



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

IOC Manual & Guides 82 (2020)

Preparing for Community Tsunami

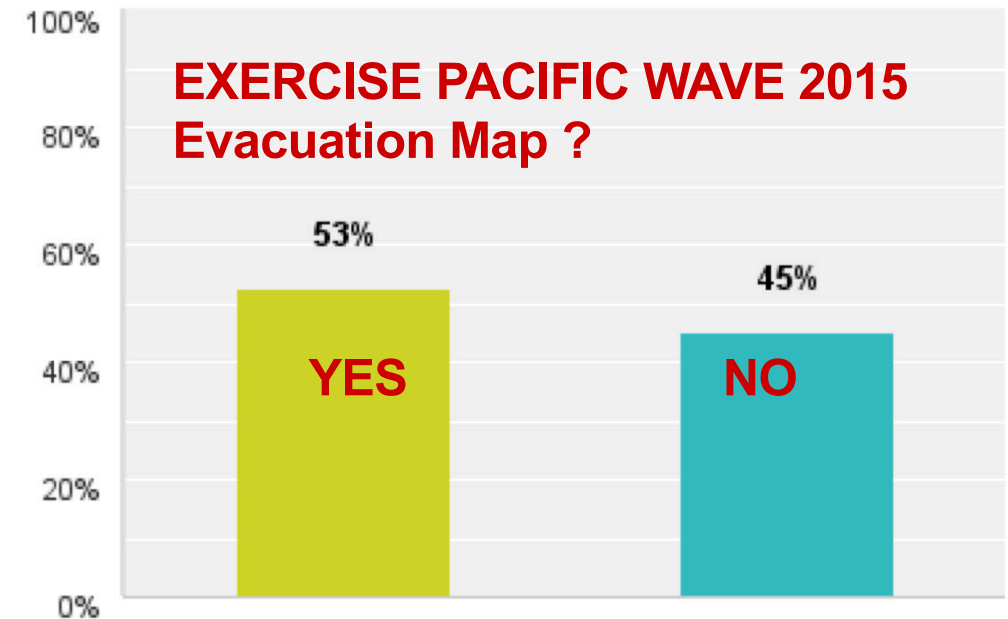
Evacuations: From inundation to evacuation
maps, response plans and exercises

Dr. Laura Kong
Director, ITIC



Motivation - PTWS Priority (2015+) – Preparedness

- **2007 – 2019:** Development of and changeover to forecast-based products (PTWC enhanced products, 2014; JMA NWPTAC, 2019)
- **2015 – 2020+:** At ICG/PTWS-XXVI (2015), Member States agreed next focus should be on Preparedness
- ***Communities must know what to do and where to go when a tsunami is imminent (> 50% lack plans)***
- ***ITIC proposed capacity building – Tsunami Evacuation Maps, Plans, and Procedures (TEMPP)***



TEMPP Training – developed as 2015-2017 Pilot

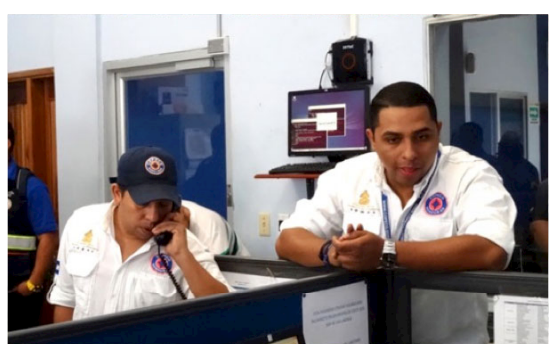
- **Goal: Reliable evacuation maps by communities and govt**
- **Global standardized tools and methodologies**
- **Direct outcomes for country:**
 - ✓ Communities that know what to do and where to go
 - ✓ Country capability and tools to replicate community evacuation map process elsewhere
 - ✓ Community meets Tsunami Ready Intl guidelines
- ◆ **Pilot – Honduras, Central America, in Spanish**
- ◆ **Final Product: IOC Publication (Manual and Guides 82) – TEMPP Review from ICGs, Global TOWS Inter-ICG TT DMP**
- ◆ **TEMPP process results in UNESCO IOC Tsunami Ready**



TEMPP PROCESS - WORKSHOPS / TRAININGS 2015-17 PILOT (1.5 YRS = 5 1-week trainings)	DATES
TEMPP 1: Tsunami Inundation Modeling – ComMIT/MOST	27-31 July 2015
TEMPP 2: Seismic Tsunami Sources for Honduras Meeting	29 Feb– 1 March 2016
TEMPP 2: Inundation Mapping for Evacuation process	2-3 March 2016
TEMPP 3: Evacuation Mapping process, Intl Tsunami Ready guidelines	15-19 Aug 2016
TEMPP 4: Response Plans and SOPs, Socialization Awareness, Community Exercises	7-11 Nov 2016
TEMPP 5: Functional Exercise (PacWave17), Official TR Recognition Ceremony	15-17 Feb, 2017

Cedeño, Honduras (Feb 2017)

- Tsunami Drill – signage, schools, community
- Tsunami Ready recognition



CEDEÑO
ES UNA COMUNIDAD

**TSUNAMI
READY**

EN CASO DE TERREMOTO O ALERTA DE TSUNAMI
SALGA DE LA ZONA DE EVACUACIÓN

16 DE FEBRERO DE 2017



ZONA DE TSUNAMI

EN CASO DE TERREMOTO O
ALERTA DE TSUNAMI
SALGA RÁPIDAMENTE DE
LA ZONA DE EVACUACIÓN

Cedeño
Drill video



IOC Manual and Guides 82 (2020)

Preparing for Community Tsunami Evacuations: from inundation to evacuation maps, response plans and exercises

Describes TEMPP process. Consists of:

1. **Manual (Modules) (English, Spanish)**

QUICK GUIDE (hard copy, EN, ES)

**Introduction, How-to-Steps, Objectives,
Target Participants, Requirements,
Methodology, Expected Results,
Content, References, Glossary**



IOC Manual and Guides 82 (2020)

2. Supplement 1 (Supplement to Modules) (English)

Detailed Module explanation, Templates, TEMPP Pilot docs, Best Practices

3. Supplement 2

Step-by-Step Manual and tutorial:

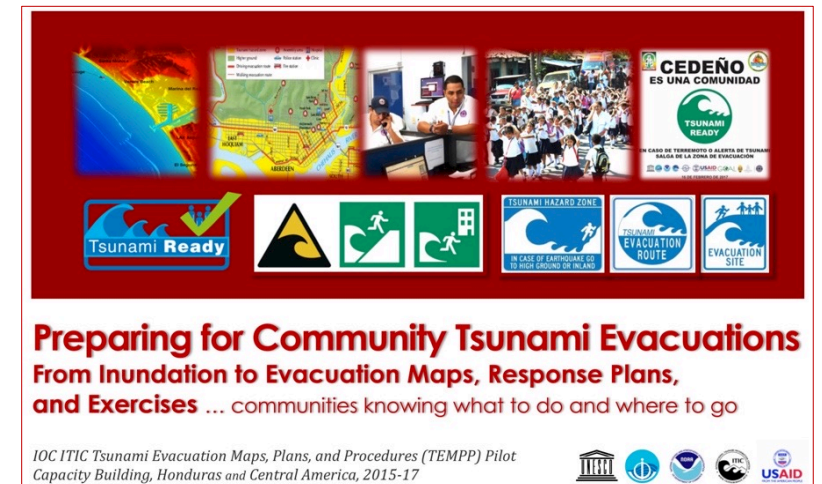
How to Create Evacuation Maps from

Inundation Maps: ComMIT to QGIS (English)

4. Specialized Documents (next slide)

** OTHER REQUIREMENTS (not included)

- DEM Acquisition – high-resolution bathy, topo, gridding
- Earthquake Tsunami Sources (IOC Tsu Sources Expert Mtgs)



IOC MG 82 (2020) – Specialized Documents

1. HAZARD ASSESSMENT – INUNDATION MODELING

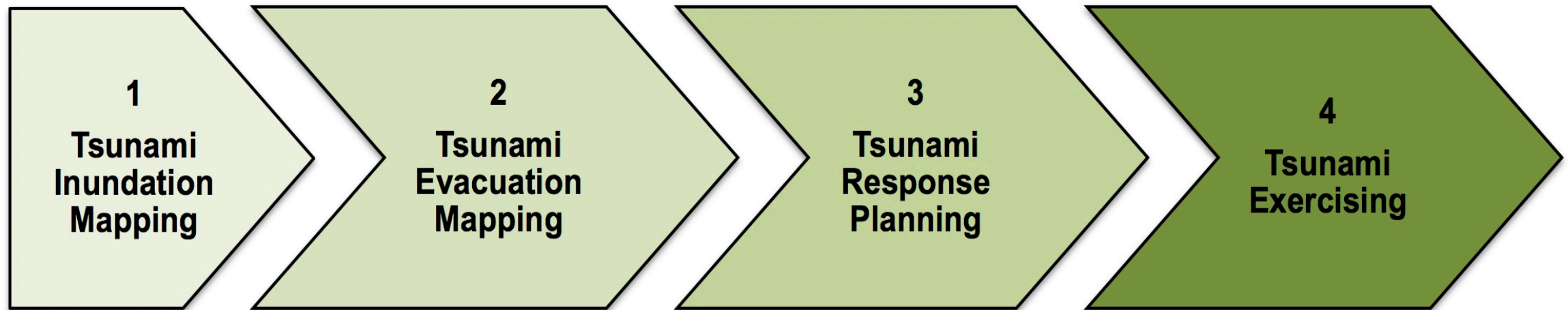
- Numerical Models in Hazard Assessment
- ComMIT tool manual (MOST model), including Appendices (abridged reqs, in Spanish) – inundation mapping for evacuation
- Seismic Worst-Case Scenarios for Tsunami Hazard Assessment (no credible sources)
- Establishing Tsunami Inundation for areas not-modeled or low-hazard (no history, low population, poor DEM)
- Tsunami Coastal Assessment Tool (TsuCAT) - exer scenario, PTWC msgs

2. COMMUNITY – EVAC MAP, RESPONSE, EXERCISES

- Best Practice Country Examples - Chile, Indo, Japan, NZ, Philippines, USA
- How to Create Evacuation Maps (templates)
- How to Create Community Tsunami Response Plans (templates)
- How to Create Community Tsunami Exercises (templates)

IOC Manual and Guide 82 (2019) - TEMPP

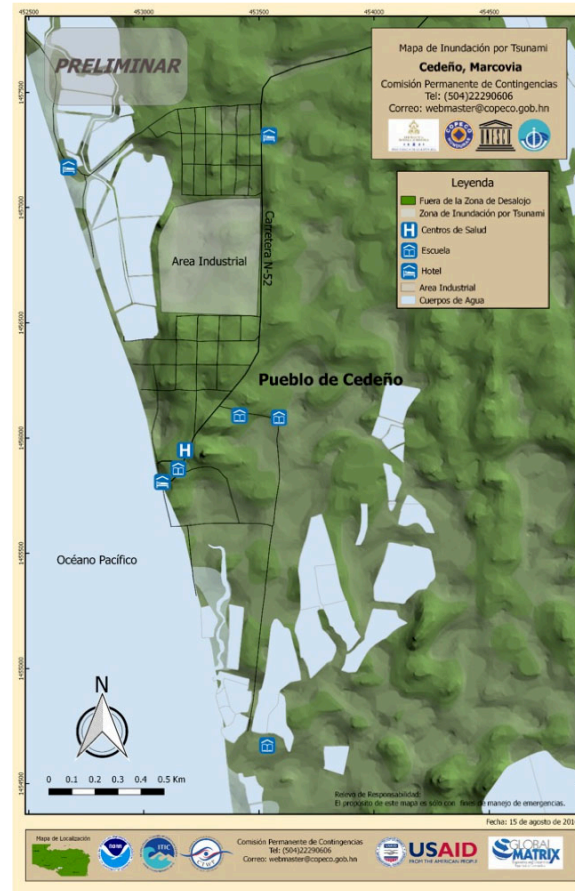
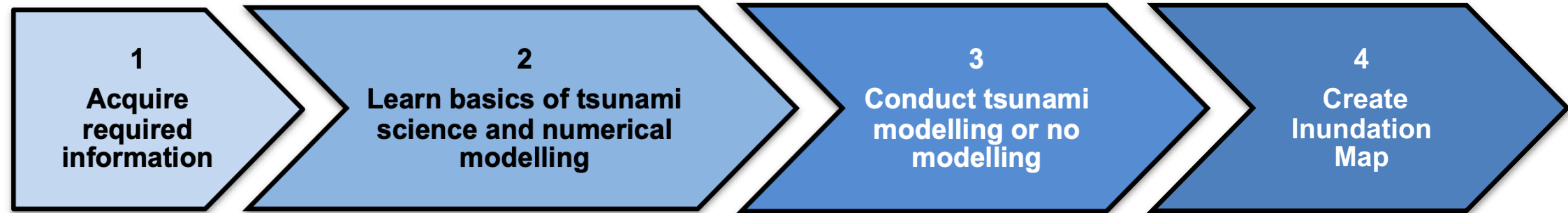
PREPARING FOR COMMUNITY TSUNAMI EVACUATIONS: FROM INUNDATION TO EVACUATION MAP, RESPONSE PLANS, AND EXERCISES



4 Foundation Blocks

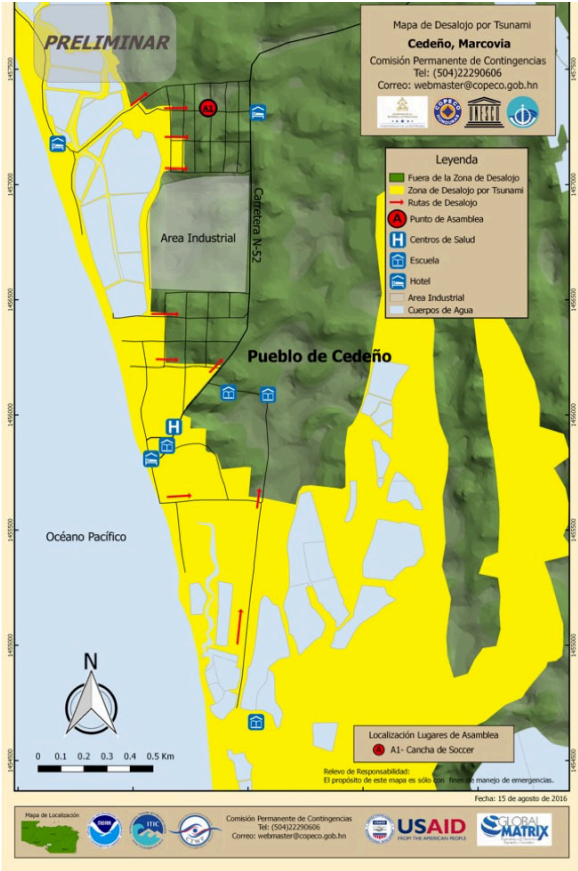
- *Key element of tsunami response involves evacuation, including self-evacuation of exposed people & key assets to safer areas*
- *Effective and successful evacuations require proper planning by relevant authorities.*

Module 1 – Tsunami Inundation Mapping



Inundation/flooding map developed for Cedeño, Honduras.

Module 2 – Tsunami Evacuation Mapping



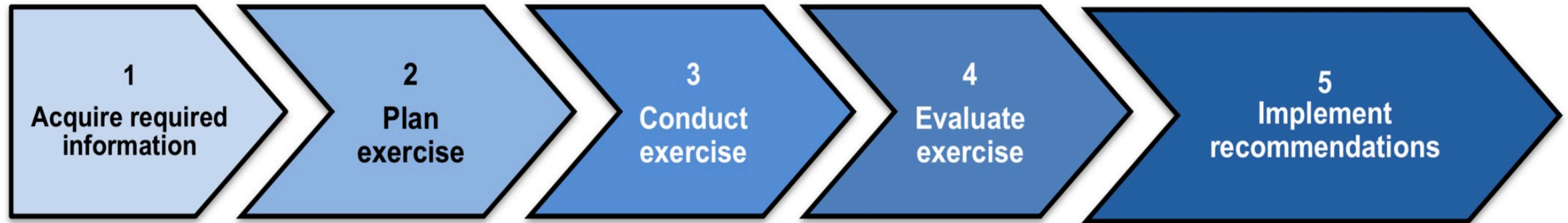
Evacuation map developed for Cedeño, Honduras.

Module 3 – Tsunami Response Planning



TSP Notification	Earthquake	Wave forecast	ETA	NTWC Level	Alert	Emergency Response Action
Tsunami Threat Message	Magnitude: >7.0 Depth: <100km	≥ 1 m	<3 hrs	WARNING	Evacuate xxx zones	
			3 - 6 hrs	WATCH	Prepare to evacuate	
			>6 hrs	INFORMATION	Monitor for subsequent forecasts	
		0.3 to 1 m	<3 hrs	ADVISORY	Evacuate beaches and harbours	
			3 - 6 hrs	WATCH	Prepare to evacuate	
			>6 hrs	INFORMATION	Monitor for subsequent forecasts	
< 0.3 m	-	INFORMATION	Monitor for subsequent forecasts			

Module 4 – Tsunami Exercising



PHASES OF A TSUNAMI DRILL



1 minute alarm signifying a strong earthquake



People do the response procedure during the earthquake such as the "duck, cover and hold"

Residents quickly move out of their houses to go to designated evacuation areas

Families from the same area or puroks should group together to better facilitate headcount/ accounting of residents

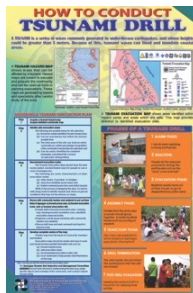


How many are expected to arrive based on barangay population information?

The drill master should inform the participants that the drill has ended



Assessing the conduct of drill is important for improving future activities



*Developing a Tsunami-Prepared Community
(Philippine Institute of Volcanology and Seismology,
PHIVOLCS, 2008)*



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

Thank You

Muchas Gracias

Dr. Laura Kong
Director, ITIC

