Working Group 2: Tsunami Detection, Warning and Dissemination

Report to PTWS Steering Committee 2018
Local-Source Tsunami Response Best Practice
(Joint with WG1, 2 and 3) (1)

**Context:** The ICG instructs Working Group 2 to develop guidelines and SOPs to inform the ‘best practice’ response to these local tsunami events

- A draft document was presented to WG1, 2 and 3 for discussion; this will be updated considering the group’s feedback.
- This document should be more about guiding principles, and we allow individual countries to shape their own SOPs to fit their own unique scenarios/ circumstances.
Local-Source Tsunami Response Best Practice (Joint with WG1, 2 and 3) (2)

**Context:** *The ICG instructs Working Group 2 to develop guidelines and SOPs to inform the ‘best practice’ response to these local tsunami events*

**Recommendation:**

➢ Steering committee reviews document and provides feedback by 16th July.

**Questions for the Steering Committee:**

1. Once final, how is this approved and adopted?
2. Where does the document reside?
New Technologies, Techniques and Studies (Joint with WG1)

Talks were presented by:

- Tim Melbourne (Central Washington University) on developments using GNSS
- Bruce Howe (University of Hawaii) on Smart Cables – sensors on telecommunications cables
- Diego Arcas (NOAA - PMEL) on 4th Generation (4G) DART buoys

These methodologies are at varying degrees of maturity, but 4G DARTs and real-time GNSS will likely be viable and valuable sources of data in the near future (5 years).
Minimum competency level for NTWC operations (1)

Context: The ICG instructed Working Group 2 to establish by mid-2018 the minimum competency level for NTWC operations, by identifying (i) what competencies are required and (ii) what training schemes are currently in existence and what guidelines and principles can be adapted for this purpose. Report progress on this task to the PTWS Steering Committee.

➢ A draft document outlining a proposed competency framework for NTWC staff was presented to the working group.

➢ The competency framework suggests a two-tier system with different levels of knowledge and skills required depending on the roles.
Minimum competency level for NTWC operations (2)

Suggested competency levels:

- Tier 1 - Tsunami event controller (or manager) which requires a comprehensive understanding of tsunami causes and impacts, the interpretation of PTWC products and national warning procedures

- Tier 2 - Tsunami event assistant which requires a basic understanding of tsunami causes and impacts, an understand of the PTWC products and can follow the national warning procedures

A list of knowledge and competency levels is defined for each tier.
The discussion on the framework produced some feedback and suggestions and it was decided to nominate a small team to work further on the document. This team will be made up of: Wilfried Strauch, 'Ofa Fa'anunu, Yuelong Miao, Chip McCreery, Lara Bland, Laura Kong, and Ken Gledhill.

This group will produce a revised draft of the document to be presented to the ICG next year.

We request that the wider group review the document further and provide feedback to Ken Gledhill by 16 July, with the intention that the group will produce the next draft well before the ICG deadline.
Optimal sensor networks for tsunami (1)

**Context:** The ICG instructed Working Group 2 to review the sensing network of the PTWS and develop an optimal (defined by functional, resourcing and capability requirements) multi-instrument design that integrates emerging techniques and sensor technologies (e.g. better use of tide gauges; GNSS technology and processing; sensors on telecom cables) with the existing sensing network to meet tsunami warning service requirements. This investigation should include cost-benefit analysis of the potential technologies being considered.

- The group discussed the instruction from the ICG to review the sensing network of the PTWS and develop an optimal multi-instrument design that integrates emerging techniques and sensors with the existing sensing network to meet tsunami warning service requirements.
Optimal sensor networks for tsunami (2)

Because the task was not well defined, we spent some time better defining the goal of the network, as follows:

- Primary goal: Detect and characterise the generation of a tsunami within 5 minutes
- Secondary goal: Monitor and understand the evolution of tsunami waves/tsunami event

Our objective is to define the optimal observing network to achieve these goals.

After much discussion in the meeting about frameworks to compare the effectiveness of the various monitoring and detecting technologies, we tasked a small group of Tim Melbourne, Lara Bland, Mike Angove, Diego Arcas and Ken Gledhill to pull together a framework based on the discussions.
The framework which is emerging will be based largely on Seismic, DART and GNSS technologies.

We then propose to devise a process that allows us to test the coverage of the networks, based largely on achieving the primary goal listed above.

The framework is based on what it takes to identify directly or estimate the sea-surface changes.
Optimal sensor networks for tsunami (4)

For example:

- if we can fully measure the sea surface within the defined detection time we have “excellent” information
- if we can estimated the sea surface within the defined detection time we have minimum information
- if the sea surface is unknown within the defined detection time we have minimal or no information
Detection and Characterisation (5)
Detection and Characterisation (6)
Detection and Characterisation (7)

Bottom Pressure (DART 4G)
Finite Fault (GNSS)

Data Availability—2021?
Report and Review of PTWS (PTWC & NWPTAC) enhanced products (1)

Context: The PTWC enhanced tsunami warming products were introduced in 2014, and the NWPTAC products in 2017. Is it now time to review the enhanced products and look at how they can be improved?

A discussion was held with the working group to gather feedback and updates on the products. Key discussion points and outcomes were:

- There is no need for a major review of products at this stage but all groups should continue conducting reviews after events and exercises to gather feedback on the products
- Repeated and regular PTWC messages over the course of an event should highlight whether information has changed
- Should graphical product transmission only be repeated if the information changes? This should be discussed by the Steering Committee
Agencies using the products would like the messages containing predicted or observed arrival times at points around the Pacific to group these arrivals by country, and order them by arrival time within that group.

A new system was proposed whereby the PTWC would issue monthly tests to these numbers and if a number fails for three consecutive months it would be removed from the database. This would then be advised to the Secretariat.

The PTWC website may be rearranged to show domestic US/Canada warnings separately from international warnings. A static display with example screen pages was shown.

Soon PTWC will alter the wave height measurements in its products to show how they were calculated.
Report and Review of PTWS (PTWC & NWPTAC) enhanced products (3)

- A list of currently outstanding changes to PTWC products is included in the PTWC report to this meeting.

**Recommendations:**

- That the Steering Committee endorses the testing and revision of the facsimile contacts database as proposed.

**Questions for the Steering Committee:**

1. Should PTWC products be altered so that repeated messages highlight the nature of any changes since previous messages?
2. Should graphical products be sent repeatedly if there is no change in them?