

# Updates on International Tsunami Information Center and Caribbean Tsunami Warning Program

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**Presentation for NTHMP 2019 Annual Meeting  
August 19-23, 2019**

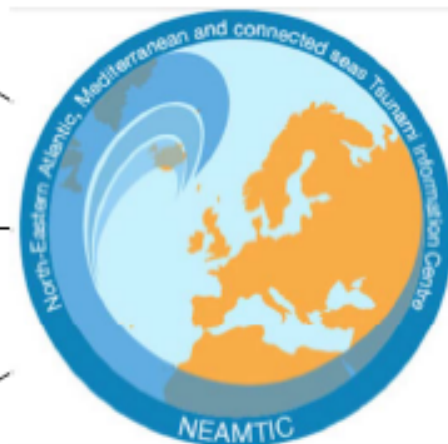
# IOC Tsunami Information Centers

PTWS  
USA NOAA – IOC  
Partnership  
1965

<https://vimeo.com/192771669>



NEAMTWS  
EC DG ECHO  
France, Greece, Italy, Portugal  
2011-13



IOTWS  
Indonesia – IOC Partnership 2012  
(formerly JTIC since 2006)

CARIBE-EWS  
Barbados– IOC Partnership  
2015 (approved 2007)



# ITIC – INTERNATIONAL

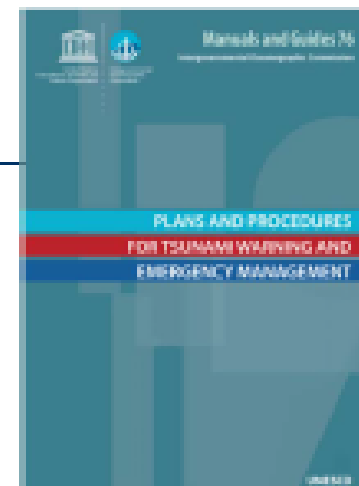


## IOC Mandate & Functions (1977)

- ❑ **Monitor / Recommend Improvements** to PTWS and other tsunami warning systems – communications, data networks, evaluations, dissemination
- ❑ **Assist in establishing** regional and national tsunami systems – comprehensive risk reduction
- ❑ **Serve as technology transfer resource;**  
**Encourage research to improve evaluations;**  
**Conduct trainings to build capacity**
- ❑ **Serve as an information resource for preparedness / education; Develop, publish, distribute materials**
- ❑ **Serve as an information resource on historical tsunamis – database, post-event surveys**



# ITIC-IOC Training, 2019 – July to Nov



## ■ In-country

- Jul: **Barbados** – Caribbean regional / national SOPs and use of PTWC Enhanced products
- Aug: **Papua New Guinea** – National / Local TWC and TER SOPs of use of PTWS Enhanced Products
- Aug: **El Salvador** – Tsunami Ready, mini-train - decision support tools
- Oct: **Fiji** – Pacific Regional Tsunami Evacuation Planning I (inundation modeling and mapping) for Pacific Islands

Later 2019/2020: Pacific Regional Tsunami Evacuation Planning I-III-IV (evac mapping, response plans, exercises)

- Oct: **Tonga** – Tsunami Warning Center operations
- Nov: **Colombia** – TEWS, TWC and TER SOPs and use of PTWC Enhanced Products

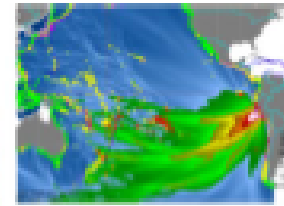
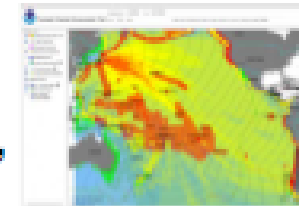
## ■ Hawaii

- 3-13 September: ITP-Hawaii, End-to-End TEWS and Tsunami Evacuation Planning - NEAMTWS, CARIBE-TWS, PTWS, IOTWMS



# ITIC Services, Products – maintain, new

- **ITIC Tsunami Bulletin Board listserve ~ 478 members**  
(no media or public)
- **TsuCAT – Develop and distribute with NOAA NCTR/PMEL - hazard assessment DB (Pacific, Caribbean) with exercise module & PTWC products, current distr v4.0 (ICG/PTWS, CARIBE-EWS)**
- **IOC MG (TEMPP) - “Preparing for Community Tsunami Evacuations: From Inundation to Evacuation Maps, Response Plans, and Exercises,”**  
Quick Guide, April (English), August (Spanish), Supplement (September 2019)
- **Compile / Share Best Practices via ITIC web site (PTWS SC action)**
  - Structures for Vertical Evacuation
  - Marine Preparedness - Port Safety Products (for evacuation)

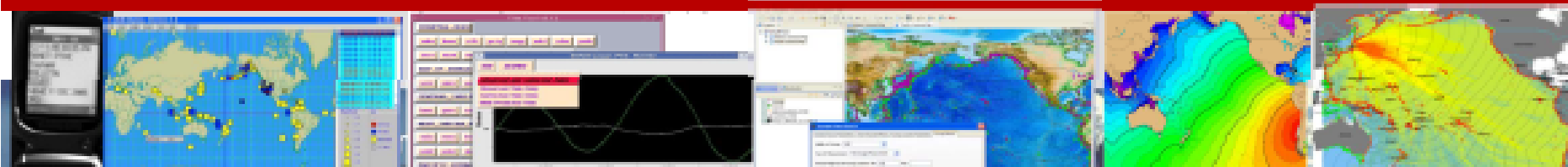




# Tsunami Warning Decision Support Tools

## ITIC-distributed, supported

- ☐ **Heads-up SMS TW Alert Bull Board**  
(NOAA USAID RANET, ITIC, PTWC, 2005-2014) - Possible 2019 restart
  - ☐ **Tsunami Bull Board** (ITIC, 1995) ~480 science/tsu/govt
  - ☐ **Real time EQ Display** (CISN, USGS / NTHMP, 2005), ~250
  - ☐ **Real-time Sea Level monitoring**
    - Tide Tool – TWC operations monitoring (PTWC, 2005)
    - IOC Sea Level Monitoring web site (IOC, 2008)
  - ☐ **Tsunami Travel Time Software** (ITIC, NGDC, 2007) – **SDK4.0** new
  - ☐ **Tsunami Historical Database** Online (WDS-NCEI), Offline (TsuDig, NCEI, ITIC, 2009)
- 
- ☐ **Tsunami Hazard Assessment Tools (2017)**
    - ☐ ComMIT/MOST, Tsu Coastal Assessment Tool (**TsuCAT**), v4



# ITIC Support and Involvement

## □ Post-Tsunami Survey - facilitate

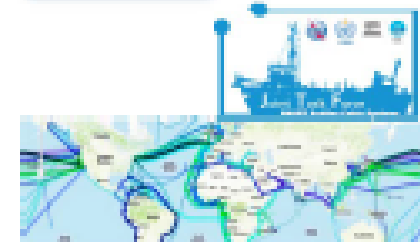
- ITST-Palu – October – November – support IOTIC/ITIIC, 7+ teams, 87+ scientists, Protocol (Indo research permit expedited and visa waiver, check-in/out, info sharing, reporting)
- Anak Krakatau – also expedited research permit and visa, but no ITST
- ITST Report Back – International Symposium - Lessons Learned, 26-28 Sept



EU, NZ, USA brief, 5 Nov



## □ SMART cables (WMO/IOC/ITU JTF) – Indonesia (Sunda), South Amer (WG1, SEP), New Caledonia-Vanuatu



## □ UNESCO IOC Tsunami Ready

- ITIC facilitate all PTWS country pilots
- Support CTWP Tsunami Ready in 2018-2019 (El Salvador, Saint Vincent and Grenadines, Jamaica, Belize)



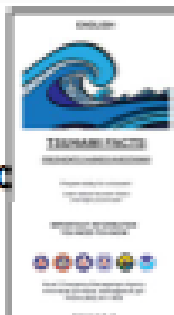
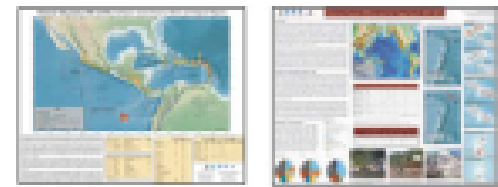
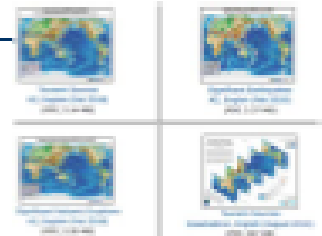
## □ PacWave exercises (since 2006) – current PacWave18, next 2020 (Sept – Nov, including WTAD 5 Nov)



## □ Host PTWS WG/TT & Steering Comm Mtg, Honolulu, 2018 + 2020

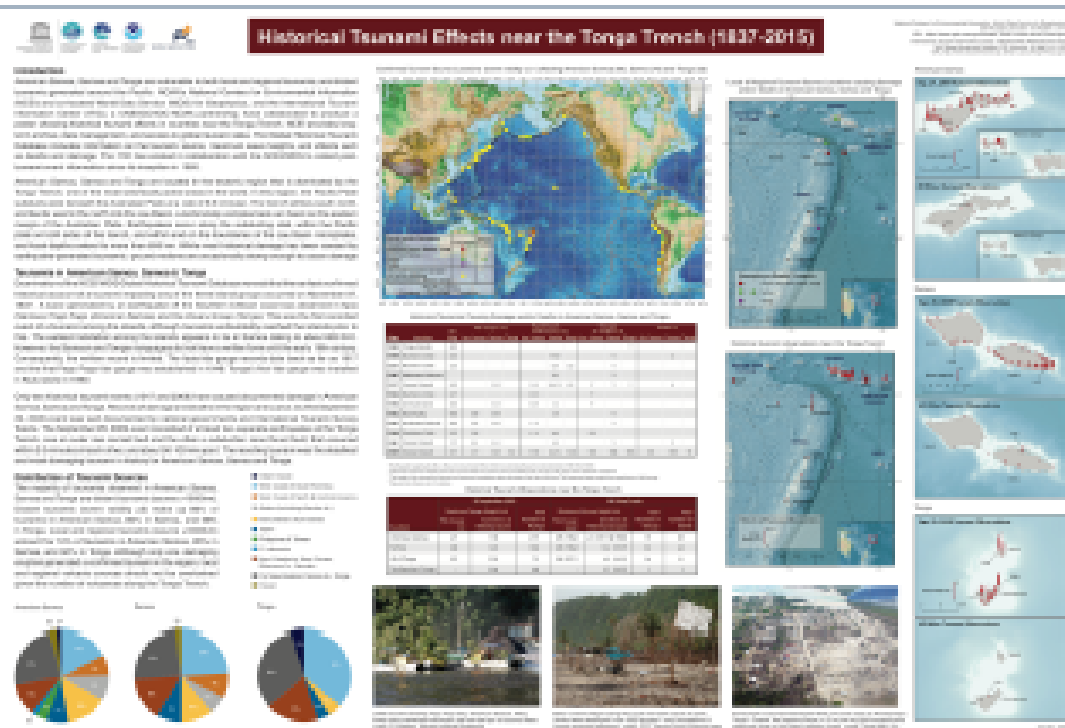
# ITIC - NOAA IOC Awareness – updates, new

- **Global Tsunami Hazard Maps** – through June 2018 – print 1000 copies
- **Regional Historical Tsunami Effects Maps** – American Samoa /Samoa/Tonga (2017); Central Am/Mexico/Carib (2018, en, sp); Papua New Guinea/Solomons (Aug 2019) – printed 500
- **Tsunami Glossary** 2019 – printed 2000
- **ITST and Hawaii Photos** – Tsunami Event video (13) Welcome contributions, help w/metadata (2004, 2010, 2009)
- **Tsunami Warning!** comic – American Samoa custom (en) printed 7000
- **What is Tsunami?** coloring book – adapted fr Guam Homeland Security
- **Hawaii Tsunami Facts** tri-fold– customized by County (Oahu, Kauai, Maui, Big Island), translated 14 languages (English, Filipino - Ilokano, Tagalog, Spanish, Hawaiian, Japanese, Chinese - Simplified, Traditional, Chuukese, Korean, Marshallese, Samoan, Tongan, Vietnamese)





# 2009 AMERICAN SAMOA, SAMOA, TONGA



## Video content, format:

- Silent, with captions
- Tectonic, Earthquake, Tsunami info (wave arrival, time, runup, etc)
- Photos - Tsunami waves and Impacts
- Summary Impact Table



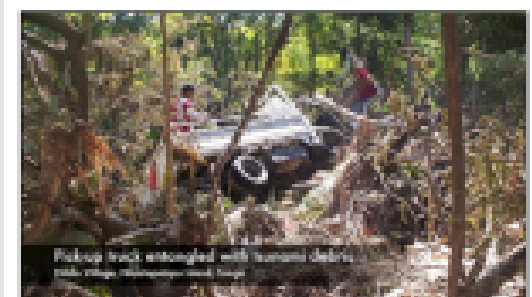
**Samoa Islands Earthquake and Tsunami Effects in American Samoa**

29 September 2009, 1748 UTC, Mw 8.1  
(video, ITIC 2018)



**Samoa Islands Earthquake and Tsunami Effects in Samoa**

29 September 2009, 1748 UTC, Mw 8.1  
(video, ITIC 2018)



**Samoa Islands Earthquake and Tsunami Effects in Tonga**

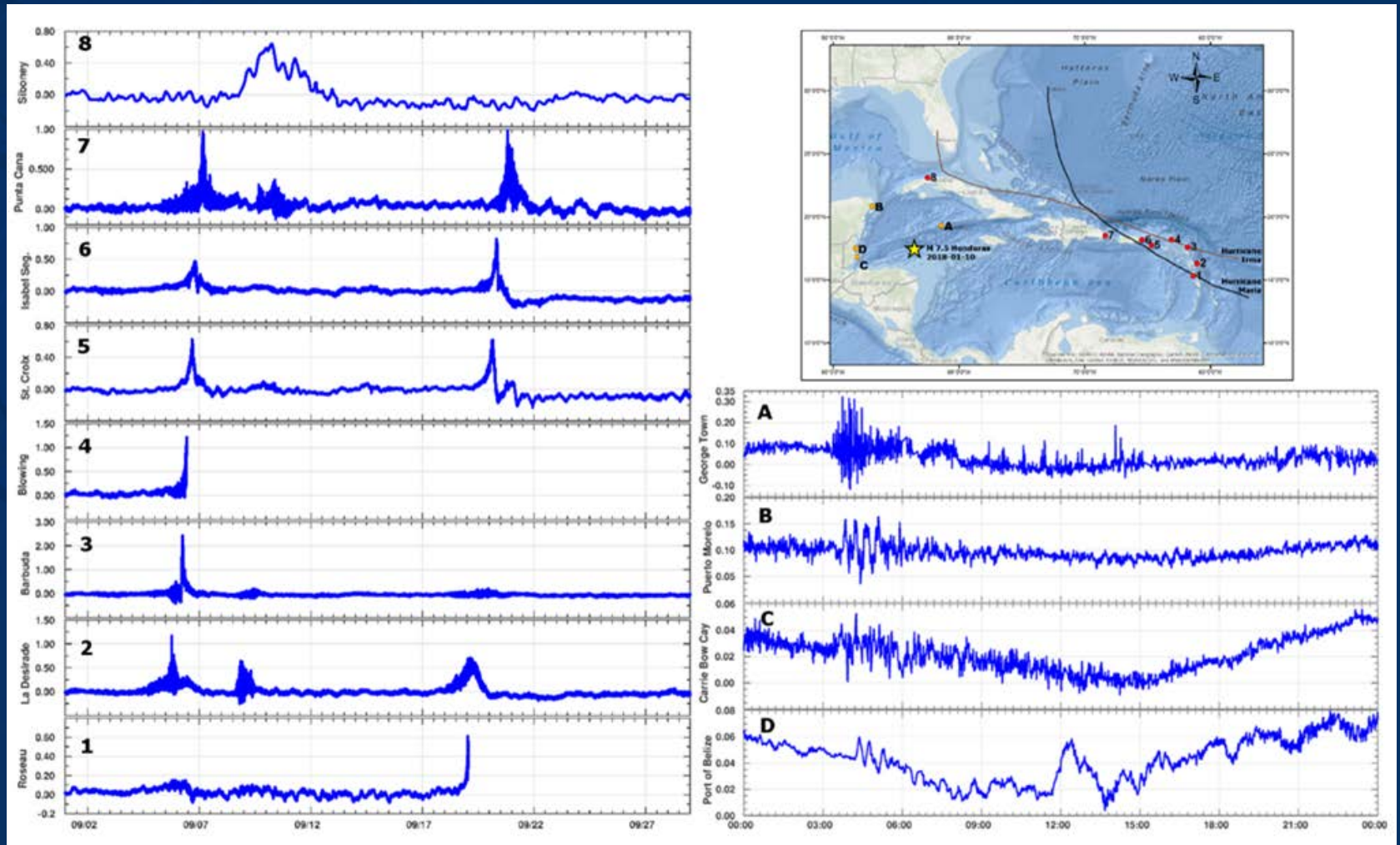
29 September 2009, 1748 UTC, Mw 8.1  
(video, ITIC 2018)

# US NWS Caribbean Tsunami Warning Program

- Established by NOAA NWS in 2010
- Co-Located with the Puerto Rico Seismic Network in Mayaguez, Puerto Rico
- In 2017 was transferred to ITIC
- Supporting observations for tsunami services (Seismic, Sea Level and GPS),
- Conducts Tsunami Operational Procedures training
- Coordinates CARIBE WAVE exercises
- TsunamiReady and Tsunami Ready Program, Education and Outreach



# Storm Surge and Tsunami Detection on Coastal Sea Level Gauges 2017-2018





# CARIBE WAVE 19 @ 800,000 participants



Intergovernmental Oceanographic Commission  
Technical Series

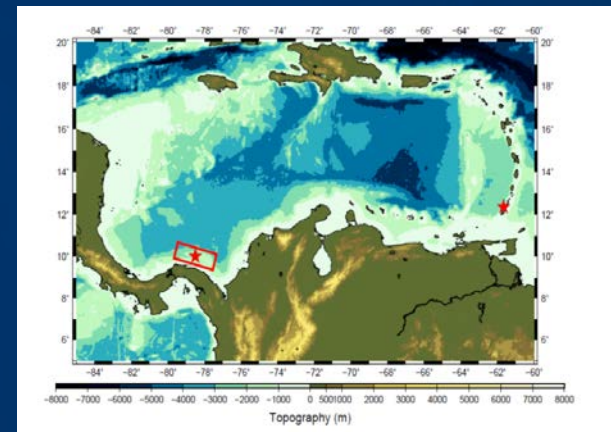
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**EXERCISE CARIBE WAVE 19**  
**A Caribbean and Adjacent Region**  
**Tsunami Warning Exercise**  
**14 March 2019**

**Volume 1**

**Participant Handbook**



Examples of exercises as part of the CARIBE WAVE 19: Colombia (a), Puerto Rico (b), Mexico (c), Honduras (d), Dominican Republic (e), Puerto Rico (f), Venezuela (g), Honduras (h), Costa Rica (i), Martinique (j), Venezuela (k), Guadeloupe (l).



# PR/USVI Support and Activities



# UNESCO/IOC CARIBE EWS Tsunami Ready Pilot Program



Categories	Completed
<b>MITIGATION</b>	
Mit-1. Have designated and mapped tsunami hazard zones	✓
Mit-2. Have a public display of tsunami information	✓
<b>PREPAREDNESS</b>	
Prep-1. Produce easily understood tsunami evacuation maps as determined to be appropriate by local authorities in collaboration with communities	✓
Prep-2. Develop and distribute outreach and public education materials	✓
Prep-3. Hold at least three outreach or educational activities <u>annually</u>	✓
Prep-4. Conduct an annual tsunami community exercise	✓

<b>RESPONSE</b>	
Resp-1. Address tsunami hazards in the community's emergency operations plan (EOP)	✓
Resp-2. Commit to supporting the emergency operations center (EOC) during a tsunami incident if an EOC is opened and activated	✓
Resp-3. Have redundant and reliable means for a 24-hour warning point (and EOC if activated) <u>to receive</u> official tsunami threats	✓
Resp-4. Have redundant and reliable means for 24-hour warning point and/or EOC <u>to disseminate</u> official tsunami alerts to the public	✓



# World Tsunami Awareness Day

## November 5



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**Thank you,  
Gracias,  
Mahalo!**