



CTIC
Caribbean Tsunami
Information Centre



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

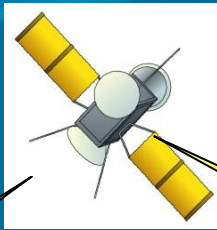
What do Tsunami Warning Centers Provide to Tsunami Emergency Response Agencies?

Laura Kong
UNESCO/IOC – NOAA International Tsunami Information Center

Charles McCreery, Stuart Weinstein
NOAA Pacific Tsunami Warning Center

TSUNAMI Warning System

**Earthquake
Tsunami**

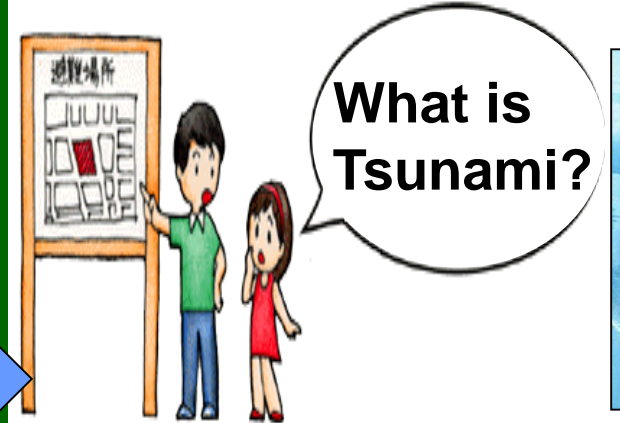
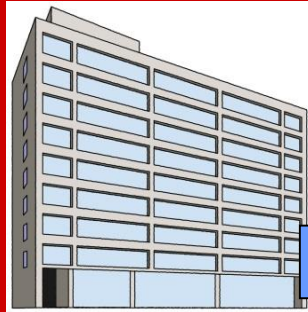


*Thanks to Cabinet Office
Japan*

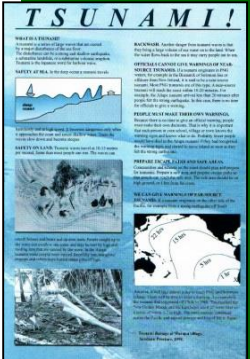
**Tsunami
Warning
Center**



National Government → **Local Government**



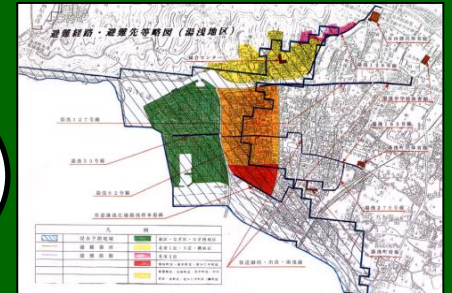
What is
Tsunami?



Mass Media



Where is
Evacuation
Route?



**International
- Regional
Framework**

National Warning System

Public Awareness

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.

Fiji



Yap



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

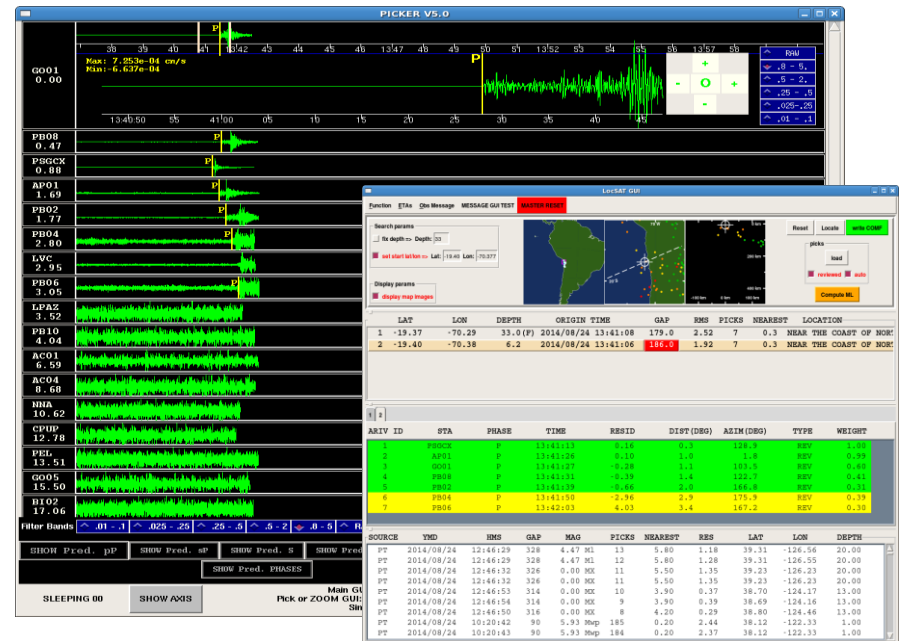
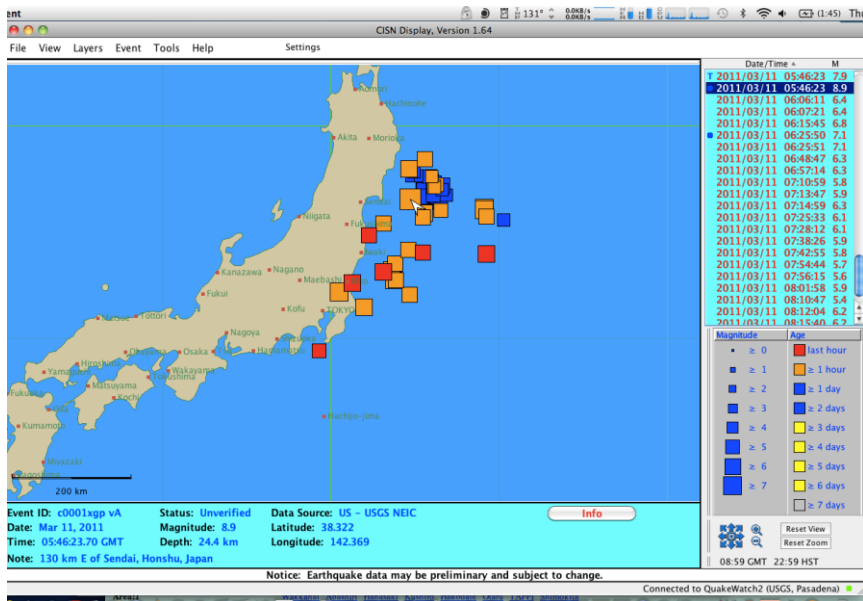
OTHER – DURING NON-CRISIS

- ❑ Outreach

Basic Functions of an NTWC

□ Monitor for Earthquakes

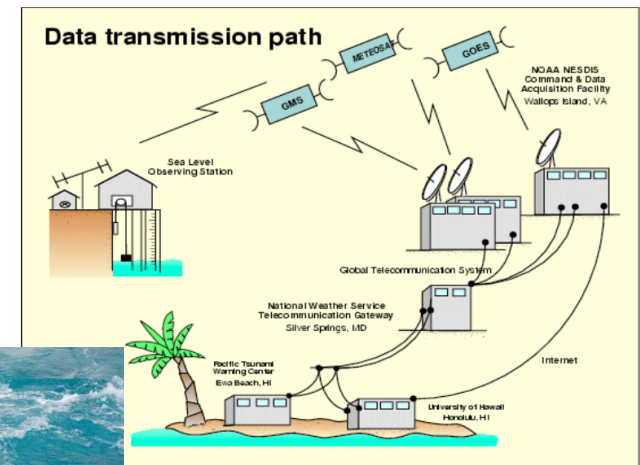
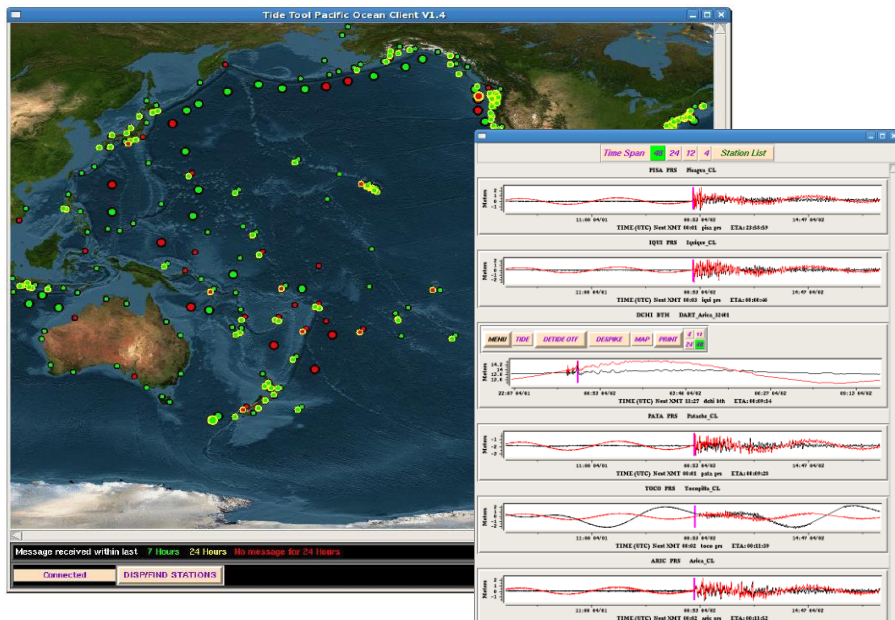
- **SIMPLE** - Monitor other observatories real-time reporting of earthquakes (e.g., CISN).
- **COMPLEX** – Operate a seismic network and perform real-time analysis of seismic waveform data.



Basic Functions of an NTWC

□ 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.



Basic Functions of an NTWC

- **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.

Basic Functions of an NTWC

- **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.

Basic Functions of an NTWC

□ 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

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