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

Tsunami Warning Center SOPs: Routine (non-crisis) operations – readiness, data, networks

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PTWC TWS Staffing

3 Staff Shifts (2 persons/shift)

- *Monitor earthquakes/tsunamis around the clock*
- *Issue earthquake information (Observatory Msg)*
  => 2-3 times a week.
- *Issue Tsunami Information Statements*
  => 1-2 times a month
- *Issue tsunami threat/warning messages*
  => A few times a year

OK. So… What are we doing when there are no Earthquakes/Tsunamis ?

Tsunami and Earthquake Monitoring System

Jet-lagged ITP Participant

Operation and maintenance
24 hours a day 7 days a week

Battle against complacency

Ongoing Efforts for More Rapid & Accurate Tsunami Information

CONTINUOUS UPGRADING/RESEARCH OF:

- *Seismic and Sea Level networks*
  => Maintaining Station Metadata, Adding new Stations
- *Processing systems for determination of earthquake location and magnitude*
  => Incorporating GNSS (Finite Fault, Fast Mw)
- *Quantitative tsunami forecast system by numerical simulations*
- *Dissemination to public*
  => Working on upgrading tsunami.gov using social science
- *Outreach for preparedness of partners and public*
  => Work with ITIC

Tsunami Warning System for Each Country

Structure of Tsunami Warning System depends on Geological Setting!

What does your country need? ***Local tsunami? Distant tsunami?***

Components of Tsunami Warning System	Local Tsunami	Distant Tsunami
Network of seismographs	○	※
Tide gauge to monitor tsunami	○	○
Dedicated line to tranmit data in real time	○	○
System to calculate magnitude with seismic data and hypocenter	○	※
Evaluation of Tsunami	○	※
Communication facility to disseminate Tsunami Warning	○	○
System to receive tsunami warning from Regional Center	–	○

○ : on your responsibility

※ : under international cooperation

TWC Operations – Routine

Goal: 100% Readiness of System (data, methods, comms)

- **Daily Operations**
  - Shift Operations - Overlap of Shifts, Briefings
  - Routine Checklists, Trouble Log
- **TWS System (Activities)**
  - Seismic Data Collection and Analysis
  - Sea Level Data Collection and Analysis
  - Decision-Making Tools and Procedures
  - Message Creation and Dissemination
- **What must be maintained to carry out Activities?**
  - Observational Networks
  - Analysis and Decision Tools
  - Communication Methods
  - Personnel (trained and ready staff)
- **What are the SOPs to ensure they are always ready?**
  - Regular Checks of Critical Systems and Software
  - Routine Communication Testing
  - Continuity of Operations - Backup Systems
  - Repair of Non-functioning Components

TWC Operations - Operation 24 hrs/day, 7 days/week ...

Succession of Operation

- ✓ Shift-change Briefings -
  Brief the next shift on activity and system readiness

- ✓ Event/System Reports –
  Official Message Product => Timeline
  System status => Report outages

- ✓ Daily Schedule Sheet -
  checklist of daily tasks
  logged as completed

TWC Operations - Operation 24 hrs/day, 7 days/week ...

PTWC OPERATIONS DAILY CHECKLIST & LOG

Version: 05/17/2022 - Post COVID Emergency Order

Date at Start: ____ / ____ / ____

Su Mo Tu We Th Fr Sa

Team Member 1: _____

Team Member 2: _____

Team Member 3: _____

		1 00-06		2 06-14		3 14-24		Notes
GENERAL	Disinfect Ops (keyboards,mice,phones,HAWAS,Hotline,chairs)							
	Ops Area Readiness (clean,tidy,lights,doors,temperature,trash)							
	Printers, Fax Machine (paper, toner, sort/recycle printouts)							
	Paging Systems (primary, redundant)							
	Phones: HAWAS, NAWAS, POTS, Iridium (check volume)							
	Crestron A/V System (check upper screens)							
STATION 1 (kaiapele, hoio)	*MONITORS*: NEXUS (restart dead processes)	R	P	R	P	R	P	
	MONITORS: FAA & NMC Circuit Logs (check PHEB tests)							
	MONITORS: Email (read/reply, run filters)							
	MONITORS: Email Check RUNUP, WCMT Mailboxes							
	MONITORS: TWFP Contacts GUI							
	SEISMIC: COMFed, Pick Map, Pick, CISN, Wphase Listener							
	SEISMIC: Watchstander Pager GUI (set to standby person)							
	SEISMIC: LocSAT GUI (ETAs, Bulletin test, Master Reset)							
	WATER: Sea Level Sentinels (rtt, nos, ak), LDMP Client							
	WATER: TSI2 Map, Tide Tool, Tide Tool Client Maps							
	WATER: RunUp Detect (note color/status of stations)							
	WATER: Tsunami Detector							
	SIFT: Event GUI (submit COMF), SIFTView (run forecast)							
	SIFT: SIFTView (run forecast and sims)							
	RIFT: RIFT GUI (submit COMF, run forecast, Reset button)							
	RIFT: Test Import of CMT PARAMS from USGS, CPPT							

e.g., For Warning Centers, SOPs are not just on what to do in an Earthquake.

<u>They should also be geared to maintaining</u>:

100% Operational Reliability

1. Data availability monitoring
2. Data quality monitoring
3. Maintenance and repair priorities
4. System Modification Procedures
5. System Failure Procedures

Long Term Readiness:

1. Communication Tests
2. Table-top Exercises

e.g., For Warning Centers, SOPs are not just on what to do in an Earthquake.

<u>They should also be geared to maintaining</u>:

Backup Capability

1. **In the event PTWC cannot fulfill its mission we transfer responsibilities to the NTWC (Based in Alaska) and vice versa.**

Thank You

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