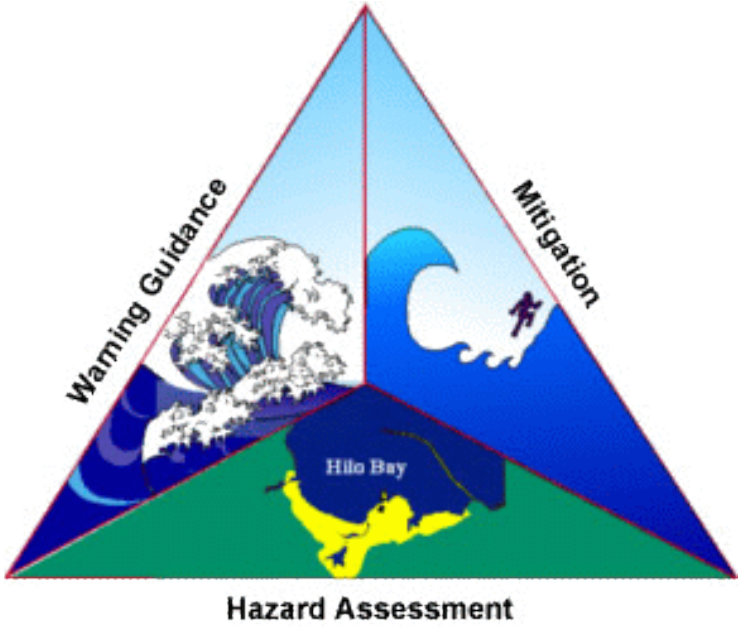
THE PUERTO RICO COMPONENT OF THE NTHMP
(NATIONAL TSUNAMI HAZARD AND MITIGATION PROGRAM)



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NTHMP Annual Meeting
February 11, 2015
Portland, OR

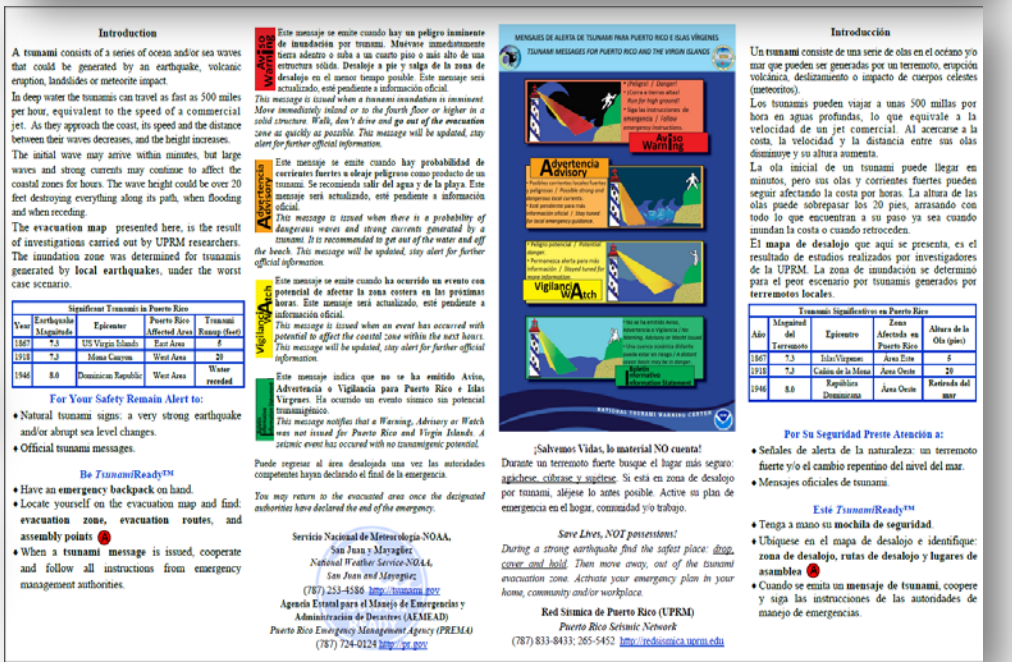
TsunamiReady Communities in Puerto Rico

February, 2015

Coastal Communities: 44

***TsunamiReady*: 44 (100%)**

- 44 Evacuation maps:
  - ✓ GIS Base
  - ✓ available online
  - ✓ follow mapping standard guidelines



Introduction

A **tsunami** consists of a series of ocean and/or sea waves that could be generated by an earthquake, volcanic eruption, landslides or meteorite impact.

In deep water the tsunamis can travel as fast as 500 miles per hour, equivalent to the speed of a commercial jet. As they approach the coast, its speed and the distance between their waves decreases, and the height increases.

The initial wave may arrive within minutes, but large waves and strong currents may continue to affect the coastal zones for hours. The wave height could be over 20 feet destroying everything along its path, when flooding and when receding.

The **evacuation map** presented here, is the result of investigations carried out by UPRM researchers. The inundation zone was determined for tsunamis generated by **local earthquakes**, under the worst case scenario.

Significant Tsunamis in Puerto Rico

Year	Earthquake Magnitude	Epicenter	Puerto Rico Affected Area	Tsunami Runup (feet)
1867	7.5	US Virgin Islands	East Area	5
1918	7.3	Mona Canyon	West Area	20
1946	8.0	Dominican Republic	West Area	Water receded

For Your Safety Remain Alert to:

- Natural tsunami signs: a very strong earthquake and/or abrupt sea level changes.
- Official tsunami messages.

Be *Tsunami*Ready™

- Have an **emergency backpack** on hand.
- Locate yourself on the evacuation map and find: **evacuation zone, evacuation routes**, and **assembly points** A
- When a **tsunami message** is issued, cooperate and follow all instructions from emergency management authorities.

Aviso / Warning

Este mensaje se emite cuando **hay un peligro inminente de inundación** por tsunami. Muévase inmediatamente tierra adentro o suba a un cuarto piso o más alto de una estructura sólida. **Desaloje a pie y salga de la zona de desalojo** en el menor tiempo posible. Este mensaje será actualizado, esté pendiente a información oficial.

This message is issued when a tsunami inundation is imminent. Move immediately inland or to the fourth floor or higher in a solid structure. Walk, don't drive and ***go out of the evacuation zone*** *as quickly as possible. This message will be updated, stay alert for further official information.*

Advertencia / Advisory

Este mensaje se emite cuando **hay probabilidad de corrientes fuertes u oleaje peligroso** como producto de un tsunami. Se recomienda **salir del agua y de la playa**. Este mensaje será actualizado, esté pendiente a información oficial.

This message is issued when ***there is a probability of dangerous waves and strong currents*** *generated by a tsunami. It is recommended to* ***get out of the water and off the beach****. This message will be updated, stay alert for further official information.*

Vigilancia / Watch

Este mensaje se emite cuando **ha ocurrido un evento con potencial de afectar la zona costera en las próximas horas**. Este mensaje será actualizado, esté pendiente a información oficial.

This message is issued when an event has occurred with potential to affect the coastal zone within the next hours. This message will be updated, stay alert for further official information.

Información / Information

Este mensaje indica que **no se ha emitido Aviso, Advertencia o Vigilancia para Puerto Rico e Islas Vírgenes**. Ha ocurrido un evento sísmico sin potencial tsunamigénico.

This message notifies that a Warning, Advisory or Watch was not issued for Puerto Rico and Virgin Islands. A seismic event has occured with no tsunamigenic potential.

Puede regresar al área desalojada una vez las autoridades competentes hayan declarado el final de la emergencia.

You may return to the evacuated area once the designated authorities have declared the end of the emergency.

Servicio Nacional de Meteorología NOAA, San Juan y Mayagüez
National Weather Service-NOAA, San Juan and Mayagüez
(787) 253-4586 http://tsunami.gov

Agencia Estatal para el Manejo de Emergencias y Administracion de Desastres (AEMEAD)
Puerto Rico Emergency Management Agency (PREMA)
(787) 724-0124 http://pr.gov

¡Salvemos Vidas, lo material NO cuenta!

Durante un terremoto fuerte busque el lugar más seguro: agáchese, cúbrase y sujétese. Si está en zona de desalojo por tsunami, aléjese lo antes posible. Active su plan de emergencia en el hogar, comunidad y/o trabajo.

Save Lives, NOT possessions!

During a strong earthquake find the safest place: drop, cover and hold. Then move away, out of the tsunami evacuation zone. Activate your emergency plan in your home, community and/or workplace.

Red Sísmica de Puerto Rico (UPRM)
Puerto Rico Seismic Network
(787) 833-8433; 265-5452 http://redsismica.uprm.edu

Introducción

Un **tsunami** consiste de una serie de olas en el océano y/o mar que pueden ser generadas por un terremoto, erupción volcánica, deslizamiento o impacto de cuerpos celestes (meteoritos).

Los tsunamis pueden viajar a unas 500 millas por hora en aguas profundas, lo que equivale a la velocidad de un jet comercial. Al acercarse a la costa, la velocidad y la distancia entre sus olas disminuye y su altura aumenta.

La ola inicial de un tsunami puede llegar en minutos, pero sus olas y corrientes fuertes pueden seguir afectando la costa por horas. La altura de las olas puede sobrepasar los 20 pies, arrasando con todo lo que encuentran a su paso ya sea cuando inundan la costa o cuando retroceden.

El **mapa de desalojo** que aquí se presenta, es el resultado de estudios realizados por investigadores de la UPRM. La zona de inundación se determinó para el peor escenario por tsunamis generados por **terremotos locales**.

Tsunamis Significativos en Puerto Rico

Año	Magnitud del Terremoto	Epicentro	Zona Afectada en Puerto Rico	Altura de la Ola (pies)
1867	7.3	Islas Vírgenes	Area Este	5
1918	7.3	Cañón de la Mona	Area Oeste	20
1946	8.0	República Dominicana	Area Oeste	Retirada del mar

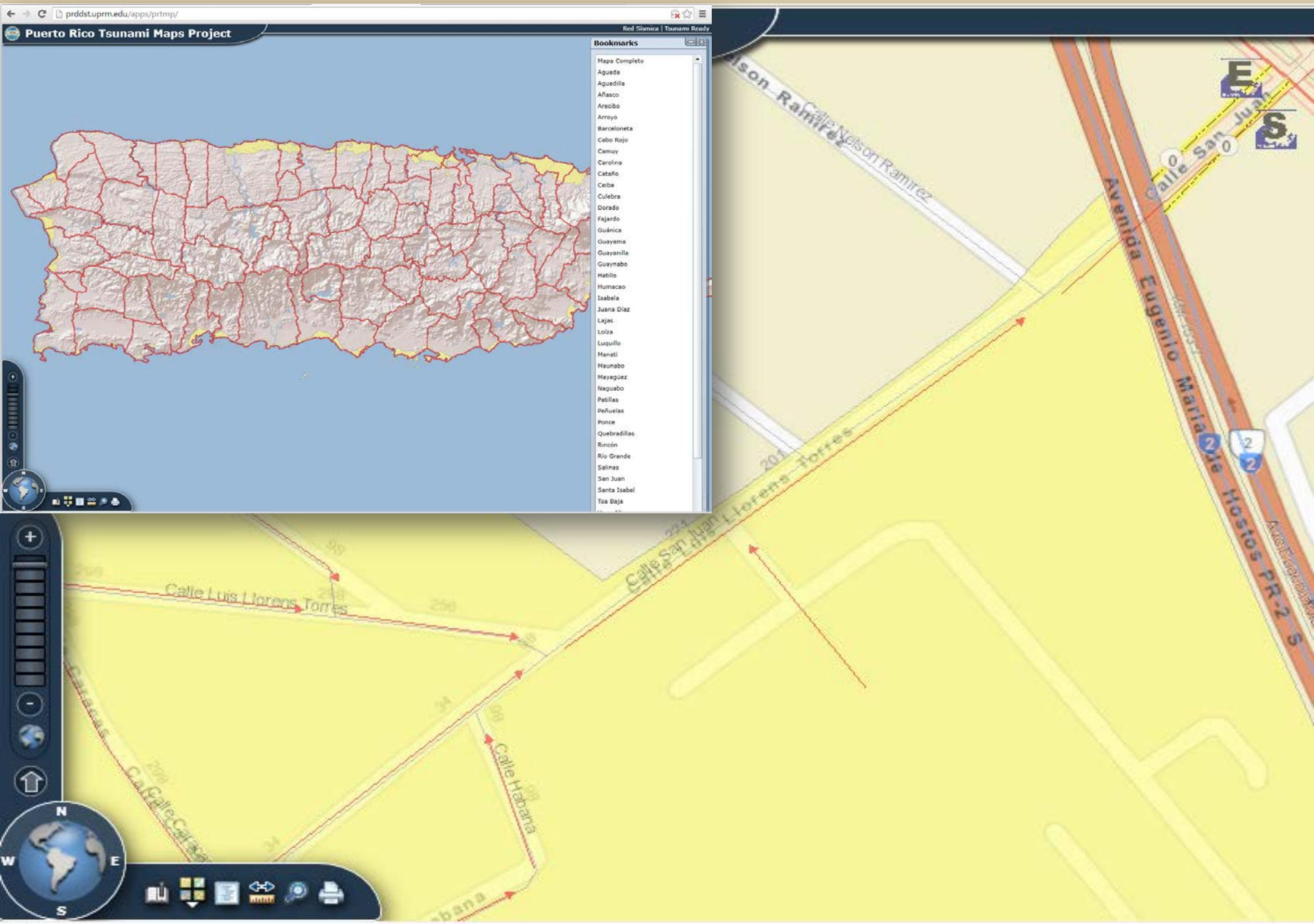
Por Su Seguridad Preste Atención a:

- Señales de alerta de la naturaleza: un terremoto fuerte y/o el cambio repentino del nivel del mar.
- Mensajes oficiales de tsunami.

Esté *Tsunami*Ready™

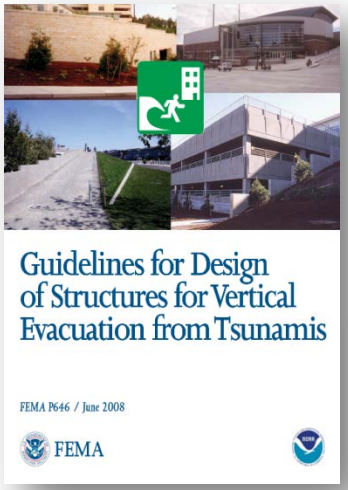
- Tenga a mano su **mochila de seguridad**.
- Ubíquese en el mapa de desalojo e identifique: **zona de desalojo, rutas de desalojo y lugares de asamblea** A
- Cuando se emita un **mensaje de tsunami**, coopere y siga las instrucciones de las autoridades de manejo de emergencias.

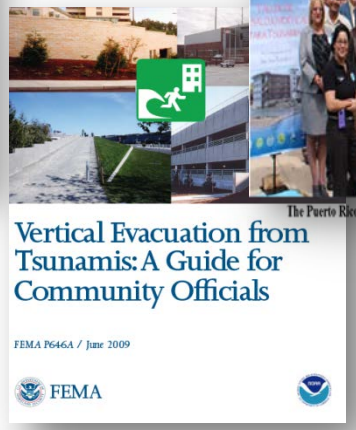
Puerto Rico TSUNAMI Decision Support Tool: http://gis.pr.gov



Education and Outreach:

- *People impacted – 70,000*
- *Total of activities – 1,427*
- *Total of interviews – 160*
- *Total of press articles – 108*
- *Radio spots – 4 daily / 70 stations*
- *FEMA-646, 646A in Spanish*

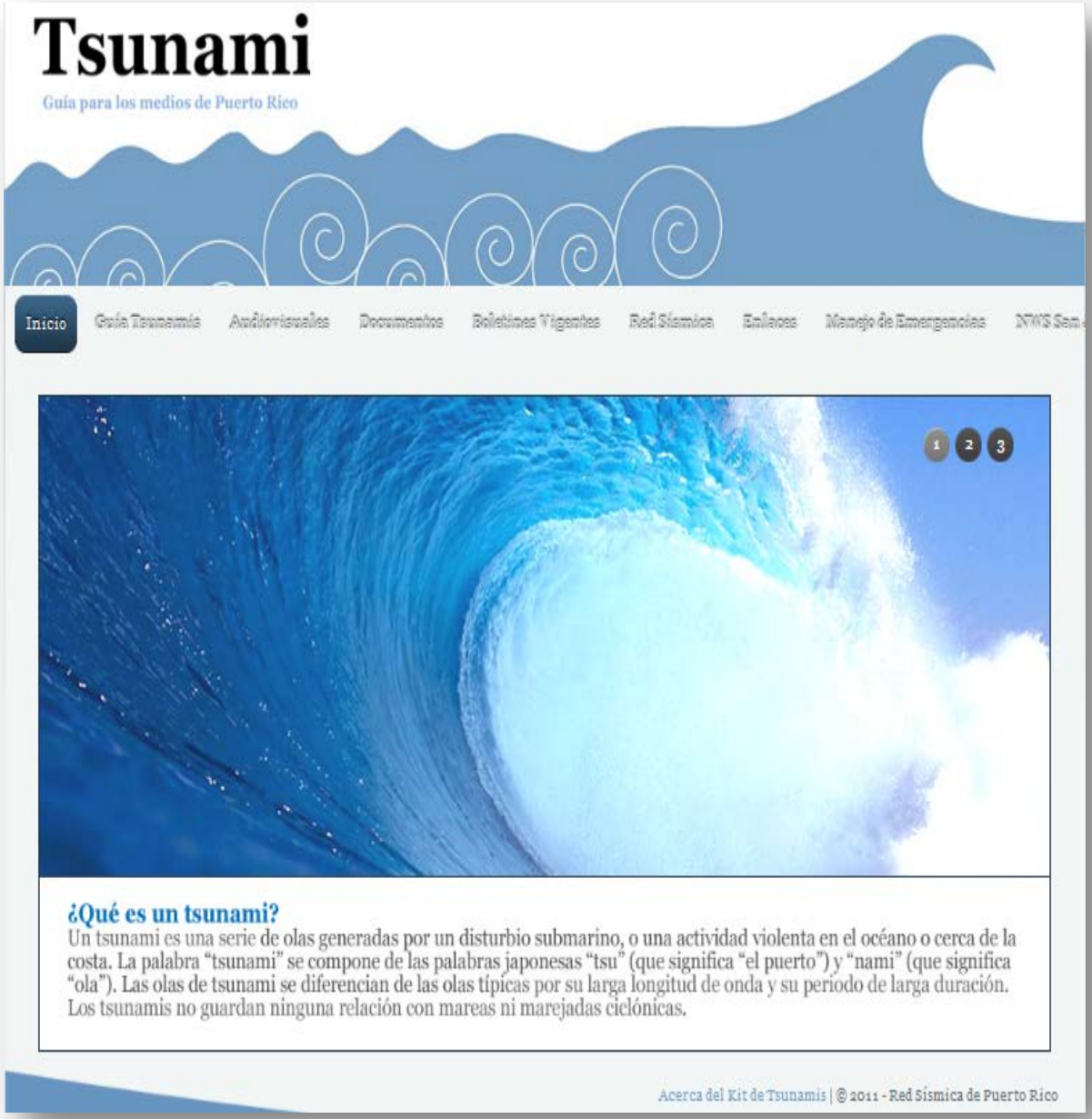




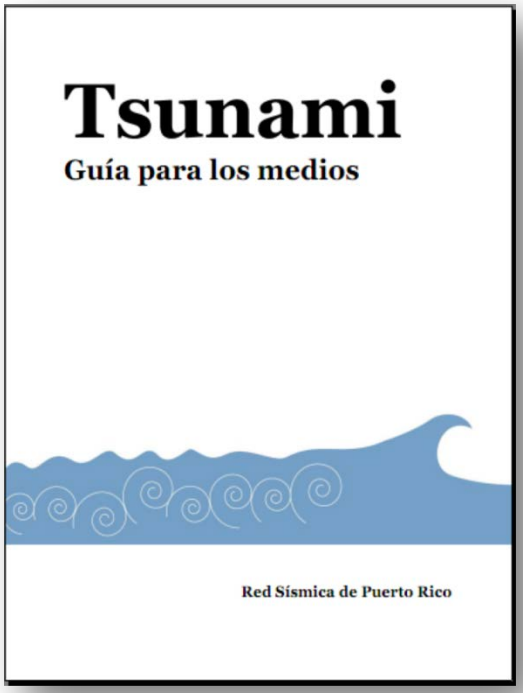
Educational Material for Schools K-12:

- *Number of workshops: 9*
- *Teachers reached: 275*
- *Number of manuals distributed: 50,200 (50,000 PREMA)*
- *Island wide Press Conference: 3*

PR Tsunami Media ToolKit: http://www.prsn.uprm.edu/mediakit

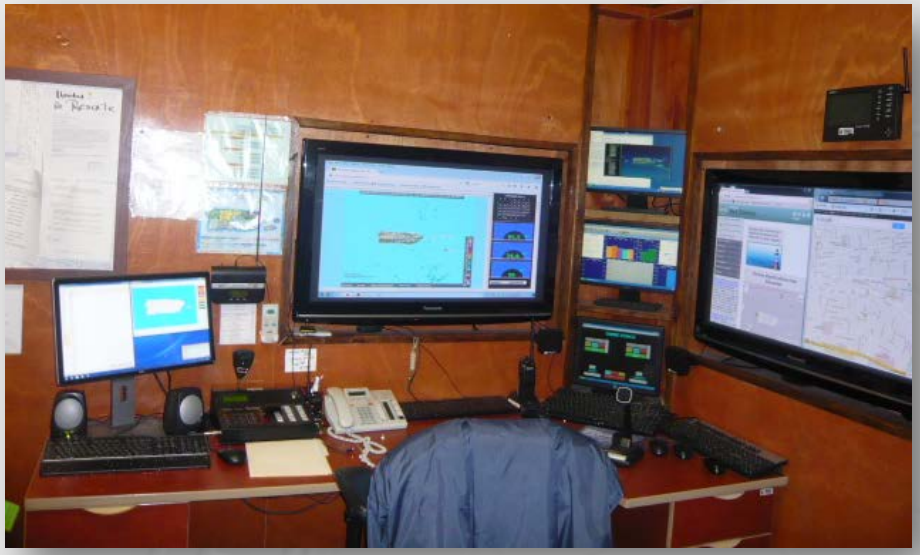


Tsunami media kit Online



Hard copy

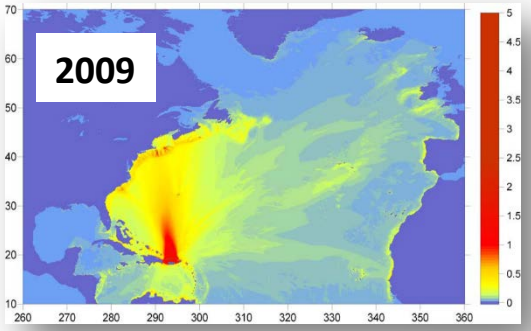
Mobile app

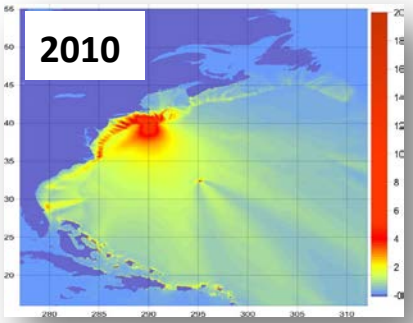


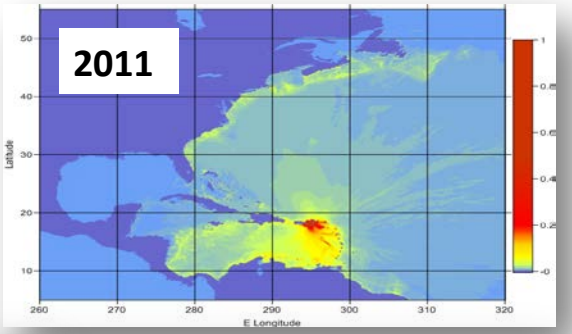
- EMWIN: 45 units + Training
- NOAA Radios: 600
- RSS terminals (50)
- Smart Phone APP (PRSN)
- Social media (PRSN)
- LOCAL EAS (NWS, PR Broadcast Association)
- Inter-Operability System (PREMA)

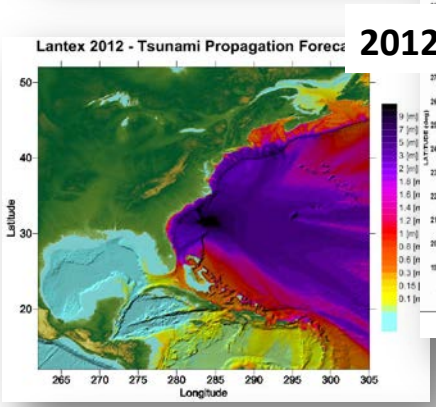
- Sirens: 71 systems (70 DHS)
- Sirens Protocol

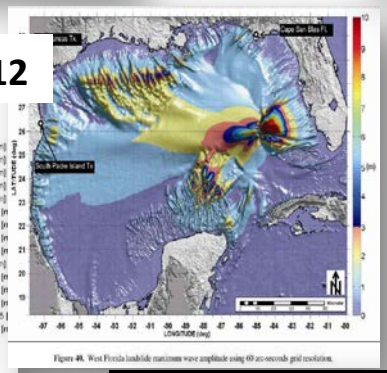
- 3,351 Tsunami signs

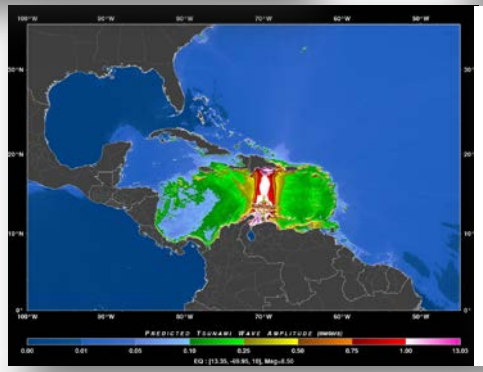


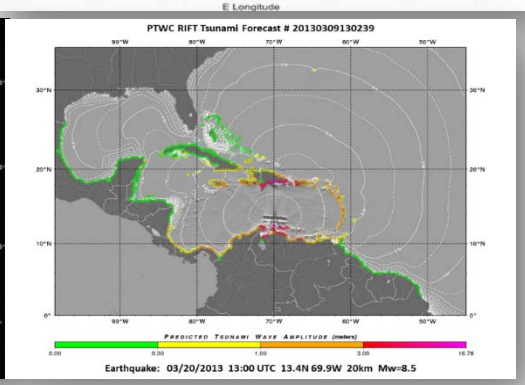


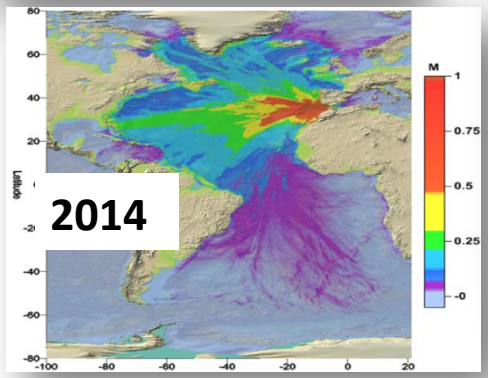


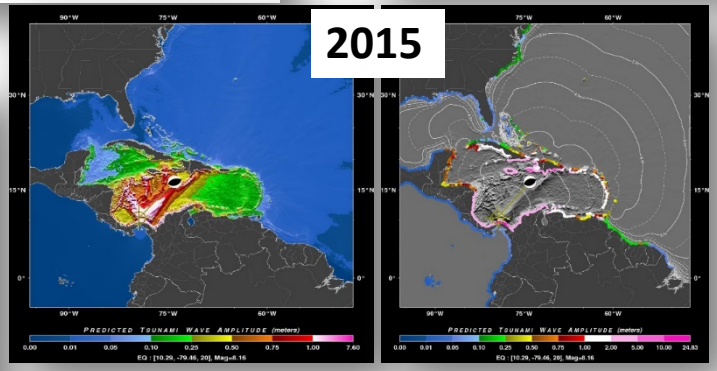












LANTEX/CARIBE WAVE
Scenarios

2014 Total Caribbean Participation: **191,973 (85% PR)**