



**SOPAC Member Countries  
National Capacity Assessments:  
Tsunami Warning and Mitigation Systems**

**Tuvalu**



Tuvalu



***SOPAC***



# 1. Results Outline



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## 1.1. Executive Summary

The National Capacity Assessment of Pacific Islands Applied Geoscience Commission (SOPAC) Member Countries: Tsunami Warning and Mitigation Systems project aims to work in collaboration with the member countries of SOPAC to assess their capacity to receive, communicate and respond effectively to tsunami warnings. The Tsunami Capacity Assessment of the ability of Tuvalu to receive, communicate and effectively respond to tsunami warnings took place in a workshop held from 26 June – 01 July 2009 in Funafuti, Tuvalu.

The workshop was facilitated by a team of visiting experts and attended by some 28 Tuvalu Government agency representatives, Non-Government Organisations (NGOs), international organisations and the private sector to discuss key areas of tsunami warning and mitigation in Tuvalu by completing a comprehensive questionnaire in session, presentations and site visits.

As well as outlining Tuvalu's current status, strengths and opportunities for improvement with regard to tsunami warning and mitigation, a list of recommendations were formulated by the visiting assessment team in consultation with national participants. The aim of these recommendations is to guide further capacity development programs to target improvements in Tuvalu's tsunami warning and mitigation system.

The local threat sources for the Tuvalu are the South Solomon's Trench, New Hebrides, Tonga, Papua, Philippine and Mariana Trenches. Long distance sources including the Kiril Islands and the South American trenches, Peru and Chile can also impact these Islands.

Warne (2009), notes that the sea-level gauge at Funafuti has been installed on the inside of the atoll and that this can result in some damping of the signal from any tsunami. The islands are regularly subject to inundation during King Tides and these have devastating effects on the densely populated (Approximately 420 person/km<sup>2</sup>) nation.

Warne (2009) also notes that there are reports that a surge possibly seismically generated, but more likely a King Tide or meteorological event, occurred at 3:00 on the 17<sup>th</sup> April 2007. While the event may have been highly localised it raises the question of the sensitivity of the measurement, and the damaging sea-level events by the enclosed atoll. All observations of tsunami have been <10cm, despite variability in the observed amplitude at nearby sites like Majuro. This would indicate that while most events will be detected, the information from this site cannot be correlated directly with impact on humans or infrastructure.

The Tuvalu National Disaster Act 2008 (NDA) covers the issue of tsunami warnings and the draft National Tsunami Plan (NDP) that identifies the Tuvalu Meteorological Service as the lead agency for issuing of tsunami warnings. These all provide a sound foundation for the enhancement of the tsunami warning and disaster management system.

The visiting team and workshop participants concluded that there were a large number of very high priority tasks to be addressed. However, the highest priority and a significant first step towards enhancing the tsunami warning and disaster management system, is to review and finalise the National Disaster Plan (NDP) as required under the National Disaster Act (2008).

The visiting team also noted that Tuvalu should be congratulated on their proactive and committed approach to improving disaster management arrangements.

Participants in the workshop stated a number of urgent priority areas that need to be addressed and these are presented in Table 2 below.

The Tuvalu workshop participants are encouraged to use this National Tsunami Capacity Assessment report to guide both national projects and aid funded projects to achieve targeted improvements on the Tuvalu tsunami warning and mitigation system. In turn, this will assist in improving systems for other natural hazards such as earthquakes and cyclones.

Contingent on the availability of human and financial resources, the Australian Bureau of Meteorology (Bureau) and project partners will aim to work with potential donors to bring the findings of this project to their attention on a country and regional scale. This will be done in the hope of further capacity development projects being undertaken.

## 1.2. Recommendations (including priority and resource intensity)

Table 2 outlines the priority and resource intensity for recommendations made to improve Tuvalu's tsunami and mitigation system. Both the priority and resource intensity are based on the consensus of the visiting Tsunami Capacity Assessment team after discussions held within the Tsunami Capacity Assessment Workshop. It is recognised that these rankings may not reflect the opinions of all individuals involved in the workshop as priorities vary depending on personal responsibilities and areas of interest. Each recommendation is important in its own right to achieve holistic improvements in Tuvalu's tsunami warning and mitigation system.

The priority ranking and resource intensity scale used as a basis for allocating a priority and resource intensity to each recommendation is explained in Table 1. The Very High priority recommendations should be seriously considered as requiring urgent completion. Low resource intensity recommendations are considered the 'low-hanging fruit' that are achievable with very few additional resources.

Table 1: Priority ranking and resource intensity scale

PRIORITY	RESOURCE INTENSITY
<b>Very High</b>	<b>Low</b> – Recommendation currently being progressed or could possibly be progressed within the capacity of existing in-country resources (funds and staff).
<b>High</b>	<b>Medium</b> – Recommendation could be progressed by existing staff or with a low to moderate number of additional staff and/or expertise and a moderate level of additional in-country funds. May or may not require external funding.
<b>Medium</b>	<b>High</b> – Recommendation would require a high level of additional staff and/or expertise and funds. External funding support is likely to be required.
<b>Low</b>	<b>Very High</b> – Recommendation would require a very high level of additional staff and funds. External funding support will be required.

**Table 2: Priority and anticipated resource intensity for completion of recommendations made for improving Tuvalu's tsunami warning and mitigation system.**

Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
Very High	Review and finalise the National Disaster Plan. Include as annexes, the completed Tuvalu National Tsunami Plan and the plans of the member agencies of the National Disaster Preparedness Working Group, as required under the National Disaster Act (2008).	Low	Governance and Coordination	Multi-hazard	1
Very High	Widely distribute and promote the National Disaster Plan through the National Disaster Preparedness Working Group and the Island Disaster Committees to key stakeholders.	Low	Governance and Coordination	Multi-hazard	2
Very High	Review the current arrangements between Pacific Tsunami Weather Centre (PTWC) and Tuvalu Meteorological Services to ascertain and clarify the services that are available.	Low	Regional and International Coordination	Tsunami specific	5
Very High	Integration of community-based warning systems into island tsunami plan using existing infrastructure such as church bells	Low	Communications	Multi-hazard	13
Very High	PTWC send SMS warnings to Director (or designate), Tuvalu Meteorological Service and the Disaster Coordinator, National Disaster Management Office (NDMO)	Low	Communications	Multi-hazard	14
Very High	NDMO give due consideration for the receipt of tsunami watch and warning alerts to be sent from the proposed re-commissioned NCC EMWIN, into the 24/7 Police office	Low	Communications	Tsunami specific	15

Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
Very High	Rapid adoption of the mobile network for the receipt of tsunami warnings provided by the PTWC – Director (or designate), Tuvalu Meteorological Service and the Disaster Coordinator, National Disaster Management Office (NDMO)	Medium	Tsunami Warning	Tsunami specific	10
Very High	Enhance the community-based awareness and education programs to ensure the appropriate response of the community to tsunami warnings.	Medium	Tsunami Emergency Response	Tsunami specific	18
Very High	Consolidate and coordinate under the National Disaster Preparedness Working Group (NDPWG), the education and awareness programs delivered by the education system, NGOs and Red Cross.	Medium	Public and Stakeholder Awareness and Education	Multi-hazard	24
Very High	Implement ongoing scheduled assessments (gap analysis), that establish the levels of community awareness. Use findings from the gap analysis to enhance program content and delivery.	Medium	Public and Stakeholder Awareness and Education	Multi-hazard	25
Very High	Provide additional staffing (Deputy Disaster Coordinator) and an appropriate resourcing level to meet the responsibilities articulated under the National Disaster Act (2008) and the National Disaster Plan.	High	Governance and Coordination	Multi-hazard	3
Very High	Develop, implement and exercise (desktop and field-based) the outer island response plans including Standard Operating Procedures (SOPs).	High	Tsunami Emergency Response	Multi-hazard	19
Very High	Obtain, catalogue and appropriately archive all research data to current standards that has been undertaken by international and regional agencies/organisations.	High	Tsunami Hazard	Tsunami specific	21



Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
Very High	Re-commission the EMWIN system in the National Coordination Centre to ensure a redundancy for receipt of warnings.	Very High	Tsunami Warning	Multi-hazard	11
Very High	Undertake risk assessments for all government development projects to the ISO 31000:2009 Risk Management Standard to mitigate identified risks.	Very High	Tsunami Hazard	Multi-hazard	23
High	To maximise the opportunities through current international and regional partnerships to strengthen Tuvalu's monitoring, warning, preparedness and response capabilities in relation to tsunami events.	Low	Regional and International Coordination	Tsunami specific	4
High	Relevant partners to provide appropriate training to the Tuvalu Meteorological Service that will enhance the maintenance and operational activities associated with monitoring equipment.	Low	Tsunami Monitoring Infrastructure	Multi-hazard	7
High	USGS to be approached to review and upgrade as required equipment and infrastructure for the seismic station.	Low	Tsunami Monitoring Infrastructure	Tsunami specific	8
High	BoM to be approached to review and upgrade as required equipment and infrastructure for the sea-level gauge.	Low	Tsunami Monitoring Infrastructure	Tsunami specific	9
High	Seek admission to UNESCO training programmes for media staff that have a multi-hazard focus on disaster preparedness and response.	Low	Tsunami Emergency Response	Multi-hazard	20
High	Develop a full set of Standard Operating Procedures (SOPs) for all agencies identified in the NDP and involved in disaster response.	Medium	Tsunami Emergency Response	Multi-hazard	16

Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
High	Develop and implement a schedule of exercises (desktop and field-based) to evaluate and improve the response phases of National Disaster Plan.	High	Tsunami Emergency Response	Multi-hazard	17
Medium	TTC to formalise with Fiji TV an agreement to provide warnings through this media.	Low	Tsunami Warning	Multi-hazard	12
Medium	To request the international and regional organisations to improve current tsunami modelling using available research resources.	Low	Tsunami Hazard	Tsunami specific	22
Low	To identify current and relevant research in respect to tsunami modelling and pursue an active role contributing to this research.	Medium	Research Expertise	Tsunami specific	6