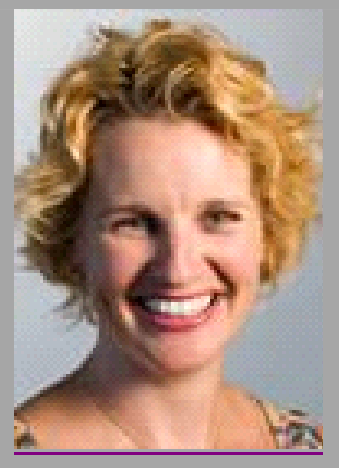
David Johnston, Joint Centre for Disaster Research, New Zealand

David has been employed with GNS since 1993 and his research is focused on reducing the vulnerability of New Zealand's society, economy and infrastructure to hazards. In December 2006 he took up a joint position with Massey University and GNS Science as Director of the Joint Centre for Disaster Research. He has been involved in developing integrated risk management strategies for different hazard events, using techniques such as scenario development, mitigation planning and community education programmes. He is also interested in assessing social and economic impacts of natural and environmental hazard events.



Laurence Dolan, Private consultant, Auckland, New Zealand

Laurence has over 18 years' experience in environmental planning and solid waste management. He has experience in all facets of solid waste management including emergency/contingency waste management planning, landfill investigations and management, landfill and transfer station permitting processes, policy development, consultation, preparation of guideline documents, strategic planning and budgeting, and analysis of options. He has specialised in the preparation of guideline documents for waste management and waste disposal activities. This has included national guidelines in respect of landfills, landfill resource consents, landfill waste acceptance criteria, landfill fires, FMD carcass burial facilities and landfill costing.



Wendy Saunders, GNS Science, Lower Hutt, New Zealand

After completing her Masters degree in Social Science, Wendy was the Hazards & Emergency Management Officer for the Wairarapa Division of the Wellington Regional Council. After one year in that position she moved to Nelson and joined Opus International Consultants as a Resource Management Planner, involved in a variety of planning projects. Three years later, Wendy moved to the Opus office in Taupo for a year. Since 2005 Wendy has been working at GNS Science, where her research focuses on land use planning for natural hazard risk and reduction.



Bruce Glavovic, Massey University, Palmerston North, New Zealand

Bruce has worked as an environmental scientist and planner in academia, private consulting and Government over the last 20 years, mainly in southern Africa, the United States and New Zealand. Bruce's current research focuses on the role of planning in building sustainable, hazard-resilient communities. It is clustered around several themes: natural hazards planning; negotiation, collaborative planning and consensus building processes; integrated environmental management (with a particular focus on coastal, ocean and water resources); and understanding poverty-environment linkages and driving forces. He is currently exploring the experiences and lessons learned in the Gulf Coast in the aftermath of the 2005 hurricanes; in Indonesia and the Maldives in the aftermath of the 2004 Indian Ocean tsunami; and in New Zealand in the aftermath of the 2004 Lower North Island floods and 2007 Northland floods.