3.7 CATAC Report

Central American Tsunami Advisory Center (CATAC)

at the Instituto Nicaragüense de Estudios Territoriales
(Geociences Institute, INETER)

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Central American Tsunami Advisory Center (CATAC)

at Geociences Institute (INETER), Nicaragua

created 2016, pilot operation from 2019, interim operation from Dec 2021,
routine operation (hopefully) starting 2026

- (interim) TSP for 6 Central American countries
- Personnel: 23
- Services:
  Central America: Tsunami advisory
  Nicaragua: Earthquake & Tsunami early warning, seismic and tsunami hazard and risk research. Tsunami hazard and risk research, seismic monitoring of volcanoes
- -23 staff, multidisciplinary: seismologists, geophysicists, geologists, electronics, IT
- -24x7 service, always 2 capacitated watchstanders
  + 1 staff for immediate info to the government
- Recording of 250 seismic stations from CATAC, +300 Central America, + 300 global (via IRIS)
- Completely automatic real-time seismological processing (advanced SeisComP PRO + EEW)
- Human supervision

The Central American Tsunami Advisory Center (CATAC)

created 2016, pilot operation from 2019, interim operation from Dec 2021, routine operation (hopefully) starting 2026

-Tsunami assessment with SeisComP TOAST system (using EasyWave or HySEA simulators)
GPU based numerical tsunami simulation within seconds

- Public earthquake early warning EEW (SeisComP, Swiss EQ service) in Nicaragua,

- EEW for TSP recipients in Central America, in seconds after EQ,
- Initial seismological and tsunami message in 2minutes

- Confirmed tsunami parameter message in less than 10 minutes, including graphical products

Target recipients:

- 11 monitoring/scientific (seismological, tsunami) institutions in Central America, NTWC

- 9 civil protection agencies in Central America,

- 6 regional/international : CEPREDENAC, IOC/UNESCO, PTWC, NWPTAC, ITIC, CITIC

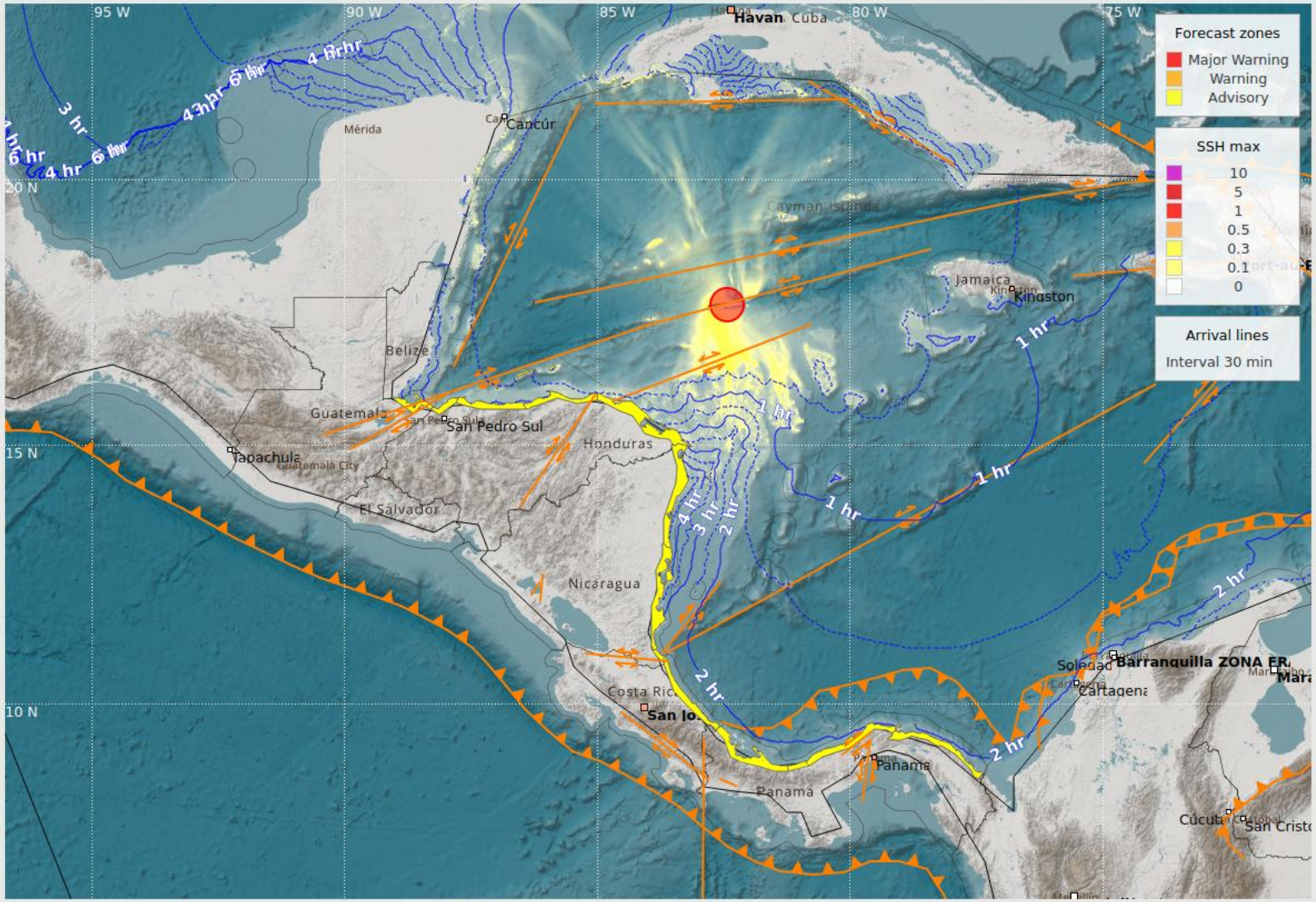
File Settings Simulation Traces View Extras Help

Final simulation

2025-02-08 23:23:13
3d and 15h ago
North of Honduras

FM M 7.4 D 10 km
CATAC2025ctfk

Map | Traces | Forecast Zones | primer mensaje | Video | tercer mensaje | catac mensaje 2 | mensaje ingles | Mensaje de prueba | segundo mensaje de texto | can



Map Layers

Color Profile: DefaultProfile

- Iso chrones
- SSH
- SSH max

Wave Propagation | Map Layers

Database - Simulations

Simulations: Show all | View | Sort by: Creation time

Creation time	M	D	Lon	Lat	Residual	FM
2025-02-10 14:35:34	7.4	14 km	-82.43°	17.67°	0.58	
2025-02-09 00:02:46	7.4	15 km	-82.43°	17.67°	0.58	
2025-02-09 00:02:46	7.4	14 km	-82.43°	17.67°	0.58	
2025-02-09 00:02:46	6.8	10 km	-82.43°	17.67°	0.62	
2025-02-08 23:54:42	7.0	10 km	-82.60°	17.80°	0.62	
2025-02-08 23:54:42	7.0	10 km	-82.60°	17.80°	0.62	
2025-02-08 23:40:41	7.0	10 km	-82.57°	17.80°	0.62	
2025-02-08 23:33:19	7.1	10 km	-82.58°	17.74°	0.60	
2025-02-08 23:33:19	7.5	15 km	-82.58°	17.74°	0.58	
2025-02-08 23:29:18	7.3	13 km	-82.83°	17.61°	0.62	
2025-02-08 23:29:18	7.3	13 km	-82.83°	17.61°	0.62	
2025-02-08 23:27:07	7.4	13 km	-82.83°	17.48°	0.62	
2025-02-08 23:26:51	7.7	18 km	-82.40°	17.78°	0.59	
2025-02-08 23:26:18	7.4	14 km	-82.33°	17.61°	0.58	
2025-02-08 23:25:55	7.2	12 km	-82.52°	17.97°	0.62	
2025-02-08 23:25:39	7.2	12 km	-82.41°	18.04°	0.63	
2025-02-08 23:25:39	7.2	12 km	-82.41°	18.04°	0.63	
2025-02-08 23:25:16	7.2	12 km	-82.26°	17.90°	0.61	
2025-02-08 23:25:16	7.2	12 km	-82.26°	17.90°	0.61	
2025-02-08 23:25:16	7.2	12 km	-82.26°	17.90°	0.61	

21/21 simulations shown

Runups and amplitudes on the coastal strips, predictions

File Settings Simulation Traces View Extras Help

2025-02-08 23:23:13
3d and 15h ago
North of Honduras

FM M 7.4 D 10 km
CATAC2025ctfk

Map | Traces | Forecast Zones | primer mensaje | Video | tercer mensaje | catac mensaje 2 | mensaje ingles | Mensaje de prueba | segundo mensaje de texto | can

Name	Runup	wir	Country	T1 Value	T1 Time	T3 Value	T3 Time
ISLA DEL CISNE	0.156 m		HONDURAS	0.010 m	2025-02-08 23:26:19	0.226 m	2025-02-08 23:42:13
GUANAJA SUR	0.092 m		HONDURAS	0.010 m	2025-02-08 23:44:55	0.110 m	2025-02-09 03:44:43
ISLAS DE LA BAHIA	0.053 m		HONDURAS	0.010 m	2025-02-08 23:46:42	0.088 m	2025-02-09 03:49:13
HAMBANTOTA	0.058 m	...	SRI LANKA	0.010 m	2025-02-08 23:48:24	0.057 m	2025-02-09 03:34:43
UTILA NORTE	0.047 m		HONDURAS	0.010 m	2025-02-08 23:52:57	0.052 m	2025-02-09 06:26:43
COLON	0.060 m		HONDURAS	0.010 m	2025-02-08 23:53:42	0.111 m	2025-02-09 05:19:43
GRACIAS A DIOS	0.066 m		HONDURAS	0.010 m	2025-02-08 23:54:27	0.125 m	2025-02-09 01:52:43
CAYO CHOCHINO GRANDE	0.044 m		HONDURAS	0.010 m	2025-02-09 00:04:13	0.062 m	2025-02-09 06:12:13
CORTES	0.038 m		HONDURAS	0.010 m	2025-02-09 00:04:39	0.063 m	2025-02-09 04:20:13
ATLANTIDA	0.040 m		HONDURAS	0.010 m	2025-02-09 00:06:06	0.065 m	2025-02-09 04:26:43
IZABAL	0.015 m		GUATEMALA	0.010 m	2025-02-09 00:15:15	0.041 m	2025-02-09 06:21:13
SAN BLAS	0.013 m		PANAMA	0.010 m	2025-02-09 00:24:15	0.048 m	2025-02-09 04:43:13
TURTLE ISLAND	0.018 m		PANAMA	0.010 m	2025-02-09 01:14:33	0.025 m	2025-02-09 06:48:13
COLON	0.017 m		PANAMA	0.010 m	2025-02-09 01:19:54	0.028 m	2025-02-09 06:40:43
CAYOS DE HONDURAS	0.055 m		HONDURAS	0.010 m	2025-02-09 01:30:13	0.083 m	2025-02-09 03:30:43
LIMON	0.009 m		COSTA RICA	0.010 m	2025-02-09 01:31:25	0.017 m	2025-02-09 07:37:43
VERAGUAS	0.012 m		PANAMA	0.010 m	2025-02-09 01:33:31	0.016 m	2025-02-09 07:39:43
BOCAS DEL TORO	0.005 m		PANAMA	0.010 m	2025-02-09 01:35:45	0.016 m	2025-02-09 07:37:13
CORN ISLAND	0.005 m		NICARAGUA	0.010 m	2025-02-09 01:41:43	0.006 m	2025-02-09 07:36:43
LITTLE CORN ISLAND	0.005 m		NICARAGUA	0.010 m	2025-02-09 01:45:13	0.006 m	2025-02-09 06:09:43
RIO SAN JUAN	0.005 m		NICARAGUA	0.010 m	2025-02-09 01:54:13	0.021 m	2025-02-09 06:34:13
REGION AUTONOMA ATL...	0.005 m		NICARAGUA	0.010 m	2025-02-09 01:57:27	0.010 m	2025-02-09 05:39:43
REGION AUTONOMA ATL...	0.028 m		NICARAGUA	0.010 m	2025-02-09 02:02:36	0.080 m	2025-02-09 06:56:43
CAYOS MISKITOS	0.050 m		NICARAGUA	0.010 m	2025-02-09 02:48:42	0.080 m	2025-02-09 06:18:43

Export

Map Layers

Color Profile: DefaultProfile

- Faults
  - Names
- Forecast zones

Wave Propagation | Map Layers

Database - Simulations

Simulations: Show all | View | Sort by: Creation time

Return to Incident View

Creation time	M	D			FM	Duration	Trigger
2025-02-10 14:35:34	7.4	14 km	-82.43°	17.67°	0.58	500 m	
2025-02-09 00:02:46	7.4	15 km	-82.43°	17.67°	0.58	200 m	
2025-02-09 00:02:46	7.4	14 km	-82.43°	17.67°	0.58	200 m	
2025-02-09 00:02:46	6.8	10 km	-82.43°	17.67°	0.62	200 m	
2025-02-08 23:54:42	7.0	10 km	-82.60°	17.80°	0.62	200 m	
2025-02-08 23:54:42	7.0	10 km	-82.60°	17.80°	0.62	200 m	
2025-02-08 23:40:41	7.0	10 km	-82.57°	17.80°	0.62	200 m	
2025-02-08 23:33:19	7.1	10 km	-82.58°	17.74°	0.60	200 m	
2025-02-08 23:33:19	7.5	15 km	-82.58°	17.74°	0.58	200 m	
2025-02-08 23:29:18	7.3	13 km	-82.83°	17.61°	0.62	200 m	
2025-02-08 23:29:18	7.3	13 km	-82.83°	17.61°	0.62	200 m	
2025-02-08 23:27:07	7.4	13 km	-82.83°	17.48°	0.62	200 m	
2025-02-08 23:26:51	7.7	18 km	-82.40°	17.78°	0.59	200 m	
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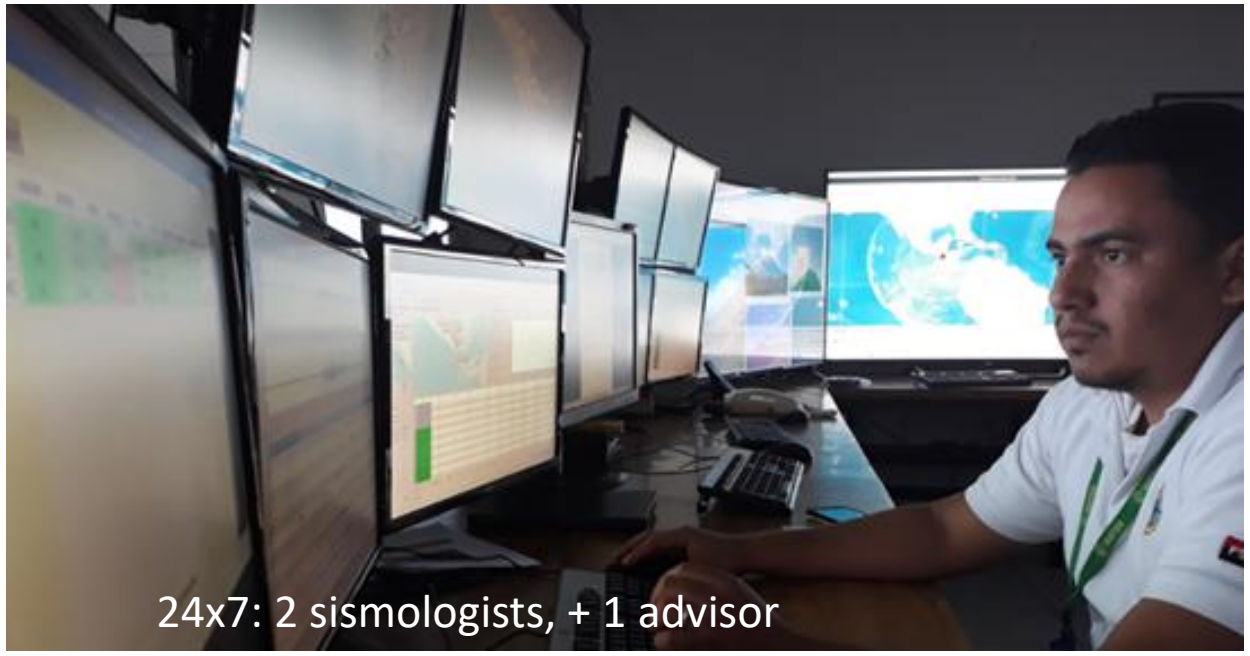
2025-02-08 23:25:39	7.2	12 km	-82.41°	18.04°	0.63	200 m	
2025-02-08 23:25:39	7.2	12 km	-82.41°	18.04°	0.63	200 m	
2025-02-08 23:25:16	7.2	12 km	-82.26°	17.90°	0.61	200 m	
2025-02-08 23:25:16	7.2	12 km	-82.26°	17.90°	0.61	200 m	
2025-02-08 23:25:16	7.2	12 km	-82.26°	17.90°	0.61	200 m	

CATAC, Processing and Alert Center

CATAC

Alert Center

Using SeisComP PRO with TOAST



24x7: 2 sismologists, + 1 advisor


Situation room / Meetings/Capacitations.


Concrete bunker: servers, seismometers, UPS


Seismometry and Electronics Lab. / Maintenance

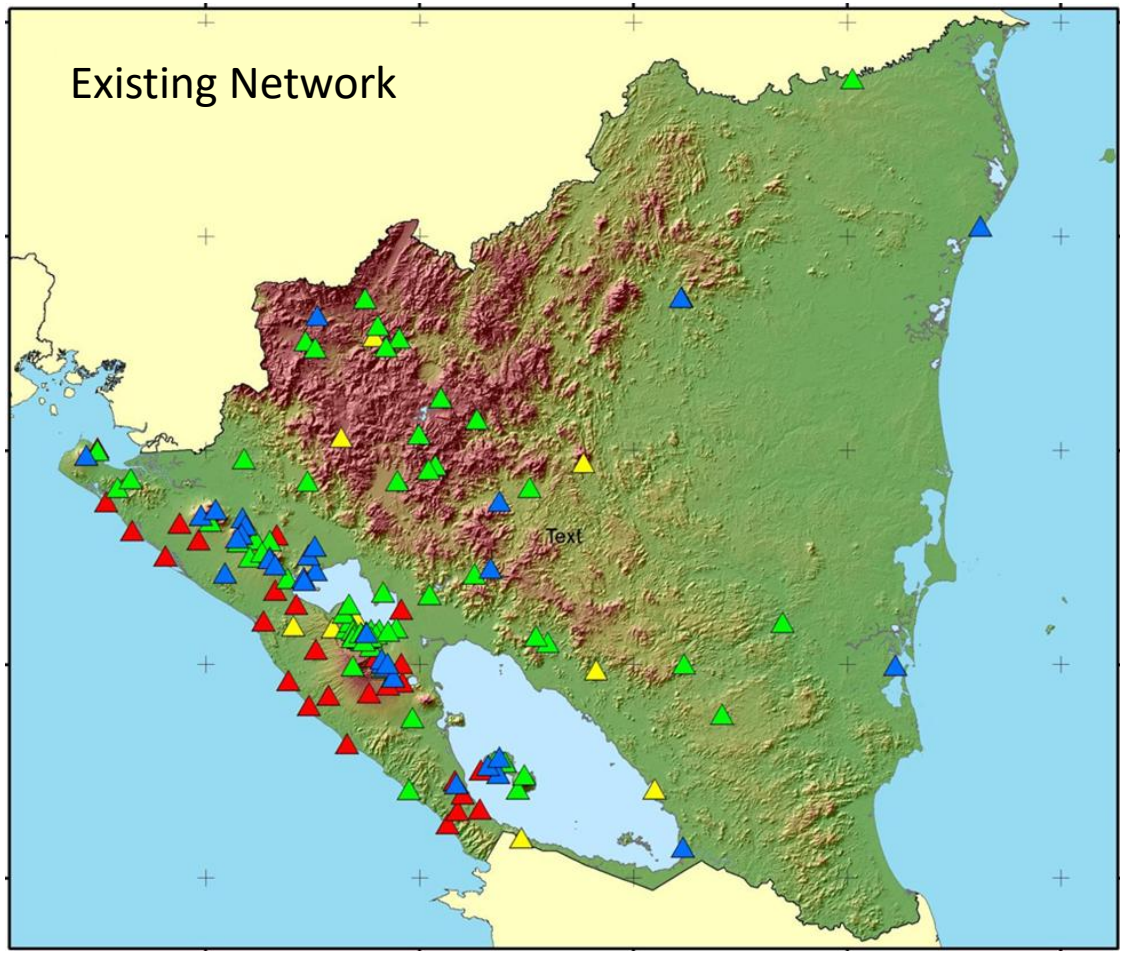

Battery backup
20kWh


Seismic stations/GPS


Sea gauges

Densification of CATAC´s Seismic Network

Part of Nicaragua/China - SINAREM Project for the Enhancement of the Disaster Mitigation System in Nicaragua.

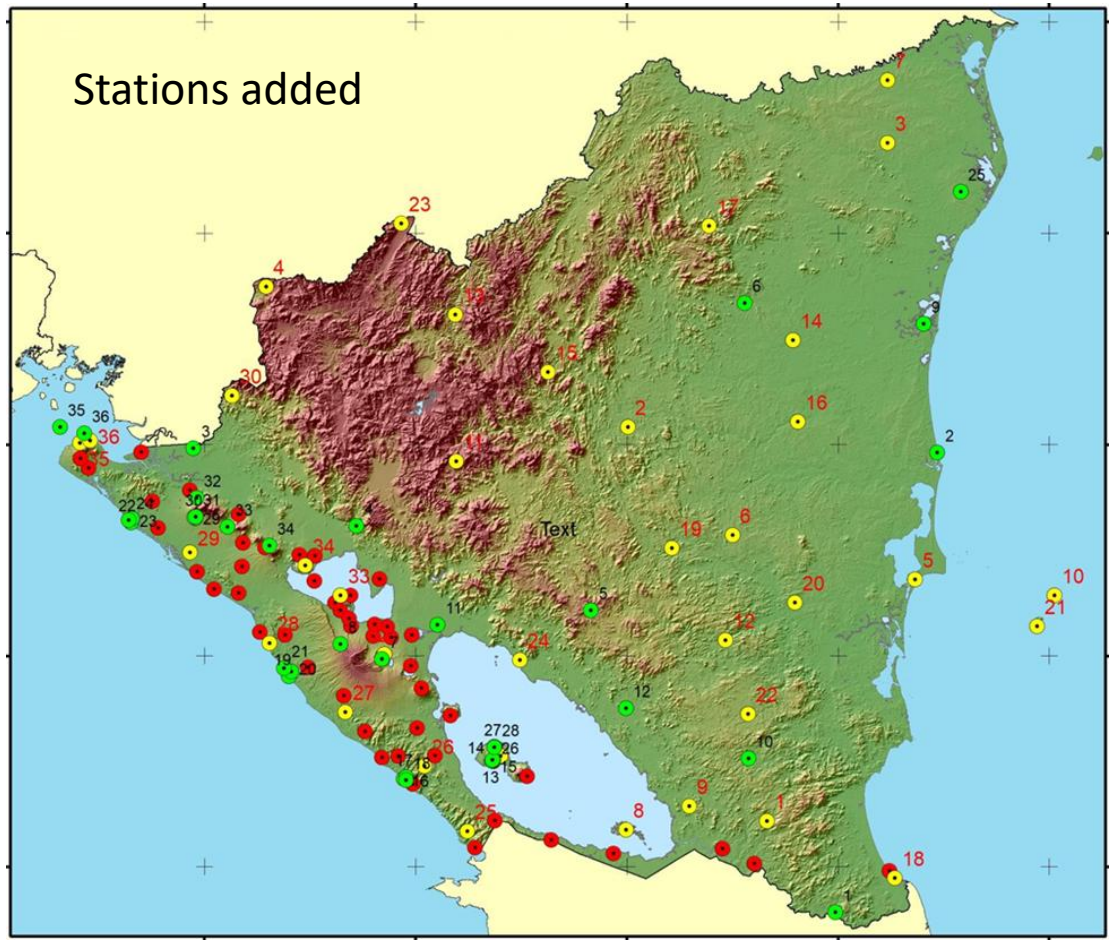


2025: CATAC network (NU FDSN)
140 stations

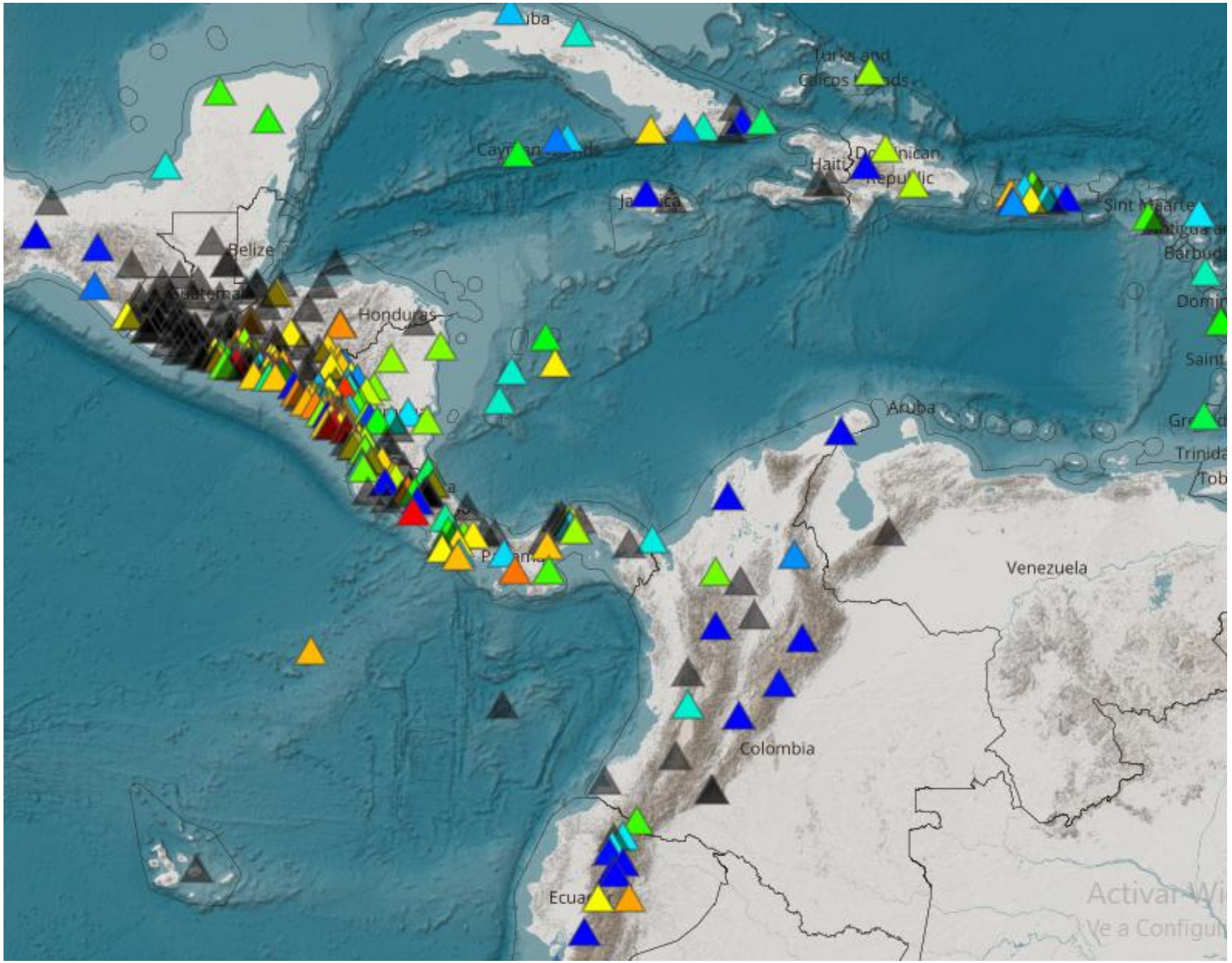
installed by CATAC

2026

+



2026: 129 Stations (N2 FDSN) added
50 accelerographs, 36 broad band (20 pending),
36 Raspberry Shake, 7 infrasound

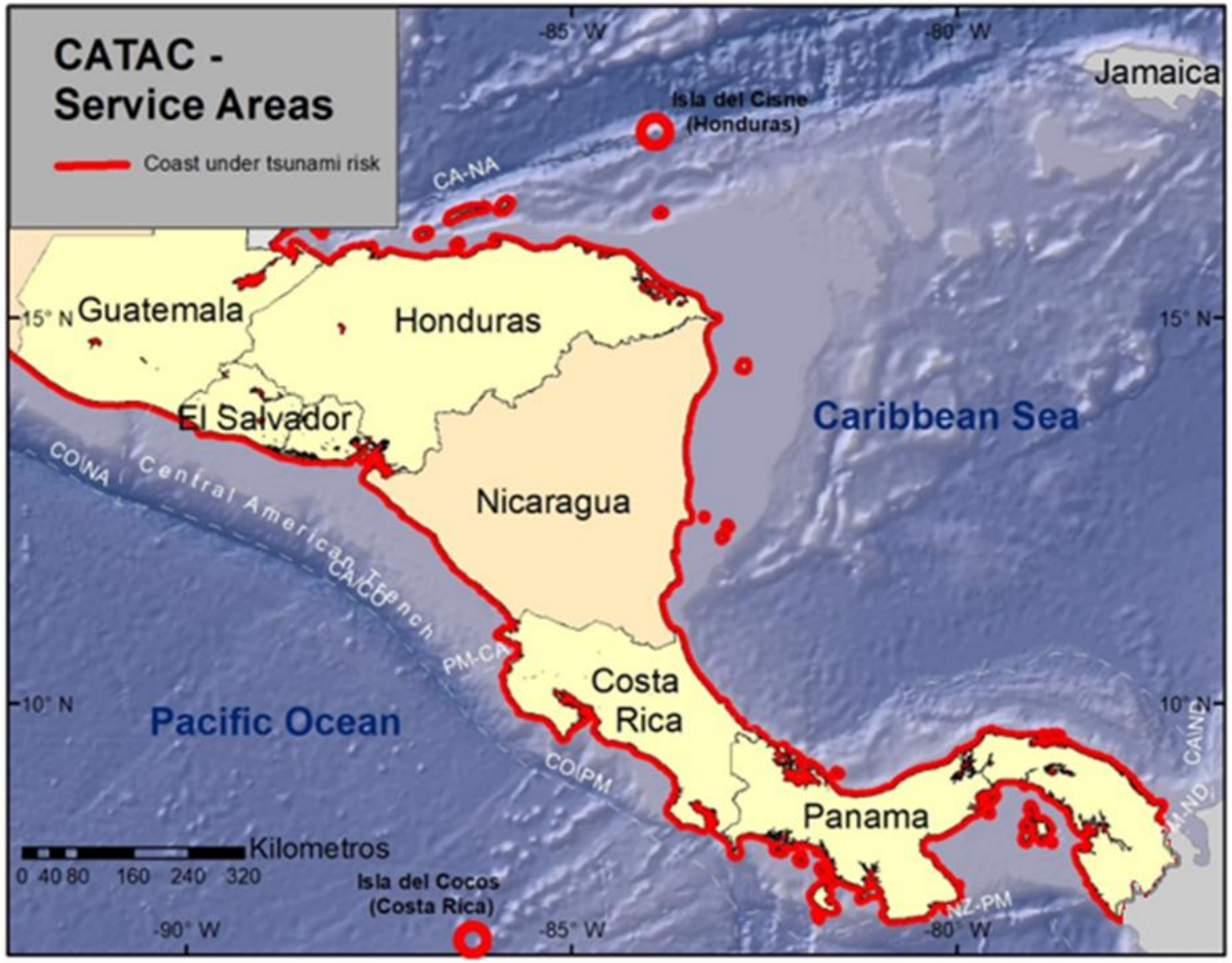


500+ seismic stations in and around Central America are used by CATAC, 2026

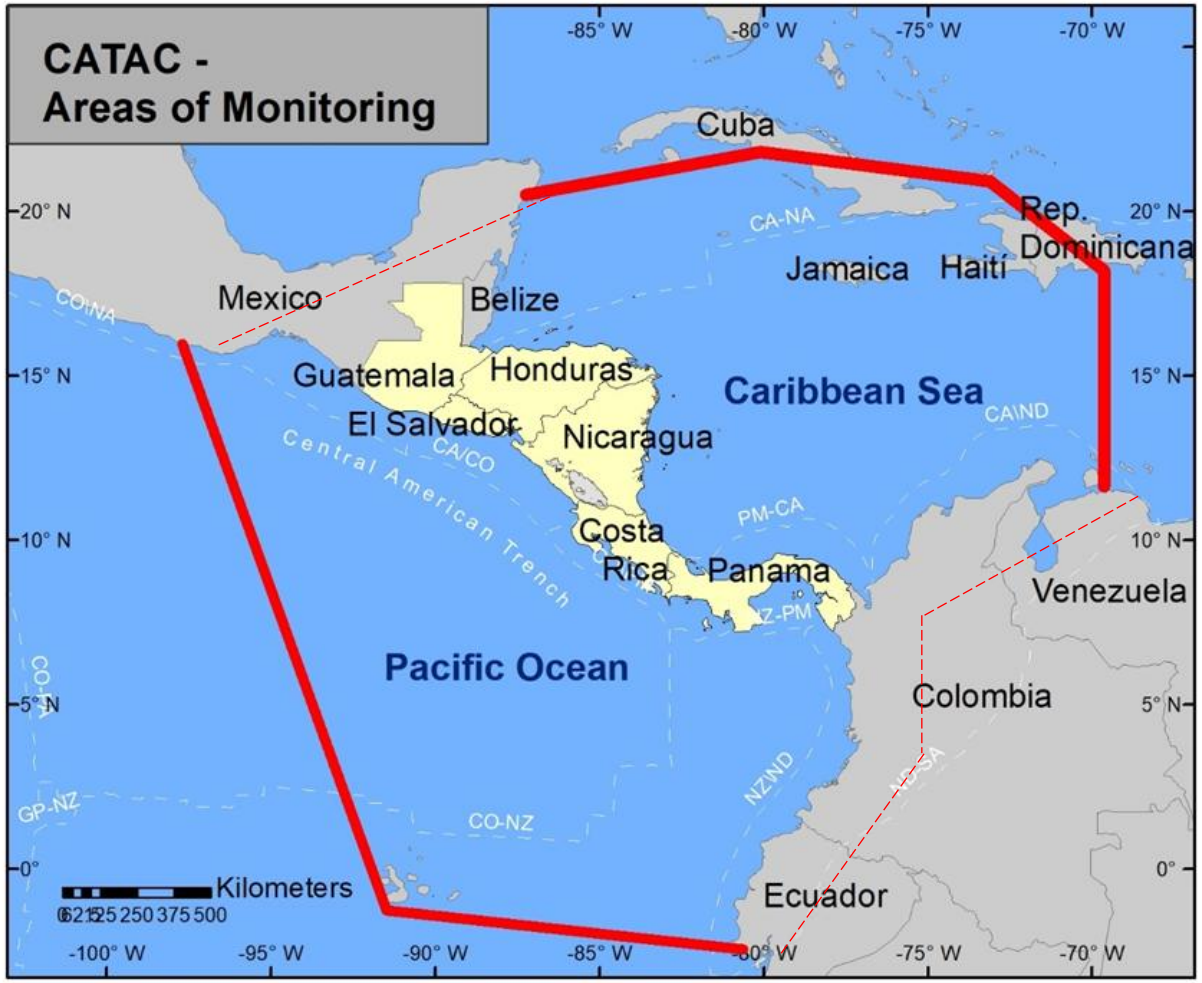
The data are streamed in real time with a sampling rate of 200,100 or 20 sps to the CATAC.

Typically the delays of the data packages are only a few seconds in Central America.

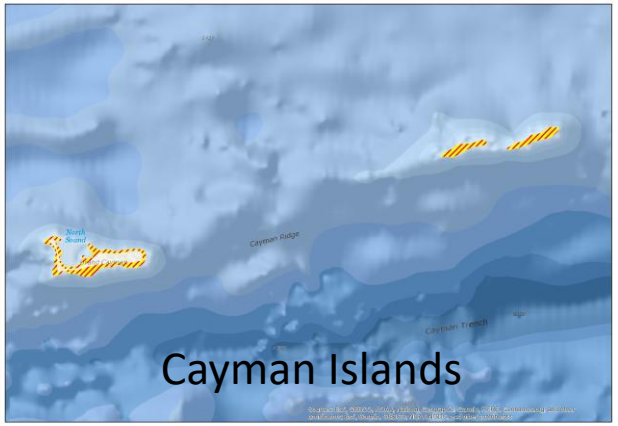
CATAC service areas and monitoring zones

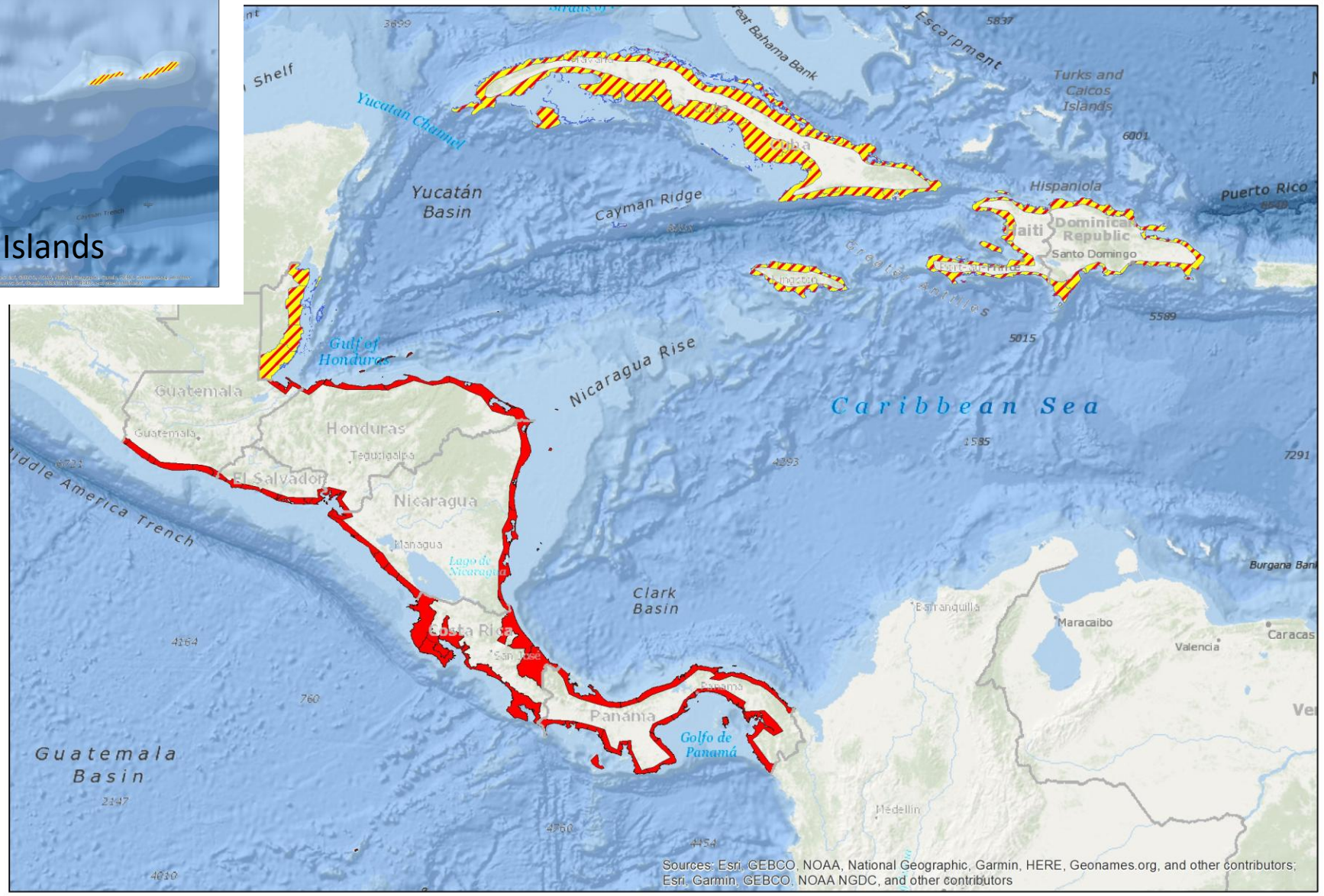


Service áreas: both coasts of Central America



Monitoring zones:
about 1 hour or less tsunami travel time to CA





Coasts with Warning Points for CATAC´s Advisory

Red: Central America; Red-yellow: others; for training and studies

Seismic Events 04/2025 – 04/2026

- 7500 seismic events located
- 73 events above M 5.0 - Info statements reported to Central America

- **No** event of M 6.5 or above, no tsunami hazard

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). The faults enter the coastal areas.
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).
5) The fault is very near the coast

The existence of these zones imposes on CATAC and Civil Protection agencies the urgency to work very fast. Therefore, CATAC pretends to use Earthquake Early Warning methods and delivers first tsunami evaluations within 2 minutes.

Participation of CATAC in tsunami exercises

In the intersessional period 2025-2026:

4 National multihazard exercises per year

2 Caribewave

1 Pacwave

Improvements of Dissemination Methods

(After problems in CARIBEWAVE 2024 - ICG/Caribe XVII recommended improvements, especially redundancy)

- Redundant methods now functioning:
  - 2 Email servers (INETER, Google), used in Caribewave 2026 (problems)
  - Whatsapp, Telegram, SMS automatically and manually, used in Caribewave 2025, ok 100%
  - Computer-Computer (using SeisComP)
  - EQ Early Warning App
- Whatsapp: Reliable, checks: reception and revisión with times, logfiles statistics

  Preferred for Sending Tsunami & Earthquake Early Warning Messages to Central America and other recipients

Whatsapp Messages Log, CARIBE WAVE 19/3/2026

REPORTE DE RECEPCIÓN - GRUPO: Alertas CATAC Oficial
Generado el: 2026-04-21 11:10:00 Mensaje de Inicio de ejercicio (dummy)
Contactos que han leído el mensaje: 32
Contactos que no han leído el mensaje: 1

[LEÍDO]	Amilcar	2026-03-19 9:06 a.m.2.
[LEÍDO]	C1	2026-03-19 9:03 a.m.3.
[LEÍDO]	C10	2026-03-19 9:02 a.m.4.
[LEÍDO]	C12	2026-03-19 10:50 a.m.5.
[LEÍDO]	C13	2026-03-19 9:00 a.m.6.
[LEÍDO]	C18	2026-03-19 11:03 a.m.7.
[LEÍDO]	C2	2026-03-19 9:21 a.m.8.
[LEÍDO]	C20	2026-03-19 9:04 a.m.9.
[LEÍDO]	C21	2026-03-19 9:05 a.m.11.
[LEÍDO]	C22	2026-03-19 9:10 a.m.12.
[LEÍDO]	C23	2026-03-19 9:13 a.m.13.
[LEÍDO]	C26	2026-03-19 9:11 a.m.14.
[LEÍDO]	C3	2026-03-19 9:01 a.m.15.
[LEÍDO]	C33	2026-03-19 9:05 a.m.16.
[LEÍDO]	C35	2026-03-22 6:36 p.m.17.
[LEÍDO]	C36	2026-03-21 8:31 p.m.18.
[LEÍDO]	C37	2026-03-19 9:00 a.m.19.
[LEÍDO]	C38	2026-03-19 9:45 a.m.20.
[LEÍDO]	C39	2026-03-20 9:30 a.m.21.
[LEÍDO]	C4	2026-03-19 9:07 p.m.22.
[LEÍDO]	C41	2026-03-19 9:31 a.m.23.
[LEÍDO]	C43	2026-03-19 9:28 a.m.24.
[LEÍDO]	C45	2026-03-19 9:00 a.m.25.
[LEÍDO]	C46	2026-03-19 9:10 a.m.26.
[LEÍDO]	C5	2026-03-19 9:07 a.m.27.
[LEÍDO]	C52	2026-03-19 9:00 a.m.28.
[LEÍDO]	C55	2026-03-19 9:11 a.m.29.
[LEÍDO]	C8	2026-03-19 9:02 a.m.30.
[RECIBIDO]	C9	2026-03-19 9:00 a.m.31.
[LEÍDO]	Dr.Strauch	2026-03-19 9:09 a.m.32.
[LEÍDO]	Miguel Flores	2026-03-19 9:16 a.m.33.
[LEÍDO]	Ulbert Grillo	2026-03-19 9:02 a.m.

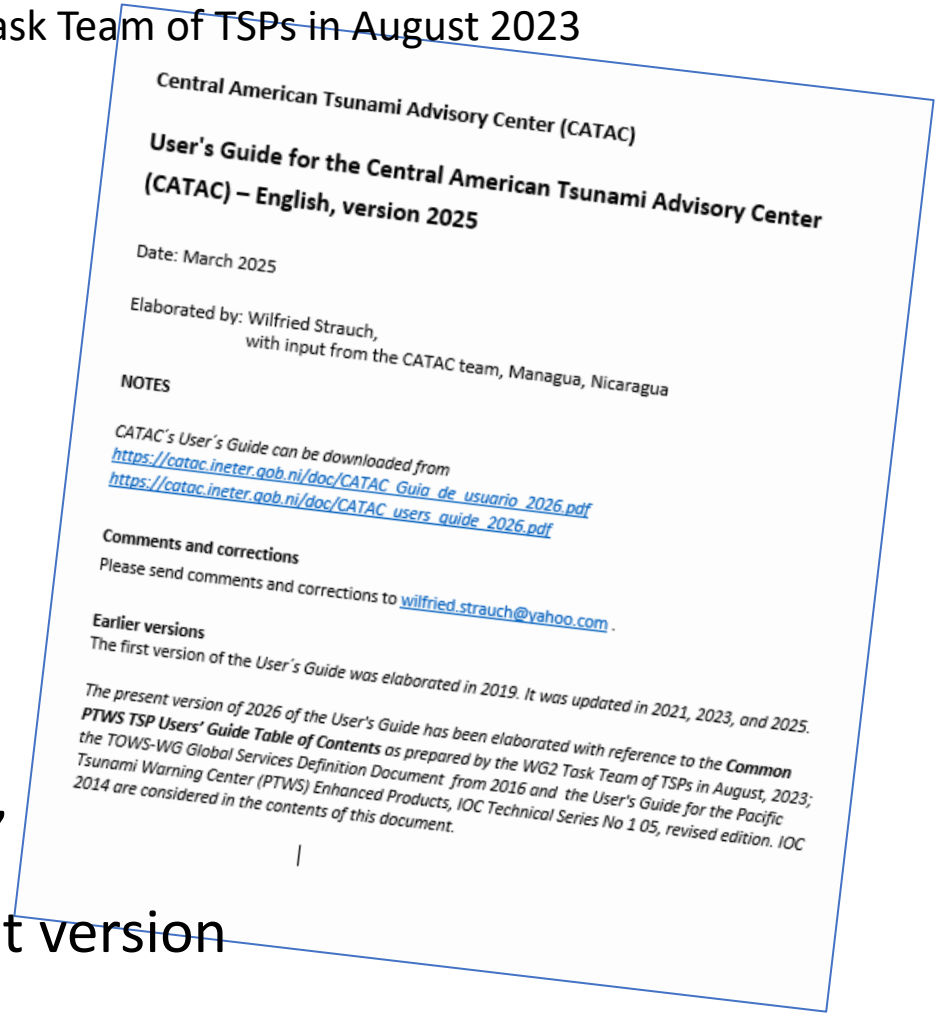
Versión 2026 of CATAC´s User´s Guide

Earlier draft was presented at ICG/PTWS, 04/2025 and ICG Caribe XIIX 2025 (virtual)

According new structure of contents definded in
-Common PTWS TSP Users' Guide Table of Contents as prepared by the WG2 Task Team of TSPs in August 2023

New info included

- New organizational structure of CATAC
- New redundant dissemination methods
- Extended seismic network of CATAC
- Use of EQ Early Warning Methods to accelerate Tsunami Warning in ICG/Caribe
- New inundation simulation with HySEA
- CATAC Capacitation efforts



Central American Tsunami Advisory Center (CATAC)

User's Guide for the Central American Tsunami Advisory Center (CATAC) – English, version 2025

Date: March 2025

Elaborated by: Wilfried Strauch,
with input from the CATAC team, Managua, Nicaragua

NOTES

CATAC´s User´s Guide can be downloaded from
https://catac.ineter.gob.ni/doc/CATAC_Guia_de_usuario_2026.pdf
https://catac.ineter.gob.ni/doc/CATAC_users_guide_2026.pdf

Comments and corrections
Please send comments and corrections to wilfried.strauch@yahoo.com .

Earlier versions
The first version of the *User´s Guide was elaborated in 2019. It was updated in 2021, 2023, and 2025.*

The present version of 2026 of the User's Guide has been elaborated with reference to the ***Common PTWS TSP Users' Guide Table of Contents*** *as prepared by the WG2 Task Team of TSPs in August, 2023; the TOWS-WG Global Services Definition Document from 2016 and the User's Guide for the Pacific Tsunami Warning Center (PTWS) Enhanced Products, IOC Technical Series No 1 05, revised edition. IOC 2014 are considered in the contents of this document.*

Revised by: 6 CA countries, WG 3 (Christa+), ITIC (Laura), USA (Greg) – Thank you!

- Revision prpoposals considered and included in present version

- DOCX & PDF available on the ICG/Caribe-XIX website