

Tsunami Risk Management Summary

NZIER Mitigation options	Current Position in New Zealand	Agency Responsibility	
<p>1. Harden critical infrastructure</p> <p><i>12 hour standby power for selected sections of the mobile network</i></p>	<p>Lifeline utilities like telecommunications, power companies and ports have a general duty under the CDEM Act 2002 to address their ability to provide services in an emergency. They work with CDEM Groups, and within lifeline groups, to understand hazard risks and to formulate individual and collective actions to manage them.</p> <p>Mobile network operators in New Zealand have emergency management structures in place. In the case of power outages caused by Tsunamis, mobile sites have battery backup systems available and operators' co-ordinate with each other to dispatch generators to ensure ongoing cellular coverage.</p> <p>This will require investment by the network operators.</p>	<p>Primary</p>	<ul style="list-style-type: none"> • Telecommunications providers.
		<p>Supporting</p>	<ul style="list-style-type: none"> • New Zealand Lifelines Committee. • National Infrastructure Unit (Treasury). • Ministry of Civil Defence and Emergency Management. • Ministry of Business Innovation and Employment.
<p>2. Designate evacuation buildings</p>	<p>New Zealand has not developed design specifications for new or existing buildings to be used as vertical evacuation structures.</p> <p>Vertical evacuation and strengthening is part of the work programme of the Tsunami Working Group (TWG).</p> <p>MCDEM has been working with MBIE on an approach to better define tsunami prone buildings and its inclusion in the building code. MCDEM and MBIE have agreed to wait until the Federal Emergency Management Agency guidelines on vertical evacuation structures is released in 2016, before proceeding further. It is likely New Zealand would base its guidance heavily on this. Research has already been conducted on the Japanese building standard requirements for designated tsunami evacuation buildings (refer also to mitigation option 8 below).</p> <p>Once code has been developed it is the responsibility of local CDEM groups to designate evacuation structures.</p>	<p>Primary</p>	<ul style="list-style-type: none"> • Civil Defence Emergency Management Groups.
		<p>Supporting</p>	<ul style="list-style-type: none"> • Ministry of Civil Defence and Emergency Management. • GNS Science and Natural Hazards Research Platform.

2. Education	<p>Public education in relation to tsunami risk is an on-going responsibility of MCDEM and CDEM Groups.</p> <p>MCDEM has developed consistent messages in this regard and tsunami hazard is included in 'Get Ready Get Thru' content, published on the MCDEM website and used by CDEM Groups.</p> <p>All official public guidance and public education advises that the only reliable warning possible for local source tsunami is to evacuate immediately following long or strong earthquakes and/or unusual ocean behaviour or sounds.</p> <p>Education includes public awareness on tsunami hazards, and also all public education resources and information on natural warnings, official warning systems, and evacuation zones and routes.</p> <p>'What's the Plan Stan' curriculum also includes tsunami awareness.</p> <p>MCDEM are leading a national tsunami exercise in 2016; the exercise steering group has recommended that it includes a public education focus.</p>	Primary	<ul style="list-style-type: none"> Ministry of Civil Defence and Emergency Management. Civil Defence Emergency Management Groups.
		Supporting	<ul style="list-style-type: none"> GNS Science. EQC. Schools.
3. Land use planning	<p>The Government's proposed changes to the RMA will add the 'management of significant risks from natural hazards' as a matter of national importance, which includes tsunami. This will give a greater weight to natural hazards in decision-making.</p> <p>The New Zealand Coastal Policy Statement 2010 outlines national policies and objectives on risks from coastal hazards and specifically includes tsunami.</p> <p>Further national guidance on managing the risks from natural hazards is also being considered as a National Policy Statement.</p> <p>There is already an example in New Zealand (i.e. at Pāpāmoa) of the RMA being used to full effect for reducing tsunami risk.</p>	Primary	<ul style="list-style-type: none"> Ministry for the Environment.
		Supporting	<ul style="list-style-type: none"> LGNZ. Ministry of Civil Defence and Emergency Management. Department of Conservation (as administrators of the NZ Coastal Policy Statement 2010).

	<p>In October 2014, the Gisborne CDEM Group carried out a two day workshop that included a focus on land use planning for tsunami. This was funded by the MCDEM Resilience Fund and the full report, including outcomes, can be found on MCDEM's website.</p> <p>MCDEM, through the Tsunami Working Group considers and discusses land use planning in a tsunami context.</p>		
<p>4. Inundation mapping and evacuation planning</p>	<p>MCDEM has developed guidelines on mass evacuation planning and evacuation zone mapping. The evacuation zone mapping guidance has recently been reviewed and the revised version will be available by mid November.</p> <p>The development of tsunami inundation mapping and corresponding mass evacuation planning is a CDEM Group responsibility.</p> <p>MCDEM are leading a national tsunami exercise in 2016; there will also be an evacuation focus as part of this exercise.</p>	<p>Primary</p>	<ul style="list-style-type: none"> • Civil Defence Emergency Management Groups.
		<p>Supporting</p>	<ul style="list-style-type: none"> • Ministry of Civil Defence and Emergency Management. • GNS Science and Natural Hazards Research Platform. • NIWA.
<p>5. Event communication and messaging</p> <p><i>Including a 24/7 operations centre and a public alerting system</i></p>	<p>The public recognising and acting-upon for natural warnings is critical for event response in local source tsunami events. Official advice for local events will then be provided in a timely manner via the national warning system. For regional and distal source tsunami the national warning system will provide official warnings and updates.</p> <p>Procedures exist to support consistent public alerting/ messages during tsunami events between MCDEM, CDEM</p>	<p>Primary</p>	<ul style="list-style-type: none"> • Ministry of Civil Defence and Emergency Management. • Civil Defence Emergency Management Groups.

	<p>Groups and GNS Science.</p> <p>The benefits of a 24/7 operations centre operated by GeoNet has been discussed by various agencies, including GNS Science. Further work is being done on the feasibility of this.</p> <p>MCDEM is developing a business case for a telecommunications-based public alerting system. The MBIE-led ERS system (Smartphone App) will be part of this system and will include the ability to alert communities of an impending tsunami threat.</p> <p>MCDEM are leading a national tsunami exercise in 2016; there will also be a public alerting/ messaging focus as part of this exercise.</p>	Supporting	<ul style="list-style-type: none"> • GNS Science and Natural Hazards Research Platform. • GeoNet/EQC.
Future Options			
1. Installing additional wave gauges	<p>LINZ and NIWA own a network of wave gauges along the New Zealand coastline. Data is monitored by GeoNet for tsunami assessment purposes, and is also publicly available.</p>	Primary	<ul style="list-style-type: none"> • LINZ. • NIWA.
	<p>Extending the network will be subject to a collective project among monitoring and research agencies. It will look at identifying gaps and options.</p>	Supporting	<ul style="list-style-type: none"> • GNS Science. • GeoNet/EQC.
2. Better local models and maps	<p>Local tsunami modelling is the responsibility of CDEM Groups, as modelling and associated maps is location specific.</p>	Primary	<ul style="list-style-type: none"> • Civil Defence Emergency Management Groups.
	<p>MCDEM is currently updating its guideline on tsunami evacuation zone mapping, to be available shortly. Guideline implementation is a CDEM Group responsibility.</p>	Supporting	<ul style="list-style-type: none"> • Ministry of Civil Defence and Emergency Management. • GNS Science and Natural Hazards Research Platform.
3. DART buoys specifically for the Kermadec	<p>DART buoys would require significant investment, including for ongoing maintenance, as well as new ownership and</p>	Primary	<ul style="list-style-type: none"> • Unknown.

Trench	funding arrangements.	Supporting	<ul style="list-style-type: none"> • Unknown.
4. LIDAR in selected locations	Regional Councils and CDEM Groups have conducted some LIDAR mapping.	Primary	<ul style="list-style-type: none"> • Regional Councils. • Civil Defence Emergency Management Groups.
		Supporting	<ul style="list-style-type: none"> • Unknown.
5. Evacuation towers in locations that are not near high ground	<p>This comes under vertical evacuation structures and should not be considered separately.</p> <p>Aligned with the feedback provided above, national advice on this is considered by the MCDEM-led Tsunami Working Group.</p>	Primary	<ul style="list-style-type: none"> • Ministry of Business, Innovation, and Employment. • Civil Defence Emergency Management Groups.
		Supporting	<ul style="list-style-type: none"> • Ministry of Civil Defence and Emergency Management.
6. Lifeline infrastructure redundancy, particularly for electricity distribution	Lifeline utilities have a general duty under the CDEM Act 2002 to address their ability to provide services in an emergency. They work with CDEM Groups, and within lifeline groups, to understand hazards risks and to formulate individual and collective actions to manage them.	Primary	<ul style="list-style-type: none"> • Electricity distribution companies and Transpower. • National Infrastructure Unit (Treasury). • Ministry of Civil Defence and Emergency Management.
		Supporting	<ul style="list-style-type: none"> • New Zealand Lifelines Committee.
7. Local sea walls for critical risks such as oil tank farms	Responsibility of critical infrastructure owners. It is important to recognise that such installations will require resource consent and should not be inconsistent with the New Zealand Coastal Policy Statement.	Primary	<ul style="list-style-type: none"> • Asset owners.
		Supporting	<ul style="list-style-type: none"> • Local authority/ Department of Conservation. • New Zealand Lifelines Committee. • Ministry of Business, Innovation, and Employment. • LGNZ.

8. Strengthening the Building Code	<p>MCDEM has been working with MBIE on an approach to better define tsunami prone buildings and its inclusion in the building code.</p> <p>New Zealand has not developed design specifications for new or existing buildings to be used as vertical evacuation structures.</p> <p>Vertical evacuation and strengthening is part of the work programme of the Tsunami Working Group (TWG).</p> <p>MCDEM and MBIE have agreed to wait until the Federal Emergency Management Agency guidelines on vertical evacuation structures is released in 2016, before proceeding further. It is likely New Zealand would base its guidance heavily on this. Research has already been conducted on the Japanese building standard requirements for designated tsunami evacuation buildings (refer also to mitigation option 8 below).</p>	Primary	<ul style="list-style-type: none"> Ministry of Business, Innovation, and Employment.
		Supporting	<ul style="list-style-type: none"> Ministry of Civil Defence and Emergency Management.
9. Conditions of building consents, i.e. provision for ready evacuation	<p>We believe this refers to having tsunami evacuation procedures for commercial buildings, similar to that required under the Fire Service Act. If so, this would require legislative change as there is currently no mandate</p>	Primary	<ul style="list-style-type: none"> Ministry of Business, Innovation, and Employment.
		Supporting	<ul style="list-style-type: none"> Ministry of Civil Defence and Emergency Management.