WORKING GROUP ON TSUNAMI WARNING AND MITIGATION IN THE SOUTHWEST PACIFIC OCEAN

Report to ICG/PTWS-XXIV, Beijing, China, 24 - 27 May 2011

Executive Summary

The Regional Working Group on Tsunami Warning and Mitigation in the Southwest Pacific Ocean (SWP-WG) was formed at the ICG/PTWS-XXI meeting in Melbourne in May 2006 and reaffirmed at ICG/PTWS-XXII in Ecuador in September 2007 and at ICG/PTWS-XXIII in Samoa in February 2009. The aim of the regional working group is to enhance tsunami warning and mitigation in the southwest Pacific Ocean region which is comprised of many small island countries, with particular, identifiable issues. The working group includes members and observer from Pacific Islands Applied Geoscience Commission (SOPAC) countries as well as France and the directors of ITIC and PTWC. The SWP-WG is currently chaired by the representative of New Zealand, with vice-chairs from Fiji and Samoa.

During the last inter-sessional period, no formal SWP-WG meeting were held, but a number of meetings progressed the objectives of the working group. This has included informal meetings held in conjunction with the 2009 and 2010 annual SOPAC meetings in Vanuatu and Fiji respectively. Two formal meetings on seismic data sharing in the region (a Task Team of Working Group 2: Tsunami Detection, Warning and Dissemination) took place in the inter-sessional period, and a seismology workshop was held in Suva, Fiji sponsored by the German Ministry of Foreign Affairs.

The Australian Aid funded capacity assessments of SOPAC member countries for tsunami warning and mitigation were completed during the inter-sessional period and have all now been published and are available.

Although progress has been made in some areas, as demonstrated by the intensive work on seismic data sharing and the completion of the Pacific Island Countries (PIC) tsunami capability assessments, much still remains to be done to fulfil the terms of reference (TOR) of the working group. For this reason it is recommended that the working group continue. Recent tsunami events have demonstrated the importance of mitigation measures, with the most important of these being public education, and the focus of SWP-WG activities needs to acknowledge this.

Recommendations to PTWS-XXIV

1. That the Working Group continues its work during the next inter-sessional period;
2. That in future regional organisations and donors be invited to attend appropriate Working Group meetings as observers;
3. That the appropriate PTWS Technical Working Groups continue to work on issues of importance to the SWP WG including tsunami SOP development, training and the technical issues of tsunami detection, warning and dissemination;
4. That the Working Group refocuses effort on tsunami mitigation including education and training because recent tsunami events confirm the importance of fast public response.

1.0 Introduction

In May 2006, the Regional Working Group on Tsunami Warning and Mitigation in the Southwest Pacific Ocean (SWP-WG) was formed at the ICG/PTWS-XXI meeting in Melbourne in 2006 (see recommendation PTWS-XXI.5). This decision was reaffirmed at ICG/PTWS-XXII in Ecuador in 2007 (see recommendation ICG/PTWS-XXII.6) and ICG/PTWS-XXIII in Samoa in 2009. The primary aim of the Working Group is to enhancing tsunami warning and mitigation in the southwest Pacific Ocean. The SWP-WG is comprised of members and observer from SOPAC countries as well as France and the directors of ITIC and PTWC. It is currently chaired by a New Zealand representative (Ken Gledhill) with vice-chairs from Fiji (position vacant) and Samoa (Filomena Nelson). One of the specific aims of the working group is to encourage Pacific Island Countries (PIC) to join IOC and PTWS.

Two formal working group meetings have been held, the first in Honiara, Solomon Islands, in September 2006, and a second in Samoa in February 2009. Several sessional meetings have also been held. During the last inter-sessional period no formal SWP-WG meetings were held, but a number of related meetings progressed the objectives of the working group. This has included informal Working Group meetings held in conjunction with the 2009 and 2010 annual SOPAC meetings in Vanuatu and Fiji respectively. Two formal meetings on seismic data sharing in the region (a Task Team of Working Group 2: Tsunami Detection, Warning and Dissemination) took place in the inter-sessional period, and a seismology workshop was held in Suva, Fiji sponsored by the German Ministry of Foreign Affairs. Various other activities have contributed to the objectives of the SWP-WG and are therefore reported in this document.

2.0 Meetings During the Inter-sessional Period

2.1 Seismic Data Sharing in the SWP, November 2009, Vanuatu

Because Working Group 2 (Tsunami Detection, Warning and Dissemination) was not in existence at the time, the first meeting of the Task Team on Seismic Data Sharing in the SWP was held under the guidance of the SWP-WG. The Task Team is comprised of representatives from countries in the region who operate or plan to operate seismic networks and technical experts in seismology and seismic network operation. The meeting agreed on principles for seismic data exchange and technical specifications. Full details of the outcome of the meeting can be found in document ICG/PTWS/RWGSP/TT-SDE-I/3. The key outcomes were:

- Data standards agreed were 40 Hz sampling, 3 channel, 20 second latency, Broadband;
- Data streams to be made available to Integrated Research Institutes for Seismology (IRIS) Data Management Centre (DMC) in seedlink protocol;
- Warning Centres (e.g. Pacific Tsunami Warning Centre; PTWC) to obtain data streams from IRIS DMC;
- Countries can run "virtual networks" by getting extra data from IRIS DMC and other concentrating nodes via seedlink.
- The German SeisComP3 software should be considered as a possible standard for training and general use in the region;
- Countries in the region running seismic networks should join the federation of Digital Seismograph Networks;
- A mechanism need to be found to ensure donor coordination and ongoing training and support to ensure seismic network sustainability.

2.2 Ad Hoc Working Group Meeting, November 2009, Vanuatu

The main objective of the Ad Hoc Working Group, held in conjunction with the annual SOPAC Science and Technology and Resources (STAR) meeting was to provide an update on tsunami-related issues and a forum for PICs to progress issues related to tsunamis at the international and regional levels and to encourage PICs that were not already members of IOC and PTWS to join. It was particularly important to meet at this stage following the impacts of the Samoan tsunami in September. A special evening session was organised during the SOPAC STAR science meeting to report on the tsunami and its impacts on Samoa and Tonga. A STAR working group formulated recommendations on improvements to tsunami warning and educations which were presented by the STAR chair to the SOPAC Governing Council followed the STAR meeting. Details of the recommendations can be found in the report of the SOPAC Governing Council session.

2.3 Seismology Training Workshop, July 2010, Fiji

A two week training course on seismology and SeisComP3 was organised by GFZ with funding from the German Ministry of Foreign Affairs and held in Suva, Fiji in July 2010. This training workshop was attended by representatives from 14 PICs with the SWP-WG chair involved as one of the tutors for part of the workshop. The workshop covered an introduction to global seismology and included training on the installation and operation of SeisComP3. During the later stages of the workshop the participants developed a position paper outlining what is required for effective tsunami warning in the region. Although this is not an official document it was presented to the SOPAC Director at the time.

2.4 Ad Hoc Working Group Meeting, October 2010, Fiji

Again in 2010 in conjunction with the annual SOPAC STAR meeting an ad hoc Working Group meeting was held. The meeting provided updates on tsunami-related issues and a forum for PICs to progress issues related to tsunamis at the international and regional. A STAR working group formulated recommendations on improvements to tsunami warning and educations (similar to those produced the year before) which were presented by the STAR chair at the SOPAC Governing Council followed the STAR meeting. Details of the recommendations can be found in the report of the SOPAC Governing Council session.

2.5 Seismic Data Sharing in the SWP, February 2011, New Zealand

As a part of a Working Group 2 (Tsunami Detection, Warning and Dissemination) meeting held in Wellington, New Zealand a second meeting of the Task Team on Seismic Data Sharing in the SWP was held. The meeting endorsed the principles for seismic data exchange and technical specifications from the previous meeting, and discussed
implementation. Full details of the outcome of the meeting can be found in the appendix to the Working Group 2 document (document reference). The key outcomes were:

- That the technical specifications agreed at the Vanuatu Task Team meeting be endorsed (40 HZ sampling, 3 channel, 20 second latency, Broadband);
- That seismic data be supplied to IRIS DMC via the seedlink protocol for use by Warning Centres;
- That SeisComP3 be endorsed as the preferred seismic analysis system for training and general use in the SWP;
- That a mechanism be established to allow users in the SWP to easily communicate for mutual support;
- There is a need for more in-depth training on how to configure and use SeisComP3;
- Documentation is needed on data communications option and the selection of appropriate seismograph sites.

3.0 Activities Contributing to Working Group Objectives

Although not formally organised by the SWP-WG, the following activities have contributed to the objectives of the working group:

3.1 Tsunami Preparedness and Education

Preparedness and education activities during the inter-sessional period have included various training missions undertaken by International Tsunami Information Centre (ITIC) and PTWC. Missions were undertaken to Samoa and Tonga (with the assistance of PTWS and SWP vice-chair Filomena Nelson), and representatives from the SWP attended the annual ITIC training programmes in Hawaii in 2009 and 2010.

3.2 Tsunami hazard in the SW Pacific

This project was funded by the Australian Agency for International Development (AusAID) and was collaboration between SOPAC and Geoscience Australia. The project’s aim was to enhance the capacity for tsunami risk assessment in PICs. This has resulted in a series of inventories of tsunami risk-related data for selected PICs, and two hazard assessments: a preliminary tsunami hazard assessment and a probabilistic tsunami hazard assessment for the SW Pacific. In addition a tsunami modeller has been trained at SOPAC to make use of this information and apply it to detailed risk assessments for individual countries.

3.3 Assessment of SOPAC Member Countries Capacity to Receive and Respond to Tsunami Warnings

The National Capacity Assessment of Pacific Islands Applied Geoscience Commission (SOPAC) Member Countries: Tsunami Warning and Mitigation Systems works in collaboration with the member countries of SOPAC to assess their capacity to receive communicate and respond effectively to tsunami warnings. The project was led by the Australian Bureau of Meteorology, in partnership with Emergency Management Australia (EMA), SOPAC, and with the assistance of the UNESCO/IOC. The project was funded by AusAID.
By undertaking an assessment of the capacity of individual nations to manage tsunami events, the project provides a better guide for donor funding towards achieving targeted improvements in the tsunami warning and mitigation systems of respective countries. The project was completed in the inter-sessional period with the final reports published in February 2011 and is now available.

3.4 Solomon Island Tsunami Capacity Strengthening

A national tsunami capacity building project in the Solomon Islands has been carried out by the Australian Bureau of Meteorology in collaboration with SOPAC and funded by AusAID. This involved the development of tsunami response SOPs, training and exercises.

3.5 Samoa Pilot Project on Community Based Tsunami Evacuation Maps

In February 2011 GNS Science, in collaboration with the Samoa Ministry of Natural Resources and Environment (MNRE), the New Zealand Ministry of Civil Defence & Emergency Management (MCDEM) and SOPAC began a pilot project on awareness and preparedness to tsunami threats in Southwest Pacific Nations. This involves developing high level evacuation maps for Samoa and to pilot the development of village specific evacuation maps, signage and simulation exercises for four selected at risk Samoan villages. This work is part of a broader project being funded by the New Zealand Aid Programme of the Ministry of Foreign Affairs to improve disaster preparedness in the region.

4.0 Forward Path

The body of this report demonstrates that there has been a wide range of activities undertaken during the inter-sessional period relating to the objectives of the Working Group. However, the range of activities also demonstrates one of the major problems facing the region: coordination of effort. For example many donor countries have already, or are about to offer funding for the establishment of observation stations, but this is often poorly coordinated, with the produced data not easily available in real-time to the regional community or Warning Centres. To address the tsunami related issues facing the region the following is required:

- Relationships between the regional organisations which contribute to tsunami warning and preparedness need to be clarified and formalised (SOPAC, PTWS/SWP-WG, Meteorological Services, etc.). Many of the aims of the Working Group are shared by other organisations in the region, at least for multi-hazard strategies.

- There needs to be a mechanism to coordinate donor contributions within the regions, particularly as this applies to seismic and sea level observation stations.

- Recent tsunami events suggest that more emphasis should be given to the mitigation work by the Working Group because the largest tsunami impacts come from local events where the warning time is very short and often no formal warning is available. A large focus of the Working Group since its formation in 2006 has been on the improvement of the warning system in the region, and although this work needs to continue, renewed focus on mitigation is required.
A number of requests and recommendations from the various meetings and activities were addressed to Working Group members, and progress on these will require continued interaction of members, and a continuation of the work of the SWP-WG.