

TSUNAMI AWARENESS

Seismology Section
Mineral Resources Department



Outline

- Introduction
- Tsunami Sources/ Tsunami Classification
- Warning Products/Alert Levels
- Way Forward

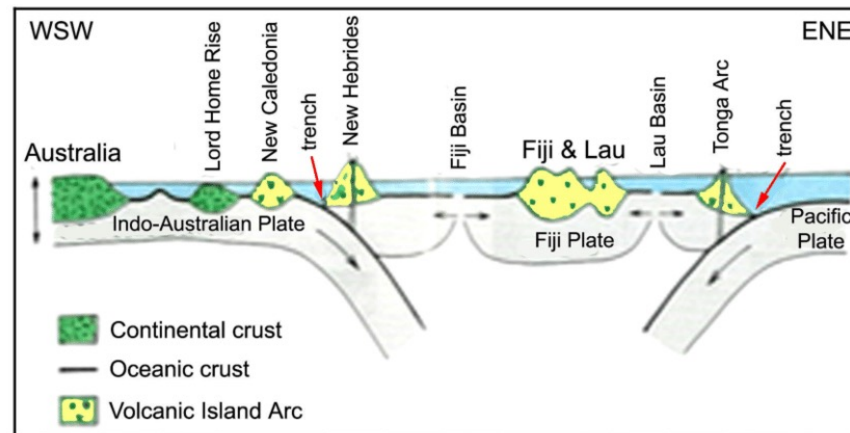
Introduction

- **What is a Tsunami?**

A tsunami is a series of enormous waves usually caused by earthquakes or volcanic eruptions occurring below or near the ocean.

- **Deadliest disaster**

- **Fiji is located in the southwest Pacific Ocean at the midpoint of the opposing potential tsunami sources, the Tonga Trench and New Hebrides Trench therefore is particularly vulnerable to tsunamis.**



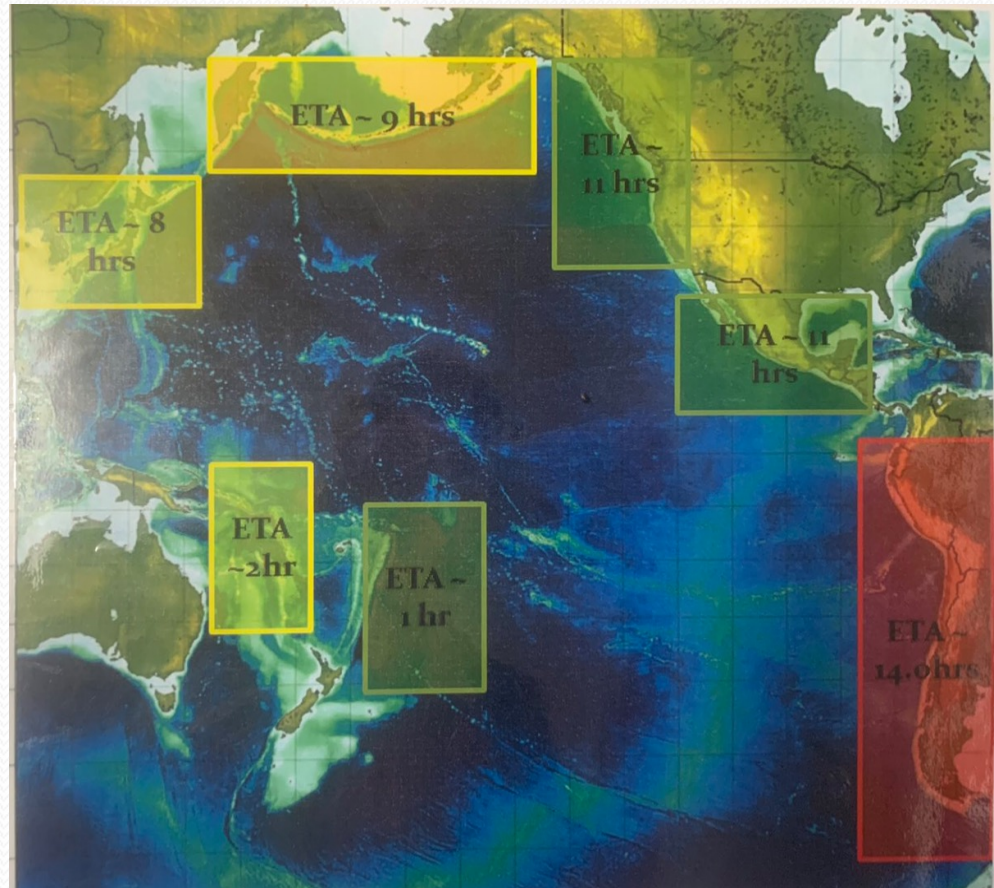


Seismology Units Responsibility

- The Seismology unit's primary role is to provide information on geo-hazards assessment and timely dissemination of information at the time of any local or felt regional event.
- The team coordinates with the National Disaster Management Office and other Operational Centers during any felt event or tsunami warning operation.
- Mineral Resources Department, Suva (earthquakes and possible aftershocks or tsunamis, landslides) Fiji National Disaster Management Plan 1998 (Section IV – 3)

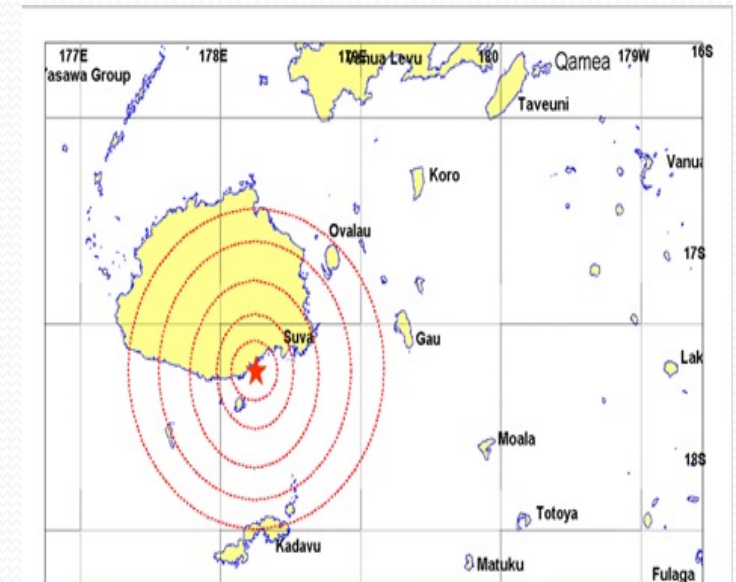
TSUNAMI CLASSIFICATION

	Wave Travel Time
Local	Less than 1.5 hour
Regional	More than 1.5 hours Less than 3 Hours
Distant	More than 3 hours



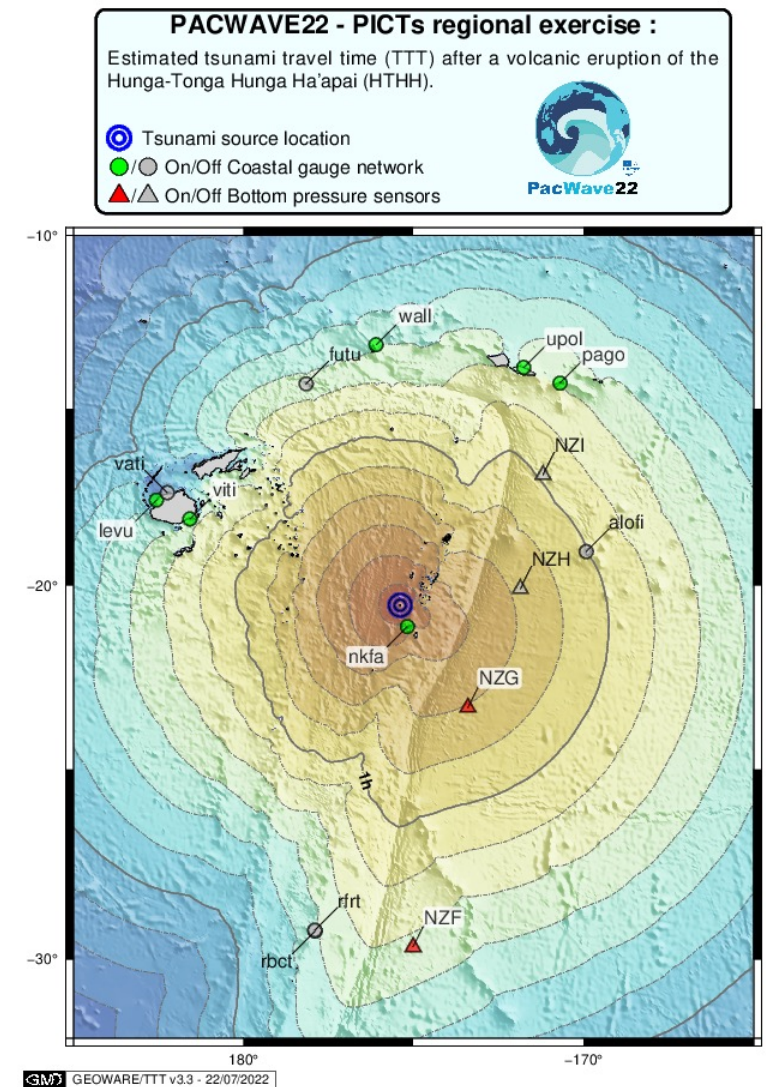
Local Source

- Earthquake Generated
- Vanuatu-Fiji-Tonga source– Estimated time of arrival is less than 1.5 hours for Fiji
- Eg. September, 14th 1953 –Suva Earthquake
 - Magnitude-6.7 Ms, Depth- 21km
 - Wave height ;
 - Nakasaleka- 5m
 - Suva- 5m
 - Levuka & Savusavu- 3m
 - 8 fatalities & 20 cases of serious injuries
 - The Suva Wharf, bridges, buildings, and water reticulation facilities in southeast Viti Levu faced severe damages.



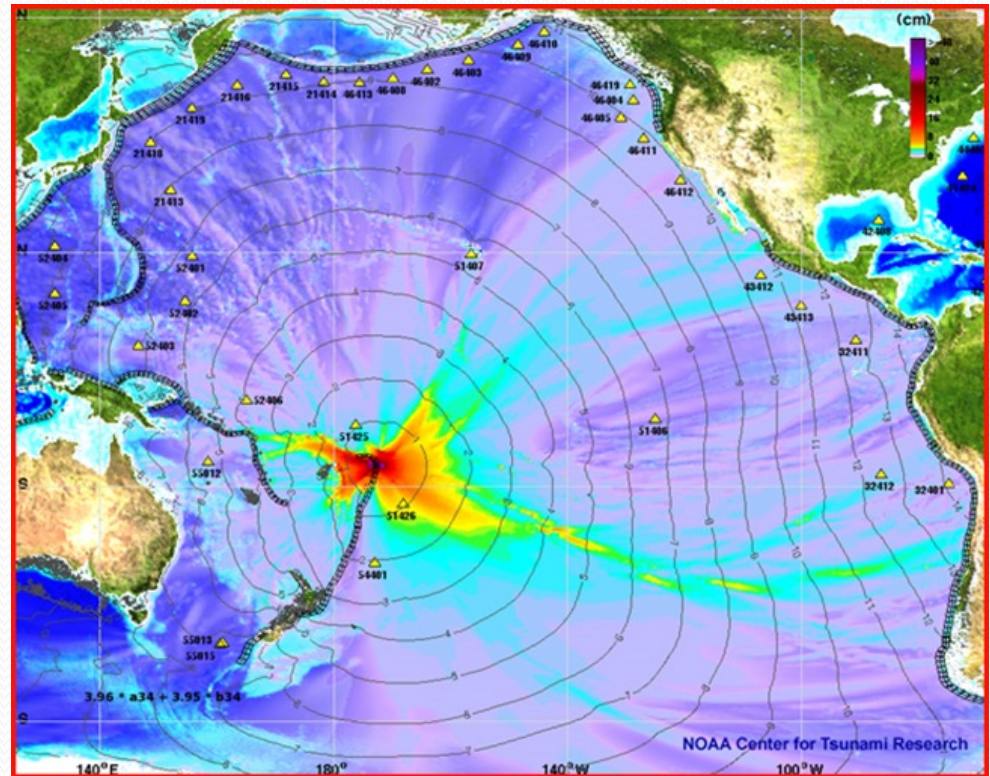
Local Source

- Volcano Generated
- Hunga Tonga Hunga-Ha'pai Volcano on the 15th of January
- Generated a 20meter wave that killed 4 people in Tonga
- This tsunami inundated coastal areas of Lau and Lomaiviti Group Kadavu and southern coast of Viti Levu.
- This tsunami follow a leading sonic boom (sound-wave) heard across the Fiji Group.



Regional Source

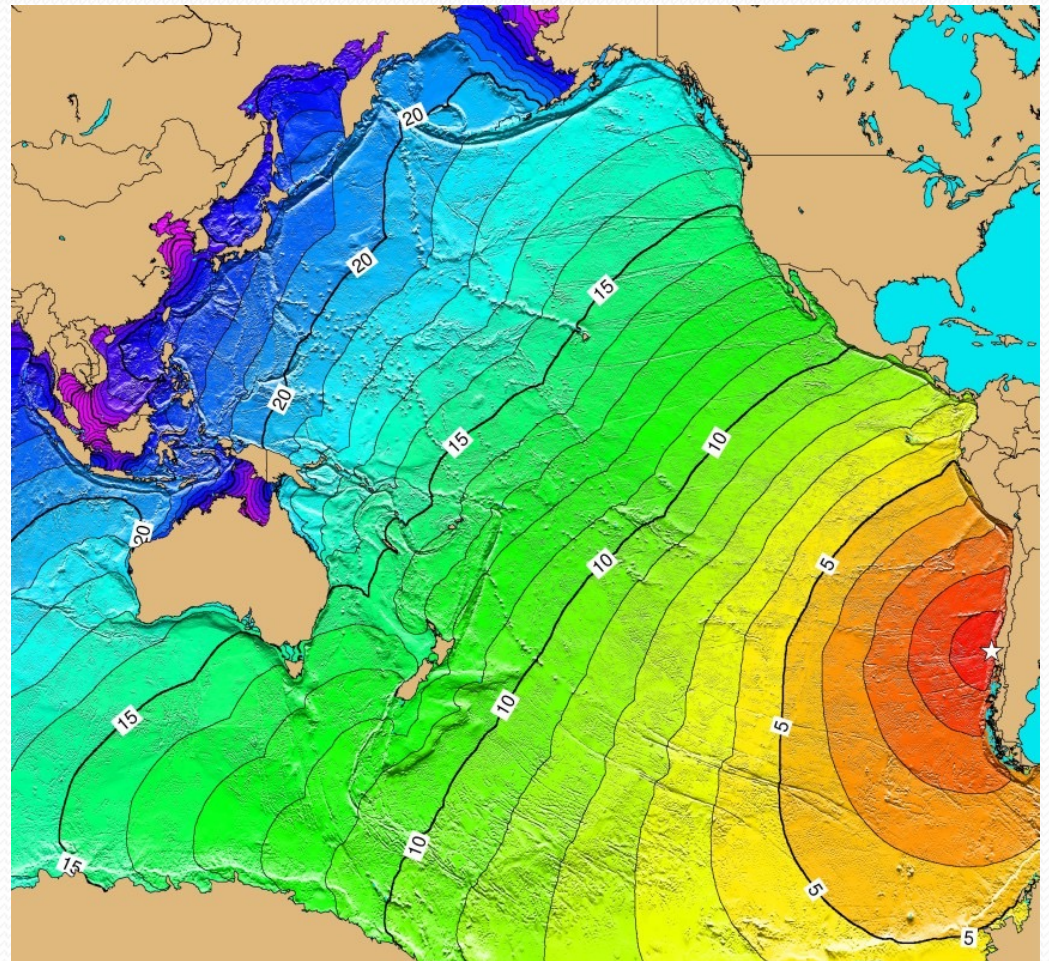
- A tsunami generally within 1,000 km or 1.5-3 hours tsunami travel time from its source.
- Eg -29th September, 2009 in the Samoa Region.
- Mag- 7.9, Depth- 15km
- Casualties- 189 in Samoa
- This tsunami was reported to have inundated Savusavu, Natewa Bay and a few coastal areas in Vanua Levu.



Source: PTWC

Distant Source

- A tsunami generally more than 1,000 km or more than 3 hours tsunami travel time from its source.
- Eg- 25th May, 1960- Great Chile Earthquake
- Mag- 9.6, Depth- 33km
- Casualties- 6,000
- This tsunami was reported to have inundated Savusavu, Natewa Bay and a few coastal areas in Vanua Levu.



Source: NOAA



WHERE DO TSUNAMI COME FROM?

CAUSES OF TSUNAMI



EARTHQUAKES



VOLCANOES



LANDSLIDES



SOURCES OF TSUNAMI

1. Distant or Telestsunami

A tsunami originating from a far away source, generally more than 1,000 km or more that 3 hours tsunami travel time from its source (e.g. Chile).

2. Regional

A tsunami capable of destruction in a particular geographic region, generally within 1,000 km or 1-3 hours travel time from its source (e.g. Tonga Trench or New Hebrides Trench).

3. Local

A tsunami from a nearby source (less than an hour away from the Fiji coastline (e.g. 1953 Navua earthquake).

WARNING PRODUCTS/ALERT LEVELS

<u>Warning Products</u>	<u>Alert Level</u>	<u>Public Action</u>	<u>Potential Hazard</u>
Tsunami Information	Information Statement	No action suggested at this time	No threat or very distant event for which hazard has 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



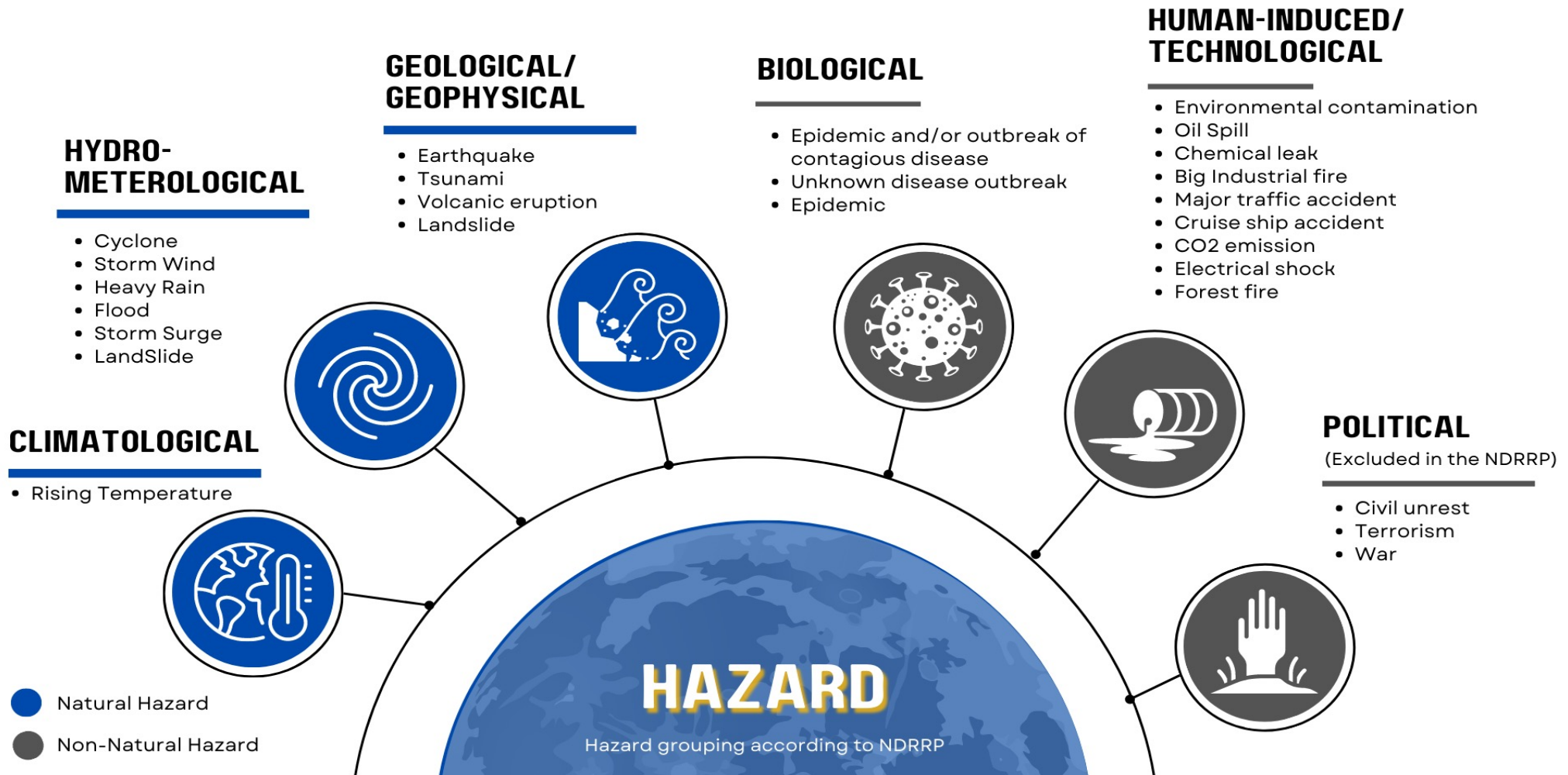
National Disaster Management Office



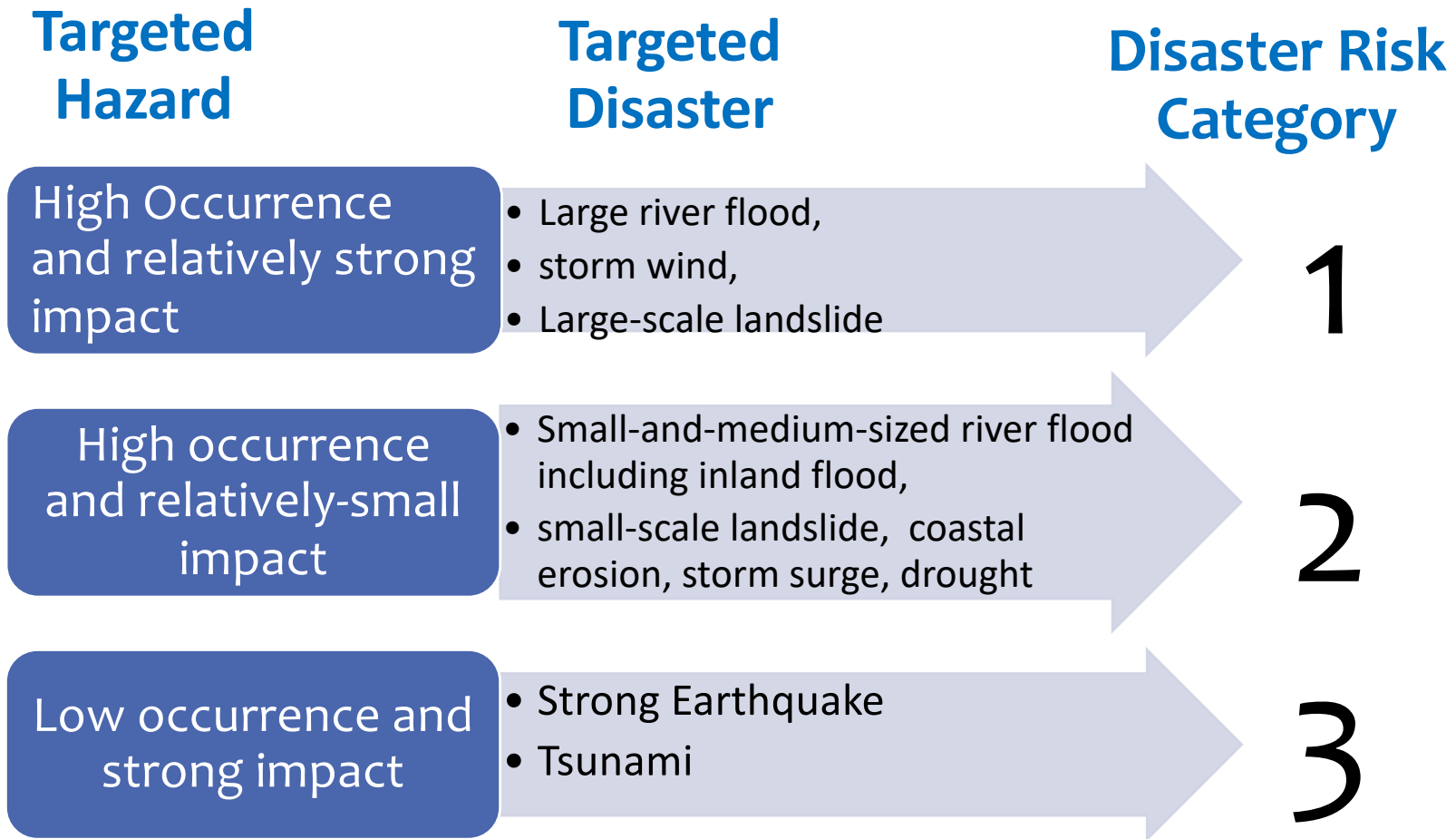
NDMO ROLES AND RESPONSIBILITIES

- Ministry of Rural & Maritime Development
- Implement policies/decisions of the National Disaster Management Council & Cabinet
- Advise National Disaster Controller, NDMC and other key agencies
- Formulate policies for disaster risk education management and related activities
- Oversee Disaster Training, Education & Awareness Functions
- Lead role in coordination of disaster response (natural hazards)
- Initiate & Co-ordinate preparedness of rehabilitation plans
- Review disaster preparedness and carry out post-disaster assessments

Disaster Risk Overview



Disaster Risk Category

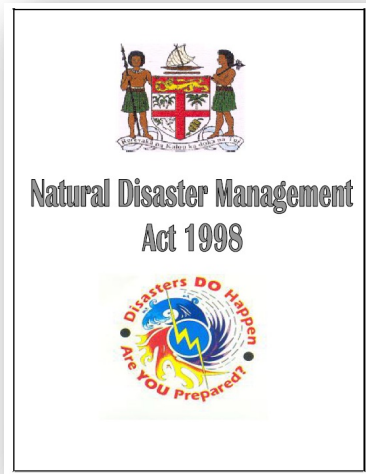


Warning Agencies

Hazard	EWS Mediums	Agency Responsible	Supporting Agencies
Cyclone	Radio bulletins, TV bulletins, RT communications, SMS	Fiji Meteorological Services	NDMO
Earthquake	Radio bulletins, TV bulletins, RT communications, SMS	Mineral Resources Department	NDMO
Tsunami	Radio bulletins, TV bulletins, RT communications, Siren alerts, SMS	Mineral Resources Department	NDMO
Floods	Radio bulletins, TV bulletins, RT communications, SMS	Fiji Meteorological Services	NDMO, Fiji Meteorological Services, Police
Landslide	Radio bulletins, TV bulletins, RT communications, SMS	Mineral Resources Department	NDMO, Ministry of Works
Drought	Radio bulletins, TV bulletins	Fiji Meteorological Services	Mineral Resources Department, and Ministry of Agriculture
Fire	Fire alarms, Radio bulletins, TV bulletins, RT communications	National Fire Authority	Police, NDMO, Ministry of Fisheries and Forests
Oil/ Hazardous Materials Spill – Land	Radio bulletins, TV bulletins, RT communications	National Fire Authority	Ministry of Environment
Oil/ Hazardous Materials Spill - Marine	Radio bulletins, TV bulletins, RT communications	MSAF	Police,
Public health crisis	Radio bulletins, TV bulletins, newspaper advertisements and supplements	Ministry of Health	NDMO
Invasive species	Radio bulletins, TV bulletins, newspaper advertisements and supplements	Biosecurity Authority of Fiji	NDMO



Disaster Management Legal Framework and Policies



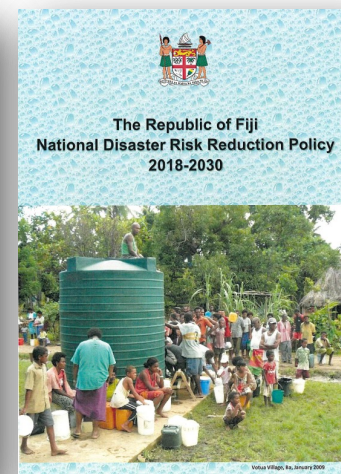
The Natural Disaster Management Act, 1998



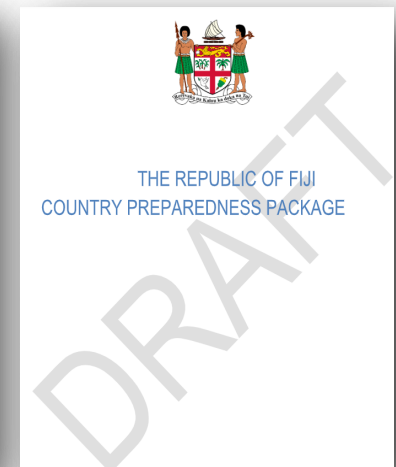
National Disaster Management Plan, 2017



The National Humanitarian Policy for Disaster Risk Management, 2017



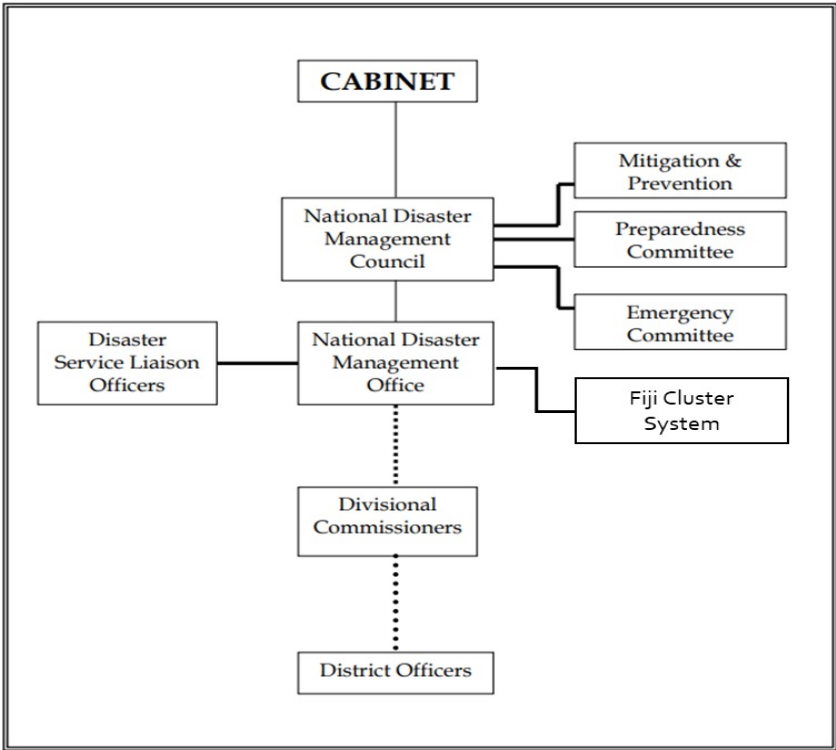
The National Disaster Risk Reduction Policy (NDRRP), 2018-2030



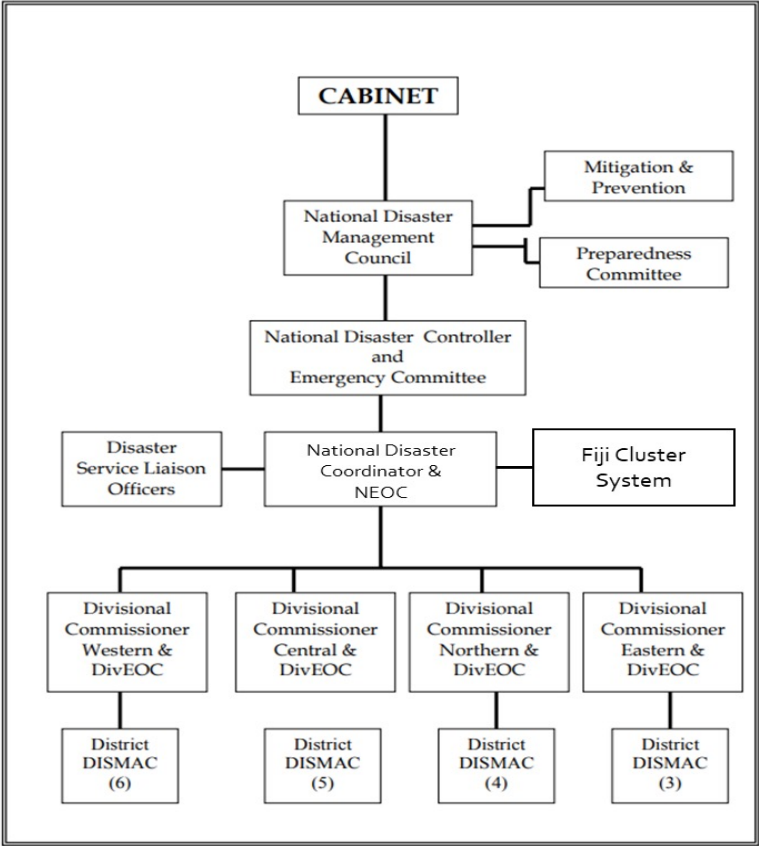
Country Preparedness Package (CPP)

Disaster Management Institutional Arrangement

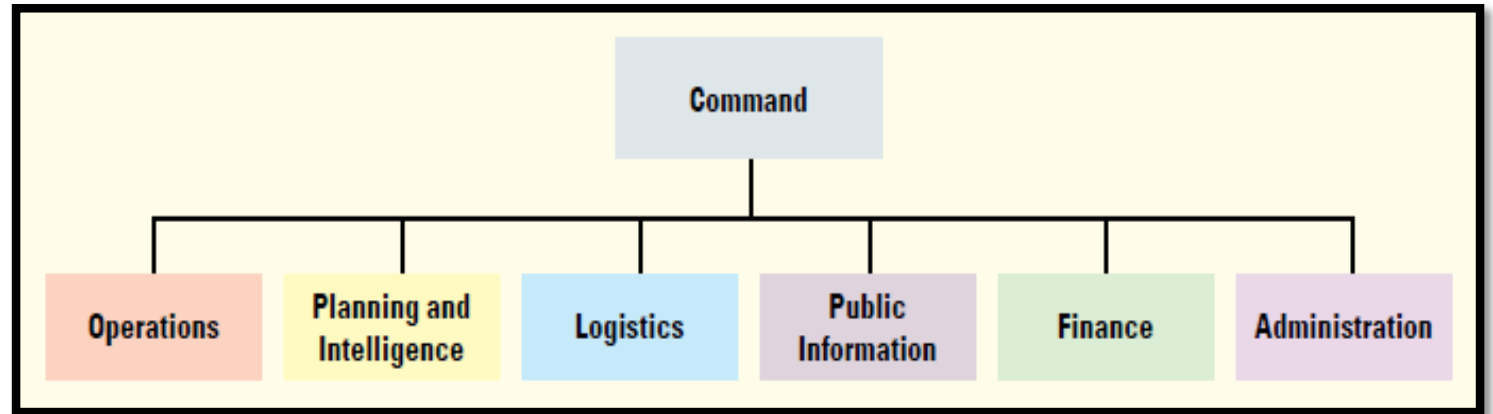
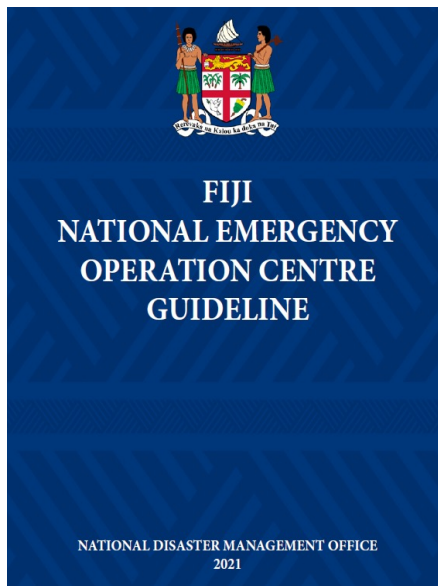
Preparedness Phase



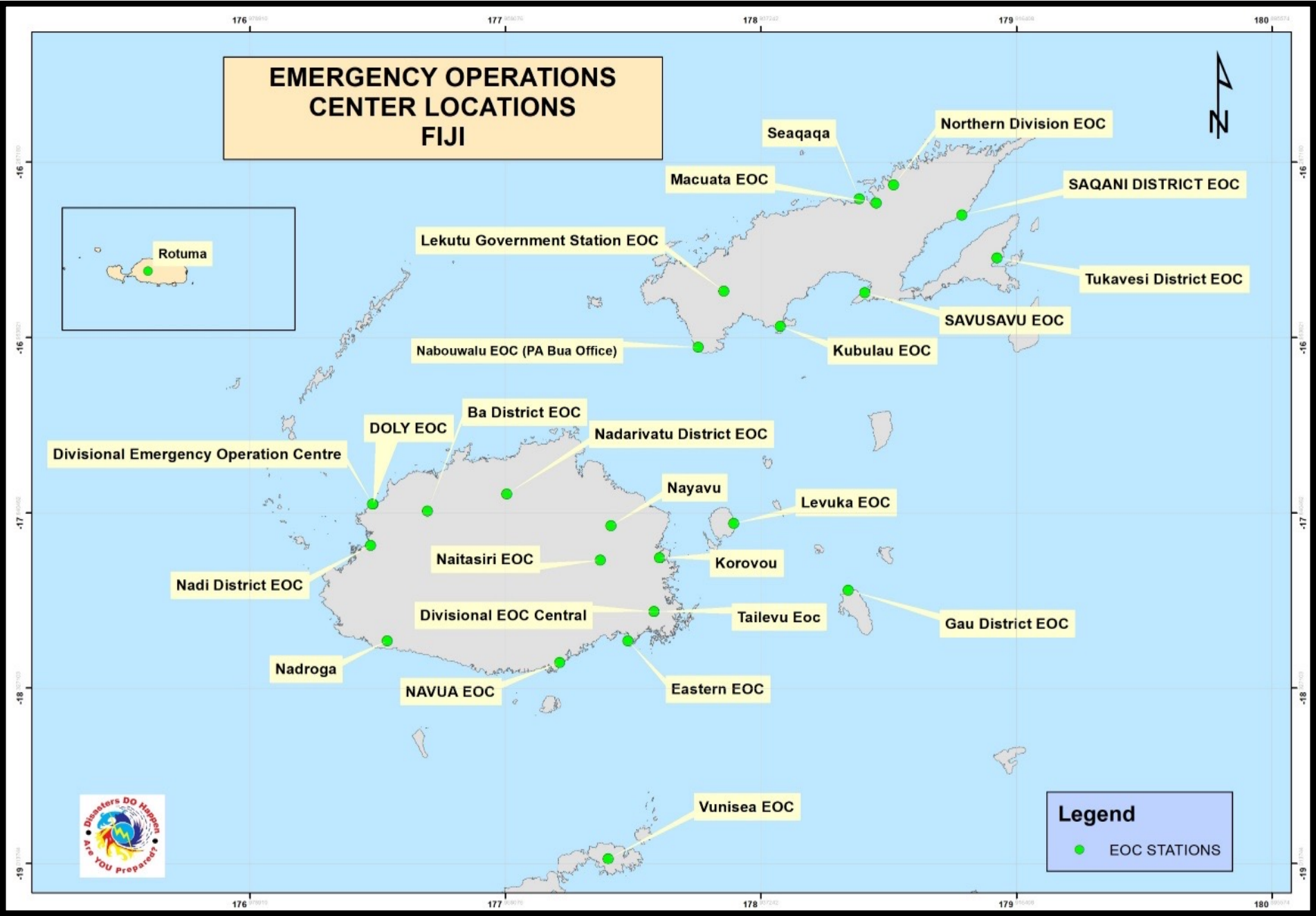
Response Phase



National Emergency Operations Centre (NEOC) Structure



EMERGENCY OPERATIONS CENTER LOCATIONS FIJI



Legend

- EOC STATIONS



WARNING PRODUCTS/ALERT LEVELS & RESPONSE ACTIONS

WARNING PRODUCTS	ALERT LEVEL	PUBLIC ACTION	POTENTIAL HAZARD	NDMO ACTIONS
Tsunami Information	Information Statement	No action suggested at this time	No threat or very distant event for which hazard has not been determined	NEOC on partial activation and monitors situation
Tsunami Watch	Watch	Be prepared to take action Stay tuned to local radio/TV	<u>Tsunami Possible</u> Alert level may change once more information is known	NEOC advises Divisional EOCs; District EOCs and First Responders (Police, Military, Navy, National Fire Authority, Health)
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	Evacuation Order (coastal communities order of ETA waves) Full activation of EOCs SMS Blasts Public Advisories Media Release *HF Radio/Sat Phone
Tsunami Warning	Warning	Move to high ground or inland immediately	Dangerous coastal flooding and powerful currents	Activation of Siren SMS Blasts Public Advisories Media Release All Clear upon Cancellation



TSUNAMI PREPAREDNESS ACTIVITIES

Tsunami Working Group :

- coordinates all tsunami preparedness & response planning activities
- infrastructure supporting communications and dissemination of national and regional oceanographic/tsunami (seismic and sea level) observations, forecasts, and warnings
- (2) identifying priorities and coordinating work related to planning and implementation of observational and communications systems, facilities, and equipment
- Membership: NDMO, Seismology Unit, MoE, Fiji Met, UNESCO IOC (co-opt members as required)



TSUNAMI PREPAREDNESS ACTIVITIES

National Disaster Awareness Week (October)

- Community training & awareness before drills



TSUNAMI PREPAREDNESS ACTIVITIES

World Tsunami Awareness Day (5th November)

- Table top exercises : test agency tsunami response plans
 - Drills
- School poster competition



Monthly Siren Tests

- Siren test : 5th of every month
- Internal Communications Test
 - Email
 - Viber platform
- Routine maintenance check



PUBLIC ADVISORY



National Disaster Management Office

NDMO TO CONDUCT LIVE TSUNAMI SIREN TEST - 05 JUNE 2023

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 05th June, 2023**.

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

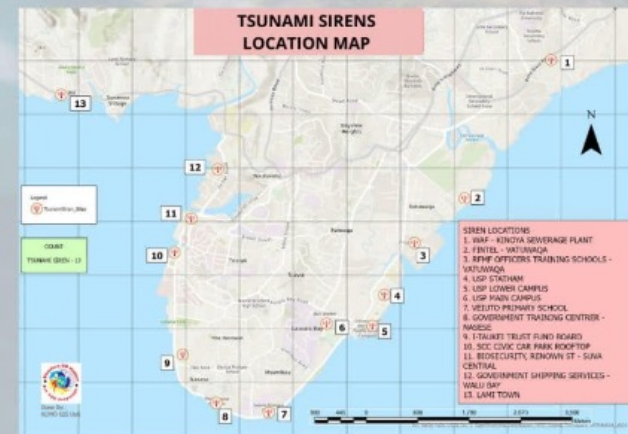
There are a total of 13 sirens installed along the Suva foreshore, having an acoustic range of 1.2kms.

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. Veiuto Primary School
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

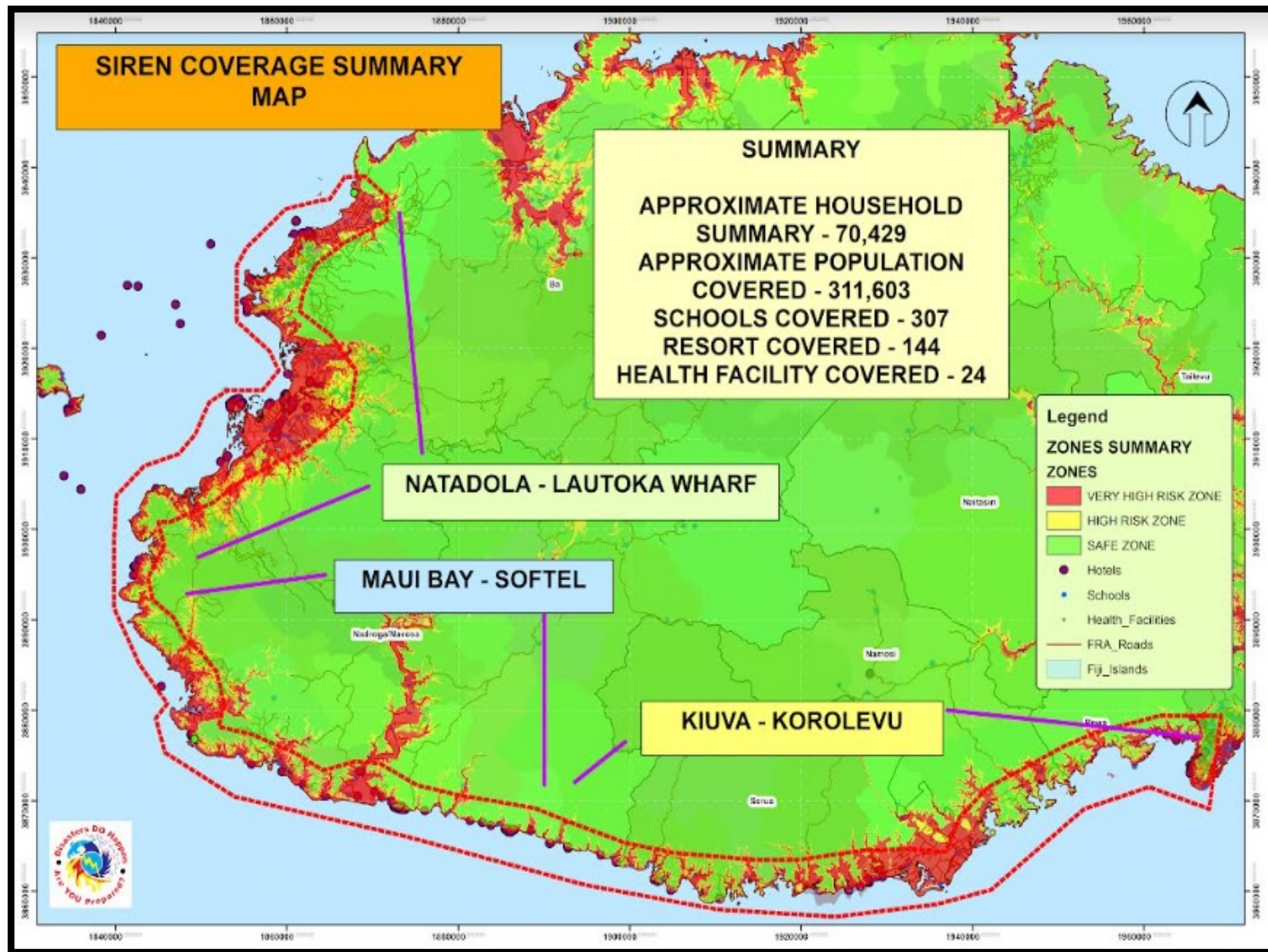
ALL THIRTEEN (13) TSUNAMI SIRENS WILL BE ACTIVATED. However, **NO EVACUATION** is REQUIRED.

For any further enquiries, please call the NDMO on 3319250 or email neofiji@gmail.com. You can also get in touch via Facebook on @FijiNDMO or Twitter on @FijiNDMO.



Issue Date: 2 June, 2023

- Tsunami Siren Network Extension Project – funded by the Government of Japan

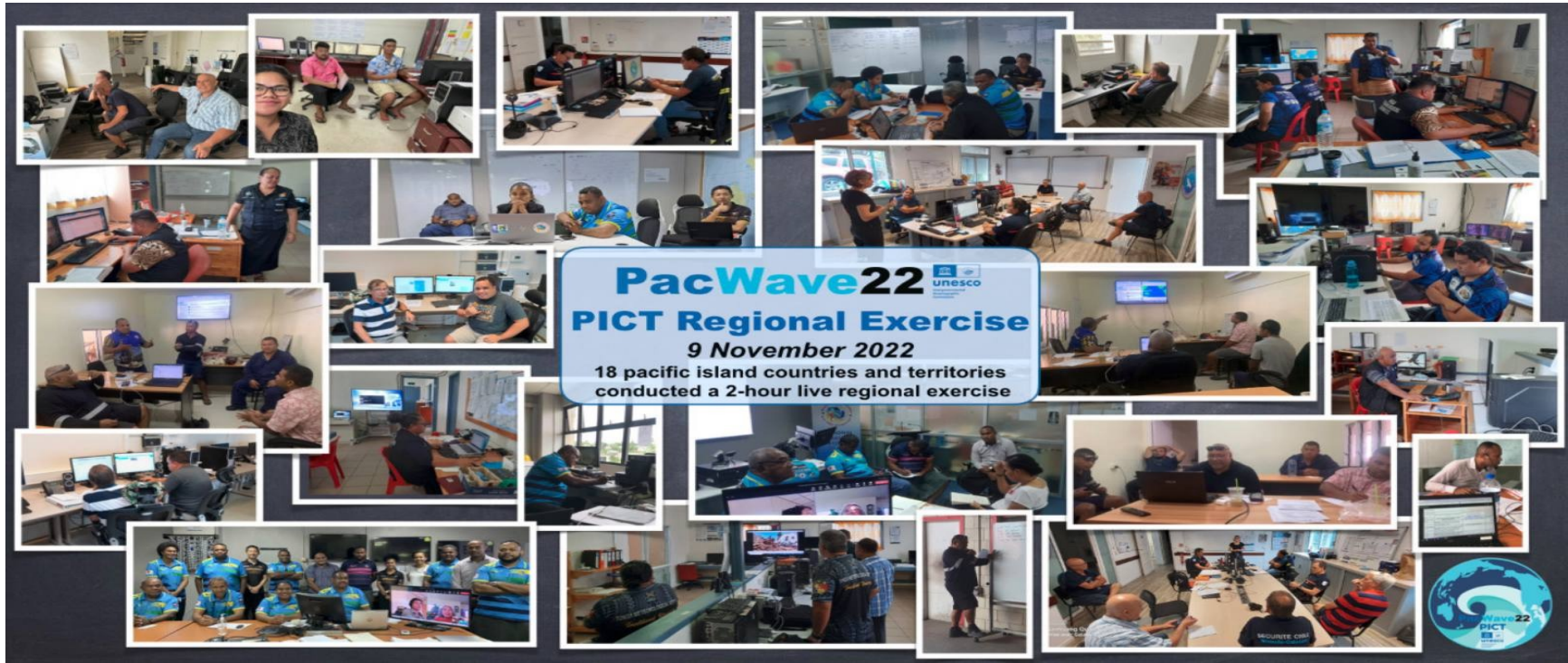


Tsunami Extension Project

- A total of 26 additional tsunami sirens will be installed from the southernmost point of Nasamila District School in Tailevu, to Lautoka City
- Site selection is based on the following three criteria:-
 - **Population density:** All homes within the 20m tsunami hazard zone in Fiji were mapped, then the high-density areas were identified. These gave high density hazard zones;
 - **Key infrastructure location:** such as schools, hospitals, community halls that would present a high-density population; and
 - **Tourism locations:** concentration of tourism activity

SRL	SITE	SRL	SITE
1	Nasamila Primary School Compound, Nasilai/Kiuva, Tailevu	14	Korolevu Government Station Compound, Baravi, Nadroga
2	Rewa Provincial Council Office Compound, Lomanikoro, Rewa	15	Maui Bay Compound, Baravi, Nadroga
3	Nadawa Garment Factory Compound, Nadawa, Nasinu	16	Vatukarasa Village Compound, Baravi, Nadroga
4	Fiji Navy HQ Compound, Nakula Street, Lami	17	Outrigger Resort Compound, Korotogo, Nadroga
5	Muaivuso Village Compound, Navakavu, Lami	18	TFL Tower, Sigatoka Town
6	Kalokolevu Village Compound, Navakavu, Lami	19	Fijian Resort Compound, Cuvu, Nadroga
7	Navua Hospital Compound, Namelimeli, Navua	20	Natadola Golf Club Compound, Nadroga
8	TFL Tower, Navua Town	21	InterContinental Resort Compound, Momi, Nadroga
9	Deuba District School Compound, Deuba, Serua	22	Rendezvous Resort Compound, Nabila, Nadroga
10	TFL Tower, Pacific Harbour, Deuba	23	Sonaisali Resort Compound, Nadi
11	Ministry of Fisheries Office Compound, Lomary, Serua	24	Denarau Island Resort Compound, Nadi
12	Serua Island Village Compound, Serua	25	Vuda Top Veiseisei
13	Namatakula Village Compound, Baravi, Nadroga	26	Lautoka City TFL Tower





TSUNAMI PREPAREDNESS ACTIVITIES

Tsunami Ready Programme

- To be piloted in September 2023
- **Standardising**
 - Modelling
 - Community Based Tsunami Response Planning
 - Evacuation Maps
 - Signages
 - Awareness Messages



CHALLENGES

- Awareness for Decision Makers
- Public Awareness : self evacuation – expect sirens
- Communications – black spot areas





Thank You

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