impact

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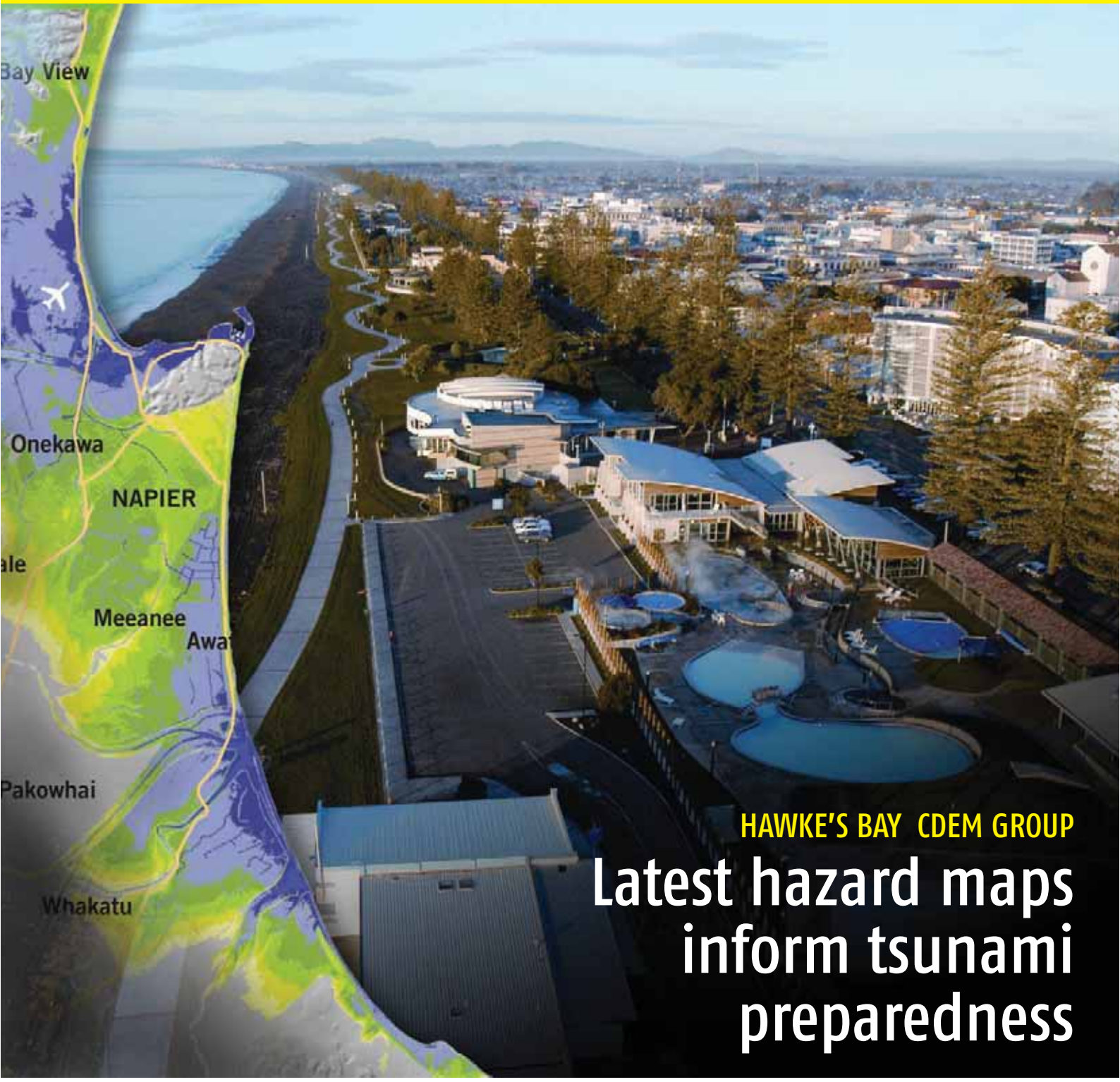

HAWKE'S BAY CDEM GROUP

Latest hazard maps inform tsunami preparedness

Cover image: New tsunami inundation maps reveal much of the populated areas of Hawke's Bay are vulnerable to the effects of tsunami. The areas in blue represent severe inundation, in this case from a near-source tsunami event.

impact

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Common acronyms
MCDEM Ministry of Civil Defence & Emergency Management
CDEM Civil defence emergency management
NCMC National Crisis Management Centre
ECC Emergency Coordination Centre
EOC Emergency Operations Centre
EMO Emergency Management Officer

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EDITORIAL
Craig Foss, Minister of Civil Defence

Attaining higher levels of preparedness

I was appointed of Minister of Civil Defence shortly after the response to the Christchurch earthquake and I have taken time to better understand the roles and responsibilities in a response as well as those that apply in recovery.

The Government has established the Royal Commission to investigate the circumstances of the building collapses in Christchurch that caused so many deaths and that will provide some independent advice on steps we might take to minimise a repeat in the future. There will also be a number of other reviews undertaken of the response to identify aspects that worked well and to show those parts that need to be strengthened.

The findings of these reviews are some way off. However, there are some aspects of CDEM that have been tested by the Canterbury earthquake sequence and which I believe provide the foundation on which developments and improvements can be based.

The concept of resilience and the use of the four Rs as the means to achieve resilient communities are right for the New Zealand conditions. Our recent experiences give no indication that there is an imperative to change the messages. Indeed it can be argued that the messages should be continued and loudly!

In a similar vein, the general arrangements and roles and responsibilities for CDEM have served us well, although I am sure the reviews will show we could benefit from some adjustments.

The third aspect of the foundation is the place of research and science in informing communities of their hazards and risks and helping to mitigate them by making preparations and informing response and recovery activities. CDEM in New Zealand is well served by a range of researchers and their work has helped New Zealand greatly, not only in the Canterbury emergencies, but in the wider community.

Fourth, we will continue to engage with international partners to understand developments elsewhere and to consider them for application in New Zealand. In turn we will share our doctrine and experiences with others to help them enhance safety and wellbeing in their communities. In recent examples as Minister I have participated in discussions with my Australian counterparts from the federal and state levels and I had the pleasure of opening the SOPAC meeting in Auckland which bought together staff of Pacific national disaster management offices and some key government departments to consider a wide range of topics associated with disaster risk management.

All that we do in CDEM is oriented towards the community

Lastly I want to emphasise the place of communities in CDEM. All that we do in CDEM is oriented towards the community. But our approach is not top down and does not direct communities and their elected representatives to do things. To be effective in achieving our goal of generating resilient communities in New Zealand, our approach has to be based on the community being involved in understanding and assessing risks, developing an appropriate level of readiness, generating community response plans, having the capacity to start a response when necessary and providing input to the recovery. The community's involvement will be backed-up by the guidance and help that is available from local authorities and central government agencies led primarily by the Ministry of Civil Defence & Emergency Management.

New Zealand has come a long way in enhancing its civil defence capacity and capability and the efforts at all levels in Canterbury illustrate our current standing. But there can be no complacency and we know there are areas that deserve our attention and improvement. As Minister I look forward to working with you to attain an even higher level of civil defence preparedness. ■

Napier Civil Defence Manager, Angela Reade, evaluating the new addition to the family

NAPIER COMMS TRAILER A FIRST

To the untrained eye, it looks like a basic trailer – nothing special. The only thing looking slightly conspicuous is the satellite dish protruding from the surface. Little do people know that this trailer has high-tech devices enabling it to serve as an emergency command post within five minutes of set-up, and Napier City Council has acquired the first of its kind in New Zealand.

The Council recognised the importance of efficient communication with emergency services after the recent tragedies in Canterbury and Japan. Their civil defence team subsequently teamed up with a team of local communications experts to create a state-of-the-art trailer designed to be a self contained multi-purpose communication base. Made in the USA, the trailer can be quickly deployed via road or air to provide communication via satellite, 3G mobile, wireless and UHF anywhere in the country.

Many local authorities have existing mobile communication systems that connect to one service, such as satellite, but this system has taken it a step further by providing connections to multiple services, such as copper, cellular, fibre and satellite. Napier Civil Defence Manager, Angela Reade says during the initial stages of an event the trailer can provide telephone and Internet access for four people via satellite within minutes.

"The trailer's capabilities expand from there depending on the scale of the event," Angela says. "The services can be escalated by connecting to the cellular network enabling communication for response teams as they arrive. It allows emergency management to continue with its response while allowing Council to continue business as usual. It basically becomes a central hub to deliver council services."

As well as recognising the importance of efficient communication in an emergency, the trailer ensures that Napier CDEM can use the national emergency management information system (EMIS) even if all the networks are down, as is recommended by MCDEM.

"We see the trailer being used for local and regional one-off events as well as a national resource when required" says Napier City Council Chief Executive, Neil Taylor.

Different portable operation devices (pods) equipped with specialist equipment are stored in the trailer and swapped depending on what is required for the event. Currently there are four pods: First aid, with first aid equipment, extra oxygen, bandages, masks; communications, with extra handheld radios, portable repeaters, battery chargers and long-range radios; server backup, containing Council systems; and a fuel pod and stand-alone generator, enabling the trailer to operate for longer periods.

Angela says she is thrilled to have the trailer as it enables her team to respond immediately after an event even if the emergency operation centre is inaccessible.

"It gives us more confidence knowing that our business continuity plan has that additional option if we need it. We are grateful to the team of local communications experts for their excellent service and expertise in creating this valuable resource as well as local businesses for their enthusiasm and support. It's a great example of how public and private sectors can work really well together."

For more information about the trailer see www.fieldcontrol.co.nz ■

EMIS roll-out has begun

Training of the emergency management information system (EMIS) super users started on 16 August. Nominees from MCDEM and all the CDEM Groups attended this training, which will be conducted weekly until the end of September. The positive feed-back received bodes well for the application of the system.

While EMIS is now in effect operational, its real value will become evident as MCDEM, CDEM Groups and their members start using it. Before that can happen, individual user agencies must set up their own EMIS portals, populating them with appropriate contacts, resources and document data, and then conduct training of their NCMC, ECC or EOC staff. This will take time at a manageable pace for each user agency. It is therefore not realistic to experience the full advantages of an integrated national EMIS until completion of at least a six month set-up and training period.

As the sector begins using the system it will no doubt discover many things that could be changed or improved. A process has been established for this, providing for representatives of user agencies to consider and make decisions before significant changes are made. MCDEM has recommend that the initial focus be on 'tweaks' rather than significant enhancements to allow time to perfect the core system before considering additional functionality. ■

Ecofest: Nelson's resilience weekend

Nelson Tasman region recently hosted a two-day "how to" expo with hands on activities, workshops and seminars centred on resilient communities and future proofing your family. In the weeks leading up to the expo the Nelson Tasman Emergency Management Office held workshops with rural communities to help them assemble an emergency kit with the focus on achievable low cost items.

The Ecofest weekend started at 4pm Friday 19 August with "Nelson's Most Prepared Family" setting up camp in the grounds. The family, chosen by local radio station Classic Hits, responded to the brief that a major flood in the region had caused them to leave their home and live out of their emergency kit for the weekend. Of course a family trip to Australia was a great incentive for them to dig out their tent, cooker and kit. All they were supplied with was a portaloo and gazebo and they were to face a number of challenges during the weekend.

The Emergency Management Office supported the family with all their welfare needs including Work and Income financial support, food parcels flown in by helicopter, hot lunches and water and blankets, medical and hygiene support from the DHB. A sticky challenge faced by the family included a neighbouring family who did not have any supplies, so what do they share?

Again the family was supported by the EMO team to make this difficult decision, leaving themselves short of water as a result. The family challenged the Nelson and Tasman mayors to build a shelter from rubbish materials. This required a great deal of cross Council co-operation as well as creativity. Other challenges included losing all cell phone contact, building a garden, foraging and gathering water.

A team of Council and Welfare volunteers raised preparedness awareness to the more than 5,000 members of the public who attended, providing examples of emergency kits and supplies as well as answering hundred's of curly questions. Local NZ Response Team, NZRT-2, demonstrated a rope rescue display finding various ways to tie up both mayors.

Positive feedback from the public included "good to be ready for all types of change – climate or earthquake" and "a strong resilient community is what the Ecofest is all about". Now to start planning for next year. ■

Waikato appoints new CDEM project manager

A former British police officer with experience in emergency management planning and training, as well as counter-terrorism, has joined the ranks of the Waikato CDEM Group. **Lee Hazlewood**, pictured opposite, began work for the Group in August and is based in the Waikato Regional Council's Hamilton offices. His primary role is to manage and progress key projects.

The full-time team leader position, which will include a role during an EOC response, was created following last year's capability and assessment report, which found the Waikato region was under-resourced and under-funded. The appointment brings the number of full-time Group positions to two, with Lee joining senior Emergency Management Officer, Ainsley Alexander.

Group EMO Manager Adam Munro said the Group took last year's report seriously and increased funding by $161,000 for the 2011/12 financial year.

"The Waikato has the highest number of councils making up its Group and arguably the most complex hazardscape in the country, but due to resourcing we've been unable to progress all key projects," Adam said.

That's about to change, with Lee overseeing the Group's key projects including developing a Group training and exercise programme and preparing a mass evacuation plan, putting steps in place to manage an influx of people to the Waikato during a major event in neighbouring areas of the country, as well as planning for evacuations within the region. Lee will also be working to prioritise and progress the capability assessment report findings, including developing a monitoring and evaluation programme.

He also has responsibility for finalising the Group Plan, which was released for public consultation in July, managing the emergency management information system (EMIS) project, and assisting in the reporting to CEG and Joint Committee. ■

EXERCISE FRONT ROW:
Welfare planning for Rugby World Cup

A simulation of a hotel fire in downtown Auckland provided a realistic run-through for the Auckland Council and Auckland Welfare Advisory Group on the challenges of hosting a major sporting tournament – in this case the Rugby World Cup.

During a civil defence emergency where welfare facilities are required, a city with every available hotel room fully booked with international and domestic visitors poses a particular problem.

In Exercise Front Row, a fictional hotel, Hotel Adieu, was packed to the rafters with national and international visitors along with a full contingent of staff when fire broke out. An added complication was that the hotel was hosting a conference for the disabled with many attendees using mobility scooters and other aids. Due to the location of the hotel, an apartment building also needed to be evacuated, and pets became an issue for the SPCA.

As smoke enveloped the building, hotel guests, conference attendees, staff and apartment occupants began to evacuate and congregate on the street. As fire and police arrived, TV crews, many of them international, were also converging on the scene. A scenario like this triggers a specialist response from members of the Auckland Welfare Advisory Group.

Some 30 people from civil defence, emergency services, government and non-government agencies and Rugby World Cup 2011 attended the workshop to better understand the relationship between their organisations when providing welfare and recovery during a real-life emergency.

"Rugby World Cup presents a number of areas where our usual welfare/recovery response may not be appropriate or available, given the lack of accommodation options," said Clive Manley, Auckland Civil Defence Controller.

"Visitors to Auckland don't have family and friends to stay with, there are language issues, and the huge number of foreign media means that truly the eyes of the world are on us as we react to an emergency.

"Exercise Front Row has been the culmination of many months preparation for Rugby World Cup. We are ready and match fit for any outcome, except a loss to the Australians!"

Valuable lessons were learned from the hot debrief held immediately after the event. As well as responding in real-time to the immediate incident, which had far-reaching effects for Auckland's traffic and prompted global press enquiries as to a possible terrorism threat, participants had to demonstrate how able they were to continue core business activities. ■

WEMO's walls tumble

The Wellington Emergency Management Office (WEMO) has undergone a major internal revamp – with design inspiration taken from lessons learned in Canterbury.

The $180,000 refit has removed poky corridors and small offices and replaced them with a simple and far more usable open-plan layout.

"It's all about making it easier for people using this building to do the most important thing – communicate effectively," says Wellington City Council's Emergency Preparedness Manager, Fred Mecoy.

In the biggest change, the main corridor, receptionist's office, call centre, operations room and control room were combined to create a much larger space. "The old ops room could take 15 people maximum – the new space can take more than 60, each seated at a desk." says Fred. For presentations, it could seat well over 100.

"Our experience helping out in Christchurch convinced us that, during an emergency, you can't over-estimate the number of people that might be involved. Giving them the ability to work together, or in near proximity, is invaluable. It just makes the flow of information more efficient.

"That said, after a large earthquake un-doubtedly even more space than this would be needed – judging by the Christchurch experience – but we're not only planning for earthquakes."

The 440 square metre building was purpose-built in Thorndon in the mid-1990s. It was designed and engineered to withstand a strong earthquake and has its own power generators, water supply and septic tank, meaning that staff can get on with helping the city back onto its feet.

However, Fred says the original floor layout was very much based on individual offices and encouraged a 'silo' approach to working. "There was a litany of wasted space – at least when compared to the modern way of working. In an area that previously housed four staff I can now fit eight, with ease. And immediately the open-plan layout has engendered greater collaboration and creativity amongst staff, which is what I was hoping for."

New features include a combined, soundproofed, call centre and radio room and the installation of data monitors in key places so that everyone can maintain situational awareness during an event. The PIM area which previously was in an isolated spot at the back of the building, will be relocated in the expanded ops room. The ops room itself is an exercise in flexibility. Trestle tables that can be folded and stored within the room allow the area to be used as an open space or with desktops, or a combination. ■

Training programmes developed for Southland

The merger of four council's civil defence offices into one entity in Southland has provided a challenge for CDEM training. The past year has seen the emergence of a training programme tailored toward CDEM volunteers and the training of EOC staff for the new EOC based in Invercargill. Training has, where possible, been aligned to the CDEM Competency Framework.

The province has many small towns and areas that have civil defence volunteer groups. These areas range from the coastal towns of Riverton, Bluff and Waikawa where tsunami is the main threat, to the mountains in and around Te Anau, Milford and across to northern Southland where the recent snow created a number of issues for farming communities. The Alpine Fault and the Puysegur subduction zone close to the coast are also cause for concern as they run through the west of Southland and could impact the entire province should the Alpine Fault rupture. Southland also has five main rivers, the Waiau, Aparima, Oreti, Makarewa and Mataura that cross the plains to the sea and pass through a number of towns.

"Stewart Island is also part of our area," says Emergency Management Southland Advisor, Craig Sinclair. "Their main issues are likely to result from their isolation, but the residents there don't let that hamper their emergency preparedness efforts."

Southland staff have been travelling to the 20 civil defence sectors doted around the province and have been continuing training for volunteers in the risks that are most appropriate to their communities.

Emergency Management Southland Manager, Neil Cruickshank, explaining his experiences in Christchurch to planning and intelligence trainees at the Southland EOC.

One of the bigger challenges has been designing a training programme for staff from the four councils to make an EOC team. The Southland EOC is a purpose built facility that is ready 24/7 to mount a response to any emergency. The days of having to shift staff from their place of work to set up an EOC, or having to convert council chambers for the day, are over.

Council staff from Invercargill City, Southland and Gore District Councils, and Environment Southland identified staff for potential EOC training and have participated in ongoing EOC training and up-skilling their understanding of CIMS. Councils have all committed to providing 20 staff each providing an overall Southland perspective to the training. This has proved to be very successful.

Three groups of planning and intelligence staff have also been trained in a module designed by Emergency Management Southland trainer, Gary Tong. This training runs for three-hours and involves a small exercise to test their new found skills. Work is now underway to develop modules for the operations and logistics EOC functions. ■

INTERESTED IN PARTICIPATING IN A CDEM EXERCISES SURVEY?

The Joint Centre for Disaster Research is looking for people to participate in their research into decisions made during emergency management exercises. Using paper based table-top exercises researchers will investigate how participants create situation reports and incident action plans based on a range of information injects for a volcanic eruption, tsunami, severe weather, or flooding scenario. The goal is to develop more effective science communication. Participants are therefore required who would be involved in incident management and are familiar with writing situation reports and incident action plans. These participants may come from a range of agencies involved in the management of hazard events.

As a thank you, participants will be given an emergency management training voucher on the exercise day. This will entitle the bearer to one free day at the Emergency Management Summer Institute being run at Massey University from 12th -16th March 2012 or, if preferred, during the Summer Institute in 2013.

For more information, contact Dr Emma E. Hudson-Doyle, 04-801-5799 ext 62458,

UPCOMING CONFERENCES

Enabling emergency management coordination
10–13 October, 2011 Christchurch

A conference for strategic and operational training personnel in emergency management. Registrations are open. For more information visit www.emqual.org.nz

Business continuity management & disaster recovery
December 6 & 7, 2011 Rendezvous Hotel, Auckland

Based upon the earlier event held in Christchurch in August. For more information visit www.conferenz.co.nz

Recovery lessons from Taiwan

Typhoon Morakot claimed nearly 700 lives and left more than 7,000 people homeless in Taiwan in August 2009

In July this year, a conference was held to commemorate the second anniversary of the event and mark Taiwan's recovery progress in two years. The conference was attended by MCDEM Emergency Management Advisor, Hazards and Risks, Peter Wood along with Bo-Yao Lee from the Department of Internal Affairs, Fire and Emergency Policy team. As well as benefiting from the recovery lessons learned in Taiwan, Peter and Bo-Yao were also able to share some of the lessons learned from the Canterbury earthquake.

Taiwan's recovery strategy and plans following Typhoon Morakot were heavily influenced by its earlier experience of recovering from the magnitude 7.3 Chi-Chi earthquake in 1999 which claimed more than 2,000 lives. A Reconstruction Council was then established to take charge of the recovery with special legislation and budgets passed to speed up the recovery process.

New Siaolin Community in Wulipu Village (funded by Red Cross). The Siaolin Village landslide killed 407 people.

Impact of Typhoon Morakot

Typhoon Morakot brought to Taiwan nearly 3,000mm of rainfall in three to four days, equivalent to 78% of the annual rainfall therefore producing the highest river flows recorded in 200 years. The intense rainfall triggered widespread landslides, some of which devastated villages including Siaolin Village where 407 residents were killed. An estimated 1.2 billion cubic metres of debris was created by Morakot throughout Taiwan: 0.4 billion has been brought down to lowland plains, damaging infrastructure and properties; the other 0.8 billion cubic metres remains perched on slopes and could cause significant damage if remobilised in future typhoon seasons. Economic losses exceeded NZ$8.3 billion, approximately 1.6% of Taiwan's GDP.

The challenges Taiwan faced for recovery included: the management of the large amount of debris (with road access already impaired); significant loss of land on slopes and riverbeds; isolated villages and continued reoccurrence of villages being cut off during typhoons and heavy rains; assessing the safety of hundreds of inhabited sites and managing the areas declared as unsafe; relocating those who lost their houses or whose inhabited sites were deemed unsafe; and considering cultural and religious differences among diverse ethnic groups.

The recovery

Following the experiences of rebuilding after the 1999 Chi-Chi Earthquake, the post-Morakot recovery goals included resettling displaced persons into permanent housing as soon as possible. Some 3,300 houses on 39 sites are to be fully completed in February 2012. As at August 2011, 90% of these have been completed. The recovery also has goals of environmental and economic sustainability and sensitivity to the cultural preferences of diverse ethnicities in the worst affected region.

Public-private partnerships are being applied extensively to implement permanent housing goals. Within this framework central government addresses legislation and policy making, simplifies procedures, acquires and provides land, matches resources, provides for infrastructure around the housing sites, and declares the new special hazard zones. Local government is responsible for assessing the eligibility of applicants/residents, leading community engagement, and construction management and administration. NGOs using construction companies, displaced persons, and volunteers to construct houses and public facilities. Six NGOs fully fund the construction of 3,309 houses and some community facilities and infrastructure.

The development and construction of permanent houses is addressing all hazards including wind and earthquakes. The houses are built to a high standard adopting sustainable community and energy efficiency concepts. NGOs and the private sector have also been involved in rebuilding 15 schools, reviving local industries, and various community programmes to help the disaster survivors re-establish their lives.

More information about Taiwan's recovery from Typhoon Morakot can be accessed from the Morakot Post-Disaster Reconstruction Council's website http://88flood.www.gov.tw/english and its publication *Rebuilding a Sustainable Homeland With Innovation and United Efforts* (in English, downloadable from the above website). ■

Latest hazard maps inform tsunami preparedness

The latest maps showing the potential impact of large tsunami on the Hawke's Bay coastline have just been completed by Hawke's Bay Regional Council engineers.

Science is fundamental to integrated, comprehensive emergency management, especially in the provision of authoritative information for the development of response plans

The new maps show scenarios for Hawke's Bay of both a 10m tsunami generated by a very large local earthquake or a 5m wave from across the Pacific Ocean. Events of this scale may happen on average only once in 2,500 years, but Hawke's Bay has 333km of coastline to consider which includes a large city, a number of coastal towns, a highway, an airport, a major shipping port, a large fertiliser works, a pulp processing plant, and some of the most productive horticultural land in the country.

The maps were published in local newspapers to ensure residents have good information about the risks. As Hawke's Bay is a major tourist destination it will also be important to get information to people who own holiday homes on the coast and to holiday visitors.

"As a community we've been talking about the possibility of a large tsunami for some years. This year alone we've had distant source tsunami strike our coast and each one has prompted more awareness. We can't panic people – a large tsunami is a very rare event – but they need to know what to do," said Lisa Pearse, Regional Council's Emergency Management Coordinator.

The modelling process

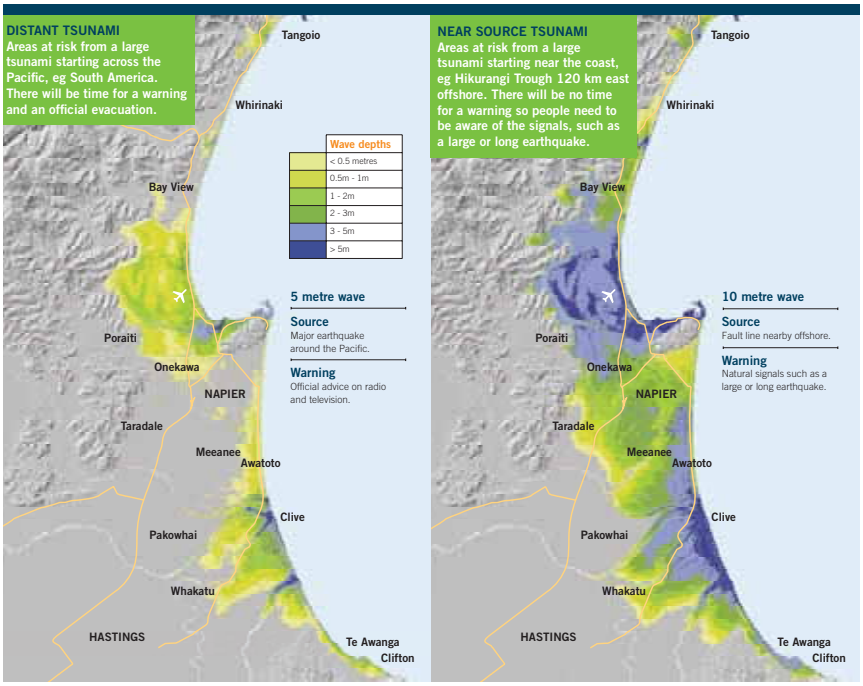
Hawke's Bay Regional Council staff have been working on developing the maps for the past 18 months using computer modelling tools and scientific survey information. Craig Goodier, Senior Design Engineer at Hawke's Bay Regional Council, has been using a computer model to map the inland inundation. The boundary where the wave starts is about 20 kilometres offshore in 50m deep water.

"GNS Science provided helpful advice for the modelling and format of the waves and we also used the 2005 GNS report Review of Tsunami Hazard and Risk in New Zealand by Kelvin Berryman," he said.

Craig has modelled two wave heights – a 10m maximum wave height for a near source event and a 5m maximum wave height for distant source event. The model uses a series of five waves, with the third wave being the largest. The wave period is 20 minutes to rise, then 20 minutes to fall.

"The 5m and 10m waves aren't the absolute worst case scenarios for Hawke's Bay but that would be over cautious. We have selected a final scenario which is quite severe and has an average return period of 2500 years," said Craig. "We have also assumed the waves strike the coast at high tide."

A lot of work went into the digital elevation model (DEM) to complete this modelling. Several buildings were incorporated in the model in Napier CBD, Clive, Haumoana and Te Awanga. The buildings were modelled as solid blocks, with elevations high enough to prevent any water flowing through. Features such as drains and stop banks were also incorporated into the DEM. No erosion or



Above: Tsunami inundation maps have been produced for distance source events (left) and near source events (right).

Left: An aerial view of Napier north of the CBD looking out towards the airport, top right. Much of this land is low-lying and is at risk of inundation from tsunami.

subsidence is factored into this model as these are unpredictable.

An unusual aspect of the Heretaunga Plains area of the Bay is that not only is it low lying, but it runs downhill inland. There are points about 6km inland that are the same height as the beach crest, which rises to around seven metres above sea level in some places. The model does not account for any widespread change in land elevation following an earthquake of the magnitude that will set off a 10m tsunami as that cannot be predicted. For example, following the 1931 earthquake some land rose about 2.5 metres, notably the former estuary around Napier, while land near Haumoana dropped by half a metre or so.

A set of tsunami waves coming over the high beach crest will flow inland several kilometres, and may take up to six hours to reach their furthest extent. Sea water would then pond in inland suburbs and drain slowly. The flat plains already have stop banks and are crossed with drainage systems and pump installations to control river flooding. A tsunami could damage much of this infrastructure making drainage and recovery a slow and difficult process.

Tsunami risk for Hawke's Bay

The east coast is particularly vulnerable to near-source tsunami. The Hikurangi Trough is a main source of earthquake activity and lies about 120km off shore and the Lachlan Fault is just off Mahia Peninsula. An earthquake or landslide in either of these could trigger a tsunami that would reach the coast within 20 minutes. This stretch of coast has very few high points where people can quickly reach safety – Napier Hill being the obvious exception.

The magnitude 7.8 Hawke's Bay earthquake on 3 February 1931 initiated a moderate tsunami. A surge was reported near Mahia Peninsula and up the Wairoa River while, in the Waikari River a wave

"We'll be using the expertise of all departments of Council to ensure a detailed and consistent approach to our planning... Once that work has been carried out, we will work with communities to help them develop their own evacuation plans."

caused by an earthquake-triggered landslides, destroyed a wool shed and deposited fish on grass about 15m above high tide level. The most damaging tsunami in recent times was in 1960 when a tsunami from Chile demolished harbour buildings and a bridge in Ahuriri late at night. However a warning of another tsunami three days later produced no damaging effects.

In 2004, Hawke's Bay Regional Council developed a tsunami display to increase awareness, and only a month before the devastating tsunami in Indonesia, it was installed in the National Aquarium on Napier's Marine Parade. Local civil defence has used this, the website, siren drills and the regular tsunami alerts to improve awareness in the community. A school in the harbour-side suburb of Ahuriri practices an evacuation of all their students who twice a year make the trip across the road and then up the many steps to safety on Napier Hill.

The mapping project

In 2010 Hawke's Bay Regional Council engineers completed the modelling and maps for Cape Kidnappers to Haumoana. Hastings District Council then met with people in the Clifton, Te Awanga and Haumoana coastal settlements and starting working with them on their response planning. They have mapped five evacuation routes, signage has been installed, and many of them practiced a trial evacuation through the vines earlier this year.

The latest maps include the growing coastal settlement of Clive. As the maps were published in mid-August, a public meeting was held to brief residents. A group of 15 Clive residents are now working with Hastings District Council staff on an emergency response plan.

"What's in the plan for Clive will be up to residents," said Hastings Emergency Management Officer Warren Meldrum. Making sure the community could manage for a couple of days without council or civil defence help is a key, and ensuring key people know the right way to respond.

"We want to make sure there's awareness within the community of what the hazards are, who has special skills, and what to do if the water reticulation goes offline."

In Wairoa, some planning was started on initial map information for a tsunami coming up the Wairoa River. The rest of the Wairoa coastline will be mapped later this year, which will involve coastal settlements like Mahia and Mahanga. Maps for Central Hawke's Bay coastal areas will be completed in 2012, which will provide information on the inundation hazards for the coastal settlements from Waimarama/Ocean Beach south to Porangahau.

So what next?

Napier Civil Defence has passed on this latest modelling data to their GIS team who are working on more specific details for the city. This will determine the priority areas that need to be evacuated immediately and the areas that will have more time.

"We'll be using the expertise of all departments of Council to ensure a detailed and consistent approach to our planning," said Napier Civil Defence Manager, Angela Reade. "Once that work has been carried out, we will work with communities to help them develop their own evacuation plans."

National guidelines recommend this sort of tsunami modelling should be noted in LIMs or in hazard registers held by councils. Hawke's Bay councils are yet to discuss precisely how the maps will be used and recorded for property information and future land use decisions, but this information will be used in assessing any proposals for new subdivisions and buildings.

One of the common questions asked is "Will there be blue lines painted on roads showing the extent of a tsunami wave, as they are in parts of Wellington?" The answer is no, as the spread of the wave across the low lying, downhill facing plains will be unpredictable.

As local councils and residents develop evacuation plans, people can now access the tsunami inundation maps and information online at www.cdemhawkesbay.govt.nz, where answers to commonly asked questions are also provided (look under Home/Hot Topics). ■

MCDEM's Specialist Services unit active on several fronts

Hazards, Risks, and Research

MCDEM's Hazards, Risks and Research team has been focused in the last three months on providing support to the Canterbury earthquake recovery, and in particular the significant science and engineering response. The team has worked closely with researchers (largely through the Hazards Research Platform) to identify short-term research to inform recovery decisions, and scope longer-term research to capitalise on opportunities arising from Canterbury for improved hazard risk reduction. Other key areas of activity have been facilitating a review of building assessment guidance and arrangements, supporting coordination of geospatial and building data information for earthquake recovery, and providing technical and policy support to national agencies involved in earthquake recovery.

As part of the Canterbury response review processes, the Hazard Risks and Research team will be working with the science, engineering and research groups to identify lessons and enhancements to national arrangements for integrated science response.

The team also facilitated a two-day workshop in August. The workshop was held in Christchurch for the Regional Hazards and Risk Management Group. The group of mostly regional council and unitary authority hazard analysts and planners spent a day examining earthquake impacts and hazard risk management in the CBD and residential red zones, and rockfall hazards in the hill suburbs. The second day was spent hearing of the experiences of hazard analysts in the response and identifying nationwide opportunities for improved hazard risk management. Proceedings of this workshop will be written up and include recommendations for follow-up actions.

In July, members of the team attended the Annual Hazards Research and Applications Workshop in Colorado in July, including invited participation in a panel discussion on the Christchurch earthquake, and presentation to FEMA Region 8 officials. Also in July, Peter Wood attended by invitation a symposium on disaster recovery in Taiwan.

For more information, please contact Richard Smith (richard.smith@dia.govt.nz).

Members of the Regional Hazards and Risks Management Group examining lateral spread and subsidence by the Avon River, August 25 2011

CDEM International Engagement in the Pacific

CDEM Specialist Services welcomed Justin Kemp as CDEM International Engagement Programme Coordinator in January this year. Under the MOU with the Ministry of Foreign Affairs and Trade, Justin is coordinating MCDEM's work with the National Disaster Management Offices of Samoa, Tonga, Niue, Tokelau and the Cook Islands on tsunami risk management. This is a continuation of MCDEM's longstanding engagement in the Pacific but the MOU now means that funding is available to achieve even more.

Specialist Services is also drawing on the experience of other units within MCDEM, who are acting as Focal Points for these countries and will manage the activities being implemented under the MOU. Some of the activities that have been undertaken so far this year include in-country support for Exercise Tropic Twilight in Tokelau with MFAT, NZ Defence and NZ Police, the purchase and installation of tsunami evacuation signs in the Cook Islands, and the scoping of an automated siren system for Samoa.

In other international news, MCDEM hosted the Third Session of the Pacific Platform for Disaster

Justin Kemp as CDEM International Engagement Programme Coordinator

Delegates from Third Session of the Pacific Platform for Disaster Risk Management, held in Auckland 1-5 August, 2011. The platform provided an ideal opportunity for MCDEM staff to build relationships with representatives from the National Disaster Management Offices of Samoa, Tonga, Niue, Tokelau and the Cook Islands.

Risk Management in Auckland 1-5 August, 2011. The Platform was attended by 22 Pacific Island countries and territories, as well as key regional stakeholders. The meeting was preceded by a two-day workshop with the National Disaster Management Officers of the five countries that New Zealand works closely with in DRM. This was a vital opportunity to meet one on one to further understand and prioritise activities for each of those countries under the MOU.

An important objective was to galvanise the leadership and support of Chief Executive Officers for mainstreaming disaster risk considerations into national planning and budgetary processes. The Platform was also an opportunity to strengthen regional partnerships by establishing stronger linkages between Pacific Island countries and territories and partner organisations. Delegates were able to examine progress in disaster risk management in the Pacific and globally in the period 2009-2011 and endorse a roadmap towards the development on an integrated regional policy framework for disaster risk management and climate change beyond 2015.

Professional Development

The Professional Development (PD) team welcomed Marika Luiso as Acting Team Leader Professional Development, in April of this year. Marika will continue in this role until the end of 2012. Updates on some of the team's key areas of work are provided below.

As a member of both the Learning State CDEM Advisory Group and the EMQUAL Industry Technical Advisory Group, the PD Team contributes learning and development advice as well as CDEM sector knowledge to advisory group meetings and continues to contribute to reviews and development of unit standards and qualifications. The public sector ITO, Learning State, took on the civil defence domain earlier this year when LGITO was disestablished.

The team is currently working closely with the Ministry's Regional Emergency Management Advisors on a several development needs analysis (DNA) initiatives with CDEM Groups. A DNA is being conducted with both the Waikato and Bay of Plenty CDEM Groups to identify ways in which the capability of group and local controllers can be enhanced. The results of this will be made available to other CDEM Groups to support the development of controllers throughout the country. Another DNA initiative has been undertaken with the Bay of Plenty CDEM Group to determine the development needs of people fulfilling a wide range of welfare roles at all levels.

PD has also been working with the Emergency Management Information System (EMIS) project team to assist in the rollout of the super user training for CDEM Groups, including the development of system user guides and super user training lesson plans, and other educational resources.

The Team is representing the Ministry on a working group comprising representatives from Local Government CDEM Response Teams, EMQUAL, NZ Fire Service and MCDEM that has been established to conduct a USAR awareness and general rescue education review. The group met in Wellington on 12-13 July, 2011 to start developing an accessible training resource that will, over time, include both an introductory theory-based awareness module and a practical element for people who have an identified rescue role.

The PD Team will host the MCDEM courses in Wellington in early November, delivering a one-day Introduction to CDEM for New Controllers, a National Controllers' Forum, and the two-day course for Public Information Managers. Interest has been great due to CDEM Groups recognising from recent experiences the need for competent, well-trained CDEM personnel to across reduction, readiness, response and recovery.

MCDEM hosted a one-day visit to Wellington for a group of new Emergency Management Officers on Thursday 25 August. The objective of this visit was to provide an orientation to national level CDEM for new EMOs to support their induction. As part of this visit attendees were introduced to the MetService, Geonet, and the National Crisis Management Centre. ■

What's the Plan, Stan? Focus groups study released

Visiting Ian Axford (NZ) Fellow, **Vicky Johnson**, recently completed a major study into the benefits of New Zealand's national disaster preparedness teaching resource What's the Plan Stan? She shares some of her findings.

Vicky Johnson (top left) conducting one of several focus group studies into the effectiveness of the What's the Plan Stan? resource. Studies were conducted with teachers and principals from primary and intermediate schools in seven regions including Hawke's Bay, Auckland, New Plymouth, Nelson, Manawatu, Greater Wellington, and Invercargill.

Before coming to New Zealand in January on an Ian Axford Fellowship in Public Policy, I worked in the United States as the Policy Director of the National Commission on Children Disasters. In our final report, we developed over 100 policy recommendations for President Obama and Congress on how to improve disaster preparedness, response and recovery to better meet the needs of children.

The Commission found that teaching resources for disaster preparedness in the U.S. are disparate, unevaluated and unaligned. For my fellowship project, I chose to research the challenges and benefits of implementing a single, national teaching resource for disaster preparedness. WTPS is a unique model of this.

While based in the Ministry's Wellington office I planned a study using a mixed methods approach. In March and April of 2011, I conducted focus groups with teachers and principals from primary and intermediate schools in seven regions: Hawke's Bay, Auckland, New Plymouth, Nelson, Manawatu, Greater Wellington, and Invercargill. I also planned a focus group in Christchurch, which unfortunately was cancelled due to the earthquake.

Focus group participants who had used WTPS in their classroom were also provided an online survey to gather additional information on their use of the resources. Lastly, individual and group interviews were conducted with regional and local CDEM and Council staff to gather perspectives on their role in working with schools.

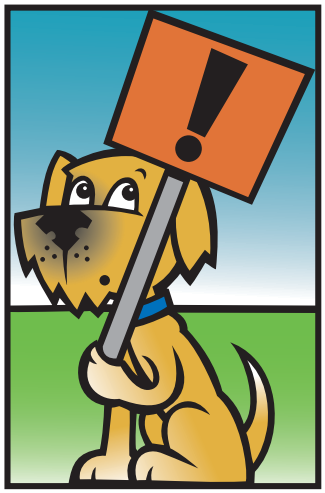
Before embarking on my research, I presumed that a large majority of schools and individual teachers were using the resource. This was based on results of surveys of teachers who participated in workshops on WTPS in 2006 and 2007, when the resource was first launched. The vast majority of those teachers indicated they would use the resource in the future.

In reality, less than half of focus group participants had used WTPS. However, those who had used it felt the resource was child-friendly, flexible, informative, well-organised and beneficial. Those teachers appreciated that the materials included pick-and-choose activities and templates that could be modified for individual classroom use, and felt the materials integrated well with the national curriculum. These teachers also indicated WTPS resources enhanced their own knowledge about what to do during a disaster.

Focus group results suggest that uptake of WTPS is variable from region to region and of those teachers who have used it, most have only used it once since it was launched in 2006. Further, there were few examples of school-wide approaches to using the resource.

Preliminary research from the Joint Centre for Disaster Research at Massey University has shown that children who have been exposed one or more times to disaster education programmes have higher levels of awareness, realistic risk perceptions and knowledge of protective behaviours like "drop, cover and hold". I recommend in my report that MCDEM's National Public Education Strategy establish measurable goals and learning outcomes

"I know one of the issues that came up after the Christchurch [earthquake] was – what do you do in an earthquake? There was quite a debate in the class as to whether getting under the tables was in fact the right thing to do. Some kids had heard, I'm not sure where, that that was no longer the drill for earthquakes. And the kid who led that discussion was a kid who has just moved up from Christchurch who was in the first Christchurch earthquake."



for the use of WTPS nationwide. Important outcomes could include increased knowledge of "drop, cover and hold", effective school disaster drills for no-notice events like earthquakes, tsunamis and tornados, or an increase in hazards adjustments in schools or households.

Once the intended outcomes are established, MCDEM and regional councils can think more strategically about what it will take to achieve those outcomes. Availability of the resource may not be enough to achieve the intended goals.

The study results found that one of the challenges to the integration of disaster preparedness education in schools is its competition with other important school-based safety and life skills education programmes, such as Firewise, Keeping Ourselves Safe, Kia Kaha and the Road Safe Series. WTPS is at a disadvantage because the agencies that support these programmes are able to provide additional resources such as in-person support at the schools or funded workshops for teachers.

I recommend that important disaster preparedness messages be incorporated into successful, established life skills programmes for children, particularly Firewise and the Life Education Trust mobile classroom. These measures could significantly increase awareness about disaster preparedness as over 92 per cent of schools have taught Firewise since its inception and the Life Education Trust mobile classroom reaches 225,000 students annually.

An interesting finding from the focus groups is how concerned teachers were about exposing children to disaster preparedness education and school disaster drills in the aftermath of the Christchurch earthquake. There were concerns about the sensitivities of transfer students from Christchurch and as well as the sensitivities of local students who had not been directly impacted by the earthquake.

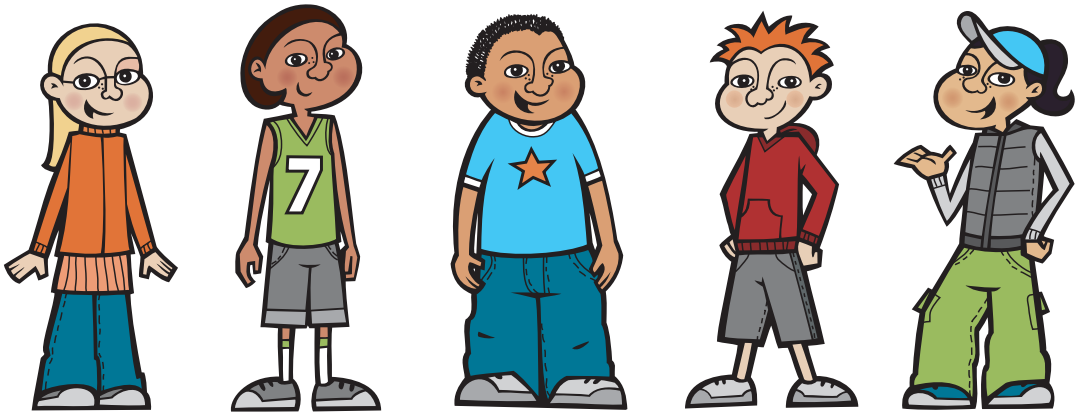
Many of the teachers who participated in the focus groups also questioned what they should do in an earthquake, how schools should prepare for different types of disasters, and the role of their school during a large-scale emergency.

It became clear that schools need more guidance on how to revisit and improve their school disaster policies and drills when concern among teachers, students and parents is high, yet remain poised to address emotional sensitivities and mitigate negative impacts as much as possible.

One step should be greater coordination of messaging to schools from MCDEM and the Ministry of Education. Although we cannot predict the circumstances of future disasters, we can anticipate that there will be an increase in inquiries and requests to CDEM staff for information and seminars from schools at a time when CDEM staff are busy assisting with the response. We can also predict there will be a psychosocial impact on teachers and students and a gap in resources to assist every affected school. MCDEM and CDEM Groups, in coordination with the Ministry of Education and other relevant agencies, should develop messages in advance of disasters that can be emailed and posted to schools immediately after a disaster to remind them of teaching resources that can be used to address questions, increase their preparedness and help them respond. This activity would also help the national agencies develop consistent messages to schools both before and after disasters.

The focus groups also revealed that few schools are conducting exercises with their students for events other than fire. It is imperative that schools prepare for disasters by practicing drills for no-notice events like earthquakes and tsunamis. Some of the reasons they are not happening in schools now is lack of time in the school schedule, the perception that drills are disruptive, lack of knowledge on how to respond to specific types of events, and the fact that earthquake and tsunami drills are not required. Most participating teachers indicated that principals are ultimately responsible for planning and executing practice drills and that Boards of Trustees also have responsibility to ensure schools meet health and safety requirements.

Because all of New Zealand is at risk from earthquakes and there is currently a surge of media interest and inquiries about disaster preparedness, there is an opportunity to gain schools' attention through a new national public education campaign. I recommend that New Zealand establish a voluntary, annual National School Earthquake



Exercise Day. This event could inspire schools to conduct these life-saving exercises as part of a single national effort.

A National School Earthquake Exercise Day would emphasise the need for disaster drills in schools and would instigate parent, community and media pressure on Boards of Trustees and principals to address this issue. As long as this event is annual and is specific to schools, over time disaster drills may become a regular part of schools' yearly agenda, like fire drills. WTPS provides materials for disaster drills and simulations in schools, including evaluation templates, so this initiative can build on current resources and should support the sharing of best practices among schools.

Another important step towards supporting schools in improving disaster preparedness is the utilisation of internet search engine optimisation to make it easier for teachers to find information on-line. The top search engine in New Zealand is Google and many teachers use Google to find teaching resources and information about disaster preparedness for personal or classroom use.

The full report Disaster Preparedness Education in Schools: Recommendations for New Zealand and the Unites States is available from: http://www.fulbright.org.nz/voices/axford/2011_johnson.html ■

New resource to help early childhood centres

When an emergency such as an earthquake occurs, the safety of a person's family is generally their first consideration. Parents who entrust the care of their children to others want the reassurance that they will do all they can to keep their children safe, particularly when those children are very young.

New Zealand early childhood education (ECE) services take this responsibility very seriously and frequently seek guidance from their local government CDEM representatives when determining how best to prepare for emergencies. In order to assist with this, MCDEM, with input from the Ministry of Education, is preparing *Early Childhood Education (ECE) Services Emergency Planning Guidance*. The guidance is designed to be of assistance to the wide range of ECE services that exist in New Zealand. It takes into account that early childhood education takes place in a variety of premises such as homes, school classrooms, community halls, marae, purpose-built facilities, and modified facilities in industrial, commercial and multi-storey buildings.

The focus of the guidance is the planning process which, if followed, should result in a comprehensive, relevant and practical emergency plan that can then be regularly exercised. When developing an emergency plan, there is no one-size-fits-all solution. Therefore, the guidance is not intended to be a set of rules, but will provide planning steps and information to support development of customised emergency plans. Planning steps include what sorts of issues should be covered in emergency plans, how to gather information to help write emergency plans, and who should be involved and consulted during an emergency plan's development. The guidance will also include recovery advice to consider during the planning process.

Given that planning for natural hazards is similar to planning for other hazards such as fire, power failure, bomb threats or threatening behaviour, the guidance is intended to fit with procedures ECE services might already have in place. It will also include information about which legislative requirements apply to ECE services within an emergency planning context.

Following consultation and review, the *Early Childhood Education (ECE) Services Emergency Planning Guidance* is expected to be available for download from the MCDEM website and the Ministry of Education (www.lead.ece.govt.nz) by the end of October 2011.

If you have any questions about the development of this guidance, please email marika.luiso@dia.govt.nz ■

Using high-rise buildings for tsunami evacuation

Tsunami risk reduction education programmes have historically focussed on evacuating to high ground in the event of a tsunami. In the case of low-lying coastal areas, the distances people are required to travel to reach high ground may be too great, resulting in casualties and fatalities during the evacuation. This becomes a greater issue as warning time is reduced, such as following local earthquake events.

Vertical evacuation, by ascending existing high-rise buildings can provide an alternative to evacuation inland or to high ground. Evacuation into structures is not intended to replace evacuation to high ground, but to provide a suitable secondary option. This strategy has long been used in Japan, and is also implemented in Indonesia.

Projects are underway in the USA in the states of Washington and Oregon to design vertical evacuation strategies for coastal communities. With significant risk of tsunami affecting the New Zealand coast from local, regional and distance sources, this is an effective component of tsunami mitigation that should not be ignored for low-lying coastal areas.

Research conducted by Stuart Fraser, Joint Centre for Disaster Research (JCDR), Massey University and GNS Science, aims to assess the potential for using existing mid to high-rise buildings as vertical evacuation tsunami refuges by assessing the performance of such structures with respect to earthquake ground shaking combined with subsequent tsunami wave loading, as in the case for near-source events.

Also under consideration are the community aspects of vertical evacuation such as how many evacuation structures are required, and where they should be sited to most effectively evacuate the population. This project is linked to a scoping study currently being carried out for the Hawke's Bay area by GNS Science, Hawke's Bay Civil Defence Emergency Management Group, Opus, Department of Building and Housing, MCDEM and Napier City Council. The scoping study outlines the needs and issues for guidance on evaluating tsunami vulnerability of evacuation buildings.

A recent field visit to the Tohoku region of Japan following the March 11, 2011 earthquake and tsunami provides valuable insight into the performance of structures used as evacuation refuges. These include buildings that were designed specifically for expected tsunami loading and evacuation, and some that were used as refuges but had not been specifically designed.

The observed performance of such refuges was varied – although many performed well and saved thousands of lives, many others were shown to be unsuitable in the latest event.

Stuart intends to implement key observations of tsunami damage in Japan and lessons from projects in the United States to develop recommendations for vertical evacuation strategies in New Zealand. ■

Example of a successful designated tsunami evacuation building in Kesennuma, Miyagi Prefecture, Japan. This office building was inundated to a height of 8 metres and sustained minor scour and non-structural damage. Videos show that people survived on the roof of this building.

Arahama Elementary School, Miyagi Prefecture, Japan. Located 750 metres from the coast, this building was successfully used as a refuge for 380 schoolchildren and surrounding residents in 7.5-metre deep inundation. The building suffered non-structural damage from water flow and debris impact.