Tsunami Preparedness Activities in Tonga

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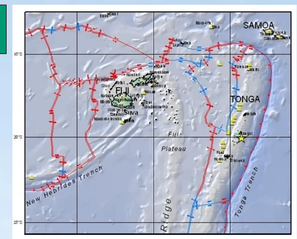
TONGA TSUNAMI RISK

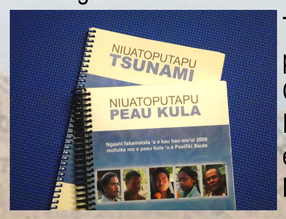
Tsunami risk in Tonga is rated as "extreme" because:

- Tonga's islands lie about 200km west of the Tonga Trench fault zone
- The Tonga Trench & Volcanic Arc are potential sources for a fault or undersea landslide caused by an earthquake or volcanic eruption
- In Nuku'alofa (Capital, pop 70,000): about 0.1-1% is above 5m; ≥between 75-90% is between 0-2m above sea level; and about 9% is between 2-5m above sea level. **Tsunami Boulder ➔**



Niuatoputapu 2009 Tsunami (8.3 earthquake)

At 6.48am on 30 September 2009, Niuatoputapu was struck by an 8.3 earthquake that generated a tsunami with a 17 metre flow depth. There were 9 deaths recorded. Up to 60% of houses were destroyed and seawater inundated 50% of the island. There was also extensive damage to infrastructure and coastal environment.



The book *Niuatoputapu Peau Kula,* published by the Tongan Broadcasting Commission & the International Tsunami Information Centre in 2012, records the experiences and reflections of the Niuatoputapu community during the tsunami.

TSUNAMI WARNING SERVICE IN TONGA

The Tonga Meteorological Services (TMS) is the official 24/7 point of contact within the Kingdom of Tonga designated to issue tsunami warnings for Tonga using the new Pacific Tsunami Warning Centre products, in association with the Geology Services Unit (GSU) and the National Emergency Management Office (NEMO). Messages are delivered via SMS text and AM Radio (Radio Tonga)

WHAT HELPS US DEAL WITH OUR SITUATION

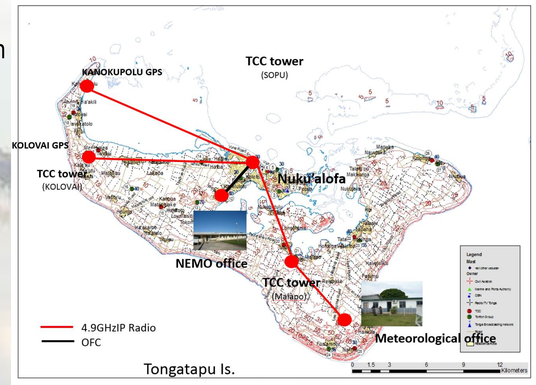
1. Legislation: allocating roles and responsibilities
   - Emergency Management Act, 2007
2. Standard Operating Procedures:
   - Met Services warning criteria and products
   - National Emergency Operation Centre SOP
3. Emergency Plans:
   - National Emergency Management Plan 2008/9
   - Tonga National Tsunami Plan 2012
   - District Emergency Management Plans
   - Village Emergency Management Plans

Tsunami Alert System Pilot Projects

Tonga's is testing 2 types of alert systems (sirens) on the main Island of Tongatapu through partnerships with the 2 telecom carriers. Five sirens are activated through the mobile network and have an audio range of 3.5km. The sirens are activated from the Tsunami Warning Centre at the MET Office.

Two multi-hazard sirens are activated through microwave radio link and have an audio range of 500m. The sirens activated by microwave enable voice over whenever required. This allows the system to also be used for other alerts and to provide clear instruction for evacuation. The network of microwave equipment and the two sirens are currently state of the art and require trained IT specialists to monitor the link. The project is a partnership between Tonga & APT.

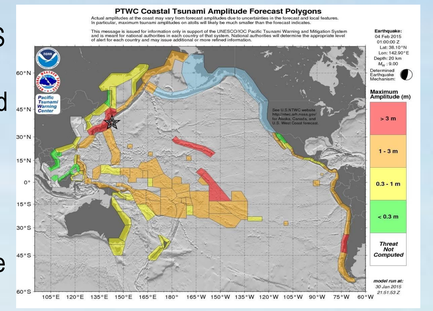
There are 3 manual sirens on Niuatoputapu that can be operated by the Town Officers



PACWAVE 15

On 5 February 2015, Tonga participated in the Pacific Wave 2015 (PacWave15) exercise. Staff from NEMO, the TMS and the Geology Office (GSU) discussed their response to simulated tsunami threats.

Tonga used the new enhanced tsunami forecast products of the US Pacific Tsunami Warning and Mitigation System (ICG/PTWS), and tested country Standard Operating Procedures. The Tonga simulated scenarios were a magnitude 9 earthquake occurring on the Tonga Trench & a magnitude 9 earthquake occurring off the coast of Japan



During the simulation, the interpretation of the new PTWC tsunami forecast messages by NEMO, MET and GSU were tested, along with Tonga's new tsunami early warning criteria and operating procedures, and respective operating plans.

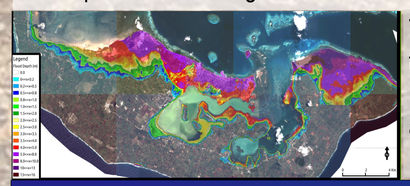
Tsunami Risk Management Project Awareness and Preparedness in Tonga 2013/14

With the support of the New Zealand Government, Tonga conducted education and awareness activities during 2013/14. Outputs from the project included the construction and placement of tsunami evacuation signs and evacuation route signage around Tongatapu.

Printed awareness material including leaflets, posters, and brochures in Tongan were produced. Public awareness workshops were held across Tongatapu. Radio and TV programmes provided information on actions to take before, during and after a tsunami. Consultations were conducted with schools in high risk areas

Capacity Building for Tsunami Risk Assessment in South West Pacific

Light Detecting and Ranging (LiDAR) data of Tongatapu from the project was used to initialize a tsunami model to simulate the worst case scenario of a local tsunami caused from a magnitude 9.0 earthquake on the Tonga Trench.



The model output was also used to develop maps used for inundation and evacuation maps, as well as awareness programmes.

Exercise PIHA –2013

Exercise PIHA was designed for coastal communities at the eastern side of Tongatapu. NEMO organised the event in partnership with international NGOs, with funding from the New Zealand Government.

PIHA was aimed at giving a great opportunity to the communities of Talafo'ou, Manuka, Makaunga, Afa and the four schools in the area to test their Emergency Response Plans and Evacuation Plans.

The Tsunami warning sirens in this area were tested.

Three manual sirens were provided to the 3 villages on Niuatoputapu. Five hailers were provided to communities in the eastern district of Tongatapu

The Tsunami Risk Management Project helped deliver community evacuation exercises.

The project also helped implement community tabletop exercises in evacuation planning.

KEY PARTNERS

- New Zealand Government
- Australian Government: Geoscience Australia
- World Bank
- Asian Development Bank
- SPC Secretariat for the Pacific Community: Applied Geoscience and Technology Division (SOPAC)
- NOAA
- JICA
- Tonga Communication Corporation
- Digicel
- UNESCO/IOC
- APT