

## **Researchers show waste management critical to natural disaster recovery**

Resilient Organisations and University of Canterbury researchers are unravelling the critical role that disaster waste management plays in recovery from natural disasters.

“As a result of the 22 February earthquake approximately 20 years worth of solid waste was produced,” said PhD student Charlotte Brown. “Disaster waste is not just a solid waste problem, however. Following the 1995 Great Hanshin-Awaji earthquake (Kobe earthquake), road blockages prevented building access, which in turn impeded rescuers from reaching survivors.”

The research team’s findings, which were published online on 21 February in a review article in the international journal *Waste Management*, summarises waste quantity estimates from nine past disasters, varying from 2 million metric tonnes for Hurricane Charley in 2004 in the US, to 76 million cubic metres (or 100 million cubic yards) for Hurricane Katrina in 2005, and 23-60 million tonnes for last year’s Haiti earthquake.

Ms Brown said that disasters can typically generate up to 15 years worth of a community’s solid waste over a few days, with the potential to overwhelm day-to-day solid waste operations and to lead to years of disruption. Ms Brown is currently contracted to Civil Defence where her research is contributing to post-earthquake waste management planning in Christchurch.

Ms Brown, whose PhD research also included a case study on waste management following the Samoan tsunami in 2009, said that prolonged problems with the management of solid waste can lead to public and environmental health issues as identified in the aftermath of the 2004 Indian Ocean tsunami.

“Slow management of solid waste can also impede economic recovery by inhibiting rebuilding activities.”

Research team member and UC Civil Engineering and Natural Processes Associate Professor, Mark Milke said that double handling of waste, uncoordinated organisations, legal hurdles, poor quality control, poor communication, or poor funding mechanisms can each lead to higher costs for collection, treatment and disposal of disaster wastes.

“The US Federal Emergency Management Agency estimates that debris removal accounted for 27 per cent of their total disaster response costs for those US disasters between 2002 and 2007.”

Sometimes debris removal can be too fast, however. “It was alleged that debris removal after the 2008 earthquake in Sichuan, China, was so fast that many bodies were not recovered and were buried with the waste.”

The researchers highlight the need for guidance that is focused on the key solid waste decisions faced by waste managers after a disaster.

“Slow clean-up can lead to community frustration. Illegal dumping was reported in New Orleans following Hurricane Katrina, and protests arose in L’Aquila, Italy, in response to less than 100,000 tonnes of an estimated 3,000,000-4,000,000 tonnes having been cleared 15 months after the April 2009 quake.”

Good public communication is the key, said Milke. “Poor public communication is an unfortunately common feature of disaster waste management responses. Following Hurricane Katrina public

opposition to the use of construction and demolition landfills for mixed disaster waste led to a lawsuit being filed and the eventual closing of a landfill, further complicating waste management planning.

“Public consultation during the disaster waste management process has the potential to increase public understanding of the necessity for emergency measures, and also to increase the authorities’ appreciation of publically unacceptable options.”

The UC researchers hope that their research can inform decision-making about waste management following natural disasters around the world.

“Our intention is that organisations charged with waste management can learn from our research results and that this, in turn, will have a very positive impact on disaster recovery,” said Ms Brown.

For the full review article go to: [waste management article](#)

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