

***Country: Pakistan***



**Webinar:  
Lessons Learnt during  
Exercise IOWave 2023**

**12 - 13 December 2023**

***Name: Ameer hyder***  
***Organisation: Pakistan Meteorological***  
***Department***  
***Email: free2hyder@yahoo.com***

## Scenarios Exercised

---



Andaman Trench (4 Oct)



Makran Trench (11 Oct)



Heard Island (18 Oct)



Java Trench (25 Oct)

*Please insert logos of participating organisations here.*



## Exercise Participants

---



Please explain which **segments of your society** participated in the exercise: **no**

**Only NDMA,**

**And**

**One private news Geo TV channel.**

# National Tsunami Warning & Mitigation System

---



*Please elaborate briefly on the Tsunami Warning & Mitigation System in your country: **Pakistan***

*Organisation: **Pakistan Meteorological Department.***

# **PAKISTAN METEOROLOGICAL DEPARTMENT**

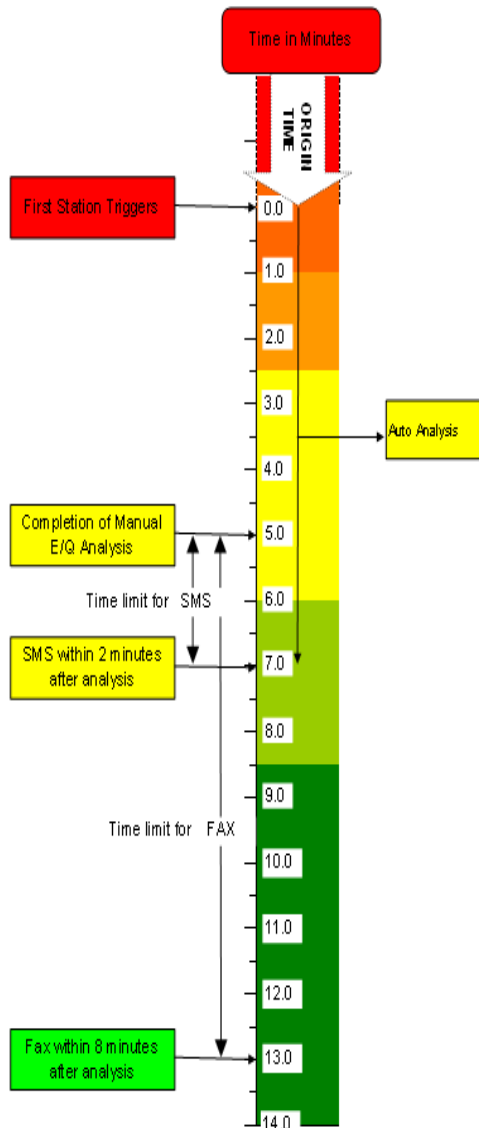
## **OBJECTIVES & RESPONSIBILITIES**

**To ensure, Timely issue warning of all kind natural Disasters types of weather/flood forecasts, warnings and advisories to the National News , Media and concerned functionaries.**

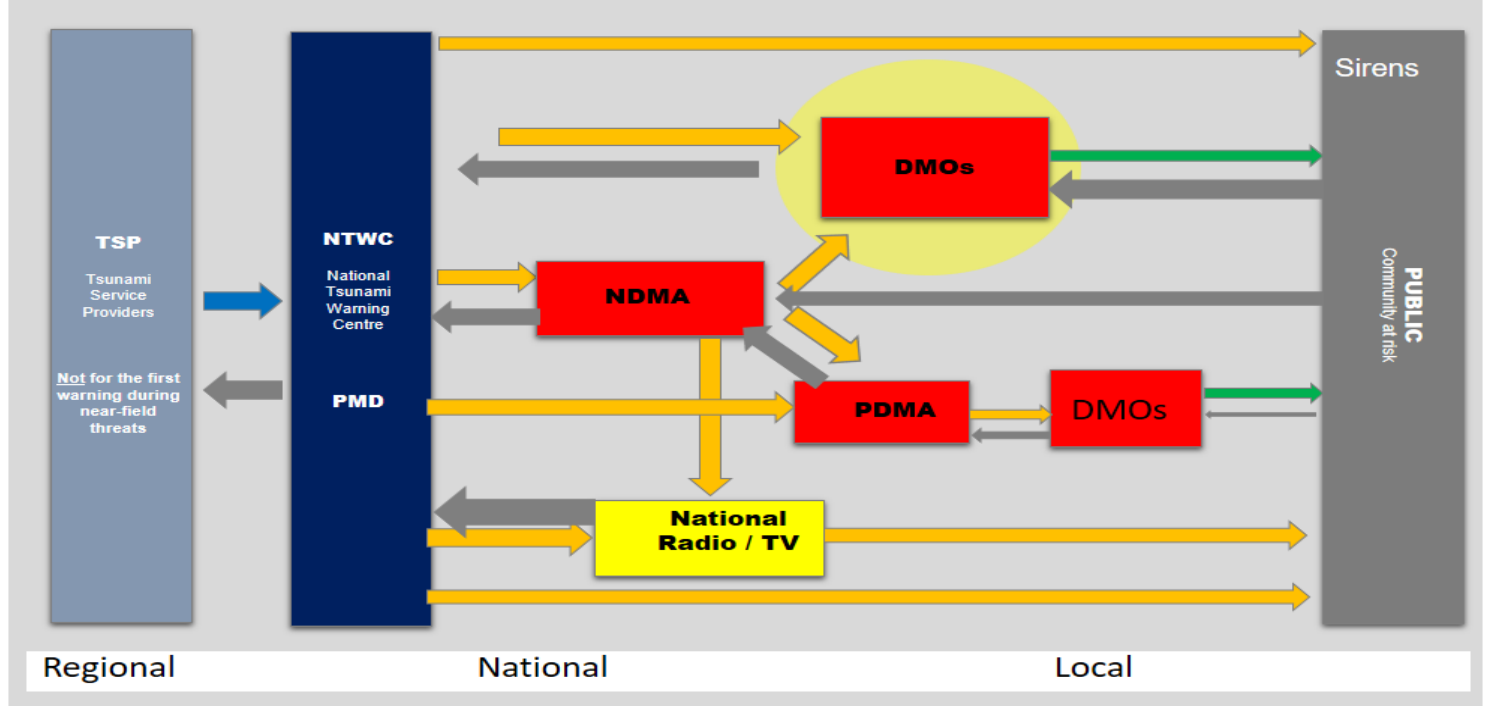
# **COMPONENTS OF TSUNAMI EARLY WARNING**

- A. Acquisition of Earthquake Data.**
- B. Analysis & Decision to issue Tsunami warning.**
- C. Dissemination of Tsunami Early Warning**
- D. Exercises**

# TIME LINE FOR EARTHQUAKE PROCESSING AND DISSEMINATION OF TSUNAMI BULLETIN (FOR MAKHRAN SUBDUCTION ZONE)



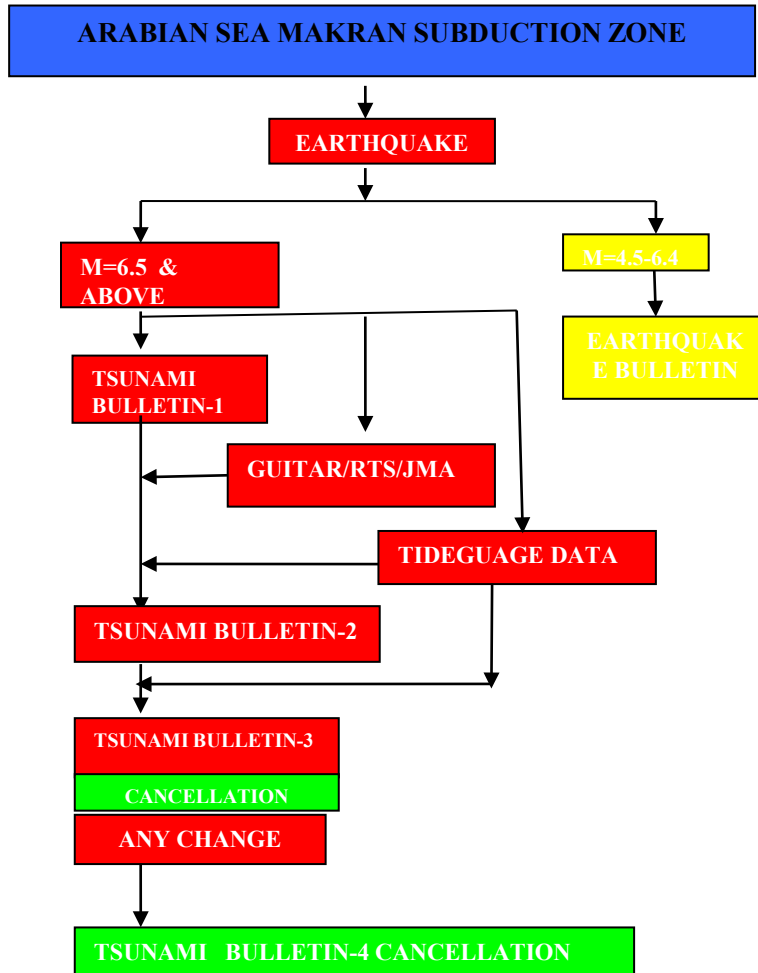
Timeline message in case of near-field threats (Minutes after EQ)



**Pakistan**  
12/12/2023

Wave Height	Level	Advice
≥2m	Warn	Evacuate inland towards higher ground.
0.5-1.9m	Alert	Stay away from beaches, rivers and low lying coastal areas.
0.2-0.5m	Watch	No immediate action required. Be prepared for action on updated information.
<0.2m	No Threat	"All clear."

**SOP FOR ISSUANCE OF “TSUNAMI BULLETINS”  
IN ARABIAN SEA (MAKRAN SUBDUCTION ZONE)**



1. For earthquakes having magnitude between **4.5 to 6.4**, only earthquake parameters will be sent to **RESPONSE AUTHORITIES** and **MEDIA** through **SMS** and **FAX**.

2. Maximum four Bulletins will be issued for earthquakes having magnitude **6.5** or above to **RESPONSE AUTHORITIES** and **MEDIA**.

3. **BULLETIN-1**:- This bulletin will contain;

- i. Earthquake Parameters.
- ii. Tsunami evaluation based on historical earthquake and tsunami data.

*•This bulletin will be issued according to time line of Bulletin-1.(page-9)*

4. **BULLETIN-2**:- This bulletin will contain;

- i. Revised **Earthquake Parameters** (if so).
- ii. **Estimated arrival times and wave heights** at various locations along Pakistan Coast based on **GUITAR/RTS** of Australia, Indonesia and India.
- iii. **Tide gauge data** if generation of tsunami has been confirmed.

*•This bulletin will be issued soon after the dissemination process of Bulletin-1 is completed.*

*•In case the Tsunami generation is confirmed, the first sentence of Evaluation will be deleted.*

5. **BULLETIN-3**:- This bulletin will contain;

- i. Revised **earthquake parameters** (if so).
- ii. **Tide gauge data** of Pakistan Coast to confirm the generation of tsunami.
- iii. Any change if tsunami has been confirmed in **Bulletin-2**.
- iv. This bulletin will serve as cancellation in case a sufficient time has lapsed after the estimated arrival time but no significant change is observed in sea level. In such case it will be the last bulletin.

*•This bulletin will be issued when ever tide gauge data confirms the tsunami generation (CONFIRMATION).*

6. **BULLETIN-4**:- (Cancellation)

- i. This bulletin will contain earthquake parameters and tsunami evaluation regarding cancellation.
- ii. This will be the last bulletin and will serve as cancellation.

*Important. Supplementary bulletins (SMS/FAX) will be issued in between regular bulletins depending upon the prevailing situation.*



# List of contact numbers

MAGNITUDE RANGE	MATTER TO BE SENT ON FAX	SEND TO	
Less than 6.0	No message to be passed except Chief Met.	<b>CHIEF MET</b> <b>0300-8026286</b>	
6.0-6.4	Earthquake Parameters	<b>1.DG Met.S</b> <b>2.NDMA</b>	<b>051-9250368</b> <b>051-9204197</b>
6.5-7.0	Earthquake Parameters & Tsunami Evaluation.	<b>3.DCO GAWADAR</b> <b>4.DCO LASBELLA</b>	<b>0864-211362</b> <b>0853-610252</b>
7.1-7.5	Earthquake Parameters & Tsunami Evaluation.	<b>5.PDMA</b> <b>BALUCHISTAN</b>	<b>081-2880189</b> <b>021-35830087</b>
7.6-8.0	Earthquake Parameters & Tsunami Evaluation.	<b>6.PDMA SINDH</b> <b>7.DCO KARACHI</b>	<b>021-9205612</b> <b>021-9232432</b>
Greater than 8.0	Earthquake Parameters & Tsunami Evaluation.	<b>8.DCO THATTA</b> <b>9.DCO BADIN</b>	<b>0298-920069</b> <b>0297-861471</b>



# Modes of Early Warning Dissemination



SMS messenger

PMD Website

Email



FAX

Serial	Name
01680161SKY21E2	Tsunami 2
01670180SKYEAF1	Tsunami 3
01670173SKY4ECE	Tsunami 4
01639365SKY9516	Tsunami 1
01670146SKY6247	Tsunami 5



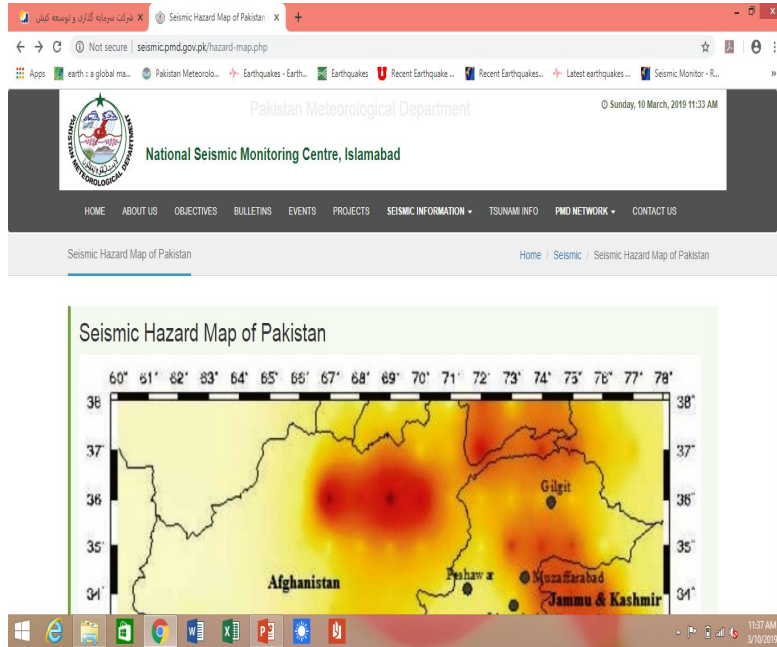
Alarm System (Proposed)



# PMD official web page for latest earthquake updates

<http://seismic.pmd.gov.pk/events.php>

## GTS Tsunami Warning system



**Meteorological Data Communication and Plotting System**  
 Product Code #: EWP/K150122  
 Licensed to: Department of Meteorology, Male' Maldives  
 MCI Socket Server Application 2.1.1

Message List | **Urgent Messages** | Connection Log | Filename Log | System Error Log | File List | Arrange Data

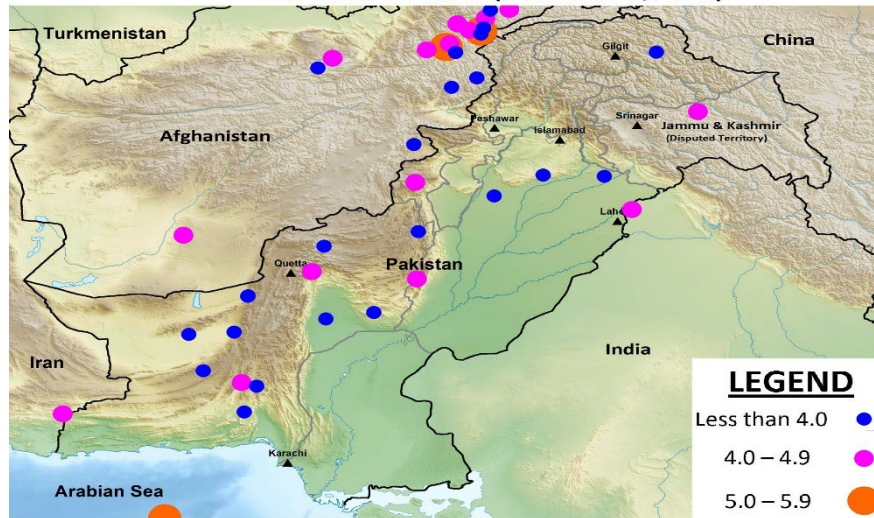
Connection Date : 2009-07-06 Message Time : 18:15:1206-07-2009 18:15:12  
 WEIO23 PHEB 061233  
 TIBID:  
 TSUNAMI BULLETIN IN NUMBER 001  
 PACIFIC TSUNAMI WARNING CENTER/NQAA/NWS  
 ISSUED AT 0350Z 29 APRIL 2009

THIS BULLETIN IS FOR ALL AREAS OF THE INDIAN OCEAN.  
 ... TSUNAMI INFORMATION BULLETIN ...  
 THIS MESSAGE IS FOR INFORMATION AND TEST PURPOSE ONLY ONLY.  
 THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS  
 ORIGIN TIME - 0350Z 29 APRIL 2009  
 COORDINATES - 11.2 NORTH 65.1 EAST  
 LOCATION - SOUTH-EAST ARABIAN SEA  
 MAGNITUDE - 8.5

EVALUATION  
 A DESTRUCTIVE WIDESPREAD TSUNAMI THREAT EXIST BASED ON HISTORICAL EARTHQUAKE AND TSUNAMI DATA.  
 THERE IS A POSSIBILITY OF A WIDE SPREAD TSUNAMI THAT COULD AFFECT THE COASTS LOCATED FIFTEEN HUNDRED KILOMETERS AWAY FROM THE EARTHQUAKE.  
 PROPRIETARY AUTHORITIES IN THE REGION NEAR THE CENTER SHOULD BE

SEISMICITY MAP ( DECEMBER, 2018)



Events (6040)

Date	Time (utc)	Latitude	Longitude	Magnitude	Depth (km)	Region	Mode	Map
07/03/2019	15:27:28	32.89 S	177.42 W	5.5	10	South of Kermadec Islands	A	-
07/03/2019	15:34:28	29.48 S	72.51 W	5.7	10	Off Coast of Central Chile	A	-
07/03/2019	11:31:38	30.79 N	140.76 E	5.3	10	Southeast of Honshu, Japan	A	-
07/03/2019	10:59:17	23.23 S	174.16 W	5.0	10	Tonga Islands Region	A	-
07/03/2019	10:56:06	38.81 N	69.77 E	4.8	19	Tajikistan	A	📍
07/03/2019	09:46:06	51.89 N	175.29 W	5.1	96	Andreanof Islands, Aleutian Islands	A	-
07/03/2019	06:44:24	28.93 N	68.96 E	4.2	10	Near Dera Bugti, Pakistan	M	-

# Communication Gaps Identified BY NTWC Karachi

- TSP Australia**

GTS Received 06:00 up to 06:30 ( UTC)	FAX Received 06:00 up to 17:30 ( UTC)	Email Received 06:00 up to 17:30 ( UTC)	SMS Received 06:00 up to 09:30 ( UTC)
05	Nil	15	08
GTS Not Received	FAX not Received	Email not Received	SMS not Received
11 messages from 07:30 up to 17:30 (UTC)	Nil Fax Received 06:00 up to 17:30 ( UTC)	01 message -4 Email not Received 06:30( UTC)	08 SMS message -4 and message 09-15

# Communication Gaps Identified BY NTWC Karachi

- TSP INDIA**

GTS Received 06:00 up to 06:30 ( UTC)	FAX Received 06:00 up to 17:30 (UTC)	Email Received 06:00 up to 17:30 ( UTC)	SMS Received 06:00 up to 17:30 ( UTC)
05	12	16	Nil
GTS Not Received	FAX not Received	Email not Received	SMS not Received
11 messages from 07:30 up to 17:30 (UTC)	04 Fax message 1-3 and 15 not Received	Nil (all messages Email Received)	Nil SMS message Received

# Communication Gaps Identified BY NTWC Karachi

- TSP INDONESIA**

GTS Received 06:00 up to 06:30 ( UTC)	FAX Received 06:00 up to 17:30 ( UTC)	Email Received 06:00 up to 17:30 ( UTC)	SMS Received 06:00 up to 17:30 ( UTC)
04	Nil	15	Nil
GTS Not Received	FAX not Received	Email not Received	SMS not Received
12 messages 5-15 from 07:30 up to 17:30 ( UTC)	Nil Fax Received 06:00 up to 17:30 ( UTC)	01 message -00 Email not Received 06:00( UTC)	Nil SMS message Received

## National Organisation of Exercise IOWave23



How was it planned?

*Ans: it was planned very good because NTWC has planned to take on board to all stakeholder and we had issued invitation letter among the all Stakeholders for specially PDMA Baluchistan and Sindh and the drill targeted area was PASNI and planned for triggering of siren system and to include the Pasni committees and school But unfortunately due to beget constrain so it was not achieved.*

*How was it executed? After this Pakistan NTWC finally went for table top drill to evaluate Tsunami Ready .*

*Summary : during the drill, which was conducted, as routine drill but this time, NTWC have engaged NDMA and electronic Media coverage for the real time Monitoring.*

*Similarly , Miss Gazala Naeem was observed as a external observer .*



## Lessons Learnt

---

What worked well?

Ans : we were included all shift members to handle such kind of seniors, if occurred in near future. They took part very efficiently ( improvement).

How can more at-risk communities be involved in future exercises?

This is very serious issue, which is can only performed well with communities, the communities should take part and also all Government stakeholders should play their own roll seriously.

Financial support should included, for execution of Full scale drills.

# Images and video

Some images representing the activity of the warning system and a video [drill.mp4](#) participation in Exercise IOWave23 in your country





**THANK YOU**