

UNESCO/IOC – NOAA ITIC Training Program in Hawaii (ITP-TEWS Chile) TSUNAMI EARLY WARNING SYSTEMS AND THE PACIFIC TSUNAMI WARNING CENTER (PTWC) ENHANCED PRODUCTS TSUNAMI EVACUATION PLANNING AND UNESCO IOC TSUNAMI READY PROGRAMME 19-30 August 2024, Valparaiso, Chile

Intergovernmental Oceanographic Commission

What Do Tsunami Warning Centers Provide to Emergency Response Agencies?

Dr. Charles McCreery Director, PTWC

presented by and with a minor contribution of Dr. Öcal Necmioğlu Technical Secretary of the ICG/PTWS and ICG/CARIBE-EWS UNESCO-IOC Tsunami Resilience Section



Tsunami Warning Centers – Two Types

Tsunami Service Provider (TSP)

A center like PTWC, NWPTAC (JMA), SCSTAC (China), CATAC (Nicaragua) with the capability to detect and assess tsunami threats over a large region, and that has been accepted by the ICG to disseminate their threat assessment to other Member States



Tsunami Warning Centers – Two Types

National Tsunami Warning Center (NTWC)

- A center operated by a Member State that has the authority by law or otherwise to issue tsunami warnings for the coasts of that Member State.
- Ideally, an NTWC should have some technical capability to aid in decisions.





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Information Flow



Functions of an NTWC

BASIC

- Monitor and Locate Earthquakes
- Monitor and Detect Tsunami Waves
- Assess the Tsunami Threat
- Create and Disseminate Alerts
- Monitor Tsunami Impacts
- **OTHER CRISIS ACTIVITIES**
- Consult with NDMO During Events
- Brief the Media Your Partner

OTHER NON-CRISIS

Outreach

Monitor for Earthquakes

- SIMPLE Monitor other observatories realtime reporting of earthquakes (e.g., CISN).
- COMPLEX Operate a seismic network and perform real-time analysis of seismic waveform data.



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Monitor for Tsunami Waves

- SIMPLE Run software to display data from existing global network of sea-level gauges (e.g., TideTool software or IOC website)
- COMPLEX Operate network of coastal and deep-ocean sea level stations.



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Assess the Tsunami Threat

- SIMPLE Base the tsunami threat on PTWC messages.
- COMPLEX Independently determine the tsunami threat based on sea-level readings, historical data and/or forecast models.

Create and Disseminate Alerts

 SIMPLE – Issue warning / no warning to NDMO for all coasts based on maximum threat anywhere (NDMO alerts public)

 COMPLEX – Issue area-specific alerts of different levels to NDMO and public by numerous communication methods.

Monitor Tsunami Impacts

- Monitor network of real-time reporting sea level gauges along coasts.
- Monitor local television and radio for reports of tsunami impacts.
- Get reports from EMs, police, fire department, other spotters, especially for vulnerable coasts.
- Determine if/when alert levels should be raised, lowered, or cancelled.
- Wait sufficient time to ensure threat has passed before cancelling.

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Other Crisis Functions of an NTWC

Consult with NDMO During Events

Consider other factors that may play into decision-making:

□ Time of Day – Day, Night, Traffic

□ Season of Year – Temperature, Weather

Weekday, Weekend, Holiday, Special Events

Advise about NTWC

What Readings are Coming Next

- Confidence in Forecast
- Expected Level of Impacts
- Places Expected to Have Biggest Impacts
- When to Expect Cancellation

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Other Crisis Functions of an NTWC

Brief the Media – Your Partner

Stay on Point – What is In Official Message

- Big Earthquake Occurred
- Potential (Watch) or Confirmed (Warning) Tsunami Threat
- Take Warnings Seriously
- Follow Instructions from NDMO

Don't Over-Speculate or Over-Discuss

- Public Won't Take Action if Mixed Message
- Media Will Want Your Opinions / Details
- □ Give Official Message Only

Non-Crisis Functions of an NTWC

Outreach

- Advise NDMO, Media, Public on Tsunamis and Potential Tsunami Threats
 - Tsunami Characteristics
 - □ Not If, But When
 - Potential Sources Local, Distant
 - Potential Impacts Lead Times,
- Advise NDMO, Media, Public on Limitations
 - Many Unknowns: Exact Source, Coastal Effects
 - □ Limited Data: A Few Readings
 - You Act Conservatively

There will be Over-Warning

What should Tsunami Emergency Response Agencies Expect from an NTWC

- Rapid Notification of a Potential Tsunami Threat
- Conservative Evaluation of a Tsunami Threat
- Reasonably Rapid Stand-Down if No Tsunami Threat
- NTWC Underlying Principles
 - Will Provide Forecast as Accurately as Possible but still Conservatively
 - Saving Lives is Highest Priority
 - Protecting Property only When Possible

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Limitations to be Prepared For

- Over-Warning due to Conservative Criteria
- General Forecast of Threat with Few Specifics
- Potential for Error in ETAs
- Uncertainty About How Long Impacts will Last

In a Nutshell...



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