



Enhancing earthquake and tsunami preparedness and response in Kura Kaupapa Māori/Schools Aotearoa New Zealand: learnings from the 5 March 2021 East Cape earthquake sequence

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ABSTRACT

Aotearoa New Zealand is exposed to numerous potentially damaging impacts from various hazard events. The east coast of the North Island, one of the most active seismic regions in New Zealand, faces significant earthquake and tsunami risk. Given the variety of hazards the regions face, how risks are managed within schools needs to be considered. This research aims to understand the challenges and opportunities for enhancing earthquake and tsunami preparedness and response in Te Tairāwhiti/Waiāriki Kura Kaupapa Māori/ Schools. Ten schools were visited from Gisborne to Matata in August 2021. Information was collected from a hui with school staff and invited members of the school Board of Trustees. Topics included tsunami zones, evacuation practice, resources for teachers, planning at home, school response plans, stakeholder involvement, and capability development. Their reflections on the 5 March 2021 earthquakes and tsunami warnings were also covered. Initial analysis of the interviews reveals long-standing knowledge of earthquakes and tsunami risk, experience from past events and various risk management strategies for future events. as well as insight on how isolated Māori communities collectively respond to disasters. There was a desire for further knowledge about what future events may look like and ways to prepare schools and the wider community. A return visit is planned for late 2022.

1 INTRODUCTION

Aotearoa New Zealand is exposed to numerous potentially damaging impacts from various hazard events. The east coast of the North Island, one of the most active seismic regions in New Zealand, faces significant earthquake and tsunami risk. Given the variety of hazards the regions face, how risks are managed within schools needs to be considered.

Over the past two decades considerable effort has been directed towards school safety at local, regional, national, and international level (Ronan et al. 2015). In 2016, East Coast LAB (Life at the Boundary) was established, aimed at fostering new research to increase the understanding of the Hikurangi plate boundary and associated natural hazards like earthquakes and tsunami (Kaiser & Boersen 2020). Annual school earthquake drills and tsunami hikoī have been developed around the national ShakeOut exercise (McBride et al., 2019; Vinnell et al., 2020). Along with these practical measures, research has accompanied these efforts to better understand programme effectiveness and the needs of children, caregivers, and schools (Johnson et al. 2014; Johnston et al. 2011; Johnston et al. 2016; Mooney et al. 2021; Tipler et al. 2016; Tipler et al. 2017a and b; Tipler et al. 2018).

On Friday 5 March 2021, three large earthquakes occurred offshore of Aotearoa New Zealand. The first earthquake at 2.27am (Mw 7.3 off East Cape) and was followed by two earthquakes in the Kermadec Islands, a Mw 7.4 earthquake at 6.41am and a Mw 8.1 earthquake at 8.28am (NEMA 2021). This complex sequence of events and resulting tsunami warnings and evacuations tested school and the wider communities' response procedures (NEMA 2021; Vinnell 2022).

2 METHOD

Ten schools were visited from Gisborne to Matata in August 2021.

- Tolga Bay Area School, Tolaga Bay.
- Hātea ā Rangi School, Tokomaru Bay.
- Te Kura Kaupapa Māori o Whātonga, Rangitukia.
- Rerekohu Area School, Te Araroa.
- Te Kura o Kawakawa mai Tawhiti, Hicks Bay.
- Te Kura Mana Māori o Whangaparaoa, Cape Runaway.
- Te Whānau ā Apanui Area School, Omaio.
- Te Kura o Torere school, Torere.
- Te Kura o Paroa school, Whakatane.
- Matata Public School, Matata.

Information was collected from a hui with school staff and invited members of the school Board of Trustees. Topics included tsunami zones, evacuation practice, resources for teachers, planning at home, school response plans, stakeholder involvement, and capability development. Their reflections on the 5 March 2021 earthquakes and tsunami warnings were also covered.

3 RESULTS

Initial analysis of the interviews reveals long-standing knowledge of earthquakes and tsunami risk, experience from past events and various risk management strategies for future events, as well as insight on how isolated Māori communities collectively respond to disasters.



Figure 1 Researchers Lucy Kaiser and Kelvin Tapuke outside Tolaga Bay Area School.

3.1 Response to the 5th of March events

“We hadn’t felt an earthquake- so it almost was a drill until we got up the hill, then we got an indication of how big a wave could be, so we needed to go. Our kids were awesome, the weather was perfect, but we realised we needed planning to figure out how to get the kids way up.”

The schools’ responses to the March 5th tsunami events were varied. Half (five) of the schools had decided to close for the day following the initial earthquake during the night and did not need to evacuate as a result. However, all schools participating in the study had an evacuation point identified and all but one had done evacuation drills in the past. Some of the schools (four) mentioned participating in the annual ShakeOut drill in the past. Several schools mentioned the importance of debriefing following tsunami drills, either within the school community (“if we learn something from a drill, share it with parents and students”) or by inviting the wider community and civil defence along, to discuss preparedness.

3.2 Evacuation

“there’s no water, no kai, no shelter there’s nothing at the evac point. I threw things in the back of my truck and rolled up there. We ended up feeding all the community up there because then we realized the community didn’t have anything, we had elderly people up there, we were parked on the side of the road next to the orchard.”

The evacuation routes used by schools were varied, some had to work with difficult terrain or cross major roads in order to get to higher ground which was a concern for younger students. There were also different levels of resources at the schools’ evacuation points which ranged from marae, clubrooms, farm sheds to open fields. Two of the schools were looking at trailers or mobile supply kits to take with them in the event of a tsunami while others were working with local landowners, marae and civil defence to determine what supplies could be left at an evacuation point permanently.

3.3 Communication

“Nannies were door knocking, some of our pakeke were refusing to leave their houses. It’s important to have trusted people so people will listen when they’re told to go.”

The manner in which participants were alerted to the tsunami events was varied. Some communities received mobile alerts, whilst others did not have mobile coverage and relied on warnings through Radio Ngāti Porou, from civil defence and the police, through door knocking or through social media. Receiving clear, accurate and up to date information on tsunami events was a significant concern for participants, particularly those whose communities have limited cellphone reception. Participants stressed the importance of good relationships with civil defence and other local authorities so when an event happens, they know who to call.

3.4 Isolated communities

“What do you do if you can’t get a helicopter in the natural disaster? We have enough animals to survive, and the kids know how to set a net.”

As one participant summarised, a good community is better than any civil defence alarm. Participants pointed to the self-efficacy of their communities as a strength for responding to tsunami alerts. Many were planning to be cut off for at least 24 hours. Resources and skills that many students and community members had, such as hunting, fishing and maintaining vegetable gardens, were deemed highly important for self-sufficiency in a disaster. A lot of this knowledge is inter-generational, and participants highlighted that there was a lot of information that tamariki could learn from elders that had experienced disasters in the past. One school had introduced food safety and understanding mahinga kai local food ecosystems into the science curriculum in order to increase students’ knowledge and their resilience for disasters.

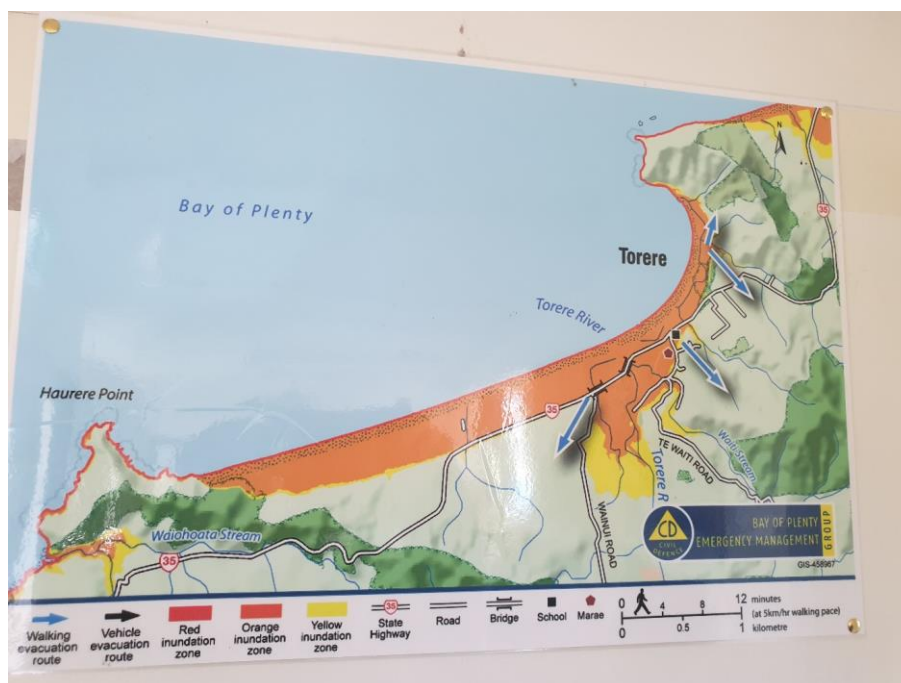


Figure 2 Tsunami risk map and evacuation routes for Torere community. This map was on display in the staff room of Te Kura o Torere School.

3.5 Trust in information

“The problem is people don’t believe the maps. The marae is on a flat, low-lying area downhill from the sea will it come up the river? That’s a big concern for whanau. How can we communicate inundation maps to the community?”

Trust in information and debunking misinformation was a common theme throughout the korero. There was some confusion around the tsunami inundation maps and questions of how accurate the red, orange and yellow zones were. Additionally, participants reported confusion from parents and community members who did not understand the maps. There were also issues with parents who did not trust the schools’ evacuation plans and drove to the school to get their tamariki instead of meeting them at the evacuation point, putting them in more danger. Tsunami sirens were a controversial issue with some participants wanting them installed in their community while others thought it was best to rely on feeling a long or strong earthquake to get gone and would not wait for a siren to be activated. Some participants suggested that wananga should be held to link up expectations, debunk myths, plan together and make sure their elderly evacuate.

3.6 Curriculum

“Life-long learning involves learning from the womb to the tomb.”

The integration of disaster preparedness into the school curriculum was also discussed with participants welcoming opportunities for developing locally and hapū-specific education resources and activities with the schools. Ideally, curriculum would focus or wrap around what the kids already are doing and build on thematic learning across multiple curriculum NCEA credits. Rūaumoko, geology and ecology were some of the curriculum areas participants saw a natural fit. Resourcing schools with seismometers was also identified as a way to increase student understanding of seismic activity and provide an opportunity to tie in conversations about disaster preparedness. One of the participants expressed a desire for Māori and women scientists particularly to be involved in school outreach to provide students with some visibility of science career pathways. Being able to tie in local pūrākau and hapū dialect was identified as a way to make sure curricula resonates with the students, particularly for Kura Kaupapa Māori. A Kura Kaupapa Māori Principle requested that any reo Māori resources be written in plain Ngāti Porou language.

4 CONCLUSION

These initial findings highlight the need for continued efforts to enhance school and community preparedness for future earthquake and tsunami events. There is a need for continued investment in building knowledge and developing capacity and capability at a local level. All schools engaged with were welcoming for further visits by the researchers and keen to explore opportunities to work together on school and community-based activities. A return visit is planned for late 2022.

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