

Regional Training Workshop on Pacific Tsunami Warning Center Enhanced Tsunami Products for ICG/CARIBE EWS Oct. 31 – Nov. 1, 2017 Cartagena, Colombia

# What do Tsunami Warning Centers Provide to Tsunami Emergency Response Agencies?

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# **TSUNAMI Warning System**



### **Tsunami Warning Centers – IOC Definitions**

#### **Tsunami Service Provider (TSP)**

Centre that monitors seismic and sea level activity and issues timely tsunami threat information within an ICG framework to National Tsunami Warning Centres / Tsunami Warning Focal Points and other TSPs operating within an ocean basin.

The NTWCs / TWFPs may use these products to develop and issue tsunami warnings for their countries. TSPs may also issue Public messages for an ocean basin and act as National Tsunami Warning Centres providing tsunami warnings for their own countries. Several ICG Tsunami Service Providers have been established.



#### **Tsunami Warning Centers – IOC Definitions**

#### National Tsunami Warning Center (NTWC)

Centre officially designated by the government to monitor and issue tsunami warnings and other related statements within their country according to established national Standard Operating Procedures.







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# **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 – DURING CRISIS**

- Consult with NDMO During Events
- □ Brief the Media Your Partner

# **OTHER – DURING 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.



#### Assess the Tsunami Threat

- SIMPLE Base the tsunami threat entirely on PTWC messages.
- COMPLEX Independently determine the tsunami threat based on the earthquake parameters, 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.

# **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 and tsunami status

- What Readings are Coming Next
- Confidence in Forecast
- Expected Level of Impacts
- Places Expected to Have Biggest Impacts
- When to Expect Cancellation

# **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 TER can Expect from NTWC

- Rapid Notification of a Potential Tsunami Threat
- Cautious Evaluation of 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

### **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



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# **Thank You**

Laura Kong UNESCO/IOC – NOAA International Tsunami Information Center

> Charles McCreery NOAA Pacific Tsunami Warning Center