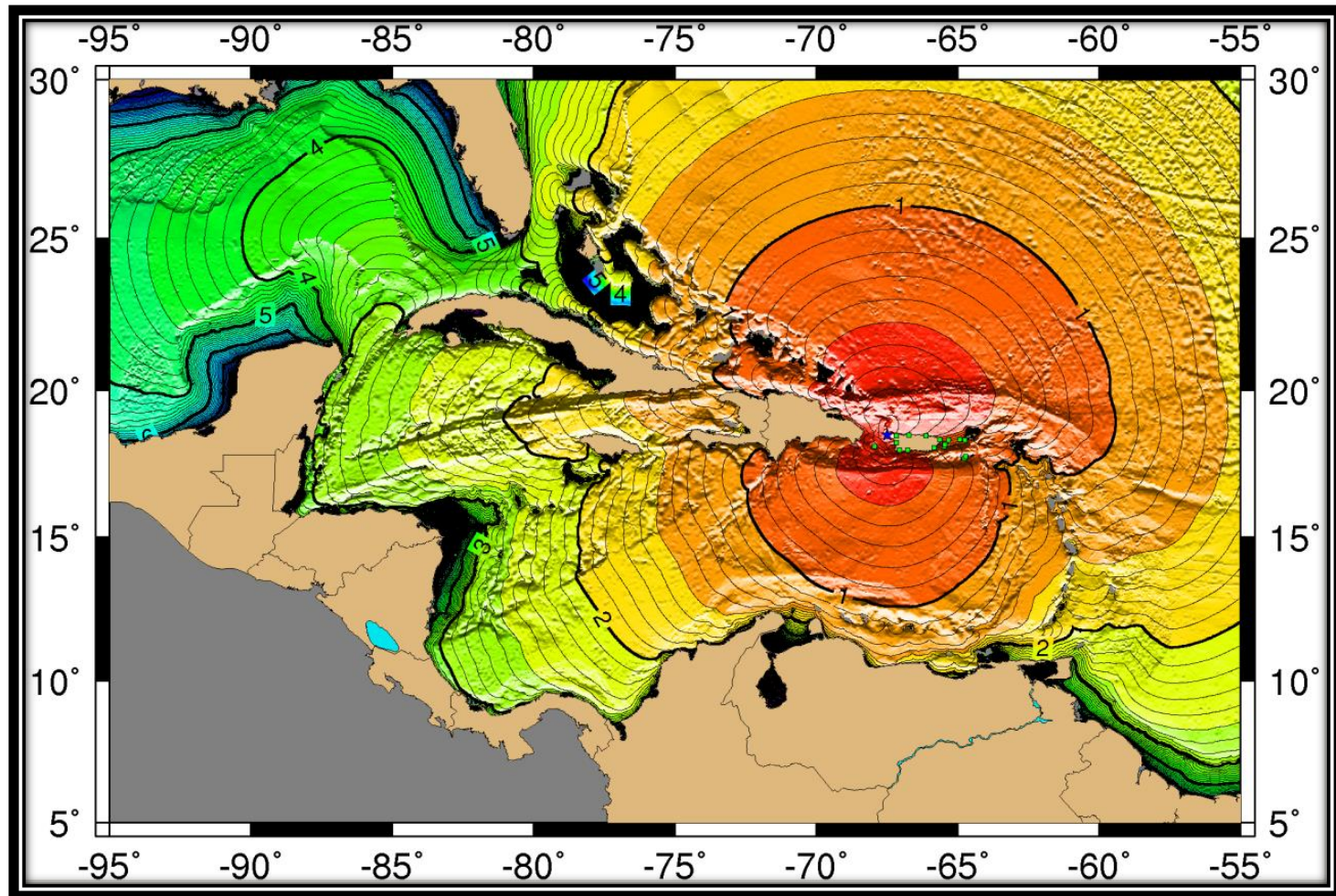


International Collaboration: A Central Component of the PRSN Tsunami Response Process

Lillian Soto-Cordero, Victor Huerfano-Moreno, Benjamin Colon and Javier Charon

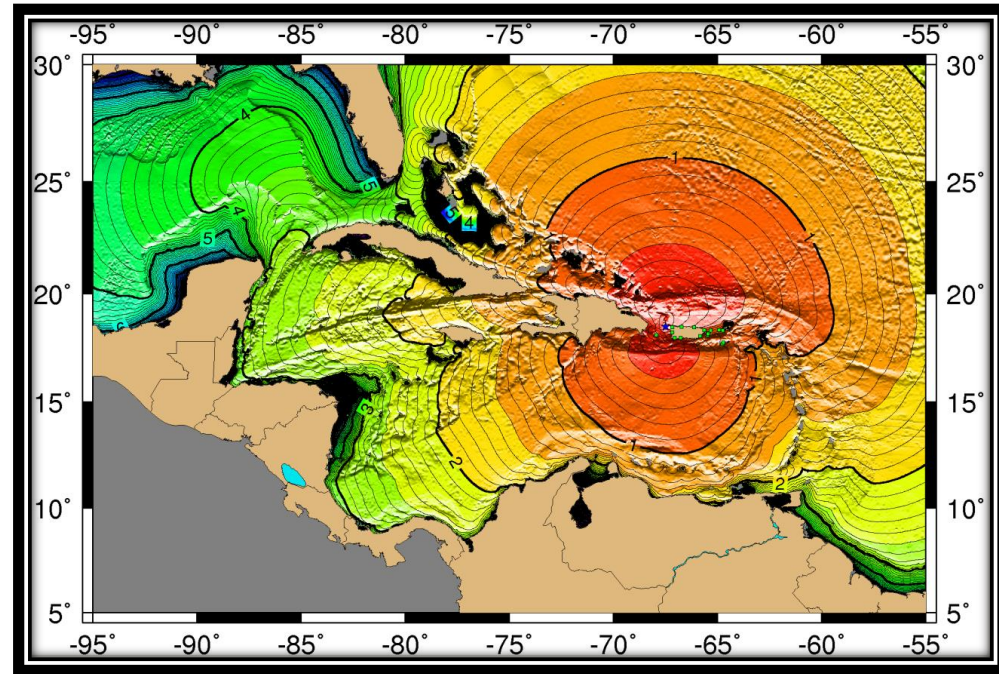


M 7.3 October 11, 1918
Historical information agrees with ETA's
Tsunami arrives to Aguadilla - 4 min after event

❖ Seismic & Sea Level data acquisition

❖ Location algorithms

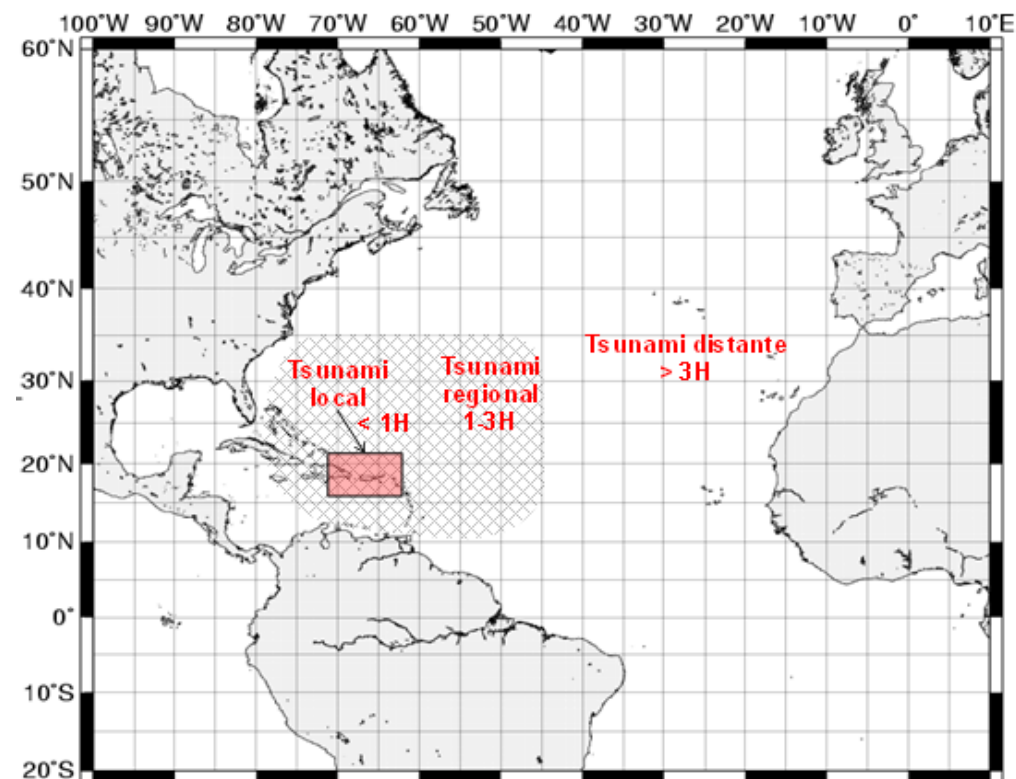
❖ Dissemination methods



**Fast, reliable, effective and
redundant**

PRSN Services

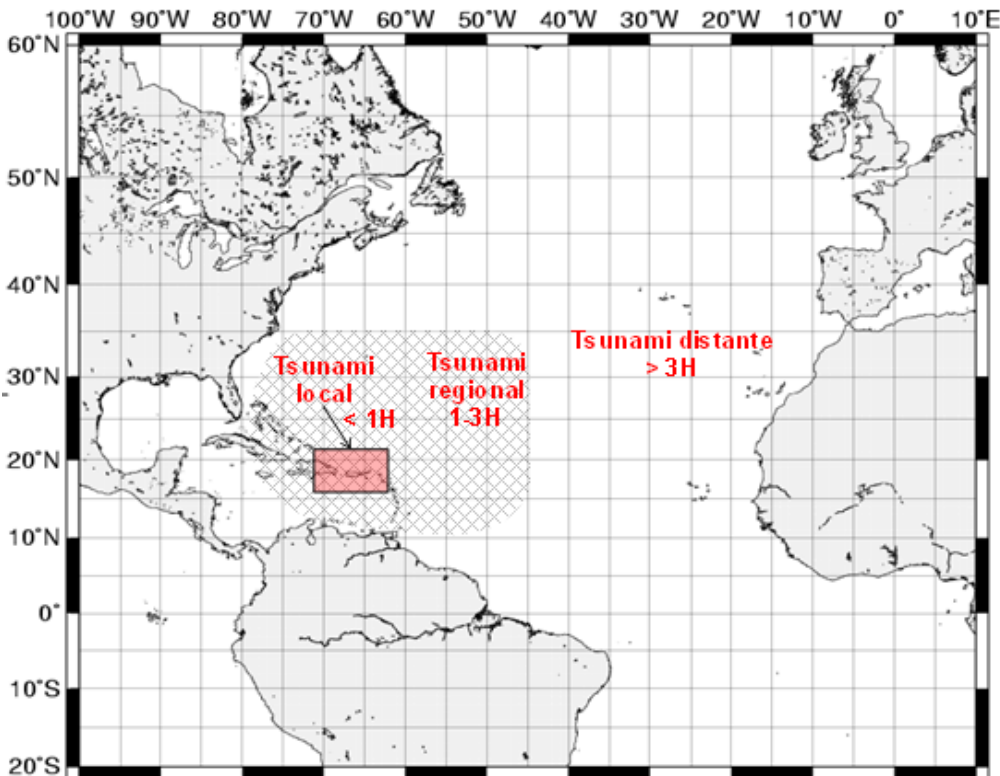
Earthquake and Tsunami Monitoring for Puerto Rico and US & British Virgin Islands



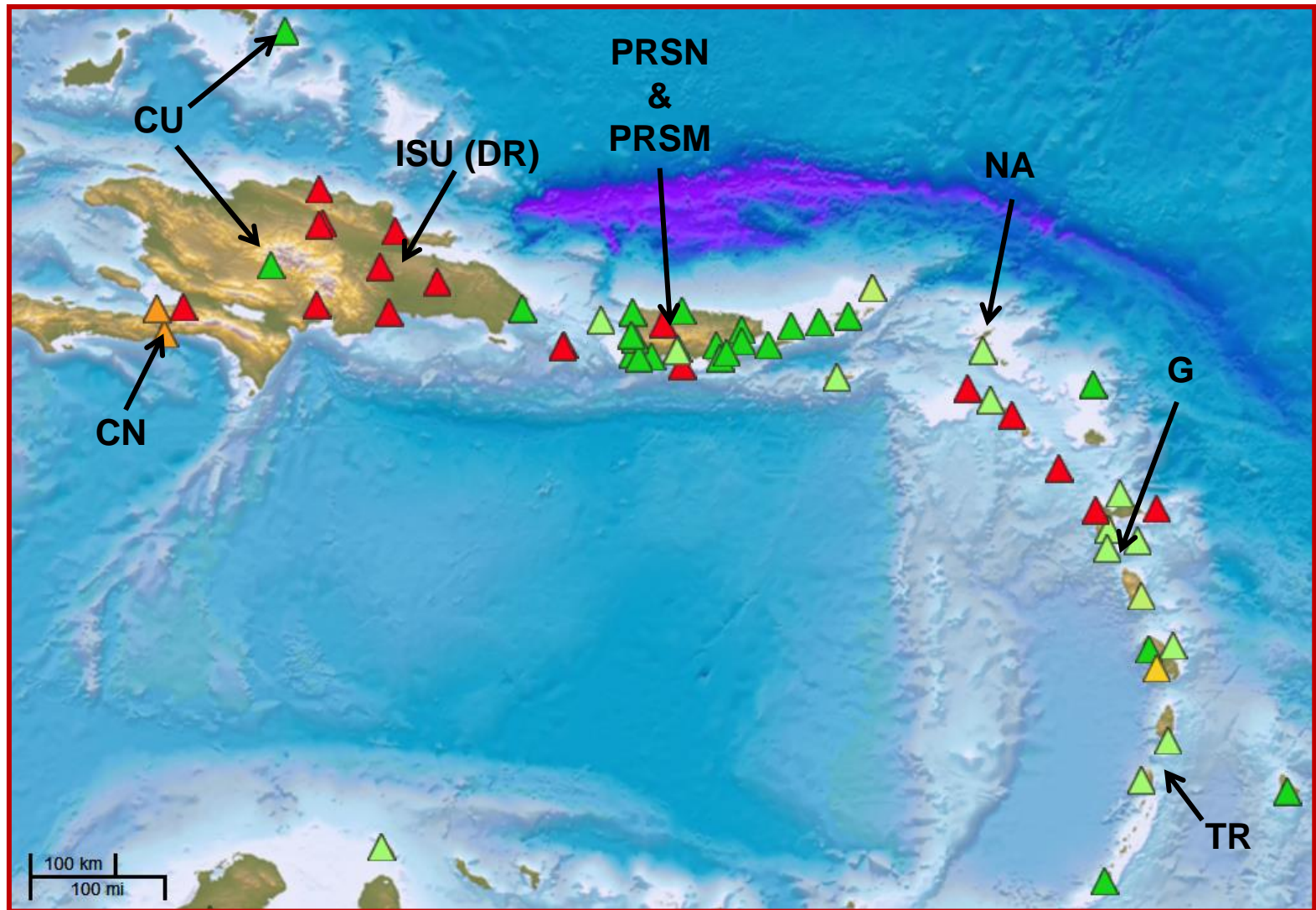
PRSN Services

Earthquake and Tsunami Monitoring for Puerto Rico and US & British Virgin Islands

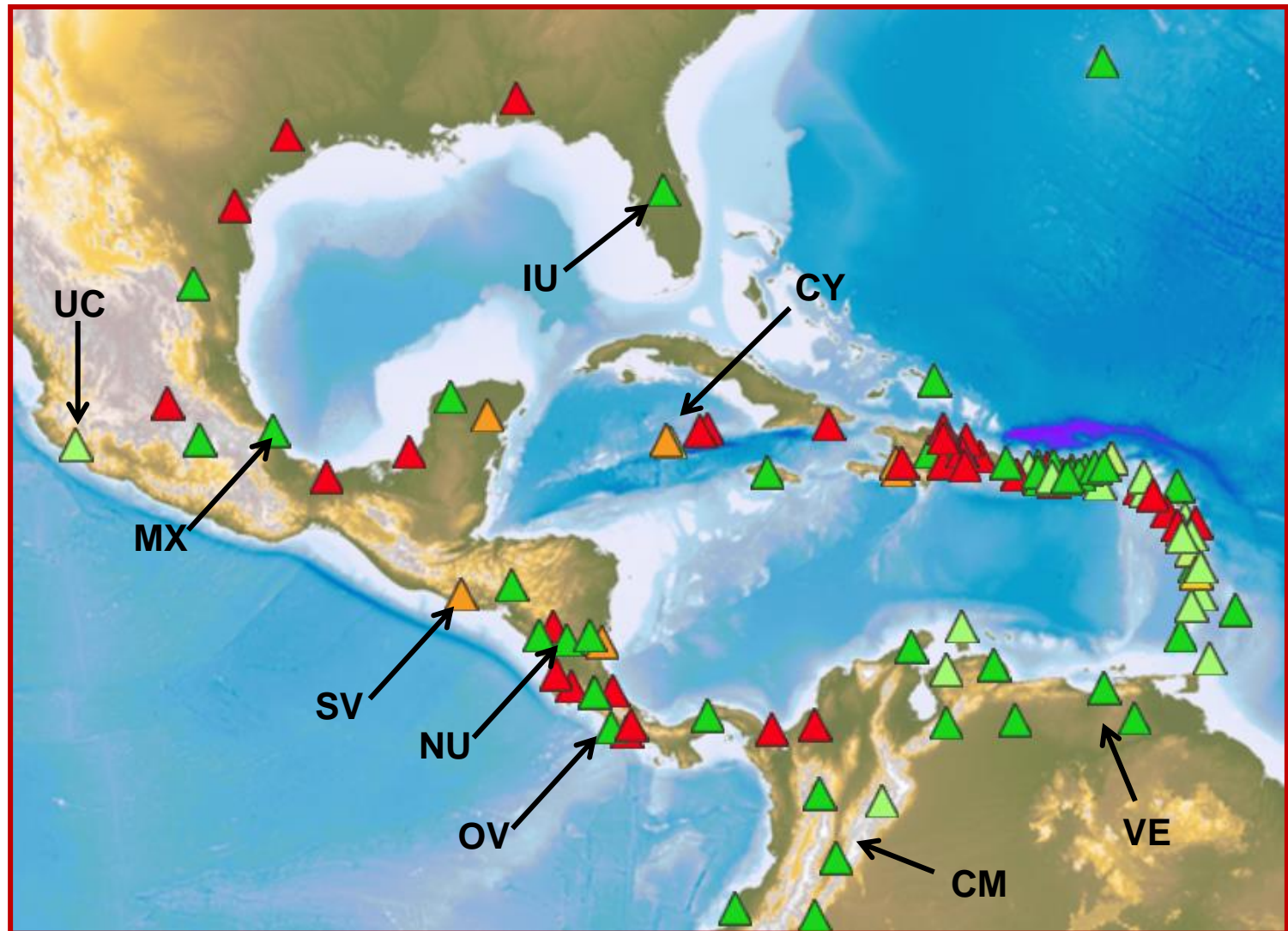
- ✓ Fast and reliable Automatic Earthquake Location
- ✓ Good azimuthal Station coverage is critical
 - **140** seismic stations entering on near real-time
 - **25** operated by PRSN & **70** at regional and teleseismic distances



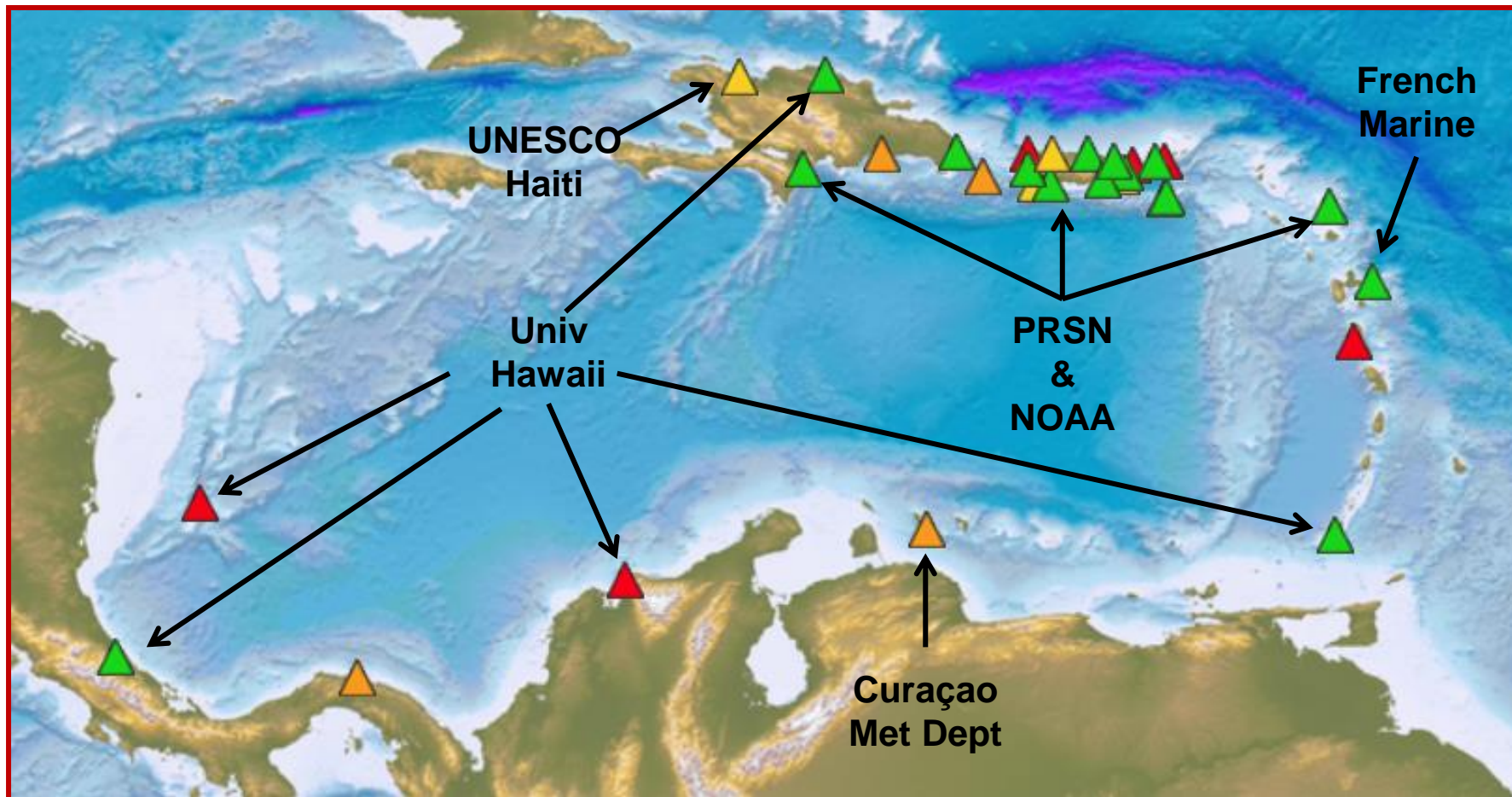
Seismic Data Exchange



Seismic Data Exchange



Sea Level Data Exchange



Instrumentation Installation

Haiti, 2011
PRSN and Haiti Personnel



Dominican Republic, 2008
PRSN and ONAMET

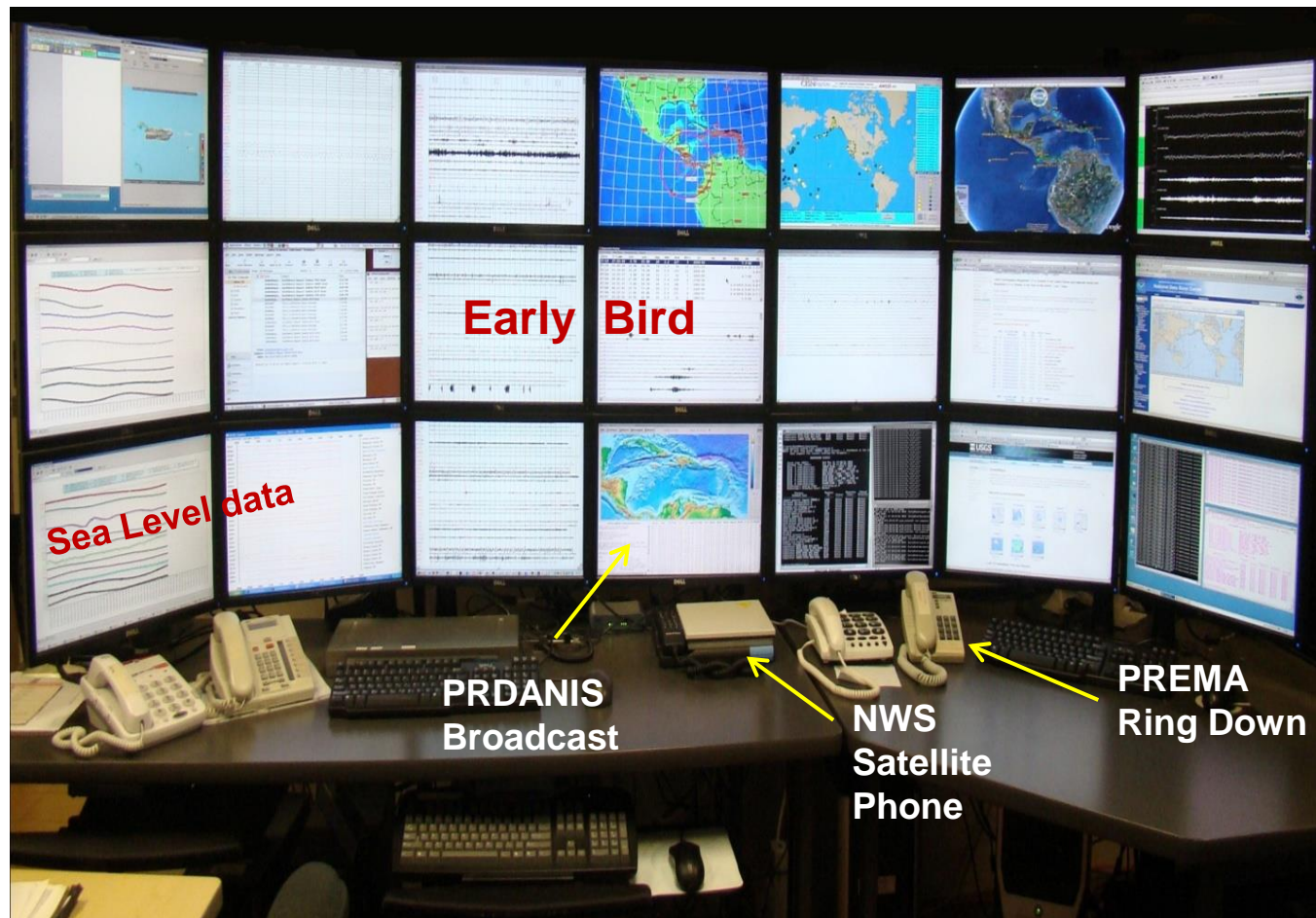
Colombia, 2012
PRSN and University of
Hawaii and Colombia
Naval personnel

Installation of Seismic and Tide Gauge stations in:

- Aruba (S)
- Colombia (TG)
- Dominican Republic (S, TG)
- Haiti (TG)

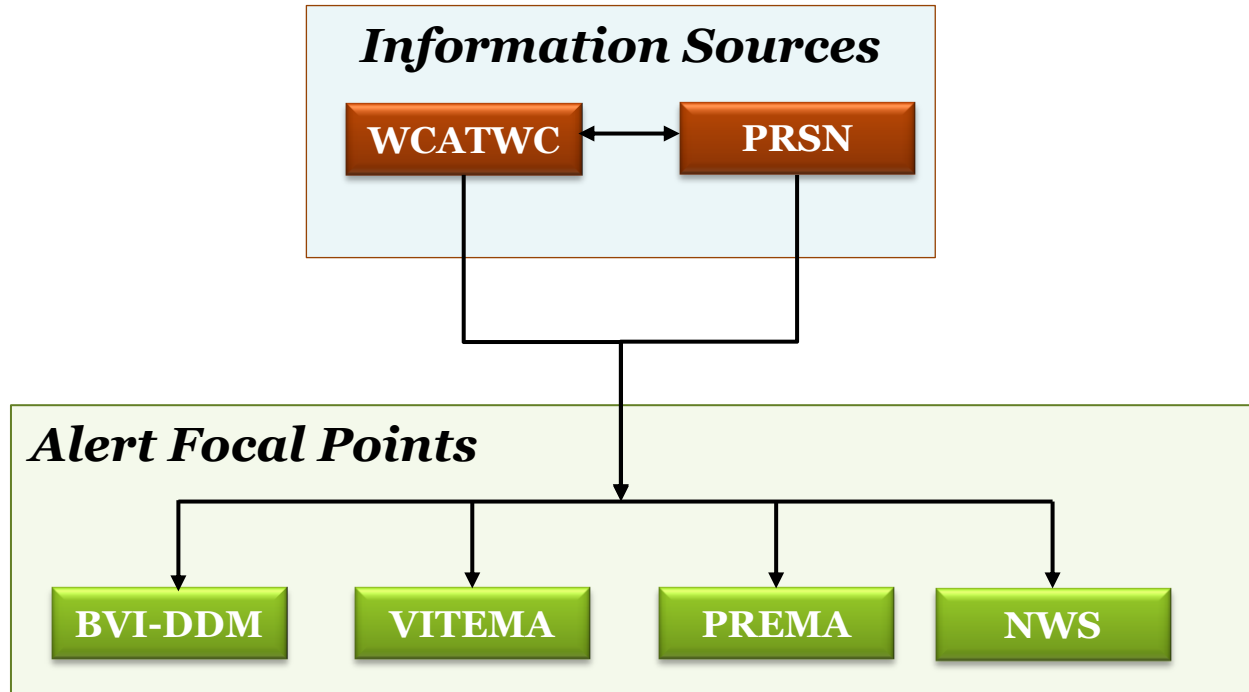


Software and Dissemination Tools



Long standing collaboration with the West Coast Alaska Tsunami Warning Center (WCATWC) has resulted on the incorporation of the WCATWC early warning system (**EarlyBird**) into PRSN operations

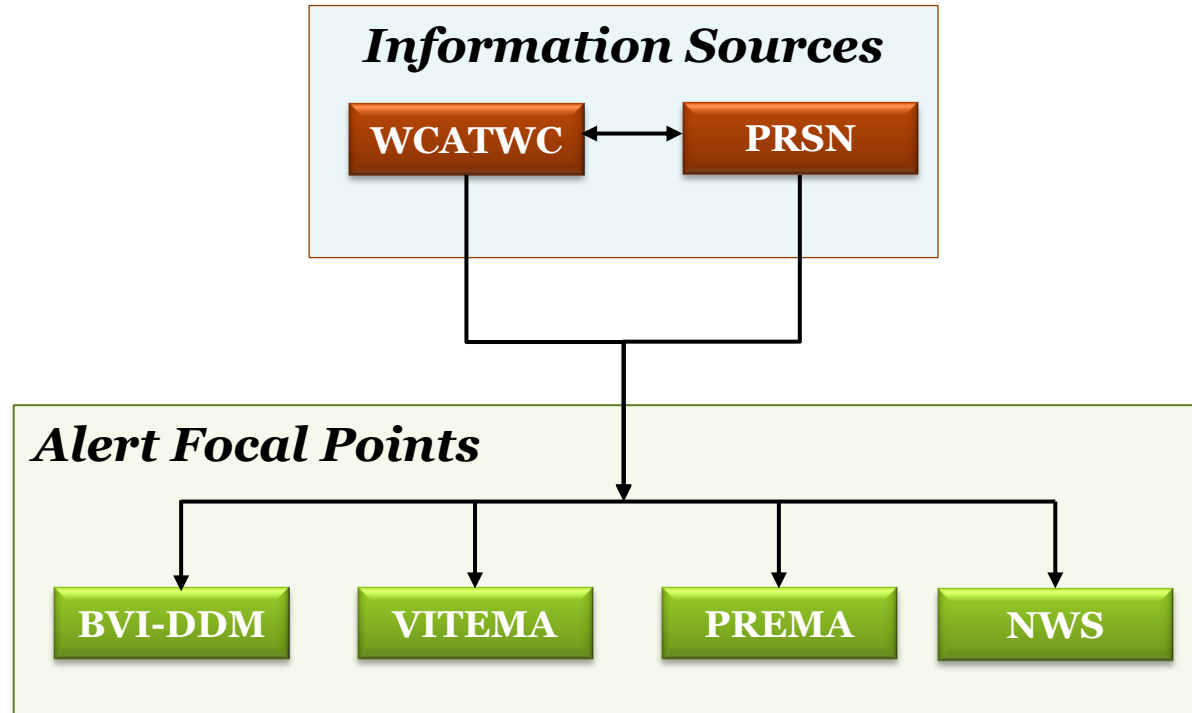
Dissemination of Eq & Tsunami Information

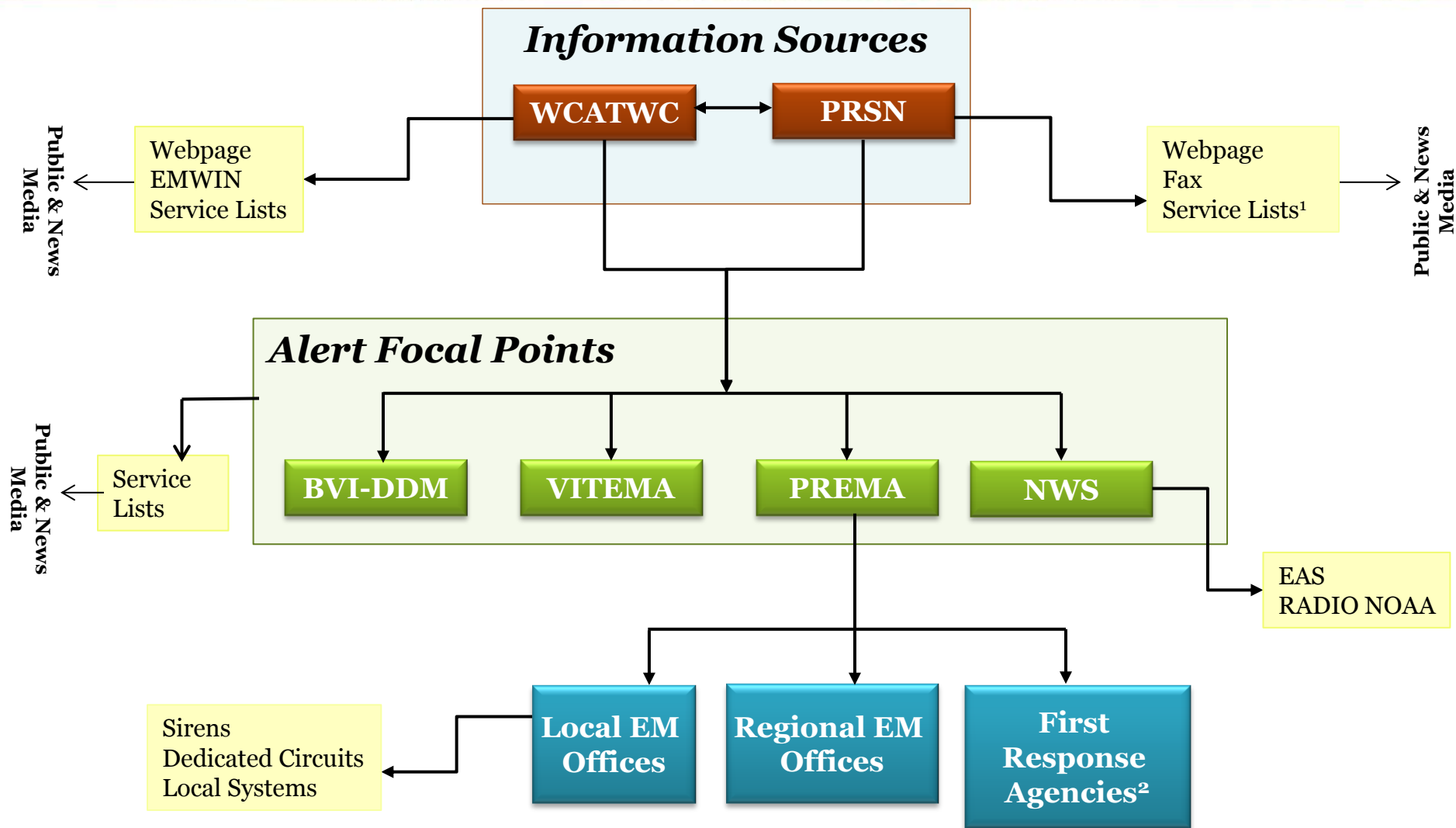


Dissemination of Eq & Tsunami Information

PRSN complements WCATWC:

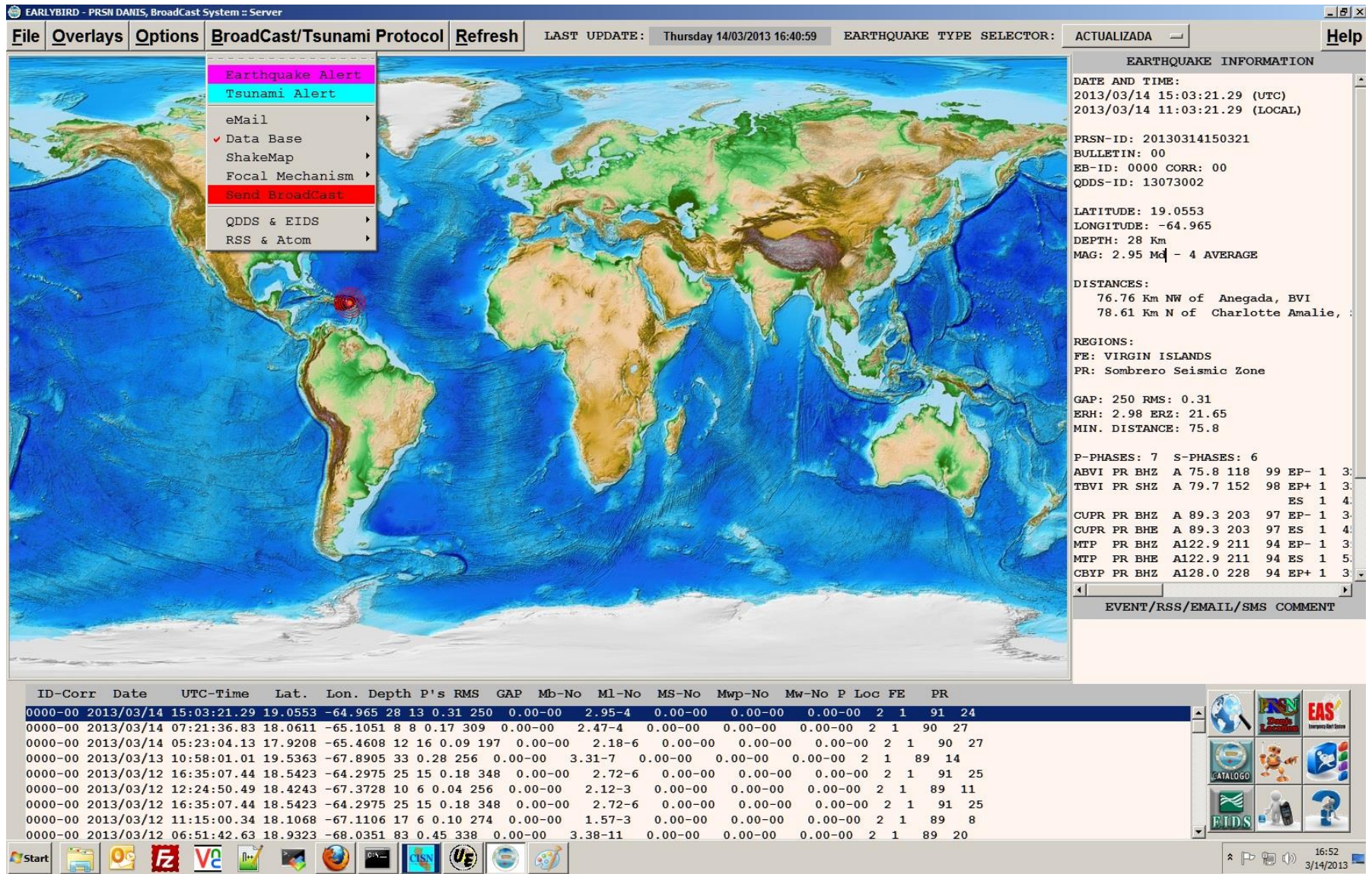
- **bilingual** (Spanish-English) service.
- Alert messages **simple, concise** and “to the point”.
- Dissemination **dedicated phone lines**.
- Use of **ham radio** (emergency frequency only).





1. They include email lists, text messages lists, RSS, etc.

2. They include : Police, Fire Department, National Guard and Medical Emergencies Personnel. PREMA will determine which agencies will be notified according to the Tsunami Alert Level in place.



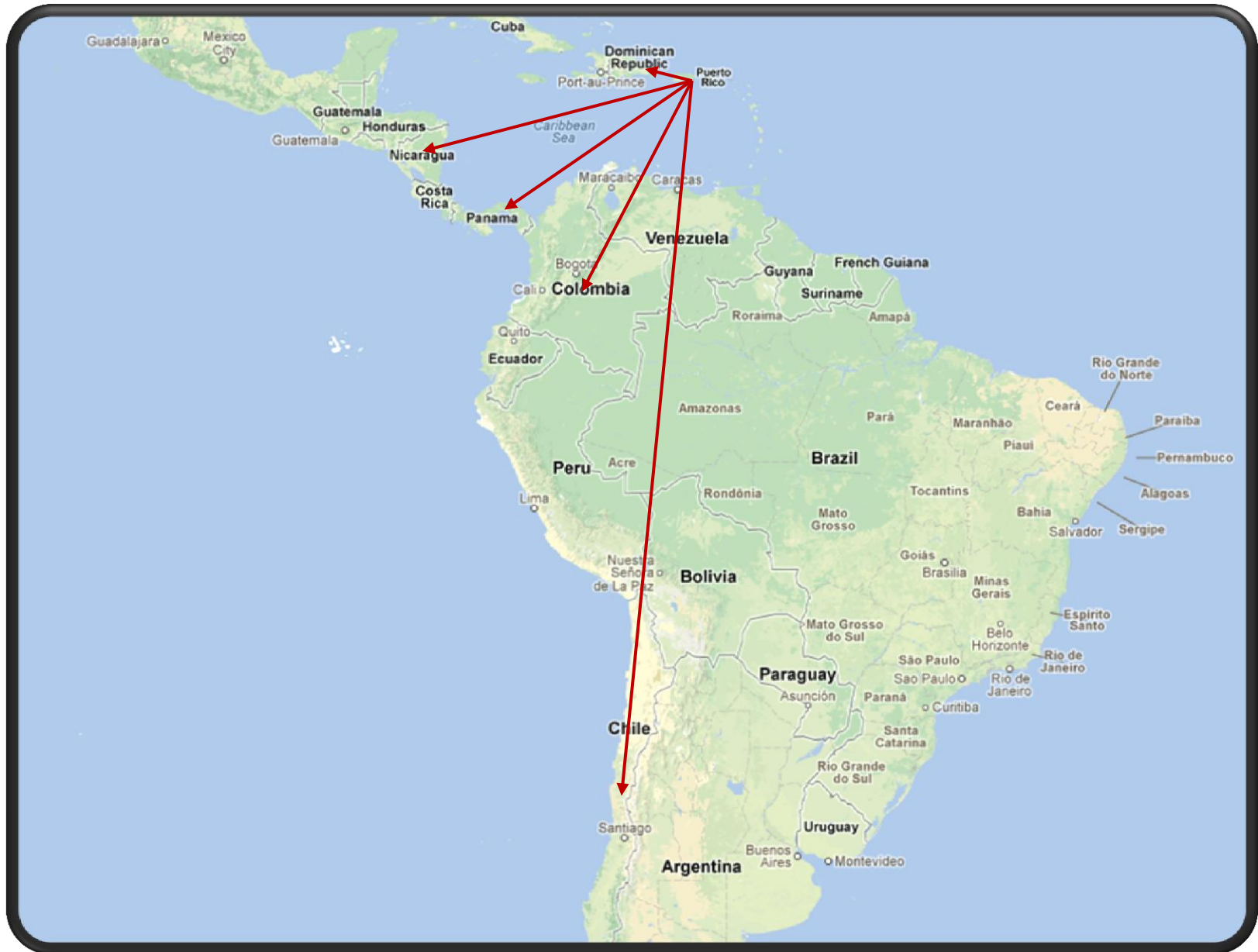
PRDANIS Broadcast Client

E.g. Haiti Eq

EarlyBird & Location Algorithms



EarlyBird Installation, Configuration & Training



Tsunami Response Procedures In-house Training (2011)

- Secretaría de Marina de México
- Haiti Meteorological Service



Real-Time
Seismic Inversion
Workshop
2011

Training & Workshops



Workshop	Year	Co-sponsors	Participants
Real-Time Seismic Inversion	October 2011	UNESCO/ IOC-GLOSS	International -mainly from Caribbean nations
Tsunami Media Kit	2012, 2011		PR News Media
Port operators workshop	November 2010	NSF/NOAA	PR & Caribbean nations
Caribbean Tsunami Ready Summit	May 2010	NOAA	PR & Caribbean nations
Caribbean Training Course for Operators of Seismic Stations	February 2010	UNESCO/ IOC-GLOSS	PR & Caribbean nations

Collaborative Research and Publications

Paper Published on ***Science of Tsunami Hazards*** (2009)

NOAA/WCATWC Atlantic Ocean Response Criteria

Whitmore, P., ten Brink, U., Caropolo, M., Huerfano-Moreno, Knight, W., Sammler, W. and, Sandrik, A.
NOAA/WCATWC
US Geological Survey
Puerto Rico Seismic Network, University of Puerto Rico at Mayaguez
NOAA/National Weather Service: North Carolina, Virginia and Florida Offices

Collaborative Research and Publications

Paper Published on ***Science of Tsunami Hazards*** (2009)

NOAA/WCATWC Atlantic Ocean Response Criteria

Whitmore, P., ten Brink, U., Caropolo, M., Huerfano-Moreno, Knight, W., Sammler, W. and, Sandrik, A.
NOAA/WCATWC
US Geological Survey
Puerto Rico Seismic Network, University of Puerto Rico at Mayaguez
NOAA/National Weather Service: North Carolina, Virginia and Florida Offices

Paper Submitted to ***BSSA***

One-dimensional reference velocity model and earthquake relocation in Puerto Rico Island

Zhang, Q., Lin, G., Huerfano, V. A. and , Soto-Cordero, L.

Department of Marine Geology and Geophysics, University of Miami
Department of Geology, University of Puerto Rico, Puerto Rico Seismic Network

