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

ITIC
www.tsunamiwave.info

INDIAN OCEAN TSUNAMI INFORMATION CENTRE
iofic.ioc-unesco.org

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

CARIBBEAN TSUNAMI INFORMATION CENTRE
ctic.ioc-unesco.org

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

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

NEAMTIC
North-Eastern Atlantic, Mediterranean and connected seas Tsunami Information Centre

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 listserv ~ 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, + 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

- 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
- 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);

- Tsunami Glossary 2019 – printed 2000

- ITST and Hawaii Photos – Tsunami Event video (13)

- 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
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

<table>
<thead>
<tr>
<th>Categories</th>
<th>Completed</th>
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<tbody>
<tr>
<td><strong>MITIGATION</strong></td>
<td></td>
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<tr>
<td>Mit-1. Have designated and mapped tsunami hazard zones</td>
<td>✓</td>
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<tr>
<td>Mit-2. Have a public display of tsunami information</td>
<td>✓</td>
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<tr>
<td><strong>PREPAREDNESS</strong></td>
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<tr>
<td>Prep-1. Produce easily understood tsunami evacuation maps as determined to be appropriate by local authorities in collaboration with communities</td>
<td>✓</td>
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<tr>
<td>Prep-2. Develop and distribute outreach and public education materials</td>
<td>✓</td>
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<tr>
<td>Prep-3. Hold at least three outreach or educational activities annually</td>
<td>✓</td>
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<tr>
<td>Prep-4: Conduct an annual tsunami community exercise</td>
<td>✓</td>
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<th>RESPONSE</th>
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<tr>
<td>Resp-1. Address tsunami hazards in the community’s emergency operations plan (EOP)</td>
<td>✓</td>
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<tr>
<td>Resp-2. Commit to supporting the emergency operations center (EOC) during a tsunami incident if an EOC is opened and activated</td>
<td>✓</td>
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<tr>
<td>Resp-3. Have redundant and reliable means for a 24-hour warning point (and EOC if activated) to receive official tsunami threats</td>
<td>✓</td>
</tr>
<tr>
<td>Resp-4. Have redundant and reliable means for 24-hour warning point and/or EOC to disseminate official tsunami alerts to the public</td>
<td>✓</td>
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World Tsunami Awareness Day
November 5
For more information:

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Thank you,
Gracias,
Mahalo!