



Intergovernmental  
Oceanographic  
Commission



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

IOC Manual & Guides 82 (2020)

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

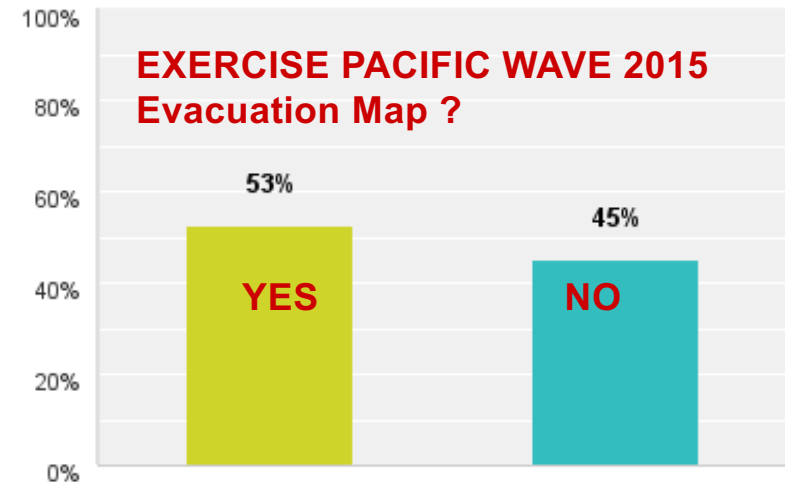
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Dr. Laura Kong  
Director, ITIC



# PTWS Priority Action (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

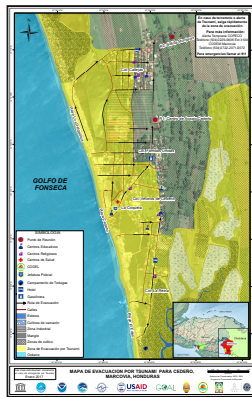
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- **Goal: Reliable evacuation maps by communities and govt**
- **Global standardized tools and methodologies**
- **Direct outcomes for country:**
  - ✓ Communities that know what to do and where to go
  - ✓ Country capability and tools to replicate 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**



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

# TEMPP PROCESS - 2015-17 Pilot



Training 3: Evacuation map, community consultation

DESPUÉS DE UN TERREMOTO FUERTE O PROLONGADO, SE PUEDE GENERAR UN TSUNAMI!

**PARA ESCAPAR A UN TSUNAMI**

- Alejarse, cubrirse y sujetarse durante el terremoto
- Salga rápidamente de la zona de evacuación por tsunami
- Esperar por información oficial

**PLAN DE EMERGENCIA FAMILIAR**

Del Centro de Emergencia, Sura de PSI

Ubicación del Punto de Reunión:

Contacto Fuera de la Comunidad:

Carrera: \_\_\_\_\_ Teléfono: \_\_\_\_\_

Teléfono: \_\_\_\_\_ Teléfono: \_\_\_\_\_

Centro de Emergencia, Sura de PSI



Training 4: Awareness, Response Plan, Training 5: Exercise and debrief

# Cedeño, Honduras



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

*ITIC Essential Community Preparedness  
Capacity Building, Honduras, Central America, 2015-17*





# IOC Manual and Guides 82 (2020)

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

Describes TEMPP process

- ❑ Manual (Modules) (English, Spanish)
- ❑ Supplement 1 (Supplement to Modules) (English)
- ❑ Supplement 2 (How to Create Evacuation Maps from Inundation Maps – from ComMIT to QGIS: Manual and Tutorial) (English)
- ❑ Specialized Documents



[http://itic.ioc-unesco.org/index.php?option=com\\_content&view=category&layout=blog&id=2166&Itemid=2640](http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=2166&Itemid=2640)

# IOC Manual and Guide 82 (2020)

UNESCO/IOC. 2020. *Preparing for Community Tsunami Evacuations: from inundation to evacuation maps, response plans and exercises*. Paris, UNESCO. (Manuals and Guides, 82)

## □ WHAT

- GUIDELINES AND HOW-TO STEPS, Train-the-Trainer manual
- 4 MODULES - Inundation Mapping, Evacuation Mapping, Response Planning, Exercises
- TIME EFFORT - 1-2 years (1 week training + between-training)

## □ CONTENTS: QUICK GUIDE (hard copy, EN, ES)

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

## □ CONTENTS: 2 SUPPLEMENTS (hard copy EN)

1. Detailed Module explanation, Templates, TEMPP Pilot documents, Best Practice examples
2. Step-by-Step Manual and Tutorial: How to Create Evacuation Maps from Inundation Maps – from ComMIT

## □ OTHER REQUIREMENTS (not included)

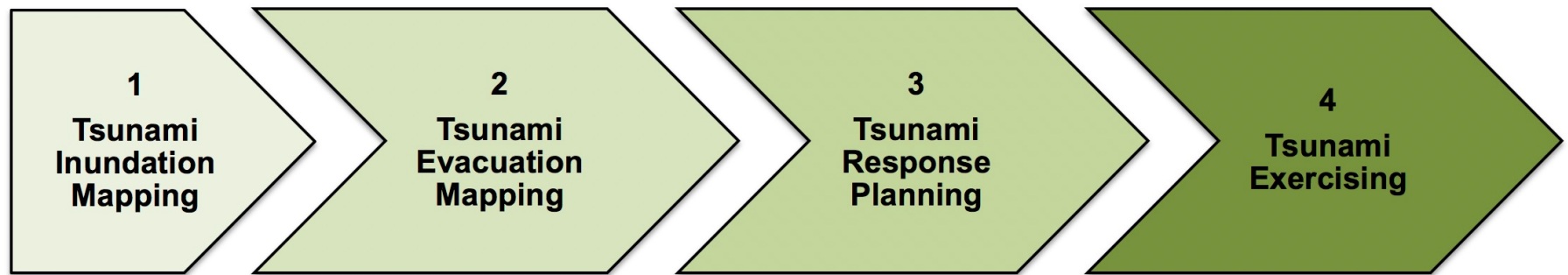
- DEM Acquisition – high-resolution bathy, topo, gridding
- Earthquake Tsunami Sources (Seismic Expert Meeting)





## IOC Manual and Guide 82 (2019) - TEMPP

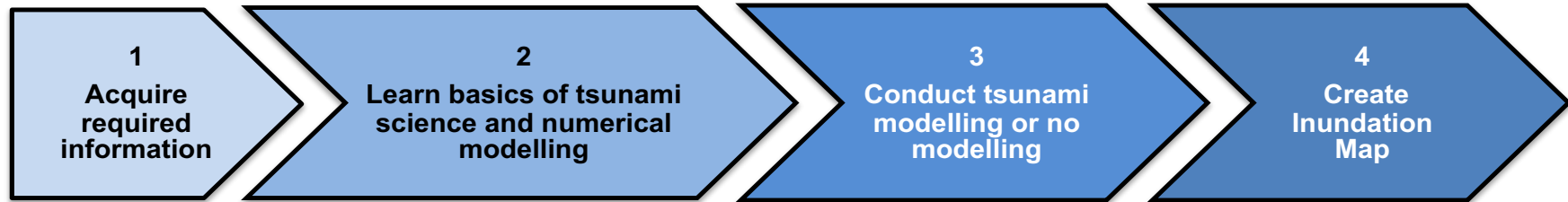
# PREPARING FOR COMMUNITY TSUNAMI EVACUATIONS: FROM INUNDATION TO EVACUATION MAP, RESPONSE PLANS, AND EXERCISES



## 4 Foundation Blocks

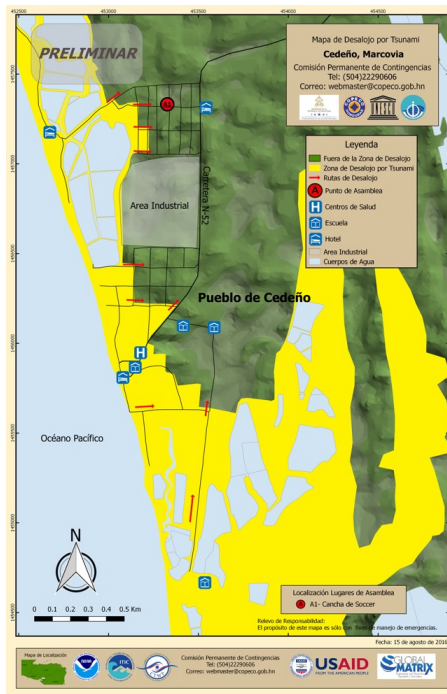
- *Key element of tsunami response involves evacuation, including self-evacuation of exposed people & key assets to safer areas*
- *Effective and successful evacuations require proper planning by relevant authorities.*

# 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
<b>Tsunami Threat Message</b>	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 ALARM PHASE:**  
1 minute alarm signifying a strong earthquake

**2 REACTION:**  
People do the response procedure during the earthquake such as the "duck, cover and hold"

**3 EVACUATION PHASE:**  
Residents quickly move out of their houses to go to designated evacuation areas

**4 ASSEMBLY PHASE:**  
Families from the same area or puroks should group together to better facilitate headcount/ accounting of residents

**5 HEADCOUNT PHASE:**  
How many are expected to arrive based on barangay population information?

**6 DRILL TERMINATION:**  
The drill master should inform the participants that the drill has ended

**7 POST-DRILL EVALUATION:**  
Assessing the conduct of drill is important for improving future activities





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

# IOC MG 82 (2020) – Topics, Templates, etc

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## 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) - exercise scenario, PTWC msgs

## 2. COMMUNITY – EVAC MAP, RESPONSE, EXERCISES

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





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# Thank You

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