

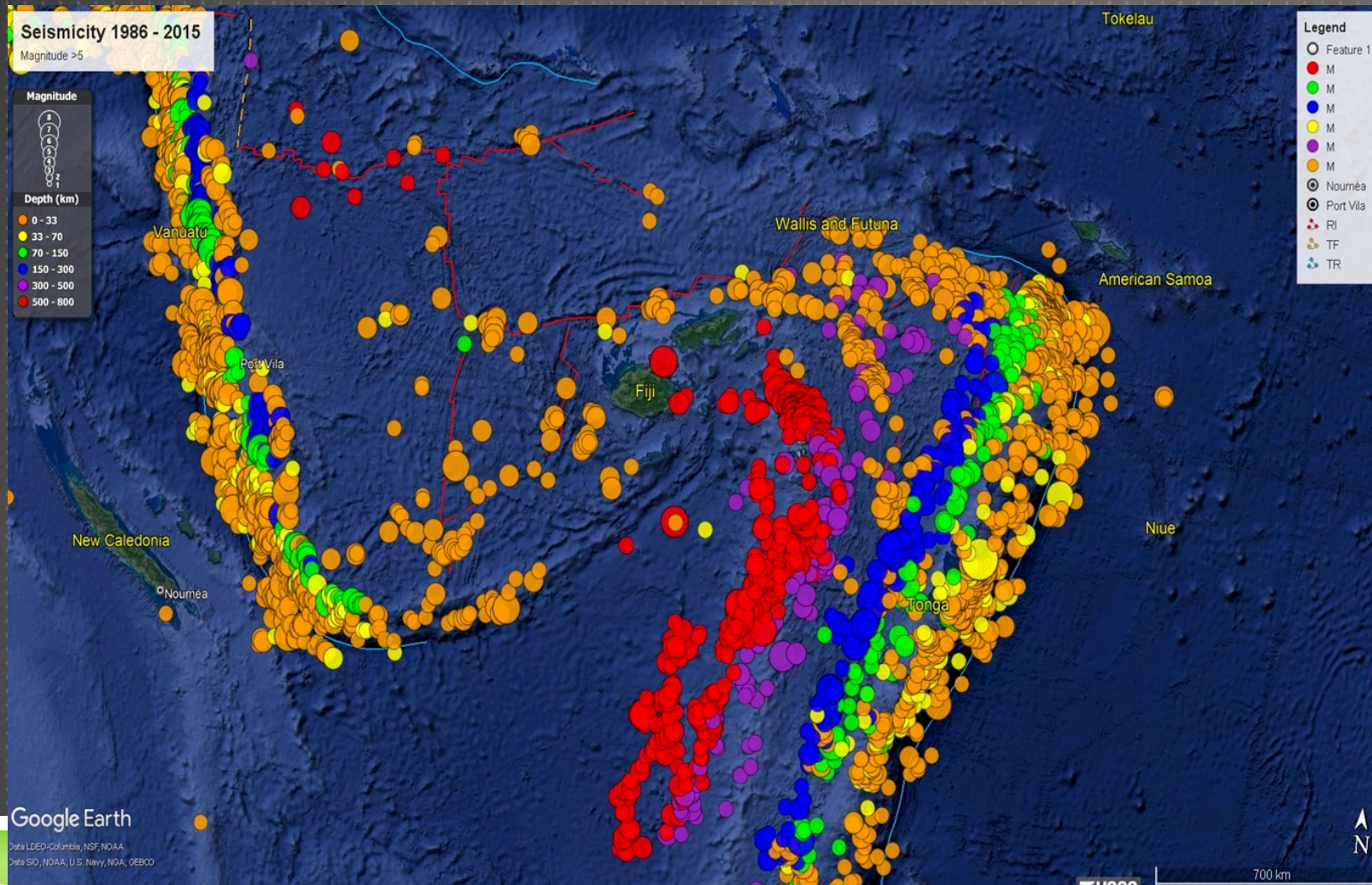


# MINERAL RESOURCES DEPARTMENT

## SEISMOLOGY SECTION

*Presented by: Joji Sakaraia Malodali*

# INTRODUCTION

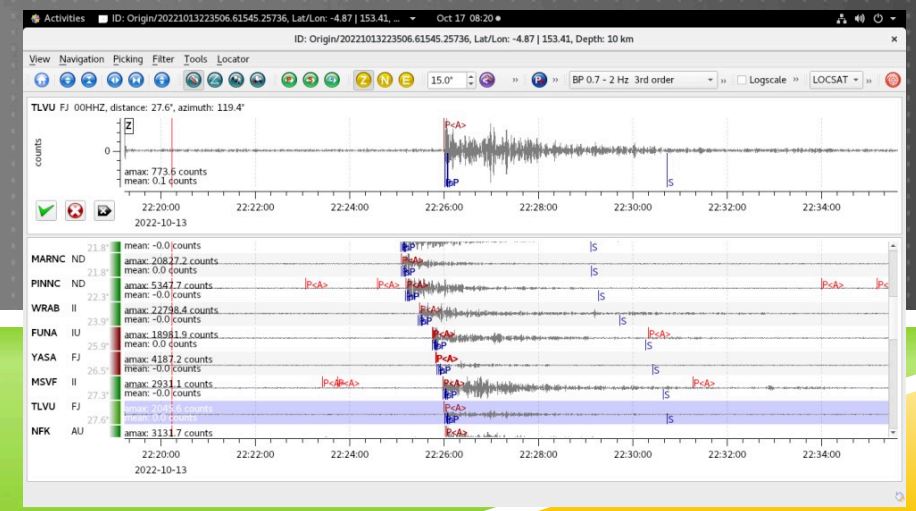
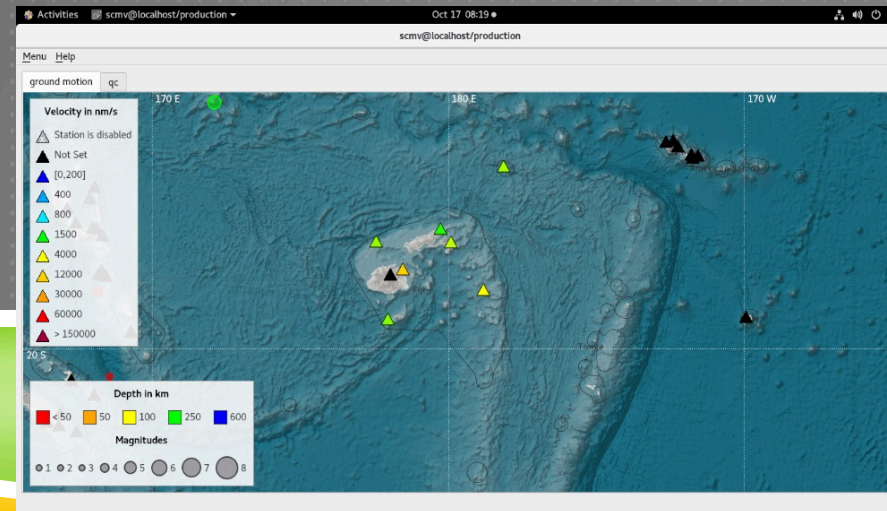


- Fiji is located at the mid-point of the potential tsunami sources, the Tonga trench and the New Hebrides trench.
- 1953: A 6.7M earthquake hit Fiji causing a tsunami along its coastlines.
- The seismology section monitors all seismic activities and potential tsunami threats to the Fiji region.

(Fiji seismicity from 1986 – 2015 , MRD)

# SEISMOLOGY SECTION

- 24/7 monitoring of earthquakes and tsunamis
- Currently 8 seismic stations transmitting real time data to our Suva hub.
- Waveforms are analyzed in software's such as Seiscomp and Swarms
- The Fiji Network shares data with other SW Pacific countries through the Oceania Regional Seismic Network (ORSNET) which also contributes in our monitoring capabilities.





# FIJI SEISMOLOGY NETWORK



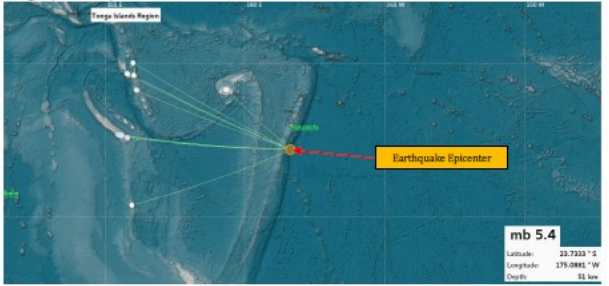
Location:

1. Lakeba, 2. Taveuni, 3. Dogotuki, 4. Nabukelevu I ra,
- Kadavu, 5. Yasawa, 6. Tailevu, 7. Monasavu, 8. Labasa

**MINERAL RESOURCES DEPARTMENT**  
**SEISMOLOGY UNIT**

**EARTHQUAKE INFORMATION RELEASE NO. 121/22**  
An earthquake occurred this morning at 08:47:36 AM local time, at 288 km SSE from Nuku'alofa, Tonga. (ORSNET)



(Map Source: ORSNET)

**i) Tabulated Results**

Description	Localization
<ul style="list-style-type: none"> <li>• Date: 24/03/2022</li> <li>• Time: 08:47:36 AM</li> <li>• Magnitude: 5.4 mb</li> <li>• Depth: 51 km</li> </ul>	<ul style="list-style-type: none"> <li>• 288 km SSE from Nuku'alofa, Tonga.</li> <li>• Offshore Earthquake</li> <li>• "No Tsunami Threat"</li> </ul>
<b>Reference</b> <ul style="list-style-type: none"> <li>• 288 km SSE from Nuku'alofa, Tonga.</li> <li>• 744 km SW from Alofi, Niue.</li> <li>• 906 km SE from Suva, Fiji.</li> </ul>	

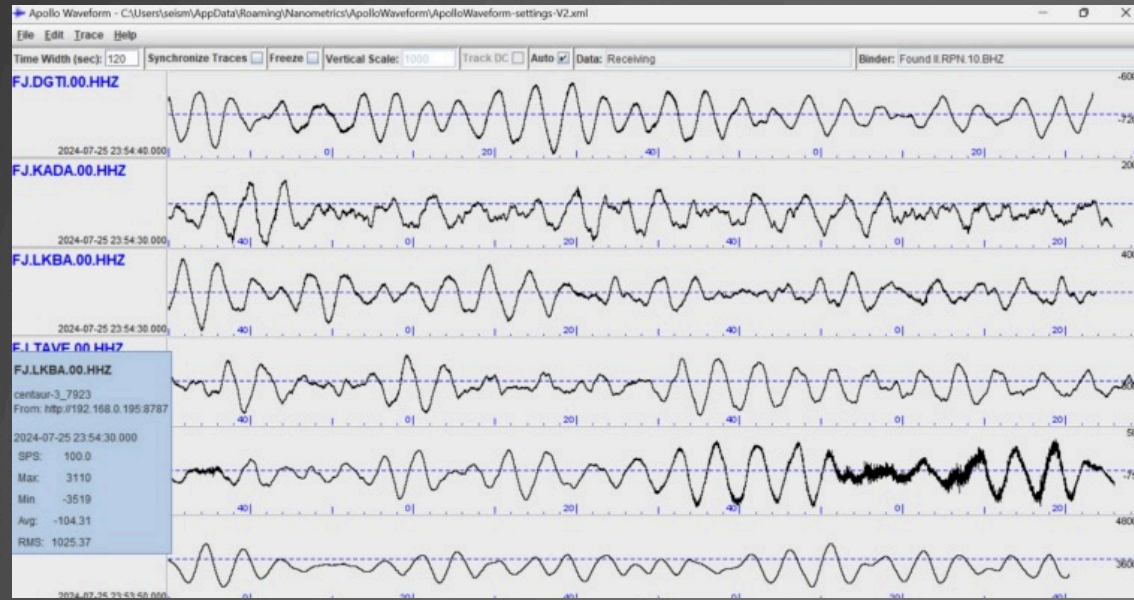
**Evaluation**  
A moderate earthquake with shallow depth source location occurred 288 km SSE from Nuku'alofa, Tonga. However, it does not pose any immediate tsunami threat to the Fiji region.

This serves as notification only and will keep monitoring for any further updates. For further information and queries you are advised to contact the Seismology Unit of the Mineral Resources Department on landline 3381611, mobile 9906165 or fax 3370039/3383910.

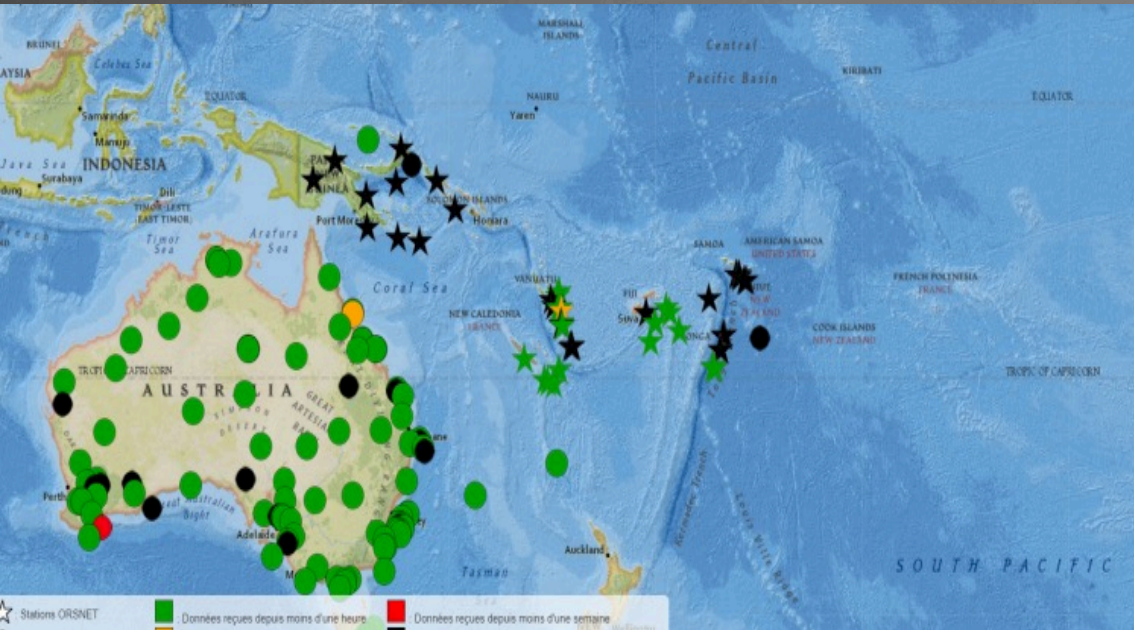
*L. Bola*  
For A/Director Mineral Development  
Seismology Unit,  
Mineral Resources Department  
24/03/2022

## Earthquake Template

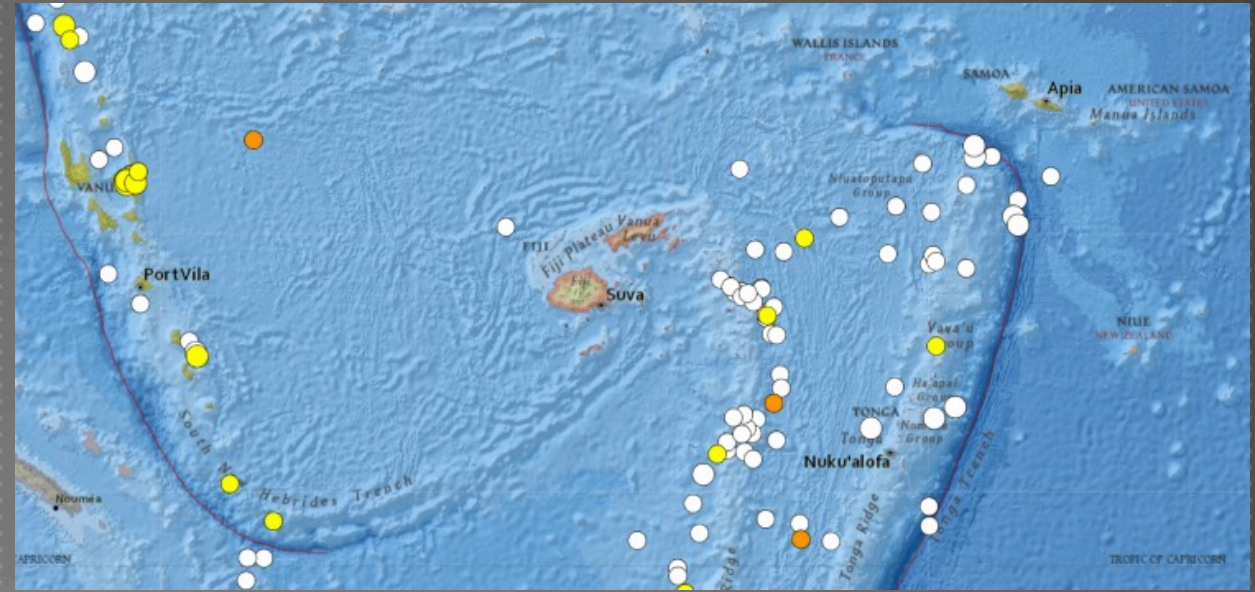
# MONITIRING SOFTWARE



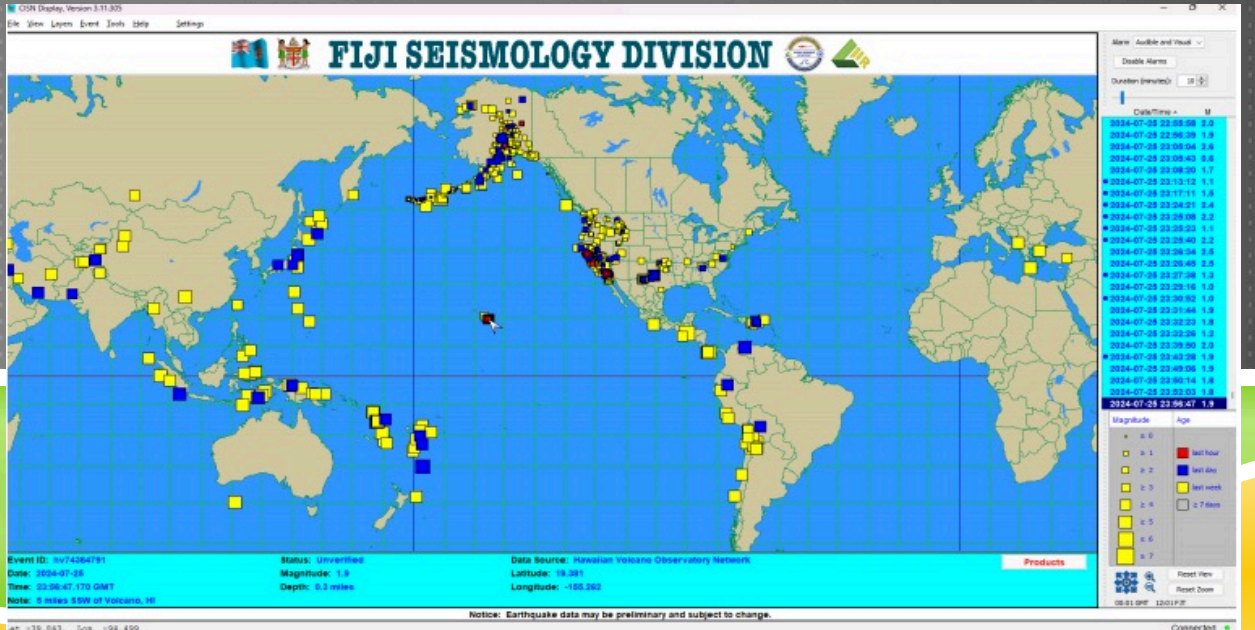
Athena



ORSNET

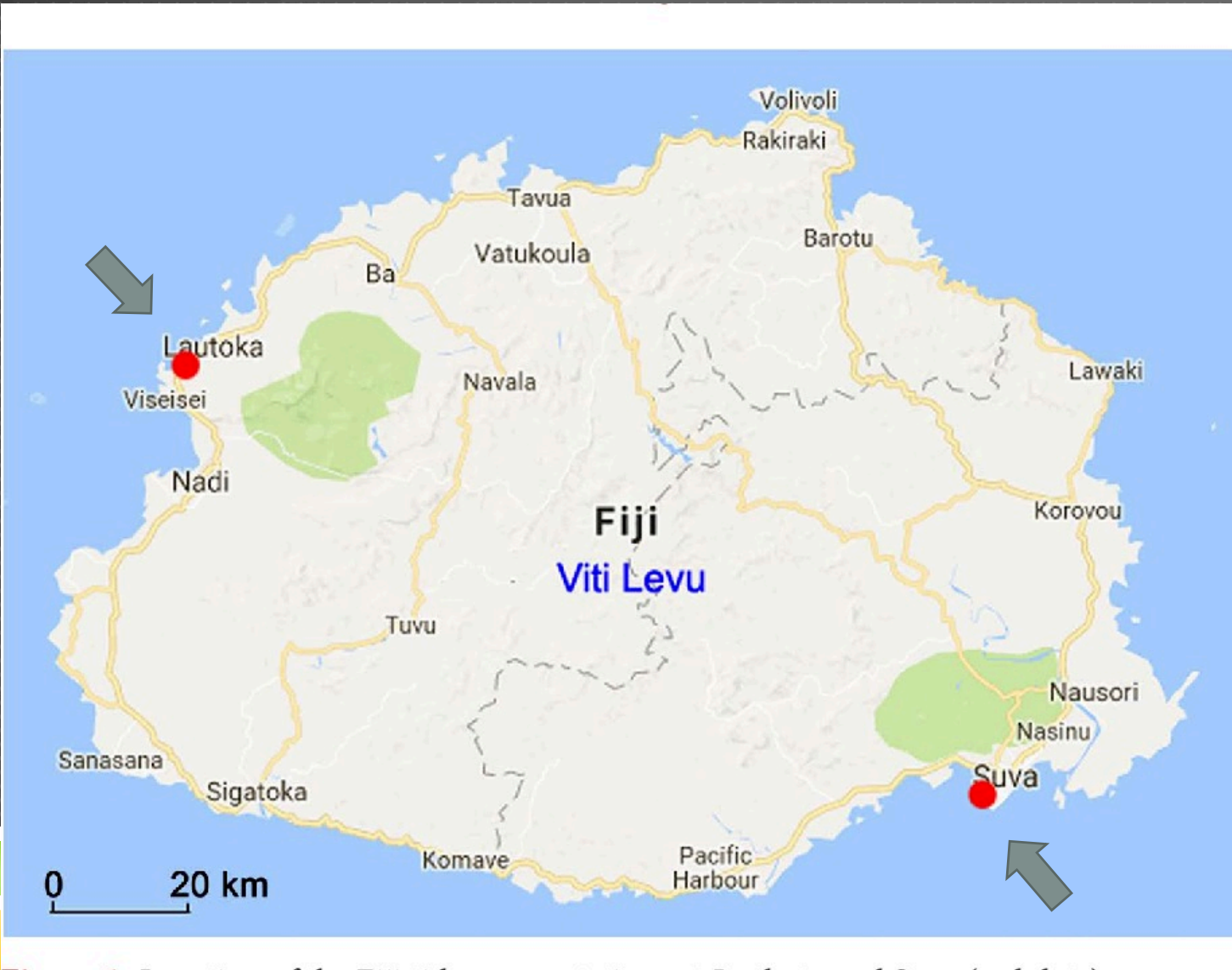


USGS

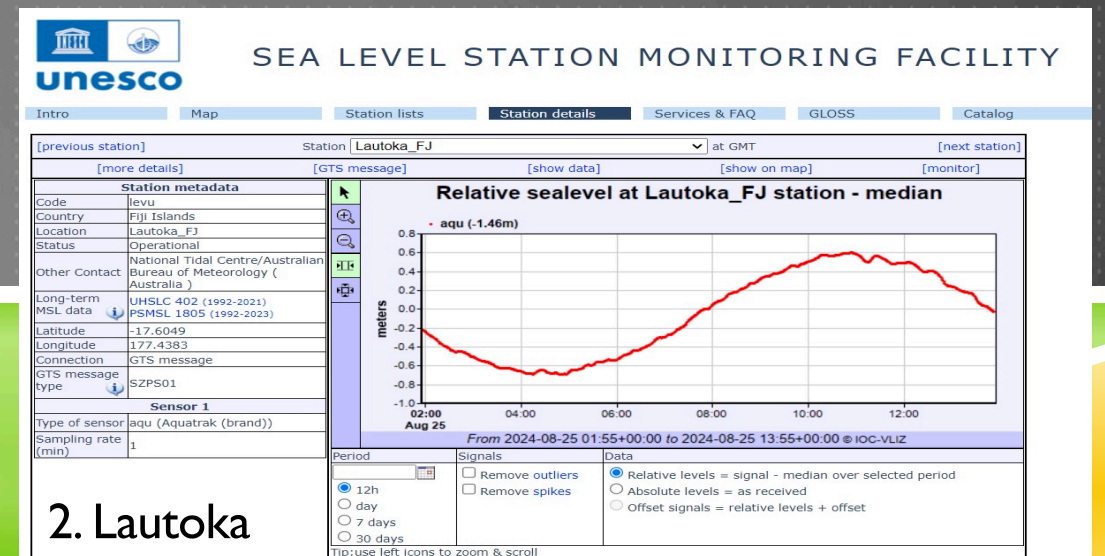
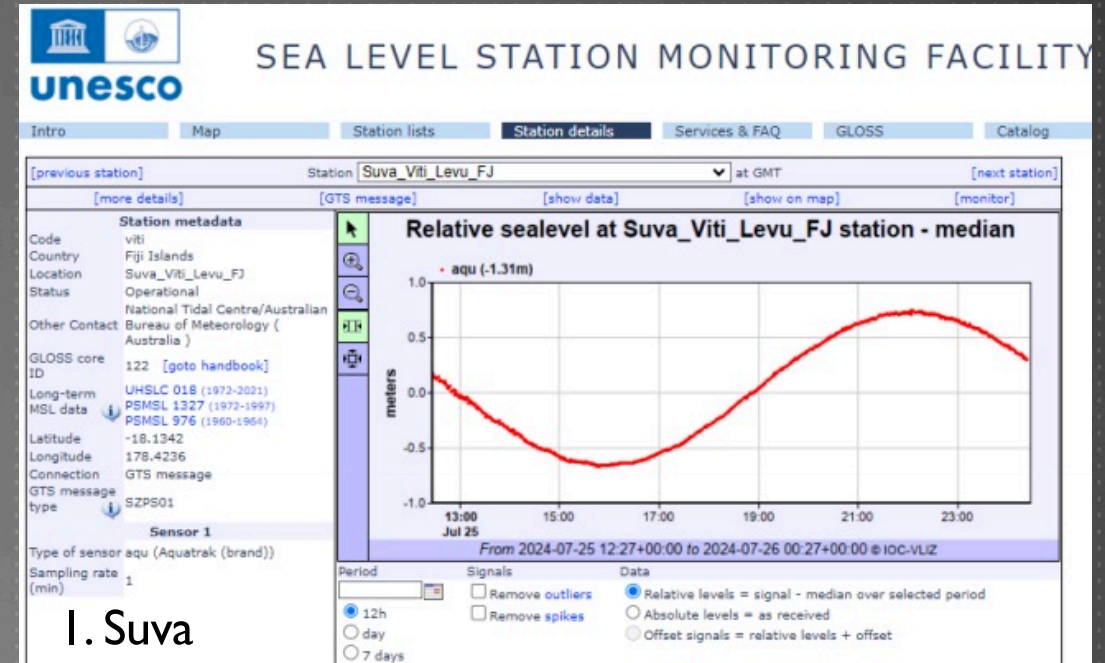


CISN

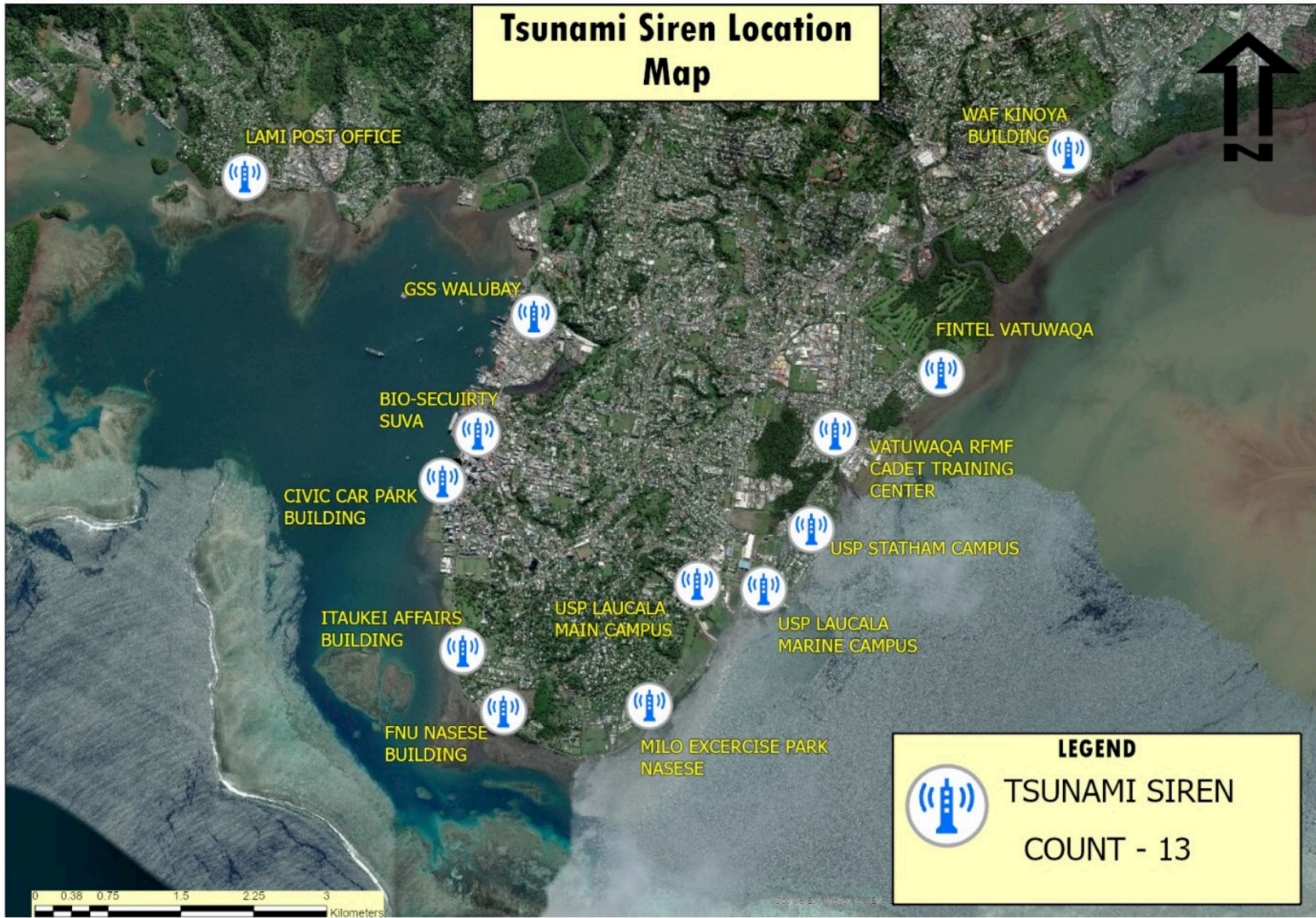
# FIJI TIDE GAUGE NETWORK



- Responsible by the Fiji Meteorological Services
- Extend to other small islands



# FIJI TSUNAMI SIREN NETWORK



- Need to install in remote islands
- Extension of siren is currently in process

## PUBLIC ADVISORY

National Disaster Management Office | 06 December 2021

### NDMO TO CONDUCT LIVE TSUNAMI SIREN TEST

The National Disaster Management Office (NDMO) wishes to advise the public that we will be conducting a **live tsunami siren test** for the **Suva - Lami corridor** at **11am, Monday 06th December, 2021**.

This exercise is part of Government's continued commitment towards improving its state of readiness for any tsunami event. The purpose of this siren test is to test the functionality of the sirens.

There are a total of 13 sirens installed along the Suva foreshore, having an acoustic range of 1.2kms.

Locations of the sirens are as follows:

1. Water Authority of Fiji – Kinoya Sewerage Plant
2. FINTEL – Vatuwaqa
3. RFMF Officers Training School – Vatuwaqa
4. USP Statham
5. USP Lower Campus
6. USP Main campus
7. My Suva Park
8. Government Training Centre – Nasese
9. I-Taukei Trust Fund Board
10. SCC Civic Car park Rooftop
11. Biosecurity, Renown Street – Suva Central
12. Government Shipping Services – Walu Bay
13. Lami Town

**ALL THIRTEEN (13) TSUNAMI SIRENS WILL BE ACTIVATED.** However, **NO EVACUATION** is REQUIRED.

For any further enquiries, please call the NDMO on 3319250 or email [neocfiji@gmail.com](mailto:neocfiji@gmail.com). You can also get in touch via Facebook on @FijiNDMO or Twitter on @FijiNDMO.



Issue Date: 3 December, 2021

- Public Advisory Template
- Comms Test
- 5<sup>th</sup> of every month

# MONITORING OF SEA LEVEL OBSERVATION

PTWC TSUNAMI INFORMATION STATEMENT

From: phoc@ptwc.noaa.gov  
To: evl\_yasrekg@yahoo.com

TSUNAMI INFORMATION STATEMENT NUMBER 1  
PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
0543 UTC FRI JUN 28 2024

PTWC TSUNAMI INFORMATION STATEMENT

\*\*\*\*\* NOTICE \*\*\*\*\*  
THIS STATEMENT IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE UNESCO PACIFIC TSUNAMI WARNING AND MITIGATION SYSTEM AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM. NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED INFORMATION.

\*\*\*\*\* NOTICE \*\*\*\*\*

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE 7.8  
ORIGIN TIME 05:07 UTC JUN 28 2024  
COORDINATES 18.0 SOUTH 74.6 WEST  
DEPTH 82 KM (51 MILES)  
LOCATION NEAR THE COAST OF CENTRAL PERU

EVALUATION

- PTWC Bulletin via email

## SEA LEVEL STATION MONITORING FACILITY

Station: Suva\_Viti\_Levu\_FJ at GMT

Station metadata

Code	viti
Country	Fiji Islands
Location	Suva_Viti_Levu_FJ
Status	Operational
Other Contact	National Tidal Centre/Australian Bureau of Meteorology (Australia)
GLOSS core ID	122 [goto handbook]
Long-term MSL data	UHSLC 018 (1973-2021) PSMSL 1327 (1972-1997) PSMSL 976 (1960-1964)
Latitude	-18.1342
Longitude	178.4236
Connection	GTS message
GTS message type	SZPS01

Sensor 1

Type of sensor aqu (Aquatrak (brand))  
Sampling rate (min) 1

Relative sealevel at Suva\_Viti\_Levu\_FJ station - median

aqu (-1.31m)

From 2024-07-25 12:27+00:00 to 2024-07-26 00:27+00:00 @ ioc-vliz

- IOC Sea level monitoring website

## Tsunami Travel Time Calculator

Input information stored in TTT\_Input.txt  
Output stored in C:\TTT Package\Examples

Please Enter Title You Would Like For Map:

Source Latitude (decimal degrees, N(+), S(-)):

Source Longitude (decimal degrees, E(+), W(-)):

Please Select Region the Ocean Event is Occurring in:

Please Note: Output times at locations arrival times are calculated correctly only for events years 1970-2038)

Select What You Would Like Outputted

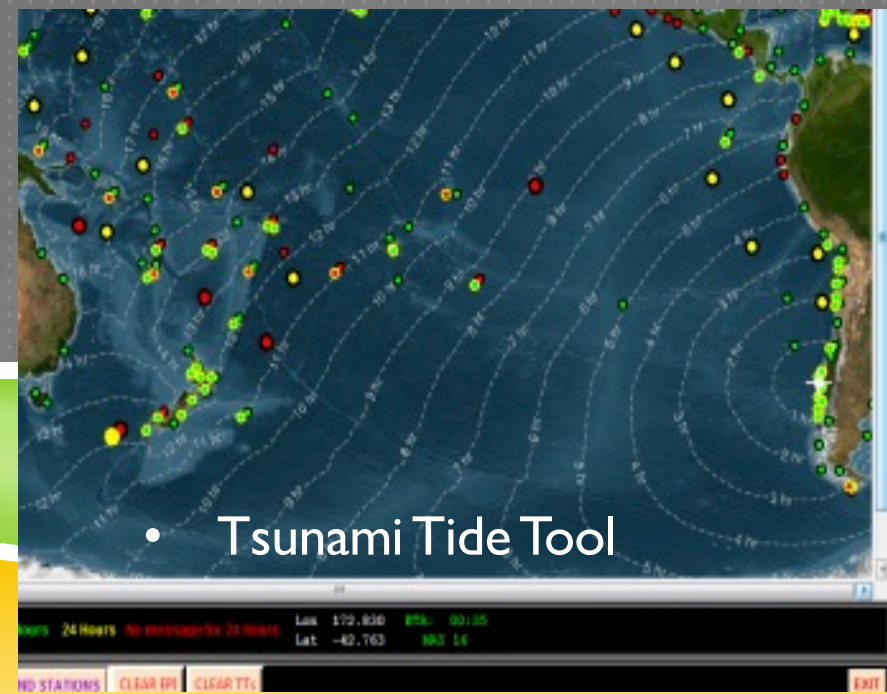
Select bathymetry grid file to use, 15min recommended for fast run.

Options are (arc min): 60, 30, 20, 15, 10, 5, 2, 1:

Plot Sea Level Stations?

Plot Historical Earthquakes? (Centennial List)

- TTT



- Tsunami Tide Tool

## NATIONAL DATA BUOY CENTER

Station ID Search:   [Station List](#)

View the latest observations near East Pacific Tropical Storm Bud.

Recent Data  Historical Data  Show Labels  [Link to This Map](#)

Program Filter:  NDBC Meteorological/Ocean  International Partners  IOOS Partners

Owner Filter:  NDBC  Australian Bureau of Meteorology  Cooperative Effort DART 4G

Map showing water column height at Station 5501006. The graph shows data from 07/22 00 GMT to 07/26 15 GMT. The y-axis is in meters, ranging from 2097.00 to 2099.00.

74 stations deployed  
56 have reported in the past 8 hours

- National Data Buoy center website



# FIJI TSUNAMI ALERT LEVEL TABLE

Warning Products	Alert Level	Public Action	Potential Hazard
Tsunami Information	Information Statement	No action required suggested at this time.	No threat or very distant event for which hazard had not been determined.
Tsunami Watch	Watch	Be prepared to take action. Stay tuned to local radio/TV	Tsunami Possible Alert Level may change once more information is known.
Tsunami Advisory	Advisory	Stay out of the water and away from the shore.	Strong currents and waves dangerous to those in or very near coastal waters.
Tsunami Warning	Warning	Move to high ground or inland immediately.	Dangerous coastal flooding and powerful currents.

**MINERAL RESOURCES DEPARTMENT  
SEISMOLOGY SECTION**

To: All Media Outlets Date: 17/10/2023  
From: Seismology Section Time: 09:46 AM  
Subject: Tsunami Watch Message  
Alert Level: Tsunami Watch

FOR EXERCISE PURPOSES ONLY

THIS STATEMENT IS ISSUED FOR A TSUNAMI WATCH ONLY AND CURRENTLY APPLIES TO ALL COASTAL LOW LYING AREAS OF FIJI ESPECIALLY FOR NAYAVU, SIKHA AND THE WESTERN DIVISION.

WE ADVISE THE PUBLIC AND PARTICULARLY ALL RESIDENTS ON LOW LYING COASTAL AREAS TO TAKE NECESSARY PRECAUTION AND BE ON STANDBY AND ALERT FOR THE NEXT AVAILABLE UPDATE.

WE ALSO ADVISE THE PUBLIC TO STAY TUNE TO LOCAL MEDIA CHANNEL FOR FURTHER UPDATES.

THE SEISMOLOGY SECTION OF MRD WILL CONTINUE TO CLOSELY MONITOR THE SITUATION DURING THIS TIME UNTIL THE THREAT IS OVER.

A GREAT EARTHQUAKE HAS OCCURRED WITH VERIFIED PARAMETERS:

Description	Location
<ul style="list-style-type: none"> <li>Date/Time: 17/10/23 09:41 AM</li> <li>Magnitude: 8.8 Mw</li> <li>Depth: 13 km</li> </ul>	<ul style="list-style-type: none"> <li>Tonga Islands Region</li> <li>Longitude: 175.89°W</li> <li>Latitude: 19.22°S</li> </ul>

**Tsunami Information**

- Tsunami Watch Period for Nayavu, Sikha and the Western Division

SEISMOLOGY SECTION  
MINERAL RESOURCES DEPARTMENT, FIJI  
PHONE: 3381611 EXT 22925, 22925, 22925  
FAX: 3370039/3383910

Tsunami Watch

**MINERAL RESOURCES DEPARTMENT  
SEISMOLOGY SECTION**

To: All Media Outlets Date: 17/10/2023  
From: Seismology Section Time: 09:45 AM  
Subject: Tsunami Advisory Message  
Alert Level: Tsunami Advisory

FOR EXERCISE PURPOSES ONLY

--- FIJI TSUNAMI ADVISORY STATEMENT ---

THIS STATEMENT IS ISSUED FOR A TSUNAMI ADVISORY AND CURRENTLY APPLIES TO ALL COASTAL LOW LYING AREAS OF FIJI ESPECIALLY THE LAU GROUP, SOUTHERN TAVEUNI, BUA BAY AND SAVAVAVU.

WE ADVISE THE PUBLIC AND PARTICULARLY ALL RESIDENTS ON LOW LYING COASTAL AREAS TO STAY OUT OF THE WATER AND AWAY FROM THE SHORE DUE TO STRONG CURRENTS AND DANGEROUS WAVES.

BE ON STANDBY AND ALERT FOR THE NEXT AVAILABLE UPDATES AND STAY TUNE TO LOCAL MEDIA CHANNEL FOR FURTHER UPDATES.

THE SEISMOLOGY SECTION OF MRD WILL CONTINUE TO CLOSELY MONITOR THE SITUATION DURING THIS TIME UNTIL THE THREAT IS OVER.

A GREAT EARTHQUAKE HAS OCCURRED WITH VERIFIED PARAMETERS:

Description	Location
<ul style="list-style-type: none"> <li>Date/Time: 17/10/23 10:00 AM</li> <li>Magnitude: 8.8 Mw</li> <li>Depth: 13 km</li> </ul>	<ul style="list-style-type: none"> <li>Tonga Islands Region</li> <li>Longitude: 173.89°W</li> <li>Latitude: 19.22°S</li> </ul>

**Tsunami Information**

- Tsunami Advisory Period for the Fiji Group.

SEISMOLOGY SECTION  
MINERAL RESOURCES DEPARTMENT, FIJI  
PHONE: 3381611 EXT 22925, 22925, 22925  
FAX: 3370039/3383910

Tsunami Advisory

**MINERAL RESOURCES DEPARTMENT  
SEISMOLOGY SECTION**

To: All Media Outlets Date: 17/09/2023  
From: Seismology Section Time: 9:46 AM  
Subject: TSUNAMI WARNING 1

FOR EXERCISE PURPOSES ONLY

A TSUNAMI WARNING IS IN PLACE FOR THE LAU GROUP, SOUTH TAVEUNI, BUA BAY AND SAVAVAVU.

VERIFIED EARTHQUAKE PARAMETERS

An earthquake has occurred with the following verified parameters:

Description	Location
<ul style="list-style-type: none"> <li>Date/Time: 17/10/23 09:41 AM</li> <li>Magnitude: 8.8 Mw</li> <li>Depth: 13 km</li> </ul>	<ul style="list-style-type: none"> <li>Tonga Islands Region</li> <li>Longitude: 173.89°W</li> <li>Latitude: 19.22°S</li> </ul>

EVALUATION

Tsunami waves up to 3 meters above tide level may hit certain coastal communities.

RECOMMENDED ACTIONS

- Members of the public are advised to remain calm and follow safety tsunami procedures (Tsunami Response Plan).
- Those already on high grounds will remain where they are until further advice.
- Stay tuned to radio broadcasts or other forms of media NEXT UPDATE AND ADDITIONAL INFORMATION
- The next message will be issued within an hour or sooner if the situation warrants.
- The Tsunami Warning will remain in effect until further notice.

SEISMOLOGY SECTION  
MINERAL RESOURCES DEPARTMENT, FIJI  
PHONE: 3381611 EXT 22925, 22925, 22925  
DISASTY LINE: 3383016 - 3383013  
FAX: 3370039/3383910

Tsunami Warning

**MINERAL RESOURCES DEPARTMENT  
SEISMOLOGY SECTION**

To: All Media Outlets Date: 17/10/2023  
From: Seismology Section  
Subject: TSUNAMI CANCELLATION MESSAGE

THE MINERAL RESOURCES DEPARTMENT - SEISMOLOGY OBSERVATORY HAS CONFIRMED ISSUING CANCELLATION AT 11:12 AM 17/10/2023.

THIS BULLETIN IS FINAL AND IS ISSUED TO INFORM THE PUBLIC IN GENERAL ESPECIALLY COASTAL COMMUNITIES OF FIJI THAT THE TSUNAMI WARNING/ADVISORY/WATCH/INFORMATION IS OVER AND IS NOW CANCELLED.

THE SEISMOLOGY OBSERVATORY (MRD) UPON ITS ASSESSMENTS HAS NOW VERIFIED AND CONFIRMED THE CANCELLATION OF THE WARNING/ADVISORY/WATCH/INFORMATION ISSUED TO THE WHOLE FIJI GROUP.

THE PUBLIC IS NOW ADVISED TO AWAIT INSTRUCTIONS FROM NDMO FOR 'ALL CLEAR INFORMATION' BEFORE RETURNING TO LOW OR COASTAL AREAS. PUBLIC IS ALSO ADVISED TO REMAIN VIGILANT AS AFTERSHOCKS ARE EXPECTED TO OCCUR ALONG THE EARTHQUAKE SOURCE ZONES.

SEISMOLOGY SECTION  
MINERAL RESOURCES DEPARTMENT, FIJI  
PHONE: 3381611, 3389055, 3389053; FAX: 3370039, 3383910.

Tsunami Cancellation

# FIJI TSUNAMI SOP

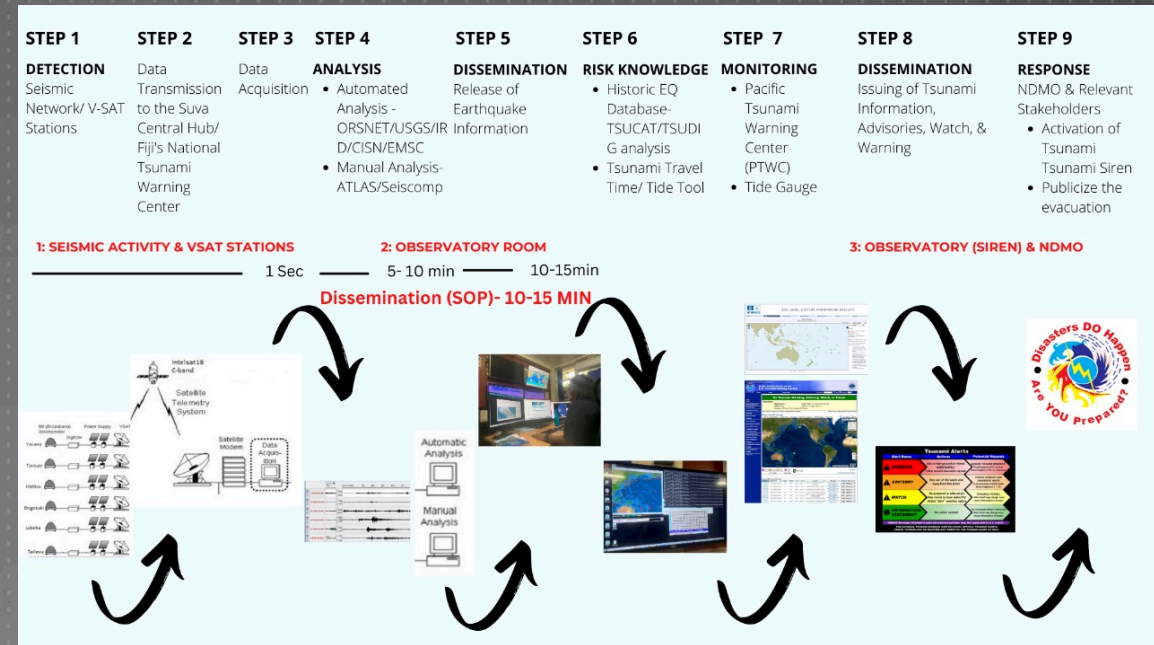
Ministry of Lands and Mineral Resources

## Standard Operational Procedures for the Issuance of Tsunami Warning/Advisory in Fiji

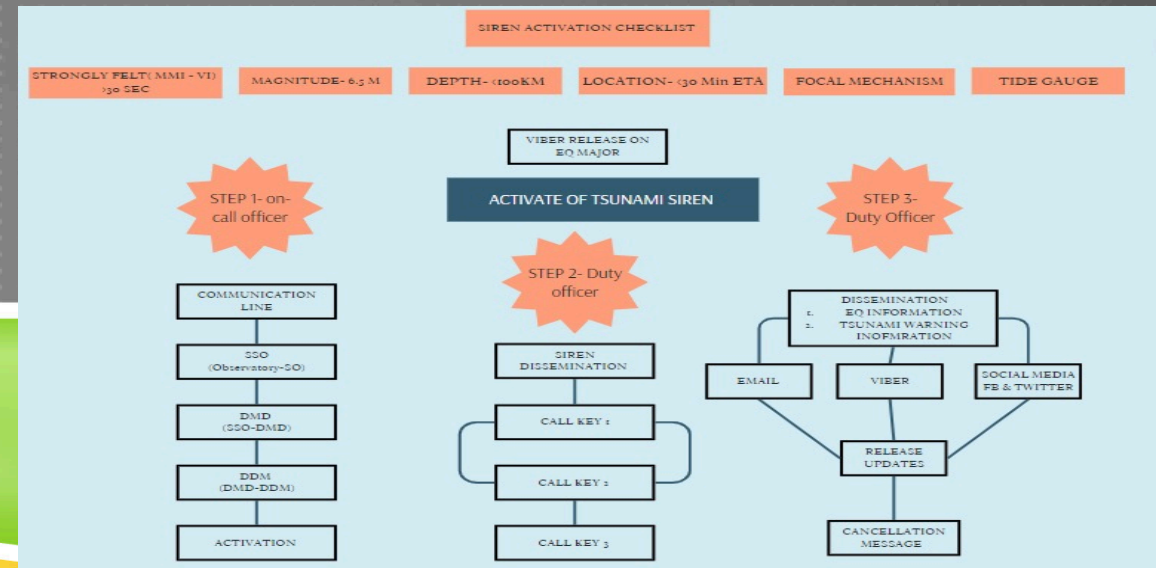
Fiji National Tsunami Warning Center

	Compiled by	Examined by	Approved by	Version
Name	Saula Mule	Raksha Rani	Ilaitia Dokonivalu	2024.003
Date	31/07/24	31/07/24	31/07/24	
Signature				

Copy of Tsunami SOP



## Tsunami SOP for a major seismic event



## Tsunami Siren Activation SOP

# FIJI TSUNAMI READY PROGRAMME





**MINISTRY OF LANDS AND MINERAL RESOURCES  
DEPARTMENT  
241 MEAD ROAD NABUA  
SUVA  
PHONE: 3381611**

***THANK YOU / VINAKA VAKALEVU***