



## MCDEM RESILIENCE FUND FINAL REPORT

**Project name:** Tsunami Warning System

**Reporting authorities:** Ōpōtiki and Whakatāne Districts

**Report produced by:** Jim Tetlow, Eastern Bay of Plenty Emergency Management Co-ordinator

**Date of Report:** June 2013

### Executive Summary:

An application was made to the MCDEM Resilience Fund in 2012 for assistance to develop a coastal alerting system along the Eastern Bay of Plenty Coastline. The project sought to utilise existing New Zealand Fire Service Sirens with some additional units to create a network of sirens along the coast. The sirens would be required to produce a constant rise tone for 10 minutes to signal a requirement for residents to switch on their radio for more information. The installation of the sirens was also to be backed up with an information campaign so that residents knew what the sirens mean and what they should do in the event that they are activated.

### Project milestones:

Three project milestones were set to achieve the overall aim of developing a Tsunami warning system along the EBOP coast;

#### August 2012

**Convert 5 existing New Zealand Fire Service sirens on EBOP coast to activate by pager and produce a constant rise tone.**

This milestone was achieved, but due to issues relating to the use of the sirens it was not completed until February 2013. 5 existing NZFS sirens were converted to produce a 10 minute constant rise tone (see map). The system was successfully tested in April 2013.

#### November 2012

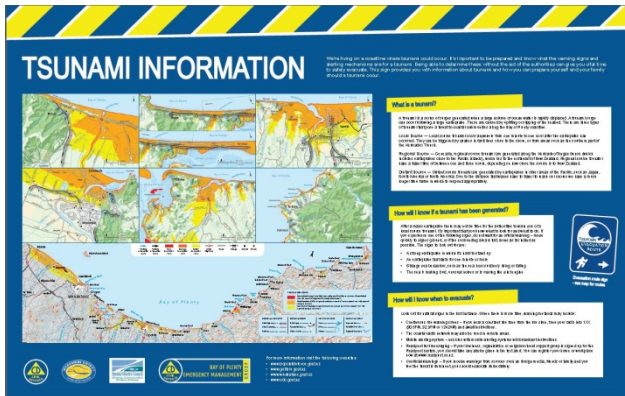
**Undertake a public education campaign to promote sirens and actions the community should take.**

This milestone was achieved in February 2013 to coincide with the conversion of the 5 existing NZFS sirens. The promotion included the development of a tsunami information booklet for the Eastern Bay of Plenty, beach signage and media coverage surrounding the public testing (radio interviews, newspaper adverts etc). Evacuation maps were developed for areas along the coast and this information is made available to the public through both councils and the Bay of Plenty Civil Defence Group website.

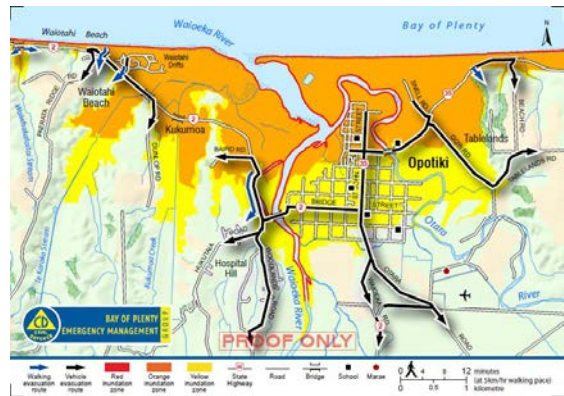
#### June 2013

**Install additional sirens along the Eastern Bay of Plenty coastline.**

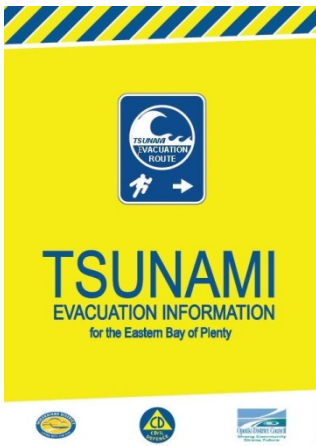
This milestone was achieved in June 2013, with 3 additional sirens installed in Waiotahi and Ōhiwa (Ōpōtiki District) and Coastlands (Whakatāne District).



Example of Information boards placed at 37 locations along the EBOP coast



Example of Evacuation maps produced for web, signage and booklet



**Contents**

- What is a tsunami? 3
- How will I know if a tsunami has been generated? 3
- How will I know when to evacuate? 4
- How can I do to protect myself from a tsunami? 4
- Always be prepared 4
- Where do I evacuate to? Understanding the maps 5
- Maps: 6
  - Māori 6
  - Otago 7
  - Whānauāke 8
  - Opotiki 9
  - Ōhau 10
  - Ōpōtiki 11
  - Tā Kaitiaki 12
  - Whānauāke 13
- Household Emergency Checklist 14
- Household Emergency Plan 15
- Other maps available 16
- Where can I go for more information? 16

**How will I know when to evacuate?**

Look out for natural signs in the first instance. When there is more time, warning methods may include:

- Continuous rising sea levels – if you have a constant rise from the sea, turn your radio into 1XX (90.5FM, 92.5FM or 124.2AM) and await instructions.
- The coastal radio network may also be used in remote areas.
- Mobile alerting system – vehicles with mobile alerting systems will broadcast instructions.
- Ready-to-test messaging – if your business, organisation or neighbourhood support group is signed up for the ReadyNet system, you should take any advice given in the text alert. You can register your home or workplace now at [www.readynet.co.nz](http://www.readynet.co.nz).
- Unofficial warnings – if you receive warnings from sources such as foreign media, friends or family and you feel the threat to be imminent, you should evacuate immediately.

**What can I do to protect myself from a tsunami?**

- Develop a household evacuation plan.** Everyone in your household needs to know what to do individually to protect themselves in case of emergency.
- Know where to go to be out of the tsunami evacuation area** (coloured red, orange and yellow on the map). Arrange to flee with family or friends who live well away from the evacuation area or prepare to go to a designated Welfare Centre – listen to the radio for details about the location of the Welfare Centres.

**Always be prepared**

For general preparedness, your household should create and practice a household Emergency Plan and assemble and maintain Emergency Survival Kits and a Getaway Kit. Details can be found on pages 14-15 or visit [www.getthrough.govt.nz](http://www.getthrough.govt.nz) for more information. In addition, your household should plan for and practice what to do if a tsunami occurs.

- Identify your risk
- Prepare members of your household
- Learn and practice evacuation routes
- Actively protect your home
- Stay informed and follow instructions
- Climb to higher ground
- Take care of yourself and help others
- Watch for hazards

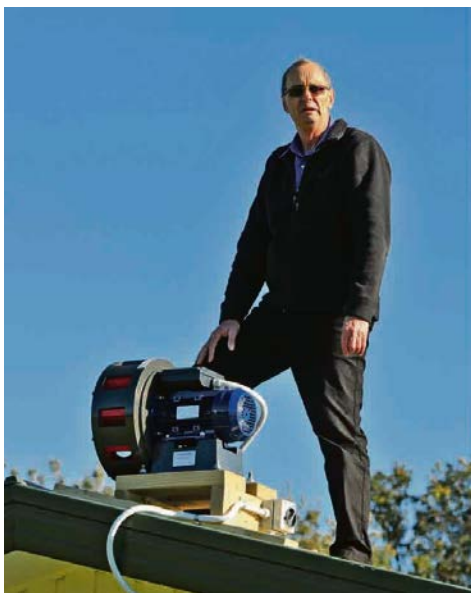
**Where do I evacuate to? Understanding the maps**

- The maps for each coastal residential area show the different evacuation areas, coloured red, orange and yellow. These are determined by the estimated run-up of tsunami of different heights. The tsunami heights, which are taken from the mean high water spring tide, are shown below for each zone. The tsunami heights for each zone are shown below:
- RED Zone** – Estimated extent of a tsunami up to 1 metre high.
- ORANGE Zone** – Estimated extent of a tsunami up to 5 metres high.
- YELLOW Zone** – Estimated extent of a tsunami up to 12 metres high.
- If people sleep or working in the orange zone are added to evacuate, you must move beyond that zone to an area of safety, either inland or to higher ground.
- If people in both the orange and yellow zones are advised to evacuate, you must move beyond the inland boundary of the yellow zone to an area of safety, either further inland or to higher ground.
- If you are within walking or cycling distance (1.2km) of a blue arrow you should not use a vehicle to reach the evacuation point on the map, unless absolutely necessary. This will help to keep roads free for those who need to use vehicles to reach safety.
- If you are not within walking or cycling distance of high ground, follow the black line shown on the map. Please do not stop along the route, as this may cause backlogs and reduce the ability of other vehicles to reach safety.
- Follow any directions given by the Emergency Services or Civil Defence staff.
- If you are on the beach, move to higher ground or go inland as far as possible.
- If you don't have time to travel to high ground, but are in a multi-story building, go to an upper level.
- Where possible, use the route through the coastal evacuation area closest to your home, as indicated on the map. Only drive if high ground is not easily accessible by foot or bicycle. This will help to get people out of the area more efficiently and reduce possible road congestion.

**DO NOT RETURN TO YOUR HOME UNTIL CIVIL DEFENCE ANNOUNCE THE EMERGENCY IS OVER AND IT IS SAFE TO GO BACK.**

The first tsunami surge is often not the largest, successive surges may be spaced many minutes apart and continue to arrive for many hours.

Example of the information booklet that was produced to accompany the installation of the sirens



Greg West of Rangitāiki Independent School next to the new siren installed to serve the Coastlands community on one of their buildings.



Ian Castles of Opotiki District Council overseeing the installation of the siren at Ōhiwa Holiday Camp.



A map showing the locations of the 8 sirens installed as part of the project

### Challenges and Issues:

During the project there were a number of challenges that had to be overcome. These included:

- **Utilising the existing NZFS sirens to be activated independently of the 111 control room**
  - This required independent control boxes developed by Kordia linked to pager numbers and agreement from the NZFS at a national level to activate the sirens independently. Protocols are in place to ensure that the NZFS are aware of activations before they occur.
- **Pager signal in remote locations**
  - On 3 of the sirens additional aerials were required to ensure constant quality of the pager signal to ensure activation
- **Choosing locations for additional sirens and gaining agreement with private landowners for siting of additional sirens**
  - The choice of site for the additional sirens was based upon identified gaps in coverage for permanent residents and requirements for coverage in areas with high summer populations. Gaps in coverage still remain, however, the locations chosen aim to maintain coverage in the most populated areas of the coast until further warning methods are implemented.
- **Additional un-identified costs**
  - During the installations there were a number of unidentified costs that increased the overall expenditure in the project. These included requirements for additional mounting structures in some locations and strengthening of roof structures to support the weight



and vibrations of the siren units when activated. There were also costs associated to increasing pager signals in some areas, which had not been foreseen.

- **Ensuring the public understand what the sirens mean**
  - The sirens are activated to alert the public to an event and the action to be taken is to listen to the radio for more information. However, regardless of the public education campaign, there are still some within the community who believe it is the signal to evacuate. We will aim to test the sirens regularly and continue the public education campaign to ensure the message regarding what the sirens mean is pushed out through as many different forms of media as possible.