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MARSHALL ISLANDS TSUNAMI WARNING AND PREPAREDNESS, MAJURO TSUNAMI READY
Tsunami Warning and Preparedness Strengthening Workshop
13-14 January 2026
Majuro, Republic of Marshall Islands

Recent Tsunami Events affecting RMI

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Tsunamis since 2014 (PTWC RIFT forecast available)

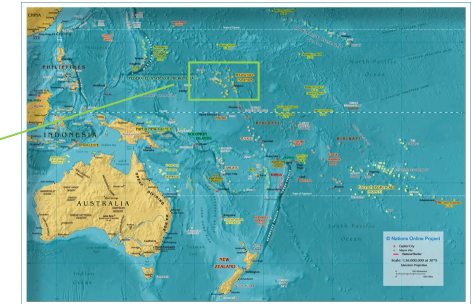
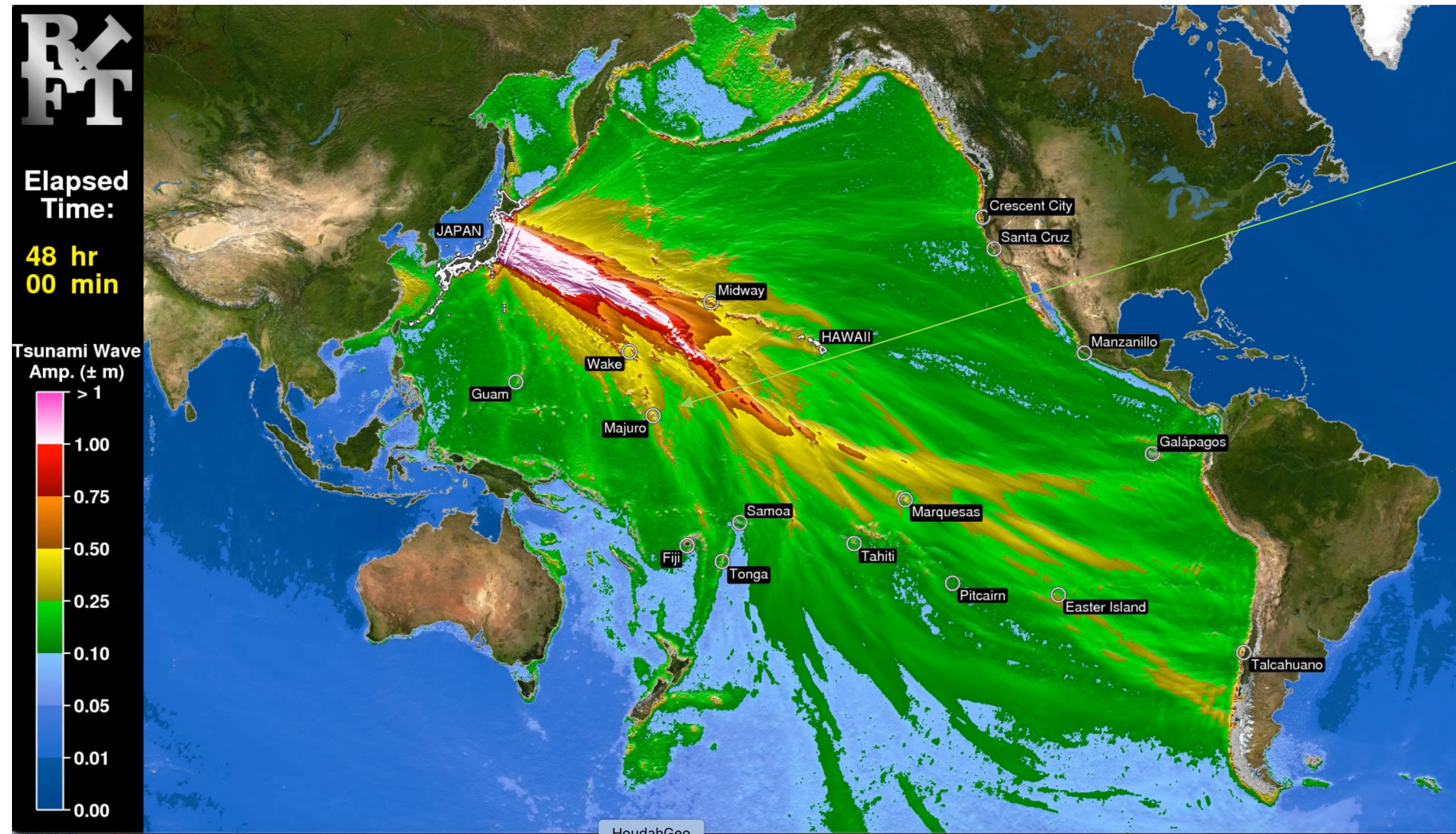
Forecasts

- Only 3 times RMI in 0.3-1m bin
2014 - N Chile
2015 - C Chile
2025 - Russia
2011 – Japan
- All rest (21) RMI in <0.3m bin

Observations less than Forecasts

x	4	1	14	8.2	Northern Chile				
x	4	13	14	7.4	Solomon Is				
x	4	19	14	7.5	Solomon Is				
x	3	29	15	7.6	New Ireland				
x	9	16	15	8.3	Central Chile				
x	4	16	16	7.7	Ecuador				
x	12	8	16	7.8	Solomon Is				
x	1	22	17	7.9	Solomon Is				
x	7	17	17	7.8	Komandorskiye Islands				
x	9	8	17	8.2	Chiapas Mexico				
x	8	29	18	7.1	Loyalty Islands				
x	12	5	18	7.6	Loyalty Islands				
x	5	14	19	7.7	New Britain				
x	7	22	20	7.8	Alaska	CM	CM	INCHES	INCHES
x	2	10	21	7.7	Loyalty Is				
x	3	4	21	8.1	Kermadec Is	3		1.2	
x	7	29	21	8.2	Alaska				
x	1	15	22	0	Hunga Tonga	9		3.5	
x	9	19	22	7.6	Michoacan, Mexico				
x	5	19	23	7.8	Loyalty Is				
x	12	2	23	7.6	Mindinao, Philippines				
x	7	29	25	8.7	Kamchatka, Russia	6		2.4	
x	9	13	25	7.5	Kamchatka, Russia				
x	12	8	25	7.6	Hokkaido, Japan				
	3	11	11	9.1	Honshu, Japan	66	51	26.0	20.1

11 March 2011 – Tohoku, Japan Tsunami M9.1



Linear Numerical Model Animation of the
11 March 2011 Tōhoku Tsunami

RIFT Model by Dr. Dailin Wang
Animation by Dr. Nathan Becker
NOAA/NWS/Pacific Tsunami Warning Center

25 July 2025 Highlights

- ❑ 6th largest earthquake in History.
Near to 1952 M9.0 earthquake that generated a destructive Pacific-wide tsunami.
Largest 1960 M9.5 Chile earthquake and tsunami that established the PTWS (ITSU) in 1965
- ❑ 1st Pacific-wide tsunami since 2011 M9.1 Great East Japan earthquake and tsunami
- ❑ PTWS Tsunami Service Providers issued 1st Threat Message 10 min after Earthquake Origin Time. **PTWC** monitored and issued 24 threat forecast information bulletins until waves hit Chile, 26 hours later. **NWPTAC** issued 15 bulletins for 20 hrs
- ❑ National Tsunami Warning Centres issued alerts prompting localized evacuations
 - Warnings: **Russia, Japan, USA, Pacific Island Countries** (**French Polynesia**, Cook Islands, Tonga, Papua New Guinea), South America (**Ecuador, Chile**)
- ❑ Tsunami monitoring by DART systems, coastal sea level stations (**IOC SLMF, PTWC Tide Tool**)
 - 5 DART systems NW Pacific triggered, and used to calibrate forecasts – largest 0.9 m ampl
 - > 100 tsunami measurements on coastal gauges – largest 1.74 m, Kahalui, Maui, Hawaii
- ❑ Earthquake was thrust/reverse faulting, but rupture was complex.
Initial earthquake magnitude of M8.0 upgraded to M8.7/8.8, updating tsunami forecast.
Later processing (finite fault solution) showed 2 bursts of rupture. (**PTWS WG 2, NZ**)

29 July 2025 – PTWC Event Timeline

UTC	Elapsed	Msg	Event
23:24:52	00:00:00		Earthquake occurs
23:34:28	00:09:39	1	Mw=8.0, Threat for Russia and Japan, no forecast yet
00:16:32	00:51:40	2	Mw=8.7, forecast for NW Pacific based on PTWC WCMT
01:07:40	01:42:48	3	Forecast for entire Pacific based on USGS WCMT
		4-6	Forecast for entire Pacific based on PTWC WCMT
06:23:14	06:58:22	7	Mw=8.8 (USGS) Forecast Unchanged
		8-23	Forecast Unchanged
01:57:16	26:32:24	24	Final Threat Message

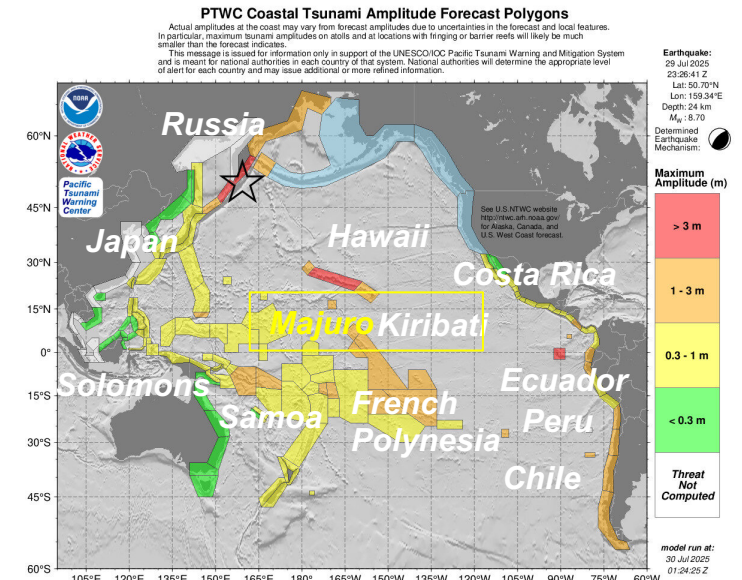
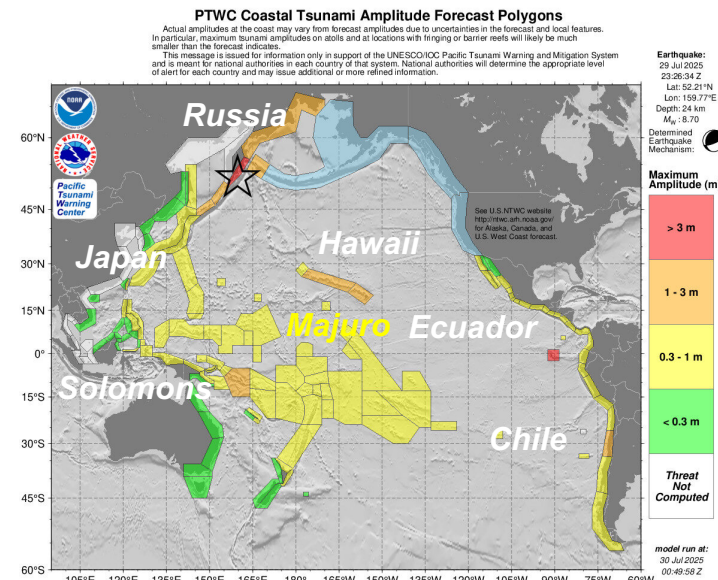
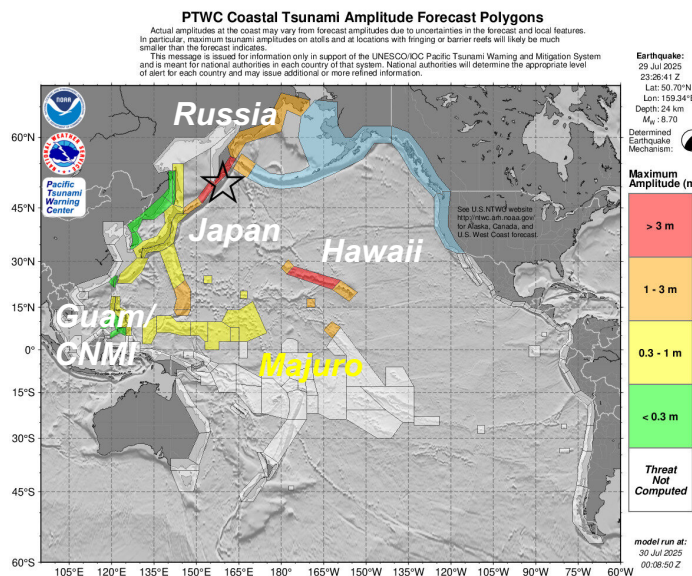
PTWS Tsunami Forecasts - PTWC

- ❑ Earliest forecasts sufficient to trigger national decision-making (warning, evacuation) for countries at regional distances
- ❑ Essential to be conservative and err on the side of public safety

Msg 2 M8.7 (+42 min)
ETA (hr): Japan (2) Guam (5.5),
Hawaii (6)

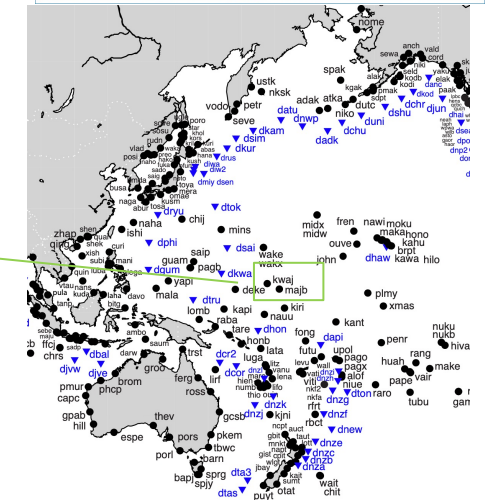
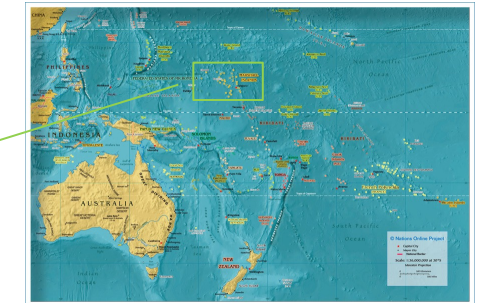
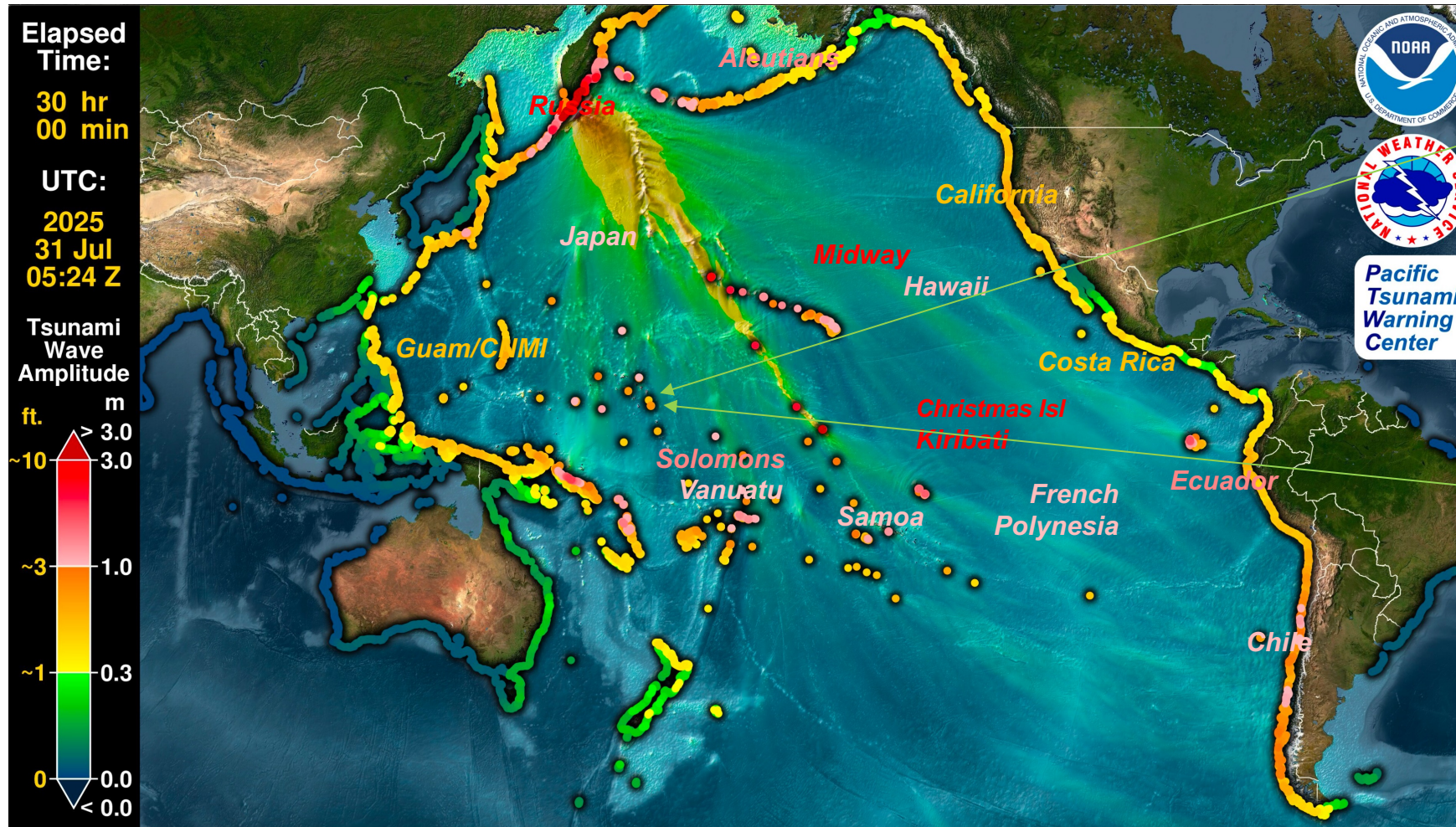
Msg 3 (+1:31 hr, M8.7)
ETA (hr): Solomons (8.5),
Galapagos (16), Chile (18)

Msg 4 (+2:12 hr, M8.8)
ETA (hr): Kanton, KI (8), Samoa (9.5), FP
(11), Costa Rica (14.5), South Amer (16+)



PTWC Forecasts – USGS Finite Fault Solution

* Done post-event



<https://www.youtube.com/watch?v=5X3bF1tCw7s>



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Thank You

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