



UNESCO/IOC – NOAA ITIC Training Program in Hawaii (ITP-Hawaii)
TSUNAMI EARLY WARNING SYSTEMS
AND THE PACIFIC TSUNAMI WARNING CENTER (PTWC) ENHANCED PRODUCTS
TSUNAMI EVACUATION PLANNING AND UNESCO IOC TSUNAMI READY PROGRAMME
7-18 August 2023, Honolulu, Hawaii USA

Lessons Learned from Past Tsunamis - 2009 South Pacific, 2022 HTHH

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South Pacific Tsunami – 29 September 2009

- ❑ Mw 8.1 earthquake and local tsunami (12-20 min). Doublet (one subduction, 1 outer rise normal fault within minutes of each other)
- ❑ Impact to American Samoa, Samoa, and Tonga (Niuatoputapu) – deaths, damage

Lessons Learned

- ❑ Awareness works.
 - ❑ AS: Disaster Preparedness Month, exercise was planned for that day; months before PTWC/ITIC briefed (15 min is minimum). Schoolteachers take charge - students to high ground (Poloa, Tula)
 - ❑ Samoa: 2007 National Drill with evacuation maps, PSA EQ and Tsunami videos (AUSAID), ICG/PTWS in Apia Feb 2009

Hunga Tonga – Hunga Ha'apai Tsunami – 15 January 2022

- ❑ Volcano eruption generated tsunami and atmospheric pressure wave that generated wave.
- ❑ Acoustic 'boom' heard in Alaska, wave observed in Caribbean, Atlantic, Indian Ocean
- ❑ 4 deaths locally, 1 in Peru (related to fuel unloading)
- ❑ PTWC ad hoc messages. No TW, nor forecast (models unknown)
- ❑ Interim HTTH PTWC response implemented in March 2022

Lessons Learned

- ❑ Must detect, then warn. But Volcano eruption has more lead time. 'Faraway' countries should monitor wave for potential threat.
- ❑ 14 January event 'pre-alerted'
- ❑ WTAD and other awareness made public aware

In Conclusion...

- ❑ **Every tsunami is unique and can provide new information to improve early warning and responding**
- ❑ **Tsunami problem is dynamic – technologies for detection, evaluation, forecasting, and alerting keep changing.**
- ❑ **Atolls / small islands are PTWC TSP challenge as forecast site specific, requires high-res bathy – scenarios most critical**
- ❑ **Continuing challenges in communications (robust, remote, low cost to reach all)**
- ❑ **Coastal vulnerabilities change with increasing coastal populations and infrastructure**
- ❑ **We must continue to share our knowledge and experiences to improve the system.**



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Thank You

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