



ICG/CARIBE-EWS-XIX Meeting
Willemstad, Curacao
22-24 April, 2026

Tsunami Service Provider Report Pacific Tsunami Warning Center

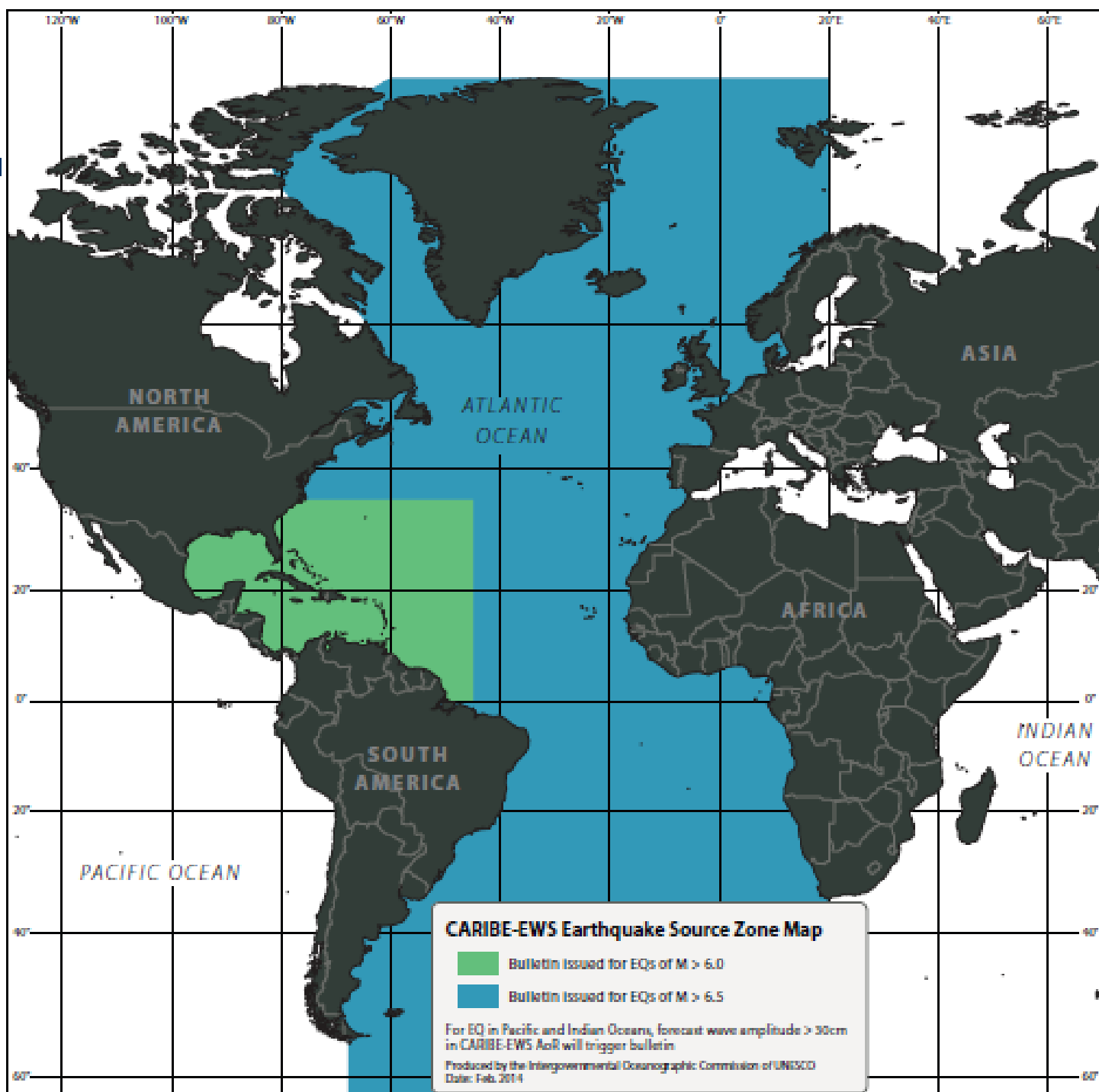
Stuart A. Weinstein, Acting Director
NOAA Pacific Tsunami Warning Center
stuart.weinstein@noaa.gov

With assistance from:
Nathan Becker, Kayla Besong, Charles McCreery



ICG/CARIBE-EWS-XIX Meeting
Willemstad, Curacao
22-24 April, 2026

PTWC PROCEDURES



CARIBE-EWS Earthquake Source Zone Map

- Bulletin Issued for EQs of $M > 6.0$
- Bulletin Issued for EQs of $M > 6.5$

For EQ in Pacific and Indian Oceans, forecast wave amplitude $> 30\text{cm}$ in CARIBE-EWS AoR will trigger bulletin

Produced by the Intergovernmental Oceanographic Commission of UNESCO
Date: Feb. 2014

PTWC Default Procedures for CARIBE-EWS Initial Products

Earthquake			Product Type	Message Type (current)	Message Type (updated)
Location	Depth	Magnitude			
Caribbean Seismic Zones	Any, but inland	≥ 6.0	Information Statement	No Tsunami Threat	
	≥ 100 km	≥ 6.0			
	< 100 km	6.0 – 7.0	Threat Message	Potential Threat to Coasts within 300 km of Epicenter	Potential Threat to Coasts with ETA within one hour
		7.1 – 7.5		Potential Threat to Coasts within 1000 km of Epicenter	Potential Threat to Coasts with ETA within two hours
		7.6 – 7.8		Potential Threat to Coasts with ETA within three hours	
		≥ 7.9		Potential Threat to Coasts with ETA within three hours	
Atlantic Seismic Zones	Any, but inland	≥ 6.5	Information Statement	No Tsunami Threat	
	≥ 100 km	≥ 6.5			
	< 100 km	6.5 – 7.0	Threat Message	Potential Threat to Coasts within 300 km of Epicenter	Potential Threat to Coasts with ETA within one hour
		7.1 – 7.5		Potential Threat to Coasts within 1000 km of Epicenter	Potential Threat to Coasts with ETA within two hours
		7.6 – 7.8		Potential Threat to Coasts with ETA within three hours *	
		≥ 7.9		Potential Threat to Coasts with ETA within three hours *	

* in the case when there are no coasts with an ETA within 3 hours, then an Information Statement is issued advising that the situation is still under evaluation.



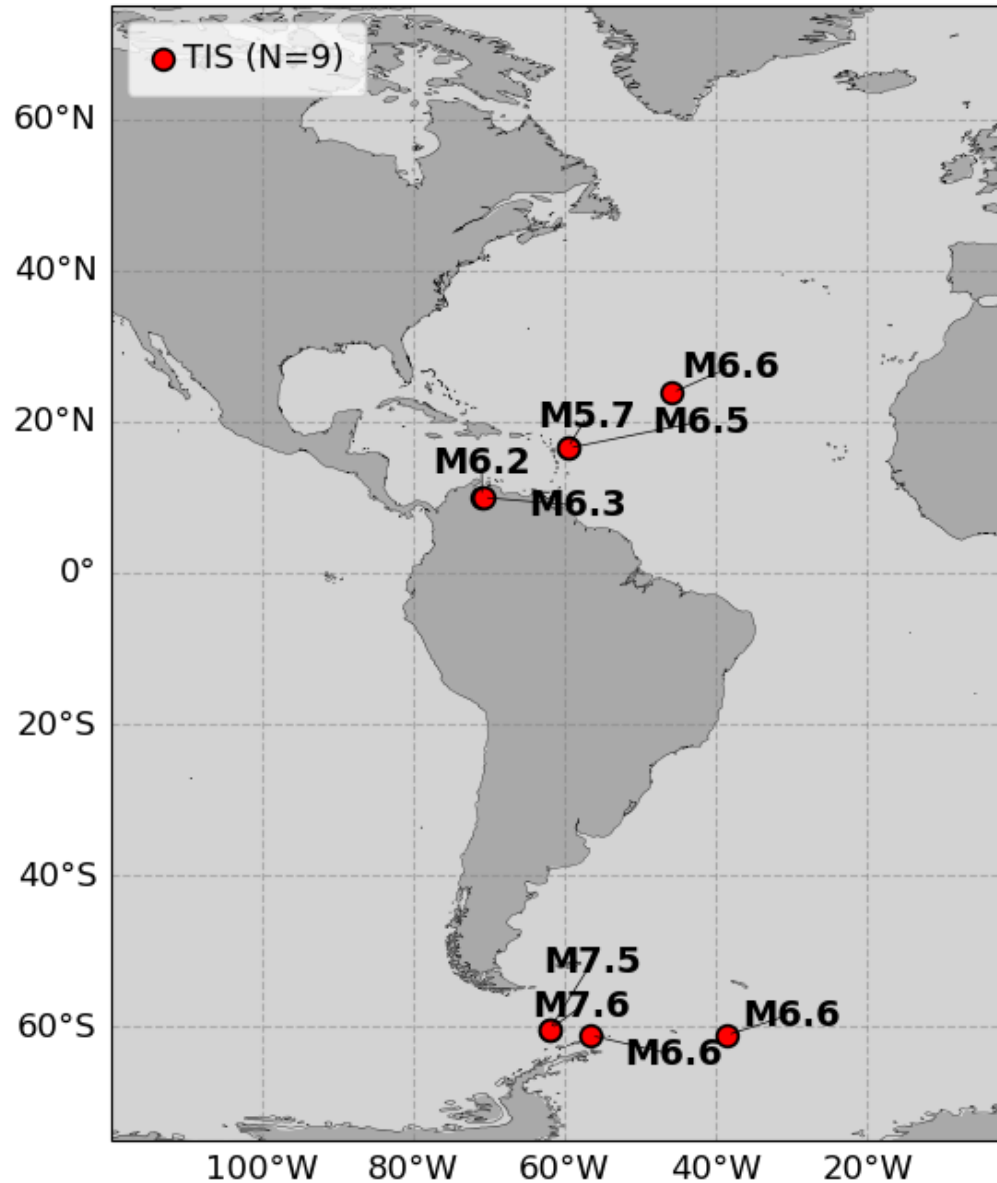
ICG/CARIBE-EWS-XIX Meeting
Willemstad, Curacao
22-24 April, 2026

PTWC Products Since Last ICG Meeting

9 Interseasonal Events: 05/05/25 – 04/16/26

USGS EARTHQUAKE PARAMETERS				PTWC PRODUCTS		
Origin Time (UTC)	Location	Mw	Depth (km)	Type	#	Elapsed Time
06/28/2025 08:32:20	SCOTIA SEA	6.5	10	INFO	1	11:04
08/22/2025 02:16:18	DRAKE PASSAGE	7.5	10	INFO	1	11:52
09/24/2025 22:21:55	MENE GRANDE VENEZUELA	6.2	9	INFO	1	07:14
09/25/2025 03:51:39	MENE GRANDE VENEZUELA	6.3	14	INFO	1	05:46
10/10/2025 20:29:20	DRAKE PASSAGE	7.6	6	INFO	1	22:52
10/27/2025 12:38:40	BEAUSEJOUR GUADALOUPE	6.5	9	INFO	1	08:23
10/27/2025 12:54:59	BEAUSEJOUR GUADALOUPE	5.7	10	INFO	1	21:50
03/20/26 00:22:24	SOUTH SHETLAND ISLANDS	6.5	21	INFO	1	14:09
03/21/26 12:16:46	NORTHERN MID-ATLANTIC RIDGE	6.6	10	INFO	1	14:04

9 Interseasonal Events: 05/05/25 – 04/16/26



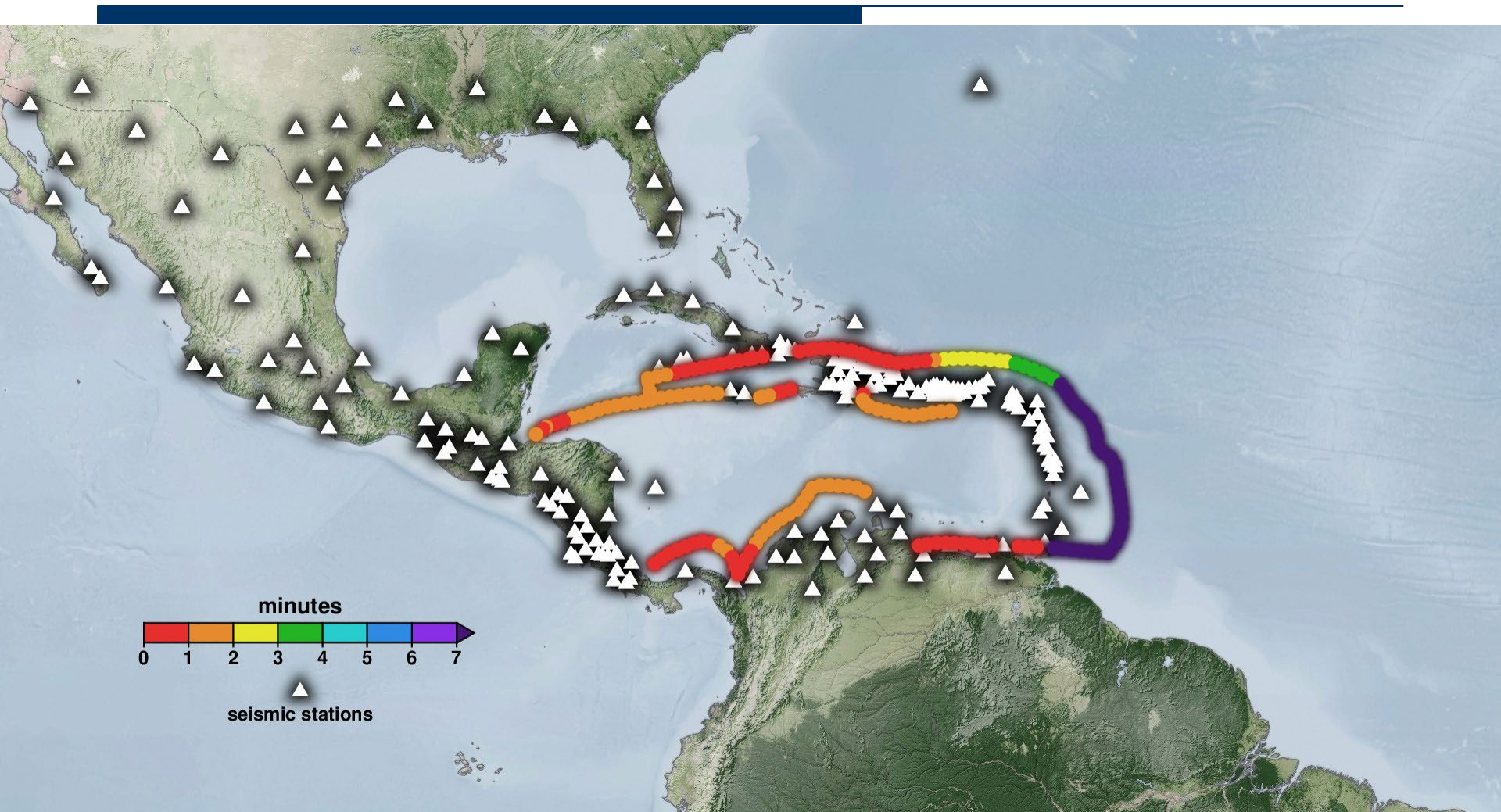


ICG/CARIBE-EWS-XIX Meeting
Willemstad, Curacao
22-24 April, 2026

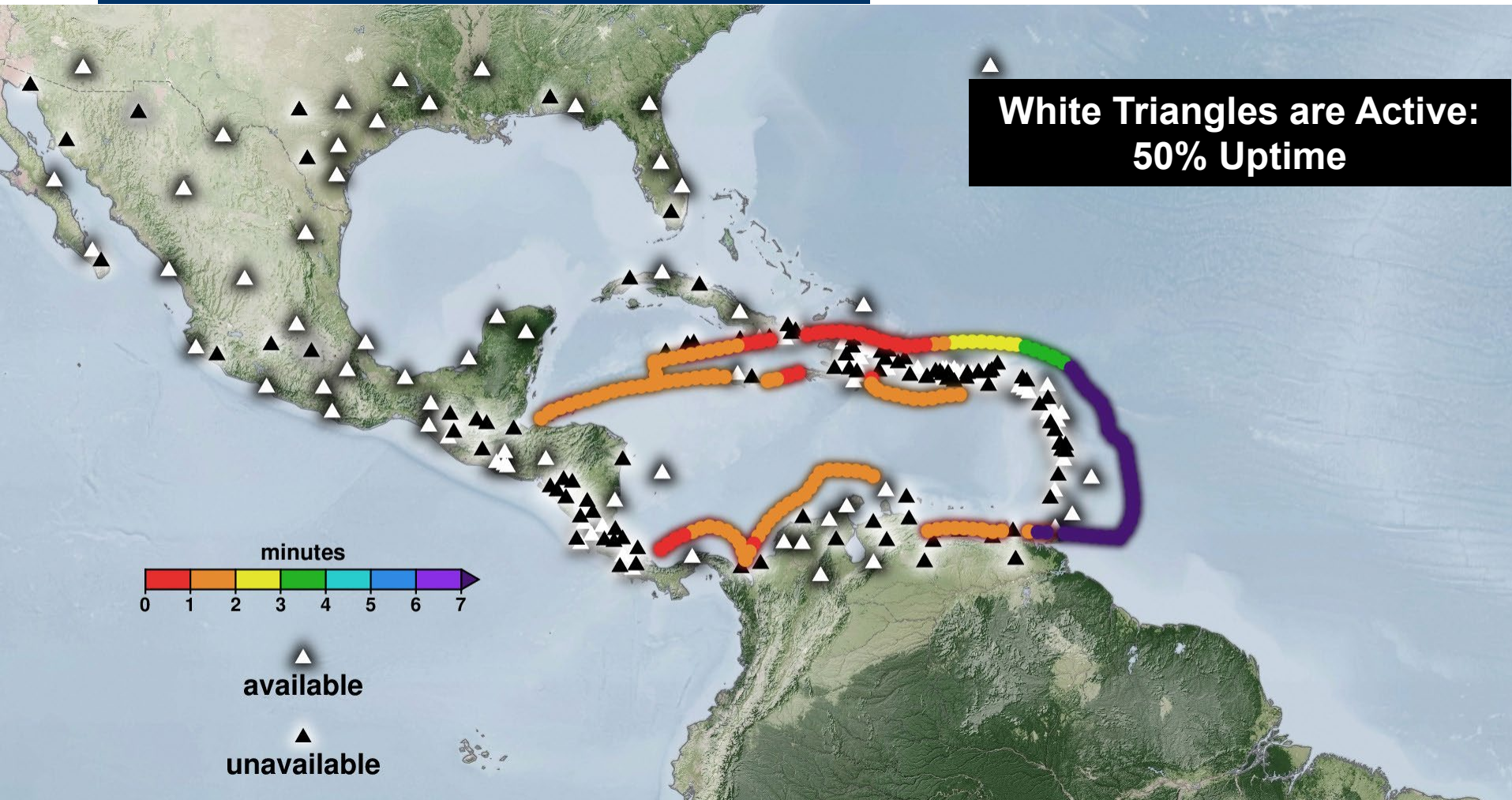
Seismic and Sea-Level Data Availability

Minimum Earthquake Location Times:

Criteria: At least 5 Stations with Azi. Gap < 180

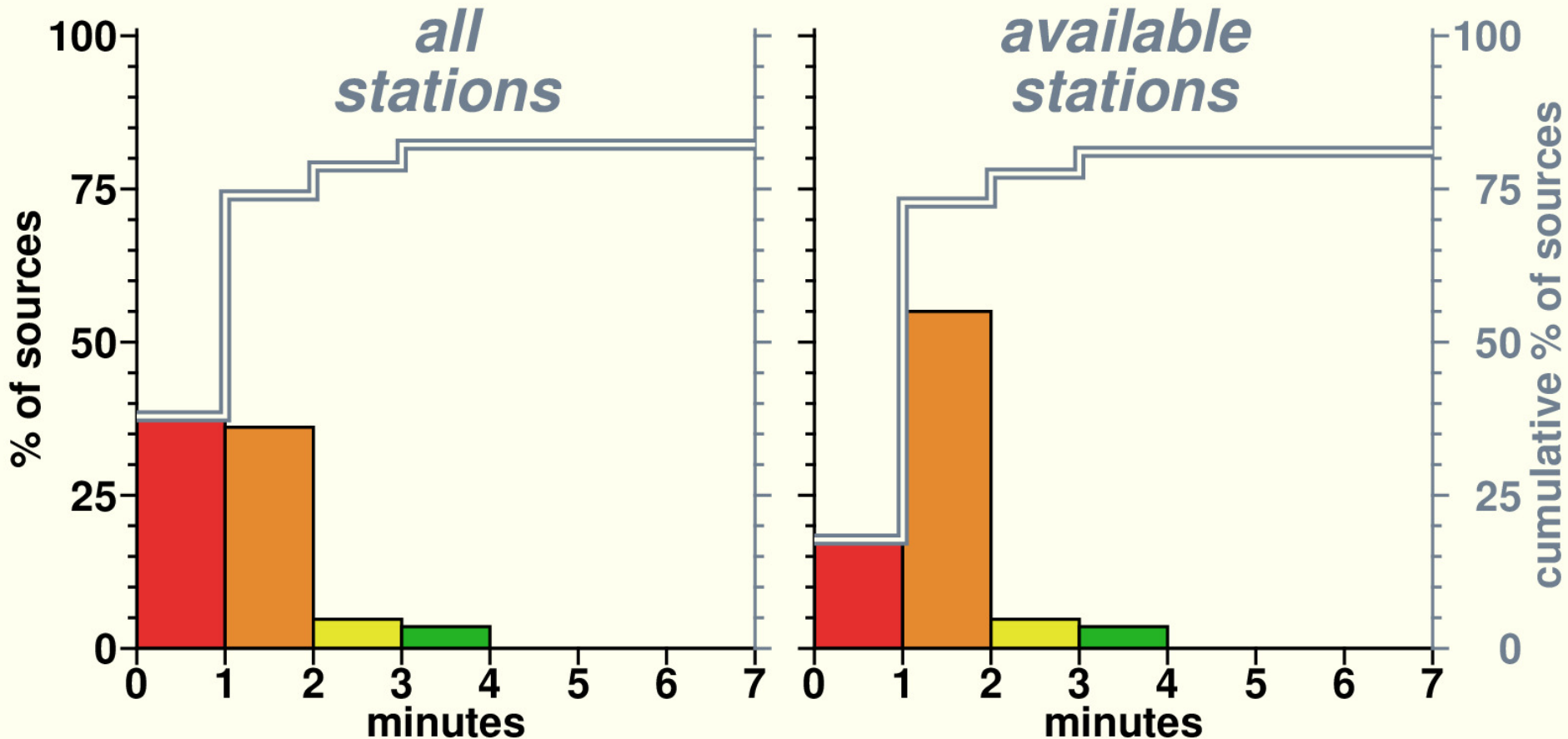


Minimum Earthquake Location Times: Only Available Stations (At least 50% Availability)



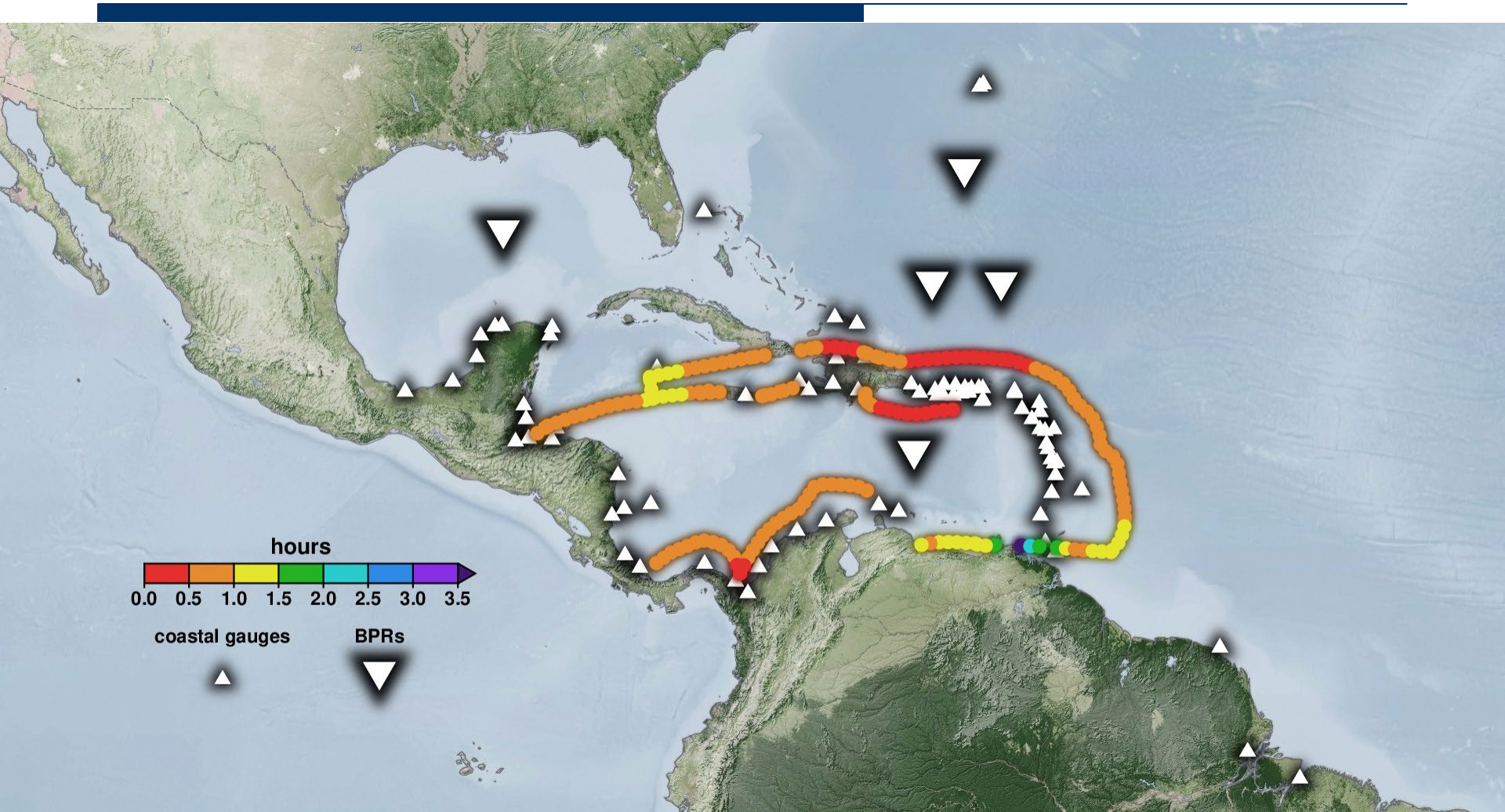
Seismic Network: Time To Locate Earthquakes

Time to Have Enough Seismic Data for Well-Constrained Solutions at Tsunami Sources

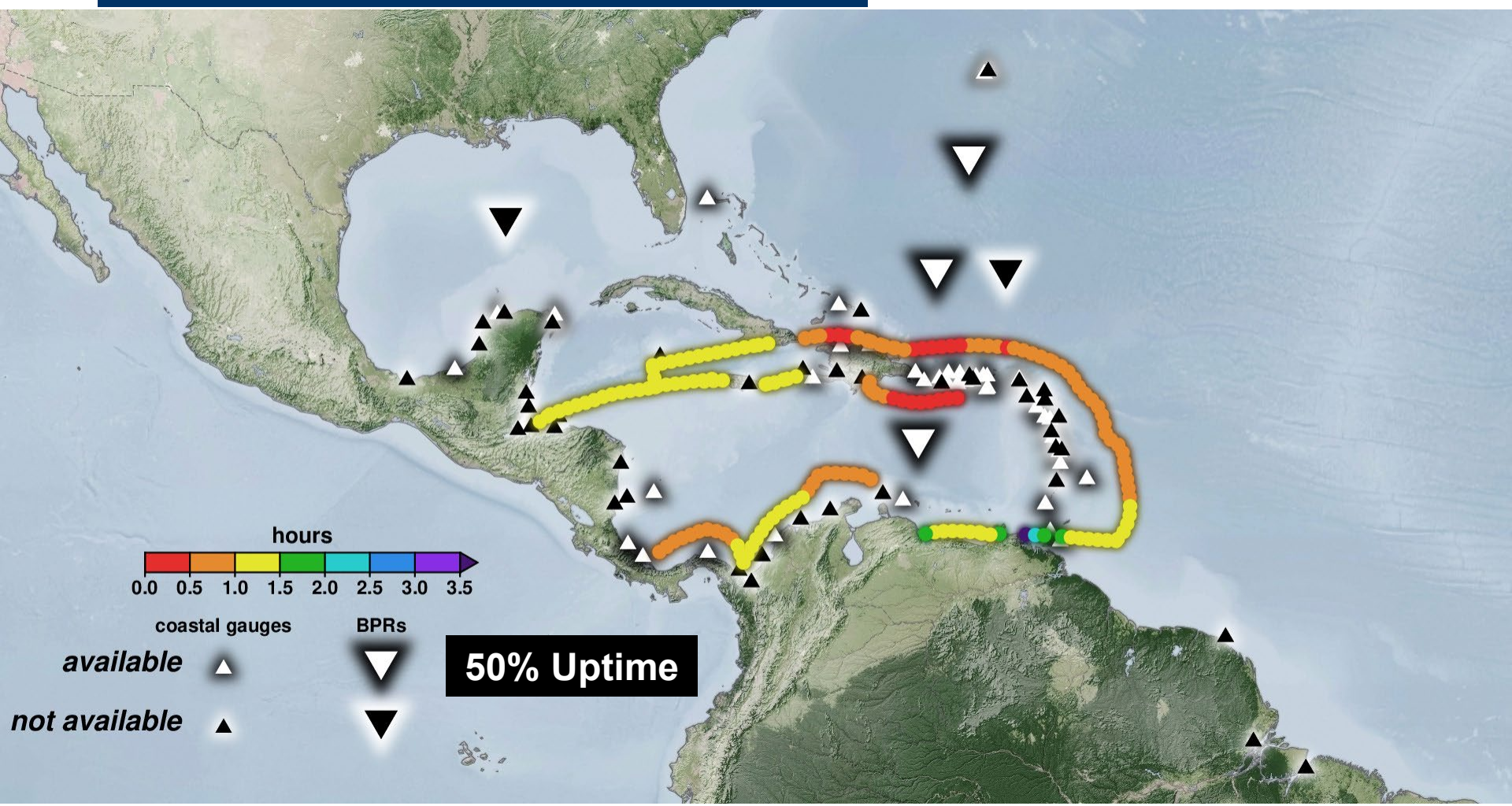


Minimum Time To Detect Tsunami at 3 Stations

All Stations

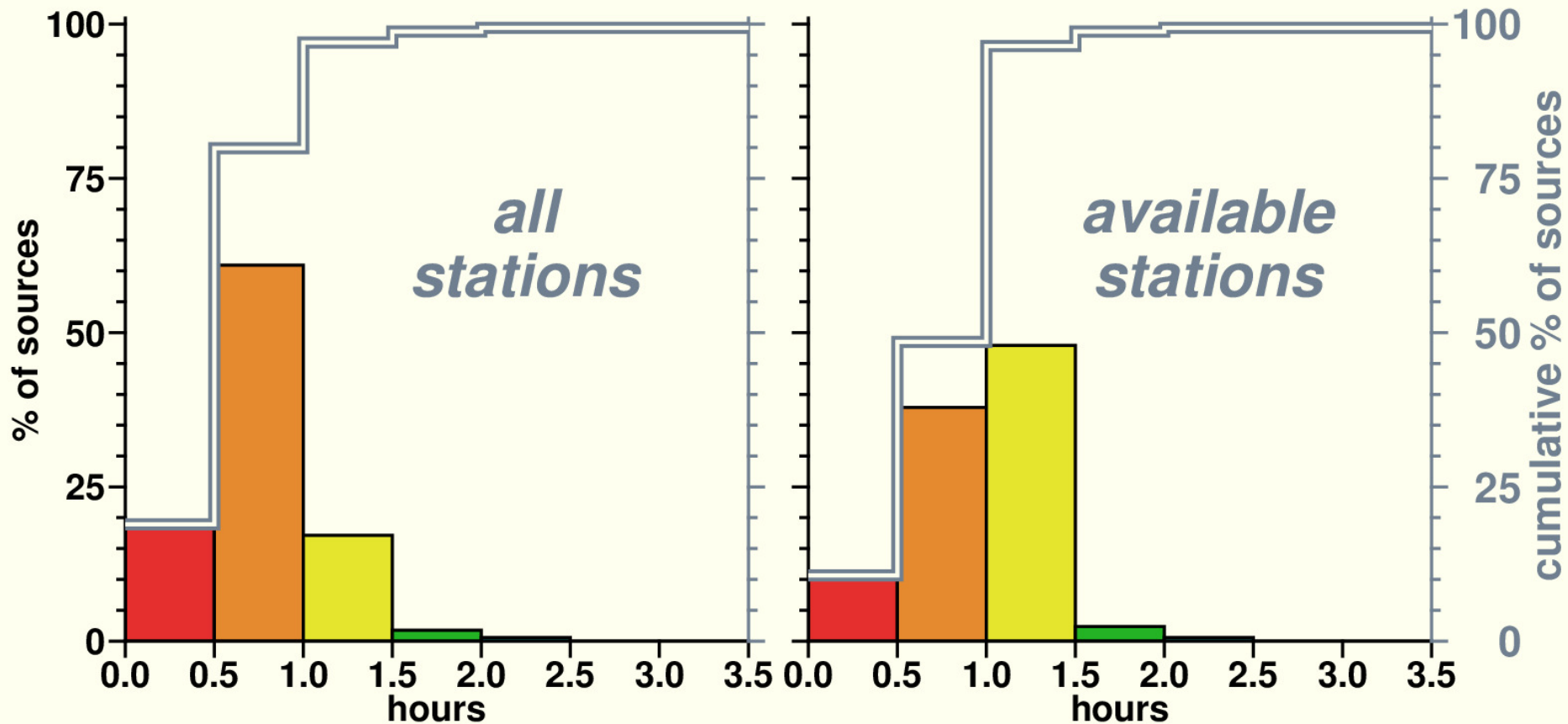


Minimum Time To Detect Tsunami at 3 Stations Only Available Stations

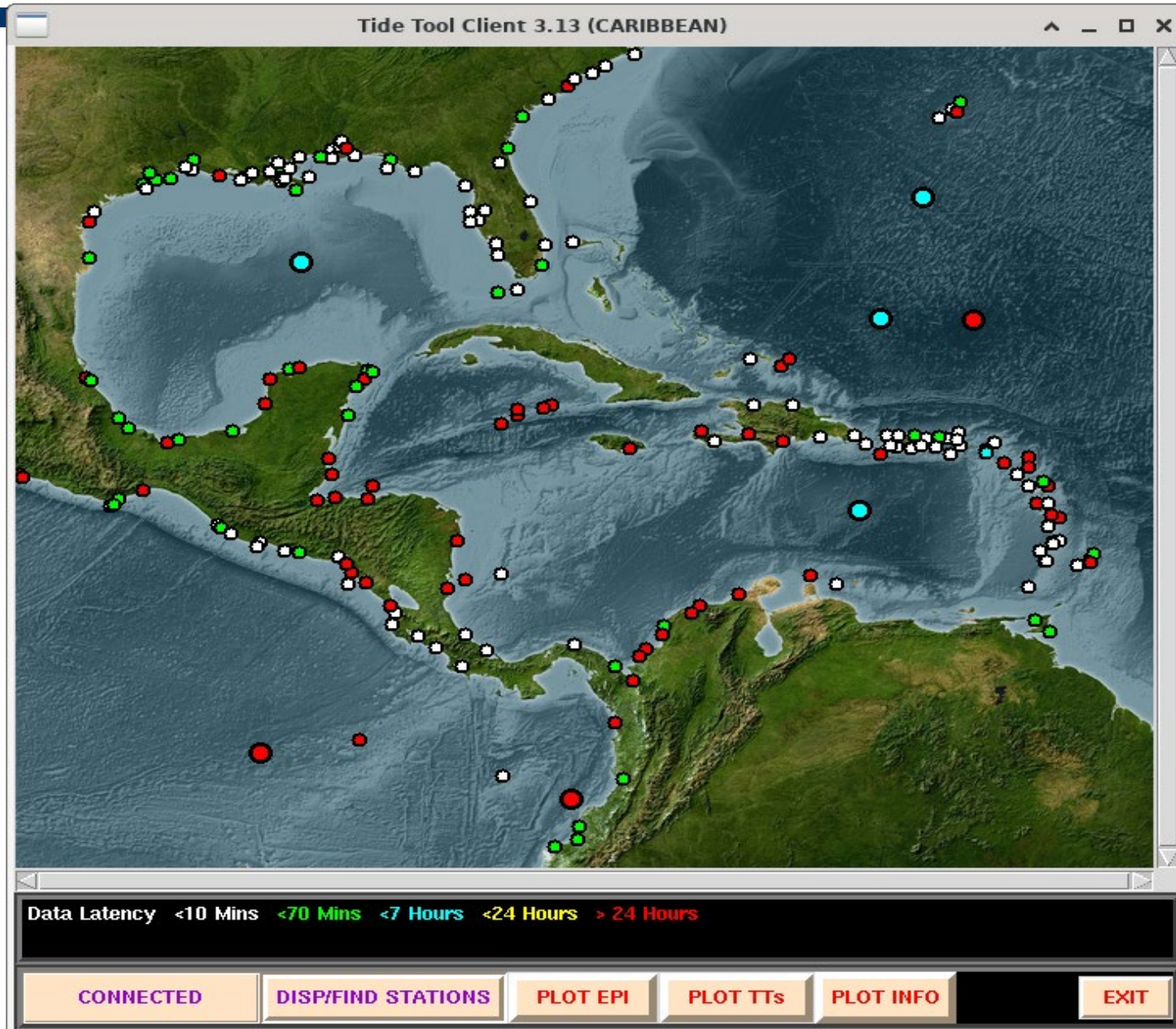


Sea-Level Network: All Possible Stations

Time for 3 Sea-Level Gauges to Record and Transmit the First Tsunami Wave Data From Each Trench-Axis Source



Sea Level Network: Available – 04/15/25



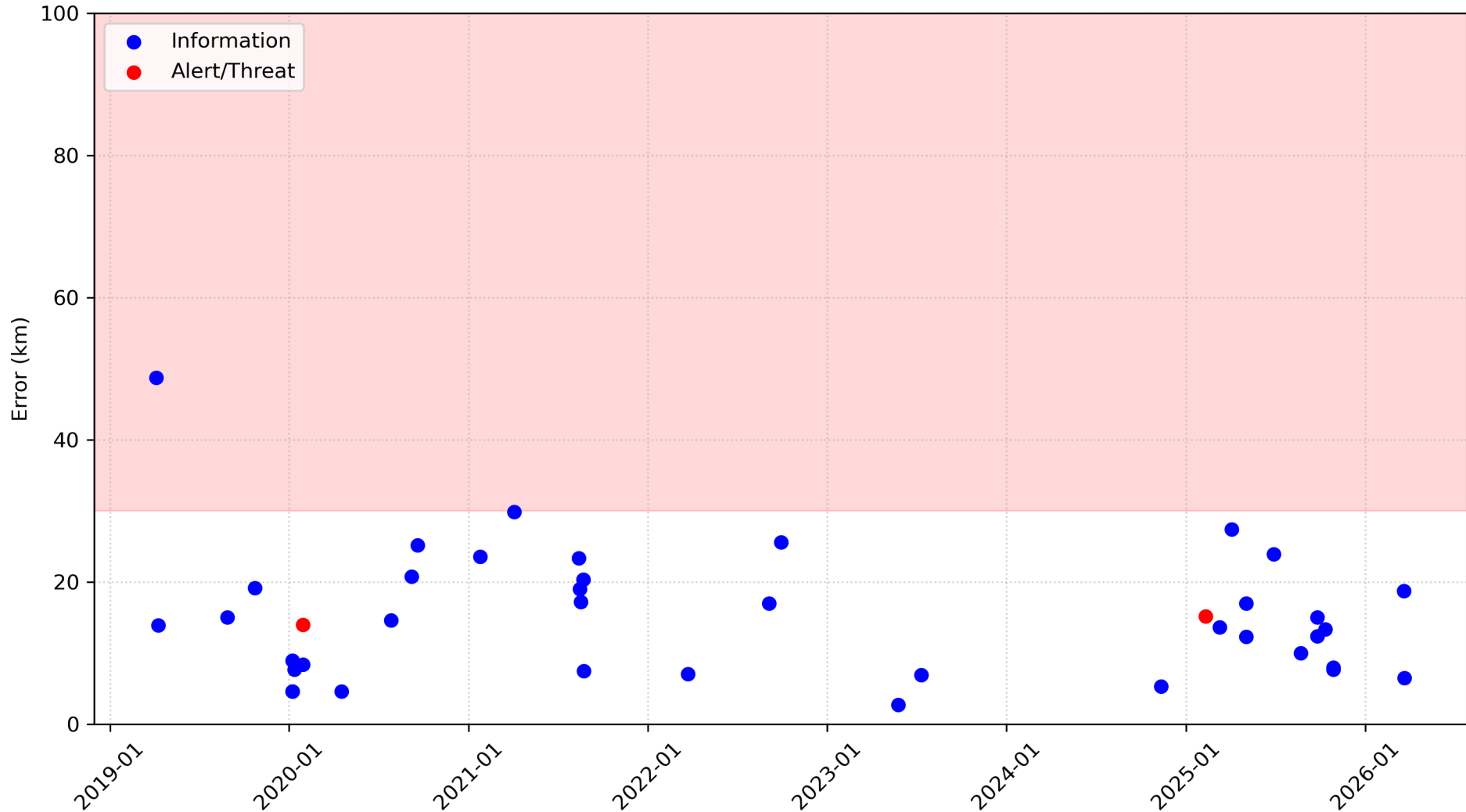


ICG/CARIBE-EWS-XIX Meeting
Willemstad, Curacao
22-24 April, 2026

PTWC Earthquake Parameters

Epicerter Location Performance - Since 2019

Epicerter Location Error - Information and Threat

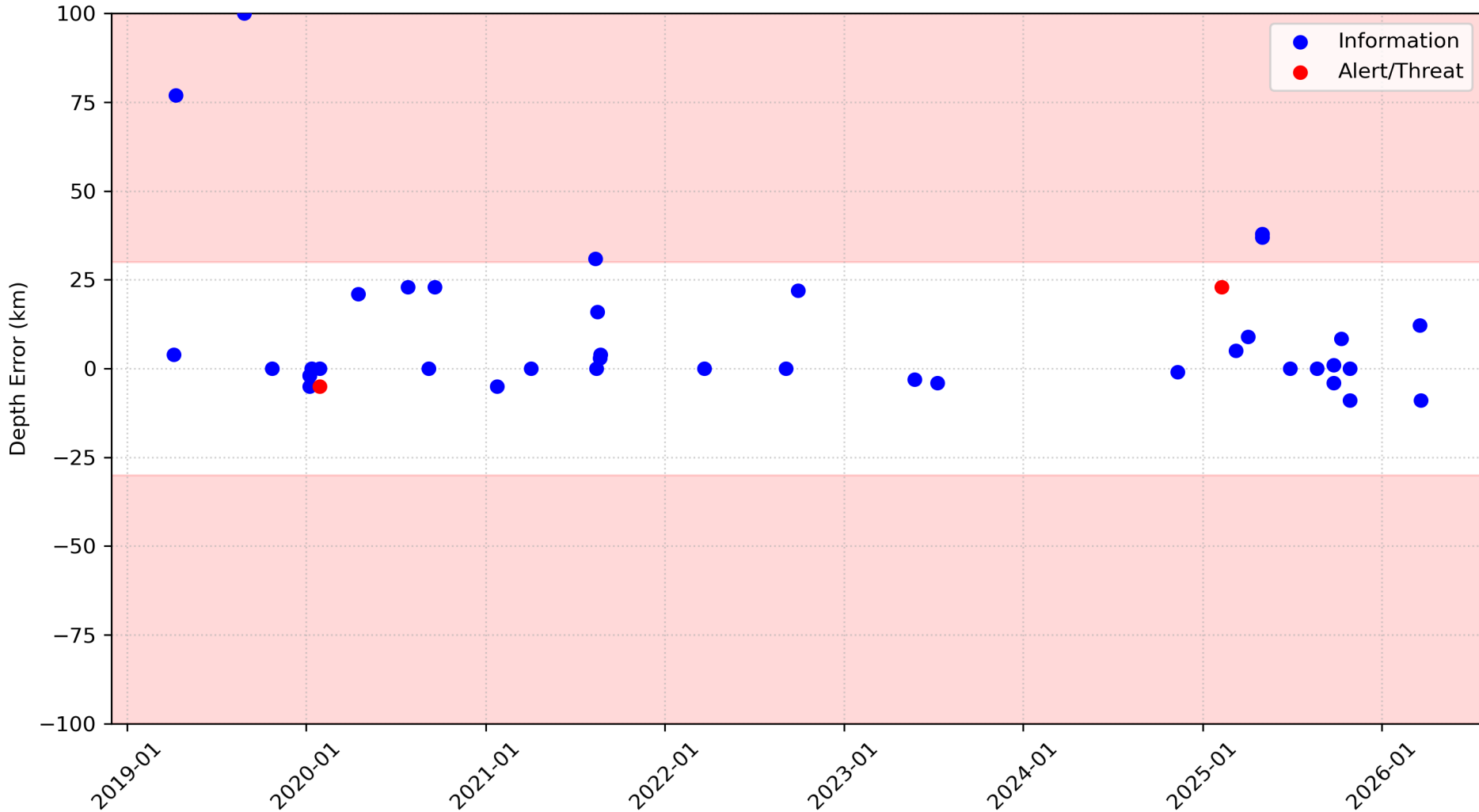


Blue dots are Information Statements

Orange dots are Threat Messages

Depth Performance - Since 2019

Hypocenter Depth Error - Information and Threat

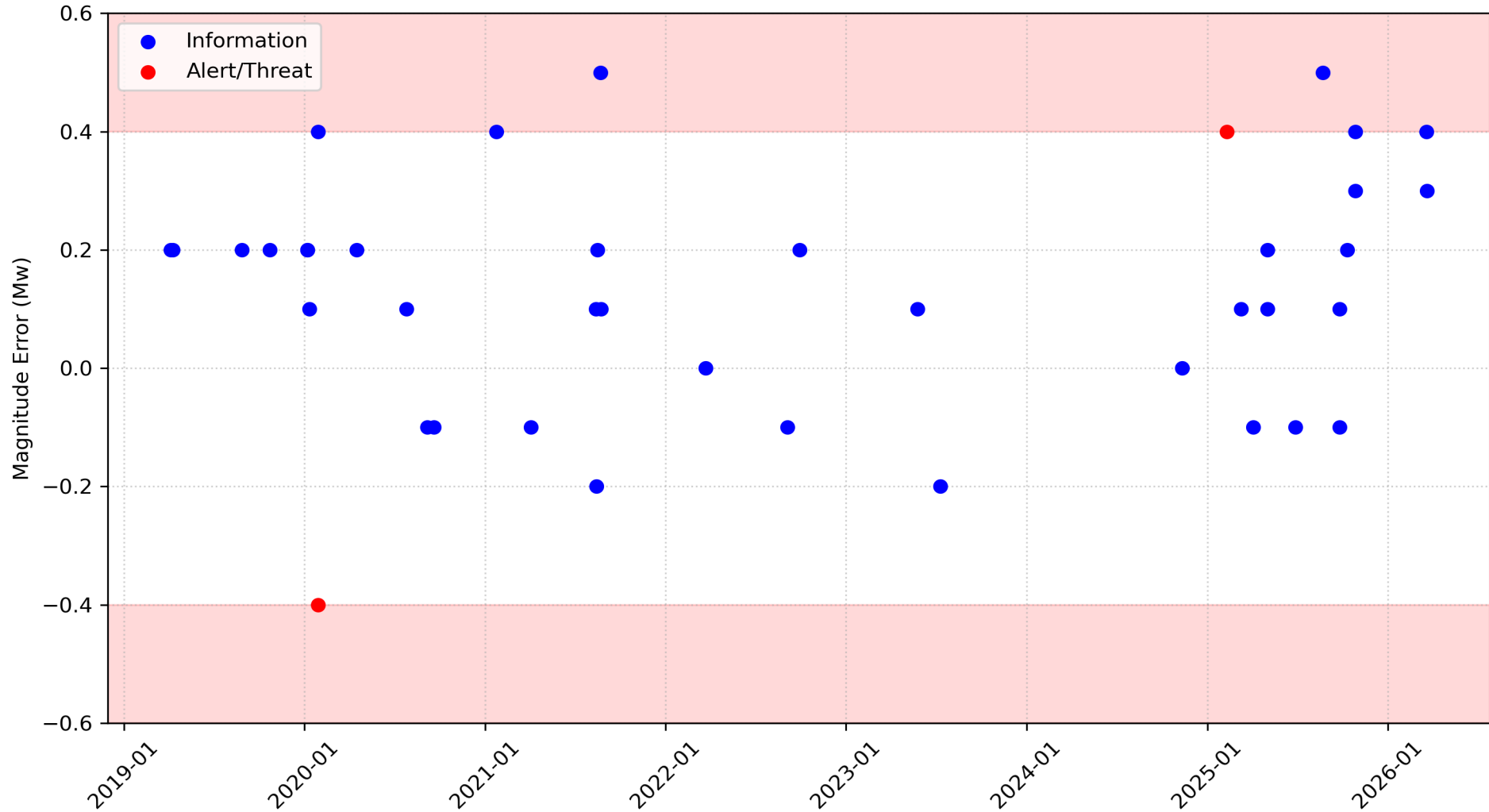


Blue dots are Information Statements

Orange dots are Threat Messages

Magnitude Performance - Since 2019

Magnitude Error (Initial) - Information and Threat



Blue dots are Information Statements

Orange dots are Threat Messages



ICG/CARIBE-EWS-XIX Meeting
Willemstad, Curacao
22-24 April, 2026

PTWC Building Flood, NTWC Backup

PTWC Building Flood, Fire, Outages: January 27 – March 5, 2026

January 27

- Water pipe connection separates in PTWC pantry ceiling causing significant flooding.
- Water floods a main building transformer causing small fire and cutting commercial power to the building.
- **PTWC is down and transfers operations to US National Tsunami Warning Center (USNTWC).**

January 28

- **Notification to PTWS and CARIBE-EWS TNCs, TWFPs, and NTWCs** reporting outage and USNTWC backup.
Duration of outage is unknown.

January 29

- **Notification to PTWS and CARIBE-EWS TNCs, TWFPs, and NTWCs** – outage will continue through at least February 2.

January 30

- PTWC sends 3 duty staff to USNTWC to help with backup.

February 2

- **Notification to PTWS and CARIBE-EWS TNCs, TWFPs, and NTWCs** – outage continues - looking for alternate space in building with power for PTWC to operate.



PTWC Building Flood, Fire, Outages: January 27 – March 5, 2026

The same methodology and response form that will be used for the upcoming quarterly PTWC response-required communication tests.

February 6

- Backup Communication Test conducted by USNTWC for PTWC

February 7

- PTWC is back up after moving equipment into a space formerly occupied by the building library that has commercial power.

February 8

- Notification to PTWS and CARIBE-EWS TNCs, TWFPs, and NTWCs – PTWC is operating again

February 11

- Notification to PTWS and CARIBE-EWS TNCs, TWFPs, and NTWCs – Announcing a Backup Communication Test from USNTWC tomorrow

February 13

- PTWC operations moves back to its normal space in the building, but under generator power

February 26

- Notification to PTWS and CARIBE-EWS TNCs, TWFPs, and NTWCs – Planned 12-hour outage tomorrow to try and restore commercial power

February 27

- PTWC is down for more than 12 hours. Commercial power could not be restored yet so power is still from generator. A router problem also occurred delaying PTWC coming back up.

February 28

- Notification to PTWS and CARIBE-EWS TNCs, TWFPs, and NTWCs – PTWC remains down due to router issue.
- PTWC is back up when the router issue gets resolved.
- Notification to PTWS and CARIBE-EWS TNCs, TWFPs, and NTWCs – PTWC is back up.

March 4

- Notification to PTWS and CARIBE-EWS TNCs, TWFPs, and NTWCs – Planned 12-hour outage tomorrow to restore commercial power

March 5

- PTWC is down for 12 hours
- PTWC is back up when commercial power is finally restored to the building



ICG/CARIBE-EWS-XIX Meeting
Willemstad, Curacao
22-24 April, 2026

New Products, Communication Tests Survey

Implementation of Updated Content and Format of PTWC Products

January 14

- User's Guide:** IOC announces publication of the *Revised User's Guide for Pacific Tsunami Warning Center Procedures and Products for Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE-EWS)*. It contains sample products with the new format and content.

March 19

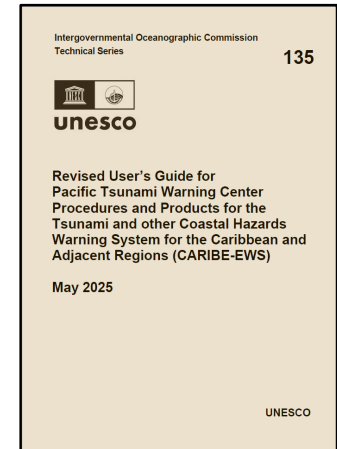
- Caribe Wave 26 Exercise** is conducted. PTWC products for the exercise were constructed with the updated content and format.

May 1 (target)

- Notification:** CARIBE-EWS TNCs, TWFPs, and NTWCs will be notified about the upcoming change with a 90 day-period for feedback.

August 1 (target)

- Implementation:** Updated products will be implemented.



```
TEST...Tsunami Message Number 2...TEST
NWS Pacific Tsunami Warning Center Honolulu HI
1515 UTC Thu Mar 19 2026

...THIS MESSAGE IS FOR TEST PURPOSES ONLY...
...TEST TSUNAMI THREAT MESSAGE TEST...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE ****

This is a test message. This message is issued for information
only in support of the UNESCO/IOC Tsunami and Other Coastal
Hazards Warning System for the Caribbean and Adjacent Regions
and is meant for national authorities in each country of that
system.

This is a test message. National authorities will determine the
appropriate level of alert for each country and may issue
additional or more refined information.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE ****

Magnitude and Forecast updated.

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST
-----
* Magnitude      7.8
* Origin Time    1500 UTC Mar 19 2026
* Coordinates    17.6 North 82.6 West
* Depth          10 KM / 6 Miles
* Location       North Of Honduras
```

Mixed Case

```
TEST... ESTIMATED TIMES OF ARRIVAL ...TEST
-----
* This is a test message. Estimated times of arrival -ETA- of
the initial tsunami wave for places within the region
identified with a potential tsunami threat. Actual arrival
times may differ and the initial wave may not be the
largest. A tsunami is a series of waves and the time between
waves can be five minutes to one hour.

LOCATION                COORDINATES      ETA(UTC)
-----
CAYMAN ISLANDS
Grand Cayman          19.3N 81.3W      1526 03/19
Cayman Brac           19.7N 79.9W      1530 03/19
CUBA
Cienfuegos            22.0N 80.5W      1549 03/19
Santiago D Cuba      19.9N 75.8W      1556 03/19
Baracoa               20.4N 74.5W      1626 03/19
La Habana            23.2N 82.4W      1633 03/19
Gibara               21.1N 76.1W      1646 03/19
HONDURAS
Puerto Cortes        15.9N 88.0W      1557 03/19
Trujillo              15.9N 86.0W      1643 03/19
MEXICO
Cozumel               20.5N 87.0W      1558 03/19
JAMAICA
Montego Bay           18.5N 77.9W      1605 03/19
Kingston              17.9N 76.9W      1644 03/19
HAITI
Jeremie               18.6N 74.1W      1616 03/19
Cap Haiten            19.8N 72.2W      1638 03/19
Jacamel              18.1N 72.5W      1641 03/19
```

ETAs by Country

```
TEST... TSUNAMI OBSERVATIONS ...TEST
-----
* This is a test message. The following are tsunami wave
observations from coastal and/or deep-ocean sea level gauges
at the indicated locations. The maximum tsunami height is
measured with respect to the normal tide level.

GAUGE LOCATION          COORDINATES      TIME      TSUNAMI      MS      PER
                        LAT   LON   UTC      AMPLITUDE  TP   MIN
-----
COLOMBIA
San Andres              12.6N 81.7W      1701      0.02M/ 0.1FT H   9
MEXICO
Puerto Morelos         20.9N 86.9W      1603      0.11M/ 0.4FT H  13

TIME UTC - Time of the reported observation
MS TP - Measurement Type
C is the maximum crest
T is the maximum trough
H is half maximum crest-to-trough
PER MIN - Tsunami wave period in minutes
```

Observations by Country

Backup Communication Test conducted by USNTWC for PTWC

February 6, 2026 – 19:30 UTC



PACIFIC TSUNAMI WARNING CENTER

CARIBE-EWS COMMUNICATIONS TEST FROM PTWC

Please respond what **date and time (UTC)** you received the most recent communication test from the Pacific Tsunami Warning Center. Consider all the methods that apply.

Thank you for your participation and helping us to maintain and improve the Regional Tsunami Early Warning System!

Por favor responda en qué **fecha y hora (UTC)** recibió la prueba mas reciente de comunicaciones del Centro de Alerta de Tsunamis del Pacífico. Considere todos los métodos que aplican.

¡Gracias por su participación y ayudarnos a mantener y mejorar el Sistema Regional de Alerta Temprana de Tsunamis!

* 1. Country

* 2. Email

Email Address

* 3. Office Designation

- National Tsunami Warning Center (NTWC)
- Tsunami Warning Focal Point (TWFP)

* 4. Agency/Office

* 5. For each communication method that applies to your office/agency, report the date and time (**UTC**) when the test message was received.

Para cada método de comunicación que aplique a su oficina/agencia, reporte la fecha y hora (**UTC**) en que recibió el mensaje de prueba.

	Month/Mes	Day/Día	Hour/Hora	Minutes/Minutos
Global Telecommunications System (GTS) / Sistema Global de Telecomunicaciones	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Aeronautical Information Service (AISR) / Servicio de Información Aeronáutica	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Email / Correo Electrónico	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
GEONET Cast Americas	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
WMO Information System (WIS)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
EMWIN	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

6. **Comments**

Please notify if the test was unacceptably delayed or not received by one or more designated communication methods (for example an incorrect email address). In that case, please indicate which method(s) failed and the email of a person to correspond with regarding the problem.

Comentarios

Por favor notifique si la prueba se retrasó inaceptablemente o no se recibió mediante uno o más métodos de comunicación designados (por ejemplo, una dirección de correo electrónico incorrecta). En ese caso, indique qué método(s) falló y el correo electrónico de una persona con quien comunicarse sobre el problema.

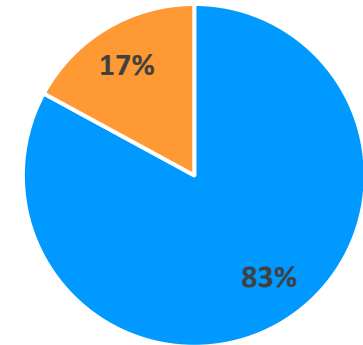
Powered by **SurveyMonkey**
Create surveys and forms with ease. [Sign up free.](#)

Backup Communication Test conducted by USNTWC for PTWC

February 6, 2026 – 19:30 UTC

Country	Responded	Method(s)	Comments
ANTIGUA & BARBUDA	Y	Email	Thanks!
ARUBA	Y	Email	N/A
BAHAMAS	Y	Email	The delay is unacceptably. The communication was via email. The person to correspond to regarding the problem is Orson M Nixon, Officer in Charge of the Forecast Office at orsonnixon@bahamas.gov.bs
BARBADOS	Y	GTS, Email	
BELIZE	Y	Email	
BRAZIL	Y	Email	Delay found on graylist.
CANADA	N		
COLOMBIA	Y	Email	
COSTA RICA	Y	GTS, Email	
CUBA	N		
CURACAO	Y	Email	
DOMINICA	Y	Email	
DOMINICAN REPUBLIC	Y	Email	
FRANCE: MARTINIQUE	Y	GTS, Email	
FRANCE: GUADELOUPE	Y	Email	The test was successfully received at 3:30 PM Guadeloupe time, or 7:30 PM UTC.
FRANCE: SAINT-BARTHELEMY and SAINT-MARTIN	Y	Email	
GRENADA	Y	Email	
GUATEMALA	Y	Email	
GUYANA	Y	Email	
HAITI	Y	GTS, Email, AISR	
HONDURAS	Y	Email	No hubo retraso.
JAMAICA	Y	Email	received
MEXICO	Y	Email	
NETHERLANDS: BONAIRE, SABA, SINT EUSTATIUS	Y	GTS	
NICARAGUA	N		
PANAMA	N		
SAINT KITTS AND NEVIS	Y	Email	The test message was received timely via email.
SAINT LUCIA	Y	Email	
SAINT VINCENT AND THE GRENADINES	Y	Email	
SINT MAARTEN	Y	Email	The test was received at 15:30 Sint Maarten time. I am not certain whether there is a time difference between Sint Maarten and the location from which the test signal originated.
SURINAME	N		
TRINIDAD AND TOBAGO	Y	Email	
UNITED KINGDOM	NA		
UK: ANGUILLA	Y	AISR	Our TWFP did not receive the email or CAP alert. Anguilla only monitors email and CAP. We received it via email, but obviously not CAP.
UK: BERMUDA	Y	AISR	
UK: BRITISH VIRGIN ISLANDS	Y	Email	We are only able to receive tests via email at this time.
UK: TURKS AND CAICOS	N		
UK: CAYMAN ISLANDS	Y	Email	
UK: MONTSERRAT	N		
UNITED STATES	NA		
US: PUERTO RICO	Y	GTS, Email, ENWIN	
US: VIRGIN ISLANDS	Y	Email	No problems.
VENEZUELA	Y	Email	no comment, all ok

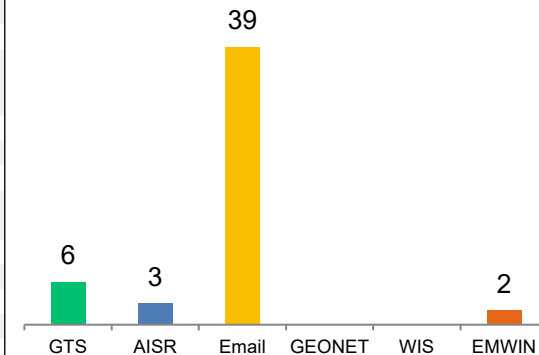
Responses Received



■ YES ■ NO

update
2/14/26

Comm Test Received by Method



Maritime Products for CARIBE-EWS



Background. The IHO's World-Wide Navigational Warning System (WWNWS) requested through the TOWS-WG that the TSPs of the IOC's Four Tsunami Warning Systems create special Maritime Products for use by the Coordinators of the 21 global NAVAREAs to alert ships at sea in their area about any potential tsunami hazard.

Current Global Status. Maritime Products have now been created by PTWC for the PTWS to cover the Pacific (8 NAVAREAs) and by the three TSPs of the IOTWMS for use in the Indian Ocean (5 NAVAREAs). The Maritime Products content, format and threshold for issuance are slightly different between the PTWS and IOTWS and the TOWS-WG is working to harmonize these products.

CARIBE-EWS Status. PTWC is in the process of creating Maritime Products for the CARIBE-EWS to cover the Caribbean and adjacent regions (NAVAREAs IV, V, and VI).

Process for Implementation (target is by the end of 2026)

- Issue communication test to the three NAVAREA Coordinators as a part of the Caribe Wave 26 Exercise. (done)
- Write the software to automatically create and disseminate the products.
- Write a manual describing the procedures and products.
- Vetting by the CARIBE-EWS, TOWS-WG, and WWNWS.
- Announce and implement the products.

Sample
Pacific
Maritime
Message

```
MARITIME TSUNAMI THREAT MESSAGE NUMBER 01
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI
1853 UTC TUE FEB 4 2025

THIS MESSAGE IS FOR NAVAREA XII, AND NAVAREA XVI.

A TSUNAMI THREAT IS OCCURRING.

A TSUNAMI MAY HAVE BEEN GENERATED BY AN EARTHQUAKE WITH A
PRELIMINARY MAGNITUDE OF 8.6 THAT OCCURRED NEAR THE COAST OF
GUATEMALA AT 1844 UTC ON TUESDAY FEBRUARY 4 2025.

HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS OF COLOMBIA,
COSTA RICA, ECUADOR, EL SALVADOR, GUATEMALA, MEXICO, NICARAGUA,
PANAMA, AND PERU.

TSUNAMI WAVES ARE NOT A HAZARD TO SHIPS IN DEEP WATER BUT CAN
CAUSE STRONG CURRENTS AND RAPID SEA LEVEL CHANGES IN SHALLOW
WATER AS WELL AS INUNDATION OF THE COAST.

SHIPS APPROACHING THE COAST SHOULD CONSULT LOCAL AUTHORITIES
REGARDING LOCAL CONDITIONS AND ADVICES.
```

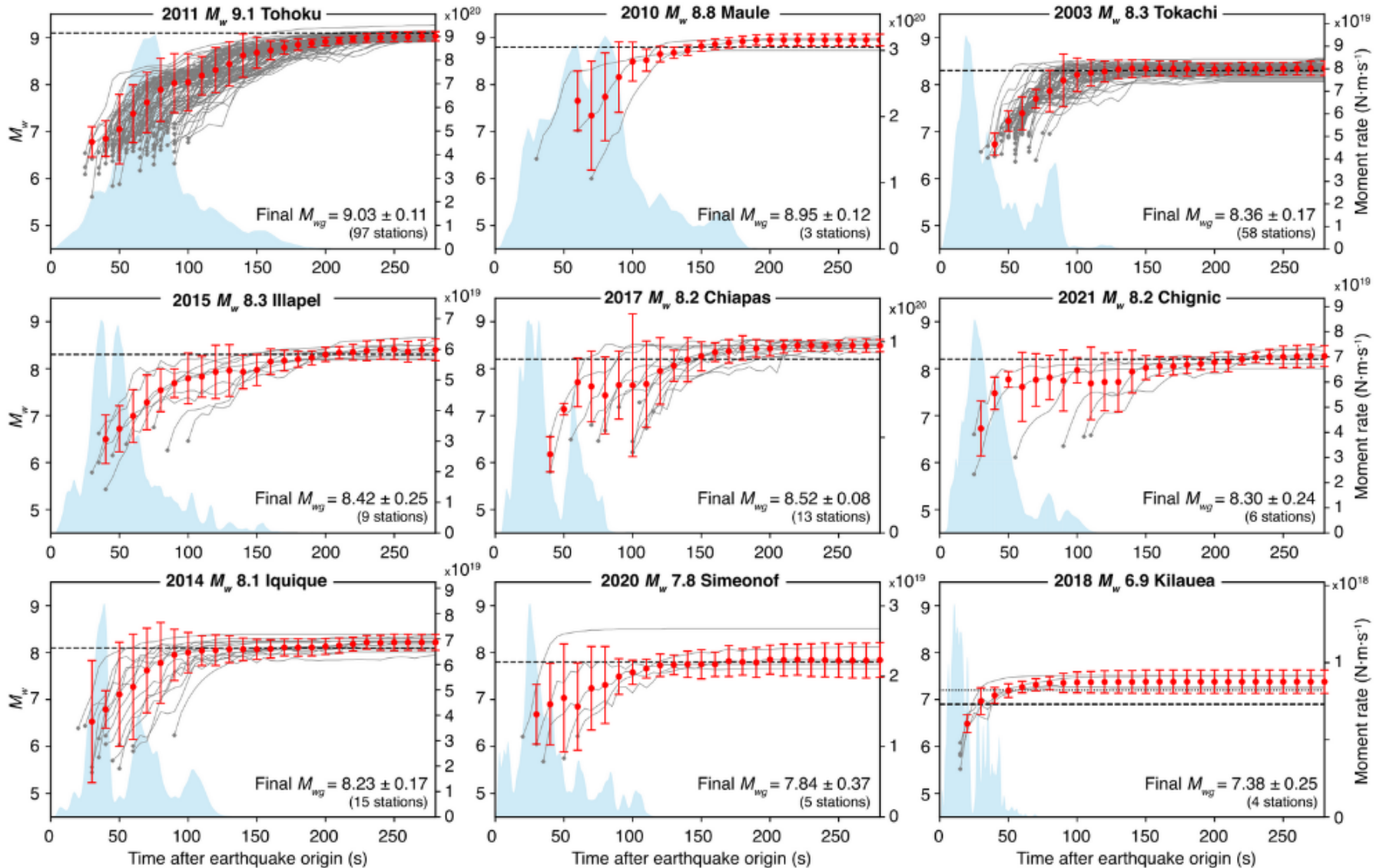


ICG/CARIBE-EWS-XIX Meeting
Willemstad, Curacao
22-24 April, 2026

New Techniques

Seismogeodetic Data Project

Rapid Earthquake Estimation for
Local Early Warning Systems Using
Seismogeodesy (Glehman et al, 2026)





ICG/CARIBE-EWS-XIX Meeting
Willemstad, Curacao
22-24 April, 2026

Duh End

Stuart Weinstein, Acting Director
NOAA Pacific Tsunami Warning Center
stuart.weinstein@noaa.gov