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Intergovernmental  
Oceanographic  
Commission



ICG/PTWS-SC  
6-9 March 2023  
In-Person and Virtual

## Agenda 8

# International Tsunami Information Center (ITIC) Report



<https://vimeo.com/192771669>

Dr. Laura Kong  
Director, ITIC, USA NOAA

Cdr. Carlos Zuniga  
Associate Director, ITIC, Chile SHOA

Christa von Hillebrandt  
Deputy Director, ITIC, USA NOAA  
Manager, ITIC Caribbean Office



UNESCO/IOC-NOAA SHOA  
International Tsunami Information Center

# ITIC – Who we are



- ❑ **ITIC - established 1965 (IOC-IV.6), USA agreed to host**
- ❑ **Support Member States** (Technical improve TW (timely accurate), Capacity Building, Awareness, Event / Post-Tsunami data coll)



## OFFICE - US NOAA NWS

- ❑ Director – Dr. Laura Kong
- ❑ Deputy Director, ITIC Caribbean Office - Christa von Hillebrandt-Andrade  
Support CTIC, CARIBE-EWS (eff Sept 1 2021, former Caribbean Tsunami Warning Prog, est. 2010)
- ❑ Scientist (Oceanographer) – Carolina Hincapie-Cardenas
- ❑ Technical Information Specialist - [vacant](#)
- ❑ Information Technology Specialist – Tammy Fukuji
- ❑ Admin Support Assistant – Art Sonen
- ❑ Student interns (part, full-time): 1-2 year-round, 2-4 Summer



## ASSOCIATE DIRECTOR – established 1974 (IOC/ITSU-IV.1, non-USA)

- ❑ Cdr. Carlos Zuniga (Chile, SHOA Navy), 2013 (Chile since 1998)



# ITIC Mandate (1977) – Intersessional Activities

[www.tsunamiwave.org](http://www.tsunamiwave.org)

<http://itic.ioc-unesco.org/index.php>

- ❑ **Monitor, recommend improvements**
  - Events – improving warning and response
  - Tsunami Warning Decision Support Tools
- ❑ **Assist in establish/strengthen national, regional systems**
  - Capacity Building, Training
  - IOC Wave Exercises
  - UN Decade for Ocean Science for Sustainable Development
- ❑ **Information resource - preparedness / education (create, compile, share)**
  - Guides, Manuals, Best Practices, Awareness materials
- ❑ **Information resource - historical tsunamis (collect, compile, share)**
  - Database, global and regional hazard, post-event surveys



# Improving TW: 15 Jan 2022 – Hunga Tonga – Hunga Ha'apai



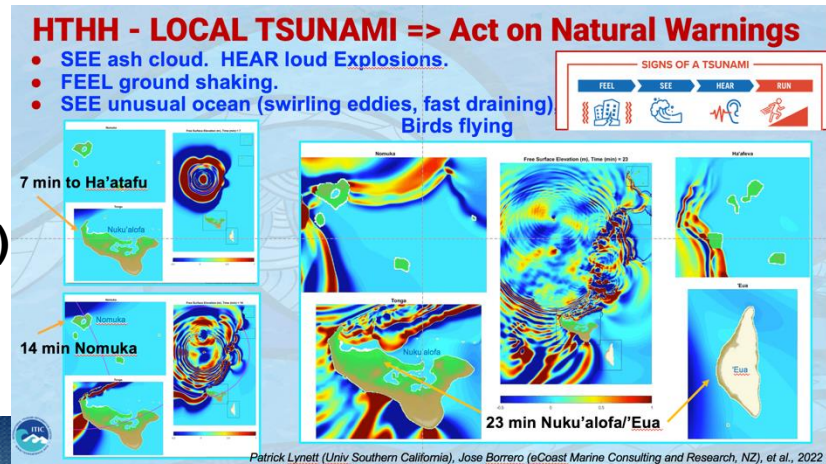
Unprecedented – massive eruption and tsunami

1. 3 PTWS Briefs (20 Jan, 3 Feb, 10 Feb 2022)
2. Post-Event Assessment (PAE)
3. ITIC expert/facilitate support to Tonga (ensure best technical effort with minimum duplication), 1<sup>st</sup> call 25 Jan => April (30+ virtual meetings, IOC hosted) – (Situational EQ/Volcano activity, HTHH interim procedures, equipment install / repair and post-tsunami survey (NZ, AU, US, SPC)
4. PTWS HTHH Interim Products and Procedures
5. Post-Tsunami Field Survey (runup, inundations)



[http://itic.ioc-](http://itic.ioc-unesco.org/index.php?option=com_content&view=article&id=2226:international-tsunami-survey-team-tonga&catid=2709&Itemid=3327)

[unesco.org/index.php?option=com\\_content&view=article&id=2226:international-tsunami-survey-team-tonga&catid=2709&Itemid=3327](http://itic.ioc-unesco.org/index.php?option=com_content&view=article&id=2226:international-tsunami-survey-team-tonga&catid=2709&Itemid=3327)





# Tsunami Warning Decision Support Tools



ITIC-distributed, supported

- ❑ **Listserv (IOC TWFP, NTWC, TNC) – TSP emerg broadcast, Other needs**
- ❑ **Tsunami Bull Board (ITIC, 1995) 469 science/tsu/govt** (Feb 2023)  
ADDR FOR POSTING: [tsunami\\_bb@list.woc.noaa.gov](mailto:tsunami_bb@list.woc.noaa.gov)
- ❑ **Real time EQ Display (CISN, USGS / NTHMP, 2005), 346+ v3.7.039** (Feb 2023)  
**NO PTWS EQ Observatory message. NO registration code required so cannot track nbr users**
- ❑ **Real-time Sea Level monitoring**
  - Tide Tool – TWC operations monitoring (PTWC, 2005) **v10.70**
  - IOC Sea Level Monitoring web site (IOC, 2008)
- ❑ **Tsunami Travel Time Software (ITIC, NGDC, 2007) – SDK4.0.1, with GUI for PC**
- ❑ **Tsunami Historical Database Online (WDS-NCEI), Offline (TsuDig, NCEI, ITIC, 2009)**
- ❑ **Tsunami Hazard Assessment Tools** (2017) – PMEL, ITIC
  - ❑ **ComMIT/MOST => OTGA TEMPP hybrid late 2023-2025**
  - ❑ **Tsu Coastal Assessment Tool (TsuCAT v4.3, Feb 2023) => Community Exercise injects**

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[www.tsunamiwave.org](http://www.tsunamiwave.org)

<http://itic.ioc-unesco.org/index.php>

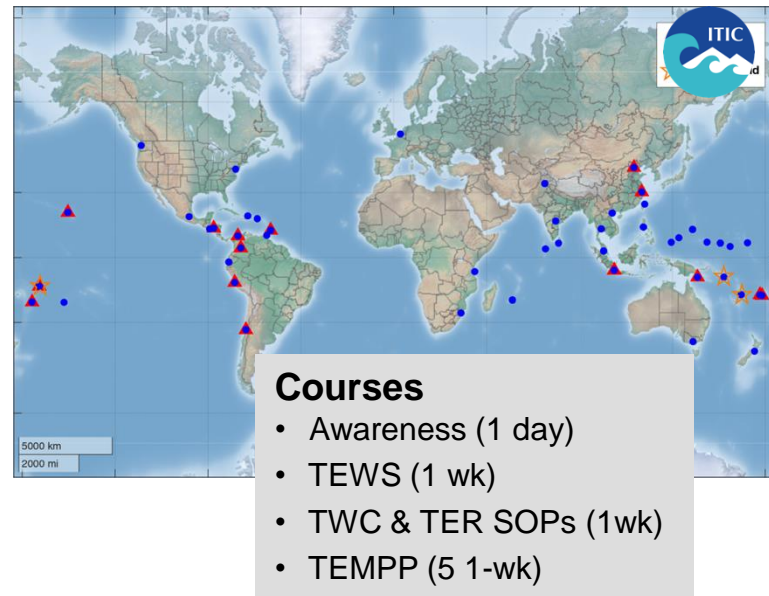
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# ITIC - IOC TSUNAMI CAPACITY BUILDING (2005-2021, >130 trainings)

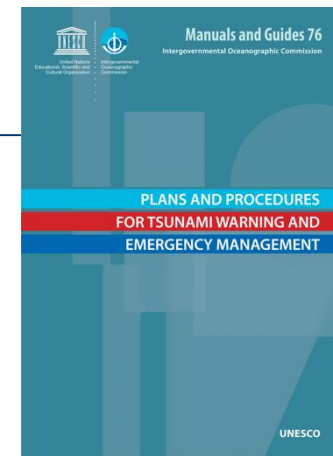
- **2019**
  - Caribbean, Colombia, Papua New Guinea, SOP
  - Hawaii (global, 2-week), End-to-end, SOPs
  - PICT, TEMP 1 - Inundation Model / Map
  - Tonga (2-week), NTCW Competency pilot
  
- **2021 - 2022:**
  - **IOC Ocean Teacher Global Academy (OTGA) online/hybrid**
  - **November, Hybrid – live remote**
    - Review / Update SOPs
    - 4 days each: Solomon Islands, Fiji, Vanuatu
  
- **2023:**
  - **Tsunami Ready Implementation, Micronesia (Chuuk, Pohnpei), Nov 2022**
  - **Cook Islands Review and Update of TWC and TER SOPs, January 2023**
  - **PICT Regional on Tsunami Ready I, January 2023**
  - **Fiji Tsunami Ready Stakeholder Workshop, February 2023**



# ITIC Training – SOPs

- ❑ **Tsunami Warning Center and Tsunami Emergency Response Standard Operating Procedures (TWC TER SOPs) – IOC MG 76** *Plans and Procedures for Tsunami Warning and Emergency Management, Guidance for countries in strengthening tsunami warning and emergency response through the development of Plans and Standard Operating Procedures for their warning and emergency management authorities (2017)*
- ❑ **Manual (English)**

[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)





# ITIC Training – TEMPP

- ❑ **Tsunami Evacuation Maps, Plans, and Procedures (TEMPP) – IOC MG 82** *Preparing for Community Tsunami Evacuations: from inundation to evacuation maps, response plans and exercises (2020)*
- ❑ Manual (English, Spanish)
- ❑ Supplement 1 (Detail Module Explanations, Guidance) (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)



**Preparing for Community Tsunami Evacuations**  
**From Inundation to Evacuation Maps, Response Plans, and Exercises ... communities knowing what to do and where to go**

# OTGA work plan (2021-2025): ITIC and IOC, work with other TICs

Course	Length (hrs)	Date	Audience - TWM tsunami warning and mitigation	Lang uage	Comments * Interest by other RTCs to teach
<b>ITIC: Tsunami Awareness</b> - overview covering hazard assessment, warning, preparedness, mitigation, response	4-8 hrs	<b>Q2. 2023</b>	All levels, no background necessary.	Eng, Span	Standard content with options for regional customization. (*)
<b>IOTIC/ITIC: Tsunami Ready (IOC MG 74)</b> - Overview of guidelines, process for establishing TR Programmes and recognizing TR communities	4-8 hrs	<b>Q4 2023</b>	Govt and NGOs responsible or interested in preparedness, in TR	Eng, Span	Standard content with options for regional customization.
<b>ITIC: Tsunami Early Warning Systems (TEWS)</b> - components of, requirements for robust, reliable, effective TWS	40 hrs	<b>2023</b>	Agencies responsible for TWM in country	Eng, Span	Standard content with options for regional customization. (*)
<b>ITIC/IOTIC TEMPP (Tsunami Evacuation Maps, Plans, and Procedures, IOC MG 82)</b> 1. Identifying Inundation Areas, 2. Developing Evacuation Maps, 3. Developing Response Plans and Standard Operating Procedures, 4. Exercising	4 40-hr module, Tot 160 hrs	<b>2022 - 2024</b>	Scientists, govt, and NGOs involved in preparedness	Eng	(*) Sequential training and product development with outcome community recognize UNESCO IOC Tsunami Ready
<b>ITIC: Tsunami Warning and Emergency Response Standard Operating Procedures (SOPs) (IOC MG 76)</b> - procedures and protocols used successful tsunami warning		<b>2024</b>	Agencies involved in TW and TER	Eng	Standard content. (*)
<b>ITIC: TWC Staff Basic Competencies</b> - Information and skill requirements for TWC staff. Topics: science of earthquakes and tsunamis, analysis methods, tools and techniques for monitoring, assessing tsunami threat, issuing alerts, cancelling tsunami warnings	120 hrs	<b>2024</b>	TWC staff	Eng, Span	Standard content with options for regional customization. (*)

# OTGA Tsunami Awareness – 3 Modules

1. Tsunami Basics – 1, 2
2. Tsunami Warning Systems – 1, 2
3. Tsunami Preparedness – 1, 2

### INTRODUCTION

**Tsunami** – The Japanese term meaning wave (tsunami) in a harbour (tsu). A series of travelling waves of extremely long length and period, usually generated by disturbances associated with earthquakes occurring below or near the ocean floor (also called seismic sea wave and, incorrectly, tidal waves). Volcanic eruptions, submarine landslides, and coastal rock falls can also generate tsunamis, as can a large meteorite impacting the ocean (ITC, Glossary, 2019).

According to the Global Historical Tsunami Database, tsunamis that cause damage or deaths near their source occur approximately twice per year. Tsunamis that cause damage or deaths on distant shores (more than 1,000 kilometers, 620 miles, away) occur about twice per decade.

Ref: Tsunami Strike: Japan

Introduction (1) 3 / 20

### APPROACHING THE COAST

Because the speed of a tsunami depends on the depth of the water it is travelling through, the deeper the water, the faster the tsunami moves. As tsunamis have very long wavelengths (hundreds or hundreds of kms) they might be barely noticeable in the deep ocean.

When tsunamis propagate into shallow water near the coast they slow down (as depth decreases) wavelengths decrease and consequently waves grow in height, and currents intensify.

Close to the shore, most tsunamis slow to the speed of a car, approximately 30 to 50 km/h. Just note you can not run away: the 100m world record runs 100m in app 10 seconds or 36km/h.

Depth	Wavelength	Height
1,000	100 km	10m
4,000	200 km	10m
2,000	100 km	10m
100	10 km	10m
10	1 km	10m

Approaching the coast 6 / 24

### TSUNAMI WARNING CENTRE

The mission of a Tsunami Warning Centre (TWC) is to provide tsunami early warnings on potentially destructive tsunamis.

It provides this information to emergency officials, and as appropriate, directly to the public. In order to carry out its mission, the TWC uses local and global seismographic networks transmitting seismograms in real-time to continuously monitor seismicity in order to locate and size potentially tsunamigenic earthquakes.

TWC also use sea level networks reporting data in real and near real-time to verify the generation and evaluate the severity of a tsunami. TWC then disseminate tsunami advisory and warning messages to designated national or local emergency response authorities for their subsequent action.

South Korea National Tsunami Warning Center, Korea Meteorological Administration

Tsunami warning centre 12 / 17

### INDIVIDUAL PREPAREDNESS. LEARN NATURAL WARNING

# FEEL

- Big local earthquakes may cause tsunamis
- FEEL the ground shaking severely, or for a long time?

**If the earth shakes a tsunami may follow!**

The earthquake shakes the coast before the arrival of the tsunami. The shaking is a natural warning for people to run to higher ground.

Learn natural warning signs 14 / 25

### THE TRANSATLANTIC TSUNAMI THAT SHOCKED EUROPE. LISBON 1st NOVEMBER 1755

The 1755 Great Lisbon earthquake and tsunami is the greatest seismic generated disaster that shook western Europe and North Morocco and triggered a transatlantic tsunami that impacted the Caribbean and Brazil. Its direct cost is evaluated between 32-48% of the Portuguese GDP.

History-Lisbon 11 / 20

### COMMUNICATION INFRASTRUCTURE

Communication infrastructure 8 / 19

### COMMUNITY PREPAREDNESS. IDENTIFY SHELTER AND ASSEMBLY POINTS

## Shelter Zones should be:

- Outside the inundation zone
- Reachable within a short walking distance
- Easily identified by locals and visitors and available to all
- In flat coastal locations with no tall buildings or other shelter sites, people should head as far inland as they can.

Community preparedness 3 / 25

### ACTIVITY 3.8

Read up about why the 5th November is the World Tsunami Awareness day  
Hint: Inamura no Hi

Activity 3.8 24 / 25

# Standalone Training and Info Videos (OTGA) - 2021 -2022



## Tsunami Warning Centers

- **PTWC Enhanced Products and Staging (Pacific, Caribbean) (EN-SP-FR)**  
10-22 min – 2021-2022, SP-FR captions still in process
- **TWC Operations – What happens at PTWC during a Pacific earthquake? (EN)**  
18 min - Nov 2022
- **Tsunami Forecasting (EN) (req fr PTWS fr 4 Mar 2021 event debrief) – 20 min**

## Tsunami Ready - Exercise Informational Videos (EN, SP, FR): 2-3 min each

- **Be Safe. Be Prepared. Get Pacific Tsunami Ready ([Pacific Islands](#), [Western Pacific Eastern Pacific](#))** – World Tsunami Awareness Day, 5 Nov 2021
- **Exercise Pacific Wave (EN)** 3 min – Dec 2021 <https://vimeo.com/showcase/9091939/video/654705877>
- **Exercise Caribbean Wave (EN SP FR)** 2 min – Jan 2022 <https://vimeo.com/showcase/9334456>



# ITIC Videos - Training

## TSUNAMI TRAINING

Videos on Tsunami Warning Operations, including from the Pacific Tsunami Warning Center

Pacific Tsunami Warning Center (PTWC)  
Graphical Tsunami Forecast Products for the PTWS

Dr. Charles "Chip" McCreery  
Director, PTWC

20:19

EN - PTWC Products, Pacific - ...

itic

Pacific Tsunami Warning Center (PTWC)  
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itic

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Graphical Tsunami Forecast Products for the PTWS

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Director, PTWC

20:19

SP - PTWC I

itic

UNESCO IOC / NOAA  
International Tsunami Information Center  
Tsunami Training Videos, August 2022

Pacific Tsunami Warning Center (PTWC)  
Product Staging from the earthquake,  
through data collection and analyses, to tsunami forecasting,  
and product generation and dissemination

10:09

EN - PTWC Product Staging, ...

itic

UNESCO IOC / NOAA  
International Tsunami Information Center  
Tsunami Training Videos, November 2022

Pacific Tsunami Warning Center (PTWC)  
What happens for a Pacific earthquake?

18:59

EN - PTWC TWS Ops - Pacific...

itic

## ITIC / Collections / Showcases

Sort: Date | Alphabetical | Videos | Duration



BROWSE SHOWCASES



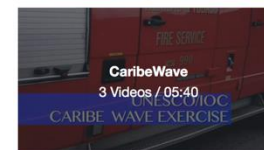
Showcases help you organize your videos, or create and share curated playlists of other videos on Vimeo.

ALSO CHECK OUT

More stuff from ITIC

65 Videos

17 Collections



<https://vimeo.com/showcase/8956022>

Password: training





# ITIC support to PacWave22

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1. Member TT
2. Create [PacWave video](#) for outreach
3. Host PW22 web site [pacwave.info](http://pacwave.info),  
incl [PW22-PICT](#) web page
4. Host Post-Exercise Eval tool (Survey Monkey)
5. For PW22-PICT, host 1 Comm method (Email listserv), serve as Observer
6. Support TT and Chair for compilation of Summary Report



**PacWave22**

# PacWave information video – Dec 2021

- **ITIC, IOC, USA, Chile**
- **TOPICS**
  - What is PacWave ?
  - Why is PacWave important ?
  - What does PacWave do ?
- **CONTENT**
  - ‘Interview’ narratives – IOC, ITIC, PTWC, NWPTAC, Chile, Philippines, El Salvador
  - Visuals of previous PacWave and other exercises (upstream, downstream)



<https://vimeo.com/654705877>



# Short videos – IOC Wave, Tsunami Ready



- Exercise Pacific Wave – Eng, Feb 2022
- CARIBE Wave Exercise – 1-min PSA. Mar 2022

English  
Spanish  
French

<https://vimeo.com/showcase/9334456>



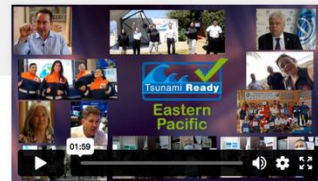
- **Get Pacific Tsunami Ready Shout-outs** (WTAD 2021)



Get Pacific Tsunami Ready!...



Get Pacific Tsunami Ready!...



Get Pacific Tsunami Ready!...

Western Pacific,  
Pacific Island Countries and  
Territories Eastern Pacific

<https://vimeo.com/showcase/8288490>

2023: additional collected: USA (NWS Director),  
Marshall Islands, Micronesia, Palau

# UN Decade Support - Pacific, Caribbean, 2021-2023



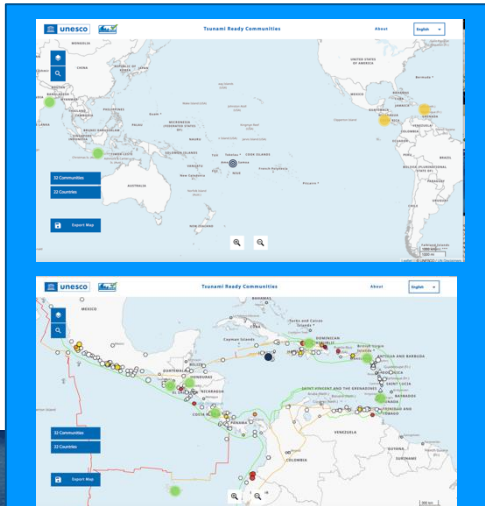
1. **Reduce time and increase certainty of forecasts for Local Tsunami Warning Advancing Tsunami Detection and support cable initiatives and SMART pilots - Vanuatu/NC (ITIC lead for training), Indonesia CBT, NZ-Antarctica, Portugal CAM2, Mediterranean MEDUSA, Caribbean**
  2. **100% at risk communities are prepared and resilient (Pacific, Caribbean) – Facilitate, participate Tsunami Ready Board, Training, Awareness materials, etc) and execute TR Pilots – 2021-2024 funding to ITIC (USAID). Partner with SPC**
    - **Pacific: Fiji, Marshall Islands (Majuro), Micronesia (Pohnpei, Chuuk, Yap), Palau**
    - **Caribbean: Dominica, St Lucia, Barbados, + 3 in 2024+**
    - **2024+: 3 additional PICT (possible Solomon Islands, Samoa, Kiribati)**
- **Capacity Building: Create online / hybrid training through OTGA**  
Courses: Tsunami Awareness, Tsunami Ready (IOTIC), TEMPP, TEWS, TWC/TER SOPs, NTWC Competencies
- Collaborations and partnerships with other stakeholders to advance **Multi-hazard Early Warning Systems – most active in Caribbean**

# UNESCO IOC Tsunami Ready Recognition



- ❑ Facilitated by TICs
- ❑ Web (ITIC): PTWS, CARIBE-EWS, IOTWMS, NEAMTWS recognized communities
- ❑ Global Tsunami Ready Interactive Map Viewer

[www.tsunamiready.org](http://www.tsunamiready.org)



UNESCO/IOC Tsunami Ready Programme - International Tsunami Information Center

International Tsunami Information Center


Home > Intergovernmental > UNESCO/IOC Tsunami Ready Programme

Home  
Contact ITIC  
General Info  
World  
Tsunami Day  
Hawaii  
Information  
American  
Samoa Info  
About  
Tsunamis  
Am I in  
Danger?  
What to Do?  
Aware,  
Educate  
Photo, Video,  
Graphic  
Quick Info -  
Media  
FAQs  
About ITIC  
Technical Info  
Current  
Warnings  
About  
Warnings  
Tsunami  
Events  
Earthquake  
Monitors  
Sea Level  
Monitors  
Research  
Meetings  
Tools &  
Products  
Library  
ITIC Tsunami  
Survey  
Marine Ports  
Guide  
Vertical Evac  
Guides

UNESCO/IOC Tsunami Ready Programme


- Caribbean
- Pacific
- Indian Ocean
- North Atlantic and Mediterranean
- Background
- Pilot Programme

UNESCO/IOC Tsunami Ready Recognition Programme



The Tsunami Ready Recognition Programme is an international community-based recognition programme developed by Intergovernmental Oceanographic Commission (IOC) of UNESCO. It aims to build resilient communities through awareness and preparedness strategies that will protect life, livelihoods and property from tsunamis in different regions.

On 5 December 2017, the United Nations declared that a Decade of Ocean Science for Sustainable Development would be held from 2021 to 2030 (Ocean Decade). In June 2022, the IOC Assembly approved the establishment of the IOC Ocean Decade Tsunami Programme. The implementation of the Tsunami Ready Recognition Programme will be a key contribution to achieving the societal outcome 'A Safe Ocean' of the Ocean Decade.



Documents
<p><b>Fulfillment of the Indicators</b></p> <p>Tsunami Ready Application</p>
<p><b>Assessment Indicators</b></p> <p>Inundation Map Estimated number of people at risk Resources</p>
<p><b>Preparedness Indicators</b></p> <p>Evacuation Map</p> <ul style="list-style-type: none"> <li>o Map 1</li> <li>o Map 2</li> <li>o Map 3</li> </ul> <p>Signage</p> <p>Educational Materials</p> <ul style="list-style-type: none"> <li>o Community Tsunami Banners</li> <li>o Social Media (12 PNGs)</li> <li>o Tsunami Ready Ad Video</li> <li>o Tsunami Ready Ad Audio</li> <li>o Get Ready for Tsunamis Brochure</li> <li>o Tsunami Safety Rules Flyer</li> </ul> <p>Outreach Activities</p> <p>Tsunami Exercise</p> <ul style="list-style-type: none"> <li>o Photos (8 JPGs)</li> <li>o Photo (IHC)</li> <li>o Photo (IHC)</li> </ul>
<p><b>Response Indicators</b></p> <p>Response Plan</p> <p>Response Operations</p> <p>Systems to Receive Alerts</p> <ul style="list-style-type: none"> <li>o Photo 1</li> <li>o Photo 2</li> <li>o Photo 3</li> <li>o Photo 4</li> </ul> <p>Systems to Disseminate Alerts</p>

Seveta, Upolu



On 28 June 2017, the village of Seveta (Upolu, Samoa) was recognized as Tsunami Ready. Seveta became the second country in the Pacific, and the first of the Pacific Island Countries, to join the UNESCO/IOC Tsunami Ready Programme. Samoa's Tsunami Ready application was approved by Samoa's National Tsunami Ready Board, who convened from June 14-16 to conduct a site verification visit, then to review, finalize, and approve their application.

Seveta Documents

St. Patrick



Tsunami Ready Ceremony and Tsunami Billboard

On 20 September 2018, the parish of St. Patrick, Grenada was recognized as Tsunami Ready under the First Community Participation Based Tsunami Recognition Programme being implemented by the UNESCO/IOC Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE-EWS). As part of the regional efforts to develop an end-to-end tsunami early warning system, Grenada agreed to participate to undertake a shared approach and fulfil the programme's guidelines at the parish level, thus empowering one of its most vulnerable coastal communities to take effective action in the event of a potential tsunami and land slide.

The Parish of St. Patrick was coordinated by the US Caribbean Tsunami Warning Program and the Caribbean Tsunami Information Center (CTIC), a partnership arrangement between UNESCO/IOC and the Government of Barbados. It was implemented in collaboration with the Government of Grenada and non-governmental organizations, together with other regional organizations. Funding was provided by the U.S. Agency for International Development (USAID). The Tsunami Ready programme implementation process, together with recognition being granted based on the satisfactory completion of a verification process conforming to the guidelines.

St. Patrick Documents

Document Title	Format/Size
Tsunami Ready Application	PDF (2.28 MB)
Tsunami Signage	





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[www.tsunamiwave.org](http://www.tsunamiwave.org)

<http://itic.ioc-unesco.org/index.php>

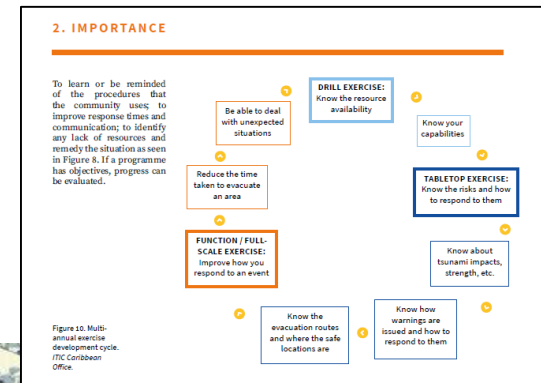
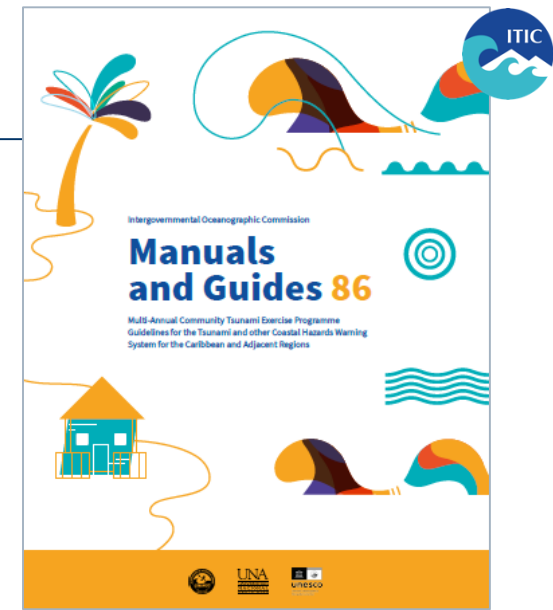
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# ITIC Services – Community Guide

- ❑ **IOC Manual and Guides 86**  
**Multi-Annual Community Tsunami Exercise Programme Guidelines** for the Tsunami and other Coastal Hazards Warning System for the **Caribbean and Adjacent Regions**
- ❑ **With Collaboration of EMIZA (French Emergency Management Agency-original manual) and National University of Costa Rica (Formatting)**
- ❑ **English, French, Spanish**

<https://unesdoc.unesco.org/ark:/48223/pf0000380540.locale=en>

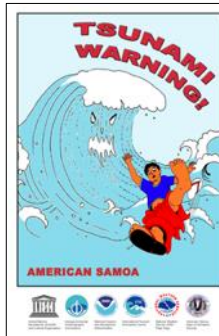
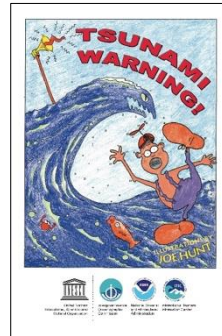
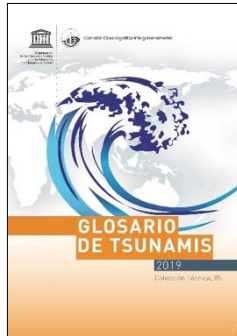
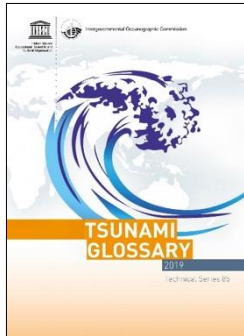


# ITIC Awareness materials – update, printed, EN, SP

[http://itic.ioc-unesco.org/index.php?option=com\\_content&view=category&layout=blog&id=1075&Itemid=1075](http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=1075&Itemid=1075)



- ❑ **Tsunami Glossary 2019 (printed En, Sp) => updated 2023 (TOWS-WG-XVI)**
- ❑ **Tsunami Warning! Comic**  
Amer Samoa (en) (IOC/INF1223) and English (update 2020)
- ❑ **Tsunami Great Waves, Surviving Tsunamis Lessons Learned (1960, 2010 Chile) Where the First Wave Arrives in Minutes (2004, 2006 Indonesia) Tsunamis on the Move, Sensing a Tsunami**



UNESCO/IOC-NOAA

International Tsunami Information Center

# ITIC Mandate (1977) – Interessional Activities

[www.tsunamiwave.org](http://www.tsunamiwave.org)

<http://itic.ioc-unesco.org/index.php>

- **Monitor, recommend improvements**
  - Events – improving warning and response
  - Tsunami Warning Decision Support Tools
- **Assist in establish/strengthen national, regional systems**
  - Capacity Building, Training
  - IOC Wave Exercises
  - UN Decade for Ocean Science for Sustainable Development
- **Information resource - preparedness / education (create, compile, share)**
  - Guides, Manuals, Best Practices, Awareness materials
- **Information resource - historical tsunamis (collect, compile, share)**
  - Database, global and regional hazard, post-event surveys





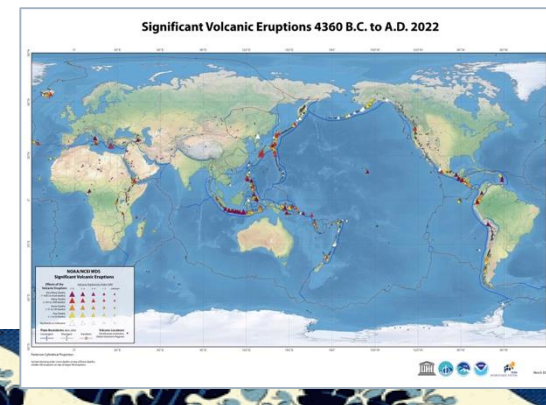
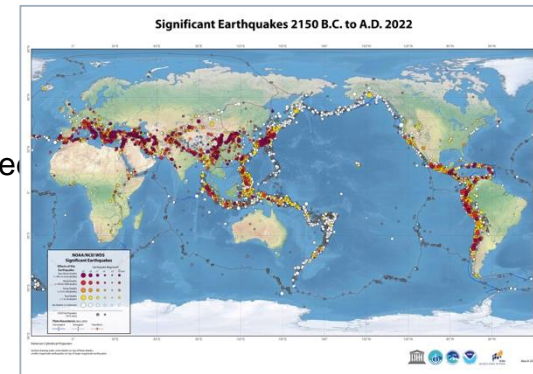
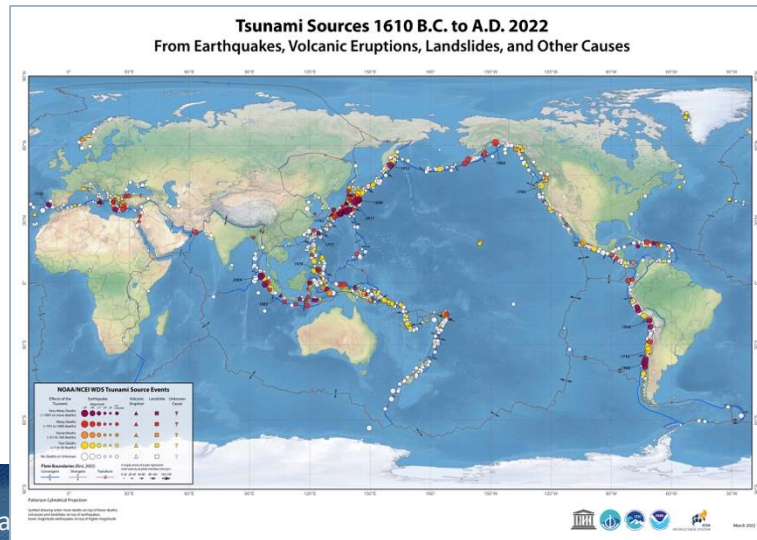
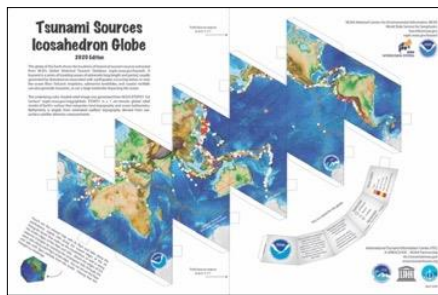
# ITIC Awareness materials – update, some printed

[http://itic.ioc-unesco.org/index.php?option=com\\_content&view=category&layout=blog&id=1075&Itemid=1075](http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=1075&Itemid=1075)



## ITIC-NCEI Hazard Posters – all updated to 2022 (low stock)

- ❑ **Global Tsunami Sources 1610 B.C. to A.D. 2022 – poster, icosahedron (2020)** (1500 printed)
- ❑ **Significant Earthquakes 2150 B.C. to A.D. 2022** (1000 printed)
- ❑ **Significant Volcanic Eruptions 4360 B.C. to A.D. 2022** (1000 printed)









# 2023+ - Next efforts

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## □ **Tsunami Ready**

- TIC "mandate" to facilitate. Build resilience capacity.
- Host TR web site (communities recognized)
- Have USAID funding to implement in few PIC

## □ **Training**

- **ITP-Hawaii (2-week)** – working end-to-end System
  - 2023 – possible NZ in July
  - 2024 – possible Chile (last in 2018)

## □ **SMART subsea cable** – advocate, NC-VN SMART- ITIC lead for TWC SOP capacity building lead

## □ **NTWC Competency** – TT finish, Conduct Pilot – small cohort groups for 1+ months (USAID funding tentative), welcome partners!



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ICG/PTWS-SC  
6-9 March 2023  
In-Person and Virtual

# Questions for Part 1?

## Thank You Muchas Gracias

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**Dr. Laura Kong**  
Director, ITIC, USA NOAA

**Cdr. Carlos Zuniga**  
Associate Director, ITIC, Chile SHOA

**Christa von Hillebrandt**  
Deputy Director, ITIC, USA NOAA  
Manager, ITIC Caribbean Office





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# GLOBAL NTWC COMPETENCY FRAMEWORK PTWS



TT TWO - TT DMP JOINT, 28 Feb 2022  
Item J7  
Laura Kong, ITIC

'Ofa Fa'anunu, Tonga Met Svcs and Coast Radio



# TOWS TT-TWO / DMP 2022



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## Recommendation 13 for training competencies:

- **Notes with appreciation** the work of the **PTWS to develop a NTWC Competency Framework (2019)**, and the **ITIC's leadership to pilot** training courses based on the Framework,
- **Noting** the **interest of other ICGs, requests the PTWS to share** its document with other regions, and invite comments and feedback,
- **Also noting** the challenges in developing and implementing a global competency framework.
- **Requests** the **TT TWO and TT DMP to continue to consider development of guidelines** for a global NTWC competency framework based on the available set of documents and Pacific input, noting that **implementation can be at a regional level**

# PTWS WG2 Task Team: Minimum Competency Levels for National Tsunami Warning Centre (NTWC) Operations Staff

ICG/PTWS-XXIX.1 (2021)



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This expert Task Team will establish and document the minimum competency levels for NTWC operations staff and develop a framework for the competencies and training requirements of the roles of a NTWC.

1. Establish the minimum competency levels required for NTWC operations staff.
2. Establish a framework for the required competencies required by the roles of a NTWC.
3. Establish what training is required to ensure NTWC staff meeting minimum competency levels.
4. Investigate and document what schemes are currently in existence and what guidelines and principles can be adapted for this purpose.

The Task Team will be composed of Wilfried Strauch (Nicaragua), Ofa Fa'anunu (Tonga), Yuelong Miao (Australia), Chip McCreery (USA), ~~Lara Bland (New Zealand)~~, Laura Kong (USA), and ~~Ken Gledhill (New Zealand)~~. Co-Chairs are Mr Ofa Fa'anunu (Tonga, second term) and Dr Laura Kong (United States, first term)

**Draft document, "NTWC Competency Framework", produced at ICG/PTWS-XXVIX (2019). Document has not been revised further nor completed.**

# Competencies

## (Tier 2: Comprehensive, Expert, Tier 1: Basic)



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- **Core science KNOWLEDGE:** Basic tsunami science / earthquake source knowledge
- **Advanced science KNOWLEDGE :** Adv tsunami science / earthquake source knowledge, tsunami forecast modelling
- **Core OPERATIONAL competency**
  - Understand & use TSP text / graphical products, core set of decision support tools. Perform all core NTWC SOPs
  - Identify potential regional, distant, and local source tsunami threats
- **Advance OPERATIONAL competency**
  - Understand and produce tsunami threat maps
  - Explain relationship of tsunami warning products to evacuation maps and routes
  - Use a comprehensive set of decision support tools
  - Advanced practical seismology (locate / characterise EQs), sea-level observations: measure & interpret records
- **Core AGENCY competencies**
  - **Liaise with NDMO and response agencies**, Post-event activities, **Manage media inquiries** and organise TV/Radio interviews, Monitor enquiries from general public, then prioritise response

# PTWS Pacific Island Countries and Territories Working Group Task Team on Capacity Development

ICG/PTWS-XXIX.1 (2021)



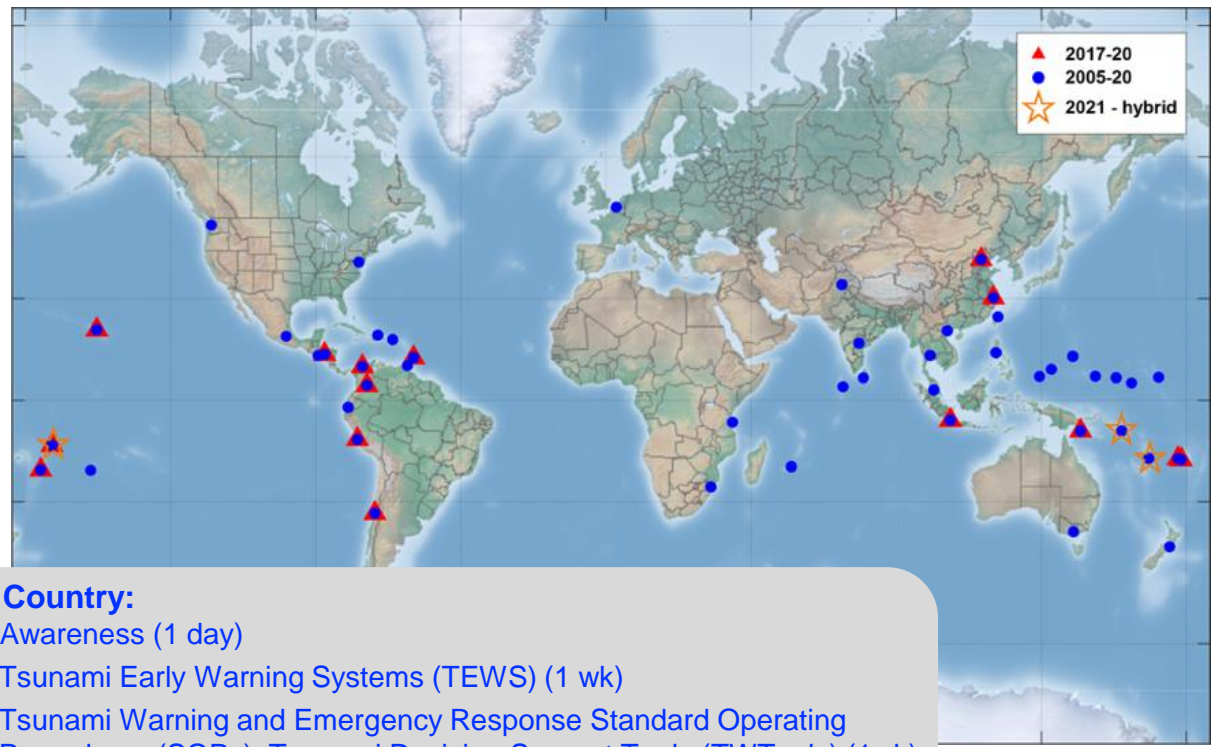
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- 1. Continue the development of competency framework for National Tsunami Warning Centres personnel and pilot it in Australia, Vanuatu, Fiji, Samoa and Tonga and report progress and lessons learnt to ICG/PTWS WG 1, 2 and 3.**
2. Continue to monitor and coordinate the Pilot Tsunami Ready Programme and TEMPP in Samoa, Tonga, Fiji, Cook Islands, Solomon Islands and Vanuatu and review the Tsunami Ready Checklist for schools and communities in PICT.
3. Continue to develop the guideline for National Tsunami Warning Centres in responding to local tsunami and report to WG 1, 2 and 3.
4. Develop an online survey of warning and mitigation capabilities in the Pacific Island Countries and Territories (Member countries and IOC).

The Task Team Members: Australia, ~~New Caledonia (Co-Chair)~~, Tonga (Co-Chair), Samoa, Vanuatu, New Zealand, Solomon Islands, Fiji, PNG, ITIC, SPREP, SPC, IOC, PTWC. Chair Mr Ofa Fa'anunu (Tonga, third term) .

# ITIC - IOC TSUNAMI CAPACITY BUILDING (2005-2021, >130 trainings)



- ## For example, Tonga
- In-Country (5) - 2009, 2010, 2015, 2019
  - ITP-Hawaii – 2006, 2009, 2011, 2014, 2016, 2018, 2019 (14 total)

- ## ITIC main challenge
- Staff turnover, so continual request from Countries
  - Limited resources



- In Country:**
- Awareness (1 day)
  - Tsunami Early Warning Systems (TEWS) (1 wk)
  - Tsunami Warning and Emergency Response Standard Operating Procedures (SOPs), Tsunami Decision Support Tools (TWTools) (1wk)
  - Tsunami Evacuation Maps, Plans, Procedures (TEMPP (5 1-wk)
- At ITIC/PTWC:** ITP-Hawaii (TEWS, 2-wk)





# PTWS Progress – 15 January 2022

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- **14-24 Oct 2019, Tonga, Competency Framework piloted, NTWC Training**
  - Knowledge, Operational SOPs, What if scenarios (esp local)
  - Before / After training - Daily Met Staff exercises (TsuCAT scenarios)
- **15 January 2022, HTHH event => Tonga from recent events:**
  - Gaps – need better understanding of volcano monitoring within NTWC;
  - Need attachment of operational staff at PTWC in Hawaii or other NTWC;
  - Met Svc operational staff familiarize with Seismic Monitoring
- **Solomon Islands Met Svc**
  - Following Impact Based Forecasting Training, identified forecasters need to understand DRR aspects in issuance of warnings => include in NTWC competency framework.

# PTWS Progress – Vanuatu perspective

*Ms. Esline Garaebiti (Vanuatu), Chair PICT Working Group:*

- PICT warning centers equipped with tools but staff needs to be trained*
- National initiative and perhaps support needed from stakeholders/ partners (ITIC to implement, UNDRR, SPC to scope issues in region)*

## **Recommended;**

- 1) Training for trainers might be useful** - more sustainable for countries to maintain their staff through consistent capacity development to address staff turnover.
- 2) Delegate responsibility [to partners] to scope need** in region on competency framework and **to map and develop framework among PICTs.**
- 3) Competency framework for PICTs should not be limited to seismic sources and to include volcanic eruptions as integrated approach** in addressing the competency framework

# PTWS Progress



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## PICT Task Team on Capacity Development met on 2 Feb 2023

### • Recommended

- IOC Secretariat to provide a **Feedback Matrix to Pilot Member States for feedback on the 2019 draft PTWS competency framework**
- Feedback submitted to WG 2 Task Team Minimum Competency Levels for National Tsunami Warning Centre (NTWC) Operations Staff by **30 April 2023**.
- **Solomon Islands and Nauru** to be included **as participant** in piloting of PTWS competency framework.

### • Requests

- WG 2 Task Team Minimum Competency Levels for National Tsunami Warning Centre (NTWC) Operations Staff to **consider including Volcano monitoring**
- WG-PICT to endorse **French Polynesia** to join Task Team Capacity Development **to assist the Competency Framework**

# PTWS Progress – Australia, existing training

Previously, have collected US, India



## **Geoscience Australia (GA) - For watch staff**

- Locating earthquakes, analyze, interpret and apply to provide useful info to Bureau of Meteorology (BOM, NTWC).
- Real -time and play back training on different events. Currently working on wave form simulation tools.

## **BOM Australia – For tsunami warning staff and decision support staff**

- Tsunami training framework since 2011.
- 3 main modules; 1) science, 2) decision making tools and 3) SOPs.
- Training online and hands-on component. End is two real scenario exercises with assessment.
- Competency certified at national level for 3 years validity to address turnover of staff, refresher and gather feedback

**GA and BOM conduct monthly joint- exercises.**

# Standalone Training and Info Videos (OTGA) - 2021 -2022

## Tsunami Warning Centers

- **PTWC Enhanced Products and Staging (Pacific, Caribbean) (EN-SP-FR)**  
10-22 min – 2021-2022, SP-FR captions still in process
- **TWC Operations – What happens at PTWC during a Pacific earthquake? (EN)** 18 min - Nov 2022
- **Tsunami Forecasting (EN)** (req fr PTWS fr 4 Mar 2021 event debrief) – 20 min

## Tsunami Ready - Exercise Informational Videos (EN, SP, FR): 2-3 min each

- **Be Safe. Be Prepared. Get Pacific Tsunami Ready** ([Pacific Islands](#), [Western Pacific Eastern Pacific](#)) – World Tsunami Awareness Day, 5 Nov 2021
- **Exercise Pacific Wave (EN)** 3 min – Dec 2021 <https://vimeo.com/showcase/9091939/video/654705877>
- **Exercise Caribbean Wave (EN SP FR)** 2 min – Jan 2022 <https://vimeo.com/showcase/9334456>





# ITIC-PTWC training videos – Support Ocean Teacher Global Academy

## TSUNAMI TRAINING

Videos on Tsunami Warning Operations, including from the Pacific Tsunami Warning Center

Pacific Tsunami Warning Center (PTWC)  
Graphical Tsunami Forecast Products for the PTWS

Dr. Charles "Chip" McCreery  
Director, PTWC

20:19

EN - PTWC Products, Pacific - ...

itic

Pacific Tsunami Warning Center (PTWC)  
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Dr. Charles "Chip" McCreery  
Director, PTWC

20:19

SP - PTWC I

itic

UNESCO IOC / NOAA  
International Tsunami Information Center  
Tsunami Training Videos, August 2022

Pacific Tsunami Warning Center (PTWC)  
Product Staging from the earthquake,  
through data collection and analyses, to tsunami forecasting,  
and product generation and dissemination

10:09

Dr. Charles "Chip" McCreery  
Director, PTWC

EN - PTWC Product Staging, ...

ITIC

UNESCO IOC / NOAA  
International Tsunami Information Center  
Tsunami Training Videos, November 2022

Pacific Tsunami Warning Center (PTWC)  
What happens for a Pacific earthquake?

18:59

Dr. Charles "Chip" McCreery  
Director, PTWC

EN - PTWC TWS Ops - Pacific...

ITIC

## ITIC / Collections / Showcases

Sort: Date | Alphabetical | Videos | Duration



BROWSE SHOWCASES



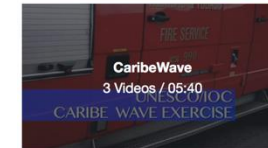
Showcases help you organize your videos, or create and share curated playlists of other videos on Vimeo.

ALSO CHECK OUT

More stuff from ITIC

65 Videos

17 Collections



<https://vimeo.com/showcase/8956022>

Password: training



# 2023 - TOWS WG TT-TWO / DMP

The Group noted with appreciation the progress made during the intersessional period, including:

- **Work of the PTWS to develop a National Tsunami Warning Centre (NTWC) Competency Framework (2017), and the ITIC's leadership to pilot training courses based on the Framework;**

**The Group recommended** the IOC Assembly at its 32<sup>nd</sup> session in 2023 to instruct the regional ICGs:

- **ITIC to pilot the PTWS NTWC Competency Framework with the goal to develop a global framework for all ICGs to use.**

# PTWS Progress – ITIC plans

## Requirements - Content and Training Modality

- KNOWLEDGE – do self-paced, hybrid
- OPERATIONS SOP – do self-paced, hybrid, in-person
- REAL-LIFE EXPERIENCE– do by attachment to Advanced Centre, e.g., PTWC and/or others (Australia, Chile, Japan, New Zealand, Philippines...)
- NATIONAL QUALIFICATION / Certification – by country. IOC / ITIC does not provide certification for tsunami training and cannot certify staff

## ITIC has funding to explore feasibility for PTWS in 2024+

Pilot with PICT at PTWC or other Advanced Centers ?

Model after Weather Pacific Training Desk (small cohort group staying 1+ month, incl attachment). Next Steps (welcome partners !!!) :

1. Complete Draft Competency Framework for NTWC in 2023 (WG2 TT, ICG/PTWS-XXX)
2. Develop Implementation Concept in 2023
3. Pilot in 2024



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ICG/PTWS-SC  
6-9 March 2023  
In-Person and Virtual

# Questions for Part 2?

## Thank You Muchas Gracias

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Director, ITIC, USA NOAA

**Cdr. Carlos Zuniga**  
Associate Director, ITIC, Chile SHOA

**Christa von Hillebrandt**  
Deputy Director, ITIC, USA NOAA  
Manager, ITIC Caribbean Office





# GLOBAL NTWC COMPETENCY FRAMEWORK

## PTWS



TT TWO - TT DMP JOINT, 28 Feb 2022  
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