



5.4 Central American Tsunami Advisory Center (CATAC)

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Identification of coastal areas with a reduced time of possible first impact by local tsunamis

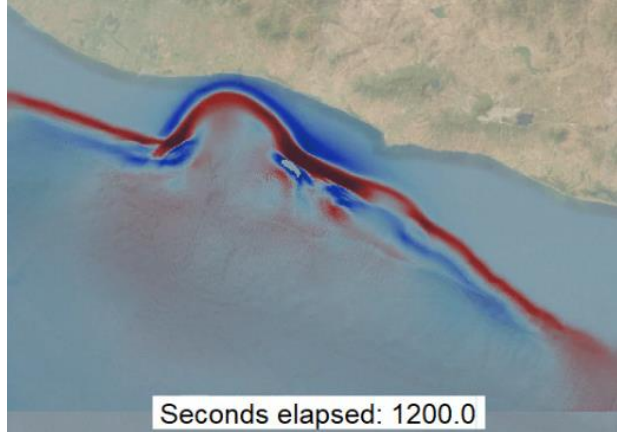
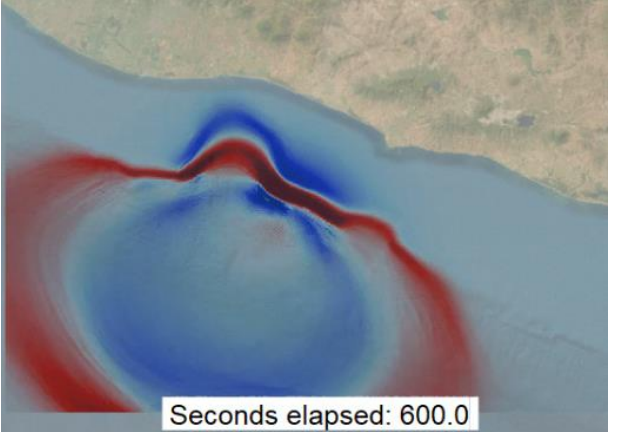
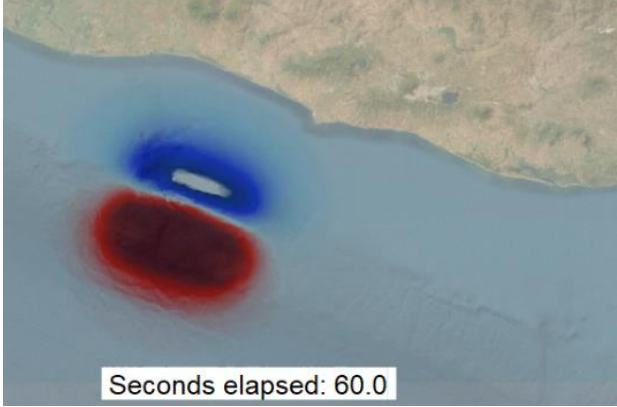


Causes:

- 1) The source is very close to the coast (Islands to the N of Honduras; San Juan del Norte in Nicaragua, El Limon in Costa Rica, Panama Canal).
- 2) Between the coast and the source zone there are very deep waters (Gulf of Chiriqui in Panama).
- 4) A deep sea channel that connects the source with the coast (South of Guatemala).

The existence of these zones imposes on CATA and Civil Protection agencies the urgency to work very fast. Therefore, CATA uses earthquake early warning methods and delivers first solutions within 2 minutes.

Example: Pacific/Guatemala-El Salvador



Example: Immediate tsunami impact, M7.3, N Honduras, 28/05/2009

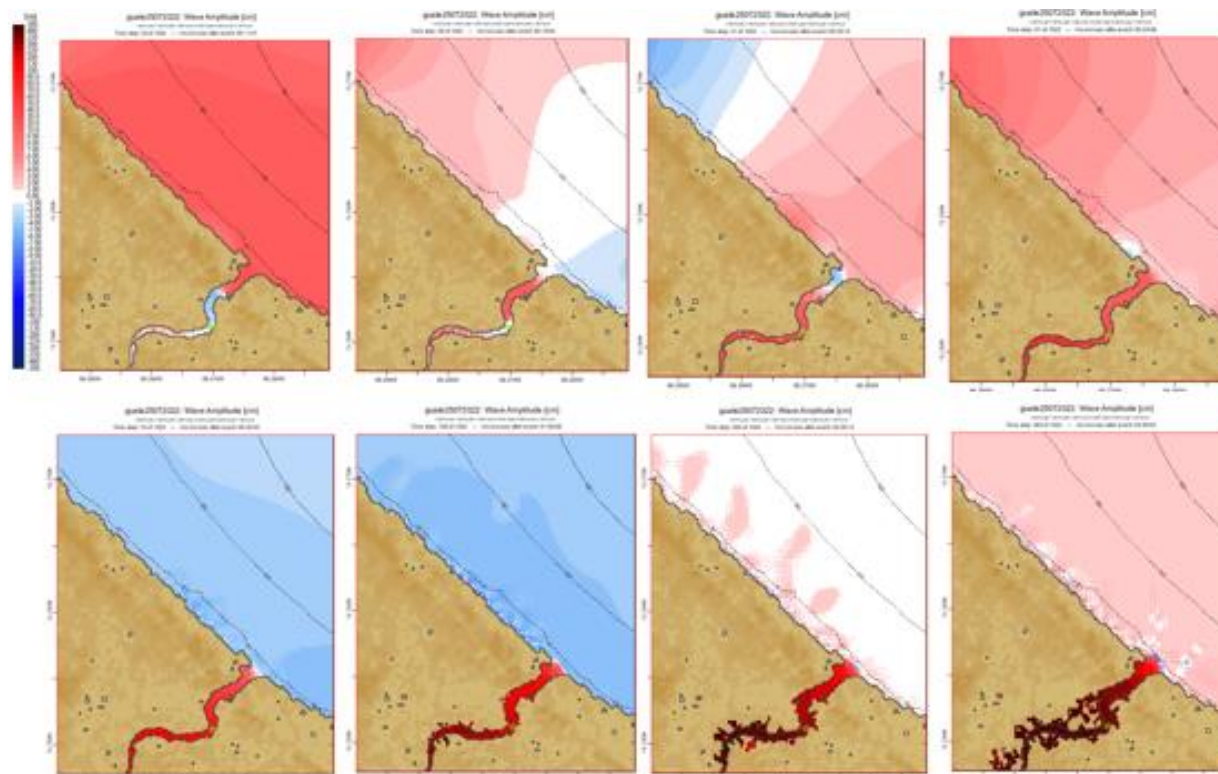
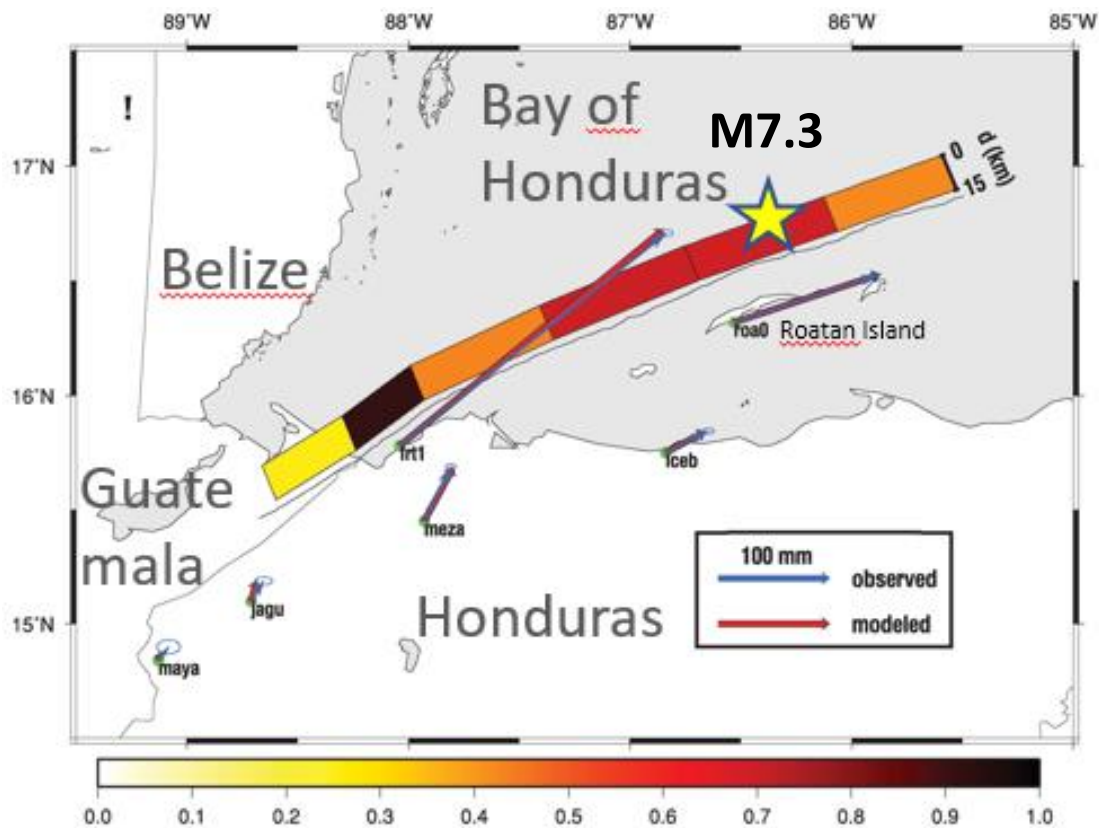
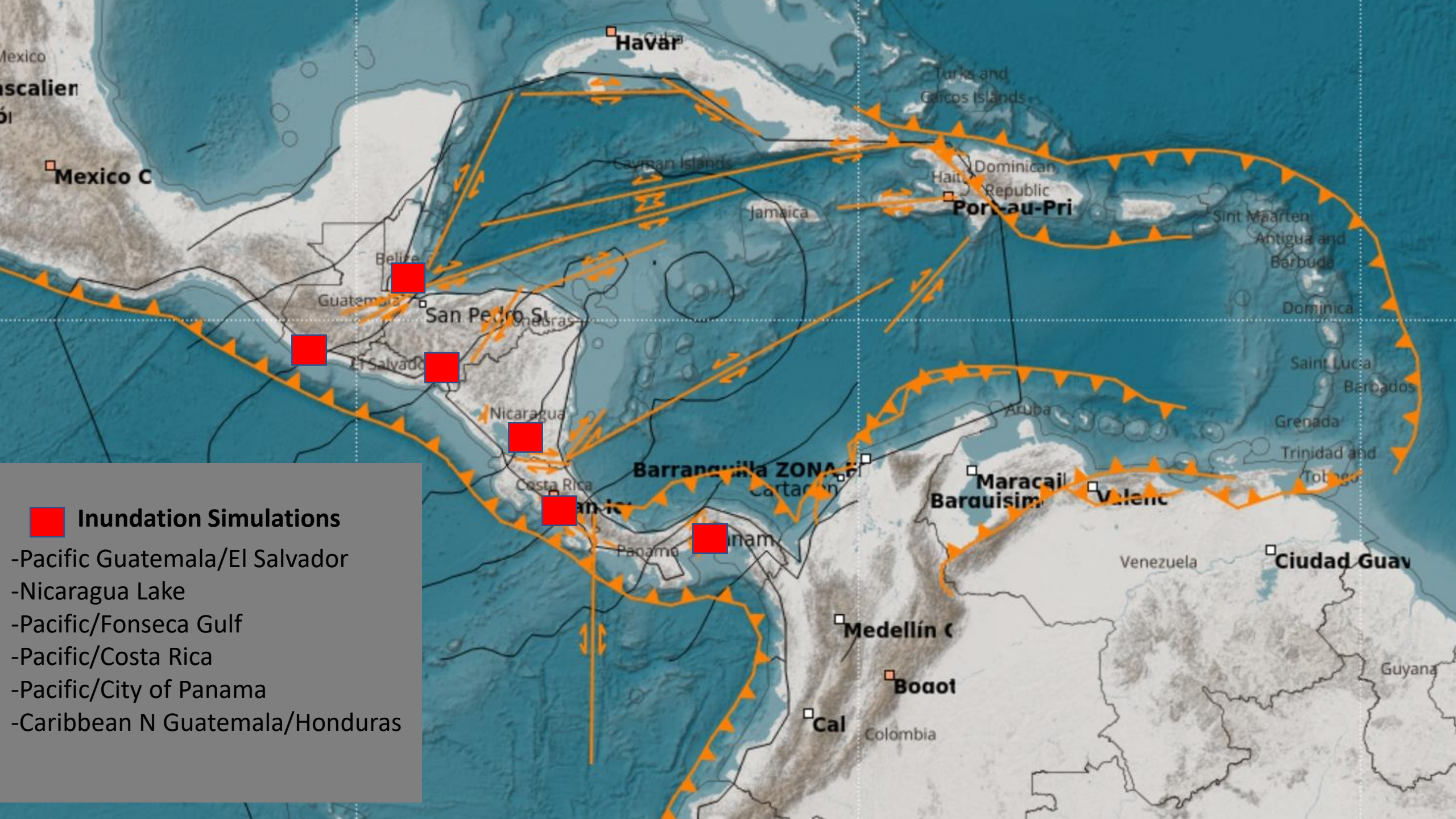


Figure 1. Slip distribution along the fault, yellow star denotes NEIC epicenter. Adapted from Graham et al. 2012. Arrows are GPS vectors post earthquake.

Series of water levels on the N Guatemalan coast and River Motagua, obtained in the simulation

The epicenter is at a distance of about 200 km from the fault segment with the maximum displacement and from the tsunami and river inundation occurrence.



■ Inundation Simulations

- Pacific Guatemala/El Salvador
- Nicaragua Lake
- Pacific/Fonseca Gulf
- Pacific/Costa Rica
- Pacific/City of Panama
- Caribbean N Guatemala/Honduras

Acceleration of Processing

Acceleration of automatic and manual Moment Tensor calculation

- Use of data from near accelerographic stations.
- Limiting the distance of stations to be used for the first message.

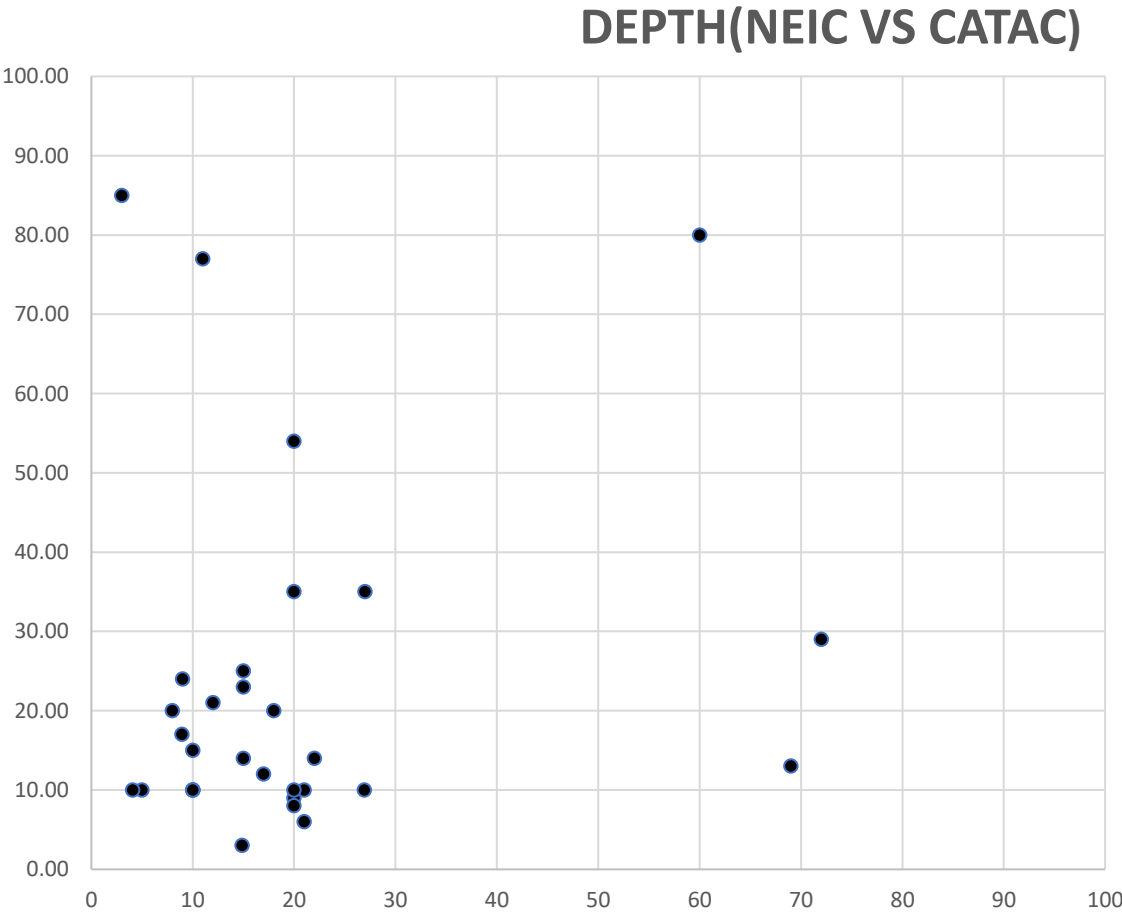
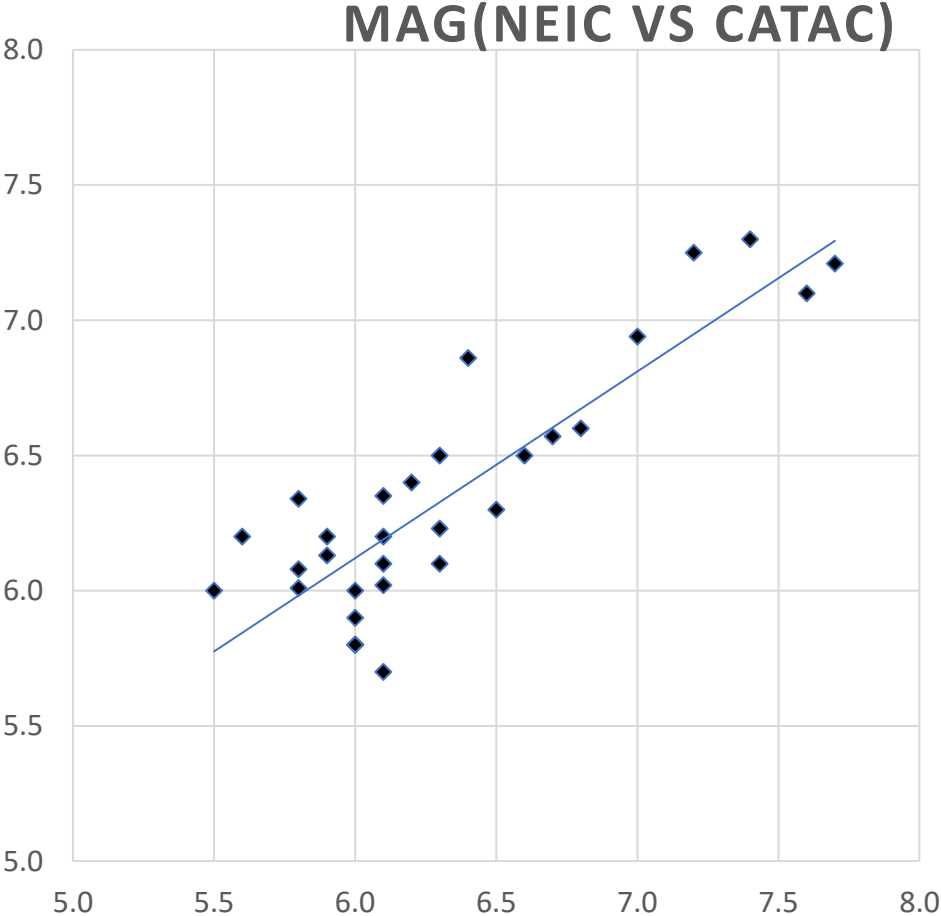
First solutions in less than 10 mins

Improvements Processing

2. Optimization of the configuration of tsunami simulations in the SeisComP module TOAST. GPU based calculations in several steps

Execution time for simulaci3n with TOAST (easywave) GPU				
	Hours of tsunami propagation			
Bathym				
arcsec	1	2	4	8
15	29	92	716	1753
30	14	32	63	140
90	7	23	46	143

CATAC processed events bigger than M6, 11/2019 - 12/2022



Updating the contact list of CATAAC (PTWC)

GUATEMALA			
DATE	NTWC	TWFP	TNC
11 February 2015 – Official Letter from the Comision Guatemalteca de Cooperacion con UNESCO / DICONIME	Instituto Nacional de Sismología Vulcanología (INSIVUMEH) NTWC (Validated through diplomatic channels) <i>Lic. Yeison Broderson SAMAYOA VELÁSQUEZ</i> Director General Tel: +50223105000, +50223105001, +50223105002 Fax: +50222613239 ybsamayoa@insivumeh.gob.gt direcciongeneral@insivumeh.gob.gt 7a Avenida 14-57, Zona 13 01013 GUATEMALA	Instituto Nacional de Sismología Vulcanología (INSIVUMEH) TWFP (Validated through diplomatic channels) Sección de sismología, Departamento de Geofísica Tel: +50223105040, +50223105052 Fax: +50222613239 geofisica.informa@insivumeh.gob.gt alfa.boletines@insivumeh.gob.gt Encargado de Departamento: Lic. Robin Onelio Yani Quiyuch Jefe Departamento de Geofísica Tel: +50223105088 royani@insivumeh.gob.gt 7a Avenida 14-57, Zona 13 01013 GUATEMALA	Instituto Nacional de Sismología Vulcanología (INSIVUMEH) TNC (Validated through diplomatic channels) <i>Lic. Yeison Broderson SAMAYOA VELÁSQUEZ</i> Director General Tel: +50223105000, +50223105001 Fax: +50222613239 ybsamayoa@insivumeh.gob.gt direcciongeneral@insivumeh.gob.gt 7a Avenida 14-57, Zona 13 01013 GUATEMALA
Communication Method		Primary (FAX): +50222613239 Alternate1(Email): geofisica.informa@insivumeh.gob.gt ; alfa.boletines@insivumeh.gob.gt	

HONDURAS			
DATE	NTWC	TWFP	TNC
<p>28 March 2014 – TWFP Official Letter from the Permanent Delegation of Honduras to Unesco.</p> <p>10 June 2015 – TNC Official Email from the Permanent Delegation of Honduras to Unesco.</p> <p>18 February 2016 – TNC Official Email from the Permanent Delegation of Honduras to Unesco.</p>	<p>Secretaria de Estado en los Despachos de Gestión de Riesgos (COPECO)</p> <p>NTWC (Validated through diplomatic channels)</p> <p><i>Mr. Juan Jose REYES</i></p> <p>Alerta Temprana/COPECO</p> <p>Tel: +50433994815</p> <p>martincito1968@yahoo.com</p> <p>Aldea el Ocotal 500m. adelante del Hospital Militar, Carretera a Mateo, Comayagüela, F.M, HONDURAS</p>	<p>Secretaria de Estado en los Despachos de Gestión de Riesgos (COPECO)</p> <p>Centro Nacional de Monitoreo</p> <p>TWFP (Validated through diplomatic channels)</p> <p><i>Mr. Juan Jose REYES</i></p> <p>Alerta Temprana/COPECO</p> <p>Tel: +50433994815</p> <p>martincito1968@yahoo.com</p> <p>Aldea el Ocotal 500m. adelante del Hospital Militar, Carretera a Mateo, Comayagüela, F.M, HONDURAS</p>	<p>Secretaria de Estado en los Despachos de Gestión de Riesgos (COPECO)</p> <p>TNC (Validated through diplomatic channels)</p> <p><i>Ing Lester CARIAS</i></p> <p>Director de la Direccion de Gestion para la Preparacion y Respuesta</p> <p>Tel: +50422290606 ext. 410</p> <p>Cell: +50494852758</p> <p>lester_carias@yahoo.com</p> <p>Lomas del Dorado Primera Etapa, Bloque No.1 Casa No.15, HONDURAS</p>

EL SALVADOR			
DATE	NTWC	TWFP	TNC
27 Nov 2015: Official information received from PermDel for TNC	<p>Direccion del Observatorio Ambiental del Ministerio de Medio Ambiente y Recursos Naturales (MARN)</p> <p>NTWC (Not validated through diplomatic channels)</p> <p><i>Mr Luis MENJIVAR</i></p> <p>Director General</p> <p>Tel: +50321329671, +50378563588</p> <p>Mob.: +50378567807</p> <p>Luis.menjivar@marn.gob.sv</p> <p>Km 5 ½ Calle a Santa Tecla y Avenida Las Mercedes, Edificio MARN, Local ISTA, contiguo al parque de Pelota Bengoa, San Salvador</p> <p>EL SALVADOR</p>	<p>Centro de Monitoreo de Amenazas Naturales</p> <p>TWFP (Not validated through diplomatic channels)</p> <p>Tel: +50321329566, +50378564381</p> <p>Fax: +50322245500</p> <p>Mobile: +50378605850</p> <p>sismologia@marn.gob.sv; deslizamientos@marn.gob.sv; cph@marn.gob.sv; Luis.menjivar@marn.gob.sv; gmarroquin@marn.gob.sv; ahernandez@marn.gob.sv; mdiaz@marn.gob.sv; fgavidia@marn.gob.sv; franciscogavidia@hotmail.com; mgmarroquin@yahoo.com; douglas_hc@yahoo.com; mrdezflores@hotmail.com</p> <p>Km 5 ½ carretera a Nueva San Salvador.</p> <p>Calle y Colonia Las Mercedes.</p> <p>EL SALVADORE</p>	<p>Ministerio de Medio Ambiente y Recursos Naturales (MARN)</p> <p>TNC (Validated through diplomatic channels)</p> <p>Oceanographer</p> <p><i>Mr. Francisco GAVIDIA</i></p> <p>Tel: +50321329610</p> <p>Fax: +50322245500</p> <p>Mobile: +50378568796</p> <p>franciscogavidia@hotmail.com</p> <p>fgavidia@marn.gob.sv</p> <p>Km 5 ½ carretera a Nueva San Salvador.</p> <p>Calle y Colonia Las Mercedes.</p> <p>EL SALVADOR</p>
Communication Method		<p>Primary (SMS): +50378563588 / +50378564381 / +50378549469 / +50378567095 / +50378563660 / +50377298430 / +50378605850 / +50377457571</p> <p>Alternate1(Fax): +50322245500</p> <p>Alternate2(Email): sismologia@marn.gob.sv; deslizamientos@marn.gob.sv; cph@marn.gob.sv; Luis.menjivar@marn.gob.sv; gmarroquin@marn.gob.sv; ahernandez@marn.gob.sv; mdiaz@marn.gob.sv; fgavidia@marn.gob.sv; franciscogavidia@hotmail.com; mgmarroquin@yahoo.com; douglas_hc@yahoo.com; mrdezflores@hotmail.com</p> <p>Alternate3(GTS): MSLP (Aeropuerto Internacional Monseñor Arnulfo Romero, La Paz, +50323492287</p> <p>Telephone number for voice communication : +50378605850 / +50378563588 / +50378564381 / +50378549469 / +50378563660 / +50378567095</p>	

Updating the contact list of CATAAC (PTWC)

National Tsunami Warning Center (NTWC), Tsunami National Contacts (TNC) and Tsunami Warning Focal Points (TWFP), according IOC webpage

- Often not updated
- Often only one institution is represented (scientific)
- Few contacts

In the discussion the interest was expressed to include more persons and more institutions

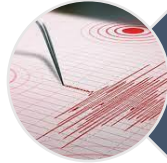
Cooperation with CEPREDENAC

Regional Simulation - General Objectives

Contribute to strengthening the capacities of the National Civil Protection and ISDR Systems, Civil-Military relations with the UHR, measure the socioeconomic impact of disasters, test the mechanisms, tools and technical guidelines for intervention in emergencies in the health sector and position the use of information and communication technologies for response to humanitarian crises and disasters.



Hypothesis



Earthquake magnitude 7.5 at a depth of 10 km, in Panama City with epicenter located in the Pedro Miguel fault, (8°58'N 79°33'W).



Damage to human settlement buildings and basic living infrastructure



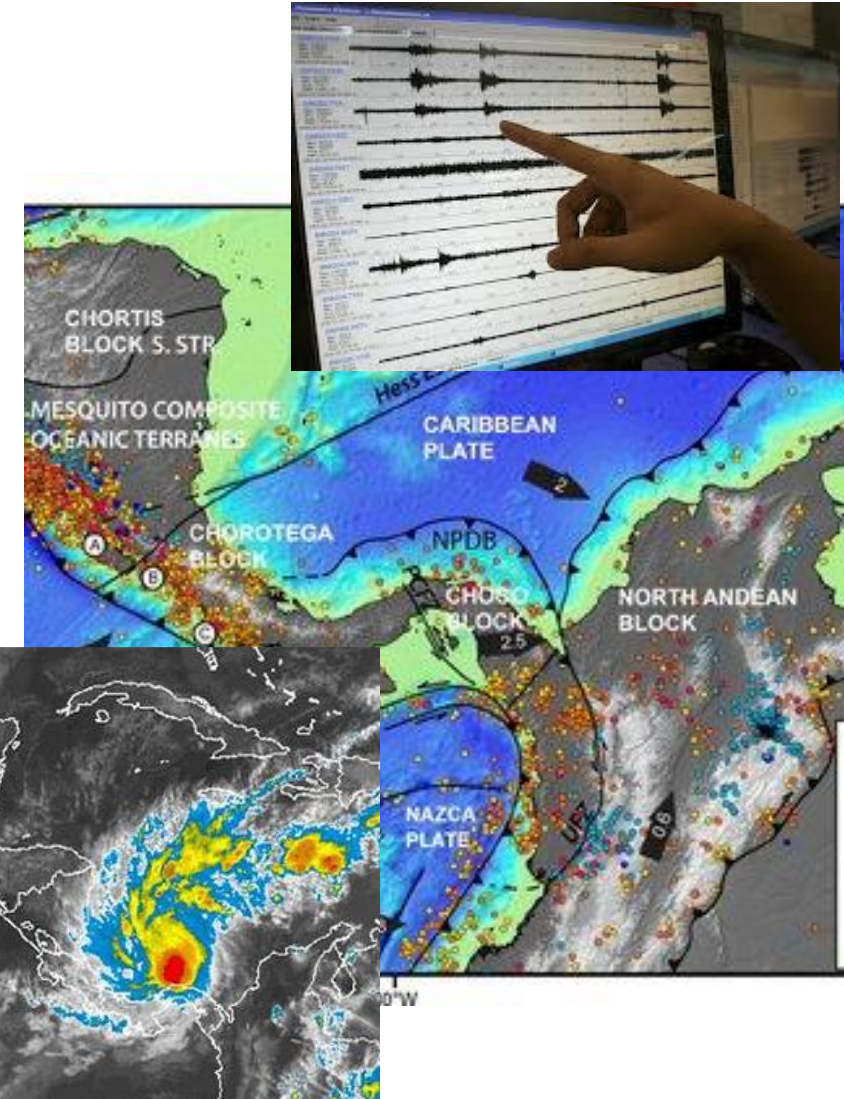
trapped and missing persons, structural fires and hazardous material spills.



Passage of Tropical Wave #10 causes rivers to overflow in the provinces of Chiriqui, Bocas del Toro, Coclé and Colon causing major flooding.



Threat of Biological contamination by monkeypox





Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura



Comisión Oceanográfica Intergubernamental



CEPREDENAC
CENTRO DE COORDINACIÓN PARA LA PREVENCIÓN DE LOS DESASTRES EN AMÉRICA CENTRAL Y REPÚBLICA DOMINICANA



SICA
Sistema de la Integración Centroamericana



CNE
Comisión Nacional de Emergencias



Protección Civil



CONRED
Comisión Nacional de Reducción de Riesgos



COPECO
Comisión Operativa de Protección Civil



SINAPRED
Sistema Nacional de Protección Civil



Protección Civil



Webinar on the use of CATAAC products, Feb-Mar 2023

prepared with **CEPREDENAC**, JICA

In support of 3rd regional disaster simulation, **CEPREDENAC**, Jun2 2023 in Panamá

8 Webinars – done.

8+1 Webinars to be organized next week

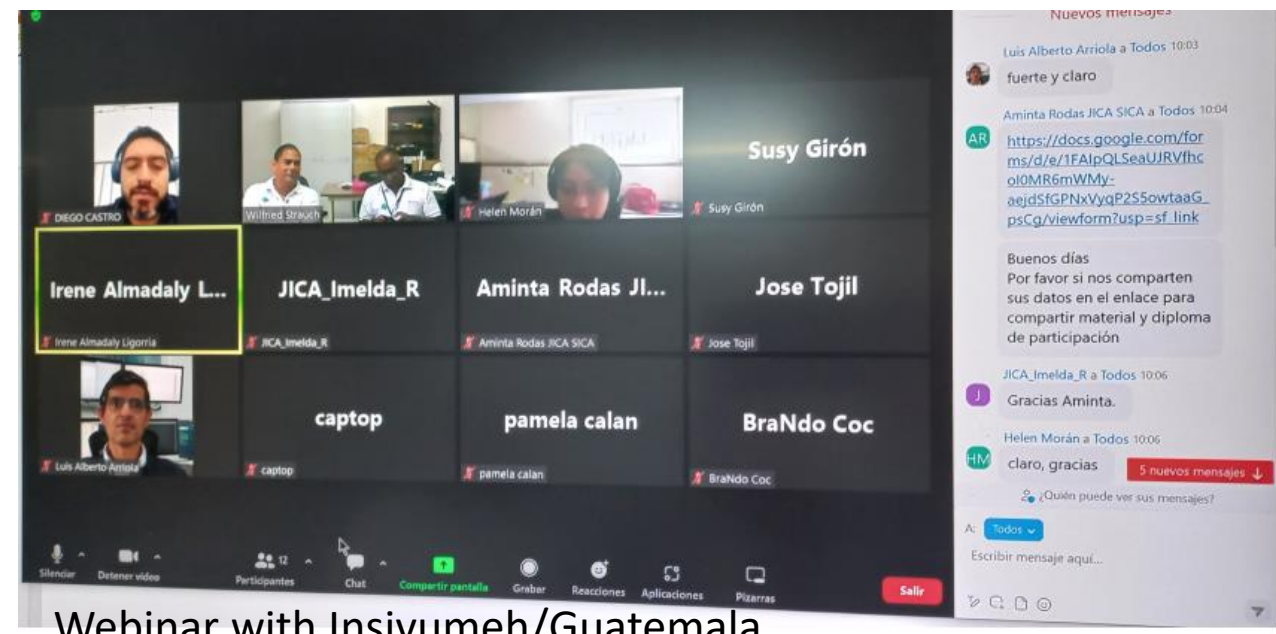
Included Belize and Dominican Republic on request of CEPREDENAC.

#	Fecha y Hora	País	Institución	Tipo institución	Modalidad	Horas
1	20/2/2023 10:00	Nicaragua	SINAPRED	Protección civil	Presencial	2
2	20/2/2023 14:00		Defensa Civil	Protección civil	Presencial	2
3	21/2/2023 10:00	El Salvador	MARN	Científica	Virtual	2
4	21/2/2023 14:00		Protección Civil	Protección Civil	Virtual	2
5	22/2/2023 10:00	Guatemala	INSIVUMEH	Científica	Virtual	2
6	22/2/2023 14:00		CONRED	Protección Civil	Virtual	2
7	23/2/2023 10:00	Honduras	UNAH	Científica	Virtual	2
8	23/2/2023 14:00		COPECO	Protección Civil	Virtual	2
9	14/3/2023 10:00	Costa Rica	SINAMOT-UNA	Científica	Virtual	2
10	14/3/2023 14:00		CNE	Protección Civil	Virtual	2
11	15/3/2023 10:00	Panamá	IG-UPA	Científica	Virtual	2
12	15/3/2023 14:00		SINAPROC	Protección Civil	Virtual	2
13	16/3/2023 10:00	República Dominicana	Sis-USAG	Científica	Virtual	2
14	16/3/2023 14:00		Defensa Civil	Protección Civil	Virtual	2
15	17/3/2023 10:00	Belice	Servicio Meteo.	Científica	Virtual	2
16	17/3/2023 14:00		Protección Civil	Protección Civil	Virtual	2
17	21/3/2023 10:00		CEPREDENAC	Protección Civil	Virtual	2

During the simulation, in June 2023, meetings to be organized with Panamanian institutions to advise Panama on CATAAC's performance in rapid earthquake and tsunami processing, CATAAC's products and how Panama can benefit from its services.

Webinar topics

- Tsunami Hazard country specific
- Minimum dangerous tsunami height
- Zones with small impact times
- CATAC procedures
- Tsunami simulation
- Warning products
- Warning messages
- Warning methods (social networks)
- Recipients of messages
- Country protocols
- Proposals



Webinar with Insivumeh/Guatemala



Norwin Acosta, CATAC, explains minimum dangerous tsunami height



New Project for Regional Capacitation at CATAAC 2023-26

- Support by JICA
- Each November: Presential capacitation with CATAAC users at INETER/Managua
- Several Zoom meetings each year with user institutions
- Visits to the institutions in the countries
- Funding of software licences SeisComP 5
- Funding of equipment for capacitation

Cooperation CATAC-MARN El Salvador

- Idea: MARN acting as backup center of CATAC
- 2022-23 several Zoom meetings

Planned actions 2023

1. February-March 2023, with JICA/CEPREDENAC

Webinar (Zoom) of all relevant CA institutions about the use of CATAC's products in 6 Central American countries, additionally Dominican Republic and Belize.

17 sessions (2 hours) with JICA & CEPREDENAC

2. Follow up of the Webinar, revision of protocols

3. Adaptation of CATAC Procedures according proposals at Webinar

4. April Start of new JICA project

6. 24-28/04/2023 ICG/CARIBE EWS meeting

7. June 2023, in Panamá: Capacitation for institutions in Panama (during regional exercise)

9. Nov 2023, with JICA/CEPREDENAC

Capacitation – presential, at CATAC/Managua, for all institutions receiving our product

(all Central America institutions plus Dominican Republic and Belize, November 2023, 1 week for 15 participants with JICA & CEPREDENAC

Exercises

1. March 2023 CARIBEWAVE

2. June 2023 Regional EQ 7.5 exercise in Panama organized by CEPREDENAC

3. Sep-Nov 2023 PACWAVE 2023