



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

What Do Tsunami Warning Centers Provide to Emergency Response Agencies?

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Director, PTWC

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.

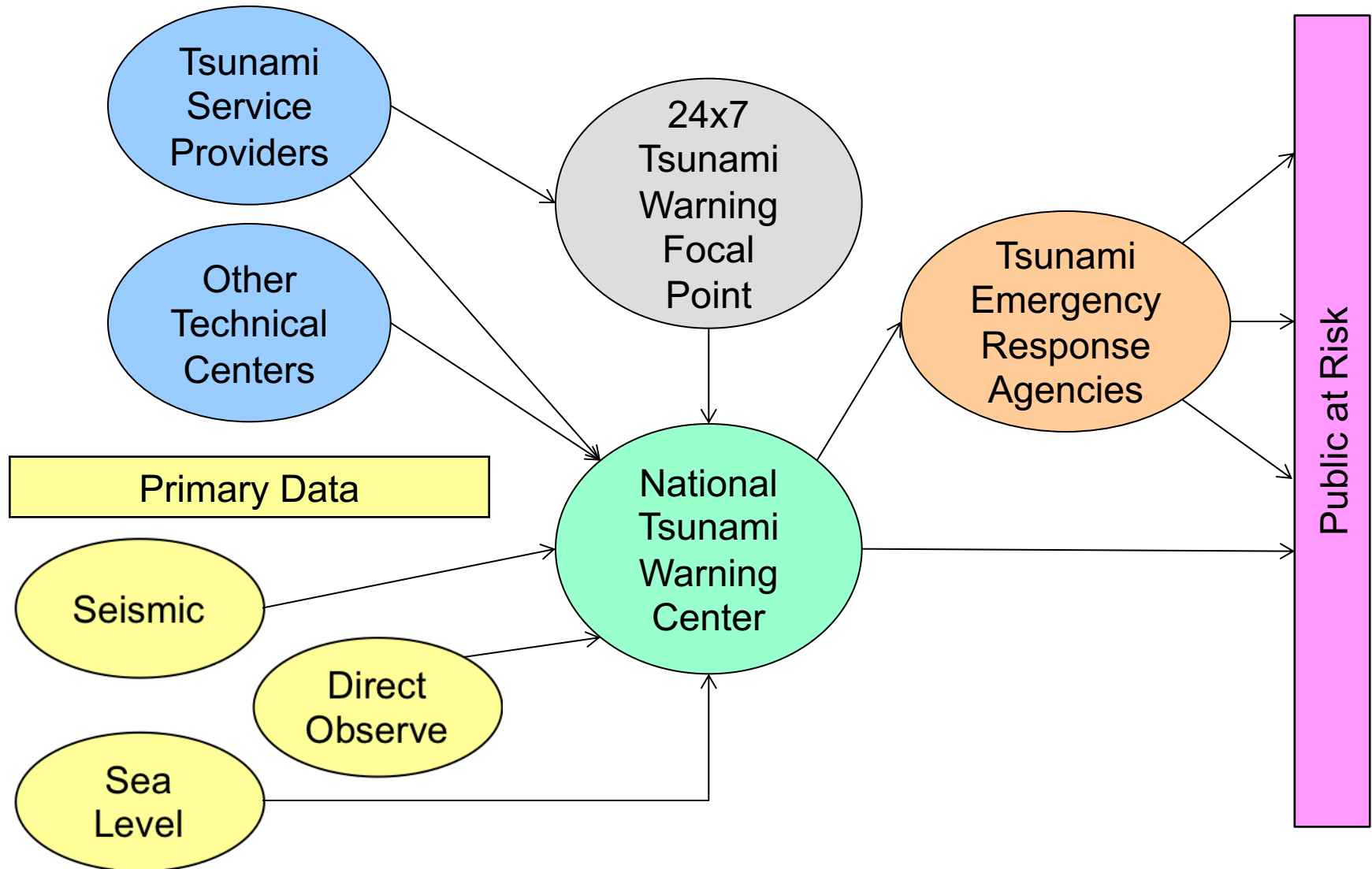


Tonga



Peru

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

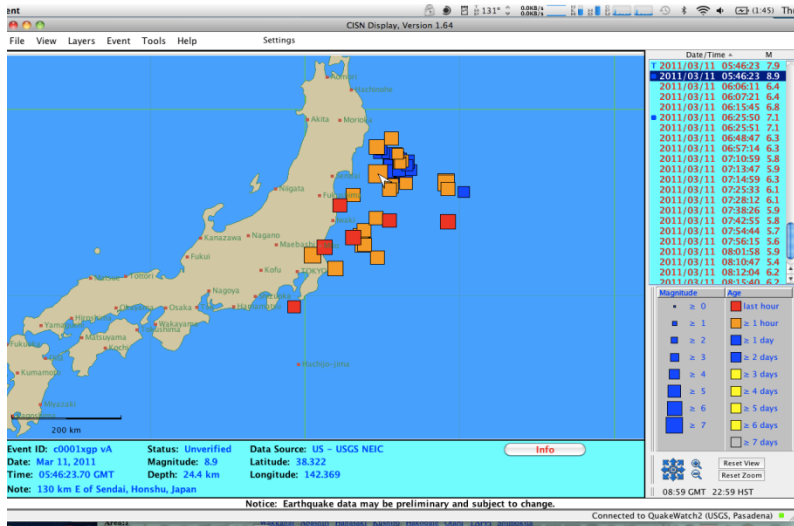
OTHER NON-CRISIS

- ❑ Outreach

Basic Functions of an NTWC

□ Monitor for Earthquakes

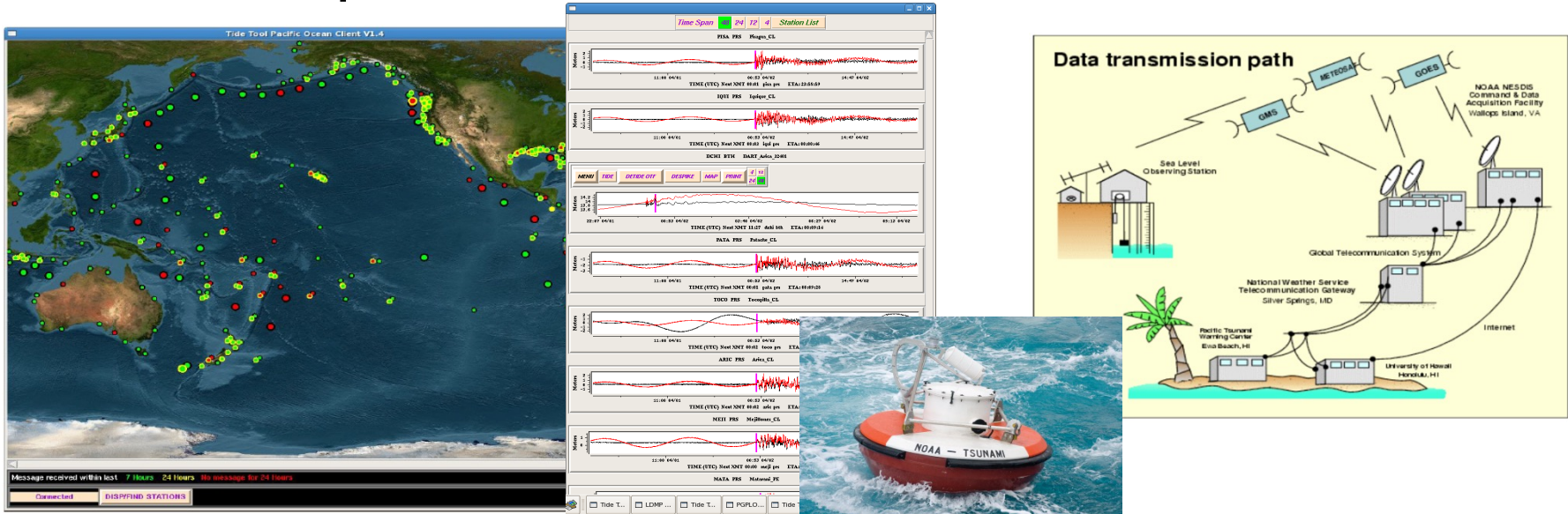
- **SIMPLE** - Monitor other observatories real-time reporting of earthquakes (e.g., CISN).
- **COMPLEX** – Operate a seismic network and perform real-time analysis of seismic waveform data.



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 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.

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**
 - 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 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

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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