

Understanding Tsunami Risk

ICG/PTWS March 2023 Meeting

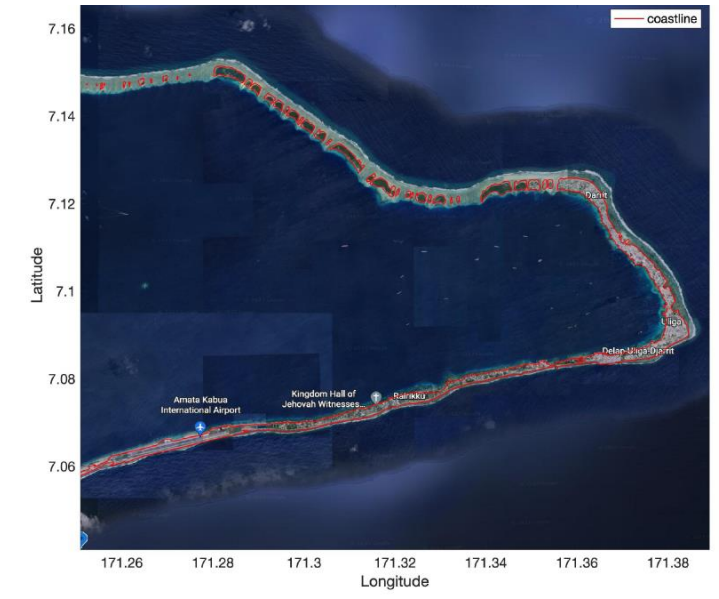
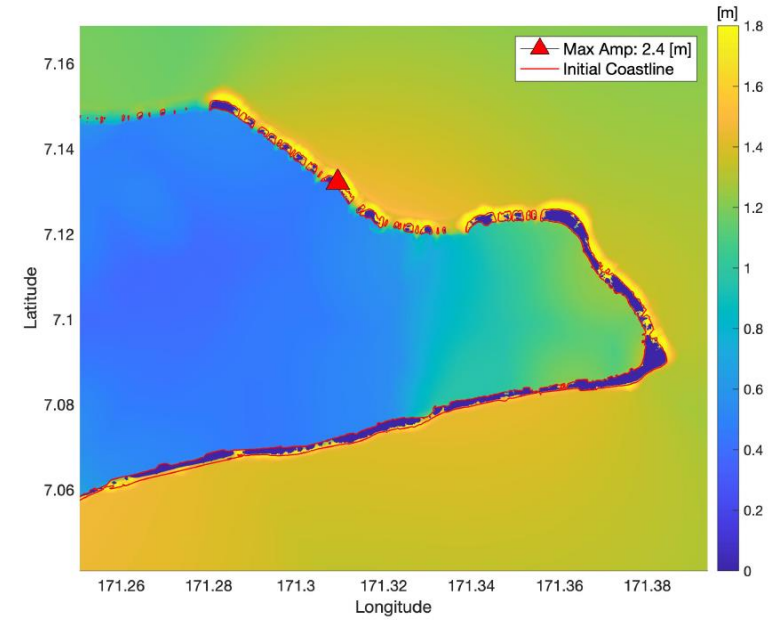
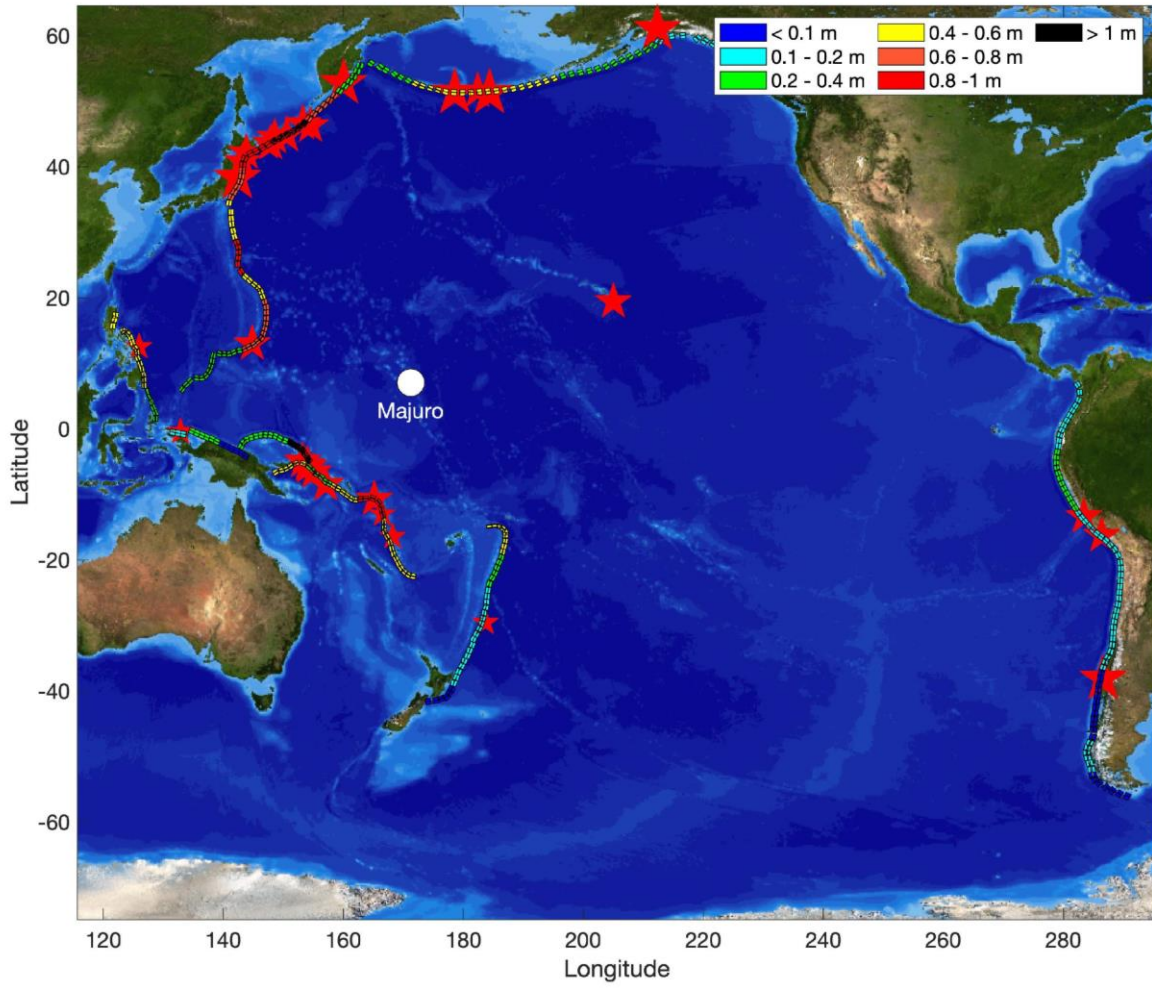


Working Group 1 Contributions

- Release of TsuCat Version 4.3 (PMEL):
 - Including real time injects in the event messaging.
 - Global Database.
- Conducted Inundation modeling for:
 - Majuro, Chuuk, Yap, Pohnpei (in progress), Palau (in progress).
- Organization and preparation of a Workshop of Experts in Seismic Sources for the Peru/Chile region.
- Finished development of SIFT V5.0.
 - Includes a GFAST Module for GNSS source inversion.

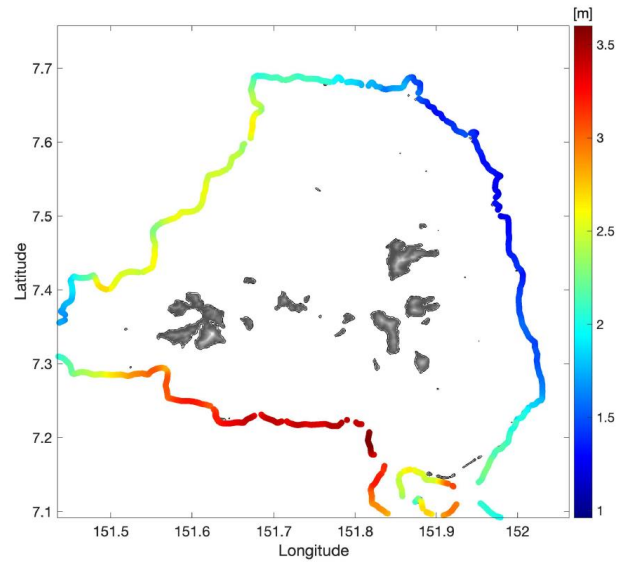


Tsunami Hazard Assessment for Majuro, Marshall Islands

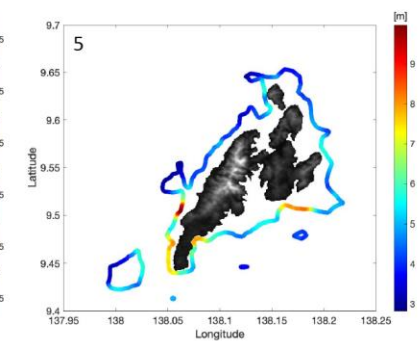
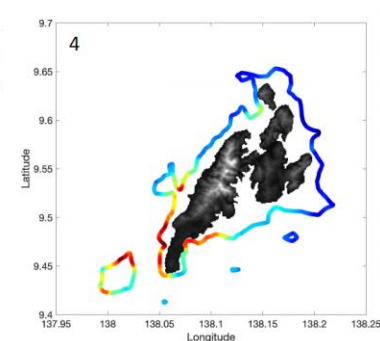
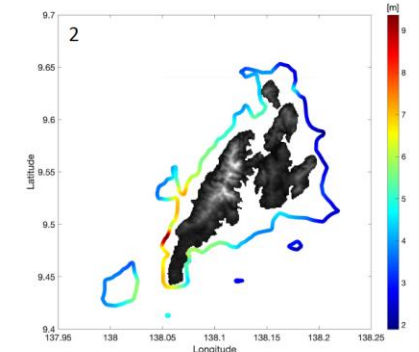
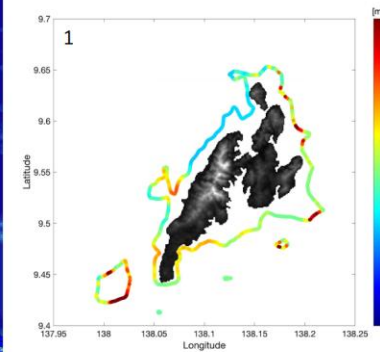
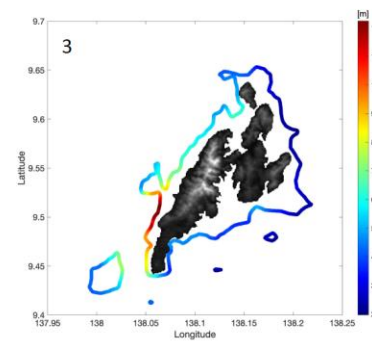
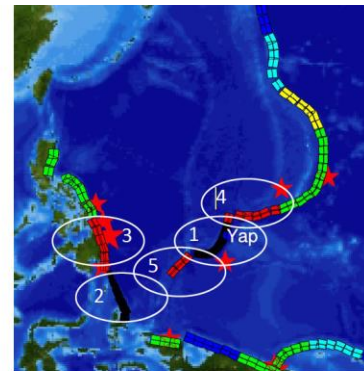


Tsunami Hazard Assessment for Chuuk and Yap, FSM

Chuuk



Yap



Meeting of Seismic Experts in Tsunami Sources



ICG/PTWS Scientific meeting of experts to understand tsunami sources, hazards, risk and uncertainties associated with the Peru-Chile Subduction Zone

Date XX—XX--2023

Tqna/Arica, Peru/Chile



Agenda Item		Time	Session Facilitator/Presenter
1.1	Welcome and introductions/role of IOC and ICG-PTWS	09:00 – 09:15	Local Authorities
1.2	Overview of meeting aims/objectives/IOC requirements and expectations of experts meeting	09:15 – 09:45	Bernardo Aliaga
1.3	Discussion on regional implications (Warning/Preparedness): <ul style="list-style-type: none"> ▪ How this work will impact our warning/preparedness of the hazard and risk ▪ What are the impacts for our national agencies? 	09:45 – 10:30	Lorena Márquez Carlos Zúñiga
1.4	Group Photo	10:30 – 10:45	
<i>Morning Break</i>			
1.5	Discussion on regional and global implications (Scientific/research) and Intro to local tectonic situation: <ul style="list-style-type: none"> ▪ How this work will impact our understanding of the hazard and risk What are the impacts on science and research? What are the constraints?	11:15 – 12:00	Francisco Ortega-Culaciati Juan González-Carrasco Alexander Rabinovich
1.6	Presentation and discussion of 'what do we want to achieve?' and key priorities. Discuss meeting outcomes (Ocean Decade) Introduction to the workshop format and afternoon session per discipline.	12:00 – 13:00	Diego Arcas
<i>Lunch</i>			
1.6.1	Tsunami Modelling	14:00 – 14:30	Patricio Catalán
1.6.2	Seismology (slow earthquakes?)	13:00 – 13:30	Emile Okal
1.6.3	Paleotsunamis along Ecuadorian coasts	13:30 – 14:00	Gabriel Easton Vargas
1.6.4	GNSS/Geodesy - GPS Network Operating on the Ecuadorian-Esmeraldas section of the coastline	14:00 – 15:30	Edmundo Norabuena Ortiz
1.6.5	Anthropology	15:30 – 16:00	Diego Rodrigo Salazar Sutil
1.6.6	Tsunami Early Warning (Chile)	16:00 – 16:30	Jorge Matus?
1.6.7	Tsunami Early Warning (Peru)	16:30 - 17:00	Lorena Márquez?

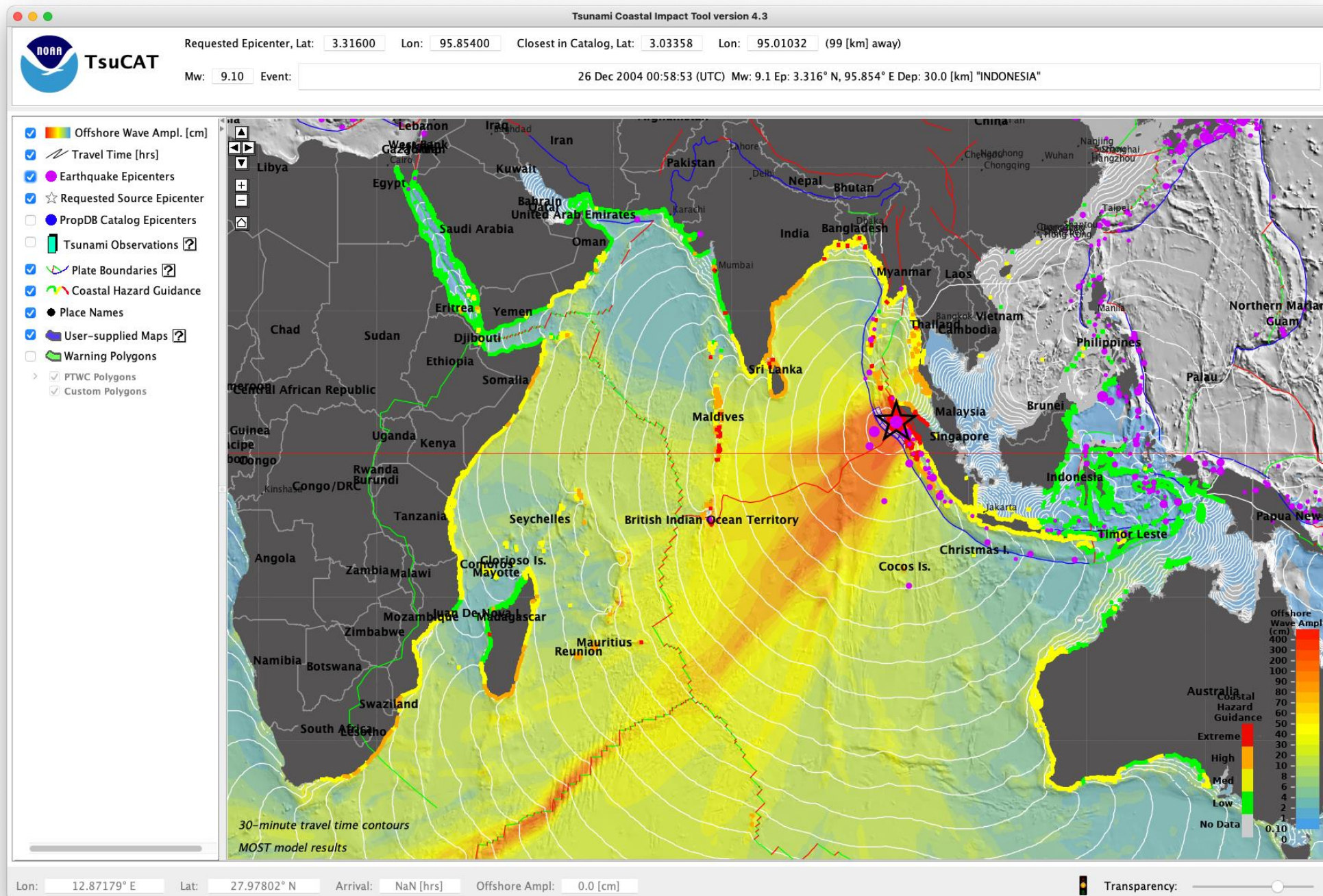


TsuCat 4.3 and SIFT V5 Reslease

- SIFT V5
Includes GNSS based event inversion solutions in the form of Mpgd magnitude, Moment Tensor and Finite Fault solutions of an event in under 5 minutes based on real time data from geodetic GNSS networks.
- TsuCat 4.3
Includes a global database and the ability of inserting real time injects of unexpected developments and updates into the event messages being generated for training purposes.



Global event database: 2004 Indian Ocean



Injects allow customization of tsunami exercise planning

The screenshot displays the 'Export Exercise Messages' application window. At the top, it shows the earthquake magnitude (Mag: 9.1) and epicenter (3.034° N, 95.010° E). Below this, there are controls for adjusting the exercise date (03/02/2023 19:56) and generating messages (00:23 Message 3). The main content area is titled 'PTWC Deep-Ocean Tsunami Amplitude Forecast' and features a map of the Indian Ocean region with a color-coded tsunami amplitude forecast. A legend on the right indicates the maximum amplitude in meters, ranging from 0.25 to 10.94. An 'Exercise Injects' dialog box is open, allowing for customization of the exercise parameters. The dialog includes fields for 'Set Country' (SRI LANKA), 'Name/Acronym of Forecast Organization' (IOTWS), 'Name/Acronym of Emergency Management' (DMC), 'Local Geophysical Institute' (Indian Regional Seismic Network), 'Head of Navy' (Vice Admiral), 'Leader in Government' (President), 'Member of the Public' (School Principal), 'Media (TV, Radio) station' (KCBS), 'Exercise Injects filename (Excel)' (ExercisInjects.xls), and 'Local Time of Exercise' (1000). The dialog also has 'Cancel' and 'OK' buttons. At the bottom of the application window, there is a progress bar labeled 'completed.' and a checkbox for 'Add Exercise Injects' which is checked. An 'Open Messages Folder' button is also present.

Export Exercise Messages

Mag: 9.1 Epicenter: 3.034° N, 95.010° E

Adjust for date of Exercise: 03/02/2023 19:56 Generate 00:23 Message 3 00:33 Deep Ocean Forecast Amplitude

Text Messages Graphical Products

PTWC Deep-Ocean Tsunami Amplitude Forecast

Exercise Injects

Set Country: SRI LANKA

Name/Acronym of Forecast Organization: IOTWS

Name/Acronym of Emergency Management: DMC

Local Geophysical Institute: Indian Regional Seismic Network

Head of Navy: Vice Admiral

Leader in Government (eg, President, Senator, Prime Minister): President

Member of the Public: School Principal

Media (TV, Radio) station: KCBS

Exercise Injects filename (Excel): ExercisInjects.xls

Local Time of Exercise: 1000

Cancel OK

Earthquake:
02 Mar 2023
19:56:38 Z
Lat: 3.03°N
Lon: 95.01°E
Depth: 30 km
Mw: 9.10

Determined Earthquake Mechanism:

Maximum Amplitude (m)

10.94
1.00
0.75
0.50
0.25

completed. Add Exercise Injects Open Messages Folder

Exercise Injects come as extra "scenarios" to help with exercise SOP preparations (Excel format)

ExerciseInjects.xls [Compatibility Mode]															
Home		Insert		Draw		Page Layout		Formulas		Data		Review		View	
A	B	C	D	E	F	G	H								
			SRI LANKA												
Inject No	Event Time	Local Time	Event	To	From										
1	0	1000	Earthquake Occurs!	All	Controller										
2	2	1002	Earthquake alarms trigger from P wave amplitudes off-scale at regional seismic network station	IOTWS	Controller										
3	3	1003	Indian Regional Seismic Network calculates Preliminary Earthquake Parameters:	IOTWS	Controller										
4	5	1005	CISN Display shows PTWC Earthquake Observatory Message, M8.9	IOTWS	Controller										
5	6	1006	PTWC Message 1: PTWC Tsunami Threat Message Initial M8.9	IOTWS	PTWC										
6	8	1008	The shaking woke me up and my house was shaking for more than 60 seconds. Some power lines fell down are down. What has just happened? Where was the earthquake? Is there a tsunami? When will it hit?	IOTWS, DMC	Coastal Resident										
7	10	1010	Many coastal provinces and local governments hear media reports that PTWC is forecasting waves more than 2.9-meters. A school principal calls DMC: What should she do? Her school is on the beach	IOTWS, DMC	Controller										
8	13	1013	PTWC Message 2: PTWC Tsunami Threat Message Magnitude Update M9.1	IOTWS	PTWC										
9	21	1021	IOTWS confirms tsunami at gauge: SIMEULUE by Tide Tool, measured 16.2 m at 2017 UTC, Wave Period 48 min	IOTWS	Controller										
10	23	1023	PTWC Message 3: PTWC Tsunami Threat Message Regional M9.1	IOTWS	PTWC										
11	33	1033	PTWC Message 4: PTWC Tsunami Threat Message Indian M9.1	IOTWS	PTWC										
12	33	1033	President calls and wants an update immediately as to what going on and what actions are being undertaken. What is expected for our country and when? Do we need to call a Tsunami Warning?	IOTWS	President										
13	44	1044	Vice Admiral calls to request: 1) Earthquake and Tsunami report, 2) Tsunami travel time plot and coastal arrival times, 3) When will waves hit coasts and how big will they be, 4) Will it arrive at high tide or low tide?	IOTWS	Vice Admiral										